

**WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AMBIENT AIR QUALITY MONITORING REPORT
JANUARY 2023
REPORT HISTORY**

Original report release data: February 28, 2023

Revised report release date: August 30, 2023

Revision 1 – Submission of H₂S data and Revision of TRS data at Patricia McInnes.

The Patricia McInnes air monitoring station (AMS06) collected H₂S data from January 3, 2023, to June 12, 2023, but it was reported as TRS. On August 30, 2023, the data was resubmitted as H₂S to the Electronic Transfer System (ETS) and the TRS data was revised. The monthly report cover letter, station summary, network summary, and calibration report contained within have been revised to reflect the change.



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Wood Buffalo Environmental Association

**JANUARY 2023
MONTHLY REPORT**

CONTINUOUS MONITORING

August 30, 2023

Revision 01

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





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August 30, 2023

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**RE: Monthly Ambient Air Quality Monitoring Report January 2023 – Revision 01
Wood Buffalo Environmental Association**

Enclosed is the January 2023 Ambient Air Quality Monitoring Report for the continuous ambient air quality monitoring stations of the Wood Buffalo Environmental Association (WBEA) regional air quality monitoring network.

The continuous ambient air quality monitoring network stations are:

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

The WBEA submits this report on behalf of its members and for some members to satisfy the requirements contained in their EPEA Approvals (as amended):



Government Members

Alberta Energy Regulator
Alberta Environment and Protected Areas
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
Chard Métis 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.
ChemTrade Logistics
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
404827-00-00
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



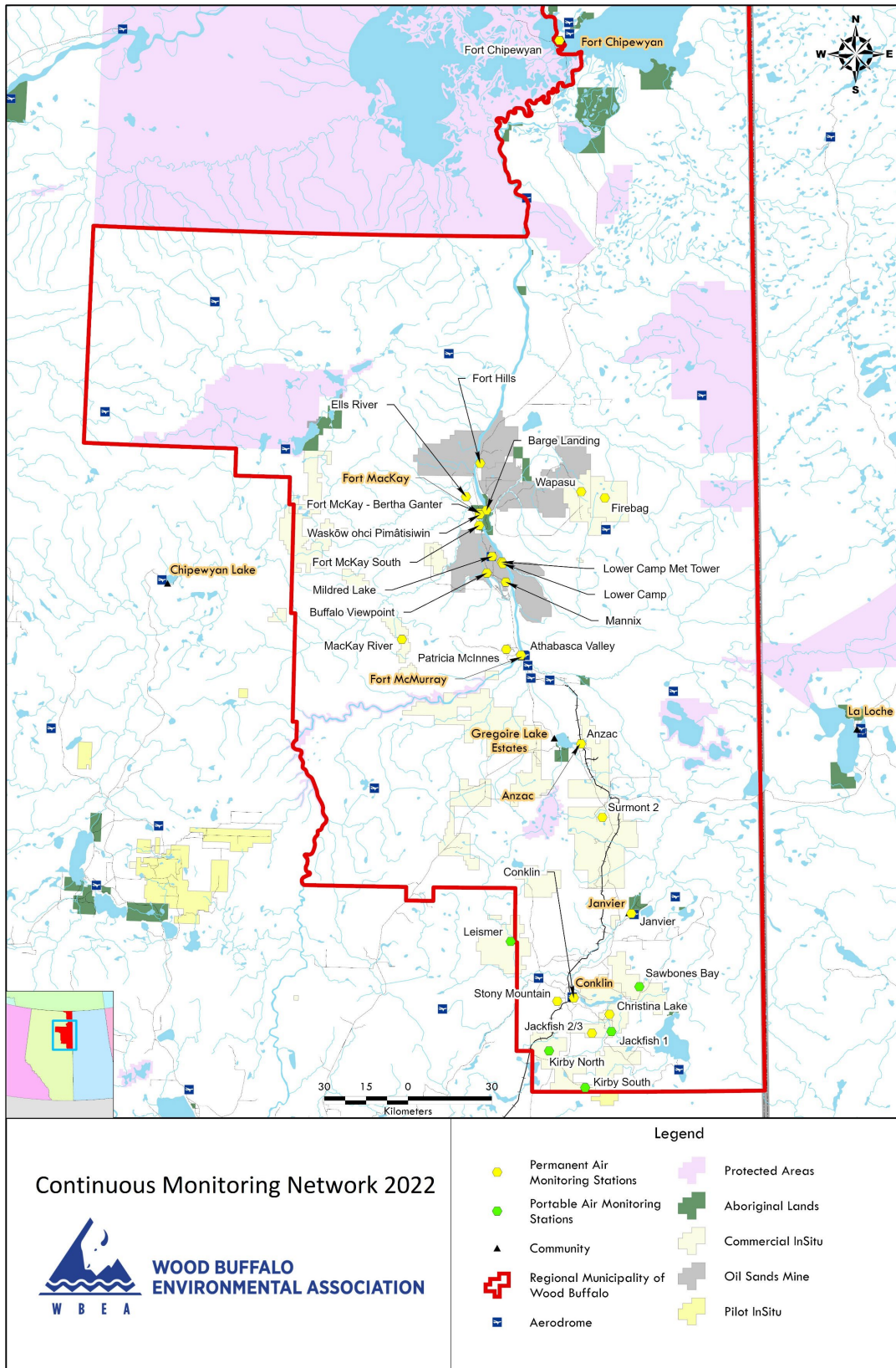


Figure 1: Map of WBEA Continuous Monitoring Network

The following operational notes are provided as per the Air Monitoring Directive requirements.

1.0 Concentrations in Excess of Alberta Ambient Air Quality Guidelines and Objectives

There were no ambient concentrations in excess of the Alberta Ambient Air Quality Objectives or Guidelines (AAAQO/AAAQG) as indicated in the Air Monitoring Directive Section RC 5-F for CO, NH₃, NO₂, O₃, and TRS.

There were fourteen ground-level concentration in excess of the 1-hour H₂S objective reported to AEPA; following data validation and processing only ten exceedances were confirmed.

There was one ground-level concentration in excess of the 24-hour H₂S objective reported to AEPA; following data validation and processing this exceedance were confirmed.

There was one ground-level concentration in excess of the 1-hour O₃ objective reported to AEPA; following data validation and processing this exceedance was not confirmed.

There were twelve ambient ground level concentrations in excess of the 1-hour PM_{2.5} guideline reported to AEPA; following data validation and processing these exceedances were confirmed.

There were five ground-level concentration in excess of the 24-hour PM_{2.5} objective reported to AEPA; following data validation and processing these exceedances were confirmed.

There was one ground-level concentration in excess of the 1-hour SO₂ objective reported to AEPA; following data validation and processing this exceedance was not confirmed.

Site	Parameter	Date / Time	Reference	Period	Reported	Final	Status*
Anzac	O3	1Jan23, 11:00	-	1-hr	-	-	ret
Stony Mtn.	PM2.5	7Jan23, 23:00	408422	1-hr	96	96.1	exc
Stony Mtn.	PM2.5	7Jan23, 24:00	408422	1-hr	101	101.2	exc
Conklin	PM2.5	7Jan23, 24:00	408423	1-hr	84	84.4	exc
Stony Mtn.	PM2.5	8Jan23, 01:00	408424	1-hr	108	107.6	exc
Ells River	PM2.5	8Jan23, 04:00	408425	1-hr	87	87.0	exc
Ells River	PM2.5	8Jan23, 24:00	408412	24-hr	35	35.2	exc
Conklin	PM2.5	8Jan23, 24:00	408413	24-hr	45	45.1	exc
Barge Landing	PM2.5	15Jan23, 05:00	408675	1-hr	95	94.9	exc
Ft. McKay S	PM2.5	15Jan23, 05:00	408674	1-hr	81	80.7	exc
Buffalo Viewpoint	PM2.5	15Jan23, 07:00	408673	1-hr	162	161.7	exc
Buffalo Viewpoint	PM2.5	15Jan23, 08:00	408673	1-hr	134	133.7	exc
Buffalo Viewpoint	PM2.5	15Jan23, 09:00	408673	1-hr	88	88.0	exc

Buffalo Viewpoint	PM2.5	15Jan23, 10:00	408673	1-hr	84	83.6	exc
Mannix	H2S	15Jan23, 11:00	408657	1-hr	19	19.2	exc
Mannix	H2S	15Jan23, 16:00	408666	1-hr	12	12.1	exc
Mannix	H2S	15Jan23, 17:00	408666	1-hr	30	29.5	exc
Mannix	H2S	15Jan23, 18:00	408666	1-hr	34	34.0	exc
Mannix	H2S	15Jan23, 19:00	408666	1-hr	46	45.9	exc
Mannix	H2S	15Jan23, 20:00	408666	1-hr	32	31.5	exc
Mannix	H2S	15Jan23, 21:00	408666	1-hr	23	22.3	exc
Mannix	H2S	15Jan23, 23:00	408666	1-hr	10	9.3	nae
Buffalo Viewpoint	PM2.5	15Jan23, 24:00	408673	24-hr	45	44.9	exc
Mannix	H2S	15Jan23, 24:00	408666	1-hr	10	9.1	nae
Mannix	H2S	15Jan23, 24:00	408666	24-hr	10	10.2	exc
Ft. McKay S	PM2.5	15Jan23, 24:00	408674	24-hr	30	30.2	exc
Barge Landing	PM2.5	15Jan23, 24:00	408675	24-hr	30	29.5	exc
Buffalo Viewpoint	PM2.5	16Jan23, 09:00	408724	1-hr	83	82.8	exc
Lower Camp	H2S	17Jan23, 03:00	408721	1-hr	11	10.8	exc
Lower Camp	H2S	17Jan23, 04:00	408722	1-hr	14	13.9	exc
Lower Camp	H2S	17Jan23, 18:00	408760	1-hr	15	15.0	exc
Mackay River	H2S	23Jan23, 15:00	-	1-hr	-	-	ret
Christina Lake	H2S	25Jan23, 12:00	409009	1-hr	-	-	ret
Christina Lake	SO2	25Jan23, 12:00	409010	1-hr	-	-	ret

*status legend:

- late exceedance, raw values were not found to be in exceedance in real time, and/or were not reported, but final values were found to be an exceedance after data processing.
- exc exceedance, raw values reported in real time were confirmed to be in exceedance after data processing.
- nae not an exceedance, raw values reported in real time were found not in exceedance after data processing.
- ret retracted, reported exceedance was found to be not an exceedance after investigation of measurement system status and/or validation of raw data in conjunction with all associated measurement parameters.

2.0 Data Processing and Validation

Concentrations reported in near real-time were raw values. The final values were determined after processing data for reporting. For all parameters, except PM_{2.5}, the final 5-minute data values were determined by subtracting the daily zero responses, interpolated to the time of each raw 5-minute value,

from the raw 5-minute data values. The PM_{2.5} analyzers do not have the capability of performing zero's, therefore, the raw 5-minute values are validated through a comparison with associated parameters at the same, or a nearby, AMS. The final 5-minute data values were then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values were calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values were calculated from final 1-hour values.

After data processing and validation, NO₂ concentrations were re-calculated from baseline-corrected NO_x and NO concentrations. Specifically, the NO concentration was subtracted from the NO_x concentration to determine the NO₂ concentration.

2.1 Revisions to ETS Electronic Transfer System – Data and Monthly Reports

There were no revisions to historical data stored at the Electronic Transfer System with this monthly report.

3.0 Operational Status

3.1 Continuous Monitoring

In January 2023, there were six instances that resulted in monitoring instruments operating less than 90% of the time.

1. The ammonia analyzer at Bertha Ganter-Fort McKay operated less than 90% of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AEPA) on January 24, 2023 (reference number 408976).

On January 12, the as-found span and the multi-point verification response of the ammonia analyzer were within 10%, however, the analyzer calibration did not meet the AMD criteria for stable response, Chapter 7, Clause Cal 5-A (aa), and the WBEA's internal acceptance criteria. All daily zero spans had been within criteria since the previous monthly calibration in December 2022. On January 13, the WBEA performed on-site maintenance including ammonia converter, pump, charcoal pack, and calibration gas replacement, however, the analyzer did not return to normal operation and was removed from service for additional investigation and repair on January 16. The WBEA continued repair efforts in the shop to both this analyzer, as well as the spare, which was being repaired at the time of this incident.

The WBEA determined that repairs of both out of service API T201 ammonia analyzers would require significant time, therefore, to minimize the disruption in ammonia monitoring, an API 201E ammonia analyzer was deployed, and passed calibration, on January 26. Data from January 12-26 was invalidated for a total of 327 hours.

2. The wind speed (WS) and wind direction (WD) at the Fort Chipewyan AMS operated less than 90% of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AEPA) on January 25, 2023 (reference number 409004).

In January 2023, a flat-line period in the WS/WD sensors' output signal occurred. Ice fog interfering with the sonic sensors is considered to be the most likely cause and the sensor operation returned to normal when weather conditions changed. Data from this event was invalidated for a total of 178 hours.

3. All air monitoring analyzers and sensors, which includes SO₂, H₂S, and meteorological parameters, at the Waskōw ohci Pimâtisiwin air monitoring station (AMS) operated less than 90% for the month of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AEPA) on February 1, 2023 (reference number 409189).

On January 27, power to the Waskōw ohci Pimâtisiwin AMS was disconnected by the electricity service provider due to a misunderstanding in the transfer of station ownership between two other parties. The error has been addressed and the owner has indicated the service provider will be restoring power imminently, dependent on their availability. Once power has been restored, the WBEA will complete a full quality assurance check of the instruments and return the AMS to normal operation.

4. The TRS analyzer at the Janvier air monitoring station operated less than 90% for the month of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AEPA) on February 16, 2023 (reference number 409684).

On January 17, the internal station temperature dropped below the range required for adequate operation of the air quality analyzers. On January 18, the WBEA completed the daily system check and noted the drop in temperature and that the TRS daily span had not initiated. The WBEA then visited site to complete an on-site inspection and discovered the station door was detached, therefore, all instruments were shut down to prevent damage. On January 19, the WBEA repaired the broken station door and powered on the instruments. At that time, it was noted that the TRS converter had failed. On January 20, the converter was replaced, and the analyzer was calibrated and returned to normal operation at 17:00MST. Data from this incident was invalidated for a total of 81 hours, resulting in an operational time of 89% for the month of January 2023.

5. The 163-meter elevation WS/WD/VWS at Lower Camp Met Tower operated less than 90% of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter 6, Clause DQ 4-C. This incident was reported to Alberta Environment and Protected Areas (AEPA) on February 22, 2023 (reference number 409814).

In February 2023, intermittent flat-line periods in the WS/WD/VWS sensors' output signal occurred. Ice fog interfering with the sonic sensors is considered to be the most likely cause and the sensor operation returned to normal once weather conditions changed. Also, intermittent periods of data acquisition system failure, due to a faulty sensor at a different elevation, resulted in additional downtime. The faulty sensor was replaced, and the communication issue was resolved. Data from both events were invalidated for a total of 87 hours, resulting in a monthly operational time of 88% for January 2023.

6. The 90-meter elevation WS/WD/VWS at Mannix Met Tower operated less than 90% of January 2023, which is a contravention of the Air Monitoring Directive (AMD) (2016, as amended), Chapter

6, Clause DQ 4-C. This letter is a follow-up to the verbal report to Alberta Environment and Protected Areas (AEPA) on February 22, 2023 (reference number 409823).

In January 2023, intermittent flat-line periods in the WS/WD/VWS sensors' output signal occurred. Ice fog interfering with the sonic sensors is considered to be the most likely cause and the sensor operation returned to normal once weather conditions changed. Data from these events were invalidated for a total of 82 hours, resulting in a monthly operational time of 89% for January 2023.

3.2 Intermittent Monitoring

The results for time-integrated sampling of precipitation, PAH, VOC, ECOC, PM_{2.5}, and PM₁₀ will be submitted in the 2022 Annual Report.

3.3 General Network Notes

The Ammonia (NH₃) analyzer currently operates on a 0 to 2500 ppb operating range with a detection level of 5 ppb in the WBEA network. In data processing, values less than five ppb have been considered below detection levels and are reported as zero.

Total hydrocarbon (THC), non-methane hydrocarbon (NMHC), and methane (CH₄) measurements are collected at some air monitoring stations in the WBEA network using the Thermo Environmental model 55i direct CH₄/NMHC analyzer. This analyzer uses a Gas Chromatography (GC) based system, which resets the baseline value at the start of every run. This may cause the ambient background to indicate a response below the expected 1.8 ppm background level. When all measurable criteria indicate valid data during the QAQC and validation process, the data is reported without any additional flags. However, a response below the expected 1.8 ppm triggers an investigation of the analyzer to determine if there is an issue.

Monitoring notes, including changes to monitoring locations, methods, or equipment, and any reporting or monitoring irregularities, for the continuous monitoring stations, are provided on a station-by-station basis. Notes of each interrupted event are provided in chronological order, and meteorological parameters are mentioned last.

Station 1, Bertha Ganter – Fort McKay

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. Additional time is required for stabilization after exposure to high concentrations of NH₃ gas, this is an inherent behavior in the NH₃ analyzer operations due to the properties of the NH₃ gas. Data for 1 hour following the daily spans have been reported as invalid for a total of 17 hours this month.

Baseline recovery after the routine calibration of the H₂S analyzer on January 10 resulted in 1 hour of invalid data.

On January 12, the as-found span, and the multi-point verification response of the NH₃ analyzer were within 10%, however, the analyzer calibration did not meet the AMD criteria for stable response, Chapter 7, Clause Cal 5-A (aa), and the WBEA's internal acceptance criteria. On January 13, the WBEA performed on-site maintenance including ammonia converter, pump, charcoal pack, and calibration gas replacement,

however, the analyzer did not return to normal operation and was removed from service for additional investigation and repair on January 16. Data from January 12-26 was invalidated for a total of 327 hours.

Unstable operations due to a flatline in the output signal of the SO₂ and TRS analyzer on January 13 resulted in 2 to 6 hours of invalid data. A subsequent maintenance to reset the TRS analyzer on January 13 resulted in an additional 1 hour of downtime.

Unstable operations due to a flatline in the output signal of the H₂S analyzer on January 19 and 20 resulted in 18 hours of invalid data. A subsequent maintenance to reset and initiate the QA check of the H₂S analyzer on January 20 resulted in an additional 2 hours of downtime.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH₄ analyzer on January 23 resulted in 4 hours of downtime.

Unstable operations of the THC/NMHC/CH₄ analyzer due to a baseline drift caused by contaminated support gas cylinder on January 23 and 24 resulted in 21 hours of invalid data.

Maintenance to replace the support gas cylinder of the THC/NMHC/CH₄ analyzer on January 24 resulted in 4 hours of downtime.

Unstable operations due to excessive baseline noise in the output signal of the THC/NMHC/CH₄ analyzer on January 30 resulted in 1 hour of invalid data.

A flatline in the output signal of the temperature sensor at the 10-meter elevation on January 26 resulted in 2 hours of invalid data.

A flatline in the output signal of the wind sensor on January 1 and 31 resulted in 3 hours of invalid data.

Station 2, Mildred Lake

An internal audit on January 11 interrupted the normal operations of all gaseous analyzers for 1 to 2 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 2 hours of invalid data.

Station 3, Lower Camp – Meteorology

Failure to record data of all parameters throughout the month resulted in 11 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 45-meter on January 8 and 25 resulted in 14 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 100-meter throughout the month resulted in 40 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 163-meter throughout the month resulted in 76 hours of invalid data.

Station 4, Buffalo Viewpoint

Unstable operations due to excessive baseline drift in the output signal of the NO₂ analyzer on January 4 resulted in 2 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 14 hours of invalid data.

Station 5, Mannix

Intermittent flatlines in the output signal of the wind sensor at 20-meter throughout the month resulted in 5 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 45-meter throughout the month resulted in 48 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 75-meter throughout the month resulted in 49 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor at 90-meter throughout the month resulted in 82 hours of invalid data.

Relative humidity and temperatures can affect the performance of the SO_x scrubbers in the H₂S analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the H₂S span was outside of the 10% AMD criteria on January 29.

Station 6, Patricia McInnes

The NH₃ analyzer required additional time to stabilize to levels below ambient concentrations following the automated daily spans and routine monthly multipoint calibrations. NH₃ analyzers require additional time for stabilization after being exposed to high concentrations, this is due to the physical properties of the NH₃ gas. Data for 1 to 4 hours following each daily span has been reported as invalid for a total of 53 hours this month.

The TRS analyzer was not in service for a total of 715 hours in January.

The H₂S analyzer was not in service for a total of 59 hours in January.

Unstable operations due to excessive baseline drift in the output signal of the NH₃ analyzer on January 2 resulted in 1 hour of invalid data.

Station 7, Athabasca Valley

No operational issues to note.

Automated daily zero-response checks of the O₃ analyzer did not meet WBEA's QC acceptance criteria for the month of January. Therefore, the calibrator zeros from the December, January, and February multipoint calibrations were used to validate the analyzer baseline response.

Station 8, Fort Chipewyan

Station power failure on January 6 affected the normal operations of all analyzers, except NO₂, for 1 hour.

Maintenance to verify the daily QA check on January 21 interrupted the normal operations of the NO₂ analyzer for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 185 hours of invalid data.

Station 9, Barge Landing

Cleaning of the sample manifold on January 13 interrupted the normal operations of the NO₂ and TRS analyzers for 1 hour.

Station operator activities on January 23 affected the normal operations of PM_{2.5} analyzer for 1 hour.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

Station 11, Lower Camp

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

Station 13, Fort McKay South

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 5 hours of invalid data.

Automated daily zero-response checks of the O₃ analyzer did not meet WBEA's QC acceptance criteria for the month of December. Therefore, the calibrator zeros from the December, and January multi-point calibrations were used to validate the analyzer baseline response.

Station 14, Anzac

Unstable operations due to the depletion of the support gas of the THC/NMHC/CH₄ analyzer on January 22 and 23 resulted in 31 hours of invalid data. Subsequent maintenance to replace the support gas cylinder on January 23 resulted in an additional 1 hour of downtime.

Maintenance to replace the support gas cylinder on January 31 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 2 hours.

A flatline in the output signal of the wind sensor throughout the month resulted in 19 hours of invalid data.

Station 17, Wapasu

Maintenance to replace the support gas cylinders on January 27 interrupted the normal operations of the THC analyzer for 2 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

Station 18, Stony Mountain

An internal audit on January 19 and 20 interrupted the normal operations of all air quality analyzers for 1 to 5 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 9 hours of invalid data.

Station 19, Firebag

Station operator activities on January 17 affected the normal operations of the NO₂ analyzer for 3 hours.

The stabilization period after the analyzer was replaced on January 17 and 18 interrupted the normal operations of the H₂S analyzer for 24 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 13 hours of invalid data.

Station 20, MacKay River

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 4 hours of invalid data.

Station 21, Conklin

Unstable operations due to the depletion of the support gas of the THC/NMHC/CH₄ analyzer on January 3 resulted in 6 hours of invalid data.

Maintenance to replace the support gas cylinder on January 4 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 5 hours.

Unstable operations due to excessive baseline noise in the output signal of the THC/NMHC/CH₄ analyzer on January 30 and 31 resulted in 25 hours of invalid data.

Maintenance to remotely troubleshoot the THC/NMHC/CH₄ analyzer on January 31 resulted in 1 hour of invalid data.

The TRS daily span checks were outside of the 10% AMD criteria on January 4 and 8. After investigating, the WBEA discovered that the high span response was caused by the over adjustment of the analyzer's coefficient during the December 22 routine calibration. The analyzer's linearity was confirmed during the multi-point verification check completed on January 9th during routine calibration. Following this, the analyzer's coefficient was readjusted, resulting in an improvement in the daily span response.

Automated daily zero-response checks of the O₃ analyzer did not meet WBEA's QC acceptance criteria for the month of January. Therefore, the calibrator zeros from the January and February multi-point calibrations were used to validate the analyzer baseline response.

Station 22, Janvier

On January 17, the station door became detached which resulted in the internal station temperature dropping below desired range for the adequate operations of the air quality analyzers. The station door was reattached on January 19. Unstable operations due to low station temperature and maintenance to allow all air quality analyzers to stabilize resulted in 43 to 81 hours of invalid data.

Station operator activities on January 26 affected the normal operations of the THC/NMHC/CH₄ analyzer for 1 hour.

A flatline in the output signal of the wind sensor on January 5 and 15 resulted in 3 hours of invalid data.

Automated daily zero-response checks of the NO₂ analyzer did not meet WBEA's QC acceptance criteria for the month of January. Therefore, the calibrator zeros from the December and January multi-point calibrations were used to validate the analyzer baseline response.

Station 23, Fort Hills

Analyzer failure due to sample pump failure in the THC/NMHC/CH₄ analyzer on January 17 and 18 resulted in 29 hours of invalid data.

Maintenance to replace the sample pump, and a subsequent multi-point verification check on January 18 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 4 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 8 hours of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Station power cut-off on January 27 affected the normal operations of all analyzers and sensors for 82 to 109 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 21 hours of invalid data.

Station 26, Christina Lake

A flatline in the output signal of the wind sensor on January 15 and 16 resulted in 36 hours of invalid data.

Station 27, Jackfish 2/3

Maintenance to reset the data logger on January 10 and 20 interrupted the normal operations of all parameters for 2 hours.

An internal audit on January 20 interrupted the normal operations of all gaseous analyzers for 2 to 4 hours.

Failure to record data of all parameters on January 29 resulted in 1 hour of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 6 hours of invalid data.

Station 29, Surmont 2

Maintenance to remotely troubleshoot the NO₂ analyzer on January 1 resulted in 2 hours of downtime.

Cleaning of the sample manifold on January 3 interrupted the normal operations of the H₂S and NO₂ analyzers for 1 hour.

Unstable operations due to an excessive shift in the output signal of the relative humidity sensor on January 2 resulted in 2 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 6 hours of invalid data.

The daily span check for the NO₂ analyzer was outside the 10% AMD criteria on January 1 due to an interruption in the station calibrator configuration.

Station 30, Ells River

Maintenance to replace the support gas cylinders and maintenance to verify daily QA check on January 1 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 5 hours.

Unstable operations due to excessive baseline drift in the output signal of the THC/NMHC/CH₄ analyzer on January 1 and 2 resulted in 16 hours of invalid data.

Maintenance to replace the sample pump on January 2 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 2 hours.

Unstable operations due to excessive baseline drift in the output signal of the NO₂ analyzer on January 10 resulted in 16 hours of invalid data.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 3 hours of invalid data.

Station 506, Jackfish 1

Maintenance to re-fill the SO₂ scrubber hydrator, and a subsequent multi-point verification check on January 20 interrupted the normal operations of the H₂S analyzer for 5 hours.

A flatline in the output signal of the wind sensor on January 11 and 13 resulted in 2 hours of invalid data.

Relative humidity and temperatures can affect the performance of the SO_x scrubbers in the analyzer. During these events, the sulfur concentrations take a longer period to stabilize during the daily span checks. Therefore, the H₂S span was outside of the 10% AMD criteria on January 4 and 20.

Station 508, Kirby North

Maintenance to reinitiate the daily QA check on January 21 interrupted the normal operations of the NO₂ analyzer for 1 hour.

Maintenance to replace the sample pump on January 22 interrupted the normal operations of the NO₂ analyzer for 6 hours.

Intermittent flatlines in the output signal of the wind sensor throughout the month resulted in 19 hours of invalid data.

If additional information is required, please contact either Sanjay Prasad at (780) 799-8216 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.

Level one (L1) data review was completed by the Field Technicians responsible for each respective air monitoring station. Level two (L2) data validation, report preparation, and submission were completed by Asad Hidayat and Karina Fenwick of WBEA. The WBEA has retained the services of Whiteley Enterprises to conduct Level three (L3) review on its behalf. Contact information for WBEA staff is included below.

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T: (780) 215-6000
E: ahidayat@wbea.org

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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

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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

January 2023
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Created: Aug 02 2023 09:10

APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	01	2023					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00							
149968-01-00							
237382-00-00							
48522-01-00							
240008-00-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	24-HOUR AVERAGE MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
48263-01-00	SO2(ppb)	1	100	14	0	3.1	0
224816-00-00	SO2(ppb)	2	100	16.4	0	4.1	0
151469-01-00	SO2(ppb)	4	100	12.6	0	1.6	0
189942-00-00	SO2(ppb)	5	100	42.7	0	4.7	0
206355-00-00	SO2(ppb)	6	100	28.5	0	2.8	0
46586-00-00	SO2(ppb)	7	100	12.7	0	1.5	0
73203-02-00	SO2(ppb)	8	100	9.1	0	4.3	0
216466-01-00	SO2(ppb)	9	100	13.4	0	3.0	0
137467-01-00	SO2(ppb)	11	100	132.0	0	24.2	0
236394-00-00	SO2(ppb)	13	100	15.9	0	2.9	0
254465-00-00	SO2(ppb)	14	100	17.2	0	1.9	0
094-03-00	SO2(ppb)	17	100	46.4	0	10.8	0
80105-01-00	SO2(ppb)	18	100	7.2	0	1.5	0
305529-00-00	SO2(ppb)	19	100	48.5	0	9.6	0
318401-00-00	SO2(ppb)	20	100	25.9	0	5.0	0
026-03-00	SO2(ppb)	21	100	11.2	0	1.9	0
364232-00-00	SO2(ppb)	22	93	6.7	0	1.5	0
228044-00-00	SO2(ppb)	23	100	10.9	0	3.1	0
247548-00-00	SO2(ppb)	25	85	15.3	0	3.2	0
231302-00-00	SO2(ppb)	26	100	50.2	0	10.0	0
153125-01-00	SO2(ppb)	27	99	11.1	0	3.3	0
	SO2(ppb)	29	100	12.5	0	1.7	0
	SO2(ppb)	30	100	7.5	0	1.4	0
	SO2(ppb)	506	100	52.9	0	14.5	0
	SO2(ppb)	508	100	11.7	0	2.8	0
	H2S(ppb)	1	97	3.2	0	1.3	0
	H2S(ppb)	2	100	3.5	0	1.0	0
	H2S(ppb)	4	100	3.2	0	1.1	0
	H2S(ppb)	5	100	45.9	7	10.2	1
	H2S(ppb)	6	100	1.9	0	0.8	0
	H2S(ppb)	11	100	15.0	3	2.7	0
	H2S(ppb)	17	100	2.9	0	0.9	0
	H2S(ppb)	19	97	2.8	0	0.6	0
	H2S(ppb)	20	100	3.0	0	0.5	0
	H2S(ppb)	25	85	3.2	0	1.3	0
	H2S(ppb)	26	100	1.4	0	0.6	0
	H2S(ppb)	27	99	1.3	0	0.4	0
	H2S(ppb)	29	100	0.6	0	0.2	0
	H2S(ppb)	506	99	1.3	0	0.4	0
	H2S(ppb)	508	100	0.4	0	0.2	0
	TRS(ppb)	1	99	3.8	0	1.7	0
	TRS(ppb)	6	100	0.3	0	0.2	0
	TRS(ppb)	7	100	4.5	0	0.9	0
	TRS(ppb)	8	100	0.5	0	0.3	0
	TRS(ppb)	9	100	3.2	0	1.3	0
	TRS(ppb)	13	100	4.6	0	1.5	0
	TRS(ppb)	14	100	1.2	0	0.4	0
	TRS(ppb)	18	100	0.5	0	0.3	0
	TRS(ppb)	21	100	0.7	0	0.6	0
	TRS(ppb)	22	89	0.3	0	0.3	0
	TRS(ppb)	23	100	2.3	0	1.1	0
	TRS(ppb)	30	100	1.5	0	1.1	0
	THC(ppm)	1	96	4.0	-	3.0	-
	THC(ppm)	2	100	5.6	-	3.0	-
	THC(ppm)	4	100	3.8	-	2.7	-
	THC(ppm)	5	100	4.7	-	3.1	-
	THC(ppm)	6	100	3.3	-	2.6	-
	THC(ppm)	7	100	4.2	-	2.8	-
	THC(ppm)	9	100	3.8	-	2.7	-
	THC(ppm)	11	100	3.7	-	2.7	-
	THC(ppm)	13	100	3.6	-	2.8	-
	THC(ppm)	14	95	2.8	-	2.2	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

REPORT DATE								
MONTH	YEAR							
01	2023	CONTINUOUS AMBIENT MONITORING						
APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE		
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	
289664-00-00	THC(ppm)	17	100	3.3	-	2.8	-	
241311-00-00	THC(ppm)	18	100	2.4	-	2.3	-	
20809-02-00	THC(ppm)	19	100	2.8	-	2.5	-	
149968-01-00	THC(ppm)	20	100	3.3	-	2.5	-	
237382-00-00	THC(ppm)	21	95	2.5	-	2.3	-	
48522-01-00	THC(ppm)	22	93	2.3	-	2.2	-	
240008-00-00	THC(ppm)	23	96	6.5	-	3.1	-	
48263-01-00	THC(ppm)	29	100	2.8	-	2.6	-	
224816-00-00	THC(ppm)	30	97	5.4	-	3.4	-	
151469-01-00	THC(ppm)	508	100	2.8	-	2.6	-	
189942-00-00	O3(ppb)	1	100	37.6	0	33.3	-	
206355-00-00	O3(ppb)	4	100	34.3	0	31.3	-	
46586-00-00	O3(ppb)	6	100	40.0	0	37.6	-	
73203-02-00	O3(ppb)	7	100	37.6	0	33.6	-	
216466-01-00	O3(ppb)	8	100	41.4	0	39.8	-	
137467-01-00	O3(ppb)	13	100	37.6	0	32.6	-	
236394-00-00	O3(ppb)	14	100	38.2	0	35.9	-	
254465-00-00	O3(ppb)	17	100	40.1	0	36.3	-	
094-03-00	O3(ppb)	18	100	37.6	0	35.6	-	
80105-01-00	O3(ppb)	21	100	38.8	0	36.9	-	
305529-00-00	O3(ppb)	22	93	39.9	0	37.5	-	
318401-00-00	NO2(ppb)	1	100	36.3	0	22.8	-	
026-03-00	NO2(ppb)	4	100	40.2	0	20.3	-	
364232-00-00	NO2(ppb)	6	100	38.8	0	20.1	-	
228044-00-00	NO2(ppb)	7	100	36.6	0	21.5	-	
247548-00-00	NO2(ppb)	8	100	20.0	0	7.7	-	
231302-00-00	NO2(ppb)	9	100	45.3	0	26.2	-	
153125-01-00	NO2(ppb)	13	100	37.9	0	23.6	-	
	NO2(ppb)	14	100	22.6	0	7.1	-	
	NO2(ppb)	17	100	31.4	0	19.3	-	
	NO2(ppb)	18	99	16.1	0	6.7	-	
	NO2(ppb)	19	100	38.7	0	20.7	-	
	NO2(ppb)	20	100	30.3	0	7.7	-	
	NO2(ppb)	21	100	18.6	0	6.7	-	
	NO2(ppb)	22	94	9.7	0	4.4	-	
	NO2(ppb)	23	100	47.4	0	27.8	-	
	NO2(ppb)	26	100	28.2	0	17.4	-	
	NO2(ppb)	27	99	22.1	0	8.7	-	
	NO2(ppb)	29	100	20.3	0	5.2	-	
	NO2(ppb)	30	100	38.8	0	24.2	-	
	NO2(ppb)	506	100	20.6	0	7.0	-	
	NO2(ppb)	508	99	14.4	0	9.5	-	
	CO(ppm)	1	100	0.3	0	0.3	-	
	CO(ppm)	7	100	0.6	0	0.3	-	
	CO(ppm)	8	100	0.2	0	0.1	-	
	CO(ppm)	18	100	0.5	0	0.2	-	
	CO2(ppm)	1	100	461.4	-	451.6	-	
	CO2(ppm)	8	100	443.4	-	438.5	-	
	CO2(ppm)	18	100	482.9	-	464.6	-	
	NH3(ppb)	1	54	0.0	0	0.0	-	
	NH3(ppb)	6	93	0.0	0	0.0	-	
	PM2.5(ug/m3)	1	100	41.7	0	22.6	0	
	PM2.5(ug/m3)	4	100	161.7	5	44.9	1	
	PM2.5(ug/m3)	6	100	69.1	0	26.1	0	
	PM2.5(ug/m3)	7	100	73.8	0	21.6	0	
	PM2.5(ug/m3)	8	100	16.9	0	9.9	0	
	PM2.5(ug/m3)	9	100	94.9	1	29.5	1	
	PM2.5(ug/m3)	13	100	80.7	1	30.2	1	
	PM2.5(ug/m3)	14	100	35.0	0	12.4	0	
	PM2.5(ug/m3)	17	100	40.5	0	20.4	0	
	PM2.5(ug/m3)	18	100	107.6	3	24.7	0	
	PM2.5(ug/m3)	21	100	84.4	1	45.1	1	
	PM2.5(ug/m3)	22	94	65.4	0	27.3	0	
	PM2.5(ug/m3)	23	100	65.0	0	28.5	0	

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

January 2023

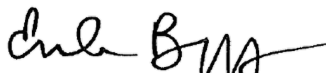
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REPORT DATE	
MONTH	YEAR
01	2023

CONTINUOUS AMBIENT MONITORING

APPROVAL NUMBERS	PARAMETER	STN. NO.	% TIME OPERATIONAL	ONE-HOUR AVERAGE		24-HOUR AVERAGE	
				MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
289664-00-00	PM2.5(ug/m3)	29	100	43.3	0	17.1	0
241311-00-00	PM2.5(ug/m3)	30	100	87	1	35.2	1
20809-02-00	WS(km/h)	1	100	-	-	-	-
149968-01-00	WS(km/h)	2	100	-	-	-	-
237382-00-00	WS(km/h)	4	98	-	-	-	-
48522-01-00	WS(km/h)	5	99	-	-	-	-
240008-00-00	WS(km/h)	6	100	-	-	-	-
48263-01-00	WS(km/h)	7	100	-	-	-	-
224816-00-00	WS(km/h)	8	75	-	-	-	-
151469-01-00	WS(km/h)	9	99	-	-	-	-
189942-00-00	WS(km/h)	11	99	-	-	-	-
206355-00-00	WS(km/h)	13	99	-	-	-	-
46586-00-00	WS(km/h)	14	97	-	-	-	-
73203-02-00	WS(km/h)	17	99	-	-	-	-
216466-01-00	WS(km/h)	18	99	-	-	-	-
137467-01-00	WS(km/h)	19	98	-	-	-	-
236394-00-00	WS(km/h)	20	99	-	-	-	-
254465-00-00	WS(km/h)	21	99	-	-	-	-
094-03-00	WS(km/h)	22	100	-	-	-	-
80105-01-00	WS(km/h)	23	99	-	-	-	-
318401-00-00	WS(km/h)	25	86	-	-	-	-
026-03-00	WS(km/h)	26	95	-	-	-	-
364232-00-00	WS(km/h)	27	99	-	-	-	-
228044-00-00	WS(km/h)	29	99	-	-	-	-
247548-00-00	WS(km/h)	30	100	-	-	-	-
231302-00-00	WS(km/h)	506	100	-	-	-	-
153125-01-00	WS(km/h)	508	97	-	-	-	-



SIGNATURE OF ASSOCIATION REPRESENTATIVE

FOR ALBERTA ENVIRONMENT USE ONLY



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS01 BERTHA GANTER - FORT MCKAY JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY - BERTHA GANTER (AMS01)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	706	36	38	99.73	14.3	0	3.1	0
H2S(ppb) Average	684	39	60	97.18	3.2	0	1.3	0
TRS(ppb) Average	699	38	45	99.06	3.8	0	1.7	0
THC(ppm) Average	680	34	64	95.97	4	-	3	-
NMHC(ppm) Average	680	34	64	95.97	0.446	-	0.229	-
CH4(ppm) Average	680	34	64	95.97	3.6	-	2.8	-
O3 (ppb) Average	709	35	35	100	37.6	0	33.3	-
NO2 (ppb) Average	707	37	37	100	36.3	0	22.8	-
NO (ppb) Average	707	37	37	100	94.4	-	49.6	-
NOX (ppb) Average	707	37	37	100	124.5	-	72.3	-
NH3 (ppb) Average	365	35	379	53.76	0	0	0	-
PM2.5 (ug/m3) Average	743	1	1	100	41.7	0	22.6	0
CO(ppm) Average	709	35	35	100	0.3	0	0.3	0
CO2(ppm) Average	708	36	36	100	461.4	0	451.6	0
Temperature 2 m (C) Average	744	0	0	100	2.3	-	-3.1	-
Temperature 10 m (C) Average	742	0	2	99.73	2.7	-	-2.7	-
Relative Humidity (%) Average	744	0	0	100	96.3	-	89.9	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	24	-	12	-
Wind Direction 10 m (deg) Average	741	0	3	99.6	-	-	-	-
Precipitation (mm) Total	744	0	0	100	1	-	3.1	-
Leaf Wetness (% of range) Average	744	0	0	100	21.3	-	4.1	-
Global Solar Radiation (W/m2) Average	744	0	0	100	342.4	-	72.3	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	706	0.99	1.5	-	0	0.1	0.1	0.4	1.2	2.6	14.3
H2S (ppb) Average	684	0.46	0.4	-	0	0.1	0.2	0.3	0.6	1	3.2
TRS (ppb) Average	699	0.76	0.4	-	0.3	0.4	0.5	0.6	0.9	1.3	3.8
THC (ppm) Average	680	2.37	0.3	-	2	2	2.1	2.3	2.5	2.7	4
NMHC(ppm) Average	680	0.077	0.083	-	0	0	0	0.1	0.1	0.2	0.446
CH4(ppm) Average	680	2.3	0.2	-	2	2	2.1	2.2	2.4	2.6	3.6
O3 (ppb) Average	709	12.01	10.1	-	0.2	0.8	2.4	10.1	19.6	27.4	37.6
NO2 (ppb) Average	707	14.69	7.9	-	0	3.8	8	15.5	20.9	24.4	36.3
NO (ppb) Average	707	8.41	14.7	-	0	0	0	1.4	10.8	25.4	94.4
NOX (ppb) Average	707	23.1	20.1	-	0	3.9	8.8	17.9	32.5	47.9	124.5
NH3 (ppb) Average	365	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	743	9.88	7	-	0.5	2.1	4.1	8.6	13.7	20.1	41.7
CO(ppm) Average	709	0.22	0	-	0.1	0.2	0.2	0.2	0.3	0.3	0.3
CO2(ppm) Average	708	431.98	9.7	-	414.1	421.5	425.6	429.5	437.1	446.2	461.4
Temperature 2 m (C) Average	744	-10.54	5.8	-	-30	-19.1	-13.2	-9	-7.1	-4.7	2.3
Temperature 10 m (C) Average	742	-10.36	5.6	-	-28.7	-18.7	-12.9	-9	-7.1	-4.5	2.7
Relative Humidity (%) Average	744	83.06	7.1	-	54.4	72.4	80.8	85.2	87.8	89.9	96.3
Wind Speed 10 m (km/h) Average	741	6.3	4	-	0	2	3	6	9	11	24
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	11.61	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	0.71	1.4	-	0	0	0	0.1	0.9	2.5	21.3
Global Solar Radiation (W/m2) Average	744	23.92	53.8	-	0	0	0	0	16.9	92.3	342.4

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BERTHA GANTER FORT MCKAY (AMS01)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	13 Jan 2023 17:00	13 Jan 2023 18:00	2	Unstable Operation - flatline in analyzer output signal
H2S	10 Jan 2023 21:00	10 Jan 2023 21:00	1	Stabilization after routine calibration
H2S	19 Jan 2023 16:00	20 Jan 2023 09:00	18	Unstable Operation - flatline in analyzer output signal
H2S	20 Jan 2023 10:00	20 Jan 2023 11:00	2	Maintenance - analyzer rebooted and QA check
TRS	13 Jan 2023 07:00	13 Jan 2023 12:00	6	Unstable Operation - flatline in analyzer output signal
TRS	13 Jan 2023 13:00	13 Jan 2023 13:00	1	Maintenance - analyzer rebooted
THC/NMHC/CH4	23 Jan 2023 12:00	23 Jan 2023 15:00	4	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	23 Jan 2023 16:00	24 Jan 2023 12:00	21	Unstable Operations - support gas cylinder contaminated
THC/NMHC/CH4	24 Jan 2023 13:00	24 Jan 2023 16:00	4	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	30 Jan 2023 03:00	30 Jan 2023 03:00	1	Unstable Operation - excessive baseline noise
NH3	01 Jan 2023 07:00	31 Jan 2023 07:00	17	Stabilization after daily QA check
NH3	12 Jan 2023 21:00	13 Jan 2023 12:00	16	Analyzer Failure - calibration within non-compliance
NH3	13 Jan 2023 13:00	13 Jan 2023 19:00	7	Maintenance - field maintenance
NH3	13 Jan 2023 20:00	26 Jan 2023 11:00	304	Analyzer Failure - calibration within non-compliance
Temperature 10 m	26 Jan 2023 04:00	26 Jan 2023 05:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Jan 2023 15:00	08 Jan 2023 16:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 11:00	31 Jan 2023 11:00	1	Flat line in sensor output signal - Sensor frozen

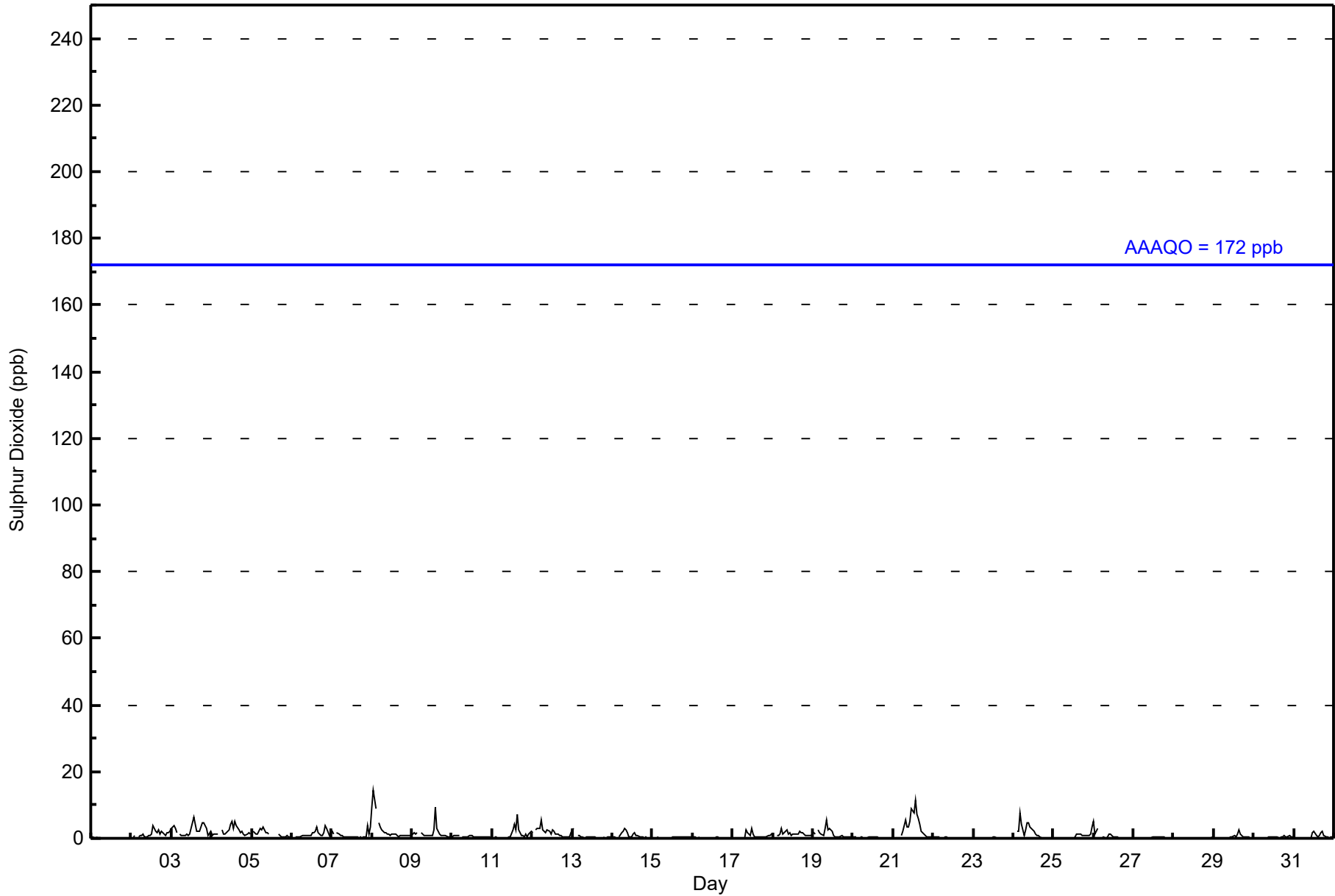


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 14.3 ppb on Jan 8 02:00	Maximum Daily Average: 3.1 ppb on Jan 21		Hours of Data:	706
Minimum Value: 0.0 ppb on Jan 1 18:00	Minimum Daily Average: 0.1 ppb on Jan 23		Hours of Missing Data:	38
Maximum Diurnal Average: 1.6 ppb at hour 14	Minimum Diurnal Average: 0.5 ppb at hour 23		Hours of Calibration:	36
Monthly Average: 0.99 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.4 Q ₃ = 1.2 P ₉₀ = 2.6 P ₉₉ = 7.8		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.3	0.4	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
2-Jan	0.0	0.2	0.9	Z	0.4	0.8	1.0	1.4	0.5	0.3	1.0	1.1	1.3	3.7	2.2	1.9	2.5	1.4	2.2	1.7	1.0	1.9	1.9	2.1	1.4	3.7	
3-Jan	2.8	3.8	2.8	1.8	Z	1.2	0.7	0.7	0.9	1.3	1.0	1.2	4.7	6.5	4.3	2.2	2.3	2.3	4.6	4.6	3.6	3.1	1.0	1.9	2.6	6.5	
4-Jan	1.1	1.1	1.1	1.3	1.4	Z	2.5	1.2	1.3	1.8	2.7	4.3	4.9	2.8	5.1	3.7	2.6	1.7	2.0	1.3	0.9	1.2	1.9	1.3	2.1	5.1	
5-Jan	Z	2.1	1.4	1.2	2.1	3.1	2.7	3.4	1.9	1.6	1.1	C	C	C	C	C	1.2	0.9	0.6	0.5	0.5	0.7	0.5	0.5	1.4	3.4	
6-Jan	0.4	Z	0.5	0.4	0.5	0.5	1.0	0.9	0.7	0.8	0.8	0.7	1.6	1.6	2.0	3.4	1.6	0.8	0.9	1.9	4.0	2.8	0.8	1.4	1.3	4.0	
7-Jan	1.9	1.3	Z	1.6	1.2	1.0	0.7	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.3	0.5	3.6	1.4	3.3	0.9	3.6	
8-Jan	9.4	14.3	9.1	Z	4.8	3.3	2.4	1.7	1.5	1.2	1.2	1.0	1.1	1.4	1.2	0.8	0.5	0.8	0.8	0.9	1.0	0.9	1.0	0.9	2.7	14.3	
9-Jan	1.2	1.5	1.3	1.6	Z	1.8	1.1	0.9	0.8	0.9	0.8	0.8	0.8	2.4	9.5	2.8	1.1	0.9	0.8	0.7	0.7	0.6	0.4	0.4	1.5	9.5	
10-Jan	0.5	0.6	0.7	0.7	0.8	Z	0.5	0.4	0.3	0.6	0.7	1.0	0.8	0.6	0.6	0.5	0.4	0.3	0.5	0.6	0.5	0.3	0.3	0.3	0.6	1.0	
11-Jan	Z	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.6	2.7	4.4	2.5	7.0	2.7	1.0	0.8	0.5	1.2	0.6	1.2	2.3	1.3	7.0	
12-Jan	1.6	Z	2.6	3.1	3.0	5.6	2.7	2.3	1.5	2.7	1.9	1.2	2.4	2.3	1.4	1.4	0.9	0.6	0.5	0.4	0.3	0.3	0.5	1.6	1.8	5.6	
13-Jan	2.5	2.9	Z	1.0	0.9	0.6	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	UO	UO	0.2	0.2	0.2	0.2	0.3	0.3	0.6	2.9	
14-Jan	0.3	0.3	0.2	Z	0.3	1.9	2.2	2.9	2.4	1.5	0.6	0.6	1.2	1.6	1.0	0.8	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.9	2.9
15-Jan	0.1	0.1	0.2	0.3	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	
16-Jan	0.3	0.3	0.2	0.1	0.2	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	
17-Jan	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.1	2.5	1.6	0.8	3.0	1.4	0.6	0.5	0.4	0.3	0.3	0.3	0.5	0.5	0.7	0.7	1.4	0.7	3.0	
18-Jan	1.1	Z	0.7	1.0	1.2	2.9	1.4	1.7	2.7	1.1	1.5	0.9	1.3	1.2	1.1	1.4	2.3	1.7	1.6	0.9	0.7	0.8	0.7	0.7	1.3	2.9	
19-Jan	1.7	1.4	Z	2.7	1.8	1.3	1.0	2.8	5.5	2.4	2.9	2.2	0.8	0.5	0.4	0.4	0.4	0.8	0.4	0.3	0.3	0.3	0.3	0.4	1.4	5.5	
20-Jan	0.4	0.4	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	
21-Jan	0.1	0.1	0.1	0.2	Z	0.7	2.2	5.4	3.6	3.6	5.0	8.9	7.8	11.6	7.2	6.0	4.2	1.9	1.1	0.8	0.6	0.5	0.4	0.4	3.1	11.6	
22-Jan	0.3	0.3	0.3	0.4	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
23-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	
24-Jan	0.6	Z	2.0	1.9	7.8	4.0	1.0	2.4	4.5	4.5	3.3	2.4	2.3	1.2	1.0	1.0	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	1.8	7.8	
25-Jan	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.4	1.1	1.2	1.1	0.9	0.9	0.7	0.9	0.8	1.4	3.5	0.6	3.5	
26-Jan	5.1	1.2	2.9	Z	0.1	0.1	0.4	0.1	0.3	1.3	1.4	0.7	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	5.1	
27-Jan	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.2	0.4	0.5	0.5	0.4	0.5	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.5	
28-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	
29-Jan	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.3	0.4	0.7	0.4	1.3	2.6	1.5	0.6	0.2	0.2	0.2	0.2	0.2	0.1	0.4	2.6	
30-Jan	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.6	0.9	0.4	0.5	0.9	0.6	0.6	0.4	0.9	
31-Jan	0.3	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	1.8	2.3	1.0	0.5	0.9	1.7	2.2	1.0	0.4	0.2	0.1	0.3	0.3	0.6	2.3	

1.2	1.3	1.1	0.8	1.1	1.1	0.8	1.0	1.0	0.9	1.0	1.2	1.4	1.6	1.5	1.4	1.0	0.7	0.7	0.6	0.6	0.7	0.5	0.8	Diurnal Average	
9.4	14.3	9.1	3.1	7.8	5.6	2.7	5.4	5.5	4.5	5.0	8.9	7.8	11.6	9.5	7.0	4.2	2.3	4.6	4.6	4.0	3.6	1.9	3.5	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	704	99.72	99.72
11 - 20	2	0.28	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	108	66	18	13	4	2	11	64	266	29	14	9	20	21	26	30	701
11 - 20	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	108	66	18	13	4	2	11	65	267	29	14	9	20	21	26	30	703

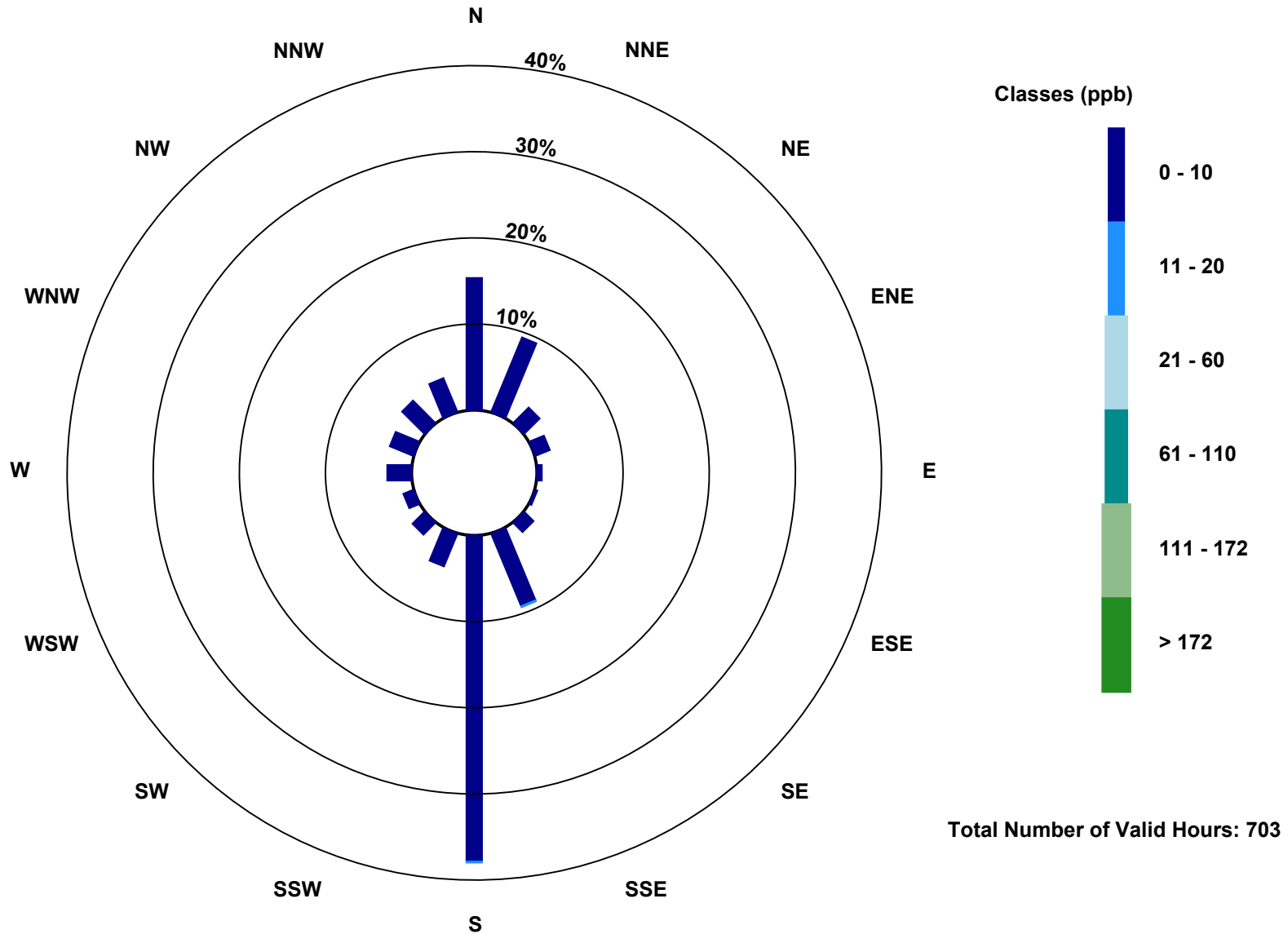
Total Number of Valid Hours: 703

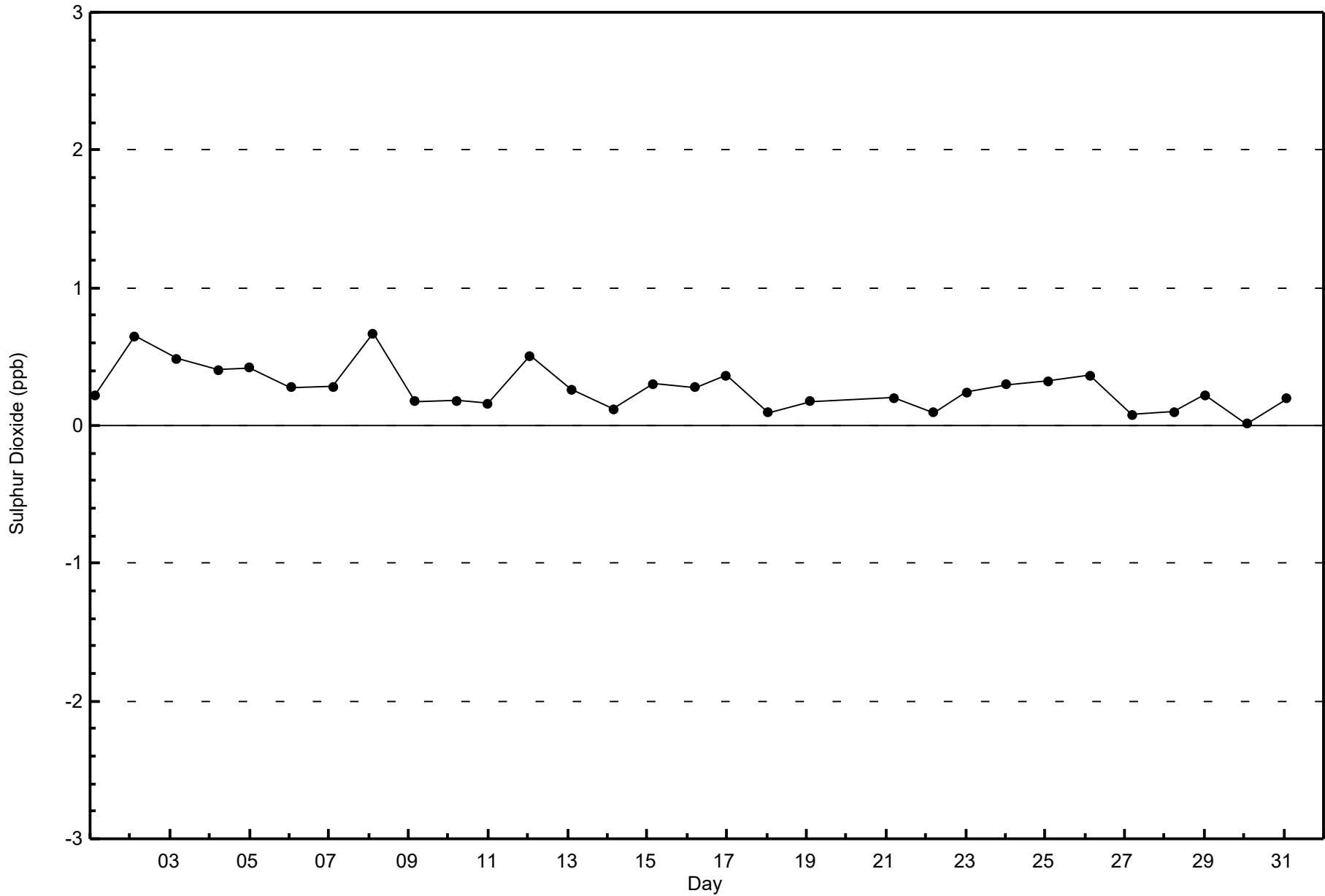
Total Number of Hours: 744

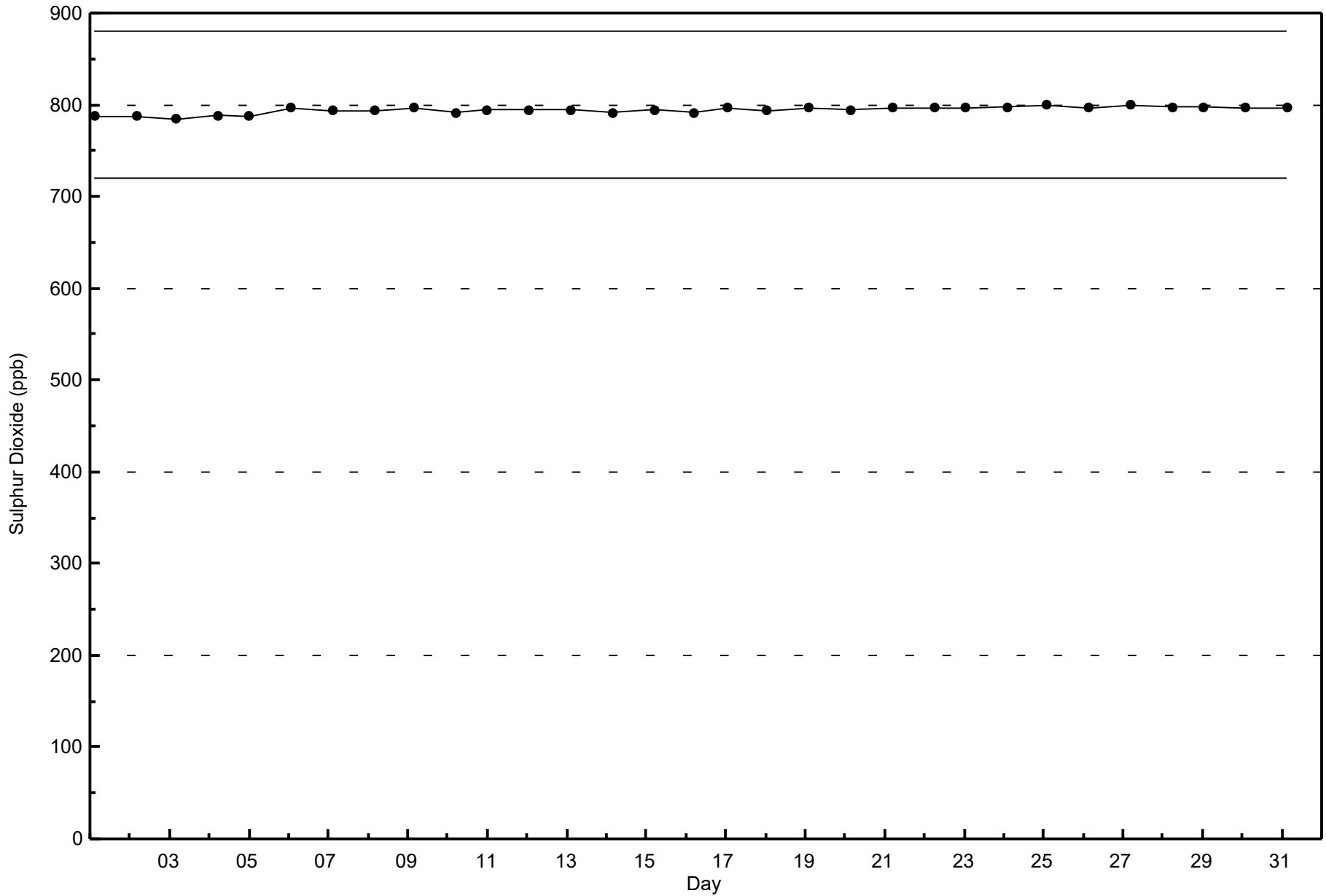


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Fort McKay - Bertha Ganter

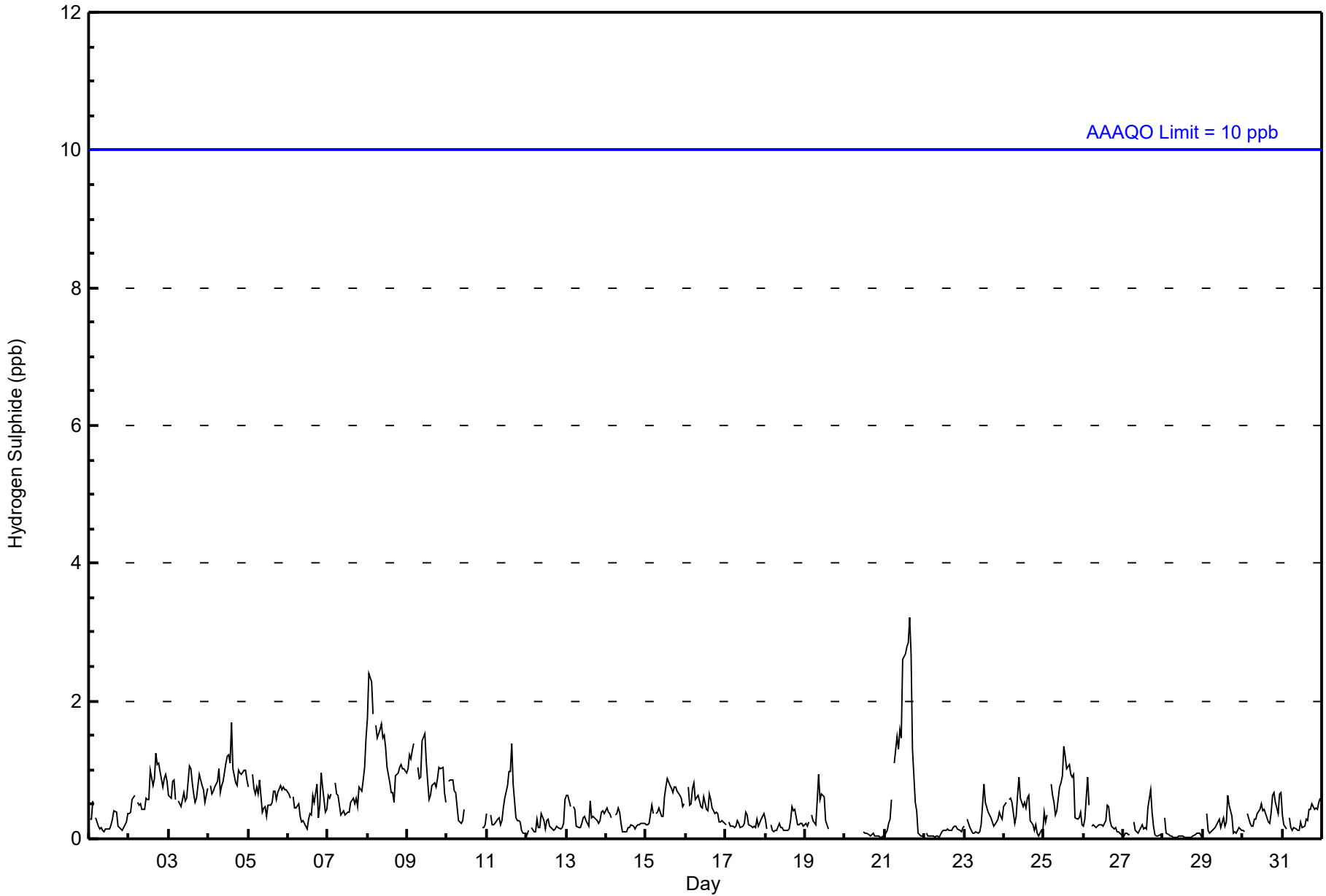








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 3.2 ppb on Jan 21 16:00		Maximum Daily Average: 1.3 ppb on Jan 8				Hours of Data:		684																		
Minimum Value: 0.0 ppb on Jan 28 18:00		Minimum Daily Average: 0.1 ppb on Jan 28				Hours of Missing Data:		60																		
Maximum Diurnal Average: 0.6 ppb at hour 16		Minimum Diurnal Average: 0.4 ppb at hour 23				Hours of Calibration:		39																		
Monthly Average: 0.46 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.6 P ₉₀ = 1.0 P ₉₉ = 2.3				Percent Operational Time:		97.2																		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.3	0.3	0.5	Z	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.2	0.5
2-Jan	0.4	0.4	0.6	0.6	Z	0.5	0.5	0.5	0.4	0.4	0.6	0.6	0.6	1.0	0.8	0.9	1.2	1.1	1.1	1.0	0.8	0.9	0.9	0.8	0.7	1.2
3-Jan	0.6	0.6	0.8	0.9	0.6	Z	0.6	0.5	0.6	0.7	0.5	0.6	1.1	1.0	0.8	0.7	0.5	0.6	0.9	0.8	0.8	0.7	0.5	0.7	0.7	1.1
4-Jan	Z	0.8	0.7	0.7	0.7	0.8	1.0	0.7	0.8	0.8	1.1	1.2	1.2	1.1	1.7	1.0	0.8	0.8	1.0	1.0	0.9	1.0	1.0	0.8	0.9	1.7
5-Jan	0.8	Z	0.9	0.7	0.6	0.7	0.6	0.9	0.4	0.4	0.5	0.3	0.5	0.5	1.5	0.7	0.7	0.6	0.7	0.8	0.7	0.8	0.7	0.7	0.6	0.9
6-Jan	0.7	0.6	Z	0.6	0.4	0.4	0.5	0.3	0.2	0.3	0.2	0.1	0.3	0.4	0.3	0.6	0.5	0.8	0.3	0.5	1.0	0.8	0.4	0.4	0.5	1.0
7-Jan	0.6	0.6	0.6	Z	0.8	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.6	0.5	0.7	0.7	0.9	1.0	1.5	0.6	1.5
8-Jan	1.8	2.4	2.3	1.8	Z	1.7	1.5	1.6	1.7	1.5	1.5	1.3	1.0	0.8	0.7	0.7	0.5	0.9	1.0	1.0	1.1	1.0	1.0	1.0	1.3	2.4
9-Jan	1.0	1.2	1.2	1.3	1.4	Z	1.0	0.9	0.9	1.4	1.5	1.1	0.8	0.6	0.6	0.8	0.8	0.7	0.9	1.0	1.0	1.0	0.7	0.5	1.0	1.5
10-Jan	Z	0.8	0.9	0.9	0.7	0.7	0.5	0.3	0.2	0.3	0.4	C	C	C	C	C	C	C	C	C	RE	0.2	0.2	0.2	--	0.9
11-Jan	0.4	Z	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.6	0.8	1.0	1.0	1.4	0.8	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.4	1.4
12-Jan	0.1	0.1	Z	0.2	0.1	0.1	0.3	0.2	0.2	0.4	0.3	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.6	0.2	0.6
13-Jan	0.6	0.6	0.5	Z	0.5	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.6
14-Jan	0.5	0.4	0.4	0.3	Z	0.3	0.4	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5
15-Jan	0.2	0.2	0.2	0.5	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.6	0.7	0.9	0.8	0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.9
16-Jan	Z	0.7	0.5	0.5	0.7	0.8	0.6	0.6	0.5	0.5	0.4	0.6	0.4	0.4	0.7	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.3	0.2	0.5	0.8
17-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.2	0.4
18-Jan	0.3	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.5
19-Jan	0.2	0.2	0.2	Z	0.4	0.3	0.2	0.5	0.9	0.6	0.6	0.6	0.3	0.2	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.9
20-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	--	0.1
21-Jan	0.0	0.1	0.2	0.3	0.6	Z	1.1	1.5	1.3	1.6	1.5	2.6	2.7	2.8	2.9	3.2	2.7	1.3	0.5	0.4	0.1	0.1	0.0	0.0	1.2	3.2
22-Jan	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2
23-Jan	0.2	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.8	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.8
24-Jan	0.5	0.5	Z	0.6	0.6	0.5	0.2	0.3	0.6	0.9	0.6	0.5	0.5	0.4	0.6	0.6	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.4	0.9
25-Jan	0.4	0.2	0.3	Z	0.8	0.6	0.5	0.3	0.4	0.7	0.8	0.9	1.3	1.2	1.0	1.1	0.9	0.9	0.9	0.3	0.3	0.3	0.4	0.2	0.7	1.3
26-Jan	0.2	0.3	0.9	0.5	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.9
27-Jan	0.0	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.4	0.7	0.4	0.2	0.1	0.0	0.0	0.1	0.0	0.2	0.7
28-Jan	Z	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.3
29-Jan	0.1	Z	0.4	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.6	0.5	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.6
30-Jan	0.1	0.1	Z	0.4	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.2	0.2	0.4	0.6	0.7	0.5	0.4	0.6	0.7	0.4	0.7
31-Jan	0.3	0.2	0.1	Z	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.6	0.3	0.6
0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.6 0.6 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4																								Diurnal Average		
1.8 2.4 2.3 1.8 1.4 1.7 1.5 1.6 1.7 1.6 1.5 2.6 2.7 2.8 2.9 3.2 2.7 1.3 1.1 1.0 1.1 1.0 1.0 1.5																								Diurnal Maximum		
Z - zerospan		C - Calibration				M - Maintenance				UO - Unstable Operation				RE - Recovery												
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	678	99.12	99.12
3 - 4	6	0.88	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 684

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	106	66	17	12	5	2	11	64	254	26	10	8	18	24	24	28	675
3 - 4	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	6
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	106	66	17	12	5	2	11	64	260	26	10	8	18	24	24	28	681

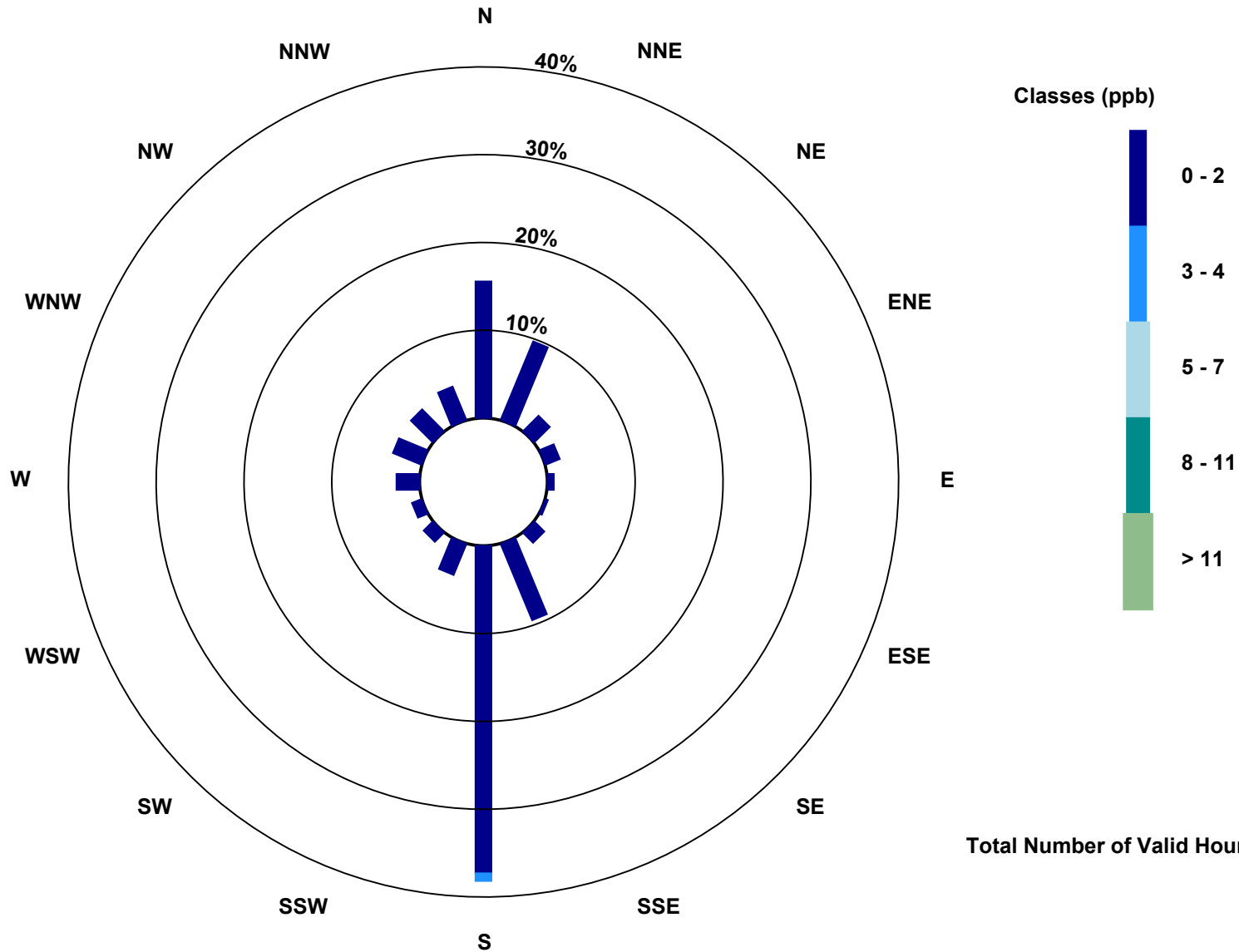
Total Number of Valid Hours: 681

Total Number of Hours: 744

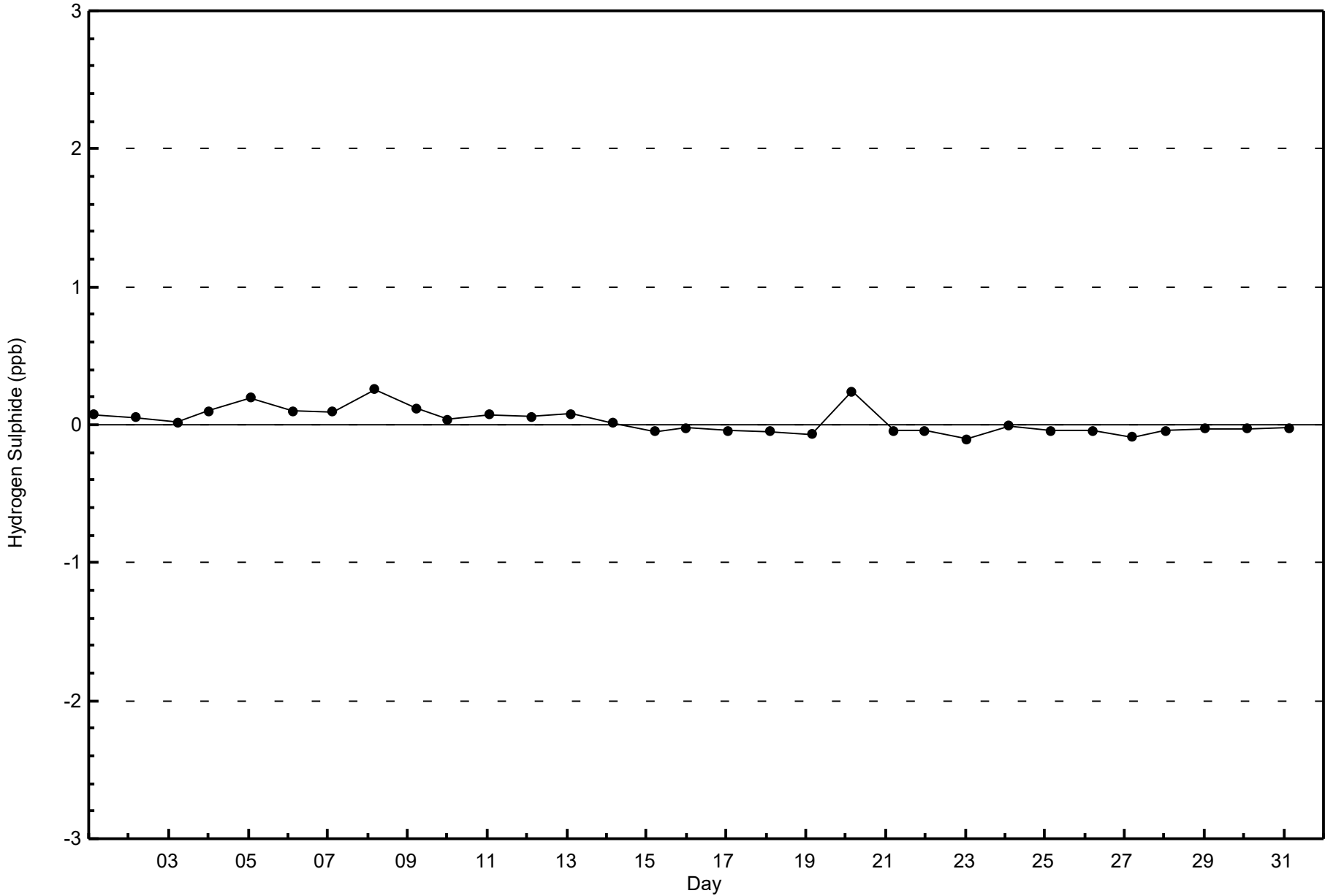


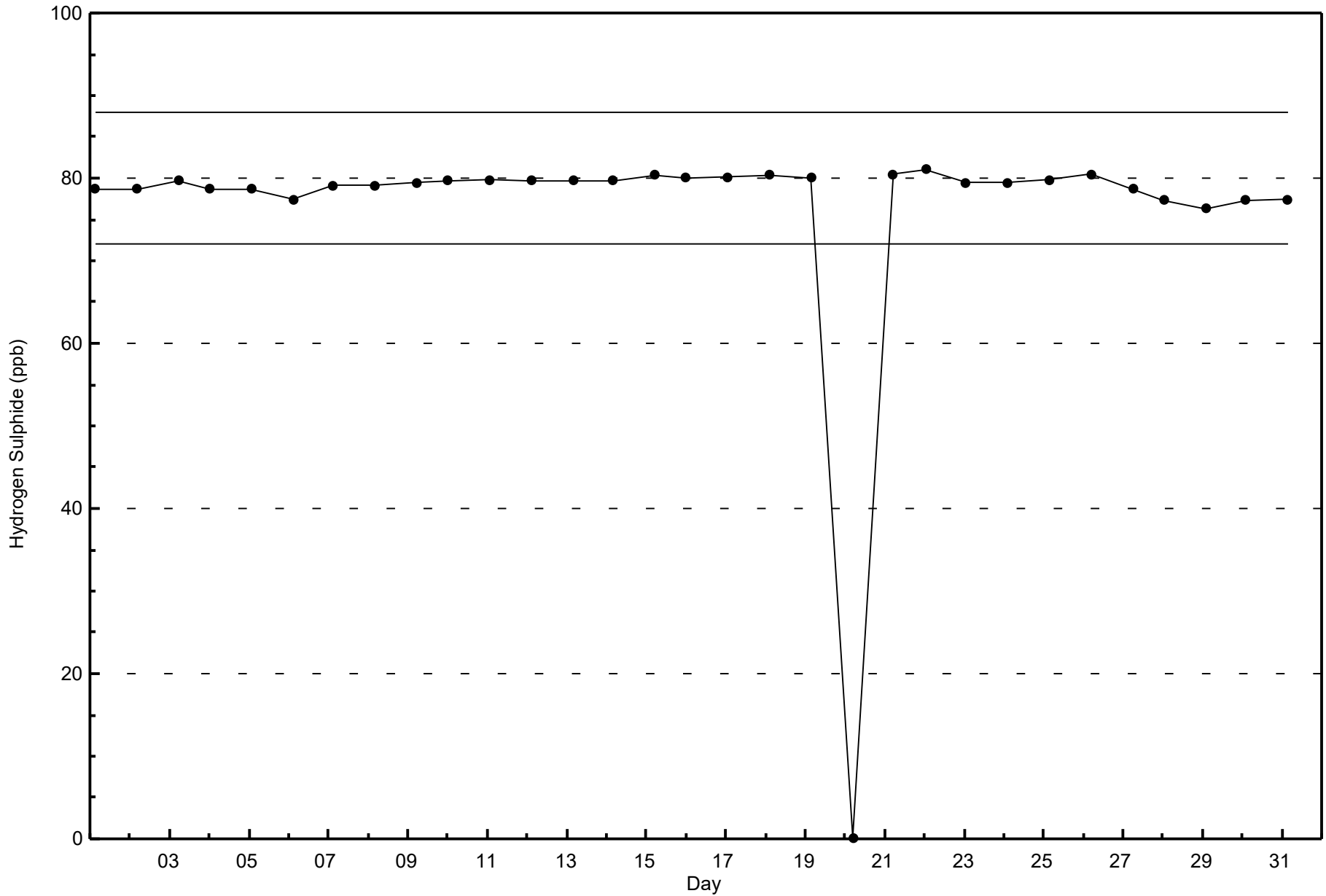
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter



Total Number of Valid Hours: 681







Wood Buffalo Environmental Association

Summary of Hour Averages

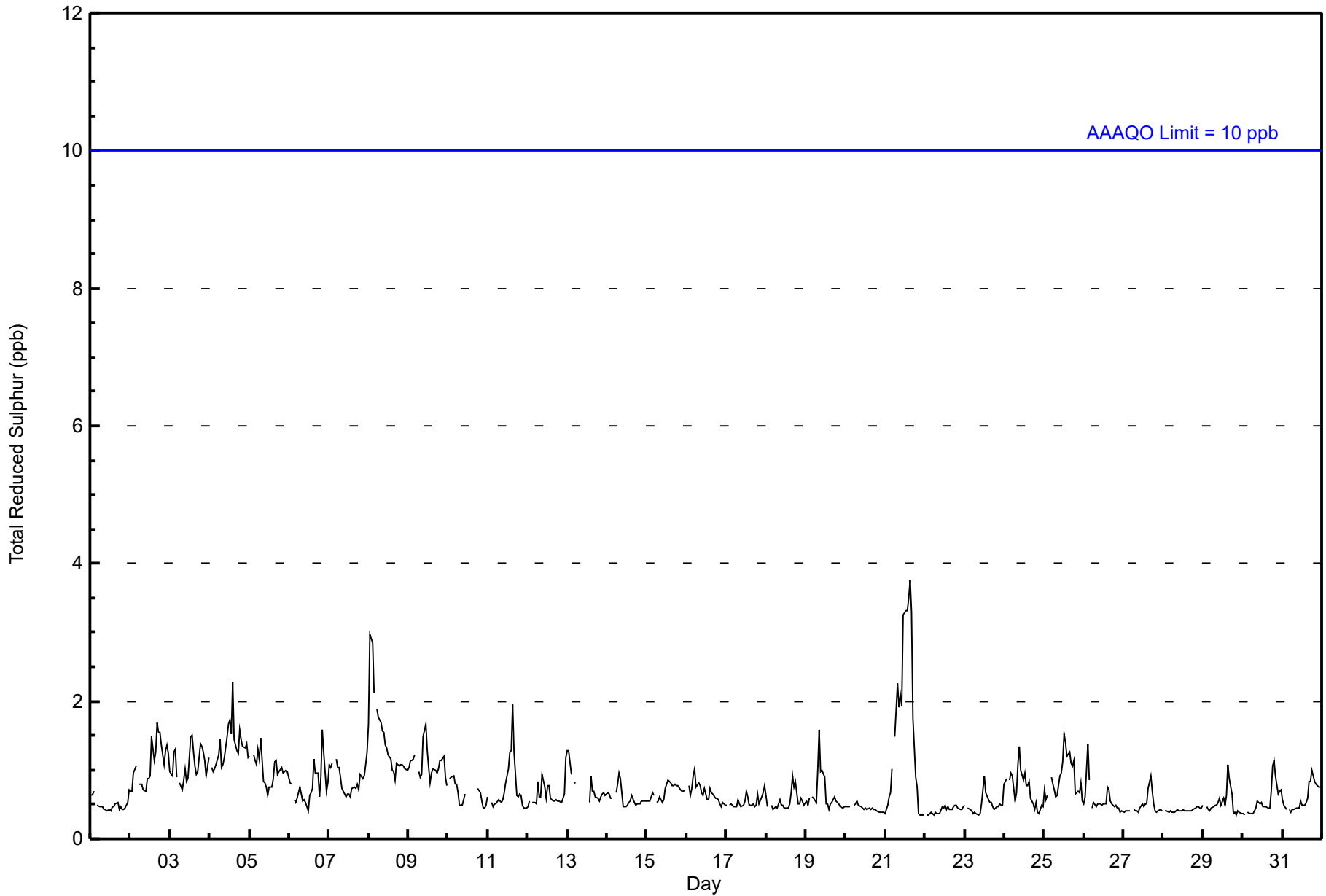
Total Reduced Sulphur (TRS) - ppb Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																								
Maximum Value: 3.8 ppb on Jan 21 16:00		Maximum Daily Average: 1.7 ppb on Jan 21		Minimum Value: 0.3 ppb on Jan 29 21:00		Minimum Daily Average: 0.4 ppb on Jan 22		Hours of Data: 699																																								
Maximum Diurnal Average: 0.9 ppb at hour 16		Minimum Diurnal Average: 0.7 ppb at hour 23		Hours of Missing Data: 45		Hours of Calibration: 38		Percent Operational Time: 99.1																																								
Monthly Average: 0.76 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.6 Q ₃ = 0.9 P ₉₀ = 1.3 P ₉₉ = 2.8																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	0.6	0.7	0.7	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.7	0.5	0.7																						
2-Jan	0.7	0.7	1.0	1.1	Z	0.8	0.8	0.8	0.7	0.7	0.9	0.9	0.9	1.5	1.1	1.3	1.7	1.5	1.6	1.4	1.1	1.3	1.4	1.2	1.1	1.7																						
3-Jan	1.0	0.9	1.3	1.3	0.9	Z	0.8	0.7	0.9	1.0	0.8	0.9	1.5	1.5	1.3	1.1	0.9	1.0	1.4	1.4	1.3	1.1	0.9	1.2	1.1	1.5																						
4-Jan	Z	1.0	1.0	1.0	1.1	1.2	1.4	1.0	1.1	1.2	1.5	1.7	1.7	1.5	2.3	1.5	1.3	1.2	1.6	1.4	1.3	1.3	1.4	1.2	1.3	2.3																						
5-Jan	1.2	Z	1.2	1.1	1.1	1.3	1.2	1.5	0.8	0.8	0.8	0.6	0.8	0.8	0.9	1.1	1.1	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5																						
6-Jan	0.8	0.8	Z	0.6	0.5	0.6	0.8	0.7	0.5	0.6	0.5	0.4	0.6	0.7	0.7	1.2	0.9	1.0	0.6	0.9	1.6	1.3	0.7	0.8	0.8	1.6																						
7-Jan	1.1	1.0	1.1	Z	1.2	1.0	1.0	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.9	0.9	0.9	1.1	1.3	0.9	1.3																						
8-Jan	1.7	3.0	2.8	2.1	Z	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.0	1.0	0.8	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.4	3.0																						
9-Jan	1.0	1.1	1.1	1.1	1.2	Z	1.0	0.9	0.9	1.5	1.7	1.3	1.0	0.8	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2	0.9	0.8	1.1	1.7																						
10-Jan	Z	0.9	0.9	0.9	0.8	0.8	0.7	0.5	0.5	0.6	0.7	C	C	C	C	C	C	C	C	0.7	0.7	0.6	0.4	0.4	0.5	0.9																						
11-Jan	0.6	Z	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.7	0.8	1.0	1.3	1.3	1.9	1.3	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.7	1.9																						
12-Jan	0.5	0.5	Z	0.5	0.5	0.5	0.8	0.6	0.6	0.9	0.7	0.6	0.8	0.8	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.7	1.2	1.2																						
13-Jan	1.3	1.3	0.9	Z	0.8	0.8	UO	UO	UO	UO	UO	UO	M	0.5	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.6	--	1.3																						
14-Jan	0.7	0.6	0.6	0.6	Z	0.7	0.8	1.0	0.9	0.7	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	1.0																						
15-Jan	0.5	0.6	0.6	0.7	0.6	Z	0.5	0.5	0.6	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8																						
16-Jan	Z	0.8	0.6	0.7	0.9	1.0	0.8	0.8	0.8	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.7	1.0																						
17-Jan	0.5	Z	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.8	0.5	0.8																						
18-Jan	0.6	0.5	Z	0.5	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.7	0.9	0.8	0.8	0.5	0.5	0.6	0.5	0.5	0.5	0.9																						
19-Jan	0.5	0.5	0.6	Z	0.6	0.6	0.5	1.0	1.6	1.0	1.0	0.9	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.6																						
20-Jan	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6																						
21-Jan	0.4	0.5	0.6	0.7	1.0	Z	1.5	2.3	1.9	2.1	1.9	3.3	3.3	3.3	3.5	3.8	3.3	1.7	0.9	0.8	0.4	0.3	0.4	0.3	1.7	3.8																						
22-Jan	Z	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5																						
23-Jan	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.9	0.7	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.9																						
24-Jan	0.8	0.9	Z	0.9	1.0	0.9	0.5	0.7	1.1	1.3	1.0	0.9	1.0	0.8	0.8	0.8	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.7	1.3																						
25-Jan	0.7	0.6	0.6	Z	0.9	0.8	0.7	0.6	0.6	0.9	1.0	1.1	1.5	1.4	1.2	1.3	1.1	1.0	1.1	0.6	0.7	0.7	0.8	0.6	0.9	1.5																						
26-Jan	0.5	0.6	1.4	0.9	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.6	1.4																						
27-Jan	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.9																						
28-Jan	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5																						
29-Jan	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.6	1.1	0.9	0.6	0.4	0.4	0.3	0.4	0.4	0.5	1.1																						
30-Jan	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	1.1	1.1	0.9	0.7	0.7	0.7	0.6	1.1																						
31-Jan	0.6	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.8	0.8	1.0	0.8	0.8	0.8	0.7	0.8	0.6	1.0																						
																								0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	Diurnal Average
																								1.7	3.0	2.8	2.1	1.2	1.9	1.8	2.3	1.9	2.1	1.9	3.3	3.3	3.3	3.5	3.8	3.3	1.7	1.6	1.4	1.6	1.3	1.4	1.3	Diurnal Maximum
Z - zerospan																								C - Calibration						M - Maintenance						UO - Unstable Operation												
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	691	98.86	98.86
3 - 4	8	1.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	102	63	17	12	5	2	11	64	263	30	13	9	18	24	24	31	688
3 - 4	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	8
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	63	17	12	5	2	11	65	270	30	13	9	18	24	24	31	696

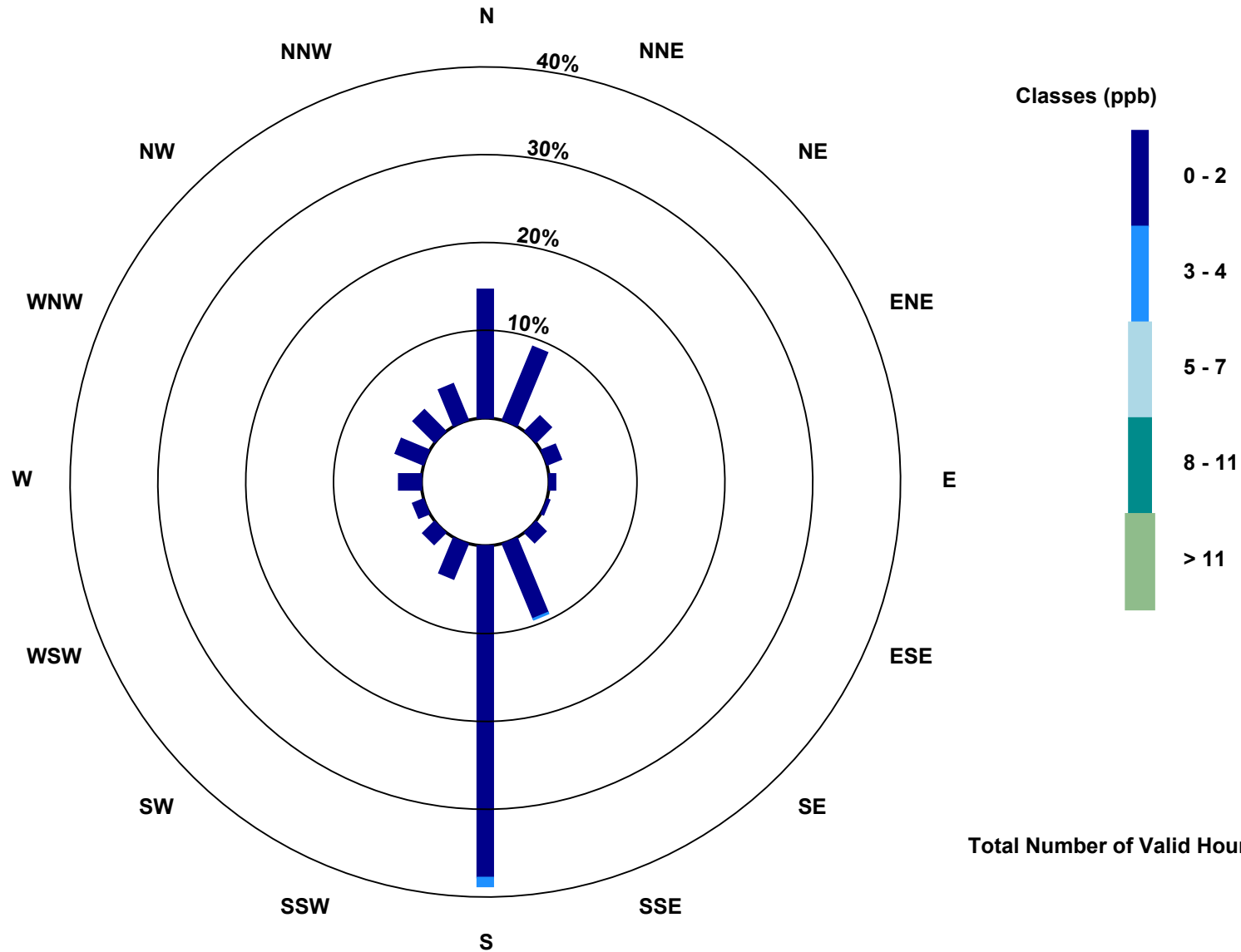
Total Number of Valid Hours: 696

Total Number of Hours: 744

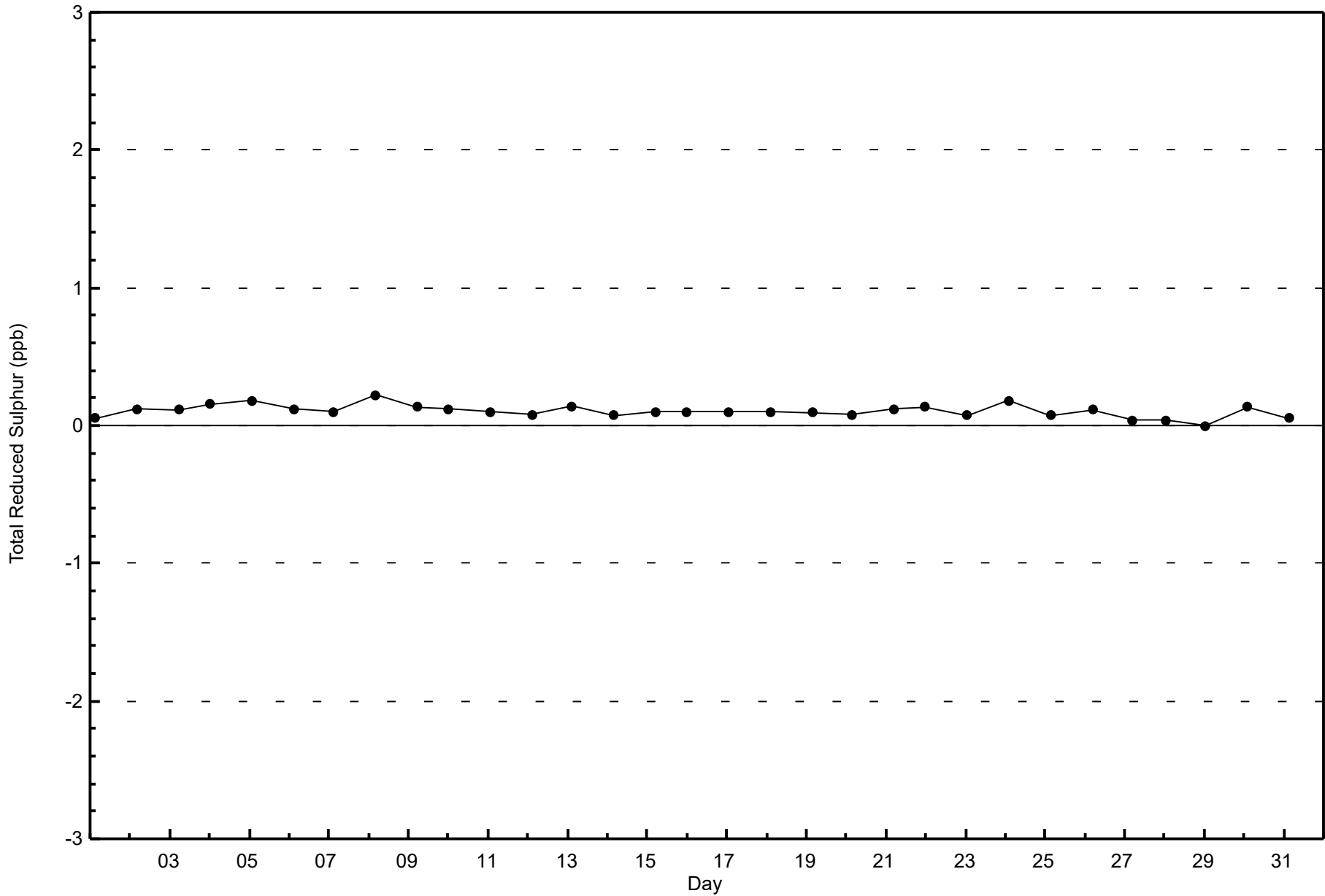


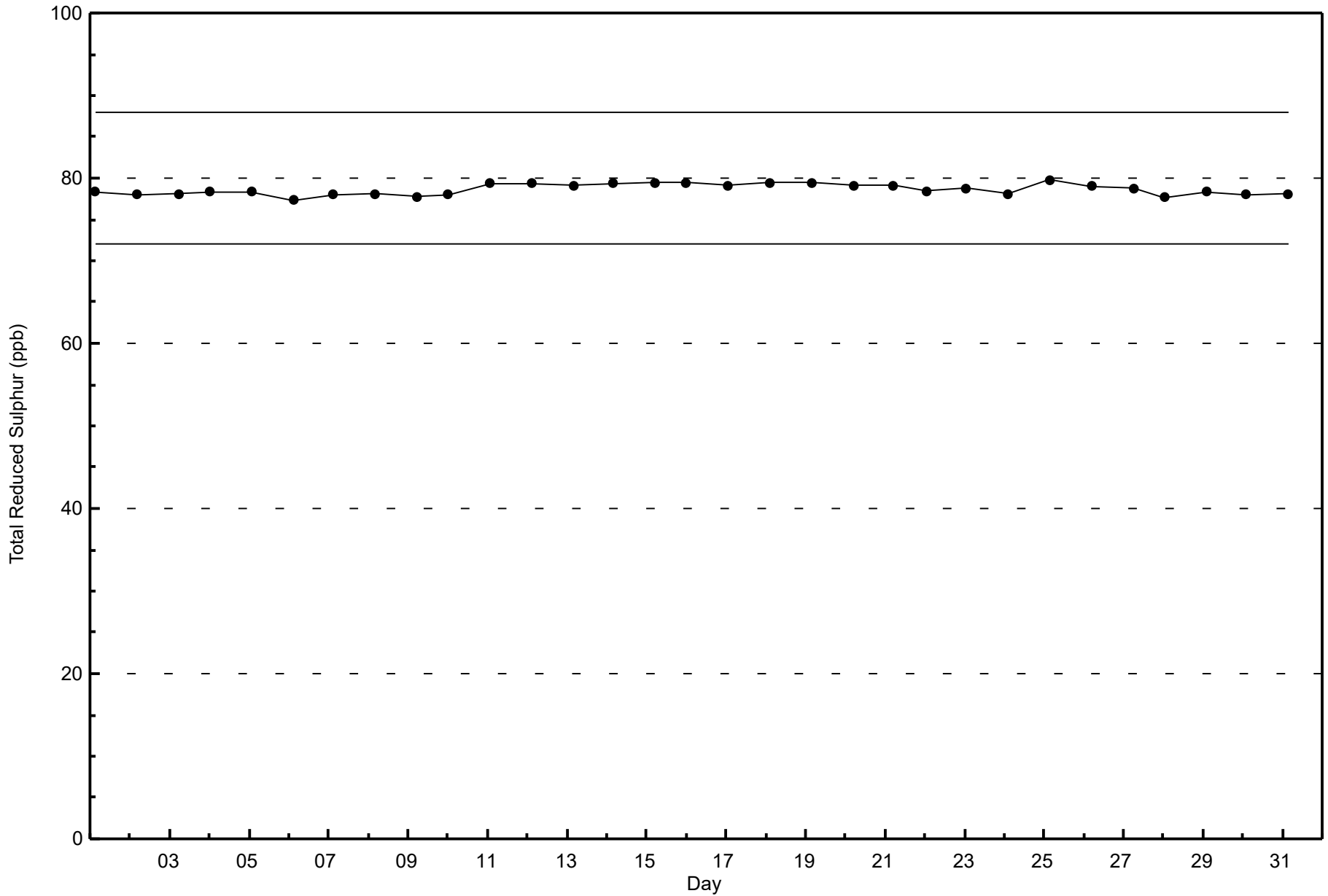
Wood Buffalo Environmental Association
Wind Rose Jan 2023

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



Total Number of Valid Hours: 696





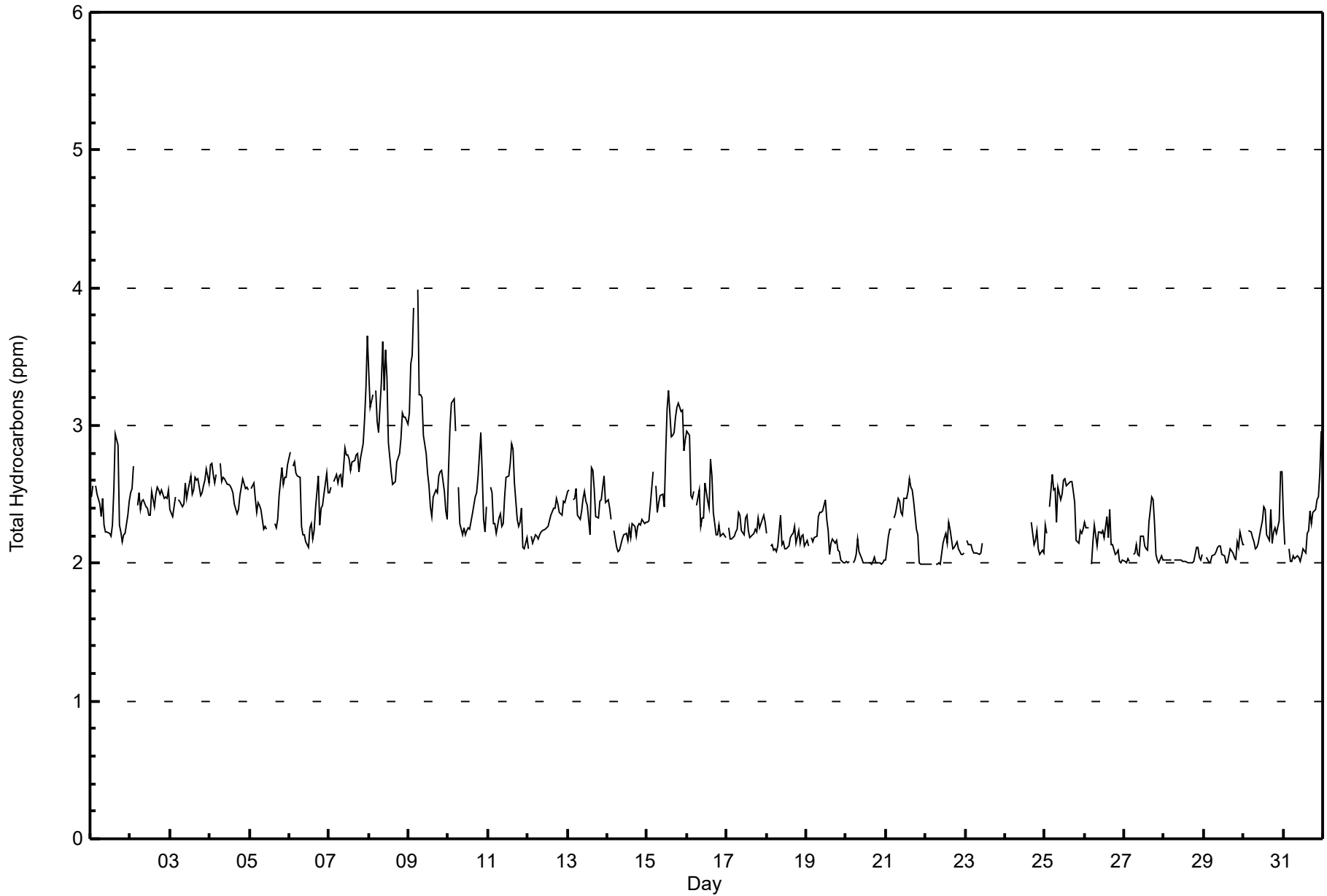


Maximum Value: 4.0 ppm on Jan 9 06:00																				Maximum Daily Average: 3.0 ppm on Jan 8					Hours in Service: 744				
Minimum Value: 2.0 ppm on Jan 26 05:00																				Minimum Daily Average: 2.0 ppm on Jan 20					Hours of Data: 680				
Maximum Diurnal Average: 2.4 ppm at hour 3																				Minimum Diurnal Average: 2.3 ppm at hour 10					Hours of Missing Data: 64				
Monthly Average: 2.37 ppm																				Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.3 Q ₃ = 2.5 P ₉₀ = 2.7 P ₉₉ = 3.4					Hours of Calibration: 34				
																				Percent Operational Time: 96.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	2.5	2.6	Z	2.6	2.5	2.4	2.3	2.5	2.3	2.2	2.2	2.2	2.3	2.5	2.9	2.9	2.3	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.9				
2-Jan	2.5	2.5	2.7	Z	2.4	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.5	2.4	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.7				
3-Jan	2.4	2.3	2.4	2.5	Z	2.5	2.4	2.4	2.4	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.6	2.6	2.5	2.5	2.6	2.6	2.7	2.6	2.7				
4-Jan	2.7	2.7	2.6	2.6	2.6	Z	2.7	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.5	2.6	2.6	2.5	2.6	2.5	2.5	2.7				
5-Jan	Z	2.5	2.6	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	C	C	C	C	2.3	2.3	2.3	2.5	2.7	2.6	2.6	2.6	2.7	2.7				
6-Jan	2.8	Z	2.7	2.7	2.7	2.6	2.6	2.3	2.2	2.2	2.2	2.1	2.3	2.3	2.2	2.2	2.4	2.6	2.3	2.4	2.4	2.5	2.7	2.5	2.8				
7-Jan	2.5	2.6	Z	2.6	2.6	2.6	2.6	2.6	2.5	2.8	2.8	2.8	2.8	2.7	2.7	2.7	2.8	2.8	2.7	2.8	2.9	3.0	3.3	3.7	3.7				
8-Jan	3.4	3.1	3.2	Z	3.3	3.0	3.0	3.3	3.6	3.3	3.5	3.3	2.9	2.7	2.6	2.6	2.6	2.7	2.8	2.9	3.1	3.1	3.1	3.0	3.6				
9-Jan	3.1	3.5	3.5	3.9	Z	4.0	3.2	3.2	3.2	2.9	2.8	2.7	2.6	2.4	2.3	2.5	2.5	2.5	2.6	2.7	2.7	2.5	2.4	2.3	4.0				
10-Jan	2.7	3.0	3.2	3.2	3.0	Z	2.6	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.4	2.4	2.5	2.5	2.6	2.9	2.7	2.3	2.2	2.4	3.2				
11-Jan	Z	2.6	2.5	2.3	2.3	2.2	2.3	2.4	2.3	2.3	2.5	2.6	2.6	2.7	2.9	2.8	2.6	2.3	2.3	2.3	2.4	2.1	2.1	2.2	2.9				
12-Jan	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.5	2.5				
13-Jan	2.5	2.5	Z	2.5	2.5	2.5	2.3	2.3	2.4	2.5	2.5	2.5	2.4	2.2	2.7	2.7	2.5	2.3	2.3	2.4	2.5	2.5	2.6	2.4	2.7				
14-Jan	2.5	2.4	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.5				
15-Jan	2.3	2.3	2.4	2.7	Z	2.6	2.4	2.4	2.5	2.5	2.4	2.8	3.1	3.3	2.9	2.9	2.9	3.1	3.1	3.2	3.1	3.1	2.8	2.9	3.3				
16-Jan	3.0	2.9	2.5	2.5	2.5	Z	2.4	2.5	2.3	2.3	2.3	2.6	2.5	2.4	2.8	2.6	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.2	3.0				
17-Jan	Z	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.2	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.3	2.4				
18-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.1	2.2	2.1	2.2	2.2	2.1	2.3				
19-Jan	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.5				
20-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2				
21-Jan	2.0	2.2	2.3	2.2	Z	2.3	2.4	2.5	2.5	2.4	2.3	2.5	2.5	2.5	2.6	2.6	2.5	2.4	2.2	2.2	2.0	2.0	2.0	2.0	2.6				
22-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.3				
23-Jan	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	M	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.2				
24-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	UO	UO	UO	UO	UO	UO	UO	UO	2.3				
25-Jan	2.3	2.2	Z	2.4	2.6	2.5	2.5	2.3	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.6				
26-Jan	2.3	2.3	2.3	Z	2.0	2.2	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.4				
27-Jan	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.5	2.5	2.3	2.1	2.0	2.0	2.1	2.0	2.5				
28-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1				
29-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.2	2.1	2.2	2.1				
30-Jan	2.1	Z	UO	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.4	2.4	2.2	2.2	2.4	2.1	2.2	2.3	2.2	2.3	2.7	2.7				
31-Jan	2.3	2.1	Z	2.1	2.0	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.4	2.3	2.4	2.4	2.5	2.5	2.7	3.0	3.0				
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan																													
C - Calibration																													
M - Maintenance																													
UO - Unstable Operation																													



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	83	12.21	12.21
2.1 - 3.0	566	83.24	95.44
3.1 - 10.0	31	4.56	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	5	3	1	1	0	0	0	1	9	4	9	5	15	15	10	4	82
2.1 - 3.0	90	59	14	11	3	0	11	56	245	23	3	3	5	6	13	22	564
3.1 - 10.0	7	5	2	1	0	1	0	2	5	2	2	1	0	0	1	2	31
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	67	17	13	3	1	11	59	259	29	14	9	20	21	24	28	677

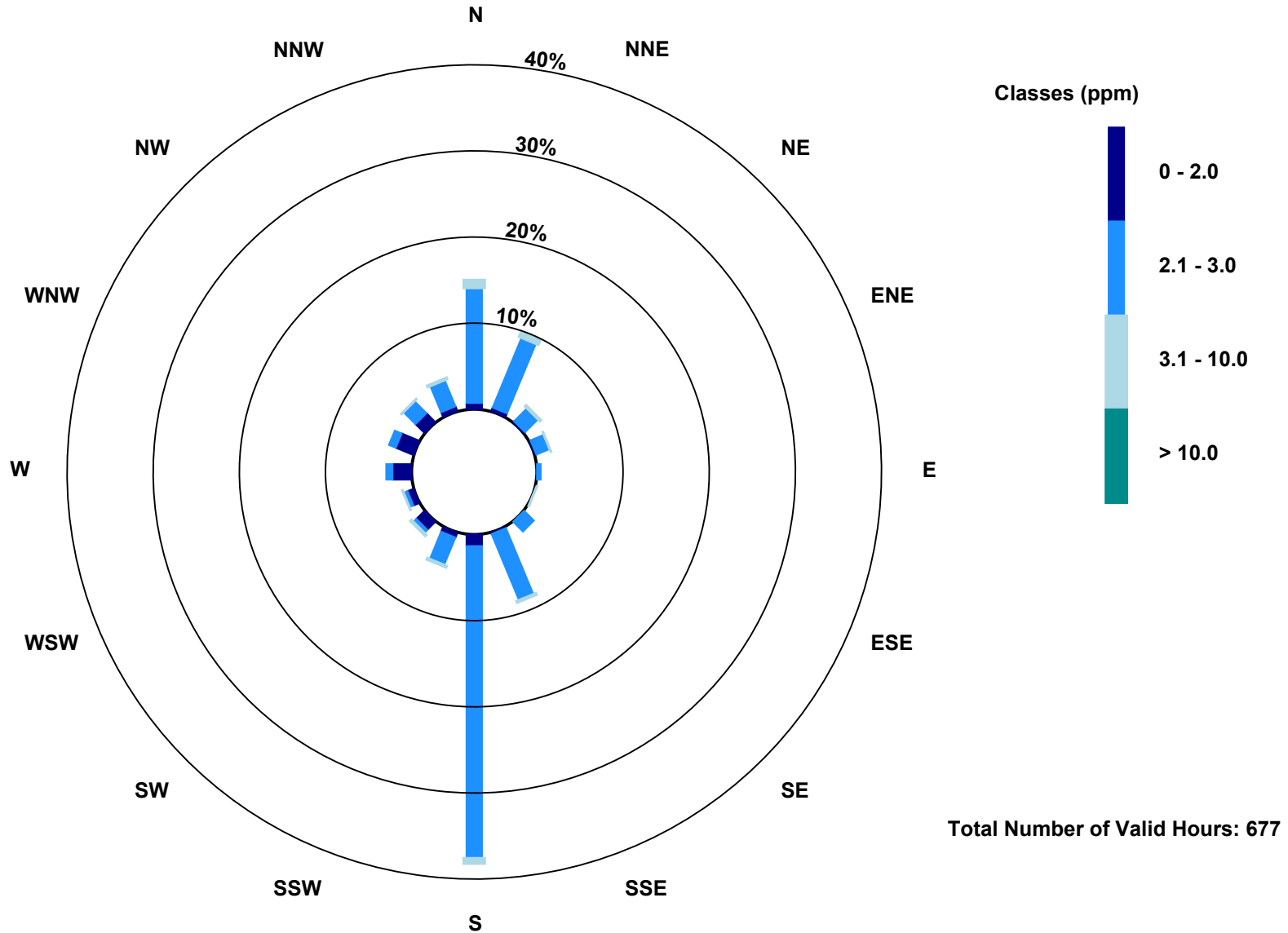
Total Number of Valid Hours: 677

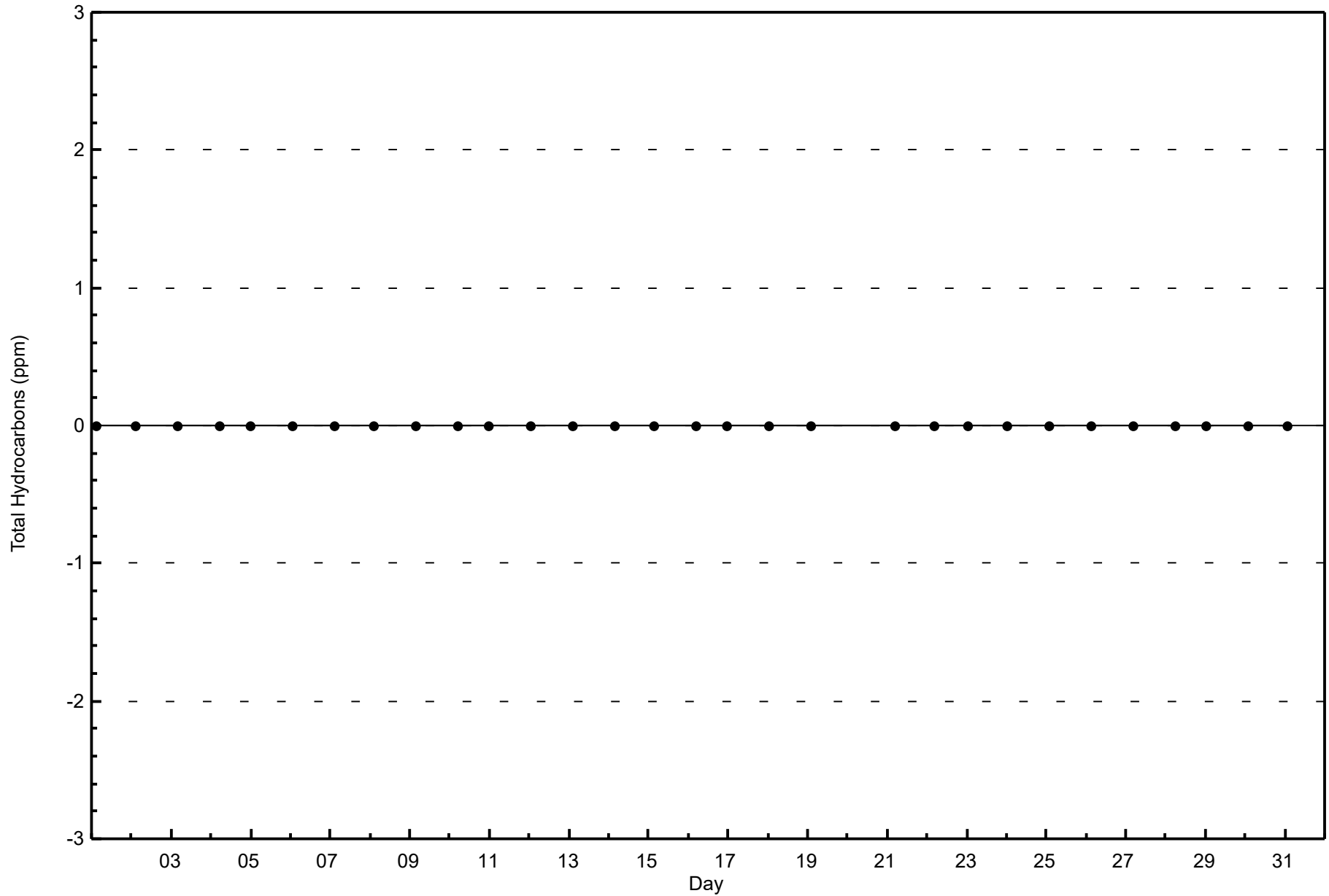
Total Number of Hours: 744

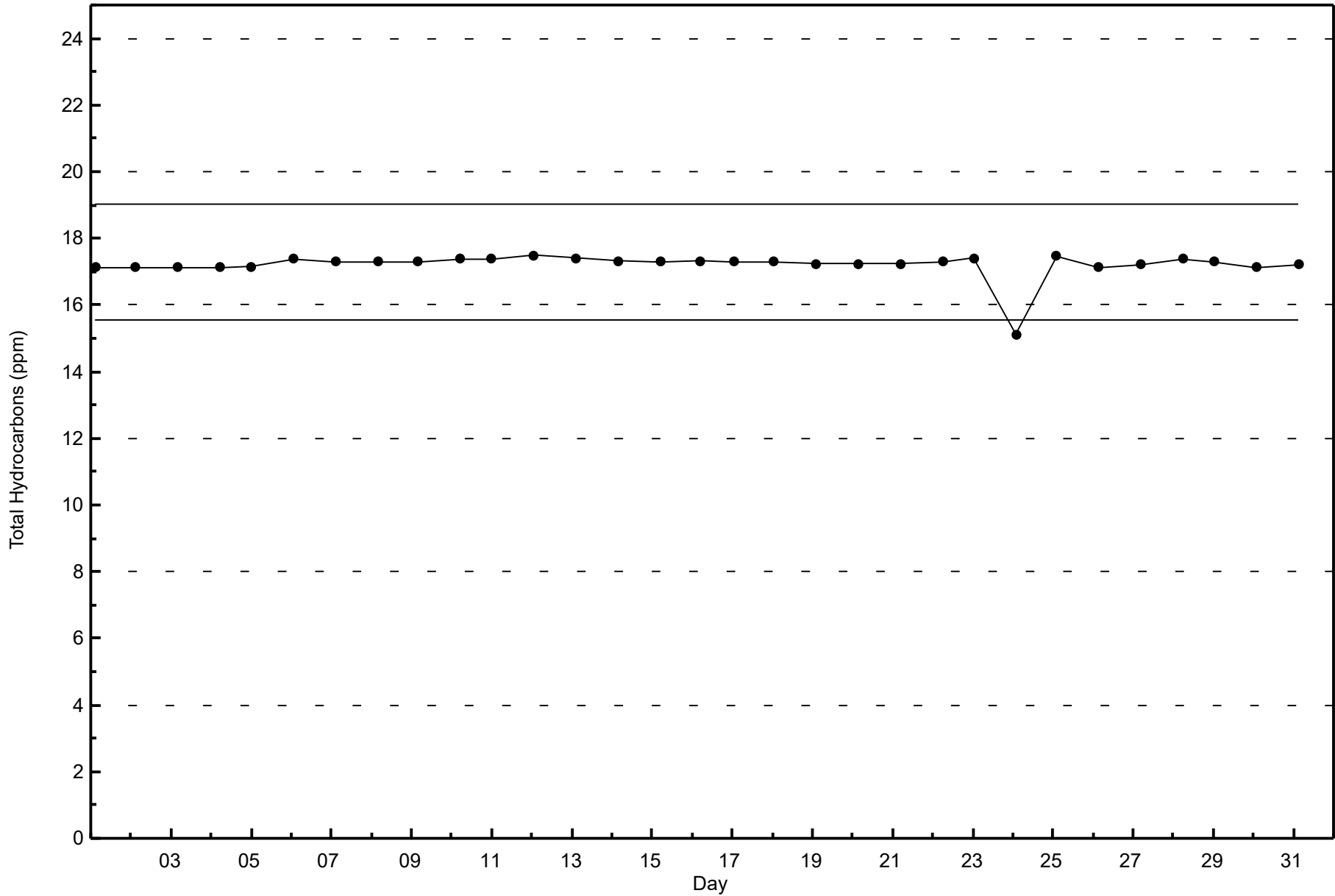


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association
Summary of Hour Averages

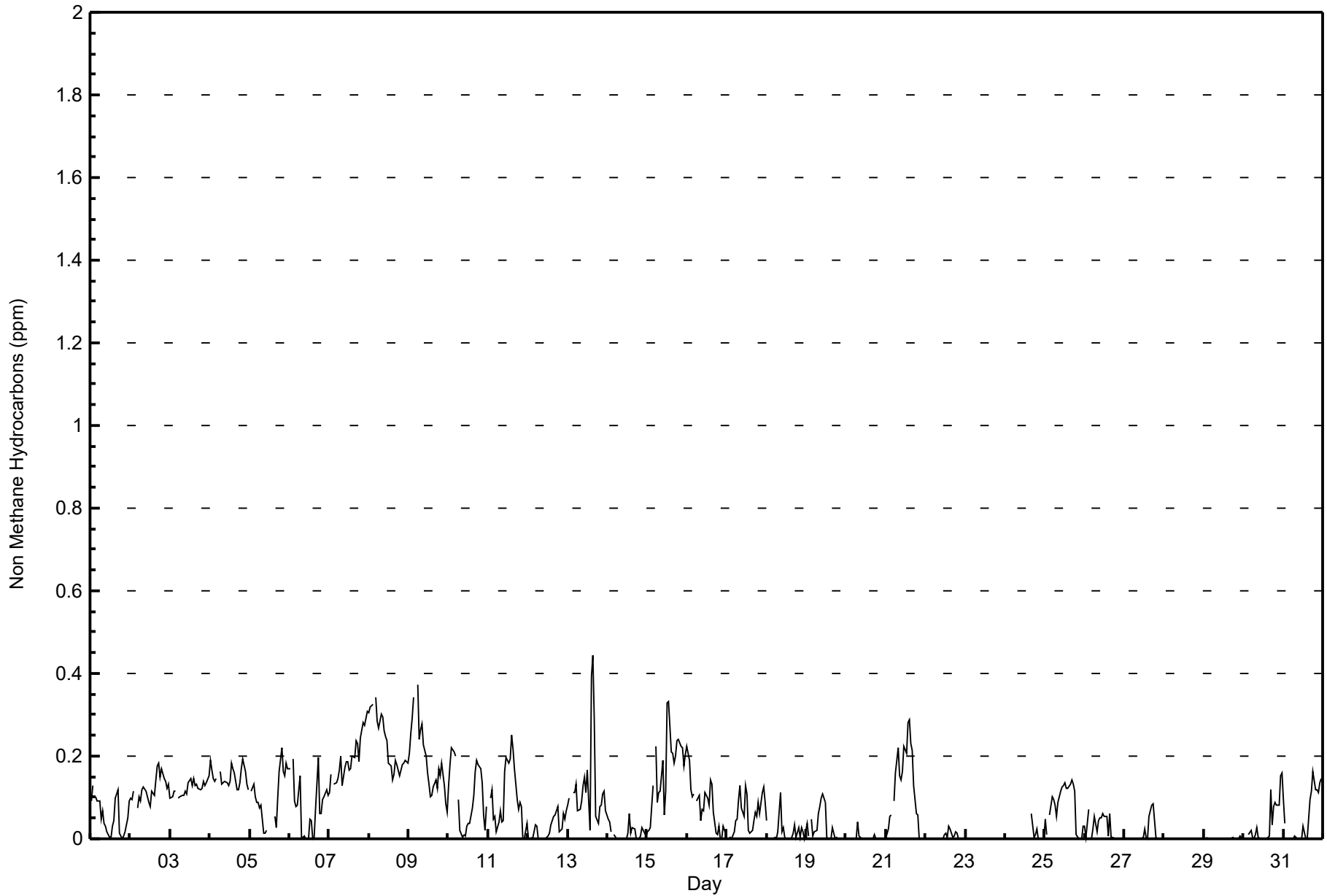
Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - January 2023

Maximum Value: 0.446 ppm on Jan 13 16:00		Maximum Daily Average: 0.229 ppm on Jan 8		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Jan 6 12:00		Minimum Daily Average: 0.000 ppm on Jan 28		Hours of Data:	680																						
Maximum Diurnal Average: 0.099 ppm at hour 17		Minimum Diurnal Average: 0.065 ppm at hour 5		Hours of Missing Data:	64																						
Monthly Average: 0.077 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.3		Hours of Calibration:	34																						
				Percent Operational Time:	96.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.091	0.129	Z	0.101	0.092	0.092	0.047	0.069	0.039	0.029	0.016	0.002	0.002	0.031	0.045	0.098	0.119	0.013	0.006	0.001	0.006	0.016	0.052	0.090	0.052	0.129	
2-Jan	0.099	0.095	0.115	Z	0.075	0.101	0.093	0.120	0.124	0.115	0.102	0.089	0.080	0.117	0.106	0.143	0.175	0.183	0.148	0.169	0.146	0.139	0.121	0.131	0.121	0.183	
3-Jan	0.100	0.102	0.114	0.114	Z	0.098	0.102	0.104	0.105	0.114	0.107	0.137	0.146	0.130	0.146	0.127	0.132	0.122	0.119	0.123	0.139	0.129	0.136	0.151	0.122	0.151	
4-Jan	0.191	0.165	0.145	0.137	0.146	Z	0.163	0.134	0.137	0.138	0.134	0.128	0.140	0.182	0.170	0.158	0.119	0.119	0.136	0.168	0.192	0.164	0.134	0.119	0.149	0.192	
5-Jan	Z	0.114	0.133	0.103	0.088	0.088	0.075	0.081	0.013	0.014	0.021	C	C	C	C	0.053	0.028	0.098	0.164	0.219	0.163	0.152	0.185	0.168	0.103	0.219	
6-Jan	0.171	Z	0.194	0.092	0.078	0.080	0.153	0.004	0.003	0.005	0.001	0.000	0.046	0.044	0.001	0.003	0.071	0.196	0.062	0.061	0.096	0.102	0.120	0.105	0.073	0.196	
7-Jan	0.112	0.157	Z	0.132	0.136	0.145	0.165	0.199	0.129	0.172	0.186	0.185	0.168	0.169	0.199	0.195	0.238	0.230	0.187	0.245	0.282	0.275	0.291	0.310	0.196	0.310	
8-Jan	0.307	0.318	0.325	Z	0.341	0.286	0.266	0.301	0.293	0.262	0.248	0.239	0.183	0.176	0.144	0.155	0.189	0.180	0.152	0.166	0.180	0.184	0.189	0.183	0.229	0.341	
9-Jan	0.205	0.254	0.291	0.344	Z	0.374	0.240	0.264	0.279	0.227	0.200	0.158	0.133	0.101	0.106	0.126	0.144	0.124	0.171	0.153	0.183	0.129	0.086	0.064	0.189	0.374	
10-Jan	0.130	0.179	0.219	0.211	0.200	Z	0.094	0.021	0.004	0.011	0.007	0.031	0.038	0.037	0.075	0.106	0.162	0.188	0.179	0.170	0.134	0.059	0.020	0.079	0.102	0.219	
11-Jan	Z	0.100	0.120	0.049	0.054	0.016	0.040	0.068	0.040	0.046	0.164	0.195	0.184	0.192	0.251	0.217	0.170	0.094	0.070	0.088	0.078	0.000	0.000	0.038	0.099	0.251	
12-Jan	0.000	Z	0.005	0.000	0.033	0.031	0.001	0.000	0.000	0.000	0.000	0.004	0.005	0.015	0.036	0.053	0.057	0.067	0.079	0.016	0.025	0.059	0.048	0.069	0.026	0.079	
13-Jan	0.080	0.098	Z	0.113	0.114	0.131	0.067	0.070	0.091	0.129	0.149	0.113	0.165	0.021	0.393	0.446	0.287	0.054	0.036	0.077	0.080	0.109	0.115	0.066	0.131	0.446	
14-Jan	0.049	0.041	0.018	Z	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.062	0.014	0.026	0.023	0.001	0.001	0.000	0.005	0.026	0.013	0.008	0.008	0.013	0.062	
15-Jan	0.018	0.022	0.026	0.128	Z	0.223	0.088	0.111	0.115	0.190	0.059	0.117	0.330	0.334	0.209	0.206	0.182	0.199	0.236	0.242	0.225	0.219	0.176	0.205	0.168	0.334	
16-Jan	0.222	0.191	0.117	0.100	0.110	Z	0.091	0.106	0.043	0.070	0.067	0.111	0.098	0.080	0.141	0.132	0.064	0.014	0.012	0.030	0.000	0.000	0.029	0.009	0.080	0.222	
17-Jan	Z	0.001	0.003	0.000	0.017	0.045	0.048	0.096	0.130	0.073	0.054	0.128	0.110	0.021	0.015	0.021	0.043	0.066	0.053	0.088	0.060	0.112	0.125	0.090	0.061	0.130	
18-Jan	0.042	Z	0.000	0.000	0.000	0.002	0.000	0.017	0.113	0.018	0.028	0.002	0.001	0.000	0.000	0.003	0.012	0.034	0.005	0.029	0.005	0.028	0.015	0.000	0.015	0.113	
19-Jan	0.036	0.007	Z	0.046	0.006	0.017	0.020	0.062	0.079	0.097	0.110	0.089	0.003	0.000	0.000	0.000	0.027	0.000	0.004	0.002	0.000	0.000	0.000	0.000	0.026	0.110	
20-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.040	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.040	
21-Jan	0.000	0.024	0.054	0.056	Z	0.091	0.159	0.219	0.154	0.143	0.163	0.223	0.207	0.282	0.287	0.231	0.214	0.129	0.061	0.057	0.000	0.000	0.000	0.000	0.120	0.287	
22-Jan	0.000	0.000	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.009	0.014	0.005	0.031	0.025	0.002	0.007	0.017	0.013	0.000	0.000	0.000	0.000	0.005	0.031	
23-Jan	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	M	M	UO	UO	UO	UO	UO	UO	UO	UO	--	0.001	
24-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	0.062	0.005	0.010	0.024	0.000	0.000	0.000	0.000	--	0.062
25-Jan	0.047	0.010	Z	0.058	0.100	0.096	0.081	0.055	0.087	0.116	0.124	0.130	0.136	0.123	0.123	0.133	0.141	0.131	0.115	0.011	0.000	0.000	0.000	0.032	0.080	0.141	
26-Jan	0.030	0.005	0.072	Z	0.000	0.023	0.054	0.018	0.043	0.052	0.049	0.060	0.055	0.054	0.006	0.062	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.072	
27-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.023	0.002	0.000	0.056	0.080	0.086	0.043	0.002	0.000	0.000	0.000	0.000	0.013	0.086	
28-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jan	Z	0.003	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.007	0.000	0.001	0.007	
30-Jan	0.000	Z	UO	0.011	0.019	0.003	0.000	0.010	0.026	0.005	0.001	0.000	0.000	0.000	0.000	0.006	0.120	0.033	0.078	0.088	0.083	0.081	0.153	0.160	0.040	0.160	
31-Jan	0.093	0.036	Z	0.000	0.000	0.000	0.000	0.007	0.001	0.000	0.000	0.000	0.030	0.000	0.000	0.046	0.094	0.115	0.162	0.119	0.118	0.111	0.137	0.146	0.053	0.162	
																								Diurnal Average		0.081 0.079 0.085 0.072 0.065 0.078 0.068 0.073 0.068 0.068 0.066 0.077 0.083 0.078 0.089 0.097 0.099 0.083 0.077 0.079 0.073 0.070 0.072 0.074	
																								Diurnal Maximum		0.307 0.318 0.325 0.344 0.341 0.374 0.266 0.301 0.293 0.262 0.248 0.239 0.330 0.334 0.393 0.446 0.287 0.230 0.236 0.245 0.282 0.275 0.291 0.310	
Z - zerospan			C - Calibration				M - Maintenance				UO - Unstable Operation																



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	215	31.62	31.62
0.006 - 0.05	129	18.97	50.59
0.06 - 0.1	211	31.03	81.62
> 0.1	125	18.38	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	21	19	3	7	1	0	4	19	65	10	8	6	15	19	12	5	214
0.006 - 0.05	20	14	5	1	1	0	6	16	51	6	3	1	0	0	3	2	129
0.06 - 0.1	39	13	4	3	1	0	1	14	109	6	0	0	4	0	5	11	210
> 0.1	22	21	5	2	0	1	0	10	34	7	3	2	1	2	4	10	124
Totals	102	67	17	13	3	1	11	59	259	29	14	9	20	21	24	28	677

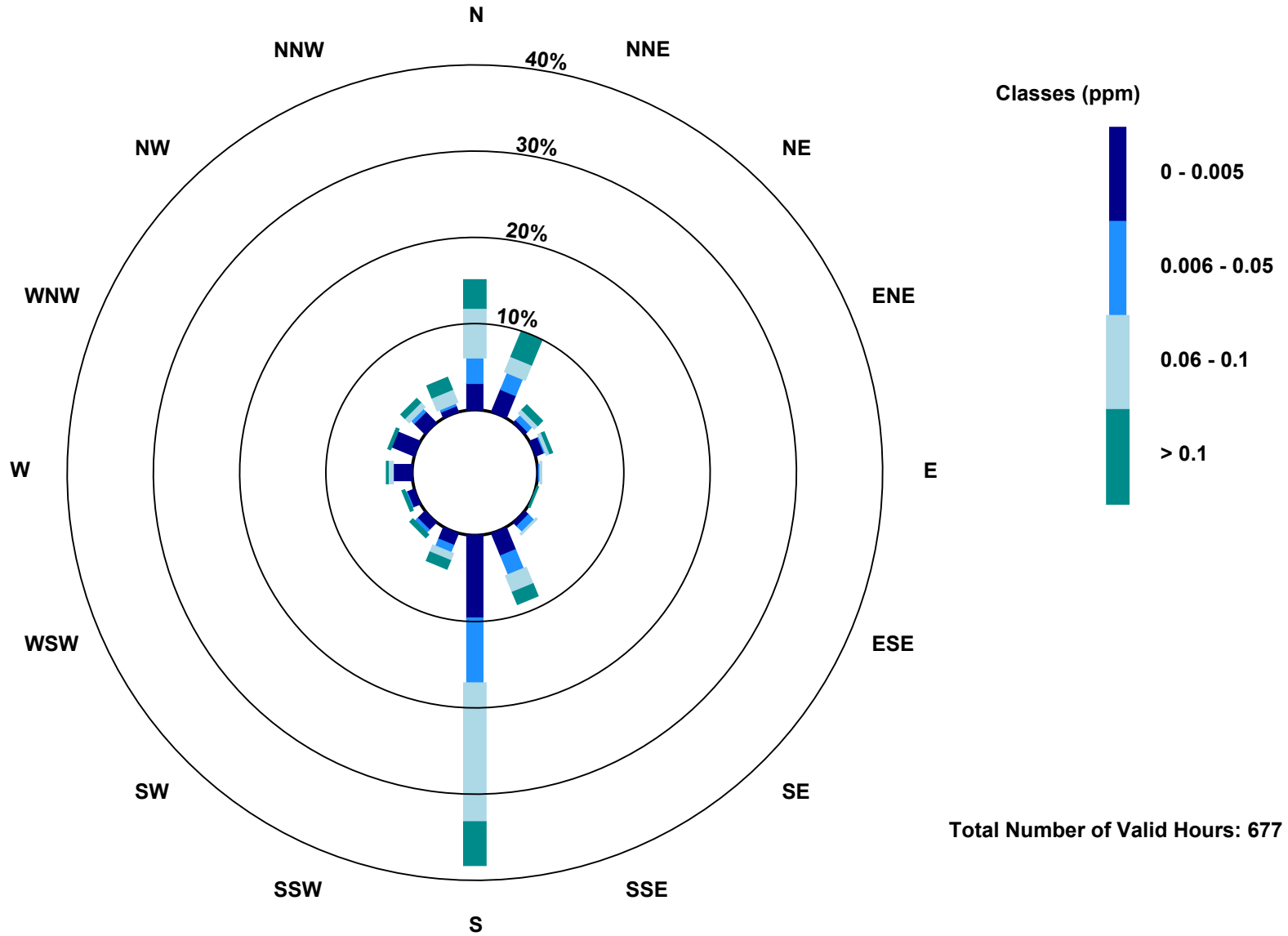
Total Number of Valid Hours: 677

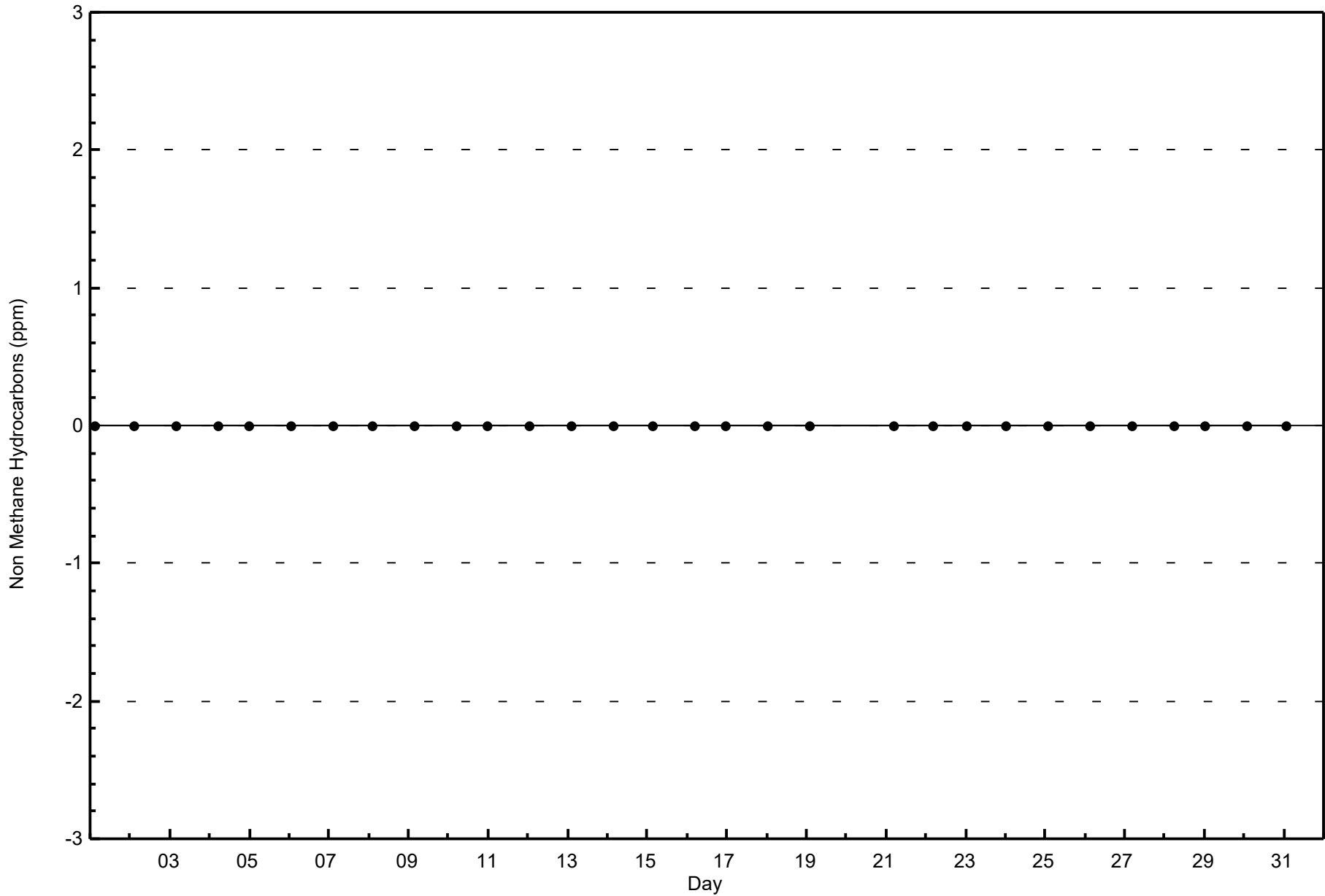
Total Number of Hours: 744

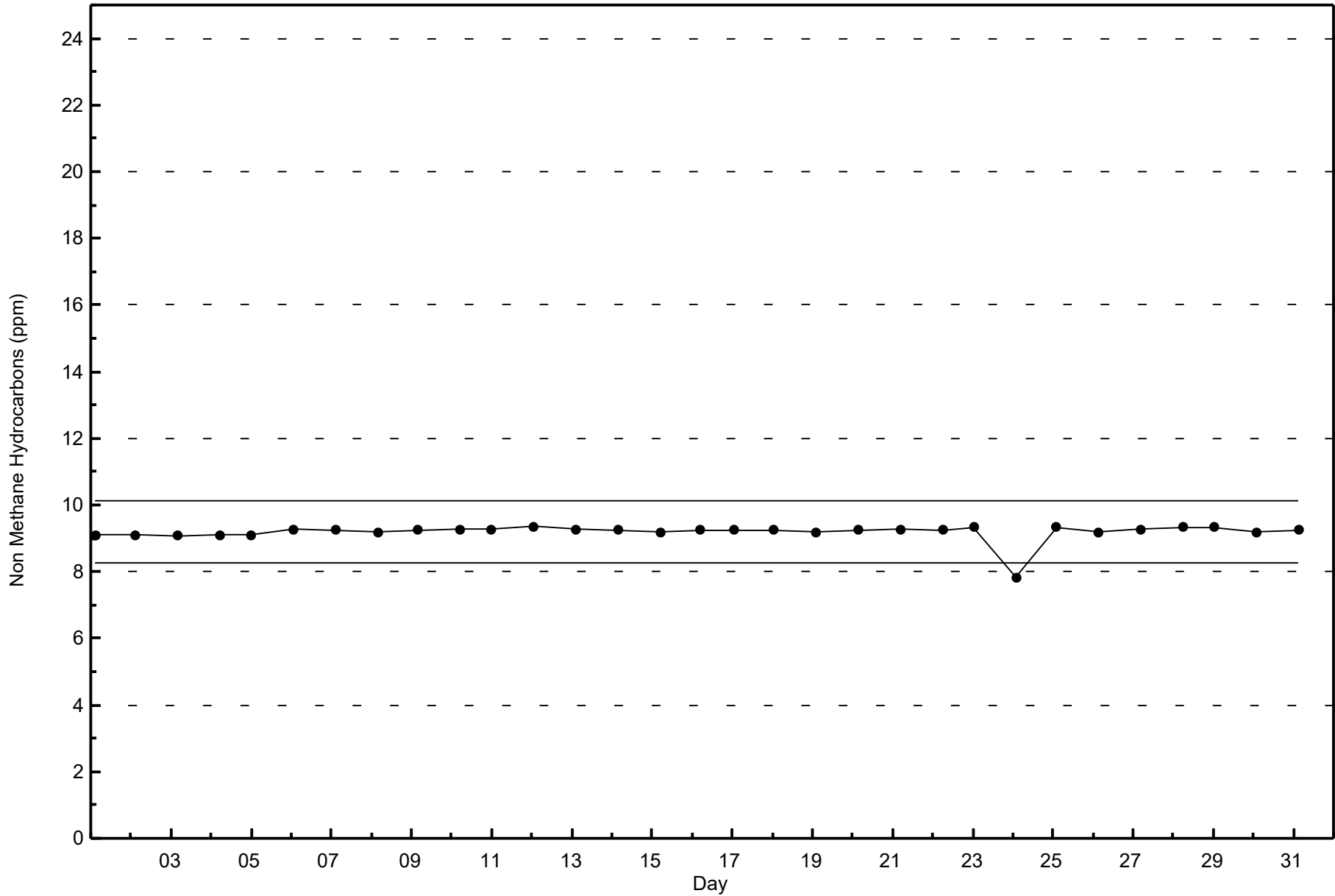


Wood Buffalo Environmental Association
Wind Rose Jan 2023

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









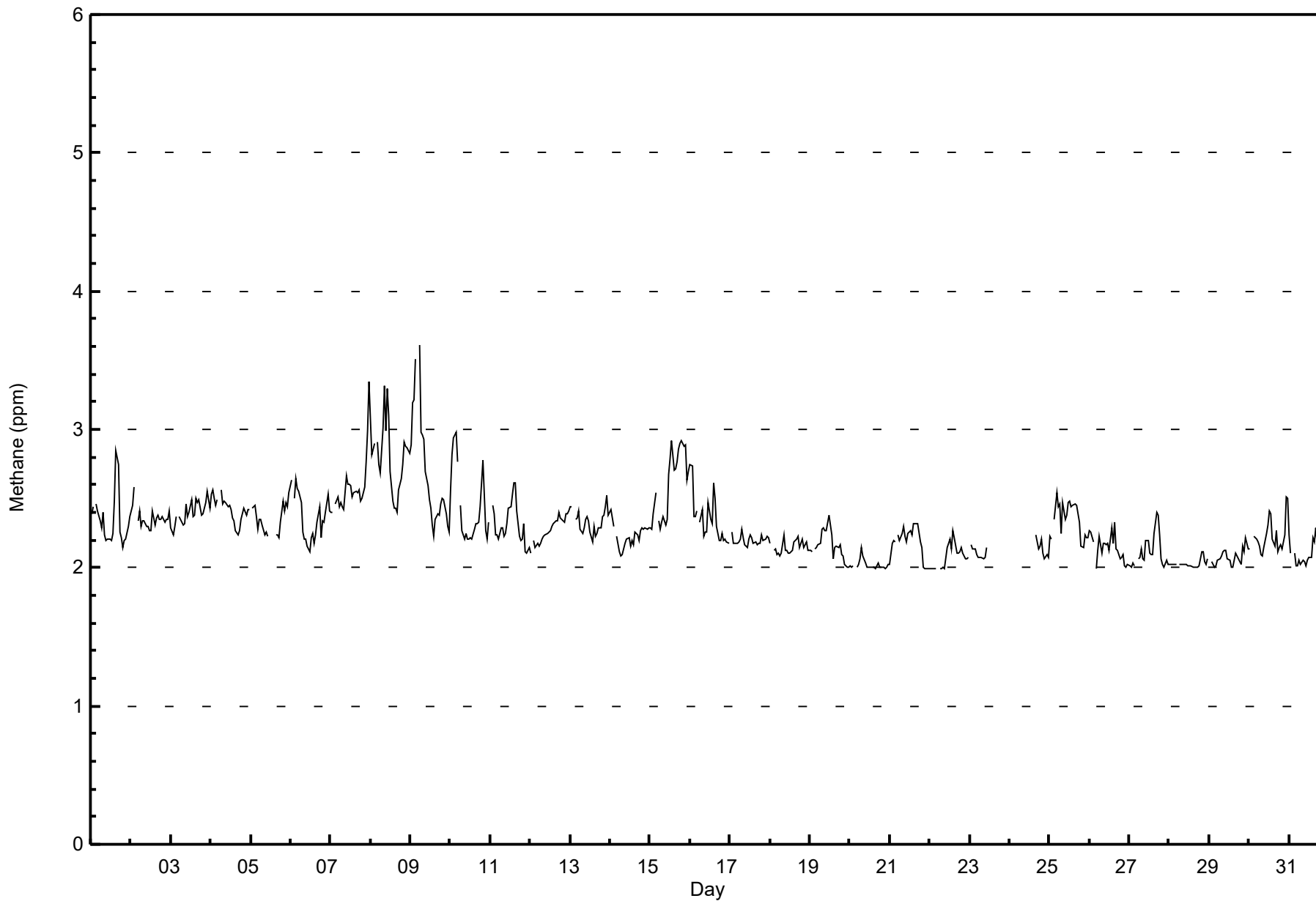
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.6 ppm on Jan 9 06:00 Maximum Daily Average: 2.8 ppm on Jan 8																	Hours in Service: 744 Hours of Data: 680 Hours of Missing Data: 64 Hours of Calibration: 34 Percent Operational Time: 96.0										
Minimum Value: 2.0 ppm on Jan 26 05:00 Minimum Daily Average: 2.0 ppm on Jan 20 Maximum Diurnal Average: 2.3 ppm at hour 3 Minimum Diurnal Average: 2.3 ppm at hour 10 Monthly Average: 2.30 ppm Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 3.1																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	2.4	2.4	Z	2.5	2.4	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.5	2.8	2.7	2.3	2.2	2.1	2.2	2.2	2.3	2.4	2.3	2.4	2.3	2.6
2-Jan	2.4	2.5	2.6	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.6
3-Jan	2.3	2.2	2.3	2.4	Z	2.4	2.3	2.3	2.3	2.5	2.4	2.4	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.5
4-Jan	2.5	2.6	2.5	2.4	2.5	Z	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6
5-Jan	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.2	C	C	C	C	2.2	2.2	2.2	2.3	2.5	2.4	2.5	2.4	2.5	2.3	2.5	
6-Jan	2.6	Z	2.5	2.6	2.6	2.6	2.5	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.3	2.3	2.4	2.5	2.4	2.4	2.6	
7-Jan	2.4	2.4	Z	2.5	2.5	2.4	2.5	2.4	2.4	2.7	2.6	2.6	2.6	2.5	2.5	2.6	2.5	2.6	2.5	2.5	2.6	2.8	3.0	3.3	2.6	3.3	
8-Jan	3.1	2.8	2.9	Z	2.9	2.7	2.7	3.0	3.3	3.0	3.3	3.1	2.7	2.5	2.4	2.4	2.4	2.6	2.6	2.7	2.9	2.9	2.9	2.8	2.8	3.3	
9-Jan	2.9	3.2	3.2	3.5	Z	3.6	3.0	3.0	2.9	2.7	2.6	2.5	2.4	2.3	2.2	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.3	2.7	3.6	
10-Jan	2.6	2.8	2.9	3.0	2.8	Z	2.5	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.8	2.5	2.3	2.2	2.3	2.4	3.0	
11-Jan	Z	2.5	2.4	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.4	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.3	2.6	
12-Jan	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.3	2.4	
13-Jan	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.4	2.3	2.3	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.4	2.3	2.5	
14-Jan	2.4	2.4	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4
15-Jan	2.3	2.3	2.4	2.5	Z	2.3	2.3	2.3	2.4	2.3	2.4	2.7	2.8	2.9	2.7	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.6	2.7	2.6	2.9
16-Jan	2.7	2.7	2.4	2.4	2.4	Z	2.3	2.4	2.2	2.3	2.3	2.5	2.4	2.3	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.7
17-Jan	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
18-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.2
19-Jan	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.2	2.4	
20-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
21-Jan	2.0	2.2	2.2	2.2	Z	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.2	2.3
22-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
23-Jan	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	M	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.2	2.2
24-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2
25-Jan	2.2	2.2	Z	2.4	2.5	2.4	2.5	2.2	2.5	2.3	2.4	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.4	2.5
26-Jan	2.3	2.3	2.2	Z	2.0	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.3
27-Jan	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.4	2.4	2.2	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.4
28-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.1
29-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.2	2.1	2.2	2.1	2.1	2.2
30-Jan	2.1	Z	UO	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.4	2.4	2.2	2.2	2.3	2.1	2.1	2.2	2.1	2.2	2.5	2.5	2.2	2.5
31-Jan	2.2	2.1	Z	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.5	2.8	2.2	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	84	12.35	12.35
2.1 - 3.0	587	86.32	98.68
3.1 - 10.0	9	1.32	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	5	3	1	1	0	0	0	1	9	4	9	5	15	16	10	4	83
2.1 - 3.0	95	64	16	12	3	1	11	58	248	23	3	4	5	5	14	23	585
3.1 - 10.0	2	0	0	0	0	0	0	0	2	2	2	0	0	0	0	1	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	102	67	17	13	3	1	11	59	259	29	14	9	20	21	24	28	677

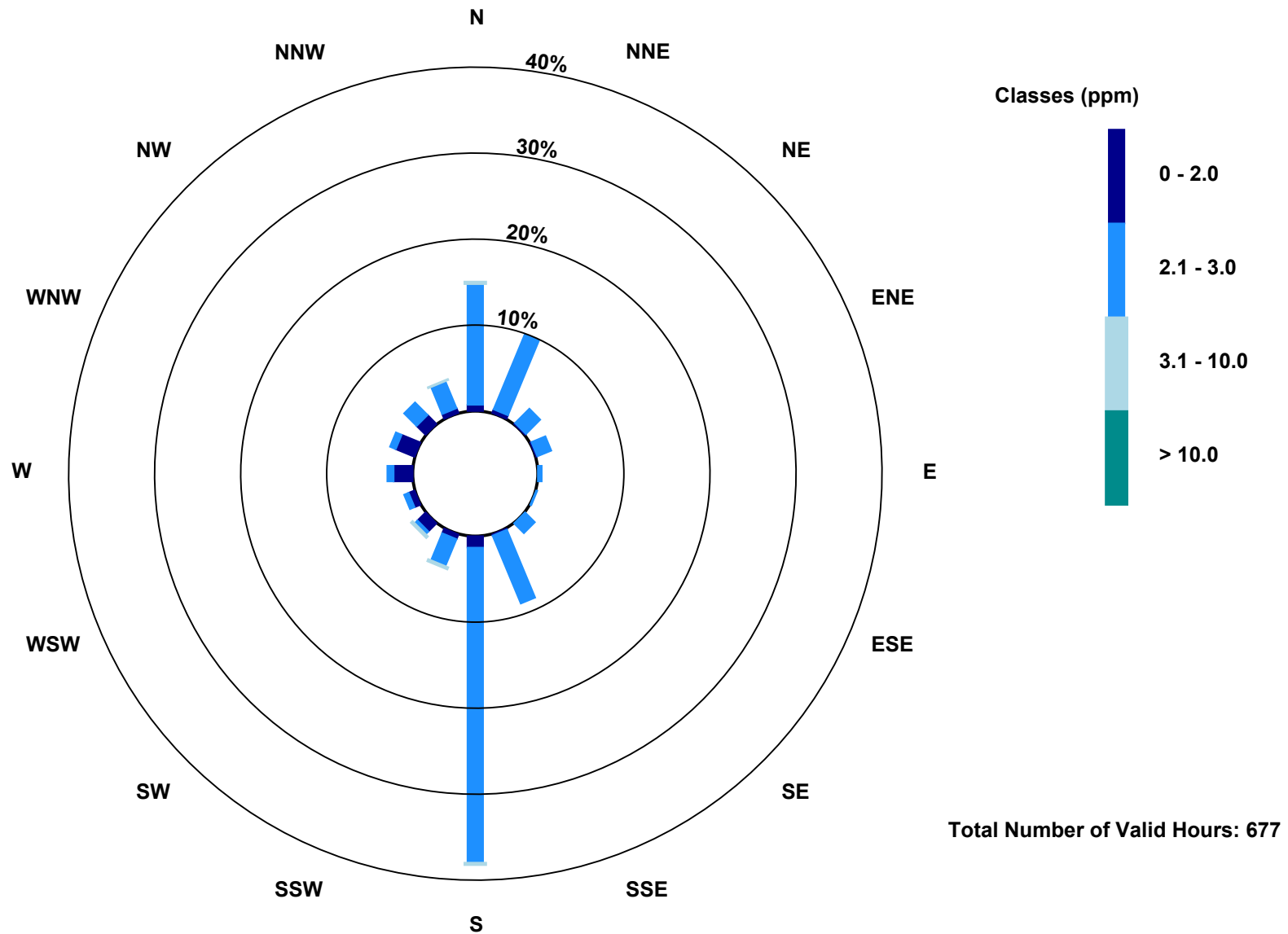
Total Number of Valid Hours: 677

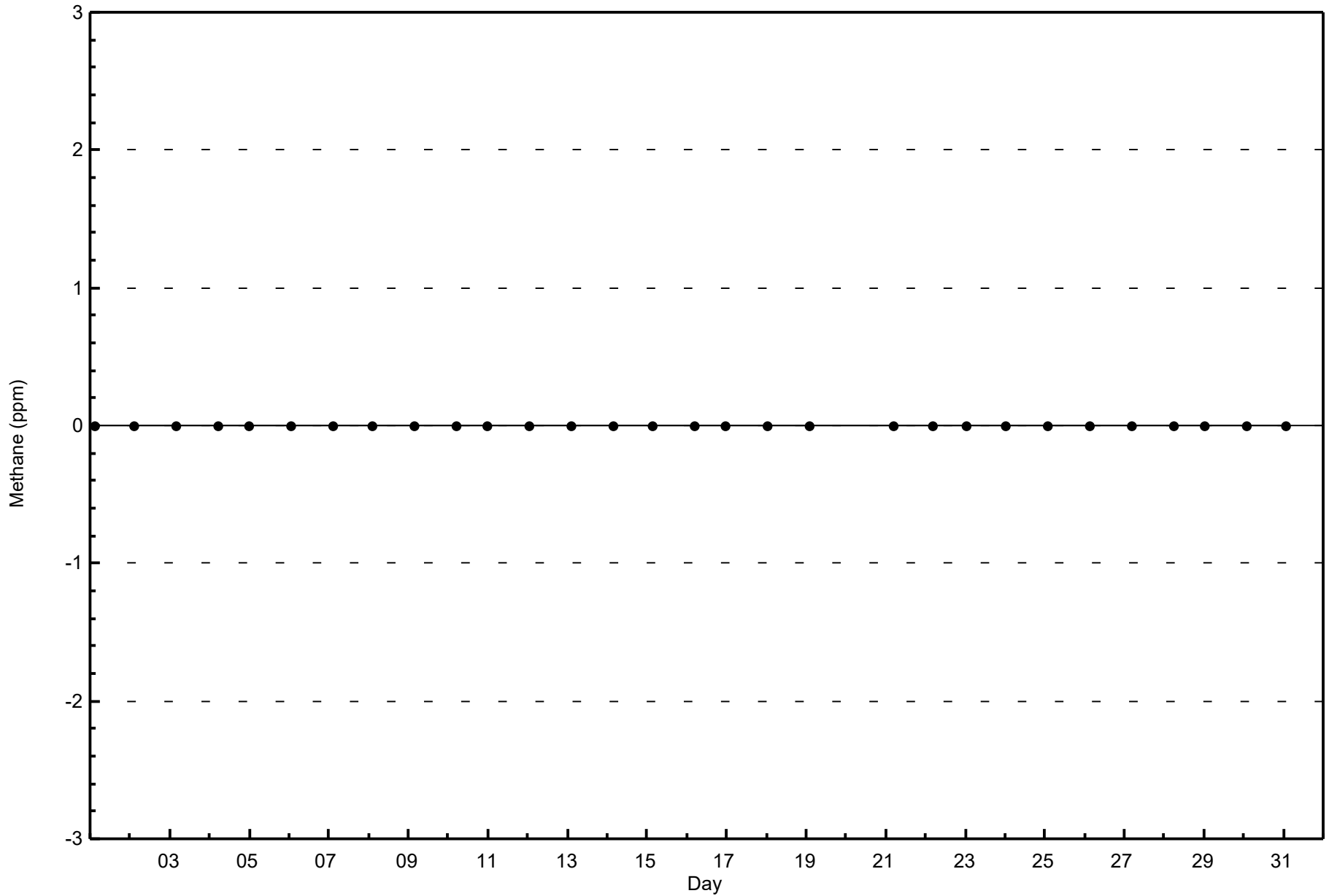
Total Number of Hours: 744

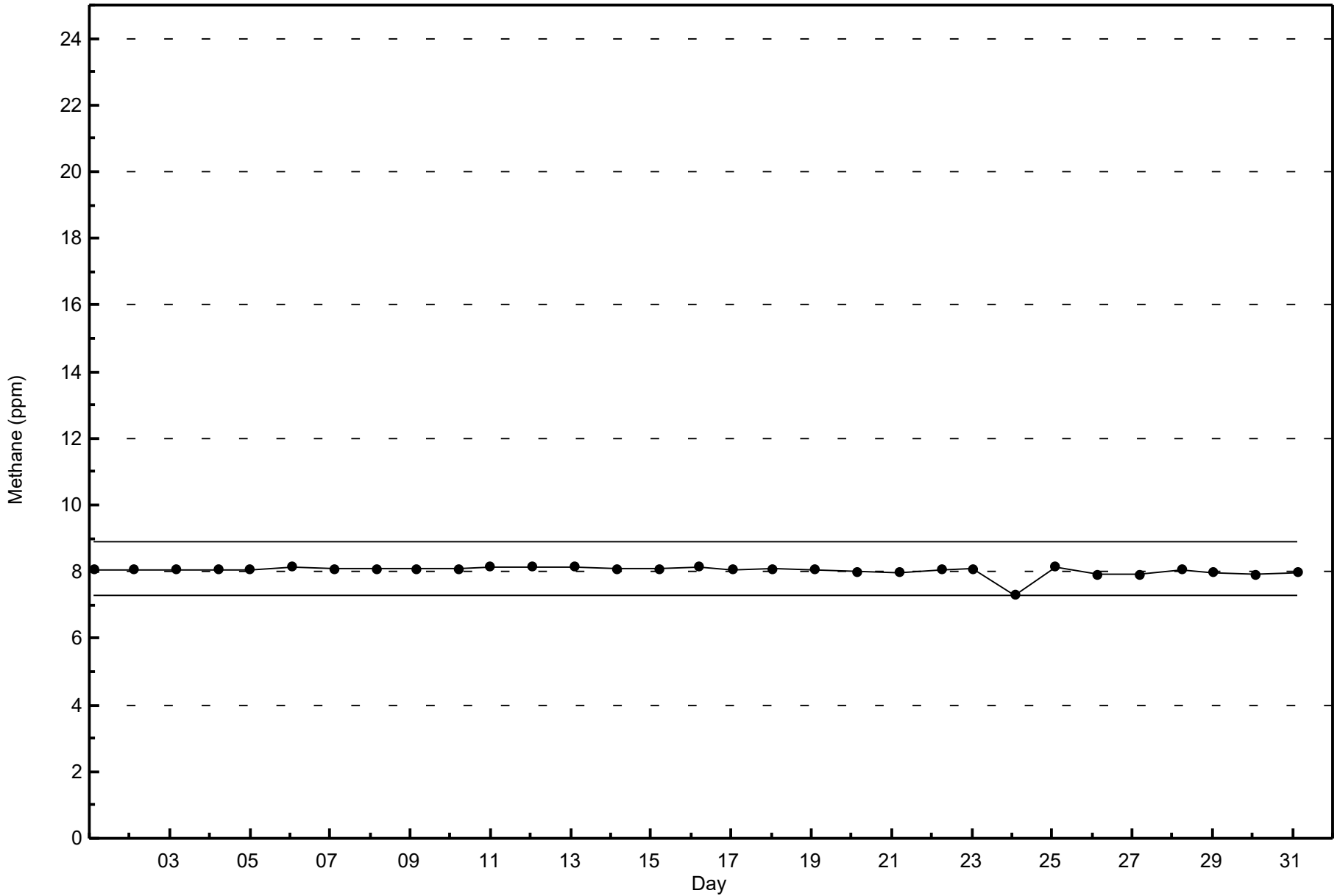


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter

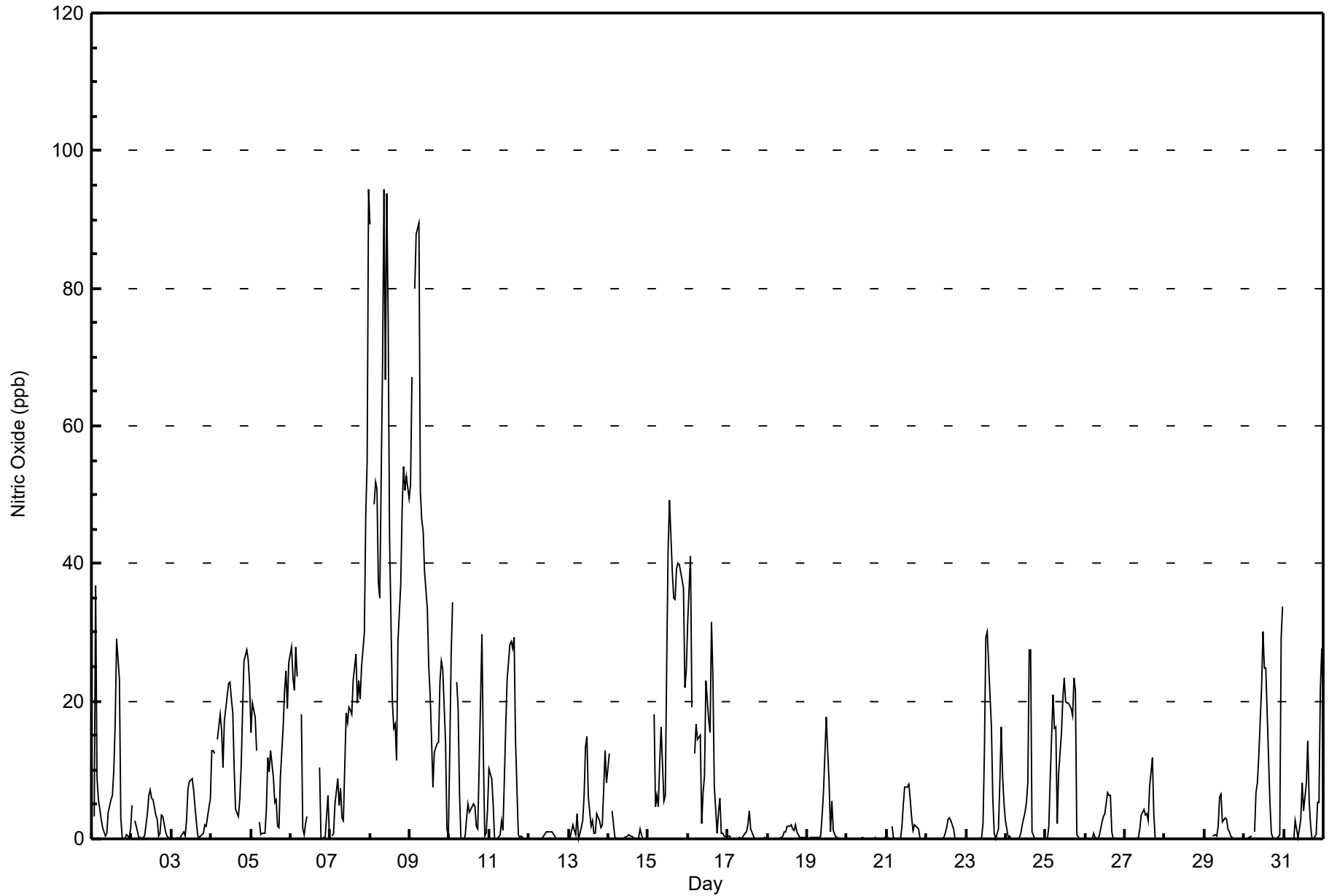








Maximum Value: 94.4 ppb on Jan 8 09:00		Maximum Daily Average: 49.6 ppb on Jan 8		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Jan 1 20:00		Minimum Daily Average: 0.0 ppb on Jan 28		Hours of Data: 707																							
Maximum Diurnal Average: 12.8 ppb at hour 12		Minimum Diurnal Average: 5.3 ppb at hour 18		Hours of Missing Data: 37																							
Monthly Average: 8.41 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 1.4 Q ₃ = 10.8 P ₉₀ = 25.4 P ₉₉ = 75.3		Hours of Calibration: 37																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	Z	3.3	36.7	8.7	5.7	2.9	1.6	1.0	0.4	0.8	3.8	5.7	6.3	10.1	16.9	29.1	23.2	3.0	0.2	0.0	0.0	0.6	0.2	1.4	7.0	36.7	
2-Jan	4.8	Z	2.7	0.9	0.0	0.1	0.0	0.1	0.5	3.7	6.4	7.2	5.8	5.6	3.4	2.9	0.3	0.7	3.5	3.2	1.0	0.4	0.2	0.1	2.3	7.2	
3-Jan	0.0	0.0	Z	0.2	0.0	0.0	0.5	1.0	0.4	2.9	7.3	8.4	8.7	7.1	4.7	2.4	0.3	0.3	0.7	0.8	2.0	1.8	3.2	5.9	2.5	8.7	
4-Jan	12.7	12.8	12.4	Z	14.3	18.0	15.9	10.3	17.4	18.8	22.6	22.8	20.3	18.4	10.1	4.3	3.3	5.7	10.6	18.8	25.8	27.4	26.0	22.6	16.1	27.4	
5-Jan	15.5	19.6	17.7	12.8	Z	2.5	0.6	0.8	0.7	4.2	11.9	9.8	12.8	8.9	5.2	5.7	1.9	1.6	9.0	16.3	21.6	24.4	18.8	25.6	10.8	25.6	
6-Jan	27.9	23.4	21.5	27.8	23.7	Z	18.1	1.5	0.6	2.2	3.3	C	C	C	C	C	C	10.4	0.3	0.1	0.1	0.1	6.3	0.4	--	27.9	
7-Jan	Z	0.4	0.8	5.2	8.7	4.8	7.4	3.0	2.6	18.4	16.8	19.1	18.8	18.0	23.0	26.8	19.8	23.0	20.4	25.1	29.8	47.0	54.9	94.3	21.2	94.3	
8-Jan	89.2	Z	48.6	51.9	50.9	37.2	35.0	68.9	94.4	66.7	93.9	75.7	43.8	19.9	16.1	16.6	11.4	28.7	37.0	48.1	54.0	50.6	52.7	49.4	49.6	94.4	
9-Jan	51.4	67.1	Z	80.0	87.9	89.4	50.5	46.5	44.7	38.9	33.3	24.9	21.0	14.5	7.5	12.6	13.8	14.0	22.7	25.9	24.5	14.0	1.4	0.2	34.2	89.4	
10-Jan	12.5	26.7	34.3	Z	22.8	19.0	6.6	0.0	0.0	0.5	2.9	5.0	3.9	4.2	5.0	4.6	1.9	1.3	10.3	29.8	12.5	0.4	0.8	4.2	9.1	34.3	
11-Jan	10.2	8.7	5.0	0.1	Z	0.0	0.7	2.6	1.2	8.5	16.3	23.2	28.3	28.7	27.6	29.3	14.2	0.6	0.2	0.4	0.2	0.0	0.0	0.0	9.0	29.3	
12-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	1.0	0.9	1.0	1.0	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	
13-Jan	Z	0.1	2.1	1.2	0.6	3.6	0.1	1.7	2.6	6.4	13.5	14.9	6.1	1.8	2.7	0.9	0.8	3.6	2.7	1.5	2.0	7.4	12.8	8.1	4.2	14.9	
14-Jan	12.3	Z	4.1	2.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.5	0.4	0.1	0.0	0.0	0.2	1.5	0.7	0.0	0.0	0.0	1.0	12.3	
15-Jan	0.0	0.0	Z	18.1	4.7	6.3	4.6	10.9	16.3	5.5	6.4	25.4	41.9	49.1	38.8	34.9	34.7	39.3	40.1	39.9	37.6	36.4	21.9	24.4	23.4	49.1	
16-Jan	31.6	41.2	19.0	Z	12.5	16.7	14.4	15.1	2.3	6.7	9.2	23.0	17.4	15.4	31.6	23.6	7.7	0.7	3.9	5.8	0.7	0.7	0.4	0.1	13.0	41.2	
17-Jan	0.4	0.5	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.2	0.7	1.1	2.0	4.1	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.5	4.1	
18-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	1.1	1.1	1.7	1.8	1.9	1.5	1.3	2.1	1.1	0.2	0.2	0.2	0.2	0.1	0.7	2.1	
19-Jan	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.5	3.2	6.6	17.8	12.8	8.3	1.1	5.4	1.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	2.5	17.8	
20-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	
21-Jan	0.0	0.2	Z	1.8	0.1	0.0	0.0	0.1	0.1	1.5	4.9	7.6	7.4	7.9	5.7	3.0	1.3	2.0	1.6	1.5	0.0	0.0	0.0	0.0	2.0	7.9	
22-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	1.7	2.9	3.1	2.6	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.1	
23-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	2.2	12.7	29.4	30.1	20.7	16.3	5.6	0.9	0.0	1.5	8.2	16.2	9.0	5.0	6.9	30.1	
24-Jan	2.7	0.3	0.4	0.0	0.0	Z	0.0	0.0	0.1	0.9	2.0	3.8	5.3	8.1	27.4	27.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	27.5	
25-Jan	Z	0.1	1.8	8.7	20.9	16.0	16.3	2.3	9.6	15.3	20.4	23.4	19.8	19.7	19.7	18.9	18.0	23.4	21.5	0.6	0.0	0.0	0.0	0.0	12.0	23.4	
26-Jan	0.1	Z	0.0	0.0	0.0	0.8	0.2	0.0	0.3	1.3	2.4	3.3	3.6	6.8	6.4	6.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	6.8	
27-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	1.3	3.5	4.3	3.5	3.8	2.7	7.6	11.8	3.7	0.0	0.0	0.0	0.0	0.1	0.0	1.8	11.8	
28-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Jan	0.0	0.0	0.0	0.0	Z	0.5	0.6	0.4	1.8	6.2	6.6	2.4	3.1	2.8	1.5	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.2	6.6	
30-Jan	0.0	0.0	0.0	0.3	0.4	Z	1.1	6.8	8.1	12.0	22.0	30.1	24.8	24.8	18.4	5.1	0.7	0.1	0.0	0.0	0.0	0.0	0.7	29.4	33.7	33.7	
31-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.3	1.4	2.8	8.2	4.1	8.1	14.3	5.6	2.0	0.1	0.0	0.5	5.3	5.3	21.7	27.7	4.8	27.7	
		10.9	7.9	8.0	8.5	9.8	8.4	5.6	5.7	6.6	7.4	10.5	12.8	11.9	11.1	10.6	9.9	6.0	5.3	6.0	7.1	7.3	7.5	8.4	9.8	Diurnal Average	
		89.2	67.1	48.6	80.0	87.9	89.4	50.5	68.9	94.4	66.7	93.9	75.7	43.8	49.1	38.8	34.9	34.7	39.3	40.1	48.1	54.0	50.6	54.9	94.3	Diurnal Maximum	
Z - zerospan		C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	604	85.43	85.43
21 - 40	74	10.47	95.90
41 - 80	23	3.25	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	81	55	12	11	5	1	12	50	250	21	11	8	16	23	20	25	601
21 - 40	24	7	3	0	0	0	0	11	10	4	2	0	1	0	7	5	74
41 - 80	4	6	2	1	0	1	0	2	5	0	0	2	0	0	0	0	23
81 - 159	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	1	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	109	68	17	12	5	2	12	63	266	27	15	10	17	23	27	31	704

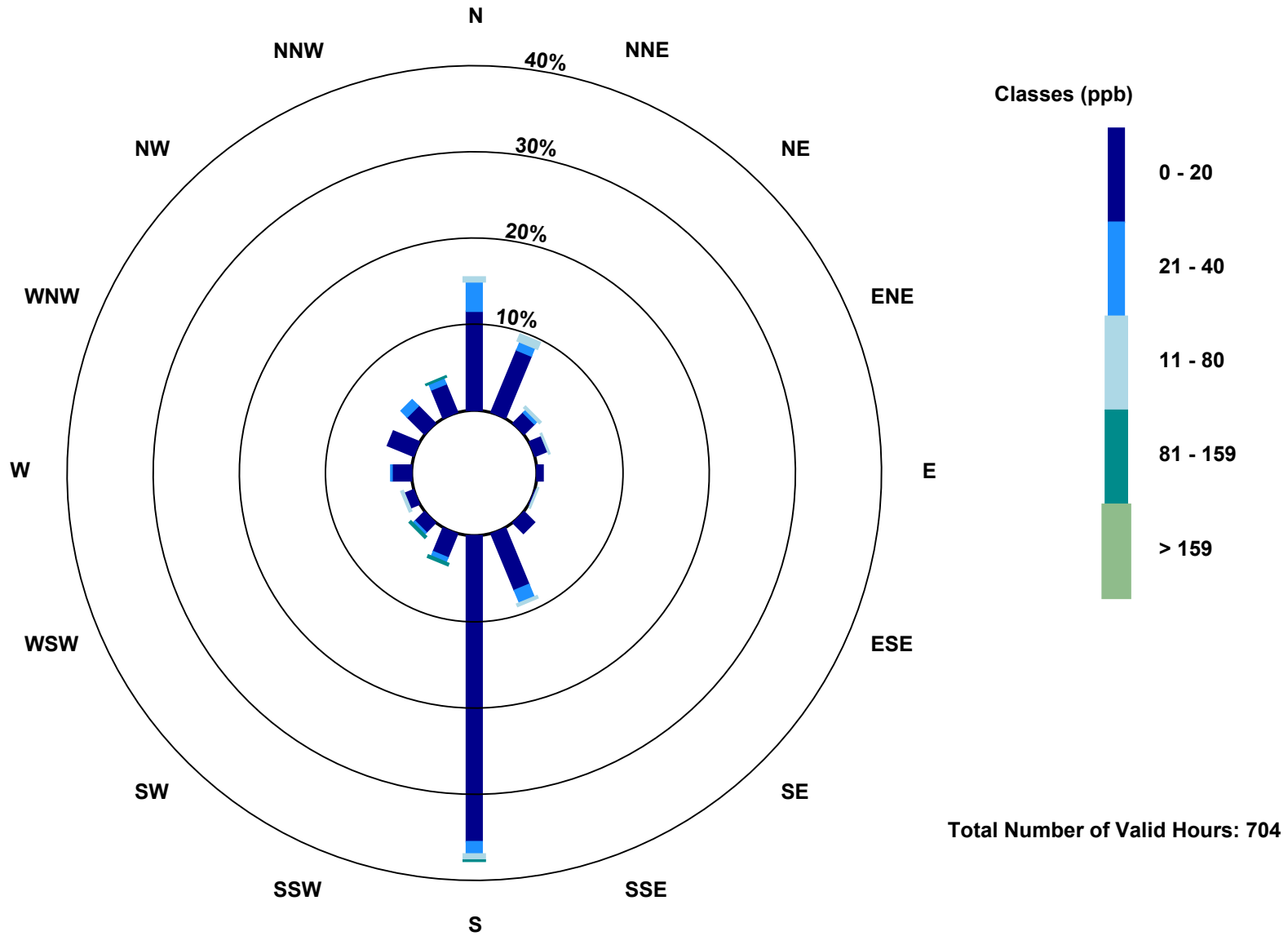
Total Number of Valid Hours: 704

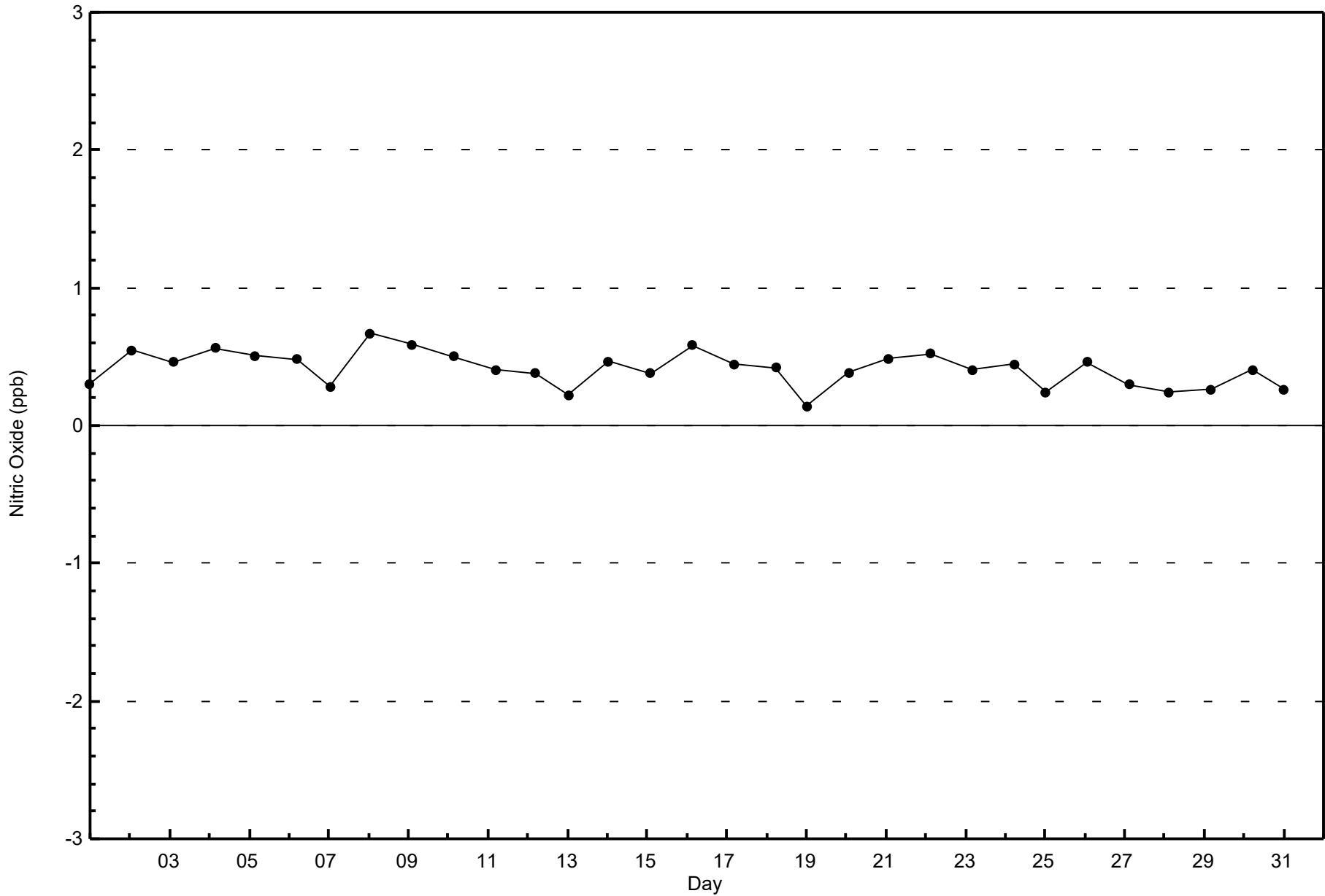
Total Number of Hours: 744

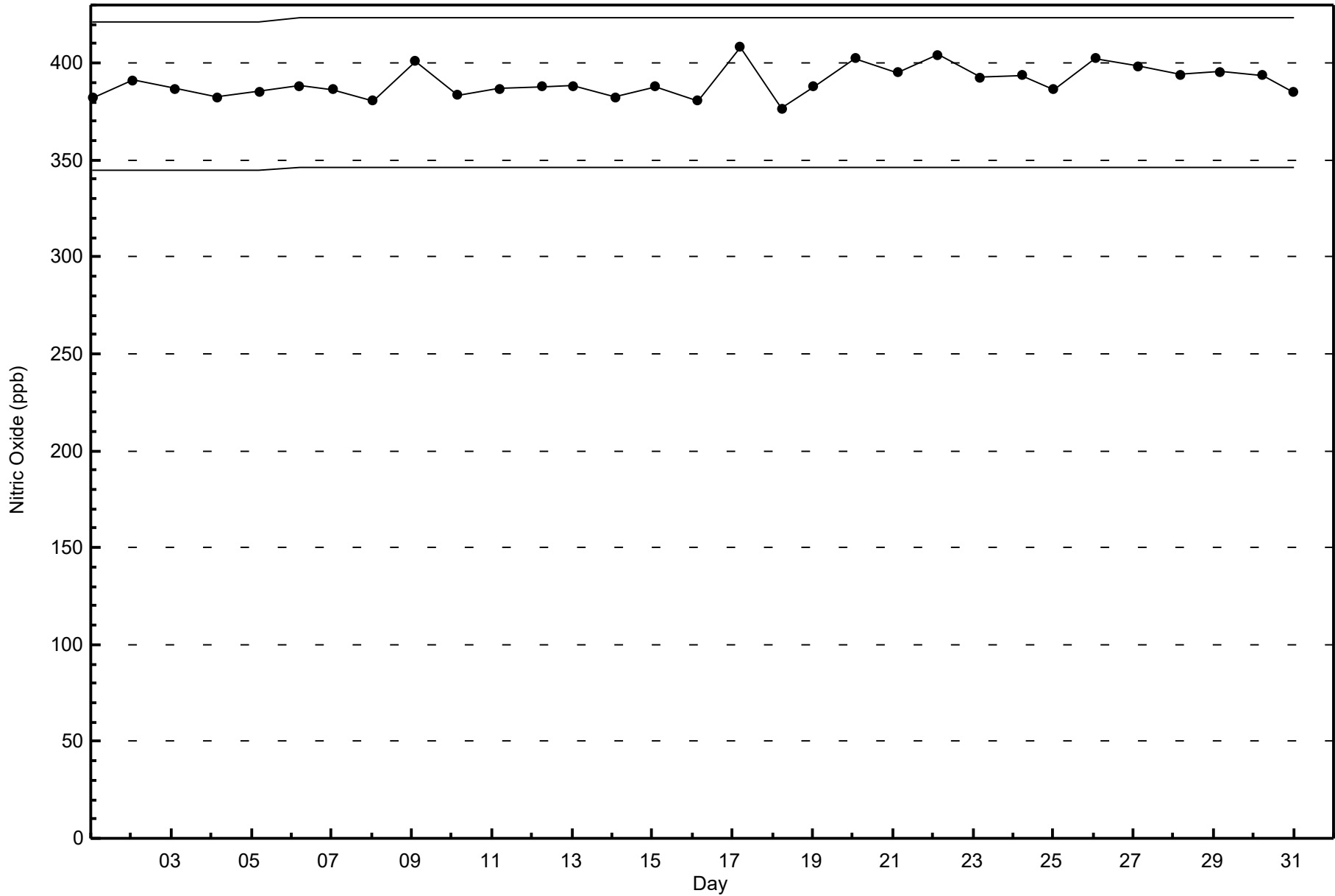


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Fort McKay - Bertha Ganter









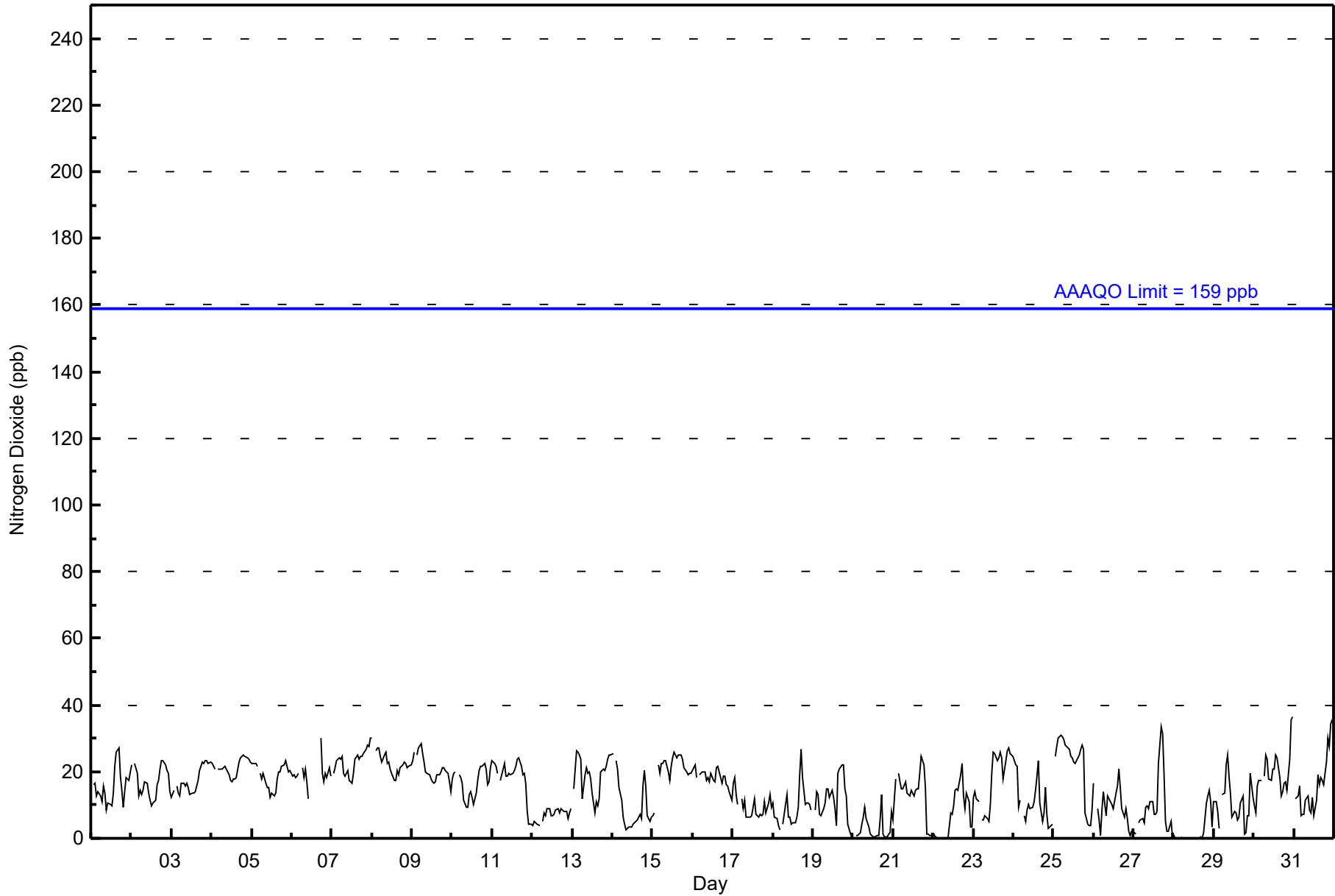
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 36.3 ppb on Jan 31 00:00		Maximum Daily Average: 22.8 ppb on Jan 7																			Hours of Data:	707					
Minimum Value: 0.0 ppb on Jan 22 06:00		Minimum Daily Average: 2.4 ppb on Jan 28																			Hours of Missing Data:	37					
Maximum Diurnal Average: 18.6 ppb at hour 18		Minimum Diurnal Average: 12.5 ppb at hour 13																			Hours of Calibration:	37					
Monthly Average: 14.69 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 3.8 Q ₁ = 8.0 Median = 15.5 Q ₃ = 20.9 P ₉₀ = 24.4 P ₉₉ = 30.6																			Percent Operational Time:	100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	Z	16.2	16.7	12.8	14.0	12.6	11.0	15.5	13.5	8.6	10.5	10.3	9.8	13.7	21.4	25.7	27.2	18.5	14.2	9.3	13.9	18.4	17.4	19.8	15.3	27.2	
2-Jan	22.2	Z	22.6	19.6	12.8	14.2	13.0	14.5	17.1	16.7	13.5	11.5	9.7	10.6	11.4	16.2	17.3	20.7	23.4	23.1	22.0	20.2	19.3	14.1	16.8	23.4	
3-Jan	12.4	14.3	Z	15.5	13.5	12.8	16.5	16.4	15.8	16.7	15.1	13.3	13.7	13.7	13.8	15.5	17.4	20.4	22.8	22.6	23.3	23.3	22.6	22.8	17.1	23.3	
4-Jan	22.4	21.7	20.9	Z	20.9	20.6	20.7	21.1	21.6	20.7	19.1	17.3	17.1	17.6	17.8	18.4	23.0	24.3	24.7	24.9	24.5	24.2	23.6	23.0	21.3	24.9	
5-Jan	22.5	22.6	22.4	21.5	Z	19.6	18.0	19.3	16.7	15.4	15.4	12.3	13.5	12.8	13.5	17.8	19.8	19.9	21.8	22.1	23.2	21.8	20.1	20.3	18.8	23.2	
6-Jan	18.6	19.2	18.2	18.6	19.7	Z	21.0	18.3	20.8	16.9	12.0	C	C	C	C	C	C	30.0	19.7	16.9	19.3	18.1	21.2	18.6	--	30.0	
7-Jan	Z	19.3	21.1	23.3	24.0	23.7	24.5	19.7	18.8	20.2	17.4	17.1	16.7	19.5	23.7	25.0	23.9	24.4	24.4	25.3	26.5	27.9	27.4	30.2	22.8	30.2	
8-Jan	30.0	Z	26.4	27.3	27.0	24.5	23.0	25.0	25.7	22.4	22.8	20.9	19.4	17.2	17.3	20.2	19.2	21.3	22.2	22.8	22.6	21.0	21.5	21.9	22.7	30.0	
9-Jan	23.3	25.8	Z	25.1	27.3	28.2	25.4	22.7	20.0	19.3	19.0	17.6	17.0	16.4	17.1	18.9	18.9	19.9	21.1	21.1	20.5	19.6	16.8	14.1	20.7	28.2	
10-Jan	18.0	19.7	20.1	Z	19.0	18.2	16.5	11.5	9.4	9.5	13.2	13.8	12.3	10.0	13.6	17.5	20.2	21.5	21.8	22.3	20.7	16.2	17.0	21.3	16.7	22.3	
11-Jan	23.5	22.6	21.7	19.6	Z	17.3	20.7	22.6	18.8	18.7	19.4	18.9	19.4	20.2	21.7	23.6	24.0	21.8	18.9	19.4	16.7	8.6	4.2	4.1	18.5	24.0	
12-Jan	3.9	5.1	4.6	4.4	4.0	Z	4.9	7.5	6.8	8.8	9.0	6.9	6.9	7.3	8.3	8.9	7.7	8.7	8.4	7.9	7.9	5.9	7.6	8.7	7.0	9.0	
13-Jan	Z	14.9	26.1	26.0	25.2	23.7	12.0	18.9	21.0	19.7	20.0	17.8	13.5	7.5	11.0	9.6	11.8	19.8	20.6	20.3	21.4	23.7	24.9	24.9	18.9	26.1	
14-Jan	25.5	Z	23.3	20.7	15.4	11.3	6.3	4.2	2.5	3.0	3.2	3.6	4.2	4.8	5.0	5.4	7.1	5.8	15.6	20.3	15.8	6.7	5.1	6.4	9.6	25.5	
15-Jan	6.7	7.6	Z	22.2	19.4	22.4	22.3	23.5	23.3	19.9	17.4	21.5	24.3	25.7	24.0	24.8	25.2	24.9	23.6	21.2	19.8	19.2	19.6	19.6	20.8	25.7	
16-Jan	20.3	21.9	18.3	Z	18.9	19.5	19.9	19.8	17.4	18.3	16.9	19.5	17.4	16.8	21.1	21.5	20.0	16.6	18.8	18.7	15.9	15.5	14.0	11.4	18.2	21.9	
17-Jan	16.6	18.4	13.1	10.3	Z	12.0	8.8	11.6	6.4	6.2	6.3	6.7	9.2	12.0	7.4	6.5	7.0	6.9	7.0	11.2	7.7	10.8	13.2	9.3	9.8	18.4	
18-Jan	10.7	6.4	5.9	3.9	2.6	Z	4.2	7.0	13.1	6.3	6.3	4.1	4.7	4.8	6.4	9.3	19.1	26.9	18.3	10.2	10.8	10.8	10.3	8.5	9.2	26.9	
19-Jan	Z	8.3	13.8	13.0	7.1	6.7	8.8	10.7	15.0	14.7	12.4	14.5	12.4	9.0	3.9	19.4	20.6	22.0	21.9	14.7	12.6	4.1	1.4	0.8	11.6	22.0	
20-Jan	0.8	Z	0.9	1.0	1.6	4.4	6.2	9.4	5.9	3.6	1.1	0.8	0.6	0.5	0.8	1.0	6.0	13.0	1.1	0.5	0.5	1.4	1.8	7.9	3.1	13.0	
21-Jan	5.7	17.9	Z	19.5	16.8	14.8	14.8	17.0	13.7	13.0	12.8	14.6	12.9	14.2	14.7	14.7	19.6	24.4	22.2	15.1	1.3	1.2	0.9	0.8	13.2	24.4	
22-Jan	1.2	0.6	0.6	Z	0.1	0.0	0.0	0.0	0.1	0.0	7.5	7.0	9.7	14.2	14.7	14.6	19.0	22.5	12.5	8.8	13.5	11.2	3.6	3.4	7.2	22.5	
23-Jan	12.3	14.1	11.8	10.9	Z	5.6	5.4	6.7	6.1	5.2	10.0	19.7	25.9	25.6	23.3	24.3	25.9	24.1	17.9	23.2	26.1	27.0	25.6	24.9	17.5	27.0	
24-Jan	24.6	22.0	21.7	9.2	11.6	Z	6.7	5.1	8.3	10.2	9.1	9.5	11.0	14.2	18.7	23.1	10.7	5.2	7.6	15.3	7.4	3.1	3.8	4.4	11.4	24.6	
25-Jan	Z	24.5	27.5	30.0	31.1	30.6	29.7	27.8	27.7	26.6	24.7	24.0	22.9	22.6	23.1	25.1	26.6	27.8	26.8	7.7	4.1	3.8	3.9	8.3	22.0	31.1	
26-Jan	16.4	Z	8.9	5.5	0.8	8.5	13.9	6.8	12.8	11.9	11.0	10.2	9.1	13.7	15.5	20.7	15.3	9.1	6.2	8.7	5.9	2.0	1.0	2.2	9.4	20.7	
27-Jan	1.9	1.1	Z	4.5	5.6	6.1	4.6	9.5	9.9	9.1	11.0	11.1	7.0	7.2	7.9	22.3	33.3	31.4	18.9	5.0	2.3	2.0	5.0	0.6	9.4	33.3	
28-Jan	1.0	0.1	0.1	Z	0.3	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.5	10.8	12.5	14.2	11.2	3.2	2.4	14.2	
29-Jan	11.1	11.0	8.0	3.1	Z	13.2	13.4	21.9	24.9	18.5	13.4	6.5	8.0	7.6	5.5	6.5	10.4	12.8	1.3	1.9	6.8	6.9	19.7	12.3	10.6	24.9	
30-Jan	9.9	7.5	15.8	17.2	17.4	Z	18.5	25.2	23.6	18.0	17.4	20.9	20.7	24.9	24.0	18.1	12.6	13.9	16.7	16.8	14.5	23.8	35.8	36.3	19.5	36.3	
31-Jan	Z	11.9	12.6	15.5	6.8	7.4	7.1	11.6	12.9	8.3	7.7	12.3	6.8	11.6	19.2	16.3	18.3	17.3	16.3	22.9	30.1	27.5	34.3	35.5	16.1	35.5	
		14.5	14.4	15.5	15.4	14.0	14.5	13.5	14.5	14.5	13.1	12.7	12.8	12.5	13.2	14.2	16.4	17.6	18.6	16.7	15.8	15.2	14.2	14.6	14.2	Diurnal Average	
		30.0	25.8	27.5	30.0	31.1	30.6	29.7	27.8	27.7	26.6	24.7	24.0	25.9	25.7	24.0	25.7	33.3	31.4	26.8	25.3	30.1	27.9	35.8	36.3	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 159 ppb																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	516	72.98	72.98
21 - 40	191	27.02	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	72	51	12	9	2	0	12	47	202	18	12	7	15	22	20	12	513
21 - 40	37	17	5	3	3	2	0	16	64	9	3	3	2	1	7	19	191
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	109	68	17	12	5	2	12	63	266	27	15	10	17	23	27	31	704

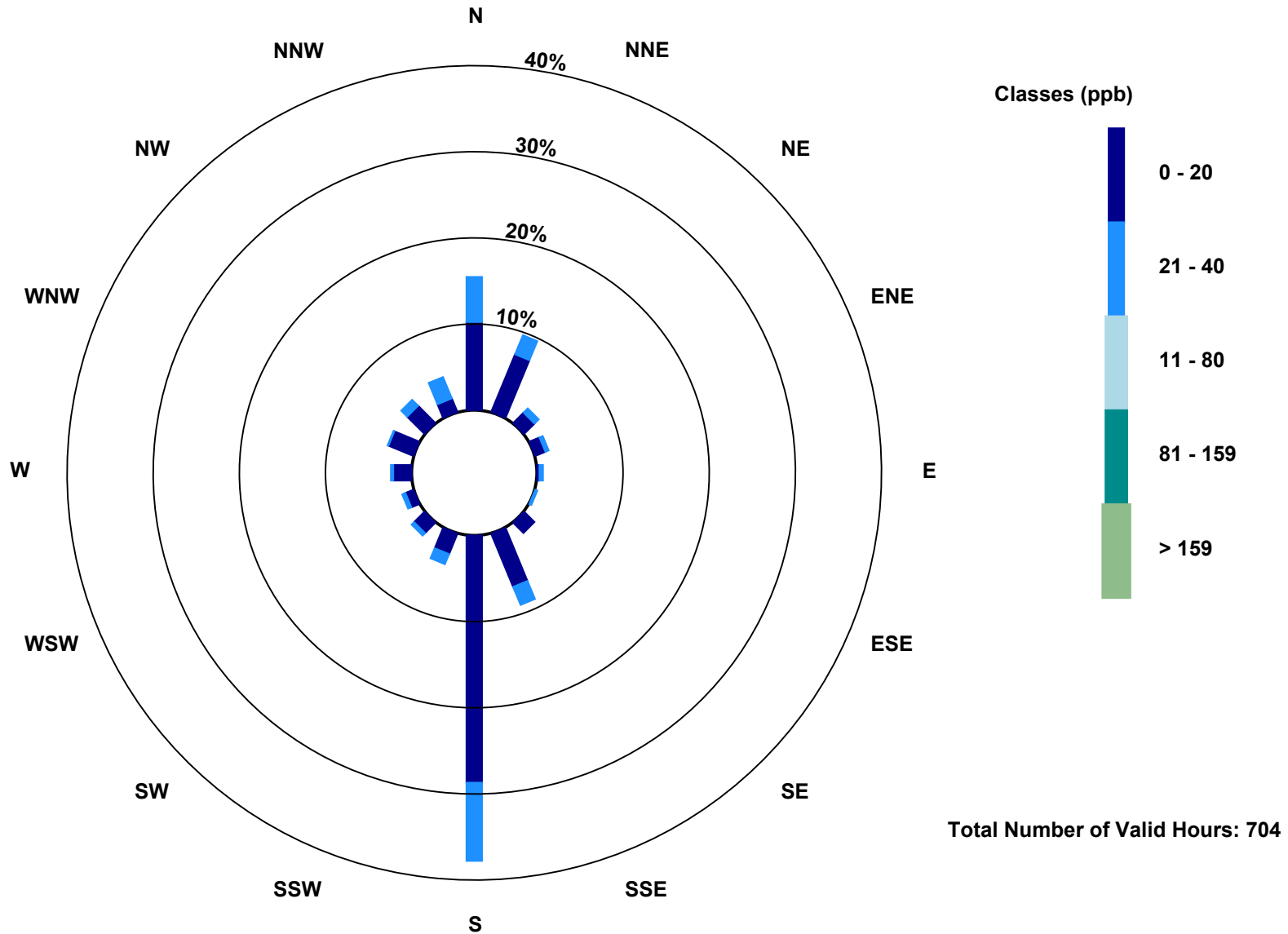
Total Number of Valid Hours: 704

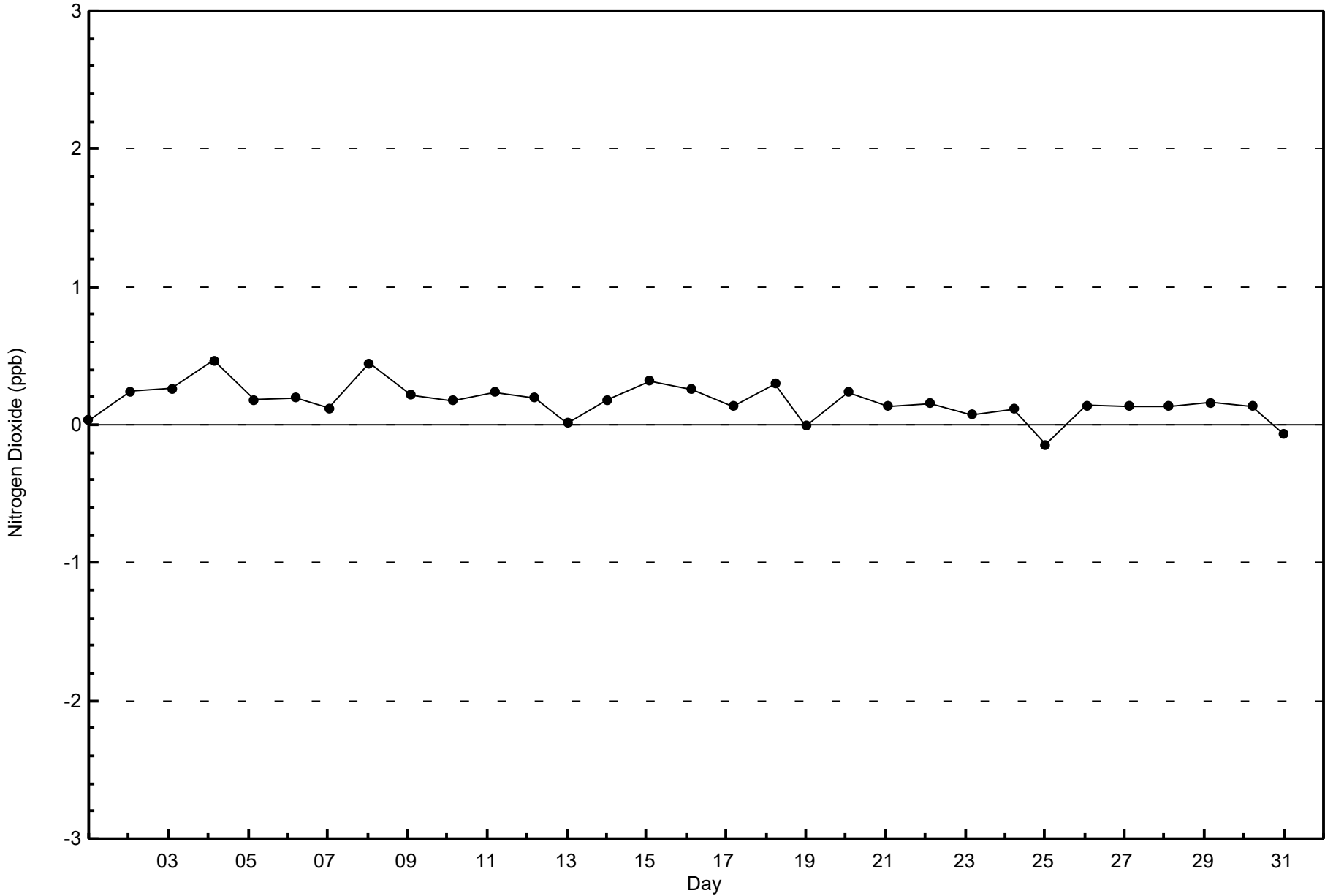
Total Number of Hours: 744

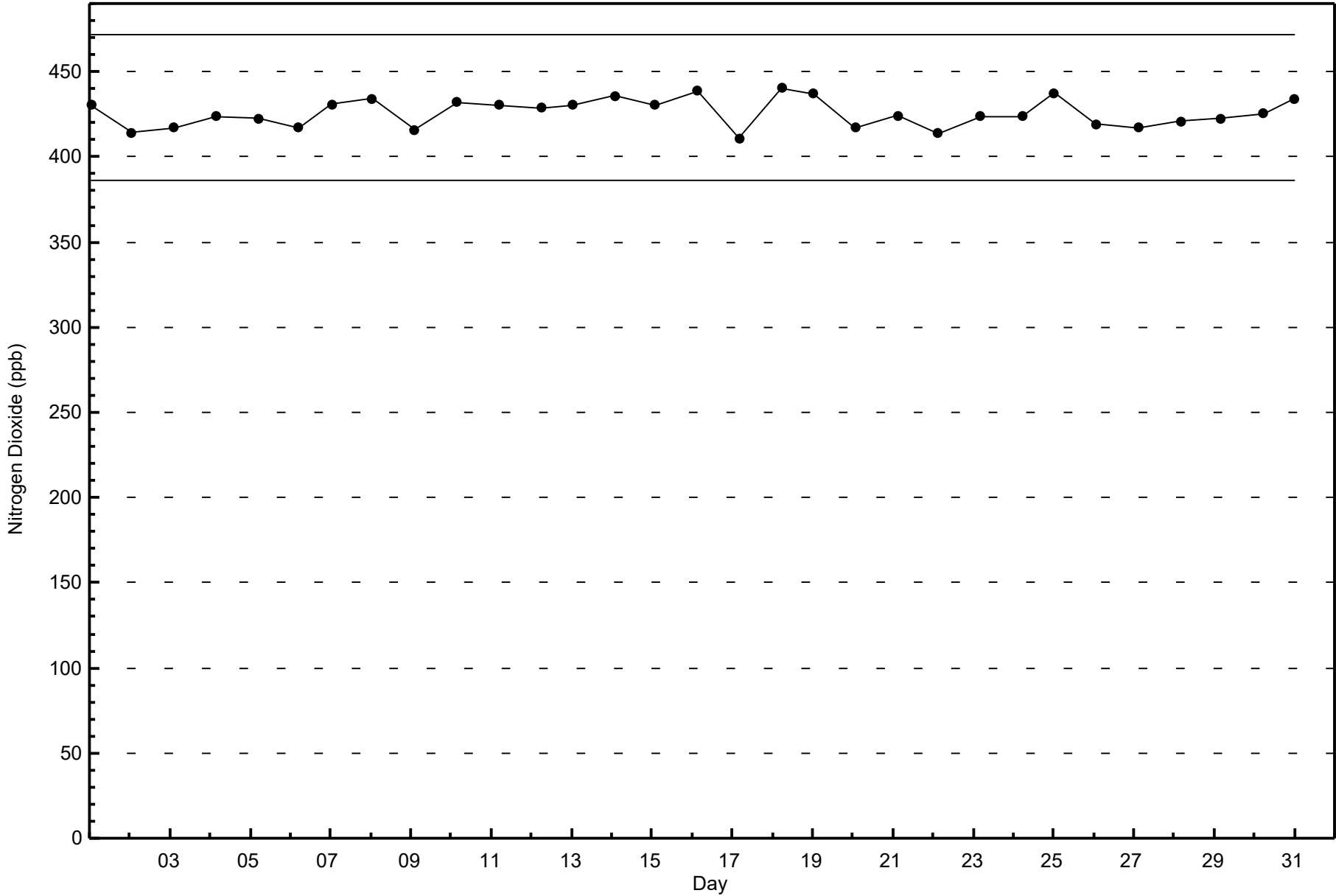


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association
Summary of Hour Averages

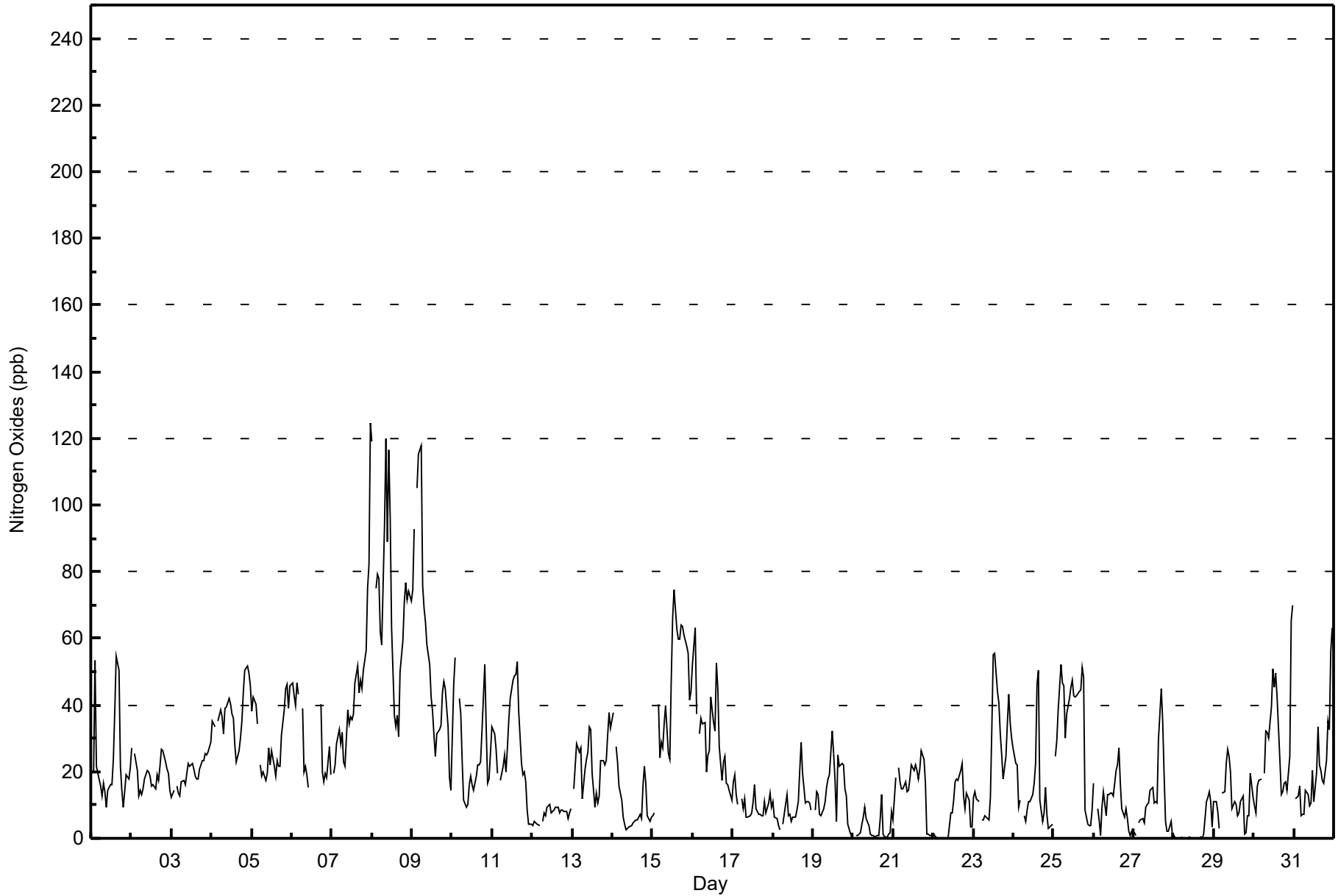
Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - January 2023

Maximum Value: 124.5 ppb on Jan 8 00:00 Maximum Daily Average: 72.3 ppb on Jan 8																						Hours in Service: 744 Hours of Data: 707				
Minimum Value: 0.0 ppb on Jan 22 08:00 Minimum Daily Average: 2.4 ppb on Jan 28 Maximum Diurnal Average: 26.2 ppb at hour 16 Minimum Diurnal Average: 19.1 ppb at hour 7 Monthly Average: 23.10 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 3.9 Q ₁ = 8.8 Median = 17.9 Q ₃ = 32.5 P ₉₀ = 47.9 P ₉₉ = 96.5																						Hours of Missing Data: 37 Hours of Calibration: 37 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	Z	19.5	53.4	21.5	19.7	15.5	12.6	16.5	13.9	9.4	14.3	16.0	16.1	23.8	38.3	54.8	50.4	21.5	14.4	9.3	13.9	19.0	17.6	21.2	22.3	54.8
2-Jan	27.0	Z	25.3	20.5	12.8	14.3	13.0	14.6	17.6	20.4	19.9	18.7	15.5	16.2	14.8	19.1	17.6	21.4	26.9	26.3	23.0	20.6	19.5	14.2	19.1	27.0
3-Jan	12.4	14.3	Z	15.7	13.5	12.8	17.0	17.4	16.2	19.6	22.4	21.7	22.4	20.8	18.5	17.9	17.7	20.7	23.5	23.4	25.3	25.1	25.8	28.7	19.7	28.7
4-Jan	35.1	34.5	33.3	Z	35.2	38.6	36.6	31.4	39.0	39.5	41.7	40.1	37.4	36.0	27.9	22.7	26.3	30.0	35.3	43.7	50.3	51.6	49.6	45.6	37.5	51.6
5-Jan	38.0	42.2	40.1	34.3	Z	22.1	18.6	20.1	17.4	19.6	27.3	22.1	26.3	21.7	18.7	23.5	21.7	21.5	30.8	38.4	44.8	46.2	38.9	45.9	29.6	46.2
6-Jan	46.5	42.6	39.7	46.4	43.4	Z	39.1	19.8	21.4	19.1	15.3	C	C	C	C	C	C	40.4	20.0	17.0	19.4	18.2	27.5	19.0	--	46.5
7-Jan	Z	19.7	21.9	28.5	32.7	28.5	31.9	22.7	21.4	38.6	34.2	36.2	35.5	37.5	46.7	51.8	43.7	47.4	44.8	50.4	56.3	74.9	82.3	124.5	44.0	124.5
8-Jan	119.2	Z	75.0	79.2	77.9	61.7	58.0	93.9	120.1	89.1	116.7	96.6	63.2	37.1	33.4	36.8	30.6	50.0	59.2	70.9	76.6	71.6	74.2	71.3	72.3	120.1
9-Jan	74.7	92.9	Z	105.1	115.2	117.6	75.9	69.2	64.7	58.2	52.3	42.5	38.0	30.9	24.6	31.5	32.7	33.9	43.8	47.0	45.0	33.6	18.2	14.3	54.9	117.6
10-Jan	30.5	46.4	54.4	Z	41.8	37.2	23.1	11.5	9.4	10.0	16.1	18.8	16.2	14.2	18.6	22.1	22.1	22.8	32.1	52.1	33.2	16.6	17.8	25.5	25.8	54.4
11-Jan	33.7	31.3	26.7	19.7	Z	17.3	21.4	25.2	20.0	27.2	35.7	42.1	47.7	48.9	49.3	52.9	38.2	22.4	19.1	19.8	16.9	8.6	4.2	4.1	27.5	52.9
12-Jan	3.9	5.1	4.6	4.4	4.0	Z	4.9	7.5	6.8	9.1	10.0	7.8	7.9	8.3	9.2	9.3	7.8	8.7	8.4	7.9	7.9	5.9	7.6	8.8	7.2	10.0
13-Jan	Z	15.0	28.2	27.2	25.8	27.3	12.1	20.6	23.6	26.1	33.5	32.7	19.6	9.3	13.7	10.5	12.6	23.4	23.3	21.8	23.4	31.1	37.7	33.0	23.1	37.7
14-Jan	37.8	Z	27.4	22.8	15.7	11.3	6.3	4.2	2.5	3.0	3.3	4.0	4.8	5.3	5.4	5.5	7.1	5.8	15.8	21.8	16.5	6.7	5.1	6.4	10.6	37.8
15-Jan	6.7	7.6	Z	40.3	24.1	28.7	26.9	34.4	39.6	25.4	23.8	46.9	66.2	74.8	62.8	59.7	59.9	64.2	63.7	61.1	57.4	55.6	41.5	44.0	44.1	74.8
16-Jan	51.9	63.1	37.3	Z	31.4	36.2	34.3	34.9	19.7	25.0	26.1	42.5	34.8	32.2	52.7	45.1	27.7	17.3	22.7	24.5	16.6	16.2	14.4	11.5	31.2	63.1
17-Jan	17.0	18.9	13.1	10.3	Z	12.0	8.8	11.7	6.4	6.4	7.0	7.8	11.2	16.1	8.9	7.0	7.0	6.9	7.0	11.2	7.7	10.8	13.4	9.3	10.3	18.9
18-Jan	10.8	6.4	5.9	3.9	2.6	Z	4.2	7.0	13.2	6.8	7.4	5.2	6.4	6.6	8.3	10.8	20.4	29.0	19.4	10.4	11.0	11.0	10.5	8.6	9.8	29.0
19-Jan	Z	8.5	14.0	13.2	7.2	6.8	8.9	10.9	15.5	17.9	19.0	32.3	25.2	17.3	5.0	24.8	21.8	22.3	22.1	14.8	12.7	4.1	1.4	0.8	14.2	32.3
20-Jan	0.8	Z	0.9	1.0	1.6	4.4	6.2	9.4	5.9	3.8	1.1	0.8	0.6	0.5	0.8	1.0	6.0	13.2	1.1	0.5	0.5	1.4	1.8	8.0	3.1	13.2
21-Jan	5.7	18.1	Z	21.3	16.9	14.8	14.8	17.1	13.8	14.5	17.7	22.2	20.3	22.1	20.4	17.7	20.9	26.4	23.8	16.6	1.3	1.2	0.9	0.8	15.2	26.4
22-Jan	1.2	0.6	0.6	Z	0.1	0.0	0.0	0.0	0.1	0.0	7.7	7.8	11.4	17.1	17.8	17.2	20.4	22.5	12.5	8.8	13.5	11.2	3.6	3.4	7.7	22.5
23-Jan	12.3	14.1	11.8	10.9	Z	5.6	5.4	6.7	6.1	5.4	12.2	32.4	55.3	55.7	44.0	40.6	31.5	25.0	17.9	24.7	34.3	43.2	34.6	29.9	24.3	55.7
24-Jan	27.3	22.3	22.1	9.2	11.6	Z	6.7	5.1	8.4	11.1	11.1	13.3	16.3	22.3	46.1	50.6	11.6	5.2	7.6	15.3	7.4	3.1	3.8	4.4	14.9	50.6
25-Jan	Z	24.6	29.3	38.7	52.0	46.6	46.0	30.1	37.3	41.9	45.1	47.4	42.3	42.8	44.0	44.6	51.2	48.3	8.3	4.1	3.8	3.9	8.3	34.0	52.0	
26-Jan	16.5	Z	8.9	5.5	0.8	9.3	14.1	6.8	13.1	13.2	13.4	13.5	12.7	20.5	21.9	27.0	16.4	9.1	6.2	8.7	5.9	2.0	1.0	2.2	10.8	27.0
27-Jan	1.9	1.1	Z	4.5	5.6	6.1	4.6	9.5	10.0	10.4	14.5	15.4	10.5	11.0	10.6	29.9	45.1	35.1	18.9	5.0	2.3	2.0	5.1	0.6	11.3	45.1
28-Jan	1.0	0.1	0.1	Z	0.3	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.5	10.8	12.5	14.2	11.2	3.2	2.4	14.2
29-Jan	11.1	11.0	8.0	3.1	Z	13.7	14.0	22.3	26.7	24.7	20.0	8.9	11.1	10.4	7.0	7.5	10.9	12.9	1.3	1.9	6.8	6.9	19.7	12.3	11.8	26.7
30-Jan	9.9	7.5	15.8	17.5	17.8	Z	19.6	32.0	31.7	30.0	39.4	51.0	45.5	49.7	42.4	23.2	13.3	14.0	16.7	16.8	14.5	24.5	65.2	70.0	29.0	70.0
31-Jan	Z	11.9	12.6	15.5	6.8	7.4	7.1	14.3	13.2	9.7	10.5	20.5	10.9	19.7	33.5	21.9	20.3	17.4	16.3	23.4	35.4	32.8	56.0	63.2	20.9	63.2
25.3 22.3 23.5 23.8 23.7 22.9 19.1 20.2 21.1 20.5 23.2 25.6 24.4 24.3 24.8 26.2 23.6 23.9 22.7 23.0 22.5 21.7 23.0 24.0																								Diurnal Average		
119.2 92.9 75.0 105.1 115.2 117.6 75.9 93.9 120.1 89.1 116.7 96.6 66.2 74.8 62.8 59.7 59.9 64.2 63.7 70.9 76.6 74.9 82.3 124.5																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	402	56.86	56.86
21 - 40	189	26.73	83.59
41 - 80	104	14.71	98.30
81 - 159	12	1.70	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	43	35	10	7	1	0	10	37	168	16	11	7	13	21	16	6	401
21 - 40	36	19	3	4	2	1	2	12	80	5	0	1	2	1	4	15	187
11 - 80	28	14	4	1	2	1	0	14	14	4	2	1	2	1	7	9	104
81 - 159	2	0	0	0	0	0	0	0	4	2	2	1	0	0	0	1	12
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	109	68	17	12	5	2	12	63	266	27	15	10	17	23	27	31	704

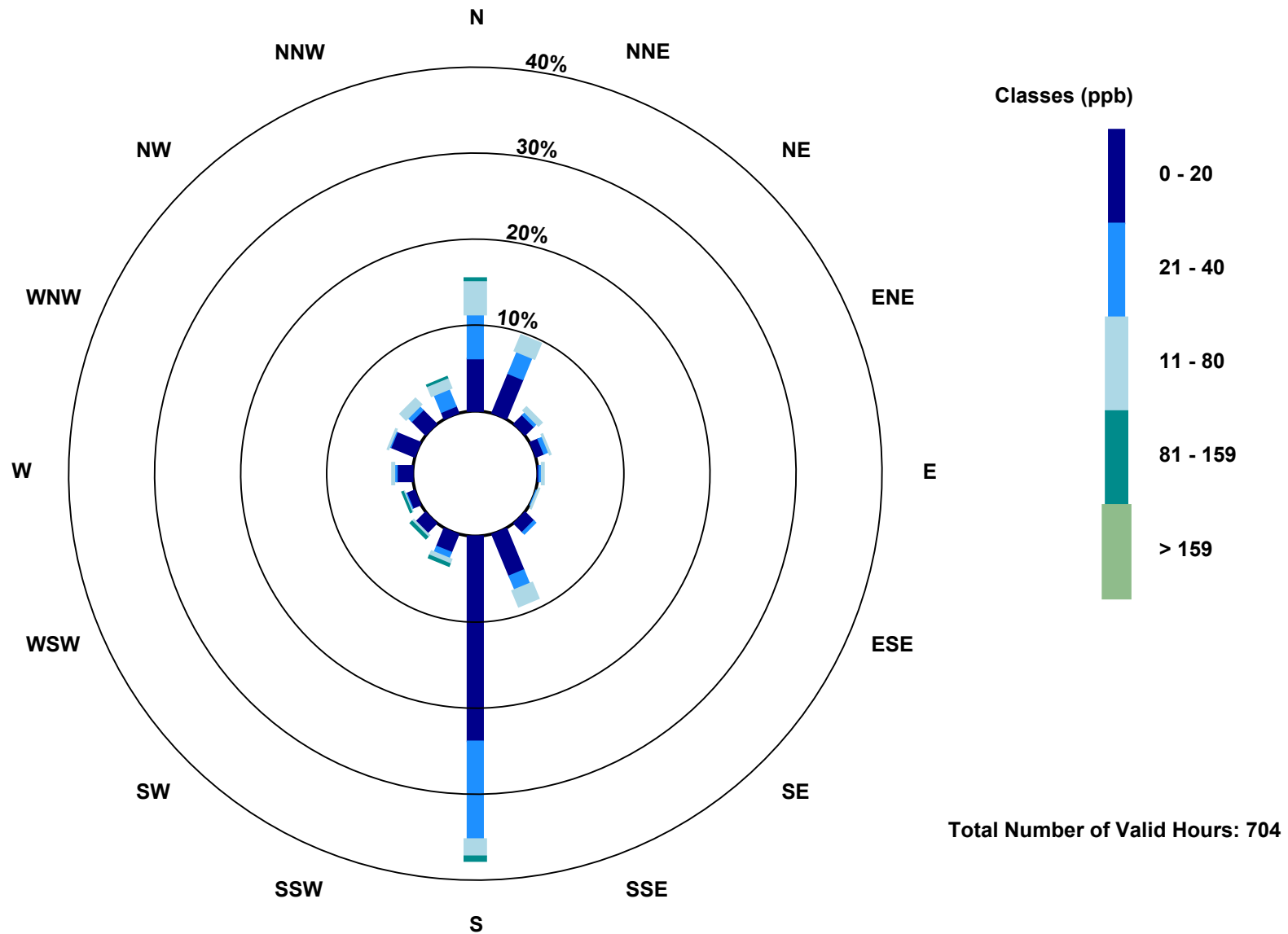
Total Number of Valid Hours: 704

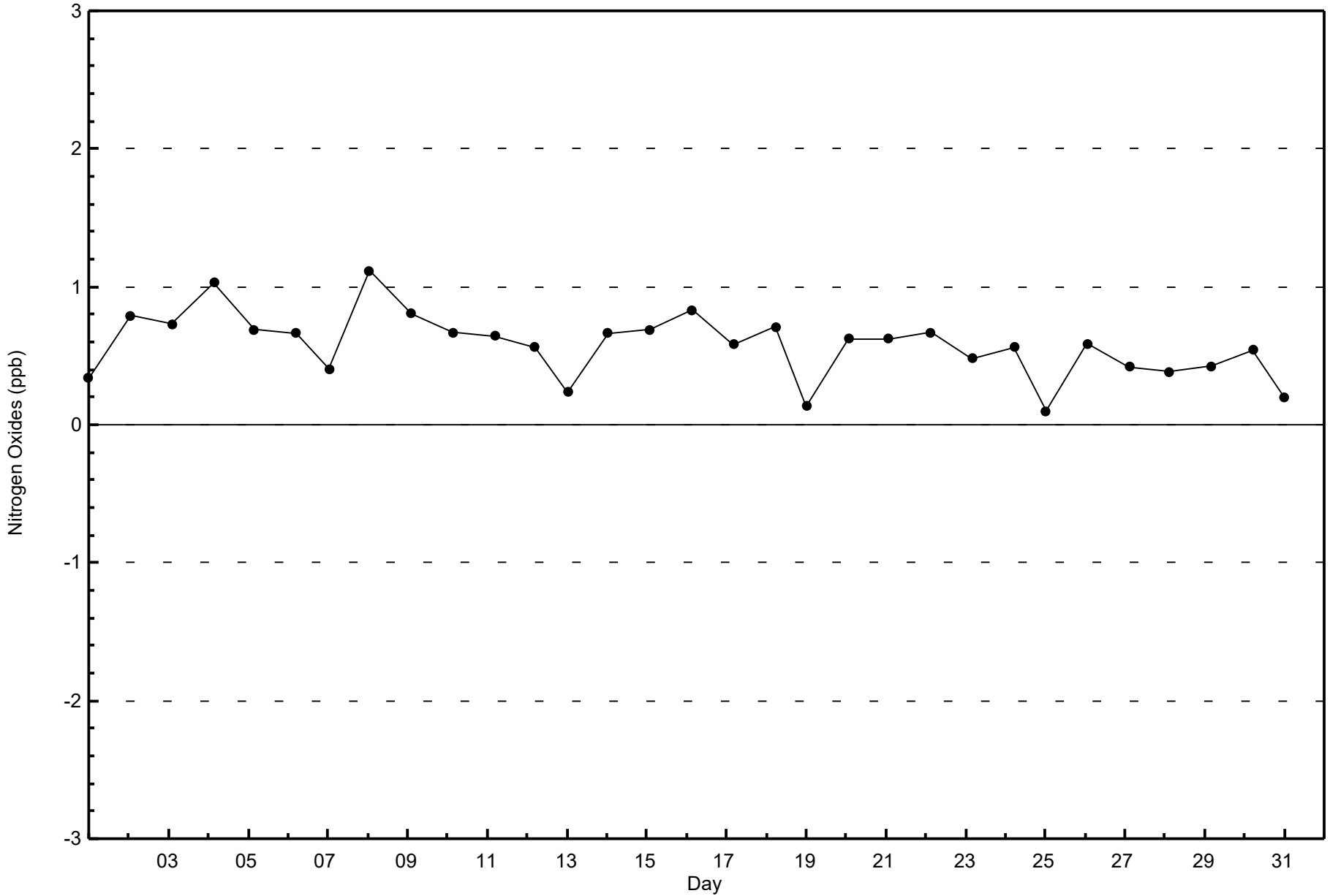
Total Number of Hours: 744

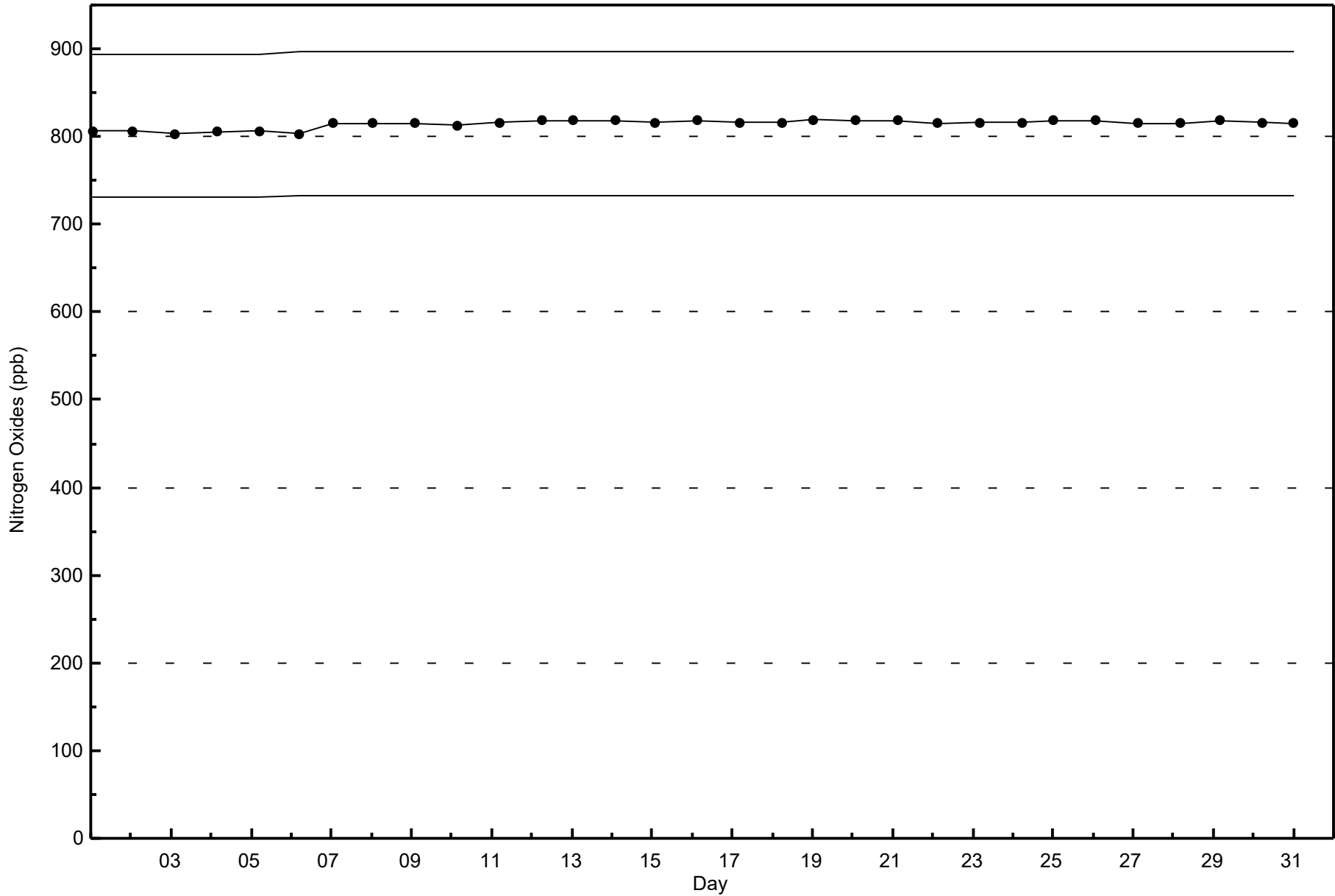


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter









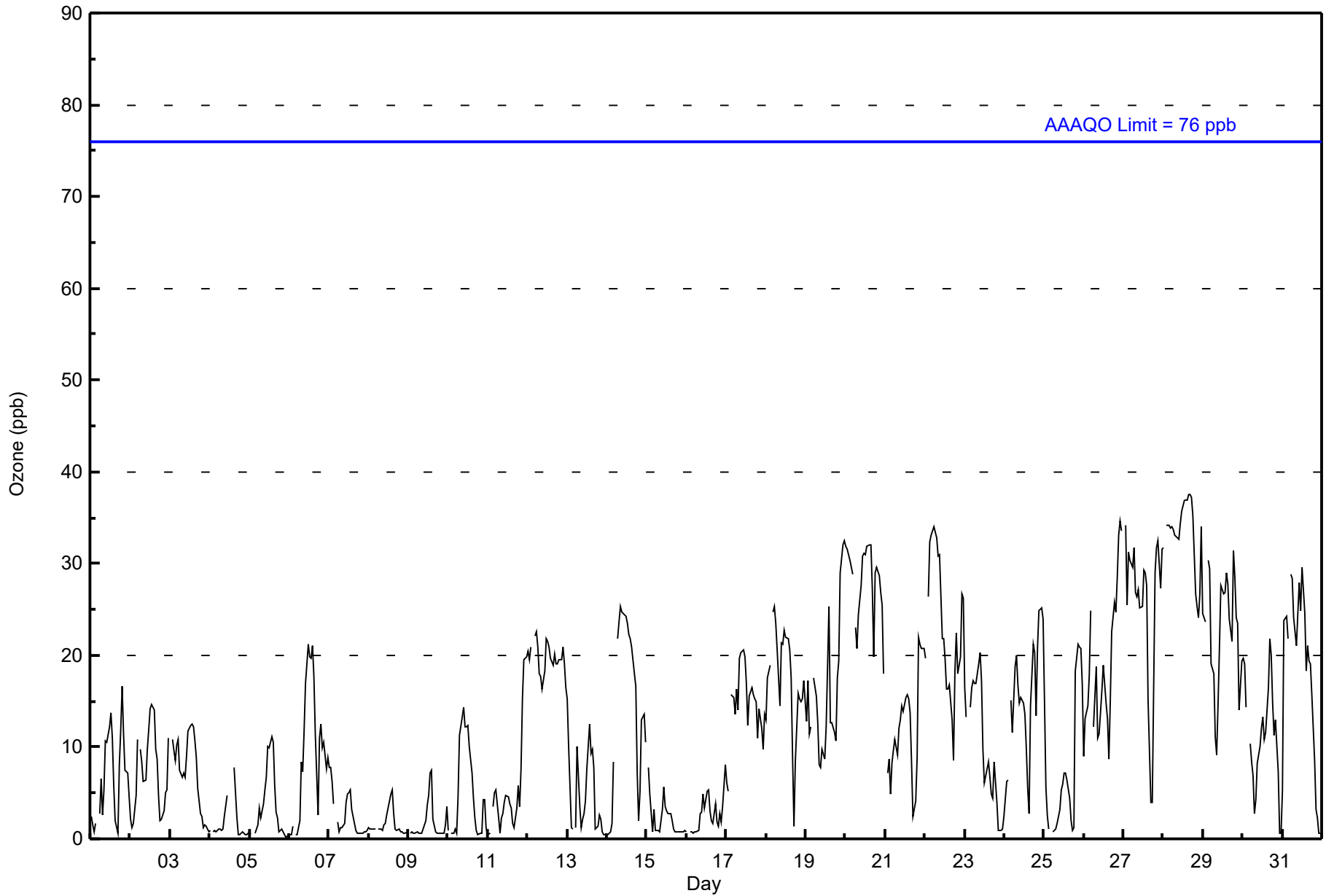
Summary of Hour Averages

Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 37.6 ppb on Jan 28 16:00	Maximum Daily Average: 33.3 ppb on Jan 28		Hours of Data:	709
Minimum Value: 0.2 ppb on Jan 5 23:00	Minimum Daily Average: 1.5 ppb on Jan 4		Hours of Missing Data:	35
Maximum Diurnal Average: 15.3 ppb at hour 13	Minimum Diurnal Average: 9.1 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 12.01 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.8 Q ₁ = 2.4 Median = 10.1 Q ₃ = 19.6 P ₉₀ = 27.4 P ₉₉ = 35.2		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.4	1.5	0.7	1.7	Z	2.7	6.6	2.6	5.4	10.7	10.5	12.1	13.8	10.9	5.8	2.0	0.6	8.1	11.9	16.6	11.5	7.5	7.2	4.6	6.8	16.6																							
2-Jan	2.1	1.2	1.7	4.8	10.8	Z	9.8	8.4	6.3	6.3	9.8	12.0	14.2	14.7	14.0	9.7	8.7	4.7	2.0	2.2	3.1	5.0	5.3	11.0	7.3	14.7																							
3-Jan	Z	10.8	9.6	8.5	10.3	10.8	7.5	6.7	7.1	6.6	9.0	11.8	12.4	12.5	12.2	10.6	8.8	5.5	2.8	2.4	1.3	1.5	1.3	0.8	7.4	12.5																							
4-Jan	0.9	Z	0.8	0.9	0.8	1.0	1.0	0.9	1.1	2.5	4.7	C	C	C	C	7.7	2.2	0.5	0.5	0.7	0.4	0.4	0.5	1.5	7.7																								
5-Jan	0.5	0.6	Z	0.7	1.0	1.5	3.4	2.4	3.8	5.4	6.7	10.1	10.0	11.1	10.5	5.9	2.9	2.2	0.7	1.1	0.8	0.4	0.2	0.3	3.6	11.1																							
6-Jan	0.5	0.5	1.4	Z	0.5	0.4	2.0	8.5	7.4	11.7	16.9	21.2	19.8	19.7	21.0	17.8	11.5	2.5	11.0	12.5	9.9	10.6	7.7	8.8	9.7	21.2																							
7-Jan	7.7	7.8	6.2	3.7	Z	1.8	0.7	1.3	1.3	1.7	4.0	4.8	5.1	5.3	3.2	1.7	0.9	0.6	0.7	0.6	0.6	0.7	0.7	0.9	2.7	7.8																							
8-Jan	1.3	1.0	1.0	1.1	1.1	Z	1.0	1.1	1.0	1.5	1.7	2.5	3.3	5.0	5.4	2.8	1.1	1.0	1.1	0.8	0.8	0.7	0.6	0.7	1.6	5.4																							
9-Jan	Z	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.7	1.1	1.9	3.6	4.7	7.2	7.4	2.2	0.7	0.6	0.6	0.6	0.6	0.7	1.5	3.5	1.8	7.4																							
10-Jan	0.9	Z	0.7	0.6	1.1	0.6	4.6	11.3	13.2	14.4	12.2	12.2	12.3	10.1	7.1	4.4	2.3	0.8	0.5	0.5	0.6	4.3	4.3	1.2	5.2	14.4																							
11-Jan	0.5	0.5	Z	3.5	5.0	5.4	2.3	0.7	2.3	2.7	4.0	4.7	4.6	3.9	3.4	1.7	1.2	3.3	5.9	3.6	7.7	15.2	19.5	19.9	5.3	19.9																							
12-Jan	20.4	19.5	20.9	Z	22.2	22.6	20.9	17.9	17.7	16.4	18.3	21.9	21.5	20.9	19.7	19.0	20.1	19.1	19.1	19.5	19.5	20.9	19.0	16.5	19.7	22.6																							
13-Jan	15.2	10.1	1.3	1.0	Z	1.2	10.1	3.5	1.2	2.1	2.7	4.1	7.6	12.5	9.3	9.8	7.8	1.1	1.4	2.7	2.2	0.8	0.4	0.4	4.7	15.2																							
14-Jan	0.4	0.6	0.7	1.7	8.4	Z	21.8	23.7	25.4	24.7	24.6	24.2	23.4	22.3	21.8	20.8	18.0	16.6	7.2	2.0	5.2	13.0	13.6	10.5	14.4	25.4																							
15-Jan	Z	7.8	4.9	0.8	3.2	1.0	0.9	0.9	0.8	3.3	5.6	3.6	3.0	2.8	2.7	2.0	1.0	0.8	0.7	0.8	0.8	0.7	0.8	0.8	2.2	7.8																							
16-Jan	0.7	Z	0.8	0.8	0.6	0.8	0.8	0.9	2.8	2.8	4.8	3.3	5.1	5.3	3.0	1.9	1.6	3.9	1.9	1.4	2.8	1.8	3.5	8.1	2.6	8.1																							
17-Jan	6.1	5.1	Z	15.7	15.3	13.6	16.3	14.1	19.6	20.3	20.5	19.8	17.0	12.3	15.6	16.5	15.7	15.3	15.0	11.0	14.2	12.0	9.8	13.5	14.5	20.5																							
18-Jan	12.9	17.6	18.9	Z	24.7	25.3	23.5	20.5	14.4	21.4	21.2	22.7	22.0	21.8	20.5	17.5	8.9	1.3	8.6	15.8	15.3	14.9	15.3	17.3	17.5	25.3																							
19-Jan	12.8	17.2	11.5	12.2	Z	17.5	15.5	12.7	8.1	7.8	9.8	8.7	12.2	18.8	25.4	12.6	12.6	11.6	10.7	17.6	19.4	29.0	32.0	32.5	16.0	32.5																							
20-Jan	31.9	31.5	31.0	30.4	28.8	Z	23.0	20.7	24.4	27.6	30.8	31.1	31.0	31.8	32.0	32.1	27.1	19.8	28.9	29.5	28.7	26.8	25.5	18.0	27.9	32.1																							
21-Jan	Z	7.2	8.6	4.8	8.2	9.7	10.9	9.2	12.0	13.0	14.4	13.8	15.5	15.7	15.3	13.7	8.3	2.5	4.1	8.9	22.0	21.2	20.7	20.8	12.2	22.0																							
22-Jan	19.7	Z	26.4	32.3	33.1	34.0	33.4	32.8	30.8	31.0	21.8	21.7	19.5	16.3	16.4	16.8	12.9	8.6	18.3	22.4	17.9	19.8	26.7	26.3	23.4	34.0																							
23-Jan	16.5	13.3	Z	14.3	16.4	17.3	16.9	16.9	19.1	20.3	17.2	9.7	6.1	6.9	8.3	6.7	4.9	4.4	8.4	4.0	1.0	0.9	1.0	1.0	10.1	20.3																							
24-Jan	2.4	6.3	6.3	Z	15.2	11.6	18.8	20.0	16.8	14.8	15.5	14.8	13.6	9.9	5.5	2.8	14.4	21.1	20.2	13.4	20.7	24.9	25.2	23.9	14.7	25.2																							
25-Jan	14.9	5.6	2.6	1.1	Z	0.8	0.9	1.1	1.6	3.2	5.3	5.9	7.2	7.2	6.5	4.4	2.0	0.9	1.3	18.3	21.2	20.9	20.7	16.8	7.4	21.2																							
26-Jan	9.1	13.1	14.5	17.8	24.9	Z	12.3	18.8	11.0	11.5	13.7	16.2	18.8	14.8	13.2	8.7	14.9	22.5	25.7	24.7	28.5	33.1	34.6	33.6	19.0	34.6																							
27-Jan	Z	34.1	25.4	31.2	30.4	29.5	31.7	26.8	26.4	27.1	25.2	25.3	29.3	28.9	27.7	15.1	4.0	4.0	16.5	29.0	31.8	32.5	27.4	31.5	25.7	34.1																							
28-Jan	31.8	Z	34.2	34.2	33.8	34.0	33.8	33.2	32.9	32.6	34.3	35.6	36.2	36.9	37.0	37.6	37.5	37.3	35.3	26.7	25.3	24.1	26.6	34.1	33.3	37.6																							
29-Jan	24.6	23.6	Z	30.4	29.5	19.0	18.0	11.1	9.1	14.6	20.9	27.7	26.6	26.9	29.0	27.8	23.9	21.4	31.4	28.5	24.2	23.5	14.0	19.3	22.8	31.4																							
30-Jan	19.7	19.1	14.3	Z	10.4	8.4	6.9	2.8	4.2	8.3	10.1	12.0	13.2	10.9	11.5	16.4	21.9	19.9	14.8	11.3	12.9	7.3	0.6	0.7	11.2	21.9																							
31-Jan	5.2	23.8	24.3	21.8	Z	28.8	28.3	24.1	21.1	24.5	27.9	24.8	29.6	24.6	18.3	21.0	19.3	19.0	15.7	8.5	3.2	2.3	0.6	0.6	18.2	29.6																							
																								10.0	10.8	10.4	10.6	13.5	11.5	12.4	11.5	11.3	12.6	13.8	14.7	15.3	14.9	14.3	11.9	10.2	9.1	10.4	10.9	11.4	12.2	11.8	12.2	Diurnal Average	
																								31.9	34.1	34.2	34.2	33.8	34.0	33.8	33.2	32.9	32.6	34.3	35.6	36.2	36.9	37.0	37.6	37.5	37.3	35.3	29.5	31.8	33.1	34.6	34.1	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	548	77.29	77.29
21 - 50	161	22.71	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	93	53	15	7	4	2	8	49	232	24	6	5	5	4	13	26	546
21 - 50	17	14	1	6	1	0	4	13	37	5	7	5	15	18	12	5	160
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	110	67	16	13	5	2	12	62	269	29	13	10	20	22	25	31	706

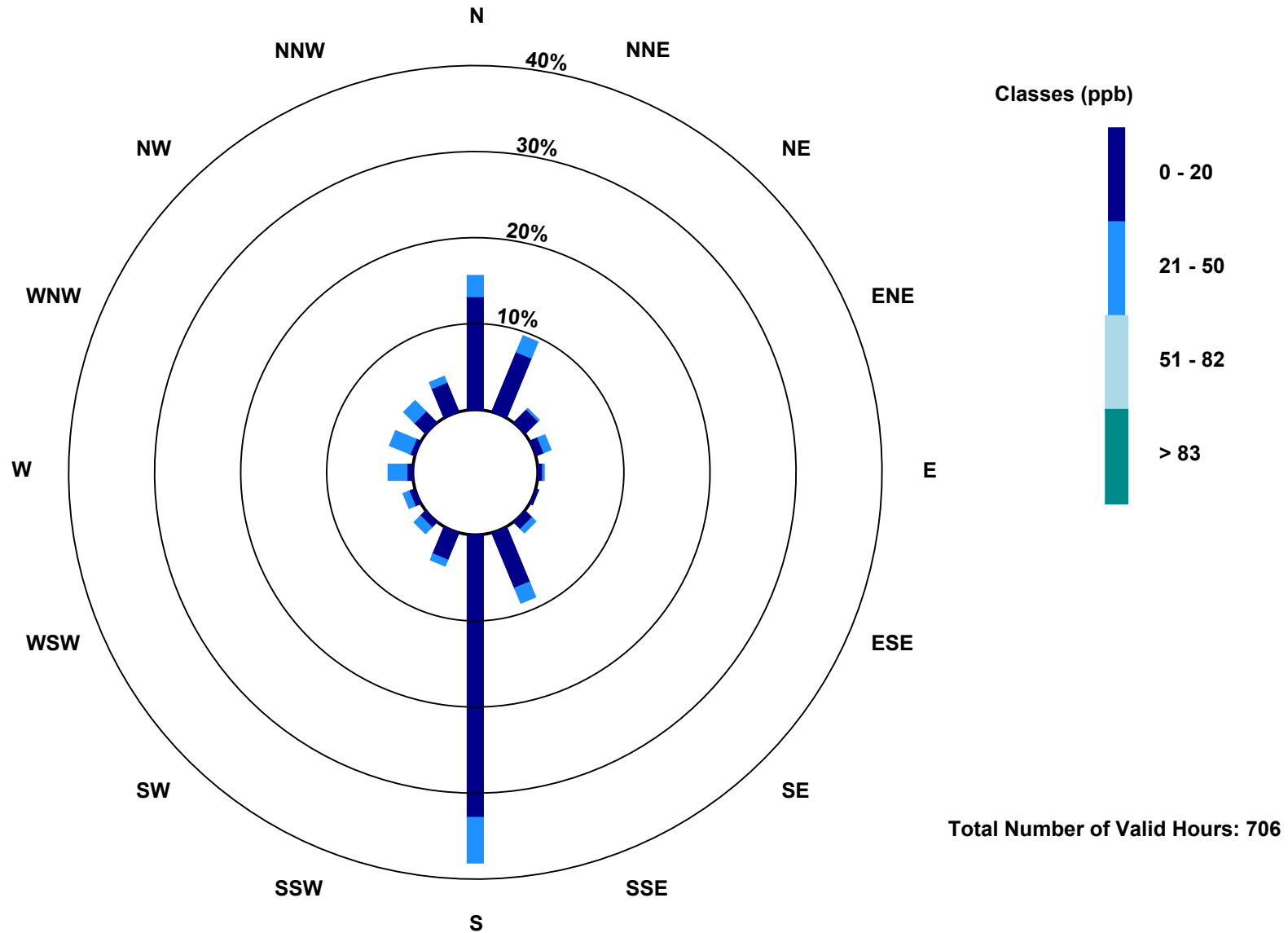
Total Number of Valid Hours: 706

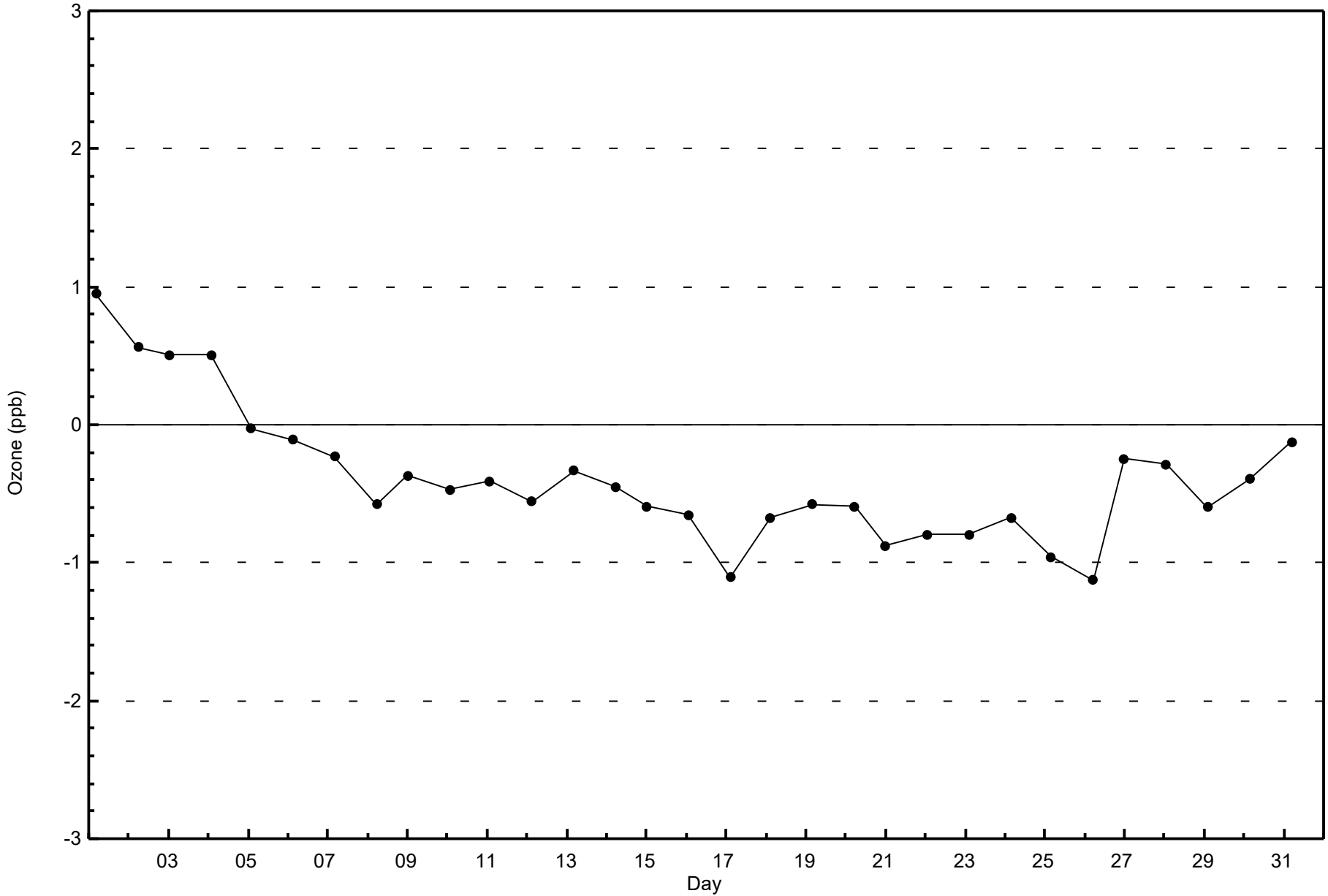
Total Number of Hours: 744

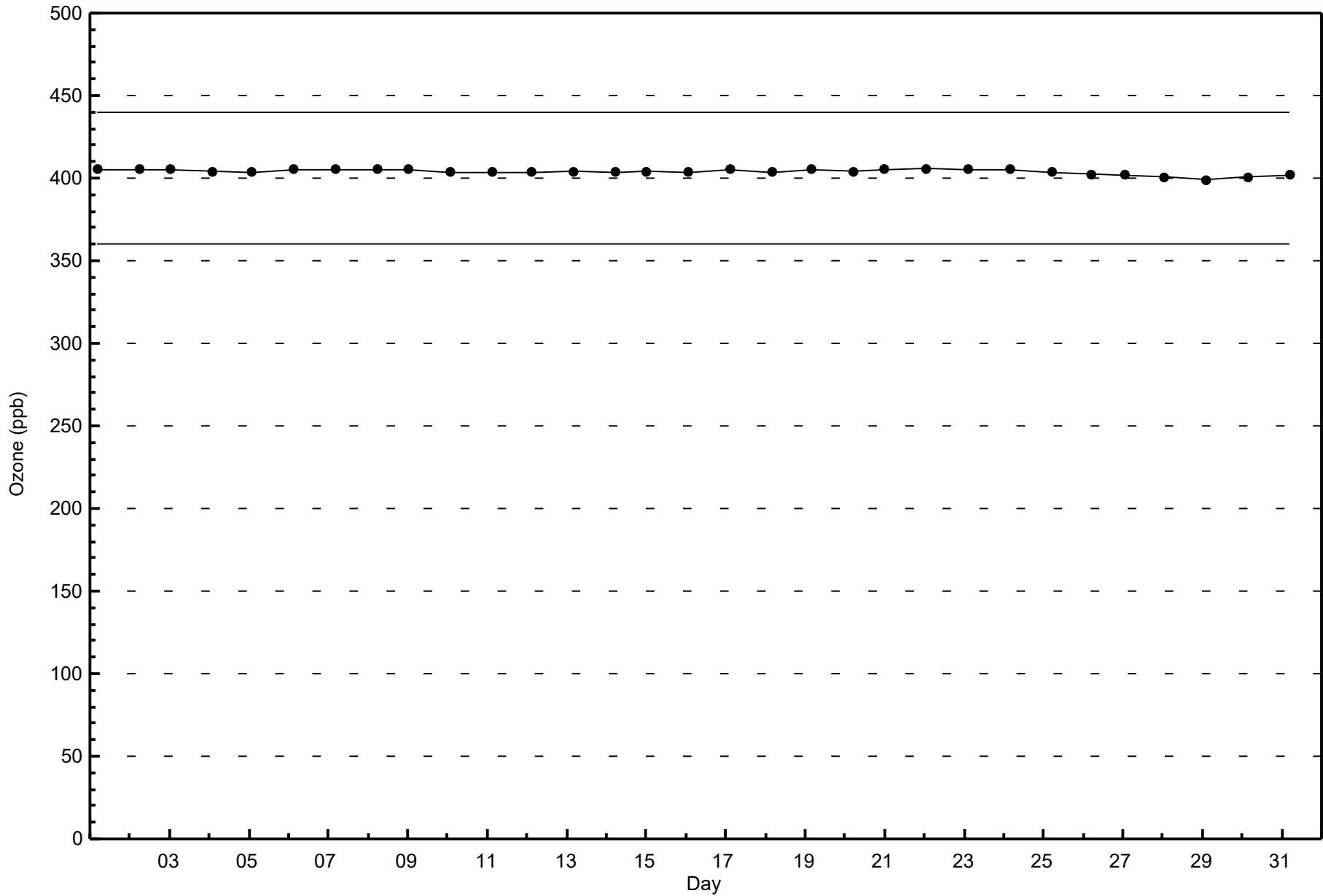


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association

Summary of Hour Averages

Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 41.7 µg/m ³ on Jan 16 03:00		Maximum Daily Average: 22.6 µg/m ³ on Jan 15														Hours of Data:		743																															
Minimum Value: 0.5 µg/m ³ on Jan 22 09:00		Minimum Daily Average: 1.8 µg/m ³ on Jan 28														Hours of Missing Data:		1																															
Maximum Diurnal Average: 11.8 µg/m ³ at hour 3		Minimum Diurnal Average: 8.7 µg/m ³ at hour 11														Hours of Calibration:		1																															
Monthly Average: 9.88 µg/m ³		Percentiles: P ₁ = 1.0 P ₁₀ = 2.1 Q ₁ = 4.1 Median = 8.6 Q ₃ = 13.7 P ₉₀ = 20.1 P ₉₉ = 29.2														Percent Operational Time:		100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	15.3	17.0	15.0	11.3	11.6	10.0	9.3	7.9	7.3	7.3	7.4	6.1	5.1	5.4	6.4	5.6	4.7	4.1	4.4	4.3	4.8	8.7	6.5	10.7	8.2	17.0																							
2-Jan	19.7	10.3	7.6	7.8	5.5	6.1	6.2	6.1	6.5	6.0	6.5	6.5	6.5	8.4	7.2	7.8	8.5	9.1	9.4	9.3	7.6	7.7	7.5	8.4	8.0	19.7																							
3-Jan	7.0	6.3	9.6	9.2	9.4	11.3	10.6	9.5	9.7	11.6	11.8	12.5	15.5	14.4	15.1	14.7	13.4	14.0	13.4	13.1	14.1	13.2	14.1	17.1	12.1	17.1																							
4-Jan	17.0	15.4	11.9	13.3	12.2	13.1	13.5	11.7	12.9	13.4	15.1	18.2	21.4	22.4	23.3	21.1	20.4	21.0	22.4	19.7	20.1	16.9	13.4	12.1	16.7	23.3																							
5-Jan	11.6	12.4	11.3	10.5	10.1	11.5	12.0	13.2	11.0	10.5	10.1	9.9	11.3	10.4	10.9	13.0	13.4	14.7	20.4	27.5	20.9	14.5	10.0	9.5	12.9	27.5																							
6-Jan	8.0	7.9	24.4	11.9	6.4	6.7	10.6	7.1	6.1	6.1	5.7	5.4	8.3	8.2	7.9	10.3	9.2	7.9	8.1	10.0	13.5	12.5	13.0	13.3	9.5	24.4																							
7-Jan	16.3	22.8	24.5	18.3	17.2	14.2	13.2	11.8	11.7	12.1	12.4	12.5	12.8	13.5	15.4	15.7	14.3	14.8	13.3	15.5	15.8	19.4	19.0	26.7	16.0	26.7																							
8-Jan	31.7	35.1	30.3	27.2	27.5	24.0	21.3	22.1	21.7	22.3	19.4	22.9	20.4	17.9	18.6	18.7	18.0	19.1	20.4	21.4	20.8	19.9	20.4	20.7	22.6	35.1																							
9-Jan	19.9	21.2	21.2	21.2	21.8	24.4	19.2	16.6	15.8	18.5	19.5	18.6	16.5	15.3	14.3	16.0	16.1	14.8	15.5	16.7	17.7	16.9	13.6	12.2	17.6	24.4																							
10-Jan	13.4	16.1	17.8	18.7	17.0	18.1	16.8	12.9	12.4	14.2	14.5	17.2	17.1	19.6	23.0	20.7	19.2	17.4	18.6	21.5	20.0	15.8	12.6	12.4	16.9	23.0																							
11-Jan	11.8	11.3	10.8	10.2	10.8	11.6	11.6	12.3	13.3	12.1	12.6	16.4	21.0	28.2	29.5	29.4	22.9	18.7	15.3	15.4	12.3	9.1	9.3	9.7	15.2	29.5																							
12-Jan	9.9	14.0	15.8	11.3	9.9	9.3	20.2	23.2	15.4	13.4	11.2	9.7	10.8	13.4	13.5	13.7	12.8	12.7	14.8	17.3	17.3	19.1	19.5	19.0	14.5	23.2																							
13-Jan	18.9	18.2	15.4	14.7	14.7	17.0	13.9	11.9	12.1	12.6	13.3	14.1	14.1	13.4	14.9	14.8	13.2	14.3	12.2	8.2	6.2	5.6	5.4	5.2	12.7	18.9																							
14-Jan	5.3	5.2	5.1	5.4	8.6	7.5	7.7	8.3	8.9	8.9	8.8	9.5	9.5	11.1	10.9	11.2	11.6	14.6	14.8	15.6	17.1	19.3	20.4	21.2	11.1	21.2																							
15-Jan	23.1	24.3	28.9	20.5	37.9	15.8	9.6	13.6	19.1	13.3	13.3	21.4	26.8	28.2	25.7	26.3	26.2	25.2	26.5	25.1	23.2	22.3	23.1	22.7	22.6	37.9																							
16-Jan	24.1	28.0	41.7	31.8	23.5	24.2	23.7	23.7	18.8	18.0	15.0	14.3	12.7	11.6	12.8	12.7	11.9	10.6	10.2	10.1	9.6	9.9	10.8	10.4	17.5	41.7																							
17-Jan	10.0	10.5	8.2	8.3	8.1	8.3	7.8	9.0	7.5	6.6	5.7	7.1	8.9	9.6	10.4	10.8	11.1	11.0	11.9	12.0	11.9	10.1	9.3	9.1	9.3	12.0																							
18-Jan	9.7	10.9	8.6	7.3	6.1	7.8	6.8	6.4	8.7	6.5	6.6	5.1	5.0	4.9	5.7	6.9	8.6	8.7	9.3	8.8	5.3	5.4	5.5	5.0	7.1	10.9																							
19-Jan	5.8	5.7	9.1	7.7	7.7	8.7	9.2	10.8	13.5	12.9	13.7	12.7	8.5	6.1	4.3	4.5	3.8	5.9	7.8	4.7	3.3	2.2	1.9	1.6	7.2	13.7																							
20-Jan	2.1	2.7	2.5	3.1	3.2	3.1	3.3	3.7	3.0	2.3	1.6	1.4	1.3	1.3	1.5	2.4	1.4	3.4	2.7	1.5	1.1	2.2	2.7	1.6	2.3	3.7																							
21-Jan	1.5	3.1	4.2	4.6	6.1	7.4	6.5	9.2	8.2	7.1	6.4	8.2	8.6	7.8	9.6	8.3	8.6	6.6	4.9	5.5	2.0	3.2	1.4	1.0	5.8	9.6																							
22-Jan	2.0	1.1	1.8	1.0	1.2	1.0	0.8	0.7	0.5	0.6	2.1	1.1	1.2	1.8	2.1	2.7	3.3	3.5	3.2	2.6	3.1	2.6	2.1	2.1	1.8	3.5																							
23-Jan	3.6	3.4	3.0	3.2	2.8	2.3	2.7	2.8	2.3	2.1	2.4	2.9	3.8	3.8	3.9	4.2	4.0	3.8	3.4	3.9	4.6	4.5	4.6	5.5	3.5	5.5																							
24-Jan	5.3	4.8	4.2	4.4	4.8	5.0	4.3	6.2	7.9	8.5	9.1	8.1	9.0	8.5	C	7.2	3.8	2.5	2.3	2.8	2.7	2.2	2.7	2.7	5.2	9.1																							
25-Jan	3.3	3.6	4.2	4.8	5.2	5.4	5.5	5.3	5.6	5.9	7.3	8.0	8.3	8.8	10.6	11.4	13.1	14.6	15.3	7.1	6.1	6.0	5.6	7.8	7.4	15.3																							
26-Jan	7.6	6.4	7.3	5.7	1.8	2.7	4.0	1.9	2.5	4.0	5.1	4.1	3.8	3.8	3.6	3.7	3.0	2.4	2.7	3.0	2.9	2.3	1.6	1.5	3.6	7.6																							
27-Jan	1.2	1.3	1.5	1.1	1.0	1.1	1.0	1.4	1.6	1.5	1.6	2.4	2.8	3.1	2.7	3.5	3.9	4.9	2.7	1.7	1.5	1.4	1.5	1.0	2.0	4.9																							
28-Jan	1.3	0.9	1.4	1.5	1.5	1.5	1.5	1.4	1.3	1.4	1.4	1.5	1.4	1.4	1.3	1.3	2.1	1.5	1.7	3.3	3.4	3.6	3.4	2.4	1.8	3.6																							
29-Jan	4.4	7.9	7.7	3.9	1.9	2.1	2.6	3.4	3.5	3.8	4.3	2.9	3.8	2.8	3.5	4.8	5.8	7.4	1.3	1.5	2.1	2.3	3.6	2.9	3.7	7.9																							
30-Jan	4.8	1.8	7.9	6.0	5.5	9.1	2.1	3.7	3.4	7.2	4.5	4.6	4.1	4.0	4.2	4.5	5.6	6.0	9.2	10.4	8.0	6.4	8.6	9.2	5.9	10.4																							
31-Jan	6.4	4.1	3.4	3.2	2.1	1.8	1.7	1.4	7.8	2.1	2.6	4.9	4.0	3.9	4.7	6.8	9.7	7.6	8.7	7.8	8.5	7.9	8.9	7.1	5.3	9.7																							
																								10.4	10.8	11.8	10.0	9.8	9.4	9.0	9.0	9.0	8.8	8.7	9.4	9.8	10.1	10.6	10.8	10.4	10.4	10.6	10.6	9.9	9.5	9.1	9.4	Diurnal Average	
																								31.7	35.1	41.7	31.8	37.9	24.4	23.7	23.7	21.7	22.3	19.5	22.9	26.8	28.2	29.5	29.4	26.2	25.2	26.5	27.5	23.2	22.3	23.1	26.7	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	246	33.11	33.11
6 - 15	355	47.78	80.89
16 - 25	121	16.29	97.17
26 - 80	21	2.83	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	45	32	7	9	3	1	5	16	43	9	8	5	15	21	16	10	245
6 - 15	39	16	4	2	2	0	2	37	204	14	4	3	5	3	9	11	355
16 - 25	26	16	7	2	0	1	5	8	32	6	3	2	0	0	2	9	119
26 - 80	4	5	0	0	0	0	0	6	3	1	0	0	0	0	0	2	21
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	114	69	18	13	5	2	12	67	282	30	15	10	20	24	27	32	740

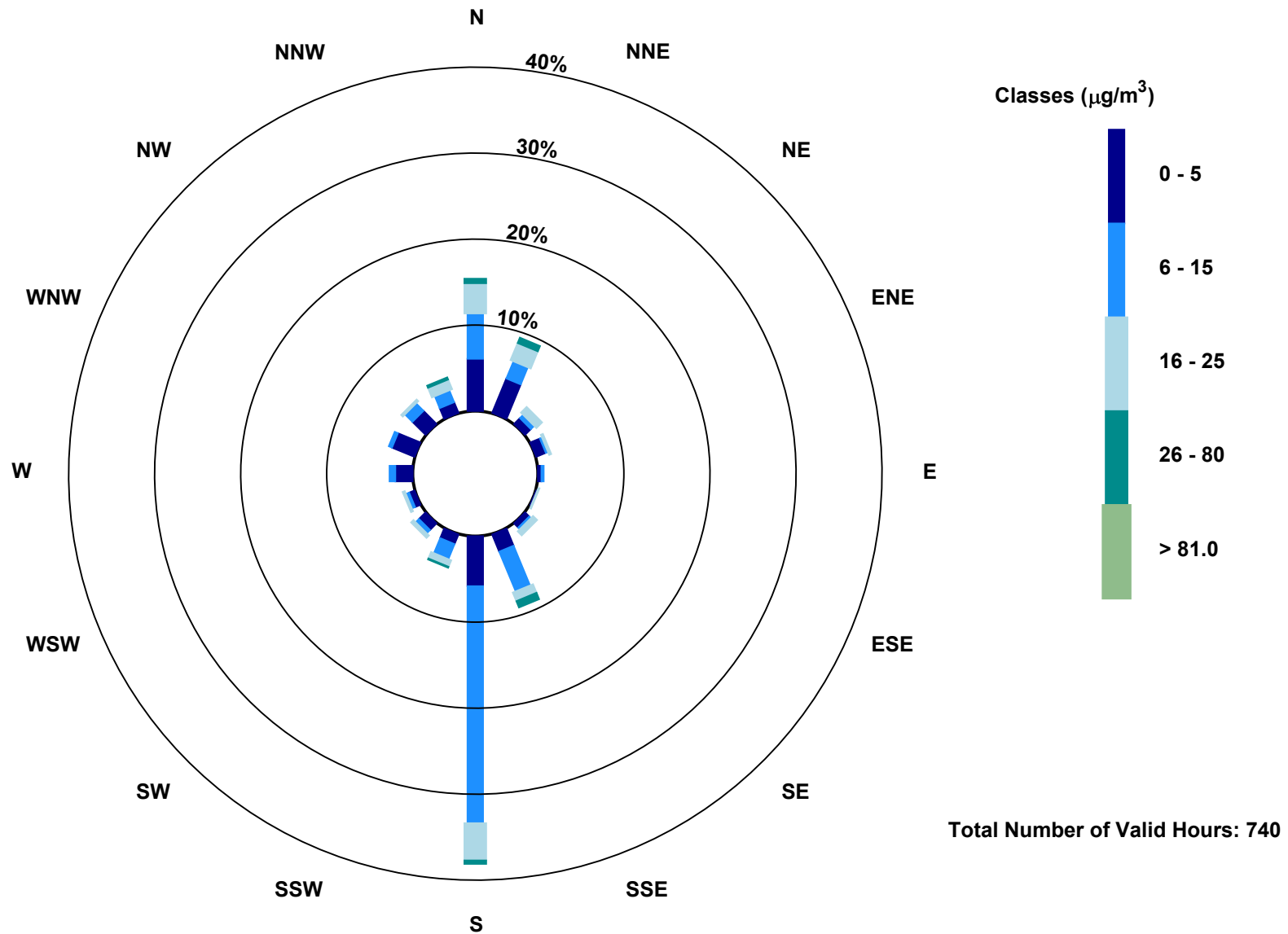
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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





Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 0.3 ppm on Jan 4 21:00	Maximum Daily Average: 0.3 ppm on Jan 4		Hours of Data:	709
Minimum Value: 0.1 ppm on Jan 23 01:00	Minimum Daily Average: 0.2 ppm on Jan 28		Hours of Missing Data:	35
Maximum Diurnal Average: 0.2 ppm at hour 16	Minimum Diurnal Average: 0.2 ppm at hour 10		Hours of Calibration:	35
Monthly Average: 0.22 ppm	Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.3 P ₉₉ = 0.3		Percent Operational Time:	100.0

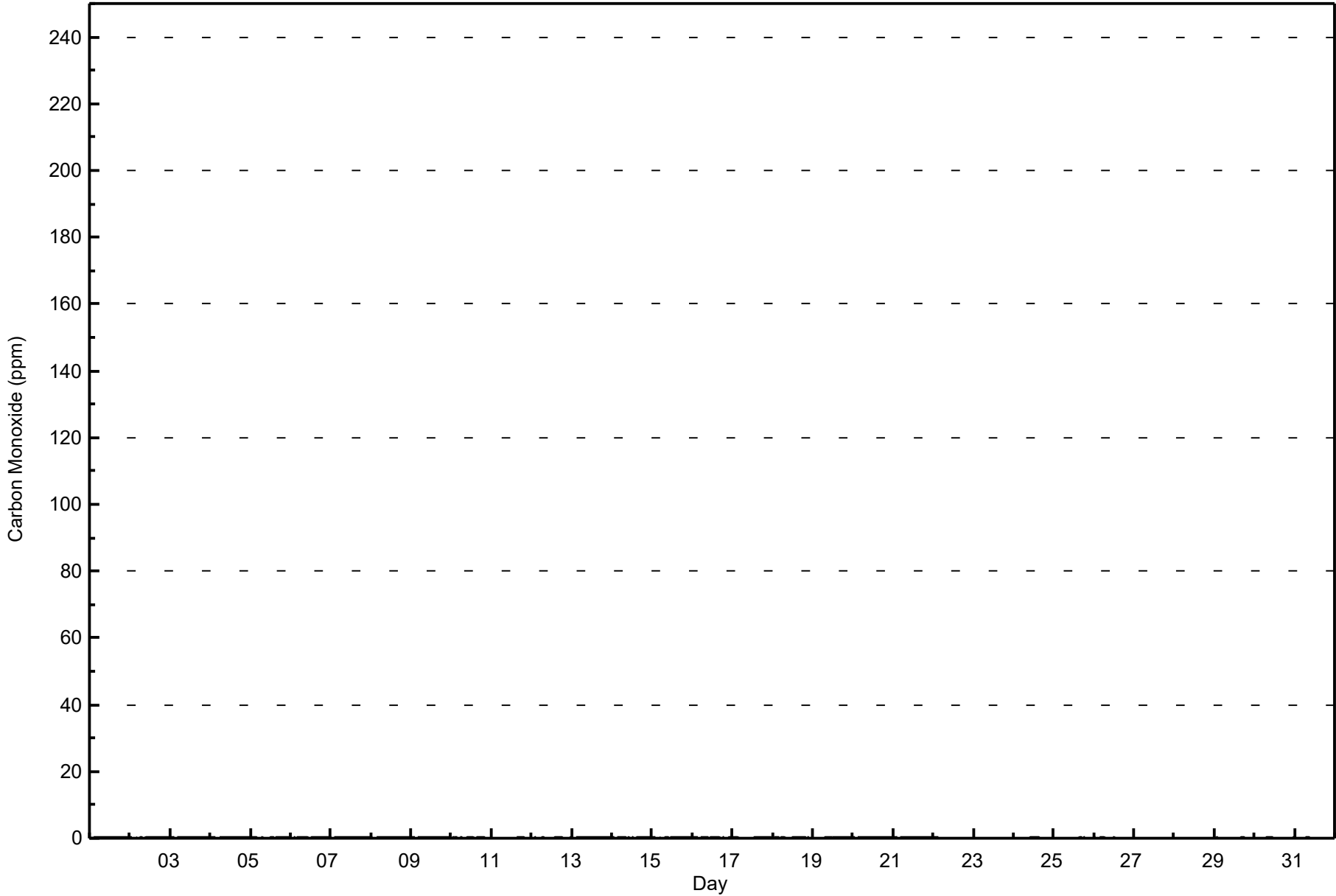
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																											
1-Jan	0.2	Z	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2																									
2-Jan	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2																								
3-Jan	0.2	0.2	0.3	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																								
4-Jan	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																								
5-Jan	0.3	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2																								
6-Jan	Z	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2																								
7-Jan	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3																								
8-Jan	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																								
9-Jan	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																								
10-Jan	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
11-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	C	C	C	C	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
12-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
13-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
14-Jan	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
15-Jan	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2																								
16-Jan	0.3	0.3	0.3	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
17-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
18-Jan	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
19-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2																								
20-Jan	0.2	0.2	Z	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
21-Jan	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3																								
22-Jan	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2																								
23-Jan	0.1	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
24-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
25-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
26-Jan	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2																								
27-Jan	0.2	0.1	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2																								
28-Jan	0.2	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2																								
29-Jan	0.1	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
30-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
31-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																								
																								0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average	
																								0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	709	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709
Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	108	67	17	13	5	2	11	61	269	28	15	10	19	22	27	32	706
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	108	67	17	13	5	2	11	61	269	28	15	10	19	22	27	32	706

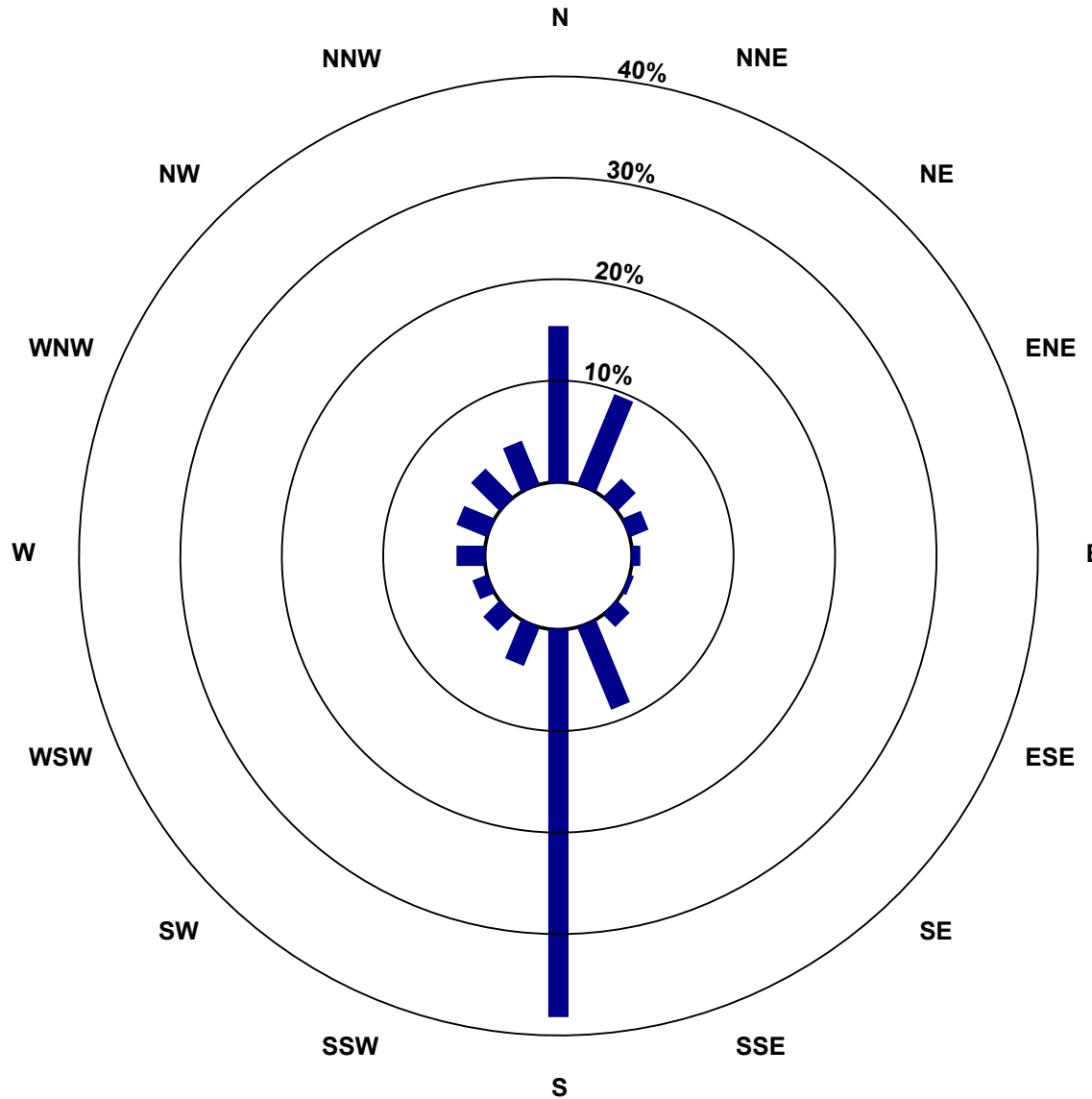
Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter



Classes (ppm)



Total Number of Valid Hours: 706

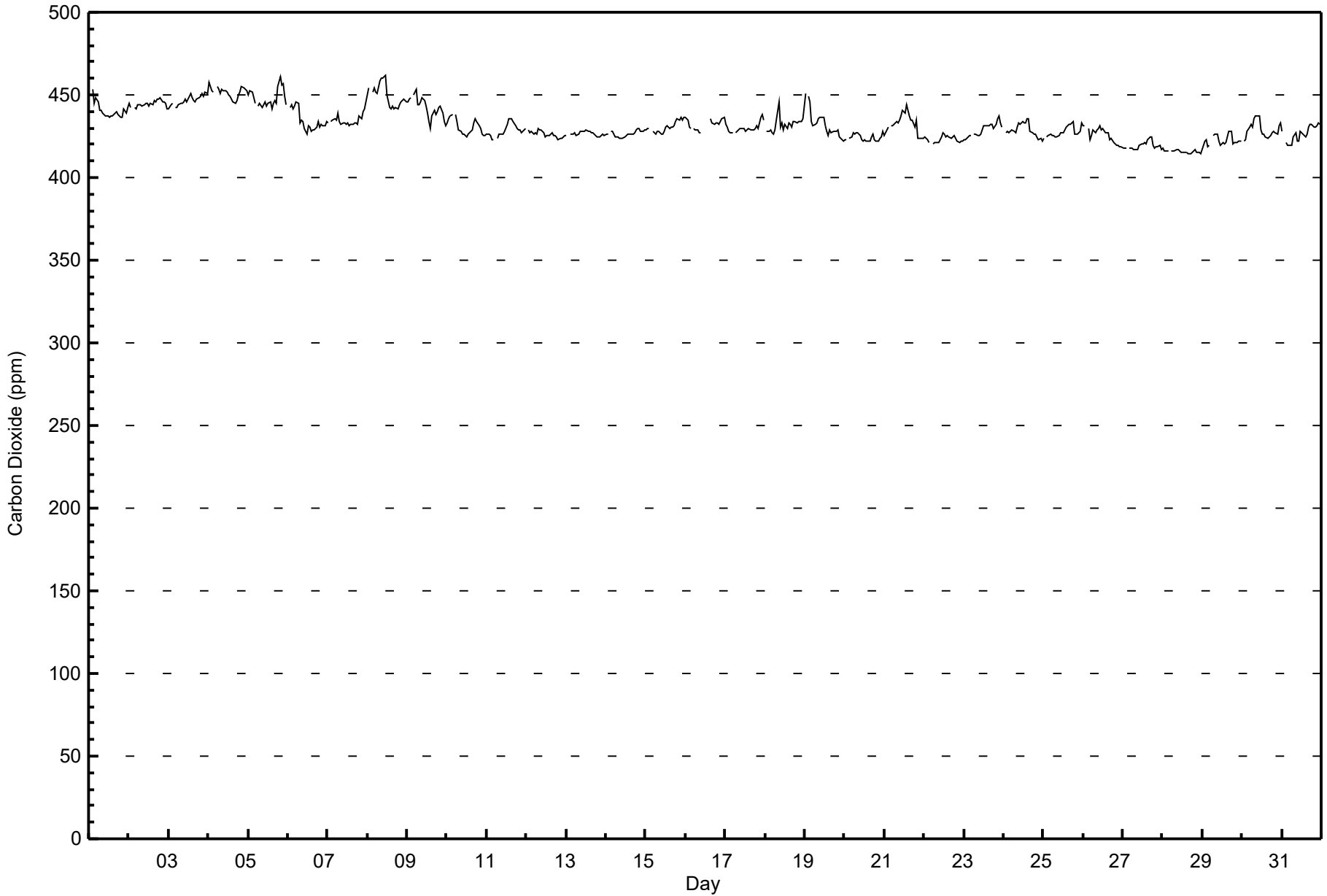


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744					
Maximum Value: 461.4 ppm on Jan 8 12:00		Maximum Daily Average: 451.6 ppm on Jan 4																	Hours of Data:	708						
Minimum Value: 414.1 ppm on Jan 29 00:00		Minimum Daily Average: 415.6 ppm on Jan 28																	Hours of Missing Data:	36						
Maximum Diurnal Average: 433.0 ppm at hour 1		Minimum Diurnal Average: 431.0 ppm at hour 15																	Hours of Calibration:	36						
Monthly Average: 431.98 ppm		Percentiles: P ₁ = 415.1 P ₁₀ = 421.5 Q ₁ = 425.6 Median = 429.5 Q ₃ = 437.1 P ₉₀ = 446.2 P ₉₉ = 456.6																	Percent Operational Time:	100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	445.2	Z	453.3	445.2	448.3	446.0	440.3	440.6	439.2	438.4	437.6	436.9	436.7	437.3	437.7	438.3	439.7	437.8	437.5	436.0	436.1	441.3	439.3	442.6	440.5	453.3
2-Jan	445.3	442.0	Z	442.0	441.2	444.3	444.3	444.2	443.6	443.7	444.7	444.7	443.4	445.1	443.8	446.7	445.8	447.1	447.7	448.1	446.2	445.5	445.1	441.2	444.6	448.1
3-Jan	441.4	443.9	445.0	Z	442.1	442.2	444.2	444.5	444.8	446.1	447.1	445.4	449.2	450.8	448.4	447.0	445.6	447.2	448.4	448.8	450.7	448.8	451.8	450.5	446.7	451.8
4-Jan	457.7	454.9	452.9	452.1	Z	455.4	453.7	450.8	453.4	452.1	452.4	451.3	449.9	449.1	447.2	445.6	444.6	446.8	449.6	451.7	455.5	454.4	453.1	452.2	451.6	457.7
5-Jan	449.6	452.3	452.0	448.5	445.3	Z	443.5	444.5	442.7	443.8	445.4	443.3	445.1	445.6	441.7	445.2	446.9	445.2	455.4	460.8	455.7	456.6	449.3	444.3	448.0	460.8
6-Jan	Z	441.9	444.2	441.6	443.4	445.5	444.5	432.8	434.6	433.6	429.9	426.6	431.4	430.4	428.2	428.5	428.6	430.2	433.7	430.2	432.2	431.3	431.5	433.6	434.3	445.5
7-Jan	432.7	Z	434.1	434.8	435.5	434.8	438.7	433.7	431.9	433.3	432.9	432.6	432.8	431.4	432.3	432.1	433.2	433.4	432.6	437.3	436.0	439.7	441.4	446.0	434.9	446.0
8-Jan	450.2	454.3	Z	451.3	453.8	451.5	450.8	458.4	459.9	460.2	460.7	461.4	450.3	442.1	441.3	443.4	441.3	442.5	441.9	444.4	445.6	446.4	447.6	445.4	449.8	461.4
9-Jan	445.4	447.1	448.3	Z	450.4	453.6	443.7	444.2	445.7	448.4	446.6	443.3	438.8	433.7	429.7	437.5	440.5	438.5	440.1	442.1	443.4	439.3	433.7	431.5	442.0	453.6
10-Jan	433.2	435.8	437.3	437.9	Z	437.8	433.7	428.6	428.2	426.4	425.9	425.6	424.9	426.2	427.9	429.1	432.8	436.0	434.1	431.8	429.8	426.1	425.1	425.7	430.4	437.9
11-Jan	426.6	426.5	425.8	423.2	422.8	Z	423.7	425.9	426.2	426.4	426.1	428.1	432.1	435.8	435.9	435.8	433.7	431.4	429.5	428.5	428.7	427.3	427.8	429.8	428.6	435.9
12-Jan	Z	428.9	427.5	427.8	426.4	426.9	426.5	429.5	429.1	429.0	427.4	424.7	425.1	425.3	425.7	426.8	425.5	425.5	424.8	423.1	423.5	423.7	424.2	425.5	426.2	429.5
13-Jan	425.6	Z	426.2	426.1	426.7	427.1	425.3	426.5	427.7	428.0	427.9	427.8	428.8	428.1	427.9	427.1	427.0	425.9	424.4	424.3	424.8	425.4	426.0	425.7	426.5	428.8
14-Jan	426.2	426.0	Z	427.6	428.0	424.7	424.7	424.2	423.4	423.7	423.8	424.5	425.6	425.9	426.2	425.9	426.4	427.1	428.6	429.4	429.5	428.3	427.8	428.5	426.4	429.5
15-Jan	429.1	429.5	429.9	Z	428.0	427.2	426.2	427.9	428.1	425.9	426.0	428.3	430.4	431.2	430.1	430.2	430.8	431.5	434.2	435.7	434.7	436.1	434.6	436.0	430.5	436.1
16-Jan	436.2	434.9	430.4	429.4	Z	429.8	428.8	428.8	427.0	427.4	C	C	C	C	435.5	433.0	431.8	432.8	433.4	432.6	434.3	435.3	436.8	432.1	436.8	
17-Jan	431.9	430.4	428.0	427.0	427.4	Z	427.0	428.0	428.9	429.3	429.5	429.9	427.7	429.2	429.6	428.9	429.1	429.1	429.4	431.5	429.8	436.2	438.4	434.9	430.1	438.4
18-Jan	Z	428.2	427.6	428.5	426.7	426.2	428.6	435.1	446.0	430.2	432.9	428.5	432.1	429.8	432.6	432.3	430.5	433.6	434.1	433.4	433.5	434.3	433.9	435.6	431.9	446.0
19-Jan	450.8	Z	448.8	445.6	433.6	431.4	432.2	433.4	435.6	436.1	436.3	436.3	431.5	428.3	425.6	428.9	427.1	427.6	428.3	427.8	428.9	424.7	422.9	422.4	432.4	450.8
20-Jan	422.5	422.8	Z	423.4	424.6	427.3	426.2	427.1	427.2	425.1	422.8	422.4	422.6	422.1	422.0	422.1	424.2	426.2	423.0	422.0	422.1	423.8	424.2	427.6	424.1	427.6
21-Jan	425.7	428.7	430.2	Z	431.4	431.7	432.2	434.2	433.2	434.4	437.0	440.8	439.0	444.3	441.0	437.5	434.5	434.3	430.7	434.5	423.4	423.7	423.7	423.6	432.6	444.3
22-Jan	424.6	423.8	422.9	421.4	Z	420.7	421.0	421.2	421.6	421.1	424.9	426.9	426.4	424.9	425.5	424.7	423.9	424.3	425.1	423.6	422.2	421.4	421.6	421.6	423.3	426.9
23-Jan	423.1	423.2	424.1	425.8	425.1	Z	426.3	425.9	425.5	425.4	426.4	428.9	431.2	431.8	431.5	431.7	431.8	432.0	430.0	432.4	436.0	436.9	433.1	430.8	429.1	436.9
24-Jan	Z	427.5	427.6	427.2	428.3	428.7	428.0	427.5	430.4	432.9	432.3	434.2	433.4	433.2	435.5	435.6	428.0	426.8	426.5	426.7	424.6	422.9	424.1	422.4	428.9	435.6
25-Jan	424.0	Z	424.9	425.6	425.9	425.4	425.2	424.5	425.0	425.7	426.8	426.8	427.3	429.1	430.8	431.9	432.0	433.1	434.2	426.3	426.0	426.9	428.0	433.1	427.8	434.2
26-Jan	431.4	431.3	Z	429.8	422.8	425.6	428.6	427.1	428.9	430.0	431.1	429.0	429.4	427.3	427.5	426.9	423.3	423.9	421.4	420.2	419.7	419.5	418.3	419.0	425.7	431.4
27-Jan	418.0	417.7	418.0	Z	417.8	418.1	417.4	417.2	417.1	417.0	419.2	420.3	420.0	420.8	420.1	423.1	424.3	424.2	419.5	417.4	418.4	418.6	419.6	416.8	419.1	424.3
28-Jan	417.6	416.4	416.0	416.2	Z	416.0	416.1	416.3	416.5	416.6	415.7	415.3	415.1	414.9	414.9	414.8	414.6	414.6	414.9	416.8	415.4	415.3	415.1	414.1	415.6	417.6
29-Jan	417.2	422.0	422.8	419.0	419.4	Z	425.1	426.3	426.0	426.0	421.9	419.5	420.9	420.5	421.2	424.8	427.7	428.4	420.7	421.1	421.4	421.4	421.9	421.9	422.5	428.4
30-Jan	Z	422.1	422.7	428.2	430.3	432.3	430.6	435.4	437.0	436.9	437.1	428.8	426.5	426.4	424.9	424.1	424.4	425.7	427.3	428.1	427.5	426.4	430.9	432.7	429.0	437.1
31-Jan	428.1	Z	420.9	419.6	419.3	419.6	419.9	424.5	426.8	421.7	422.1	428.2	427.2	425.6	425.0	426.0	430.4	431.9	432.1	430.4	430.9	431.6	433.1	431.9	426.4	433.1
433.0 432.5 432.4 431.7 431.7 432.7 431.5 431.9 432.6 432.1 432.4 432.0 431.8 431.5 431.0 431.9 431.7 432.0 432.0 432.2 431.8 431.9 431.7 431.7																								Diurnal Average		
457.7 454.9 453.3 452.1 453.8 455.4 453.7 458.4 459.9 460.2 460.7 461.4 450.3 450.8 448.4 447.0 446.9 447.2 455.4 460.8 455.7 456.6 453.1 452.2																								Diurnal Maximum		
Z - zerospan		C - Calibration																								



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	56	7.91	7.91
420 - 440	500	70.62	78.53
440 - 460	149	21.05	99.58
460 - 480	3	0.42	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	11	10	1	3	0	0	0	0	2	0	0	0	6	11	11	1	56
420 - 440	88	47	13	9	5	1	11	57	166	21	12	9	10	11	13	26	499
440 - 460	4	10	3	1	0	1	0	8	99	7	2	1	3	0	3	5	147
460 - 480	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	103	67	17	13	5	2	11	65	269	28	15	10	19	22	27	32	705

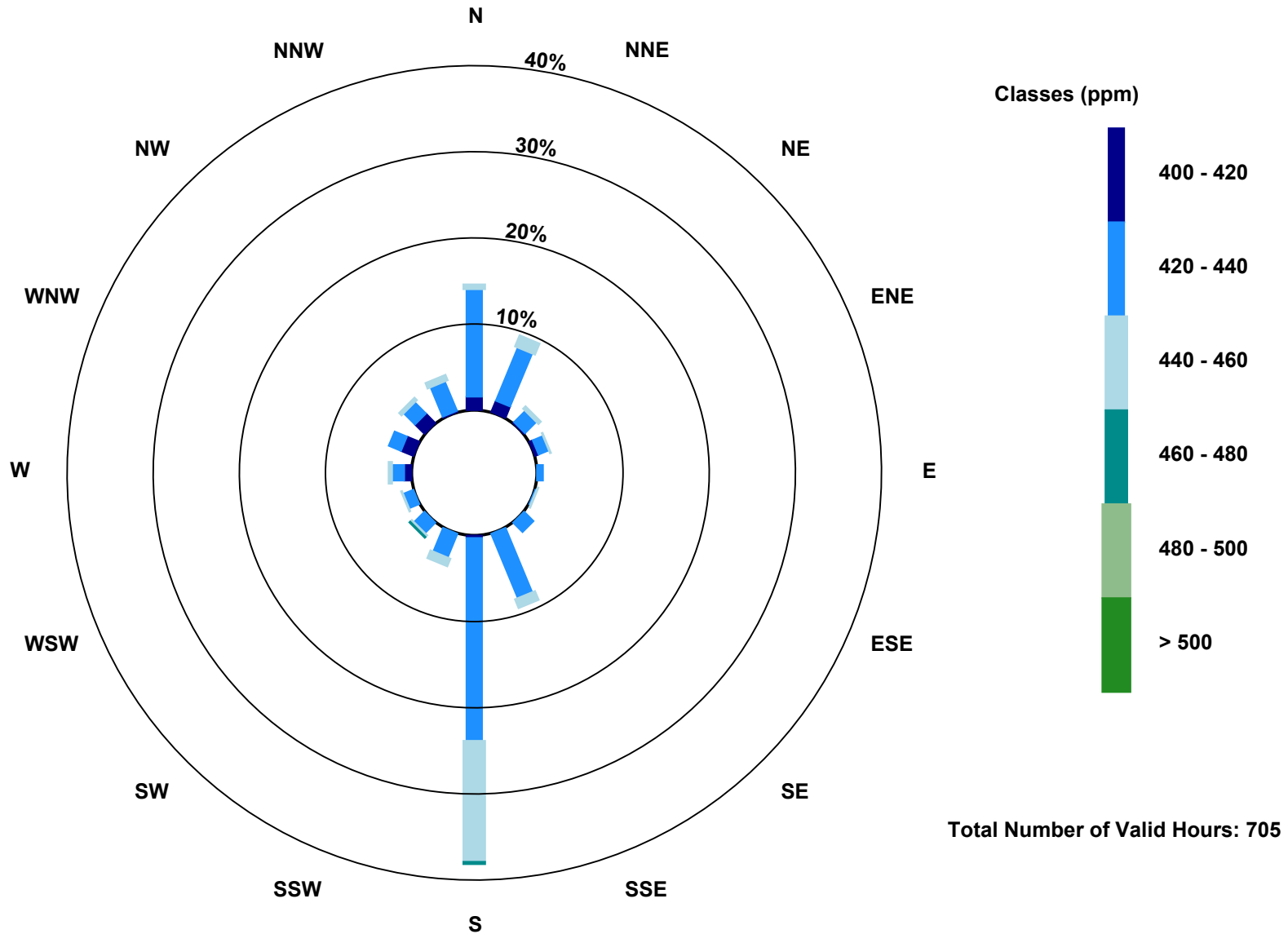
Total Number of Valid Hours: 705

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

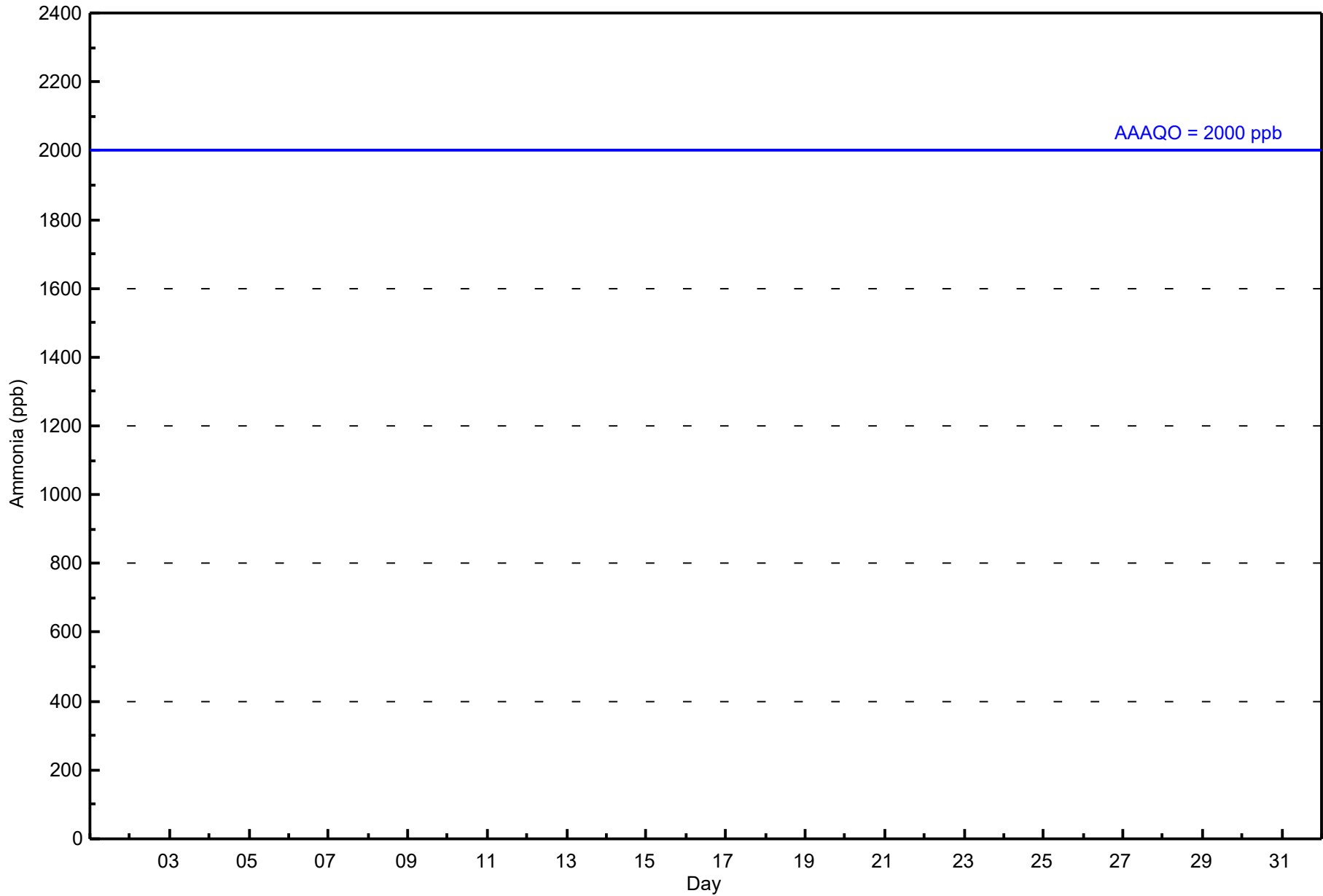
Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	365	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 365

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	38	30	6	6	0	1	9	33	152	15	7	4	5	16	20	20	362
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	30	6	6	0	1	9	33	152	15	7	4	5	16	20	20	362

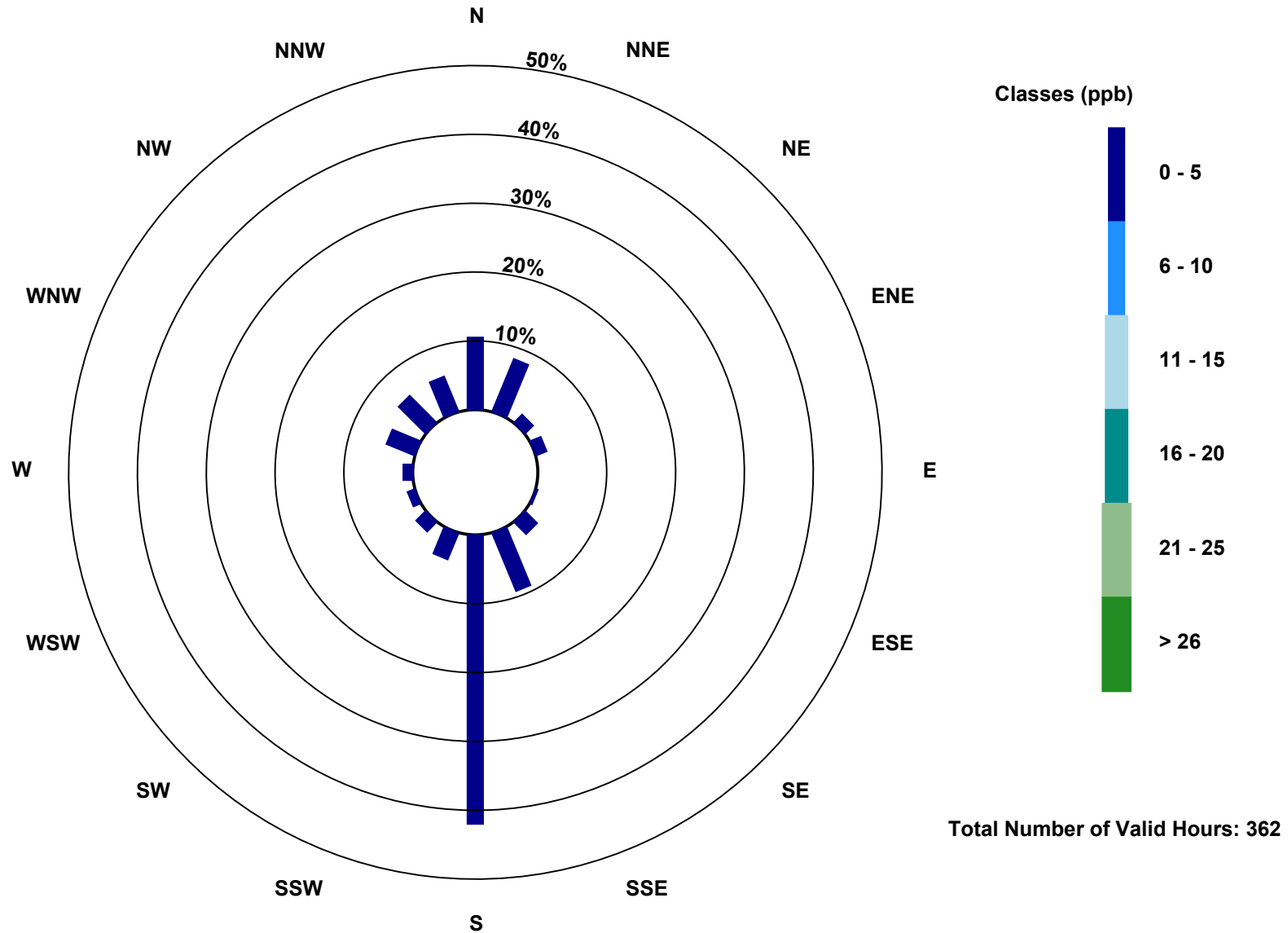
Total Number of Valid Hours: 362

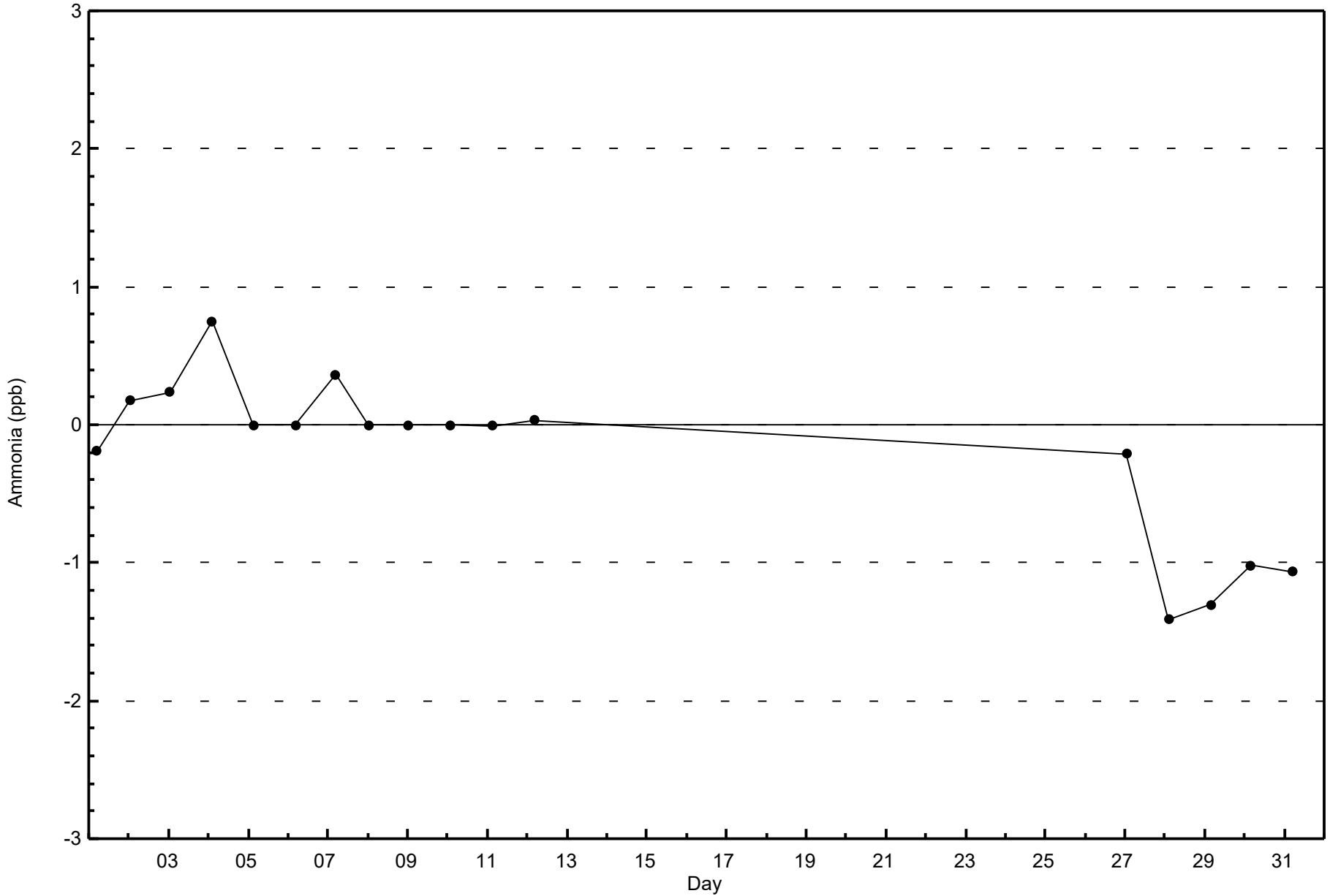
Total Number of Hours: 744

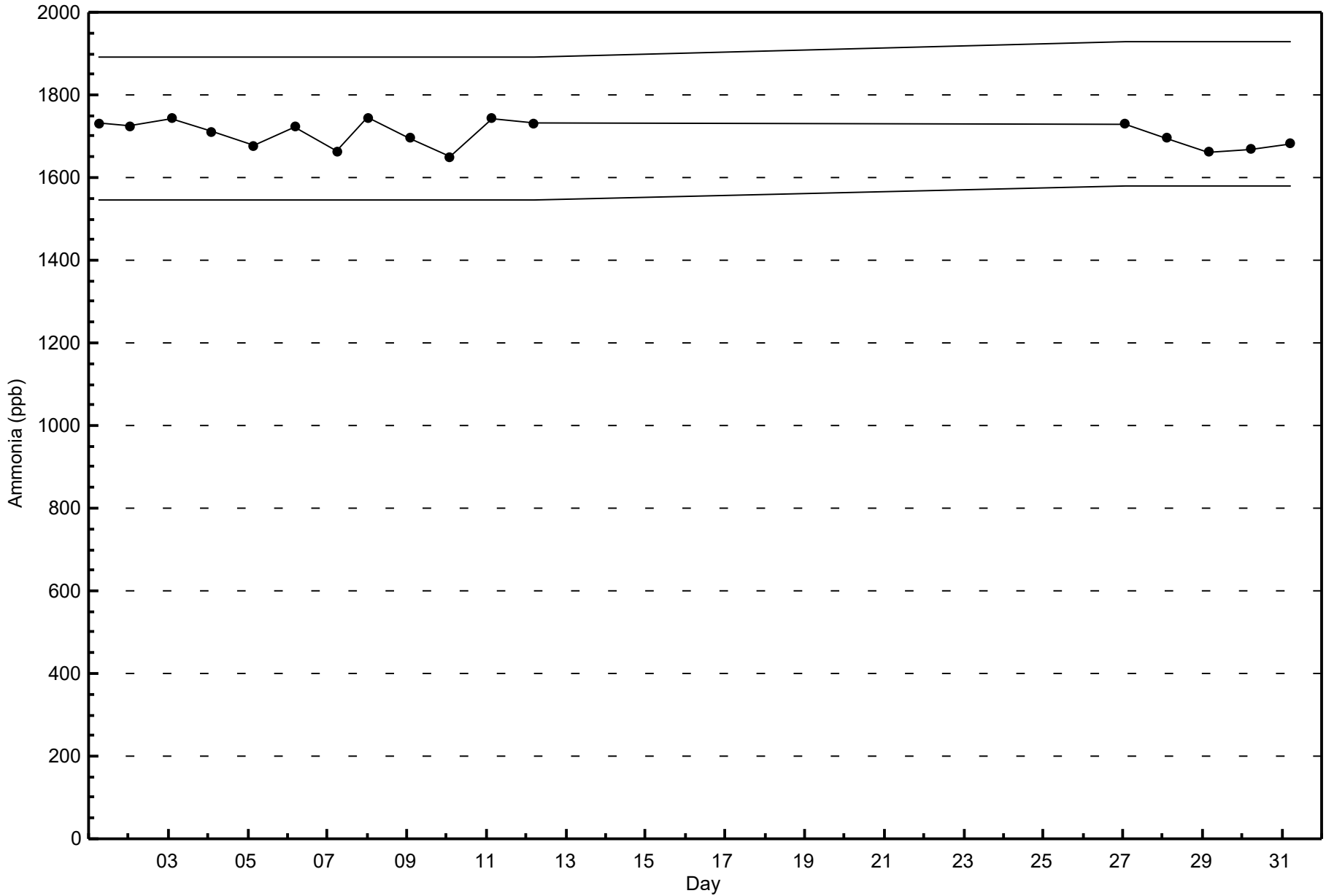


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter









Wood Buffalo Environmental Association
Summary of Hour Averages

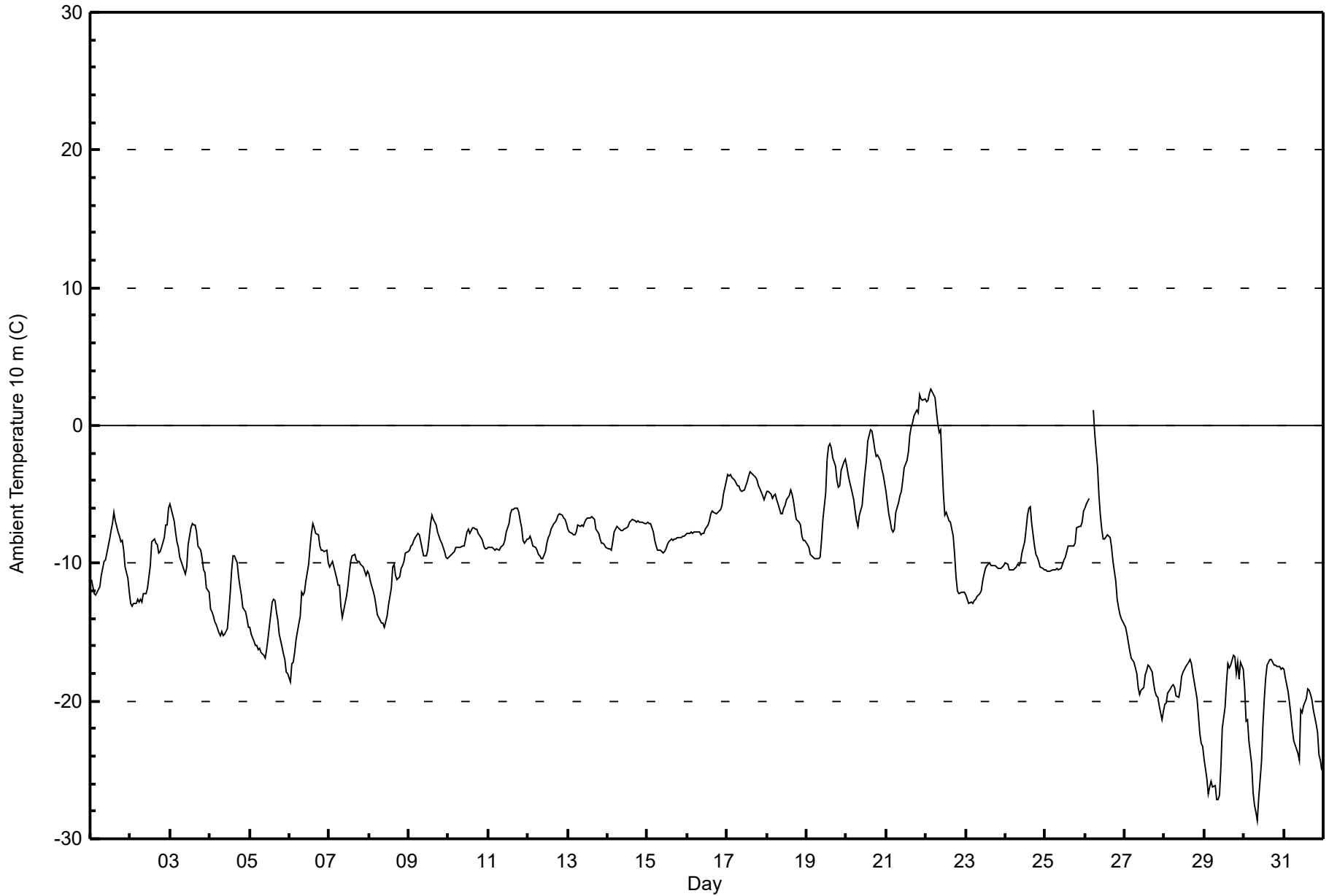
Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - January 2023

Maximum Value: 2.7 C on Jan 22 04:00 Maximum Daily Average: -2.7 C on Jan 21		Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7																									
Minimum Value: -28.7 C on Jan 30 09:00 Minimum Daily Average: -21.8 C on Jan 29 Maximum Diurnal Average: -8.5 C at hour 15 Minimum Diurnal Average: -11.7 C at hour 9 Monthly Average: -10.36 C Percentiles: P ₁ = -26.7 P ₁₀ = -18.7 Q ₁ = -12.9 Median = -9.0 Q ₃ = -7.1 P ₉₀ = -4.5 P ₉₉ = 1.8																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-11.2	-11.7	-12.2	-12.3	-12.1	-11.7	-10.9	-10.4	-9.9	-9.7	-9.3	-8.2	-7.6	-7.2	-6.3	-6.9	-7.7	-8.0	-8.4	-8.4	-9.1	-10.3	-11.0	-12.1	-9.7	-6.3	
2-Jan	-13.0	-13.1	-13.0	-12.9	-12.6	-12.8	-12.7	-12.8	-12.2	-12.2	-11.8	-10.9	-10.2	-8.5	-8.2	-8.5	-8.7	-9.2	-9.2	-8.9	-8.2	-7.2	-7.3	-6.0	-10.4	-6.0	
3-Jan	-5.7	-6.5	-6.9	-7.7	-8.4	-8.9	-9.6	-10.1	-10.5	-10.7	-10.2	-8.6	-7.4	-7.1	-7.2	-7.2	-7.8	-8.7	-9.1	-9.6	-10.5	-10.7	-11.8	-12.1	-8.9	-5.7	
4-Jan	-13.3	-13.5	-13.9	-14.2	-14.5	-15.1	-15.3	-14.9	-15.3	-15.1	-14.7	-13.5	-12.2	-10.5	-9.5	-9.5	-10.0	-11.0	-11.7	-12.3	-13.2	-13.5	-14.1	-14.6	-13.1	-9.5	
5-Jan	-14.6	-15.1	-15.7	-15.9	-15.9	-16.3	-16.2	-16.5	-16.7	-16.9	-16.3	-15.4	-14.5	-12.9	-12.6	-12.7	-13.5	-14.2	-15.2	-16.1	-16.6	-17.0	-17.9	-18.0	-15.5	-12.6	
6-Jan	-18.6	-17.3	-17.2	-16.4	-15.6	-15.0	-13.9	-12.2	-12.3	-12.1	-11.3	-10.0	-8.9	-7.8	-7.1	-7.4	-7.8	-7.9	-8.7	-9.1	-9.1	-9.2	-9.0	-9.9	-11.4	-7.1	
7-Jan	-10.3	-10.1	-9.9	-10.3	-11.1	-11.6	-11.6	-13.1	-14.0	-12.9	-12.4	-11.7	-10.7	-9.8	-9.5	-9.4	-9.7	-9.9	-9.9	-10.1	-10.3	-10.6	-10.9	-10.6	-10.8	-9.4	
8-Jan	-10.8	-11.2	-12.0	-12.4	-13.0	-13.7	-13.9	-14.3	-14.3	-14.7	-14.3	-13.9	-13.0	-11.8	-10.3	-10.0	-10.9	-11.2	-11.0	-10.4	-10.2	-9.9	-9.3	-9.2	-11.9	-9.2	
9-Jan	-9.0	-8.8	-8.6	-8.4	-8.1	-7.8	-7.9	-8.5	-8.9	-9.5	-9.4	-9.1	-8.1	-7.1	-6.5	-6.8	-7.2	-7.7	-8.0	-8.4	-8.6	-9.2	-9.6	-9.7	-8.4	-6.5	
10-Jan	-9.5	-9.4	-9.3	-9.1	-8.8	-8.9	-8.9	-8.8	-8.8	-8.7	-8.2	-7.7	-7.6	-7.8	-7.4	-7.4	-7.5	-7.6	-7.8	-8.1	-8.4	-8.8	-9.0	-8.9	-8.4	-7.4	
11-Jan	-8.8	-8.8	-8.9	-8.9	-9.0	-9.0	-9.0	-8.9	-8.7	-8.6	-8.4	-7.7	-7.1	-6.4	-6.1	-6.1	-6.0	-6.0	-6.3	-6.9	-7.4	-8.3	-8.6	-8.2	-7.8	-6.0	
12-Jan	-8.2	-8.0	-8.3	-8.7	-8.9	-9.0	-9.3	-9.4	-9.7	-9.6	-9.1	-8.6	-8.2	-7.9	-7.5	-7.1	-7.0	-6.9	-6.5	-6.4	-6.5	-6.7	-6.8	-7.2	-8.0	-6.4	
13-Jan	-7.5	-7.7	-7.8	-7.9	-7.9	-7.7	-7.2	-7.3	-7.3	-7.0	-6.8	-6.7	-6.7	-6.6	-6.7	-6.8	-6.8	-7.5	-7.8	-8.3	-8.5	-8.6	-8.6	-8.9	-7.6	-6.6	
14-Jan	-8.9	-8.9	-9.0	-8.4	-7.8	-7.3	-7.4	-7.5	-7.6	-7.6	-7.4	-7.3	-7.1	-6.9	-6.8	-6.9	-7.0	-6.9	-7.0	-7.0	-7.1	-7.1	-7.1	-7.1	-7.5	-6.8	
15-Jan	-7.0	-7.1	-7.1	-7.8	-8.4	-8.7	-9.0	-9.0	-9.1	-9.2	-9.2	-9.0	-8.7	-8.4	-8.3	-8.3	-8.3	-8.2	-8.2	-8.1	-8.2	-8.1	-8.1	-7.9	-8.3	-7.0	
16-Jan	-7.9	-7.8	-7.8	-7.8	-7.7	-7.7	-7.8	-7.7	-7.9	-7.8	-7.8	-7.5	-7.2	-6.9	-6.4	-6.2	-6.3	-6.4	-6.3	-6.2	-6.1	-5.8	-4.9	-4.1	-6.9	-4.1	
17-Jan	-3.6	-3.6	-3.6	-3.8	-4.0	-4.2	-4.3	-4.4	-4.7	-4.7	-4.7	-4.3	-4.0	-3.6	-3.4	-3.5	-3.7	-3.8	-3.9	-4.4	-4.5	-5.1	-5.4	-5.1	-4.2	-3.4	
18-Jan	-4.8	-4.8	-4.9	-5.3	-5.1	-5.0	-5.4	-5.7	-6.4	-6.4	-6.0	-5.8	-5.4	-5.1	-4.7	-5.0	-5.5	-6.3	-6.8	-7.0	-7.3	-8.0	-8.3	-8.4	-6.0	-4.7	
19-Jan	-8.6	-8.8	-9.4	-9.5	-9.5	-9.7	-9.7	-9.7	-9.5	-8.4	-6.8	-4.9	-2.5	-1.6	-1.3	-1.6	-2.3	-3.0	-4.0	-4.5	-4.4	-3.2	-2.7	-2.5	-5.7	-1.3	
20-Jan	-2.9	-3.5	-4.1	-4.5	-5.4	-6.2	-6.9	-7.4	-6.5	-5.8	-4.6	-3.5	-2.5	-1.1	-0.3	-0.4	-1.0	-1.7	-2.2	-2.1	-2.5	-3.1	-3.6	-4.2	-3.6	-0.3	
21-Jan	-4.8	-6.4	-6.9	-7.6	-7.7	-7.5	-6.4	-5.6	-5.1	-4.8	-3.9	-3.0	-2.5	-1.9	-0.7	-0.1	0.2	0.7	1.1	0.9	2.2	1.9	1.9	1.9	-2.7	2.2	
22-Jan	1.7	1.8	2.4	2.7	2.5	2.0	1.0	0.1	-0.6	-0.3	-5.0	-6.5	-6.3	-6.6	-6.9	-7.0	-8.0	-9.4	-11.0	-12.0	-12.3	-12.1	-12.1	-12.1	-4.7	2.7	
23-Jan	-12.3	-12.6	-12.9	-12.8	-12.9	-12.7	-12.6	-12.4	-12.2	-12.0	-11.3	-10.7	-10.4	-10.2	-10.0	-10.2	-10.2	-10.2	-10.2	-10.4	-10.3	-10.4	-10.3	-10.2	-11.3	-10.0	
24-Jan	-10.0	-10.1	-10.5	-10.5	-10.5	-10.5	-10.2	-10.1	-10.2	-10.0	-9.3	-8.4	-7.5	-6.5	-6.0	-5.9	-7.1	-8.7	-9.4	-9.6	-9.9	-10.3	-10.4	-10.4	-9.2	-5.9	
25-Jan	-10.5	-10.6	-10.6	-10.6	-10.5	-10.5	-10.4	-10.4	-10.5	-10.3	-10.1	-9.8	-9.6	-9.2	-8.8	-8.8	-8.7	-8.7	-8.5	-7.4	-7.3	-7.3	-7.0	-6.2	-9.3	-6.2	
26-Jan	-6.0	-5.7	-5.3	UO	UO	1.1	-0.6	-3.1	-5.1	-6.5	-7.5	-8.2	-8.2	-8.0	-8.0	-8.1	-8.8	-9.9	-11.3	-12.6	-13.2	-13.7	-14.0	-14.3	-8.0	1.1	
27-Jan	-14.7	-15.2	-15.8	-16.3	-16.9	-17.2	-17.6	-18.0	-19.0	-19.5	-19.3	-19.0	-18.1	-17.8	-17.4	-17.5	-17.9	-18.7	-19.3	-19.7	-19.7	-20.3	-21.3	-20.7	-18.2	-14.7	
28-Jan	-20.2	-20.1	-19.5	-19.1	-19.0	-18.8	-19.1	-19.6	-19.7	-19.1	-18.2	-17.9	-17.7	-17.5	-17.2	-17.0	-17.2	-18.0	-18.7	-19.9	-21.0	-22.3	-23.1	-23.2	-19.3	-17.0	
29-Jan	-24.2	-25.6	-26.7	-26.2	-25.9	-26.3	-26.2	-27.2	-27.1	-26.8	-24.8	-22.0	-20.5	-18.7	-17.3	-17.6	-17.4	-16.6	-16.8	-18.0	-17.2	-18.4	-17.2	-17.7	-21.8	-16.6	
30-Jan	-19.1	-21.5	-21.4	-22.8	-24.6	-26.6	-27.6	-28.0	-28.7	-27.0	-24.4	-21.8	-19.8	-18.3	-17.4	-17.0	-17.0	-17.2	-17.4	-17.4	-17.5	-17.5	-17.7	-17.6	-21.1	-17.0	
31-Jan	-17.7	-18.3	-19.3	-20.1	-21.0	-22.1	-22.9	-23.2	-23.8	-24.3	-20.6	-20.8	-20.4	-19.9	-19.2	-19.3	-19.5	-19.9	-20.7	-21.6	-22.2	-23.9	-24.3	-25.1	-21.3	-17.7	
	-10.4	-10.7	-10.8	-11.2	-11.3	-11.1	-11.3	-11.5	-11.7	-11.6	-11.1	-10.4	-9.7	-9.0	-8.5	-8.6	-8.9	-9.3	-9.7	-10.0	-10.2	-10.5	-10.6	-10.7	Diurnal Average		
	1.7	1.8	2.4	2.7	2.5	2.0	1.0	0.1	-0.6	-0.3	-3.9	-3.0	-2.5	-1.1	-0.3	-0.1	0.2	0.7	1.1	0.9	2.2	1.9	1.9	1.9	Diurnal Maximum		
UO - Unstable Operation																											



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 10 m (AT 10m) - C
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	49	6.60	6.60
-20 - 0	676	91.11	97.71
0 - 10	17	2.29	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 742

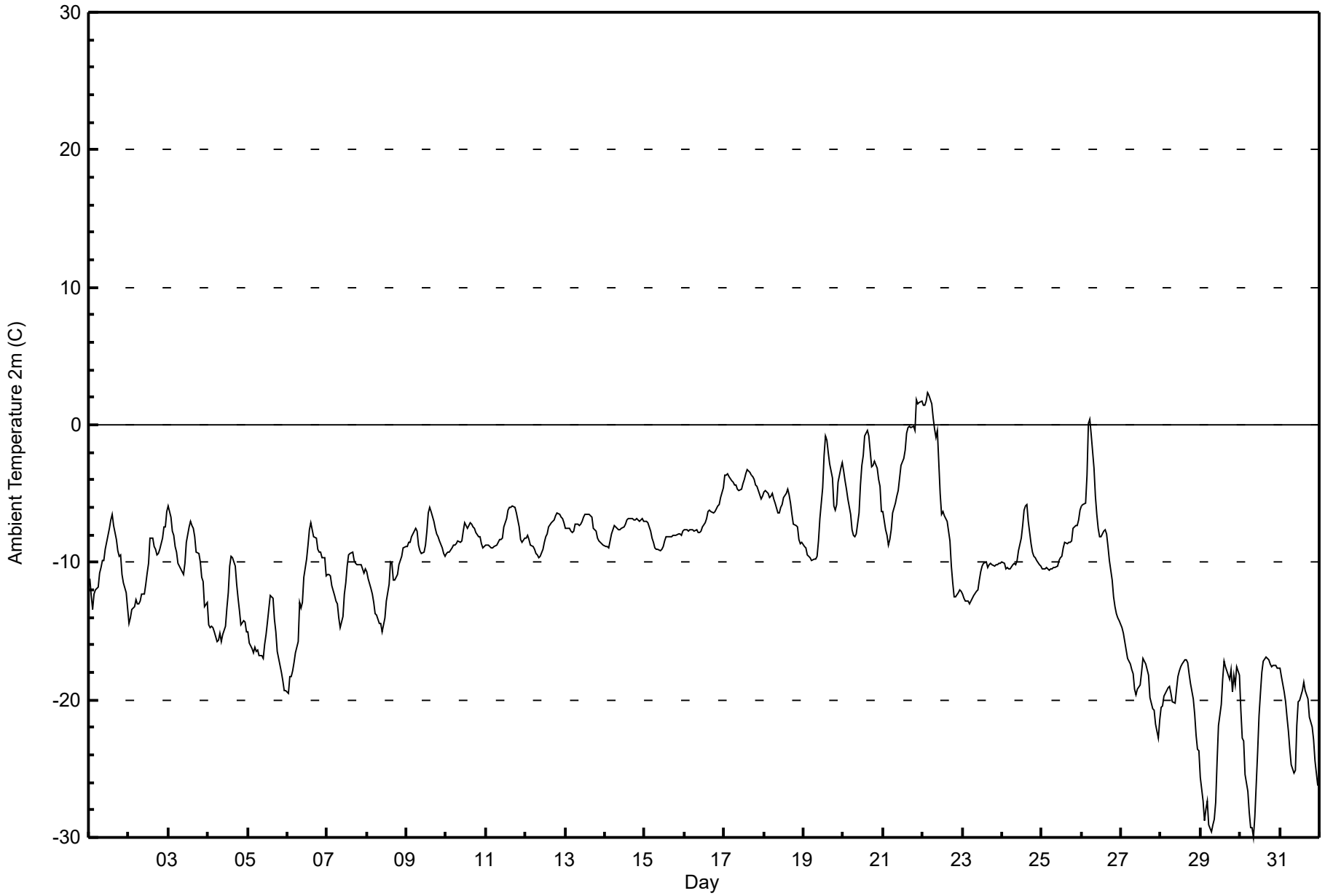
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - January 2023

Maximum Value: 2.3 C on Jan 22 04:00		Maximum Daily Average: -3.1 C on Jan 21		Hours in Service: 744																						
Minimum Value: -30.0 C on Jan 30 09:00		Minimum Daily Average: -22.8 C on Jan 29		Hours of Data: 744																						
Maximum Diurnal Average: -8.4 C at hour 15		Minimum Diurnal Average: -12.0 C at hour 9		Hours of Missing Data: 0																						
Monthly Average: -10.54 C		Percentiles: P ₁ = -28.6 P ₁₀ = -19.1 Q ₁ = -13.2 Median = -9.0 Q ₃ = -7.1 P ₉₀ = -4.7 P ₉₉ = 1.5		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-11.2	-12.4	-13.5	-12.3	-12.0	-11.8	-10.8	-10.4	-9.9	-9.8	-9.1	-8.1	-7.5	-6.9	-6.5	-7.3	-8.4	-9.1	-9.6	-9.5	-10.8	-11.5	-12.2	-13.3	-10.2	-6.5
2-Jan	-14.5	-14.0	-13.4	-13.2	-12.7	-13.0	-13.0	-12.8	-12.3	-12.3	-11.6	-10.7	-10.0	-8.3	-8.2	-8.9	-9.0	-9.5	-9.3	-9.0	-8.3	-7.4	-7.4	-6.3	-10.6	-6.3
3-Jan	-5.9	-6.7	-7.8	-8.1	-8.9	-9.3	-10.1	-10.5	-10.7	-10.9	-10.1	-8.5	-7.4	-7.1	-7.3	-7.5	-8.1	-9.2	-9.4	-9.9	-11.1	-11.4	-13.2	-12.9	-9.2	-5.9
4-Jan	-14.5	-14.7	-14.6	-14.7	-15.0	-15.8	-15.7	-15.2	-15.7	-15.3	-14.7	-13.3	-12.2	-10.3	-9.5	-9.7	-10.2	-11.6	-12.6	-13.5	-14.5	-14.3	-14.4	-15.1	-13.6	-9.5
5-Jan	-15.0	-15.9	-16.3	-16.5	-16.2	-16.5	-16.4	-16.8	-16.7	-17.0	-16.0	-15.2	-14.3	-12.4	-12.5	-12.6	-14.1	-15.1	-16.4	-17.5	-18.0	-18.6	-19.3	-19.4	-16.0	-12.4
6-Jan	-19.5	-18.3	-18.3	-17.9	-17.3	-16.6	-15.8	-12.9	-13.3	-12.9	-11.1	-9.8	-8.7	-7.6	-7.2	-7.6	-8.2	-8.2	-9.0	-9.3	-9.3	-9.6	-9.7	-10.9	-12.0	-7.2
7-Jan	-10.9	-10.8	-10.9	-11.7	-12.4	-12.8	-13.0	-14.0	-14.8	-13.9	-12.3	-11.5	-10.3	-9.5	-9.4	-9.2	-9.9	-10.0	-10.1	-10.2	-10.2	-10.5	-10.8	-10.4	-11.2	-9.2
8-Jan	-10.7	-11.2	-11.9	-12.3	-12.9	-13.7	-13.9	-14.4	-14.4	-15.0	-14.5	-14.1	-12.8	-11.6	-9.9	-10.1	-11.3	-11.3	-10.9	-10.1	-9.8	-9.6	-9.0	-8.8	-11.8	-8.8
9-Jan	-8.9	-8.6	-8.6	-8.2	-7.9	-7.6	-7.7	-8.8	-9.2	-9.4	-9.2	-8.8	-7.7	-6.4	-6.0	-6.3	-7.0	-7.6	-7.9	-8.2	-8.4	-8.9	-9.3	-9.5	-8.2	-6.0
10-Jan	-9.4	-9.2	-9.2	-9.0	-8.8	-8.8	-8.7	-8.4	-8.5	-8.5	-7.7	-7.1	-7.3	-7.5	-7.2	-7.2	-7.4	-7.6	-7.8	-8.1	-8.2	-8.7	-9.0	-8.9	-8.3	-7.1
11-Jan	-8.8	-8.8	-8.9	-9.0	-8.9	-8.8	-8.7	-8.5	-8.4	-8.4	-8.2	-7.4	-6.8	-6.2	-6.0	-6.0	-5.9	-6.0	-6.4	-6.9	-7.4	-8.3	-8.6	-8.2	-7.7	-5.9
12-Jan	-8.2	-8.0	-8.3	-8.7	-8.9	-9.0	-9.3	-9.4	-9.6	-9.6	-9.1	-8.5	-8.1	-7.9	-7.5	-7.1	-7.0	-6.9	-6.6	-6.4	-6.5	-6.7	-6.8	-7.1	-8.0	-6.4
13-Jan	-7.5	-7.5	-7.5	-7.7	-7.9	-7.7	-7.2	-7.2	-7.3	-7.3	-7.0	-6.7	-6.5	-6.5	-6.6	-6.8	-6.8	-7.5	-7.8	-8.2	-8.5	-8.5	-8.6	-8.8	-7.5	-6.5
14-Jan	-8.9	-8.9	-9.0	-8.4	-7.9	-7.3	-7.4	-7.5	-7.6	-7.6	-7.5	-7.4	-7.2	-6.9	-6.8	-6.8	-6.9	-6.9	-6.9	-6.9	-6.9	-7.0	-6.9	-7.1	-7.4	-6.8
15-Jan	-7.0	-7.0	-7.1	-7.7	-8.3	-8.6	-9.0	-9.0	-9.0	-9.1	-9.1	-8.8	-8.4	-8.1	-8.1	-8.1	-8.1	-8.0	-8.0	-8.1	-8.0	-7.9	-8.0	-7.7	-8.2	-7.0
16-Jan	-7.7	-7.6	-7.7	-7.7	-7.6	-7.6	-7.7	-7.6	-7.9	-7.8	-7.7	-7.4	-7.1	-6.8	-6.3	-6.2	-6.3	-6.4	-6.3	-6.1	-5.9	-5.8	-5.3	-4.6	-6.9	-4.6
17-Jan	-3.6	-3.7	-3.6	-3.8	-4.0	-4.2	-4.4	-4.4	-4.7	-4.8	-4.7	-4.2	-4.0	-3.5	-3.3	-3.5	-3.6	-3.8	-3.9	-4.4	-4.5	-5.1	-5.4	-5.2	-4.2	-3.3
18-Jan	-4.9	-4.8	-4.9	-5.3	-5.2	-5.0	-5.4	-5.7	-6.4	-6.4	-6.0	-5.8	-5.3	-5.0	-4.7	-5.1	-5.7	-6.5	-7.2	-7.3	-7.4	-8.3	-8.6	-8.6	-6.1	-4.7
19-Jan	-8.8	-8.9	-9.5	-9.6	-9.7	-9.9	-9.8	-9.8	-9.6	-8.4	-6.8	-4.6	-2.3	-0.9	-1.2	-2.0	-2.8	-3.9	-5.9	-6.2	-5.8	-4.2	-3.1	-2.7	-6.1	-0.9
20-Jan	-3.4	-4.0	-4.7	-5.4	-6.5	-7.6	-8.0	-8.2	-8.0	-6.4	-4.3	-3.0	-2.3	-0.8	-0.4	-0.8	-1.9	-3.1	-3.0	-2.7	-3.2	-4.0	-4.5	-6.3	-4.3	-0.4
21-Jan	-6.3	-7.6	-8.0	-8.8	-8.3	-7.7	-6.4	-5.6	-5.1	-4.8	-3.8	-2.9	-2.5	-1.9	-0.6	-0.2	-0.1	-0.2	-0.1	-0.4	1.9	1.6	1.6	1.7	-3.1	1.9
22-Jan	1.4	1.4	1.7	2.3	2.1	1.6	0.5	-0.4	-0.9	-0.5	-4.9	-6.5	-6.3	-6.6	-6.8	-7.0	-8.4	-10.3	-11.5	-12.5	-12.5	-12.2	-12.0	-12.1	-5.0	2.3
23-Jan	-12.3	-12.6	-12.8	-12.8	-13.0	-12.8	-12.6	-12.4	-12.1	-12.0	-11.3	-10.6	-10.3	-10.1	-10.0	-10.4	-10.2	-10.1	-10.2	-10.3	-10.1	-10.2	-10.1	-10.0	-11.2	-10.0
24-Jan	-10.0	-10.1	-10.5	-10.4	-10.5	-10.5	-10.2	-10.0	-10.1	-9.9	-9.2	-8.2	-7.3	-6.2	-5.9	-5.8	-7.0	-8.6	-9.2	-9.5	-9.7	-9.9	-10.1	-10.3	-9.1	-5.8
25-Jan	-10.4	-10.4	-10.4	-10.4	-10.5	-10.4	-10.5	-10.4	-10.4	-10.2	-9.9	-9.6	-9.5	-8.9	-8.5	-8.6	-8.5	-8.5	-8.4	-7.5	-7.3	-7.4	-6.9	-6.2	-9.2	-6.2
26-Jan	-5.9	-5.8	-5.7	-3.6	0.1	0.4	-0.7	-3.1	-5.2	-6.5	-7.5	-8.2	-8.1	-7.7	-7.7	-8.0	-8.8	-9.9	-11.3	-12.6	-13.2	-13.7	-14.0	-14.3	-7.5	0.4
27-Jan	-14.7	-15.2	-15.8	-16.4	-17.0	-17.4	-17.7	-18.1	-19.2	-19.6	-19.2	-18.9	-18.0	-17.0	-17.2	-17.4	-18.2	-19.8	-20.2	-20.6	-20.7	-21.8	-22.8	-21.5	-18.5	-14.7
28-Jan	-20.5	-20.4	-19.7	-19.4	-19.1	-19.0	-19.5	-20.2	-20.3	-19.2	-18.3	-17.9	-17.6	-17.4	-17.1	-17.1	-17.3	-18.1	-18.8	-19.9	-21.1	-22.6	-23.5	-23.7	-19.5	-17.1
29-Jan	-25.6	-27.4	-28.8	-27.9	-27.4	-29.1	-29.5	-29.1	-28.7	-27.5	-24.5	-21.8	-20.4	-18.5	-17.2	-17.6	-17.9	-18.5	-17.8	-19.4	-18.2	-18.9	-17.6	-18.2	-22.8	-17.2
30-Jan	-20.7	-22.8	-23.0	-25.5	-26.7	-28.2	-29.3	-29.3	-30.0	-28.4	-23.8	-21.2	-19.5	-18.0	-17.2	-16.9	-16.9	-17.1	-17.4	-17.6	-17.5	-17.5	-17.7	-17.7	-21.7	-16.9
31-Jan	-17.7	-18.3	-19.4	-20.2	-21.2	-22.3	-23.6	-24.7	-25.4	-25.1	-21.8	-20.1	-20.0	-19.4	-18.8	-19.3	-19.6	-20.0	-21.3	-22.0	-22.9	-24.4	-25.4	-26.3	-21.6	-17.7
	-10.7	-11.0	-11.2	-11.3	-11.3	-11.5	-11.7	-11.8	-12.0	-11.8	-11.0	-10.2	-9.5	-8.8	-8.4	-8.6	-9.1	-9.6	-10.0	-10.3	-10.5	-10.7	-10.9	-11.0		Diurnal Average
	1.4	1.4	1.7	2.3	2.1	1.6	0.5	-0.4	-0.9	-0.5	-3.8	-2.9	-2.3	-0.8	-0.4	-0.2	-0.1	-0.2	-0.1	-0.4	1.9	1.6	1.6	1.7		Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Fort McKay - Bertha Ganter - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	55	7.39	7.39
-20 - 0	676	90.86	98.25
0 - 10	13	1.75	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



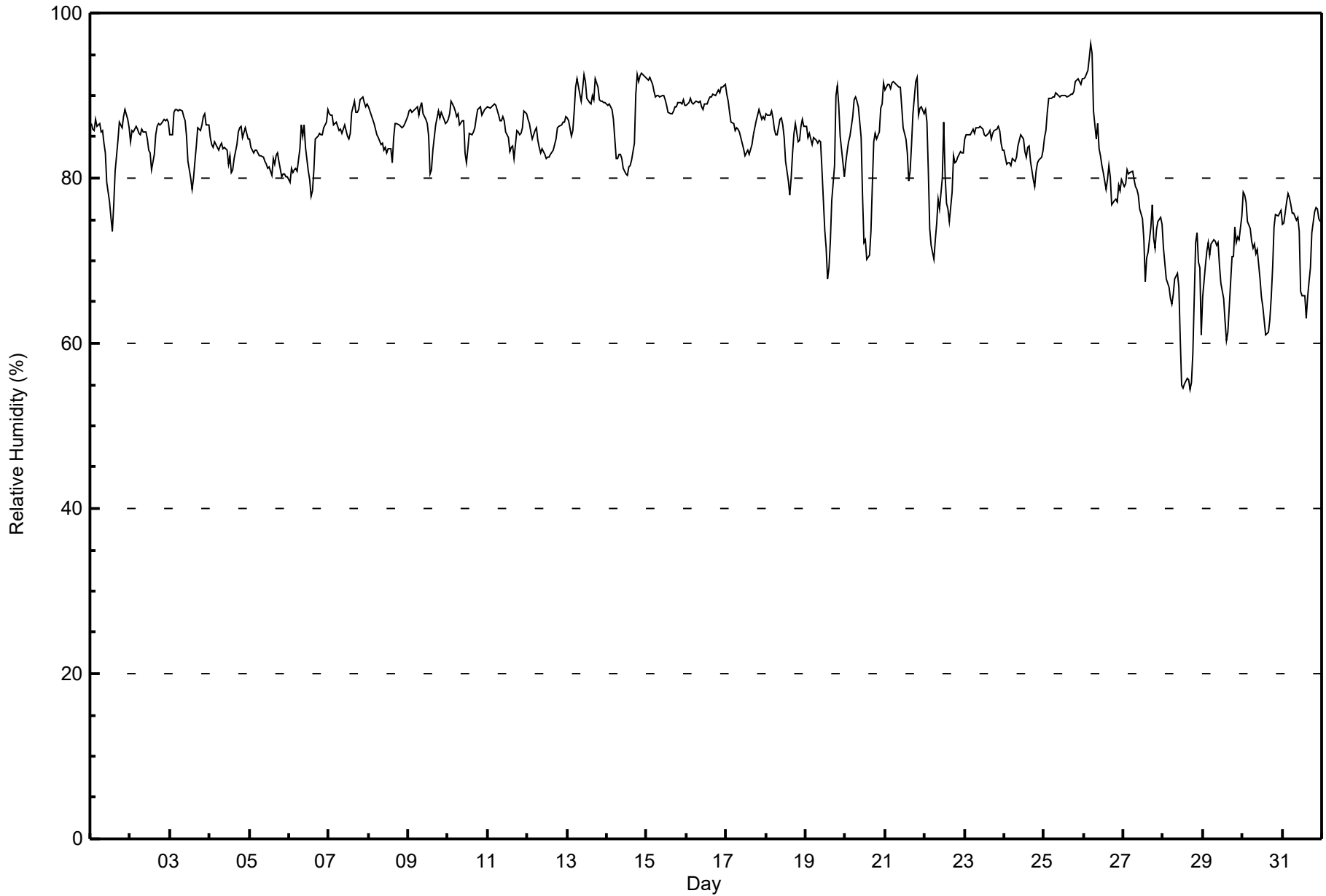
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Fort McKay - Bertha Ganter - January 2023

Maximum Value: 96.3 % on Jan 26 05:00 Maximum Daily Average: 89.9 % on Jan 25																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 54.4 % on Jan 28 17:00 Minimum Daily Average: 63.5 % on Jan 28 Maximum Diurnal Average: 84.8 % at hour 1 Minimum Diurnal Average: 78.4 % at hour 14 Monthly Average: 83.06 % Percentiles: P ₁ = 59.4 P ₁₀ = 72.4 Q ₁ = 80.8 Median = 85.2 Q ₃ = 87.8 P ₉₀ = 89.9 P ₉₉ = 92.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	86.6	86.0	85.8	87.2	86.3	86.6	85.6	85.7	84.3	83.1	79.4	77.2	75.3	73.5	76.8	80.9	84.6	86.8	86.5	86.1	87.5	88.3	87.2	86.1	83.9	88.3
2-Jan	84.4	85.8	85.6	86.3	86.0	85.4	85.2	86.0	85.7	85.6	84.8	83.4	83.1	80.9	82.9	85.3	86.3	86.6	86.5	86.7	87.0	86.9	87.1	86.8	85.4	87.1
3-Jan	85.3	85.3	88.0	88.4	88.3	88.1	88.3	88.2	87.5	86.9	85.0	82.1	80.0	78.6	79.9	82.0	83.8	86.1	85.8	86.4	87.4	87.7	86.4	86.5	85.5	88.4
4-Jan	84.8	84.0	83.7	84.4	84.0	83.4	83.8	84.3	83.6	83.7	83.5	81.8	82.7	80.7	81.0	82.4	84.0	85.5	86.1	86.3	84.9	86.0	85.4	84.7	83.9	86.3
5-Jan	84.8	83.7	83.0	83.4	83.4	83.1	82.8	82.8	82.6	82.1	81.7	81.2	81.4	80.4	82.4	81.7	82.7	83.1	82.0	80.2	80.5	80.4	80.2	80.1	82.1	84.8
6-Jan	79.5	81.2	80.6	80.9	81.2	80.9	83.5	86.4	85.1	86.5	83.8	80.8	79.8	77.8	78.5	81.0	84.8	85.1	85.4	85.3	85.3	86.2	86.8	88.2	83.1	88.2
7-Jan	87.8	87.6	87.7	86.4	86.8	86.2	85.8	85.9	85.5	86.5	85.8	85.1	84.7	85.4	88.0	89.4	88.0	88.0	88.3	89.4	89.9	89.1	88.6	88.9	87.3	89.9
8-Jan	88.6	88.2	87.2	86.7	85.9	85.3	84.8	84.1	84.2	83.4	83.8	83.0	83.6	83.6	81.8	84.9	86.7	86.6	86.4	86.3	86.1	86.3	86.6	87.4	85.5	88.6
9-Jan	88.1	88.4	88.0	88.1	88.4	88.6	87.7	88.6	89.1	87.9	87.0	86.7	85.1	80.5	81.0	83.5	86.5	87.3	88.2	87.2	88.0	87.2	86.6	86.7	86.8	89.1
10-Jan	87.1	87.9	89.3	88.7	88.2	87.5	87.9	86.4	86.9	87.0	83.1	81.8	83.5	85.4	85.3	85.5	86.2	87.2	88.3	88.6	87.6	87.9	88.3	88.5	86.8	89.3
11-Jan	88.7	88.4	88.7	88.8	88.9	88.9	87.6	87.0	86.9	87.4	86.9	85.6	84.9	83.2	83.7	83.9	82.4	85.7	85.5	85.2	85.4	86.1	88.2	87.9	86.5	88.9
12-Jan	87.1	86.6	85.6	84.8	85.7	86.0	84.5	83.8	83.1	83.6	82.9	82.4	82.6	82.6	82.8	83.5	84.1	84.8	86.1	86.3	86.5	86.7	86.8	87.4	84.8	87.4
13-Jan	87.4	86.9	85.2	85.8	88.1	91.1	92.0	90.1	89.3	90.9	92.5	91.6	89.7	89.1	89.0	90.0	89.4	92.0	91.0	89.6	89.3	89.3	89.2	89.1	89.5	92.5
14-Jan	88.9	89.0	88.7	88.4	87.1	82.4	82.3	82.9	82.9	82.5	81.2	80.6	80.4	81.3	81.5	82.2	84.2	90.1	92.5	91.7	92.4	92.8	92.4	92.1	86.3	92.8
15-Jan	92.1	91.8	92.2	91.3	90.6	89.9	90.0	90.1	89.8	89.9	90.0	89.5	88.8	87.9	87.8	88.2	88.7	88.6	89.2	89.2	89.0	89.6	88.8	89.6	89.6	92.2
16-Jan	88.8	89.1	89.6	89.1	89.0	89.1	89.4	89.2	89.3	88.7	88.3	89.0	89.0	89.5	89.9	89.9	90.3	89.9	90.4	90.6	90.3	91.0	91.0	91.4	89.7	91.4
17-Jan	90.3	89.3	88.0	86.9	86.6	85.8	86.1	86.0	85.6	84.9	83.6	82.6	83.0	83.3	82.8	84.0	85.3	86.1	86.9	87.7	88.4	87.2	87.5	87.2	86.0	90.3
18-Jan	87.8	87.6	87.6	88.1	87.3	86.0	85.3	85.3	87.1	87.3	86.5	84.9	82.0	79.6	78.0	79.9	83.1	85.5	86.6	84.4	84.7	86.3	87.2	86.3	85.2	88.1
19-Jan	86.3	84.8	85.4	84.8	84.0	85.0	84.5	84.2	84.6	84.4	81.0	73.7	71.5	67.7	69.2	72.4	77.3	81.5	89.9	91.1	88.8	85.1	81.8	80.2	81.6	91.1
20-Jan	81.8	83.3	84.4	85.0	87.5	89.5	89.9	89.4	88.6	84.8	77.8	72.1	72.5	70.1	70.7	73.6	79.2	84.3	85.4	84.7	85.6	88.4	89.0	91.5	82.9	91.5
21-Jan	90.8	91.4	91.3	90.8	91.5	91.6	91.6	91.2	91.1	91.0	88.7	86.2	84.8	83.0	79.7	80.9	84.1	87.7	91.6	92.2	87.7	88.5	88.6	87.7	88.5	92.2
22-Jan	88.3	86.7	80.8	73.9	71.9	70.2	72.6	74.6	77.5	76.2	80.0	86.7	80.4	76.9	76.3	74.8	78.3	82.7	81.8	82.1	82.6	83.3	83.1	83.1	79.4	88.3
23-Jan	84.8	85.2	85.2	85.3	85.6	85.9	85.4	86.0	86.1	86.2	86.1	86.0	85.2	85.4	85.7	84.8	85.3	85.7	85.9	86.3	85.7	84.2	83.4	85.4	85.4	86.3
24-Jan	83.3	81.7	81.8	81.9	81.5	82.4	82.1	82.6	83.9	84.5	85.2	84.7	83.3	82.5	83.7	83.8	82.1	79.8	79.0	80.8	81.8	82.2	82.6	83.4	82.5	85.2
25-Jan	84.9	85.8	88.0	89.7	89.6	89.8	89.9	90.3	90.1	89.8	90.0	90.0	90.0	90.0	89.9	90.0	90.1	90.4	91.7	92.0	91.7	91.4	92.1	89.9	89.9	92.1
26-Jan	92.1	92.3	93.0	94.5	96.3	95.1	88.2	84.7	86.6	83.5	82.7	81.5	80.6	78.7	79.9	81.6	80.1	76.7	77.3	77.4	77.1	79.2	78.4	79.9	84.1	96.3
27-Jan	78.9	79.4	81.0	80.4	80.6	80.9	79.8	79.0	78.7	78.0	76.3	75.1	72.6	67.5	70.4	71.0	74.1	76.7	72.6	71.6	73.7	74.7	75.2	74.3	75.9	81.0
28-Jan	71.5	69.6	67.8	66.7	65.4	64.7	65.9	67.8	68.4	66.7	60.5	54.9	54.7	55.1	55.8	55.5	54.4	55.2	58.8	72.2	73.4	69.8	69.2	61.0	63.5	73.4
29-Jan	65.7	69.6	71.1	72.2	70.6	72.1	72.5	72.4	71.8	72.1	69.4	67.3	65.5	62.6	60.3	61.4	64.4	70.6	70.5	74.0	72.2	72.9	72.6	75.4	69.6	75.4
30-Jan	78.4	78.0	77.1	74.8	73.9	72.3	71.5	72.0	70.8	71.4	67.8	65.7	64.5	62.7	61.1	61.4	63.0	65.6	69.1	74.0	75.6	75.5	75.7	76.1	70.7	78.4
31-Jan	74.4	74.6	77.0	78.1	77.6	76.7	75.8	75.7	75.0	75.2	73.5	66.3	65.8	65.7	63.0	65.5	67.4	69.1	73.5	75.9	76.5	76.3	75.2	74.7	72.9	78.1
84.8 84.8 84.8 84.6 84.4 84.2 83.9 84.0 83.9 83.6 82.2 80.6 79.7 78.4 78.7 79.8 81.3 82.9 83.8 84.5 84.6 84.8 84.6 84.4																								Diurnal Average		
92.1 92.3 93.0 94.5 96.3 95.1 92.0 91.2 91.1 91.0 92.5 91.6 90.0 90.0 89.9 90.0 90.3 92.0 92.5 92.2 92.4 92.8 92.4 92.1																								Diurnal Maximum		



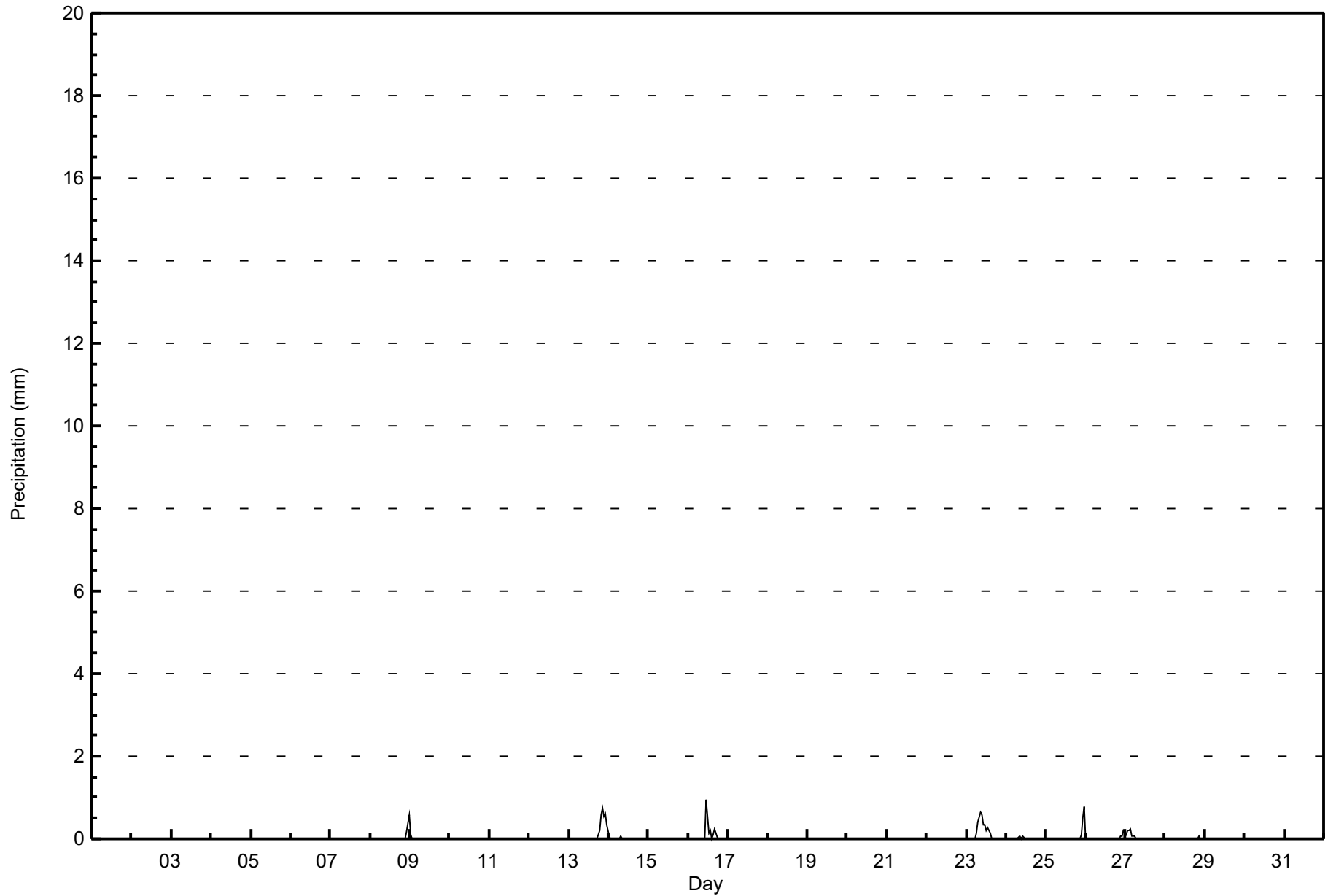


Maximum Value: 1.0 mm on Jan 16 12:00																				Maximum Daily Total: 3.1 mm on Jan 23					Hours in Service: 744																								
Minimum Value: 0.0 mm on Jan 1 01:00																				Minimum Daily Total: 0.0 mm on Jan 1					Hours of Data: 744																								
Maximum Diurnal Total: 1.9 mm at hour 24																				Minimum Diurnal Total: 0.1 mm at hour 18					Hours of Missing Data: 0																								
Monthly Total: 11.61 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.6					Hours of Calibration: 0																								
																									Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Total	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
5-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.8	0.6	0.8																		
9-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																	
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.7	0.6	0.6	0.3	3.0	0.7	3.1	0.7	3.0	0.7																		
14-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1																	
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	0.2	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.0																	
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																	
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	0.6	0.3	0.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.7																	
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2																	
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	1.4	0.8	1.4	0.8																	
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.2	0.4	0.2	0.4	0.2																	
27-Jan	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.9	0.2																
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1																
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																
																								0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.5	0.7	0.6	0.4	1.3	0.3	0.5	0.1	0.1	0.2	0.1	0.2	0.6	0.8	0.7	1.4	1.9	Diurnal Average	
																								0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.4	0.7	0.6	0.3	1.0	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.6	0.7	0.6	0.6	0.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort McKay - Bertha Ganter - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	733	98.52	98.52
0.4 - 0.5	2	0.27	98.79
0.6 - 0.7	7	0.94	99.73
0.8 - 1.4	2	0.27	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

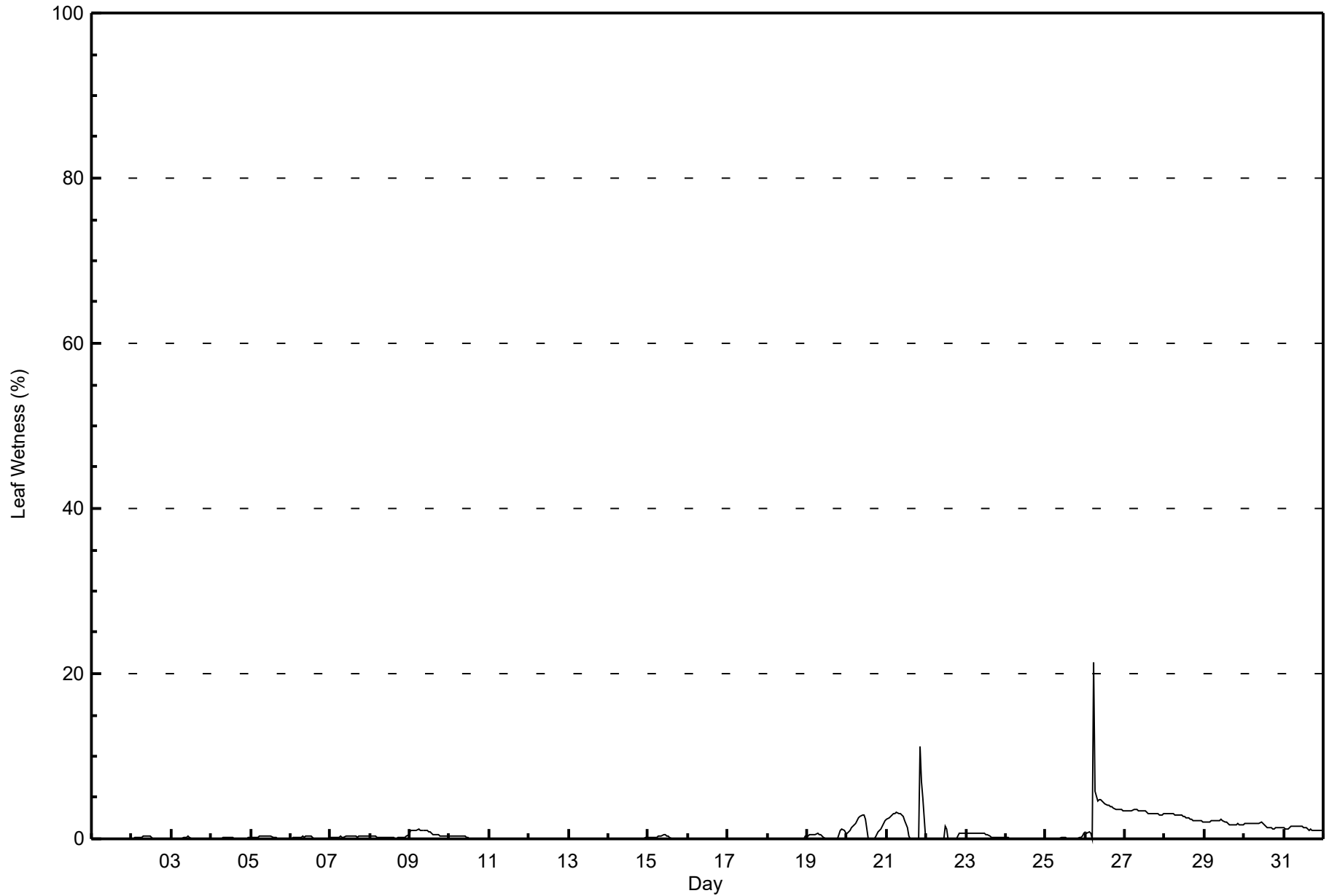


Wood Buffalo Environmental Association
Summary of Hour Averages

Leaf Wetness (LW) - %

Fort McKay - Bertha Ganter - January 2023

Maximum Value: 21.3 % on Jan 26 06:00 Maximum Daily Average: 4.1 % on Jan 26																				Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																
Minimum Value: 0.0 % on Jan 1 01:00 Minimum Daily Average: 0.0 % on Jan 1 Maximum Diurnal Average: 1.4 % at hour 6 Minimum Diurnal Average: 0.5 % at hour 18 Monthly Average: 0.71 % Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.9 P ₉₀ = 2.5 P ₉₉ = 4.5																																				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24												
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2-Jan	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	
5-Jan	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	
6-Jan	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
7-Jan	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	
8-Jan	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.6	0.2	0.2	0.6	0.2	0.6	0.2	0.6	0.2	0.6	0.2	0.6	
9-Jan	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.7	0.7	1.1	0.7	1.1	0.7	1.1	0.7	1.1	1.1		
10-Jan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3		
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.2	0.0	0.2	
15-Jan	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Jan	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.3	0.0	0.3	
19-Jan	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.9	1.1	1.1	0.4	0.4	1.1	0.4	1.1	0.4	1.1	0.4	1.1	0.4	1.1	
20-Jan	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.5	2.7	2.9	2.9	2.4	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.8	1.1	1.5	1.3	1.3	2.9	1.3	2.9	1.3	2.9	1.3	2.9	1.3	2.9		
21-Jan	2.4	2.6	2.8	2.9	3.0	3.1	3.2	3.1	3.0	2.9	2.7	2.1	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	7.0	2.4	2.4	11.1	2.4	11.1	2.4	11.1	2.4	11.1	2.4	11.1	
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.3	0.3	1.5	0.3	1.5	0.3	1.5	0.3	1.5	0.3	1.5		
23-Jan	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.7	0.4	0.7	0.4	0.7	0.4	0.7		
24-Jan	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	
26-Jan	0.8	0.8	0.8	0.8	0.0	21.3	5.7	4.5	4.8	4.7	4.6	4.4	4.3	4.1	4.0	4.0	3.9	3.8	3.6	3.6	3.5	3.5	3.5	3.5	4.1	4.1	21.3	4.1	21.3	4.1	21.3	4.1	21.3	4.1	21.3	
27-Jan	3.4	3.4	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.3	3.2	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.3	3.3	3.5	3.3	3.5	3.3	3.5	3.3	3.5	3.3	3.5		
28-Jan	3.0	3.0	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6	3.0	2.6	3.0	2.6	3.0	2.6	3.0	2.6	3.0	2.6	3.0
29-Jan	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.2	2.0	2.0	1.8	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	2.0	2.0	2.3	2.0	2.3	2.0	2.3	2.0	2.3	2.0	2.3		
30-Jan	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.9	1.7	1.5	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.6	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0		
31-Jan	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.5	1.5	1.5	1.6	1.5	1.4	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.3	1.3	1.6	1.3	1.6	1.3	1.6	1.3	1.6	1.3	1.6	1.3	1.6	
																								Diurnal Average												
																								Diurnal Maximum												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Fort McKay - Bertha Ganter - January 2023

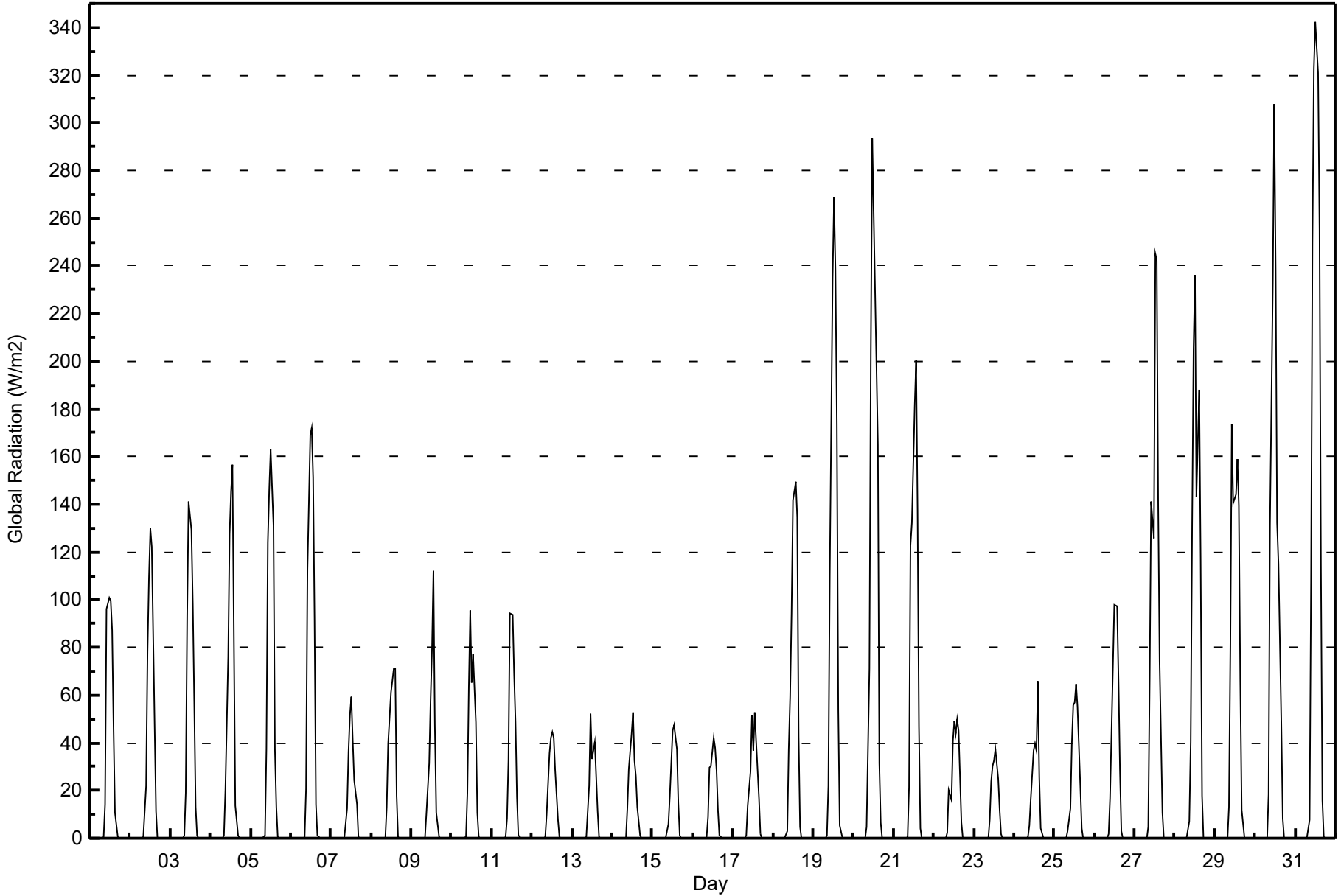
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	498	66.94	66.94
0.4 - 0.5	27	3.63	70.56
0.6 - 0.7	22	2.96	73.52
0.8 - 1.4	57	7.66	81.18
1.5 - 10	136	18.28	99.46
> 10	2	0.27	99.73

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 342.4 W/m2 on Jan 31 13:00 Maximum Daily Average: 72.3 W/m2 on Jan 31																						Hours in Service:	744			
Minimum Value: 0.0 W/m2 on Jan 1 01:00 Minimum Daily Average: 7.1 W/m2 on Jan 23																						Hours of Data:	744			
Maximum Diurnal Average: 122.2 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 20																						Hours of Missing Data:	0			
Monthly Average: 23.92 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 16.9 P ₉₀ = 92.3 P ₉₉ = 252.6																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	14.0	96.0	100.7	99.9	87.0	46.0	10.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	100.7
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	21.7	78.1	108.9	130.1	122.3	47.3	11.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7	130.1
3-Jan	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	1.3	18.8	92.8	141.2	129.1	98.1	56.8	13.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	141.2
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	20.3	75.6	127.5	145.3	156.5	84.9	13.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.1	156.5
5-Jan	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	37.1	123.9	146.8	162.9	131.1	37.1	13.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.3	162.9
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	20.8	112.9	168.8	171.9	151.1	91.1	14.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	30.5	171.9
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	12.3	36.4	51.8	59.1	41.0	24.0	14.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	59.1
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	13.0	39.7	50.2	60.8	71.2	71.2	17.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	71.2
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	10.1	31.5	58.3	79.6	112.3	47.6	10.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	112.3
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	18.8	63.3	95.4	65.3	77.2	48.5	10.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.8	95.4
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	8.3	32.7	94.3	93.5	68.9	48.8	17.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	94.3
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	10.3	35.4	42.0	44.7	42.0	28.6	7.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	44.7
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	11.5	21.9	52.0	33.5	40.1	25.7	11.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	52.0
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	12.7	29.1	44.0	52.6	32.6	26.0	13.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	52.6
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	5.9	18.0	31.4	45.1	47.5	37.2	14.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	47.5
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	8.6	29.7	30.3	42.0	37.7	28.4	12.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	42.0
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	13.5	27.6	51.5	37.0	52.9	40.6	16.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	52.9
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	37.4	59.2	94.1	142.0	149.4	134.8	42.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.8	149.4
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	21.8	110.4	234.7	268.9	238.6	173.5	53.8	5.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	46.2	268.9
20-Jan	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	4.7	70.9	204.1	293.6	262.0	229.3	164.8	31.7	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.8	293.6
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	21.3	122.7	132.1	181.6	200.3	137.4	46.9	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.3	200.3
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	20.2	16.1	40.9	49.3	43.9	50.1	44.9	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	50.1
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	7.7	23.5	30.4	32.5	37.1	25.0	11.6	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	37.1
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.2	16.5	36.8	39.9	36.6	65.9	25.8	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	65.9
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	12.4	39.7	55.5	56.9	64.7	55.2	21.7	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	64.7
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	16.4	43.4	71.2	98.1	97.5	65.7	28.6	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.8	98.1
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	66.0	141.4	126.1	245.1	241.9	141.1	74.3	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.8	245.1
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	40.1	131.5	205.4	236.3	142.8	188.3	117.2	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.3	236.3
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	80.0	173.9	140.5	143.9	158.7	139.1	66.4	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.7	173.9
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.5	130.8	232.6	308.1	238.5	132.6	114.9	48.9	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.4	308.1
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	107.6	249.6	322.9	342.4	320.9	254.8	113.8	16.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	72.3	342.4
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Fort McKay - Bertha Ganter - January 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	567	76.21	76.21
21 - 100	112	15.05	91.26
101 - 300	61	8.20	99.46
301 - 600	4	0.54	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

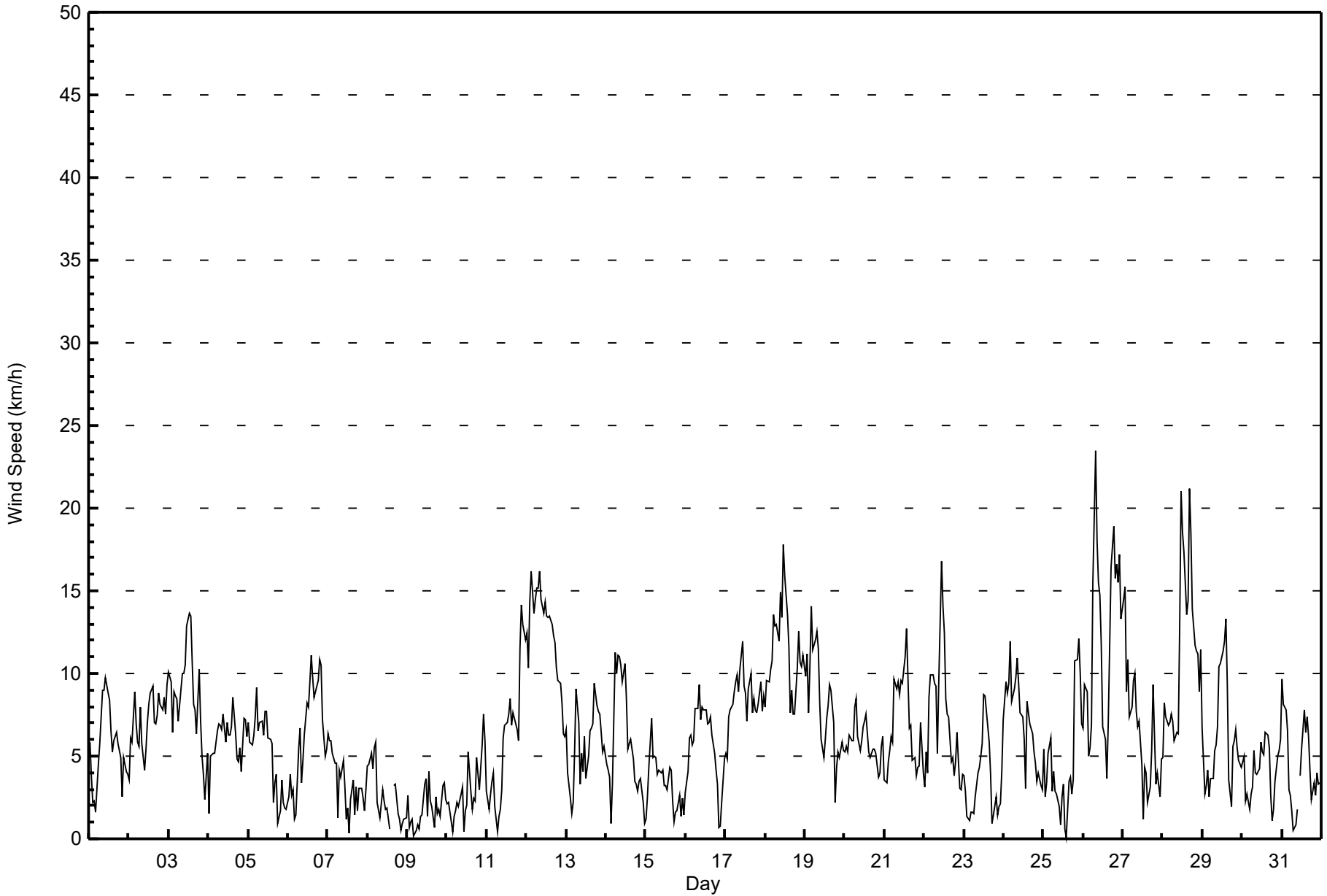


Maximum Speed: 24 km/h on Jan 26 08:00	Maximum Daily Speed Average: 12.4 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 25 15:00	Minimum Daily Speed Average: 0.9 km/h on Jan 7	Hours of Data: 741
Maximum Diurnal Speed Average: 3.0 km/h at hour 15	Minimum Diurnal Speed Average: 0.5 km/h at hour 19	Hours of Missing Data: 3
Monthly Average Velocity: 2.0 km/h 180.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 6 Q ₃ = 9 P ₉₀ = 11 P ₉₉ = 18	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S6	S4	SW2	W2	SSE2	SSE4	S6	S7	S9	S9	S10	S9	S8	S7	SSW5	S6	S6	S6	SSE5	S5	SE3	S5	S4	S4	S5.4	S10
2-Jan	S4	S6	S6	S9	S7	SSE6	S6	S8	S6	S4	S5	S7	S8	S9	S9	S7	S7	S7	S9	S8	S8	S9	S8	S9	S7.1	S9
3-Jan	S10	S9	S6	S9	S9	S8	S7	S9	S10	S10	S11	S13	S14	S13	S11	S8	S8	S6	S10	S7	S5	S4	SSE2	SSW5	S8.5	S14
4-Jan	S1	S5	S5	S5	S5	S7	S7	S7	S7	S8	S6	S7	S6	SSE6	S7	S9	S6	S5	S5	S6	S4	S7	S7	S6	S5.9	S9
5-Jan	S7	S6	S6	S6	S7	S9	S7	S7	S7	S6	S8	S8	S6	S6	S6	S2	S3	SSW4	S1	S2	SSW4	SSW2	NNW2	NNW2	S4.8	S9
6-Jan	N3	NW4	NW3	NW3	W1	W1	S5	S7	S3	S5	S6	S8	S8	S9	S11	S10	S9	S9	S10	S11	S11	SSW7	S5	S5	S5.4	S11
7-Jan	SSW6	S6	S6	S5	S5	S5	W1	N4	N4	WNW5	N3	NNE1	ENE2	NW0	NW2	N4	WNW1	N3	NNW2	SSE3	SW3	WSW2	WSW2	SSW3	SW0.9	SSW6
8-Jan	S4	SSE5	S5	SSE4	SSE6	S6	SSW2	S1	SSW2	S3	SW2	S2	S2	NNE1	UO	UO	NNW3	N3	N2	NNE1	ENE0	NNE1	NNE1	NE1	S1.3	S6
9-Jan	N3	N1	NNW1	N1	NNW0	SW0	ESE1	NE1	NNE1	NNE1	NNE3	NNE4	NE1	SSE4	S2	ENE2	NNE1	NNE3	N2	NE2	NNE1	NNE3	NNE3	NNE2	NNE1.2	SSE4
10-Jan	N2	NNE2	N2	NE0	SSW1	SE2	S2	SE2	SSE3	SSE3	SSW0	SE2	N2	N5	NE3	NNE2	NNE2	NNE2	NNW5	NNW3	NNW4	N6	N8	N6	NNE1.7	N8
11-Jan	NNW3	NNW2	NNW3	NW3	N4	NNE2	WSW0	SSW1	SE2	SSE3	SSE6	SSE7	SSE7	SSE8	SSE8	SSE7	S8	S7	S7	S6	S11	SSE14	S13	S12	SSE4.6	SSE14
12-Jan	SSE12	S10	S14	S16	S14	SSE14	SSE15	S15	S16	S14	S14	S14	SSE14	SSE13	S13	S13	S12	SSE12	S10	S10	S9	S8	SSE6	SSE6	S12.4	S16
13-Jan	SSE7	SE4	E2	ENE2	NW2	NNW5	N9	NNE7	N3	N5	N4	NNE6	NNE4	NNE5	NNE7	NE7	NNE7	N9	NNE8	N8	N8	N6	NNE5	N6	NNE4.7	N9
14-Jan	N5	N4	N4	N1	SSE3	SSE11	SSE10	S11	S11	S11	S10	SSE11	SSE8	SSE5	SSE6	SSE6	S5	SSE3	SSE3	SE3	S3	SSE4	SE2	NNE1	SSE4.7	SSE11
15-Jan	NE1	N3	N4	N7	NNE5	N5	N5	N4	NNW4	N4	N4	N3	NNE3	NNE3	NNE4	NNE4	NNW2	NW1	NNW2	N2	N3	N1	N2	N1	N3.2	N7
16-Jan	N3	N4	N6	N6	N6	N6	N8	N8	N9	N7	N8	N8	N8	N7	N7	N7	NNW6	N5	NNW4	N3	NE1	NNW1	S2	S5	N5.0	N9
17-Jan	SSW5	S5	SSW7	S8	S8	S9	S9	S10	S9	S10	S12	S9	S9	S7	S9	S10	SSW8	SSW8	S8	S8	S8	S10	SSE8	S9	S8.3	S12
18-Jan	S8	S10	S9	S10	S11	S14	S13	S13	S12	S15	S13	S18	S16	S14	S12	S8	S9	S8	S8	S10	S13	SSE11	S10	S11	S11.4	S18
19-Jan	S10	S11	S8	S10	S14	S11	S12	S13	S11	S8	S6	S5	S6	SSW7	SSW8	S9	S9	S7	S2	SSW4	SSE5	S5	SW6	SSW5	S7.9	S14
20-Jan	SW5	SSW6	S5	S6	S6	S6	S8	S8	SSW6	SW5	WSW6	SW7	WSW7	W8	WSW5	SW5	S5	SW5	WSW5	WNW5	WNW4	SW4	SSW6	S6	SSW4.9	S8
21-Jan	S4	SSE3	S5	S5	S6	S6	S10	S9	S9	S9	S10	S9	S11	S13	S10	S7	S7	S5	SSW5	S4	W4	W4	W7	W4	S6.1	S13
22-Jan	WSW3	WNW5	W4	WNW9	WNW10	WNW10	W9	WNW9	W5	NW9	NNE17	NNE14	N12	NNE8	NNE8	NNE7	NNE5	N5	NE4	NNE5	NNE6	NNE3	ENE3	N4	NNW4.9	NNE17
23-Jan	N4	N3	N1	NNE1	ENE2	N2	ENE1	N3	N4	N4	N5	N6	N9	N9	N7	NNW6	NNW4	NW1	N1	SSE3	ESE1	E2	S2	SSE4	N2.5	N9
24-Jan	SSE7	SSE9	S9	SSE9	S12	S8	S9	SSE10	S11	S9	S8	S7	SSE6	NE3	N8	N8	NE7	NE6	NE5	NE5	ENE4	E4	ENE3	N3	SE3.7	S12
25-Jan	N5	NE3	NNE3	N5	N6	NNW3	NW4	NNE3	NNE3	NNE2	E1	NE3	N3	W1	N0	SSE3	S4	SSE3	S4	S11	S11	S12	S10	SSW7	SSE1.0	S12
26-Jan	SSW7	S9	S9	WSW5	NW5	N7	N15	N24	N18	NNE16	NNE15	N12	NNE7	NNE6	E4	NNE7	NNE12	N16	NNE19	NNE16	NNE17	NNE16	N17	N13	N9.4	N24
27-Jan	NNE14	N15	NNE9	N11	N7	N8	N10	N10	NNE8	NNE7	NNE7	NNE4	ENE1	SE4	ENE4	ENE2	NNW3	NNW5	NW9	NW6	W3	W4	WNW3	WNW5	N5.5	N15
28-Jan	W5	WNW8	WNW7	W7	W7	WNW8	WNW7	WNW6	WNW6	WNW6	NW13	NW21	NW19	NW17	WNW14	NW14	NW21	NW19	NW14	N12	N11	N11	NNW9	NW11	NW10.4	NW21
29-Jan	WNW7	SW3	SW3	W4	W3	SSW4	S4	S5	S6	S7	S10	S11	SSE11	S12	S13	S9	S4	WSW2	WNW6	NNW6	NNW7	N6	NW5	WNW4	SSW3.2	S13
30-Jan	WNW5	N5	NW2	SW3	SW2	SSW3	SSW3	S5	S4	S4	SSE4	SSE6	SSE5	SSE5	SSE6	S6	S6	SSE3	N1	N2	N3	N5	N5	N6	S1.2	SSE6
31-Jan	N10	NNE8	N8	N6	NE3	ENE3	NNE2	NNW1	WNW1	NNW2	UO	SE4	SE5	SE8	SSE6	SSE7	SSE6	SSE4	NNE2	NNE3	NNW3	NNW4	NW3	NW3	NE1.2	N10

SSW1.5	S1.7	S1.9	SSW2.0	S2.5	S2.8	S2.5	S2.6	S2.8	S2.7	S2.4	S2.8	S2.9	S2.9	S3.0	SSE2.3	S1.7	S1.0	SSW0.5	SSE0.9	S1.1	SSE1.2	S0.9	SSW1.3		Diurnal Average
NNE14	N15	S14	S16	S14	SSE14	N15	N24	N18	NNE16	NNE17	NW21	NW19	NW17	WNW14	NW14	NW21	NW19	NNE19	NNE16	NNE17	NNE16	N17	N13		Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	344	46.42	46.42
6 - 11	325	43.86	90.28
12 - 19	69	9.31	99.60
20 - 28	3	0.40	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	61	42	15	13	5	2	11	27	62	18	13	8	15	10	15	27	344
6 - 11	44	17	3	0	0	0	1	32	185	12	2	2	5	13	4	5	325
12 - 19	9	10	0	0	0	0	0	8	35	0	0	0	0	1	6	0	69
20 - 28	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	69	18	13	5	2	12	67	282	30	15	10	20	24	27	32	741

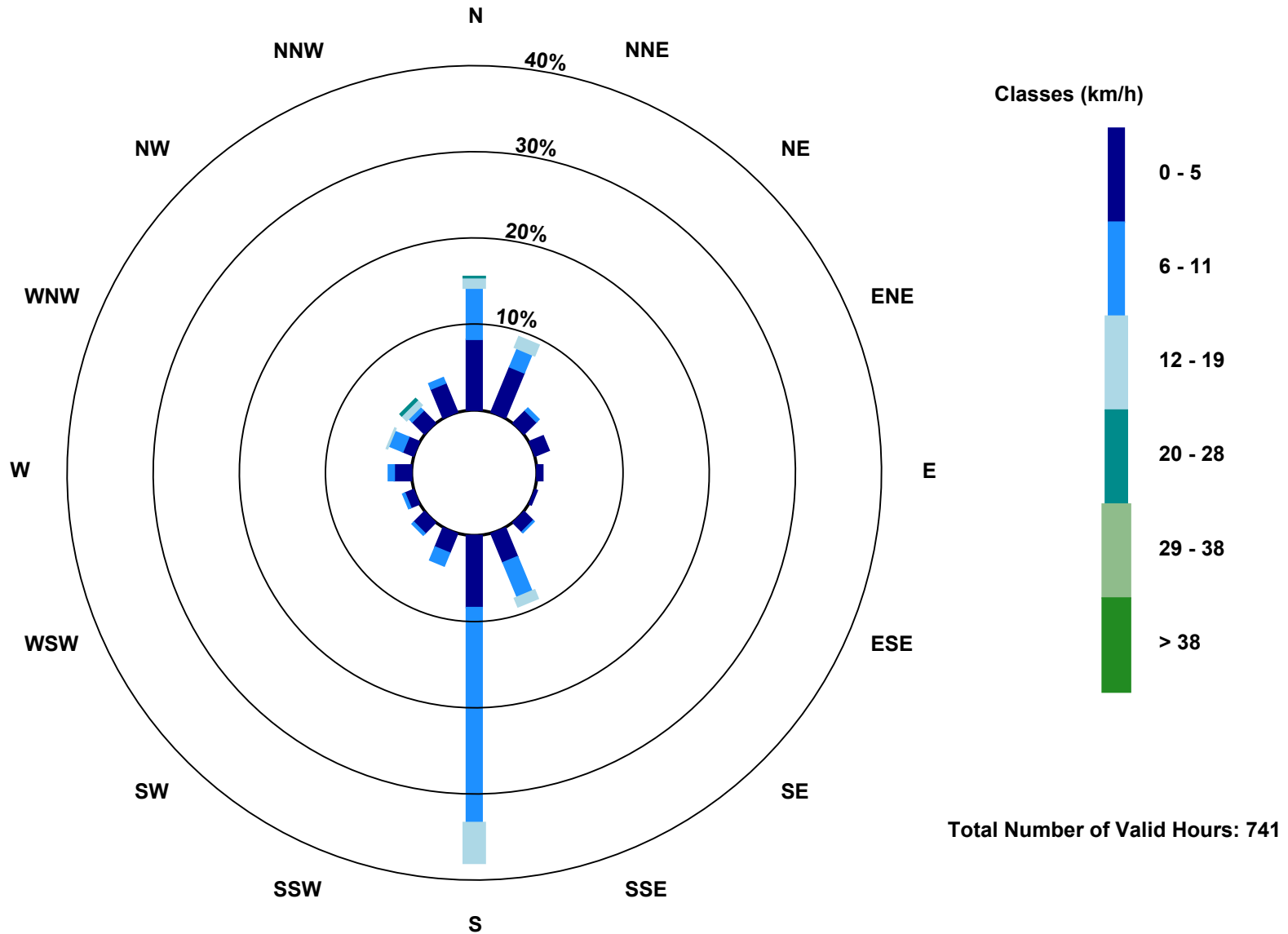
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Jan 26 07:00 Minimum Value: 0 km/h on Jan 15 21:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	1	1	2	1	1	2	1	2	2	2	2	2	2	1	1	1	1	2	1	1	1	1	1	2	2
2-Jan	1	2	1	2	2	1	1	2	1	2	1	2	2	2	2	1	2	1	2	2	2	2	2	2	2	2
3-Jan	2	2	3	2	2	2	2	2	2	2	3	2	2	2	1	2	2	2	2	2	2	3	2	2	3	
4-Jan	1	2	1	1	2	2	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	2	1	1	2	
5-Jan	2	1	1	1	2	2	3	1	2	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	3	
6-Jan	2	1	1	1	1	1	2	1	2	1	1	1	1	2	2	2	2	2	2	3	2	2	1	1	3	
7-Jan	1	3	1	1	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
8-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	1	UO	UO	1	1	1	1	1	1	1	1	2	
9-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	1	1	2	
10-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	2	
11-Jan	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	3	2	1	2	3	3	3	2	3	
12-Jan	2	2	3	3	3	3	3	3	3	3	3	3	2	3	3	2	2	2	2	2	2	2	2	2	3	
13-Jan	1	2	1	1	1	2	2	2	1	1	2	2	1	1	2	2	2	2	2	1	1	1	1	2	2	
14-Jan	1	1	1	1	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	3	
15-Jan	1	0	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	2	
16-Jan	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	2	
17-Jan	1	1	2	2	2	2	2	2	1	2	2	2	2	2	3	3	2	2	2	2	3	2	2	2	3	
18-Jan	2	2	2	2	2	3	3	3	3	4	4	4	4	3	2	2	2	2	3	2	3	2	2	2	4	
19-Jan	3	2	2	3	3	2	2	3	3	2	1	1	2	3	3	2	1	2	1	2	1	2	2	2	3	
20-Jan	2	2	2	1	1	1	2	2	1	2	2	3	3	3	2	2	1	2	2	2	2	1	1	2	3	
21-Jan	2	1	1	2	2	2	2	2	2	2	2	3	2	2	1	1	1	1	1	1	2	2	3	2	3	
22-Jan	2	2	2	4	3	3	4	3	2	5	5	4	4	3	2	2	2	1	1	2	2	2	1	1	5	
23-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	2	
24-Jan	2	2	2	1	2	2	2	2	3	2	1	2	1	2	2	2	3	2	2	2	1	1	1	2	3	
25-Jan	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	
26-Jan	2	2	2	2	3	4	6	5	5	4	4	3	2	2	1	3	4	4	5	5	5	5	4	4	6	
27-Jan	5	4	2	3	4	3	2	2	2	2	2	2	1	1	1	1	1	2	2	2	1	1	2	1	5	
28-Jan	2	3	3	3	2	3	2	2	2	2	6	5	4	5	4	4	4	4	2	3	3	2	2	3	6	
29-Jan	2	1	1	2	1	1	2	1	1	2	2	2	2	2	3	3	2	1	2	1	2	2	1	1	3	
30-Jan	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1	2	3	
31-Jan	2	3	2	2	1	1	1	1	1	1	UO	1	1	1	2	1	1	1	1	1	1	1	1	1	3	
																	Diurnal Maximum									
																	5 4 3 4 4 4 6 5 5 5 6 5 4 5 4 4 4 4 5 5 5 5 4 4									
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

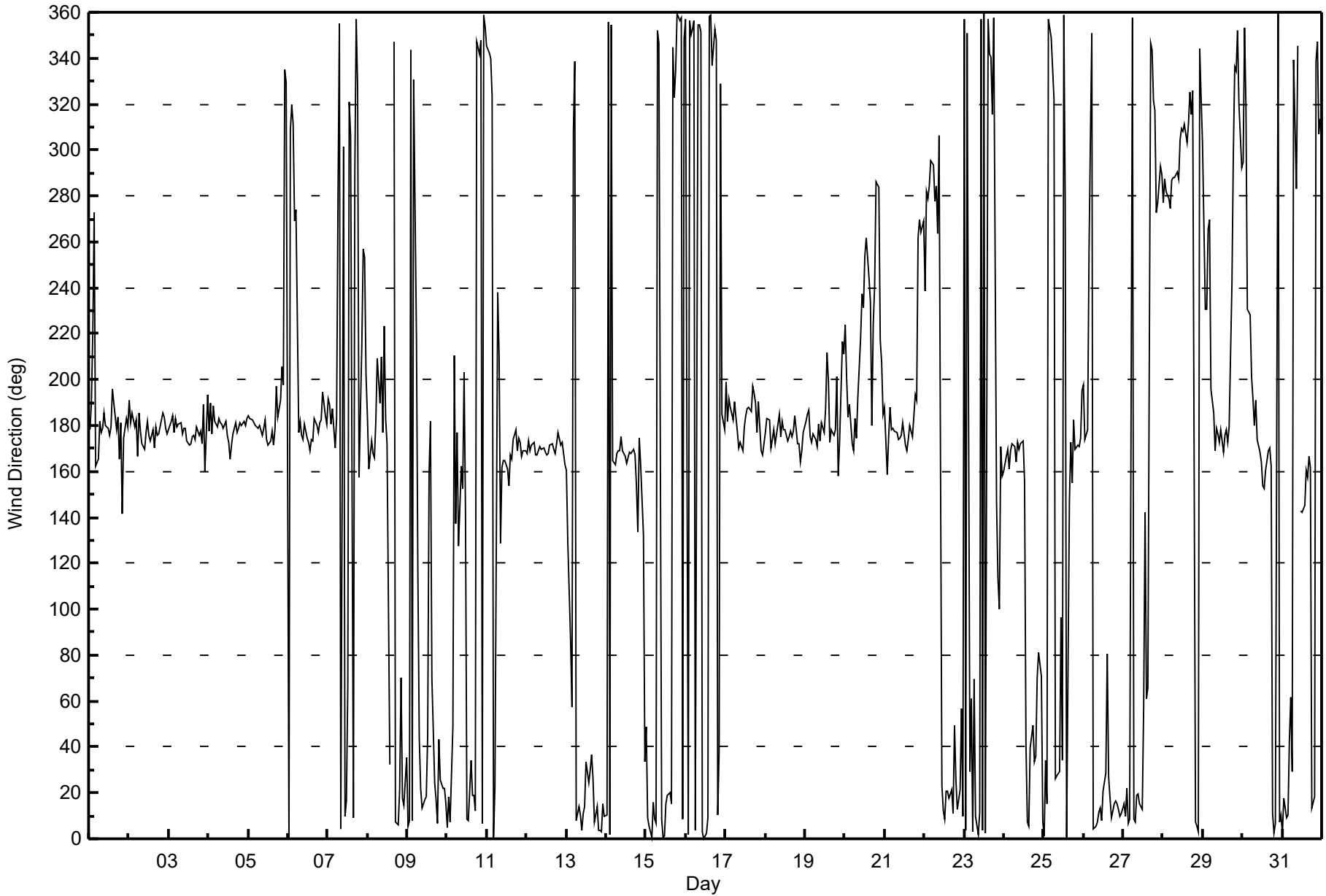
Wind Direction (WD) - deg
Fort McKay - Bertha Ganter - January 2023

Direction of Maximum Speed: 5 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 169.9 deg on Jan 12	Hours of Data: 741
Direction of Minimum Speed: 0 deg on Jan 25 15:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 7	Percent Operational Time: 99.6
Monthly Average Direction: 180.8 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	178	190	220	273	162	165	182	177	179	185	180	178	176	179	196	190	178	184	165	181	142	174	183	179	180.7
2-Jan	191	181	186	179	183	166	186	177	172	170	177	182	176	173	178	170	179	176	177	179	186	184	179	177	178.3
3-Jan	178	182	184	177	183	179	180	181	177	179	179	173	172	172	175	176	174	179	175	177	172	189	160	194	177.5
4-Jan	177	190	176	188	182	179	183	181	181	179	182	176	173	165	171	177	181	177	179	181	180	182	180	183	179.2
5-Jan	184	183	183	181	180	179	179	180	175	179	182	174	171	174	177	172	178	197	184	191	206	198	335	329	181.5
6-Jan	1	309	320	311	269	274	177	182	176	174	181	174	173	169	174	174	183	180	177	181	182	195	184	181	182.5
7-Jan	192	189	181	187	170	183	279	355	4	302	10	16	67	321	306	9	291	357	327	158	215	257	253	202	223.9
8-Jan	184	161	173	168	166	182	209	190	210	177	223	183	172	32	UO	UO	347	8	6	21	70	18	15	35	174.8
9-Jan	6	8	344	8	331	218	116	44	22	14	17	18	44	159	182	70	24	17	7	43	25	22	22	15	29.0
10-Jan	5	18	7	49	211	137	177	128	162	153	203	142	9	8	34	19	19	12	347	341	348	7	359	354	11.6
11-Jan	345	343	340	323	0	22	238	210	129	162	165	165	161	154	167	166	174	178	169	175	172	166	169	169	168.0
12-Jan	168	173	169	171	173	167	167	169	171	169	170	169	167	168	172	172	169	168	172	177	171	173	168	163	169.9
13-Jan	161	130	86	57	308	339	8	14	11	4	11	14	33	25	30	36	26	7	14	4	4	3	15	10	17.0
14-Jan	10	356	2	355	165	163	168	169	169	175	169	166	164	166	168	168	170	167	154	134	174	163	132	33	164.0
15-Jan	49	9	5	1	16	9	7	352	346	9	0	1	15	19	20	15	345	323	335	359	356	358	9	349	4.5
16-Jan	357	2	356	350	353	356	3	355	354	352	3	0	2	9	358	359	337	353	348	11	38	329	185	178	356.7
17-Jan	199	182	192	188	183	190	184	178	170	172	169	179	184	188	188	186	197	194	190	177	190	169	167	172	182.0
18-Jan	177	183	182	170	174	178	172	176	185	175	182	178	178	174	175	178	175	178	184	172	172	164	169	177	176.2
19-Jan	182	185	187	175	173	176	174	171	181	173	181	177	187	212	199	173	178	176	178	201	158	174	216	211	181.5
20-Jan	224	201	184	189	172	169	183	174	192	219	237	231	254	262	244	234	180	224	241	286	284	217	207	185	213.6
21-Jan	188	159	175	188	178	179	177	177	174	175	176	181	171	169	174	180	178	175	193	191	262	270	264	269	184.6
22-Jan	239	282	279	284	295	294	278	284	264	307	23	12	9	21	21	17	21	11	50	25	13	21	57	10	342.2
23-Jan	357	4	351	29	61	3	70	10	2	11	357	3	360	2	357	342	341	316	358	147	113	100	171	158	6.9
24-Jan	160	166	170	161	169	172	171	164	173	169	172	173	156	41	7	5	40	49	34	36	70	81	71	7	142.9
25-Jan	2	34	16	357	349	336	322	26	27	30	97	34	359	279	0	147	173	155	183	169	172	171	174	195	155.4
26-Jan	198	174	178	256	305	351	4	5	7	12	14	8	21	29	81	27	18	9	15	16	15	13	10	11	11.1
27-Jan	15	10	22	7	8	358	8	8	19	19	15	13	57	142	61	66	347	343	321	317	273	277	293	289	2.1
28-Jan	277	287	282	279	275	287	288	288	291	287	304	309	308	311	303	312	325	316	326	8	5	3	344	323	313.4
29-Jan	302	230	231	265	270	196	185	169	179	176	173	178	168	176	178	173	179	241	299	336	334	352	320	292	202.7
30-Jan	295	353	318	231	228	201	192	180	191	174	168	164	154	153	160	169	170	162	11	2	7	359	8	10	174.5
31-Jan	3	17	9	10	43	62	29	339	283	346	UO	143	142	145	161	158	167	162	13	19	338	347	307	314	49.4

198.1 188.8 190.0 202.5 190.6 185.9 184.1 176.6 178.3 180.2 172.5 175.6 170.6 169.1 174.5 168.2 178.7 190.5 212.6 162.4 175.2 168.4 185.8 203.5
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay - Bertha Ganter - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 103 deg on Jan 7 14:00	Hours of Data: 741
Minimum Value: 9 deg on Jan 20 06:00	Hours of Missing Data: 3
Percentiles: P ₁ = 10 P ₁₀ = 12 Q ₁ = 13 Median = 17 Q ₃ = 29 P ₉₀ = 49 P ₉₉ = 81	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	16	24	36	70	65	19	18	13	13	14	14	14	17	22	40	16	15	17	31	49	43	14	19	25	70
2-Jan	22	14	13	13	15	21	24	16	16	29	14	18	15	11	13	12	13	13	11	13	13	12	16	14	29
3-Jan	12	13	21	14	11	11	10	12	13	13	12	11	11	12	12	12	12	14	12	14	41	64	59	40	64
4-Jan	80	16	21	13	15	13	12	15	11	12	14	18	17	14	12	12	14	17	19	11	15	12	13	12	80
5-Jan	12	10	14	11	13	12	15	13	15	12	13	14	14	15	15	24	11	12	72	70	18	48	49	41	72
6-Jan	51	19	49	15	59	43	14	12	24	17	13	12	12	12	11	11	11	12	12	14	14	18	36	13	59
7-Jan	11	18	11	14	33	31	81	31	30	15	34	70	56	103	44	28	79	36	70	30	37	44	42	25	103
8-Jan	21	14	15	14	14	15	47	66	47	37	31	29	60	50	UO	UO	20	12	69	57	49	59	65	19	69
9-Jan	27	58	24	20	68	82	73	81	36	13	14	16	36	25	53	25	28	22	22	27	26	14	13	18	82
10-Jan	15	15	13	47	75	45	51	21	22	20	95	55	55	14	62	23	18	13	10	14	18	12	11	10	95
11-Jan	16	27	24	22	15	17	85	62	77	28	11	14	13	11	15	15	16	16	12	18	13	12	13	12	85
12-Jan	12	13	12	13	13	12	11	12	11	11	12	12	11	12	13	13	12	11	12	12	13	13	12	14	14
13-Jan	13	22	32	51	38	22	13	14	14	13	17	20	24	23	22	23	22	15	15	12	13	13	16	20	51
14-Jan	21	18	30	55	59	13	13	12	13	13	13	12	12	15	13	15	12	13	12	14	16	16	33	27	59
15-Jan	16	9	15	14	20	15	15	16	19	13	16	12	23	22	15	14	27	15	19	33	17	32	11	32	33
16-Jan	17	16	13	13	11	13	12	12	12	14	14	14	15	16	16	23	14	15	12	28	47	63	32	10	63
17-Jan	20	32	19	16	14	16	14	13	11	12	12	15	15	22	18	17	20	19	19	18	20	11	10	13	32
18-Jan	21	15	17	12	13	16	13	14	16	15	16	14	14	13	13	13	12	12	13	11	12	10	11	13	21
19-Jan	14	16	15	14	11	12	11	11	14	13	16	19	21	33	30	11	10	12	80	34	14	33	34	56	80
20-Jan	44	29	38	24	11	9	10	10	16	46	45	48	38	36	57	41	14	27	36	49	37	40	25	19	57
21-Jan	56	40	16	23	14	16	13	13	15	18	14	13	12	11	12	13	12	14	17	47	60	45	48	59	60
22-Jan	61	31	38	30	24	25	30	26	53	26	17	17	16	17	18	16	18	16	34	22	17	31	32	29	61
23-Jan	24	22	68	63	31	27	35	25	18	18	16	16	12	14	12	15	27	73	66	35	51	40	65	24	73
24-Jan	13	13	14	11	12	13	13	12	14	12	13	14	12	62	17	30	29	32	23	25	37	20	29	38	62
25-Jan	14	21	19	14	13	42	14	39	37	45	74	44	29	84	92	15	26	41	27	13	14	14	17	28	92
26-Jan	36	16	17	41	65	45	18	17	17	18	16	17	20	23	40	22	17	17	17	18	18	18	16	16	65
27-Jan	18	18	18	20	23	16	16	16	17	18	18	31	71	20	30	36	37	36	9	17	35	19	82	20	82
28-Jan	24	20	23	26	29	21	19	21	25	23	16	13	14	16	18	15	12	12	21	15	15	12	18	13	29
29-Jan	13	37	31	33	66	42	52	11	10	12	11	15	12	13	18	13	38	61	40	22	23	27	22	21	66
30-Jan	15	16	44	38	63	27	53	16	16	23	13	12	17	12	13	16	17	47	56	21	51	10	16	12	63
31-Jan	15	19	15	17	22	25	46	29	76	16	UO	16	17	13	31	12	11	21	47	12	37	18	21	27	76
	80	58	68	70	75	82	85	81	77	46	95	70	71	103	92	41	79	73	80	70	60	64	82	59	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02 MILDRED LAKE JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	34	36	99.73	16.4	0	4.1	0
H2S (ppb) Average	706	36	38	99.73	3.5	0	1	0
THC (ppm) Average	709	34	35	99.87	5.6	-	3	-
NMHC(ppm) Average	709	34	35	99.87	0.366	-	0.149	-
CH4(ppm) Average	709	34	35	99.87	5.4	-	2.9	-
Temperature (C) Average	744	0	0	100	3.1	-	-2	-
Relative Humidity (%) Average	744	0	0	100	98.9	-	93.9	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	23	-	16	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)

JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	0.97	1.8	-	0	0.1	0.2	0.4	0.8	2.4	16.4
H2S (ppb) Average	706	0.43	0.4	-	0	0.1	0.2	0.3	0.5	0.9	3.5
THC (ppm) Average	709	2.35	0.4	-	2	2	2.1	2.2	2.5	2.9	5.6
NMHC(ppm) Average	709	0.058	0.063	-	0	0	0	0	0.1	0.1	0.366
CH4(ppm) Average	709	2.3	0.3	-	2	2	2.1	2.2	2.4	2.8	5.4
Temperature 2 m (C) Average	744	-10.15	5.6	-	-26	-18.9	-12.3	-9	-7.3	-4.3	3.1
Relative Humidity (%) Average	744	85.99	7.8	-	57.3	74.5	82.8	87.8	92.1	93.8	98.9
Wind Speed 10 m (km/h) Average	742	7.4	4	-	0	3	4	7	10	13	23
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	11 Jan 2023 13:00	11 Jan 2023 14:00	2	Maintenance - WBEA internal audit
H2S	11 Jan 2023 12:00	11 Jan 2023 13:00	2	Maintenance - WBEA internal audit
THC/NMHC/CH4	11 Jan 2023 15:00	11 Jan 2023 15:00	1	Maintenance - WBEA internal audit
Wind Speed, Wind Direction	10 Jan 2023 18:00	10 Jan 2023 18:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 22:00	31 Jan 2023 22:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

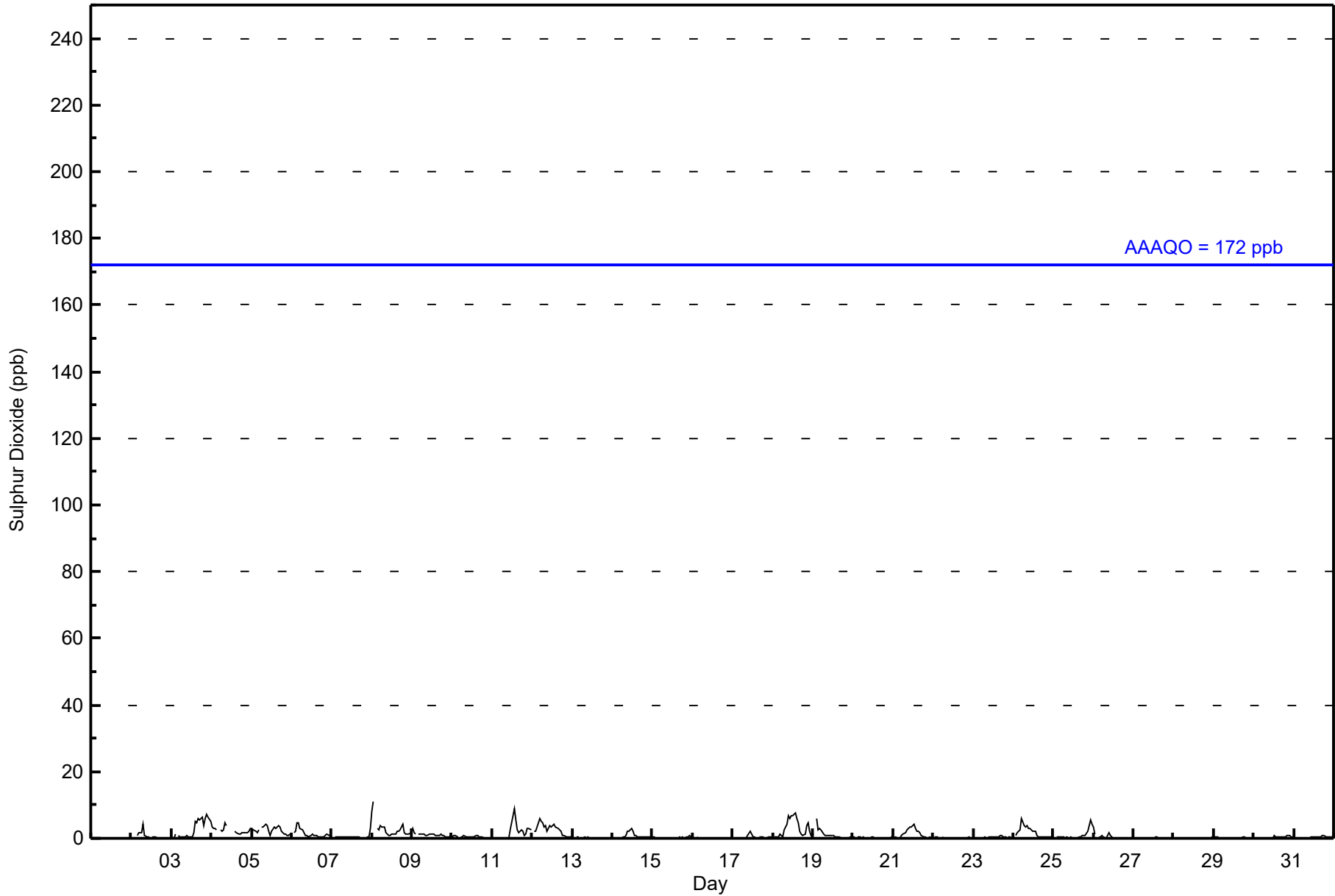
Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 10.9 ppb on Jan 8 02:00		Maximum Daily Average: 3.1 ppb on Jan 18																	Hours of Data:	709																													
Minimum Value: 0.0 ppb on Jan 1 20:00		Minimum Daily Average: 0.1 ppb on Jan 1																	Hours of Missing Data:	35																													
Maximum Diurnal Average: 1.3 ppb at hour 14		Minimum Diurnal Average: 0.6 ppb at hour 20																	Hours of Calibration:	35																													
Monthly Average: 0.99 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.2 P ₉₀ = 3.0 P ₉₉ = 6.7																	Percent Operational Time:	100.0																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.6	4.3																					
2-Jan	0.1	0.1	Z	0.8	1.8	1.6	1.8	4.3	0.7	0.5	0.3	0.2	0.2	0.4	0.3	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	4.3																			
3-Jan	0.2	0.1	1.1	Z	0.8	0.4	0.3	0.2	0.3	0.8	0.3	0.4	0.5	1.9	5.2	4.8	5.9	5.6	6.4	3.7	5.8	7.0	6.5	4.9	2.7	7.0	2.7	7.0																					
4-Jan	3.5	3.1	2.9	2.4	Z	2.7	2.1	2.6	4.6	4.0	C	C	C	C	2.2	1.9	1.4	1.4	1.8	1.7	1.6	1.6	2.0	2.8	2.4	4.6	2.4	4.6																					
5-Jan	3.0	2.4	1.9	1.8	2.4	Z	3.4	3.3	4.1	3.8	2.0	1.0	2.3	3.3	3.2	3.3	3.7	3.5	2.2	1.3	1.4	1.0	1.0	1.3	2.5	4.1	2.5	4.1																					
6-Jan	Z	1.6	1.9	4.5	4.8	2.9	2.6	1.7	0.9	0.7	0.6	0.7	1.2	0.7	0.6	0.7	0.6	0.4	0.4	0.4	1.0	1.4	0.8	0.6	1.4	4.8	1.4	4.8																					
7-Jan	0.3	Z	0.5	0.4	0.3	0.4	0.5	0.4	0.2	0.3	0.4	0.3	0.4	0.5	0.4	0.2	0.3	0.1	0.1	0.0	0.2	0.4	0.4	3.0	0.4	3.0	0.4	3.0																					
8-Jan	8.2	10.9	Z	3.0	2.6	3.9	3.6	3.3	1.8	1.5	1.0	0.9	1.4	1.3	1.2	2.0	2.2	2.4	4.2	1.8	1.4	1.4	1.4	1.8	2.7	10.9	2.7	10.9																					
9-Jan	2.8	1.8	1.3	Z	1.2	1.2	1.1	1.1	0.9	0.9	1.1	1.1	1.1	1.2	1.0	0.8	1.0	1.1	1.0	0.7	0.5	0.5	0.5	0.7	1.1	2.8	1.1	2.8																					
10-Jan	0.5	0.7	0.7	0.5	Z	0.6	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.6	0.9	0.8	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.4	0.9	0.4	0.9																					
11-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.1	2.8	6.6	8.8	5.5	2.7	1.8	2.4	2.0	1.0	1.2	3.1	3.1	2.6	1.9	8.8	1.9	8.8																					
12-Jan	Z	1.9	2.1	3.4	6.0	4.9	4.5	3.6	3.6	2.3	3.6	3.4	3.8	4.3	3.5	3.0	2.7	2.1	0.9	0.7	0.6	0.5	0.5	0.6	2.7	6.0	2.7	6.0																					
13-Jan	0.7	Z	0.6	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.7	0.7	0.2	0.7																				
14-Jan	0.2	0.2	Z	0.1	0.1	0.1	0.3	0.5	0.8	1.9	2.3	3.1	2.1	1.0	0.7	0.6	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.7	3.1	0.7	3.1																				
15-Jan	0.4	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.6	0.6	0.3	0.2	0.6	0.2	0.6																					
16-Jan	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.3	0.1	0.3																					
17-Jan	0.2	0.2	0.1	0.0	0.1	Z	0.1	0.1	0.0	0.7	2.0	1.5	0.4	0.2	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.4	0.4	0.2	0.4	2.0	0.4	2.0																					
18-Jan	Z	0.5	0.3	0.3	1.5	0.7	0.6	2.4	4.4	7.0	5.9	6.7	6.7	7.5	5.9	4.5	1.9	1.2	0.7	1.5	4.0	4.7	2.1	0.7	3.1	7.5	3.1	7.5																					
19-Jan	1.3	Z	5.9	2.4	3.0	2.4	1.5	0.9	1.0	0.8	1.0	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	1.1	5.9	1.1	5.9																					
20-Jan	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.3	0.2	0.3	0.2	0.3																					
21-Jan	0.2	0.4	0.1	Z	0.1	1.0	1.4	1.6	2.6	2.9	3.4	3.4	4.1	2.9	2.1	2.3	1.7	0.7	0.3	0.2	0.2	0.2	0.3	0.2	1.4	4.1	1.4	4.1																					
22-Jan	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0.3																					
23-Jan	0.1	0.2	0.1	0.1	0.1	Z	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.8	0.7	0.3	0.3	0.2	0.5	0.3	0.2	0.3	0.8	0.3	0.8																					
24-Jan	Z	0.8	1.5	2.1	2.3	5.9	4.0	3.2	3.8	3.0	3.0	2.3	2.3	2.2	1.0	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	1.8	5.9	1.8	5.9																					
25-Jan	0.4	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.5	0.2	0.3	0.2	0.2	0.1	0.2	0.3	0.5	0.7	0.6	0.8	2.2	3.8	5.7	4.4	1.0	5.7	1.0	5.7																					
26-Jan	3.2	1.5	Z	0.2	0.3	1.0	0.6	0.0	0.9	1.7	0.8	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.5	3.2	0.5	3.2																					
27-Jan	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.4																					
28-Jan	0.1	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3	0.1	0.3																					
29-Jan	0.3	0.3	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.1	0.1	0.2	0.0	0.2	0.4	0.2	0.4																					
30-Jan	Z	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.9	0.6	0.4	0.3	0.3	0.5	0.6	0.5	0.7	0.8	0.6	0.4	0.3	0.9	0.3	0.9																					
31-Jan	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.5	0.5	0.4	0.5	0.7	0.8	0.6	0.3	0.5	0.3	0.2	0.3	0.8	0.3	0.8																					
																								1.0	1.1	0.9	0.9	1.1	1.2	1.0	1.0	1.1	1.1	1.0	1.0	1.2	1.3	1.2	1.0	0.9	0.8	0.8	0.6	0.8	1.0	0.9	0.9	Diurnal Average	
																								8.2	10.9	5.9	4.5	6.0	5.9	4.5	4.3	4.6	7.0	5.9	6.7	6.7	8.8	5.9	4.8	5.9	5.6	6.4	3.7	5.8	7.0	6.5	4.9	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	118	63	16	5	3	11	57	135	125	53	23	6	6	15	24	40	700
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	135	126	53	23	6	6	15	24	40	701

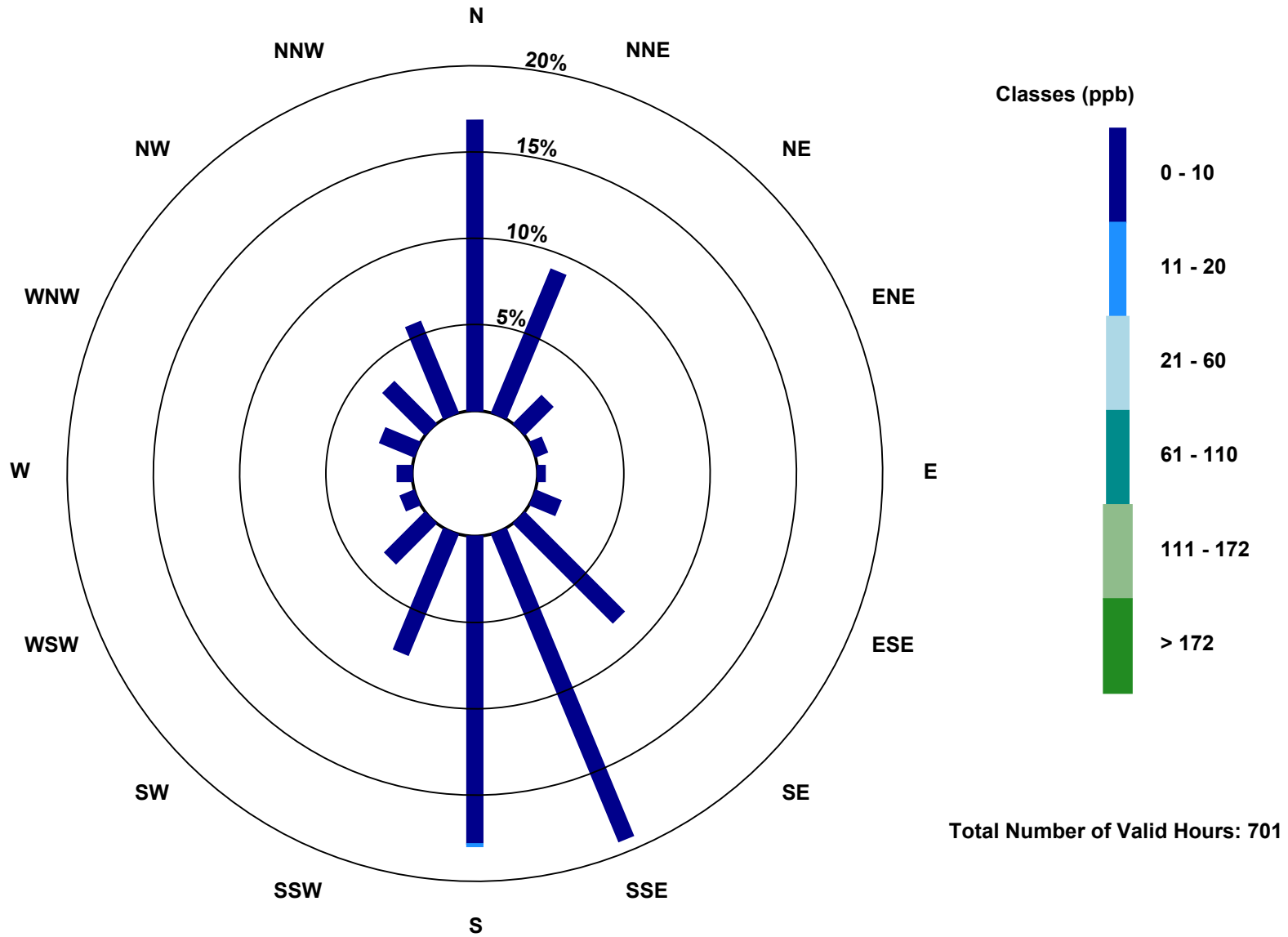
Total Number of Valid Hours: 701

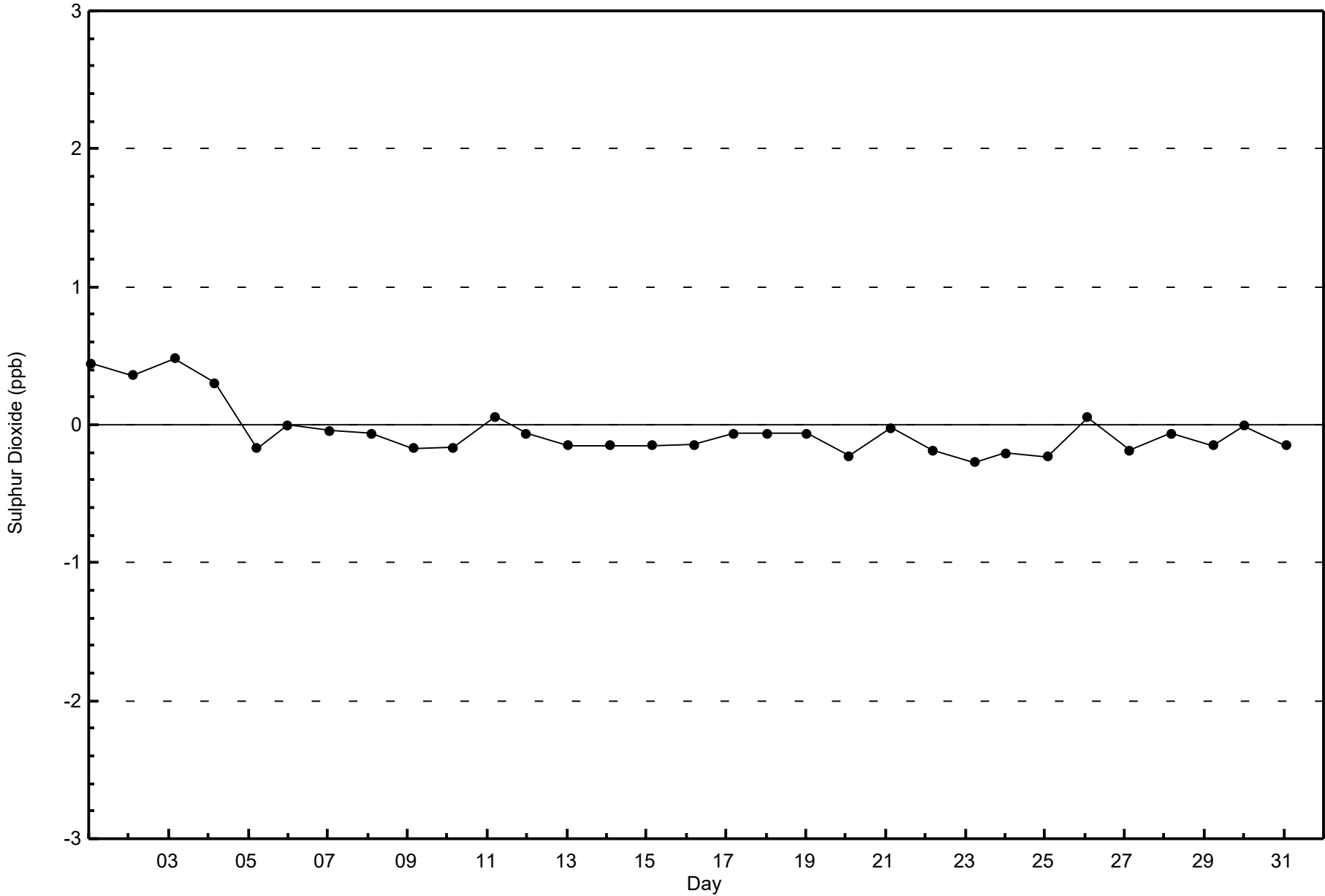
Total Number of Hours: 744

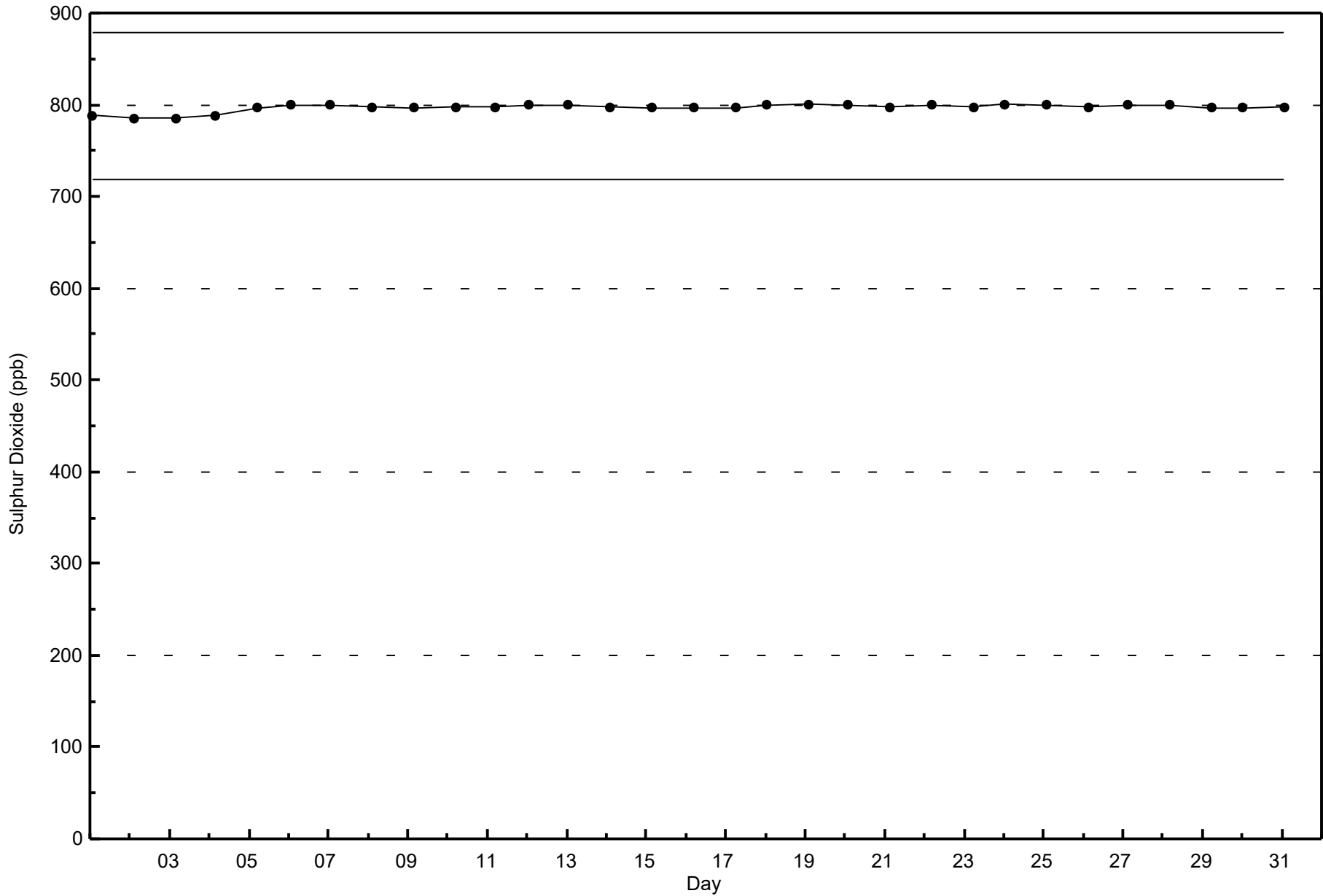


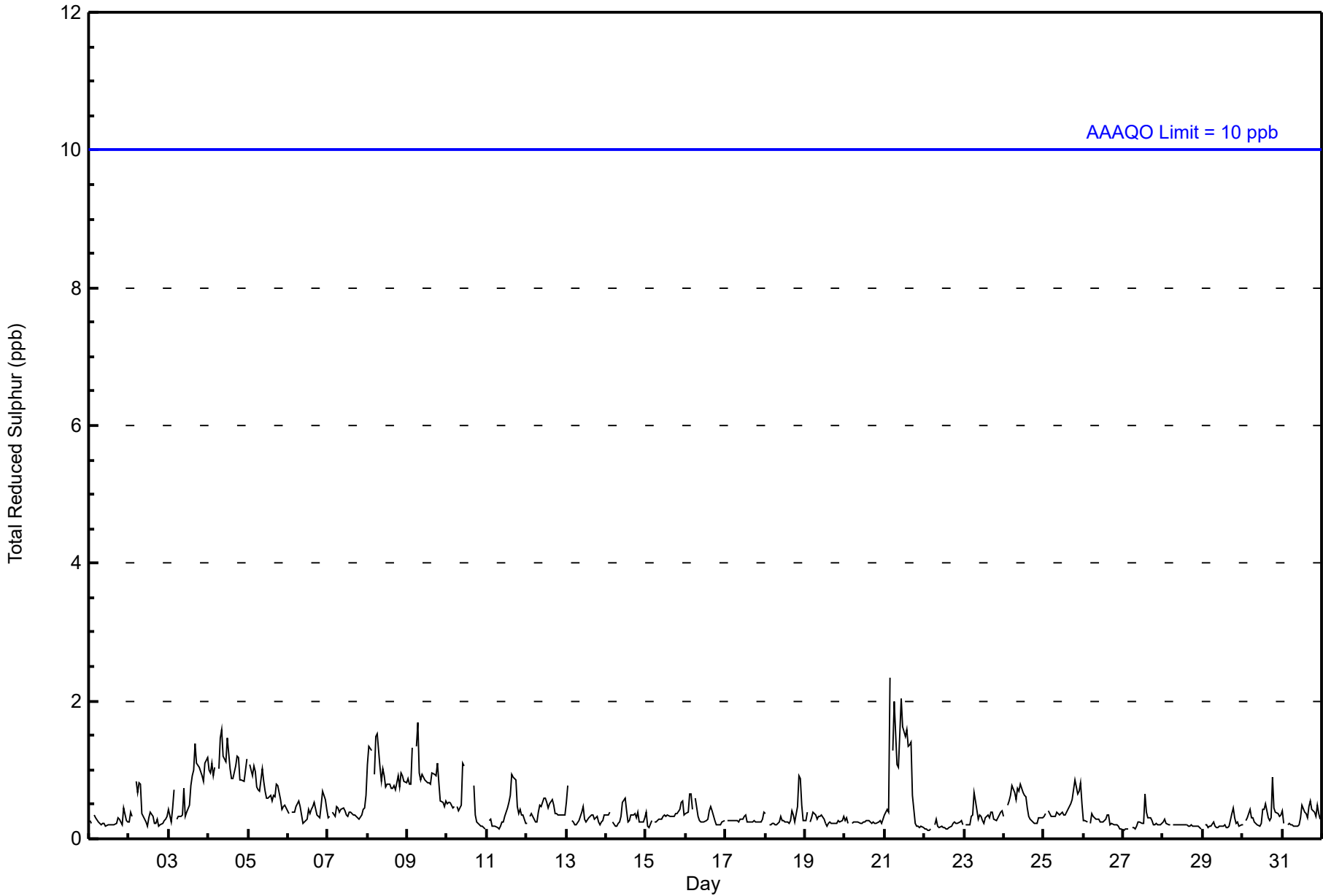
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Fort Hills











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	115	63	16	5	2	12	60	138	127	54	24	5	4	15	22	38	700
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	63	16	5	2	12	60	138	127	54	24	5	4	15	22	38	700

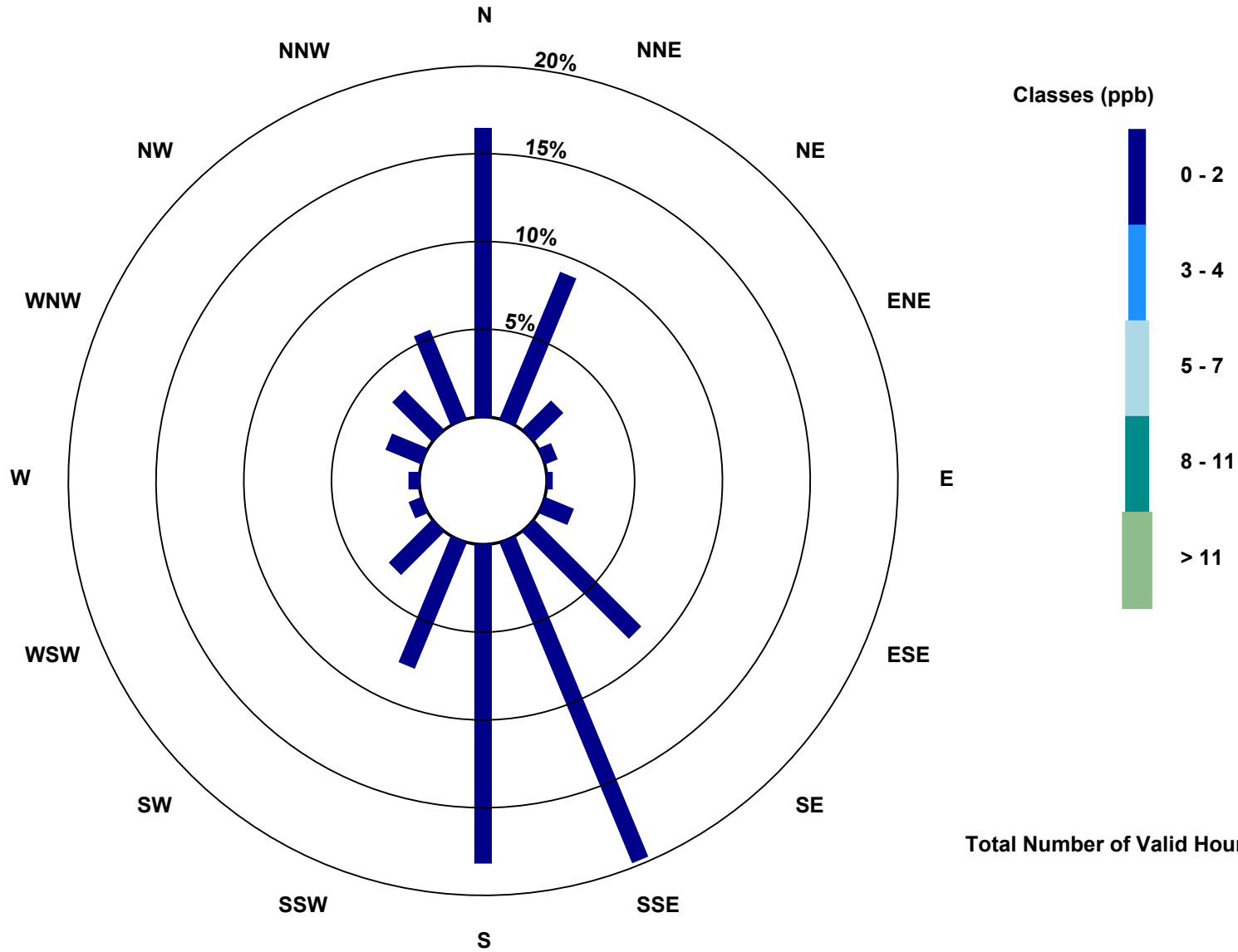
Total Number of Valid Hours: 700

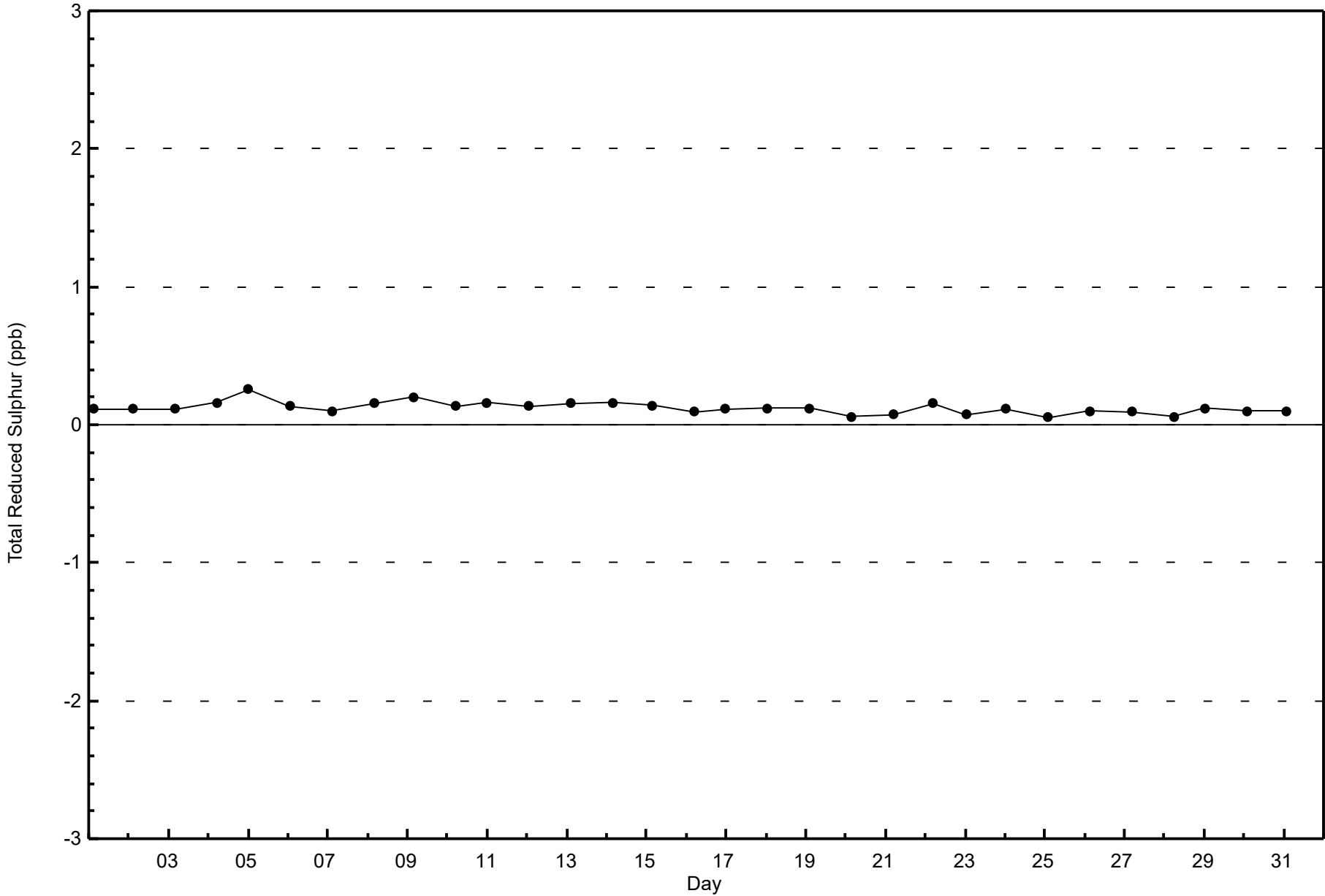
Total Number of Hours: 744

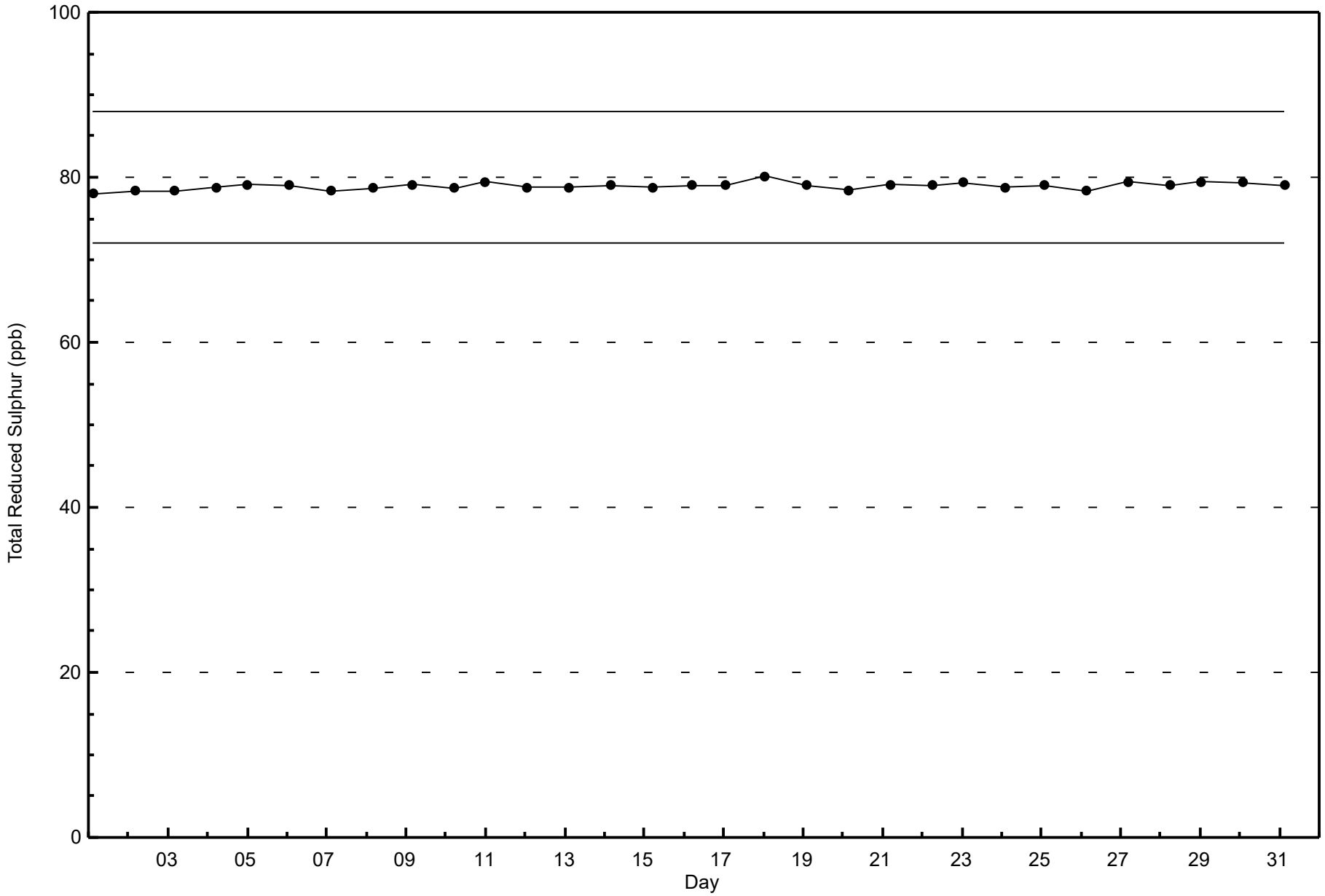


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills









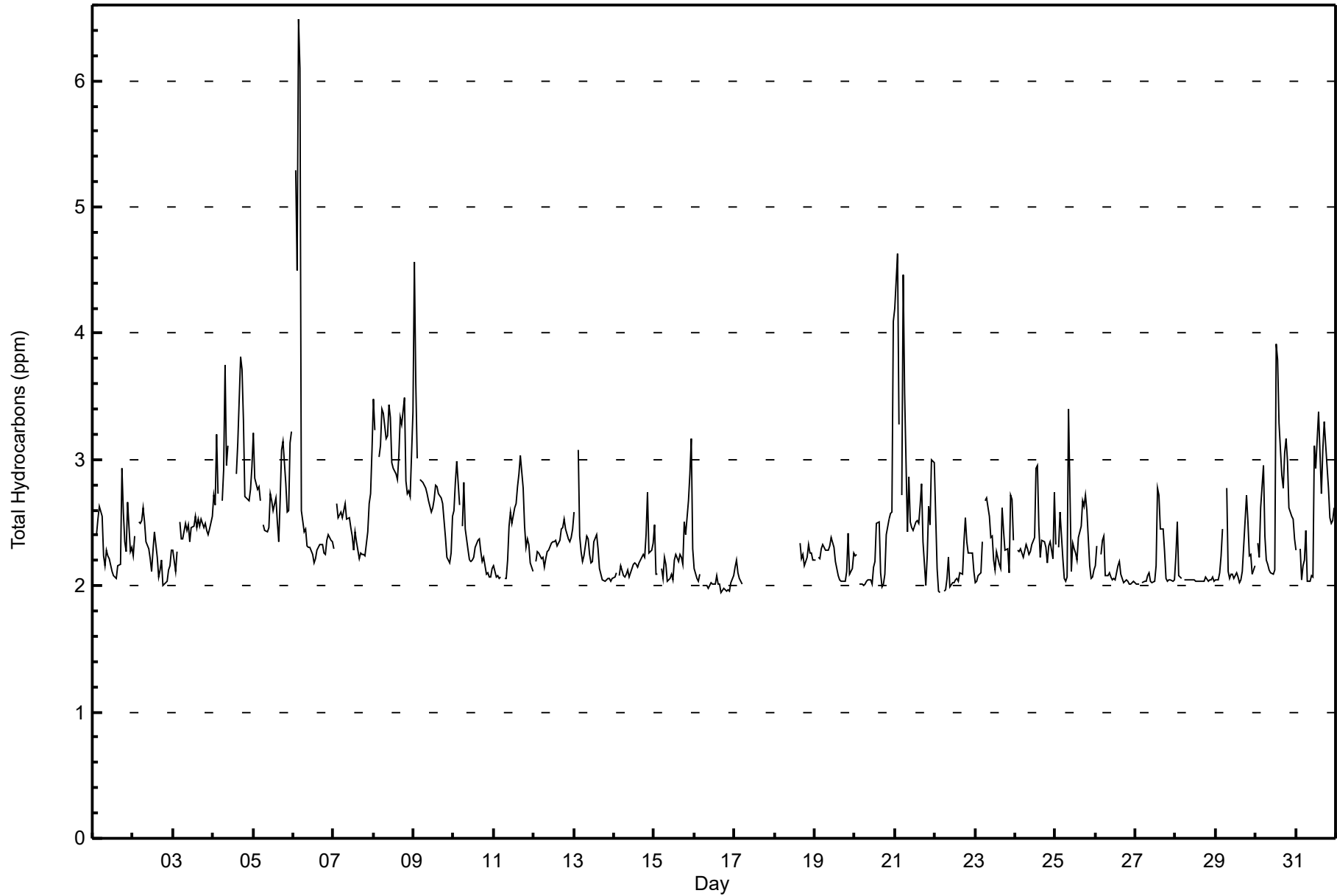
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 6.5 ppm on Jan 6 04:00		Maximum Daily Average: 3.1 ppm on Jan 8		Hours of Data: 677																																													
Minimum Value: 1.9 ppm on Jan 16 17:00		Minimum Daily Average: 2.0 ppm on Jan 16		Hours of Missing Data: 67																																													
Maximum Diurnal Average: 2.6 ppm at hour 2		Minimum Diurnal Average: 2.3 ppm at hour 11		Hours of Calibration: 34																																													
Monthly Average: 2.41 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.3 Q ₃ = 2.6 P ₉₀ = 2.9 P ₉₉ = 4.3		Percent Operational Time: 95.6																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.3	Z	2.4	2.5	2.6	2.6	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.9	2.6	2.3	2.3	2.7	2.3	2.3	2.3	2.9	2.9																						
2-Jan	2.2	2.4	Z	2.5	2.5	2.5	2.6	2.5	2.3	2.3	2.2	2.1	2.3	2.4	2.2	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.6	2.6																					
3-Jan	2.3	2.1	2.3	Z	2.5	2.4	2.4	2.5	2.4	2.5	2.3	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6																					
4-Jan	2.7	2.6	3.2	2.7	Z	2.7	2.9	3.7	3.0	3.1	C	C	C	C	2.9	3.1	3.8	3.7	3.3	2.7	2.7	2.8	2.9	2.9	2.9	3.0	3.8																						
5-Jan	3.2	2.8	2.8	2.8	2.7	Z	2.5	2.4	2.4	2.5	2.7	2.7	2.6	2.7	2.5	3.3	2.7	3.1	3.1	2.8	2.6	2.6	3.1	3.2	2.7	3.2	3.2																						
6-Jan	Z	5.3	4.5	6.5	6.1	2.6	2.4	2.5	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.4	2.4	2.4	2.9	6.5	6.5																						
7-Jan	2.3	Z	2.7	2.5	2.6	2.5	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.4	2.3	2.2	2.3	2.3	2.2	2.2	2.4	2.6	2.7	3.1	2.5	3.1	3.1																						
8-Jan	3.5	3.2	Z	3.0	3.1	3.4	3.4	3.2	3.2	3.4	3.3	3.0	2.9	2.9	2.8	3.0	3.3	3.3	3.5	2.8	2.7	2.7	2.7	3.4	3.1	3.5	3.5																						
9-Jan	4.6	3.6	3.0	Z	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.7	2.8	2.8	2.7	2.7	2.6	2.5	2.4	2.2	2.2	2.3	2.6	2.8	4.6	4.6																						
10-Jan	2.6	2.8	3.0	2.6	Z	2.5	2.8	2.5	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.4	3.0	3.0																						
11-Jan	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.5	2.6	2.5	2.6	2.7	2.8	2.9	3.0	2.8	2.5	2.3	2.4	2.3	2.2	2.1	2.4	3.0	3.0																						
12-Jan	Z	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.5	2.3	2.5	2.5																						
13-Jan	2.6	Z	3.1	2.4	2.3	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.3	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.3	3.1	3.1																						
14-Jan	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.7	2.3	2.3	2.3	2.2	2.7	2.7																						
15-Jan	2.5	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.0	2.2	2.3	2.2	2.2	2.2	2.2	2.5	2.4	2.7	2.9	3.2	2.3	2.3	3.2	3.2																						
16-Jan	2.1	2.1	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1																						
17-Jan	2.1	2.2	2.1	2.1	2.0	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	2.2	2.2																					
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	AF	2.3	2.3																						
19-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.4	2.1	2.1	2.3	2.2	2.4	2.4																						
20-Jan	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.2	2.5	2.5	2.1	2.0	2.0	2.1	2.4	2.5	2.6	2.6	4.1	2.3	4.1	4.1																						
21-Jan	4.2	4.6	3.3	Z	2.7	4.5	3.5	2.4	2.9	2.5	2.5	2.4	2.5	2.5	2.5	2.6	2.8	2.4	2.0	2.2	2.6	2.5	3.0	3.0	2.9	4.6	4.6																						
22-Jan	2.6	2.1	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.3	2.5	2.3	2.3	2.3	2.3	2.1	2.1	2.6	2.6																						
23-Jan	2.0	2.0	2.1	2.1	2.3	Z	2.7	2.7	2.6	2.4	2.4	2.2	2.1	2.3	2.2	2.1	2.6	2.4	2.3	2.3	2.1	2.7	2.7	2.4	2.3	2.7	2.7																						
24-Jan	Z	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.4	2.9	3.0	2.5	2.2	2.4	2.4	2.3	2.2	2.3	2.3	2.2	2.7	2.4	3.0	3.0																						
25-Jan	2.3	Z	2.3	2.6	2.2	2.1	2.0	2.1	3.4	2.1	2.3	2.3	2.3	2.2	2.4	2.5	2.7	2.6	2.7	2.6	2.2	2.1	2.1	2.1	2.4	3.4	3.4																						
26-Jan	2.2	2.3	Z	2.2	2.4	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.4																						
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.8	2.7	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.8	2.8																						
28-Jan	2.2	2.5	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.5	2.5																						
29-Jan	2.0	2.0	2.1	2.2	2.5	Z	2.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.5	2.7	2.5	2.2	2.2	2.1	2.2	2.8	2.8																						
30-Jan	Z	2.3	2.2	2.6	2.9	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	3.9	3.8	3.3	2.9	2.8	3.1	3.2	3.0	2.6	2.6	2.5	2.4	2.7	3.9																						
31-Jan	2.3	Z	2.3	2.0	2.2	2.2	2.4	2.0	2.0	2.1	2.1	3.1	2.9	3.4	3.1	2.7	3.1	3.3	3.1	2.8	2.5	2.5	2.5	2.6	2.6	3.4	3.4																						
																								2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.4	2.4	2.5	Diurnal Average	
																								4.6	5.3	4.5	6.5	6.1	4.5	3.5	3.7	3.4	3.4	3.3	3.1	3.9	3.8	3.3	3.1	3.8	3.7	3.5	3.0	2.7	2.9	3.2	4.1	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				AF - Analyzer Failure																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort Hills - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	95	14.03	14.03
2.1 - 3.0	530	78.29	92.32
3.1 - 10.0	52	7.68	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	29	16	0	0	0	0	0	0	6	12	3	0	3	3	10	12	94
2.1 - 3.0	84	45	14	4	3	6	46	126	86	31	19	4	3	12	12	28	523
3.1 - 10.0	5	2	2	1	0	5	11	8	10	3	1	2	0	0	2	0	52
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

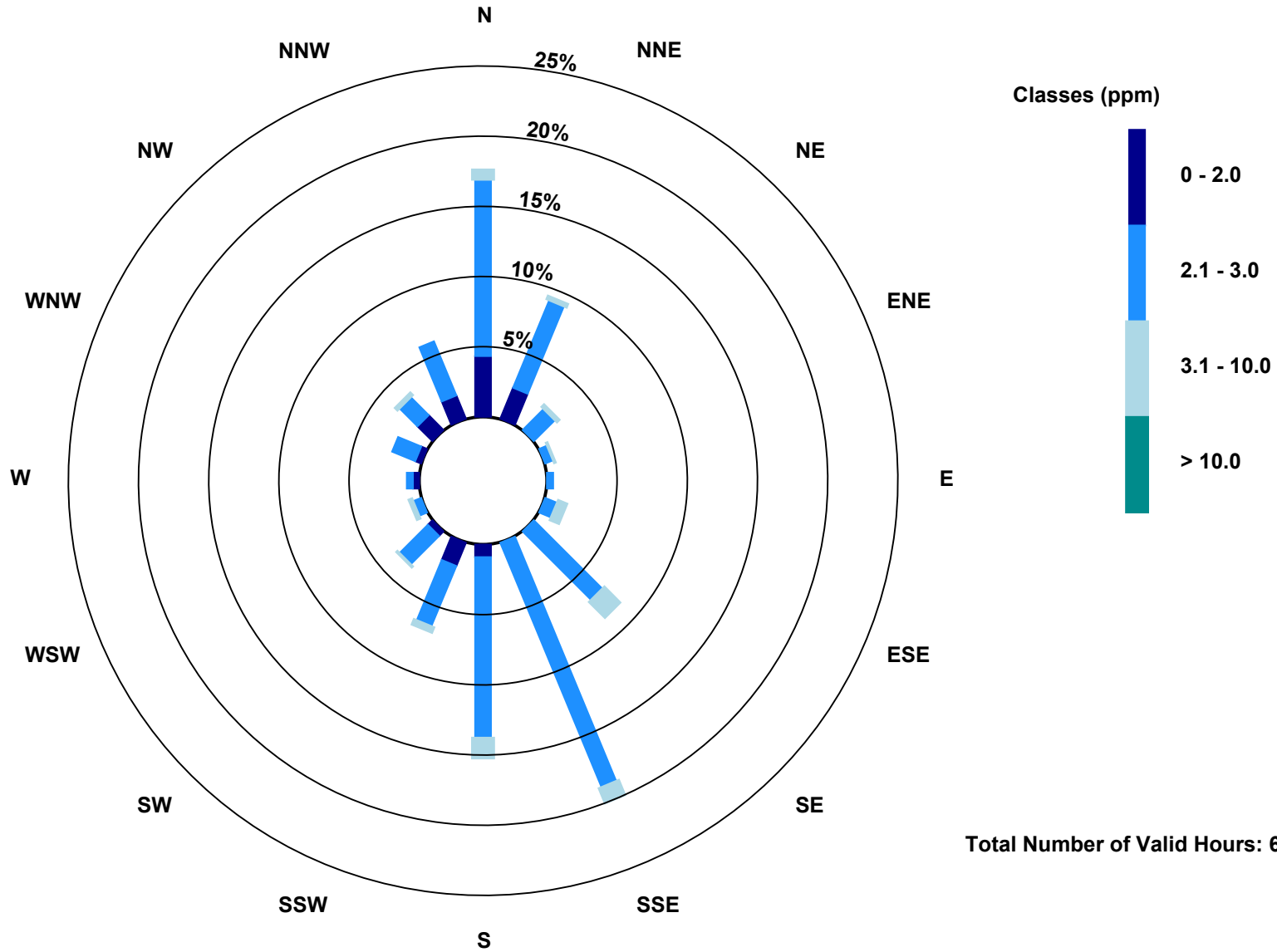
Total Number of Valid Hours: 669

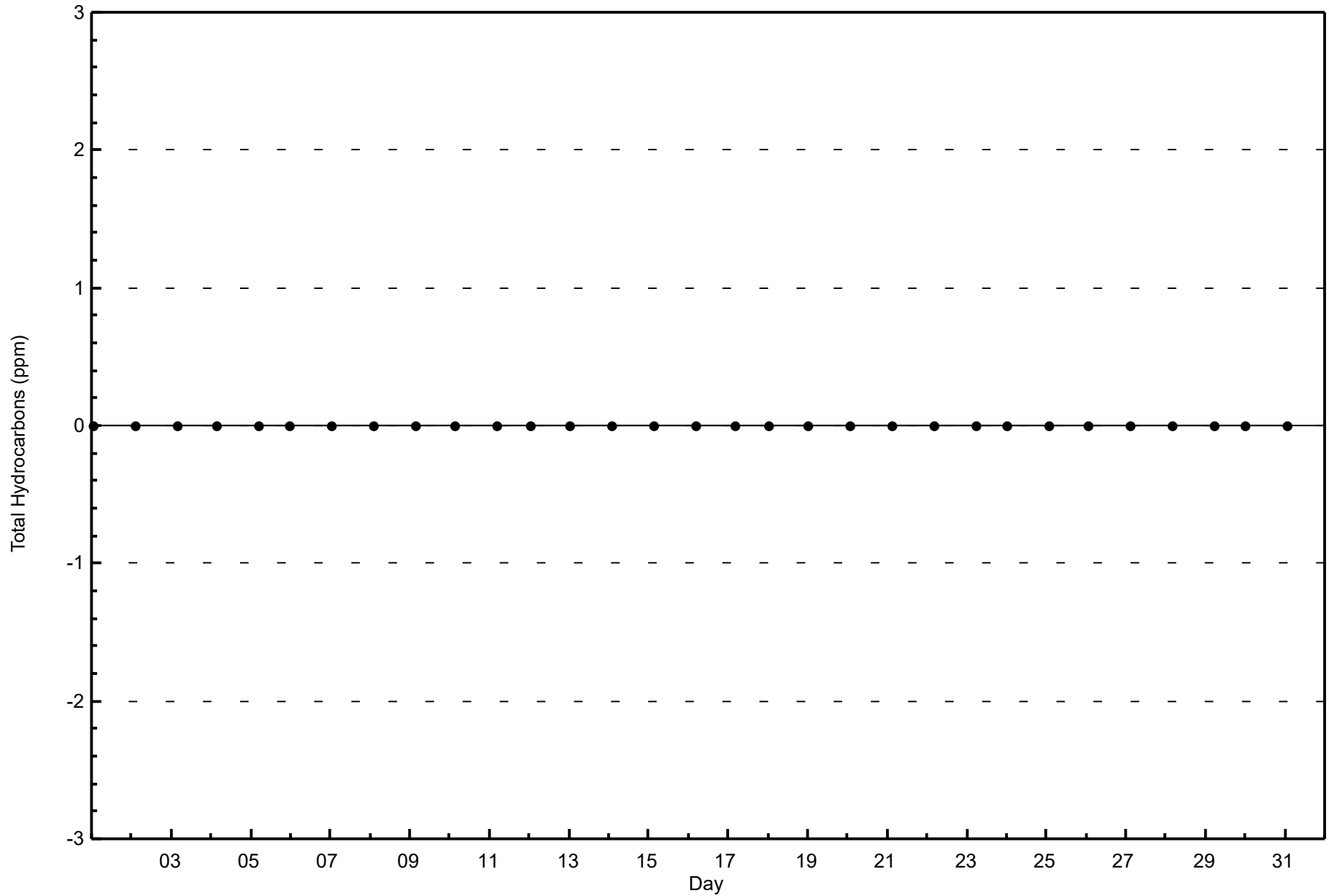
Total Number of Hours: 744

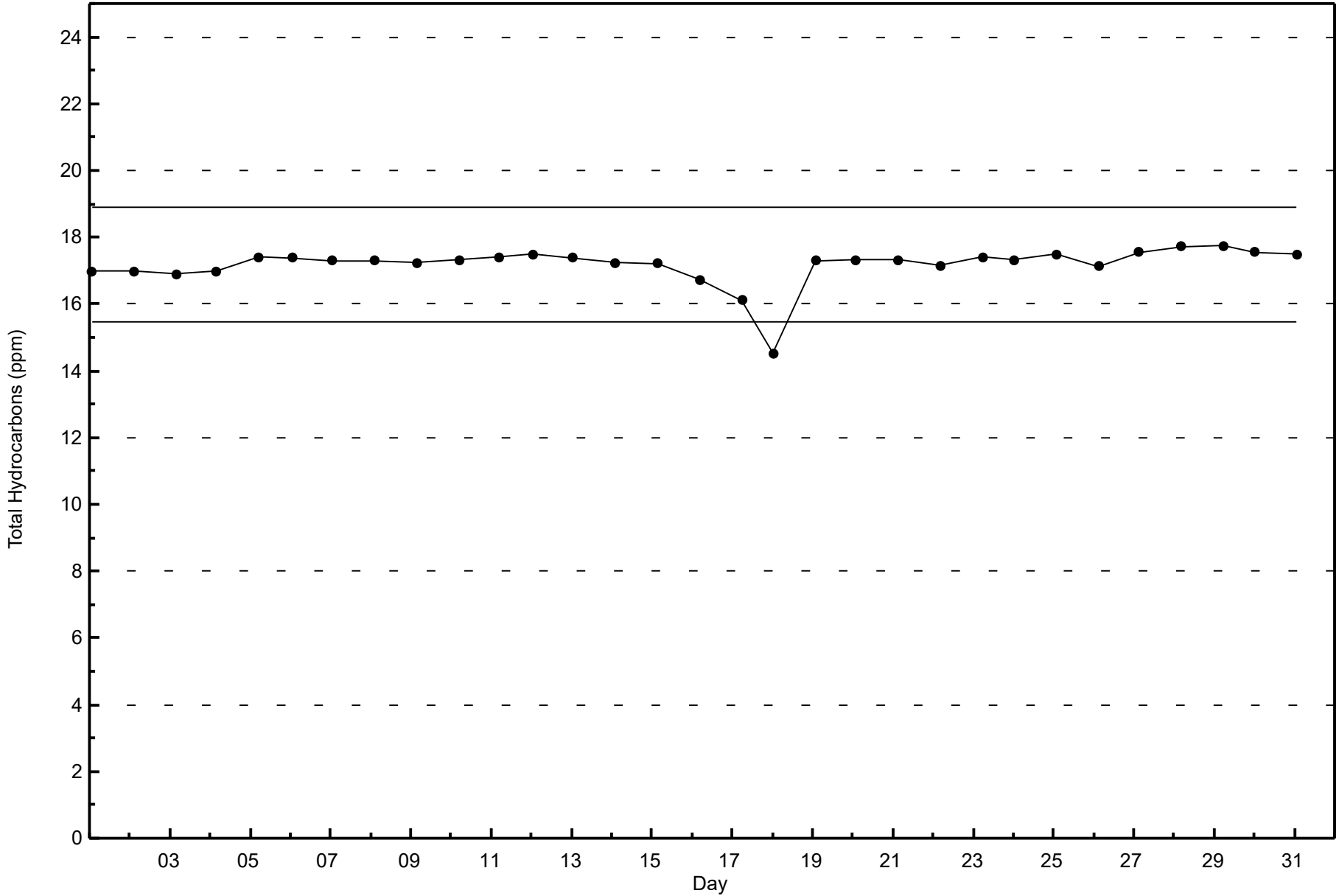


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Fort Hills





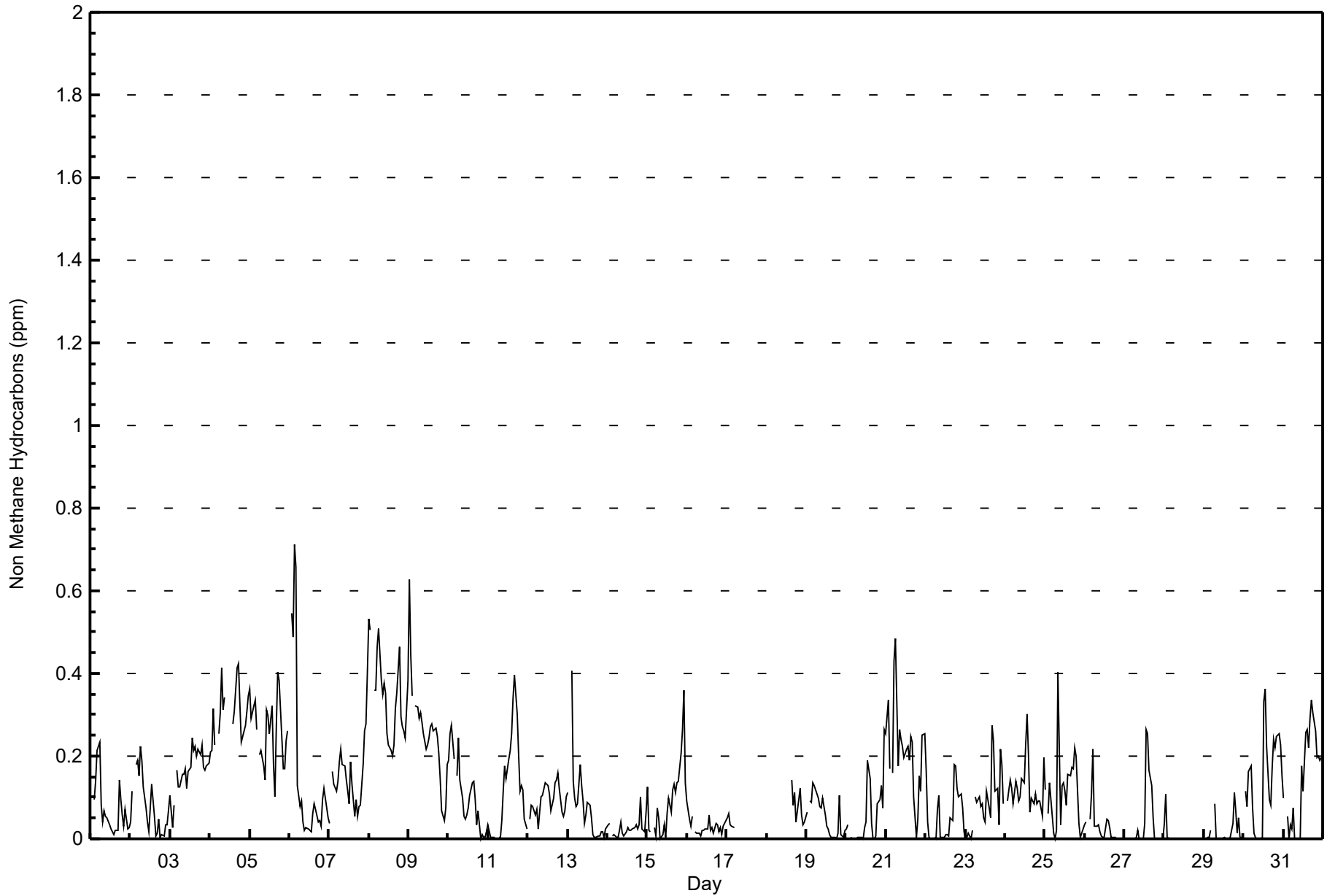




Summary of Hour Averages

Fort Hills - January 2023

Maximum Value: 0.711 ppm on Jan 6 04:00		Maximum Daily Average: 0.343 ppm on Jan 8		Hours in Service: 744																						
Minimum Value: 0.000 ppm on Jan 20 05:00		Minimum Daily Average: 0.007 ppm on Jan 28		Hours of Data: 677																						
Maximum Diurnal Average: 0.142 ppm at hour 14		Minimum Diurnal Average: 0.084 ppm at hour 12		Hours of Missing Data: 67																						
Monthly Average: 0.115 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.5		Hours of Calibration: 34																						
				Percent Operational Time: 95.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.050	Z	0.094	0.140	0.215	0.236	0.081	0.042	0.069	0.054	0.051	0.032	0.025	0.018	0.011	0.020	0.019	0.143	0.095	0.057	0.029	0.073	0.022	0.026	0.070	0.236
2-Jan	0.042	0.116	Z	0.179	0.189	0.153	0.225	0.189	0.125	0.073	0.039	0.016	0.076	0.131	0.055	0.008	0.013	0.048	0.004	0.009	0.006	0.036	0.036	0.069	0.080	0.225
3-Jan	0.104	0.028	0.082	Z	0.168	0.125	0.125	0.158	0.157	0.171	0.121	0.163	0.174	0.246	0.212	0.224	0.201	0.216	0.203	0.227	0.174	0.167	0.176	0.184	0.165	0.246
4-Jan	0.209	0.212	0.315	0.228	Z	0.254	0.306	0.414	0.311	0.341	C	C	C	C	0.277	0.307	0.413	0.423	0.324	0.234	0.248	0.276	0.307	0.345	0.302	0.423
5-Jan	0.363	0.290	0.324	0.334	0.265	Z	0.204	0.212	0.176	0.141	0.311	0.299	0.255	0.322	0.204	0.103	0.272	0.403	0.383	0.241	0.170	0.169	0.239	0.260	0.257	0.403
6-Jan	Z	0.546	0.488	0.711	0.657	0.128	0.077	0.090	0.041	0.021	0.026	0.024	0.021	0.018	0.059	0.086	0.071	0.041	0.044	0.032	0.093	0.121	0.073	0.051	0.153	0.711
7-Jan	0.037	Z	0.162	0.134	0.115	0.139	0.187	0.218	0.180	0.178	0.141	0.115	0.085	0.187	0.132	0.054	0.096	0.053	0.077	0.081	0.181	0.262	0.279	0.399	0.152	0.399
8-Jan	0.532	0.504	Z	0.359	0.359	0.465	0.508	0.383	0.350	0.375	0.354	0.253	0.226	0.212	0.201	0.227	0.314	0.351	0.464	0.295	0.271	0.263	0.243	0.383	0.343	0.532
9-Jan	0.628	0.443	0.346	Z	0.323	0.319	0.291	0.305	0.280	0.255	0.218	0.228	0.244	0.270	0.278	0.262	0.269	0.249	0.208	0.145	0.068	0.043	0.076	0.178	0.257	0.628
10-Jan	0.189	0.255	0.276	0.195	Z	0.154	0.246	0.143	0.097	0.055	0.046	0.059	0.074	0.105	0.136	0.139	0.096	0.035	0.068	0.001	0.010	0.002	0.003	0.017	0.104	0.276
11-Jan	0.034	0.003	0.003	0.004	0.003	Z	0.003	0.004	0.045	0.116	0.176	0.146	0.192	0.213	0.253	0.338	0.396	0.301	0.205	0.117	0.129	0.119	0.049	0.025	0.125	0.396
12-Jan	Z	0.047	0.080	0.079	0.058	0.071	0.025	0.066	0.103	0.104	0.137	0.133	0.128	0.108	0.068	0.097	0.136	0.143	0.158	0.121	0.065	0.056	0.069	0.100	0.094	0.158
13-Jan	0.111	Z	0.406	0.140	0.099	0.078	0.086	0.179	0.129	0.093	0.037	0.057	0.088	0.082	0.049	0.009	0.004	0.004	0.005	0.006	0.017	0.018	0.003	0.025	0.075	0.406
14-Jan	0.035	0.038	Z	0.006	0.009	0.002	0.002	0.020	0.042	0.014	0.006	0.016	0.028	0.022	0.019	0.024	0.026	0.033	0.024	0.035	0.100	0.023	0.017	0.065	0.026	0.100
15-Jan	0.126	0.022	0.019	Z	0.028	0.007	0.075	0.050	0.001	0.010	0.035	0.005	0.060	0.022	0.066	0.117	0.132	0.113	0.135	0.140	0.208	0.265	0.360	0.137	0.096	0.360
16-Jan	0.092	0.047	0.030	0.056	Z	0.017	0.015	0.015	0.006	0.019	0.022	0.022	0.025	0.058	0.019	0.026	0.015	0.037	0.032	0.016	0.027	0.010	0.031	0.045	0.030	0.092
17-Jan	0.052	0.062	0.035	0.031	0.029	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.062
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	0.141	0.082	0.111	0.042	0.095	0.121	0.058	0.035	0.039	--	0.141
19-Jan	0.065	Z	0.090	0.088	0.135	0.127	0.107	0.100	0.078	0.075	0.097	0.059	0.031	0.023	0.009	0.005	0.003	0.005	0.001	0.015	0.106	0.009	0.005	0.021	0.054	0.135
20-Jan	0.025	0.033	Z	0.003	0.000	0.000	0.001	0.002	0.003	0.002	0.001	0.026	0.041	0.190	0.145	0.036	0.001	0.001	0.008	0.085	0.094	0.130	0.074	0.264	0.051	0.264
21-Jan	0.253	0.336	0.170	Z	0.160	0.429	0.485	0.176	0.266	0.239	0.223	0.196	0.218	0.224	0.190	0.248	0.235	0.102	0.003	0.048	0.152	0.117	0.252	0.253	0.216	0.485
22-Jan	0.163	0.040	0.002	0.000	Z	0.002	0.001	0.070	0.105	0.004	0.003	0.005	0.010	0.010	0.005	0.050	0.044	0.178	0.176	0.123	0.101	0.109	0.076	0.016	0.056	0.178
23-Jan	0.000	0.002	0.012	0.001	0.022	Z	0.103	0.089	0.101	0.079	0.086	0.050	0.042	0.116	0.076	0.052	0.275	0.237	0.116	0.122	0.035	0.218	0.178	0.085	0.091	0.275
24-Jan	Z	0.092	0.119	0.143	0.121	0.083	0.139	0.122	0.090	0.103	0.144	0.135	0.227	0.300	0.202	0.066	0.099	0.084	0.109	0.086	0.091	0.093	0.056	0.195	0.126	0.300
25-Jan	0.120	Z	0.060	0.136	0.054	0.015	0.001	0.022	0.404	0.033	0.128	0.134	0.117	0.081	0.156	0.154	0.172	0.169	0.219	0.199	0.037	0.003	0.015	0.024	0.107	0.404
26-Jan	0.033	0.041	Z	0.048	0.108	0.217	0.032	0.030	0.035	0.018	0.008	0.003	0.002	0.049	0.043	0.028	0.003	0.002	0.005	0.001	0.001	0.000	0.000	0.001	0.031	0.217
27-Jan	0.001	0.000	0.001	Z	0.000	0.000	0.000	0.005	0.022	0.002	0.000	0.000	0.037	0.265	0.255	0.166	0.128	0.051	0.002	0.000	0.000	0.000	0.000	0.000	0.041	0.265
28-Jan	0.039	0.108	0.002	0.000	Z	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.007	0.108
29-Jan	0.000	0.000	0.005	0.003	0.022	Z	0.084	0.001	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.001	0.002	0.038	0.113	0.068	0.013	0.052	0.005	0.005	0.018	0.113
30-Jan	Z	0.115	0.077	0.162	0.178	0.074	0.013	0.003	0.000	0.001	0.000	0.002	0.332	0.362	0.222	0.095	0.081	0.172	0.241	0.219	0.247	0.255	0.227	0.153	0.140	0.362
31-Jan	0.098	Z	0.056	0.000	0.032	0.024	0.073	0.001	0.001	0.001	0.001	0.177	0.116	0.258	0.266	0.220	0.293	0.337	0.305	0.261	0.198	0.201	0.188	0.197	0.144	0.337
																								Diurnal Average		
																								Diurnal Maximum		
																								0.131 0.141 0.130 0.127 0.134 0.125 0.121 0.107 0.111 0.089 0.086 0.084 0.103 0.142 0.124 0.110 0.130 0.136 0.126 0.103 0.100 0.105 0.103 0.119		
																								0.628 0.546 0.488 0.711 0.657 0.465 0.508 0.414 0.404 0.375 0.354 0.299 0.332 0.362 0.278 0.338 0.413 0.423 0.464 0.295 0.271 0.276 0.360 0.399		
																								Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	122	18.02	18.02
0.006 - 0.05	161	23.78	41.80
0.06 - 0.1	187	27.62	69.42
> 0.1	207	30.58	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



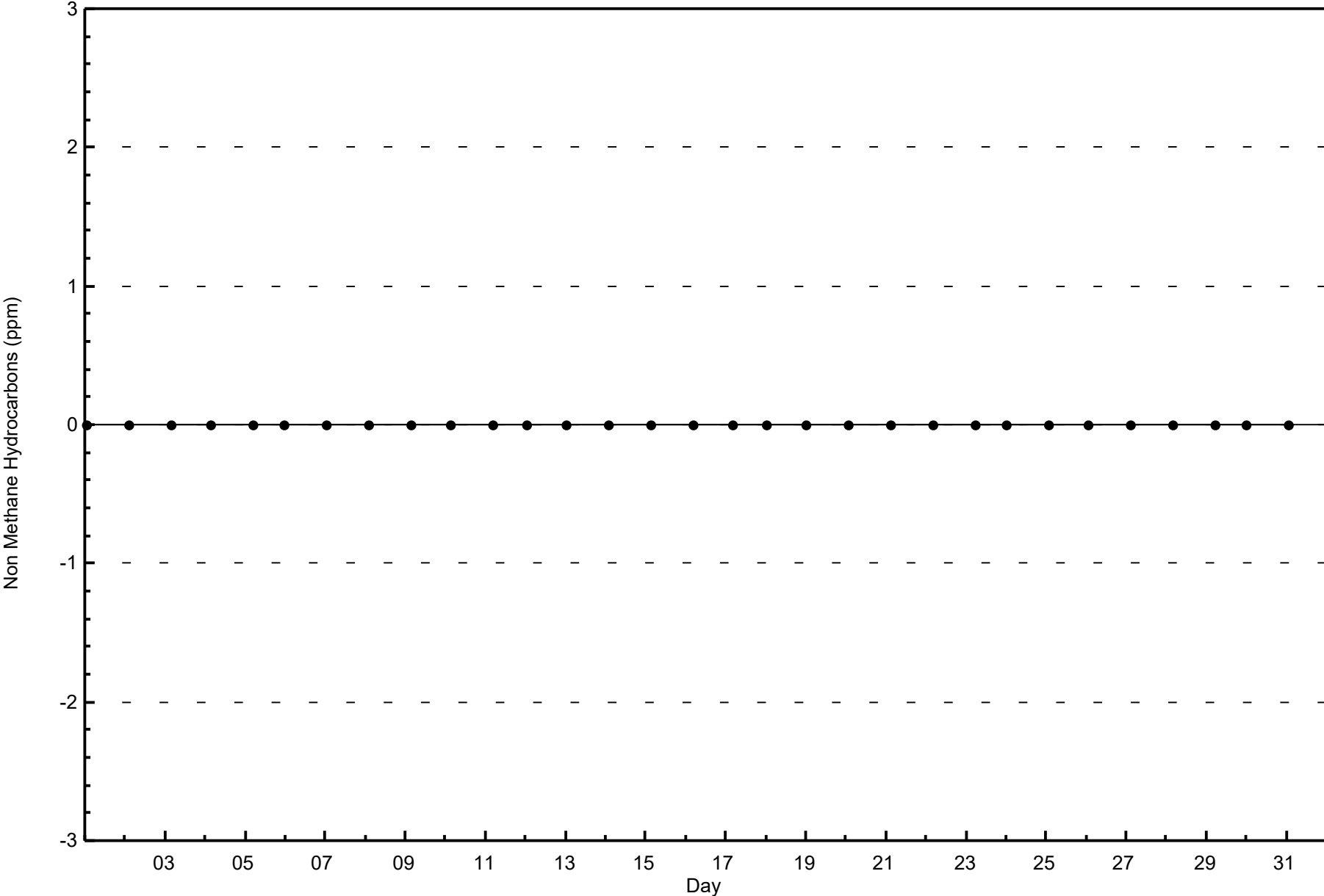
Wood Buffalo Environmental Association
Frequency Distribution

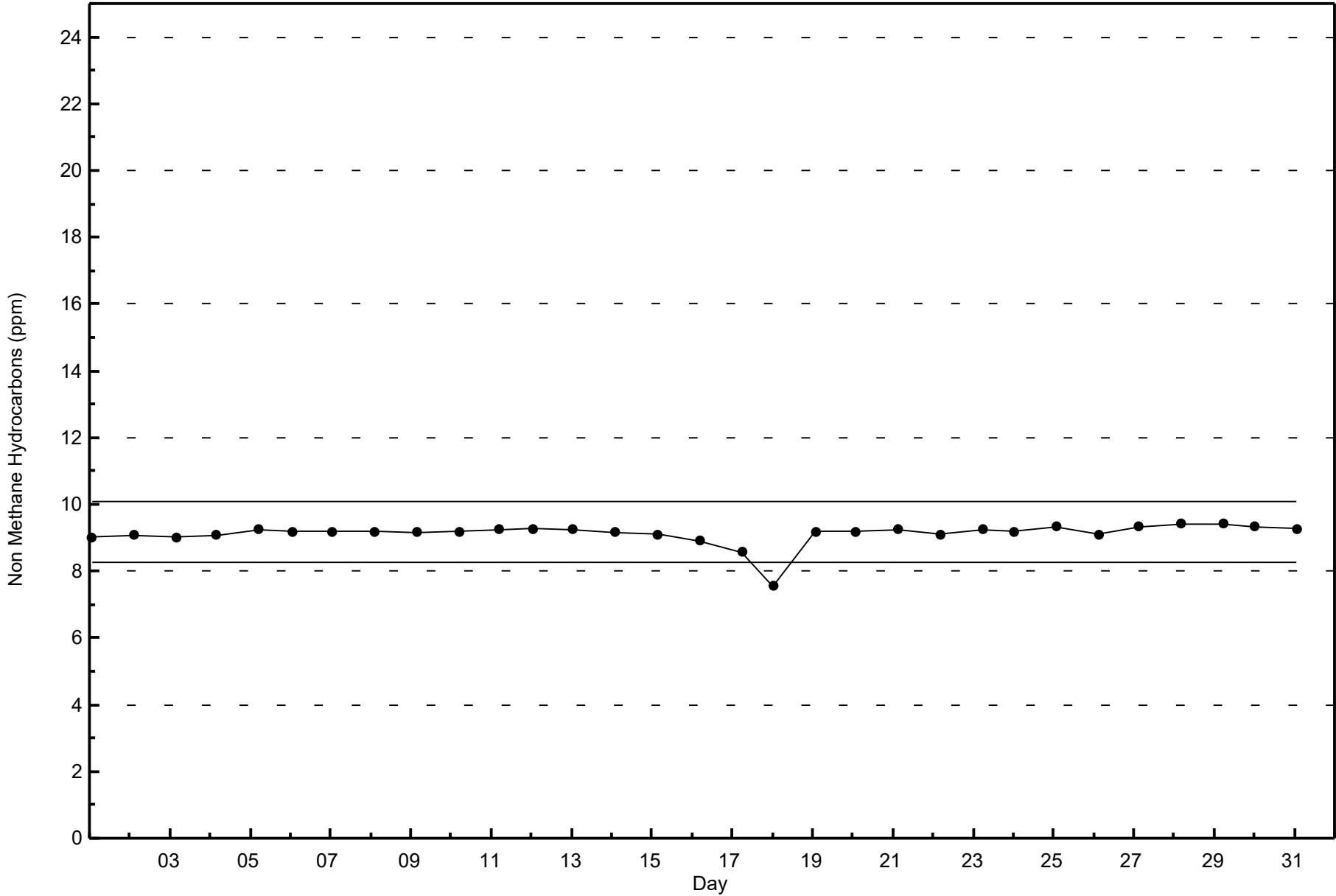
Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	21	21	0	0	0	0	4	3	14	14	5	1	4	8	11	15	121
0.006 - 0.05	42	18	3	0	0	1	5	20	38	16	8	1	0	1	2	5	160
0.06 - 0.1	25	16	8	4	2	3	12	56	24	7	5	2	2	4	2	13	185
> 0.1	30	8	5	1	1	7	36	55	26	9	5	2	0	2	9	7	203
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

Total Number of Valid Hours: 669

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

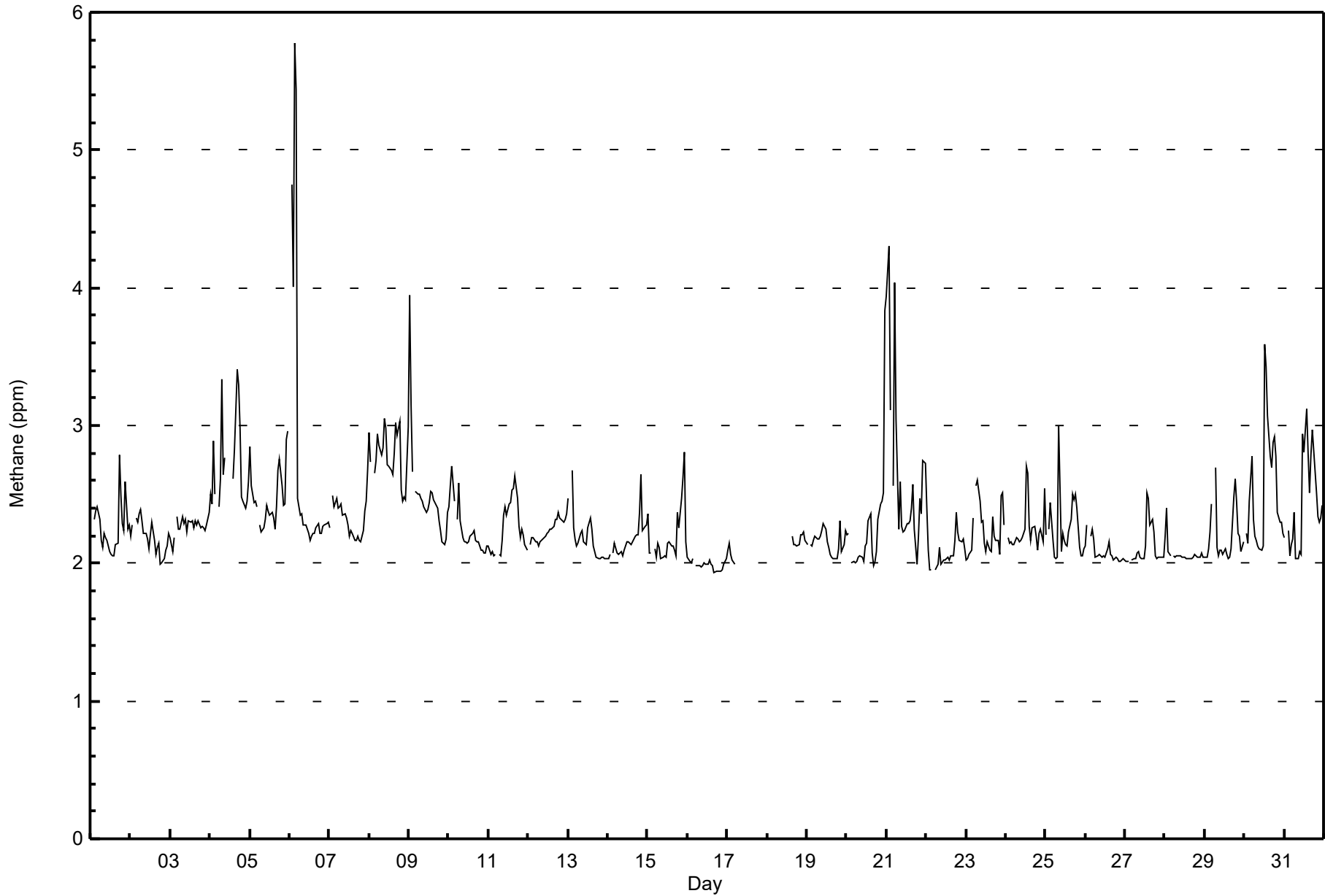
Methane (CH₄) - ppm Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744									
Maximum Value: 5.8 ppm on Jan 6 04:00		Maximum Daily Average: 2.8 ppm on Jan 8		Hours of Data: 677														677											
Minimum Value: 1.9 ppm on Jan 16 17:00		Minimum Daily Average: 2.0 ppm on Jan 16		Hours of Missing Data: 67														67											
Maximum Diurnal Average: 2.5 ppm at hour 2		Minimum Diurnal Average: 2.2 ppm at hour 11		Hours of Calibration: 34														34											
Monthly Average: 2.30 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.4 P ₉₀ = 2.7 P ₉₉ = 3.9		Percent Operational Time: 95.6														95.6											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	2.2	Z	2.3	2.4	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.8	2.5	2.3	2.2	2.6	2.3	2.3	2.3	2.7	2.8		
2-Jan	2.2	2.3	Z	2.3	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.2	2.3	2.2	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.4	2.4	
3-Jan	2.2	2.1	2.2	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.4	
4-Jan	2.5	2.4	2.9	2.5	Z	2.4	2.6	3.3	2.6	2.8	C	C	C	C	2.6	2.8	3.4	3.3	3.0	2.5	2.4	2.4	2.5	2.6	2.7	3.4	3.4		
5-Jan	2.9	2.6	2.4	2.5	2.4	Z	2.3	2.2	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.2	2.4	2.7	2.8	2.6	2.4	2.4	2.9	3.0	2.5	3.0	3.0		
6-Jan	Z	4.7	4.0	5.8	5.4	2.5	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.7	5.8	5.8		
7-Jan	2.3	Z	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.7	2.3	2.7	2.7		
8-Jan	3.0	2.7	Z	2.7	2.8	2.9	2.9	2.8	2.8	3.1	3.0	2.7	2.7	2.7	2.6	2.8	3.0	2.9	3.0	2.5	2.5	2.5	2.5	3.0	2.8	3.1	3.1		
9-Jan	3.9	3.2	2.7	Z	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.2	2.2	2.1	2.2	2.4	2.5	3.9	3.9	
10-Jan	2.4	2.6	2.7	2.4	Z	2.3	2.6	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.7	2.7	2.7	
11-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.4	2.4	2.3	2.4	2.4	2.5	2.5	2.6	2.5	2.3	2.2	2.2	2.2	2.1	2.1	2.3	2.6	2.6	2.6	
12-Jan	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.2	2.4	2.4	2.4	
13-Jan	2.5	Z	2.7	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.7	2.7	2.7	
14-Jan	2.0	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.4	2.6	2.2	2.3	2.3	2.2	2.6	2.6	2.6	
15-Jan	2.4	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.4	2.3	2.5	2.6	2.8	2.2	2.2	2.8	2.8	2.8	
16-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	
17-Jan	2.1	2.1	2.1	2.0	2.0	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
19-Jan	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.1	2.2	2.1	2.3	2.3	2.3
20-Jan	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.4	2.1	2.0	2.0	2.1	2.3	2.4	2.4	2.5	3.8	2.2	3.8	3.8	3.8	
21-Jan	3.9	4.3	3.1	Z	2.6	4.0	3.0	2.2	2.6	2.3	2.2	2.2	2.3	2.3	2.3	2.4	2.6	2.2	2.0	2.2	2.5	2.4	2.7	2.7	2.7	4.3	4.3	4.3	
22-Jan	2.4	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.4	2.4	2.4	
23-Jan	2.0	2.0	2.1	2.1	2.3	Z	2.6	2.6	2.5	2.3	2.3	2.1	2.1	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.1	2.5	2.5	2.3	2.2	2.6	2.6	2.6	
24-Jan	Z	2.2	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.7	2.7	2.3	2.2	2.3	2.3	2.2	2.1	2.2	2.3	2.2	2.5	2.2	2.7	2.7	2.7	
25-Jan	2.2	Z	2.2	2.4	2.2	2.0	2.0	2.0	3.0	2.1	2.2	2.2	2.1	2.1	2.2	2.3	2.5	2.5	2.5	2.4	2.1	2.1	2.1	2.1	2.2	3.0	3.0	3.0	
26-Jan	2.1	2.3	Z	2.2	2.3	2.2	2.0	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	2.3	2.3
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.5	2.5	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.5	2.5	2.5
28-Jan	2.2	2.4	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.4	2.4	2.4
29-Jan	2.0	2.0	2.1	2.2	2.4	Z	2.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.5	2.6	2.4	2.2	2.2	2.1	2.2	2.7	2.7	2.7	
30-Jan	Z	2.2	2.1	2.5	2.8	2.3	2.2	2.2	2.1	2.1	2.1	2.1	3.6	3.4	3.1	2.8	2.7	2.9	2.9	2.8	2.4	2.3	2.3	2.2	2.5	3.6	3.6	3.6	
31-Jan	2.2	Z	2.2	2.0	2.1	2.2	2.4	2.0	2.0	2.1	2.1	2.9	2.8	3.1	2.8	2.5	2.8	3.0	2.8	2.5	2.3	2.3	2.3	2.4	2.4	3.1	3.1	3.1	
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan																													
C - Calibration																													
M - Maintenance																													
AF - Analyzer Failure																													



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	117	17.28	17.28
2.1 - 3.0	541	79.91	97.19
3.1 - 10.0	19	2.81	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	39	21	0	0	0	0	0	0	7	15	3	1	3	4	10	13	116
2.1 - 3.0	79	42	15	5	3	10	49	132	93	30	19	4	3	11	12	27	534
3.1 - 10.0	0	0	1	0	0	1	8	2	2	1	1	1	0	0	2	0	19
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

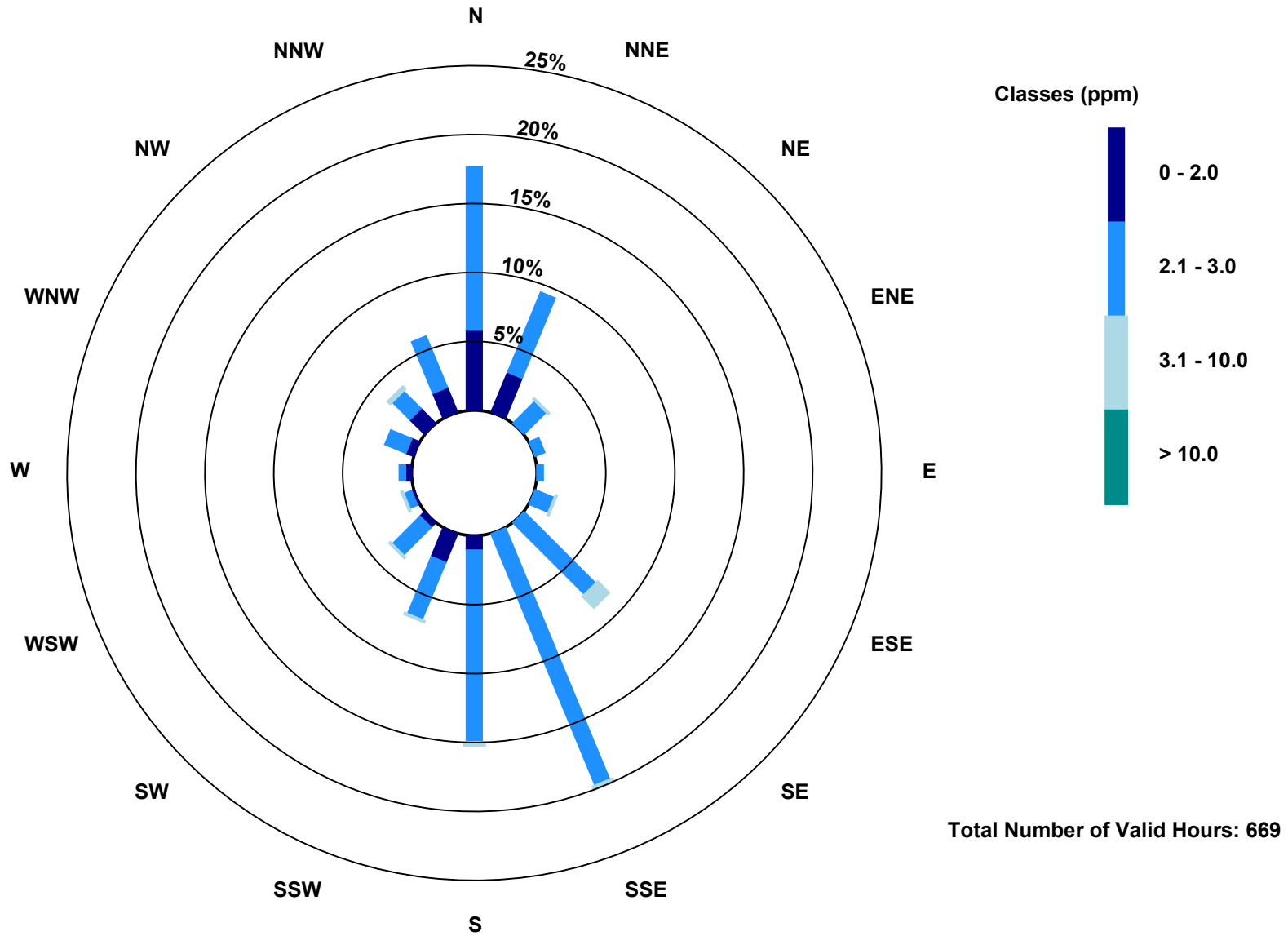
Total Number of Valid Hours: 669

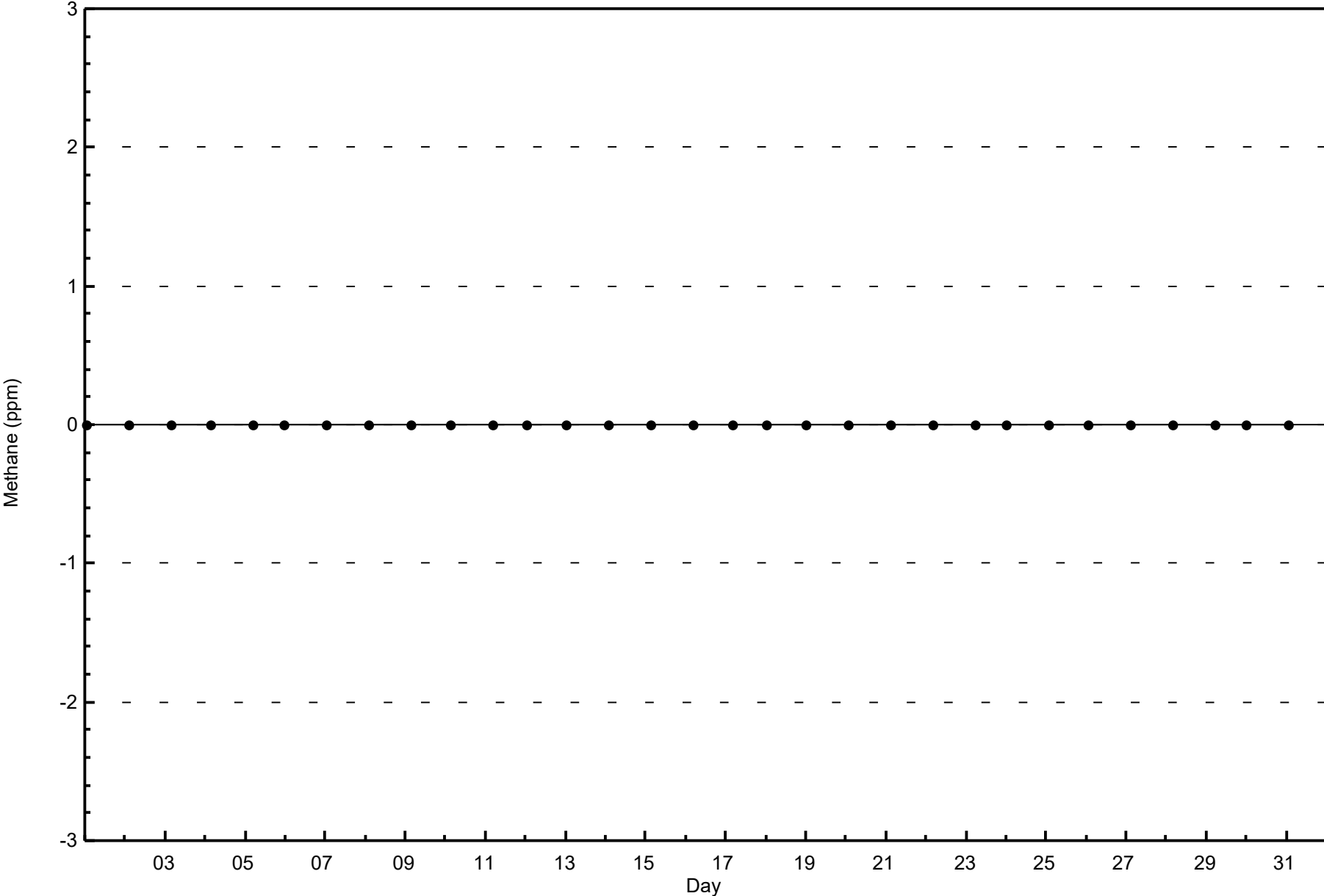
Total Number of Hours: 744

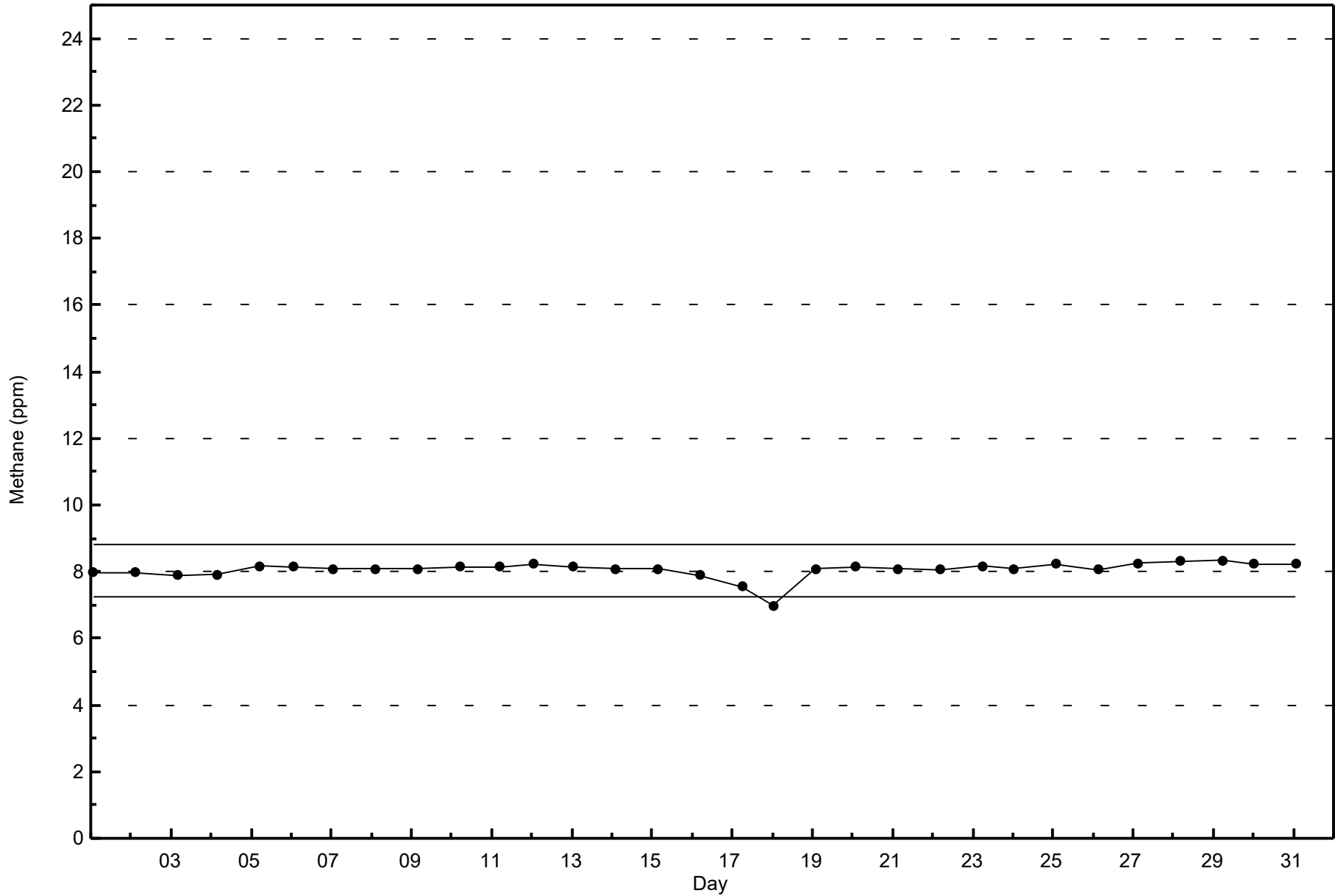


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

Fort Hills - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 133.5 ppb on Jan 6 04:00	Maximum Daily Average: 53.0 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.0 ppb on Jan 1 08:00	Minimum Daily Average: 0.3 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 19.1 ppb at hour 18	Minimum Diurnal Average: 6.7 ppb at hour 21		Hours of Calibration:	37
Monthly Average: 12.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 2.9 Q ₃ = 13.7 P ₉₀ = 39.3 P ₉₉ = 104.1		Percent Operational Time:	100.0

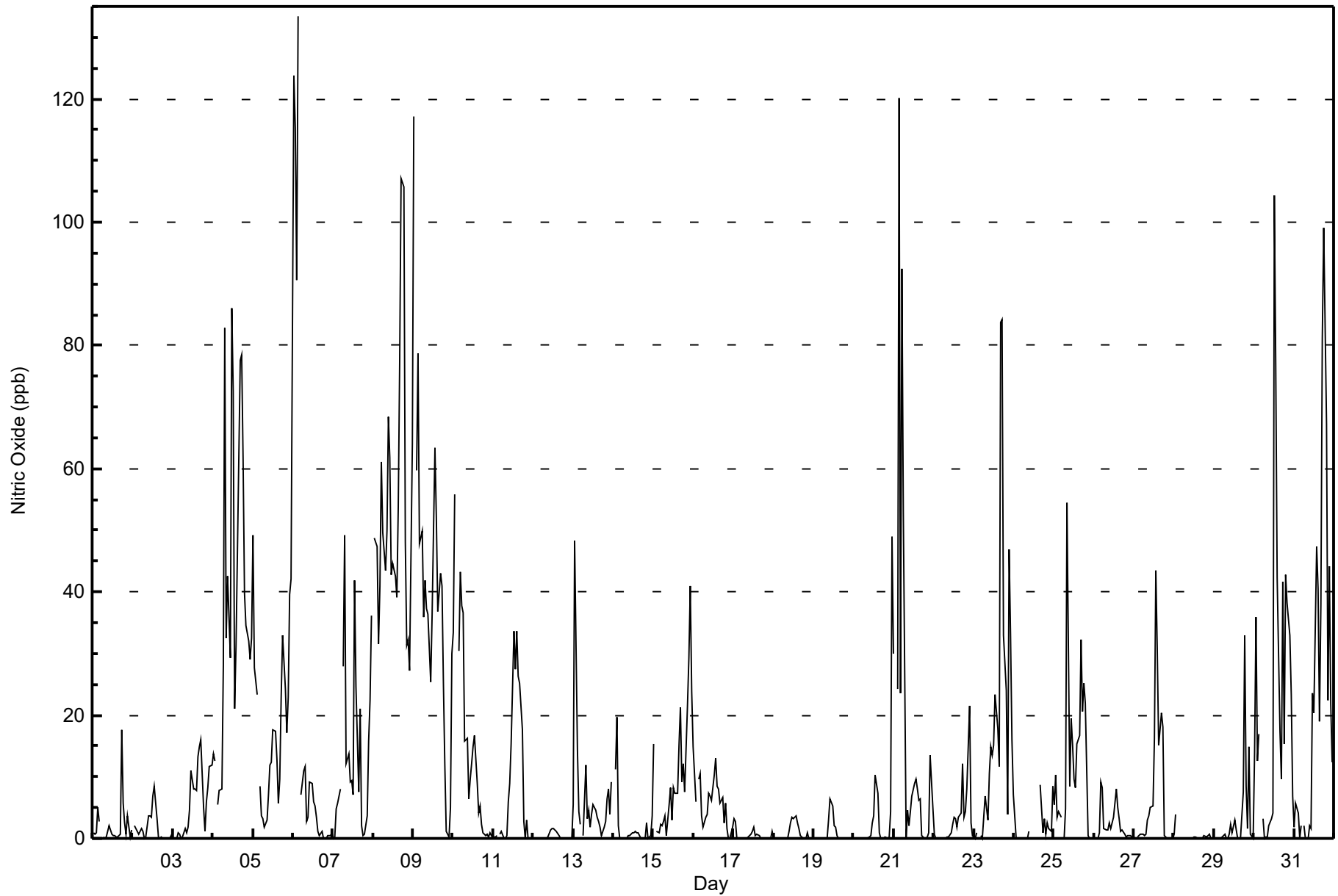
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.9	0.6	0.8	5.1	2.7	Z	0.1	0.0	0.2	1.1	2.0	0.6	0.5	0.5	0.3	0.2	0.6	17.5	5.6	2.5	0.7	3.7	0.3	1.4	2.1	17.5																							
2-Jan	Z	2.0	1.5	0.8	1.0	1.5	1.1	0.1	0.2	3.6	3.6	3.4	6.8	8.4	3.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.3	1.7	8.4																							
3-Jan	0.0	Z	0.0	0.9	0.7	0.0	0.2	1.6	0.9	1.9	4.6	11.1	7.9	8.0	7.8	13.3	14.9	16.0	4.9	1.1	6.0	8.3	11.7	12.0	5.8	16.0																							
4-Jan	13.6	12.6	Z	5.5	7.7	8.0	28.2	82.9	32.4	42.6	29.2	85.9	72.5	21.1	31.4	46.8	77.6	78.5	61.7	39.9	34.6	32.1	29.1	32.5	39.4	85.9																							
5-Jan	49.2	27.6	23.3	Z	8.4	3.8	3.2	1.8	3.0	7.0	11.8	12.3	17.6	17.4	12.9	5.8	9.7	23.0	32.9	24.2	17.1	23.0	39.5	42.1	18.1	49.2																							
6-Jan	123.8	115.2	90.6	133.5	Z	7.1	11.1	11.7	2.7	3.5	9.1	8.9	5.9	5.4	3.5	1.2	0.4	1.1	0.0	0.0	0.0	0.5	0.5	0.9	23.3	133.5																							
7-Jan	0.0	0.2	4.7	5.7	8.1	Z	28.0	49.1	12.2	13.8	9.3	9.3	7.1	41.9	24.8	7.6	21.0	2.0	0.5	0.7	3.6	15.9	22.4	36.2	14.1	49.1																							
8-Jan	Z	48.9	47.4	31.7	41.0	61.1	49.6	43.4	49.9	68.5	61.7	42.7	44.7	42.6	39.1	53.8	77.3	107.0	105.8	48.0	31.3	32.2	27.2	64.1	53.0	107.0																							
9-Jan	117.2	Z	59.8	78.7	47.8	49.9	35.9	41.8	37.4	36.3	25.4	36.4	50.2	63.4	51.8	36.8	42.9	40.9	25.2	11.8	1.2	0.2	5.1	30.1	40.3	117.2																							
10-Jan	33.4	55.9	Z	30.5	43.2	37.8	36.5	15.7	16.2	6.4	9.6	12.2	14.8	16.6	8.8	4.0	5.3	2.3	0.8	0.4	0.6	0.3	0.9	0.4	15.3	55.9																							
11-Jan	0.2	0.2	0.5	Z	0.7	1.1	0.0	0.0	0.3	6.0	8.9	15.4	33.5	27.6	33.6	26.3	25.2	17.7	2.6	0.0	2.9	0.0	0.0	0.0	8.8	33.6																							
12-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	1.4	1.7	1.5	1.4	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7																							
13-Jan	5.4	48.2	14.5	4.3	2.3	Z	0.4	11.8	3.2	4.6	1.8	3.9	5.4	4.7	3.3	2.7	1.8	0.4	1.8	2.8	6.4	8.1	4.0	9.1	6.6	48.2																							
14-Jan	Z	11.2	19.8	2.2	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.9	0.9	1.1	1.0	0.9	0.1	0.0	0.0	0.0	2.4	0.0	0.5	3.7	2.0	19.8																							
15-Jan	15.3	Z	1.2	0.8	2.4	2.0	2.7	3.7	0.5	5.4	8.1	2.9	8.3	7.3	7.3	15.2	21.2	9.2	12.1	7.5	21.4	29.3	40.9	23.8	10.8	40.9																							
16-Jan	14.8	5.8	Z	9.6	10.4	3.8	1.9	3.4	3.9	7.3	6.8	6.1	10.2	13.1	8.4	7.9	5.7	6.6	2.5	5.7	1.5	0.0	0.0	1.9	6.0	14.8																							
17-Jan	3.2	2.7	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.3	1.8	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	3.2																							
18-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.2	2.5	3.4	3.2	3.6	2.5	1.7	0.4	0.2	0.0	0.1	0.9	0.0	0.0	0.0	0.9	3.6																							
19-Jan	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	3.0	6.3	5.2	2.2	1.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	6.3																							
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	2.6	3.7	10.3	7.2	0.9	0.0	0.0	0.0	0.2	0.0	0.3	4.4	49.0	3.5	49.0																							
21-Jan	30.0	Z	24.2	120.1	23.5	92.4	52.9	0.1	4.5	2.1	4.3	6.9	8.9	9.7	8.0	6.3	6.5	0.5	0.0	0.0	0.1	0.9	13.6	4.8	18.3	120.1																							
22-Jan	0.7	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	1.0	2.3	3.5	3.2	1.8	3.3	4.2	12.1	3.5	4.3	7.9	21.4	2.5	0.5	3.2	21.4																							
23-Jan	0.5	0.0	1.0	Z	0.4	0.0	3.4	6.8	3.1	10.5	14.8	13.4	15.2	23.3	17.8	11.7	83.8	84.1	33.0	23.9	3.9	46.9	33.1	15.9	19.4	84.1																							
24-Jan	7.2	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.1	C	C	C	C	C	C	8.6	1.0	3.3	0.6	2.6	1.5	1.2	8.4	--	8.6																							
25-Jan	5.5	10.4	3.4	4.3	3.4	Z	0.0	4.7	54.6	8.5	19.5	15.0	9.6	8.2	15.4	16.7	32.2	20.5	25.2	22.0	0.4	0.0	0.0	0.0	12.2	54.6																							
26-Jan	Z	0.0	0.0	1.0	9.2	8.2	1.7	1.5	1.3	2.5	1.6	2.6	3.4	8.0	5.1	3.3	1.0	1.4	0.6	0.3	0.5	0.4	0.4	0.3	2.4	9.2																							
27-Jan	0.1	Z	0.1	0.4	0.6	0.6	0.4	0.8	3.1	3.6	5.0	5.3	16.3	43.5	30.6	15.1	20.4	18.1	0.5	0.2	0.0	0.0	0.0	0.0	7.2	43.5																							
28-Jan	0.8	3.9	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.4	0.2	0.4	0.6	0.1	0.1	0.3	3.9																							
29-Jan	0.0	0.0	0.0	Z	0.0	0.1	0.6	0.0	0.0	0.6	2.3	0.9	2.9	1.5	0.0	0.0	0.0	7.6	33.0	8.5	1.6	14.9	0.7	0.0	3.3	33.0																							
30-Jan	13.9	36.0	12.5	17.0	Z	3.2	0.1	0.2	0.3	2.0	3.1	4.0	104.4	76.6	42.3	17.4	9.5	41.7	15.3	42.8	38.3	32.9	23.3	6.9	23.6	104.4																							
31-Jan	1.9	5.7	4.1	0.1	2.0	Z	2.1	0.1	0.1	2.0	1.5	23.5	20.4	47.3	40.5	18.9	37.9	81.2	99.0	67.2	22.5	44.1	21.6	12.3	24.2	99.0																							
																								16.8	14.9	11.9	17.4	8.3	11.2	8.4	9.1	7.4	8.0	8.6	11.3	16.1	17.3	13.7	10.6	16.4	19.1	15.2	10.2	6.7	10.2	9.1	11.5	Diurnal Average	
																								123.8	115.2	90.6	133.5	47.8	92.4	52.9	82.9	54.6	68.5	61.7	85.9	104.4	76.6	51.8	53.8	83.8	107.0	105.8	67.2	38.3	46.9	40.9	64.1	Diurnal Maximum	

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	569	80.48	80.48
21 - 40	70	9.90	90.38
41 - 80	52	7.36	97.74
81 - 159	15	2.12	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	85	57	13	4	2	5	42	115	103	50	21	4	6	12	17	29	565
21 - 40	17	1	1	0	0	3	8	14	10	2	0	1	0	2	4	4	67
11 - 80	15	1	2	1	1	3	5	9	9	1	0	0	0	0	1	4	52
81 - 159	2	2	0	0	0	0	4	1	1	0	2	1	0	0	1	0	14
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	61	16	5	3	11	59	139	123	53	23	6	6	14	23	37	698

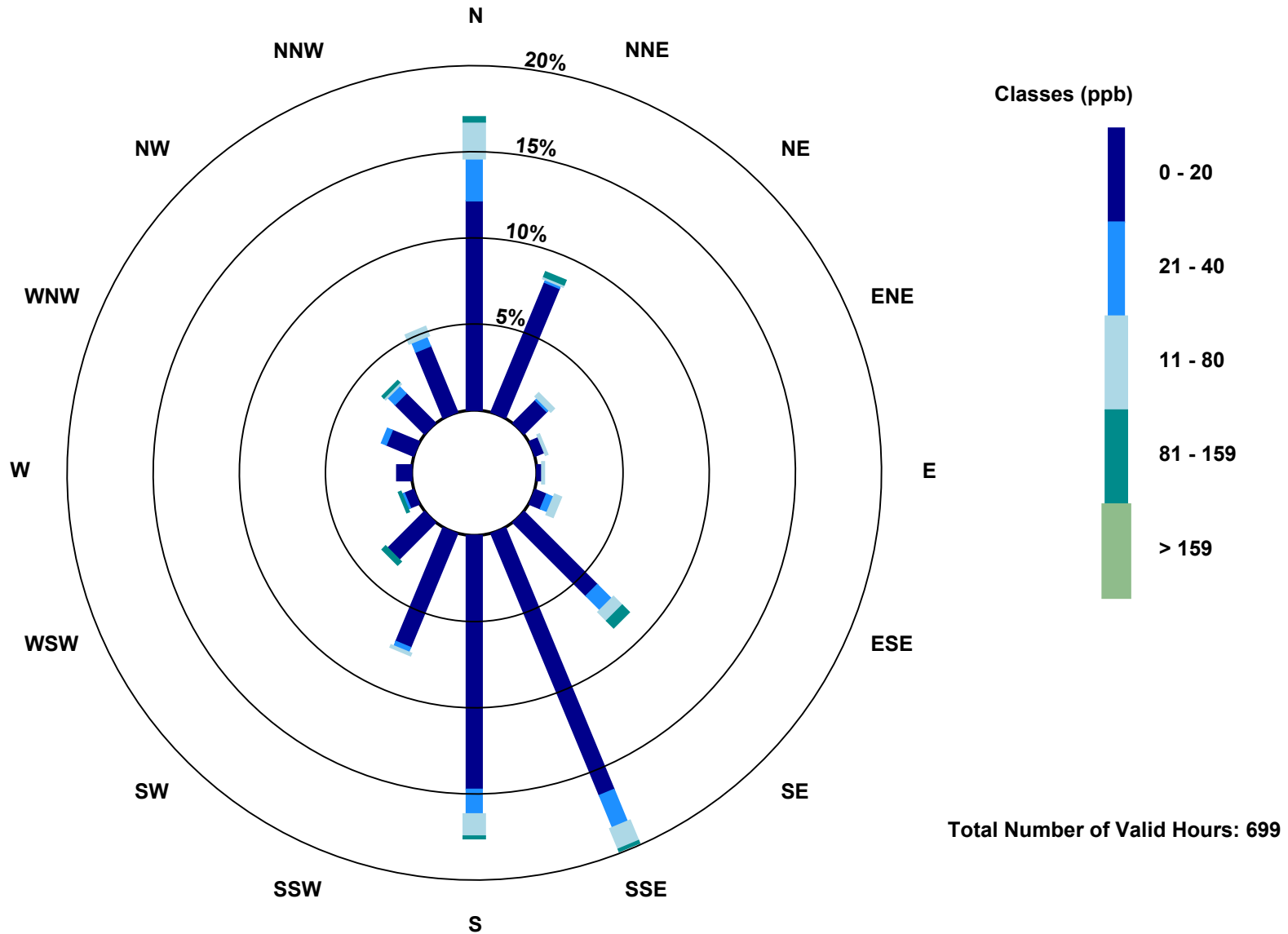
Total Number of Valid Hours: 699

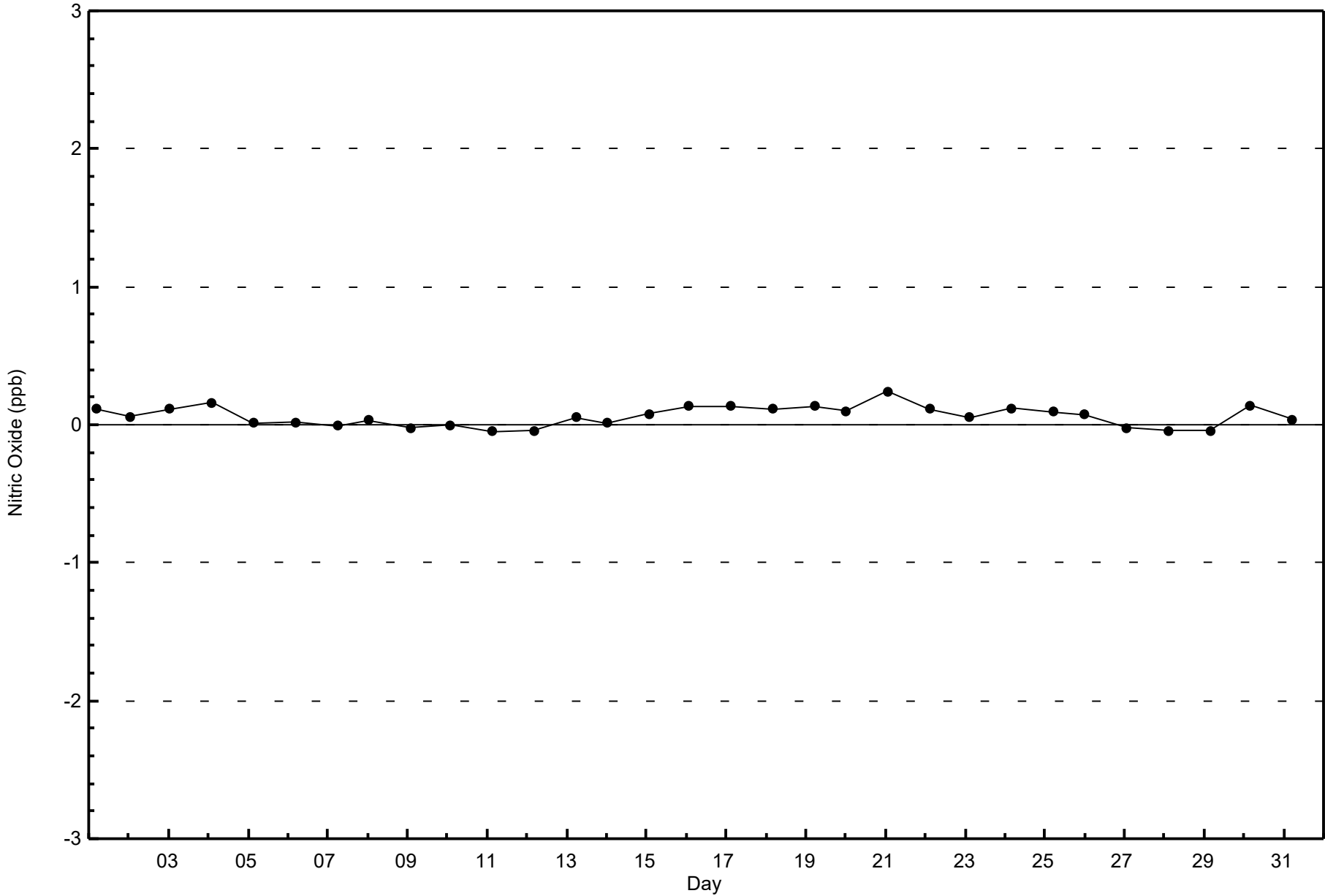
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Fort Hills

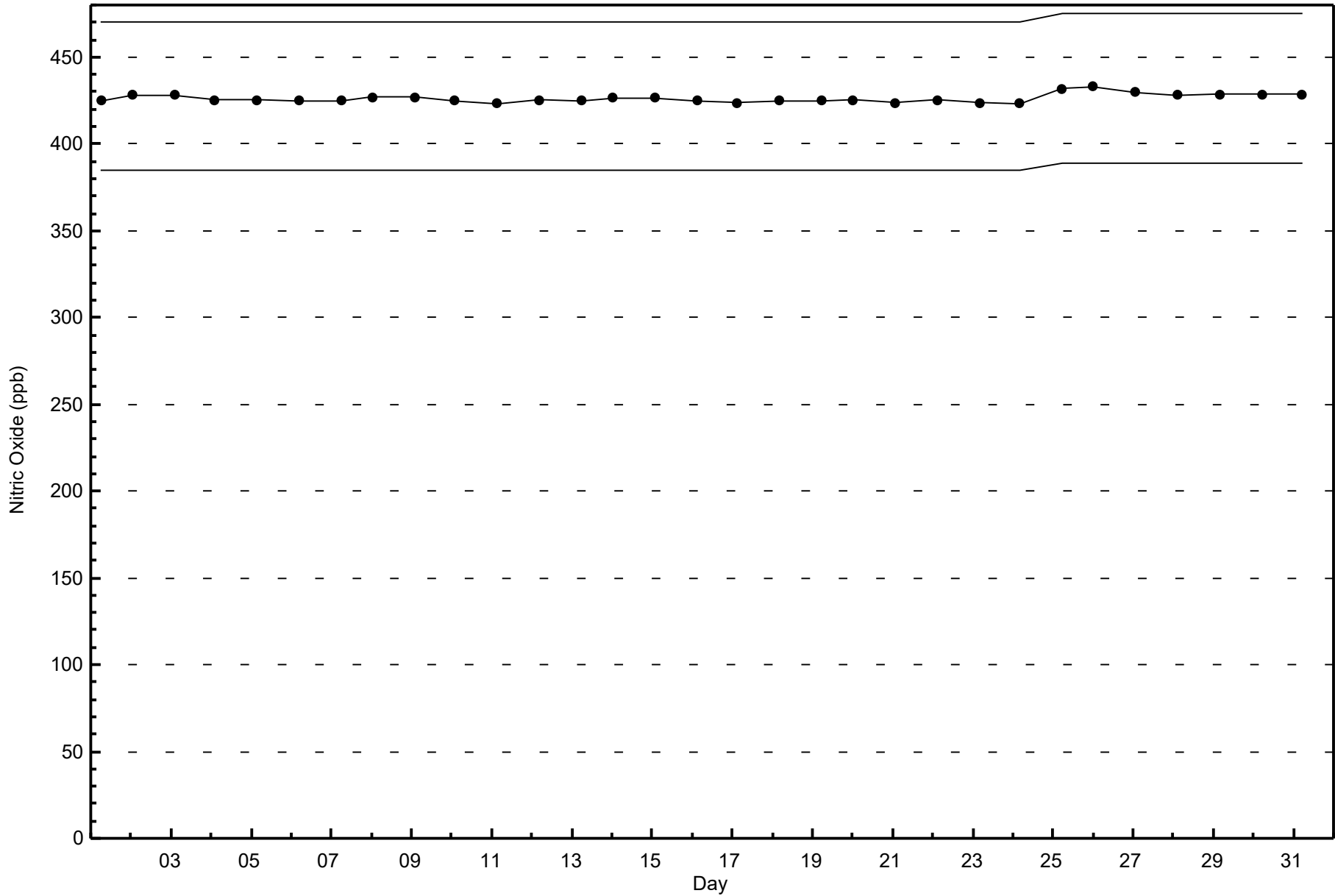






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Fort Hills - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

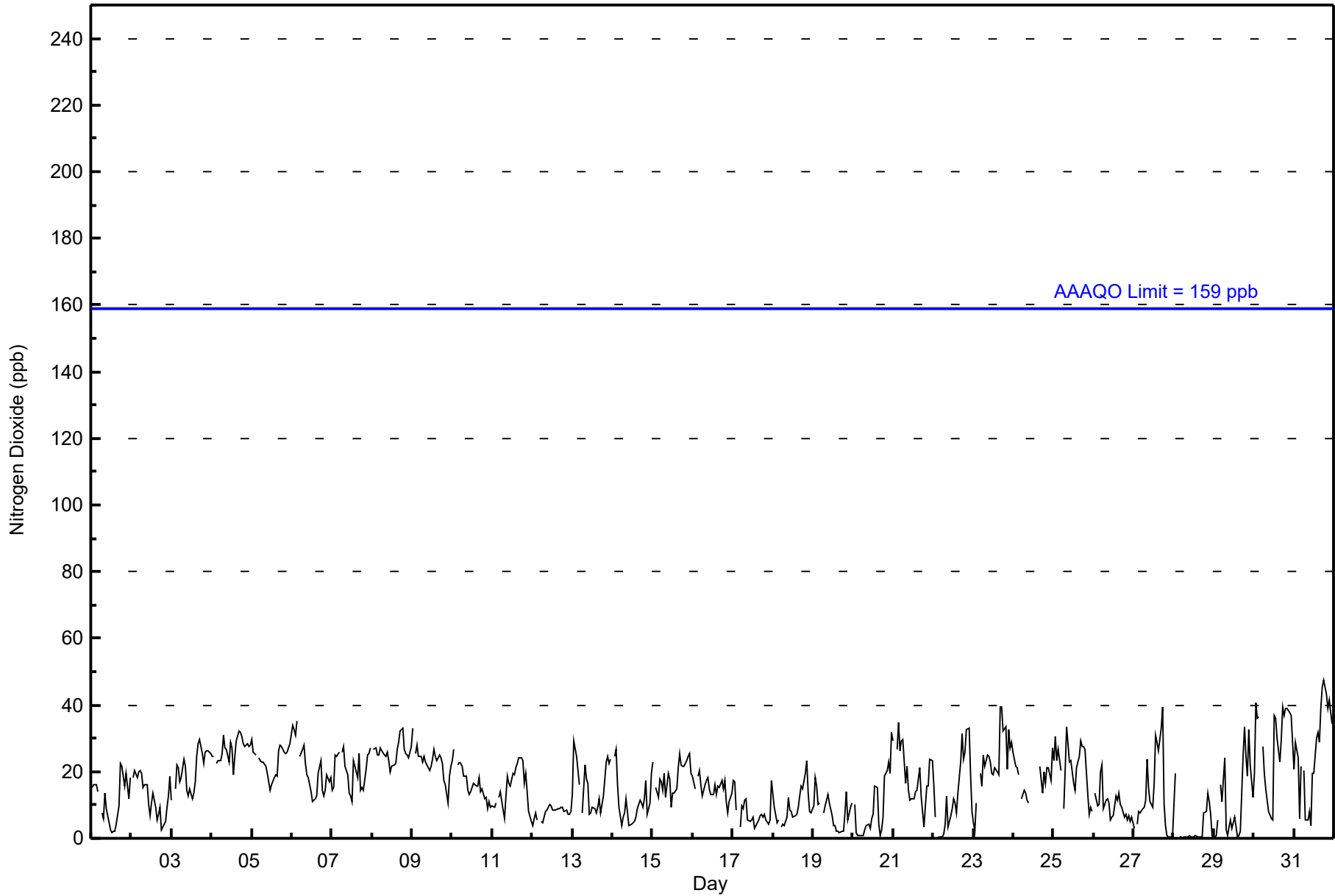
Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 47.4 ppb on Jan 31 19:00		Maximum Daily Average: 27.8 ppb on Jan 30		Hours of Data: 707																	11.8		22.5																										
Minimum Value: 0.2 ppb on Jan 28 06:00		Minimum Daily Average: 3.7 ppb on Jan 28		Hours of Missing Data: 37																	12.5		20.5																										
Maximum Diurnal Average: 20.4 ppb at hour 18		Minimum Diurnal Average: 11.3 ppb at hour 12		Hours of Calibration: 37																	20.3		27.4																										
Monthly Average: 16.23 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 4.1 Q ₁ = 8.6 Median = 15.7 Q ₃ = 23.2 P ₉₀ = 28.0 P ₉₉ = 39.3		Percent Operational Time: 100.0																	20.3		27.4																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	15.1	16.0	15.9	16.2	14.0	Z	7.6	6.1	13.5	8.7	6.9	2.6	1.7	2.0	2.3	4.2	9.7	22.5	21.7	18.6	15.7	19.7	11.8	18.2	11.8	22.5																							
2-Jan	Z	18.4	20.2	18.4	20.1	20.5	19.3	15.2	16.2	16.0	10.2	6.7	10.7	13.5	9.3	5.3	7.2	9.5	2.4	3.2	5.0	9.5	12.6	18.6	12.5	20.5																							
3-Jan	11.5	Z	14.8	21.9	21.1	16.8	18.1	23.8	21.5	14.6	12.6	14.9	11.9	13.7	16.8	24.6	28.4	29.6	25.3	22.4	25.7	26.1	26.3	25.6	20.3	29.6																							
4-Jan	24.7	24.6	Z	22.6	23.5	23.4	25.6	31.0	27.2	26.6	22.9	28.8	27.0	19.1	24.4	29.4	32.1	31.6	30.6	28.2	27.7	28.6	27.7	28.0	26.8	32.1																							
5-Jan	29.7	26.0	25.2	Z	24.0	23.1	22.9	22.8	21.6	19.7	16.8	14.2	16.0	18.1	18.9	18.6	26.2	27.8	27.5	25.9	25.3	26.0	27.2	28.3	23.1	29.7																							
6-Jan	33.9	32.6	30.9	35.1	Z	24.4	26.9	27.8	22.5	19.1	18.2	14.0	11.0	11.4	12.0	12.5	19.4	23.2	14.3	12.7	14.2	19.0	17.0	18.4	20.5	35.1																							
7-Jan	14.3	15.1	25.2	24.5	25.8	Z	25.9	27.4	21.6	19.1	13.6	12.6	11.0	23.4	21.5	18.2	25.3	14.4	15.4	14.3	20.7	24.9	25.6	27.2	20.3	27.4																							
8-Jan	Z	26.9	27.0	24.8	24.9	27.0	26.4	24.9	24.4	26.0	23.1	20.1	21.4	22.0	22.5	26.5	28.8	32.0	33.1	26.6	25.5	24.8	24.1	27.6	25.7	33.1																							
9-Jan	33.1	Z	25.5	28.0	24.6	24.7	22.9	24.6	22.9	22.0	20.3	21.8	23.8	26.9	24.6	23.4	24.9	24.0	22.4	17.3	15.9	10.8	18.6	21.8	22.8	33.1																							
10-Jan	23.5	26.5	Z	22.2	22.9	22.3	21.8	18.6	18.8	14.2	13.2	13.8	15.1	16.6	15.6	15.6	18.4	14.1	14.9	11.7	12.3	8.8	11.2	9.4	16.6	26.5																							
11-Jan	9.7	9.4	10.7	Z	12.3	14.1	8.6	6.0	12.6	18.6	16.7	15.8	19.3	19.1	21.3	22.4	24.0	24.3	23.4	16.4	19.5	13.9	8.2	5.0	15.3	24.3																							
12-Jan	4.0	6.0	7.6	5.6	Z	5.0	4.8	6.3	7.9	8.4	10.0	9.7	8.5	8.4	8.6	9.0	9.1	9.4	9.3	8.2	8.3	7.3	7.2	7.9	7.7	10.0																							
13-Jan	13.3	29.4	24.7	20.4	15.9	Z	7.7	22.0	17.9	16.5	7.2	7.8	9.3	9.1	7.6	9.5	11.7	7.7	12.7	17.9	22.7	24.4	22.4	23.8	15.7	29.4																							
14-Jan	Z	24.6	26.5	15.9	9.5	3.8	6.4	7.6	11.9	8.2	3.9	4.3	4.5	5.0	6.2	8.8	11.5	10.8	9.4	11.8	17.4	7.4	10.7	19.3	10.7	26.5																							
15-Jan	22.9	Z	15.4	12.2	17.7	17.1	14.3	19.6	12.1	19.3	17.6	9.4	13.6	13.5	14.9	21.1	25.4	22.2	21.5	21.4	23.2	24.6	25.6	19.5	18.4	25.6																							
16-Jan	18.6	15.0	Z	18.8	20.5	15.9	12.8	16.3	17.5	18.3	14.7	13.0	13.2	16.1	13.0	15.6	15.2	17.2	15.0	17.4	11.0	7.6	11.2	13.7	15.1	20.5																							
17-Jan	17.2	17.1	8.5	Z	3.5	9.9	9.0	11.3	11.9	5.7	4.9	5.6	6.4	3.1	3.7	5.5	6.7	7.1	6.3	7.4	5.6	4.2	5.7	17.3	8.0	17.3																							
18-Jan	13.1	9.2	4.8	5.5	Z	3.6	4.3	3.8	6.4	12.1	8.5	7.9	6.5	6.9	7.2	9.3	12.9	15.7	14.7	19.4	23.4	13.7	8.1	7.5	9.8	23.4																							
19-Jan	9.9	18.4	15.5	10.1	10.5	Z	7.6	9.8	11.3	13.0	10.6	6.9	3.7	3.7	2.3	2.1	1.9	2.1	2.1	7.2	13.9	5.3	9.5	10.5	8.2	18.4																							
20-Jan	Z	10.2	1.7	0.8	0.7	0.7	1.0	2.4	3.9	4.3	2.9	5.9	7.1	15.7	15.4	4.3	0.9	2.4	6.5	18.7	20.5	22.7	19.6	31.9	8.7	31.9																							
21-Jan	29.3	Z	26.5	34.6	26.1	29.2	29.5	16.5	21.6	14.2	11.6	11.8	12.0	13.9	14.4	17.7	21.2	12.9	3.2	9.7	15.6	15.8	23.6	23.1	18.9	34.6																							
22-Jan	15.8	6.2	Z	0.3	0.3	0.6	1.1	4.3	12.7	3.6	6.6	8.8	12.0	10.6	7.8	13.7	22.8	31.2	23.6	26.0	32.5	32.9	18.9	8.2	13.1	32.9																							
23-Jan	4.8	2.0	10.5	Z	19.3	15.8	24.9	21.5	25.0	24.4	23.0	19.7	19.0	21.2	20.0	19.2	39.3	39.3	32.0	33.3	20.9	32.8	27.3	28.7	22.8	39.3																							
24-Jan	25.9	21.8	21.2	18.9	Z	12.0	14.6	13.7	11.5	10.5	C	C	C	C	C	C	21.5	13.4	19.8	16.4	21.3	21.2	17.3	27.2	--	27.2																							
25-Jan	23.2	30.7	23.3	26.7	20.5	Z	8.7	20.6	33.4	23.0	23.2	19.9	16.4	14.4	21.1	24.7	29.2	27.7	27.4	26.7	13.1	7.2	9.4	8.0	20.8	33.4																							
26-Jan	Z	13.5	9.9	10.3	19.9	22.0	8.8	11.3	11.7	10.6	5.7	6.5	6.9	12.8	11.3	13.4	10.3	9.4	6.3	7.3	5.6	6.8	5.2	6.2	10.1	22.0																							
27-Jan	3.0	Z	4.1	8.1	7.5	9.0	9.4	11.5	23.7	15.4	11.2	9.5	16.5	31.0	28.8	26.3	33.1	39.3	10.5	3.7	1.0	0.6	0.6	0.6	13.2	39.3																							
28-Jan	10.2	19.6	Z	0.5	0.6	0.2	0.4	0.6	0.5	0.8	0.5	0.4	0.5	0.7	0.5	0.6	0.3	0.5	7.8	8.2	13.4	10.9	7.4	0.9	3.7	19.6																							
29-Jan	0.2	1.0	5.7	Z	16.1	10.9	24.0	2.6	1.0	3.4	5.5	2.9	6.4	3.6	0.6	0.8	2.3	25.1	33.5	24.5	18.7	32.6	22.0	12.3	11.1	33.5																							
30-Jan	19.6	40.5	36.2	36.3	Z	27.5	19.7	14.8	11.4	8.2	6.0	5.5	36.7	35.9	30.1	23.0	29.7	39.5	36.9	38.8	38.8	37.8	37.0	28.9	27.8	40.5																							
31-Jan	20.6	29.0	24.1	6.0	21.4	Z	20.2	5.7	5.7	8.1	3.8	19.3	19.5	30.2	31.7	29.0	38.9	45.3	47.4	43.2	39.1	41.5	37.9	34.4	26.2	47.4																							
																								17.2	18.8	17.8	17.1	16.3	15.2	14.7	14.5	15.5	14.0	11.7	11.3	12.9	14.7	14.5	15.1	19.0	20.4	18.6	18.2	18.5	18.4	17.3	18.0	Diurnal Average	
																								33.9	40.5	36.2	36.3	26.1	29.2	29.5	31.0	33.4	26.6	23.2	28.8	36.7	35.9	31.7	29.4	39.3	45.3	47.4	43.2	39.1	41.5	37.9	34.4	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	461	65.21	65.21
21 - 40	241	34.09	99.29
41 - 80	5	0.71	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	70	45	5	2	1	2	27	87	97	42	17	4	6	12	15	27	459
21 - 40	48	14	11	3	2	9	32	52	26	11	6	2	0	2	8	9	235
11 - 80	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	61	16	5	3	11	59	139	123	53	23	6	6	14	23	37	699

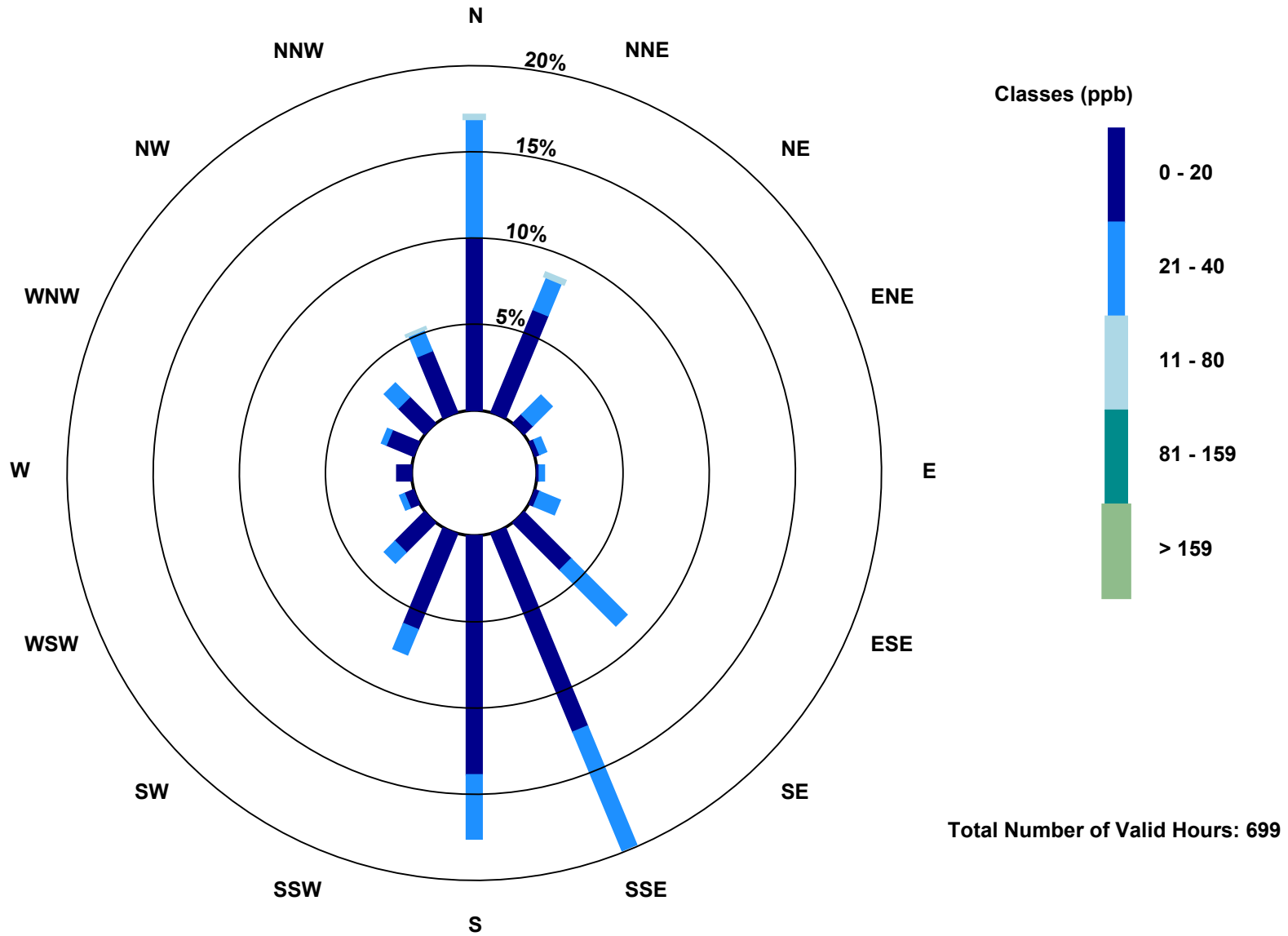
Total Number of Valid Hours: 699

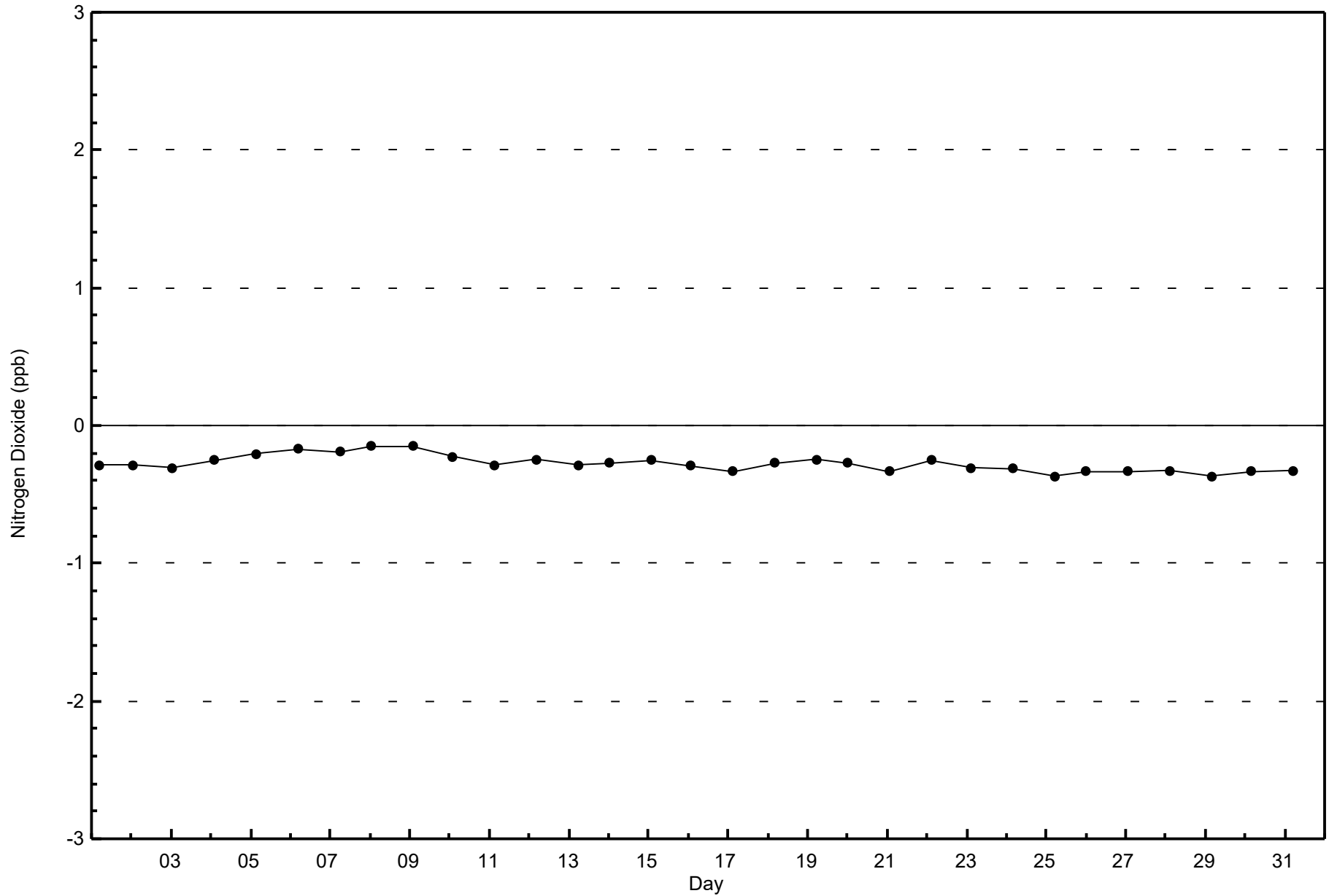
Total Number of Hours: 744

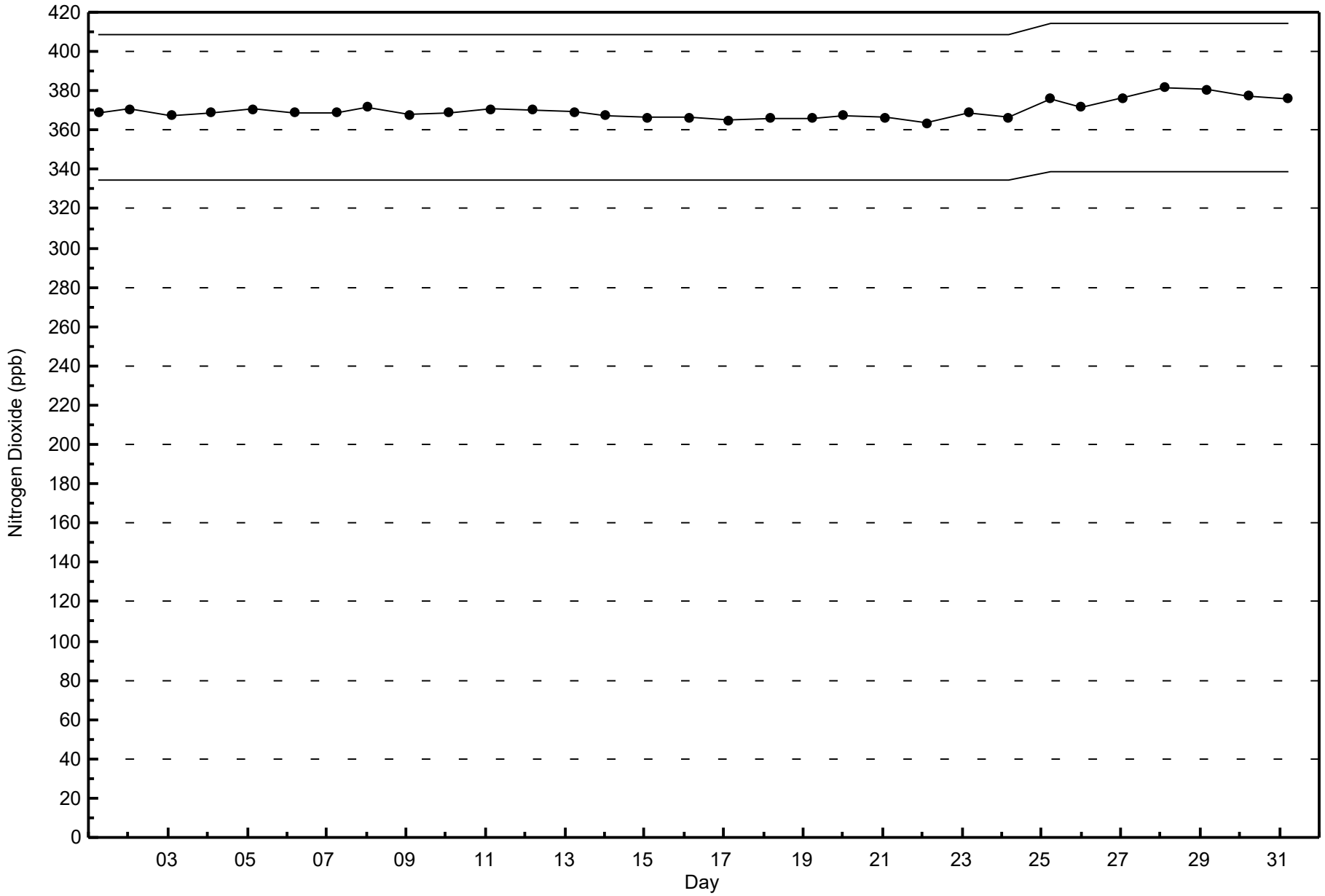


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Hills









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 168.6 ppb on Jan 6 04:00	Maximum Daily Average: 78.7 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.2 ppb on Jan 28 06:00	Minimum Daily Average: 4.0 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 39.4 ppb at hour 18	Minimum Diurnal Average: 20.3 ppb at hour 11		Hours of Calibration:	37
Monthly Average: 28.22 ppb	Percentiles: P ₁ = 0.5 P ₁₀ = 4.4 Q ₁ = 9.6 Median = 19.6 Q ₃ = 36.4 P ₉₀ = 66.0 P ₉₉ = 139.0		Percent Operational Time:	100.0

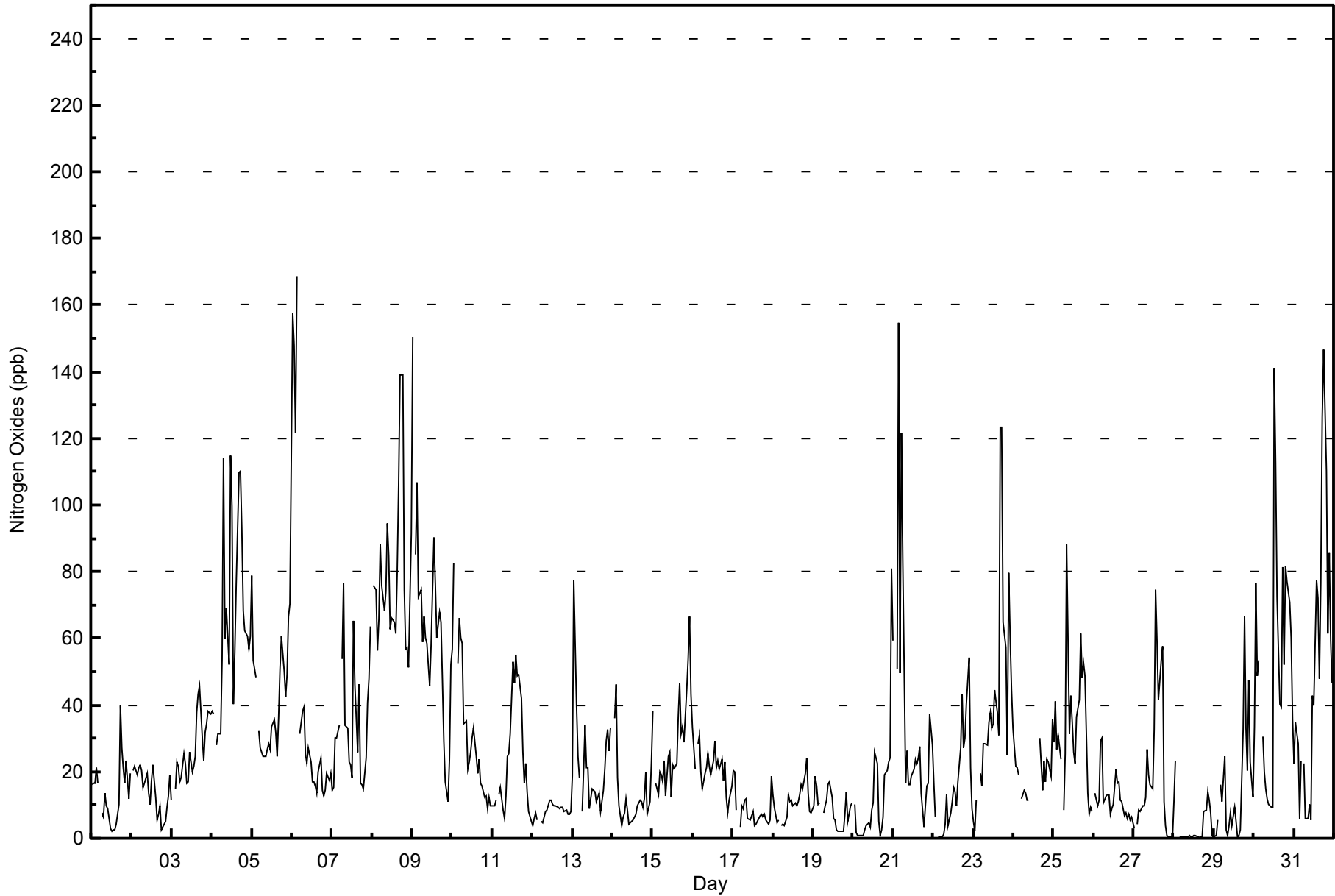
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	16.0	16.6	16.7	21.3	16.7	Z	7.7	6.1	13.7	9.8	8.9	3.2	2.2	2.5	2.6	4.4	10.3	40.0	27.3	21.1	16.4	23.4	12.1	19.6	13.8	40.0																							
2-Jan	Z	20.4	21.7	19.2	21.1	22.0	20.4	15.3	16.4	19.6	13.8	10.1	17.5	21.9	12.4	5.6	7.2	9.7	2.4	3.2	5.0	9.5	12.7	18.9	14.2	22.0																							
3-Jan	11.5	Z	14.8	22.8	21.8	16.8	18.3	25.4	22.4	16.5	17.2	26.0	19.8	21.7	24.6	37.9	43.3	45.6	30.2	23.5	31.7	34.4	38.0	37.5	26.2	45.6																							
4-Jan	38.3	37.2	Z	28.1	31.2	31.4	53.8	113.9	59.6	69.2	52.1	114.7	99.5	40.2	55.8	76.2	109.7	110.1	92.3	68.1	62.3	60.7	56.8	60.5	66.2	114.7																							
5-Jan	78.9	53.6	48.5	Z	32.4	26.9	26.1	24.6	24.6	26.7	28.6	26.5	33.6	35.5	31.8	24.4	35.9	50.8	60.4	50.1	42.4	49.0	66.7	70.4	41.2	78.9																							
6-Jan	157.7	147.8	121.5	168.6	Z	31.5	38.0	39.5	25.2	22.6	27.3	22.9	16.9	16.8	15.5	13.7	19.8	24.3	14.3	12.7	14.2	19.5	17.5	19.3	43.8	168.6																							
7-Jan	14.3	15.3	29.9	30.2	33.9	Z	53.9	76.5	33.8	32.9	22.9	21.9	18.1	65.3	46.3	25.8	46.3	16.4	15.9	15.0	24.3	40.8	48.0	63.4	34.4	76.5																							
8-Jan	Z	75.8	74.4	56.5	65.9	88.1	76.0	68.3	74.3	94.5	84.8	62.8	66.1	64.6	61.6	80.3	106.1	139.0	138.9	74.6	56.8	57.1	51.3	91.7	78.7	139.0																							
9-Jan	150.3	Z	85.3	106.7	72.4	74.6	58.8	66.4	60.3	58.3	45.7	58.2	74.0	90.3	76.4	60.2	67.8	64.9	47.6	29.1	17.1	11.0	23.7	51.9	63.1	150.3																							
10-Jan	56.9	82.4	Z	52.7	66.1	60.1	58.3	34.3	35.0	20.6	22.8	26.0	29.9	33.2	24.4	19.6	23.7	16.4	15.7	12.1	12.9	9.1	12.1	9.8	31.9	82.4																							
11-Jan	9.9	9.6	11.2	Z	13.0	15.2	8.6	6.0	12.9	24.6	25.6	31.2	52.8	46.7	54.9	48.7	49.2	42.0	26.0	16.4	22.4	13.9	8.2	5.0	24.1	54.9																							
12-Jan	4.0	6.0	7.6	5.6	Z	5.0	4.8	6.3	7.9	8.7	11.4	11.4	10.0	9.8	9.7	9.5	9.1	9.4	9.3	8.2	8.3	7.3	7.2	7.9	8.0	11.4																							
13-Jan	18.7	77.6	39.2	24.7	18.2	Z	8.1	33.8	21.1	21.1	9.0	11.7	14.7	13.8	10.9	12.2	13.5	8.1	14.5	20.7	29.1	32.5	26.4	32.9	22.3	77.6																							
14-Jan	Z	35.8	46.3	18.1	9.5	3.8	6.4	7.6	11.9	8.6	4.3	5.2	5.4	6.1	7.2	9.7	11.6	10.8	9.4	11.8	19.8	7.4	11.2	23.0	12.7	46.3																							
15-Jan	38.2	Z	16.6	13.0	20.1	19.1	17.0	23.3	12.6	24.7	25.7	12.3	21.9	20.8	22.2	36.3	46.6	31.4	33.6	28.9	44.6	53.9	66.5	43.3	29.2	66.5																							
16-Jan	33.4	20.8	Z	28.4	30.9	19.7	14.7	19.7	21.4	25.6	21.5	19.1	23.4	29.2	21.4	23.5	20.9	23.8	17.5	23.1	12.5	7.6	11.2	15.6	21.1	33.4																							
17-Jan	20.4	19.8	8.5	Z	3.5	9.9	9.0	11.3	11.9	5.9	5.6	6.9	8.2	3.7	4.3	5.9	6.7	7.1	6.3	7.4	5.6	4.2	5.7	18.5	8.5	20.4																							
18-Jan	13.1	9.2	4.8	5.5	Z	3.6	4.3	3.8	6.4	13.3	11.0	11.3	9.7	10.5	9.7	11.0	13.3	15.9	14.7	19.5	24.3	13.7	8.1	7.5	10.6	24.3																							
19-Jan	9.9	18.5	15.5	10.1	10.5	Z	7.6	9.8	11.4	16.0	16.9	12.1	5.9	5.4	2.7	2.2	1.9	2.1	2.1	7.2	13.9	5.3	9.5	10.5	9.0	18.5																							
20-Jan	Z	10.2	1.7	0.8	0.7	0.7	1.0	2.4	3.9	4.6	3.5	8.5	10.8	26.0	22.6	5.2	0.9	2.4	6.5	18.9	20.5	23.0	24.0	80.9	12.2	80.9																							
21-Jan	59.3	Z	50.7	154.7	49.6	121.6	82.4	16.6	26.1	16.3	15.9	18.7	20.9	23.6	22.4	24.0	27.7	13.4	3.2	9.7	15.7	16.7	37.2	27.9	37.1	154.7																							
22-Jan	16.5	6.3	Z	0.3	0.3	0.6	1.1	4.3	13.0	3.8	7.6	11.1	15.5	13.8	9.6	17.0	27.0	43.3	27.1	30.3	40.4	54.3	21.4	8.7	16.2	54.3																							
23-Jan	5.3	2.0	11.5	Z	19.7	15.8	28.3	28.3	28.1	34.9	37.8	33.1	34.2	44.5	37.8	30.9	123.1	123.4	65.0	57.2	24.8	79.7	60.4	44.6	42.2	123.4																							
24-Jan	33.1	21.8	21.2	18.9	Z	12.0	14.6	13.7	11.5	11.6	C	C	C	C	C	C	30.1	14.4	23.1	17.0	23.9	22.7	18.5	35.6	--	35.6																							
25-Jan	28.7	41.1	26.7	31.0	23.9	Z	8.7	25.3	88.0	31.5	42.7	34.9	26.0	22.6	36.5	41.4	61.4	48.2	52.6	48.7	13.5	7.2	9.4	8.0	33.0	88.0																							
26-Jan	Z	13.5	9.9	11.3	29.1	30.2	10.5	12.8	13.0	13.1	7.3	9.1	10.3	20.8	16.4	16.7	11.3	10.8	6.9	7.6	6.1	7.2	5.6	6.5	12.4	30.2																							
27-Jan	3.1	Z	4.2	8.5	8.1	9.6	9.8	12.3	26.8	19.0	16.2	14.8	32.8	74.5	59.4	41.4	53.5	57.4	11.0	3.9	1.0	0.6	0.6	0.6	20.4	74.5																							
28-Jan	11.0	23.5	Z	0.5	0.6	0.2	0.4	0.6	0.5	0.8	0.6	0.5	0.7	0.8	0.5	0.6	0.3	0.5	8.2	8.4	13.8	11.5	7.5	1.0	4.0	23.5																							
29-Jan	0.2	1.0	5.7	Z	16.1	11.0	24.6	2.6	1.0	4.0	7.8	3.8	9.3	5.1	0.6	0.8	2.3	32.7	66.5	33.0	20.3	47.5	22.7	12.3	14.4	66.5																							
30-Jan	33.5	76.5	48.7	53.3	Z	30.7	19.8	15.0	11.7	10.2	9.1	9.5	141.1	112.5	72.4	40.4	39.2	81.2	52.2	81.6	77.1	70.7	60.3	35.8	51.4	141.1																							
31-Jan	22.5	34.7	28.2	6.1	23.4	Z	22.3	5.8	5.8	10.1	5.3	42.8	39.9	77.5	72.2	47.9	76.8	126.5	146.4	110.4	61.6	85.6	59.5	46.7	50.4	146.4																							
																								34.0	33.7	29.7	34.5	24.6	26.4	23.1	23.6	23.0	21.9	20.3	22.7	29.0	32.0	28.2	25.8	35.4	39.4	33.8	28.4	25.2	28.6	26.5	29.5	Diurnal Average	
																								157.7	147.8	121.5	168.6	72.4	121.6	82.4	113.9	88.0	94.5	84.8	114.7	141.1	112.5	76.4	80.3	123.1	139.0	146.4	110.4	77.1	85.6	66.7	91.7	Diurnal Maximum	

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	370	52.33	52.33
21 - 40	179	25.32	77.65
41 - 80	121	17.11	94.77
81 - 159	34	4.81	99.58
> 159	1	0.14	99.72

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	33	41	3	1	1	1	14	75	93	39	16	3	5	10	13	20	368
21 - 40	48	16	9	3	1	2	27	36	7	9	4	1	1	2	2	9	177
11 - 80	31	1	3	0	1	7	12	23	19	5	1	1	0	2	6	6	118
81 - 159	8	3	1	1	0	0	5	5	4	0	1	1	0	0	2	2	33
> 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	120	61	16	5	3	10	58	139	123	53	23	6	6	14	23	37	697

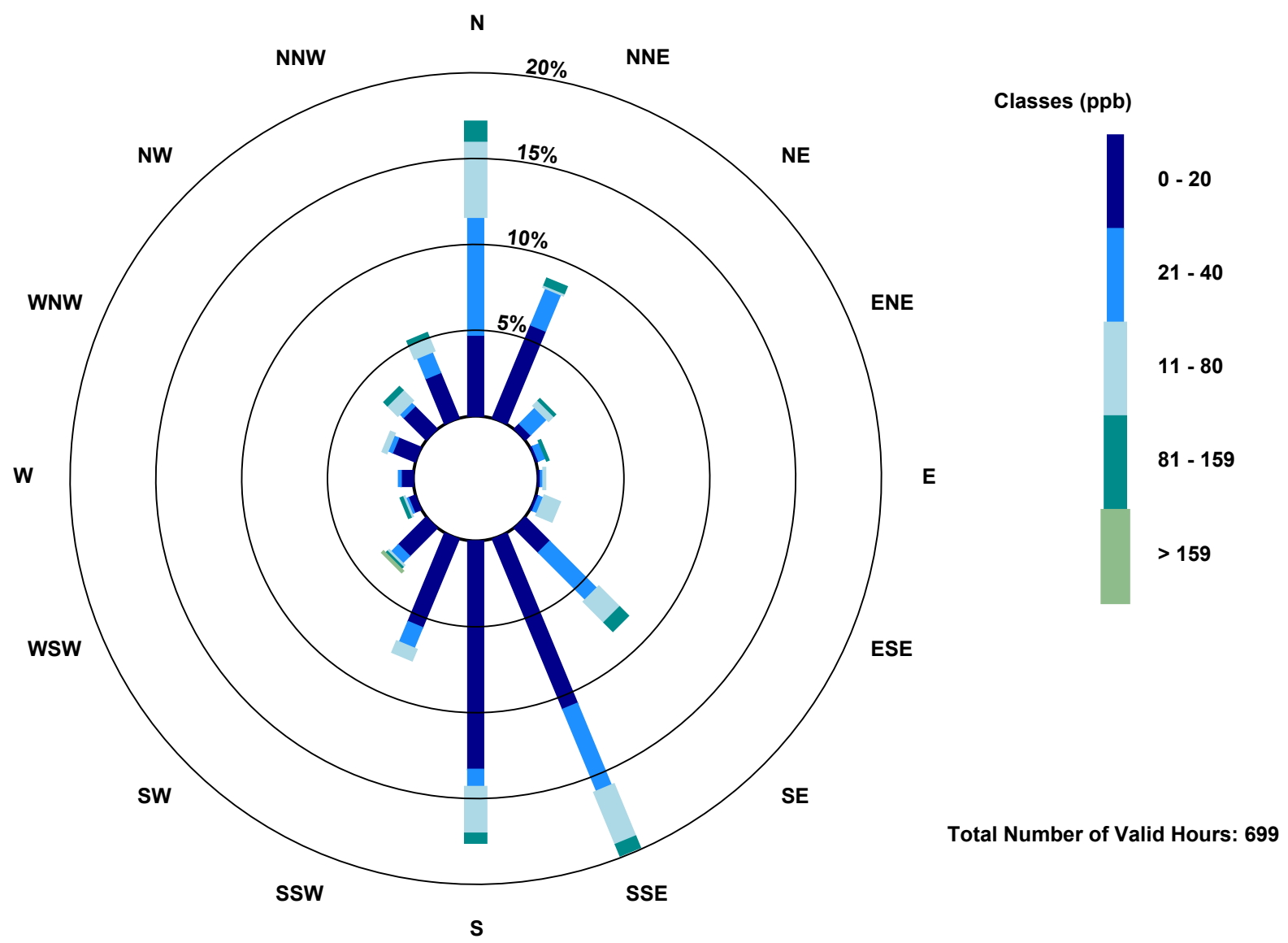
Total Number of Valid Hours: 699

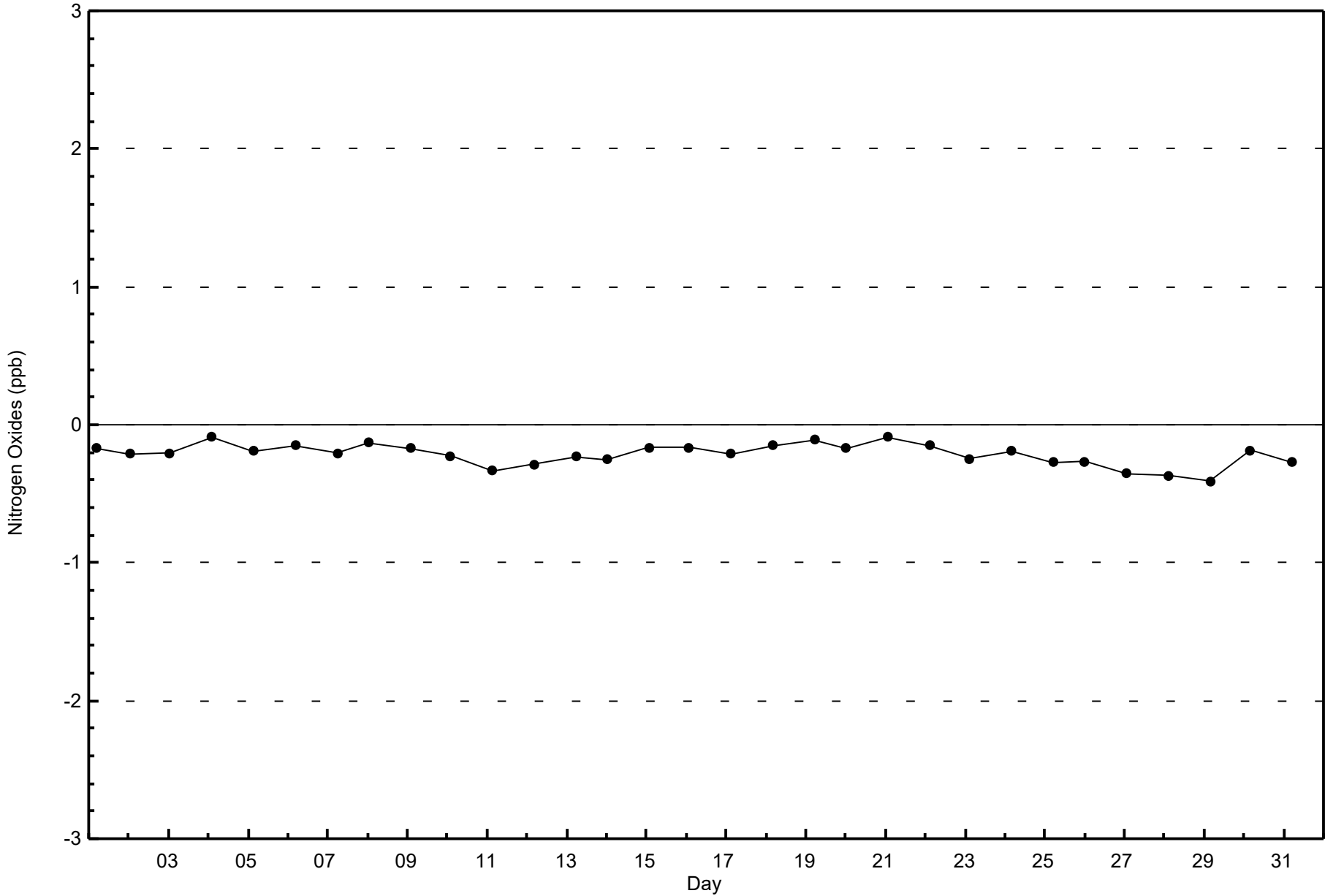
Total Number of Hours: 744

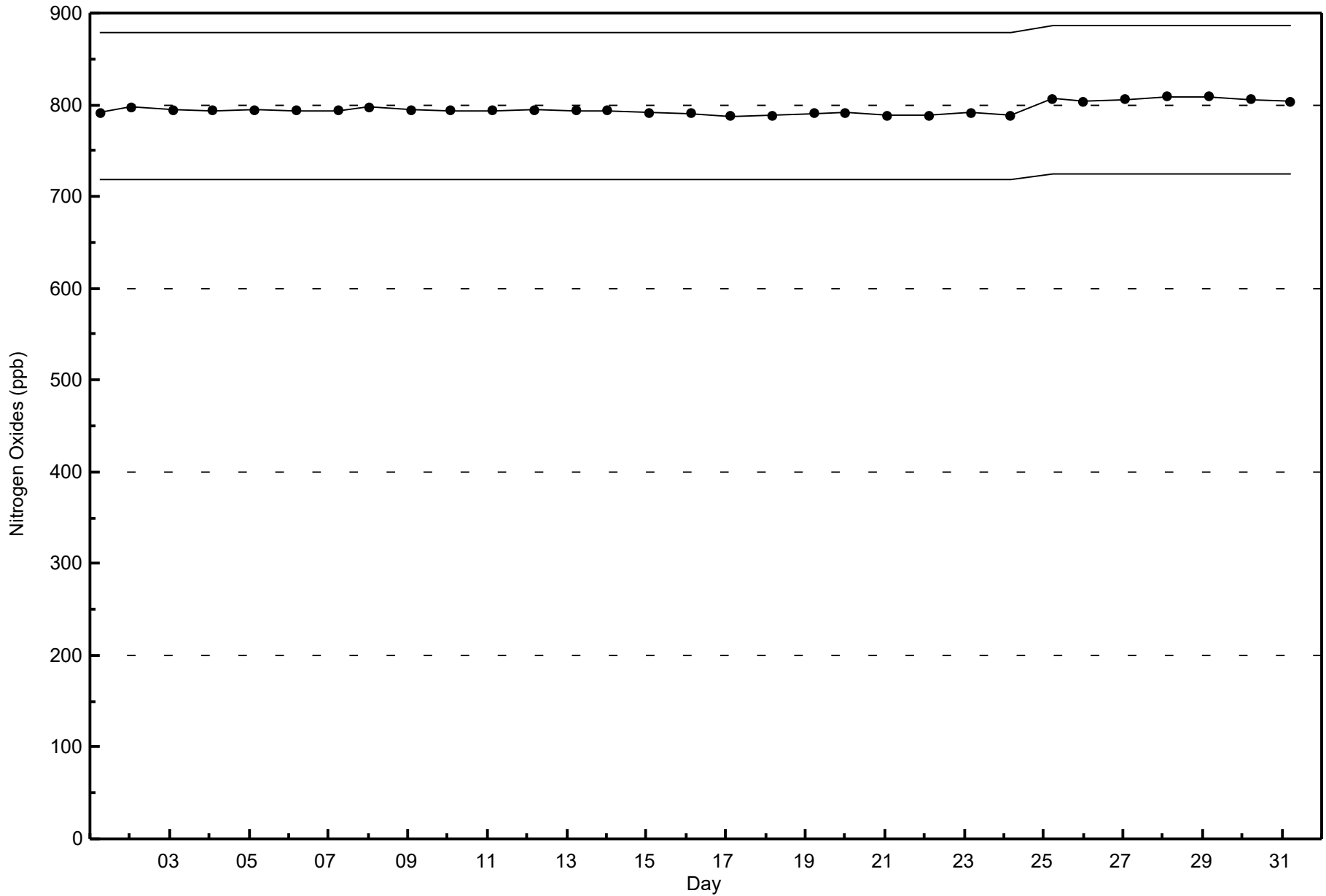


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Fort Hills







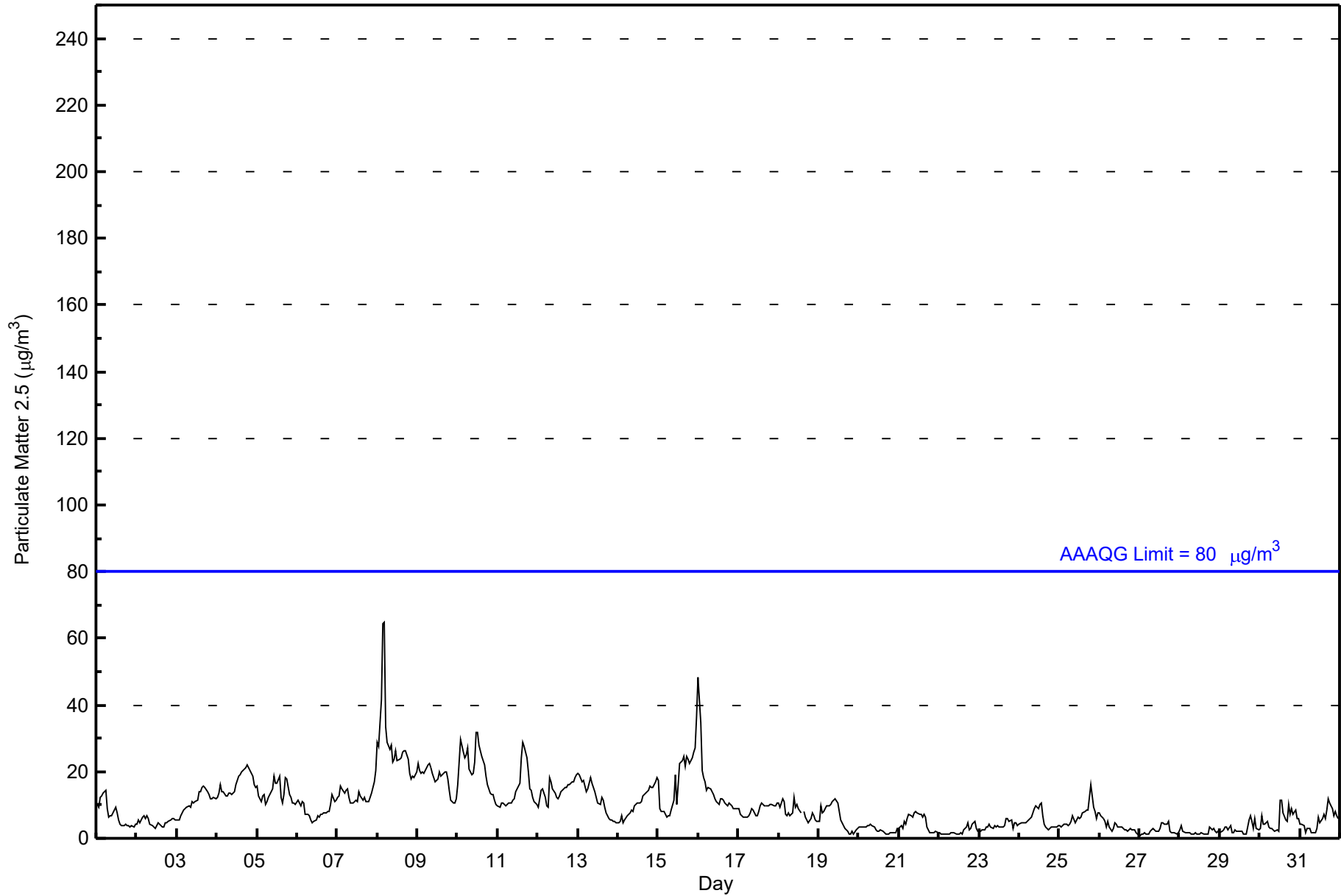


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 65.0 µg/m ³ on Jan 8 05:00	Maximum Daily Average: 28.5 µg/m ³ on Jan 8		Hours of Data:	743
Minimum Value: 1.0 µg/m ³ on Jan 27 01:00	Minimum Daily Average: 1.9 µg/m ³ on Jan 28		Hours of Missing Data:	1
Maximum Diurnal Average: 10.6 µg/m ³ at hour 4	Minimum Diurnal Average: 8.5 µg/m ³ at hour 23		Hours of Calibration:	1
Monthly Average: 9.55 µg/m ³	Percentiles: P ₁ = 1.2 P ₁₀ = 2.0 Q ₁ = 3.7 Median = 7.7 Q ₃ = 13.1 P ₉₀ = 19.5 P ₉₉ = 31.7		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	10.4	9.5	12.4	12.6	13.4	14.4	8.8	6.4	6.8	6.7	7.6	9.1	7.7	5.5	4.4	3.9	3.8	4.3	3.9	3.7	3.5	3.8	3.4	4.3	7.1	14.4																						
2-Jan	4.0	5.3	4.7	6.2	6.7	5.8	6.9	6.0	4.1	3.6	3.3	2.9	4.0	4.5	3.7	3.3	3.5	4.6	4.7	5.2	5.5	5.9	5.8	5.6	4.8	6.9																						
3-Jan	5.5	5.3	6.7	7.4	8.3	8.9	9.2	9.9	9.3	10.9	10.5	11.0	11.4	13.8	14.1	15.4	15.6	15.1	13.8	13.3	12.0	11.7	12.2	11.7	11.0	15.6																						
4-Jan	12.3	13.3	16.1	14.1	14.2	12.8	12.7	13.6	13.5	13.2	14.1	16.1	17.4	18.5	19.3	19.7	20.7	21.0	21.9	21.1	20.4	18.5	16.2	15.1	16.5	21.9																						
5-Jan	15.6	12.8	11.0	12.8	13.1	10.1	11.0	12.3	13.8	14.8	18.8	16.4	16.7	18.8	12.5	10.5	13.3	18.3	17.7	13.0	12.1	10.7	10.7	10.0	13.6	18.8																						
6-Jan	11.5	10.8	9.7	11.1	10.6	7.1	7.2	6.7	5.6	4.7	5.3	5.6	6.6	6.4	7.2	7.4	7.8	7.8	8.0	8.0	10.4	13.0	11.1	11.6	8.4	13.0																						
7-Jan	12.4	12.8	15.7	14.8	13.4	14.5	14.9	12.2	10.4	10.8	11.0	11.3	11.2	13.8	12.6	11.3	12.2	11.1	10.9	11.1	13.4	15.1	16.7	20.4	13.1	20.4																						
8-Jan	28.6	27.6	41.4	64.4	65.0	33.3	29.0	26.6	27.8	22.7	23.7	26.4	23.2	23.8	24.2	25.8	26.2	26.2	23.9	19.6	17.9	18.5	18.4	19.7	28.5	65.0																						
9-Jan	22.3	20.4	19.5	20.0	19.7	21.1	21.8	22.5	21.3	19.5	17.0	17.4	18.0	19.8	18.5	18.9	20.1	19.9	17.8	14.4	11.3	10.5	10.7	11.9	18.1	22.5																						
10-Jan	16.2	23.0	29.5	25.9	24.4	24.8	27.1	20.8	19.2	19.6	23.0	31.7	31.7	28.1	24.4	23.4	22.2	18.7	15.9	13.4	13.1	13.1	11.5	10.1	21.3	31.7																						
11-Jan	9.6	9.2	10.5	10.5	10.2	9.6	10.6	10.5	10.5	11.3	12.0	14.2	15.7	16.5	24.2	28.6	27.5	24.2	19.8	15.0	14.4	12.1	11.1	10.4	14.5	28.6																						
12-Jan	9.5	11.7	14.3	14.7	12.1	10.0	9.4	18.2	16.8	14.6	13.6	12.2	11.9	12.8	14.1	14.7	15.2	15.5	15.9	16.1	16.8	17.1	18.1	19.2	14.4	19.2																						
13-Jan	19.3	19.2	17.0	17.2	15.6	14.1	15.0	18.1	16.6	15.2	14.1	12.3	10.5	10.2	12.5	11.5	9.4	7.5	5.8	5.6	5.6	5.2	4.9	4.8	12.0	19.3																						
14-Jan	4.9	5.2	6.6	4.8	5.3	6.6	7.1	7.7	8.4	8.3	9.7	10.7	10.5	10.5	11.1	12.7	13.6	13.9	14.3	15.6	15.3	15.3	16.7	18.2	10.6	18.2																						
15-Jan	17.6	9.0	8.0	7.8	7.4	6.2	6.6	6.6	8.6	11.6	19.0	10.0	15.9	22.5	23.2	24.5	21.5	24.4	23.7	22.6	24.0	25.7	27.2	36.5	17.1	36.5																						
16-Jan	48.4	34.8	20.4	18.4	16.8	14.4	15.2	14.9	13.9	13.0	11.8	10.9	10.4	11.9	11.7	11.5	10.8	9.8	10.7	10.2	9.9	9.0	9.0	9.0	14.9	48.4																						
17-Jan	8.7	7.3	6.8	6.5	6.4	6.4	7.0	7.6	8.8	8.4	6.9	6.8	7.9	9.6	10.6	9.9	9.9	9.9	9.9	10.4	10.1	9.7	9.9	10.6	8.6	10.6																						
18-Jan	10.6	9.5	12.0	10.9	7.1	6.8	7.8	6.7	7.5	12.1	9.5	10.4	8.7	7.6	C	8.0	6.5	5.5	4.7	5.9	7.6	6.8	5.5	4.9	7.9	12.1																						
19-Jan	5.2	9.9	7.6	8.0	9.0	9.7	9.9	10.2	11.2	11.3	11.9	10.4	7.9	5.6	4.6	3.8	3.0	2.2	1.5	1.3	2.0	1.5	2.6	2.8	6.4	11.9																						
20-Jan	3.2	3.4	3.2	3.3	3.6	3.8	3.9	4.1	3.7	3.3	2.6	2.2	2.1	2.5	2.1	1.5	1.2	1.3	1.5	1.8	1.8	1.9	1.7	3.1	2.6	4.1																						
21-Jan	3.0	3.7	3.0	5.3	4.2	6.0	7.3	6.9	6.4	7.7	8.0	7.5	7.0	7.1	6.3	7.1	6.4	3.6	1.5	1.5	1.7	1.7	2.1	1.8	4.9	8.0																						
22-Jan	1.5	1.2	1.1	1.2	1.4	1.5	1.2	1.5	1.7	1.8	1.4	1.2	1.3	1.6	1.4	2.3	3.2	4.5	2.7	3.0	4.2	5.2	3.1	2.3	2.1	5.2																						
23-Jan	2.1	2.0	2.6	2.6	3.3	3.2	4.4	3.3	3.0	3.8	3.4	3.7	3.4	3.3	3.5	3.7	5.9	5.8	5.0	5.6	2.9	4.8	4.5	3.7	3.7	5.9																						
24-Jan	4.2	4.7	4.8	4.9	4.7	5.0	5.8	6.2	7.8	8.8	9.6	8.9	10.0	10.6	6.7	4.4	3.5	2.4	3.0	3.3	3.4	3.3	3.5	3.9	5.6	10.6																						
25-Jan	3.9	3.5	3.7	4.1	4.1	4.0	4.1	5.0	6.9	4.5	5.4	6.3	6.1	6.2	7.7	8.0	8.6	8.3	12.2	16.0	9.5	7.9	5.8	7.5	6.6	16.0																						
26-Jan	7.8	6.6	6.1	5.0	3.5	5.0	3.4	2.1	3.1	4.7	4.2	3.6	3.2	3.5	3.1	2.6	2.5	2.1	2.8	2.4	2.5	2.6	1.8	1.4	3.6	7.8																						
27-Jan	1.0	1.1	1.1	1.6	1.2	1.4	2.0	2.4	2.8	2.5	2.1	2.1	3.0	4.8	4.8	4.4	4.4	5.0	2.2	1.8	1.6	1.5	1.4	1.6	2.4	5.0																						
28-Jan	2.5	3.9	2.0	1.7	1.9	1.6	1.5	1.5	1.4	1.5	1.5	1.4	1.4	1.5	1.4	1.3	1.4	1.3	3.5	2.7	3.2	2.0	1.8	2.0	1.9	3.9																						
29-Jan	1.8	1.9	2.7	3.4	3.4	2.5	3.8	1.8	1.6	2.6	2.3	1.9	2.1	2.0	1.3	1.2	1.3	5.3	6.6	5.0	3.1	6.0	3.1	2.4	2.9	6.6																						
30-Jan	2.9	6.6	4.1	4.1	5.0	3.5	3.1	3.0	2.6	2.1	2.6	2.3	11.4	11.3	7.7	5.4	4.9	10.2	7.3	9.1	7.2	8.5	6.0	5.8	5.7	11.4																						
31-Jan	4.1	4.1	3.8	1.7	3.1	2.9	2.8	1.6	1.6	1.6	2.9	6.6	4.7	5.9	7.1	6.1	8.6	11.9	10.8	8.9	6.7	7.9	6.8	5.8	5.3	11.9																						
																								10.0	9.7	9.9	10.6	10.3	8.9	9.0	8.9	8.9	8.9	9.3	9.5	9.8	10.3	10.2	10.1	10.2	10.4	9.8	9.3	8.8	8.9	8.5	9.0	Diurnal Average
																								48.4	34.8	41.4	64.4	65.0	33.3	29.0	26.6	27.8	22.7	23.7	31.7	31.7	28.1	24.4	28.6	27.5	26.2	23.9	22.6	24.0	25.7	27.2	36.5	Diurnal Maximum

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Hills - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	271	36.47	36.47
6 - 15	341	45.90	82.37
16 - 25	105	14.13	96.50
26 - 80	26	3.50	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Hills - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	32	42	12	3	3	2	18	32	27	30	20	2	3	12	15	17	270
6 - 15	51	18	3	1	0	8	33	87	83	25	4	3	3	2	4	14	339
16 - 25	32	5	2	1	0	2	11	22	9	1	0	1	0	1	5	9	101
26 - 80	9	0	0	0	0	0	1	2	11	0	0	0	0	1	1	0	25
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	65	17	5	3	12	63	143	130	56	24	6	6	16	25	40	735

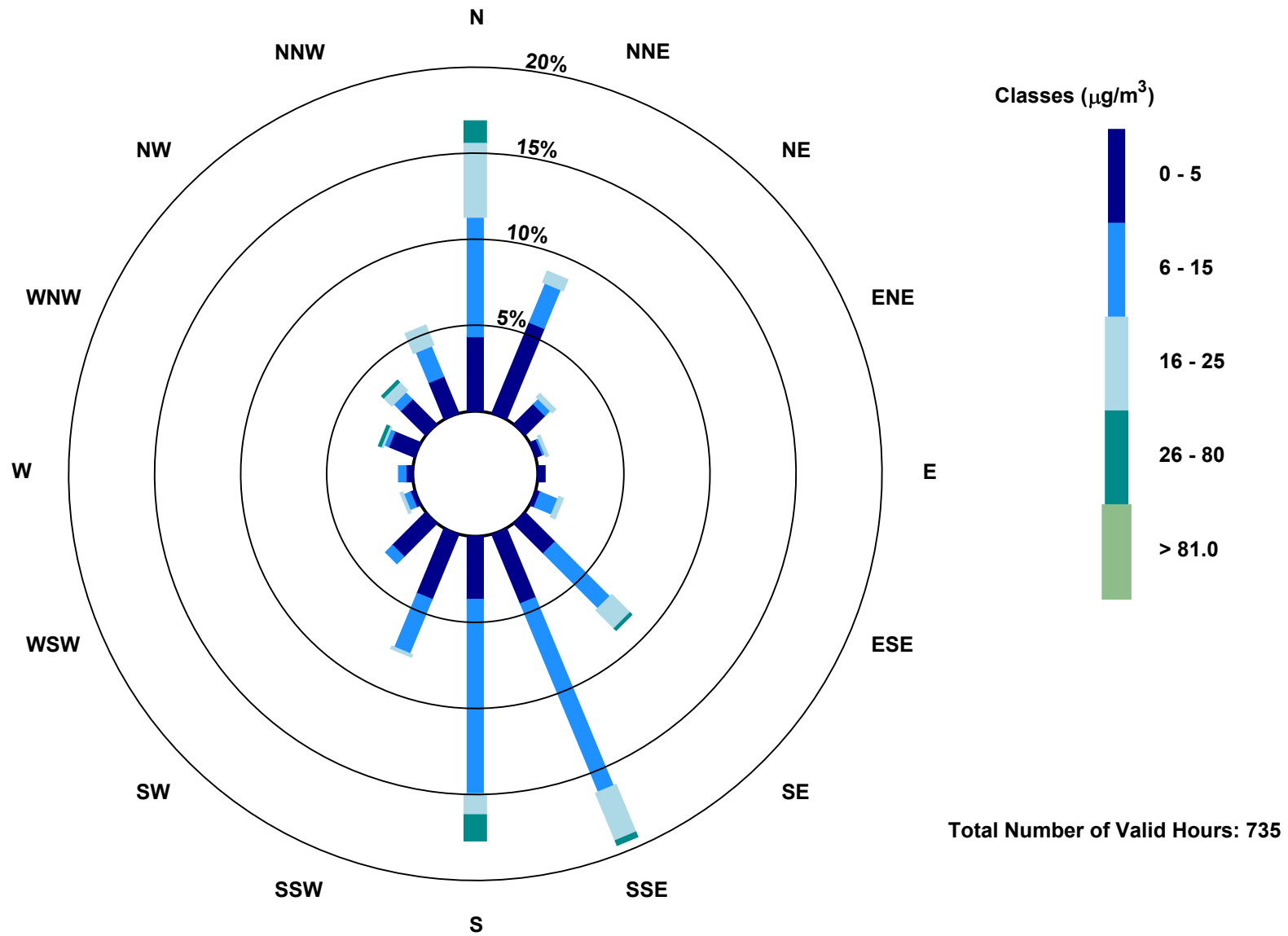
Total Number of Valid Hours: 735

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

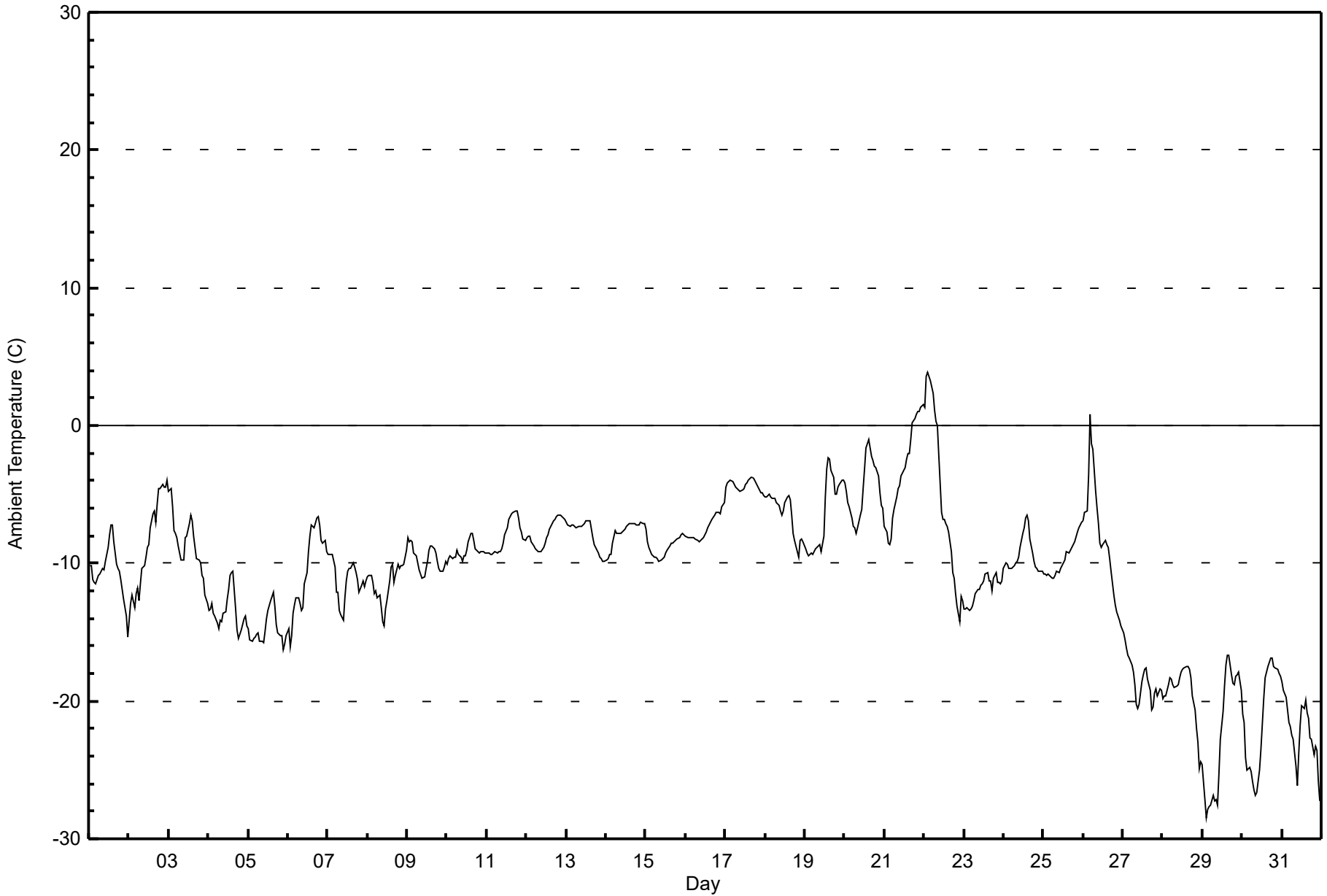
Ambient Temperature (AT) - C
Fort Hills - January 2023

Maximum Value: 3.8 C on Jan 22 03:00 Maximum Daily Average: -3.3 C on Jan 21 Minimum Value: -28.5 C on Jan 29 03:00 Minimum Daily Average: -22.5 C on Jan 29 Maximum Diurnal Average: -9.0 C at hour 15 Minimum Diurnal Average: -11.8 C at hour 10 Monthly Average: -10.63 C Percentiles: P ₁ = -27.2 P ₁₀ = -18.8 Q ₁ = -13.1 Median = -9.4 Q ₃ = -7.2 P ₉₀ = -4.6 P ₉₉ = 1.2																						Hours in Service: 744	Hours of Data: 744	Hours of Missing Data: 0	Hours of Calibration: 0	Percent Operational Time: 100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.1	-10.2	-11.2	-11.4	-11.5	-10.9	-10.7	-10.6	-10.3	-10.5	-9.8	-8.8	-8.0	-7.2	-7.2	-8.5	-10.1	-10.4	-10.5	-11.2	-11.9	-12.6	-13.8	-15.4	-10.5	-7.2
2-Jan	-14.2	-12.9	-12.3	-13.2	-12.2	-11.8	-12.7	-11.5	-10.4	-10.2	-9.5	-8.9	-8.6	-7.5	-6.4	-6.2	-7.0	-5.7	-4.6	-4.6	-4.3	-4.5	-4.5	-4.0	-8.6	-4.0
3-Jan	-4.8	-4.6	-5.9	-7.7	-7.9	-8.2	-8.8	-9.7	-9.7	-9.7	-8.1	-8.0	-7.1	-6.5	-6.9	-8.1	-8.8	-9.6	-9.8	-10.0	-10.9	-11.1	-12.3	-12.9	-8.6	-4.6
4-Jan	-13.4	-13.3	-12.9	-13.6	-13.8	-14.4	-14.7	-14.1	-14.3	-13.6	-13.5	-12.6	-11.9	-10.9	-10.7	-10.6	-13.3	-14.9	-15.4	-15.1	-14.8	-14.0	-13.9	-14.5	-13.5	-10.6
5-Jan	-14.8	-15.6	-15.7	-15.5	-15.3	-15.2	-15.1	-15.6	-15.7	-15.8	-15.0	-14.0	-13.4	-12.7	-12.4	-12.1	-13.1	-14.4	-15.0	-15.2	-15.3	-16.3	-15.9	-15.2	-14.8	-12.1
6-Jan	-14.8	-16.1	-15.3	-13.6	-13.1	-12.5	-12.5	-12.9	-13.4	-13.2	-11.5	-10.7	-9.2	-8.1	-7.3	-7.3	-7.4	-6.7	-6.6	-7.2	-8.3	-8.5	-8.3	-9.2	-10.6	-6.6
7-Jan	-9.3	-9.3	-9.4	-9.3	-10.2	-12.1	-12.1	-13.4	-13.7	-14.1	-12.6	-11.3	-10.6	-10.3	-10.3	-9.9	-10.3	-10.6	-11.2	-12.1	-11.6	-11.3	-11.7	-11.3	-11.2	-9.3
8-Jan	-11.0	-10.9	-10.9	-11.4	-12.2	-12.0	-12.5	-12.3	-13.2	-14.2	-14.5	-13.3	-12.8	-11.2	-10.3	-10.1	-11.4	-10.9	-10.0	-10.4	-10.2	-10.2	-10.0	-9.1	-11.5	-9.1
9-Jan	-8.2	-8.5	-8.3	-8.4	-9.3	-9.5	-9.9	-10.5	-10.8	-11.1	-11.0	-10.4	-9.9	-9.0	-8.8	-8.8	-9.0	-9.2	-9.8	-10.3	-10.6	-10.6	-10.2	-9.9	-9.7	-8.2
10-Jan	-10.1	-9.7	-9.5	-9.7	-9.6	-9.6	-9.1	-9.3	-9.6	-9.8	-9.5	-9.4	-9.1	-8.5	-7.8	-7.8	-8.4	-9.0	-9.1	-9.2	-9.2	-9.1	-9.2	-9.2	-9.2	-7.8
11-Jan	-9.3	-9.3	-9.3	-9.4	-9.2	-9.2	-9.2	-9.2	-9.1	-9.0	-8.6	-8.0	-7.4	-6.8	-6.6	-6.4	-6.3	-6.2	-6.2	-6.7	-7.4	-7.7	-8.2	-8.4	-8.0	-6.2
12-Jan	-8.1	-8.0	-8.0	-8.5	-8.7	-9.0	-9.1	-9.1	-9.1	-9.1	-8.9	-8.5	-8.2	-7.9	-7.6	-7.2	-7.0	-6.8	-6.6	-6.5	-6.5	-6.6	-6.7	-6.8	-7.8	-6.5
13-Jan	-7.0	-7.2	-7.3	-7.2	-7.2	-7.3	-7.4	-7.3	-7.3	-7.3	-7.2	-7.1	-6.9	-6.9	-6.9	-7.5	-8.1	-8.7	-9.0	-9.3	-9.5	-9.7	-9.9	-9.9	-7.9	-6.9
14-Jan	-9.8	-9.6	-9.3	-9.3	-8.6	-7.7	-7.8	-7.8	-7.8	-7.9	-7.7	-7.6	-7.4	-7.2	-7.1	-7.1	-7.1	-7.2	-7.2	-7.2	-7.2	-7.1	-7.1	-7.1	-7.8	-7.1
15-Jan	-7.5	-8.5	-8.8	-9.3	-9.4	-9.6	-9.6	-9.7	-9.9	-9.8	-9.7	-9.6	-9.3	-9.0	-8.7	-8.5	-8.5	-8.4	-8.3	-8.3	-8.1	-7.9	-7.9	-7.9	-8.8	-7.5
16-Jan	-8.1	-8.1	-8.2	-8.1	-8.1	-8.2	-8.3	-8.4	-8.5	-8.4	-8.2	-8.1	-7.8	-7.4	-7.2	-7.1	-6.8	-6.5	-6.3	-6.3	-6.3	-6.4	-5.9	-5.6	-7.4	-5.6
17-Jan	-4.5	-4.2	-4.1	-4.0	-4.1	-4.3	-4.5	-4.6	-4.6	-4.8	-4.7	-4.5	-4.2	-4.1	-3.9	-3.7	-3.8	-3.9	-4.1	-4.3	-4.5	-4.9	-4.9	-5.1	-4.4	-3.7
18-Jan	-5.2	-5.2	-4.9	-5.1	-5.3	-5.2	-5.2	-5.6	-5.8	-6.2	-6.5	-6.2	-5.6	-5.1	-5.1	-5.4	-6.5	-7.8	-8.3	-9.1	-9.6	-8.3	-8.2	-8.5	-6.4	-4.9
19-Jan	-8.9	-9.3	-9.5	-9.3	-9.2	-9.4	-8.9	-8.8	-8.8	-8.7	-9.2	-8.1	-5.2	-3.2	-2.3	-2.4	-3.2	-3.8	-5.0	-5.0	-4.4	-4.3	-3.9	-4.0	-6.4	-2.3
20-Jan	-4.2	-4.8	-5.6	-5.9	-6.7	-7.4	-7.4	-7.9	-7.4	-6.5	-6.1	-4.6	-3.2	-1.6	-1.0	-1.7	-2.2	-2.6	-2.9	-3.0	-3.7	-4.9	-5.8	-6.0	-4.7	-1.0
21-Jan	-7.3	-7.8	-8.6	-8.6	-8.2	-6.7	-6.1	-5.2	-4.6	-4.3	-3.7	-3.5	-3.0	-2.5	-2.0	-2.0	-1.0	0.2	0.5	0.8	1.1	1.0	1.3	1.5	-3.3	1.5
22-Jan	1.3	3.6	3.8	3.6	3.3	2.3	1.1	0.4	0.0	-2.2	-6.3	-6.8	-6.8	-7.1	-7.4	-7.7	-9.1	-10.7	-11.1	-12.2	-13.1	-14.2	-12.4	-12.7	-5.0	3.8
23-Jan	-13.3	-13.3	-13.3	-13.4	-13.3	-13.2	-12.7	-12.2	-11.9	-11.9	-11.6	-11.5	-11.3	-10.8	-10.7	-11.2	-11.3	-12.0	-11.1	-10.6	-11.4	-11.4	-11.5	-11.3	-11.9	-10.6
24-Jan	-10.4	-10.0	-10.1	-10.3	-10.3	-10.4	-10.2	-10.0	-9.8	-9.5	-8.9	-7.9	-7.4	-6.8	-6.5	-6.9	-8.2	-9.3	-9.8	-10.3	-10.4	-10.6	-10.6	-10.6	-9.4	-6.5
25-Jan	-10.7	-10.8	-10.9	-10.8	-11.0	-11.1	-11.1	-10.9	-10.5	-10.7	-10.4	-10.2	-10.0	-9.8	-9.1	-9.3	-9.0	-8.8	-8.7	-8.5	-7.8	-7.5	-7.2	-7.0	-9.7	-7.0
26-Jan	-6.9	-6.4	-6.2	-3.6	0.8	-1.3	-1.7	-4.8	-6.0	-7.1	-8.6	-8.9	-8.7	-8.4	-8.6	-8.9	-9.7	-10.5	-12.3	-13.0	-13.5	-13.9	-14.1	-14.6	-8.2	0.8
27-Jan	-15.0	-15.6	-16.2	-16.7	-16.8	-17.4	-17.9	-18.8	-20.2	-20.5	-20.3	-18.6	-18.1	-17.7	-17.6	-18.4	-19.3	-20.6	-20.5	-19.5	-19.1	-19.6	-19.1	-19.2	-18.4	-15.0
28-Jan	-19.9	-19.6	-19.6	-18.8	-18.3	-18.4	-18.8	-19.1	-19.0	-18.8	-18.3	-17.9	-17.7	-17.6	-17.5	-17.4	-17.7	-18.3	-19.6	-20.6	-22.0	-23.0	-24.9	-24.4	-19.5	-17.4
29-Jan	-24.6	-27.2	-28.5	-27.9	-27.6	-27.6	-26.8	-27.3	-27.1	-27.6	-25.3	-22.7	-20.8	-18.9	-17.4	-16.7	-16.7	-18.1	-18.8	-18.9	-18.2	-18.1	-17.9	-19.2	-22.5	-16.7
30-Jan	-20.9	-21.5	-24.1	-25.1	-24.8	-25.1	-25.8	-26.4	-26.8	-26.7	-25.1	-23.5	-21.7	-19.8	-18.3	-17.5	-17.1	-16.9	-16.8	-17.5	-17.6	-17.7	-18.0	-18.2	-21.4	-16.8
31-Jan	-18.6	-19.2	-19.7	-20.7	-21.6	-21.9	-22.5	-22.7	-24.7	-26.1	-23.8	-21.8	-20.4	-20.6	-19.9	-20.8	-21.3	-22.7	-22.8	-23.9	-23.3	-23.6	-25.9	-27.3	-22.3	-18.6
	-10.6	-10.7	-11.0	-11.0	-11.0	-11.1	-11.2	-11.5	-11.6	-11.8	-11.4	-10.7	-10.0	-9.4	-9.0	-9.1	-9.6	-10.0	-10.2	-10.5	-10.6	-10.8	-10.9	-11.1	Diurnal Average	
	1.3	3.6	3.8	3.6	3.3	2.3	1.1	0.4	0.0	-2.2	-3.7	-3.5	-3.0	-1.6	-1.0	-1.7	-1.0	0.2	0.5	0.8	1.1	1.0	1.3	1.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort Hills - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	56	7.53	7.53
-20 - 0	671	90.19	97.72
0 - 10	17	2.28	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

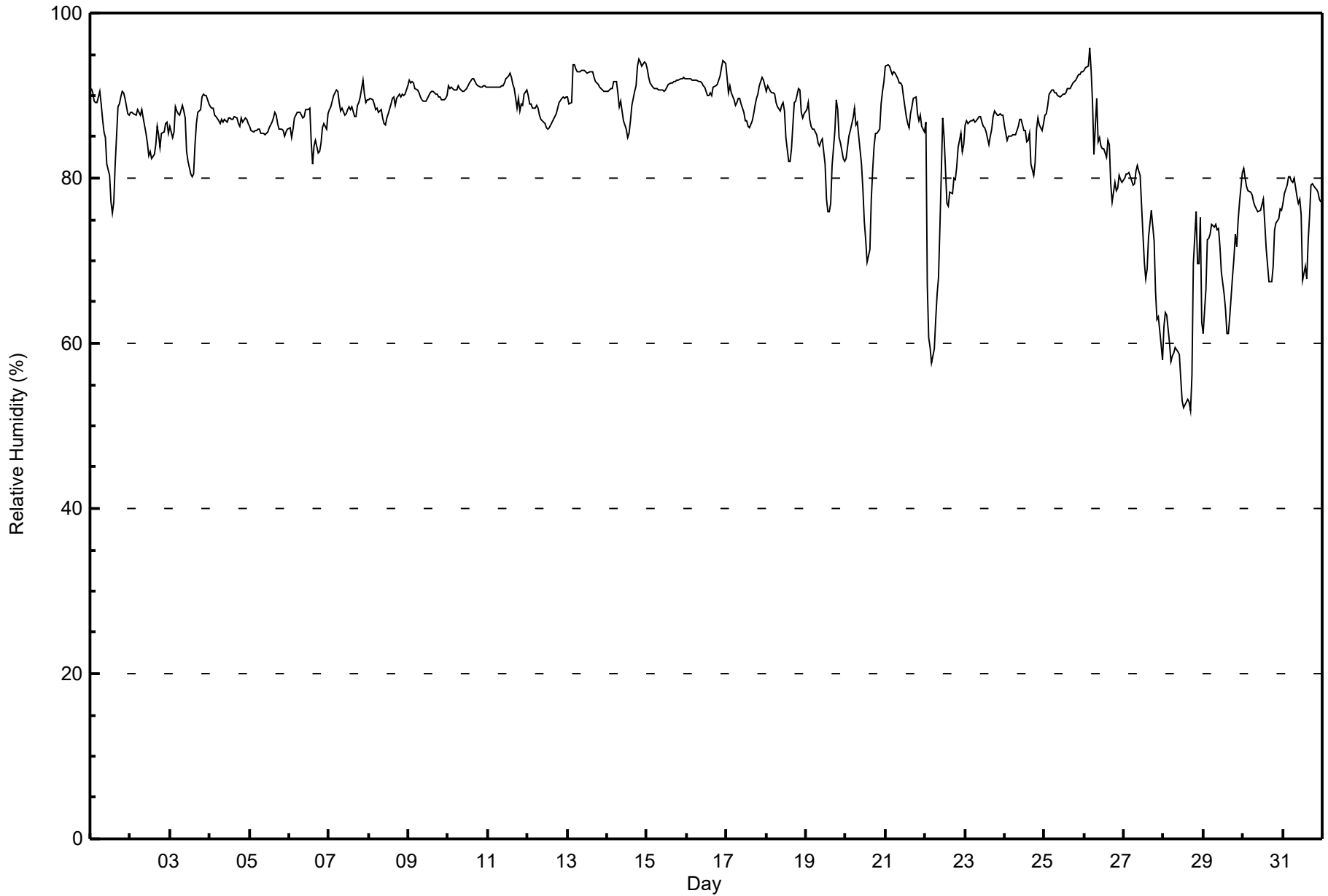
Fort Hills - January 2023

Maximum Value: 95.8 % on Jan 26 04:00 Maximum Daily Average: 91.9 % on Jan 13																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 51.8 % on Jan 28 17:00 Minimum Daily Average: 60.5 % on Jan 28 Maximum Diurnal Average: 86.5 % at hour 1 Minimum Diurnal Average: 82.0 % at hour 15 Monthly Average: 85.00 % Percentiles: P ₁ = 56.7 P ₁₀ = 74.3 Q ₁ = 83.2 Median = 87.5 Q ₃ = 90.3 P ₉₀ = 91.7 P ₉₉ = 93.7																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	90.8	90.4	89.3	89.1	89.2	90.6	89.0	87.1	85.6	84.9	81.7	80.3	77.1	75.8	77.1	81.7	88.6	89.0	89.9	90.4	90.4	89.6	87.8	87.6	86.4	90.8
2-Jan	88.0	88.0	87.8	87.6	88.4	87.9	87.6	88.3	87.3	85.5	84.3	82.7	83.2	82.4	82.9	84.2	86.3	85.2	83.8	85.5	85.6	86.6	86.8	85.4	85.9	88.4
3-Jan	86.3	84.9	85.7	88.6	88.1	87.8	87.7	88.8	88.2	87.3	83.2	82.0	80.5	80.2	80.6	84.1	86.5	88.0	88.4	89.8	90.2	89.9	89.9	89.0	86.5	90.2
4-Jan	88.6	88.5	88.5	87.7	87.4	86.9	86.6	87.0	86.8	87.1	86.8	87.2	87.2	87.2	87.2	87.4	87.3	86.6	86.3	87.3	86.8	87.3	87.2	86.6	87.2	88.6
5-Jan	86.3	85.7	85.5	85.7	85.8	85.9	85.9	85.5	85.4	85.3	85.5	85.7	86.1	86.7	87.3	87.9	87.6	86.6	86.0	86.0	85.8	85.1	85.6	85.9	86.0	87.9
6-Jan	86.1	84.8	85.9	87.3	87.6	88.0	87.9	87.7	87.3	87.5	88.4	88.3	88.5	84.5	81.8	83.9	84.6	83.0	83.2	84.2	86.1	86.7	85.9	87.9	86.1	88.5
7-Jan	88.3	88.7	89.3	90.1	90.6	90.5	89.1	88.1	88.6	87.6	87.8	88.3	88.6	88.3	88.6	87.5	87.4	88.8	89.1	89.8	91.8	90.2	89.1	89.5	89.0	91.8
8-Jan	89.5	89.6	89.6	89.1	88.4	88.6	88.0	88.3	87.3	86.5	86.4	87.3	87.8	89.0	89.7	89.9	88.8	89.7	90.2	89.9	90.1	90.0	90.2	91.1	89.0	91.1
9-Jan	91.8	91.5	91.7	91.6	90.8	90.7	90.3	89.8	89.6	89.2	89.3	89.6	90.0	90.3	90.5	90.5	90.3	90.2	89.8	89.8	89.5	89.5	89.7	90.0	90.2	91.8
10-Jan	91.3	90.9	91.0	90.7	90.8	90.6	91.2	90.8	90.6	90.5	90.7	90.9	91.1	91.5	92.0	92.0	91.7	91.3	91.2	91.1	91.0	91.2	91.1	91.0	91.1	92.0
11-Jan	91.1	91.1	91.0	90.9	91.0	91.1	91.0	91.0	91.1	91.2	91.6	92.0	92.3	92.7	92.2	91.3	90.8	88.5	89.7	88.2	89.0	88.8	90.2	90.7	90.8	92.7
12-Jan	89.9	89.1	89.1	88.5	88.5	88.9	88.5	87.6	87.1	87.0	86.6	86.2	85.9	86.1	86.5	87.1	87.5	87.8	88.5	89.1	89.7	89.8	89.7	89.9	88.1	89.9
13-Jan	89.8	88.9	89.1	93.7	93.7	93.2	92.9	92.9	93.0	93.0	92.8	92.8	92.8	92.9	92.8	92.2	91.7	91.4	91.0	90.9	90.6	90.5	90.5	91.9	91.9	93.7
14-Jan	90.6	90.7	90.9	90.9	91.7	91.6	90.4	88.7	89.3	88.2	87.0	85.9	84.9	85.4	87.0	88.8	90.5	91.2	93.5	94.5	94.1	93.6	94.0	93.8	90.3	94.5
15-Jan	93.3	92.2	91.6	91.1	90.9	90.8	90.9	90.7	90.6	90.6	90.6	90.6	91.0	91.3	91.6	91.6	91.7	91.8	91.8	92.0	92.1	92.2	92.1	91.4	91.4	93.3
16-Jan	92.0	92.0	92.0	91.9	91.8	91.8	91.9	91.8	91.7	91.5	91.2	91.1	90.1	90.0	90.4	90.1	91.1	91.2	91.4	91.8	92.3	93.4	94.2	93.9	91.7	94.2
17-Jan	92.3	90.4	91.2	90.3	89.5	88.8	89.2	89.7	89.7	89.0	87.9	87.0	87.0	86.3	86.1	87.0	87.8	88.7	89.7	90.2	91.1	92.2	91.9	91.2	89.3	92.3
18-Jan	90.5	91.1	90.6	90.3	90.4	90.1	89.2	88.7	88.1	88.8	89.1	88.1	85.0	82.1	82.0	83.5	86.5	89.2	89.4	90.8	90.7	88.0	87.3	87.8	88.2	91.1
19-Jan	88.3	89.1	87.1	86.2	86.0	86.0	85.2	84.3	83.9	84.5	84.8	81.8	77.4	75.9	75.9	77.0	81.6	85.8	89.5	88.3	84.9	84.2	82.4	82.0	83.8	89.5
20-Jan	82.4	83.7	85.1	85.7	87.3	88.5	86.5	86.8	85.1	81.7	78.7	74.7	72.6	69.8	71.4	77.4	81.1	83.8	85.4	85.4	85.9	89.0	90.5	91.7	82.9	91.7
21-Jan	93.6	93.8	93.6	93.0	92.5	92.8	92.8	92.1	91.6	91.6	91.2	89.8	87.5	86.7	86.1	87.8	88.7	89.7	89.8	87.8	86.9	87.6	86.3	85.5	89.9	93.8
22-Jan	86.7	67.0	60.7	59.5	57.6	59.4	62.9	65.9	67.9	74.0	87.3	85.0	81.0	77.0	76.6	78.4	78.1	80.0	79.8	81.4	83.7	85.4	83.2	84.0	75.1	87.3
23-Jan	86.4	87.0	86.6	87.0	86.9	87.2	86.8	86.9	87.5	87.5	86.8	86.3	86.2	85.6	84.1	85.1	85.9	87.4	88.2	87.6	87.7	87.8	87.6	87.6	86.8	88.2
24-Jan	86.5	84.5	85.2	85.1	85.1	85.3	85.2	85.7	86.3	87.1	87.2	85.8	85.7	84.4	84.7	85.4	81.7	80.3	81.9	85.9	87.2	86.4	85.8	86.6	85.2	87.2
25-Jan	87.7	87.8	88.9	90.1	90.6	90.7	90.3	90.3	90.1	89.9	90.0	90.2	90.1	90.3	90.8	90.9	91.3	91.5	91.7	91.9	92.5	92.6	92.8	92.9	90.7	92.9
26-Jan	93.1	93.5	93.5	95.8	93.0	89.2	82.9	89.6	84.4	84.9	83.8	83.6	83.5	82.6	84.5	84.1	79.3	77.2	79.5	78.5	78.8	80.3	79.9	79.4	84.8	95.8
27-Jan	80.0	80.5	80.5	80.8	80.2	79.1	79.4	80.8	81.5	80.9	80.4	73.3	69.8	67.9	69.0	73.0	76.1	74.2	72.4	66.3	63.0	63.2	59.8	57.9	73.7	81.5
28-Jan	62.1	63.7	63.4	60.0	57.9	58.5	58.8	59.6	59.0	58.6	55.8	53.1	52.2	52.5	53.3	52.9	51.8	56.1	69.7	75.9	69.7	69.6	75.3	62.6	60.5	75.9
29-Jan	61.2	66.7	72.6	72.7	73.1	74.4	74.1	74.5	73.6	74.0	71.7	68.7	65.9	64.1	61.2	61.3	63.3	68.2	70.4	73.3	71.6	74.9	77.2	80.7	70.4	80.7
30-Jan	81.1	80.0	79.0	78.4	78.3	77.9	77.2	76.7	76.2	75.9	76.2	76.8	77.5	74.7	71.5	67.4	67.5	67.5	69.3	73.8	74.6	75.1	76.3	76.0	75.2	81.1
31-Jan	76.9	78.2	79.2	80.3	80.1	79.7	79.5	80.0	77.7	77.0	77.4	75.6	67.6	69.3	67.9	72.4	75.5	79.1	79.4	78.8	78.7	78.3	77.4	77.0	76.8	80.3
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Fort Hills - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	20	2.69	2.69
60 - 80	121	16.26	18.95
80 - 100	603	81.05	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Fort Hills - January 2023

Maximum Speed: 28 km/h on Jan 26 08:00	Maximum Daily Speed Average: 16.8 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 9 01:00	Minimum Daily Speed Average: 1.1 km/h on Jan 7	Hours of Data: 736
Maximum Diurnal Speed Average: 4.1 km/h at hour 13	Minimum Diurnal Speed Average: 1.1 km/h at hour 20	Hours of Missing Data: 8
Monthly Average Velocity: 2.8 km/h 162.1 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 18 P ₉₉ = 25	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S7	SSW4	W4	W3	SSW6	SSE7	S11	S12	SSE13	S13	S16	S16	S14	S10	SSW10	SSE10	SSE12	SE13	SE11	SE5	SSE8	S6	SSE4	S3	S8.4	S16
2-Jan	S7	SSE9	SSE10	SSE10	SSE11	SSE14	SSE12	SSE12	SSE15	SSE19	S17	SSE18	SSE20	SSE20	S20	S16	SE15	SSE14	S15	S14	S14	S14	SSE15	SSE13	SSE14.0	SSE20
3-Jan	SSE12	S13	SSE13	SE16	SE15	SSE13	SSE11	SE13	SSE14	SSE13	S13	SSE14	SSE14	SSE14	SE10	SE10	SSE13	SSE12	SSE12	S6	SE7	SSE4	SSE7	SSE5	SSE11.3	SE16
4-Jan	SSE6	SSE9	SE9	SSE9	SE7	SSE9	SSE9	SE9	SE9	SE10	SE9	SE7	SSE6	SSE6	SSE2	NE0	S1	SSE2	SSE5	SSE5	SSE8	SE7	SE6	SSE6.5	SE10	
5-Jan	SSE4	S5	SSE7	SE9	SSE10	SSE11	SSE9	SE8	SE9	SSE8	SE8	SE9	SE12	SE10	SSE12	SSE13	SSE7	SSE4	S5	S6	S6	SSW3	SSW4	SSW4	SSE7.2	SSE13
6-Jan	SW2	WSW2	S3	SW5	SSW5	SSW8	SSW7	SSW8	SSW7	SSW7	SSW9	SSW7	S11	S16	SSE17	SSE18	SSE18	S21	S23	SSE22	SSE19	SSE17	SSE15	SSE12	S11.0	S23
7-Jan	SE12	SE13	SE13	SE9	SSE5	NNW2	N6	N8	N7	NW3	NW3	NNW5	NNW3	N3	NNW5	N6	N7	NNW5	S3	S5	SSW7	S6	SE6	SE7	ESE1.1	SE13
8-Jan	S5	S6	S6	S6	S5	S7	S5	SSE6	S4	SSE5	S5	S5	SSE4	SSE2	SSE2	SE3	N3	N4	N3	NNW4	NNW3	NW3	UO	ENE1	S2.4	S7
9-Jan	NW0	NW1	NW2	N4	N5	NNW5	N6	N4	NNW4	N5	N6	N4	N3	N3	N4	N5	N5	N7	N10	NNW8	NNW6	NNW6	ENE1	NNW2	N4.3	N10
10-Jan	N4	N2	WNW2	NW3	N3	NW1	S3	NNW2	N3	NNW5	N7	N9	N7	N5	N2	NNW3	N9	NNE11	N6	N6	N6	N7	NNE8	NNE8	N4.7	NNE11
11-Jan	N8	N7	N5	NNW4	N4	N3	W2	WSW3	S2	SE6	SSE8	S10	S9	SSE10	SSE11	SSE10	S9	SSW11	S12	S10	SSE11	SSE16	SSE17	S18	SSE5.7	S18
12-Jan	S18	S18	S16	S19	S19	SSE21	SSE20	SSE21	SSE21	SSE20	SSE20	SSE18	SSE21	SSE21	SSE18	S17	SSE16	SSE17	S16	S15	SSE12	S11	SSE6	SSE6	SSE16.8	SSE21
13-Jan	SE5	ESE5	NE5	NNE9	NNE11	NNE13	NNE11	NNE8	NNE6	N9	NNE10	NNE11	NE7	NE8	NE10	NNE14	NNE14	N13	N12	N11	NNE10	N9	N9	N8	NNE8.8	NNE14
14-Jan	N7	N6	N5	NW2	S4	S11	S12	SSE12	SSE11	S9	S11	S13	SSW12	S11	S10	S9	SSE8	SSE7	SE4	ESE5	SSE3	UO	N3	N6	S5.2	S13
15-Jan	N9	N10	N10	NNE10	N7	N7	NNE6	N6	N6	N6	N5	NNW5	NNW4	NNW4	N4	N3	WNW1	WSW2	UO	UO	UO	UO	N4	N7	N5.5	N10
16-Jan	N9	N9	N11	N9	N9	N9	N10	N10	N12	N9	N11	N12	N13	N11	N13	N13	N12	N10	N7	N6	NNW5	NW3	SSW4	S6	N8.4	N13
17-Jan	S11	SSW12	SSW11	SSW13	S14	S14	S14	S13	S13	S14	S16	S14	SSW13	SSW16	SSW16	SSW12	S15	S15	S13	SSW13	SSW15	S17	S14	S13	S13.7	S17
18-Jan	S11	SSE14	SSW18	S19	S16	S16	S18	S18	S18	S19	S17	S19	S21	S18	S18	S13	SSE13	SSE13	SSE11	SSE11	SSE12	S17	S20	S19	S16.1	S21
19-Jan	S18	S17	S16	S16	S20	S20	SSE21	S18	S16	SSE13	SE12	SE11	S10	SW15	SSW13	SSW14	SSW14	SSW12	SSW10	SSW15	SSW12	SSW13	SW15	SW18	S13.8	SSE21
20-Jan	SW21	SSW14	SSW14	SSW16	SSW13	S13	SSW11	S10	SSW15	SSW15	SSW15	SW16	SW21	SW15	SW14	SW16	SSW15	SW16	SW14	SW15	SW7	SSE6	SE9	SE9	SSW12.7	SW21
21-Jan	SE9	SE7	SSE6	SSE9	SE10	SE13	SSE10	SSE12	SSE13	SSE14	SSE13	SE13	SE12	SE12	SE8	SE12	SSE9	SSW7	SSW9	SSW11	SSW9	SW10	SW12	SW11	SSE8.9	SSE14
22-Jan	SW11	WNW12	NW22	WNW24	NW18	W13	W15	WSW14	WNW11	N19	NNE27	NNE23	NNE11	NNE13	NNE14	NNE11	NE6	NE6	NE12	NE9	NNE6	NE6	NE8	NNE7	NNW8.1	NNE27
23-Jan	NNW6	N4	SE1	S4	SSW4	S5	SSE6	SSE6	ESE1	NNE4	N6	N9	N10	N11	N9	N9	NNE6	UO	N5	N8	N7	NE3	NW2	SSW2	N3.0	N11
24-Jan	SSE7	SSE11	S10	SSE10	SSE13	S13	S13	SSE14	S11	SSE14	SSE15	SE7	ESE6	NNW8	NNE11	NNE13	NE11	ENE9	NNE8	NNE8	ENE7	ENE7	E5	NNE5	SE4.6	SSE15
25-Jan	NE5	SE4	E1	NNE2	N4	NNW4	NNW5	NNE5	NNE4	N5	NW3	N7	N5	NNW3	SSW1	SSE4	S8	S7	S7	S8	S13	S13	S9	SW9	S1.3	S13
26-Jan	S11	SSE16	SE12	SSW5	NNW8	NNE17	N25	NNE28	N25	NNE27	NNE24	NNE19	NNE13	NNE11	NNE12	NNE13	NNE21	NNE25	NNE25	NNE27	NNE26	NNE23	NNE22	NNE23	NNE15.8	NNE28
27-Jan	N22	N21	N19	NNE17	N16	NNE17	NNE15	NNE13	NNE10	N6	W3	N3	SE3	E4	SSE1	SE4	N4	N7	NNW8	NW8	NW7	NW13	NNW12	NW7	N8.4	N22
28-Jan	WSW7	WNW6	WNW5	NW9	WNW9	WNW13	WNW15	WNW14	WNW13	WNW9	NW13	NW16	NNW18	NNW20	NW14	NNW19	NNW19	NNW18	N15	NNE17	N15	N10	N5	NNW11	NW11.0	NNW20
29-Jan	NW7	SW3	S7	SSW9	S6	SSW7	S5	S8	S10	SSE11	SSE13	S17	S17	S18	SSW21	SW23	SW15	SSE8	ESE3	NNW7	NNW5	N7	NNW4	NNW4	SSW6.5	SW23
30-Jan	N8	NNE7	SW3	SSE6	SSE5	SSE7	SSE6	SE6	SE7	SSE6	SE6	SE8	SE9	SE9	SE8	SE8	SE6	ESE5	ESE1	NNW3	N8	N7	N8	N14	ESE3.0	N14
31-Jan	NNE17	NE13	NNE13	NNE12	NNE9	NE7	NE7	N4	UO	NW3	WNW4	WSW2	ESE5	ESE6	ESE7	ESE8	E5	N5	NNE4	NNW3	N6	N7	NNW4	NW4	NNE4.7	NNE17

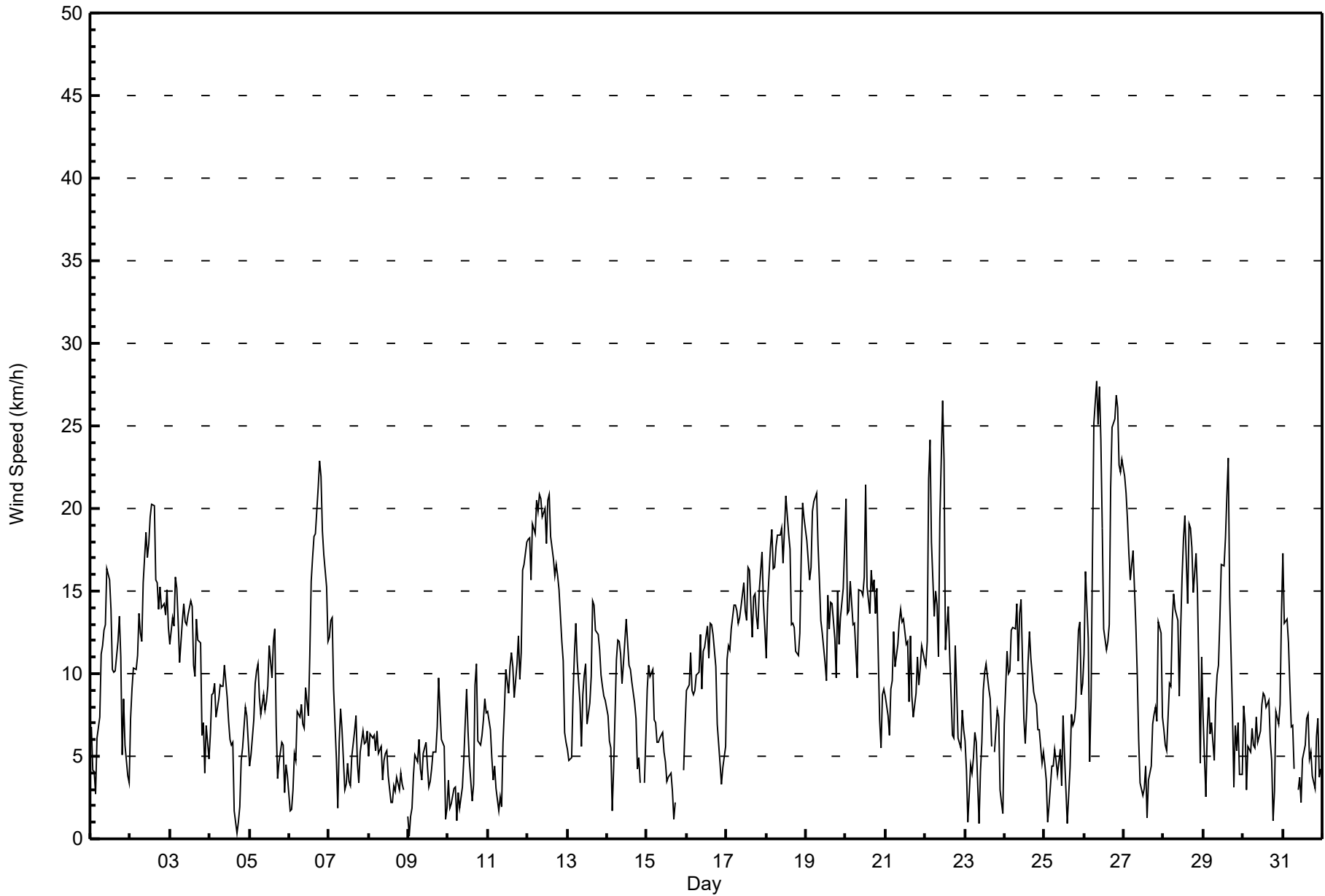
S2.2 SSE2.7 SSE2.5 S2.8 SSE2.9 SSE3.7 SSE3.3 SSE3.8 SSE3.9 SSE3.4 SSE3.4 SSE3.2 SSE4.1 SSE3.8 SSE3.6 SSE3.2 SE2.5 SSE2.2 SSE2.0 S1.1 SSE1.4 SSE1.9 SSE2.2 S1.3	Diurnal Average
N22 N21 NW22WNW24 S20 SSE21 N25 NNE28 N25 NNE27 NNE27 NNE23 SW21 SSE21 SSW21 SW23 NNE21 NNE25 NNE25 NNE27 NNE26 NNE23 NNE22 NNE23	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Hills - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	174	23.64	23.64
6 - 11	291	39.54	63.18
12 - 19	229	31.11	94.29
20 - 28	42	5.71	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 736

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Hills - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	38	6	4	2	3	8	7	19	19	10	4	4	4	6	14	26	174
6 - 11	69	26	11	3	0	4	40	54	41	20	5	1	0	4	5	8	291
12 - 19	13	20	2	0	0	0	16	59	64	25	12	1	2	5	5	5	229
20 - 28	4	13	0	0	0	0	0	11	7	1	3	0	0	1	1	1	42
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	65	17	5	3	12	63	143	131	56	24	6	6	16	25	40	736

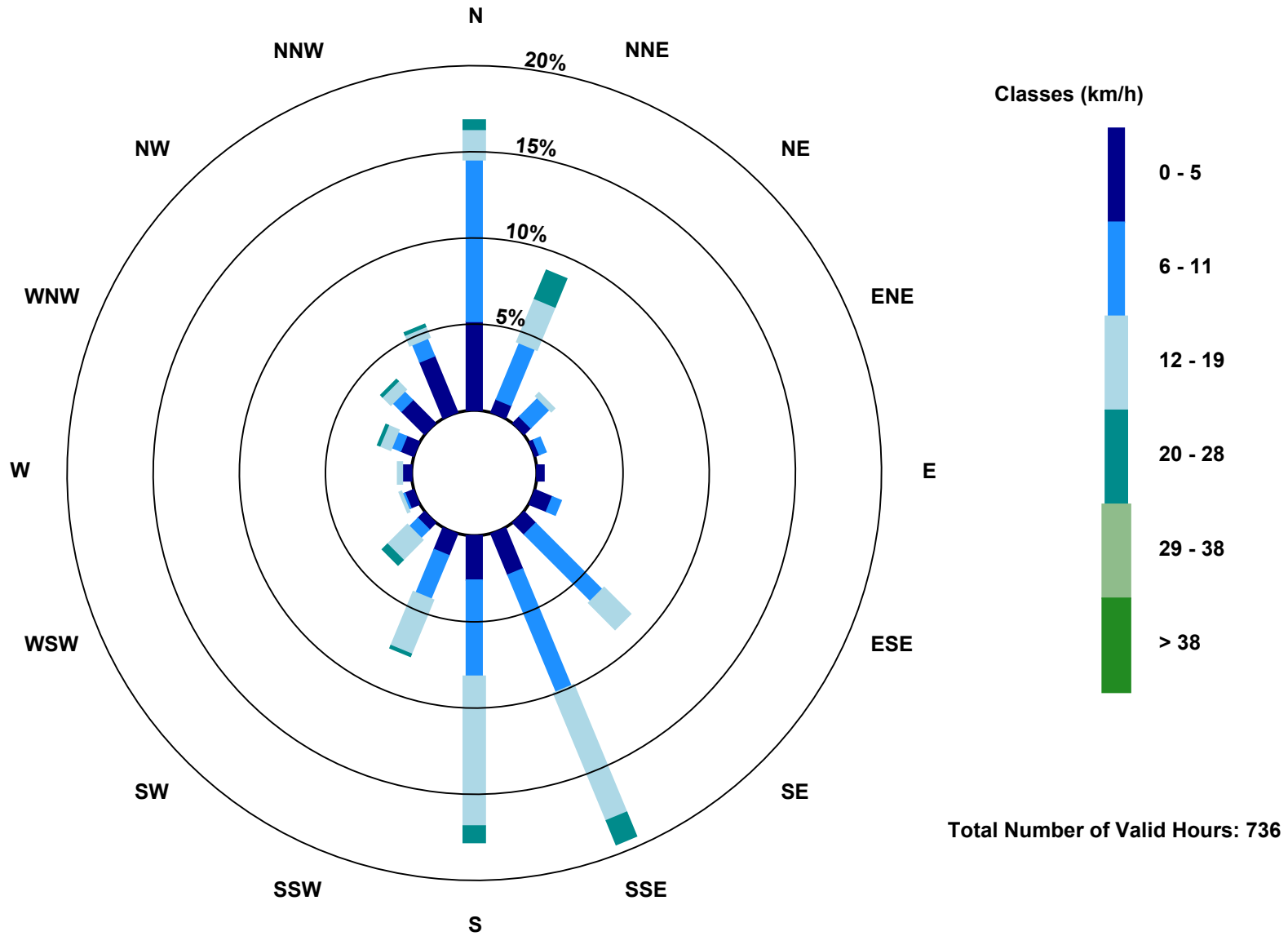
Total Number of Valid Hours: 736

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort Hills - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 22 05:00 Minimum Value: 0 km/h on Jan 15 16:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 736 Hours of Missing Data: 8 Hours of Calibration: 0 Percent Operational Time: 98.9									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	1	3	3	
2-Jan	1	1	1	1	2	1	2	3	3	3	2	2	4	3	3	2	3	3	4	3	3	3	3	3	4	
3-Jan	2	3	2	1	2	2	2	1	1	2	2	2	1	1	1	1	2	2	2	2	2	3	2	1	3	
4-Jan	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	2	
5-Jan	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	1	1	2	
6-Jan	2	1	1	1	2	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	3	4	4	2	4	
7-Jan	1	1	2	3	3	3	2	2	3	2	1	1	1	2	1	2	2	2	1	1	2	1	1	1	3	
8-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	UO	1	1	
9-Jan	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	2	
10-Jan	1	1	0	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	2	
11-Jan	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	
12-Jan	2	2	2	3	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	
13-Jan	2	1	3	2	2	2	2	2	2	3	2	2	1	1	3	2	2	2	2	2	2	1	1	1	3	
14-Jan	1	1	1	1	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	UO	1	1	3	
15-Jan	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	UO	UO	UO	UO	2	1	2	
16-Jan	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2	
17-Jan	2	1	1	2	2	2	2	2	1	2	2	2	2	3	2	2	2	2	2	2	3	2	2	1	3	
18-Jan	1	2	2	3	2	3	3	2	3	3	3	4	3	2	3	2	1	1	2	1	2	2	2	2	4	
19-Jan	3	2	2	3	2	3	2	3	3	1	1	1	2	3	2	2	2	2	2	2	3	3	2	3	3	
20-Jan	2	3	2	2	2	2	2	2	3	2	3	3	3	3	2	2	2	2	2	2	4	1	1	1	4	
21-Jan	2	1	1	1	2	1	1	2	2	2	2	2	1	2	2	1	2	1	2	1	2	2	2	2	2	
22-Jan	2	4	6	6	9	4	5	3	5	5	5	6	3	3	3	2	3	2	3	3	1	3	2	1	9	
23-Jan	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	UO	1	2	1	1	2	1	2	
24-Jan	2	2	1	1	2	2	2	2	2	3	3	1	1	2	2	3	3	2	2	2	2	1	1	1	3	
25-Jan	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	2	2	1	2	2	
26-Jan	3	3	3	2	3	4	7	6	4	4	5	4	3	3	2	3	3	4	4	5	5	5	4	4	7	
27-Jan	4	4	4	3	4	3	3	3	2	3	1	1	1	1	2	2	2	1	2	3	2	2	3	2	4	
28-Jan	1	2	3	2	2	5	3	3	3	2	3	4	5	3	4	5	5	4	3	4	3	3	2	2	5	
29-Jan	2	1	2	1	1	1	1	1	1	2	2	3	3	3	3	3	3	2	2	2	1	2	1	1	3	
30-Jan	3	3	2	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	3	2	2	1	6	6	
31-Jan	3	2	3	3	2	1	2	3	UO	1	1	1	1	2	2	1	2	1	2	2	1	4	2	2	4	
	4	4	6	6	9	5	7	6	5	5	5	6	5	3	4	5	5	4	4	5	5	5	4	6		
Diurnal Maximum																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

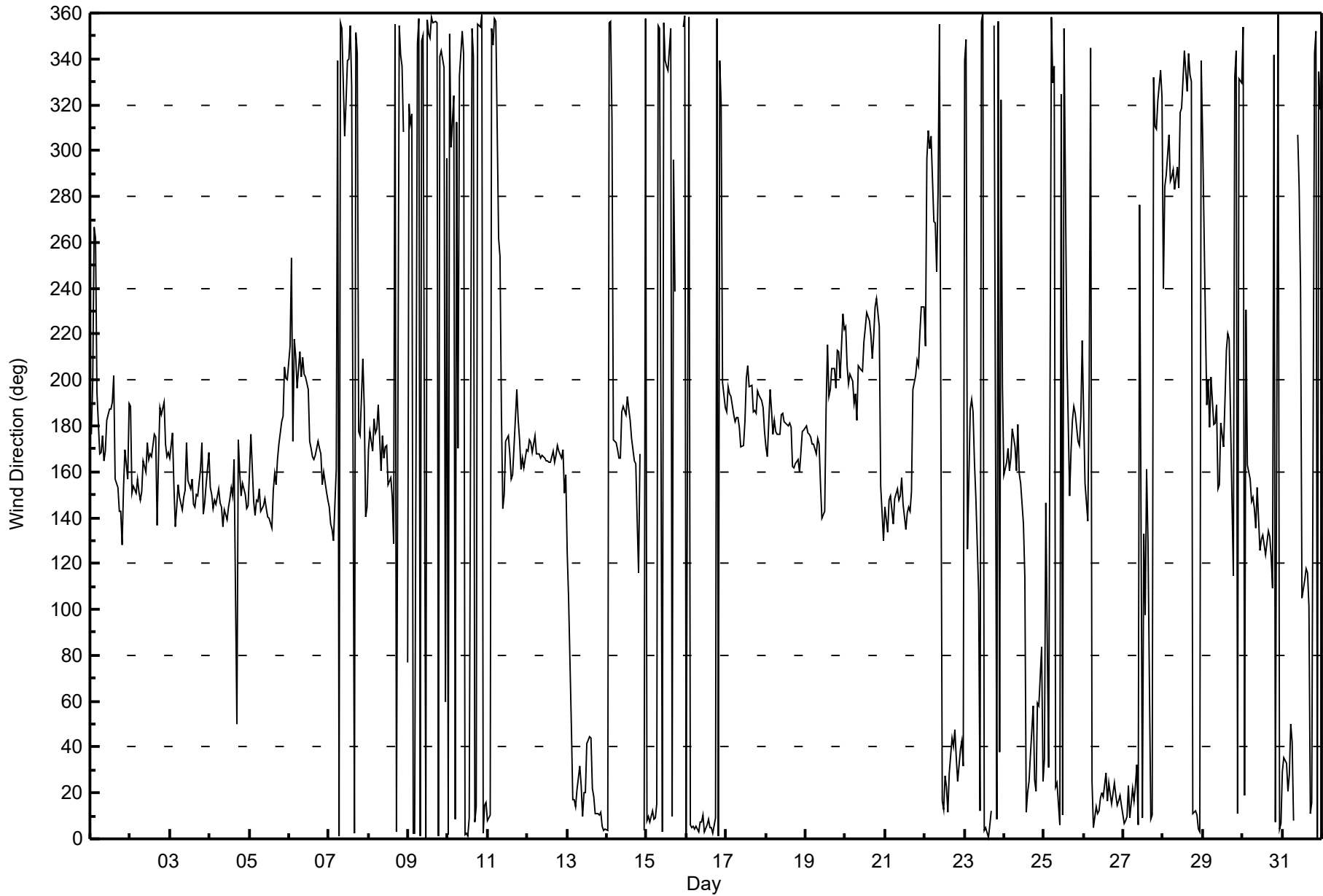
Wind Direction (WD) - deg
Fort Hills - January 2023

Direction of Maximum Speed: 14 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 167.5 deg on Jan 12	Hours of Data: 736
Direction of Minimum Speed: 320 deg on Jan 9 01:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 1.1 deg on Jan 7	Percent Operational Time: 98.9
Monthly Average Direction: 162.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	176	200	267	262	194	168	169	176	165	169	182	187	187	190	202	157	153	143	143	128	153	169	157	190	172.8
2-Jan	188	151	154	151	157	151	148	151	164	160	173	166	168	166	176	175	137	167	188	185	190	172	166	168	166.0
3-Jan	166	177	154	136	144	154	149	144	149	152	173	156	153	157	146	145	150	149	161	173	142	147	154	168	153.5
4-Jan	153	150	144	148	146	153	147	145	136	144	139	145	148	153	149	165	50	174	160	150	155	150	144	145	147.0
5-Jan	160	177	147	141	148	147	152	143	145	148	144	140	140	135	152	160	154	166	172	182	184	206	201	200	154.1
6-Jan	215	253	173	218	211	197	212	201	210	202	202	196	173	171	166	166	167	173	170	168	154	160	151	148	174.1
7-Jan	145	137	135	130	161	339	1	356	353	306	321	339	340	354	328	2	351	342	177	176	209	188	140	145	112.0
8-Jan	169	177	169	183	177	179	189	160	176	166	171	171	155	157	149	128	355	3	354	342	337	308	UO	77	170.9
9-Jan	320	312	316	2	3	346	357	1	348	350	0	357	351	349	358	356	356	356	1	341	343	336	60	297	351.9
10-Jan	2	351	302	324	8	312	170	333	352	342	2	3	1	9	353	341	7	14	355	354	359	2	15	16	0.4
11-Jan	8	10	353	346	358	356	262	254	186	144	150	173	176	168	157	159	171	196	183	174	161	166	162	169	167.0
12-Jan	169	174	173	169	176	168	168	168	166	167	166	165	165	164	164	169	164	167	172	169	166	170	151	159	167.5
13-Jan	125	105	49	17	17	14	21	32	23	10	20	20	42	44	22	18	11	11	11	12	5	4	5	21.8	
14-Jan	4	356	356	314	174	173	169	166	166	186	188	185	193	187	183	175	165	163	139	116	168	UO	3	358	173.7
15-Jan	8	10	7	12	8	9	15	355	354	3	356	339	337	335	353	10	296	239	UO	UO	UO	UO	354	359	0.4
16-Jan	0	358	6	5	6	4	6	3	7	7	10	3	6	9	5	5	2	9	357	1	339	320	199	188	3.2
17-Jan	186	197	194	193	185	182	184	183	179	171	171	182	201	206	197	198	186	187	185	195	193	191	188	178	188.0
18-Jan	171	167	196	187	176	183	178	176	177	185	185	182	181	180	181	179	163	162	164	165	160	169	178	178	177.0
19-Jan	180	177	176	175	172	172	168	175	172	154	139	143	188	215	193	196	205	205	197	213	212	201	229	222	186.1
20-Jan	223	206	198	202	199	190	194	182	206	204	204	216	223	230	226	219	209	219	232	235	223	154	142	130	208.6
21-Jan	145	133	148	150	143	137	148	153	148	150	157	146	135	142	145	143	152	196	202	209	207	220	232	232	163.0
22-Jan	215	296	308	301	306	269	268	247	283	355	17	13	27	23	12	29	44	40	47	35	25	39	43	31	343.8
23-Jan	339	349	126	187	192	186	164	149	107	12	356	360	4	5	0	6	12	UO	355	8	356	38	322	197	4.9
24-Jan	158	164	170	160	166	179	171	160	181	159	155	138	114	12	20	25	36	58	25	21	59	58	84	25	124.4
25-Jan	35	146	88	31	358	330	337	23	24	6	325	10	354	285	213	150	169	183	189	185	173	171	184	217	179.3
26-Jan	186	155	139	198	344	25	5	14	11	12	18	20	18	29	17	25	20	15	24	19	15	16	19	15	19.8
27-Jan	7	8	10	23	9	22	17	23	32	6	276	9	133	98	161	130	8	10	332	311	309	321	335	324	4.5
28-Jan	240	284	289	307	287	288	292	283	293	284	317	318	331	344	326	342	333	330	11	12	11	4	3	339	325.1
29-Jan	307	227	189	200	179	202	181	181	189	152	155	181	171	191	213	221	218	147	115	332	344	11	331	329	195.8
30-Jan	354	19	230	163	157	147	149	144	136	153	126	131	132	128	124	134	132	123	110	342	7	360	4	7	107.2
31-Jan	30	35	33	21	28	50	42	8	UO	307	284	241	105	113	118	116	101	11	16	342	352	1	335	318	32.3

171.2 159.7 165.5 172.2 168.4 165.6 166.6 161.6 165.8 155.7 155.7 157.2 162.5 164.6 168.7 156.5 142.9 152.2 149.5 179.5 160.2 161.5 159.1 175.0
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort Hills - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 98 deg on Jan 4 17:00	Hours of Data: 736
Minimum Value: 4 deg on Jan 18 18:00	Hours of Missing Data: 8
Percentiles: P ₁ = 6 P ₁₀ = 7 Q ₁ = 9 Median = 11 Q ₃ = 18 P ₉₀ = 31 P ₉₉ = 84	Hours of Calibration: 0
	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	14	17	14	34	8	10	10	9	8	8	10	9	11	21	12	24	10	10	14	32	12	13	25	41	41
2-Jan	7	11	11	9	10	10	9	14	10	11	10	14	15	9	13	9	12	27	18	12	11	15	15	13	27
3-Jan	10	12	22	6	6	13	11	8	6	12	8	9	5	6	8	8	6	7	9	22	11	41	14	17	41
4-Jan	10	9	7	7	7	7	7	13	10	6	7	8	7	20	13	90	98	79	39	19	12	5	8	8	98
5-Jan	12	13	7	6	5	6	7	8	7	11	8	8	8	7	9	6	14	25	20	10	18	32	17	25	32
6-Jan	24	20	19	19	10	10	7	8	5	6	8	22	11	11	9	8	10	9	9	9	11	17	20	13	24
7-Jan	7	10	9	20	51	84	25	27	10	41	35	24	37	56	26	20	18	24	60	21	15	14	14	12	84
8-Jan	13	10	10	10	11	8	10	11	24	18	10	8	16	23	21	10	47	9	26	22	20	14	UO	55	55
9-Jan	90	45	49	11	14	18	10	35	30	17	11	10	26	20	14	13	12	11	12	12	14	30	66	83	90
10-Jan	13	28	17	28	13	57	14	53	18	12	10	11	11	13	23	16	9	7	18	13	10	11	8	7	57
11-Jan	8	8	24	19	14	28	34	30	48	19	7	12	9	14	7	7	15	9	7	9	13	7	7	7	48
12-Jan	9	8	7	7	8	7	8	8	7	7	7	7	7	7	7	7	7	6	7	8	10	15	18	27	27
13-Jan	21	24	41	12	11	9	9	11	31	12	10	11	12	10	16	8	8	8	9	9	8	11	11	11	41
14-Jan	11	11	17	46	54	10	9	8	8	11	9	10	8	9	8	8	7	8	18	11	24	UO	UO	19	54
15-Jan	8	7	10	8	8	10	8	15	14	9	12	12	24	9	17	10	46	13	UO	UO	UO	UO	16	12	46
16-Jan	10	12	11	11	10	10	10	12	10	12	9	12	10	9	12	11	11	9	10	10	9	12	34	20	34
17-Jan	10	7	11	7	7	7	8	8	8	8	8	9	16	12	9	7	9	9	8	8	8	9	12	7	16
18-Jan	10	11	10	9	8	10	10	8	8	8	9	8	8	7	7	7	6	4	6	5	7	8	7	7	11
19-Jan	7	8	7	10	9	7	8	10	11	11	9	8	21	12	9	8	7	6	19	10	20	19	7	7	21
20-Jan	6	21	12	8	11	8	18	17	12	9	8	15	8	9	10	8	7	8	7	5	44	15	16	12	44
21-Jan	15	9	16	6	10	6	9	10	8	9	8	8	8	9	24	6	21	27	13	10	10	11	8	11	27
22-Jan	13	25	13	13	21	21	13	19	35	39	10	11	15	10	12	13	42	19	12	19	10	20	14	31	42
23-Jan	13	27	86	13	31	12	13	14	84	34	26	11	10	8	11	14	14	UO	17	11	17	52	77	79	86
24-Jan	11	9	9	11	9	8	9	7	10	12	9	19	51	14	12	13	13	17	14	10	14	15	26	26	51
25-Jan	43	19	82	72	27	33	14	26	32	20	39	10	20	35	82	37	14	16	16	13	8	10	17	13	82
26-Jan	22	9	15	49	53	10	15	9	11	10	9	9	9	11	8	10	9	11	10	9	11	12	11	13	53
27-Jan	13	13	11	10	12	9	9	8	10	36	24	29	25	24	84	48	44	19	14	13	15	9	12	28	84
28-Jan	15	35	25	15	13	16	12	10	14	19	13	15	12	12	11	14	11	11	21	9	11	13	42	8	42
29-Jan	23	55	20	8	22	21	30	12	11	8	14	10	19	12	10	8	8	31	56	27	20	10	39	30	56
30-Jan	21	38	45	20	14	15	23	21	14	14	6	7	10	8	10	7	13	15	91	54	11	13	10	21	91
31-Jan	9	11	11	9	9	18	19	17	UO	44	19	59	25	21	18	13	38	10	41	80	12	29	21	29	80
	90	55	86	72	54	84	34	53	84	44	39	59	51	56	84	90	98	79	91	80	44	52	77	83	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03 LOWER CAMP METEOROLOGY JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
JANUARY 2023

MONTHLY SUMMARY for
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
Temperature 20 m (C) Average	733	0	11	98.52	3.8	-	-2.4	-
Temperature 45 m (C) Average	733	0	11	98.52	3.7	-	-2.1	-
Temperature 100 m (C) Average	733	0	11	98.52	3.7	-	-0.7	-
Temperature 163 m (C) Average	733	0	11	98.52	3.6	-	0.2	-
Relative Humidity 20 m (%) Average	733	0	11	98.52	98.4	-	93.6	-
Relative Humidity 45 m (%) Average	733	0	11	98.52	95	-	92.8	-
Relative Humidity 100 m (%) Average	733	0	11	98.52	93	-	89.7	-
Relative Humidity 163 m (%) Average	733	0	11	98.52	97.1	-	91.0	-
Wind Speed 20 m (km/h) Average	733	0	11	98.52	23	-	17.0	-
Wind Speed 45 m (km/h) Average	718	0	26	96.51	36	-	22.0	-
Wind Speed 100 m (km/h) Average	693	0	51	93.15	44	-	29.0	-
Wind Speed 163 m (km/h) Average	657	0	87	88.31	49	-	33.0	-
Wind Direction 20 m (deg) Average	733	0	11	98.52	-	-	-	-
Wind Direction 45 m (deg) Average	718	0	26	96.51	-	-	-	-
Wind Direction 100 m (deg) Average	693	0	51	93.15	-	-	-	-
Wind Direction 163 m (deg) Average	657	0	87	88.31	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	733	0	11	98.52	0.3	-	0.0	-
Vertical Wind Speed 45 m (km/h) Average	718	0	26	96.51	1.5	-	0.5	-
Vertical Wind Speed 100 m (km/h) Average	693	0	51	93.15	2.6	-	0.5	-
Vertical Wind Speed 163 m (km/h) Average	657	0	87	88.31	3.8	-	1.5	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
Temperature 20 m (C) Average	733	-9.92	5.7	-	-28.1	-18.2	-12.6	-8.6	-6.7	-4	3.8
Temperature 45 m (C) Average	733	-9.85	5.6	-	-26.5	-18.3	-12.3	-8.7	-7	-4	3.7
Temperature 100 m (C) Average	733	-9.35	5.5	-	-26.1	-18.6	-10.8	-8.5	-6.7	-3.6	3.7
Temperature 163 m (C) Average	733	-9.05	5.6	-	-25.8	-19.1	-10.3	-8.3	-6.2	-2.7	3.6
Relative Humidity 20 m (%) Average	733	83.41	7.8	-	52.2	73.5	79.3	84.7	88.4	92.8	98.4
Relative Humidity 45 m (%) Average	733	84.27	7.6	-	54.5	73.7	80.5	86.2	89.8	92.6	95
Relative Humidity 100 m (%) Average	733	81.18	7.6	-	54	70.4	77.3	82.5	86.9	89.3	93
Relative Humidity 163 m (%) Average	733	82.74	8.2	-	56.5	70.9	78	85.2	89.3	91	97.1
Wind Speed 20 m (km/h) Average	733	8.9	6	-	0	2	4	8	14	17	23
Wind Speed 45 m (km/h) Average	718	11.7	7	-	0	3	6	11	17	22	36
Wind Speed 100 m (km/h) Average	693	14.7	9	-	1	4	8	14	20	27	44
Wind Speed 163 m (km/h) Average	657	17.4	10	-	0	4	9	17	24	30	49
Wind Direction 20 m (deg) Average	733	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	718	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	693	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	657	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	733	-0.31	0.4	-	-1.7	-0.9	-0.5	-0.2	0	0	0.3
Vertical Wind Speed 45 m (km/h) Average	718	0.11	0.4	-	-1.1	-0.2	-0.1	0.1	0.3	0.6	1.5
Vertical Wind Speed 100 m (km/h) Average	693	0	0.6	-	-2.3	-0.8	-0.3	0	0.3	0.7	2.6
Vertical Wind Speed 163 m (km/h) Average	657	0.3	0.8	-	-3.8	-0.4	0	0.2	0.5	1.1	3.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	20 Jan 2023 10:00	20 Jan 2023 11:00	2	DAS Failure - data not recorded
ALL PARAMETERS	28 Jan 2023 12:00	28 Jan 2023 12:00	1	DAS Failure - data not recorded
ALL PARAMETERS	29 Jan 2023 12:00	29 Jan 2023 18:00	7	DAS Failure - data not recorded
ALL PARAMETERS	30 Jan 2023 00:00	30 Jan 2023 00:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	08 Jan 2023 05:00	08 Jan 2023 05:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	25 Jan 2023 09:00	25 Jan 2023 22:00	14	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 100m	13 Jan 2023 06:00	14 Jan 2023 01:00	20	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 100m	25 Jan 2023 08:00	26 Jan 2023 03:00	20	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	01 Jan 2023 02:00	01 Jan 2023 10:00	9	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	07 Jan 2023 12:00	07 Jan 2023 19:00	8	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	08 Jan 2023 02:00	08 Jan 2023 14:00	13	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	08 Jan 2023 22:00	09 Jan 2023 04:00	7	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	13 Jan 2023 07:00	14 Jan 2023 01:00	19	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	25 Jan 2023 08:00	26 Jan 2023 03:00	20	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Summary of Hour Averages

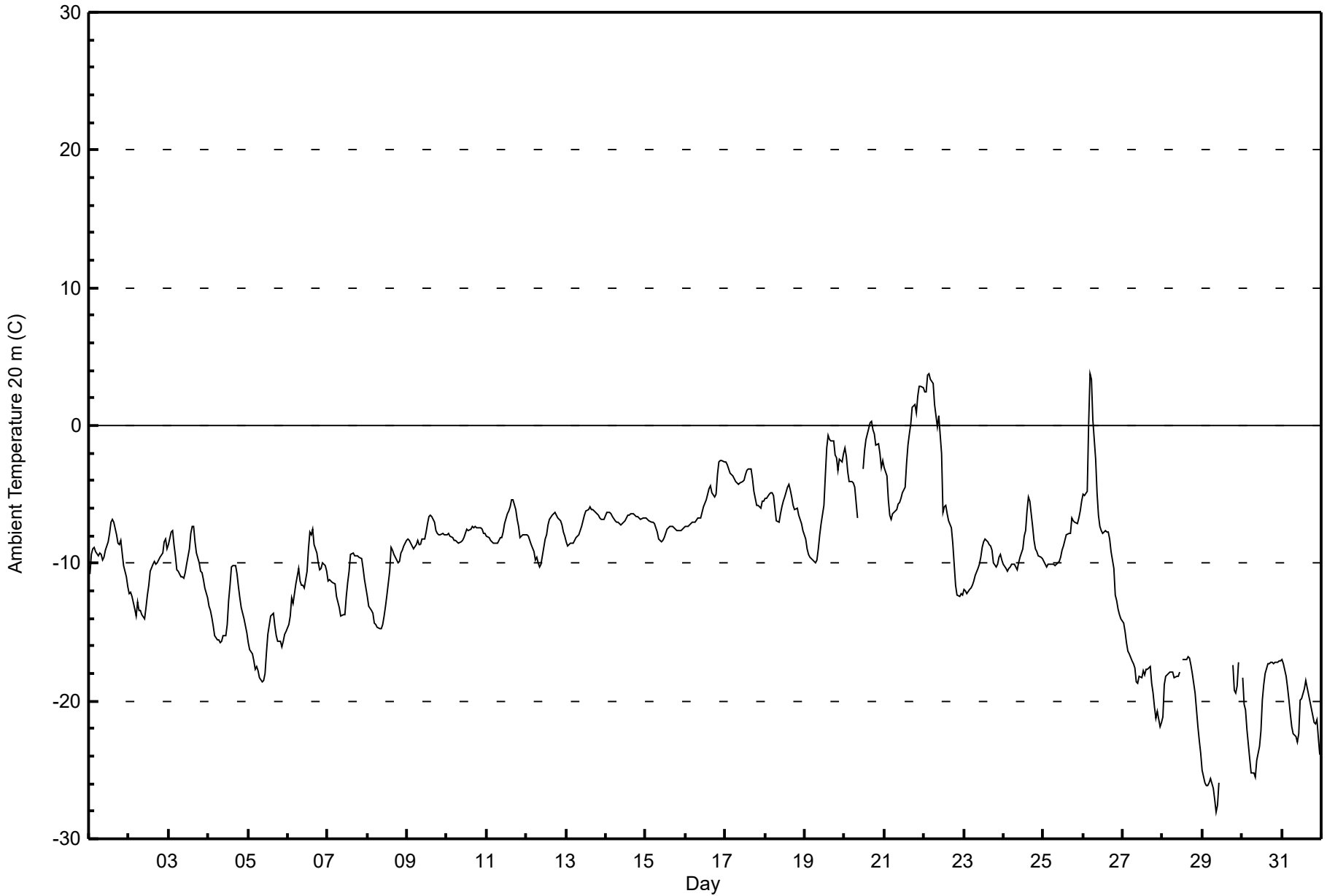
Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - January 2023

Maximum Value: 3.8 C on Jan 26 05:00 Maximum Daily Average: -2.4 C on Jan 20		Hours in Service: 744 Hours of Data: 733 Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5																									
Minimum Value: -28.1 C on Jan 29 09:00 Maximum Diurnal Average: -8.0 C at hour 16 Monthly Average: -9.92 C		Minimum Daily Average: -20.5 C on Jan 31 Minimum Diurnal Average: -11.5 C at hour 9 Percentiles: P ₁ = -25.9 P ₁₀ = -18.2 Q ₁ = -12.6 Median = -8.6 Q ₃ = -6.7 P ₉₀ = -4.0 P ₉₉ = 2.8																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-10.7	-9.3	-9.0	-8.9	-9.1	-9.4	-9.3	-9.4	-9.7	-9.5	-9.0	-8.5	-7.9	-7.0	-6.9	-7.0	-7.9	-8.6	-8.6	-8.3	-9.2	-10.2	-10.9	-11.7	-9.0	-6.9	
2-Jan	-12.2	-12.1	-12.4	-13.4	-13.9	-12.8	-13.5	-13.5	-13.7	-14.0	-13.3	-12.3	-11.6	-10.6	-10.1	-9.8	-10.1	-9.9	-9.7	-9.5	-9.2	-8.4	-8.2	-8.9	-11.4	-8.2	
3-Jan	-8.6	-7.7	-7.7	-8.7	-9.4	-10.4	-10.6	-11.0	-11.0	-11.1	-10.7	-10.1	-8.9	-7.8	-7.3	-7.3	-8.4	-9.2	-9.9	-10.6	-10.7	-11.2	-11.8	-12.6	-9.7	-7.3	
4-Jan	-13.2	-13.5	-13.9	-14.5	-15.2	-15.6	-15.6	-15.8	-15.7	-15.3	-15.3	-14.5	-12.7	-11.5	-10.3	-10.1	-10.8	-11.7	-12.5	-13.3	-14.0	-14.5	-15.1	-13.5	-10.1		
5-Jan	-15.7	-16.3	-16.6	-17.1	-17.7	-17.5	-17.8	-18.3	-18.6	-18.5	-18.0	-16.5	-15.2	-13.8	-13.7	-13.6	-14.6	-15.3	-15.7	-15.7	-16.1	-15.7	-15.2	-16.2	-13.6		
6-Jan	-14.4	-13.9	-12.5	-12.9	-12.2	-11.5	-10.4	-11.3	-11.6	-11.6	-11.8	-10.5	-8.9	-7.7	-7.9	-7.6	-8.6	-9.2	-10.0	-10.4	-10.3	-10.0	-10.2	-10.6	-10.7	-7.6	
7-Jan	-11.3	-11.2	-11.3	-11.4	-11.5	-12.4	-12.8	-13.2	-13.8	-13.8	-13.7	-12.4	-11.4	-10.5	-9.3	-9.3	-9.5	-9.5	-9.5	-9.5	-9.7	-10.4	-11.2	-11.8	-11.3	-9.3	
8-Jan	-12.5	-13.2	-13.4	-13.7	-14.3	-14.4	-14.6	-14.7	-14.7	-14.5	-13.8	-13.2	-12.3	-10.5	-8.9	-9.0	-9.4	-9.6	-10.0	-9.8	-9.3	-9.0	-8.7	-8.3	-11.7	-8.3	
9-Jan	-8.2	-8.3	-8.6	-8.8	-9.0	-8.6	-8.4	-8.6	-8.6	-8.2	-8.2	-7.8	-7.1	-6.7	-6.5	-6.6	-7.0	-7.6	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9	-6.5	
10-Jan	-7.9	-7.9	-8.0	-8.2	-8.4	-8.4	-8.4	-8.6	-8.4	-8.3	-8.1	-7.8	-7.5	-7.6	-7.6	-7.3	-7.4	-7.3	-7.4	-7.4	-7.4	-7.5	-7.8	-7.8	-7.9	-7.3	
11-Jan	-8.0	-8.2	-8.3	-8.5	-8.5	-8.5	-8.5	-8.3	-8.2	-8.1	-7.7	-7.1	-6.4	-6.2	-5.8	-5.4	-5.4	-6.1	-6.8	-7.4	-8.1	-8.0	-8.0	-8.0	-7.5	-5.4	
12-Jan	-8.0	-8.1	-8.4	-8.7	-9.2	-9.7	-9.6	-9.9	-10.3	-10.1	-8.8	-8.2	-8.0	-7.2	-6.8	-6.6	-6.4	-6.3	-6.5	-6.7	-6.9	-7.2	-7.8	-8.1	-8.1	-6.3	
13-Jan	-8.4	-8.7	-8.5	-8.5	-8.5	-8.3	-8.1	-8.0	-7.6	-7.3	-7.0	-6.5	-6.2	-6.1	-5.9	-6.1	-6.1	-6.2	-6.4	-6.6	-6.7	-6.8	-6.8	-6.8	-7.2	-5.9	
14-Jan	-6.3	-6.3	-6.3	-6.4	-6.6	-6.9	-7.0	-7.0	-7.2	-7.2	-7.1	-6.9	-6.7	-6.5	-6.5	-6.4	-6.4	-6.5	-6.6	-6.6	-6.7	-6.8	-6.7	-6.7	-6.7	-6.3	
15-Jan	-6.7	-6.8	-6.9	-7.0	-7.0	-7.1	-7.4	-7.7	-8.2	-8.5	-8.4	-8.1	-7.8	-7.5	-7.3	-7.3	-7.3	-7.4	-7.5	-7.6	-7.6	-7.6	-7.6	-7.4	-7.5	-6.7	
16-Jan	-7.4	-7.3	-7.2	-7.1	-7.0	-7.0	-7.0	-6.7	-6.7	-6.7	-6.3	-5.9	-5.4	-5.0	-4.5	-4.4	-4.8	-5.2	-5.0	-3.6	-2.6	-2.6	-2.6	-2.6	-5.4	-2.6	
17-Jan	-2.6	-2.8	-3.2	-3.4	-3.7	-3.9	-4.0	-4.2	-4.3	-4.2	-4.1	-4.0	-3.6	-3.2	-3.2	-3.2	-3.8	-4.8	-5.3	-5.8	-5.8	-6.0	-5.5	-5.5	-4.2	-2.6	
18-Jan	-5.3	-5.3	-5.0	-4.9	-4.9	-5.1	-6.0	-6.9	-7.1	-6.4	-5.9	-5.5	-5.2	-4.5	-4.3	-4.6	-5.2	-5.8	-6.1	-6.0	-6.5	-6.8	-7.1	-7.6	-5.8	-4.3	
19-Jan	-8.2	-9.0	-9.3	-9.6	-9.7	-9.8	-10.0	-9.7	-9.0	-8.0	-7.2	-5.8	-3.6	-1.6	-0.7	-1.0	-1.2	-1.1	-2.1	-2.3	-3.2	-2.4	-2.7	-2.0	-5.4	-0.7	
20-Jan	-1.6	-2.3	-3.3	-4.1	-4.1	-4.2	-4.5	-5.6	-6.7	DF	DF	-3.1	-1.8	-1.0	-0.2	0.2	0.3	-0.3	-0.6	-1.4	-1.3	-2.0	-3.1	-2.5	-2.4	0.3	
21-Jan	-3.1	-3.7	-5.4	-6.5	-6.8	-6.5	-6.3	-6.1	-5.7	-5.6	-5.3	-4.8	-4.5	-2.7	-1.4	-0.6	0.1	1.3	1.6	0.9	2.2	2.8	2.9	2.7	-2.5	2.9	
22-Jan	2.4	2.4	3.6	3.8	3.4	3.1	1.5	0.7	-0.1	0.7	-2.0	-6.3	-5.9	-5.7	-6.4	-6.9	-7.4	-8.5	-10.1	-11.6	-12.3	-12.4	-12.2	-12.3	-4.1	3.8	
23-Jan	-11.9	-12.0	-12.2	-11.9	-11.8	-11.5	-11.3	-10.9	-10.4	-10.0	-9.6	-8.9	-8.4	-8.3	-8.5	-8.7	-8.7	-9.1	-10.0	-10.3	-10.0	-9.5	-9.4	-9.7	-10.1	-8.3	
24-Jan	-10.1	-10.4	-10.6	-10.4	-10.3	-10.0	-10.1	-10.2	-10.5	-10.0	-9.6	-9.0	-8.1	-7.6	-6.2	-5.2	-5.5	-7.3	-8.3	-8.9	-9.2	-9.4	-9.6	-9.7	-9.0	-5.2	
25-Jan	-9.9	-10.1	-10.2	-10.1	-10.0	-10.1	-10.1	-10.1	-10.1	-9.8	-9.6	-9.0	-8.7	-8.3	-8.0	-7.9	-7.8	-6.7	-6.9	-7.0	-7.1	-6.7	-6.2	-5.5	-8.6	-5.5	
26-Jan	-5.0	-5.1	-4.8	0.1	3.8	3.4	0.4	-2.4	-4.9	-6.5	-7.3	-7.6	-7.8	-7.6	-7.7	-7.7	-8.2	-9.2	-10.4	-12.3	-12.7	-13.3	-13.7	-14.1	-6.7	3.8	
27-Jan	-14.3	-15.0	-15.8	-16.3	-16.6	-17.0	-17.3	-17.6	-18.6	-18.7	-18.2	-18.3	-17.8	-18.1	-17.7	-17.7	-17.5	-18.7	-19.4	-20.4	-21.2	-20.8	-21.9	-21.6	-18.2	-14.3	
28-Jan	-21.2	-18.9	-18.2	-18.0	-17.9	-17.9	-17.9	-18.3	-18.3	-18.2	-17.9	DF	-17.0	-17.0	-16.9	-16.8	-16.9	-17.4	-18.0	-19.4	-20.6	-21.8	-22.8	-23.8	-18.7	-16.8	
29-Jan	-25.1	-26.0	-26.2	-26.1	-25.9	-25.6	-26.3	-27.1	-28.1	-27.5	-25.9	DF	DF	DF	DF	DF	DF	DF	DF	-17.4	-19.2	-19.4	-18.9	-17.2	DF	--	-17.2
30-Jan	-18.3	-20.2	-20.6	-22.0	-24.2	-25.2	-25.3	-25.2	-25.6	-24.3	-23.3	-22.2	-20.0	-18.8	-18.0	-17.3	-17.3	-17.2	-17.2	-17.2	-17.2	-17.2	-17.1	-17.1	-20.3	-17.1	
31-Jan	-17.0	-17.3	-18.2	-19.1	-20.0	-20.9	-21.9	-22.3	-22.6	-23.0	-22.3	-20.0	-19.8	-19.1	-18.5	-19.0	-19.5	-20.1	-20.6	-21.5	-21.6	-21.3	-22.6	-23.9	-20.5	-17.0	
																								Diurnal Average			
																								Diurnal Maximum			
DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	45	6.14	6.14
-20 - 0	665	90.72	96.86
0 - 10	23	3.14	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 733

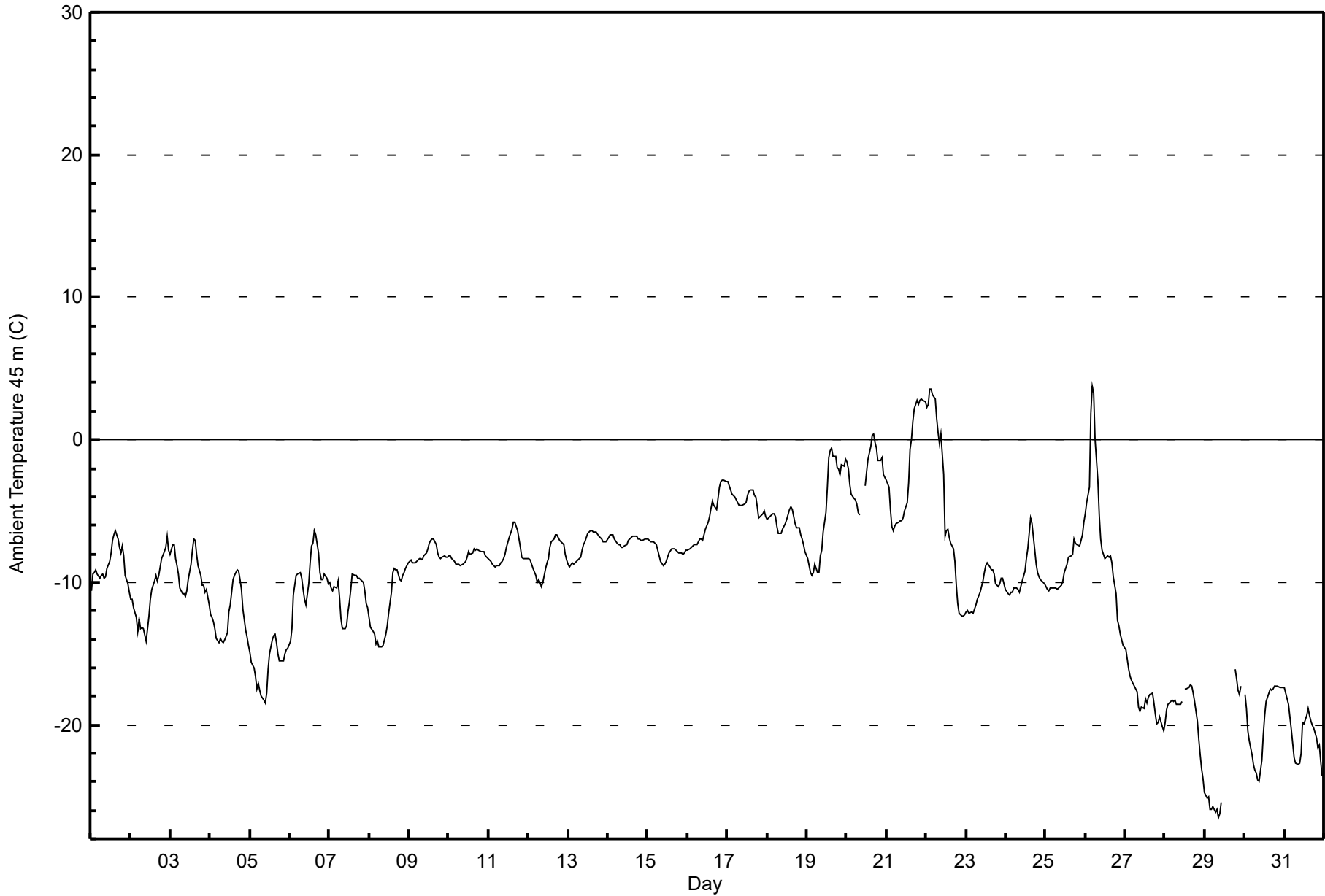
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature 45 m (AT45m) - C
Lower Camp Met Tower - January 2023

Maximum Value: 3.7 C on Jan 26 05:00 Maximum Daily Average: -2.1 C on Jan 21																					Hours in Service:	744					
Minimum Value: -26.5 C on Jan 29 09:00 Minimum Daily Average: -20.6 C on Jan 31																					Hours of Data:	733					
Maximum Diurnal Average: -8.1 C at hour 16 Minimum Diurnal Average: -11.5 C at hour 10																					Hours of Missing Data:	11					
Monthly Average: -9.85 C Percentiles: P ₁ = -25.4 P ₁₀ = -18.3 Q ₁ = -12.3 Median = -8.7 Q ₃ = -7.0 P ₉₀ = -4.0 P ₉₉ = 2.8																					Hours of Calibration:	0					
																					Percent Operational Time:	98.5					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-10.6	-9.5	-9.3	-9.2	-9.5	-9.7	-9.5	-9.4	-9.8	-9.7	-9.0	-8.6	-8.0	-7.0	-6.7	-6.4	-7.0	-7.5	-8.0	-7.5	-8.1	-9.5	-10.1	-10.7	-8.8	-6.4	
2-Jan	-11.2	-11.2	-11.7	-12.5	-13.4	-12.5	-13.2	-13.2	-13.3	-14.1	-13.3	-12.4	-11.2	-10.5	-9.9	-9.5	-9.9	-9.5	-9.0	-8.3	-7.8	-7.6	-6.7	-7.7	-10.8	-6.7	
3-Jan	-8.1	-7.3	-7.3	-8.3	-8.9	-9.4	-10.4	-10.8	-10.8	-11.0	-10.6	-9.8	-8.7	-7.7	-7.0	-7.1	-8.1	-8.9	-9.5	-10.2	-10.2	-10.6	-10.5	-11.5	-9.3	-7.0	
4-Jan	-12.3	-12.5	-12.7	-13.2	-14.0	-14.3	-14.0	-14.2	-14.3	-14.1	-13.6	-12.1	-11.6	-10.7	-9.9	-9.5	-9.1	-9.3	-9.8	-10.5	-11.9	-13.3	-13.8	-14.5	-12.3	-9.1	
5-Jan	-15.0	-15.7	-16.0	-16.6	-17.4	-17.1	-17.6	-17.9	-18.2	-18.4	-17.8	-16.1	-15.0	-14.0	-13.8	-13.6	-14.3	-15.0	-15.5	-15.5	-15.5	-15.0	-14.7	-14.7	-15.9	-13.6	
6-Jan	-14.1	-13.2	-10.9	-10.2	-9.6	-9.5	-9.3	-9.8	-10.5	-11.2	-11.6	-10.1	-8.7	-7.5	-7.3	-6.4	-6.6	-7.9	-9.4	-9.8	-9.8	-9.4	-9.7	-10.1	-9.7	-6.4	
7-Jan	-10.0	-10.4	-10.6	-10.3	-10.4	-9.9	-11.1	-12.6	-13.2	-13.3	-13.1	-12.0	-11.3	-10.5	-9.4	-9.5	-9.6	-9.7	-9.7	-9.8	-10.0	-10.6	-11.5	-11.8	-10.9	-9.4	
8-Jan	-12.5	-13.2	-13.5	-13.7	-14.4	-14.2	-14.5	-14.5	-14.4	-14.0	-13.7	-13.1	-12.2	-10.7	-9.3	-9.1	-9.1	-9.1	-9.9	-9.9	-9.6	-9.3	-9.0	-8.7	-11.7	-8.7	
9-Jan	-8.5	-8.5	-8.6	-8.6	-8.7	-8.4	-8.3	-8.3	-8.5	-8.1	-7.9	-7.7	-7.3	-7.0	-7.0	-7.0	-7.4	-8.0	-8.2	-8.3	-8.2	-8.2	-8.2	-8.2	-8.0	-7.0	
10-Jan	-8.2	-8.1	-8.4	-8.6	-8.8	-8.8	-8.8	-8.8	-8.7	-8.6	-8.5	-8.2	-7.9	-8.0	-7.9	-7.7	-7.7	-7.6	-7.7	-7.8	-7.8	-7.9	-8.1	-8.2	-8.2	-7.6	
11-Jan	-8.4	-8.5	-8.7	-8.9	-8.9	-8.9	-8.8	-8.7	-8.5	-8.4	-8.0	-7.5	-6.9	-6.6	-6.3	-5.8	-5.8	-6.3	-6.9	-7.6	-8.3	-8.4	-8.4	-8.4	-7.8	-5.8	
12-Jan	-8.3	-8.4	-8.7	-9.0	-9.6	-10.0	-9.9	-10.0	-10.3	-10.0	-9.1	-8.6	-8.4	-7.6	-7.2	-6.9	-6.7	-6.6	-6.8	-7.0	-7.2	-7.4	-8.0	-8.4	-8.3	-6.6	
13-Jan	-8.8	-8.9	-8.6	-8.7	-8.7	-8.5	-8.4	-8.2	-7.8	-7.4	-7.2	-6.9	-6.6	-6.4	-6.4	-6.4	-6.5	-6.5	-6.7	-6.8	-7.0	-7.1	-7.2	-7.2	-7.4	-6.4	
14-Jan	-6.9	-6.7	-6.6	-6.7	-7.0	-7.3	-7.4	-7.4	-7.5	-7.5	-7.5	-7.3	-7.1	-6.9	-6.9	-6.8	-6.7	-6.8	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0	-6.6	
15-Jan	-7.0	-7.1	-7.1	-7.2	-7.2	-7.4	-7.7	-8.1	-8.6	-8.9	-8.8	-8.5	-8.3	-8.0	-7.7	-7.6	-7.7	-7.8	-7.9	-8.0	-8.0	-8.0	-7.9	-7.8	-7.8	-7.0	
16-Jan	-7.7	-7.6	-7.6	-7.4	-7.4	-7.4	-7.4	-7.0	-7.0	-7.1	-6.7	-6.3	-5.8	-5.4	-4.8	-4.3	-4.6	-4.9	-4.1	-3.3	-3.0	-2.8	-2.8	-3.0	-5.6	-2.8	
17-Jan	-2.9	-3.2	-3.5	-3.8	-4.0	-4.2	-4.4	-4.6	-4.6	-4.6	-4.5	-4.4	-4.0	-3.6	-3.6	-3.5	-3.9	-4.1	-4.7	-5.5	-5.4	-5.2	-5.0	-5.4	-4.3	-2.9	
18-Jan	-5.6	-5.5	-5.3	-5.2	-5.2	-5.4	-6.1	-6.6	-6.6	-6.3	-6.1	-5.8	-5.6	-4.9	-4.7	-4.9	-5.4	-5.9	-6.2	-6.1	-6.6	-7.0	-7.3	-7.9	-5.9	-4.7	
19-Jan	-8.3	-8.8	-9.3	-9.5	-9.3	-8.8	-9.3	-9.3	-8.2	-7.7	-6.5	-5.1	-3.4	-1.3	-0.7	-0.6	-1.1	-1.2	-2.0	-2.0	-2.5	-1.8	-1.8	-1.3	-5.0	-0.6	
20-Jan	-1.6	-2.0	-3.2	-3.8	-4.1	-4.2	-4.5	-5.1	-5.3	DF	DF	-3.2	-2.2	-1.4	-0.5	0.4	0.4	-0.2	-0.6	-1.4	-1.4	-1.3	-2.4	-2.6	-2.3	0.4	
21-Jan	-2.8	-3.3	-4.9	-6.1	-6.3	-6.1	-5.9	-5.7	-5.7	-5.7	-5.5	-5.0	-4.4	-3.0	-0.7	0.0	1.3	2.2	2.7	2.5	2.7	2.9	2.8	2.7	-2.1	2.9	
22-Jan	2.3	2.5	3.5	3.5	3.2	2.9	1.5	0.5	-0.2	0.5	-2.5	-6.8	-6.4	-6.2	-6.9	-7.3	-7.7	-8.5	-10.2	-11.5	-12.2	-12.4	-12.4	-12.3	-4.3	3.5	
23-Jan	-12.0	-12.0	-12.2	-12.1	-12.1	-11.9	-11.6	-11.2	-10.7	-10.4	-9.9	-9.3	-8.8	-8.7	-8.9	-9.1	-9.1	-9.4	-10.1	-10.3	-10.1	-9.8	-9.7	-10.1	-10.4	-8.7	
24-Jan	-10.5	-10.8	-10.9	-10.7	-10.7	-10.4	-10.4	-10.5	-10.7	-10.3	-9.9	-9.3	-8.4	-7.6	-6.5	-5.5	-5.9	-7.8	-8.7	-9.3	-9.6	-9.8	-10.0	-10.1	-9.3	-5.5	
25-Jan	-10.3	-10.5	-10.6	-10.4	-10.4	-10.4	-10.5	-10.4	-10.2	-9.9	-9.4	-9.1	-8.7	-8.3	-8.2	-8.0	-8.0	-7.0	-7.2	-7.4	-7.5	-7.1	-6.6	-5.8	-8.9	-5.8	
26-Jan	-5.2	-4.4	-3.3	1.9	3.7	3.3	0.1	-2.8	-5.3	-7.0	-7.7	-8.1	-8.3	-8.2	-8.2	-8.2	-8.6	-9.6	-10.8	-12.7	-13.1	-13.7	-14.1	-14.4	-6.9	3.7	
27-Jan	-14.7	-15.4	-16.1	-16.6	-16.9	-17.2	-17.5	-17.7	-18.8	-19.1	-18.8	-18.8	-18.1	-18.5	-18.0	-17.9	-17.7	-18.4	-19.3	-20.0	-19.8	-19.4	-20.2	-20.4	-18.1	-14.7	
28-Jan	-19.9	-19.0	-18.6	-18.4	-18.3	-18.3	-18.3	-18.5	-18.6	-18.6	-18.3	DF	-17.5	-17.5	-17.4	-17.2	-17.3	-17.7	-18.4	-19.8	-21.0	-22.1	-23.1	-23.8	-19.0	-17.2	
29-Jan	-24.8	-25.2	-25.1	-26.0	-26.0	-25.7	-26.2	-26.0	-26.5	-26.3	-25.4	DF	DF	DF	DF	DF	DF	DF	DF	-16.1	-16.8	-17.6	-17.9	-17.3	DF	--	-16.1
30-Jan	-17.9	-18.9	-20.5	-21.2	-22.1	-22.8	-23.1	-23.4	-23.9	-24.0	-22.5	-20.7	-19.4	-18.4	-18.0	-17.5	-17.5	-17.4	-17.3	-17.3	-17.2	-17.4	-17.4	-17.4	-19.7	-17.2	
31-Jan	-17.3	-17.7	-18.6	-19.5	-20.3	-21.3	-22.3	-22.7	-22.8	-22.7	-22.0	-19.8	-20.0	-19.3	-18.9	-19.3	-19.7	-20.0	-20.2	-20.9	-21.6	-21.4	-22.6	-23.6	-20.6	-17.3	
																								Diurnal Average	-9.85		
																								Diurnal Maximum	2.7		
DF - DAS Failure																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C
Lower Camp Met Tower - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	40	5.46	5.46
-20 - 0	669	91.27	96.73
0 - 10	24	3.27	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744

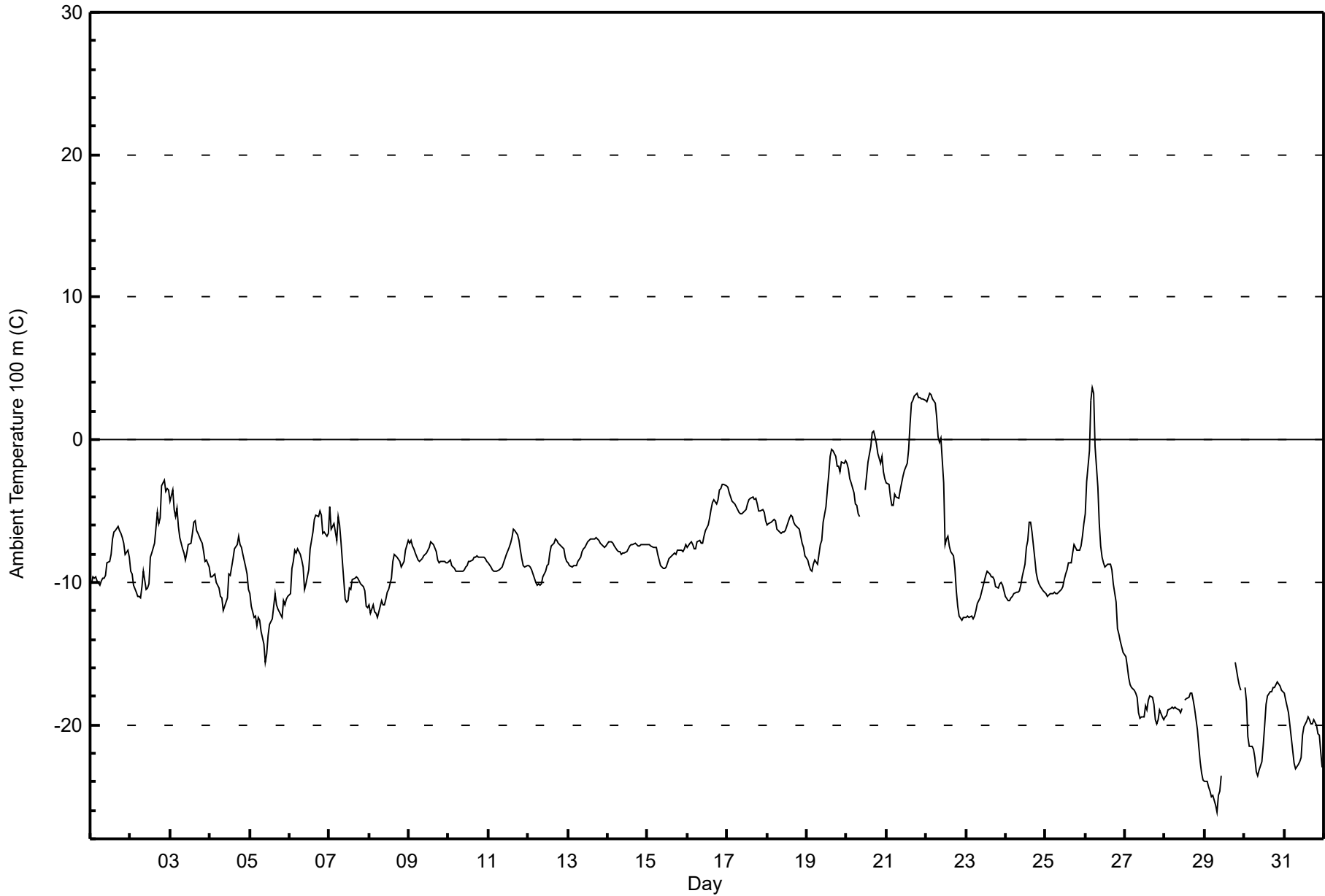


Maximum Value: 3.7 C on Jan 26 05:00		Maximum Daily Average: -0.7 C on Jan 21		Hours in Service: 744																																												
Minimum Value: -26.1 C on Jan 29 08:00		Minimum Daily Average: -20.7 C on Jan 31		Hours of Data: 733																																												
Maximum Diurnal Average: -7.9 C at hour 16		Minimum Diurnal Average: -10.9 C at hour 10		Hours of Missing Data: 11																																												
Monthly Average: -9.35 C		Percentiles: P ₁ = -24.2 P ₁₀ = -18.6 Q ₁ = -10.8 Median = -8.5 Q ₃ = -6.7 P ₉₀ = -3.6 P ₉₉ = 2.9		Hours of Calibration: 0																																												
				Percent Operational Time: 98.5																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-10.1	-9.6	-9.7	-9.6	-10.0	-10.2	-10.0	-9.7	-9.7	-9.5	-8.6	-8.5	-8.1	-7.0	-6.5	-6.4	-6.1	-6.4	-6.6	-6.9	-7.3	-8.0	-7.8	-8.2	-8.3	-6.1																						
2-Jan	-9.2	-9.4	-10.2	-10.7	-11.0	-11.0	-11.1	-10.3	-9.2	-10.5	-10.4	-10.2	-8.2	-7.9	-7.3	-6.1	-5.1	-5.8	-5.5	-3.2	-2.8	-3.6	-3.4	-3.5	-7.7	-2.8																						
3-Jan	-4.3	-3.6	-4.9	-5.4	-4.8	-6.1	-6.9	-7.7	-8.0	-8.5	-7.9	-7.4	-7.3	-6.6	-5.8	-5.7	-6.4	-6.6	-7.0	-7.2	-7.9	-8.5	-8.5	-9.0	-6.7	-3.6																						
4-Jan	-9.7	-9.6	-9.5	-9.5	-10.0	-10.4	-11.0	-11.1	-11.9	-11.7	-11.1	-9.5	-9.5	-8.9	-8.4	-7.7	-7.4	-6.8	-7.3	-7.6	-8.1	-9.0	-9.4	-10.5	-9.4	-6.8																						
5-Jan	-10.8	-11.7	-12.5	-12.4	-13.0	-12.5	-12.7	-13.4	-14.3	-15.6	-15.0	-13.7	-12.9	-12.6	-11.6	-10.8	-11.6	-11.9	-12.1	-12.5	-11.3	-11.6	-11.2	-11.0	-12.4	-10.8																						
6-Jan	-10.8	-9.0	-8.5	-7.8	-7.9	-7.7	-8.0	-8.4	-8.9	-10.5	-10.1	-9.2	-7.7	-7.1	-6.5	-5.6	-5.3	-5.4	-5.0	-5.3	-6.5	-6.5	-6.8	-6.5	-7.5	-5.0																						
7-Jan	-4.7	-6.2	-6.1	-5.9	-7.1	-5.4	-5.9	-7.2	-8.5	-11.2	-11.4	-11.3	-10.4	-10.5	-9.8	-9.7	-9.6	-9.7	-9.9	-10.1	-10.3	-10.6	-11.7	-11.8	-9.0	-4.7																						
8-Jan	-11.6	-12.2	-11.6	-12.1	-12.2	-12.5	-12.0	-11.3	-11.6	-11.5	-11.2	-10.7	-10.5	-9.7	-8.6	-8.1	-8.2	-8.3	-8.5	-8.9	-8.7	-8.5	-7.8	-7.1	-10.1	-7.1																						
9-Jan	-7.2	-7.1	-7.4	-7.6	-8.0	-8.5	-8.5	-8.4	-8.3	-8.1	-8.0	-7.8	-7.6	-7.2	-7.3	-7.3	-7.8	-8.5	-8.6	-8.6	-8.6	-8.5	-8.6	-8.6	-8.0	-7.1																						
10-Jan	-8.6	-8.4	-8.8	-9.0	-9.3	-9.3	-9.2	-9.3	-9.2	-9.1	-8.9	-8.8	-8.5	-8.6	-8.5	-8.2	-8.2	-8.1	-8.2	-8.2	-8.2	-8.3	-8.4	-8.6	-8.7	-8.1																						
11-Jan	-8.7	-8.9	-9.1	-9.2	-9.2	-9.2	-9.1	-9.0	-8.9	-8.6	-8.3	-8.0	-7.5	-7.2	-6.8	-6.3	-6.3	-6.7	-7.1	-7.8	-8.4	-8.9	-8.9	-8.9	-8.2	-6.3																						
12-Jan	-8.8	-9.0	-9.1	-9.4	-10.0	-10.2	-10.1	-10.2	-10.1	-9.7	-9.2	-8.9	-8.8	-7.9	-7.5	-7.2	-7.0	-7.0	-7.3	-7.4	-7.6	-7.7	-8.2	-8.6	-8.6	-7.0																						
13-Jan	-8.7	-8.8	-8.9	-8.9	-8.8	-8.8	-8.6	-8.2	-7.9	-7.7	-7.6	-7.4	-7.2	-7.0	-7.0	-7.0	-7.0	-6.9	-7.1	-7.2	-7.4	-7.5	-7.5	-7.5	-7.8	-6.9																						
14-Jan	-7.2	-7.2	-7.1	-7.2	-7.5	-7.8	-7.9	-7.8	-8.0	-7.9	-7.9	-7.8	-7.6	-7.5	-7.4	-7.3	-7.3	-7.3	-7.5	-7.4	-7.4	-7.4	-7.4	-7.4	-7.5	-7.1																						
15-Jan	-7.4	-7.4	-7.5	-7.5	-7.5	-7.6	-8.0	-8.4	-8.9	-9.1	-9.1	-8.9	-8.6	-8.3	-8.1	-8.1	-7.9	-8.1	-7.8	-7.7	-7.7	-7.8	-7.7	-7.4	-8.0	-7.4																						
16-Jan	-7.6	-7.2	-7.2	-7.3	-7.6	-7.7	-7.2	-7.1	-7.3	-7.2	-6.8	-6.4	-6.0	-5.5	-4.9	-4.4	-4.3	-4.5	-4.2	-3.5	-3.4	-3.2	-3.1	-3.3	-5.7	-3.1																						
17-Jan	-3.4	-3.7	-4.0	-4.3	-4.5	-4.7	-4.9	-5.1	-5.2	-5.2	-5.0	-4.9	-4.5	-4.2	-4.1	-4.0	-4.2	-4.1	-4.5	-5.0	-5.0	-4.9	-5.1	-5.7	-4.6	-3.4																						
18-Jan	-5.9	-5.8	-5.8	-5.7	-5.6	-5.7	-6.2	-6.4	-6.5	-6.5	-6.5	-6.3	-6.1	-5.4	-5.3	-5.4	-5.7	-5.9	-6.1	-6.3	-6.8	-7.3	-7.5	-8.1	-6.2	-5.3																						
19-Jan	-8.4	-8.8	-9.2	-9.3	-8.7	-8.5	-8.7	-8.0	-7.3	-7.0	-5.8	-4.7	-3.6	-2.4	-1.1	-0.6	-0.8	-1.2	-1.8	-1.9	-2.3	-1.6	-1.6	-1.5	-4.8	-0.6																						
20-Jan	-1.6	-2.0	-2.8	-3.1	-3.7	-4.5	-4.7	-5.2	-5.3	DF	DF	-3.5	-2.6	-1.5	-0.4	0.5	0.6	0.2	-0.3	-1.0	-1.6	-1.2	-2.2	-2.8	-2.2	0.6																						
21-Jan	-3.0	-3.1	-4.0	-4.6	-4.6	-3.8	-4.0	-4.1	-3.6	-3.1	-2.5	-2.2	-1.6	-0.7	1.1	2.6	2.7	3.1	3.3	3.0	3.0	2.9	2.9	2.7	-0.7	3.3																						
22-Jan	2.7	2.9	3.3	3.2	2.9	2.5	1.6	0.2	-0.2	0.1	-3.1	-7.3	-6.9	-6.8	-7.4	-7.8	-8.2	-9.0	-10.6	-11.7	-12.4	-12.7	-12.5	-12.5	-4.6	3.3																						
23-Jan	-12.5	-12.4	-12.4	-12.4	-12.6	-12.4	-12.0	-11.5	-11.1	-10.7	-10.3	-9.9	-9.5	-9.2	-9.4	-9.6	-9.6	-9.9	-10.3	-10.4	-10.1	-10.0	-10.2	-10.6	-10.8	-9.2																						
24-Jan	-11.0	-11.3	-11.3	-11.1	-11.0	-10.8	-10.7	-10.7	-10.6	-10.2	-9.6	-8.7	-7.5	-7.0	-5.7	-5.7	-6.5	-8.3	-9.3	-9.9	-10.1	-10.4	-10.6	-10.7	-9.5	-5.7																						
25-Jan	-10.8	-11.0	-10.8	-10.8	-10.8	-10.7	-10.7	-10.8	-10.7	-10.5	-10.3	-9.8	-9.4	-9.1	-8.7	-8.6	-8.0	-7.4	-7.5	-7.7	-7.8	-7.4	-6.8	-5.9	-9.3	-5.9																						
26-Jan	-5.1	-2.9	-0.8	2.7	3.7	3.3	-0.4	-3.4	-5.9	-7.5	-8.3	-8.7	-8.9	-8.7	-8.8	-8.7	-9.2	-10.1	-11.4	-13.2	-13.7	-14.2	-14.6	-14.9	-7.1	3.7																						
27-Jan	-15.2	-15.9	-16.7	-17.2	-17.4	-17.6	-17.8	-18.1	-19.2	-19.6	-19.4	-19.4	-18.7	-18.9	-18.2	-18.0	-18.1	-18.6	-19.6	-20.0	-19.6	-18.9	-19.5	-19.7	-18.4	-15.2																						
28-Jan	-19.4	-19.3	-19.0	-18.8	-18.8	-18.8	-18.7	-18.9	-19.0	-19.1	-18.9	DF	-18.2	-18.2	-18.1	-17.8	-17.8	-18.3	-18.9	-20.3	-21.5	-22.5	-23.4	-23.9	-19.5	-17.8																						
29-Jan	-24.0	-24.0	-24.3	-24.6	-25.1	-24.9	-25.6	-26.1	-24.9	-24.7	-23.6	DF	DF	DF	DF	DF	DF	DF	DF	-15.6	-16.2	-16.8	-17.3	-17.6	DF	-15.6																						
30-Jan	-17.4	-18.4	-20.8	-21.5	-21.6	-21.7	-22.3	-23.3	-23.6	-23.2	-22.6	-21.4	-20.1	-18.6	-18.0	-17.7	-17.6	-17.4	-17.3	-17.2	-17.0	-17.3	-17.6	-17.7	-19.6	-17.0																						
31-Jan	-17.8	-18.3	-19.1	-20.0	-20.9	-21.8	-22.7	-23.1	-22.8	-22.6	-22.3	-20.7	-20.1	-19.8	-19.4	-19.7	-20.0	-19.9	-19.6	-20.1	-20.6	-20.7	-21.9	-23.0	-20.7	-17.8																						
																								-9.3	-9.3	-9.5	-9.6	-9.8	-9.8	-10.1	-10.4	-10.5	-10.9	-10.7	-9.4	-9.1	-8.7	-8.2	-7.9	-7.9	-8.2	-8.7	-8.9	-9.2	-9.3	-9.5	-9.4	Diurnal Average
																								2.7	2.9	3.3	3.2	3.7	3.3	1.6	0.2	-0.2	0.1	-2.5	-2.2	-1.6	-0.7	1.1	2.6	2.7	3.1	3.3	3.0	3.0	2.9	2.9	2.7	Diurnal Maximum
DF - DAS Failure																																																



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 100 m (AT100m) - C
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 100 m (AT100m) - C
Lower Camp Met Tower - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	42	5.73	5.73
-20 - 0	666	90.86	96.59
0 - 10	25	3.41	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 163 m (AT163m) - C

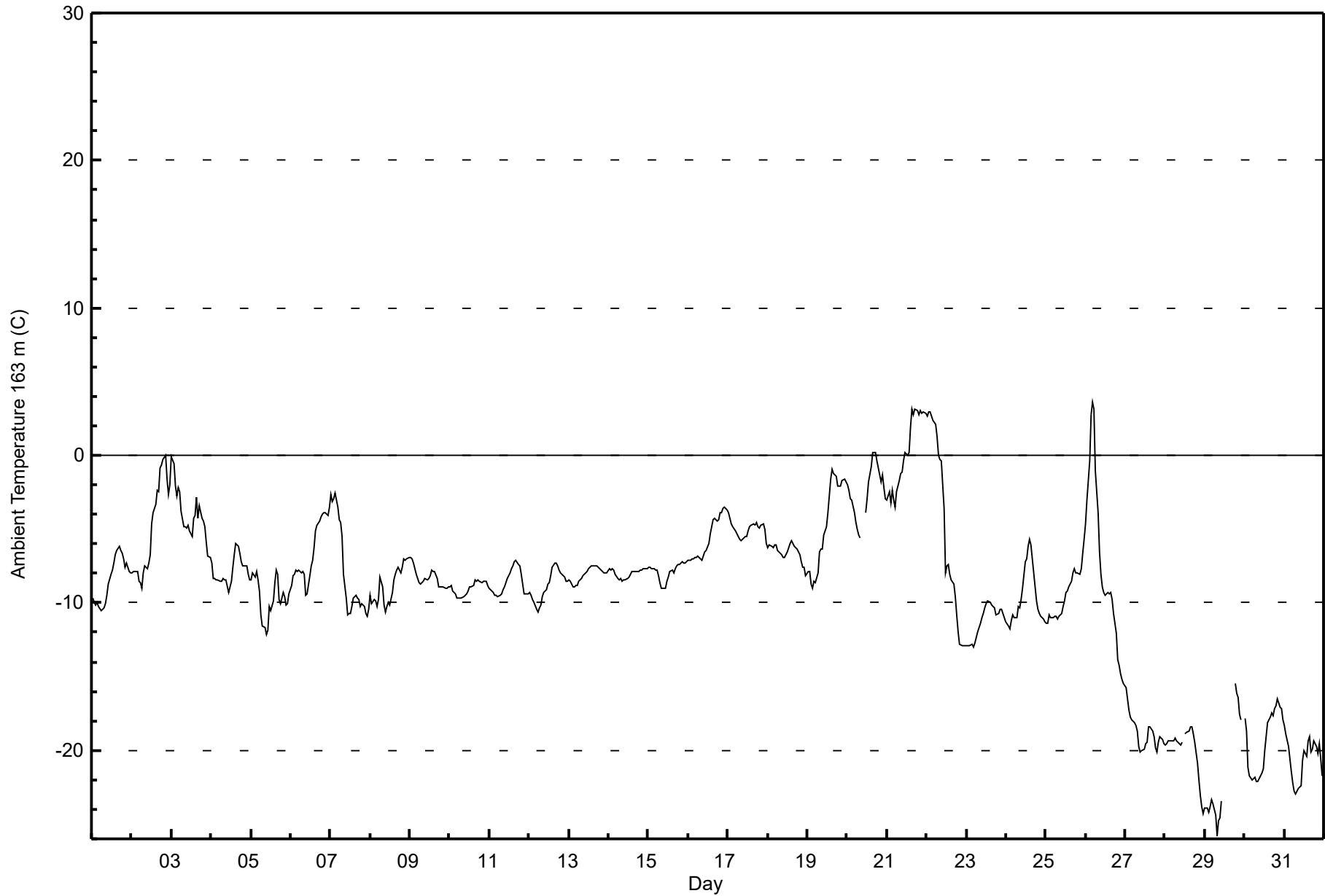
Lower Camp Met Tower - January 2023

Maximum Value: 3.6 C on Jan 26 05:00 Maximum Daily Average: 0.2 C on Jan 21																					Hours in Service:	744																							
Minimum Value: -25.8 C on Jan 29 08:00 Minimum Daily Average: -20.6 C on Jan 31																					Hours of Data:	733																							
Maximum Diurnal Average: -7.7 C at hour 16 Minimum Diurnal Average: -10.3 C at hour 10																					Hours of Missing Data:	11																							
Monthly Average: -9.05 C Percentiles: P ₁ = -23.9 P ₁₀ = -19.1 Q ₁ = -10.3 Median = -8.3 Q ₃ = -6.2 P ₉₀ = -2.7 P ₉₉ = 2.9																					Hours of Calibration:	0																							
																					Percent Operational Time:	98.5																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																					
1-Jan	-9.7	-10.0	-10.1	-10.0	-10.2	-10.5	-10.5	-10.3	-10.0	-9.5	-8.7	-8.1	-7.8	-7.3	-6.8	-6.5	-6.2	-6.4	-6.7	-7.1	-7.6	-7.3	-7.9	-7.9	-8.5	-6.2																			
2-Jan	-8.0	-7.9	-7.9	-7.9	-8.5	-8.6	-9.0	-7.9	-7.5	-7.7	-7.3	-6.7	-4.6	-3.9	-3.3	-2.4	-2.5	-0.8	-0.7	-0.3	0.0	-1.6	-2.6	-2.0	-5.0	0.0																			
3-Jan	-0.1	-0.6	-2.1	-2.8	-2.2	-2.5	-3.7	-4.8	-4.8	-4.9	-4.8	-5.1	-5.5	-4.3	-4.1	-2.8	-4.3	-3.4	-4.2	-4.4	-4.8	-5.8	-6.8	-7.0	-4.0	-0.1																			
4-Jan	-7.3	-8.4	-8.3	-8.4	-8.4	-8.5	-8.6	-8.3	-8.5	-8.4	-9.3	-9.0	-8.5	-7.6	-6.7	-6.0	-6.1	-6.7	-7.2	-7.5	-7.5	-7.5	-8.1	-8.5	-7.9	-6.0																			
5-Jan	-8.5	-8.0	-8.3	-7.9	-8.4	-9.2	-10.8	-11.5	-11.7	-12.2	-11.9	-10.2	-10.6	-9.8	-8.6	-7.7	-8.1	-9.8	-10.1	-9.3	-9.6	-10.2	-10.0	-9.4	-9.7	-7.7																			
6-Jan	-8.8	-8.2	-8.1	-7.8	-7.9	-7.8	-8.0	-7.9	-8.0	-9.5	-9.4	-8.2	-7.5	-7.1	-6.3	-5.1	-4.8	-4.5	-4.2	-4.0	-3.9	-3.9	-4.1	-3.5	-6.6	-3.5																			
7-Jan	-2.6	-3.1	-2.9	-2.6	-3.5	-4.3	-4.5	-5.5	-8.0	-9.7	-10.8	-10.7	-10.7	-10.3	-9.6	-9.5	-9.6	-9.8	-10.2	-10.1	-10.3	-10.8	-10.9	-10.5	-7.9	-2.6																			
8-Jan	-9.4	-10.0	-9.7	-9.8	-10.2	-9.8	-8.3	-9.0	-10.1	-10.6	-10.2	-10.0	-10.1	-9.3	-8.4	-8.0	-7.8	-7.6	-7.9	-7.6	-7.0	-7.1	-7.0	-6.9	-8.8	-6.9																			
9-Jan	-6.9	-7.0	-7.3	-7.7	-8.1	-8.6	-8.8	-8.7	-8.6	-8.4	-8.4	-8.3	-8.1	-7.8	-7.9	-7.9	-8.4	-8.9	-9.0	-8.9	-8.9	-9.0	-9.0	-8.9	-8.3	-6.9																			
10-Jan	-8.9	-8.8	-9.2	-9.4	-9.7	-9.7	-9.6	-9.7	-9.6	-9.5	-9.4	-9.2	-8.9	-8.9	-8.8	-8.5	-8.5	-8.4	-8.6	-8.6	-8.5	-8.5	-8.6	-8.9	-9.0	-8.4																			
11-Jan	-9.0	-9.2	-9.3	-9.5	-9.5	-9.5	-9.5	-9.4	-9.1	-8.9	-8.6	-8.4	-7.9	-7.7	-7.5	-7.2	-7.1	-7.4	-7.5	-8.1	-8.7	-9.4	-9.4	-9.4	-8.6	-7.1																			
12-Jan	-9.3	-9.5	-9.7	-10.0	-10.4	-10.6	-10.3	-10.2	-9.6	-9.3	-9.1	-8.7	-8.6	-8.1	-7.6	-7.3	-7.3	-7.5	-7.8	-7.9	-8.1	-8.2	-8.5	-8.5	-8.8	-7.3																			
13-Jan	-8.4	-8.5	-8.9	-8.9	-8.8	-8.8	-8.5	-8.4	-8.2	-8.1	-8.0	-7.8	-7.7	-7.5	-7.5	-7.5	-7.5	-7.5	-7.7	-7.8	-7.9	-8.0	-8.0	-8.0	-8.1	-7.5																			
14-Jan	-7.7	-7.7	-7.7	-7.8	-8.1	-8.4	-8.4	-8.4	-8.6	-8.4	-8.4	-8.4	-8.2	-8.1	-7.9	-7.9	-7.9	-7.9	-7.9	-7.8	-7.8	-7.7	-7.7	-7.7	-8.0	-7.7																			
15-Jan	-7.6	-7.6	-7.7	-7.7	-7.7	-7.8	-8.1	-8.6	-9.0	-9.0	-9.0	-8.5	-8.3	-7.9	-7.8	-7.9	-7.7	-7.5	-7.4	-7.2	-7.2	-7.3	-7.3	-7.2	-7.9	-7.2																			
16-Jan	-7.2	-7.1	-7.0	-7.0	-7.0	-7.0	-6.9	-7.0	-7.1	-6.8	-6.6	-6.5	-6.0	-5.3	-4.8	-4.3	-4.2	-4.5	-4.3	-3.9	-3.9	-3.6	-3.5	-3.7	-5.6	-3.5																			
17-Jan	-3.9	-4.3	-4.6	-4.9	-5.1	-5.3	-5.5	-5.7	-5.8	-5.7	-5.5	-5.5	-5.1	-4.8	-4.7	-4.7	-4.7	-4.5	-4.8	-4.9	-4.7	-4.7	-5.1	-6.0	-5.0	-3.9																			
18-Jan	-6.2	-6.1	-6.2	-6.2	-6.0	-6.1	-6.5	-6.5	-6.8	-6.9	-7.0	-6.8	-6.6	-6.0	-5.8	-6.0	-6.1	-6.2	-6.4	-6.7	-7.2	-7.6	-7.6	-8.1	-6.6	-5.8																			
19-Jan	-7.9	-7.9	-8.7	-9.0	-8.5	-8.6	-8.0	-6.5	-6.4	-6.3	-5.4	-4.8	-3.8	-2.7	-1.6	-0.9	-1.2	-1.5	-2.1	-2.1	-2.1	-1.7	-1.6	-1.8	-4.6	-0.9																			
20-Jan	-2.0	-2.4	-2.9	-3.0	-3.8	-4.5	-5.0	-5.4	-5.6	DF	DF	-3.8	-3.0	-1.8	-0.8	0.2	0.2	0.2	-0.4	-0.8	-1.8	-1.4	-2.2	-2.9	-2.4	0.2																			
21-Jan	-3.1	-2.5	-3.2	-2.3	-3.0	-3.5	-2.5	-1.7	-1.2	-1.2	-0.4	0.2	0.0	0.2	1.9	3.2	2.7	3.1	3.0	2.8	3.0	2.8	3.0	2.9	0.2	3.2																			
22-Jan	2.7	2.9	3.0	2.7	2.4	2.1	1.3	0.0	-0.3	-0.3	-3.6	-8.0	-7.5	-7.4	-8.0	-8.4	-8.8	-9.5	-10.8	-12.0	-12.8	-12.9	-12.9	-12.9	-5.0	3.0																			
23-Jan	-12.9	-12.9	-12.9	-12.8	-13.0	-12.7	-12.3	-12.0	-11.3	-11.0	-10.7	-10.4	-10.1	-9.9	-10.0	-10.1	-10.2	-10.3	-10.8	-10.7	-10.5	-10.4	-10.7	-11.0	-11.2	-9.9																			
24-Jan	-11.3	-11.6	-11.8	-11.2	-10.8	-11.0	-11.0	-10.2	-10.3	-9.8	-9.1	-7.2	-7.0	-6.2	-5.6	-6.1	-7.0	-8.9	-9.9	-10.4	-10.7	-10.9	-11.1	-11.2	-9.6	-5.6																			
25-Jan	-11.4	-11.4	-10.8	-11.0	-11.0	-10.9	-10.9	-11.1	-10.9	-10.7	-10.3	-9.9	-9.3	-9.2	-9.0	-8.5	-8.0	-7.7	-7.9	-8.0	-8.1	-7.6	-6.6	-5.7	-9.4	-5.7																			
26-Jan	-4.6	-3.0	-0.4	2.8	3.6	3.1	-1.0	-3.9	-6.5	-8.1	-8.9	-9.3	-9.5	-9.3	-9.4	-9.3	-9.8	-10.8	-12.0	-13.8	-14.3	-14.8	-15.1	-15.5	-7.5	3.6																			
27-Jan	-15.8	-16.5	-17.2	-17.7	-18.0	-18.1	-18.3	-18.6	-19.7	-20.1	-20.0	-20.0	-19.5	-19.5	-18.4	-18.4	-18.6	-19.1	-19.8	-20.1	-19.5	-19.1	-19.2	-19.6	-18.8	-15.8																			
28-Jan	-19.6	-19.6	-19.4	-19.3	-19.3	-19.4	-19.2	-19.4	-19.5	-19.7	-19.4	DF	-18.9	-18.8	-18.7	-18.4	-18.4	-18.9	-19.5	-20.9	-22.1	-23.1	-23.8	-24.3	-20.0	-18.4																			
29-Jan	-23.9	-23.9	-24.2	-23.8	-23.3	-23.6	-24.3	-25.8	-24.8	-24.6	-23.4	DF	DF	DF	DF	DF	DF	DF	DF	-15.4	-16.1	-16.4	-17.5	-17.9	DF	-15.4																			
30-Jan	-17.8	-18.7	-21.2	-21.7	-22.0	-21.9	-21.8	-22.1	-22.1	-21.9	-21.6	-21.3	-20.0	-19.0	-18.1	-17.7	-17.4	-17.7	-17.1	-17.0	-16.5	-17.1	-17.2	-17.9	-19.5	-16.5																			
31-Jan	-18.3	-18.9	-19.7	-20.6	-21.4	-22.2	-22.8	-23.0	-22.6	-22.5	-22.4	-20.7	-20.0	-20.4	-19.4	-19.1	-20.1	-19.9	-19.3	-19.7	-20.2	-19.6	-20.6	-21.8	-20.6	-18.3																			
																					-8.9	-9.0	-9.2	-9.1	-9.3	-9.5	-9.7	-9.9	-10.1	-10.3	-10.2	-9.0	-9.0	-8.5	-8.0	-7.7	-7.9	-8.0	-8.5	-8.8	-8.9	-9.1	-9.3	-9.1	Diurnal Average
																					2.7	2.9	3.0	2.8	3.6	3.1	1.3	0.0	-0.3	-0.3	-0.4	0.2	0.0	0.2	1.9	3.2	2.7	3.1	3.0	2.8	3.0	2.8	3.0	2.9	Diurnal Maximum
DF - DAS Failure																																													



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 163 m (AT163m) - C
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 163 m (AT163m) - C
Lower Camp Met Tower - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	44	6.00	6.00
-20 - 0	663	90.45	96.45
0 - 10	26	3.55	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

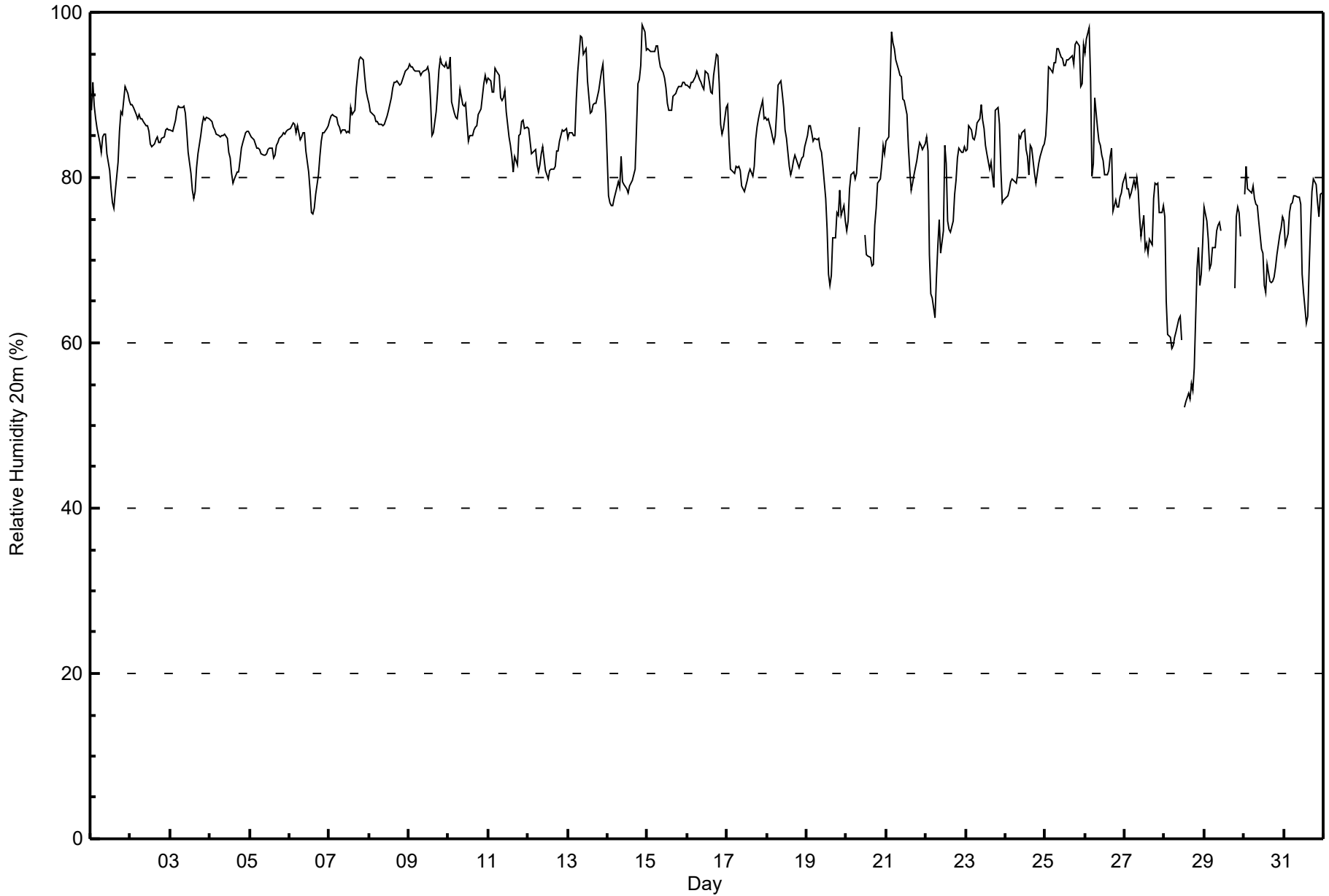
Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - January 2023

Maximum Value: 98.4 % on Jan 14 22:00 Maximum Daily Average: 93.6 % on Jan 25																						Hours in Service: 744 Hours of Data: 733																									
Minimum Value: 52.2 % on Jan 28 13:00 Minimum Daily Average: 61.6 % on Jan 28 Maximum Diurnal Average: 85.2 % at hour 24 Minimum Diurnal Average: 79.3 % at hour 15 Monthly Average: 83.41 % Percentiles: P ₁ = 59.4 P ₁₀ = 73.5 Q ₁ = 79.3 Median = 84.7 Q ₃ = 88.4 P ₉₀ = 92.8 P ₉₉ = 96.4																						Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	88.1	91.5	88.7	87.1	85.9	84.3	83.1	84.9	85.2	85.3	82.8	80.9	78.7	76.9	76.3	78.3	81.9	85.6	88.1	87.7	89.4	91.0	90.2	89.3	85.0	91.5																					
2-Jan	88.8	88.9	88.5	87.6	87.2	87.7	87.1	87.1	86.8	86.3	86.3	85.6	84.1	83.7	84.0	84.5	85.0	84.3	84.2	84.8	85.0	85.8	85.9	85.7	86.0	88.9																					
3-Jan	85.7	85.6	86.3	87.0	88.1	88.6	88.4	88.4	88.7	87.9	85.5	83.0	80.5	78.5	77.4	78.3	81.2	82.9	85.0	86.4	87.2	87.0	87.3	87.1	85.1	88.7																					
4-Jan	87.0	86.8	86.2	85.7	85.2	85.1	85.0	85.0	85.2	84.7	83.0	82.4	80.6	79.3	79.8	80.7	80.7	82.1	83.5	84.2	85.4	85.4	85.6	85.5	83.9	87.0																					
5-Jan	85.3	84.9	84.5	84.0	83.5	83.6	83.4	82.9	82.7	82.7	82.8	83.5	83.6	83.5	82.3	82.6	83.9	84.2	84.7	85.1	85.4	85.3	85.6	85.8	84.0	85.8																					
6-Jan	85.9	86.3	86.6	86.5	85.4	86.2	84.6	84.9	85.5	85.5	83.1	80.6	78.4	75.8	75.6	76.2	78.0	80.3	82.5	84.3	85.5	85.5	85.9	86.2	83.1	86.6																					
7-Jan	87.0	87.5	87.6	87.5	87.3	86.5	86.1	85.4	85.7	85.8	85.5	85.6	85.4	88.4	87.6	88.1	90.8	92.5	94.2	94.6	94.3	92.2	90.4	89.7	88.6	94.6																					
8-Jan	88.9	88.0	87.7	87.4	86.8	86.8	86.4	86.4	86.3	86.5	86.9	87.5	88.2	89.6	90.9	91.5	91.5	91.7	91.1	91.4	91.9	92.4	92.9	93.2	89.3	93.2																					
9-Jan	93.8	93.4	93.3	93.0	92.9	93.0	92.8	92.4	92.7	92.8	93.0	93.3	92.6	89.4	85.1	85.3	88.0	90.4	93.1	94.3	93.8	93.4	94.0	93.2	92.0	94.3																					
10-Jan	93.2	94.6	89.2	87.9	87.2	87.0	88.4	90.7	88.8	88.6	89.0	86.6	84.4	85.0	85.2	85.8	86.2	86.3	87.6	88.3	89.8	91.4	92.4	91.4	88.5	94.6																					
11-Jan	92.0	91.8	90.3	90.4	93.2	92.9	92.4	89.7	89.3	89.7	90.6	88.0	84.9	83.9	82.5	80.7	82.5	81.6	85.0	85.3	86.8	86.9	85.9	86.2	87.6	93.2																					
12-Jan	85.9	84.5	82.9	83.1	83.4	81.5	80.6	81.5	82.9	83.8	80.8	80.3	79.8	80.9	81.0	81.1	81.3	83.3	83.2	84.4	85.7	85.6	85.7	85.9	82.9	85.9																					
13-Jan	84.8	85.4	85.4	85.0	85.1	89.5	92.8	97.1	97.0	95.0	95.3	95.6	91.8	87.8	88.0	88.9	89.0	90.5	91.7	92.8	93.7	90.5	87.7	90.4	97.1	97.1																					
14-Jan	77.8	76.9	76.6	76.6	77.4	78.9	79.5	78.9	82.5	79.4	79.1	78.7	78.2	79.0	79.4	79.7	81.1	86.1	91.3	91.9	93.5	98.4	97.6	95.5	83.1	98.4																					
15-Jan	95.6	95.5	95.2	95.3	95.3	96.0	95.9	94.4	93.3	92.8	92.1	90.8	89.0	88.2	88.1	89.8	89.9	90.2	90.7	91.0	90.9	91.5	91.5	91.2	92.2	96.0																					
16-Jan	91.2	90.9	91.5	91.5	91.9	92.1	92.9	91.9	91.6	91.0	90.6	92.8	92.6	91.5	90.4	90.1	92.4	94.9	94.8	91.3	86.5	85.2	86.0	88.4	91.0	94.9																					
17-Jan	88.9	84.2	81.0	80.8	80.5	81.4	81.2	81.4	80.8	79.0	78.3	79.0	79.7	80.5	81.1	80.1	81.4	84.5	86.1	87.1	88.0	89.3	87.1	87.3	82.9	89.3																					
18-Jan	87.0	87.1	85.8	85.0	84.3	85.1	88.0	91.3	91.7	90.2	88.4	85.7	84.7	81.4	80.3	81.0	82.0	82.7	82.1	81.1	81.9	82.4	82.5	83.7	84.8	91.7																					
19-Jan	85.1	86.3	86.2	85.5	84.4	84.7	84.6	84.7	83.6	83.0	81.3	77.5	73.7	68.4	67.0	68.2	72.7	72.7	75.8	75.4	78.5	75.4	76.5	74.7	78.6	86.3																					
20-Jan	73.5	74.7	78.6	80.4	80.7	79.8	80.5	83.4	86.1	DF	DF	73.1	70.6	70.4	70.3	69.3	69.5	74.2	76.3	79.2	79.9	81.5	84.0	82.8	77.2	86.1																					
21-Jan	84.3	84.9	91.6	97.6	96.3	95.5	94.2	93.0	92.4	92.3	89.5	89.3	87.6	83.7	80.9	78.5	79.3	80.4	82.0	83.2	84.2	83.9	83.4	84.1	87.2	97.6																					
22-Jan	84.9	83.3	70.7	66.0	65.4	63.0	67.7	71.7	74.8	70.8	73.5	83.9	81.7	74.8	73.8	73.4	74.7	77.9	79.7	82.3	83.6	83.1	83.1	83.8	76.2	84.9																					
23-Jan	83.3	83.3	86.3	85.7	84.7	84.7	85.3	86.6	87.2	88.7	87.0	86.0	83.8	82.9	81.0	81.8	80.2	78.8	88.2	88.4	86.4	81.0	77.0	77.4	84.0	88.7																					
24-Jan	77.4	77.8	78.5	79.4	79.9	79.6	79.4	80.6	85.1	84.8	85.4	85.7	83.4	82.6	80.4	83.9	83.5	80.5	79.4	80.5	81.7	82.6	83.8	84.0	81.7	85.7																					
25-Jan	85.0	88.2	93.4	93.2	92.7	93.9	93.8	95.6	95.6	94.5	94.4	93.6	93.6	94.3	94.2	94.5	94.7	93.8	96.2	96.5	95.9	91.0	91.4	96.2	93.6	96.5																					
26-Jan	95.1	96.8	98.1	92.0	80.1	81.6	89.6	85.9	84.4	83.9	82.7	82.1	80.3	80.4	80.8	82.5	83.5	76.0	77.4	76.5	76.4	77.6	78.1	79.3	83.4	98.1																					
27-Jan	80.4	78.7	78.6	77.6	78.1	79.7	78.9	80.1	78.4	75.2	73.0	75.4	71.3	72.0	70.9	72.6	71.8	77.5	79.4	79.1	79.3	75.8	75.8	76.6	76.5	80.4																					
28-Jan	75.3	65.2	61.1	60.7	59.3	59.6	60.7	61.3	63.0	63.2	60.4	DF	52.2	52.9	53.9	53.2	55.2	54.3	57.0	69.1	71.6	67.0	68.2	72.0	61.6	75.3																					
29-Jan	76.4	74.8	72.6	69.1	69.6	71.5	71.6	73.5	74.3	74.5	73.5	DF	DF	DF	DF	DF	DF	DF	66.7	75.2	76.4	75.7	72.8	DF	--	76.4																					
30-Jan	77.9	81.4	78.6	78.5	78.1	78.9	77.5	76.8	76.7	74.7	71.3	70.8	67.0	66.1	69.5	67.4	67.3	67.4	67.9	69.1	70.8	73.1	74.0	75.2	73.2	81.4																					
31-Jan	74.8	71.9	73.3	75.7	76.8	76.9	77.8	77.8	77.7	77.5	76.8	68.3	66.2	62.4	63.2	69.0	74.2	78.3	79.8	79.1	76.9	75.3	78.0	78.2	74.4	79.8																					
																						85.2	84.9	84.4	84.0	83.4	83.7	84.2	84.7	85.0	84.4	83.5	83.7	81.0	79.8	79.3	79.9	81.1	82.1	83.3	84.4	85.0	84.7	84.6	85.2	Diurnal Average	
																						95.6	96.8	98.1	97.6	96.3	96.0	95.9	97.1	97.0	95.0	95.3	95.6	93.6	94.3	94.2	94.5	94.7	94.9	96.2	96.5	95.9	98.4	97.6	96.2	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20m) - %
Lower Camp Met Tower - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	9	1.23	1.23
60 - 80	195	26.60	27.83
80 - 100	529	72.17	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

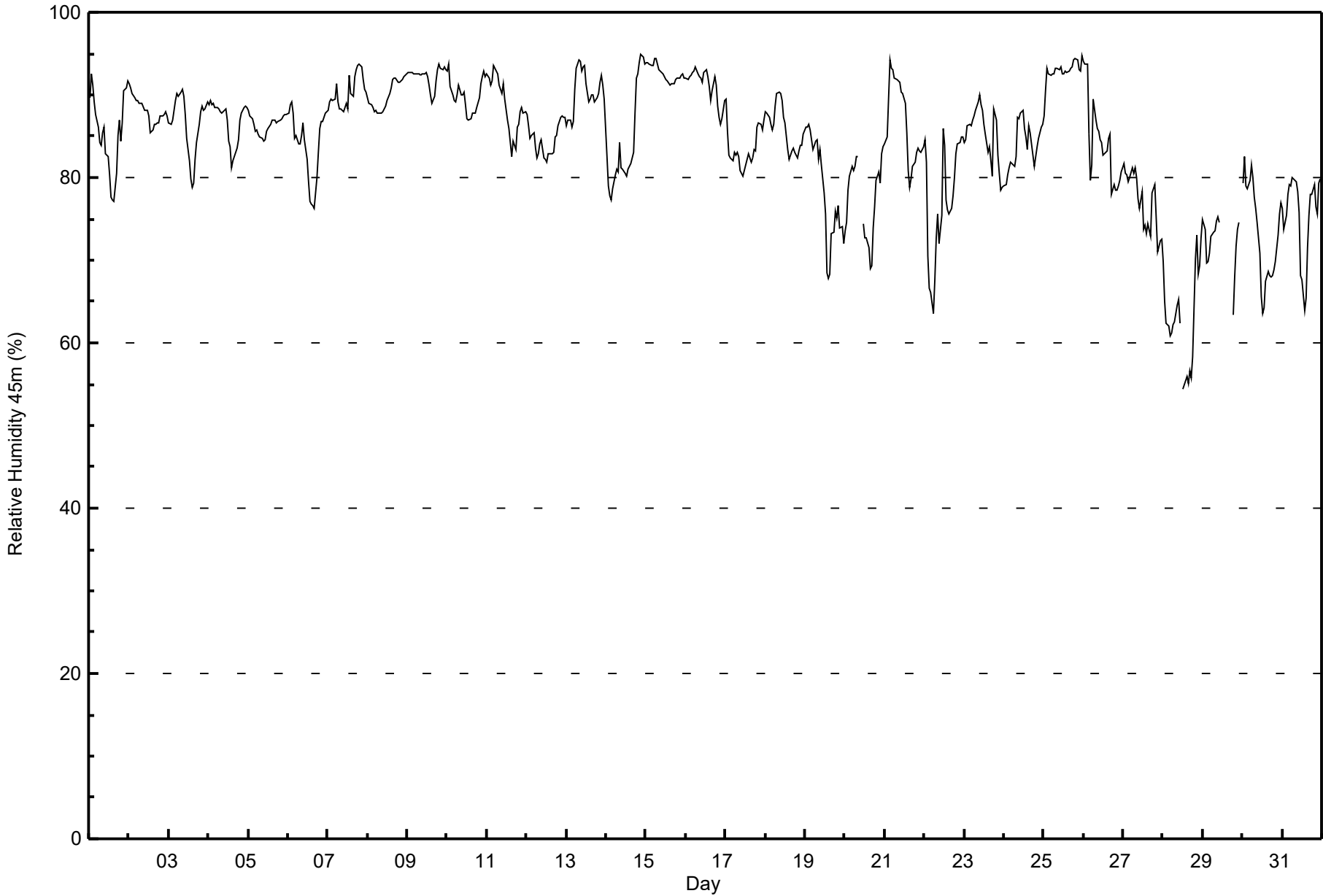
Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - January 2023

Maximum Value: 95.0 % on Jan 14 22:00																						Maximum Daily Average: 92.8 % on Jan 25																						Hours in Service: 744			
Minimum Value: 54.5 % on Jan 28 13:00																						Minimum Daily Average: 62.7 % on Jan 28																						Hours of Data: 733			
Maximum Diurnal Average: 86.0 % at hour 24																						Minimum Diurnal Average: 81.0 % at hour 15																						Hours of Missing Data: 11			
Monthly Average: 84.27 %																						Percentiles: P ₁ = 60.9 P ₁₀ = 73.7 Q ₁ = 80.5 Median = 86.2 Q ₃ = 89.8 P ₉₀ = 92.6 P ₉₉ = 94.3																						Hours of Calibration: 0			
																																												Percent Operational Time: 98.5			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	89.6	92.6	91.1	89.1	87.7	86.1	84.3	84.0	85.4	86.2	82.8	82.5	80.4	77.6	77.3	77.1	80.6	85.1	86.9	84.3	86.6	90.5	90.9	91.7	85.4	92.6																					
2-Jan	91.4	90.8	90.2	89.7	89.4	89.4	89.0	89.1	88.9	88.1	88.2	88.1	87.5	85.5	85.7	86.4	86.5	86.6	86.6	87.5	87.5	87.6	88.0	87.5	88.1	91.4																					
3-Jan	86.5	86.4	86.9	88.1	89.3	90.3	89.8	90.4	90.7	89.9	87.7	84.8	82.0	79.9	78.7	79.4	82.2	84.3	86.4	88.0	88.6	88.1	88.3	89.2	86.5	90.7																					
4-Jan	88.8	89.3	88.8	89.0	88.4	88.5	88.3	88.0	87.9	87.9	88.3	86.9	84.4	83.7	81.2	82.0	83.1	83.5	84.6	87.0	87.8	88.5	88.6	88.5	86.8	89.3																					
5-Jan	88.2	87.5	87.1	86.4	85.6	85.8	85.3	85.0	84.7	84.3	84.6	85.5	85.9	86.4	87.0	87.0	87.0	86.6	86.8	86.9	87.1	87.5	87.7	87.7	86.4	88.2																					
6-Jan	87.8	88.8	89.2	87.9	84.7	85.2	84.2	84.1	85.1	86.7	84.6	82.2	79.5	77.1	76.8	76.5	76.3	80.1	83.0	85.9	86.8	86.9	87.8	88.0	84.0	89.2																					
7-Jan	88.2	89.2	89.5	89.3	89.5	91.4	89.1	88.3	88.2	88.0	88.5	89.0	88.3	92.4	90.2	89.8	92.3	93.1	93.5	93.7	93.4	91.9	90.7	90.4	90.3	93.7																					
8-Jan	89.7	89.0	88.7	88.5	87.9	88.1	87.7	87.8	87.8	88.1	88.3	88.7	89.3	90.1	90.8	91.8	92.0	92.1	91.5	91.5	91.8	91.9	92.2	92.5	89.9	92.5																					
9-Jan	92.8	92.8	92.8	92.7	92.6	92.6	92.5	92.5	92.4	92.6	92.5	92.7	92.2	91.2	89.9	89.0	89.8	91.7	93.1	93.8	93.3	93.0	93.4	93.1	92.3	93.8																					
10-Jan	92.9	93.7	91.1	90.0	89.3	89.2	90.0	91.1	90.1	90.1	90.3	88.9	87.0	86.9	87.2	87.7	87.8	87.8	88.5	89.6	91.4	92.2	92.9	92.2	89.9	93.7																					
11-Jan	92.5	92.1	91.2	91.7	93.6	93.2	92.6	91.2	90.7	90.2	91.4	89.5	87.0	85.9	84.2	82.6	84.4	83.4	86.1	86.4	87.9	88.5	87.7	88.0	88.8	93.6																					
12-Jan	87.7	86.4	84.7	85.0	85.4	83.6	82.4	83.0	84.1	84.6	82.3	82.2	81.8	82.9	82.9	82.8	83.1	84.9	85.1	86.2	87.4	87.4	87.3	87.3	84.6	87.7																					
13-Jan	86.3	87.0	87.0	86.2	86.9	90.6	93.2	94.3	94.1	92.9	93.4	93.5	91.4	89.2	89.4	90.1	90.0	89.2	89.6	90.2	91.5	92.4	91.2	89.5	90.4	94.3																					
14-Jan	82.6	78.9	77.8	77.3	78.6	80.3	81.0	80.7	84.2	81.2	80.9	80.6	80.2	81.0	81.4	81.6	83.0	87.8	92.0	92.6	93.8	95.0	94.5	93.7	84.2	95.0																					
15-Jan	93.9	93.9	93.7	93.5	93.6	94.4	94.4	93.7	93.1	92.8	92.6	92.3	91.9	91.7	91.2	91.4	91.3	91.4	91.9	92.1	92.0	92.4	92.5	92.1	92.6	94.4																					
16-Jan	92.1	91.9	92.3	92.4	92.7	92.9	93.4	92.5	92.3	92.0	91.6	92.7	93.0	92.2	91.0	89.3	90.5	92.2	91.1	88.7	87.3	86.4	87.1	89.3	91.1	93.4																					
17-Jan	89.4	85.6	82.7	82.4	82.0	83.0	82.7	83.1	82.6	80.8	80.2	80.9	81.6	82.2	82.8	81.8	82.4	83.4	83.2	86.1	86.6	86.5	85.8	87.0	83.5	89.4																					
18-Jan	88.0	87.8	87.2	86.5	85.7	86.4	88.7	90.1	90.4	90.1	89.3	87.3	86.5	83.4	82.2	82.6	83.2	83.6	83.0	82.4	83.2	83.8	84.0	85.2	85.9	90.4																					
19-Jan	86.0	86.1	86.4	85.8	84.6	83.4	84.3	84.6	82.2	83.3	81.6	78.2	75.6	68.5	67.8	68.3	73.3	73.4	75.9	75.0	76.5	73.9	74.0	72.1	78.4	86.4																					
20-Jan	73.5	74.5	78.5	80.2	81.3	80.9	81.4	82.5	82.6	DF	DF	74.4	72.6	72.7	71.5	69.0	69.3	74.0	76.5	79.7	80.7	79.3	82.8	83.7	77.3	83.7																					
21-Jan	84.0	84.9	89.7	94.3	93.3	93.0	92.1	91.8	91.6	91.6	90.4	90.2	88.9	85.4	80.8	78.8	79.9	81.3	81.8	83.0	83.6	83.2	83.1	83.8	86.7	94.3																					
22-Jan	84.5	81.9	70.4	66.6	66.1	63.6	67.7	72.8	75.6	72.0	75.4	85.9	83.8	77.2	76.1	75.6	76.2	77.9	80.1	82.8	84.0	84.3	84.9	84.8	77.1	85.9																					
23-Jan	84.3	84.5	86.2	86.4	86.3	87.0	87.4	88.2	89.1	90.0	88.9	88.2	86.4	85.2	83.1	83.8	82.0	80.2	88.3	86.9	82.7	80.5	78.6	78.8	85.1	90.0																					
24-Jan	79.0	79.2	80.3	81.2	81.9	81.7	81.4	82.5	87.3	87.1	87.8	88.1	86.0	84.8	83.4	86.2	85.5	82.6	81.4	82.6	83.7	84.8	86.1	86.4	83.8	88.1																					
25-Jan	87.4	90.5	93.2	92.5	92.3	92.6	92.5	93.2	93.2	93.0	93.4	92.6	92.5	92.9	92.7	92.9	93.2	93.4	94.3	94.4	94.2	93.1	92.9	94.7	92.8	94.7																					
26-Jan	94.1	93.7	93.7	85.2	79.7	81.6	89.5	87.0	85.9	85.6	84.7	84.3	82.7	83.1	83.3	84.8	85.3	77.9	79.2	78.5	78.5	79.0	79.7	80.7	84.1	94.1																					
27-Jan	81.8	80.4	80.4	79.4	79.9	81.2	80.5	81.1	80.1	77.4	76.2	78.2	73.7	74.3	73.2	74.5	72.9	78.2	78.6	79.1	75.2	71.0	72.5	72.6	77.2	81.8																					
28-Jan	69.8	65.1	62.4	62.0	60.8	61.1	62.1	62.6	64.5	65.2	62.4	DF	54.5	54.9	55.8	55.0	56.7	55.7	58.3	70.1	73.0	68.3	69.3	72.8	62.7	73.0																					
29-Jan	75.0	73.8	69.6	69.8	70.8	72.9	73.4	73.5	74.8	75.2	74.6	DF	DF	DF	DF	DF	DF	DF	DF	63.4	68.0	71.6	73.7	74.6	DF	--	75.2																				
30-Jan	79.4	82.6	79.0	78.6	79.7	81.6	80.0	77.5	76.3	74.6	70.9	65.6	63.5	64.2	67.5	68.6	68.1	67.9	68.1	68.8	69.8	73.0	75.5	77.0	73.3	82.6																					
31-Jan	76.2	73.7	75.4	78.0	79.1	79.0	80.1	79.9	79.5	78.3	75.7	68.2	67.7	63.9	65.5	71.5	75.5	78.0	77.9	79.1	76.4	75.6	79.4	79.7	75.6	80.1																					
																						85.9	85.6	85.1	84.7	84.5	84.8	85.2	85.4	85.7	85.3	84.6	84.9	82.6	81.6	81.0	81.3	82.1	82.9	83.4	84.5	85.0	84.8	85.3	86.0	Diurnal Average	
																						94.1	93.9	93.7	94.3	93.6	94.4	94.4	94.3	94.1	93.0	93.4	93.5	93.0	92.9	92.7	92.9	93.2	93.4	94.3	94.4	94.2	95.0	94.5	94.7	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 45m (RH45m) - %
Lower Camp Met Tower - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	7	0.95	0.96
60 - 80	161	21.96	22.92
80 - 100	565	77.08	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

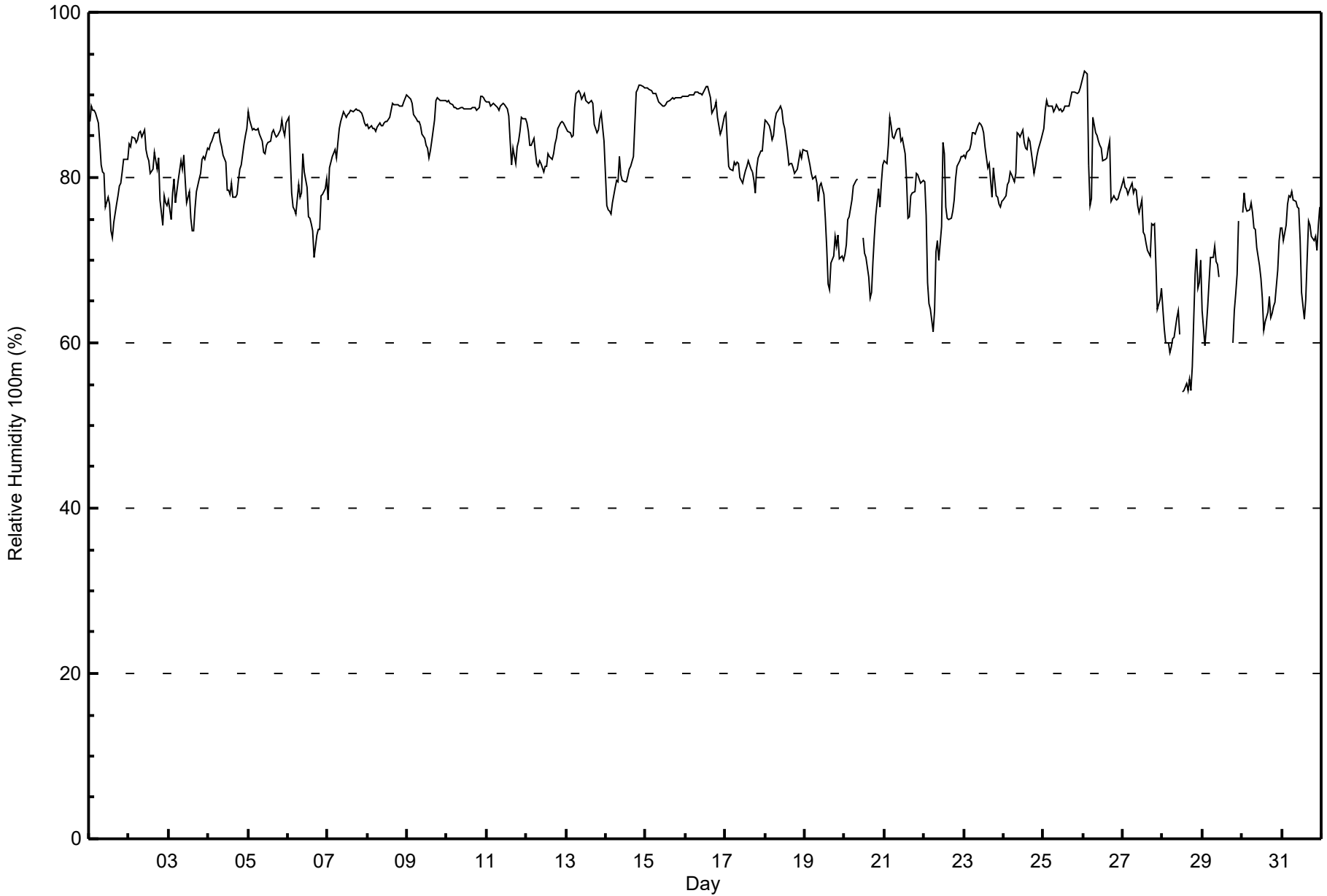
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - January 2023

Maximum Value: 93.0 % on Jan 26 02:00 Maximum Daily Average: 89.7 % on Jan 15																						Hours in Service: 744 Hours of Data: 733																									
Minimum Value: 54.0 % on Jan 28 13:00 Minimum Daily Average: 60.9 % on Jan 28 Maximum Diurnal Average: 82.6 % at hour 24 Minimum Diurnal Average: 79.0 % at hour 15 Monthly Average: 81.18 % Percentiles: P ₁ = 59.1 P ₁₀ = 70.4 Q ₁ = 77.3 Median = 82.5 Q ₃ = 86.9 P ₉₀ = 89.3 P ₉₉ = 91.0																						Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	86.7	88.6	88.2	88.1	87.7	86.5	84.3	81.5	80.7	80.5	76.4	77.7	76.8	73.6	72.7	74.6	76.9	77.8	78.9	79.3	80.7	82.3	82.2	82.3	81.0	88.6																					
2-Jan	84.1	83.7	85.0	84.7	84.2	84.6	85.5	85.7	85.0	85.7	83.3	82.5	82.0	80.4	81.1	83.0	82.1	81.0	82.4	77.3	74.3	77.8	76.9	76.6	82.0	85.7																					
3-Jan	77.3	75.0	78.2	79.9	76.9	78.4	79.6	82.1	81.0	82.7	79.7	77.0	78.3	75.1	73.5	73.6	76.3	78.4	79.8	80.6	82.3	82.6	82.2	83.6	78.9	83.6																					
4-Jan	83.3	84.0	84.4	84.9	85.5	85.4	85.7	84.3	83.7	82.7	81.9	78.5	78.4	77.9	79.3	77.5	77.7	78.0	79.6	81.0	81.6	84.0	85.1	85.9	82.1	85.9																					
5-Jan	87.9	86.9	85.8	85.9	85.7	85.8	86.0	85.2	84.4	83.0	82.9	83.8	84.2	84.5	85.5	85.7	85.3	85.0	85.1	85.8	86.9	85.8	85.0	86.6	85.4	87.9																					
6-Jan	87.3	82.5	78.2	76.5	76.0	75.6	79.1	77.6	78.2	82.9	80.7	78.8	75.3	75.0	74.5	73.5	70.3	73.1	73.7	73.7	77.8	78.0	78.6	79.9	77.4	87.3																					
7-Jan	77.3	81.1	81.9	82.6	83.3	82.3	84.2	86.0	86.7	88.0	87.6	87.4	87.7	87.8	88.1	88.0	88.2	88.3	88.2	88.1	87.9	87.4	86.6	86.3	85.9	88.3																					
8-Jan	86.4	86.0	86.4	86.0	85.9	85.7	86.1	86.5	86.3	86.3	86.6	86.9	86.8	87.4	88.2	88.9	88.9	88.8	88.7	88.6	88.6	88.7	89.2	90.0	87.4	90.0																					
9-Jan	89.8	89.6	89.5	89.0	87.7	87.0	86.8	86.8	86.3	85.3	84.8	83.8	83.6	82.4	83.3	84.4	87.0	89.3	89.6	89.5	89.4	89.3	89.4	89.2	87.2	89.8																					
10-Jan	89.1	89.3	89.0	88.9	88.5	88.5	88.3	88.3	88.4	88.4	88.3	88.3	88.4	88.3	88.4	88.5	88.5	88.5	88.2	88.5	89.9	89.9	89.7	89.4	88.7	89.9																					
11-Jan	89.1	89.1	88.6	88.8	89.1	88.8	88.4	88.2	88.6	88.9	88.9	88.8	88.4	87.5	84.4	81.6	83.5	81.7	83.7	84.5	85.5	87.2	87.1	87.1	87.0	89.1																					
12-Jan	86.7	85.6	83.8	83.9	84.7	83.1	81.7	81.4	82.1	81.6	80.7	81.4	81.4	82.8	82.5	82.2	82.9	84.1	84.8	85.9	86.6	86.9	86.6	86.3	83.7	86.9																					
13-Jan	86.0	85.6	85.4	84.9	85.1	88.5	90.2	90.5	90.3	89.5	89.9	90.1	89.4	89.0	89.1	89.4	88.9	86.4	85.4	85.8	87.0	87.8	86.2	84.5	87.7	90.5																					
14-Jan	76.6	76.1	76.0	75.6	76.9	78.8	79.6	79.6	82.5	80.3	79.7	79.4	79.4	80.2	81.0	81.4	82.5	86.4	90.4	90.7	91.2	91.3	91.0	90.9	82.4	91.3																					
15-Jan	90.9	90.9	90.7	90.5	90.2	90.2	90.2	89.7	89.1	88.8	88.7	88.7	88.8	89.1	89.3	89.5	89.6	89.5	89.7	89.7	89.7	89.6	89.8	89.8	89.7	90.9																					
16-Jan	89.8	89.9	90.0	90.0	90.0	90.1	90.4	90.3	90.2	90.2	90.1	90.4	91.0	91.1	90.3	89.6	87.8	88.5	89.2	87.3	86.3	85.3	85.7	87.5	89.2	91.1																					
17-Jan	87.8	84.5	81.4	81.0	80.9	81.8	81.5	81.9	81.7	79.9	79.4	80.2	80.9	81.4	82.1	81.0	80.8	79.7	78.1	81.2	82.4	83.3	83.2	85.2	81.7	87.8																					
18-Jan	86.9	86.7	86.4	85.6	84.7	85.2	86.9	87.8	88.3	88.6	88.2	86.6	85.9	83.2	81.5	81.7	81.6	81.2	80.4	81.0	82.1	83.0	82.4	83.4	84.6	88.6																					
19-Jan	83.3	83.2	82.3	81.5	80.6	79.8	80.2	79.4	77.1	79.1	79.4	77.9	75.0	71.5	67.1	66.4	69.7	70.5	72.9	71.7	73.1	70.2	70.4	69.9	75.5	83.3																					
20-Jan	70.6	71.8	74.9	75.2	77.3	79.0	79.3	79.7	79.8	DF	DF	72.8	70.9	70.3	67.9	65.4	66.1	69.9	72.9	75.4	78.6	76.5	79.3	81.5	74.3	81.5																					
21-Jan	82.0	81.8	83.9	87.3	86.2	84.9	84.8	85.7	86.0	85.9	84.5	84.7	82.8	79.6	75.0	75.3	77.7	78.1	78.3	80.5	80.4	79.9	79.3	79.7	81.8	87.3																					
22-Jan	79.6	75.4	67.2	64.8	64.0	61.4	63.9	71.0	72.3	70.0	74.0	84.2	82.9	76.4	75.1	74.9	75.0	75.9	77.3	79.9	81.3	82.1	82.5	82.5	74.7	84.2																					
23-Jan	82.7	82.4	83.0	83.4	84.0	85.5	85.3	86.3	86.6	86.5	86.2	86.5	83.7	81.3	81.7	79.6	77.6	81.1	77.8	77.7	76.8	76.5	77.1	82.2	86.6																						
24-Jan	77.3	77.8	79.1	79.5	80.7	80.4	79.5	80.4	85.4	85.2	84.9	85.7	84.3	83.5	83.4	84.8	84.4	81.9	80.5	81.3	82.5	83.4	84.5	85.2	82.3	85.7																					
25-Jan	86.0	88.1	89.4	88.7	88.6	88.6	88.0	88.3	88.8	88.1	88.3	88.0	88.2	88.6	88.6	88.7	89.4	90.3	90.4	90.3	90.1	90.3	90.8	91.5	89.0	91.5																					
26-Jan	92.2	93.0	92.6	81.5	76.6	77.5	87.3	85.4	85.2	84.4	83.8	83.6	82.0	82.2	82.4	83.6	84.4	77.1	77.9	77.4	77.4	77.4	78.1	78.7	82.6	93.0																					
27-Jan	79.8	78.9	78.6	78.0	78.5	79.3	78.2	78.6	78.5	76.5	75.7	77.3	73.3	73.1	72.0	71.2	70.5	74.4	74.3	74.4	69.5	64.0	65.3	66.6	74.4	79.8																					
28-Jan	64.0	61.7	60.0	60.0	58.9	59.5	60.4	60.8	63.0	64.0	61.1	DF	54.0	54.3	55.1	54.3	55.6	54.3	57.0	68.2	71.4	66.7	67.3	70.0	60.9	71.4																					
29-Jan	63.9	59.7	61.8	64.5	67.4	70.4	70.3	71.7	69.8	69.5	68.0	DF	DF	DF	DF	DF	DF	DF	DF	60.0	64.0	66.0	68.3	74.7	DF	--	74.7																				
30-Jan	75.8	78.2	76.4	76.0	76.1	77.0	75.8	73.9	73.7	71.5	69.4	67.7	65.3	61.5	62.6	63.7	65.6	63.0	63.5	64.3	65.0	68.8	72.4	73.9	70.0	78.2																					
31-Jan	73.9	72.4	74.2	76.7	77.9	77.7	78.3	77.3	77.0	76.5	76.2	72.4	66.1	62.9	65.2	70.2	74.7	74.3	72.8	72.3	72.9	71.1	74.3	76.4	73.5	78.3																					
																						82.4	81.9	81.7	81.4	81.3	81.5	82.1	82.3	82.5	82.3	81.6	82.4	80.6	79.5	79.0	79.1	79.7	79.8	79.8	80.5	81.2	81.1	81.7	82.6	Diurnal Average	
																						92.2	93.0	92.6	90.5	90.2	90.2	90.4	90.5	90.3	90.2	90.1	90.4	91.0	91.1	90.3	89.6	89.6	90.3	90.4	90.7	91.2	91.3	91.0	91.5	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	13	1.77	1.77
60 - 80	260	35.47	37.24
80 - 100	460	62.76	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

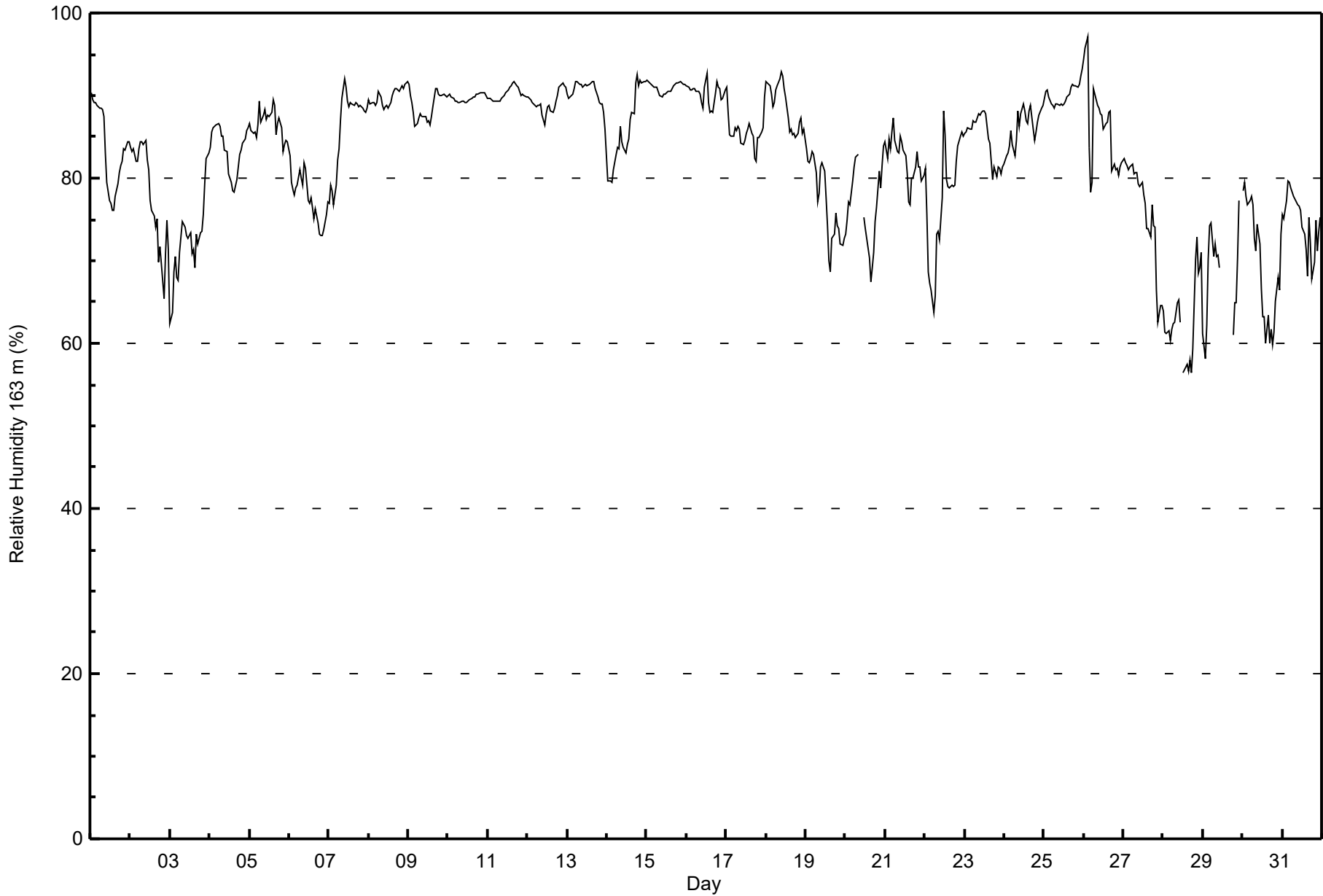
Relative Humidity 163 m (RH163m) - %
Lower Camp Met Tower - January 2023

Maximum Value: 97.1 % on Jan 26 03:00 Maximum Daily Average: 91.0 % on Jan 15																						Hours in Service:	744																								
Minimum Value: 56.5 % on Jan 28 18:00 Minimum Daily Average: 62.6 % on Jan 28																						Hours of Data:	733																								
Maximum Diurnal Average: 84.2 % at hour 12 Minimum Diurnal Average: 81.1 % at hour 19																						Hours of Missing Data:	11																								
Monthly Average: 82.74 % Percentiles: P ₁ = 59.5 P ₁₀ = 70.9 Q ₁ = 78.0 Median = 85.2 Q ₃ = 89.3 P ₉₀ = 91.0 P ₉₉ = 92.4																						Hours of Calibration:	0																								
																						Percent Operational Time:	98.5																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	90.4	89.5	89.1	89.1	88.8	88.4	88.5	88.4	87.5	83.1	79.5	77.3	76.9	76.1	76.0	77.8	79.3	80.6	81.5	82.1	83.6	83.3	84.4	84.4	83.6	90.4																					
2-Jan	83.8	83.2	83.6	82.0	82.0	83.6	84.4	84.5	84.0	84.6	82.3	81.1	77.3	76.0	75.4	74.0	75.0	69.8	71.6	69.7	65.4	70.9	74.9	71.4	77.9	84.6																					
3-Jan	62.4	63.7	68.7	70.5	67.9	67.7	70.9	74.7	74.4	74.1	73.1	72.8	73.4	70.8	71.4	69.2	73.2	72.0	73.3	73.6	75.5	79.3	82.3	83.0	72.4	83.0																					
4-Jan	83.7	85.6	86.2	86.2	86.4	86.7	86.3	85.0	85.0	83.4	83.3	80.5	80.1	79.4	78.5	78.2	79.8	81.4	82.9	83.5	84.2	84.8	85.8	86.2	83.5	86.7																					
5-Jan	86.7	85.7	85.5	85.6	84.9	86.5	89.4	86.7	87.6	88.3	87.1	87.6	87.4	88.0	89.6	88.8	85.2	86.6	87.3	86.1	83.3	84.0	84.5	84.4	86.5	89.6																					
6-Jan	82.8	79.5	78.7	78.0	78.9	79.1	81.0	80.0	79.2	81.9	81.1	77.2	76.9	77.6	76.5	75.2	76.3	74.6	73.2	73.0	73.1	73.8	75.7	77.1	77.5	82.8																					
7-Jan	77.0	79.1	78.5	76.8	79.1	82.1	83.6	87.0	89.6	92.0	91.0	89.3	88.6	89.1	89.0	88.8	89.2	89.1	88.7	88.9	88.5	88.1	88.1	88.5	86.2	92.0																					
8-Jan	89.5	88.9	89.2	89.1	88.8	89.2	90.6	89.9	88.8	88.3	88.6	88.8	88.5	89.1	89.9	90.6	90.9	90.9	90.5	90.9	91.2	90.8	91.4	91.7	89.8	91.7																					
9-Jan	91.3	90.1	89.1	88.1	86.3	86.6	87.3	87.9	87.5	87.5	87.4	86.8	86.9	86.5	87.5	88.7	90.8	90.9	90.1	89.9	90.1	90.1	90.1	89.9	88.6	91.3																					
10-Jan	90.0	90.1	89.8	89.7	89.3	89.3	89.2	89.2	89.3	89.4	89.2	89.1	89.3	89.5	89.6	89.8	89.8	90.1	90.1	90.3	90.4	90.3	90.3	90.0	89.7	90.4																					
11-Jan	89.7	89.6	89.5	89.3	89.3	89.3	89.3	89.3	89.6	89.8	90.1	90.3	90.7	91.0	91.2	91.6	91.7	91.2	91.0	90.6	90.0	90.1	89.9	89.9	90.2	91.7																					
12-Jan	89.9	89.7	89.4	89.2	88.8	88.6	88.8	88.9	89.0	87.6	86.4	87.8	88.7	88.8	88.1	88.0	88.5	89.3	90.1	90.9	91.4	91.5	91.1	91.1	89.2	91.5																					
13-Jan	90.1	89.7	90.1	90.1	90.9	91.8	91.6	91.4	91.3	91.0	91.2	91.4	91.1	91.3	91.6	91.7	91.7	90.8	89.8	89.1	88.9	89.0	87.9	85.9	90.4	91.8																					
14-Jan	79.7	79.7	79.7	79.5	80.9	82.9	83.8	83.6	86.3	84.4	83.7	83.0	84.1	84.7	87.1	87.9	87.9	91.5	92.5	91.2	91.8	91.6	91.7	91.7	85.9	92.5																					
15-Jan	91.8	91.7	91.5	91.3	91.1	91.1	91.1	90.5	90.0	89.8	90.1	90.2	90.3	90.5	90.6	90.9	91.3	91.4	91.5	91.5	91.7	91.5	91.4	91.3	91.0	91.8																					
16-Jan	91.3	91.0	90.7	90.7	90.8	90.9	90.5	90.4	90.1	89.2	88.5	91.0	92.6	89.2	88.0	88.1	87.9	90.4	91.7	91.0	90.9	89.6	89.7	90.7	90.2	92.6																					
17-Jan	91.0	88.0	85.2	85.1	85.2	86.2	85.8	86.2	86.0	84.2	84.1	84.6	85.4	85.9	86.6	85.5	85.1	82.3	82.1	84.9	84.9	85.6	86.0	89.8	85.7	91.0																					
18-Jan	91.7	91.5	91.2	90.2	88.7	89.1	90.7	91.3	92.1	92.8	92.3	90.8	89.8	87.3	85.6	85.9	85.2	85.4	85.0	85.4	86.8	87.4	85.4	85.9	88.6	92.8																					
19-Jan	83.6	82.0	81.9	82.4	83.2	82.9	80.7	77.2	78.1	81.4	81.9	80.9	77.6	74.2	70.1	68.7	72.7	73.2	75.8	74.2	73.9	72.0	71.8	72.7	77.2	83.6																					
20-Jan	73.2	74.9	77.2	76.9	79.7	81.4	82.5	82.8	82.8	DF	DF	75.3	74.0	72.6	70.3	67.5	69.1	71.0	74.7	76.5	80.9	78.9	81.5	83.9	76.7	83.9																					
21-Jan	84.5	82.3	84.8	83.5	85.7	87.3	84.6	83.1	83.0	85.1	84.4	83.5	82.7	80.4	77.1	76.8	79.9	80.0	81.3	83.2	81.4	81.4	79.6	80.3	82.3	87.3																					
22-Jan	81.3	75.5	68.6	67.2	66.5	63.8	65.8	73.2	73.5	72.6	77.6	88.1	85.3	79.9	78.9	78.8	79.1	79.0	79.2	82.1	83.9	85.1	85.7	85.1	77.3	88.1																					
23-Jan	85.4	85.5	86.1	86.0	86.0	86.9	86.8	86.8	87.7	87.7	87.9	88.1	88.2	87.7	84.8	84.3	82.1	79.9	81.3	80.2	81.3	81.2	80.5	81.4	84.7	88.2																					
24-Jan	81.7	82.8	83.0	83.9	85.8	84.1	82.7	84.5	88.2	86.3	87.9	88.9	88.1	87.0	86.6	88.1	88.7	86.0	84.6	85.6	86.9	87.6	88.5	88.9	86.1	88.9																					
25-Jan	89.7	90.6	90.7	89.8	89.0	88.8	88.5	89.0	89.1	88.8	89.0	88.8	88.9	89.3	89.8	90.2	91.1	91.4	91.2	91.1	91.0	91.4	92.4	93.3	90.1	93.3																					
26-Jan	94.3	95.7	97.1	83.7	78.2	79.5	90.9	89.4	88.9	88.4	87.8	87.7	86.0	86.6	86.8	88.0	88.2	80.9	81.6	81.0	81.2	80.4	81.4	81.8	86.1	97.1																					
27-Jan	82.4	81.8	81.5	81.0	81.3	81.7	80.5	80.8	80.7	79.3	79.0	79.5	78.0	76.9	73.9	73.9	72.9	76.8	74.3	74.1	66.5	62.6	64.5	64.6	76.2	82.4																					
28-Jan	64.0	61.4	61.3	61.5	60.4	61.7	62.3	62.5	64.9	65.3	62.5	DF	56.5	56.8	57.5	56.5	57.9	56.5	59.4	70.2	72.9	68.5	69.1	71.1	62.6	72.9																					
29-Jan	61.1	58.1	62.3	70.1	74.3	74.6	70.4	72.0	70.6	70.6	69.2	DF	DF	DF	DF	DF	DF	DF	DF	61.1	64.9	64.8	70.3	77.3	DF	--	77.3																				
30-Jan	78.4	79.5	77.7	76.7	77.3	77.8	76.8	72.6	71.1	74.3	72.0	66.6	63.3	63.2	59.9	63.3	60.0	61.7	59.8	61.3	65.0	68.0	66.5	73.3	69.4	79.5																					
31-Jan	75.5	75.1	77.3	79.7	79.5	78.9	78.3	77.7	77.2	76.7	76.5	76.1	74.1	73.3	71.3	68.1	75.3	72.2	67.9	69.8	74.9	71.1	73.5	75.3	74.8	79.7																					
																						83.5	83.0	83.1	82.7	82.7	83.2	83.7	83.7	84.0	83.9	83.5	84.2	82.7	81.9	81.3	81.2	81.9	81.6	81.1	81.8	82.1	82.3	83.0	83.8	Diurnal Average	
																						94.3	95.7	97.1	91.3	91.1	91.8	91.6	91.4	92.1	92.8	92.3	91.4	92.6	91.3	91.6	91.7	91.7	91.5	92.5	91.5	91.8	91.6	92.4	93.3	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 163 m (RH163m) - %
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 163 m (RH163m) - %
Lower Camp Met Tower - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	11	1.50	1.50
60 - 80	218	29.74	31.24
80 - 100	504	68.76	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Maximum Speed: 23 km/h on Jan 26 08:00	Maximum Daily Speed Average: 17.1 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 13 05:00	Minimum Daily Speed Average: 1.0 km/h on Jan 30	Hours of Data: 733
Maximum Diurnal Speed Average: 5.4 km/h at hour 8	Minimum Diurnal Speed Average: 2.6 km/h at hour 19	Hours of Missing Data: 11
Monthly Average Velocity: 4.0 km/h 144.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 8 Q ₃ = 14 P ₉₀ = 17 P ₉₉ = 22	Percent Operational Time: 98.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SE7	SSW10	SSW14	SW4	W5	SW7	SE8	SE14	SE16	SE13	SE13	SE15	SE14	SE12	SE9	SE7	SE9	SE13	SE11	SE10	SE14	SE8	SE6	SSE3	SSE8.8	SE16	
2-Jan	SE4	SE12	SE12	SE14	SE12	SE9	SE8	SE11	SE12	SE12	SE11	SE10	SE18	SE13	SE11	SE11	SE12	SE9	SE11	SE17	SE18	SE14	SE15	SE18	SE12.2	SE18	
3-Jan	SE12	SE12	SE9	SE11	SE15	SE12	SE10	SE11	SE12	SE11	SE12	SE16	SE14	SE13	SE14	SE12	SE10	SE12	SE12	SE14	SE9	SE11	SE12	SE15	SE12.1	SE16	
4-Jan	SE10	SE13	SE14	SE15	SE16	SE15	SE17	SE15	SE15	SE14	SE15	SE15	SE14	SE13	SE12	SE14	SE14	SE15	SE14	SE16	SE16	SE14	SE15	SE14	SE14.3	SE17	
5-Jan	SE15	SE13	SE12	SE16	SE14	SE15	SE11	SE9	SE12	SE7	SE13	SE13	SE10	SE7	SE7	SE8	SE6	SE7	SE8	SE6	ESE4	SE4	SE7	SE6	SE14.3	SE16	
6-Jan	SSE3	S1	NW1	SSW0	SSE6	SSE12	SE12	SE10	SE12	SSE4	SE10	SE10	SE11	SE12	SE15	SE16	SE21	SE18	SE14	SE14	SE13	SE15	SE13	SE14	SE10.5	SE21	
7-Jan	SE20	SE13	SE17	SE15	SE12	SE18	SE14	SE8	ENE0	NNE1	E1	SW1	NNW2	W2	NW1	NNW5	NW3	N5	NNW3	ENE1	SW4	SW7	SSE5	SSE4	SE4.5	SE20	
8-Jan	SSE7	SSE6	SSE6	SE8	SE10	SE9	SE8	SE10	SE9	SSE5	SSE4	SE6	SE4	SE1	SW0	SW1	NNW1	NNW3	NNW3	NNW3	NNW2	NNW2	NNW3	NNW3	SE3.1	SE10	
9-Jan	NW3	NNW3	NW2	NW3	WNW3	NW1	NNW2	NNW3	W1	NNW2	NNW3	NW2	S2	SSE6	SSE5	SSE8	S9	SSW7	SW3	SW4	SSW3	SW2	W2	NNE1	SW1.1	S9	
10-Jan	NNE1	SE2	SSE9	SSE8	S9	S6	SSW1	W1	S1	N1	NNW3	NW1	SW1	WSW4	WSW5	SW2	W3	WSW2	WSW3	WSW4	WNW2	N4	NNW5	NNW4	SW1.4	SSE9	
11-Jan	NW3	NNW3	NNW4	NNW5	NNW4	NNW3	WNW3	WSW1	WNW1	ESE3	SE3	SE5	SE5	SE8	SE10	SSE9	SSE10	S6	SE7	SSE10	SSE15	SSE17	SSE15	SSE16	SSE4.7	SSE17	
12-Jan	SSE17	SSE20	SSE20	SSE18	SSE17	SSE17	SSE20	SSE21	SE21	SE20	SSE20	SSE21	SSE23	SSE22	SSE19	SSE20	SSE18	SSE15	SSE14	SSE13	SSE10	S11	SE7	SE6	SSE17.1	SSE23	
13-Jan	SE9	SE7	S2	SE3	NE0	NW3	NW1	NNW1	WNW1	NNW3	N3	N2	N3	NNE3	NNE6	NNE5	NE3	ENE3	NE4	ENE4	ENE4	E4	E5	NE2.1	SE9		
14-Jan	SE11	SE13	SE15	SE17	SE17	SE17	SE17	SSE18	SSE22	SSE16	SSE22	SSE13	SSE11	SSE10	SSE10	SSE11	S8	SSE6	SW4	SW3	ESE2	SE1	E2	E2	SSW0	SSE9.8	SSE22
15-Jan	NNE1	NNW2	NNW2	NNW2	NNW3	N7	NNW5	NNW4	NNW4	NNW4	NNW3	NNW3	NNW3	NNW3	N6	N5	NNW2	NNW2	NNW2	NNW3	NNW3	NNW3	NNW3	NNW3	NNW3.3	N7	
16-Jan	NNW3	NNW3	NNW3	NNW3	NNW4	NNW4	NNW5	NNW6	NNW6	N6	N7	N8	N6	NNW4	NW3	N7	N9	NNW7	NNW3	SE6	SE15	SSE20	SSE17	SSE14	NNE1.2	SSE20	
17-Jan	S12	SSW14	SSW16	SSW17	S17	S14	SSE15	SSE16	SSE16	SSE19	SSE17	SSE11	S12	S13	S12	S14	S10	SSW9	SSE10	SE14	SE12	SSE15	SSE16	SSE15	SSE13.4	SSE19	
18-Jan	SSE15	SSE16	SSE16	S17	S19	S20	SSE16	SSE14	SSE16	SSE13	SSE14	SSE16	SSE14	SSE16	SE18	SSE13	SSE11	SE7	SSE9	SE15	SE14	SE17	SSE20	SSE17	SSE14.9	S20	
19-Jan	SSE14	SE11	ESE3	ESE7	SE19	SE22	SE19	SE19	SE23	SE20	SE18	SE14	SSE9	SE4	SSE5	SE14	SSE12	SSW10	SSE8	SW7	ESE6	SE7	ESE9	ESE7	SE11.4	SE23	
20-Jan	WSW3	WSW7	SW5	SW6	S7	SSW11	SSE8	SE10	SE12	DF	DF	SSW7	SSW7	WSW8	WSW12	WSW18	WSW13	WSW13	WSW16	W14	WNW3	WSW3	S5	SSE8	SW6.6	WSW18	
21-Jan	SE8	SSE7	SE10	SE9	SE12	SE14	SE13	SE13	SE14	SE13	SE13	SE13	SE14	SE13	SE16	SE15	SE12	SE12	SSE10	SE12	SW7	WSW16	WSW18	W13	SSE9.3	WSW18	
22-Jan	W11	W9	WNW7	WNW13	WNW11	WNW14	W13	W9	W13	WNW16	NNW17	NNE17	NNW9	N11	N12	NNE10	N9	N7	N7	NNW6	NNW5	NNW1	WNW2	NW3	NW7.3	NNE17	
23-Jan	WNW2	NE1	SE1	ESE3	ESE6	SE4	E2	ESE7	ESE2	ENE3	W0	E3	SSW1	ENE2	E6	E3	ENE2	E2	N6	NW2	W0	SE8	SE11	SE8	ESE2.4	SSE11	
24-Jan	SE8	SE12	SE10	SE8	SE10	SSE9	SE8	SE10	ESE6	ESE4	ESE5	SE9	SE9	SE6	WNW1	NNW5	NNE10	NNE9	N8	NNE7	N5	N5	NNW4	NW5	ESE3.5	SE12	
25-Jan	NNW5	NNW5	NNW6	NW4	NW5	N4	N4	N4	NNW2	NNW3	WNW2	NNE1	NNW4	NNW1	N2	NNW2	SE2	SSE18	SSE19	SE14	SE14	SSE13	SE4	SSE5	SE1.6	SSE19	
26-Jan	SSE9	SE17	SE18	WSW8	WNW16	NW13	NNW14	N23	N21	N22	N18	NNW14	N13	N9	NNE7	NNE7	N8	N13	N13	N12	N13	N16	N17	N11	N9.7	N23	
27-Jan	N14	N16	N16	N12	NNE11	N8	N8	N8	N9	NNW10	N12	NNW10	NNW5	WSW5	SW6	W3	NNW6	NNW3	NW4	NW2	WSW1	NNW3	NW2	NW4	NNW6.5	N16	
28-Jan	NNW4	WNW16	WNW19	WNW17	WNW19	WNW18	WNW16	WNW17	WNW18	WNW18	WNW16	DF	NW18	NW19	NW17	NW17	NW18	NW17	NW16	N15	N14	NNW11	NNW8	NNW5	NW14.3	WNW19	
29-Jan	N3	SSE2	S3	WNW3	WNW1	S3	S6	SE12	SE12	SE14	SE17	DF	DF	DF	DF	DF	DF	DF	SSE2	NNW4	NNW6	NW6	NW8	DF	---	SE17	
30-Jan	NNW5	NNW6	NNW6	NW2	NW2	SW3	S2	SE5	SE4	SSW4	SE6	SE8	SE4	SE4	SE8	SE8	SE6	ESE5	N2	NNW2	NW2	NNW5	NNW5	NW3	ESE1.0	SE8	
31-Jan	N7	N13	N9	NNE8	NNE6	NNE5	N4	NW3	NNW3	WNW2	W3	SW3	SSW5	SSW3	SE4	SE6	SE4	ESE3	S1	NNW3	NW3	NNW3	NNW5	NW2	N2.1	N13	

SE4.1 SSE4.0 SSE4.0 SSE3.8 SSE4.3 SSE4.9 SSE4.8 SE5.4 SE5.2 SE4.1 SE4.3 SE5.1 SE4.3 SSE4.1 SSE4.1 SSE3.9 SE3.4 SSE3.0 SSE2.6 SE3.4 SE3.6 SE3.8 SE3.6 SE4.1	Diurnal Average
SE20 SSE20 SSE20 SSE18 S19 SE22 SSE20 N23 SE23 N22 SSE20 SSE21 SSE23 SSE22 SSE19 SSE20 SE21 SSE18 SSE19 SE17 SE18 SSE20 SSE20 SE18	Diurnal Maximum

DF - DAS Failure
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

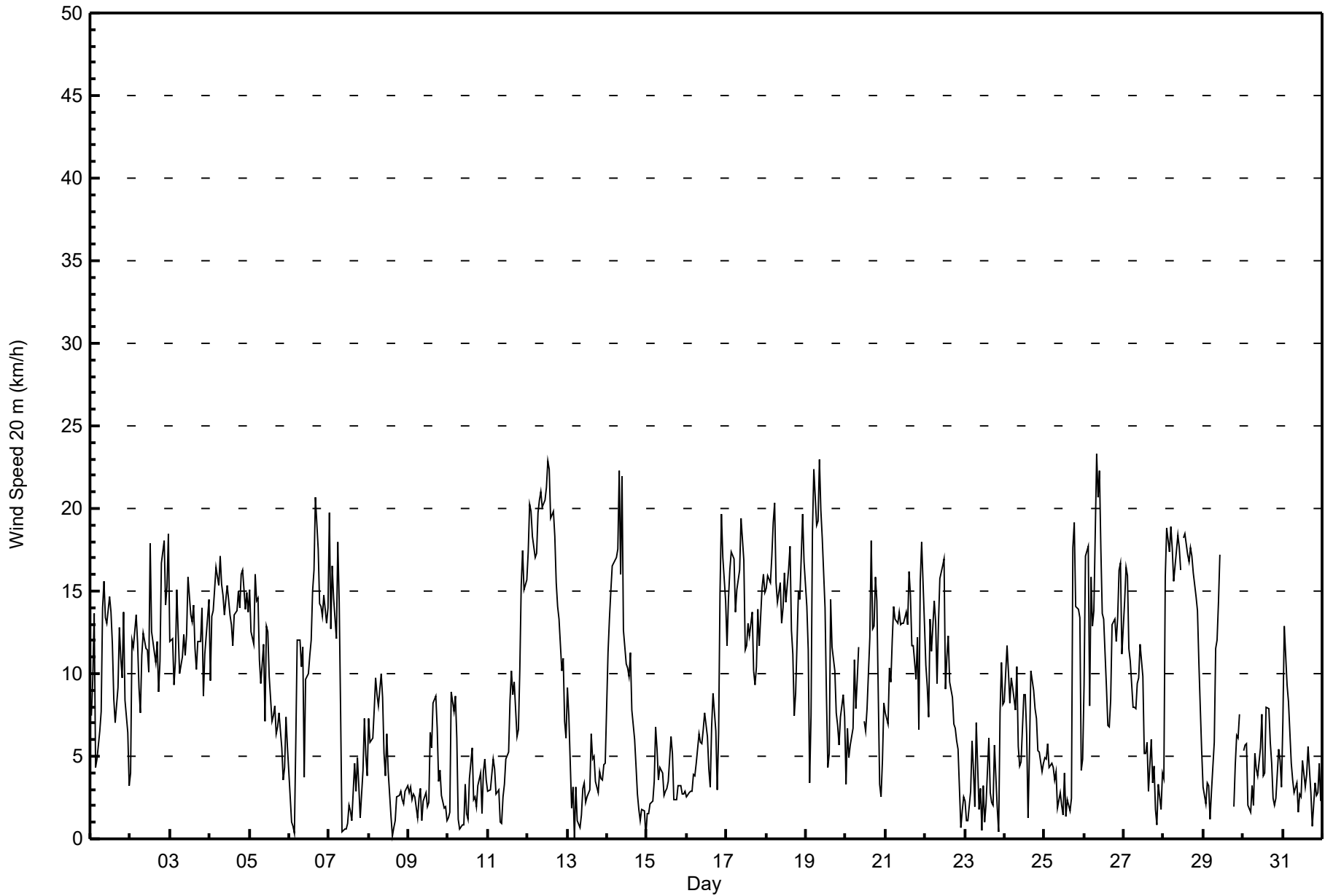
Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 8 16:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																		Hours in Service: 744 Hours of Data: 733 Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	3	2	4	3	2	4	2	2	3	3	3	3	3	3	3	3	2	1	3	2	2	1	1	4	
2-Jan	1	3	2	3	4	5	4	4	3	3	3	5	3	4	4	3	2	2	3	3	3	2	3	3	5	
3-Jan	3	3	2	2	4	4	3	2	2	2	2	3	4	3	2	3	3	2	3	3	2	2	2	2	4	
4-Jan	2	3	2	1	2	2	1	2	1	1	1	1	1	2	1	2	2	1	2	1	2	2	2	2	3	
5-Jan	2	1	1	2	3	3	3	3	4	1	3	4	2	2	2	2	2	2	1	1	2	2	3	3	4	
6-Jan	2	2	2	2	4	2	3	3	4	3	1	2	2	4	4	2	2	2	4	5	4	3	2	3	5	
7-Jan	4	3	2	2	2	3	3	3	2	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	4	
8-Jan	3	2	3	1	2	2	2	2	2	2	1	2	2	1	1	0	1	1	2	1	2	1	2	2	3	
9-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1	1	2	
10-Jan	1	1	4	2	2	2	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	4	
11-Jan	1	2	1	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	4	4	4	4	
12-Jan	3	3	4	4	3	3	3	3	3	3	3	3	3	2	2	3	3	2	2	2	2	2	2	2	4	
13-Jan	3	2	2	1	1	1	1	1	1	1	1	1	1	2	2	3	2	1	1	1	1	1	2	2	3	
14-Jan	4	5	5	6	5	4	4	5	3	3	4	2	3	2	2	2	1	2	1	1	1	1	1	1	6	
15-Jan	1	1	1	1	1	2	2	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	
16-Jan	1	2	1	1	2	2	2	3	3	2	2	2	3	3	2	3	4	2	1	6	4	5	3	2	6	
17-Jan	2	2	3	3	3	3	2	2	2	3	4	3	2	2	2	3	2	2	3	2	4	2	2	2	4	
18-Jan	2	2	3	3	5	4	2	2	2	2	3	3	3	3	4	3	3	3	4	4	3	3	4	3	5	
19-Jan	4	3	2	4	4	2	4	6	3	4	3	2	4	2	2	3	2	3	2	4	2	4	3	3	6	
20-Jan	2	2	3	5	2	2	2	2	3	DF	DF	3	2	4	6	4	4	4	4	5	2	2	2	1	6	
21-Jan	2	2	3	3	1	2	4	4	3	4	4	4	4	3	3	2	2	2	3	3	3	4	5	6	6	
22-Jan	4	4	3	4	5	5	4	4	5	5	7	7	4	4	3	3	3	2	2	2	2	1	1	1	7	
23-Jan	1	1	1	3	2	2	1	3	1	2	1	2	1	2	2	1	1	1	1	1	1	2	2	3	3	
24-Jan	3	4	4	3	3	4	2	2	3	2	2	3	4	1	2	3	4	4	3	3	2	2	2	2	4	
25-Jan	2	2	3	2	1	2	2	1	1	2	2	1	2	1	1	1	5	3	3	3	3	6	5	4	6	
26-Jan	4	5	3	6	5	5	5	8	8	9	6	5	4	3	2	2	3	4	5	4	5	6	5	4	9	
27-Jan	4	5	5	6	4	3	3	4	3	4	3	3	2	2	1	1	2	1	1	1	1	2	2	1	6	
28-Jan	2	6	6	5	6	5	5	5	6	5	5	DF	6	6	6	5	5	6	5	6	5	4	3	3	6	
29-Jan	1	1	1	3	2	2	5	2	1	2	4	DF	DF	DF	DF	DF	DF	DF	DF	1	2	2	2	1	DF	5
30-Jan	2	2	2	1	1	2	1	2	2	2	2	1	2	2	1	2	2	2	1	1	1	3	1	1	3	
31-Jan	4	4	4	3	2	2	2	1	1	1	1	1	1	1	2	2	1	2	1	2	2	2	3	1	4	
Diurnal Maximum																										
DF - DAS Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	263	35.88	35.88
6 - 11	202	27.56	63.44
12 - 19	244	33.29	96.73
20 - 28	24	3.27	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

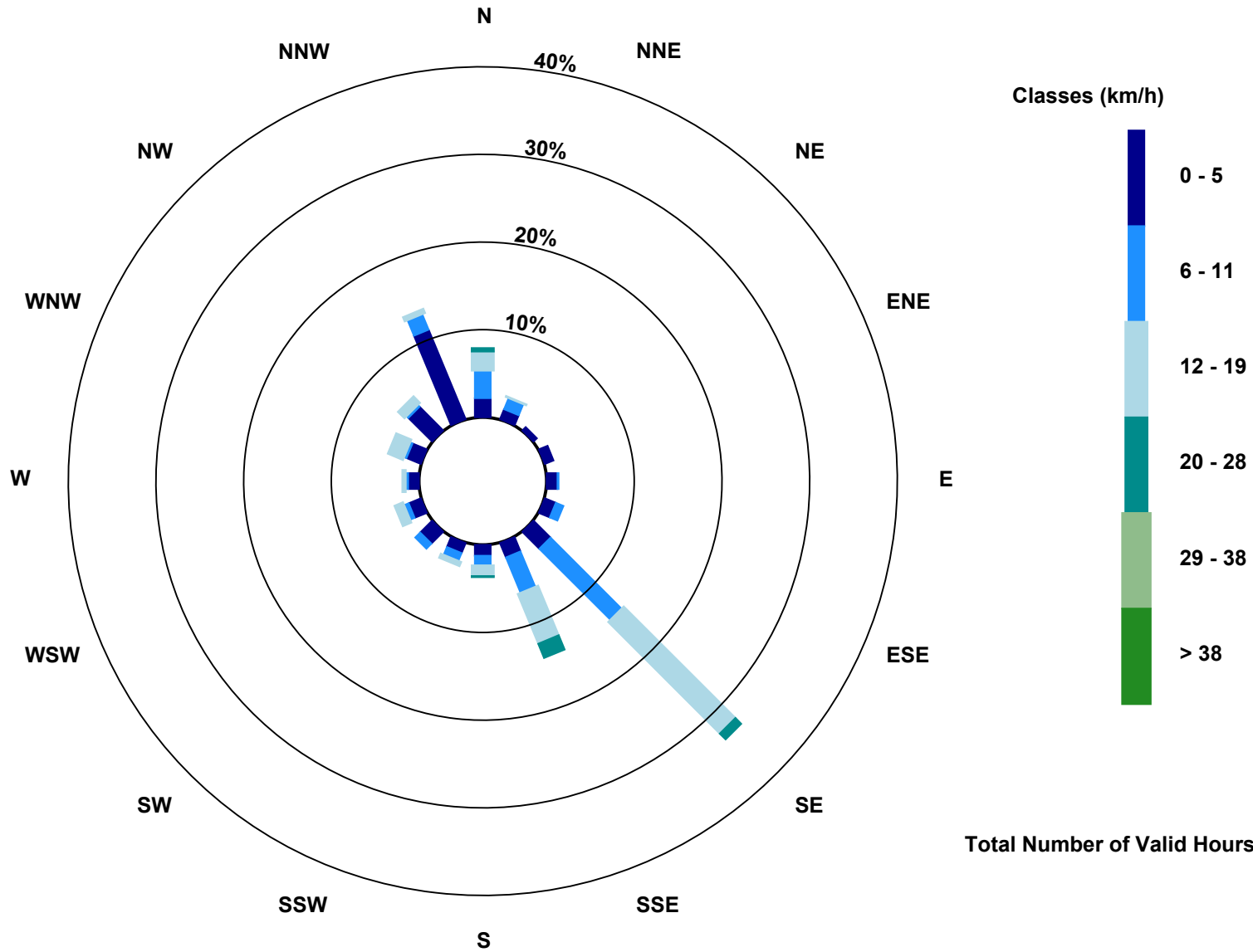
Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower





Maximum Speed: 36 km/h on Jan 26 10:00	Maximum Daily Speed Average: 20.8 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 8 17:00	Minimum Daily Speed Average: 0.2 km/h on Jan 30	Hours of Data: 718
Maximum Diurnal Speed Average: 5.6 km/h at hour 9	Minimum Diurnal Speed Average: 2.1 km/h at hour 19	Hours of Missing Data: 26
Monthly Average Velocity: 4.2 km/h 140.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 11 Q ₃ = 17 P ₉₀ = 22 P ₉₉ = 27	Percent Operational Time: 96.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SE8	SW14	SSW16	SW6	W7	SW10	SSE9	SSE14	SE17	SE16	SE14	SE18	SE16	SE13	SSE9	SSE9	SE11	SE13	SSE10	S8	SE13	SE11	SE12	SE10	SSE10.1	SE18	
2-Jan	SE10	SE16	SE14	SE18	SE16	SE13	SE10	SE12	SE17	SE16	SE13	SE14	SE19	SE18	SE17	SE13	SE14	SE11	SE12	SE17	SE18	SE16	SE16	SE21	SE15.0	SE21	
3-Jan	SE16	SE17	ESE12	SE13	SE19	SE16	ESE12	SE13	SE15	SE12	SE15	SE19	SE18	SE17	SE17	SE14	SE12	SE13	SE13	SE15	SE10	SE14	SE13	SE16	SE14.7	SE19	
4-Jan	SE12	SE14	SE15	SE16	SE18	SE17	SE18	SE17	SE18	SE17	SE16	SE15	SE13	ESE15	SE13	SE12	SE15	SE14	SE15	SE16	SE16	SE17	SE16	SE16	SE15.5	SE18	
5-Jan	SE17	SE14	SE14	SE18	SE17	SE17	SE14	SE12	SE14	SE7	SE14	SE14	SE10	SE10	SE8	SE11	SE10	SE9	SE10	SE9	ESE10	SE8	SE10	SE7	SE11.8	SE18	
6-Jan	SE5	SE6	SE8	SE13	SE16	SE19	SE20	SE20	SE16	SSE5	SE10	SE12	SE14	SE14	SE19	SSE19	SSE21	SE21	SE23	SE22	SE21	SE18	SE14	SE16	SE15.4	SE23	
7-Jan	SE20	SE15	SE19	SE18	SE10	SE15	SE16	SE9	SW1	NNW1	NNE2	WNW2	N4	NNW1	WSW1	NNW7	NW6	NNW8	NNW6	ENE2	SW5	SW7	SE7	SE5	SE4.4	SE20	
8-Jan	SE9	SE7	SE9	SE8	UO	SE8	SE7	SE10	SE10	ESE7	SE7	SE8	SE4	SE2	ESE1	SE2	ENE0	NNW5	NNW6	NNW6	NNW4	NW4	NNW4	NNW4	ESE3.1	SE10	
9-Jan	NNW5	NNW6	NNW6	NNW6	N2	ESE3	ENE1	N3	NNE0	N1	N2	NNW4	SSE3	SE7	SSE7	SSE8	S10	SSW7	SW4	SW5	S3	SSW3	W3	NW1	SSW0.7	S10	
10-Jan	NE1	SE3	SSE12	SE10	S9	S7	S2	SSE0	SSE2	SSE1	NNW4	NW2	WSW1	WSW3	WSW5	WSW2	W3	W3	WSW6	SW6	W3	NNW7	NNW8	NNW6	SW1.5	SSE12	
11-Jan	NNW5	NNW4	NNW7	NNW8	NNW7	NNW5	NW4	WSW2	WSW2	SE3	SE5	SE6	SE6	SE10	SE12	SSE10	SSE11	SSE8	SE9	SE14	SSE19	SSE20	SSE17	SSE17	SSE5.2	SSE20	
12-Jan	SSE19	SSE22	SSE22	SSE21	SSE19	SSE19	SSE23	SSE23	SSE24	SSE24	SSE23	SSE24	SSE25	SSE25	SSE22	SSE22	SSE21	SSE18	SSE16	SSE15	SSE11	S12	SE9	SE9	SSE19.4	SSE25	
13-Jan	SE13	ESE10	ESE2	SE3	NW2	NNW6	NNW3	NNW2	N3	N6	N6	N4	N4	NNE5	NNE10	NNE7	ENE6	E5	ENE7	ENE6	ENE6	E8	ESE9	NE3.7	SE13		
14-Jan	SE17	SE20	SE22	SE27	SE25	SE24	SE23	SSE25	SSE18	SSE25	SE16	SSE13	SSE11	SSE10	S12	S9	S7	SW6	SW4	SSE2	SE2	SSE1	ESE2	ESE2	SE12.7	SE27	
15-Jan	ENE2	NNE2	NNE2	NNW3	NNW6	NNW10	N8	NNW5	NNW7	NNW6	NNW4	NNW3	NNW3	NNW4	NNW6	NNW5	NNW4	NNW4	NNW4	NNW5	NNW5	NNW5	NNW5	NNW5	NNW4.6	NNW10	
16-Jan	NNW4	NNW5	NNW6	NNW5	NNW6	NNW6	NNW8	NNW10	NNW9	N10	N10	N11	N9	N6	NNW3	N5	N8	N6	SSE2	SE14	SE23	SSE23	SSE20	SSE17	NNE2.1	SSE23	
17-Jan	S14	SSW17	SSW18	SSW19	S19	S15	SSE17	SSE18	SSE18	SSE22	SSE19	SSE13	S13	S14	S13	S16	S13	SSW13	SSE15	SSE15	SSE15	SSE18	SSE17	SSE17	S15.6	SSE22	
18-Jan	SSE17	SSE18	SSE18	SSE19	SSE22	S23	SSE17	SSE15	SSE17	SSE15	SSE17	SSE19	SE17	SSE18	SE22	SE15	SE16	SE15	SE14	SE22	SE21	SE22	SSE23	SSE20	SSE18.1	S23	
19-Jan	SE19	SE14	SE7	SE12	SE23	SSE26	SE23	SE26	SSE25	SE22	SE18	SSE11	SSW9	S3	SSW6	SSE15	S15	SSW14	S8	SW13	SE4	SSE7	SE9	SE5	SSE12.7	SE26	
20-Jan	WSW8	WSW12	SW10	SW10	SW11	SSW14	SSW8	S7	S9	DF	DF	SW11	SW10	WSW14	WSW21	WSW27	WSW21	WSW22	WSW25	WSW24	WNNW6	W8	SW6	S8	SW12.1	WSW27	
21-Jan	S7	S8	SE11	SE14	SE15	SE18	SE20	SE16	SE17	SE19	SE20	SE19	SE18	SE18	SE18	SE17	SE13	S8	SSW7	SSW8	WSW13	WSW23	WSW27	WSW22	SSE10.4	WSW27	
22-Jan	WSW18	WSW16	NNW13	NNW19	NNW17	NNW21	W20	W14	W19	NNW22	NNW23	NNE26	N14	N16	N18	N14	N14	N11	N10	NNW12	NNW11	NNW4	NW4	NW5	NW11.3	NNE26	
23-Jan	NNW4	NW1	SE1	SE6	ESE9	SE6	ESE4	ESE12	SE4	E7	ESE2	ESE6	SSE1	ENE3	E9	E5	ENE4	E4	N7	N3	SE2	SE11	SE13	SE13	ESE4.3	SE13	
24-Jan	SE14	SE19	SE17	SE15	SE15	SE12	SE11	SE13	SE11	ESE7	ESE8	SE11	SE10	ESE7	NW2	NNW9	NNE15	NNE13	N12	NNE11	N8	N7	NNW6	NNW7	ESE5.4	SE19	
25-Jan	NNW8	NNW7	N9	NW6	NW7	NNW6	NNW5	N6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SE10	
26-Jan	SSE11	SE21	SE15	W18	NNW24	NW20	NNW21	N35	N32	N36	N27	NNW19	N18	N14	N10	NNE11	N13	N19	N19	N17	N19	N25	N26	N18	N15.1	N36	
27-Jan	N22	N25	N25	N18	NNE16	N14	N13	N13	N16	N15	N16	NNW14	NNW7	W5	WSW6	WNW3	NNW11	NNW7	NNW9	NW4	W4	NW8	NW5	NNW7	N10.8	N25	
28-Jan	NW10	NNW24	NNW28	NNW26	NNW27	NNW24	NNW22	NNW25	NNW27	NNW24	NNW23	DF	NW24	NW25	NW23	NW22	NW24	NW25	NW22	N22	N21	NNW17	NNW14	NNW11	NW20.8	NNW28	
29-Jan	NNW5	N2	SW6	WSW8	WSW4	SW4	SSW8	SSE8	SE13	SE17	SE21	DF	DF	DF	DF	DF	DF	DF	DF	SW2	NNW12	NNW13	NNW14	NW12	DF	---	SE21
30-Jan	NNW8	NNW12	NNW10	NW6	WSW3	SSE3	SSE5	S5	SSW4	SW8	SSW5	SSE4	S2	SSW2	SE6	SE8	SE8	SE7	NE2	NE2	NW2	NNW8	NNW8	NNW6	NNW0.2	NNW12	
31-Jan	N13	N20	N13	NNE12	NNE10	NNE7	NNE6	NNW4	N5	N3	SSW1	SW2	SW4	SW3	SE4	ESE7	ESE5	ESE6	ESE3	NNW6	N3	NNW5	NNW10	NNW4	NNE4.1	N20	

SE4.4	SE4.2	SSE4.3	SSE4.4	SSE4.6	SSE5.0	SE5.4	SE5.5	SE5.6	SE4.7	ESE5.0	SE5.5	SE4.5	SE4.3	SE4.5	SE4.4	SE3.5	SSE2.5	SE2.1	SE2.7	SE3.4	SE3.0	SE3.3	SE4.3	Diurnal Average
N22	N25	WNW28	SE27	WNW27	SSE26	SE23	N35	N32	N36	N27	NNE26	SSE25	NW25	NW23	WSW27	NW24	NW25	WSW25	WSW24	SE23	N25	WSW27	WSW22	Diurnal Maximum

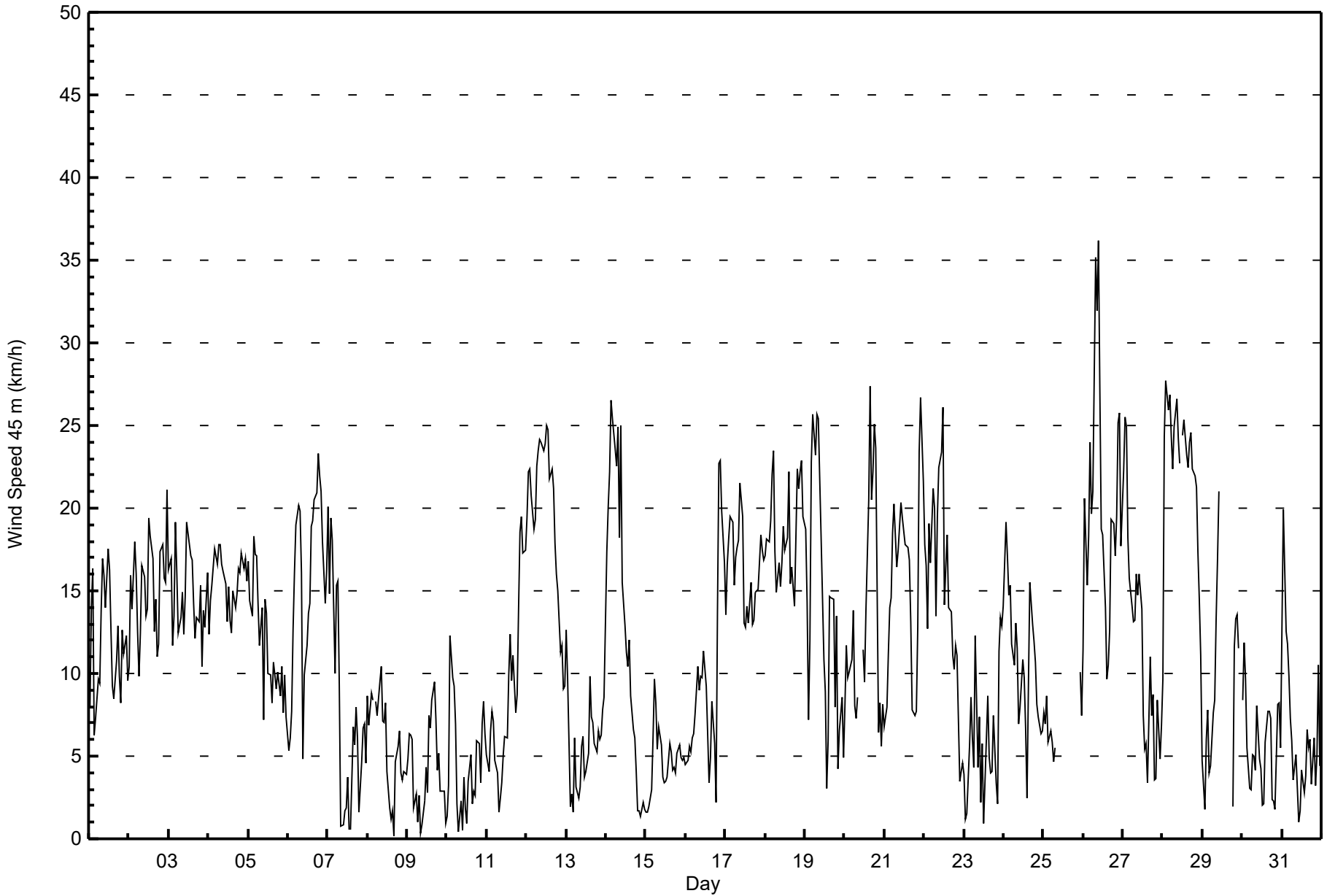
DF - DAS Failure UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 26 10:00 Minimum Value: 1 km/h on Jan 10 08:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 718 Hours of Missing Data: 26 Hours of Calibration: 0 Percent Operational Time: 96.5							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	2	3	2	4	3	3	4	1	1	2	2	2	2	2	2	2	2	2	1	2	2	2	1	1	4
2-Jan	1	2	3	2	3	3	4	3	3	3	3	2	3	2	3	2	2	2	2	5	4	4	3	3	5
3-Jan	2	2	2	2	3	5	4	3	2	2	2	3	1	2	4	4	3	3	3	2	2	2	2	5	
4-Jan	3	2	1	1	2	1	1	1	1	1	2	1	2	1	3	1	2	2	2	2	1	1	1	3	
5-Jan	1	2	2	2	2	2	3	2	4	1	3	2	1	2	1	1	1	2	1	1	3	2	2	4	
6-Jan	3	2	3	5	4	2	3	2	8	3	2	2	2	3	2	2	1	2	2	5	4	3	2	8	
7-Jan	4	4	1	1	3	3	2	4	1	1	1	2	3	1	2	3	1	1	2	1	2	1	1	4	
8-Jan	3	2	2	2	UO	2	3	2	2	1	1	2	2	1	1	1	1	2	2	1	2	2	2	3	
9-Jan	1	2	1	2	2	2	1	1	1	1	1	3	1	2	2	2	2	2	1	1	2	2	1	3	
10-Jan	1	2	4	4	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	4	
11-Jan	1	1	1	1	2	1	1	1	1	1	1	1	2	2	3	3	3	2	2	3	3	5	4	5	
12-Jan	3	3	4	4	3	3	3	3	2	3	3	4	3	2	3	3	2	2	2	2	2	1	2	4	
13-Jan	2	2	2	1	2	2	2	1	2	2	1	2	2	2	1	3	2	2	2	1	1	1	2	3	
14-Jan	4	4	4	6	5	4	4	6	3	3	3	2	2	2	2	2	1	2	1	1	1	1	1	6	
15-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	
16-Jan	1	2	1	2	2	3	3	3	3	2	2	2	3	2	2	3	4	3	2	8	3	4	3	8	
17-Jan	2	3	3	3	3	3	3	3	3	3	4	3	2	2	3	3	2	1	3	2	4	3	2	4	
18-Jan	3	3	3	3	5	4	3	2	3	3	3	3	3	3	3	3	4	5	4	4	3	3	4	5	
19-Jan	3	3	4	5	3	2	2	2	2	2	3	2	3	2	2	3	2	4	3	5	2	3	3	5	
20-Jan	3	2	3	7	4	2	2	2	3	DF	DF	3	3	5	7	3	4	4	3	6	3	3	4	7	
21-Jan	2	3	3	3	1	1	2	3	2	3	4	3	3	2	2	2	2	3	3	2	4	4	3	6	
22-Jan	4	3	4	4	6	6	4	5	6	6	6	7	4	4	3	3	2	2	3	2	2	1	1	7	
23-Jan	1	1	2	4	3	2	2	4	2	4	3	3	1	3	3	2	2	1	3	2	2	2	2	4	
24-Jan	3	2	3	3	3	3	2	3	5	3	2	2	1	2	3	3	5	2	3	2	2	3	2	5	
25-Jan	2	2	3	2	1	2	2	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	7	
26-Jan	4	4	5	7	5	6	5	8	8	9	6	5	4	2	2	2	4	4	5	5	5	5	4	9	
27-Jan	5	5	5	8	5	3	3	5	3	4	3	3	2	1	1	1	2	1	2	3	2	2	3	8	
28-Jan	3	5	5	5	4	4	5	5	5	5	5	DF	6	6	6	6	5	6	5	6	4	3	3	6	
29-Jan	2	2	3	4	3	3	6	2	2	2	2	DF	DF	DF	DF	DF	DF	DF	DF	2	5	1	2	6	
30-Jan	1	3	2	1	2	1	1	2	2	3	2	1	1	1	1	2	1	2	1	1	1	1	4	4	
31-Jan	5	3	3	3	2	3	2	1	1	2	1	1	2	1	2	1	1	1	1	4	2	3	2	5	
Diurnal Maximum																									
DF - DAS Failure UO - Unstable Operation																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	156	21.73	21.73
6 - 11	213	29.67	51.39
12 - 19	249	34.68	86.07
20 - 28	97	13.51	99.58
29 - 38	3	0.42	100.00
> 38	0	0.00	100.00

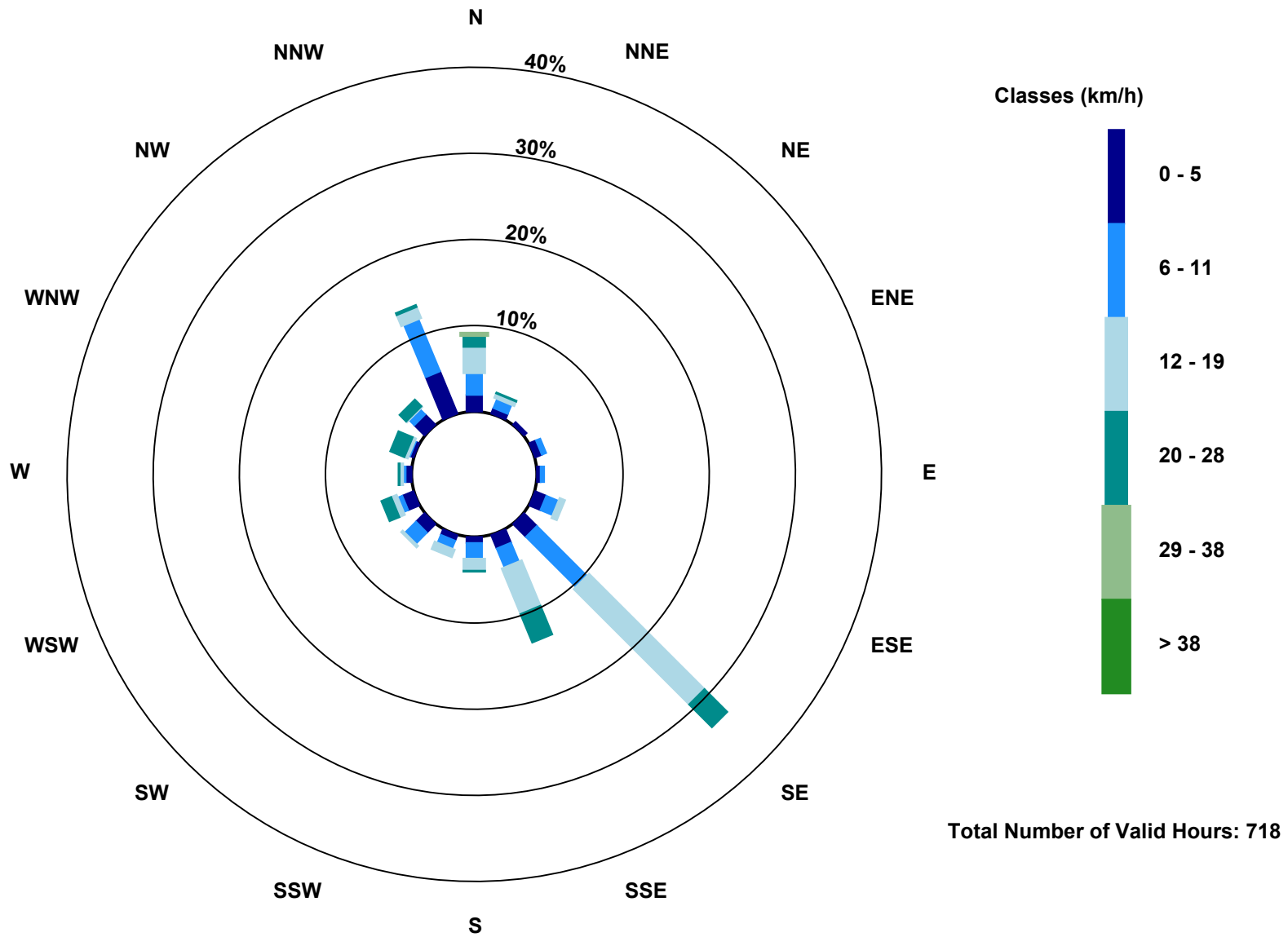
Total Number of Valid Hours: 718

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 45 m (WS45m) - km/h
Lower Camp Met Tower





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 100 m (WS100m) - km/h

Lower Camp Met Tower - January 2023

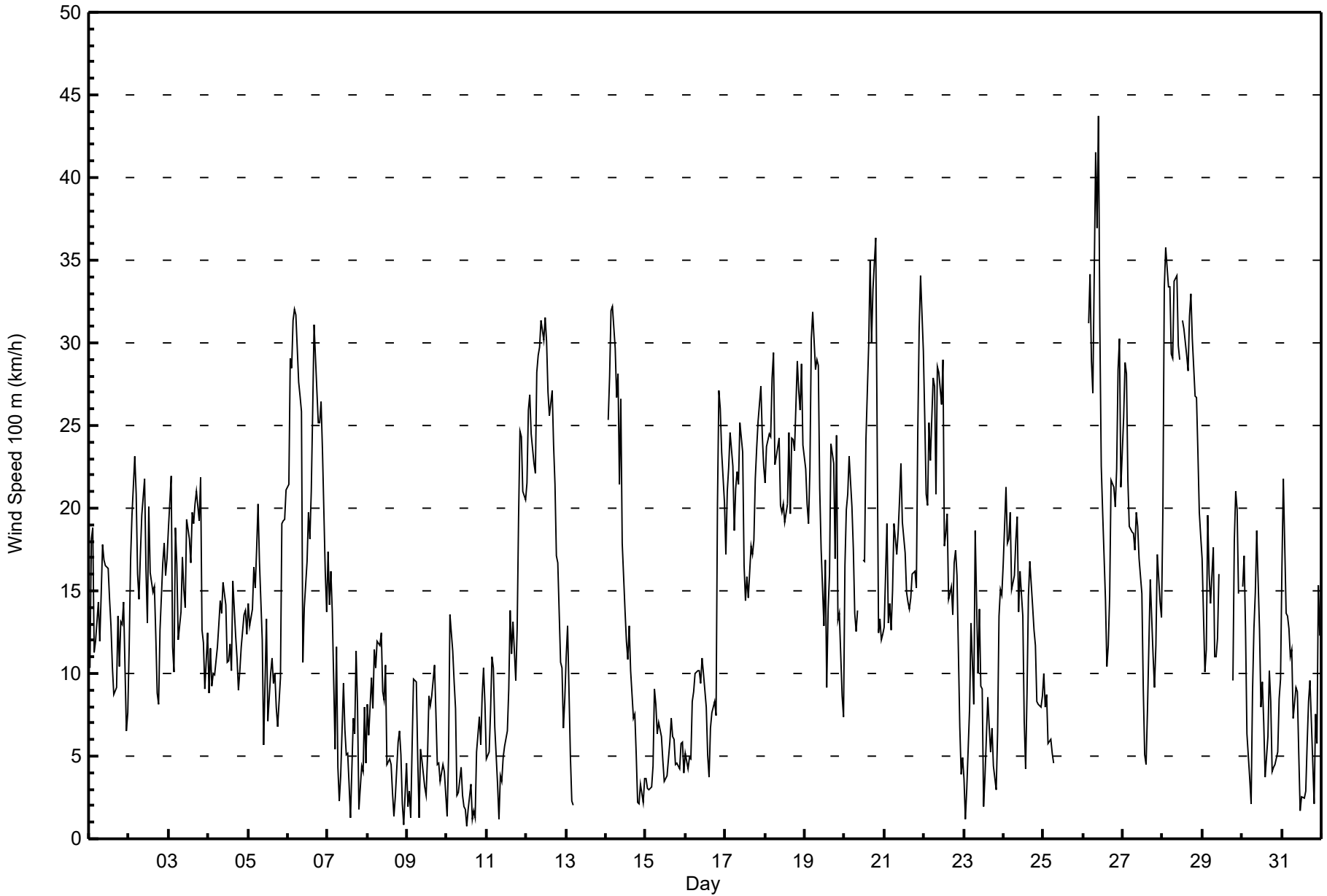
Maximum Speed: 44 km/h on Jan 26 10:00		Maximum Daily Speed Average: 27.1 km/h on Jan 28		Hours in Service: 744																						
Minimum Speed Value: 1 km/h on Jan 10 13:00		Minimum Daily Speed Average: 1.1 km/h on Jan 10		Hours of Data: 693																						
Maximum Diurnal Speed Average: 7.3 km/h at hour 8		Minimum Diurnal Speed Average: 3.1 km/h at hour 23		Hours of Missing Data: 51																						
Monthly Average Velocity: 5.2 km/h 175.0 deg		Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 8 Median = 14 Q ₃ = 20 P ₉₀ = 27 P ₉₉ = 34		Percent Operational Time: 93.2																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SSW10	SW18	SW19	WSW11	W12	WSW14	S12	S15	S18	SSE17	SSE16	SSE16	SSE14	S13	S10	SSW9	SSW9	S13	SSW10	SW13	S13	S14	S7	S8	S11.5	SW19
2-Jan	S12	SSE17	SSE20	SSE23	SSE21	SSE16	SSE15	SSE17	SSE20	SSE22	SSE16	SSE13	SSE20	SSE16	SSE15	SE15	SSE12	S9	SSW8	S13	SSE17	SSE18	SSE16	SSE17	SSE15.9	SSE23
3-Jan	SSE19	SSE22	SSE12	SSE10	S19	SSE17	S12	SSE14	SSE17	SSE15	SSE14	SSE19	SSE18	SSE17	SSE20	SSE19	SSE20	SSE21	SSE19	SSE22	SSE13	SSE12	SSE9	SSE12	SSE16.2	SSE22
4-Jan	S9	SSE11	S9	S10	S10	S12	SSE13	SSE14	SSE14	SSE16	SSE14	S11	SSE11	SSE12	SSE10	SSE16	SSE12	S11	S9	S10	S12	S14	SSE14	SSE12	SSE11.7	SSE16
5-Jan	SSE14	SSE13	SSE14	SSE16	SSE15	SSE18	SSE20	SSE17	SSE12	SSE6	S10	SSE13	SSE7	SSE10	SSE11	S9	S10	S8	S7	SSE10	SE19	SE19	SE19	SE21	SSE13.1	SE21
6-Jan	SE21	SE29	SE29	SE31	SE32	SE32	SE28	SSE27	SSE26	SSE11	SSE14	SSE17	SSE20	SSE18	SSE21	SSE26	SSE31	SSE27	SSE25	SSE25	SSE26	SSE23	SSE16	S14	SSE23.2	SE32
7-Jan	S17	SSE14	SSE16	SSE14	SSE5	SW12	SW4	ESE2	NW4	NW9	NNW7	NW5	N5	E3	S1	N7	NNW6	NNW11	N8	E2	SW4	S4	SE8	SE5	S1.7	S17
8-Jan	SSE8	SE6	S10	S8	SSE11	SSE10	SSE12	SSE12	S12	SSE9	SSE8	S11	S4	SSE5	SSE4	SSE3	SE1	NNE3	N6	NE7	NNE5	N2	E1	SE5	SSE5.1	S12
9-Jan	SE2	SSE3	E1	ESE6	ESE10	ESE9	ESE5	ESE1	SE5	SE5	ESE3	ENE3	SE5	SE9	SE8	SSE9	S11	SSW8	SSW4	SSW5	SSE3	SSW4	WSW4	WSW3	SSE4.0	S11
10-Jan	E1	SSE5	SE14	SE11	S9	S8	SSE3	SE3	SSE4	SSE3	NNW2	NW2	NW1	W2	W3	W1	WNW2	NW1	WSW5	WSW7	W6	NNW9	N10	N8	S1.1	SE14
11-Jan	NNW5	NW5	NNW8	NNW11	NNW10	N7	N3	SW1	SW4	S3	SSE5	SSE6	SSE7	SE9	SE14	SSE11	SSE13	SSE10	SE13	SSE19	SSE25	SSE24	SSE21	SSE21	SSE6.3	SSE25
12-Jan	SSE22	SSE26	SSE27	S25	SSE23	SSE22	SSE28	SSE29	SSE30	SSE31	SSE30	SSE32	SSE30	SSE27	SSE26	SSE27	SSE24	S21	SSE17	S17	S11	S10	SSE7	SE9	SSE22.7	SSE32
13-Jan	SE11	SE13	ESE5	E2	NE2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SE13
14-Jan	UO	SE25	SE28	SE32	SE32	SE30	SE27	SSE28	SSE21	SSE27	SE18	SSE14	SSE12	SSE11	S13	S10	S7	SW8	SW5	SSW2	S2	SSW3	SE2	ESE4	SSE14.6	SE32
15-Jan	E4	ENE3	ENE3	NE3	NNE4	N9	N8	N6	N7	N6	N5	NNW3	NNW4	NNW6	NNW7	N6	N6	NNE5	NNE5	N4	N6	NNE6	N4	N4	N4.6	N9
16-Jan	NNW5	NNE4	NNE5	NNW5	NNW8	NNW9	NNE10	N10	N10	NNE9	NE11	NE10	NE8	NE5	E4	ESE7	ESE8	ESE8	SE7	SE20	SE27	SSE26	SSE23	S20	E4.4	SE27
17-Jan	S17	SSW21	SSW22	SSW25	S23	S19	SSE21	SSE22	SSE21	SSE25	SSE23	S17	S14	S16	S15	S18	S17	S18	SSE22	SSE24	SSE25	S27	S24	SSE23	S20.3	S27
18-Jan	SSE22	SSE24	SSE25	SSE24	SSE28	SSE29	SSE23	SSE23	SSE24	SSE20	SSE20	SSE20	SSE19	SSE20	SE25	SE20	SE24	SE24	SE23	SE29	SE27	SE26	SSE29	SSE24	SSE23.4	SSE29
19-Jan	SSE22	SSE20	SSE19	SSE22	SSE30	SSE32	SSE28	SSE29	SSE29	S21	S18	SW13	SW17	SW9	SW14	S16	SSW24	SW23	SW17	SW24	SW13	SW14	SSW9	SW7	S16.8	SSE32
20-Jan	WSW16	WSW20	WSW21	WSW23	WSW20	SW18	SW14	SW13	SW14	DF	DF	SW17	SW17	WSW24	WSW30	WSW35	WSW30	WSW33	WSW35	WSW36	W12	W13	WSW12	SW12	WSW20.7	WSW36
21-Jan	SW13	SW19	S13	SSE14	S13	SSE15	SSE19	SSE17	SSE19	SSE21	SSE23	SSE19	SSE17	SSE15	S14	SSW14	SSW15	SW16	WSW16	SW15	WSW25	WSW31	WSW34	W29	SSW13.8	WSW34
22-Jan	W25	W21	WNW20	WNW25	WNW23	WNW28	W27	W21	W29	WNW28	N26	NNE29	N18	N18	N20	N14	N15	NNE14	NNE17	N17	N16	N7	NNE4	NNW5	NW14.5	NNE29
23-Jan	NW4	WNW1	SSE3	SSE8	ESE13	SE11	SE8	ESE19	SE10	ESE14	ESE9	ESE9	ESE2	E4	E9	E7	ENE5	ESE7	NNE4	ESE3	SE6	SE13	SE15	SE15	ESE7.2	ESE19
24-Jan	SE17	SE21	SE18	SE18	SE20	SSE15	SSE16	SSE18	SE20	SE14	SSE16	SSE13	S7	E4	N9	N15	NNE17	NNE14	N13	N12	N8	N8	N8	NNW9	ESE6.1	SE21
25-Jan	NNW10	N8	NNE9	NNW6	NNW6	N5	NNW5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNW10
26-Jan	UO	UO	UO	W31	WNW34	NW29	N27	N41	N37	N44	N31	NNW23	N20	N15	N10	N12	N15	N22	N21	N20	N22	N28	N30	N21	N22.5	N44
27-Jan	N26	N29	N28	N22	NNE19	N19	N18	N17	N20	N19	N17	NNW15	NNW9	WNW5	WNW4	NNW8	NNW16	NNW13	N11	NNW9	NW12	NW17	NW14	NW13	N14.8	N29
28-Jan	WNW20	WNW33	WNW36	WNW33	WNW33	WNW29	WNW29	WNW34	WNW34	WNW30	WNW29	DF	NW31	NW31	NW29	NW28	NW32	NW33	NW30	N27	N27	N23	N20	NNW18	NW27.1	WNW36
29-Jan	NNW17	NW10	WSW11	W20	WSW16	WSW14	WSW18	SW11	SSW11	S12	S16	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	---	NNW21
30-Jan	NNW15	NNW17	N13	N6	NNW4	SE2	SSW9	SW13	WSW15	WSW19	WSW13	SW8	WSW9	WSW7	S4	ESE6	SE10	SE8	ESE4	ESE4	ESE5	N5	N8	N10	W2.5	WSW19
31-Jan	N16	NNE22	N14	NNE13	NNE13	NE11	NE11	NNE7	NE9	NE9	ENE5	NNW2	WSW3	SW2	ESE3	ESE6	SE8	SE10	SSE7	N2	NE8	NNE6	NNW15	NNW12	NNE6.0	NNE22
S4.1 S5.4 S6.0 S6.3 S6.2 S6.4 S6.7 SSE7.3 S7.3 SSE5.8 SSE5.6 SSE6.0 S4.7 S4.9 S5.5 S5.3 S5.3 S4.5 SSW3.3 S4.0 SSE3.7 S3.9 S3.1 S4.1																								Diurnal Average		
N26 WNW33 WNW36 WNW33 WNW34 SSE32 WNW29 N41 N37 N44 N31 SSE32 NW31 NW31 WSW30 WSW35 NW32 WSW33 WSW35 WSW36 SE27 WSW31 WSW34 W29																								Diurnal Maximum		
DF - DAS Failure UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 15 03:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																	Hours in Service: 744 Hours of Data: 693 Hours of Missing Data: 51 Hours of Calibration: 0 Percent Operational Time: 93.2									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	4	1	1	4	
2-Jan	2	2	2	3	4	3	3	5	2	2	3	2	3	2	1	1	2	3	3	4	2	3	3	2	5	
3-Jan	1	3	4	2	3	3	3	3	3	3	2	2	3	2	2	2	2	1	3	3	2	2	1	1	4	
4-Jan	4	2	1	1	2	2	2	2	2	2	1	1	1	1	1	3	2	1	1	1	1	2	1	1	4	
5-Jan	2	1	2	3	2	2	2	2	5	2	2	2	2	1	1	2	1	3	2	4	3	5	4	4	5	
6-Jan	4	4	3	4	5	3	3	3	5	3	1	4	3	2	3	4	1	3	2	4	2	2	3	2	5	
7-Jan	3	3	2	2	4	3	2	2	2	3	3	2	4	2	1	2	2	2	3	1	2	2	1	1	4	
8-Jan	2	2	2	2	3	2	1	2	3	2	1	2	3	2	1	1	1	1	1	1	1	2	1	2	3	
9-Jan	2	1	1	2	2	2	2	1	2	2	1	1	2	2	2	2	1	2	1	1	1	2	1	1	2	
10-Jan	1	2	4	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	4	
11-Jan	1	1	1	1	2	1	1	1	1	1	1	1	1	1	3	3	3	3	3	4	5	5	4	4	5	
12-Jan	3	3	4	4	3	3	2	3	2	3	3	3	3	2	2	2	1	2	2	2	1	2	2	2	4	
13-Jan	2	2	2	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	
14-Jan	UO	4	3	5	4	4	3	5	3	3	3	2	3	2	2	2	1	1	1	1	1	1	1	1	5	
15-Jan	1	1	0	0	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	
16-Jan	1	2	1	1	2	2	2	4	2	1	1	1	1	2	3	4	4	4	3	7	3	4	2	2	7	
17-Jan	2	2	3	2	3	3	3	3	3	3	4	3	3	2	3	3	2	1	3	3	4	2	4	3	4	
18-Jan	2	3	3	4	5	4	5	3	4	4	4	4	4	4	3	3	4	4	3	4	3	4	5	4	5	
19-Jan	5	3	5	5	3	2	3	3	4	3	2	3	4	3	2	5	3	3	4	6	6	8	5	4	8	
20-Jan	3	2	2	5	2	3	3	5	4	DF	DF	3	2	4	5	2	2	3	2	4	5	3	6	3	6	
21-Jan	3	2	3	2	2	2	1	3	2	3	3	1	1	2	2	2	2	3	3	3	3	4	1	5	5	
22-Jan	3	3	4	5	7	6	5	5	6	6	6	7	4	3	2	3	2	2	4	2	2	2	1	1	7	
23-Jan	1	1	3	4	2	3	3	4	4	4	3	4	1	3	2	2	2	3	2	2	1	3	3	2	4	
24-Jan	2	2	3	2	2	4	3	4	4	4	3	3	2	1	2	2	3	5	3	3	2	2	2	2	5	
25-Jan	2	1	3	1	1	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3	
26-Jan	UO	UO	UO	4	6	6	6	7	8	8	6	4	4	2	3	2	5	4	5	6	5	5	5	4	8	
27-Jan	5	5	5	7	4	3	4	5	4	4	3	2	2	1	3	2	2	3	2	3	2	5	2	7		
28-Jan	5	3	3	4	3	3	4	4	4	4	5	DF	6	5	5	5	5	6	5	5	4	3	3	3	6	
29-Jan	2	4	3	2	4	3	8	4	2	2	2	DF	DF	DF	DF	DF	DF	DF	DF	3	4	2	2	3	DF	8
30-Jan	1	3	3	2	1	1	3	3	3	4	5	2	2	2	1	1	1	2	2	2	1	2	2	1	5	
31-Jan	4	3	3	3	2	3	4	2	2	1	1	1	2	1	1	2	1	0	2	3	1	3	1	4	4	
Diurnal Maximum																										
DF - DAS Failure UO - Unstable Operation																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	116	16.74	16.74
6 - 11	166	23.95	40.69
12 - 19	213	30.74	71.43
20 - 28	140	20.20	91.63
29 - 38	56	8.08	99.71
> 38	2	0.29	100.00

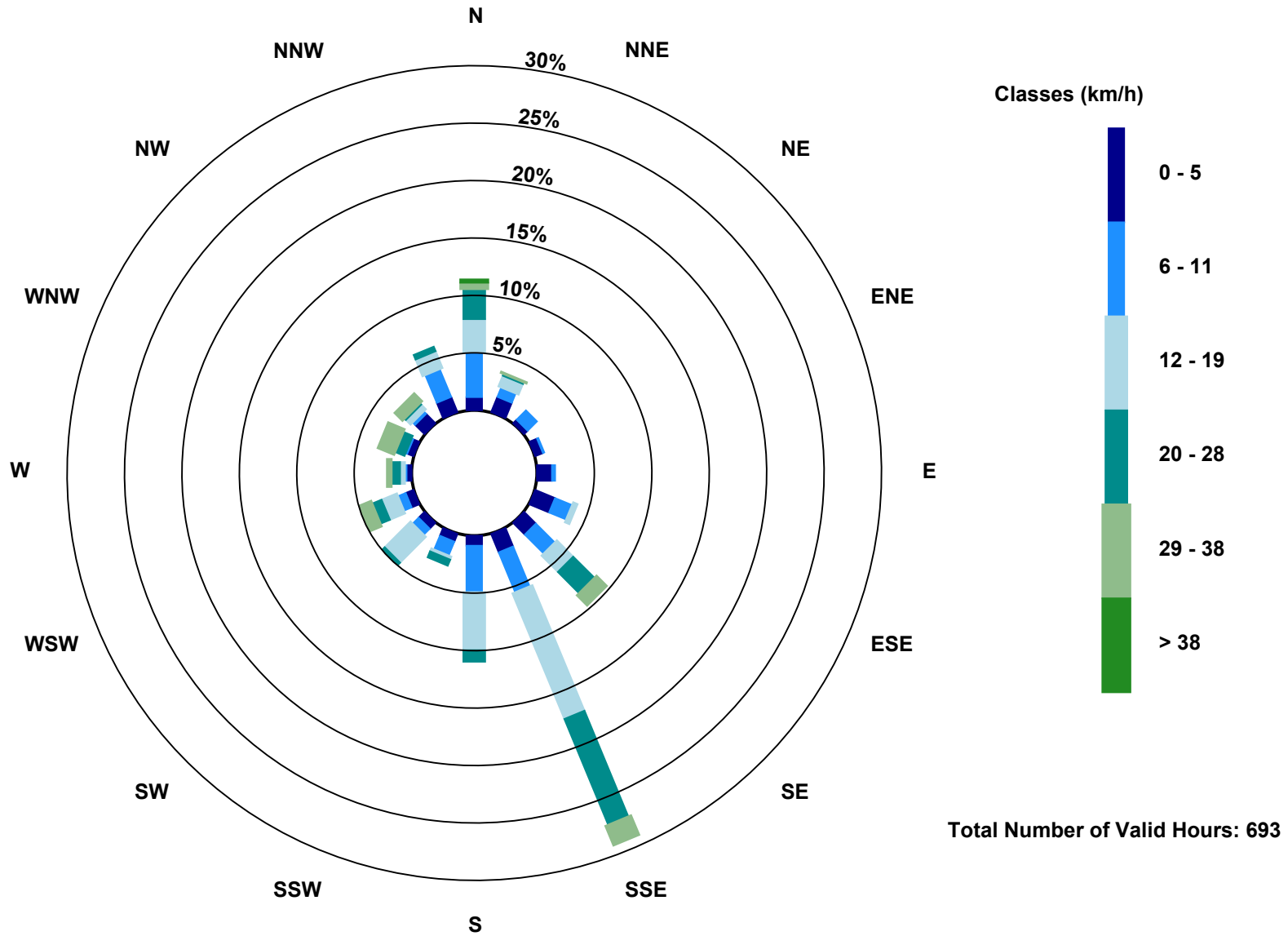
Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 100 m (WS100m) - km/h
Lower Camp Met Tower





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 163 m (WS163m) - km/h

Lower Camp Met Tower - January 2023

Maximum Speed: 49 km/h on Jan 26 10:00	Maximum Daily Speed Average: 30.3 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 14 20:00	Minimum Daily Speed Average: 1.6 km/h on Jan 10	Hours of Data: 657
Maximum Diurnal Speed Average: 7.8 km/h at hour 9	Minimum Diurnal Speed Average: 3.6 km/h at hour 23	Hours of Missing Data: 87
Monthly Average Velocity: 6.0 km/h 196.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 9 Median = 17 Q ₃ = 24 P ₉₀ = 30 P ₉₉ = 40	Percent Operational Time: 88.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SW15	UO	UO	UO	UO	UO	UO	UO	UO	UO	SSW14	SSW14	SSW13	SSW12	SW10	SW17	SW15	SW15	WSW15	WSW18	SW14	SSW12	SW8	SW10	---	WSW18	
2-Jan	SW12	SSW13	S16	S18	S21	S16	S23	S19	S27	S26	S19	S15	S18	S20	S23	SSW15	SSW11	SSW17	SW20	SW19	SSW19	SSW17	SSW18	SSW22	S17.8	SSE27	
3-Jan	SSW25	SSW27	SSW21	SSW14	S16	S20	SSW18	S10	S12	S15	SSW12	S16	SSE21	S15	SSE18	S17	S26	S18	S17	S18	SSW11	SSW11	SW10	SSW9	S16.3	SSW27	
4-Jan	SW11	SW11	SW13	SW14	SW13	SW12	SSW11	SSW11	SSW14	SSW14	SSW13	SSW11	SSW9	SSW11	SSW11	SSW12	SW13	SW11	SW12	SW13	SSW12	SSW12	SW15	SW12	SW11.9	SW15	
5-Jan	SSW9	S13	S17	SSW15	SSW13	SSE15	SSE25	SSE24	SSE30	SSE24	SSE26	SSE23	SSE18	SSE16	SSE18	SE16	SE18	SE15	SE17	SE22	SE28	SE28	SE27	SE32	SSE19.4	SE32	
6-Jan	SE34	SE37	SE37	SE37	SE35	SE33	SSE30	SSE29	SSE31	SSE24	SSE23	S28	S25	S22	S24	S24	S28	SSW25	SSW22	S22	S21	S19	SSW14	SW17	SSE24.7	SE37	
7-Jan	SW20	SSW18	SSW23	SW17	SW14	WSW27	WSW20	NW9	NNW11	NNW11	NNW13	UO	UO	UO	UO	UO	UO	UO	UO	E1	S3	SE3	SE5	S11	---	WSW27	
8-Jan	S16	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	S10	S7	SSE5	ESE4	NNE4	ENE6	ESE9	UO	UO	UO	---	S16	
9-Jan	UO	UO	UO	UO	ESE14	ESE15	ESE11	ESE8	SE11	SSE9	SE5	ESE4	SE6	SE9	SE9	SSE9	S10	S7	S2	S2	SSE4	SSW6	SW4	SSW3	SE6.6	ESE15	
10-Jan	SE3	SSE6	SE13	SE11	SSE9	SSE8	SE4	SE4	SSE6	SE5	E2	NNE1	ENE1	NNE1	WNN1	NE1	N1	N3	WNN3	W5	WNN5	N8	NNE9	NNE7	SE1.6	SE13	
11-Jan	N3	NNW4	NNW4	NNW8	N9	N7	NE4	SSE1	WSW3	SSW4	S5	S6	S7	SSE7	SSE11	SSE12	SSE16	SSE12	SSE16	SSE22	SSE30	S28	S25	S24	SSE7.8	SSE30	
12-Jan	S22	S28	S30	S25	S26	S23	S28	S30	S27	S31	S30	S28	S30	S23	S21	S23	S22	S21	S17	S17	S10	SSW10	SSW6	S5	S22.1	S31	
13-Jan	SSW8	S6	SSE4	ESE2	NE2	NNW8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SSW8	
14-Jan	UO	SE27	SE31	SE34	SE34	SE32	SE27	SSE29	SSE23	SSE26	SSE18	SSE16	S12	S11	SSW11	SSW10	SSW8	SW8	WSW6	S0	SSW2	SW2	SSE2	ESE3	SSE14.7	SE34	
15-Jan	ESE3	ENE2	E2	NE2	NNE3	NNE5	NNE7	NNE6	N4	NE3	ENE5	ESE2	E1	NE1	NNW3	NNE6	NE5	ENE3	E3	ESE4	ESE4	ESE4	E4	E4	ENE2.8	NNE7	
16-Jan	E4	E4	E5	E4	ENE4	ENE6	ENE10	NE10	NE12	ENE8	E7	E7	E8	ESE11	ESE13	SE18	SE19	SE19	SE16	SE25	SE28	SSE27	S24	SSW20	ESE10.2	SE28	
17-Jan	SSW20	SSW24	SSW25	SSW27	S24	S21	S24	S26	SSE25	SSE28	S27	S19	S16	S16	S15	S19	S19	S19	S19	S23	S25	S28	S29	S30	S27	S22.8	S30
18-Jan	S26	S26	S28	SSE28	SSE30	SSE32	SSE29	SSE29	SSE29	SSE25	SSE23	SSE21	SSE19	SSE21	SE24	SE24	SE30	SE27	SE25	SSE29	SSE26	SSE25	SSE30	SSE29	SSE25.9	SSE32	
19-Jan	SSE31	SSE30	SSE31	S32	S34	S31	S26	S26	S21	SSW21	SW21	WSW22	WSW25	WSW18	SW19	SSW20	SW27	SW29	SW25	WSW34	WSW29	SW24	SW19	WSW16	SSW21.6	S34	
20-Jan	WSW23	WSW26	WSW29	W28	WSW23	WSW19	WSW21	WSW22	WSW23	DF	DF	WSW20	WSW22	WSW28	WSW34	WSW41	WSW35	WSW40	WSW41	WSW44	W22	W21	W15	WSW18	WSW26.8	WSW44	
21-Jan	WSW22	WSW19	SW19	SSW17	SW18	SSW12	S15	S17	SSW20	SSW24	SSW23	SSW22	S18	S15	SSW17	SW21	SW20	WSW23	WSW24	WSW25	W34	W34	W38	W34	SW19.2	W38	
22-Jan	WNN26	WNN26	WNN27	WNN31	WNN28	WNN33	W33	W31	W37	WNN33	N30	NNE31	N21	N20	N20	NNE15	N16	NNE17	NNE26	NNE25	NNE21	NE12	NE9	NE8	NNW17.0	W37	
23-Jan	NE4	E1	SE5	SSE12	SE17	SE16	SE13	SE24	SE16	SE18	SE15	ESE12	ESE4	E4	E7	E8	E6	ESE8	E3	SE7	SSE6	SSE12	SSE15	SSE13	SE9.3	SE24	
24-Jan	SE15	SE19	SSE19	SSE18	SSE21	SSE18	SSE21	SSE23	SSE24	SSE24	SSE22	SSW14	SW11	W6	N13	N16	NNE17	NNE15	NNE14	NNE12	NNE9	N9	N9	NNW8	SE6.3	SSE24	
25-Jan	N11	NNE8	ENE8	NE5	N9	N2	NNW2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	N11	
26-Jan	UO	UO	UO	W38	WNN44	NW37	N32	N45	N40	N49	N34	N25	N19	NNE14	N11	NNE13	NNE16	N22	NNE23	NNE22	NNE24	N31	N32	NNE24	N24.8	N49	
27-Jan	N27	N30	N29	NNE24	NNE22	N21	NNE22	NNE21	NNE24	N21	N16	N14	NNW9	NW6	NNW6	N13	N17	N16	N17	NNW15	NNW22	NW22	NW21	NW22	N17.8	N30	
28-Jan	NW25	WNN37	WNN39	WNN38	WNN36	WNN32	WNN34	WNN39	WNN37	WNN34	WNN34	DF	NW34	NW33	NW32	NW32	NW34	NW37	NW35	N29	N30	N27	N25	N22	NW30.3	WNN39	
29-Jan	NNW27	NNW17	W14	W24	WNN24	W23	W27	WSW24	SW20	SW17	SSW16	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	DF	---	NNW28	
30-Jan	NNW17	N21	NNE18	NNE11	NNW4	S3	SW10	WSW15	W21	W18	W13	W10	WSW11	WSW8	SW7	S5	S6	SSE8	SSE6	SE4	ESE3	ENE2	NNE9	NNE14	WNN3.5	W21	
31-Jan	NNE20	NNE23	NNE16	NNE14	NNE14	NE15	NE18	NE17	NNE14	NE12	NE9	NNE3	WNN1	SW3	SE2	SSE2	SE6	S7	SSW8	SSW3	NE9	NNE6	NNE11	N14	NNE7.7	NNE23	

SW5.5	SSW5.5	S7.5	SSW7.6	SSW6.8	SSW6.5	S7.4	S7.3	S7.8	S7.0	S6.1	S7.2	SSW6.8	SSW6.2	SSW6.4	SSW6.5	S6.7	SSW5.9	SW4.9	SSW5.0	SSW3.8	SSW4.0	SSW3.6	SSW4.6	Diurnal Average			
SE34	SE37	WNN39	WNN38	WNN44	NW37	WNN34	N45	N40	N49	WNN34	NNE31	NW34	NW33	WSW34	WSW41	WSW35	WSW40	WSW41	WSW44	W34	W34	W38	W34	Diurnal Maximum			

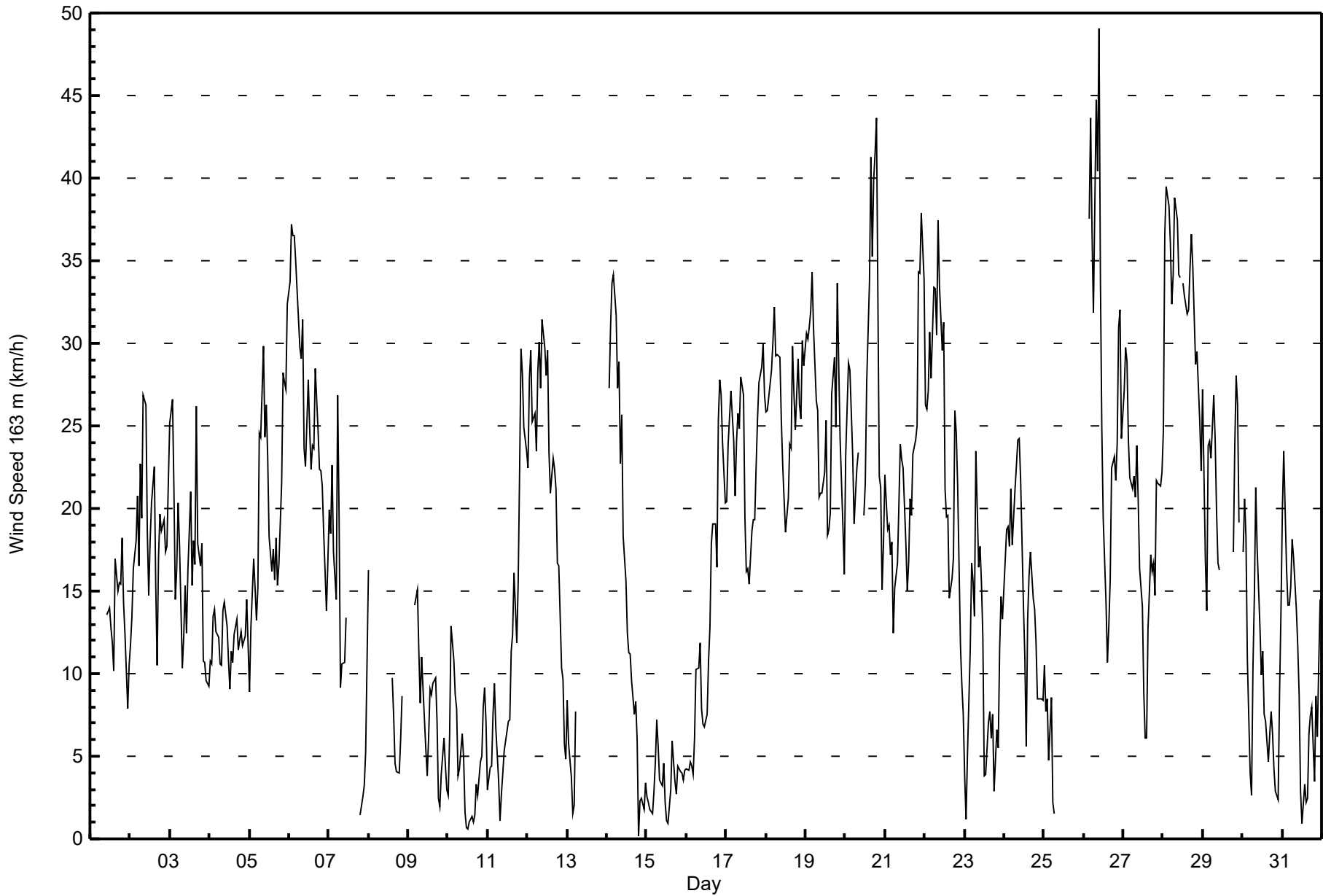
DF - DAS Failure UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 163 m (WS163m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 24 km/h on Jan 25 05:00														Hours in Service: 744 Hours of Data: 657 Hours of Missing Data: 87 Hours of Calibration: 0 Percent Operational Time: 88.3											
Minimum Value: 0 km/h on Jan 15 04:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Jan	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	2	2	2	2	3	2	1	2	2	3	2	2	2	3
2-Jan	1	2	2	2	3	3	3	2	4	3	4	1	2	2	1	2	3	2	1	2	2	2	2	2	2
3-Jan	1	2	3	2	3	3	3	2	2	3	1	3	3	2	2	3	3	3	3	3	2	2	2	1	3
4-Jan	2	1	1	2	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	2
5-Jan	1	2	3	2	1	3	2	3	1	3	2	4	2	1	1	1	1	4	2	4	2	2	2	4	4
6-Jan	3	3	2	5	5	4	3	3	3	3	3	3	3	2	1	3	4	2	2	2	2	2	2	3	5
7-Jan	4	3	1	2	3	3	4	3	2	2	2	UO	UO	UO	UO	UO	UO	UO	UO	2	2	2	2	2	4
8-Jan	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	1	2	2	1	2	2	UO	UO	UO	3
9-Jan	UO	UO	UO	UO	1	1	2	1	2	2	2	2	1	1	2	1	1	2	2	1	1	2	2	1	2
10-Jan	1	2	3	3	2	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2	3	3
11-Jan	0	1	1	2	1	1	1	1	1	1	1	1	1	2	3	3	4	3	4	3	5	3	3	5	
12-Jan	2	3	4	5	4	3	2	2	3	2	3	1	2	2	2	3	1	2	2	2	2	1	1	1	5
13-Jan	1	2	2	1	1	4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4
14-Jan	UO	3	3	4	4	3	3	4	3	2	2	2	2	2	2	1	1	1	1	1	0	1	1	1	4
15-Jan	1	1	0	0	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2
16-Jan	1	2	2	2	1	2	1	3	3	2	2	2	3	3	3	5	4	4	3	5	2	4	2	1	5
17-Jan	2	2	3	2	3	2	3	2	2	2	3	3	3	1	3	3	1	3	2	5	3	2	2	2	5
18-Jan	2	1	1	2	3	3	4	3	3	3	5	6	4	4	3	3	4	5	3	4	3	3	3	3	6
19-Jan	2	2	2	3	2	3	1	2	3	2	2	3	3	2	2	4	3	3	4	4	4	7	6	6	7
20-Jan	2	2	2	4	2	2	3	4	5	DF	DF	3	2	2	6	2	3	2	2	3	6	3	4	3	6
21-Jan	3	3	3	3	3	2	1	2	4	1	1	1	1	2	4	1	2	2	4	5	3	3	1	4	5
22-Jan	3	5	4	4	7	5	5	5	5	6	6	7	4	3	2	3	2	4	3	3	3	3	2	2	7
23-Jan	3	1	3	3	2	3	5	3	5	4	3	5	2	2	2	2	2	2	1	2	1	2	3	2	5
24-Jan	2	2	2	2	2	5	3	3	3	3	3	2	2	2	2	1	3	4	4	4	2	2	3	2	5
25-Jan	1	1	2	1	24	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	24
26-Jan	UO	UO	UO	5	6	6	8	7	9	9	7	4	4	3	2	2	5	4	5	7	5	5	5	5	9
27-Jan	5	5	4	7	4	2	4	5	4	4	3	2	3	2	2	3	2	2	4	2	2	2	2	2	7
28-Jan	5	3	2	3	3	3	3	3	3	3	4	DF	5	5	5	5	5	6	4	5	4	3	3	3	6
29-Jan	2	5	3	2	2	3	4	3	3	2	2	DF	DF	DF	DF	DF	DF	DF	4	4	2	2	4	DF	5
30-Jan	2	2	3	3	1	1	2	4	3	2	4	2	1	1	2	2	1	2	2	1	1	1	4	2	4
31-Jan	4	4	3	3	1	3	2	2	1	1	1	1	1	1	2	1	2	1	1	3	3	2	2	3	4
														Diurnal Maximum											
DF - DAS Failure														UO - Unstable Operation											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 163 m (WS163m) - km/h
Lower Camp Met Tower - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	93	14.16	14.16
6 - 11	115	17.50	31.66
12 - 19	177	26.94	58.60
20 - 28	180	27.40	86.00
29 - 38	82	12.48	98.48
> 38	10	1.52	100.00

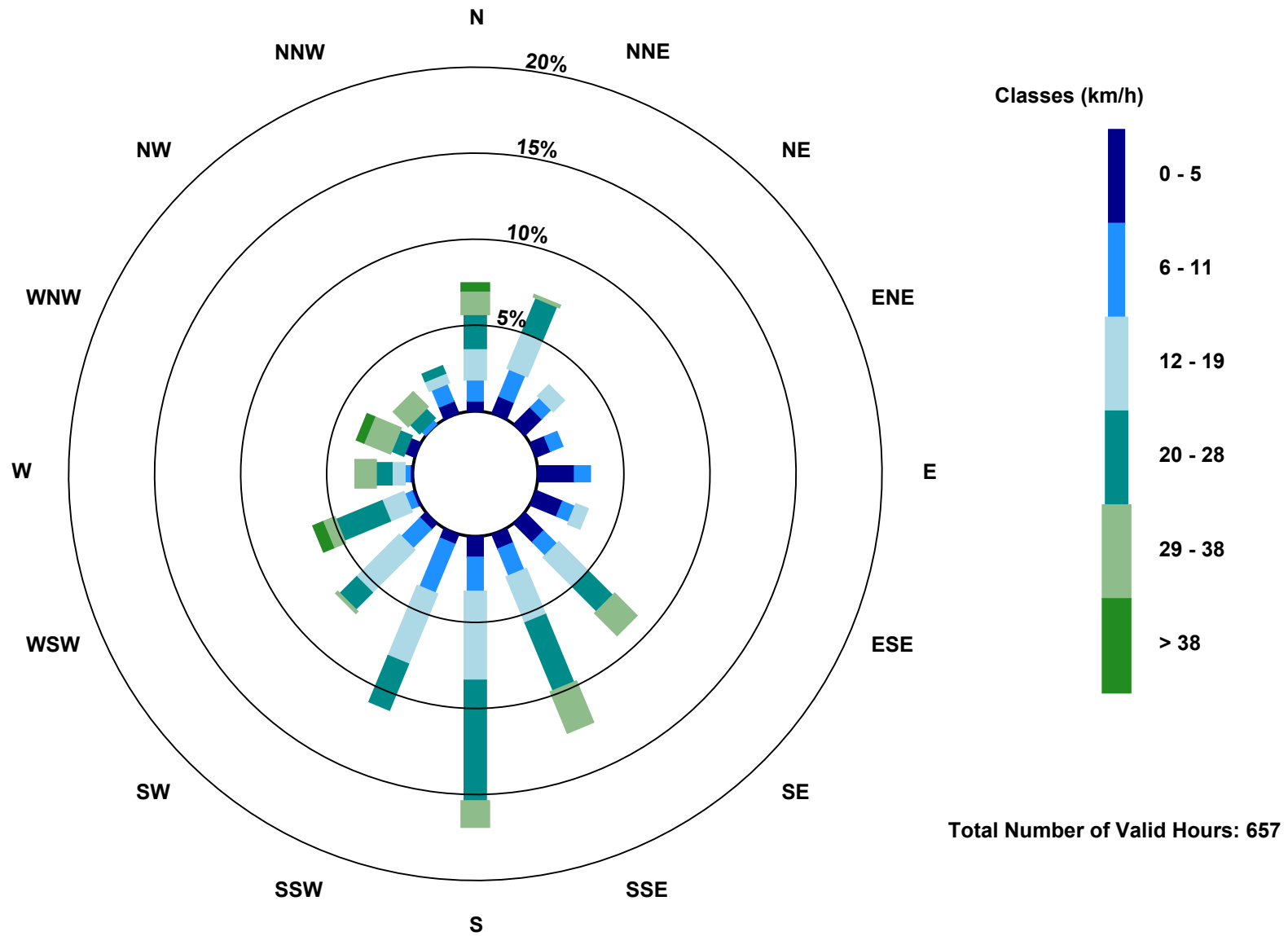
Total Number of Valid Hours: 657

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 163 m (WS163m) - km/h
Lower Camp Met Tower





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - January 2023

Direction of Maximum Speed: 1 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 154.8 deg on Jan 12	Hours of Data: 733
Direction of Minimum Speed: 36 deg on Jan 13 05:00	Direction of Minimum Daily Speed Average: 1.0 deg on Jan 30
Direction of Minimum Speed: 36 deg on Jan 13 05:00	Hours of Missing Data: 11
Monthly Average Direction: 144.4 deg	Percent Operational Time: 98.5

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	133	207	202	221	269	234	145	142	141	141	139	142	140	142	146	137	141	139	136	138	132	130	142	164	149.4	
2-Jan	146	135	131	134	133	129	133	135	131	132	137	137	135	134	137	144	135	142	139	135	135	137	136	134	135.3	
3-Jan	140	133	133	141	131	134	132	137	134	131	135	135	137	133	136	132	133	130	133	132	138	139	137	134	134.5	
4-Jan	137	135	135	136	136	136	136	136	135	131	131	128	129	133	137	133	133	134	136	136	134	132	134	135	134.1	
5-Jan	137	140	140	136	138	130	130	140	145	143	137	139	143	134	135	139	135	139	143	144	123	137	129	134	137.2	
6-Jan	148	174	317	210	155	152	142	139	134	163	145	137	131	134	135	134	136	135	134	132	131	129	135	137	137.0	
7-Jan	133	137	138	143	137	134	139	138	65	30	83	221	343	259	318	337	312	349	334	76	229	223	156	155	141.6	
8-Jan	152	154	151	137	140	142	142	140	137	147	148	143	139	146	224	214	338	329	331	327	346	333	337	348	140.7	
9-Jan	321	343	323	326	296	318	331	343	270	343	328	321	187	151	151	150	177	197	230	231	209	214	280	22	220.9	
10-Jan	25	133	161	160	191	174	194	280	175	352	345	318	214	244	238	233	260	256	248	237	297	349	332	338	222.4	
11-Jan	324	337	329	333	332	336	301	256	294	118	128	130	142	139	146	160	156	171	146	148	156	164	160	158	155.0	
12-Jan	152	157	158	165	160	150	157	149	145	142	154	159	155	156	157	161	159	159	155	161	150	169	137	124	154.8	
13-Jan	128	129	172	132	36	324	310	337	302	347	353	356	355	21	14	22	22	54	62	56	58	57	83	94	53.7	
14-Jan	124	126	127	135	137	143	147	161	154	157	148	153	157	155	165	171	167	227	220	119	140	101	92	206	148.5	
15-Jan	14	334	348	334	337	349	348	337	332	341	329	337	339	346	352	352	330	333	334	331	337	335	330	336	340.8	
16-Jan	333	341	338	341	340	338	339	346	340	354	358	359	354	348	315	349	357	342	339	136	134	155	160	165	22.7	
17-Jan	177	201	194	195	188	178	162	161	155	154	155	161	169	184	179	173	181	197	156	139	143	147	148	152	168.2	
18-Jan	154	155	166	170	170	175	159	148	149	150	154	159	153	163	146	150	147	139	149	142	145	146	155	148	154.9	
19-Jan	147	142	116	116	139	140	138	137	141	138	138	137	156	134	159	144	164	200	150	219	105	128	113	118	141.8	
20-Jan	247	238	218	219	191	194	163	141	140	DF	DF	211	199	247	256	256	250	256	254	259	290	251	181	163	224.5	
21-Jan	146	157	125	133	133	134	137	132	133	134	134	135	134	135	136	132	130	139	147	142	221	251	258	261	147.7	
22-Jan	262	259	294	292	300	297	262	278	267	289	345	13	346	355	359	12	10	9	359	340	339	346	296	323	317.9	
23-Jan	295	40	139	116	122	142	88	102	108	67	276	98	210	58	81	82	61	91	359	318	272	138	146	133	108.3	
24-Jan	135	139	135	138	129	148	134	137	119	109	114	131	130	144	300	340	12	22	356	14	5	354	343	324	103.9	
25-Jan	339	348	348	317	323	349	350	355	329	339	289	12	336	333	359	335	141	160	165	144	145	151	127	152	142.9	
26-Jan	150	133	127	249	295	317	345	1	1	6	360	343	353	6	13	14	5	355	10	1	4	3	357	7	0.7	
27-Jan	357	354	359	8	14	353	8	4	359	345	351	344	345	251	231	272	329	344	326	310	247	341	308	319	347.9	
28-Jan	344	293	288	292	286	284	290	291	287	286	293	DF	316	309	308	308	316	316	316	349	350	343	335	329	305.4	
29-Jan	351	164	178	289	284	191	173	136	135	135	133	DF	DF	DF	DF	DF	DF	DF	DF	159	328	345	323	311	DF	-
30-Jan	346	338	332	306	317	221	182	127	141	192	132	136	131	127	137	141	134	121	353	341	319	345	333	326	116.9	
31-Jan	359	8	359	17	27	22	2	315	335	284	267	218	213	209	144	130	130	123	181	342	324	331	342	323	1.1	

140.0 149.2 151.0 159.1 156.1 156.6 147.5 138.0 140.4 137.7 131.8 134.7 142.1 149.2 148.2 146.9 141.4 149.4 147.7 138.2 130.7 144.9 144.5 142.6
 Diurnal Average

DF - DAS Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



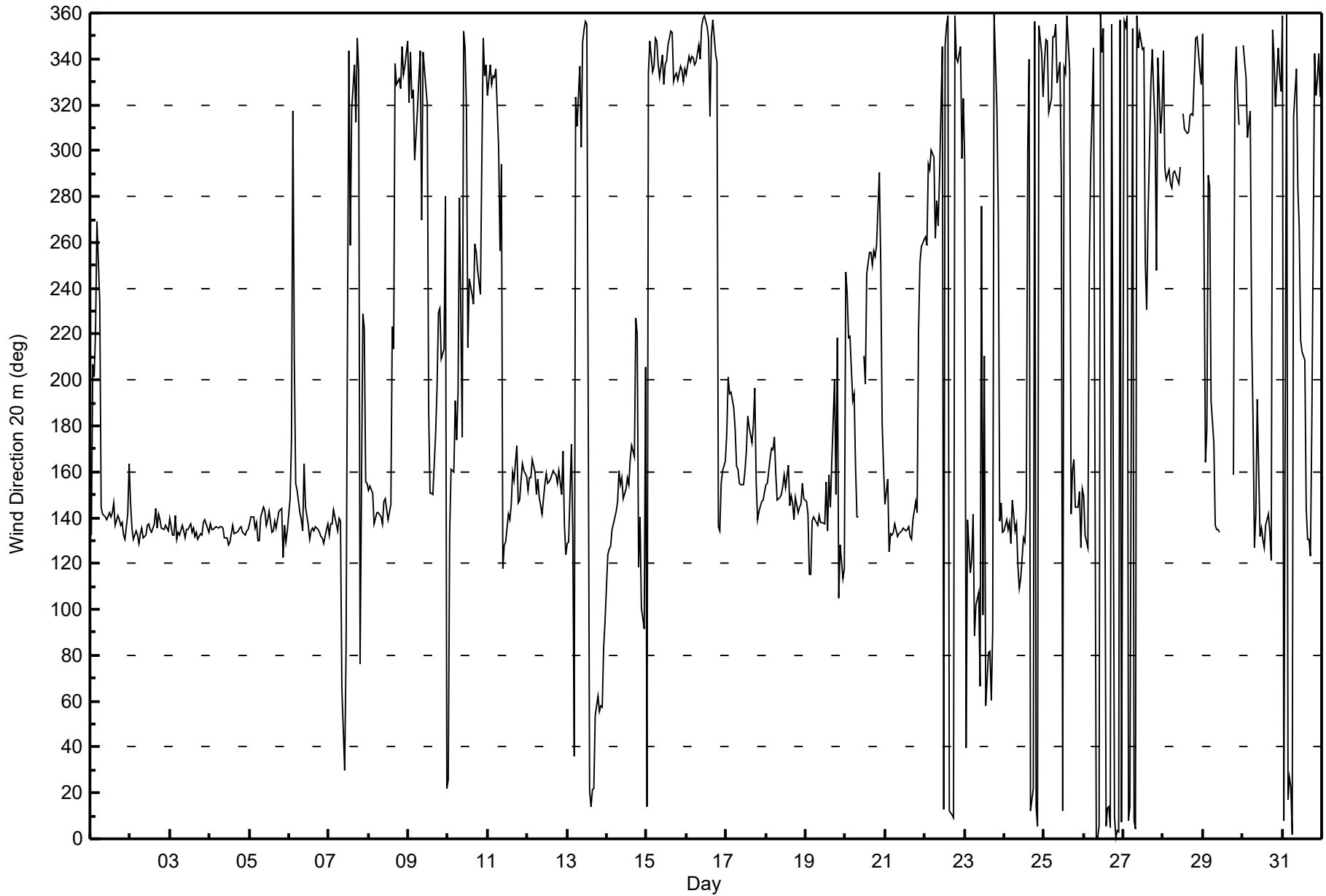
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 105 deg on Jan 23 11:00	Hours of Data: 733
Minimum Value: 3 deg on Jan 4 07:00	Hours of Missing Data: 11
Percentiles: P ₁ = 4 P ₁₀ = 7 Q ₁ = 10 Median = 16 Q ₃ = 25 P ₉₀ = 50 P ₉₉ = 91	Hours of Calibration: 0
	Percent Operational Time: 98.5

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	11	15	11	57	43	21	23	5	7	8	8	9	8	9	11	15	8	6	8	9	6	7	8	26	57	
2-Jan	24	9	6	10	12	21	17	9	12	14	11	19	7	14	16	11	7	11	8	7	6	8	6	5	24	
3-Jan	10	9	10	6	11	10	7	7	5	6	6	8	11	10	7	8	10	8	6	8	7	5	5	4	11	
4-Jan	8	4	5	4	4	4	3	5	4	6	5	5	6	5	4	3	4	5	4	5	4	4	4	5	8	
5-Jan	4	6	8	6	8	5	13	12	8	9	7	8	7	17	8	10	10	8	7	11	65	37	12	41	65	
6-Jan	80	92	86	92	71	7	11	17	14	69	8	9	9	7	9	5	4	6	14	13	16	9	7	8	92	
7-Jan	8	9	6	6	8	5	7	15	99	82	88	91	85	72	81	36	37	19	23	63	23	11	40	20	99	
8-Jan	16	14	19	8	9	8	10	7	10	12	15	11	23	34	102	36	71	16	36	19	38	29	36	19	102	
9-Jan	21	15	33	26	28	70	22	19	68	25	23	56	45	12	14	11	17	13	25	17	48	52	49	60	70	
10-Jan	33	55	22	21	8	20	75	65	60	80	15	64	69	22	6	21	16	21	20	23	52	14	15	21	80	
11-Jan	18	31	16	17	20	20	16	54	56	28	22	17	14	13	13	12	13	12	11	14	14	11	10	9	56	
12-Jan	9	8	8	14	9	8	7	8	8	9	9	7	7	5	6	7	6	7	5	6	10	6	22	18	22	
13-Jan	15	13	61	31	90	27	89	65	58	39	19	57	32	43	18	28	16	15	18	13	15	25	21	27	90	
14-Jan	18	15	15	16	17	13	11	8	10	6	13	15	12	10	7	9	11	30	18	29	37	20	24	85	85	
15-Jan	65	22	17	13	10	12	17	21	15	16	24	21	22	22	9	12	20	22	20	23	16	19	25	29	65	
16-Jan	23	35	22	21	19	26	30	16	26	16	16	13	26	38	39	18	18	16	21	89	13	12	7	6	89	
17-Jan	12	8	7	7	8	10	7	8	7	8	9	12	13	9	13	9	8	15	19	5	8	8	7	11	19	
18-Jan	10	10	8	8	8	8	15	7	8	12	13	12	11	11	9	11	17	25	19	12	12	9	9	8	25	
19-Jan	11	11	40	24	8	4	6	11	5	7	5	7	32	24	22	9	12	15	19	44	27	37	18	19	44	
20-Jan	65	18	48	70	33	15	16	12	10	DF	DF	31	23	33	25	12	18	17	14	21	58	85	36	12	85	
21-Jan	23	30	10	13	6	7	12	11	10	11	15	14	11	12	7	6	12	9	18	11	43	12	13	19	43	
22-Jan	22	23	22	18	19	19	15	29	20	19	36	18	20	17	15	18	16	14	21	21	17	91	50	42	91	
23-Jan	39	48	87	59	19	28	45	23	47	50	105	51	77	72	21	32	48	67	9	51	82	12	13	16	105	
24-Jan	18	17	22	25	17	16	15	15	46	48	29	12	15	11	85	26	21	19	20	21	20	17	26	19	85	
25-Jan	18	24	23	18	17	29	25	20	39	42	72	67	28	79	44	33	63	7	7	13	13	27	89	74	89	
26-Jan	26	10	8	55	22	25	18	19	16	18	18	16	13	18	18	23	21	16	21	20	18	17	16	18	55	
27-Jan	14	15	17	20	16	18	19	21	17	17	14	17	26	36	17	21	16	18	13	56	76	29	89	17	89	
28-Jan	32	18	15	17	14	15	16	16	15	15	17	DF	16	17	16	17	14	15	15	17	17	15	15	18	32	
29-Jan	26	20	35	58	96	54	52	11	5	6	9	DF	DF	DF	DF	DF	DF	DF	DF	43	35	12	21	9	DF	96
30-Jan	10	15	13	47	63	43	42	19	28	35	27	11	26	17	8	7	13	47	43	34	26	14	16	19	63	
31-Jan	21	15	16	21	20	25	35	24	14	36	25	33	16	23	26	15	11	26	47	26	29	40	26	35	47	
	80	92	87	92	96	70	89	65	99	82	105	91	85	79	102	36	71	67	47	89	82	91	89	85		
	Diurnal Maximum																									

DF - DAS Failure





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - January 2023

Direction of Maximum Speed: 6 deg on Jan 26 10:00																						Hours in Service: 744				
Direction of Maximum Daily Speed Average: 305.9 deg on Jan 28																						Hours of Data: 718				
Direction of Minimum Speed: 70 deg on Jan 8 17:00											Direction of Minimum Daily Speed Average: 0.2 deg on Jan 30											Hours of Missing Data: 26				
Monthly Average Direction: 140.4 deg																						Percent Operational Time: 96.5				
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	139	214	206	229	266	233	156	151	146	143	144	140	138	145	148	151	144	145	148	175	143	133	127	133	155.8	
2-Jan	131	130	128	128	127	125	125	124	126	128	128	129	128	127	128	132	128	134	133	134	135	133	138	130	129.5	
3-Jan	127	125	120	131	129	127	123	129	128	124	128	127	130	128	131	128	126	124	125	124	125	130	136	133	127.6	
4-Jan	130	129	132	133	131	132	130	133	126	129	131	136	122	126	125	128	135	134	131	133	131	127	126	125	129.9	
5-Jan	128	126	128	127	130	125	125	127	133	125	132	130	130	126	124	128	124	125	128	127	121	127	127	128	127.4	
6-Jan	130	132	128	130	134	137	136	141	135	148	131	134	132	135	133	147	150	134	130	130	128	125	129	134	134.4	
7-Jan	132	130	129	136	140	130	128	132	232	339	15	296	7	330	252	346	313	347	339	77	230	220	138	139	129.8	
8-Jan	141	138	137	130	UO	136	141	132	130	122	133	132	129	127	114	128	70	331	342	336	336	324	338	340	123.0	
9-Jan	332	347	341	347	355	117	72	350	31	9	358	345	161	146	148	150	183	196	224	226	188	203	266	309	201.7	
10-Jan	43	136	148	145	188	172	184	168	157	159	336	323	246	250	240	248	263	259	239	236	269	346	336	346	218.9	
11-Jan	329	328	329	332	337	341	318	256	249	131	128	128	139	137	143	155	152	161	139	144	158	163	160	159	152.3	
12-Jan	152	158	161	168	160	152	157	153	150	147	157	160	156	155	157	161	159	160	155	163	154	174	139	125	156.3	
13-Jan	129	123	114	127	321	329	336	346	358	10	353	5	3	13	15	25	29	70	81	74	74	73	96	103	54.4	
14-Jan	125	127	128	132	133	136	142	158	148	155	145	149	156	154	169	174	174	228	216	148	139	162	102	105	145.1	
15-Jan	70	27	21	346	337	347	353	343	336	342	330	335	331	330	339	340	337	335	333	335	336	336	337	338	341.1	
16-Jan	337	338	336	338	340	341	344	345	345	357	6	360	0	349	330	9	2	349	159	134	131	151	160	167	33.3	
17-Jan	180	201	195	196	188	180	164	161	155	155	155	161	171	184	179	173	184	194	165	150	155	162	161	159	171.5	
18-Jan	157	158	164	167	166	169	161	160	160	158	154	153	145	156	140	140	133	130	132	136	137	141	153	147	151.0	
19-Jan	144	146	143	133	142	148	139	137	147	142	146	150	196	173	192	156	180	212	187	226	143	161	133	142	154.0	
20-Jan	245	238	230	231	216	210	194	178	171	DF	DF	222	216	248	252	250	242	247	247	253	290	264	214	185	235.7	
21-Jan	180	190	133	128	129	130	131	130	129	129	129	130	128	131	139	131	139	173	210	195	248	252	256	257	155.0	
22-Jan	258	256	292	290	300	295	262	279	267	288	348	12	350	356	359	11	10	10	5	346	338	332	317	317	318.2	
23-Jan	293	304	136	126	121	134	111	109	124	96	106	103	149	66	84	83	63	99	353	358	127	136	144	131	110.2	
24-Jan	131	135	134	136	130	146	139	138	129	121	122	128	124	121	320	342	14	22	359	12	4	355	346	327	101.7	
25-Jan	339	347	352	322	323	347	344	349	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	125	146	--	
26-Jan	148	136	136	264	292	314	348	2	2	6	2	343	354	6	10	14	6	356	10	2	5	3	358	6	357.6	
27-Jan	357	356	1	8	13	356	5	5	3	349	354	346	347	269	237	301	336	336	335	319	280	305	309	344	349.4	
28-Jan	313	290	288	290	287	285	290	291	287	286	293	DF	316	309	308	306	315	315	313	351	352	346	341	332	305.9	
29-Jan	335	7	223	247	246	224	211	155	134	131	134	DF	DF	DF	DF	DF	DF	DF	DF	233	337	340	342	320	DF	--
30-Jan	333	347	344	321	255	162	159	184	198	227	201	147	169	194	129	126	124	126	51	50	322	341	336	339	336.3	
31-Jan	0	8	2	16	26	28	22	337	351	351	192	232	214	216	125	121	109	116	116	346	354	335	334	330	11.6	
137.6 145.8 147.0 155.9 156.0 153.2 143.3 136.5 139.1 131.4 123.7 127.1 134.3 142.7 144.1 143.8 139.0 147.5 143.0 135.1 124.3 141.4 140.2 138.3																										
Diurnal Average																										
DF - DAS Failure UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

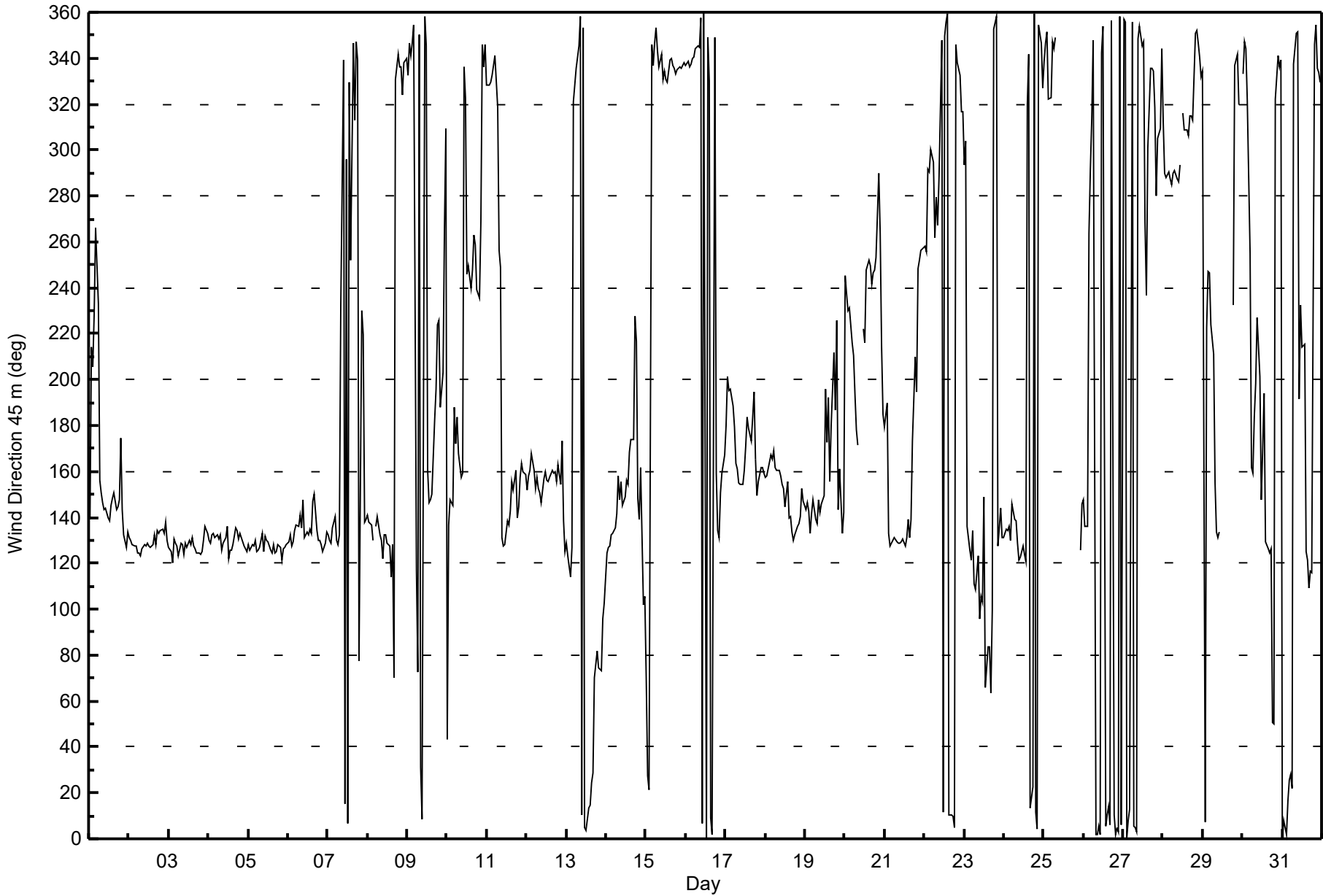
Wind Direction 45 m (WD45m) - deg
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 101 deg on Jan 7 14:00	Hours of Data: 718
Minimum Value: 2 deg on Jan 4 23:00	Hours of Missing Data: 26
Percentiles: P ₁ = 3 P ₁₀ = 5 Q ₁ = 7 Median = 11 Q ₃ = 18 P ₉₀ = 37 P ₉₉ = 84	Hours of Calibration: 0
	Percent Operational Time: 96.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	23	8	9	40	27	14	20	7	6	5	8	5	6	9	8	15	7	8	7	20	13	9	2	6	40
2-Jan	5	3	6	5	7	10	11	6	6	8	7	6	4	3	4	7	5	7	8	8	9	8	6	5	11
3-Jan	3	3	8	5	7	8	5	5	4	6	4	4	4	3	4	7	9	6	5	5	7	4	6	7	9
4-Jan	6	7	4	4	3	4	4	4	2	4	4	7	3	4	4	4	5	4	4	4	4	3	2	3	7
5-Jan	3	4	4	4	4	4	7	6	5	8	4	4	8	7	5	4	3	5	5	6	10	15	11	22	22
6-Jan	36	23	23	12	7	5	5	5	34	64	6	7	9	6	5	8	8	4	4	6	6	7	7	6	64
7-Jan	9	9	3	5	17	6	6	17	75	72	76	58	75	101	88	31	22	10	15	60	18	19	27	12	101
8-Jan	8	23	8	19	UO	13	36	42	12	9	7	8	12	24	42	24	92	8	17	9	13	18	20	16	92
9-Jan	11	6	10	8	66	57	63	15	87	84	39	57	39	10	13	11	11	10	24	14	40	35	39	54	87
10-Jan	36	34	21	22	8	18	38	78	26	88	17	59	71	25	9	22	16	21	6	8	31	9	9	12	88
11-Jan	7	22	10	13	11	13	13	41	21	31	13	14	14	11	10	11	14	16	8	14	11	10	10	9	41
12-Jan	8	7	8	12	9	7	6	7	7	8	7	7	6	4	6	6	5	6	5	6	9	7	22	8	22
13-Jan	8	7	55	30	84	12	41	30	47	30	7	26	17	20	13	26	14	10	8	6	8	17	12	14	84
14-Jan	10	8	8	6	10	9	8	8	11	5	12	15	12	9	7	8	13	20	10	32	18	31	26	40	40
15-Jan	39	44	20	9	4	8	13	14	10	10	13	15	16	16	8	11	12	9	20	12	7	9	13	14	44
16-Jan	12	11	11	10	10	14	14	10	15	8	11	6	9	17	38	49	43	33	62	16	6	11	6	7	62
17-Jan	10	8	6	6	8	9	7	8	7	7	9	12	13	8	12	9	7	10	12	10	9	6	6	9	13
18-Jan	9	7	8	8	7	8	11	8	9	14	14	13	9	13	5	9	12	11	12	7	7	7	8	7	14
19-Jan	9	9	25	18	8	6	6	7	6	5	9	15	31	41	23	11	13	11	22	26	53	51	31	51	53
20-Jan	33	8	14	66	24	11	17	24	21	DF	DF	16	16	17	11	7	10	9	7	10	43	32	37	15	66
21-Jan	26	25	22	7	3	3	3	7	6	4	4	5	4	5	9	4	9	24	23	23	17	5	6	11	26
22-Jan	11	15	14	12	14	13	11	22	14	15	35	10	13	11	9	13	9	8	16	11	9	20	19	21	35
23-Jan	20	45	78	20	12	21	23	12	26	18	82	40	89	63	11	21	27	42	6	68	72	5	11	9	89
24-Jan	8	6	9	12	9	11	12	11	19	30	15	7	8	10	61	18	16	15	13	14	12	13	18	12	61
25-Jan	12	17	17	13	12	24	15	14	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	38
26-Jan	26	9	19	33	16	23	13	13	9	11	13	11	7	10	11	18	13	10	15	14	12	11	10	12	33
27-Jan	8	8	11	14	11	11	13	14	10	12	9	10	20	33	17	33	10	10	9	47	26	10	65	17	65
28-Jan	16	10	9	10	8	8	11	10	9	9	11	DF	12	12	13	12	11	10	11	13	10	10	9	10	16
29-Jan	10	63	30	32	85	53	50	21	7	4	5	DF	DF	DF	DF	DF	DF	DF	DF	65	16	9	11	8	85
30-Jan	6	9	9	25	81	26	18	28	29	19	34	14	49	25	14	6	12	9	43	25	33	16	10	11	81
31-Jan	11	10	14	15	12	18	25	24	10	35	44	71	19	25	29	13	7	5	13	55	42	25	8	12	71
	39	63	78	66	85	57	63	78	87	88	82	71	89	101	88	49	92	42	65	68	72	51	65	54	

Diurnal Maximum

DF - DAS Failure UO - Unstable Operation





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - January 2023

Direction of Maximum Speed: 4 deg on Jan 26 10:00																				Hours in Service: 744							
Direction of Maximum Daily Speed Average: 308.3 deg on Jan 28																				Hours of Data: 693							
Direction of Minimum Speed: 326 deg on Jan 10 13:00										Direction of Minimum Daily Speed Average: 1.1 deg on Jan 10										Hours of Missing Data: 51							
Monthly Average Direction: 175.0 deg																								Percent Operational Time: 93.2			
Day	Hourly Period Ending At (MST)																								Daily Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	197	223	217	239	262	241	184	171	169	165	167	159	158	171	177	205	196	189	203	217	187	170	177	179	190.9		
2-Jan	169	156	157	155	162	154	163	163	164	156	162	154	153	158	156	140	150	180	195	178	163	159	164	160	159.9		
3-Jan	162	167	160	159	174	168	169	156	160	165	163	154	150	153	156	154	155	155	158	157	156	158	163	157	159.3		
4-Jan	172	167	175	177	172	172	158	162	158	161	161	172	159	157	150	163	167	181	181	183	174	169	168	157	166.5		
5-Jan	150	157	166	155	158	147	153	150	156	165	172	147	165	154	167	173	170	177	171	154	143	140	141	145	154.3		
6-Jan	139	135	134	136	137	139	145	151	151	156	160	156	161	160	155	165	165	166	163	165	159	157	156	170	152.1		
7-Jan	174	162	162	156	166	217	214	112	307	326	329	310	351	95	174	353	336	342	352	93	226	177	136	144	185.2		
8-Jan	157	146	170	177	158	158	163	166	176	168	162	171	175	158	150	168	127	14	7	38	16	11	96	141	157.1		
9-Jan	137	154	80	121	105	111	102	104	124	133	119	73	139	146	146	152	186	194	207	206	168	197	243	247	149.4		
10-Jan	93	149	146	139	179	169	168	139	153	152	341	311	326	267	259	277	284	307	256	249	269	345	357	6	190.7		
11-Jan	342	319	335	335	343	2	358	224	233	181	152	152	160	145	142	156	158	155	141	149	158	167	164	165	157.3		
12-Jan	159	165	168	174	168	165	164	160	162	159	164	166	163	162	165	167	168	170	164	176	171	189	156	140	165.3		
13-Jan	146	131	108	91	42	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
14-Jan	UO	131	131	135	135	138	142	156	148	153	146	156	164	162	178	185	191	227	223	198	178	209	131	118	149.5		
15-Jan	101	76	78	54	12	355	10	359	350	356	350	337	336	326	331	342	354	351	18	17	9	354	12	359	1.7		
16-Jan	345	15	12	347	347	344	14	1	2	17	42	41	35	38	93	123	113	113	126	136	136	151	162	179	97.0		
17-Jan	187	200	196	196	189	183	168	165	160	159	162	169	178	185	179	175	187	183	167	163	163	171	170	165	175.1		
18-Jan	166	164	167	166	161	161	161	160	161	167	159	154	148	149	140	138	135	137	138	142	143	144	152	150	152.6		
19-Jan	151	157	158	155	157	156	154	157	163	172	188	220	233	230	216	185	203	223	222	232	231	218	213	222	184.1		
20-Jan	244	245	244	243	237	229	227	226	227	DF	DF	233	231	251	249	247	239	242	247	252	281	274	248	224	243.5		
21-Jan	224	222	181	165	181	163	155	162	164	156	157	155	149	153	171	198	196	221	239	232	255	255	258	260	199.8		
22-Jan	267	279	291	291	295	292	268	273	270	292	350	14	353	355	1	10	9	14	20	4	355	3	12	343	319.7		
23-Jan	317	298	154	151	122	130	133	120	134	115	118	114	109	80	84	84	70	102	18	113	134	143	145	138	121.3		
24-Jan	135	137	147	141	141	150	148	147	141	140	152	161	176	89	6	349	16	25	8	9	10	359	351	334	116.2		
25-Jan	345	357	18	347	336	351	341	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
26-Jan	UO	UO	UO	272	290	311	353	2	3	4	360	347	355	8	8	11	8	358	11	5	7	4	0	9	351.8		
27-Jan	359	358	2	9	14	0	8	8	7	356	358	345	344	292	283	344	346	344	353	328	316	304	306	319	350.0		
28-Jan	303	292	291	293	289	288	292	292	288	288	297	DF	318	311	309	307	316	316	316	354	355	352	352	339	308.3		
29-Jan	328	321	258	259	253	252	245	222	208	187	174	DF	DF	DF	DF	DF	DF	DF	DF	281	329	327	345	336	DF	--	
30-Jan	327	346	4	352	328	142	207	223	239	249	243	234	248	245	175	120	136	146	119	110	116	5	359	1	268.2		
31-Jan	9	12	9	13	26	37	40	33	41	56	58	345	237	236	116	120	124	138	150	353	45	12	337	328	27.6		
185.2	177.8	175.4	185.6	181.5	178.0	169.2	164.9	172.8	166.8	160.6	159.1	174.4	173.8	172.5	174.4	175.0	190.8	198.7	186.0	165.5	176.8	180.0	174.9				
Diurnal Average																											
DF - DAS Failure UO - Unstable Operation																											
All monthly, daily, and diurnal averages have been calculated using vector methods																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 96 deg on Jan 10 13:00	Hours of Data: 693
Minimum Value: 2 deg on Jan 21 22:00	Hours of Missing Data: 51
Percentiles: P ₁ = 3 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 26 P ₉₉ = 70	Hours of Calibration: 0
	Percent Operational Time: 93.2

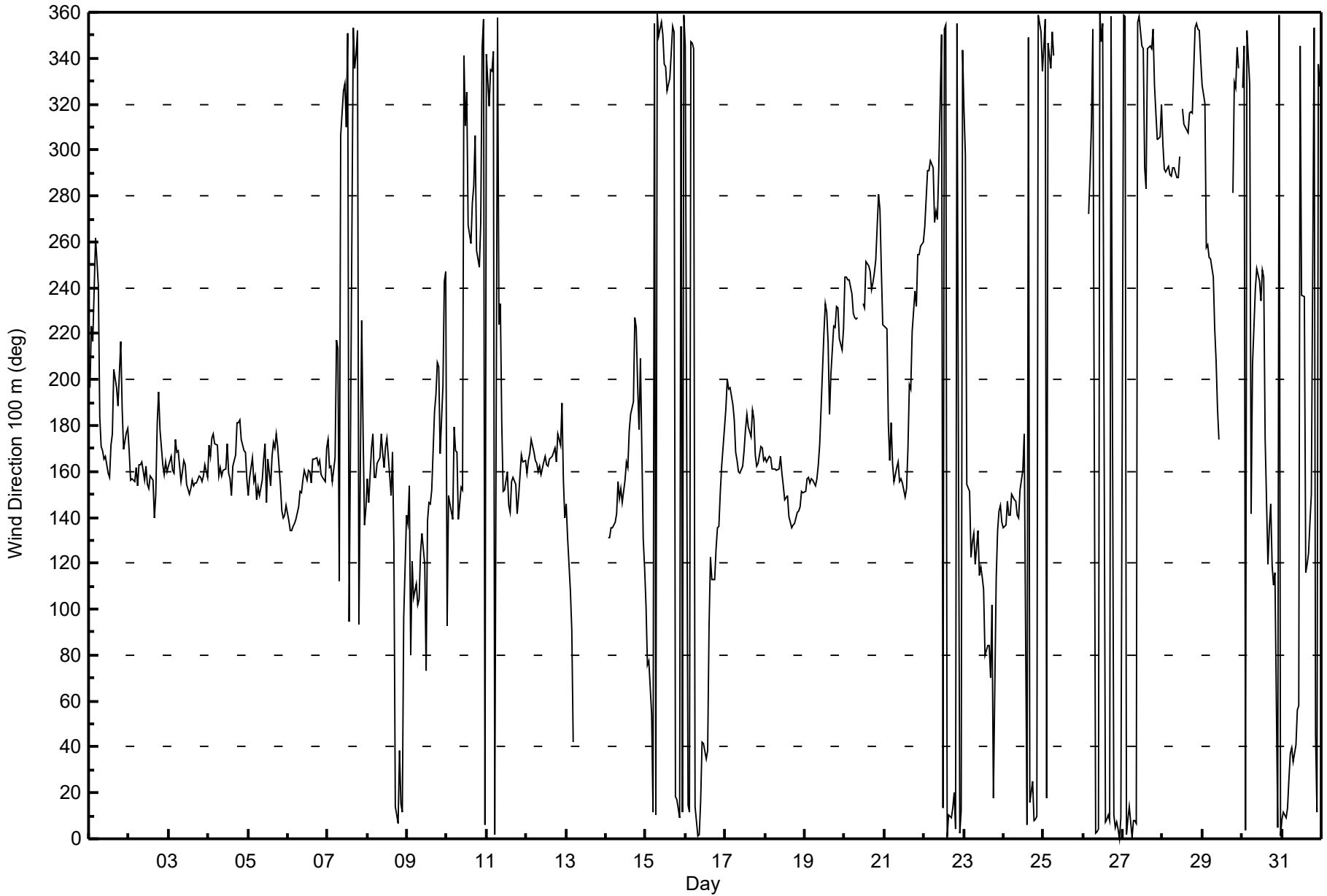
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	13	6	7	19	14	11	17	8	6	7	9	10	11	12	11	16	12	12	11	9	17	5	13	10	19	
2-Jan	8	7	5	6	6	14	7	5	4	9	5	7	4	5	4	7	7	19	16	12	8	11	6	5	19	
3-Jan	3	4	10	6	5	6	8	5	3	8	6	3	8	5	4	4	5	4	4	3	3	4	5	4	10	
4-Jan	10	6	8	8	10	7	4	4	4	4	6	13	5	6	4	4	9	12	11	9	11	8	8	7	13	
5-Jan	7	3	5	5	6	6	5	7	12	14	11	6	27	13	6	5	4	9	8	13	9	8	15	9	27	
6-Jan	5	4	4	3	4	4	6	6	7	23	7	7	6	8	5	4	2	4	4	4	4	4	4	10	23	
7-Jan	16	10	4	10	28	19	31	92	41	14	27	32	54	44	80	27	12	8	11	56	16	34	15	12	92	
8-Jan	14	13	11	10	13	8	6	6	13	6	6	5	24	12	13	16	33	22	9	9	17	69	79	15	79	
9-Jan	56	55	81	23	7	8	14	29	16	21	14	30	15	10	13	11	7	10	21	14	22	25	27	24	81	
10-Jan	46	21	18	20	9	15	33	12	18	34	65	63	96	74	13	31	28	46	11	8	20	8	8	7	96	
11-Jan	13	18	7	7	4	8	15	61	9	27	18	17	13	12	6	10	12	14	7	11	7	8	8	8	61	
12-Jan	9	5	8	9	8	9	5	5	5	4	6	4	5	3	3	3	6	4	5	6	9	14	31	17	31	
13-Jan	17	5	19	27	44	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	44	
14-Jan	UO	5	5	4	5	6	6	7	9	4	8	13	11	9	8	7	11	12	8	22	30	6	40	16	40	
15-Jan	20	14	8	11	16	4	17	11	6	7	10	11	13	14	9	6	9	7	13	26	21	13	26	29	29	
16-Jan	15	25	14	19	7	7	11	13	11	8	10	8	16	38	64	49	40	26	21	9	4	7	7	6	64	
17-Jan	6	6	4	4	6	6	6	6	6	5	8	10	10	7	10	7	7	7	2	4	4	5	5	6	10	
18-Jan	7	5	5	6	6	6	8	6	7	9	12	10	9	11	5	6	6	5	5	5	5	5	5	6	12	
19-Jan	6	8	9	8	5	4	4	9	6	8	16	12	10	14	10	9	8	8	8	9	26	33	51	39	51	
20-Jan	8	4	3	6	5	9	9	16	14	DF	DF	11	7	6	4	5	4	4	4	5	15	10	19	13	19	
21-Jan	13	6	20	12	10	6	4	10	4	7	6	6	4	7	16	7	8	11	9	9	6	2	3	5	20	
22-Jan	7	11	9	8	10	9	8	15	10	11	35	8	11	8	8	11	8	8	11	10	6	14	27	19	35	
23-Jan	23	63	70	21	7	12	17	6	16	9	26	30	60	65	9	19	21	17	19	44	7	5	9	8	70	
24-Jan	5	5	8	8	6	9	9	7	8	16	8	12	13	21	27	13	11	13	11	10	11	11	13	7	27	
25-Jan	7	17	12	13	14	19	6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	19	
26-Jan	UO	UO	UO	9	10	22	12	10	7	7	10	8	6	8	11	14	11	8	12	12	10	11	7	11	22	
27-Jan	5	6	8	12	10	9	9	11	7	10	8	7	11	27	32	11	7	7	10	8	8	8	13	7	32	
28-Jan	12	5	4	6	5	5	9	6	5	6	9	DF	8	8	8	8	6	6	7	11	6	6	5	7	12	
29-Jan	4	10	25	8	12	12	22	22	11	11	9	DF	DF	DF	DF	DF	DF	DF	DF	11	12	5	10	11	DF	25
30-Jan	4	17	11	14	36	39	21	10	9	8	13	9	9	10	40	13	9	8	29	8	13	57	13	8	57	
31-Jan	8	8	12	12	7	13	14	15	6	8	16	60	41	34	33	13	9	3	13	91	12	40	3	8	91	
Diurnal Maximum																										
56 63 81 27 44 39 33 92 41 34 65 63 96 74 80 49 40 46 29 91 30 69 79 39																										

DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction 100 m (WD100m) - deg
Lower Camp Met Tower - January 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - January 2023

Direction of Maximum Speed: 8 deg on Jan 26 10:00																				Hours in Service: 744							
Direction of Maximum Daily Speed Average: 313.1 deg on Jan 28																				Hours of Data: 657							
Direction of Minimum Speed: 171 deg on Jan 14 20:00										Direction of Minimum Daily Speed Average: 1.6 deg on Jan 10										Hours of Missing Data: 87							
Monthly Average Direction: 196.8 deg																								Percent Operational Time: 88.3			
Day	Hourly Period Ending At (MST)																								Daily Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	231	UO	UO	UO	UO	UO	UO	UO	UO	UO	199	194	194	201	214	236	228	223	241	238	222	209	223	221	--		
2-Jan	215	194	169	178	173	176	181	181	169	173	179	179	187	189	191	195	208	201	227	221	203	198	201	202	190.0		
3-Jan	197	196	195	195	187	184	192	175	178	182	198	180	167	172	168	183	173	182	186	179	196	195	222	198	185.6		
4-Jan	218	218	231	231	223	218	209	203	205	209	211	212	206	211	201	212	220	224	230	220	211	213	221	218	216.0		
5-Jan	192	176	183	207	197	163	155	166	163	164	168	162	159	153	154	142	135	135	134	141	139	139	141	138	155.6		
6-Jan	135	136	137	139	141	144	148	150	151	162	162	169	179	179	179	187	187	193	192	190	174	179	195	216	162.7		
7-Jan	220	203	211	214	223	246	254	306	327	340	341	UO	UO	UO	UO	UO	UO	UO	UO	94	170	131	141	177	--		
8-Jan	176	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	176	170	150	116	24	58	102	UO	UO	UO	--		
9-Jan	UO	UO	UO	UO	117	121	110	123	129	148	138	102	132	145	141	150	183	187	172	182	167	195	217	207	143.6		
10-Jan	125	153	143	136	167	162	146	140	151	136	100	20	61	24	291	36	2	10	298	277	301	356	13	23	124.0		
11-Jan	3	332	335	344	349	11	42	160	244	205	182	180	185	163	147	158	161	159	149	156	161	172	170	173	163.8		
12-Jan	170	173	173	180	179	178	179	177	184	172	178	180	179	174	180	182	181	183	176	188	190	201	205	190	179.2		
13-Jan	200	182	149	111	37	347	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
14-Jan	UO	136	135	137	137	140	145	154	150	150	148	163	178	171	198	205	208	234	242	171	196	217	160	120	152.9		
15-Jan	107	62	80	47	20	17	28	30	11	38	62	105	100	43	348	19	50	66	98	109	120	115	92	95	58.0		
16-Jan	98	96	94	96	77	68	64	46	46	70	84	82	96	103	120	133	131	124	124	138	141	153	172	195	123.7		
17-Jan	194	200	198	199	191	187	174	171	167	167	173	178	184	190	181	178	188	179	174	170	177	189	187	176	181.9		
18-Jan	181	177	173	168	161	157	157	157	159	165	161	160	156	150	145	139	140	144	145	147	148	149	150	152	155.9		
19-Jan	155	158	162	173	172	170	180	185	188	211	223	242	242	238	225	202	217	234	235	239	240	234	235	242	205.5		
20-Jan	247	250	251	259	252	249	241	241	239	DF	DF	246	243	258	252	250	245	250	254	258	272	275	261	244	251.8		
21-Jan	243	243	220	206	225	200	187	190	199	192	194	199	189	190	212	215	219	238	248	246	260	264	270	275	228.4		
22-Jan	285	298	295	292	293	293	275	276	276	297	355	19	360	359	7	13	11	22	32	21	15	34	45	35	327.3		
23-Jan	36	88	144	164	129	134	141	128	139	124	125	119	108	88	82	87	84	103	86	133	167	153	147	148	128.7		
24-Jan	145	144	163	150	150	154	157	168	154	156	168	194	225	276	10	4	24	33	22	14	22	11	6	345	136.5		
25-Jan	358	25	58	37	6	2	333	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--		
26-Jan	UO	UO	UO	279	294	315	2	8	8	8	3	355	1	13	9	12	15	4	17	12	15	10	6	16	355.9		
27-Jan	6	5	8	13	18	8	15	14	14	7	6	351	343	309	328	349	356	359	3	338	328	321	311	325	356.0		
28-Jan	307	297	297	298	295	296	298	295	291	292	303	DF	320	314	310	309	319	320	320	359	1	359	4	350	313.1		
29-Jan	338	337	280	280	285	274	260	244	231	225	210	DF	DF	DF	DF	DF	DF	DF	DF	279	316	342	358	354	DF	--	
30-Jan	340	359	25	27	346	183	221	254	265	279	279	260	251	249	216	173	174	168	150	141	114	76	22	18	294.3		
31-Jan	21	21	23	19	30	44	46	45	32	36	47	14	294	216	142	158	138	170	193	197	37	28	16	358	33.7		
214.0 196.1 190.0 207.5 199.5 195.0 186.9 185.9 190.2 184.3 184.7 184.0 200.5 199.8 193.7 196.7 190.9 203.6 219.0 208.5 197.4 203.1 210.2 205.7																											
Diurnal Average																											
DF - DAS Failure UO - Unstable Operation																											
All monthly, daily, and diurnal averages have been calculated using vector methods																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 90 deg on Jan 14 20:00	Hours of Data: 657
Minimum Value: 2 deg on Jan 21 22:00	Hours of Missing Data: 87
Percentiles: P ₁ = 3 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 19 P ₉₉ = 66	Hours of Calibration: 0
	Percent Operational Time: 88.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	8	UO	UO	UO	UO	UO	UO	UO	UO	UO	13	11	11	11	16	6	6	5	6	5	12	10	15	12	16
2-Jan	10	13	11	15	14	11	6	8	2	8	6	9	8	4	6	10	20	10	9	8	8	7	6	6	20
3-Jan	7	5	4	5	8	6	8	11	9	14	13	11	9	7	9	8	6	10	7	10	11	11	12	11	14
4-Jan	11	6	5	5	7	7	8	7	8	10	7	8	7	5	8	10	12	10	8	9	8	11	6	11	12
5-Jan	11	7	9	15	13	12	4	5	2	4	3	8	5	4	3	7	3	4	3	5	6	5	4	4	15
6-Jan	4	3	3	3	4	5	5	3	3	6	5	7	6	8	8	3	3	5	7	9	7	8	9	14	14
7-Jan	11	14	4	5	16	4	4	30	13	7	9	UO	UO	UO	UO	UO	UO	UO	UO	74	51	30	19	9	74
8-Jan	4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	7	6	20	24	20	22	11	UO	UO	UO	24
9-Jan	UO	UO	UO	UO	4	4	5	6	8	10	9	16	16	10	11	12	11	15	41	23	13	14	21	33	41
10-Jan	31	16	14	18	12	14	25	14	20	22	60	90	85	64	51	45	22	10	23	15	17	16	6	7	90
11-Jan	22	12	8	6	3	16	11	55	15	12	10	14	8	11	8	10	11	13	8	6	8	5	6	6	55
12-Jan	10	4	6	7	8	9	4	4	5	3	4	2	2	4	5	4	5	4	6	7	12	16	21	20	21
13-Jan	8	14	30	47	44	20	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	47
14-Jan	UO	5	4	3	5	5	7	6	7	4	6	12	12	8	13	9	9	10	11	90	19	11	45	19	90
15-Jan	23	11	8	19	9	7	12	8	10	17	30	29	32	36	21	16	11	10	13	11	12	14	12	9	36
16-Jan	8	9	9	9	9	11	5	15	11	8	8	7	9	6	16	10	9	8	10	7	5	6	12	5	16
17-Jan	3	5	4	3	5	5	4	4	4	5	5	8	8	6	9	6	6	7	3	3	4	4	3	4	9
18-Jan	5	3	3	4	6	5	5	5	5	7	9	8	11	10	6	5	4	4	5	5	5	5	4	4	11
19-Jan	3	3	4	7	3	6	9	6	11	8	8	6	4	5	8	6	8	7	6	5	6	10	14	16	16
20-Jan	5	3	3	4	5	8	6	7	8	DF	DF	9	6	5	4	4	3	3	3	3	8	6	12	6	12
21-Jan	5	6	13	11	6	12	7	10	5	6	3	6	8	10	8	4	7	6	7	5	4	2	3	5	13
22-Jan	7	6	8	6	9	6	6	10	6	9	36	8	9	8	8	9	7	7	7	8	5	9	6	15	36
23-Jan	34	68	37	21	4	8	11	4	10	7	12	18	21	25	9	19	17	10	22	14	11	10	10	10	68
24-Jan	8	8	7	7	5	9	6	10	8	7	5	14	9	34	6	9	9	11	11	9	11	11	10	6	34
25-Jan	7	23	12	19	29	38	32	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	38
26-Jan	UO	UO	UO	9	8	19	10	9	7	7	8	7	7	8	11	13	10	9	11	11	11	8	7	10	19
27-Jan	6	6	8	10	8	8	6	9	6	8	8	7	10	17	15	9	5	7	7	8	5	8	10	6	17
28-Jan	13	3	4	4	4	5	6	4	4	5	7	DF	8	7	7	6	6	5	7	11	6	5	5	8	13
29-Jan	2	9	15	7	6	4	13	6	6	7	15	DF	DF	DF	DF	DF	DF	DF	DF	12	13	9	9	9	15
30-Jan	6	17	7	7	29	48	22	9	6	4	5	9	6	17	6	15	10	6	16	19	16	51	13	6	51
31-Jan	7	7	11	10	4	6	5	6	5	9	10	31	70	23	45	26	11	10	6	89	18	9	7	9	89
	34	68	37	47	44	48	32	55	20	22	60	90	85	64	51	45	22	24	41	90	51	51	45	33	

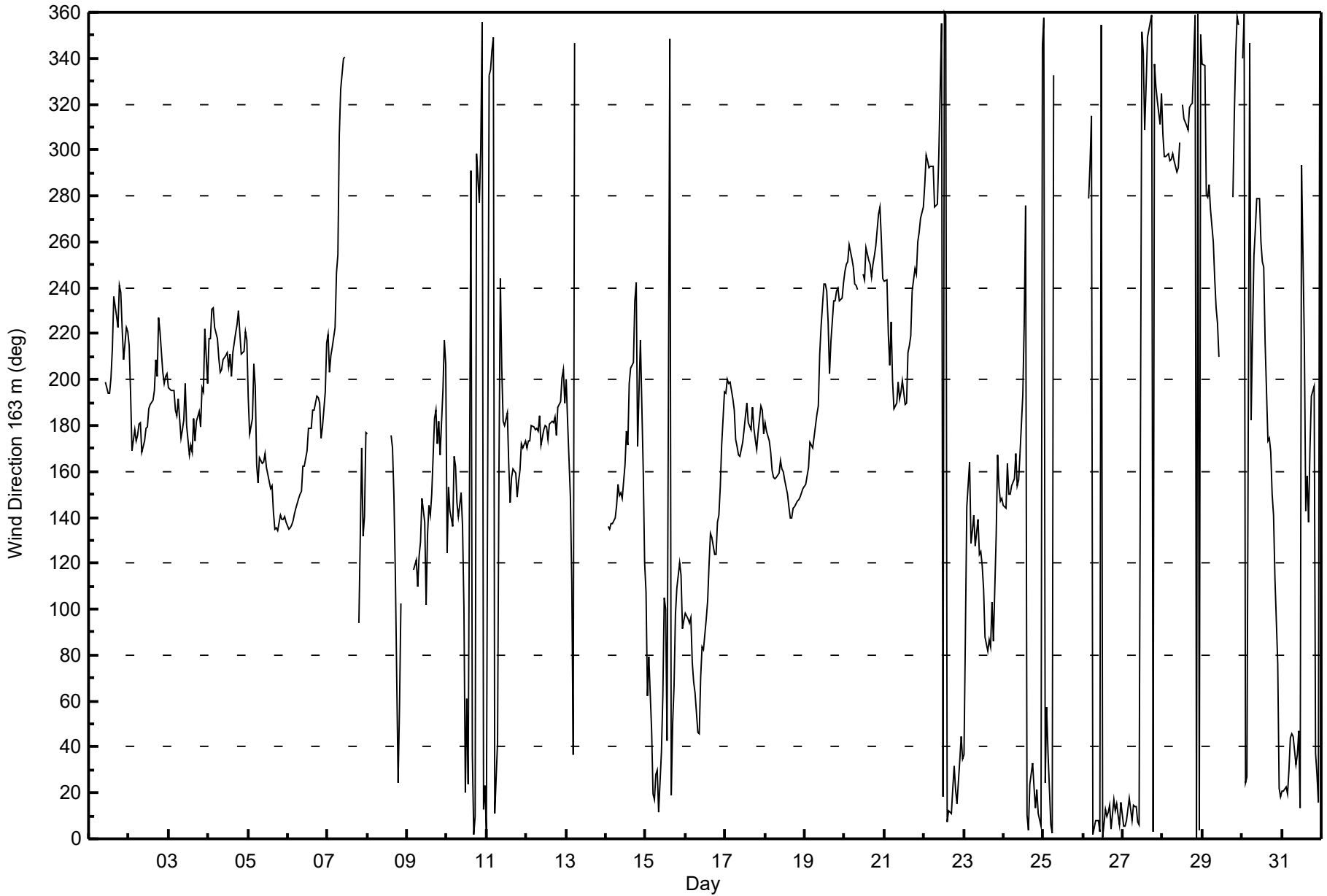
Diurnal Maximum

DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - January 2023





Maximum Value: 0.3 km/h on Jan 31 02:00 Maximum Daily Average: 0.0 km/h on Jan 15																						Hours in Service: 744 Hours of Data: 733				
Minimum Value: -1.7 km/h on Jan 18 06:00 Minimum Daily Average: -1.0 km/h on Jan 12 Maximum Diurnal Average: -0.2 km/h at hour 19 Minimum Diurnal Average: -0.4 km/h at hour 14 Monthly Average: -0.31 km/h Percentiles: P ₁ = -1.3 P ₁₀ = -0.9 Q ₁ = -0.5 Median = -0.2 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2																						Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-0.2	-0.4	-0.6	-0.2	-0.2	-0.3	-0.3	-0.7	-0.9	-0.7	-0.5	-0.8	-0.9	-0.3	-0.2	0.1	0.0	0.0	0.1	-0.1	0.1	0.0	0.1	-0.1	-0.3	0.1
2-Jan	-0.1	-0.1	-0.5	-1.1	-0.5	-0.4	-0.3	-0.5	-0.4	-0.7	-0.5	-0.5	-0.9	-0.7	-0.5	-0.3	-0.3	-0.3	-0.1	-0.5	-0.8	-0.5	-0.6	-0.7	-0.5	-0.1
3-Jan	-0.6	-0.5	-0.3	-0.3	-0.8	-0.4	-0.3	-0.3	-0.3	-0.6	-0.5	-0.9	-0.7	-0.9	-1.0	-0.5	-0.5	-0.4	-0.4	-0.8	-0.1	-0.2	0.1	-0.1	-0.5	0.1
4-Jan	0.0	-0.1	-0.1	-0.2	-0.4	-0.4	-0.8	-0.5	-0.5	-0.4	-0.7	-0.4	-0.7	-0.6	-0.6	-0.4	-0.3	-0.3	0.1	-0.3	-0.5	-0.2	-0.3	-0.2	-0.4	0.1
5-Jan	-0.4	-0.5	-0.6	-0.8	-0.8	-0.9	-0.5	-0.3	-0.6	-0.1	-0.6	-0.6	-0.5	-0.4	-0.3	0.0	0.2	0.2	0.1	-0.1	0.0	-0.1	-0.3	-0.5	-0.3	0.2
6-Jan	-0.1	0.0	0.0	0.0	-0.2	-0.3	-0.5	-0.4	-0.6	-0.3	-0.6	-0.5	-0.6	-0.7	-0.9	-0.6	-0.7	-0.6	-0.6	-0.7	-1.0	-1.1	-0.5	-0.5	-0.5	0.0
7-Jan	-0.9	-0.3	-0.6	-0.5	-0.2	0.0	-0.2	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.1	0.1	0.0	-0.2	-0.4	-0.3	-0.1	-0.2	0.1
8-Jan	-0.2	-0.3	-0.1	0.0	-0.4	-0.2	-0.3	-0.2	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.3	-0.3	-0.5	-0.4	-0.4	-0.1	-0.2	0.0	-0.1	-0.1	0.0	-0.1	0.0
10-Jan	0.1	-0.1	-0.4	-0.5	-0.5	-0.3	0.0	0.0	-0.1	0.0	-0.1	-0.2	-0.1	-0.3	-0.4	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1
11-Jan	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.3	-0.5	-0.5	-0.6	-0.6	-0.6	-0.5	-0.3	-0.4	-1.0	-1.2	-1.0	-1.0	-0.4	0.1
12-Jan	-1.0	-1.3	-1.1	-1.1	-1.1	-1.0	-1.1	-1.3	-1.2	-1.2	-1.2	-1.2	-1.4	-1.3	-1.1	-1.1	-1.1	-0.9	-0.8	-0.8	-0.4	-0.7	-0.3	-0.3	-1.0	-0.3
13-Jan	-0.5	-0.3	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.2
14-Jan	-0.5	-0.6	-0.7	-0.7	-0.6	-0.8	-1.0	-1.2	-0.8	-1.2	-0.5	-0.5	-0.6	-0.6	-0.6	-0.4	-0.3	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.5	0.0
15-Jan	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
16-Jan	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.5	-1.0	-0.9	-0.9	-0.2	0.1
17-Jan	-0.9	-0.9	-1.1	-1.3	-1.3	-1.0	-1.0	-1.1	-0.9	-1.1	-0.9	-0.6	-0.7	-1.0	-0.8	-1.0	-0.8	-0.2	-0.2	-0.6	-0.2	-0.5	-0.7	-0.9	-0.8	-0.2
18-Jan	-0.9	-0.9	-1.1	-1.2	-1.3	-1.7	-0.8	-0.6	-0.7	-0.6	-0.7	-1.0	-1.2	-1.1	-1.0	-0.8	-0.5	-0.3	-0.6	-0.7	-0.8	-1.2	-0.8	-1.2	-0.9	-0.3
19-Jan	-0.7	-0.5	0.1	-0.3	-1.1	-1.2	-1.0	-0.6	-1.2	-1.0	-0.6	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.5	0.0	0.1	0.0	0.0	0.0	0.0	-0.4	0.1
20-Jan	-0.2	-0.3	-0.2	0.0	-0.2	-0.7	-0.4	-0.1	-0.3	DF	DF	-0.3	-0.2	-0.4	-0.5	-0.9	-0.6	-0.6	-1.0	-0.6	-0.2	0.0	-0.2	-0.2	-0.4	0.0
21-Jan	0.0	-0.2	-0.2	-0.5	-0.4	-0.6	-0.8	-0.7	-0.6	-0.5	-0.7	-0.5	-0.7	-0.8	-0.7	-0.4	-0.1	-0.3	-0.5	-0.6	-0.4	-0.6	-1.0	-0.4	-0.5	0.0
22-Jan	-0.3	-0.2	-0.3	-0.6	-0.3	-0.5	-0.7	-0.6	-0.6	-0.6	-0.4	0.2	0.1	-0.1	-0.2	0.0	0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.2	0.2
23-Jan	-0.1	0.0	0.0	-0.1	-0.2	-0.2	0.0	-0.1	0.0	0.2	-0.1	0.0	0.0	0.1	-0.1	-0.1	0.0	0.0	0.1	-0.1	0.0	-0.2	-0.5	-0.2	-0.1	0.2
24-Jan	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.9	-0.2	-0.5	-0.2	-0.4	-0.3	-0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	-0.1	-0.2	0.1
25-Jan	0.0	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.1	-0.1	0.1	-0.1	0.0	-0.1	0.1	0.1	-0.1	-1.0	-1.3	-0.8	-0.8	-0.8	-0.3	-0.3	-0.2	0.1
26-Jan	-0.4	-0.8	-0.5	-0.4	-0.5	-0.2	0.0	0.0	0.0	0.2	0.2	-0.2	-0.4	0.2	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.2	-0.1	0.2	-0.1	0.2
27-Jan	-0.1	-0.2	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	-0.3	0.0	0.2	-0.4	-0.5	-0.2	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.2
28-Jan	0.1	-0.5	-0.4	-0.5	-0.6	-0.8	-0.5	-0.5	-0.4	-0.7	-0.4	DF	-0.4	-0.7	-0.6	-0.5	-0.5	-0.5	-0.5	-0.3	-0.2	0.0	0.0	-0.1	-0.4	0.1
29-Jan	-0.1	0.0	0.0	-0.2	0.0	-0.3	-0.2	0.1	0.0	-0.2	-0.6	DF	DF	DF	DF	DF	DF	DF	DF	0.0	-0.1	0.0	-0.1	-0.2	DF	0.1
30-Jan	-0.1	-0.1	-0.2	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.2	-0.2	-0.4	-0.5	-0.3	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.1
31-Jan	0.0	0.3	0.0	0.1	0.1	0.1	0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.6	-0.5	-0.1	-0.4	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 20 m (VW20m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744						
Maximum Value: 4.6 km/h on Jan 26 10:00																				Hours of Data: 738						
Minimum Value: 0.1 km/h on Jan 8 17:00																				Hours of Missing Data: 11						
Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.5 P ₉₀ = 2.0 P ₉₉ = 3.3																				Hours of Calibration: 0						
																				Percent Operational Time: 98.5						
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.8	1.2	1.4	0.9	1.2	0.9	0.7	0.9	1.2	1.2	1.1	1.6	1.5	1.2	0.8	0.7	0.5	0.8	0.6	0.7	0.8	0.6	0.4	0.4	1.6	
2-Jan	0.4	0.7	0.8	1.7	1.5	1.1	0.7	1.2	1.7	1.5	1.3	1.5	1.6	1.9	1.7	0.9	0.8	0.7	0.8	1.4	1.2	1.1	1.0	1.4	1.9	
3-Jan	1.4	1.3	0.9	0.7	1.2	1.3	0.9	0.7	0.7	0.9	0.9	1.7	1.9	1.6	1.3	0.9	1.1	1.0	0.9	1.2	0.7	0.7	0.5	0.6	1.9	
4-Jan	0.7	0.7	0.6	0.7	0.9	0.8	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.9	0.8	0.5	0.5	0.7	0.6	0.5	0.7	0.6	0.7	0.8	0.9	
5-Jan	0.7	0.8	0.8	1.3	1.2	1.1	1.4	1.2	1.1	0.7	1.0	1.3	0.7	1.1	0.7	0.6	0.7	0.5	0.4	0.5	0.8	0.6	0.7	0.9	1.4	
6-Jan	0.6	0.6	0.9	0.6	0.6	0.7	1.3	1.4	1.8	0.8	0.8	0.7	1.0	1.1	1.7	1.0	1.1	1.3	2.0	2.0	2.1	1.6	0.9	0.8	2.1	
7-Jan	1.5	1.0	1.2	1.0	0.8	0.9	1.1	0.8	0.3	0.1	0.2	0.4	0.7	0.4	0.6	0.8	0.4	0.7	0.7	0.3	0.5	0.5	0.8	0.3	1.5	
8-Jan	0.7	0.5	0.6	0.5	0.9	0.8	0.8	0.8	0.8	0.4	0.4	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.4	0.4	0.4	0.5	0.6	0.5	0.9	
9-Jan	0.4	0.4	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.7	0.8	0.9	0.7	0.5	0.5	0.3	0.4	0.5	0.2	0.9	
10-Jan	0.2	0.5	1.3	1.1	0.6	0.7	0.3	0.1	0.2	0.3	0.4	0.6	0.5	0.7	0.4	0.3	0.3	0.2	0.6	0.5	0.5	0.6	0.8	0.6	1.3	
11-Jan	0.5	0.5	0.7	0.9	0.8	0.6	0.4	0.2	0.2	0.3	0.5	0.8	0.9	1.2	1.4	1.0	1.2	0.7	0.7	1.3	1.4	1.9	1.7	1.5	1.9	
12-Jan	1.5	1.7	1.8	1.6	1.6	1.3	1.5	1.6	1.5	1.8	1.8	2.0	1.9	1.5	1.5	1.7	1.3	1.3	0.9	0.9	0.8	0.6	1.0	0.9	2.0	
13-Jan	1.3	0.9	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.6	1.1	1.0	0.7	0.5	0.5	0.6	0.6	0.7	1.0	1.2	1.3	
14-Jan	2.3	2.6	2.8	3.1	3.0	2.7	2.3	2.0	1.7	1.8	1.6	1.3	1.1	0.8	0.8	0.6	0.5	0.6	0.4	0.2	0.1	0.1	0.1	0.1	3.1	
15-Jan	0.2	0.2	0.2	0.1	0.4	0.7	0.9	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.4	0.5	0.7	0.6	0.5	0.6	0.5	0.9	
16-Jan	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	0.9	0.9	1.1	1.1	1.0	0.9	0.7	1.0	1.4	1.1	0.4	1.8	2.5	1.7	1.2	1.1	2.5	
17-Jan	0.9	1.4	1.6	1.6	1.5	1.2	1.4	1.5	1.5	1.9	1.8	1.4	1.2	1.2	1.2	1.2	0.6	0.5	0.6	0.9	0.9	0.9	0.8	1.2	1.9	
18-Jan	1.3	1.5	1.5	1.6	1.9	1.8	1.2	0.9	1.2	1.4	1.7	1.8	1.7	1.8	2.0	1.6	1.8	1.7	1.4	2.2	1.9	1.8	1.8	1.6	2.2	
19-Jan	1.7	1.2	1.1	1.1	1.5	1.4	1.6	2.0	1.7	1.7	1.2	1.2	1.3	0.8	0.7	1.0	1.0	1.4	1.1	1.2	1.1	1.0	1.2	1.1	2.0	
20-Jan	0.7	0.6	0.8	0.8	1.0	1.0	0.8	1.0	1.2	DF	DF	1.0	1.1	1.9	2.4	2.6	2.0	2.2	2.5	2.6	1.1	0.5	0.6	0.7	2.6	
21-Jan	1.1	1.4	0.9	1.0	0.7	1.1	1.8	1.4	1.5	2.0	2.4	1.9	1.7	1.9	1.5	1.0	0.9	1.2	1.4	1.1	1.5	1.9	2.6	2.3	2.6	
22-Jan	2.2	1.8	1.5	2.3	2.1	2.6	2.0	2.0	2.5	2.8	3.5	3.4	1.8	1.9	1.9	1.7	1.2	0.9	1.1	1.0	0.8	0.3	0.2	0.3	3.5	
23-Jan	0.2	0.1	0.3	0.8	1.1	0.9	0.7	1.6	0.7	1.1	0.9	1.2	0.6	1.0	1.3	0.8	0.6	0.5	0.5	0.3	0.2	0.9	1.2	1.5	1.6	
24-Jan	1.8	2.0	2.1	2.0	1.8	1.2	1.2	1.4	1.7	1.2	1.1	1.3	1.2	0.7	0.6	1.1	2.0	1.7	1.4	1.4	1.0	0.9	0.9	0.8	2.1	
25-Jan	1.1	0.9	0.9	0.7	0.8	0.7	0.6	0.7	0.5	0.6	0.7	0.6	0.9	0.7	0.6	0.5	0.6	1.2	1.5	2.0	2.0	2.6	1.9	1.2	2.6	
26-Jan	1.4	2.1	1.4	2.0	2.9	2.3	2.7	4.1	3.8	4.6	3.3	2.2	1.8	1.7	1.3	1.3	1.7	2.1	2.7	2.4	2.6	2.8	2.8	2.1	4.6	
27-Jan	2.4	2.7	2.7	2.2	1.7	1.3	1.2	1.4	1.6	1.9	1.7	1.8	1.3	0.8	0.6	0.4	1.0	0.4	0.5	0.2	0.3	0.5	0.5	0.2	2.7	
28-Jan	0.7	2.9	3.1	3.1	3.1	2.7	2.8	3.0	3.1	2.8	2.9	DF	3.3	3.4	3.0	2.9	3.0	3.1	2.8	2.7	2.5	1.9	1.4	0.9	3.4	
29-Jan	0.3	0.2	0.6	1.2	1.1	1.2	1.5	1.3	0.5	1.0	1.9	DF	DF	DF	DF	DF	DF	DF	DF	0.4	0.4	0.5	0.7	0.7	DF	1.9
30-Jan	0.4	0.6	0.8	0.3	0.1	0.2	0.4	0.8	0.8	0.9	0.7	0.4	0.5	0.5	0.9	0.7	0.5	0.5	0.3	0.2	0.2	0.7	0.7	0.5	0.9	
31-Jan	1.5	2.1	1.6	1.5	1.1	1.0	0.9	0.5	0.3	0.2	0.2	0.4	0.6	0.6	1.0	0.7	0.3	0.2	0.1	0.3	0.2	0.4	0.8	0.4	2.1	
2.4 2.9 3.1 3.1 3.1 2.7 2.8 4.1 3.8 4.6 3.5 3.4 3.3 3.4 3.0 2.9 3.0 3.1 2.8 2.7 2.6 2.8 2.8 2.3																										
Diurnal Maximum																										
DF - DAS Failure																										



Maximum Value: 1.5 km/h on Jan 8 08:00		Maximum Daily Average: 0.5 km/h on Jan 4		Hours in Service: 744																						
Minimum Value: -1.1 km/h on Jan 28 16:00		Minimum Daily Average: -0.7 km/h on Jan 28		Hours of Data: 718																						
Maximum Diurnal Average: 0.2 km/h at hour 9		Minimum Diurnal Average: 0.0 km/h at hour 13		Hours of Missing Data: 26																						
Monthly Average: 0.11 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.2 Q ₁ = -0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 1.2		Hours of Calibration: 0																						
				Percent Operational Time: 96.5																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.2	0.4	0.4	0.2	-0.3	0.0	0.3	0.1	0.4	0.5	0.6	0.5	0.4	0.6	0.6	0.5	0.7	0.8	0.5	-0.1	0.8	0.6	0.6	0.5	0.4	0.8
2-Jan	0.7	0.7	0.1	-0.2	0.0	0.1	0.4	0.1	0.4	0.0	0.2	0.3	-0.3	0.2	0.4	0.4	0.4	0.5	0.6	0.5	0.1	0.4	0.5	0.2	0.3	0.7
3-Jan	0.2	0.5	0.3	0.5	0.3	0.7	0.2	0.5	0.3	0.0	-0.1	-0.4	0.0	-0.4	-0.2	0.2	-0.1	0.2	0.3	0.0	0.4	0.5	1.1	0.6	0.2	1.1
4-Jan	0.9	0.8	0.9	1.0	0.7	0.8	0.2	0.7	0.2	0.4	0.2	0.4	-0.1	0.0	-0.1	0.3	0.7	0.7	1.0	0.8	0.4	0.8	0.5	0.7	0.5	1.0
5-Jan	0.3	0.4	0.2	0.0	0.1	-0.1	0.7	0.6	0.6	0.5	0.2	0.1	0.2	0.2	0.3	0.7	1.0	0.8	0.6	0.2	0.5	0.3	0.1	-0.1	0.4	1.0
6-Jan	0.2	0.3	0.4	0.5	0.8	1.2	1.0	1.3	0.8	-0.1	0.0	0.0	-0.1	-0.1	0.1	0.6	0.4	0.6	0.7	0.6	0.0	-0.3	0.4	0.5	0.4	1.3
7-Jan	0.3	0.5	0.3	0.9	0.5	1.2	1.1	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.3	0.3	0.2	1.2
8-Jan	0.6	0.4	0.7	1.0	UO	1.0	1.3	1.5	0.8	0.4	0.5	0.6	0.2	0.0	0.1	0.1	0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.4	1.5
9-Jan	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	-0.1	-0.1	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3
10-Jan	0.1	0.0	0.5	0.5	0.0	0.1	0.1	0.0	0.0	0.1	-0.1	-0.2	0.0	-0.1	-0.2	0.0	-0.1	0.0	0.4	0.5	0.1	0.0	0.0	0.0	0.1	0.5
11-Jan	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.3	0.1	0.0	-0.1	0.1	0.3	0.0	0.3	0.2	0.2	0.2	0.1	-0.1	-0.4	-0.3	0.0	0.3
12-Jan	0.1	-0.4	-0.3	-0.2	-0.5	-0.1	-0.1	0.2	0.2	0.4	-0.1	-0.1	-0.3	-0.2	-0.1	-0.3	-0.3	-0.3	-0.1	-0.3	0.3	-0.1	0.2	0.1	-0.1	0.4
13-Jan	0.2	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	-0.1	-0.1	0.0	0.1	0.2	0.0	0.2
14-Jan	0.2	0.3	0.5	0.9	1.2	1.2	1.0	0.3	1.2	0.0	0.7	0.5	0.1	0.2	0.0	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.4	1.2
15-Jan	0.0	0.1	0.1	0.0	-0.2	-0.1	-0.1	0.0	-0.2	-0.1	0.0	0.1	0.0	0.0	-0.2	-0.1	0.0	0.0	0.0	-0.1	-0.2	-0.1	0.0	-0.1	0.0	0.1
16-Jan	0.0	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.4	0.1	-0.2	-0.3	-0.1	0.1	0.8	0.8	0.5	0.0	-0.3	0.0	0.8
17-Jan	-0.2	0.0	-0.1	0.0	-0.3	-0.1	-0.4	-0.3	0.0	-0.1	0.0	0.0	0.0	-0.2	0.0	-0.3	-0.1	0.5	0.4	0.3	0.6	0.0	-0.2	-0.2	0.0	0.6
18-Jan	-0.1	-0.1	-0.5	-0.4	-0.6	-0.7	0.1	-0.1	-0.2	0.2	0.9	0.8	0.5	0.7	0.6	0.4	0.7	0.5	0.6	0.8	0.8	0.8	0.7	0.5	0.3	0.9
19-Jan	0.9	0.6	0.1	0.1	0.1	0.3	0.5	0.9	0.6	0.7	0.5	0.4	0.3	0.0	0.1	0.3	0.2	0.2	0.4	0.8	0.3	0.5	0.4	0.1	0.4	0.9
20-Jan	-0.1	-0.1	0.0	0.6	0.3	0.0	-0.1	0.1	0.0	DF	DF	0.3	0.5	0.4	0.3	-0.4	0.2	-0.3	0.0	-0.3	-0.2	0.0	0.0	0.0	0.1	0.6
21-Jan	-0.1	-0.3	0.2	0.2	0.2	0.3	-0.1	-0.1	0.2	0.4	0.1	0.4	-0.3	0.2	0.6	0.5	0.8	0.0	-0.2	-0.2	-0.2	-0.1	-0.5	0.0	0.1	0.8
22-Jan	0.4	0.4	-0.3	-0.9	-0.7	-1.0	-0.4	-0.7	-0.4	-0.8	-0.2	0.1	0.0	0.2	0.1	0.1	0.1	0.0	-0.1	0.0	-0.2	0.0	-0.1	-0.2	-0.2	0.4
23-Jan	-0.2	0.0	0.2	0.2	0.1	-0.2	0.1	0.3	0.3	0.4	0.3	0.3	0.1	0.2	-0.2	0.0	0.0	0.1	-0.1	-0.1	0.1	0.3	0.3	0.3	0.1	0.4
24-Jan	0.2	0.9	0.4	0.3	0.4	-0.2	-0.5	-0.7	0.3	-0.6	0.2	-0.1	0.1	0.2	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.1	-0.1	0.0	0.9
25-Jan	0.0	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.5	0.5
26-Jan	0.1	0.3	0.3	-0.2	-0.7	-0.5	-0.3	0.1	0.1	0.4	-0.1	-0.2	-0.4	0.1	0.0	0.1	0.1	-0.1	-0.1	0.0	-0.2	0.0	0.1	0.2	0.0	0.4
27-Jan	-0.2	-0.1	0.0	0.2	0.1	0.1	0.2	0.1	0.2	-0.1	-0.3	-0.4	0.1	-0.2	-0.2	-0.2	-0.1	0.0	-0.2	0.0	0.0	-0.3	0.0	0.0	-0.1	0.2
28-Jan	-0.2	-0.5	-0.9	-0.9	-1.1	-1.1	-0.7	-0.9	-0.8	-0.9	-0.6	DF	-0.8	-1.1	-1.0	-1.1	-0.9	-1.0	-1.0	-0.2	-0.1	-0.2	-0.3	-0.1	-0.7	-0.1
29-Jan	-0.1	0.0	0.0	-0.5	-0.2	-0.4	0.4	0.4	1.0	0.9	0.4	DF	DF	DF	DF	DF	DF	DF	DF	0.1	-0.2	-0.1	-0.2	-0.4	DF	1.0
30-Jan	-0.1	-0.1	-0.2	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	-0.1	-0.1	0.0	0.0	0.2
31-Jan	0.1	0.2	-0.2	0.1	0.1	0.1	0.1	0.0	-0.1	0.0	0.0	0.1	-0.2	-0.4	0.4	0.0	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.9		
																								0.2 0.9		
																								0.1 0.9		
																								0.1 1.0		
																								0.0 1.2		
																								0.1 1.2		
																								0.2 1.3		
																								0.2 1.5		
																								0.1 1.2		
																								0.1 0.9		
																								0.1 0.9		
																								0.1 0.8		
																								0.0 0.5		
																								0.1 0.7		
																								0.1 0.6		
																								0.1 0.7		
																								0.1 1.0		
																								0.1 0.7		
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																								0.1 1.0		
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																								0.1 0.8		
																								0.1 0.8		
																								0.1 1.1		
																								0.1 0.7		
																								DF - DAS Failure		
																								UO - Unstable Operation		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 45 m (VW45m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.9 km/h on Jan 26 10:00 Minimum Value: 0.1 km/h on Jan 8 17:00 Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.9 Q ₃ = 1.4 P ₉₀ = 1.9 P ₉₉ = 3.2																				Hours in Service: 744 Hours of Data: 718 Hours of Missing Data: 26 Hours of Calibration: 0 Percent Operational Time: 96.5					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	0.9	1.1	1.4	1.1	1.5	0.9	0.9	0.8	0.9	0.8	0.9	1.2	1.2	0.9	0.7	1.1	0.5	0.6	0.6	0.9	0.9	0.6	0.3	0.4	1.5
2-Jan	0.4	0.5	0.7	1.0	0.9	1.0	0.7	0.6	0.7	1.3	1.0	0.9	0.9	0.9	1.0	0.7	0.7	0.7	0.7	1.0	1.0	0.7	0.7	0.8	1.3
3-Jan	0.7	0.8	0.7	0.5	0.8	0.9	0.6	0.7	0.7	0.8	0.6	0.8	0.9	0.8	0.7	0.9	1.0	1.0	0.8	1.0	0.7	0.6	0.5	0.5	1.0
4-Jan	0.4	0.6	0.4	0.5	0.5	0.5	0.5	0.7	0.4	0.5	0.4	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.6	0.7
5-Jan	0.5	0.4	0.4	0.6	0.7	0.7	1.3	0.8	0.7	0.5	0.6	0.8	0.5	0.8	0.5	0.4	0.4	0.5	0.3	0.4	0.9	0.7	0.9	1.0	1.3
6-Jan	0.7	1.1	1.6	1.2	1.1	0.8	1.1	1.0	1.2	1.0	0.6	1.0	1.1	1.1	1.0	0.9	0.9	0.8	1.1	1.2	1.0	1.1	0.7	0.9	1.6
7-Jan	1.1	0.7	0.7	0.6	0.9	0.8	0.6	0.6	0.3	0.1	0.2	0.3	0.4	0.2	0.4	0.4	0.3	0.4	0.6	0.3	0.4	0.4	0.7	0.4	1.1
8-Jan	0.7	1.0	0.5	1.2	UO	1.0	2.3	2.9	0.5	0.3	0.4	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.4	0.3	0.3	0.4	0.4	0.3	2.9
9-Jan	0.4	0.3	0.3	0.8	0.4	0.5	0.3	0.1	0.3	0.3	0.2	0.3	0.5	0.6	0.8	0.8	1.0	0.9	0.5	0.5	0.4	0.5	0.5	0.2	1.0
10-Jan	0.2	0.8	1.4	1.1	0.7	0.7	0.5	0.2	0.4	0.4	0.4	0.5	0.6	0.8	0.3	0.3	0.3	0.2	0.4	0.6	0.6	0.4	0.8	0.6	1.4
11-Jan	0.4	0.4	0.6	0.8	0.8	0.5	0.3	0.2	0.3	0.3	0.5	0.6	0.8	0.9	1.1	1.1	1.5	0.9	0.9	1.4	1.7	2.2	2.2	1.7	2.2
12-Jan	1.6	2.0	1.9	1.7	1.9	1.4	1.7	1.8	1.5	1.7	2.0	2.3	2.3	1.5	1.6	1.8	1.3	1.4	1.0	0.9	0.7	0.5	0.7	0.6	2.3
13-Jan	0.7	0.6	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.7	0.4	0.5	0.5	0.6	1.0	0.9	0.6	0.5	0.5	0.5	0.5	0.7	1.0	1.2	1.2
14-Jan	1.9	1.9	2.1	2.1	2.5	2.2	1.8	2.4	2.0	1.9	1.5	1.3	1.2	0.9	0.8	0.7	0.7	0.6	0.3	0.2	0.2	0.2	0.2	0.2	2.5
15-Jan	0.2	0.2	0.2	0.1	0.2	0.5	0.7	0.6	0.6	0.5	0.6	0.7	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.5	0.4	0.5	0.6	0.4	0.7
16-Jan	0.4	0.4	0.5	0.5	0.7	0.6	0.7	0.6	0.8	0.7	0.7	0.6	0.7	0.8	0.9	1.2	1.5	1.4	0.6	1.6	1.7	1.6	1.3	1.1	1.7
17-Jan	0.9	1.6	1.8	1.9	1.6	1.3	1.6	1.8	1.7	2.1	1.8	1.8	1.5	1.4	1.5	1.3	0.6	0.5	0.7	1.2	1.2	1.1	1.2	1.5	2.1
18-Jan	1.6	1.6	1.9	1.9	2.1	2.0	1.5	1.3	1.8	1.8	2.2	1.9	1.7	1.9	1.5	1.6	1.9	1.8	1.7	1.9	1.7	1.6	2.1	1.7	2.2
19-Jan	1.7	1.3	1.6	1.7	1.6	1.5	1.1	1.2	1.3	1.2	0.9	1.3	1.6	1.0	0.9	1.0	1.3	1.7	1.4	1.7	1.5	1.5	1.7	1.4	1.7
20-Jan	1.0	0.6	0.9	1.2	1.0	1.0	1.0	1.3	1.4	DF	DF	1.0	1.4	1.9	2.0	1.7	1.8	1.8	1.9	2.3	1.5	0.7	0.7	1.0	2.3
21-Jan	1.5	1.9	1.3	0.8	0.6	0.8	0.9	0.9	1.0	1.0	1.3	1.1	1.0	1.0	0.9	0.7	1.0	1.3	1.4	1.1	1.8	1.2	1.8	1.7	1.9
22-Jan	2.1	1.5	1.8	2.3	2.5	2.5	2.0	2.6	2.6	3.0	3.5	3.0	1.8	1.7	1.6	1.3	0.9	1.0	1.3	1.2	0.9	0.4	0.2	0.3	3.5
23-Jan	0.3	0.1	0.4	0.7	1.1	1.1	0.9	1.3	0.9	1.0	1.0	1.2	0.6	1.1	1.1	0.8	0.6	0.5	0.4	0.3	0.2	0.7	0.9	1.1	1.3
24-Jan	1.3	1.3	1.6	1.7	1.5	1.4	1.5	1.7	2.0	1.5	1.2	0.9	0.7	0.4	0.6	1.1	1.7	1.6	1.3	1.1	0.8	0.7	0.8	0.9	2.0
25-Jan	1.0	0.8	0.6	0.6	0.6	0.5	0.4	0.5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.0	1.3	2.0
26-Jan	1.4	1.4	1.4	2.1	2.9	2.1	2.7	3.7	3.3	3.9	2.9	2.2	1.3	1.4	1.0	1.1	1.6	1.7	2.6	2.3	2.6	2.4	2.3	1.9	3.9
27-Jan	1.8	2.0	2.1	1.9	1.6	1.0	1.1	1.5	1.5	1.8	1.4	1.5	1.3	0.8	0.6	0.5	1.0	0.5	0.5	0.3	0.4	0.7	0.8	0.3	2.1
28-Jan	1.1	2.9	2.8	2.8	2.5	2.5	2.6	2.7	2.8	2.5	2.8	DF	3.6	3.5	3.2	3.0	3.2	3.2	2.8	2.2	2.2	1.6	1.4	1.1	3.6
29-Jan	0.4	0.2	0.8	1.6	1.6	1.6	1.8	1.6	0.7	0.9	1.1	DF	DF	DF	DF	DF	DF	DF	0.5	0.5	0.5	0.6	0.6	DF	1.8
30-Jan	0.3	0.5	1.0	0.3	0.2	0.2	0.6	1.2	1.0	1.5	1.0	0.4	0.5	0.4	0.5	0.3	0.3	0.4	0.3	0.2	0.1	0.5	0.5	0.4	1.5
31-Jan	1.3	1.8	1.5	1.4	1.0	1.0	1.2	0.7	0.3	0.3	0.2	0.5	0.7	0.6	1.1	0.5	0.3	0.2	0.1	0.3	0.3	0.4	1.0	0.5	1.8
2.1 2.9 2.8 2.8 2.9 2.5 2.7 3.7 3.3 3.9 3.5 3.0 3.6 3.5 3.2 3.0 3.2 3.2 2.8 2.3 2.6 2.4 2.3 1.9																									
Diurnal Maximum																									
DF - DAS Failure																									
UO - Unstable Operation																									



Maximum Value: 2.6 km/h on Jan 18 14:00 Maximum Daily Average: 0.5 km/h on Jan 18																								Hours in Service: 744 Hours of Data: 693		
Minimum Value: -2.3 km/h on Jan 24 08:00 Minimum Daily Average: -0.8 km/h on Jan 12																								Hours of Missing Data: 51 Hours of Calibration: 0		
Maximum Diurnal Average: 0.1 km/h at hour 21 Minimum Diurnal Average: -0.2 km/h at hour 5																								Percent Operational Time: 93.2		
Monthly Average: 0.00 km/h Percentiles: P ₁ = -1.4 P ₁₀ = -0.8 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 1.7																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-0.5	0.1	0.0	-0.1	-0.6	-0.4	-0.1	-0.4	-0.4	-0.1	0.0	-0.1	0.4	0.5	-0.1	-0.4	-0.2	-0.2	-0.2	-0.6	-0.2	-0.2	-0.1	-0.1	-0.2	0.5
2-Jan	-0.2	0.4	-0.3	0.2	-0.3	0.0	0.0	-0.5	-0.1	-0.7	-0.2	0.4	0.7	0.7	0.9	0.6	0.5	-0.2	-0.3	-0.5	-0.3	0.0	-0.4	-0.1	0.0	0.9
3-Jan	-0.2	0.1	0.0	0.1	-0.4	-0.5	-0.3	0.2	-0.3	-0.4	-0.5	0.7	0.5	0.3	0.7	0.4	-0.3	0.1	0.1	0.0	0.3	0.0	0.0	0.3	0.0	0.7
4-Jan	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	0.1	0.2	0.1	0.0	-0.1	0.0	0.2	0.4	0.4	0.1	-0.1	-0.2	-0.2	-0.4	-0.4	-0.3	0.0	0.3	0.0	0.4
5-Jan	0.2	0.0	-0.5	0.4	-0.1	0.2	0.8	1.1	0.0	0.1	-0.3	0.3	0.9	0.5	-0.3	-0.2	-0.1	-0.2	-0.2	0.0	0.8	0.8	0.0	0.3	0.2	1.1
6-Jan	0.8	0.7	0.3	0.5	0.6	0.9	1.3	1.7	1.7	0.0	-0.5	-0.7	-0.9	-0.6	0.0	-0.3	-0.6	-0.5	0.4	0.8	1.2	0.7	0.3	-0.3	0.3	1.7
7-Jan	-0.1	0.1	-0.1	0.1	-0.1	-0.2	0.0	0.1	0.0	-0.1	0.0	-0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	-0.1	0.1	0.5	0.2	0.0	0.5
8-Jan	0.3	0.3	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.4	-0.1	0.0	-0.3	-0.1	-0.1	0.0	-0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.3
9-Jan	0.0	0.0	0.1	0.1	0.4	0.5	0.0	0.1	0.2	0.2	0.1	0.1	-0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.5
10-Jan	0.2	0.1	0.7	1.3	-0.2	0.0	0.2	0.1	0.0	0.3	0.1	-0.2	-0.1	-0.1	-0.1	0.1	0.0	0.1	0.4	0.4	0.2	0.1	0.2	0.5	0.2	1.3
11-Jan	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.2	-0.2	0.4	0.5	0.1	0.3	0.3	-0.7	-0.8	-0.8	0.0	0.5
12-Jan	-0.4	-1.2	-1.2	-0.8	-1.3	-1.0	-1.1	-0.9	-0.9	-0.4	-0.7	-1.0	-1.0	-1.3	-1.1	-1.1	-1.1	-1.1	-0.8	-0.9	-0.3	-0.2	0.0	-0.1	-0.8	0.0
13-Jan	-0.2	-0.6	0.2	0.1	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.2
14-Jan	UO	-0.2	-0.3	0.0	1.2	1.9	1.9	0.6	2.6	-0.1	2.1	1.0	-0.1	0.1	-0.2	-0.2	-0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.5	2.6
15-Jan	0.1	0.1	0.2	0.2	0.1	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.3
16-Jan	0.1	0.2	0.2	0.1	0.0	0.1	0.7	0.2	0.1	0.7	0.3	0.2	0.4	0.3	0.2	0.3	0.2	0.6	1.0	1.1	0.6	0.4	-0.4	-0.9	0.3	1.1
17-Jan	-0.6	-0.7	-0.6	-1.0	-1.0	-0.6	-0.8	-0.6	-0.4	-0.7	-0.6	-0.3	-0.2	-0.7	-0.3	-0.8	-0.6	-0.2	-0.2	0.0	0.0	-0.8	-1.1	-0.9	-0.6	0.0
18-Jan	-1.0	-1.0	-1.1	-1.0	-0.9	-0.8	-0.1	-0.3	-0.7	0.2	1.9	1.7	1.8	2.6	0.2	0.8	1.2	1.4	1.3	1.0	0.9	1.0	1.7	1.2	0.5	2.6
19-Jan	1.1	0.7	-0.1	-0.2	-0.7	-0.4	0.2	0.4	-0.3	-0.6	-0.7	-0.2	0.3	-0.1	-0.1	-0.4	0.0	-0.2	0.2	0.4	0.3	0.7	0.1	-0.3	0.0	1.1
20-Jan	-0.5	-0.7	-0.6	1.0	0.0	-0.5	-0.3	-0.2	-0.4	DF	DF	-0.1	0.6	1.0	0.5	-1.2	-0.3	-0.9	-0.7	-0.6	-0.6	-0.5	-0.3	-0.4	-0.3	1.0
21-Jan	-1.0	-1.7	-0.4	-0.1	-0.5	-0.3	0.7	0.3	0.0	0.5	0.5	0.5	0.1	0.4	-0.1	-0.4	-0.2	-0.3	-0.7	-0.7	-0.8	-0.6	-1.0	0.0	-0.2	0.7
22-Jan	0.8	0.2	-0.6	-1.4	-1.1	-1.3	-0.7	-1.3	-0.8	-1.0	0.9	0.6	0.5	0.5	0.7	0.6	0.4	0.5	0.6	0.7	0.1	0.1	0.1	0.0	0.0	0.9
23-Jan	-0.1	0.0	-0.1	0.1	-0.1	-0.4	0.3	0.2	0.3	1.0	1.0	0.8	0.3	0.3	0.0	0.2	0.1	0.4	0.1	0.1	0.1	0.0	0.1	0.1	0.2	1.0
24-Jan	-0.1	0.5	0.3	0.9	0.5	-0.8	-1.8	-2.3	0.7	-1.4	0.5	0.4	-0.1	0.3	0.2	0.4	0.4	0.6	0.6	0.4	0.3	0.1	0.3	0.0	0.0	0.9
25-Jan	0.1	0.0	0.4	0.1	-0.1	0.0	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4
26-Jan	UO	UO	UO	-0.7	-1.0	-0.7	0.2	1.2	1.1	1.7	0.7	0.0	0.1	0.5	0.2	0.5	0.9	0.3	0.9	0.5	0.3	0.6	0.9	0.8	0.4	1.7
27-Jan	0.5	0.7	0.7	0.9	0.7	0.5	0.7	0.8	0.9	0.2	-0.2	-0.2	0.3	-0.3	-0.3	0.0	0.1	0.1	0.1	-0.1	-0.3	-0.6	-0.2	-0.4	0.2	0.9
28-Jan	-0.5	-0.8	-1.1	-1.1	-1.4	-1.3	-1.0	-1.3	-1.2	-1.0	-0.7	DF	-0.9	-1.5	-1.4	-1.5	-1.0	-1.1	-0.9	0.5	0.8	0.3	0.2	0.2	-0.8	0.8
29-Jan	-0.1	-0.1	-0.4	-1.2	-2.0	-2.1	0.3	-0.3	-0.3	-0.4	-0.5	DF	DF	DF	DF	DF	DF	DF	DF	-0.3	-0.2	-0.3	0.1	-0.3	DF	0.3
30-Jan	-0.3	0.1	0.0	0.1	0.0	0.0	-0.1	-0.1	-1.1	-1.0	-0.4	-0.3	-0.3	-0.3	-0.1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.2	-0.1	0.3
31-Jan	0.7	0.8	-0.2	0.5	0.7	0.7	0.9	0.4	0.1	0.2	0.1	0.1	-0.2	-0.5	0.3	0.0	0.1	0.3	0.1	0.1	0.2	0.1	0.3	-0.1	0.2	0.9
0.0																								Diurnal Average		
1.1																								Diurnal Maximum		
DF - DAS Failure UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 100 m (VW100m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.4 km/h on Jan 26 10:00 Minimum Value: 0.2 km/h on Jan 23 02:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.9 Q ₃ = 1.5 P ₉₀ = 2.0 P ₉₉ = 3.2																				Hours in Service: 744 Hours of Data: 698 Hours of Missing Data: 51 Hours of Calibration: 0 Percent Operational Time: 93.2						
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.9	0.7	1.3	1.3	1.5	0.5	1.1	1.1	0.9	1.0	1.1	1.2	1.3	1.3	0.9	1.2	0.7	0.7	0.7	1.1	1.1	0.7	0.4	0.4	1.5	
2-Jan	0.5	0.9	0.9	1.0	1.1	1.6	0.9	0.6	0.7	1.2	0.7	0.7	0.7	1.0	0.9	0.9	1.0	0.7	0.5	0.7	1.1	0.8	0.8	1.0	1.6	
3-Jan	0.7	0.8	0.9	0.5	0.7	0.9	0.6	0.5	0.6	0.7	0.5	0.8	1.3	0.8	0.9	0.9	1.1	1.0	0.9	0.9	0.7	0.6	0.6	0.7	1.3	
4-Jan	0.5	0.7	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.7	0.7	0.7	0.7	0.7	0.4	0.8	0.8	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.8	
5-Jan	0.7	0.6	0.6	0.8	0.8	0.7	1.3	0.9	0.7	0.6	0.7	0.6	0.8	0.7	0.5	0.3	0.3	0.4	0.3	0.6	0.9	0.9	0.8	0.9	1.3	
6-Jan	0.9	1.2	1.7	1.3	1.3	1.1	1.5	1.4	1.5	1.6	0.8	1.5	1.2	1.3	1.2	0.6	0.5	0.9	1.2	1.1	1.2	1.0	0.8	1.4	1.7	
7-Jan	1.7	0.9	0.5	0.7	0.6	0.9	0.8	0.6	0.5	0.3	0.5	0.3	0.4	0.3	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.6	0.3	1.7	
8-Jan	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.5	0.6	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.7	
9-Jan	0.5	0.4	0.5	0.8	0.6	0.8	0.6	0.3	0.6	0.7	0.4	0.3	0.5	0.9	1.0	1.0	1.1	1.0	0.5	0.5	0.4	0.6	0.5	0.4	1.1	
10-Jan	0.3	0.9	1.5	1.4	0.8	1.0	0.6	0.4	0.8	0.8	0.5	0.6	0.7	0.6	0.4	0.3	0.3	0.2	0.5	0.6	0.7	0.3	0.4	0.5	1.5	
11-Jan	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.8	0.9	1.1	1.5	1.8	1.2	1.2	1.6	2.0	2.3	2.2	1.8	2.3	
12-Jan	1.6	1.8	1.9	1.7	1.6	1.3	1.4	1.7	1.3	1.5	1.6	1.6	1.8	1.1	1.1	1.1	0.9	0.9	0.9	0.7	0.8	0.6	0.8	0.4	1.9	
13-Jan	0.7	0.6	0.4	0.2	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.7	
14-Jan	UO	1.9	1.9	1.7	2.1	1.9	1.9	2.8	2.3	1.9	1.6	1.6	1.4	1.0	0.8	0.7	0.7	0.5	0.4	0.2	0.3	0.2	0.2	0.2	2.8	
15-Jan	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.5	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.6	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.7	
16-Jan	0.2	0.4	0.3	0.3	0.4	0.4	0.7	0.3	0.5	0.5	0.5	0.5	0.7	0.8	1.4	1.7	2.2	2.1	1.4	2.1	1.6	2.0	1.4	0.7	2.2	
17-Jan	0.9	1.2	1.6	1.5	1.4	1.2	1.4	1.7	1.7	1.8	1.8	1.9	1.7	1.3	1.6	1.3	0.6	0.5	0.4	1.3	0.9	0.7	1.2	1.4	1.9	
18-Jan	1.3	1.4	1.6	1.9	2.0	2.2	2.1	1.8	2.1	2.2	2.7	2.2	2.0	2.4	1.8	1.8	1.9	1.5	1.6	2.1	2.2	2.0	2.1	2.1	2.7	
19-Jan	2.1	1.8	2.0	2.0	1.5	1.5	1.3	1.5	1.4	1.3	1.3	1.5	1.4	1.5	1.0	0.9	1.3	1.6	1.4	1.7	2.5	1.9	2.1	2.0	2.5	
20-Jan	1.3	0.8	0.6	1.5	0.9	0.9	1.1	1.8	1.6	DF	DF	0.9	1.0	1.2	1.4	0.9	1.3	1.1	1.0	1.4	2.0	1.3	0.9	1.0	2.0	
21-Jan	1.7	1.6	1.7	0.8	0.8	0.7	0.6	1.0	0.7	1.0	1.0	0.8	0.8	1.0	1.0	0.7	1.0	1.1	1.7	1.3	1.5	0.7	0.6	1.1	1.7	
22-Jan	1.5	1.4	2.0	2.6	2.7	2.5	2.0	3.2	2.7	3.1	4.1	3.2	1.9	1.7	1.7	1.5	0.9	1.1	1.8	1.5	0.9	0.5	0.3	0.5	4.1	
23-Jan	0.4	0.2	0.6	1.1	1.0	1.3	1.4	1.2	1.4	1.1	1.6	1.4	0.7	0.9	0.9	0.7	0.6	0.6	0.3	0.3	0.8	0.9	1.2	1.6	1.6	
24-Jan	1.1	1.2	1.7	1.5	1.3	1.7	2.1	2.2	2.0	2.2	1.9	1.2	0.5	0.4	0.5	1.0	1.8	2.0	1.5	1.5	1.0	0.7	0.7	0.6	2.2	
25-Jan	0.9	0.5	0.5	0.4	0.4	0.3	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.9	
26-Jan	UO	UO	UO	2.4	3.0	2.2	2.7	3.7	3.7	4.4	3.0	2.3	1.2	1.6	1.2	1.1	2.0	2.0	3.1	2.8	3.0	2.7	2.1	2.1	4.4	
27-Jan	1.8	2.1	2.0	1.8	1.7	1.0	1.1	1.8	1.8	1.7	1.5	1.6	1.4	0.8	0.5	0.7	0.8	0.6	0.9	0.4	0.9	0.9	1.2	0.8	2.1	
28-Jan	1.4	2.0	1.7	2.3	1.9	1.9	2.2	2.0	2.0	2.2	2.8	DF	3.5	3.1	2.8	2.6	2.4	2.4	2.3	2.1	2.1	1.6	1.1	0.9	3.5	
29-Jan	0.7	0.4	0.7	1.0	1.7	1.6	2.0	2.2	0.7	0.9	0.8	DF	DF	DF	DF	DF	DF	DF	DF	0.8	0.9	0.7	1.0	0.7	DF	2.2
30-Jan	0.4	0.9	1.5	0.5	0.3	0.3	0.8	1.4	1.5	1.6	0.9	0.5	0.4	0.2	0.2	0.3	0.5	0.5	0.3	0.3	0.2	0.3	0.3	0.4	1.6	
31-Jan	1.7	2.4	2.0	1.9	1.0	1.2	1.6	1.0	0.5	0.4	0.4	0.8	0.7	0.7	1.0	0.4	0.3	0.4	0.3	0.2	0.3	0.3	0.4	0.7	2.4	
Diurnal Maximum																										
DF - DAS Failure UO - Unstable Operation																										



Maximum Value: 3.8 km/h on Jan 20 15:00																				Maximum Daily Average: 1.5 km/h on Jan 20					Hours in Service:	744	
Minimum Value: -3.8 km/h on Jan 24 08:00																				Minimum Daily Average: -0.8 km/h on Jan 12					Hours of Data:	657	
Maximum Diurnal Average: 0.5 km/h at hour 20																				Minimum Diurnal Average: 0.1 km/h at hour 10					Hours of Missing Data:	87	
Monthly Average: 0.30 km/h																				Percentiles: P ₁ = -1.4 P ₁₀ = -0.4 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 3.0					Hours of Calibration:	0	
																									Percent Operational Time:	88.3	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4	0.3	0.8	0.7	0.1	0.2	0.3	0.6	0.4	0.0	0.3	0.3	0.1	0.3	--	0.8	
2-Jan	0.3	0.1	-0.3	0.1	0.2	-0.3	0.1	-0.5	0.4	-1.0	-0.2	0.1	-0.2	0.3	0.3	-0.1	0.2	0.1	0.5	0.3	-0.2	-0.1	-0.3	-0.3	0.0	0.5	
3-Jan	-0.3	0.2	0.0	-0.1	0.0	-0.3	-0.1	-0.1	-0.2	-0.1	-0.2	0.4	0.7	0.3	0.6	0.0	-0.5	-0.5	-0.1	-0.3	-0.1	-0.1	0.2	0.1	0.0	0.7	
4-Jan	0.3	0.2	0.4	0.3	0.2	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.2	0.0	0.1	0.3	0.3	0.3	0.1	0.1	0.1	0.3	0.2	0.2	0.4	
5-Jan	-0.2	-0.2	-0.3	0.1	-0.2	-0.2	0.8	0.8	0.1	-0.1	-0.4	0.6	0.4	1.5	0.7	0.6	0.3	-0.1	-0.1	0.7	1.0	1.4	0.7	1.2	0.4	1.5	
6-Jan	1.0	1.1	0.6	0.9	1.1	1.6	2.2	2.1	2.8	0.4	-0.1	-1.5	-1.5	-0.9	-0.7	-0.1	-0.2	-0.3	0.1	0.5	0.9	0.3	0.0	0.2	0.4	2.8	
7-Jan	0.3	0.1	0.3	0.1	0.3	0.5	0.8	0.2	0.2	0.4	0.4	UO	UO	UO	UO	UO	UO	UO	UO	0.1	0.1	0.3	0.1	-0.3	--	0.8	
8-Jan	-0.6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	-0.3	-0.3	0.0	0.1	0.5	0.3	0.2	UO	UO	UO	--	0.5	
9-Jan	UO	UO	UO	UO	-0.2	0.0	-0.2	0.0	0.3	0.4	-0.1	0.0	-0.2	0.4	0.6	0.2	0.4	0.2	0.2	0.1	0.1	0.3	0.4	0.1	0.1	0.6	
10-Jan	0.2	0.0	1.2	1.5	0.3	0.3	0.4	0.2	0.0	0.5	0.2	-0.2	-0.1	0.0	0.1	0.0	0.0	0.2	0.4	0.5	0.4	0.3	0.3	0.7	0.3	1.5	
11-Jan	0.2	0.1	0.2	0.4	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.6	0.1	0.9	1.0	0.5	0.9	0.4	-0.8	-0.9	-1.1	0.2	1.0	
12-Jan	-0.7	-1.3	-1.1	-0.5	-1.4	-1.3	-1.0	-1.2	-1.0	-0.7	-0.6	-1.0	-1.4	-1.2	-1.0	-1.0	-0.9	-0.9	-0.8	-0.5	-0.1	0.1	0.3	0.1	-0.8	0.3	
13-Jan	0.2	-0.1	0.1	0.1	0.1	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.2	
14-Jan	UO	-0.8	-0.7	-0.3	2.0	2.9	3.3	1.3	3.0	0.7	2.4	1.3	0.0	0.3	0.4	0.4	0.2	0.7	0.2	0.1	0.1	0.0	0.1	0.2	0.8	3.3	
15-Jan	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.4	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.4	
16-Jan	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.1	0.1	0.4	0.6	0.6	0.7	0.3	1.0	1.6	1.8	1.1	0.5	-0.3	-0.4	0.3	1.8	
17-Jan	-0.3	-0.2	-0.1	-0.5	-0.6	-0.2	-0.5	-0.5	-0.3	-0.6	-0.5	0.2	0.2	-0.2	0.0	-0.5	-0.3	0.0	0.0	0.2	0.0	-0.2	-0.9	-0.8	-0.3	0.2	
18-Jan	-1.0	-0.9	-1.0	-0.9	-0.5	0.3	0.4	0.1	-0.3	0.7	3.4	2.7	2.7	3.7	0.8	1.0	1.9	2.0	1.4	1.4	1.1	1.1	2.1	2.3	1.0	3.7	
19-Jan	1.7	1.5	0.3	-0.1	-0.9	-0.3	-0.3	-0.1	0.0	0.0	0.4	0.5	2.0	0.9	0.9	0.5	1.2	1.5	1.5	2.5	2.6	2.4	1.7	0.4	0.9	2.6	
20-Jan	0.6	0.5	0.8	3.6	1.4	0.5	0.7	0.8	0.7	DF	DF	1.0	2.1	3.7	3.8	1.3	1.8	1.6	2.3	3.1	0.6	0.4	0.8	0.3	1.5	3.8	
21-Jan	-0.4	-0.4	0.4	0.1	0.6	-0.2	0.1	0.3	0.4	0.2	0.0	0.7	0.0	0.2	0.5	0.5	0.6	0.7	0.2	0.1	0.9	1.5	1.3	2.0	0.4	2.0	
22-Jan	1.8	1.2	0.7	-0.4	-0.1	0.0	1.0	0.6	1.1	0.1	1.6	0.8	0.6	0.5	0.5	0.6	0.1	0.7	0.7	1.1	0.4	0.2	0.0	0.1	0.6	1.8	
23-Jan	0.1	0.0	-0.1	0.2	-0.2	-0.5	0.6	-0.4	0.4	0.6	1.3	1.1	0.1	0.1	-0.1	0.1	0.0	0.3	0.1	0.1	0.0	0.0	0.3	0.3	0.2	1.3	
24-Jan	0.2	0.8	0.7	1.7	0.4	-1.2	-3.2	-3.8	1.2	-2.9	0.8	0.6	0.3	0.2	0.2	0.6	0.6	0.2	0.4	0.3	0.2	0.2	0.4	0.2	0.0	1.7	
25-Jan	0.2	-0.1	-0.2	0.1	0.1	0.0	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.2	
26-Jan	UO	UO	UO	1.3	0.5	0.4	0.4	1.3	1.2	2.0	0.4	0.3	0.0	0.3	0.1	0.4	0.8	0.3	0.9	0.4	0.4	0.3	0.5	0.8	0.6	2.0	
27-Jan	0.3	0.5	0.6	0.7	0.6	0.4	0.7	0.6	1.0	0.4	-0.2	-0.1	0.5	-0.2	0.0	0.2	0.4	0.3	0.3	0.2	0.3	0.1	0.2	0.1	0.3	1.0	
28-Jan	0.5	0.8	0.4	0.2	0.0	0.0	0.1	0.3	0.2	0.2	0.2	DF	-0.1	-0.3	-0.4	-0.4	-0.1	0.0	0.3	0.9	1.0	0.3	0.2	0.7	0.2	1.0	
29-Jan	0.8	0.4	0.4	0.2	-0.7	-1.4	2.5	1.7	0.4	0.4	0.2	DF	DF	DF	DF	DF	DF	DF	DF	0.6	0.2	0.4	0.3	0.2	DF	--	2.5
30-Jan	0.2	0.4	0.3	0.2	0.1	0.0	0.3	0.7	0.1	0.2	0.4	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.3	0.5	0.2	0.7	
31-Jan	1.0	0.4	-0.5	0.1	0.6	0.8	0.6	0.5	0.4	0.5	0.0	0.1	-0.3	-0.5	0.0	0.1	0.1	0.0	0.0	0.2	0.1	0.3	0.5	0.4	0.2	1.0	
																								Diurnal Average			
																								Diurnal Maximum			
0.2 0.2 0.1 0.3 0.1 0.1 0.4 0.2 0.5 0.1 0.4 0.3 0.3 0.4 0.3 0.2 0.3 0.4 0.5 0.5 0.4 0.4 0.3 0.3																											
1.8 1.5 1.2 3.6 2.0 2.9 3.3 2.1 3.0 2.0 3.4 2.7 2.7 3.7 3.8 1.3 1.9 2.0 2.3 3.1 2.6 2.4 2.1 2.3																											
DF - DAS Failure UO - Unstable Operation																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 163 m (VW163m) - km/h
Lower Camp Met Tower - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.3 km/h on Jan 26 10:00 Minimum Value: 0.1 km/h on Jan 25 07:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.5 P ₉₀ = 2.1 P ₉₉ = 3.3																				Hours in Service: 744 Hours of Data: 657 Hours of Missing Data: 87 Hours of Calibration: 0 Percent Operational Time: 88.3						
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.7	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.6	1.4	1.5	1.6	1.2	0.7	0.9	0.7	0.8	0.8	1.1	1.0	0.8	1.0	1.6	
2-Jan	0.8	1.0	0.9	1.0	1.1	2.0	1.2	0.7	0.8	1.4	0.9	0.6	0.8	1.0	0.8	1.1	1.0	0.7	0.8	1.1	0.8	0.7	0.9	0.8	2.0	
3-Jan	0.8	0.6	1.2	0.4	0.7	0.8	0.9	0.8	0.8	0.8	0.6	1.0	1.6	0.8	1.0	0.9	1.3	1.2	1.0	1.2	0.9	0.7	1.2	0.7	1.6	
4-Jan	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.8	0.6	0.7	0.5	0.6	0.7	1.0	1.0	0.8	0.8	0.8	0.8	0.7	0.6	1.0	
5-Jan	0.6	0.4	0.8	0.7	0.8	1.1	1.4	1.0	0.8	0.9	0.6	1.1	0.8	0.8	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	1.4	
6-Jan	0.8	1.0	1.1	1.5	1.7	1.6	1.7	1.6	1.3	1.7	1.3	1.7	1.2	1.2	1.0	0.4	0.3	0.6	1.2	1.7	1.3	1.4	1.0	2.0	2.0	
7-Jan	2.3	1.0	0.8	0.8	1.0	0.9	0.7	0.4	0.6	0.3	0.4	UO	UO	UO	UO	UO	UO	UO	UO	0.3	0.7	1.0	0.4	0.4	2.3	
8-Jan	0.3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.7	0.3	0.6	0.3	0.5	0.7	0.4	UO	UO	UO	0.7	
9-Jan	UO	UO	UO	UO	0.4	0.7	0.6	0.5	0.6	1.0	0.6	0.3	0.6	1.1	0.9	1.0	1.0	0.9	0.5	0.4	0.4	0.6	0.5	0.5	1.1	
10-Jan	0.5	1.3	1.6	1.6	1.1	1.3	0.7	0.4	0.9	1.1	0.7	0.5	0.8	0.7	0.5	0.4	0.3	0.3	0.5	0.6	0.6	0.4	0.4	0.6	1.6	
11-Jan	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.4	0.7	0.7	0.9	1.4	1.8	1.5	1.3	1.6	1.8	1.7	1.6	1.5	1.8	
12-Jan	1.3	1.3	1.6	2.0	1.4	1.3	0.9	0.9	0.7	0.6	0.8	0.5	0.6	0.7	0.9	0.8	0.7	0.8	0.9	0.8	0.9	0.7	0.8	0.3	2.0	
13-Jan	0.4	0.6	0.6	0.4	0.4	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.6	
14-Jan	UO	2.1	1.9	1.8	2.2	1.9	2.1	3.1	2.5	1.8	1.7	1.6	1.4	0.9	1.0	0.8	0.8	0.5	0.3	0.2	0.2	0.2	0.2	0.3	3.1	
15-Jan	0.2	0.1	0.2	0.1	0.2	0.4	0.3	0.5	0.2	0.2	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	
16-Jan	0.3	0.5	0.4	0.3	0.3	0.5	0.5	0.3	0.6	0.6	0.5	0.5	0.7	0.7	1.6	1.8	2.3	2.0	1.8	2.3	2.1	2.4	1.4	0.6	2.4	
17-Jan	0.9	1.0	1.3	1.2	1.4	1.1	1.1	1.3	1.4	1.3	1.6	1.6	1.5	1.1	1.7	1.3	0.8	0.5	0.6	0.7	0.5	0.6	0.6	0.8	1.7	
18-Jan	0.7	0.6	1.0	1.5	2.1	2.1	2.3	2.1	2.1	2.3	2.6	2.6	2.4	2.7	2.3	1.7	1.8	1.8	1.9	2.5	2.3	2.1	1.9	1.9	2.7	
19-Jan	1.6	1.3	1.3	1.4	1.1	1.3	1.0	1.1	1.5	1.4	1.2	1.2	1.2	1.2	1.1	1.1	1.5	1.8	1.7	1.8	1.9	2.2	2.5	2.4	2.5	
20-Jan	1.5	1.1	0.7	1.6	0.9	0.9	1.4	1.7	1.6	DF	DF	1.2	1.2	0.9	1.2	1.1	1.6	1.2	1.1	1.2	1.8	1.1	1.0	1.1	1.8	
21-Jan	1.2	0.8	1.2	1.0	0.9	0.7	0.8	1.0	0.8	0.9	1.0	1.0	0.9	1.0	0.7	0.8	1.1	1.0	1.9	1.3	1.1	0.7	0.6	1.0	1.9	
22-Jan	1.8	1.8	1.9	2.3	3.2	2.3	2.1	2.6	2.1	3.1	3.8	3.3	1.8	2.0	1.9	1.6	0.8	1.1	1.4	1.4	0.9	0.6	0.4	0.5	3.8	
23-Jan	0.6	0.3	0.7	1.1	0.6	1.4	1.6	1.3	1.5	1.0	1.5	1.4	0.8	0.7	0.8	0.7	0.5	0.6	0.4	0.4	0.8	0.9	1.2	1.6	1.6	
24-Jan	1.2	1.4	1.6	1.8	1.4	2.3	1.9	2.7	2.6	3.4	2.1	1.1	0.5	0.7	0.6	0.8	1.7	2.0	1.8	1.5	1.2	1.0	0.8	0.5	3.4	
25-Jan	0.5	0.5	0.6	0.4	0.4	0.4	0.1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.6	
26-Jan	UO	UO	UO	2.6	2.7	2.0	2.8	3.8	4.1	4.3	3.0	2.2	1.2	1.6	1.3	1.0	2.1	2.3	3.3	3.2	3.4	2.9	2.1	2.4	4.3	
27-Jan	2.0	2.1	2.2	1.7	1.7	0.9	1.1	1.8	1.9	1.9	1.5	1.3	1.7	0.7	0.6	0.6	0.9	0.8	1.0	0.6	1.1	1.0	1.0	0.9	2.2	
28-Jan	1.1	1.3	1.4	1.9	1.7	1.7	1.7	1.4	1.8	1.8	2.7	DF	3.4	3.2	2.7	2.3	2.4	2.3	2.3	2.2	2.0	1.6	1.4	0.9	3.4	
29-Jan	0.6	0.4	0.6	0.7	1.2	1.0	2.0	1.9	1.0	0.9	0.8	DF	DF	DF	DF	DF	DF	DF	DF	1.2	1.0	0.7	1.2	0.8	DF	2.0
30-Jan	0.6	0.8	1.5	0.9	0.3	0.3	0.7	0.7	1.1	0.6	0.5	0.4	0.3	0.3	0.2	0.3	0.5	0.4	0.4	0.2	0.2	0.4	0.4	0.7	1.5	
31-Jan	2.1	2.5	2.3	2.2	0.9	1.1	1.5	1.0	0.6	0.4	0.4	0.9	0.6	0.7	0.6	0.6	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	2.5	
Diurnal Maximum																										
DF - DAS Failure UO - Unstable Operation																										



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04 BUFFALO VIEWPOINT JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	12.6	0	1.6	0
H2S (ppb) Average	707	37	37	100	3.2	0	1.1	0
THC (ppm) Average	710	34	34	100	3.8	-	2.7	-
NMHC(ppm) Average	710	34	34	100	0.634	-	0.068	-
CH4(ppm) Average	710	34	34	100	3.7	-	2.6	-
O3(ppb) Average	709	35	35	100	34.3	0	31.3	-
NO2(ppb) Average	705	37	39	99.73	40.2	0	20.3	-
NO(ppb) Average	705	37	39	99.73	90	-	30.3	-
NOX(ppb) Average	705	37	39	99.73	119	-	50.6	-
PM2.5(ug/m3) Average	743	1	1	100	161.7	5	44.9	1
Temperature (C) Average	744	0	0	100	3.2	-	-1.5	-
Relative Humidity (%) Average	744	0	0	100	95.6	-	92.2	-
Wind Speed 10 m (km/h) Average	730	0	14	98.12	30	-	17	-
Wind Direction 10 m (deg) Average	730	0	14	98.12	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	0.38	0.8	-	0	0	0.1	0.2	0.3	0.8	12.6
H2S (ppb) Average	707	0.3	0.4	-	0	0	0.1	0.2	0.3	0.7	3.2
THC (ppm) Average	710	2.12	0.2	-	1.9	2	2	2.1	2.1	2.3	3.8
NMHC(ppm) Average	710	0.007	0.039	-	0	0	0	0	0	0	0.634
CH4(ppm) Average	710	2.12	0.2	-	1.9	2	2	2.1	2.1	2.3	3.7
O3(ppb) Average	709	17.48	9	-	1.2	3.2	10.9	18.5	23.5	30.6	34.3
NO2(ppb) Average	705	8.17	7.9	-	0	0.7	1.9	5.3	12.3	20.4	40.2
NO(ppb) Average	705	4.46	11.1	-	0	0	0.1	0.6	2	11.7	90
NOX(ppb) Average	705	12.63	17.5	-	0	0.9	2.1	5.9	15.1	31.5	119
PM2.5(ug/m3) Average	743	10.32	11.8	-	0.7	2.1	3.8	8	13.1	19.5	161.7
Temperature 2 m (C) Average	744	-10.19	5.7	-	-27.7	-18.9	-12.6	-9	-7.4	-4	3.2
Relative Humidity (%) Average	744	85.03	7.8	-	56.5	73	82.3	87.5	90.7	92.2	95.6
Wind Speed 10 m (km/h) Average	730	7.5	4	-	0	3	5	7	9	13	30
Wind Direction 10 m (deg) Average	730	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2	04 Jan 2023 14:00	04 Jan 2023 15:00	2	Unstable Operation - excessive baseline drift
Wind Speed, Wind Direction	06 Jan 2023 03:00	06 Jan 2023 05:00	3	Flat line in sensor output signal
Wind Speed, Wind Direction	07 Jan 2023 20:00	07 Jan 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Jan 2023 00:00	08 Jan 2023 00:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Jan 2023 17:00	08 Jan 2023 18:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	08 Jan 2023 22:00	08 Jan 2023 23:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	09 Jan 2023 08:00	09 Jan 2023 08:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	09 Jan 2023 11:00	09 Jan 2023 11:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	10 Jan 2023 17:00	10 Jan 2023 18:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Jan 2023 04:00	15 Jan 2023 04:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 12.6 ppb on Jan 24 15:00	Maximum Daily Average: 1.6 ppb on Jan 31		Hours of Data:	710
Minimum Value: 0.0 ppb on Jan 2 22:00	Minimum Daily Average: 0.0 ppb on Jan 22		Hours of Missing Data:	34
Maximum Diurnal Average: 0.8 ppb at hour 15	Minimum Diurnal Average: 0.3 ppb at hour 3		Hours of Calibration:	34
Monthly Average: 0.38 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.8 P ₉₉ = 3.1		Percent Operational Time:	100.0

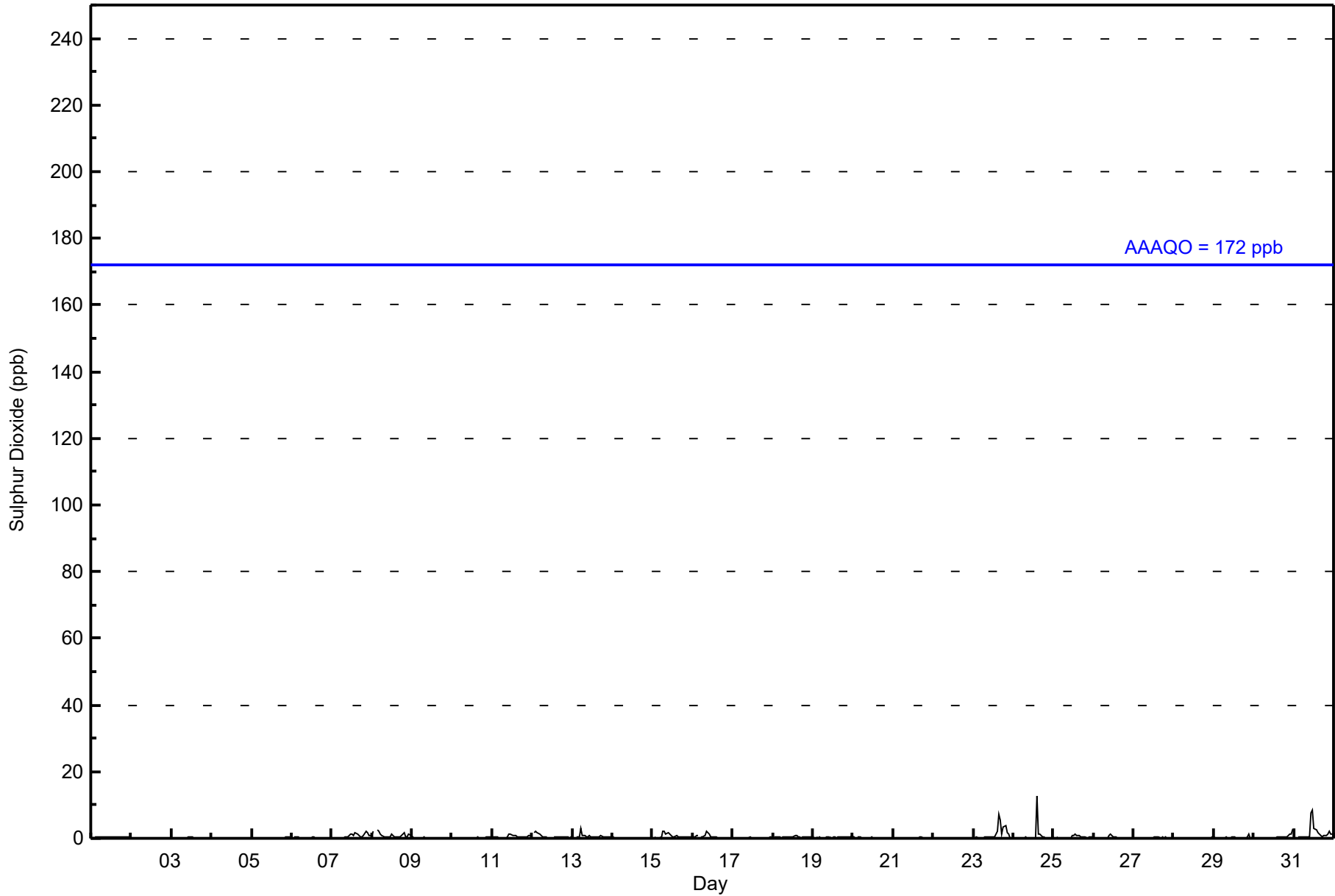
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.2	Z	0.3	0.3	0.2	0.3	0.3	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.5	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.5																							
2-Jan	0.2	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2																						
3-Jan	0.1	0.0	0.0	Z	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																						
4-Jan	0.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
5-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.1	0.3																							
6-Jan	Z	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.3																							
7-Jan	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.0	0.3	0.4	0.9	1.2	1.3	0.9	1.9	1.3	0.8	0.5	0.5	0.7	2.2	1.6	0.9	0.9	0.7	2.2																							
8-Jan	0.8	2.3	Z	2.6	2.1	1.1	0.8	0.6	0.4	0.4	0.4	0.5	1.1	0.5	0.4	0.4	0.3	0.6	1.4	1.5	0.5	0.5	1.2	0.8	0.9	2.6																							
9-Jan	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.3	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																							
10-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.3	0.1	0.4																							
11-Jan	0.4	0.5	0.4	0.3	0.2	Z	0.2	0.2	0.1	0.3	1.1	1.5	1.0	0.7	0.7	0.5	0.6	0.5	0.3	0.3	0.4	0.5	0.6	0.7	0.5	1.5																							
12-Jan	Z	1.9	1.9	1.6	1.2	0.6	0.5	0.4	0.3	0.3	C	C	C	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	1.9																							
13-Jan	0.3	Z	0.4	0.3	0.4	2.8	0.8	0.6	0.4	0.5	0.6	0.4	0.4	0.5	0.4	0.4	0.3	1.0	0.4	0.3	0.3	0.2	0.3	0.3	0.5	2.8																							
14-Jan	0.2	0.2	Z	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2																							
15-Jan	0.0	0.0	0.5	Z	0.3	0.2	2.3	2.0	1.5	1.5	1.2	0.7	0.5	0.6	0.8	0.6	0.5	0.3	0.4	0.5	0.4	0.5	0.6	0.6	0.7	2.3																							
16-Jan	0.5	0.6	0.6	0.6	Z	0.6	0.5	1.0	2.3	1.8	1.1	0.6	0.5	0.5	0.6	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.6	2.3																							
17-Jan	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.3																							
18-Jan	Z	0.3	0.3	0.3	0.4	0.2	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.7	0.7	0.5	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.3	0.7																							
19-Jan	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.3	0.4	0.4	0.6	0.7	0.3	0.7																							
20-Jan	0.4	0.4	Z	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.2	0.2	0.4																							
21-Jan	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																							
22-Jan	0.0	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
23-Jan	0.0	0.0	0.3	0.1	0.0	Z	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.6	2.2	7.3	5.4	1.3	3.2	4.0	1.5	1.3	0.2	0.1	1.3	7.3																							
24-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	12.6	1.4	1.5	0.5	0.2	0.2	0.2	0.2	0.1	0.1	0.8	12.6																							
25-Jan	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.7	1.2	0.6	0.8	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	1.2																							
26-Jan	0.2	0.2	Z	0.0	0.0	0.0	0.2	0.1	0.2	0.9	1.2	0.8	0.5	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.2	1.2																							
27-Jan	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.0	0.0	0.1	0.0	0.1	0.4																							
28-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.4																							
29-Jan	0.4	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.3	1.1	0.2	0.2	1.1																							
30-Jan	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.6	0.6	0.6	1.3	1.3	2.7	0.4	2.7																							
31-Jan	2.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.6	7.5	8.6	3.1	2.4	1.6	1.2	0.8	0.6	0.8	0.9	1.3	1.9	1.4	1.1	1.6	8.6																							
																								0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.4	0.4	0.8	0.6	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	Diurnal Average		
																								2.2	2.3	1.9	2.6	2.1	2.8	2.3	2.0	2.3	1.8	7.5	8.6	3.1	2.4	12.6	7.3	5.4	1.3	3.2	4.0	2.2	1.9	1.4	2.7	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	709	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	75	56	22	5	8	17	67	213	72	33	17	37	23	18	19	14	696
11 - 20	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	57	22	5	8	17	67	213	72	33	17	37	23	18	19	14	697

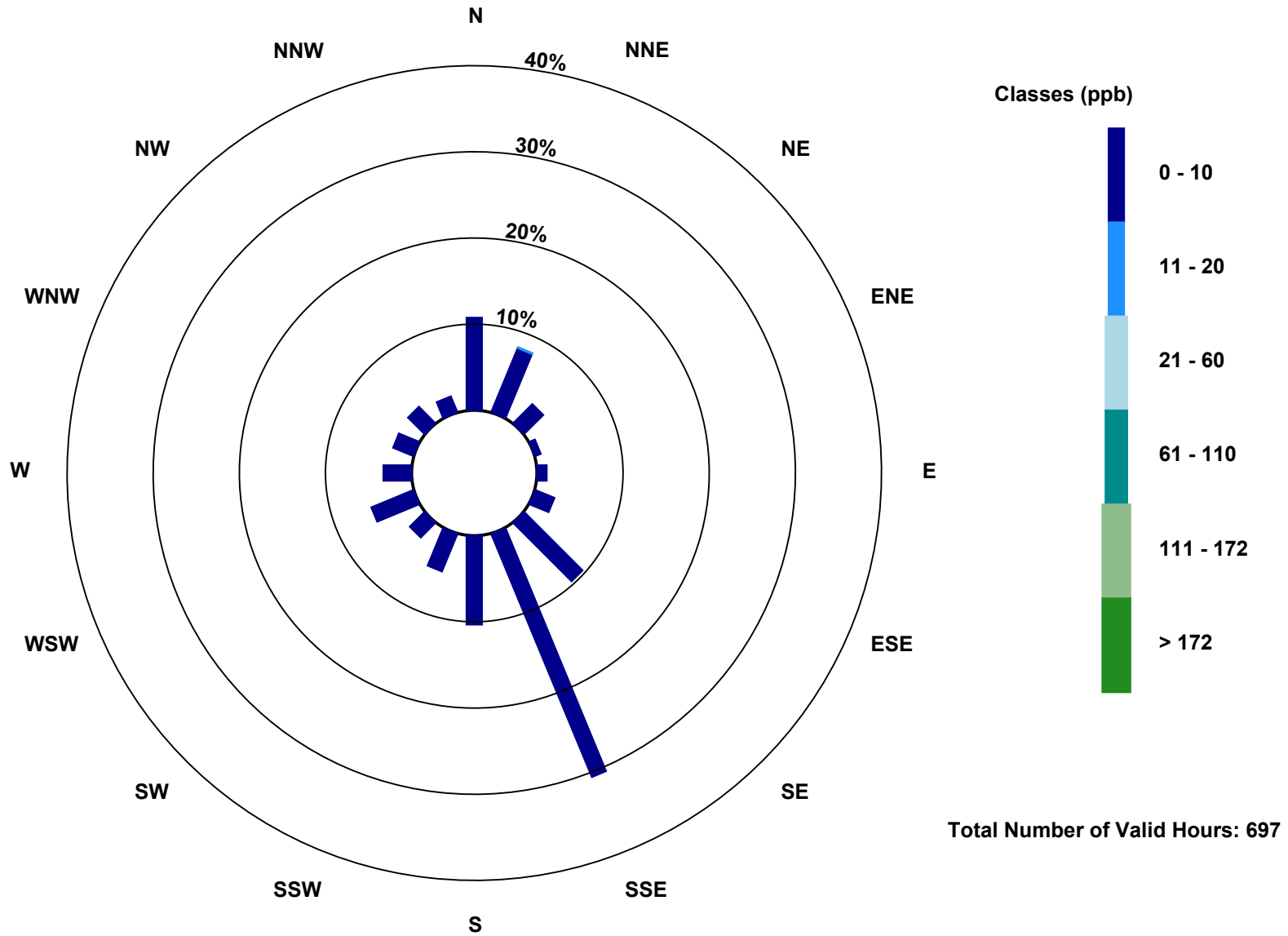
Total Number of Valid Hours: 697

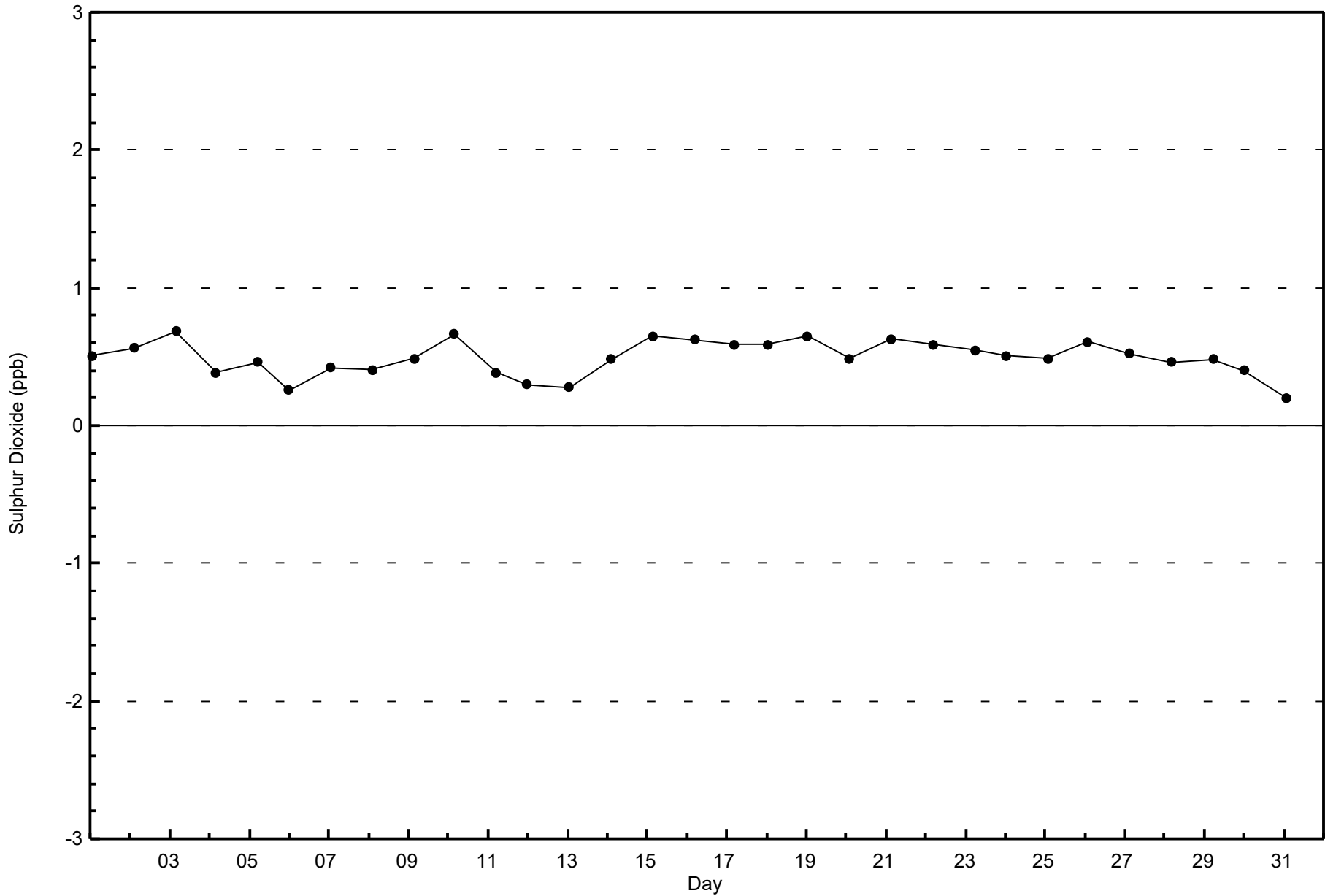
Total Number of Hours: 744

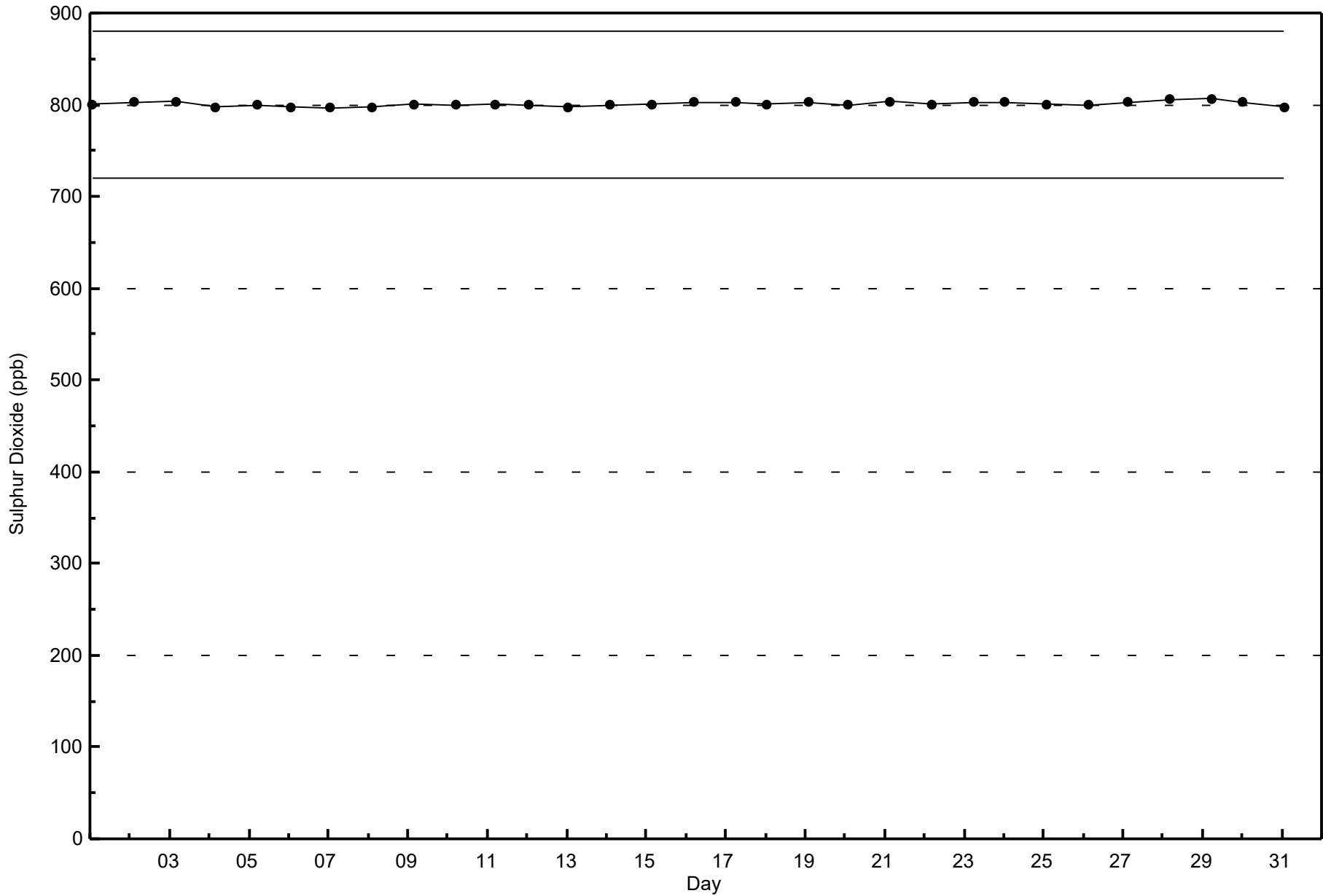


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint



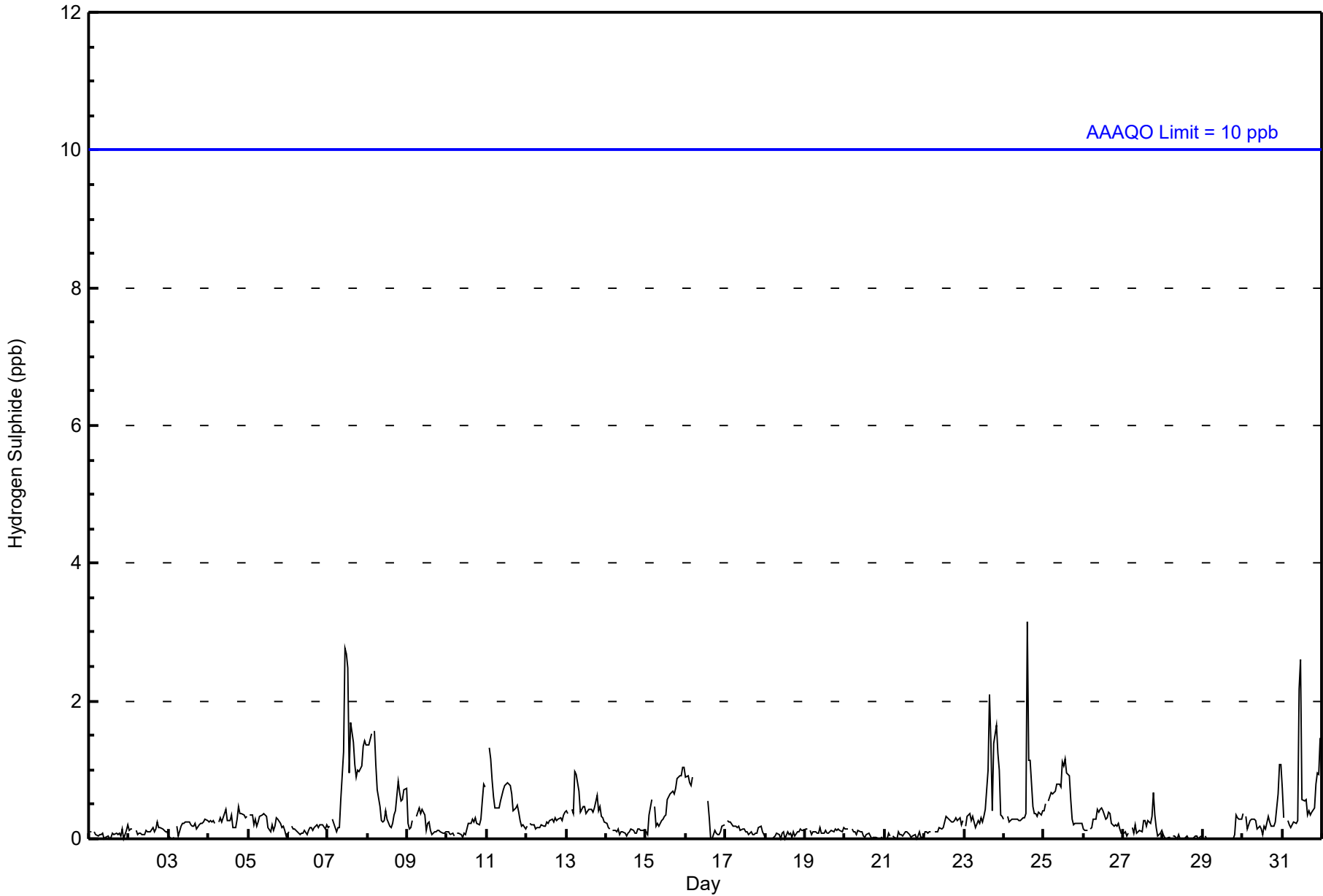






Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.43	99.43
3 - 4	4	0.57	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



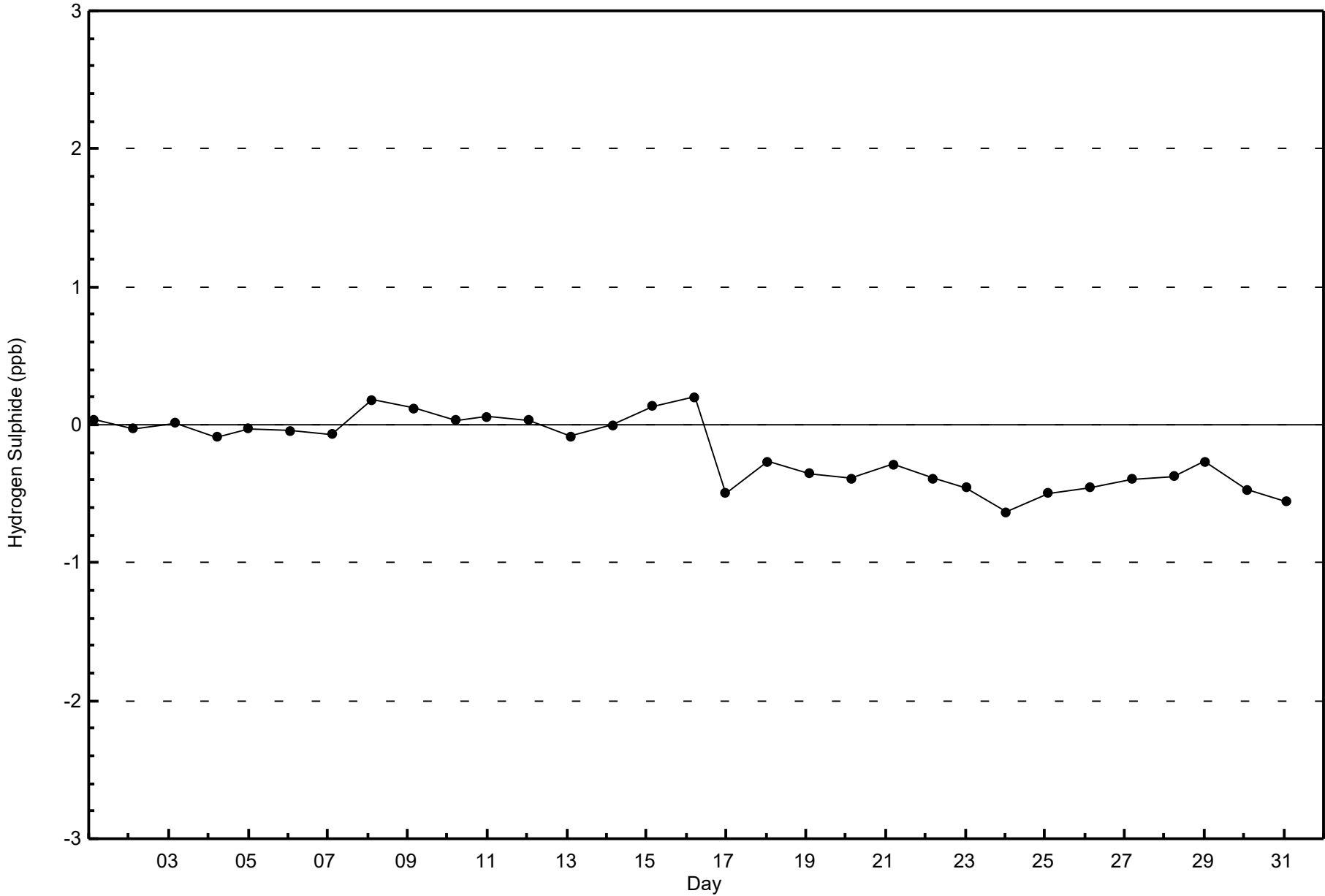
**Wood Buffalo Environmental Association
Frequency Distribution**

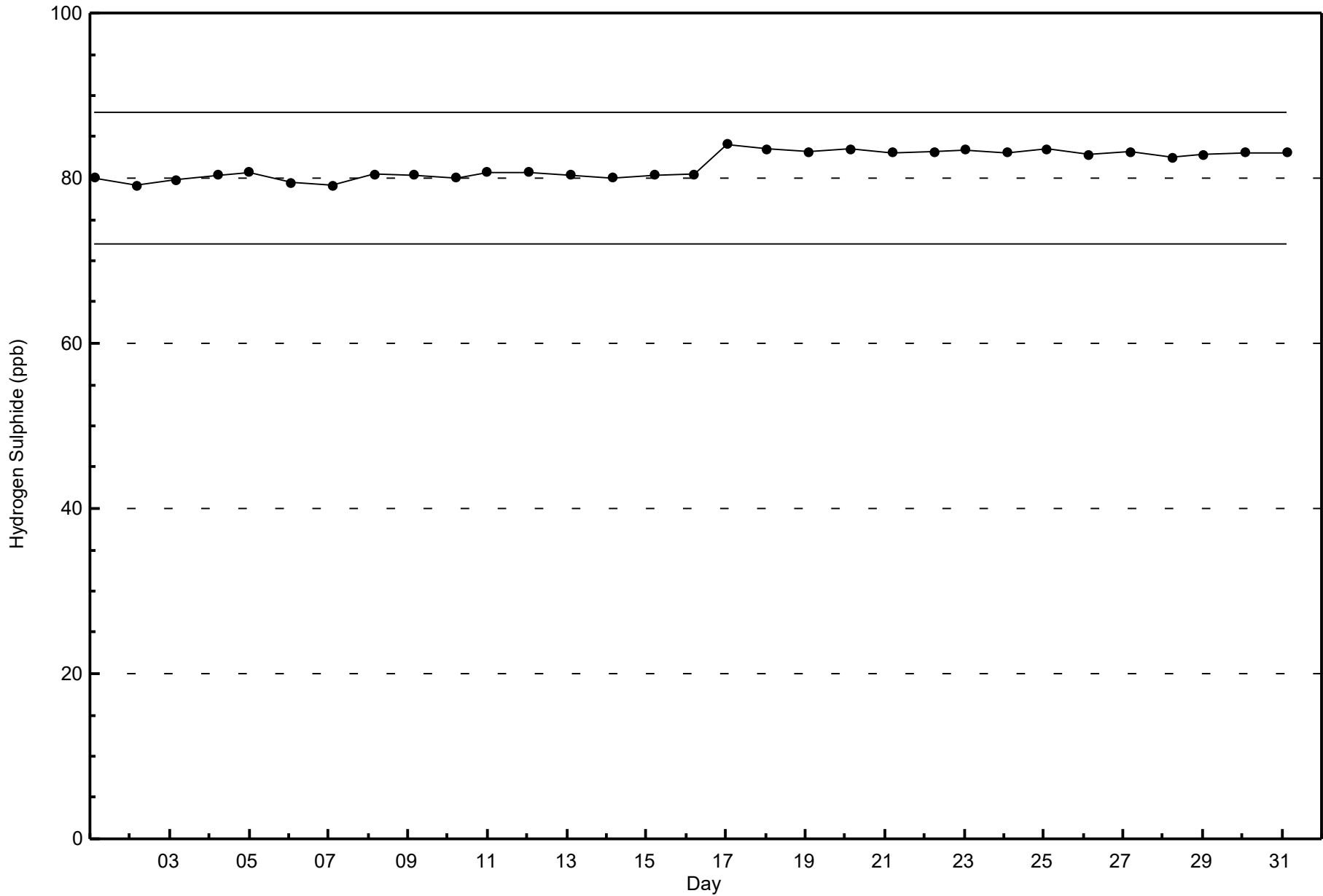
**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	72	56	18	5	8	18	69	211	76	33	17	37	22	17	17	13	689
3 - 4	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	4
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	57	18	5	8	18	69	211	76	33	17	37	22	18	18	13	693

Total Number of Valid Hours: 693

Total Number of Hours: 744

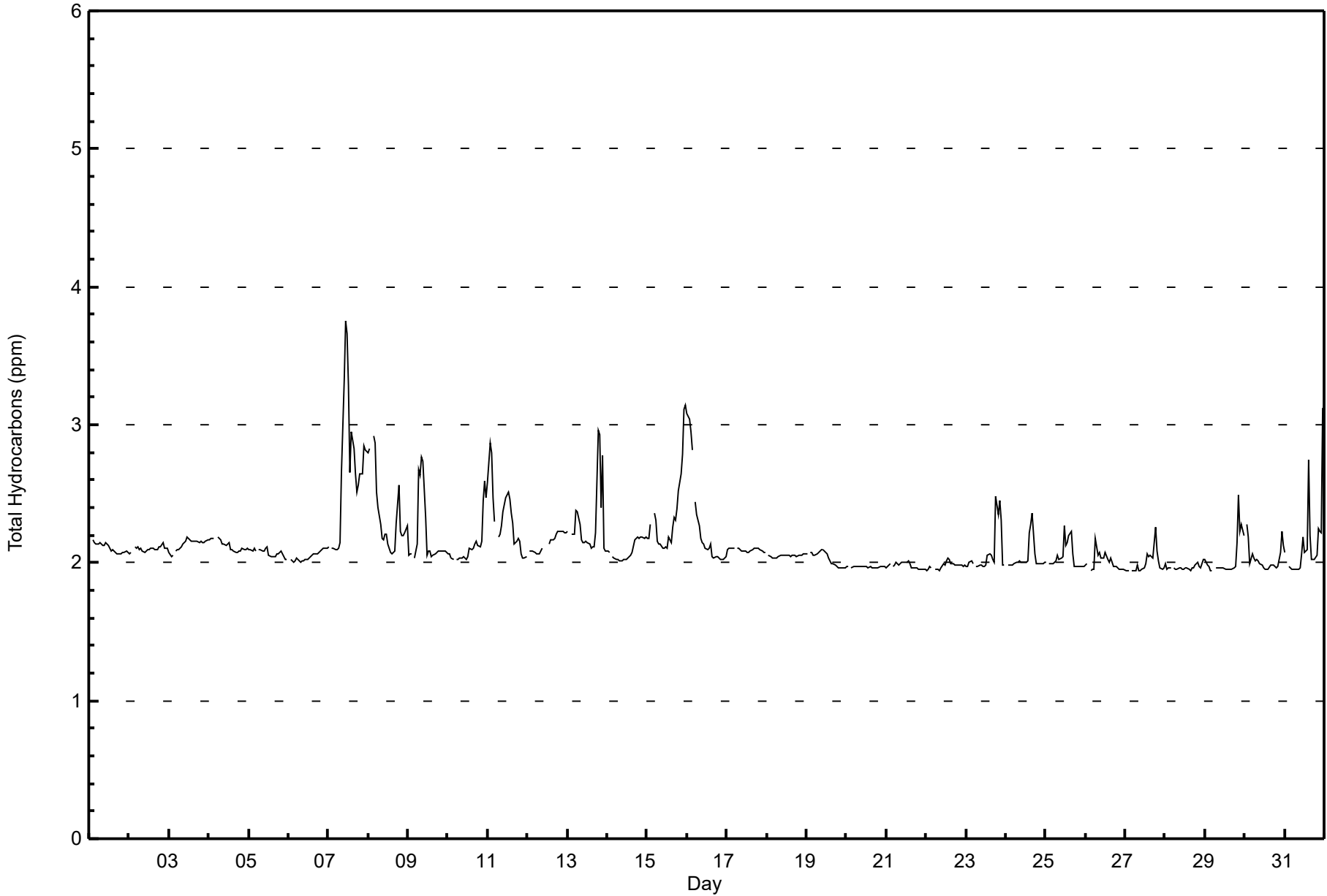






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	305	42.96	42.96
2.1 - 3.0	397	55.92	98.87
3.1 - 10.0	8	1.13	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	33	24	9	1	1	9	23	72	24	11	9	32	20	17	13	4	302
2.1 - 3.0	39	32	13	4	7	8	44	141	48	22	8	5	3	0	4	9	387
3.1 - 10.0	3	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	57	22	5	8	17	67	213	72	33	17	37	23	18	19	14	697

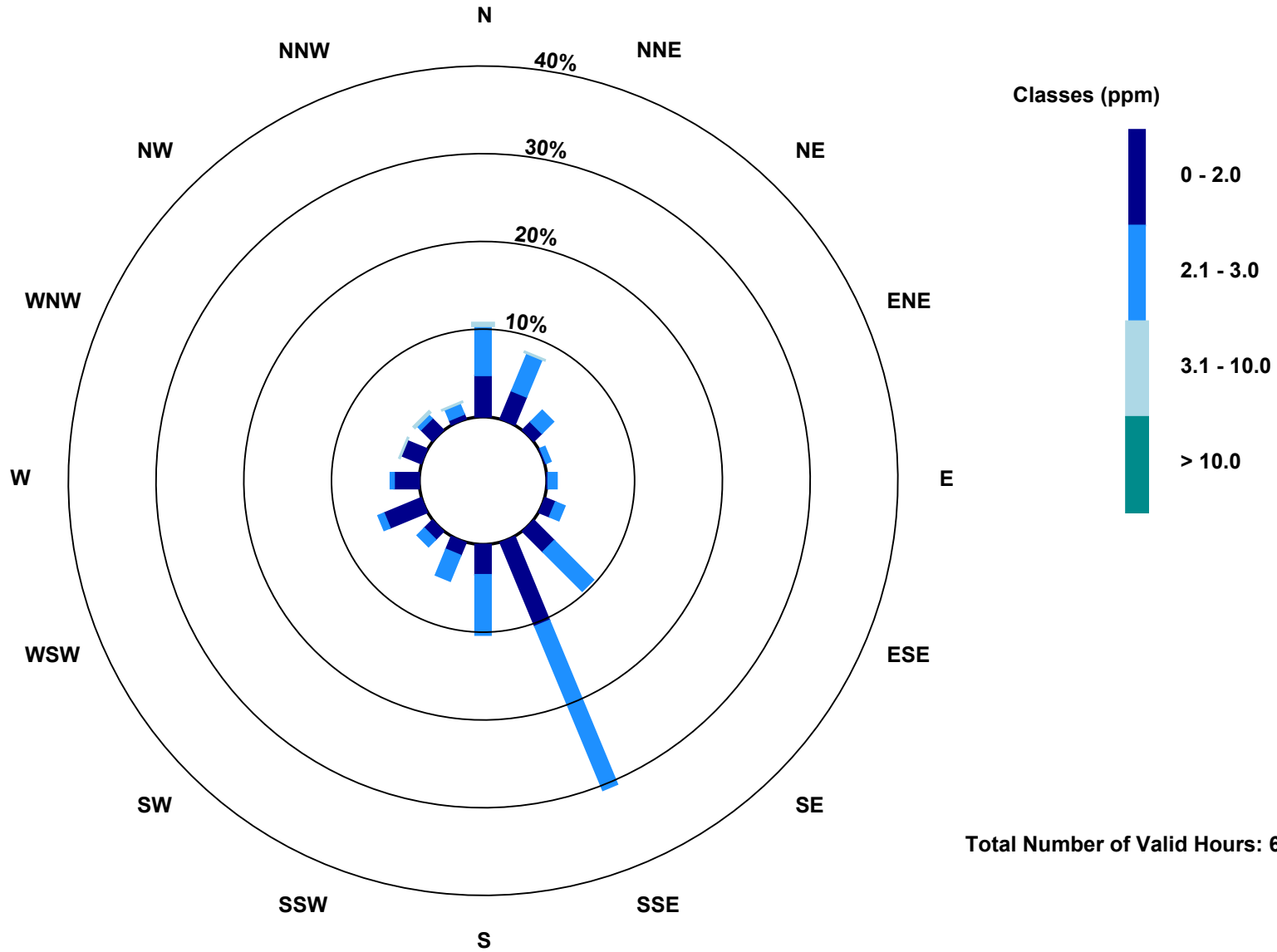
Total Number of Valid Hours: 697

Total Number of Hours: 744

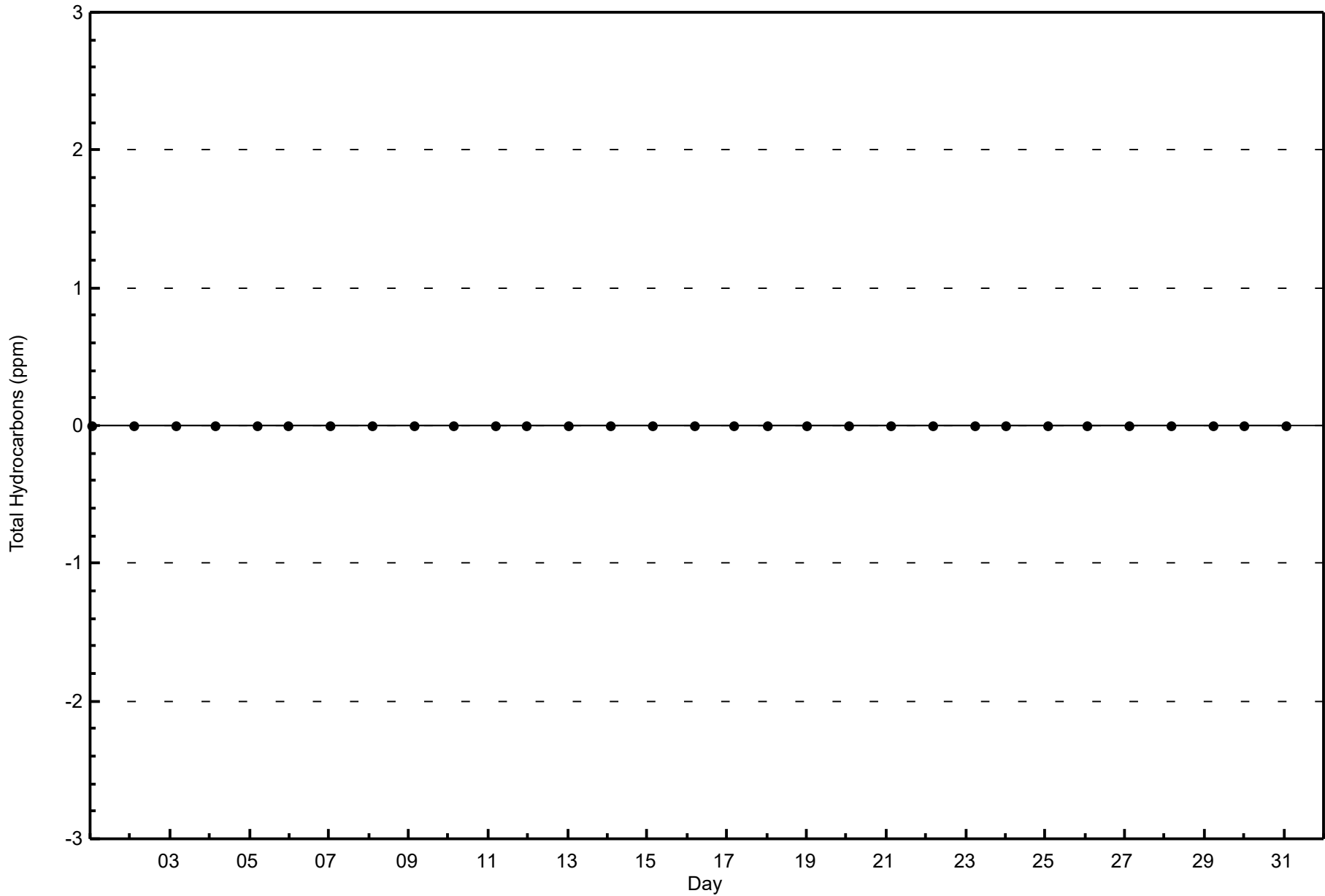


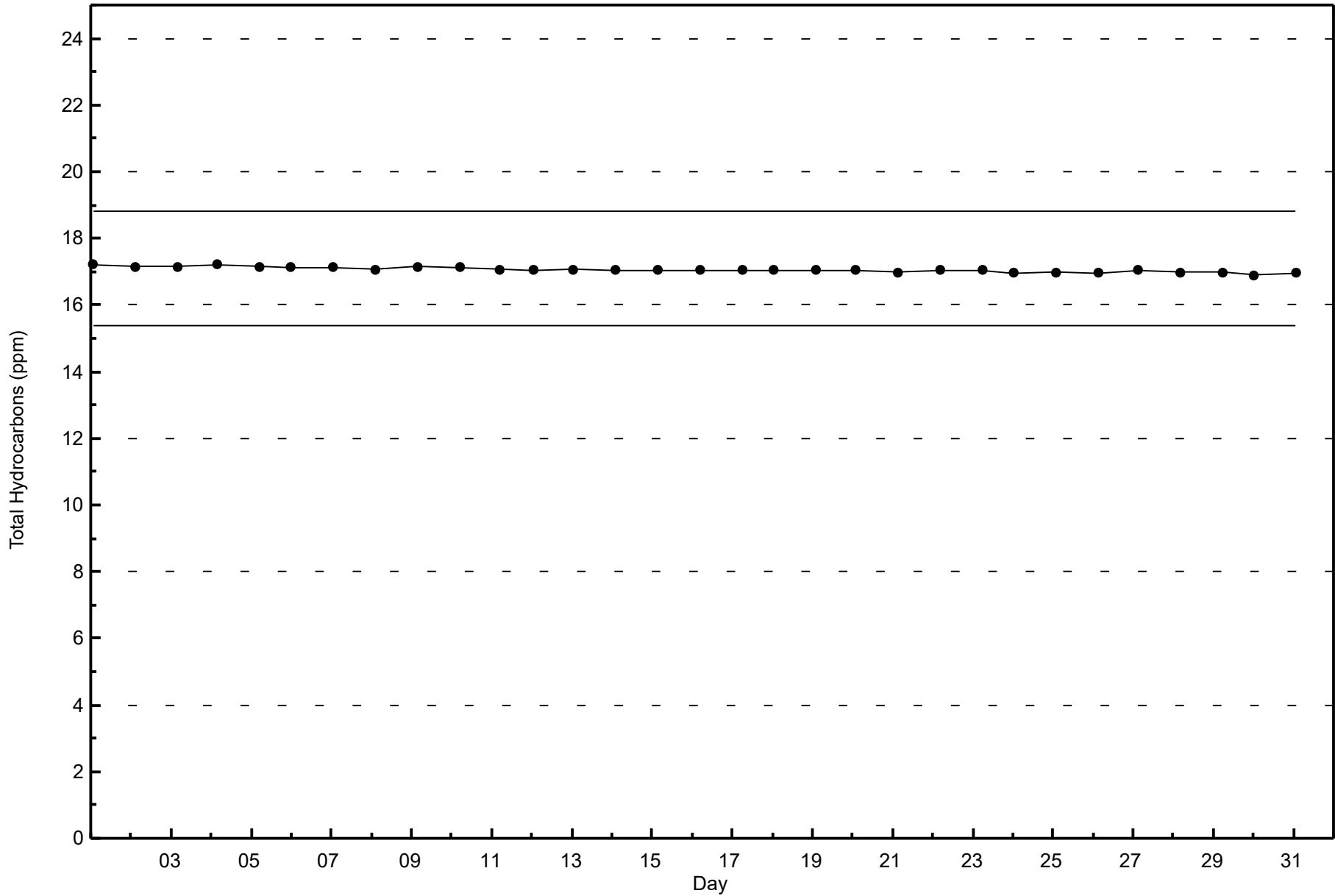
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint



Total Number of Valid Hours: 697



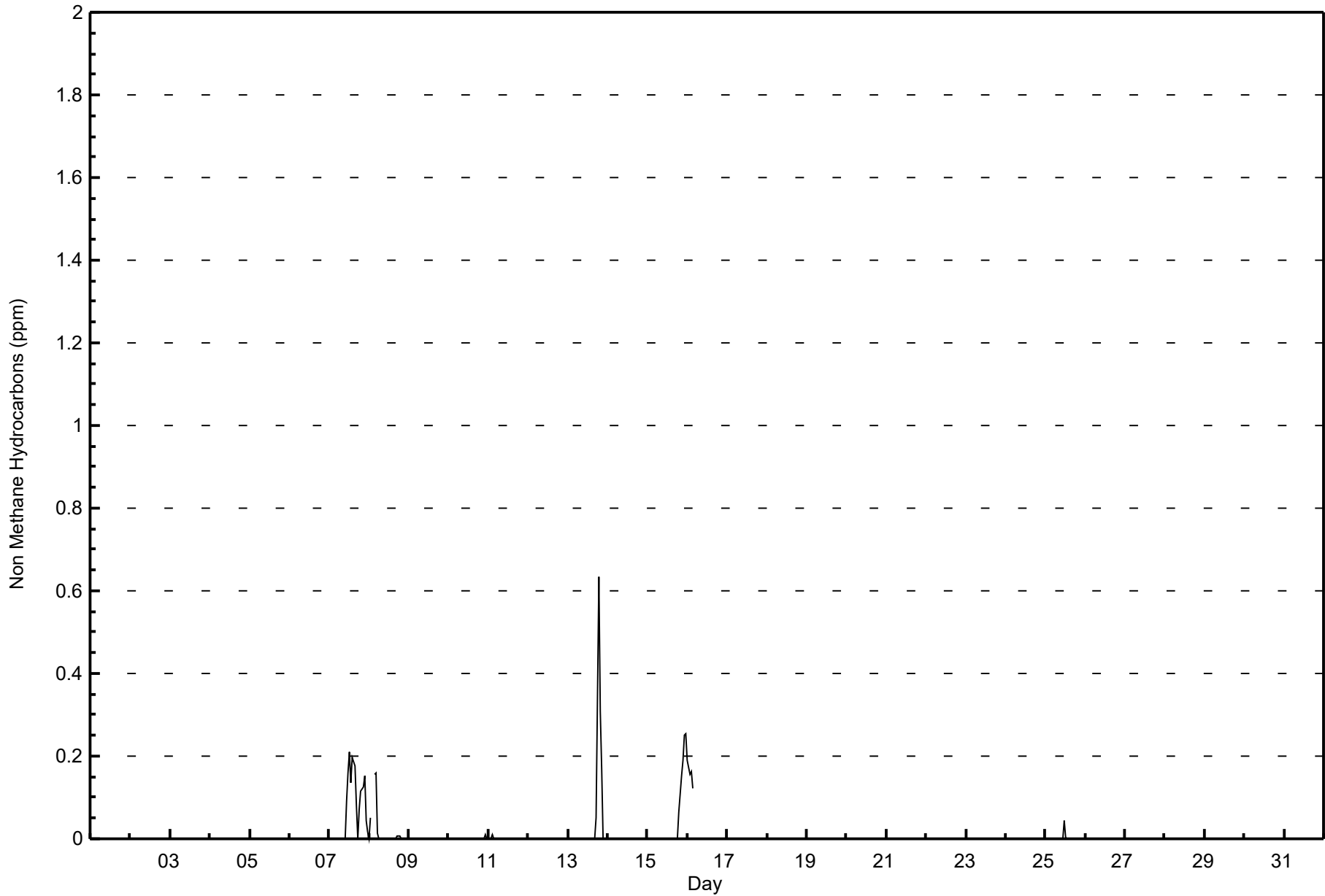




Summary of Hour Averages

Buffalo Viewpoint - January 2023

Maximum Value: 0.634 ppm on Jan 13 19:00																				Maximum Daily Average: 0.068 ppm on Jan 7					Hours in Service: 744									
Minimum Value: 0.000 ppm on Jan 1 01:00																				Minimum Daily Average: 0.000 ppm on Jan 1					Hours of Data: 710									
Maximum Diurnal Average: 0.023 ppm at hour 19																				Minimum Diurnal Average: 0.000 ppm at hour 7					Hours of Missing Data: 34									
Monthly Average: 0.007 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2					Hours of Calibration: 34									
																									Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
2-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
3-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
4-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
5-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.159	0.209	0.135	0.195	0.177	0.081	0.000	0.071	0.114	0.126	0.152	0.044	0.018	0.068	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8-Jan	0.000	0.050	Z	0.157	0.159	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.017	0.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11-Jan	0.000	0.000	0.009	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.634	0.308	0.168	0.000	0.000	0.051	0.634	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.153	0.191	0.250	0.040	0.254	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16-Jan	0.188	0.155	0.164	0.123	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.188	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
18-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
																								Diurnal Average										
																								Diurnal Maximum										
																								Z - zerospan C - Calibration										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	675	95.07	95.07
0.006 - 0.05	10	1.41	96.48
0.06 - 0.1	8	1.13	97.61
> 0.1	17	2.39	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	66	52	21	3	6	16	66	209	72	31	15	37	23	17	18	13	665
0.006 - 0.05	1	0	1	1	0	0	1	2	0	0	1	0	0	0	0	1	8
0.06 - 0.1	4	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	7
> 0.1	4	5	0	0	2	1	0	2	0	1	1	0	0	1	0	0	17
Totals	75	57	22	5	8	17	67	213	72	33	17	37	23	18	19	14	697

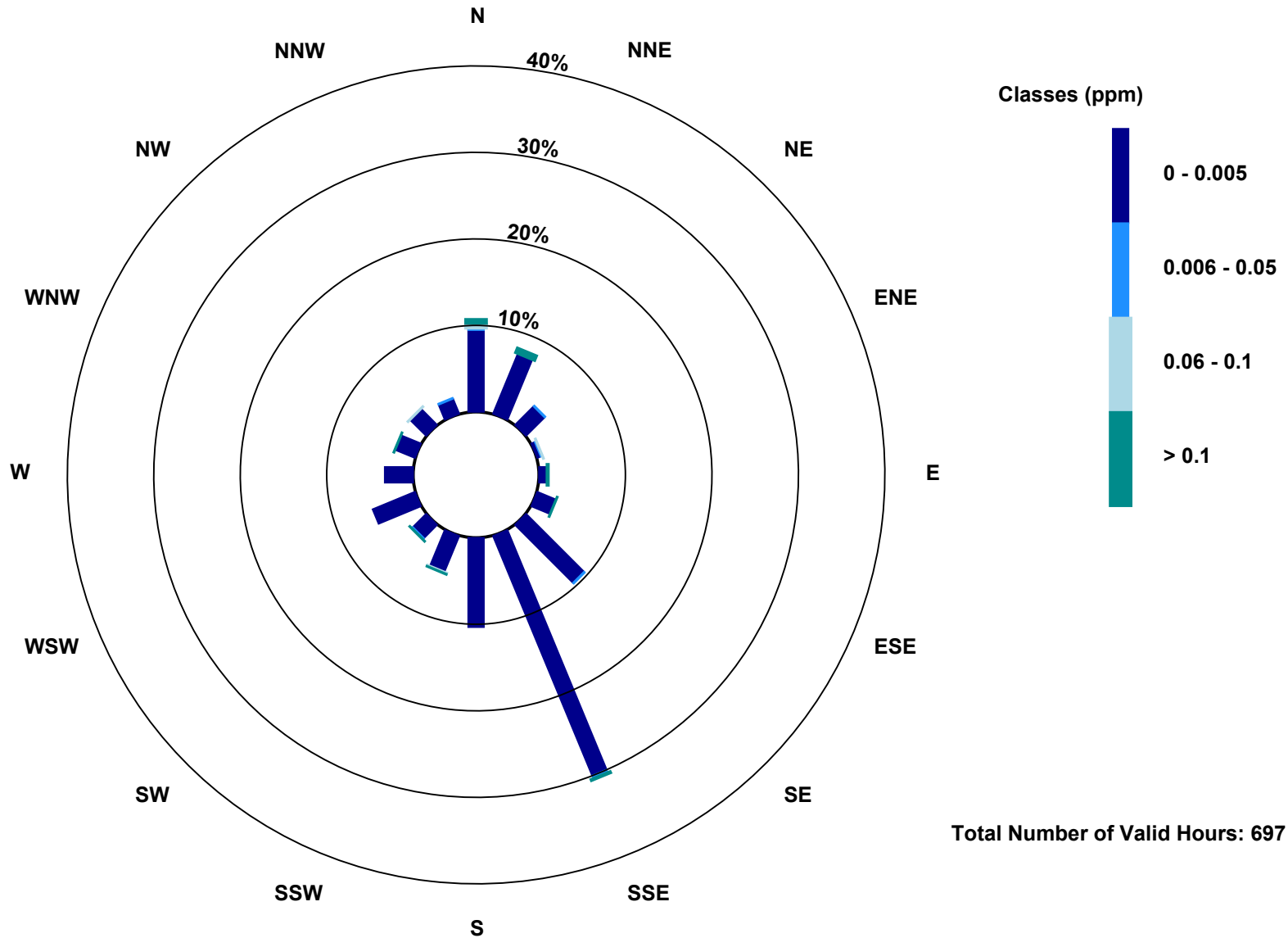
Total Number of Valid Hours: 697

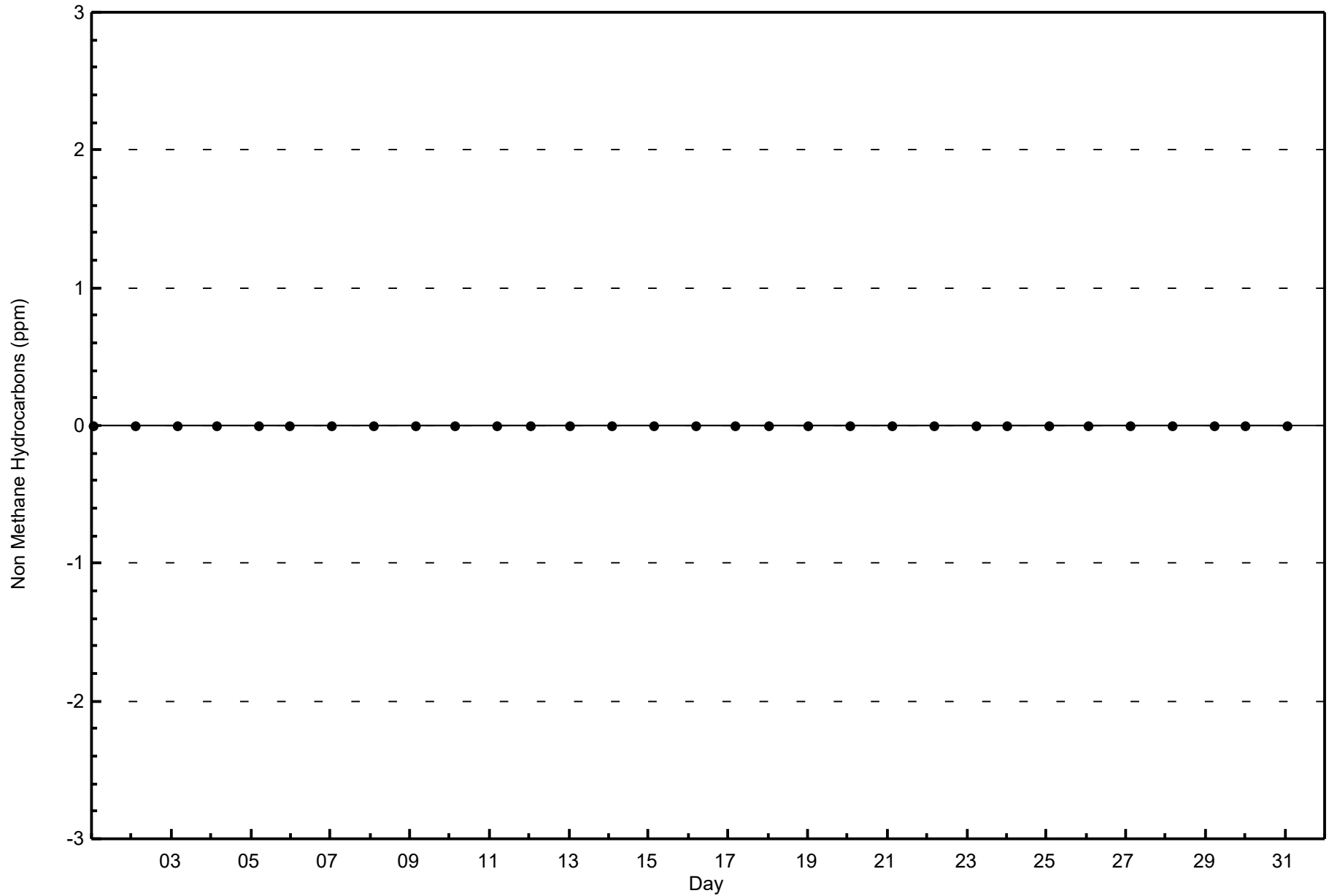
Total Number of Hours: 744

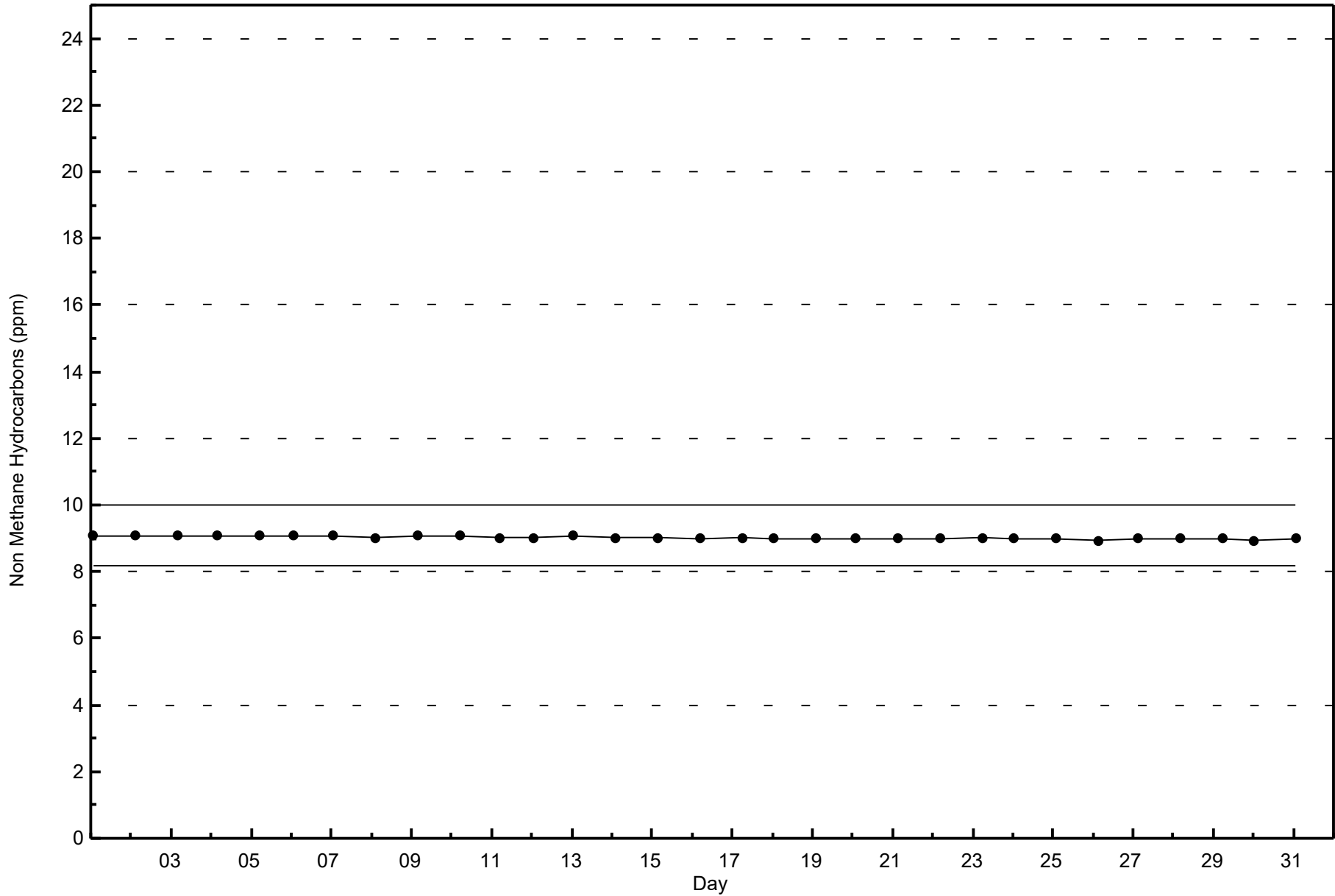


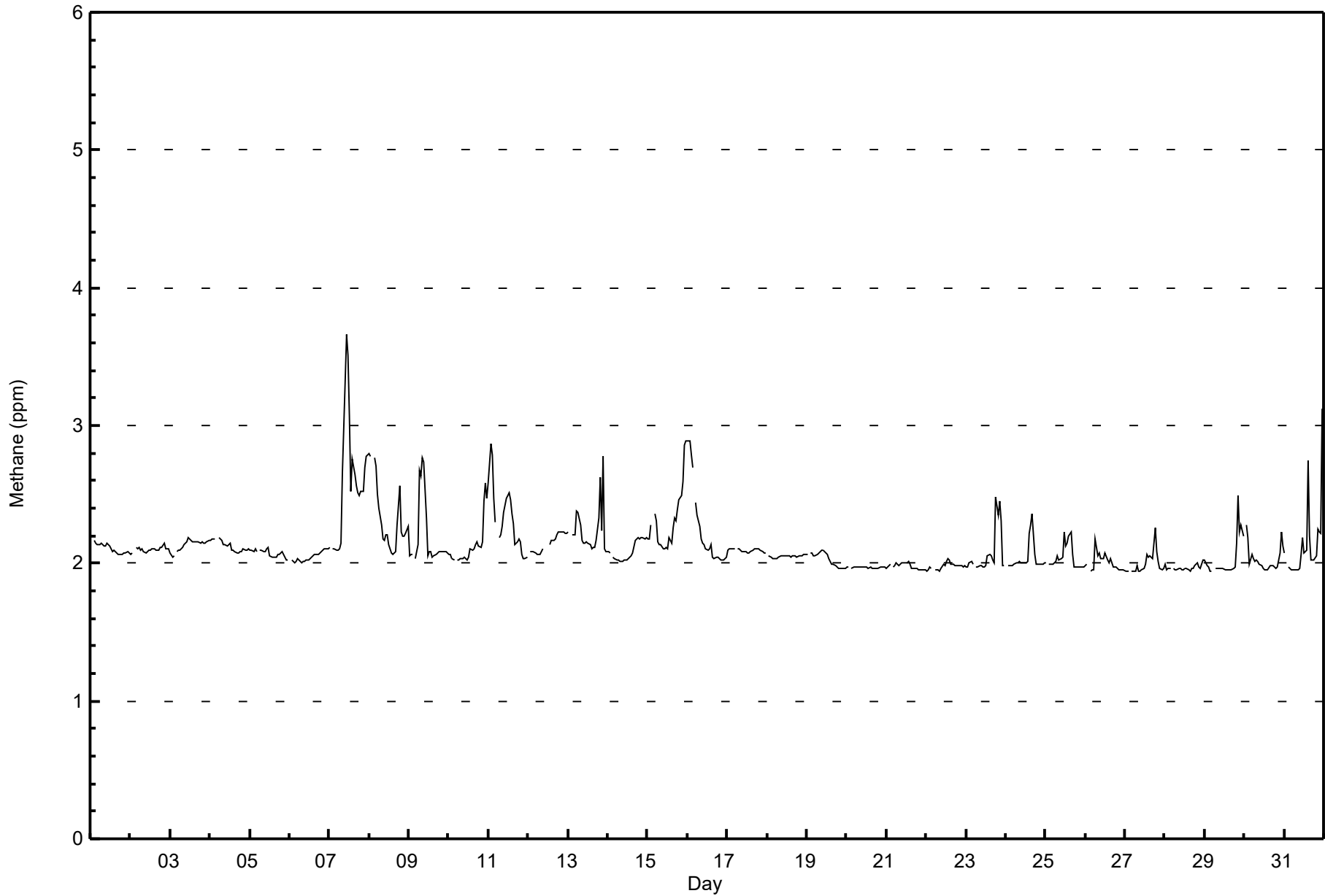
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	305	42.96	42.96
2.1 - 3.0	400	56.34	99.30
3.1 - 10.0	5	0.70	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Buffalo Viewpoint - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	33	24	9	1	1	9	23	72	24	11	9	32	20	17	13	4	302
2.1 - 3.0	41	33	13	4	7	8	44	141	48	22	8	5	3	0	4	9	390
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	57	22	5	8	17	67	213	72	33	17	37	23	18	19	14	697

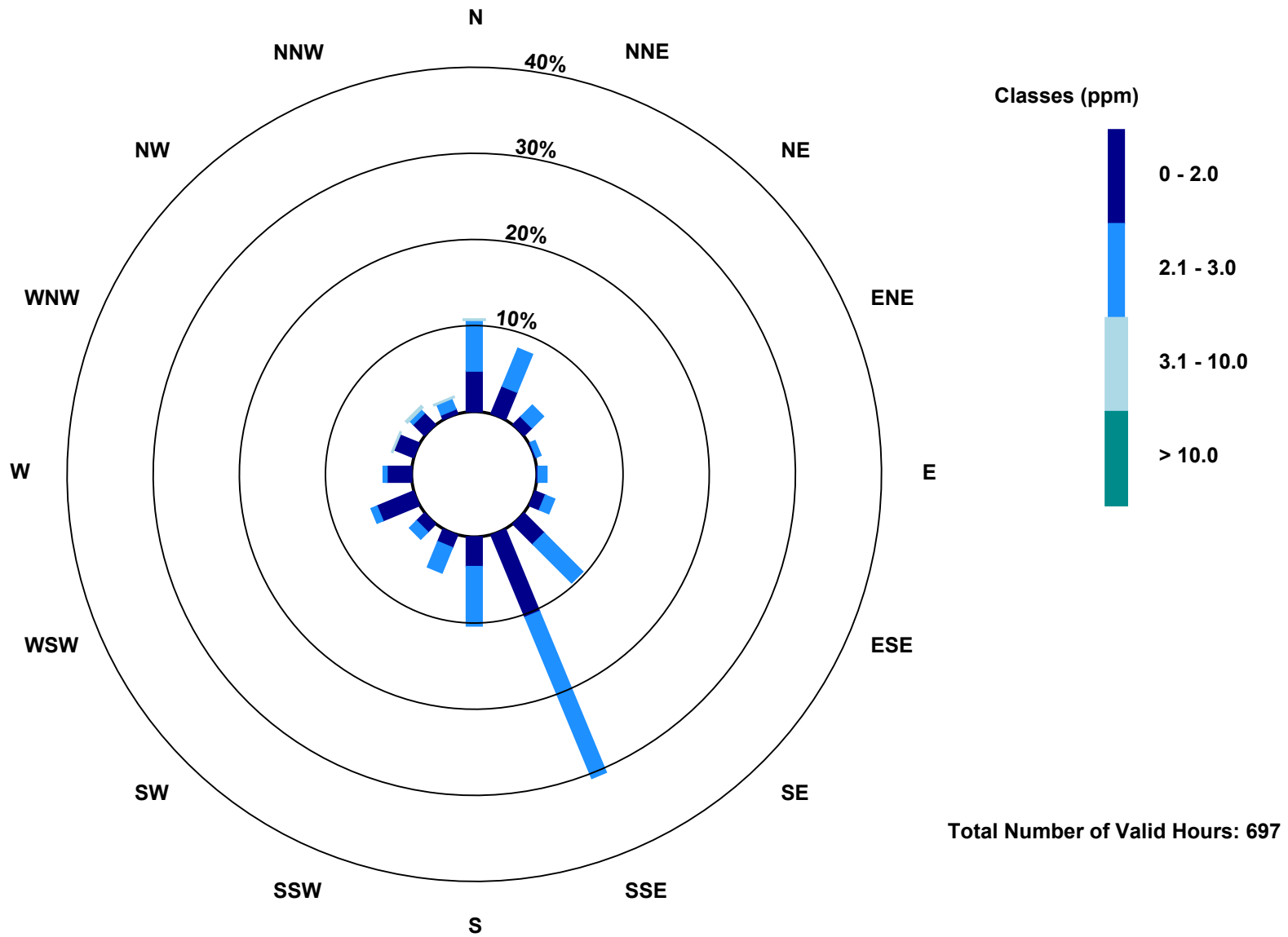
Total Number of Valid Hours: 697

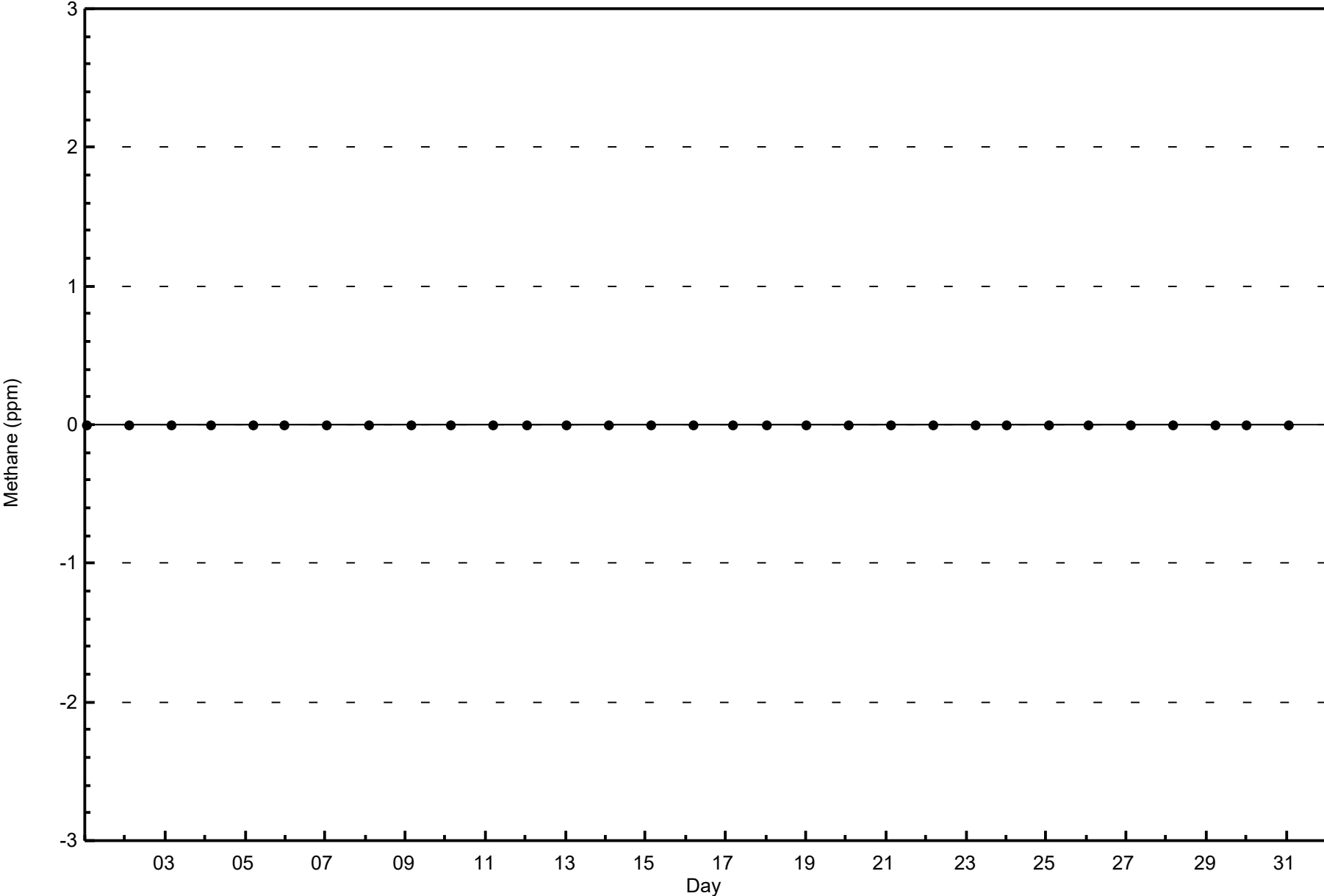
Total Number of Hours: 744

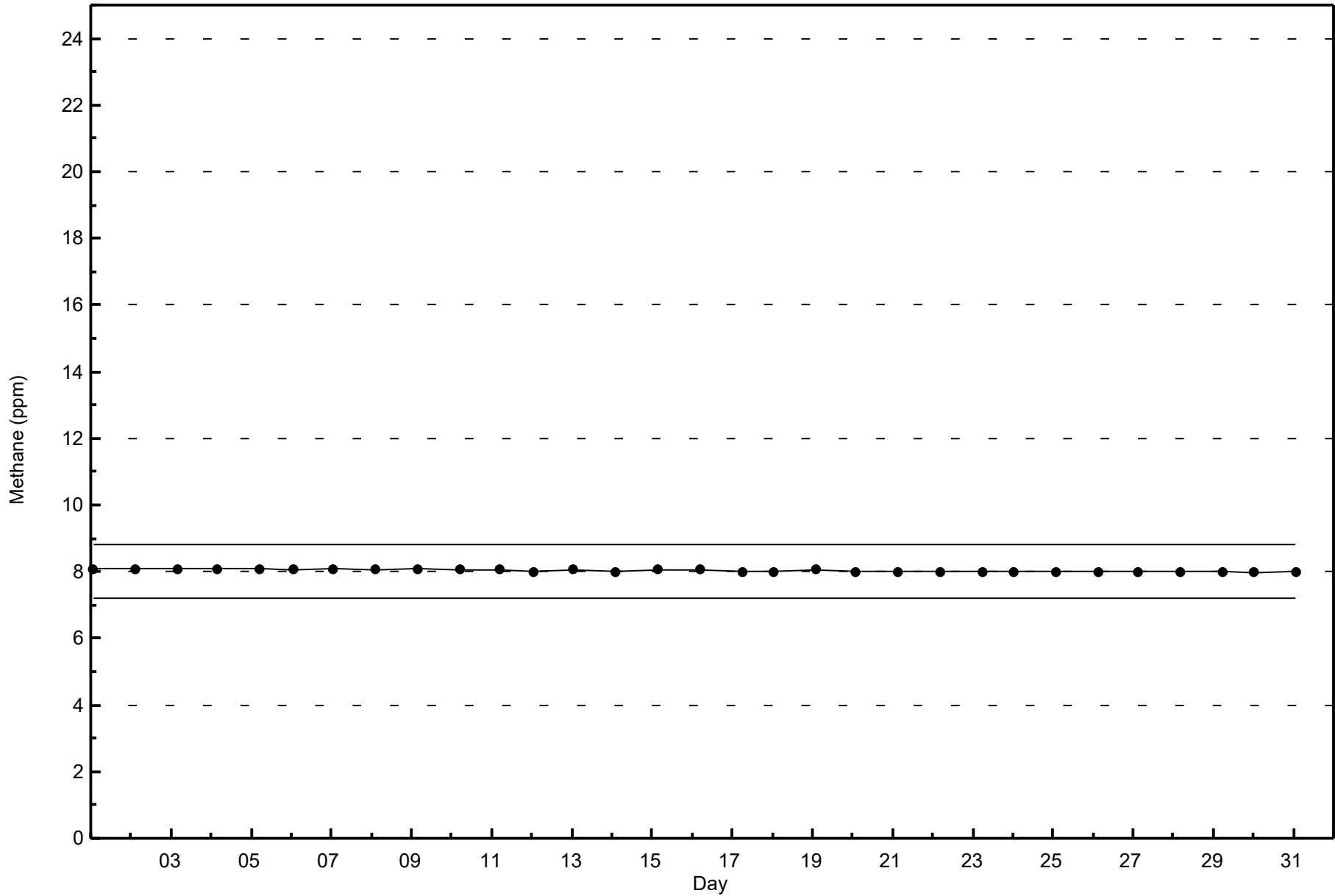


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Buffalo Viewpoint







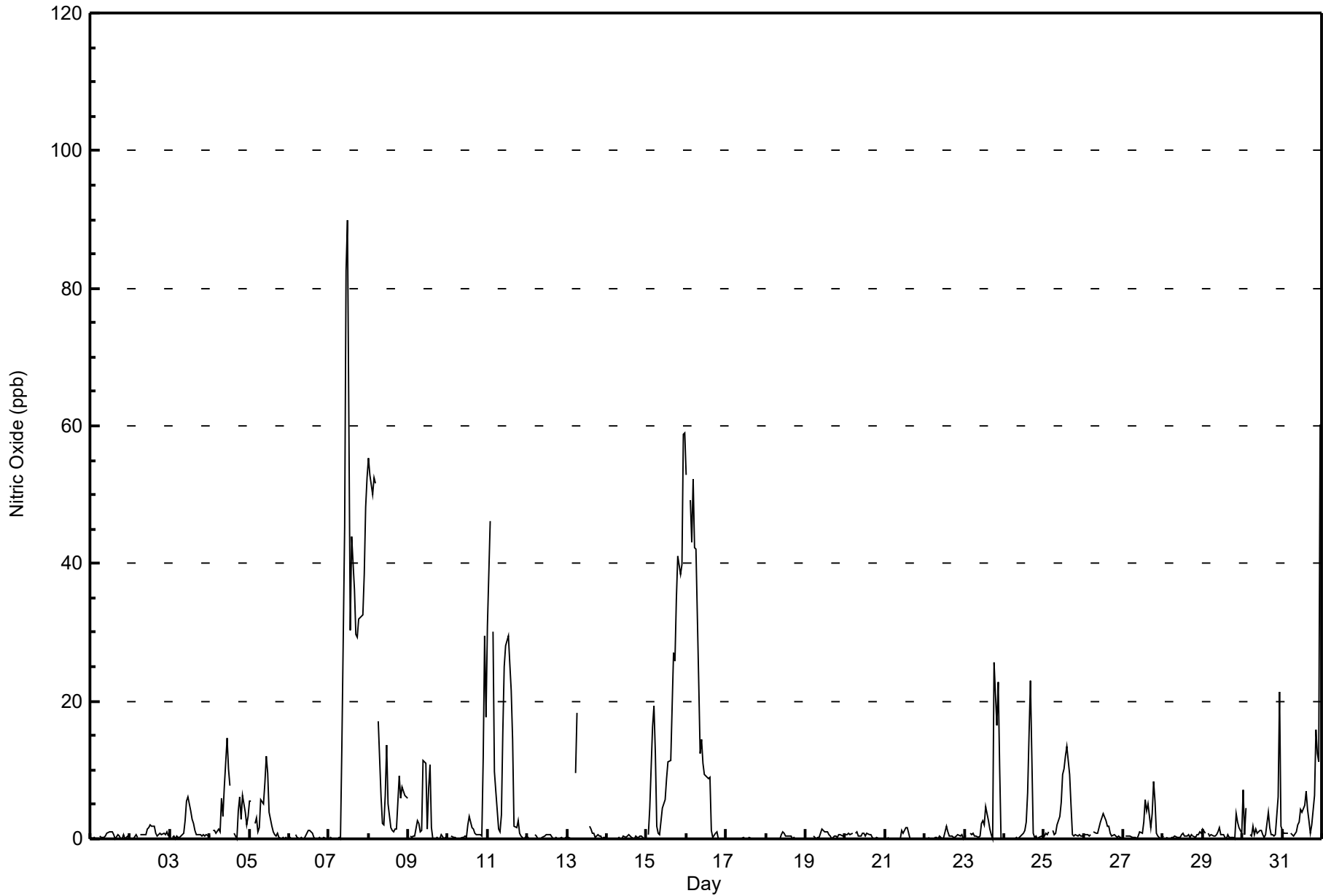


Maximum Value: 90.0 ppb on Jan 7 12:00		Maximum Daily Average: 30.3 ppb on Jan 7		Hours in Service: 744																																												
Minimum Value: 0.0 ppb on Jan 1 02:00		Minimum Daily Average: 0.0 ppb on Jan 17		Hours of Data: 705																																												
Maximum Diurnal Average: 6.9 ppb at hour 12		Minimum Diurnal Average: 1.7 ppb at hour 8		Hours of Missing Data: 39																																												
Monthly Average: 4.46 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.6 Q ₃ = 2.0 P ₉₀ = 11.7 P ₉₉ = 52.9		Hours of Calibration: 37																																												
				Percent Operational Time: 99.7																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	0.2	0.0	0.3	0.1	Z	0.4	0.1	0.3	0.3	0.4	0.8	1.0	1.0	0.9	0.7	0.1	0.5	0.5	0.1	0.1	0.5	0.0	0.5	0.5	0.4	1.0																						
2-Jan	0.1	0.1	0.0	0.5	0.2	Z	0.6	0.7	0.7	0.6	1.5	1.6	2.0	1.9	1.9	0.9	0.4	0.5	0.7	0.5	0.8	0.7	0.9	0.4	0.8	2.0																						
3-Jan	Z	0.3	0.4	0.0	0.4	0.2	0.1	0.6	0.7	2.7	5.6	6.1	4.1	2.9	2.3	1.2	0.6	0.6	0.6	0.4	0.6	0.5	0.6	0.4	1.4	6.1																						
4-Jan	0.5	Z	1.1	1.2	0.9	1.4	1.1	5.8	3.3	7.6	14.6	10.1	7.7	UO	UO	0.7	0.1	4.2	6.1	2.9	6.2	3.8	2.0	3.2	4.0	14.6																						
5-Jan	5.6	5.5	Z	2.2	3.1	1.0	1.7	5.8	5.0	8.1	12.0	9.5	3.8	1.8	1.0	0.7	0.3	0.7	0.2	0.1	0.2	0.0	0.2	0.0	3.0	12.0																						
6-Jan	0.3	0.0	0.0	Z	0.5	0.2	0.0	0.2	0.0	0.0	0.5	1.2	1.2	1.1	0.8	0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.3	1.2																						
7-Jan	0.0	0.2	0.0	0.0	Z	0.0	0.1	0.0	13.5	45.4	82.6	90.0	60.6	30.3	44.0	36.1	29.7	29.2	32.0	32.2	32.6	38.3	48.2	52.6	30.3	90.0																						
8-Jan	55.3	52.9	50.1	52.5	51.7	Z	17.0	6.0	2.3	2.1	6.4	13.7	5.1	1.7	1.1	1.1	1.5	1.4	9.2	5.9	7.6	7.0	6.2	5.9	15.8	55.3																						
9-Jan	Z	0.4	0.1	0.3	0.3	2.6	2.3	1.1	1.2	11.4	10.9	1.5	7.4	10.7	1.6	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.2	0.0	2.3	11.4																						
10-Jan	0.1	Z	0.4	0.3	0.2	0.0	0.0	0.0	0.3	0.2	0.4	0.3	2.0	3.2	1.6	1.4	0.7	0.5	0.6	0.6	0.5	11.8	29.4	17.7	3.1	29.4																						
11-Jan	31.0	46.1	Z	30.1	9.8	6.9	1.4	1.0	3.5	15.5	25.1	28.1	29.6	25.3	21.5	14.4	1.8	1.7	2.6	0.9	0.5	0.3	0.0	0.3	12.9	46.1																						
12-Jan	0.1	0.0	0.0	Z	0.6	0.4	0.0	0.0	0.1	0.1	0.4	0.5	0.6	0.6	0.6	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.6																						
13-Jan	0.1	0.2	0.0	0.0	Z	9.6	18.3	C	C	C	C	C	C	1.9	1.5	0.9	0.9	0.2	0.6	0.4	0.5	0.0	0.1	0.1	--	18.3																						
14-Jan	0.0	0.1	0.0	0.0	0.0	Z	0.1	0.2	0.0	0.0	0.4	0.3	0.4	0.7	0.5	0.1	0.0	0.3	0.3	0.2	0.4	0.4	0.0	0.3	0.2	0.7																						
15-Jan	Z	0.6	4.5	16.3	19.3	12.5	1.9	0.8	0.5	4.5	5.0	5.7	8.7	11.2	11.4	19.4	27.1	25.8	34.7	41.2	38.5	39.9	58.7	59.0	19.4	59.0																						
16-Jan	52.9	Z	49.3	43.1	52.3	42.4	42.1	22.6	12.5	14.4	11.1	9.3	8.9	8.7	9.0	1.2	0.3	0.9	1.0	0.0	0.0	0.0	0.0	0.0	16.6	52.9																						
17-Jan	0.0	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2																						
18-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.8	0.5	0.4	0.4	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9																						
19-Jan	0.1	0.0	0.1	0.0	Z	0.4	0.0	0.3	0.2	0.8	1.3	1.0	1.1	1.0	0.5	0.4	0.1	0.3	0.3	0.3	0.7	0.6	0.4	0.7	0.5	1.3																						
20-Jan	0.6	0.6	0.8	0.7	0.8	Z	0.8	0.9	0.5	0.5	0.8	0.7	0.5	0.8	0.5	0.5	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.5	0.9																						
21-Jan	Z	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.8	1.5	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.6																						
22-Jan	0.0	Z	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.1	0.3	1.0	1.8	0.9	0.4	0.4	0.3	0.2	0.4	0.7	0.4	0.6	0.1	0.4	1.8																						
23-Jan	0.4	0.5	Z	0.9	0.5	0.7	0.5	0.4	0.3	0.4	2.2	2.7	2.1	4.6	2.6	1.4	0.6	0.0	25.7	16.5	22.8	10.3	0.1	0.0	4.2	25.7																						
24-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.1	0.2	0.4	0.8	1.2	2.5	6.7	15.1	22.9	0.7	0.1	0.3	0.1	0.2	0.4	0.3	2.3	22.9																						
25-Jan	0.4	0.7	0.6	1.0	Z	1.1	0.6	0.9	2.1	3.2	5.3	9.3	10.1	12.1	13.3	9.4	4.9	0.7	0.4	0.6	0.4	0.5	0.4	0.3	3.4	13.3																						
26-Jan	0.7	0.6	0.6	0.4	0.6	Z	0.9	0.8	0.9	1.6	2.4	3.1	3.7	2.6	1.8	1.9	0.8	0.4	0.6	0.4	0.2	0.5	0.1	0.2	1.1	3.7																						
27-Jan	Z	0.4	0.3	0.3	0.3	0.1	0.2	0.3	0.1	0.3	0.9	0.9	2.5	5.7	4.0	5.1	1.7	3.7	8.3	5.5	0.8	0.3	0.1	0.0	1.8	8.3																						
28-Jan	0.4	Z	0.2	0.0	0.0	0.2	0.1	0.4	0.2	0.2	0.3	0.6	0.8	0.4	0.4	0.6	0.1	0.6	0.4	0.3	0.7	0.5	0.9	0.9	0.4	0.9																						
29-Jan	1.4	0.9	Z	0.9	0.4	0.5	0.4	0.5	0.5	0.9	1.6	0.7	0.6	0.2	0.0	0.6	0.1	0.1	0.1	0.0	3.7	2.5	1.6	0.9	0.8	3.7																						
30-Jan	7.2	0.6	4.4	Z	0.6	0.5	1.7	0.6	1.4	0.7	1.2	1.3	0.7	0.2	0.6	3.8	1.6	0.7	0.6	0.5	0.6	6.2	21.4	1.8	2.6	21.4																						
31-Jan	1.3	0.7	0.9	0.8	Z	0.7	0.6	0.4	1.0	2.1	2.5	4.2	3.9	4.9	6.9	4.2	2.7	0.9	2.0	6.3	15.9	12.4	11.3	60.2	6.4	60.2																						
																								6.1	4.3	4.4	5.8	5.7	3.1	3.0	1.7	1.7	4.2	6.6	6.9	5.8	4.7	4.6	3.9	3.2	2.4	4.1	3.8	4.4	4.4	6.0	6.6	Diurnal Average
																								55.3	52.9	50.1	52.5	52.3	42.4	42.1	22.6	13.5	45.4	82.6	90.0	60.6	30.3	44.0	36.1	29.7	29.2	34.7	41.2	38.5	39.9	58.7	60.2	Diurnal Maximum
Z - zerospan																								C - Calibration				UO - Unstable Operation																				



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	656	93.05	93.05
21 - 40	26	3.69	96.74
41 - 80	21	2.98	99.72
81 - 159	2	0.28	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	55	48	21	3	7	19	65	205	73	30	17	34	24	16	17	11	645
21 - 40	11	4	0	1	0	0	1	3	2	2	0	0	0	0	0	1	25
11 - 80	5	5	0	0	0	0	1	3	2	0	1	0	0	0	2	1	20
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	57	21	4	7	19	67	211	77	32	18	34	24	17	20	13	692

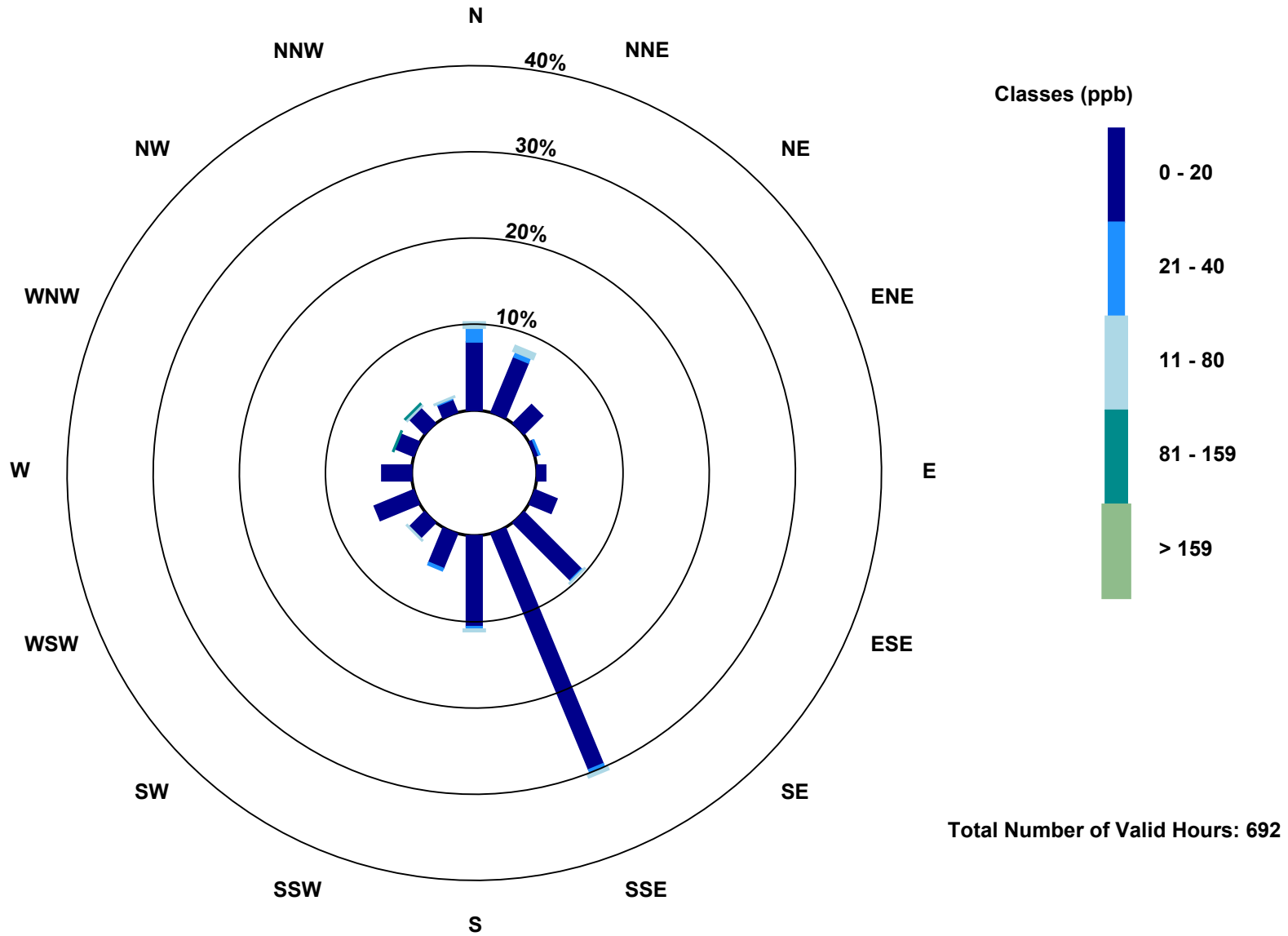
Total Number of Valid Hours: 692

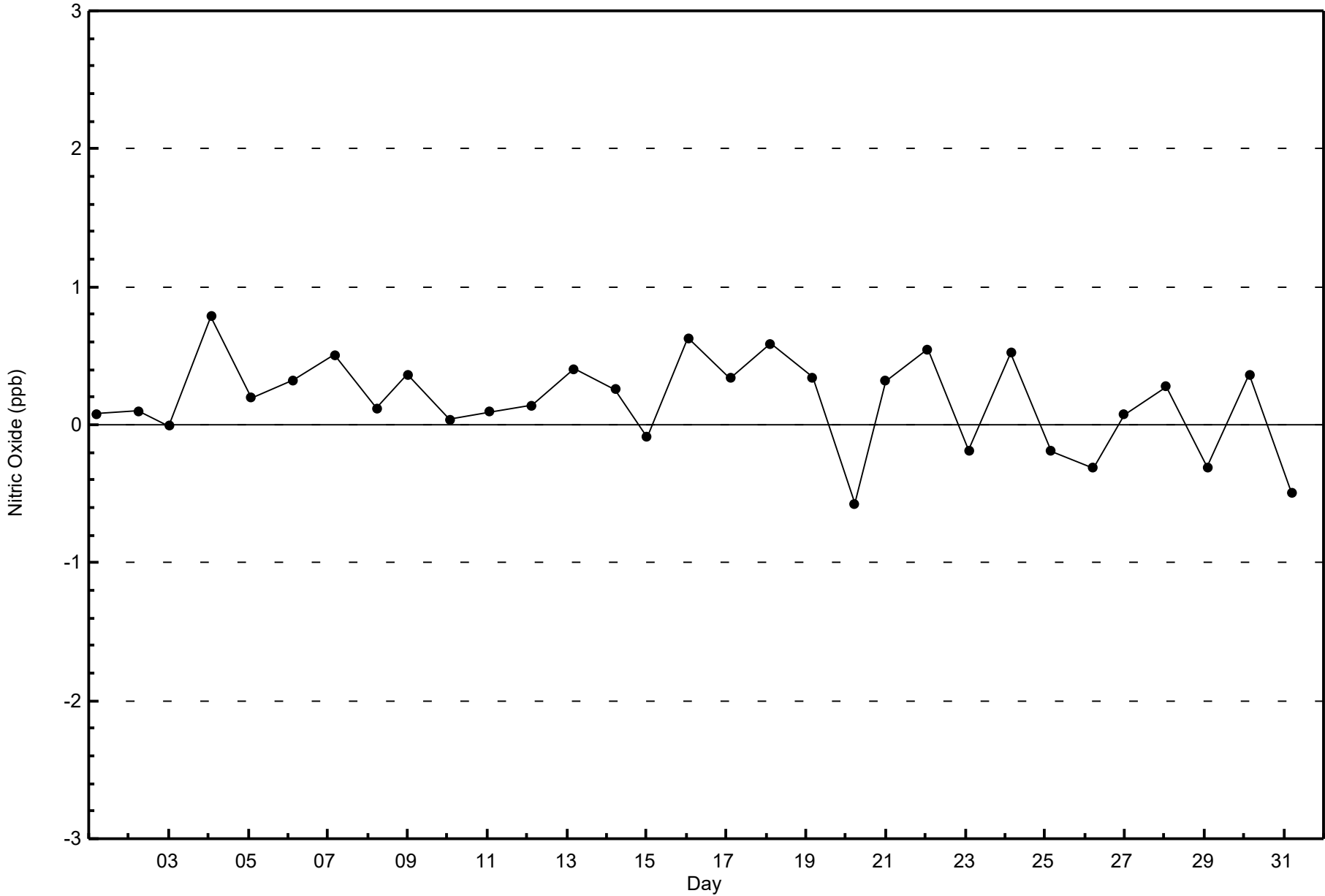
Total Number of Hours: 744

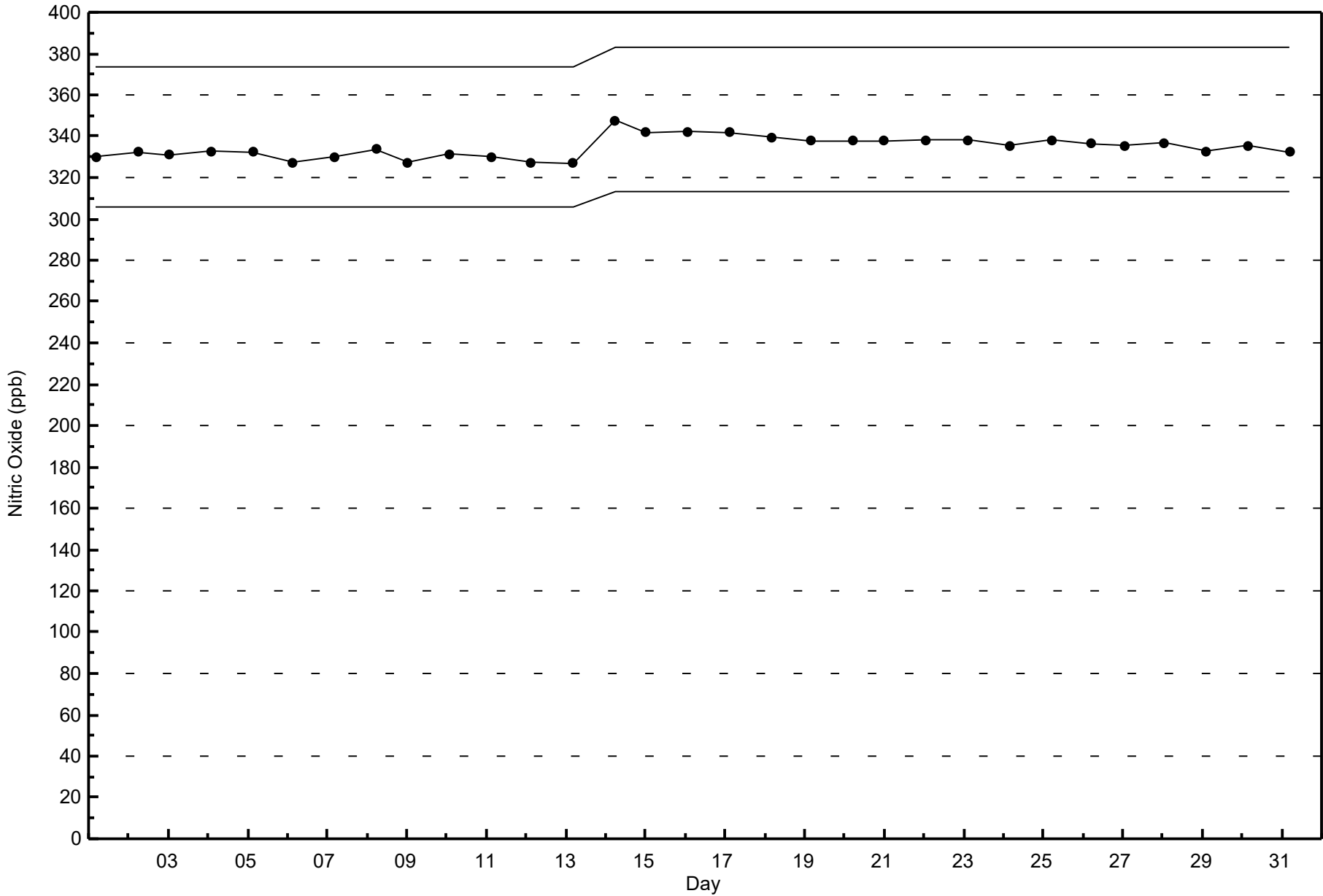


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 40.2 ppb on Feb 1 00:00	Maximum Daily Average: 20.3 ppb on Jan 7		Hours of Data:	705
Minimum Value: 0.0 ppb on Jan 14 03:00	Minimum Daily Average: 0.8 ppb on Jan 20		Hours of Missing Data:	39
Maximum Diurnal Average: 11.0 ppb at hour 19	Minimum Diurnal Average: 5.8 ppb at hour 3		Hours of Calibration:	37
Monthly Average: 8.17 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.7 Q ₁ = 1.9 Median = 5.3 Q ₃ = 12.3 P ₉₀ = 20.4 P ₉₉ = 30.0		Percent Operational Time:	99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	5.7	5.1	2.0	2.2	Z	2.2	2.2	2.9	6.6	2.3	2.3	2.6	2.1	2.4	2.9	3.5	4.7	4.5	4.9	3.6	7.9	4.4	7.9	9.8	4.1	9.8
2-Jan	6.0	7.2	6.1	7.5	4.4	Z	3.4	5.5	5.5	5.5	6.1	4.9	4.3	5.2	6.7	6.6	8.3	14.7	11.3	10.8	12.8	12.4	12.7	7.9	7.6	14.7
3-Jan	Z	1.9	2.2	4.7	7.3	3.6	3.9	9.2	12.2	13.3	12.8	9.2	8.0	6.6	8.2	9.7	10.1	9.8	10.8	9.8	10.2	9.3	14.3	11.4	8.6	14.3
4-Jan	11.3	Z	11.3	10.0	12.3	11.5	9.8	13.3	13.0	15.0	15.9	10.8	8.6	UO	UO	5.5	6.0	16.6	22.2	18.8	21.0	19.9	16.9	17.4	13.7	22.2
5-Jan	16.1	15.5	Z	9.5	11.8	10.2	12.6	16.5	16.3	16.5	13.6	9.7	5.8	3.5	4.9	5.5	7.2	13.8	12.7	10.2	7.5	5.6	2.6	2.0	10.0	16.5
6-Jan	3.3	4.5	5.6	Z	5.3	4.9	4.2	2.1	2.8	4.1	3.6	4.7	4.7	4.8	4.4	4.7	6.7	6.3	4.5	6.3	5.3	4.5	4.6	6.6	4.7	6.7
7-Jan	7.9	9.1	5.5	6.1	Z	5.8	11.1	7.7	21.2	26.4	28.4	29.0	27.8	23.1	27.5	27.2	25.9	23.3	25.0	25.2	25.7	25.7	25.5	25.7	20.3	29.0
8-Jan	24.7	24.4	24.7	24.6	24.5	Z	20.8	18.5	12.3	10.6	10.1	14.8	8.5	4.8	3.8	7.4	15.6	13.7	23.2	21.3	20.0	19.6	19.9	20.0	16.9	24.7
9-Jan	Z	2.7	3.4	7.7	10.9	18.6	18.4	15.9	15.8	19.8	15.2	4.2	11.3	16.0	5.9	1.3	2.2	2.7	2.6	2.0	2.0	1.6	1.3	1.9	8.0	19.8
10-Jan	2.0	Z	1.7	0.2	0.1	0.7	0.8	0.7	2.0	2.3	1.3	1.6	6.6	10.9	8.9	10.7	15.2	14.5	10.0	9.3	10.9	21.1	21.8	20.4	7.6	21.8
11-Jan	21.6	23.3	Z	20.3	21.5	21.9	18.2	18.7	20.3	19.4	19.2	19.2	18.9	18.5	19.7	21.0	16.3	19.6	19.6	16.1	9.4	4.6	3.0	2.9	17.1	23.3
12-Jan	3.4	2.7	2.5	Z	1.9	1.7	3.1	3.1	4.3	4.8	4.6	4.0	3.8	5.0	4.7	5.2	4.9	4.4	3.5	1.8	1.6	1.6	5.2	6.3	3.7	6.3
13-Jan	5.3	5.6	5.3	4.3	Z	15.3	25.9	C	C	C	C	C	C	7.5	7.0	8.2	8.8	7.8	17.8	14.2	16.2	6.0	11.0	9.3	--	25.9
14-Jan	4.9	0.5	0.0	0.3	0.0	Z	0.6	0.6	0.5	1.2	1.1	1.4	1.3	2.1	2.6	3.2	2.1	2.2	0.7	1.0	1.5	1.1	1.2	1.3	1.4	4.9
15-Jan	Z	2.6	12.3	20.9	21.1	19.5	9.7	10.2	13.7	14.9	13.0	11.9	12.0	13.8	15.1	19.5	22.9	22.4	23.4	23.6	23.6	23.3	24.8	24.0	17.3	24.8
16-Jan	23.3	Z	22.2	20.5	20.7	19.2	18.6	16.7	14.6	13.4	11.6	11.2	10.3	10.7	13.9	7.1	8.2	14.5	15.0	1.8	0.5	0.8	0.6	2.1	12.1	23.3
17-Jan	1.7	0.9	Z	1.1	0.9	0.9	1.5	0.7	1.0	2.0	2.4	1.5	0.7	1.0	1.4	1.9	1.9	3.5	5.2	5.9	9.1	7.9	7.4	3.9	2.8	9.1
18-Jan	2.4	2.5	1.7	Z	1.8	2.1	4.0	6.9	7.0	7.3	5.6	4.2	2.4	3.0	2.9	3.2	4.7	10.0	8.6	7.8	5.7	6.5	6.1	4.0	4.8	10.0
19-Jan	4.6	4.9	4.4	3.6	Z	3.8	4.0	4.7	5.2	5.3	4.5	3.0	2.6	1.9	1.7	1.2	1.4	1.3	1.1	1.1	1.1	0.6	0.7	0.9	2.8	5.3
20-Jan	0.9	0.9	0.8	0.7	0.8	Z	1.0	0.8	0.5	0.7	0.6	0.6	0.5	0.5	0.7	0.8	0.7	1.1	1.1	0.9	0.8	0.7	0.8	0.6	0.8	1.1
21-Jan	Z	1.5	4.3	2.6	2.1	1.5	1.3	0.9	2.2	3.1	4.6	3.8	4.1	4.3	3.3	0.0	0.7	0.1	0.9	0.1	0.0	0.3	0.3	0.2	1.8	4.6
22-Jan	0.0	Z	0.2	0.2	0.0	0.0	0.1	0.0	0.0	0.0	1.2	0.4	3.7	7.0	5.6	3.6	4.9	9.1	7.9	7.1	4.8	2.6	1.9	2.3	2.7	9.1
23-Jan	1.1	1.3	Z	3.6	5.5	18.2	2.8	3.2	2.6	4.0	10.3	8.4	6.9	12.1	9.3	8.4	6.5	4.7	28.8	27.7	30.0	26.3	7.5	1.2	10.0	30.0
24-Jan	0.1	0.5	0.2	Z	0.8	0.5	1.6	2.2	3.3	2.5	3.2	2.9	4.3	6.7	13.7	18.4	22.5	9.1	3.0	2.9	3.5	4.4	4.1	3.2	4.9	22.5
25-Jan	6.6	7.7	8.3	9.0	Z	10.3	11.3	14.7	19.4	15.3	13.2	15.2	15.8	16.3	17.6	19.4	13.1	3.1	1.6	1.4	1.8	1.5	1.4	1.4	9.8	19.4
26-Jan	1.6	2.0	1.5	0.6	0.2	Z	10.3	7.1	9.1	6.8	7.0	7.9	9.0	6.5	5.8	9.9	7.5	2.0	3.0	1.5	1.0	0.2	0.7	0.5	4.4	10.3
27-Jan	Z	0.3	0.2	0.7	1.8	4.0	3.2	9.0	5.3	2.0	4.0	4.3	6.6	10.8	9.3	17.1	16.6	23.9	36.2	26.2	12.0	1.0	0.4	0.4	8.5	36.2
28-Jan	1.0	Z	0.4	0.5	0.4	0.3	0.8	1.1	0.2	0.3	0.5	1.3	0.6	0.7	0.2	0.8	1.5	1.4	0.7	4.0	6.3	7.0	10.6	11.7	2.3	11.7
29-Jan	15.8	11.0	Z	0.3	0.1	0.2	0.5	0.5	2.6	3.1	3.8	1.3	0.5	0.6	0.4	0.2	0.0	0.5	0.5	2.8	25.8	27.0	29.2	22.2	6.5	29.2
30-Jan	29.5	11.9	20.4	Z	15.9	14.9	15.2	11.9	12.0	4.2	3.4	2.6	0.4	0.7	1.4	14.0	12.7	13.6	9.6	9.3	11.8	17.3	35.9	26.1	12.8	35.9
31-Jan	23.3	8.6	4.5	3.1	Z	1.8	2.5	4.6	6.4	8.7	7.1	8.8	8.0	9.6	14.0	13.4	18.3	18.5	26.1	36.4	38.2	36.7	35.6	40.2	16.3	40.2

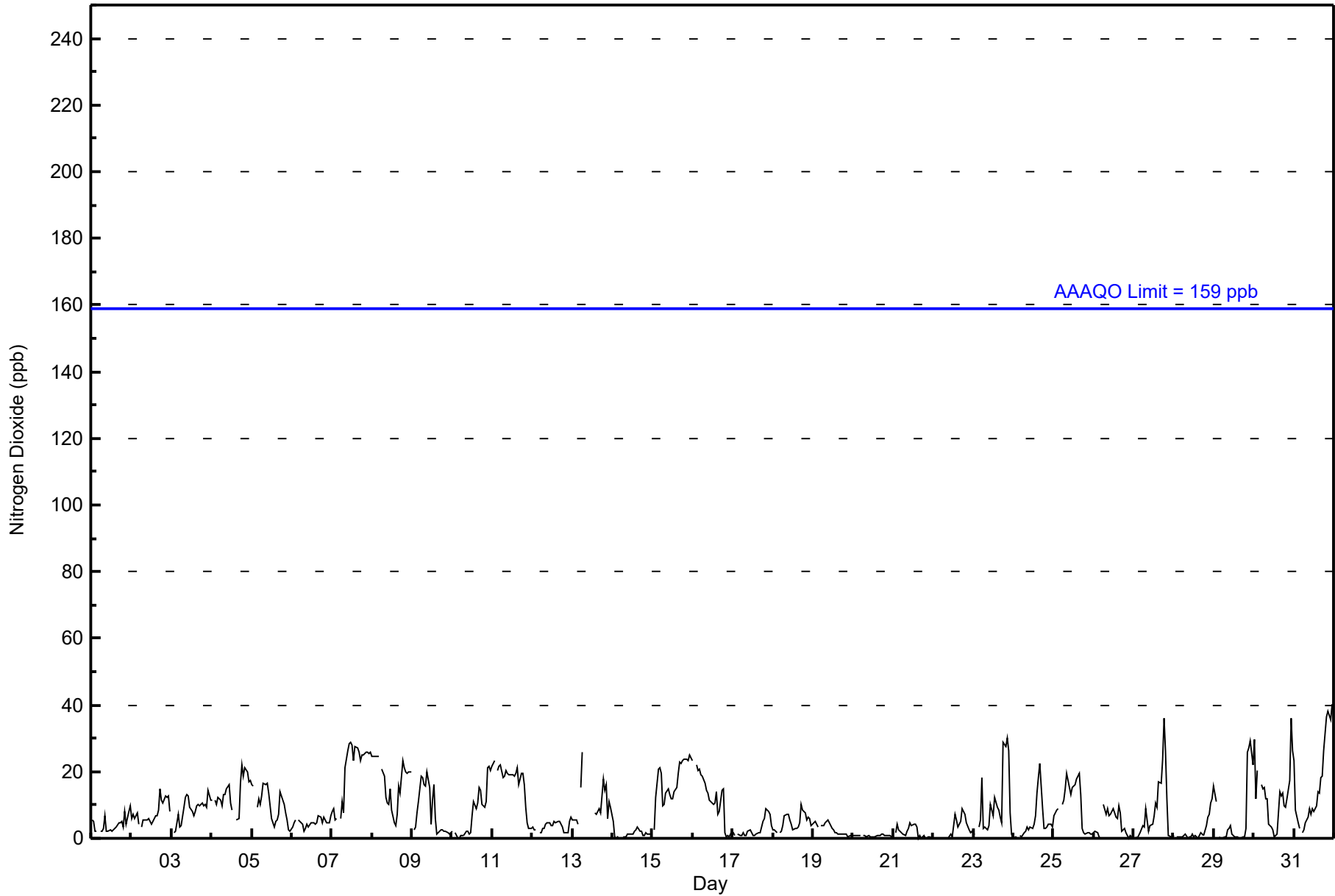
8.6	6.1	5.8	6.3	6.9	7.4	7.2	7.0	7.9	7.8	7.7	6.8	6.7	7.2	7.5	8.3	9.0	9.4	11.0	10.0	10.6	9.7	10.2	9.3	Diurnal Average	
29.5	24.4	24.7	24.6	24.5	21.9	25.9	18.7	21.2	26.4	28.4	29.0	27.8	23.1	27.5	27.2	25.9	23.9	36.2	36.4	38.2	36.7	35.9	40.2	Diurnal Maximum	

Z - zerospan C - Calibration UO - Unstable Operation
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	635	90.07	90.07
21 - 40	70	9.93	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	50	46	18	3	7	19	63	204	74	30	17	34	24	16	15	5	625
21 - 40	21	11	3	1	0	0	4	7	3	2	1	0	0	1	5	8	67
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	57	21	4	7	19	67	211	77	32	18	34	24	17	20	13	692

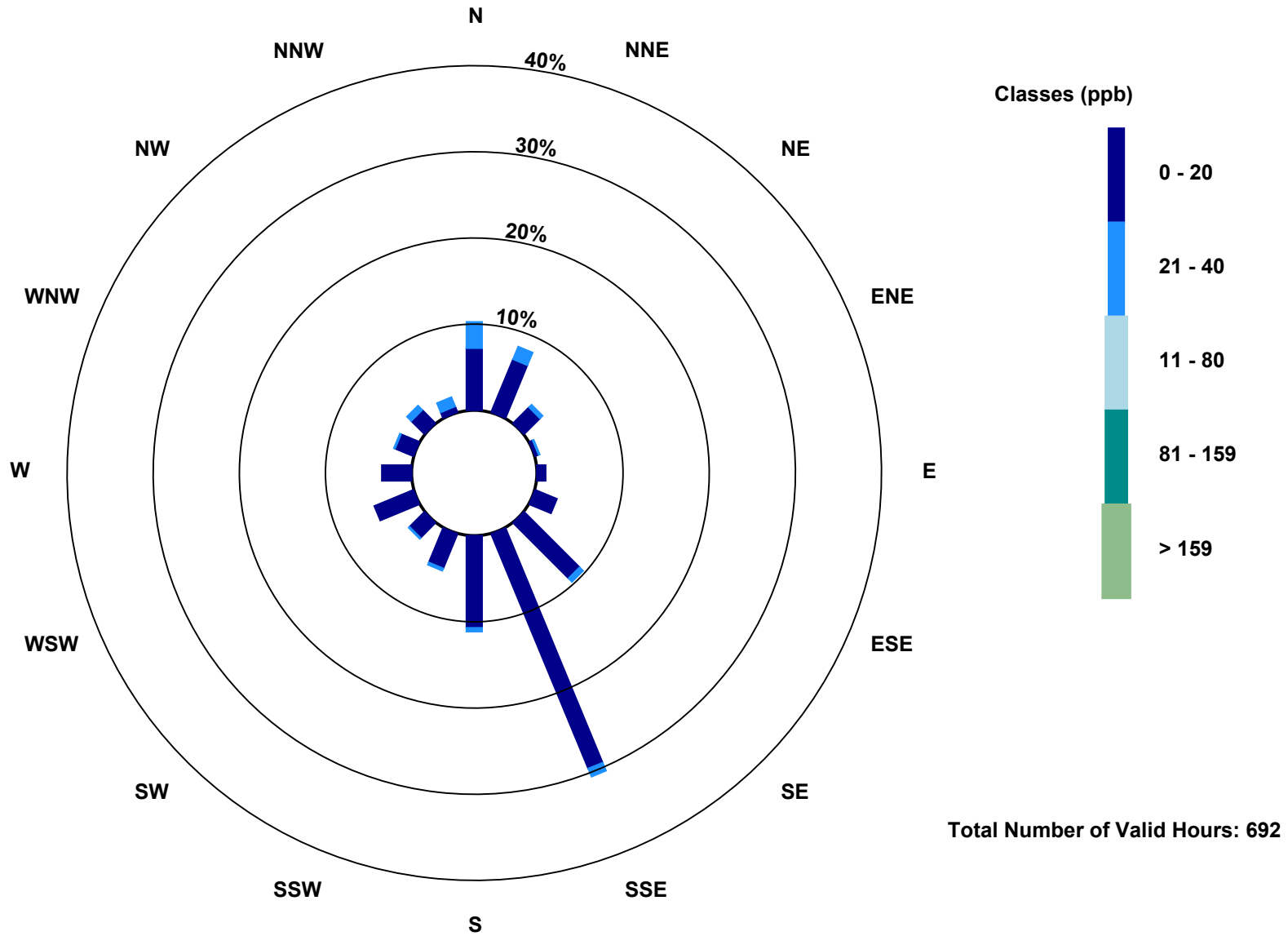
Total Number of Valid Hours: 692

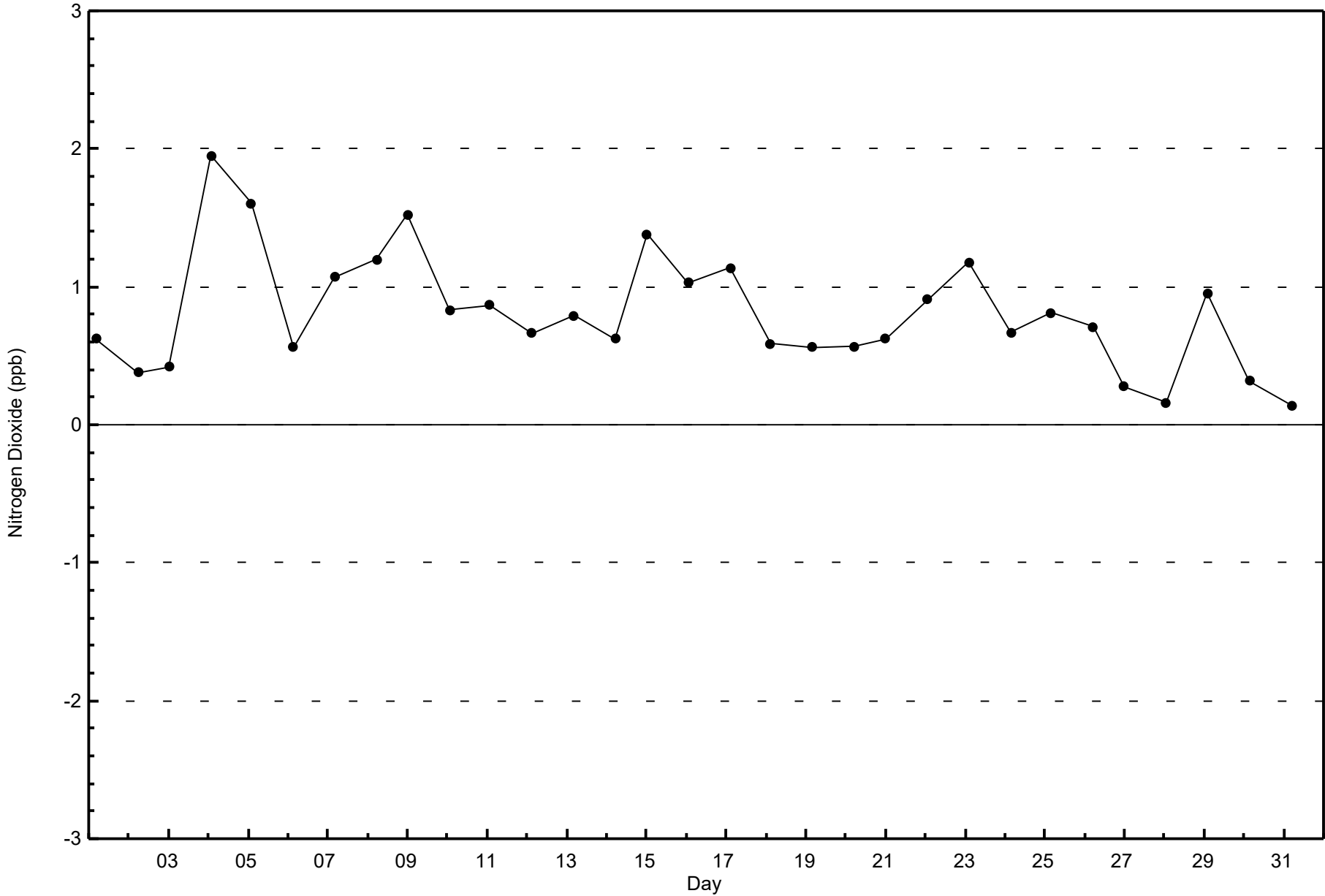
Total Number of Hours: 744

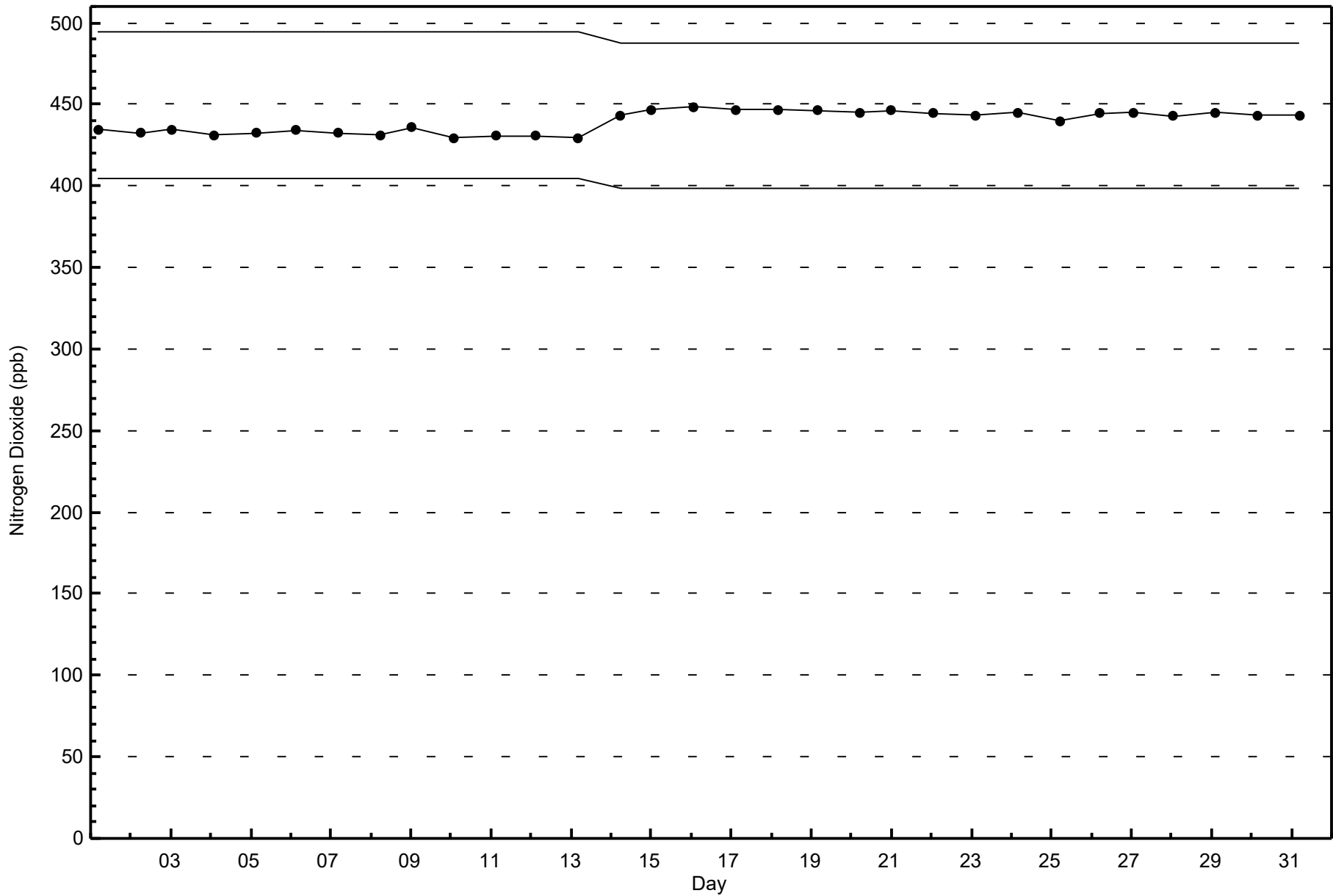


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

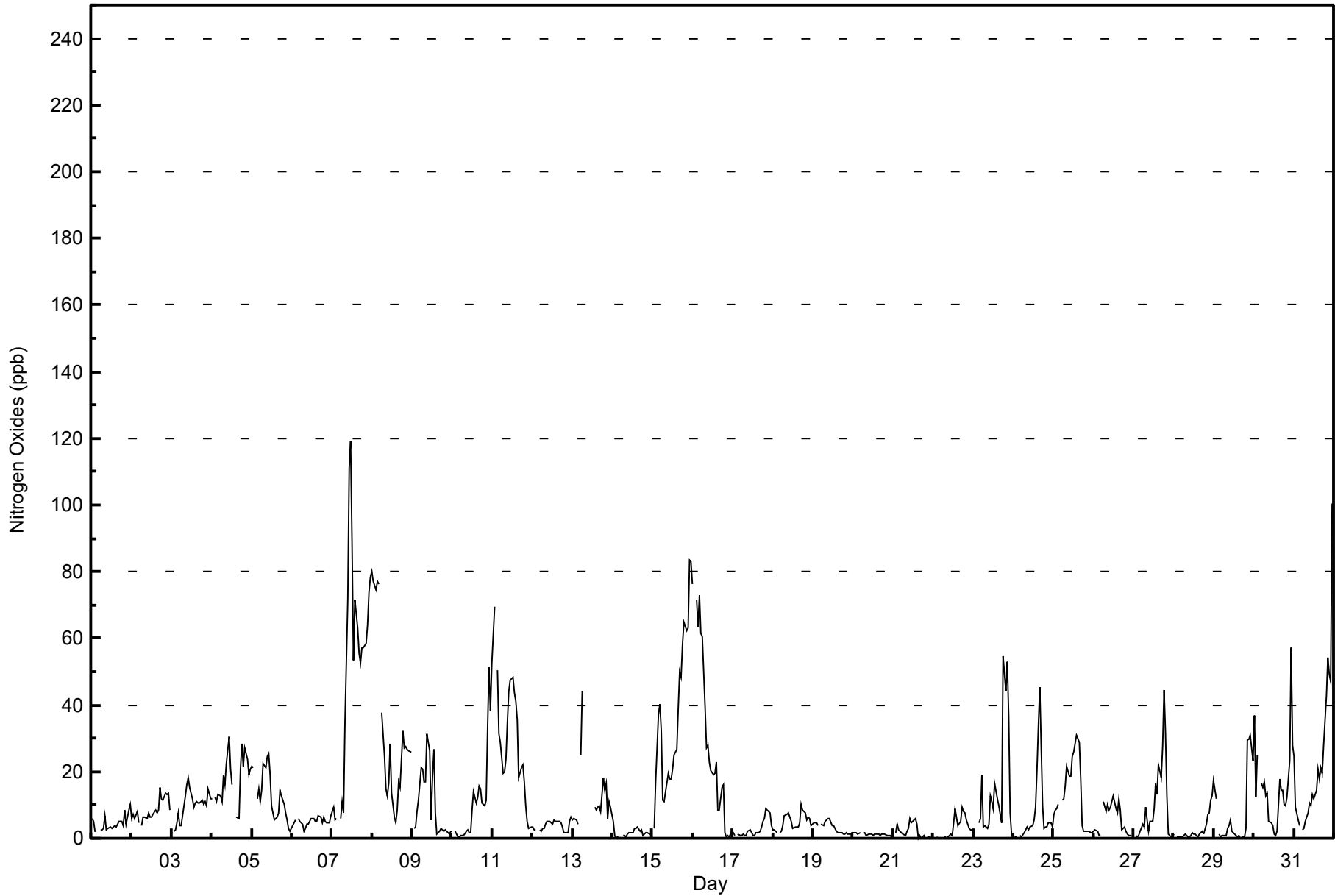
Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 119.0 ppb on Jan 7 12:00		Maximum Daily Average: 50.6 ppb on Jan 7				Hours of Data:		705																																									
Minimum Value: 0.0 ppb on Jan 14 03:00		Minimum Daily Average: 1.2 ppb on Jan 20				Hours of Missing Data:		39																																									
Maximum Diurnal Average: 16.1 ppb at hour 23		Minimum Diurnal Average: 8.7 ppb at hour 8				Hours of Calibration:		37																																									
Monthly Average: 12.63 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.9 Q ₁ = 2.1 Median = 5.9 Q ₃ = 15.1 P ₉₀ = 31.5 P ₉₉ = 78.2				Percent Operational Time:		99.7																																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	5.9	5.1	2.3	2.3	Z	2.6	2.3	3.2	6.9	2.7	3.1	3.6	3.1	3.3	3.6	3.6	5.2	5.0	5.0	3.7	8.4	4.4	8.4	10.3	4.5	10.3																							
2-Jan	6.1	7.3	6.1	8.0	4.6	Z	4.0	6.2	6.2	6.1	7.6	6.5	6.3	7.1	8.6	7.5	8.7	15.2	12.0	11.3	13.6	13.1	13.6	8.3	8.4	15.2																							
3-Jan	Z	2.2	2.6	4.7	7.7	3.8	4.0	9.8	12.9	16.0	18.4	15.3	12.1	9.5	10.5	10.9	10.7	10.4	11.4	10.2	10.8	9.8	14.9	11.8	10.0	18.4																							
4-Jan	11.8	Z	12.4	11.2	13.2	12.9	10.9	19.1	16.3	22.6	30.5	20.9	16.3	UO	UO	6.2	6.1	20.8	28.3	21.7	27.2	23.7	18.9	20.6	17.7	30.5																							
5-Jan	21.7	21.0	Z	11.7	14.9	11.2	14.3	22.3	21.3	24.6	25.6	19.2	9.6	5.3	5.9	6.2	7.5	14.5	12.9	10.3	7.7	5.6	2.8	2.0	13.0	25.6																							
6-Jan	3.6	4.5	5.6	Z	5.8	5.1	4.2	2.3	2.8	4.1	4.1	5.9	5.9	5.9	5.2	4.9	6.7	6.3	4.7	6.3	5.3	4.6	4.6	6.6	5.0	6.7																							
7-Jan	7.9	9.3	5.5	6.1	Z	5.8	11.2	7.7	34.7	71.8	111.0	119.0	88.4	53.4	71.5	63.3	55.6	52.5	57.0	57.4	58.3	64.0	73.7	78.3	50.6	119.0																							
8-Jan	80.0	77.3	74.8	77.1	76.2	Z	37.8	24.5	14.6	12.7	16.5	28.5	13.6	6.5	4.9	8.5	17.1	15.1	32.4	27.2	27.6	26.6	26.1	25.9	32.7	80.0																							
9-Jan	Z	3.1	3.5	8.0	11.2	21.2	20.7	17.0	17.0	31.2	26.1	5.7	18.7	26.7	7.5	1.3	2.2	2.9	2.6	2.0	2.5	1.6	1.5	1.9	10.3	31.2																							
10-Jan	2.1	Z	2.1	0.5	0.3	0.7	0.8	0.7	2.3	2.5	1.7	1.9	8.6	14.1	10.5	12.1	15.9	15.0	10.6	9.9	11.4	32.9	51.2	38.1	10.7	51.2																							
11-Jan	52.6	69.4	Z	50.4	31.3	28.8	19.6	19.7	23.8	34.9	44.3	47.3	48.5	43.8	41.2	35.4	18.1	21.3	22.2	17.0	9.9	4.9	3.0	3.2	30.0	69.4																							
12-Jan	3.5	2.7	2.5	Z	2.5	2.1	3.1	3.1	4.4	4.9	5.0	4.5	4.4	5.6	5.3	5.2	4.9	4.5	3.5	1.8	1.7	1.7	5.2	6.5	3.9	6.5																							
13-Jan	5.4	5.8	5.3	4.3	Z	24.9	44.2	C	C	C	C	C	C	9.4	8.5	9.1	9.7	8.0	18.4	14.6	16.7	6.0	11.1	9.4	--	44.2																							
14-Jan	4.9	0.6	0.0	0.3	0.0	Z	0.7	0.8	0.5	1.2	1.5	1.7	1.7	2.8	3.1	3.3	2.1	2.5	1.0	1.2	1.9	1.5	1.2	1.6	1.6	4.9																							
15-Jan	Z	3.2	16.8	37.2	40.4	32.0	11.6	11.0	14.2	19.4	18.0	17.6	20.7	25.0	26.5	38.9	50.0	48.2	58.1	64.8	62.1	63.2	83.5	83.0	36.8	83.5																							
16-Jan	76.2	Z	71.5	63.6	73.0	61.6	60.7	39.3	27.1	27.8	22.7	20.5	19.2	19.4	22.9	8.3	8.5	15.4	16.0	1.8	0.5	0.8	0.6	2.1	28.7	76.2																							
17-Jan	1.7	0.9	Z	1.2	0.9	1.0	1.5	0.7	1.0	2.0	2.6	1.5	0.7	1.0	1.6	1.9	1.9	3.5	5.2	5.9	9.1	7.9	7.5	4.0	2.8	9.1																							
18-Jan	2.4	2.5	1.7	Z	1.8	2.1	4.0	6.9	7.0	7.8	6.5	5.0	2.9	3.4	3.3	3.5	4.7	10.1	8.6	7.8	5.7	6.5	6.1	4.0	5.0	10.1																							
19-Jan	4.7	4.9	4.5	3.6	Z	4.2	4.0	5.0	5.4	6.1	5.8	4.0	3.7	2.9	2.2	1.6	1.5	1.6	1.4	1.4	1.8	1.2	1.1	1.6	3.2	6.1																							
20-Jan	1.5	1.5	1.6	1.4	1.6	Z	1.8	1.7	1.0	1.2	1.4	1.3	1.0	1.3	1.2	1.3	0.8	1.1	1.1	1.1	0.8	0.8	0.9	0.6	1.2	1.8																							
21-Jan	Z	1.7	4.3	2.6	2.1	1.5	1.3	0.9	2.2	3.1	5.9	4.6	5.6	5.9	4.1	0.0	0.7	0.1	0.9	0.1	0.0	0.3	0.3	0.2	2.1	5.9																							
22-Jan	0.0	Z	0.4	0.2	0.0	0.0	0.2	0.2	0.0	0.4	1.3	0.7	4.7	8.8	6.5	4.0	5.3	9.4	8.1	7.5	5.5	3.0	2.5	2.4	3.1	9.4																							
23-Jan	1.5	1.8	Z	4.5	6.0	18.9	3.3	3.6	2.9	4.4	12.5	11.1	9.0	16.7	11.9	9.8	7.1	4.7	54.5	44.2	52.8	36.6	7.6	1.2	14.2	54.5																							
24-Jan	0.1	0.5	0.2	Z	0.8	0.5	1.6	2.4	3.4	2.7	3.6	3.7	5.5	9.2	20.4	33.5	45.4	9.8	3.1	3.2	3.6	4.6	4.5	3.5	7.2	45.4																							
25-Jan	7.0	8.4	8.9	10.0	Z	11.4	11.9	15.6	21.5	18.5	18.5	24.5	25.9	28.4	30.9	28.8	18.0	3.8	2.0	2.0	2.2	2.0	1.8	1.7	13.2	30.9																							
26-Jan	2.3	2.6	2.1	1.0	0.8	Z	11.2	7.9	10.0	8.4	9.4	11.0	12.7	9.1	7.6	11.8	8.3	2.4	3.6	1.9	1.2	0.7	0.8	0.7	5.5	12.7																							
27-Jan	Z	0.7	0.5	1.0	2.1	4.1	3.4	9.3	5.4	2.3	4.9	5.2	9.1	16.5	13.3	22.2	18.3	27.6	44.5	31.7	12.8	1.3	0.5	0.4	10.3	44.5																							
28-Jan	1.4	Z	0.6	0.5	0.4	0.5	0.9	1.5	0.4	0.5	0.8	1.9	1.4	1.1	0.6	1.4	1.6	2.0	1.1	4.3	7.0	7.5	11.5	12.6	2.7	12.6																							
29-Jan	17.2	11.9	Z	1.2	0.5	0.7	0.9	1.0	3.1	4.0	5.4	2.0	1.1	0.8	0.4	0.8	0.1	0.6	0.6	2.8	29.5	29.5	30.8	23.1	7.3	30.8																							
30-Jan	36.7	12.5	24.8	Z	16.5	15.4	16.9	12.5	13.4	4.9	4.6	3.9	1.1	0.9	2.0	17.8	14.3	14.3	10.2	9.8	12.4	23.5	57.3	27.9	15.4	57.3																							
31-Jan	24.6	9.3	5.4	3.9	Z	2.5	3.1	5.0	7.4	10.8	9.6	13.0	11.9	14.5	20.9	17.6	21.0	19.4	28.1	42.7	54.1	49.1	46.9	100.4	22.7	100.4																							
																								14.7	10.4	10.2	12.2	12.6	10.6	10.2	8.7	9.6	12.0	14.3	13.7	12.4	11.9	12.1	12.3	12.2	11.9	15.1	13.8	15.0	14.2	16.1	15.9	Diurnal Average	
																								80.0	77.3	74.8	77.1	76.2	61.6	60.7	39.3	34.7	71.8	111.0	119.0	88.4	53.4	71.5	63.3	55.6	52.5	58.1	64.8	62.1	64.0	83.5	100.4	Diurnal Maximum	
Z - zerospan																								C - Calibration				UO - Unstable Operation																					



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	575	81.56	81.56
21 - 40	75	10.64	92.20
41 - 80	49	6.95	99.15
81 - 159	6	0.85	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	43	33	15	3	4	18	57	188	69	29	16	34	24	16	15	4	568
21 - 40	10	13	5	0	3	1	7	17	4	1	1	0	0	0	2	7	71
11 - 80	16	10	1	1	0	0	3	6	4	2	1	0	0	0	2	1	47
81 - 159	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	6
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	57	21	4	7	19	67	211	77	32	18	34	24	17	20	13	692

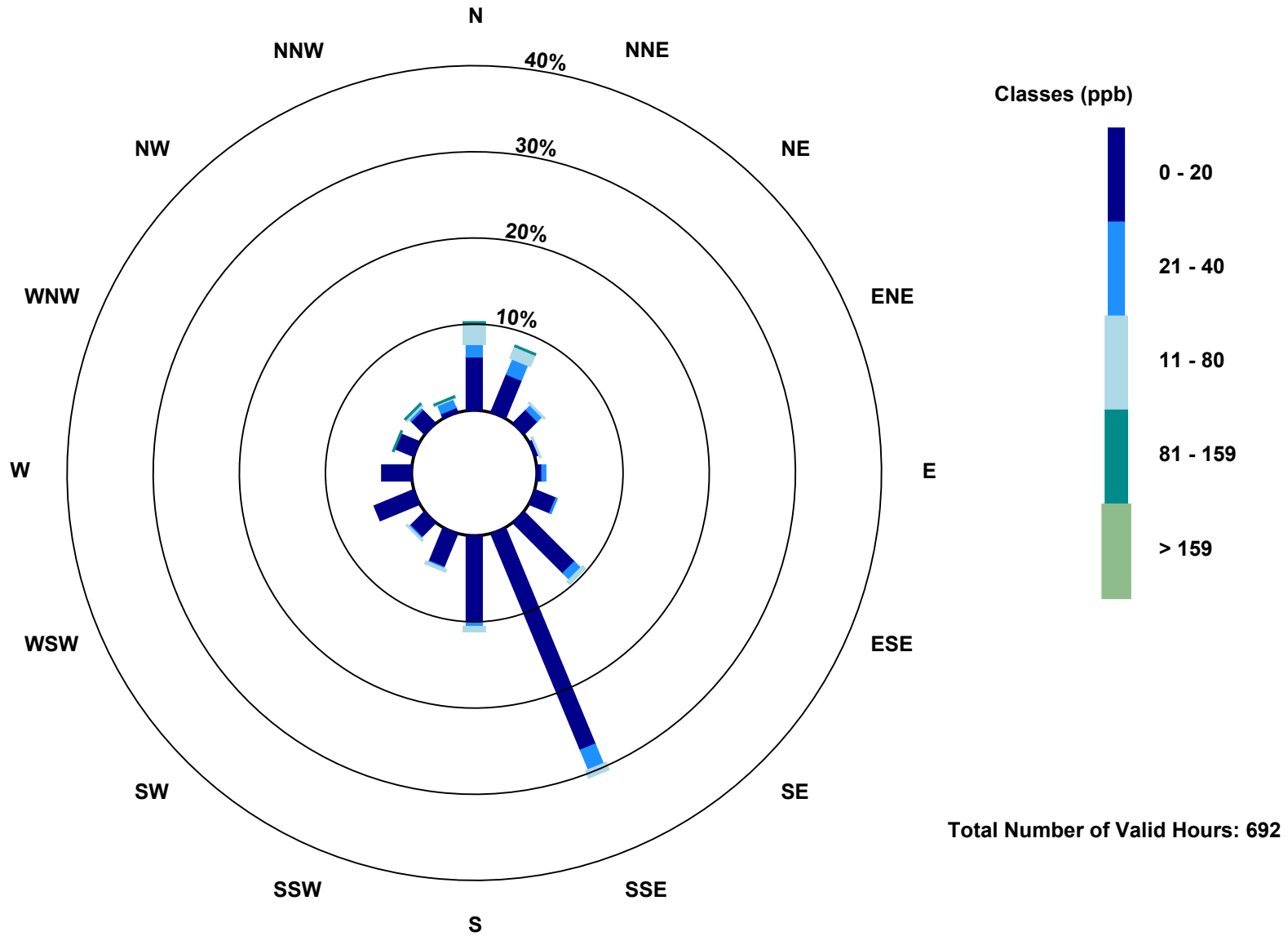
Total Number of Valid Hours: 692

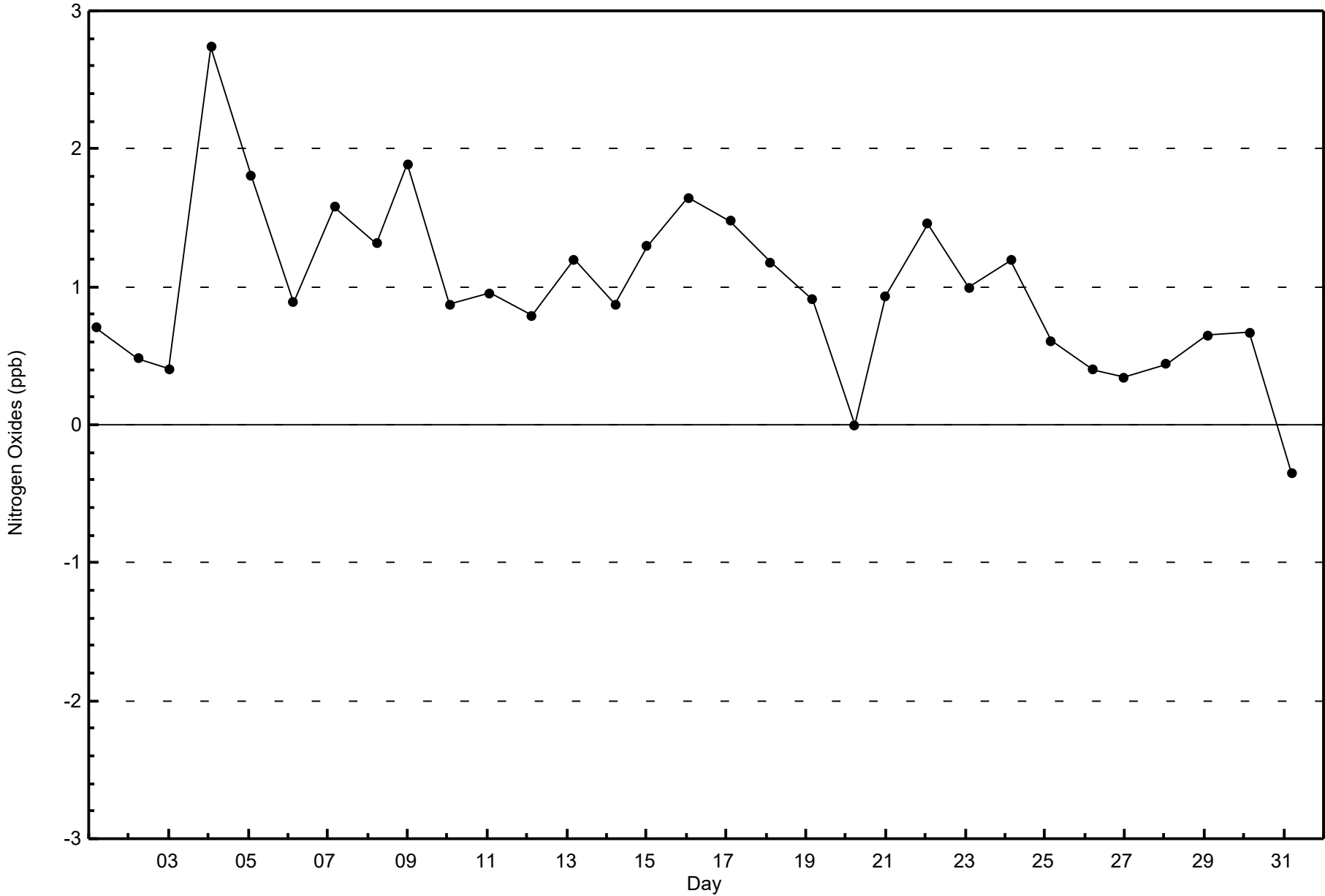
Total Number of Hours: 744

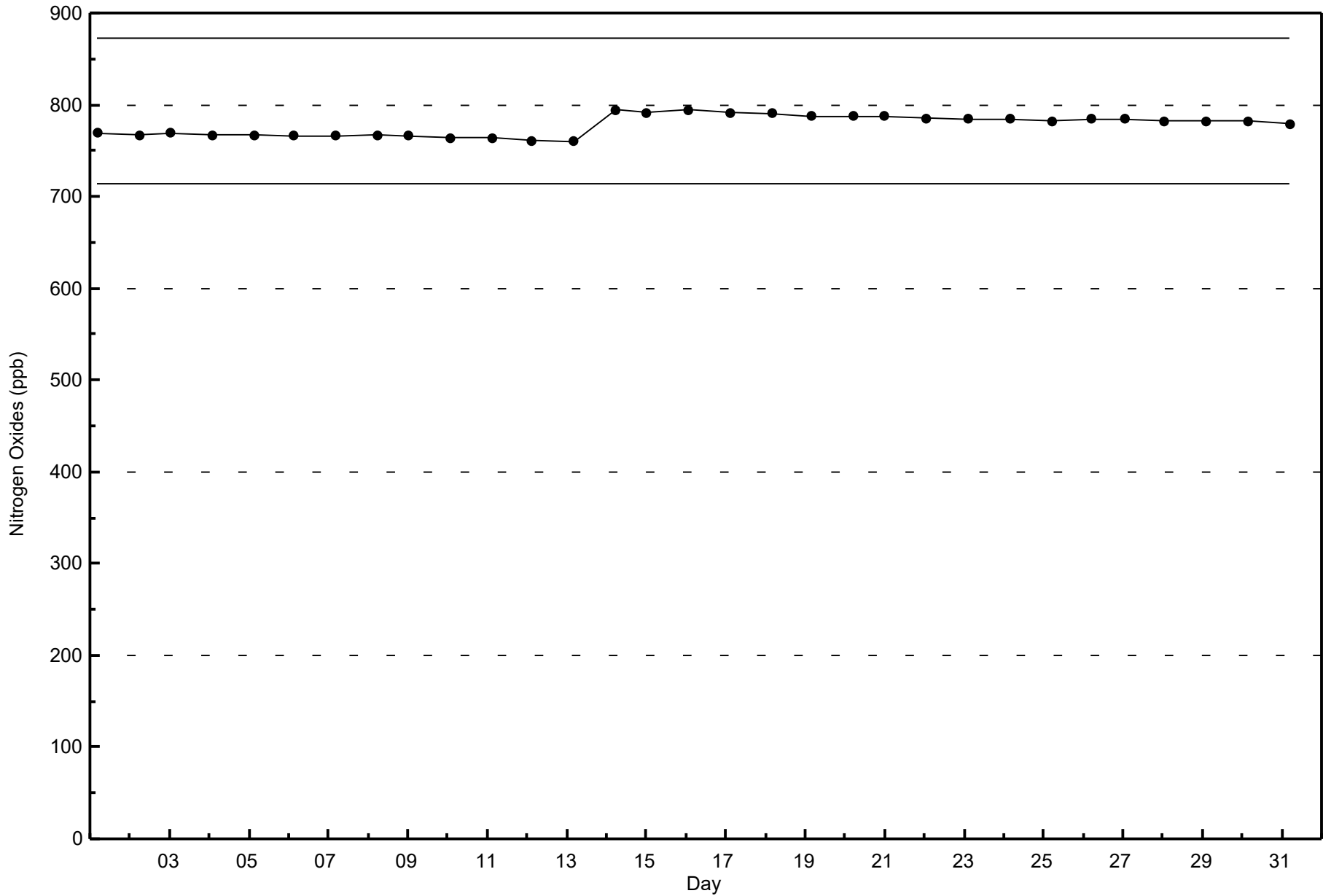


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint









Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 34.3 ppb on Jan 28 15:00	Maximum Daily Average: 31.3 ppb on Jan 28		Hours of Data:	709
Minimum Value: 1.2 ppb on Jan 13 07:00	Minimum Daily Average: 5.2 ppb on Jan 15		Hours of Missing Data:	35
Maximum Diurnal Average: 19.4 ppb at hour 4	Minimum Diurnal Average: 15.4 ppb at hour 19		Hours of Calibration:	35
Monthly Average: 17.48 ppb	Percentiles: P ₁ = 1.6 P ₁₀ = 3.2 Q ₁ = 10.9 Median = 18.5 Q ₃ = 23.5 P ₉₀ = 30.6 P ₉₉ = 33.2		Percent Operational Time:	100.0

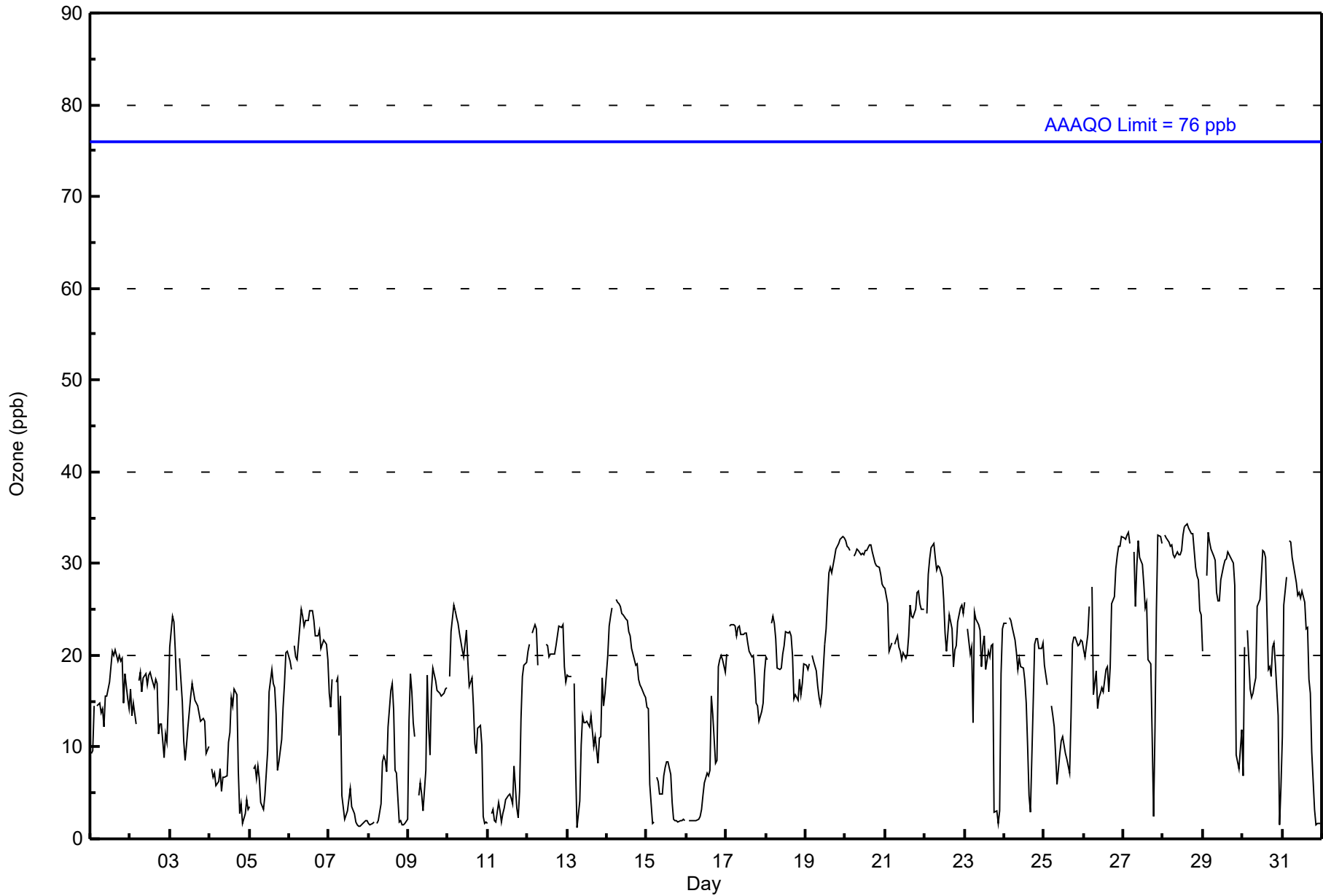
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	9.2	9.6	14.5	Z	14.5	14.8	13.7	14.2	12.2	15.5	15.6	17.1	18.8	20.5	19.9	20.6	19.3	20.0	19.3	19.7	14.8	18.1	15.2	14.2	16.1	20.6
2-Jan	16.3	13.4	14.9	12.4	Z	17.3	18.2	16.0	17.5	18.0	16.7	17.8	18.1	17.6	16.5	17.4	16.9	11.4	12.6	12.5	8.8	11.4	10.6	14.8	15.1	18.2
3-Jan	20.9	24.3	23.7	20.5	16.2	Z	19.7	14.9	10.6	8.6	10.2	12.2	15.5	17.0	16.0	15.2	14.7	14.4	12.8	13.0	13.1	12.9	9.4	10.0	15.0	24.3
4-Jan	Z	7.6	6.7	7.2	5.7	6.2	7.7	5.1	6.8	6.6	6.9	10.5	11.5	15.4	14.6	16.3	15.8	7.5	2.7	3.8	1.6	2.7	4.3	3.3	7.7	16.3
5-Jan	3.5	Z	7.6	7.9	6.5	7.9	6.5	3.9	3.1	4.7	7.2	9.7	16.0	18.5	16.9	16.5	13.6	7.4	8.4	10.9	14.3	17.0	20.3	20.5	10.8	20.5
6-Jan	19.4	18.5	Z	21.0	19.9	19.5	23.2	25.0	24.3	23.2	23.8	23.8	24.8	24.8	24.9	23.8	22.1	22.1	22.7	20.8	21.2	21.6	21.1	19.5	22.2	25.0
7-Jan	15.8	14.3	17.4	Z	17.1	17.6	11.4	15.6	4.7	2.1	2.6	3.0	4.3	5.5	3.5	2.7	1.9	1.6	1.4	1.3	1.6	1.8	1.9	1.9	6.6	17.6
8-Jan	1.7	1.6	1.7	1.8	Z	1.7	1.9	3.8	8.4	9.0	8.6	7.3	12.3	16.1	16.9	14.1	7.5	7.2	1.9	1.9	1.5	1.5	1.7	2.2	5.8	16.9
9-Jan	13.0	17.9	16.0	12.7	11.2	Z	4.7	6.1	5.0	3.1	7.4	17.8	12.0	9.1	16.1	18.5	17.2	16.2	16.0	15.9	15.5	15.9	16.3	16.5	13.1	18.5
10-Jan	Z	17.7	22.6	25.4	24.9	24.2	23.5	22.4	20.7	19.9	21.2	22.7	19.4	16.7	17.5	14.5	10.4	9.4	12.0	12.4	10.2	2.4	1.7	1.8	16.2	25.4
11-Jan	1.7	Z	2.7	3.2	2.0	1.8	3.9	3.0	1.8	2.7	3.4	4.3	4.7	4.8	4.4	3.8	8.0	3.4	2.3	5.1	13.2	17.6	18.9	19.2	5.9	19.2
12-Jan	20.4	21.2	Z	22.5	23.3	22.9	18.9	C	C	C	C	21.2	21.1	19.8	20.1	20.2	20.2	21.0	22.2	23.1	23.0	23.3	18.8	17.1	21.1	23.3
13-Jan	17.8	17.7	17.8	Z	17.0	8.0	1.2	4.1	10.3	13.4	12.6	12.7	12.7	12.2	13.5	11.8	10.1	11.1	8.2	11.0	11.1	17.6	14.5	15.9	12.3	17.8
14-Jan	20.1	23.3	24.3	25.2	Z	26.0	25.8	25.6	25.3	24.5	24.3	23.9	23.8	22.6	22.1	20.8	19.6	18.9	19.1	17.4	16.8	16.5	15.6	15.4	21.6	26.0
15-Jan	14.4	14.2	6.0	1.7	1.8	Z	6.7	6.2	4.8	4.9	6.9	7.8	8.3	8.4	7.0	4.0	2.2	1.9	2.0	1.9	1.9	2.0	2.1	2.0	5.2	14.4
16-Jan	Z	2.0	1.9	2.0	2.0	1.9	1.9	2.1	2.4	3.2	4.7	6.1	7.2	6.8	7.4	15.6	13.6	8.3	8.5	18.7	19.6	19.9	19.6	18.1	8.4	19.9
17-Jan	20.2	Z	23.2	23.3	23.3	23.2	22.1	23.0	23.1	22.3	22.3	22.5	22.4	21.4	20.4	19.9	20.0	17.8	14.8	14.5	12.8	13.9	14.7	18.1	20.0	23.3
18-Jan	19.9	19.6	Z	23.4	24.2	23.4	21.9	18.6	18.5	18.6	20.2	21.1	22.6	22.3	22.6	22.2	19.9	15.3	15.7	15.2	17.4	15.7	16.9	19.1	19.8	24.2
19-Jan	18.9	18.4	19.0	Z	19.9	19.4	18.2	16.7	15.5	14.7	15.8	21.3	22.9	26.1	29.0	29.6	28.9	30.7	31.6	31.9	32.2	32.7	32.9	32.8	24.3	32.9
20-Jan	32.5	31.8	31.7	31.4	Z	30.8	31.2	31.5	31.4	30.9	31.1	31.0	31.4	31.5	32.1	32.0	31.3	30.7	30.0	29.7	29.6	28.8	27.8	27.4	30.8	32.5
21-Jan	27.3	25.7	20.5	20.9	21.4	Z	21.2	22.1	20.8	20.5	19.5	20.3	19.7	20.1	22.1	25.5	24.2	24.1	25.0	26.9	27.1	25.7	25.0	25.0	23.1	27.3
22-Jan	Z	24.6	28.9	30.5	31.7	32.2	30.6	29.4	29.7	29.6	28.6	26.1	22.4	20.5	22.5	24.4	22.9	18.8	20.6	21.0	23.6	25.2	25.4	24.6	25.8	32.2
23-Jan	25.7	Z	22.9	20.2	21.0	12.7	24.7	23.9	23.4	22.7	18.7	21.0	22.2	18.5	20.5	19.9	21.0	21.2	2.9	3.1	1.6	3.1	18.1	22.9	17.9	25.7
24-Jan	23.5	23.5	Z	24.1	23.8	23.1	21.6	20.3	18.5	19.7	18.8	18.6	17.2	14.8	10.0	4.8	2.9	14.9	21.1	21.9	21.8	20.7	20.7	21.4	18.6	24.1
25-Jan	18.9	17.8	16.8	Z	14.4	13.5	12.1	9.2	6.0	9.3	10.7	11.1	10.2	9.3	8.8	7.2	13.3	21.3	22.0	21.9	21.0	21.3	21.6	21.6	14.7	22.0
26-Jan	20.7	19.8	22.3	25.3	Z	27.5	15.7	18.4	14.2	15.4	15.9	16.5	16.1	18.4	18.8	16.1	18.8	25.7	26.3	29.5	30.8	31.8	31.9	33.0	22.1	33.0
27-Jan	32.8	32.7	33.1	33.4	32.2	Z	31.3	25.3	29.7	32.5	30.6	29.9	27.8	25.2	25.9	19.5	19.0	11.1	2.4	12.1	24.8	33.1	33.0	32.3	26.5	33.4
28-Jan	Z	33.1	32.8	32.4	31.9	32.0	31.0	30.6	31.3	31.0	31.0	31.5	33.1	34.0	34.3	33.9	33.6	33.2	33.2	29.6	28.6	28.2	24.9	24.4	31.3	34.3
29-Jan	20.4	Z	28.6	33.4	32.3	31.5	30.8	30.4	26.9	26.0	25.9	28.2	29.7	30.4	30.5	31.3	31.0	30.3	30.0	27.6	9.1	8.4	7.6	12.0	25.8	33.4
30-Jan	6.9	20.9	Z	22.7	16.4	15.4	15.9	16.7	17.5	25.3	26.1	28.7	31.4	31.3	30.7	18.5	18.8	17.6	21.0	21.3	19.1	13.5	1.6	5.7	19.3	31.4
31-Jan	11.1	25.4	28.5	Z	32.5	32.3	30.7	29.8	27.9	26.5	26.8	26.3	27.1	25.7	23.0	23.0	17.3	15.9	9.4	3.2	1.6	1.7	1.7	1.6	19.5	32.5
	17.4	19.1	18.7	19.4	18.7	18.7	17.7	17.1	16.4	16.8	17.1	18.5	18.9	18.9	19.0	18.2	17.3	16.5	15.4	16.1	15.8	16.3	16.0	16.6		Diurnal Average
	32.8	33.1	33.1	33.4	32.5	32.3	31.3	31.5	31.4	32.5	31.1	31.5	33.1	34.0	34.3	33.9	33.6	33.2	33.2	31.9	32.2	33.1	33.0	33.0		Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Buffalo Viewpoint - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Buffalo Viewpoint - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	431	60.79	60.79
21 - 50	278	39.21	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Buffalo Viewpoint - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	47	39	14	4	8	13	55	142	51	17	8	3	1	1	5	11	419
21 - 50	24	21	7	1	0	5	14	67	25	15	10	33	22	16	14	3	277
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	71	60	21	5	8	18	69	209	76	32	18	36	23	17	19	14	696

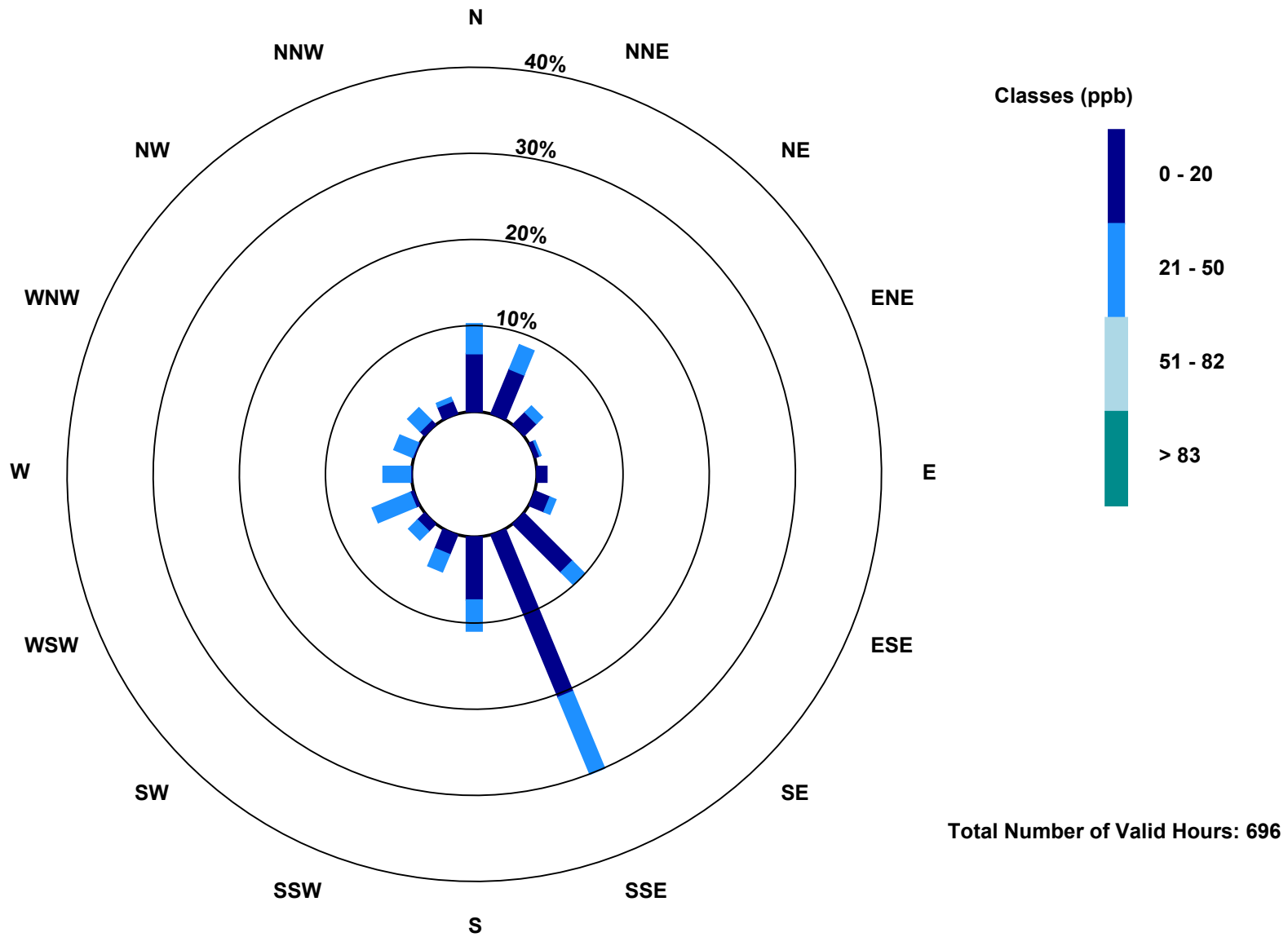
Total Number of Valid Hours: 696

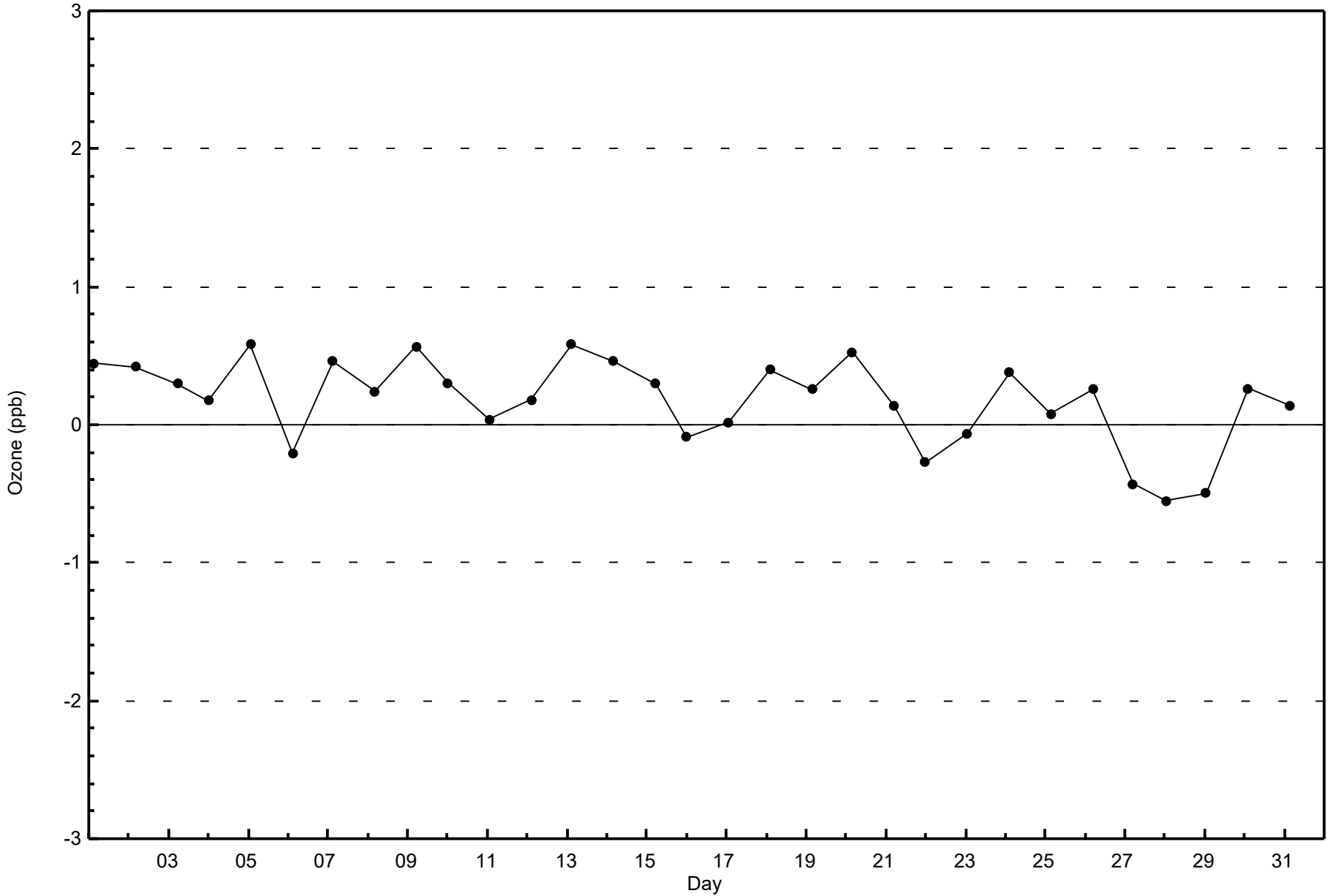
Total Number of Hours: 744

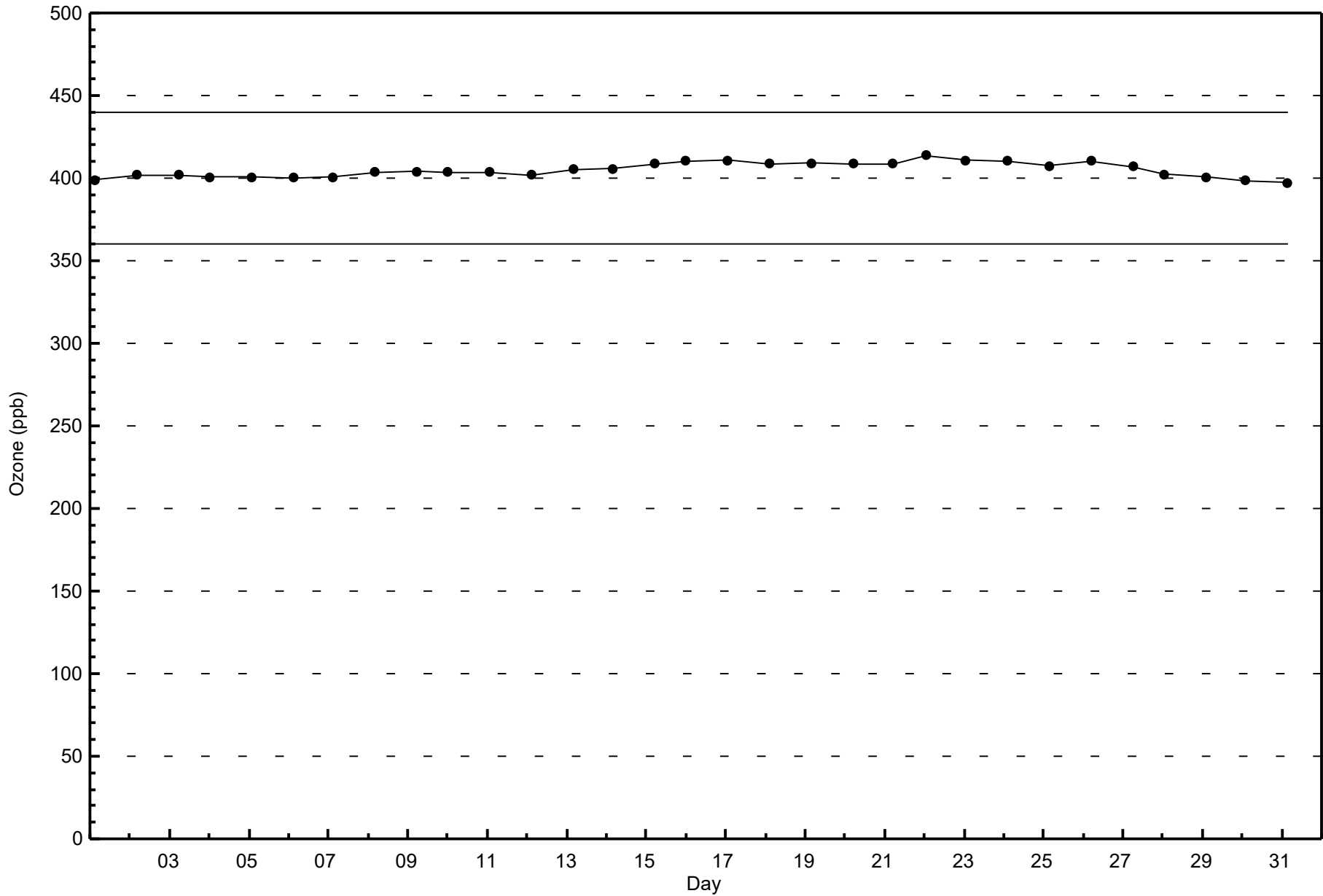


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Buffalo Viewpoint





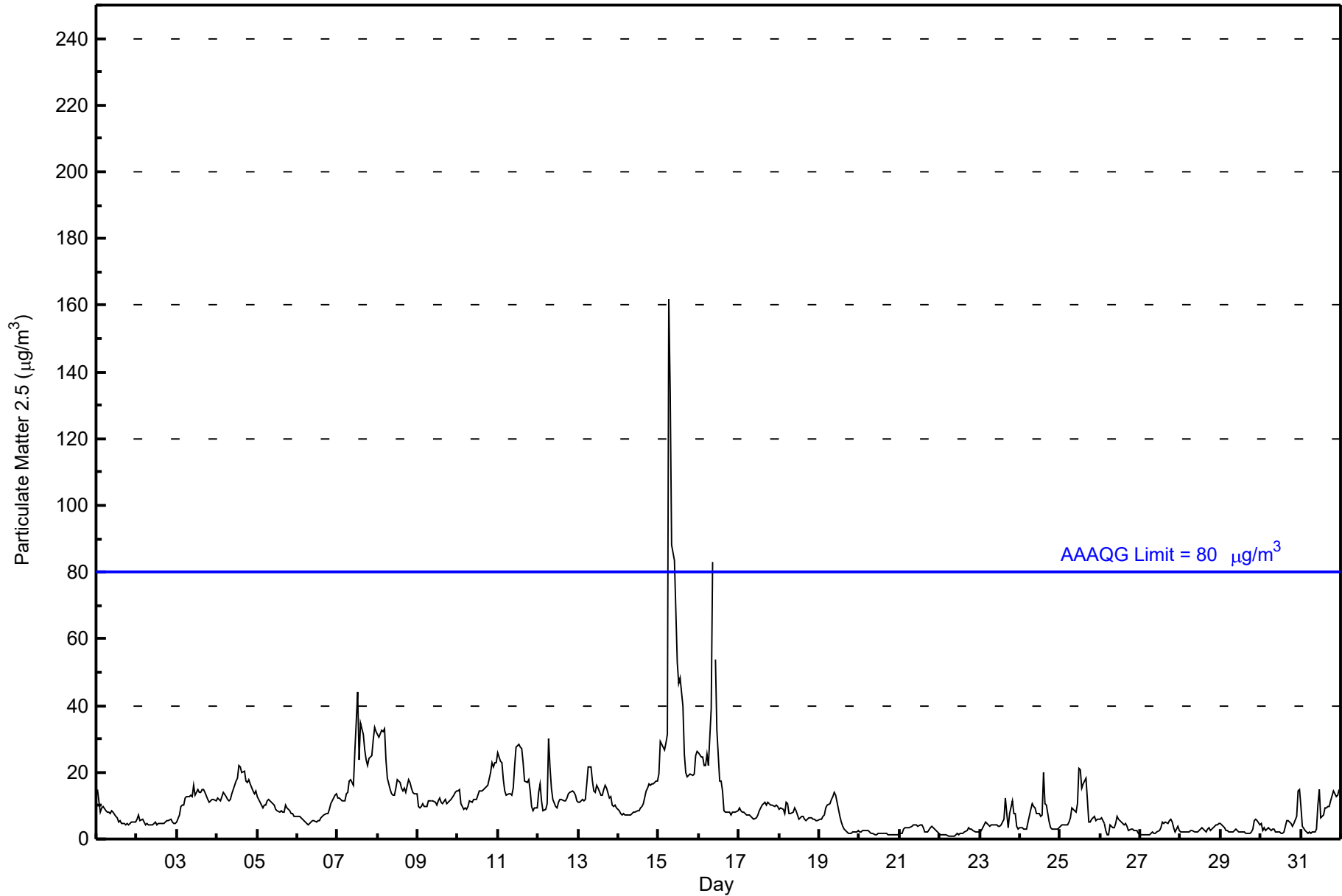




Number of Exceedences (AAAQO):		1-hr: 5		24-hr: 1		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 161.7 µg/m ³ on Jan 15 07:00		Maximum Daily Average: 44.9 µg/m ³ on Jan 15		Hours of Data: 743														Hours of Missing Data: 1		Hours of Calibration: 1							
Minimum Value: 0.7 µg/m ³ on Jan 22 10:00		Minimum Daily Average: 1.7 µg/m ³ on Jan 22		Hours of Calibration: 1														Percent Operational Time: 100.0									
Maximum Diurnal Average: 13.8 µg/m ³ at hour 7		Minimum Diurnal Average: 8.6 µg/m ³ at hour 4		Percentiles: P ₁ = 1.1 P ₁₀ = 2.1 Q ₁ = 3.8 Median = 8.0 Q ₃ = 13.1 P ₉₀ = 19.5 P ₉₉ = 51.0																							
Monthly Average: 10.32 µg/m ³																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	14.8	11.5	8.2	9.3	9.7	8.4	8.2	8.0	7.8	8.3	8.0	7.0	6.2	5.2	5.4	4.7	4.8	4.4	4.5	4.3	4.6	5.2	5.1	5.2	7.0	14.8	
2-Jan	6.0	7.1	5.7	5.7	4.9	4.4	4.6	4.3	4.3	4.3	4.5	5.1	4.2	4.6	4.7	4.7	4.6	5.2	5.4	5.5	5.8	5.0	4.7	4.6	5.0	7.1	
3-Jan	5.0	7.1	9.8	10.3	10.1	12.4	12.8	12.7	13.0	12.8	16.0	13.3	15.0	13.9	14.0	14.6	14.8	14.0	11.8	11.0	11.6	11.7	11.9	11.6	12.1	16.0	
4-Jan	12.4	12.0	11.6	12.8	13.9	12.6	11.8	11.5	11.8	13.8	16.2	17.5	18.3	21.9	21.4	20.1	20.2	17.5	17.1	17.8	16.6	14.6	13.5	14.2	15.5	21.9	
5-Jan	12.5	11.8	10.0	9.4	10.2	10.3	11.2	11.7	11.1	10.6	10.2	9.0	8.4	7.9	8.3	7.9	8.0	10.3	9.5	8.3	7.6	7.5	6.9	6.6	9.4	12.5	
6-Jan	6.8	6.6	6.5	5.9	5.4	5.1	4.4	4.8	5.2	5.6	5.6	5.2	5.3	5.6	6.2	6.6	7.1	7.4	7.5	8.8	10.4	11.5	12.9	13.4	7.1	13.4	
7-Jan	12.3	12.3	11.7	11.4	11.6	13.6	13.9	17.5	17.8	16.1	26.3	35.2	44.1	23.8	34.8	31.4	26.9	23.8	21.9	24.2	24.9	29.6	33.6	32.1	22.9	44.1	
8-Jan	31.2	30.6	32.5	32.4	32.9	23.5	18.1	14.9	13.4	13.0	13.2	15.3	17.7	16.9	15.3	14.2	15.4	13.9	17.9	16.8	15.2	14.1	13.7	13.6	19.0	32.9	
9-Jan	9.9	9.5	9.9	10.6	9.6	9.8	11.4	11.5	11.4	11.3	11.0	10.1	11.6	12.4	10.9	10.4	11.8	10.6	11.0	11.6	11.9	13.0	14.1	14.5	11.2	14.5	
10-Jan	14.4	14.6	10.7	8.9	9.2	8.9	9.6	11.3	11.0	11.9	12.0	12.0	13.2	14.4	14.3	15.0	15.2	15.6	16.1	19.8	22.9	21.5	22.7	23.0	14.5	23.0	
11-Jan	26.0	23.5	22.9	17.6	14.5	13.2	13.7	13.6	13.0	15.1	22.1	27.4	28.4	27.5	27.0	23.0	17.3	17.1	17.6	14.6	9.6	8.4	9.1	9.3	18.0	28.4	
12-Jan	14.0	16.5	11.6	8.6	8.7	10.8	30.3	21.7	15.3	11.7	9.8	9.4	11.1	11.8	11.8	11.4	11.5	12.1	13.6	14.0	14.6	13.9	13.3	11.4	13.3	30.3	
13-Jan	11.0	11.1	11.9	11.5	11.7	16.5	21.7	21.5	17.3	14.5	14.1	15.9	15.4	13.2	13.0	14.9	16.1	15.4	12.3	12.9	10.3	9.7	10.1	9.4	13.8	21.7	
14-Jan	8.4	7.6	7.3	7.5	7.2	7.3	7.1	7.2	7.7	8.0	7.9	8.3	8.5	9.3	9.9	10.7	14.5	15.0	16.5	15.9	16.7	16.5	17.3	17.3	10.8	17.3	
15-Jan	19.3	29.0	28.5	26.7	28.7	31.5	161.7	133.7	88.0	83.6	68.0	53.1	46.4	48.2	39.9	25.4	19.9	18.6	19.1	19.5	18.9	19.5	24.8	26.5	44.9	161.7	
16-Jan	25.9	24.5	24.6	22.1	21.9	25.6	21.9	39.2	82.8	C	54.0	32.7	17.4	17.2	14.5	8.4	8.0	8.2	7.9	7.2	8.0	8.2	7.9	8.6	21.6	82.8	
17-Jan	9.2	8.4	8.2	8.0	7.3	7.3	7.3	7.0	6.3	5.9	6.3	7.2	8.4	9.5	10.1	10.9	10.4	10.9	10.6	10.0	10.0	9.7	10.1	9.7	8.7	10.9	
18-Jan	8.9	9.3	8.9	7.5	11.0	10.7	7.5	7.5	8.3	9.2	8.6	7.0	5.8	6.6	6.9	5.9	5.4	5.9	6.2	6.2	5.9	5.8	5.5	5.6	7.3	11.0	
19-Jan	5.8	5.9	6.6	7.2	9.2	10.4	10.8	11.7	12.8	14.1	13.2	8.9	7.0	5.2	3.8	2.8	2.4	1.7	1.6	1.9	2.2	2.2	2.2	2.4	6.3	14.1	
20-Jan	2.3	2.2	2.4	2.6	2.6	2.4	2.2	1.9	1.5	1.4	1.4	1.5	1.7	1.7	1.7	1.6	1.5	1.5	1.3	1.4	1.3	1.4	1.4	1.3	1.8	2.6	
21-Jan	1.6	1.9	2.9	3.5	3.5	3.3	3.5	3.7	4.4	4.4	4.3	4.0	4.1	4.1	3.3	2.1	2.0	2.0	3.4	3.8	3.4	3.0	2.5	1.7	3.2	4.4	
22-Jan	1.4	1.4	1.2	1.2	1.1	0.8	0.8	0.8	0.7	0.7	1.7	1.2	1.5	1.8	1.9	2.1	2.5	3.2	3.1	2.9	2.5	2.1	2.2	2.2	1.7	3.2	
23-Jan	2.3	2.3	3.5	5.0	4.5	4.3	3.9	4.2	4.3	4.3	4.2	3.8	3.6	4.2	6.1	12.2	7.7	3.3	7.6	11.3	7.8	7.4	3.7	3.2	5.2	12.2	
24-Jan	3.3	3.4	3.0	3.1	3.1	5.2	8.9	10.7	9.9	9.3	7.8	7.5	7.0	7.0	20.1	10.5	10.3	5.3	3.2	3.1	3.0	3.2	3.1	3.2	6.4	20.1	
25-Jan	3.6	4.0	4.2	4.3	4.4	5.0	6.2	9.3	8.8	8.2	10.7	21.2	20.6	15.2	16.4	18.2	11.9	5.2	5.2	5.9	6.6	5.6	5.9	5.9	8.9	21.2	
26-Jan	6.1	6.2	4.9	2.3	1.4	1.2	4.1	3.6	3.6	4.5	6.8	5.8	5.3	4.9	4.4	4.7	3.8	2.6	2.9	2.8	2.6	2.4	2.4	1.5	3.8	6.8	
27-Jan	1.1	1.2	1.1	1.2	1.3	1.4	1.5	2.0	1.8	1.7	2.0	2.4	3.3	4.9	4.6	5.1	4.6	5.5	6.0	5.0	3.5	2.3	4.0	2.4	2.9	6.0	
28-Jan	2.1	2.2	2.2	2.1	2.1	2.3	2.4	2.4	2.1	2.2	2.2	2.4	2.8	3.4	2.4	2.2	3.0	3.5	2.8	3.4	3.9	4.1	4.2	4.8	2.8	4.8	
29-Jan	4.8	3.8	3.6	2.4	2.5	2.3	2.3	2.2	2.6	2.8	2.5	2.3	2.2	2.2	2.0	1.7	1.6	1.7	2.0	2.8	5.6	6.1	5.3	4.4	3.0	6.1	
30-Jan	4.5	2.5	3.5	2.5	3.2	2.8	2.6	2.9	3.1	2.0	2.1	2.1	1.8	1.7	2.0	5.6	5.3	5.2	4.7	4.0	4.5	6.6	14.5	14.8	4.4	14.8	
31-Jan	9.7	3.7	2.7	1.9	1.8	1.9	1.9	2.1	2.2	2.8	10.3	15.0	6.6	7.4	9.4	9.2	9.7	9.8	11.2	14.4	13.7	12.7	13.3	14.8	7.8	15.0	
																								Diurnal Average		Diurnal Maximum	
																								9.6		31.2	
																								9.5		30.6	
																								9.1		32.5	
																								8.6		32.4	
																								8.7		32.9	
																								8.9		31.5	
																								13.8		161.7	
																								13.5		133.7	
																								13.0		88.0	
																								10.5		83.6	
																								12.3		68.0	
																								11.9		53.1	
																								11.4		46.4	
																								10.8		48.2	
																								11.2		39.9	
																								10.3		31.4	
																								9.6		26.9	
																								8.9		23.8	
																								9.1		21.9	
																								9.4		24.2	
																								9.2		24.9	
																								9.7		29.6	
																								9.6		33.6	
																								9.7		32.1	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Buffalo Viewpoint - January 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	277	37.28	37.28
6 - 15	349	46.97	84.25
16 - 25	76	10.23	94.48
26 - 80	36	4.85	99.33
> 81.0	5	0.67	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Buffalo Viewpoint - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	37	28	7	1	0	6	19	43	19	12	9	33	23	18	16	5	276
6 - 15	12	14	8	2	7	12	44	155	53	15	6	4	2	0	0	6	340
16 - 25	13	13	5	1	1	0	7	19	2	5	2	1	0	0	3	2	74
26 - 80	9	5	2	1	0	1	2	6	3	1	1	0	0	1	1	1	34
> 81.0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Totals	75	61	22	5	8	19	72	223	77	33	18	38	25	19	20	14	729

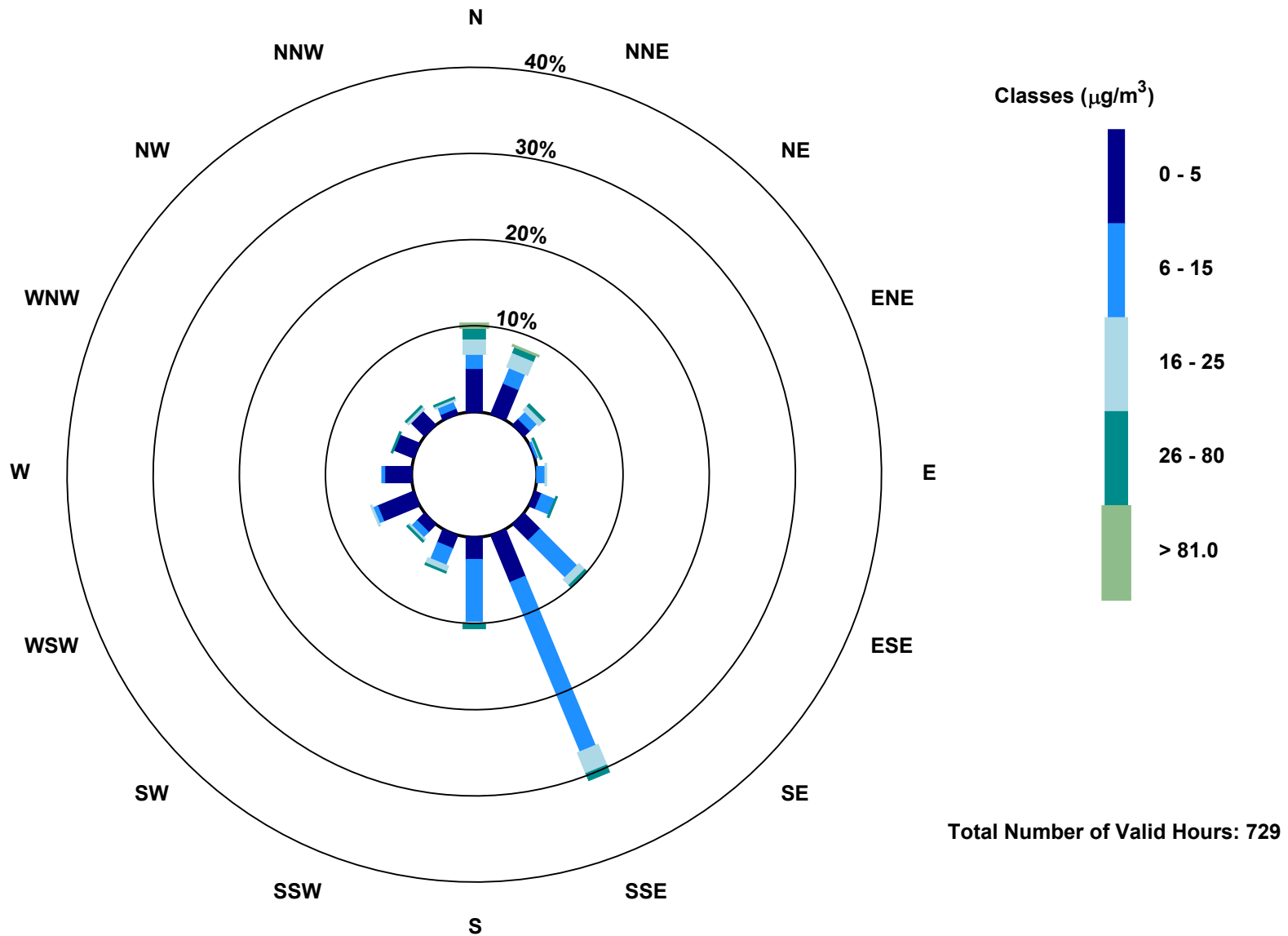
Total Number of Valid Hours: 729

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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

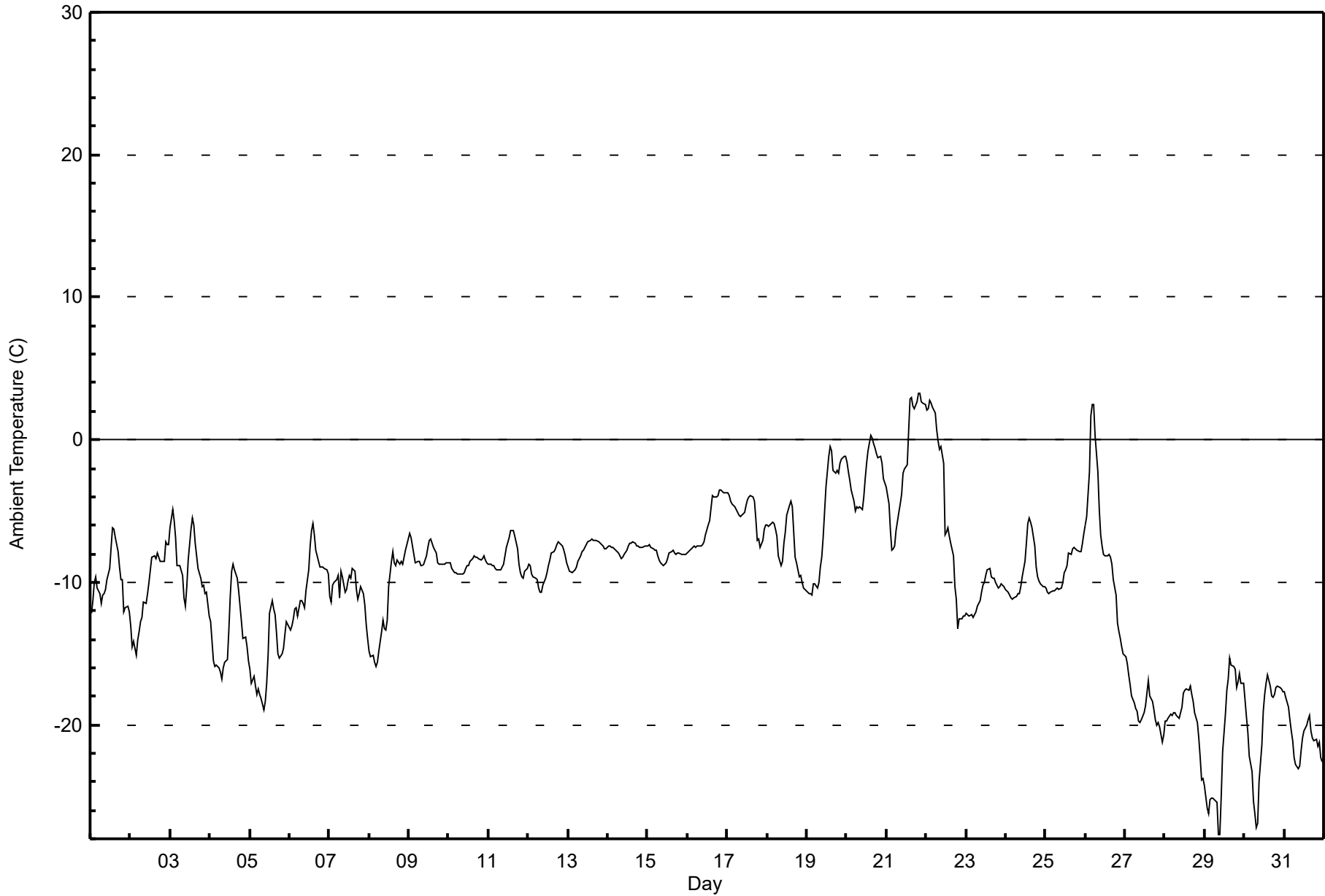




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Buffalo Viewpoint - January 2023

Maximum Value: 3.2 C on Jan 21 21:00		Maximum Daily Average: -1.5 C on Jan 21		Hours in Service: 744																																												
Minimum Value: -27.7 C on Jan 29 10:00		Minimum Daily Average: -21.1 C on Jan 29		Hours of Data: 744																																												
Maximum Diurnal Average: -8.1 C at hour 15		Minimum Diurnal Average: -11.6 C at hour 9		Hours of Missing Data: 0																																												
Monthly Average: -10.19 C		Percentiles: P ₁ = -25.4 P ₁₀ = -18.9 Q ₁ = -12.6 Median = -9.0 Q ₃ = -7.4 P ₉₀ = -4.0 P ₉₉ = 2.6		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-12.2	-11.3	-10.0	-9.6	-10.4	-10.8	-11.5	-10.9	-10.8	-10.5	-9.8	-9.0	-7.5	-6.2	-6.3	-6.9	-7.8	-8.9	-9.8	-9.8	-12.1	-11.8	-11.7	-12.0	-9.9	-6.2																						
2-Jan	-13.1	-14.5	-14.1	-15.1	-14.1	-13.4	-12.7	-12.5	-11.3	-11.5	-10.8	-10.0	-9.1	-8.3	-8.2	-8.4	-8.0	-8.3	-8.5	-8.6	-8.5	-7.2	-7.4	-7.4	-10.5	-7.2																						
3-Jan	-6.1	-4.9	-5.7	-6.8	-8.8	-8.8	-8.8	-9.5	-11.1	-11.7	-10.3	-8.4	-6.3	-5.5	-6.0	-7.3	-8.1	-9.1	-9.7	-10.3	-10.2	-10.8	-10.7	-12.4	-8.6	-4.9																						
4-Jan	-12.8	-14.1	-15.5	-16.0	-15.9	-16.1	-16.3	-16.8	-16.0	-15.6	-15.4	-13.4	-11.0	-9.2	-8.7	-9.1	-9.7	-10.6	-11.7	-12.8	-13.9	-13.8	-14.5	-15.5	-13.5	-8.7																						
5-Jan	-16.1	-17.1	-16.6	-17.3	-17.9	-17.5	-17.9	-18.2	-18.9	-18.3	-17.1	-15.2	-12.2	-11.3	-11.9	-12.3	-13.6	-15.0	-15.3	-15.0	-14.6	-13.6	-12.8	-12.9	-15.4	-11.3																						
6-Jan	-13.4	-13.0	-12.5	-11.9	-11.7	-12.3	-11.3	-11.3	-11.5	-11.8	-10.6	-9.1	-7.4	-6.4	-5.9	-6.7	-7.7	-8.5	-8.9	-9.0	-8.9	-9.0	-9.1	-9.5	-9.9	-5.9																						
7-Jan	-11.0	-11.4	-10.2	-10.0	-9.8	-9.5	-11.1	-9.2	-9.6	-10.7	-10.5	-9.9	-9.5	-9.8	-9.0	-9.2	-10.5	-11.2	-10.8	-10.3	-10.8	-11.5	-13.0	-14.0	-10.5	-9.0																						
8-Jan	-14.8	-15.3	-15.1	-15.6	-15.9	-15.6	-14.8	-13.5	-12.7	-13.3	-13.4	-12.6	-10.3	-8.5	-7.9	-8.6	-8.9	-8.5	-8.7	-8.6	-8.8	-8.3	-7.7	-7.0	-11.4	-7.0																						
9-Jan	-6.6	-6.9	-7.4	-8.0	-8.7	-8.6	-8.5	-8.8	-8.8	-8.7	-8.1	-7.6	-7.0	-7.0	-7.2	-7.5	-8.0	-8.6	-8.8	-8.7	-8.7	-8.7	-8.6	-8.6	-8.1	-6.6																						
10-Jan	-8.6	-8.7	-9.0	-9.3	-9.4	-9.4	-9.4	-9.4	-9.4	-9.3	-9.1	-8.8	-8.8	-8.5	-8.3	-8.2	-8.2	-8.2	-8.3	-8.4	-8.4	-8.2	-8.4	-8.7	-8.8	-8.2																						
11-Jan	-8.7	-8.7	-8.8	-8.9	-9.0	-9.1	-9.2	-9.1	-8.9	-8.7	-8.1	-7.6	-6.9	-6.4	-6.3	-6.4	-6.8	-7.7	-8.7	-9.3	-9.6	-9.7	-9.2	-9.1	-8.4	-6.3																						
12-Jan	-8.8	-8.9	-9.4	-9.6	-9.7	-9.8	-10.4	-10.7	-10.7	-10.2	-9.7	-9.3	-8.9	-8.4	-7.9	-7.8	-7.6	-7.4	-7.2	-7.3	-7.5	-7.7	-8.1	-8.6	-8.8	-7.2																						
13-Jan	-8.9	-9.2	-9.4	-9.3	-9.1	-8.9	-8.6	-8.1	-7.8	-7.8	-7.5	-7.3	-7.2	-7.1	-6.9	-7.0	-7.1	-7.1	-7.1	-7.3	-7.4	-7.4	-7.6	-7.6	-7.9	-6.9																						
14-Jan	-7.5	-7.5	-7.6	-7.5	-7.6	-7.8	-8.0	-8.1	-8.3	-8.3	-8.0	-7.8	-7.5	-7.3	-7.2	-7.2	-7.3	-7.4	-7.5	-7.5	-7.6	-7.5	-7.5	-7.5	-7.6	-7.2																						
15-Jan	-7.5	-7.3	-7.5	-7.7	-7.8	-7.8	-8.2	-8.4	-8.7	-8.9	-8.7	-8.6	-8.3	-8.0	-7.8	-7.8	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0	-7.3																						
16-Jan	-7.9	-7.8	-7.7	-7.6	-7.5	-7.6	-7.4	-7.4	-7.5	-7.4	-7.2	-6.6	-6.0	-5.7	-4.8	-4.0	-4.0	-4.0	-3.9	-3.5	-3.5	-3.6	-3.7	-3.7	-5.8	-3.5																						
17-Jan	-3.7	-3.9	-4.3	-4.5	-4.7	-4.9	-5.1	-5.3	-5.4	-5.3	-5.1	-4.6	-4.2	-4.0	-4.0	-4.0	-4.3	-5.6	-7.0	-7.0	-7.6	-7.0	-6.3	-6.0	-5.2	-3.7																						
18-Jan	-5.9	-6.1	-5.9	-5.8	-5.9	-6.2	-6.7	-8.1	-8.9	-8.6	-7.3	-6.5	-5.3	-4.6	-4.3	-4.7	-6.4	-8.2	-8.7	-9.6	-9.5	-10.0	-10.4	-10.5	-7.3	-4.3																						
19-Jan	-10.7	-10.8	-10.8	-10.9	-10.1	-10.1	-10.4	-10.0	-8.9	-8.2	-6.9	-3.4	-2.2	-1.1	-0.5	-0.8	-2.1	-2.3	-2.1	-2.3	-1.7	-1.4	-1.2	-1.2	-5.4	-0.5																						
20-Jan	-1.5	-2.3	-2.9	-3.6	-4.3	-5.0	-4.7	-4.8	-4.7	-4.9	-4.0	-2.7	-1.7	-0.8	0.3	0.1	-0.3	-0.6	-0.9	-1.2	-1.1	-1.7	-2.7	-3.1	-2.5	0.3																						
21-Jan	-3.3	-4.5	-6.3	-7.7	-7.6	-7.4	-6.4	-5.1	-4.5	-3.8	-2.3	-2.0	-1.7	0.6	2.9	3.0	2.3	2.2	2.6	3.2	3.2	2.7	2.6	2.5	-1.5	3.2																						
22-Jan	2.1	2.2	2.8	2.6	2.3	1.9	0.7	-0.1	-0.7	-0.4	-1.7	-6.7	-6.5	-6.1	-6.8	-7.3	-8.1	-10.3	-11.2	-13.2	-12.6	-12.5	-12.4	-12.3	-4.8	2.8																						
23-Jan	-12.2	-12.2	-12.3	-12.3	-12.5	-12.3	-12.1	-11.7	-11.3	-10.7	-10.2	-10.0	-9.5	-9.1	-9.0	-9.6	-9.8	-9.7	-10.0	-10.4	-10.3	-10.1	-10.2	-10.3	-10.7	-9.0																						
24-Jan	-10.5	-10.7	-10.9	-11.1	-11.2	-11.1	-11.0	-10.8	-10.8	-10.3	-9.6	-8.6	-7.3	-5.8	-5.5	-5.8	-6.2	-7.5	-9.0	-9.6	-9.9	-10.1	-10.3	-10.3	-9.3	-5.5																						
25-Jan	-10.4	-10.7	-10.8	-10.7	-10.6	-10.6	-10.5	-10.4	-10.5	-10.4	-10.0	-9.3	-9.2	-8.8	-7.9	-8.0	-7.6	-7.6	-7.7	-7.8	-7.8	-7.8	-7.3	-6.6	-9.1	-6.6																						
26-Jan	-5.9	-5.4	-2.3	1.7	2.5	2.4	0.3	-2.2	-4.9	-6.7	-7.5	-8.0	-8.1	-8.2	-8.1	-8.2	-8.8	-9.8	-10.9	-12.8	-13.5	-14.0	-14.5	-15.1	-7.0	2.5																						
27-Jan	-15.2	-15.7	-16.5	-17.2	-17.9	-18.5	-18.9	-19.1	-19.8	-19.9	-19.6	-19.2	-18.6	-17.7	-16.9	-18.0	-18.3	-19.0	-19.6	-20.1	-19.9	-20.1	-21.2	-20.8	-18.7	-15.2																						
28-Jan	-19.8	-19.7	-19.5	-19.3	-19.3	-19.1	-19.1	-19.3	-19.5	-19.2	-18.7	-17.8	-17.6	-17.5	-17.6	-17.3	-17.9	-18.4	-19.2	-19.8	-20.9	-22.3	-23.8	-23.7	-19.4	-17.3																						
29-Jan	-24.3	-25.8	-26.2	-25.3	-25.1	-25.2	-25.4	-25.4	-27.7	-27.7	-25.1	-21.9	-19.3	-17.6	-16.8	-15.3	-15.8	-15.9	-16.1	-17.4	-17.0	-16.4	-17.1	-17.1	-21.1	-15.3																						
30-Jan	-18.3	-19.5	-20.5	-22.2	-23.3	-25.3	-26.2	-27.2	-26.9	-23.9	-21.4	-19.0	-17.9	-17.1	-16.5	-17.3	-18.0	-18.1	-17.9	-17.3	-17.3	-17.4	-17.4	-17.6	-20.1	-16.5																						
31-Jan	-17.6	-18.1	-18.8	-19.6	-20.4	-21.1	-22.3	-22.8	-23.1	-22.9	-21.8	-20.9	-20.5	-20.0	-19.6	-19.4	-20.4	-20.9	-21.1	-21.0	-21.6	-21.2	-22.3	-22.6	-20.8	-17.6																						
																								-10.4	-10.6	-10.7	-10.8	-11.0	-11.2	-11.3	-11.4	-11.6	-11.5	-10.8	-10.1	-9.1	-8.4	-8.1	-8.3	-8.8	-9.4	-9.7	-10.0	-10.2	-10.2	-10.4	-10.6	Diurnal Average
																								2.1	2.2	2.8	2.6	2.5	2.4	0.7	-0.1	-0.7	-0.4	-1.7	-2.0	-1.7	0.6	2.9	3.0	2.3	2.2	2.6	3.2	3.2	2.7	2.6	2.5	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Buffalo Viewpoint - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	46	6.18	6.18
-20 - 0	674	90.59	96.77
0 - 10	24	3.23	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

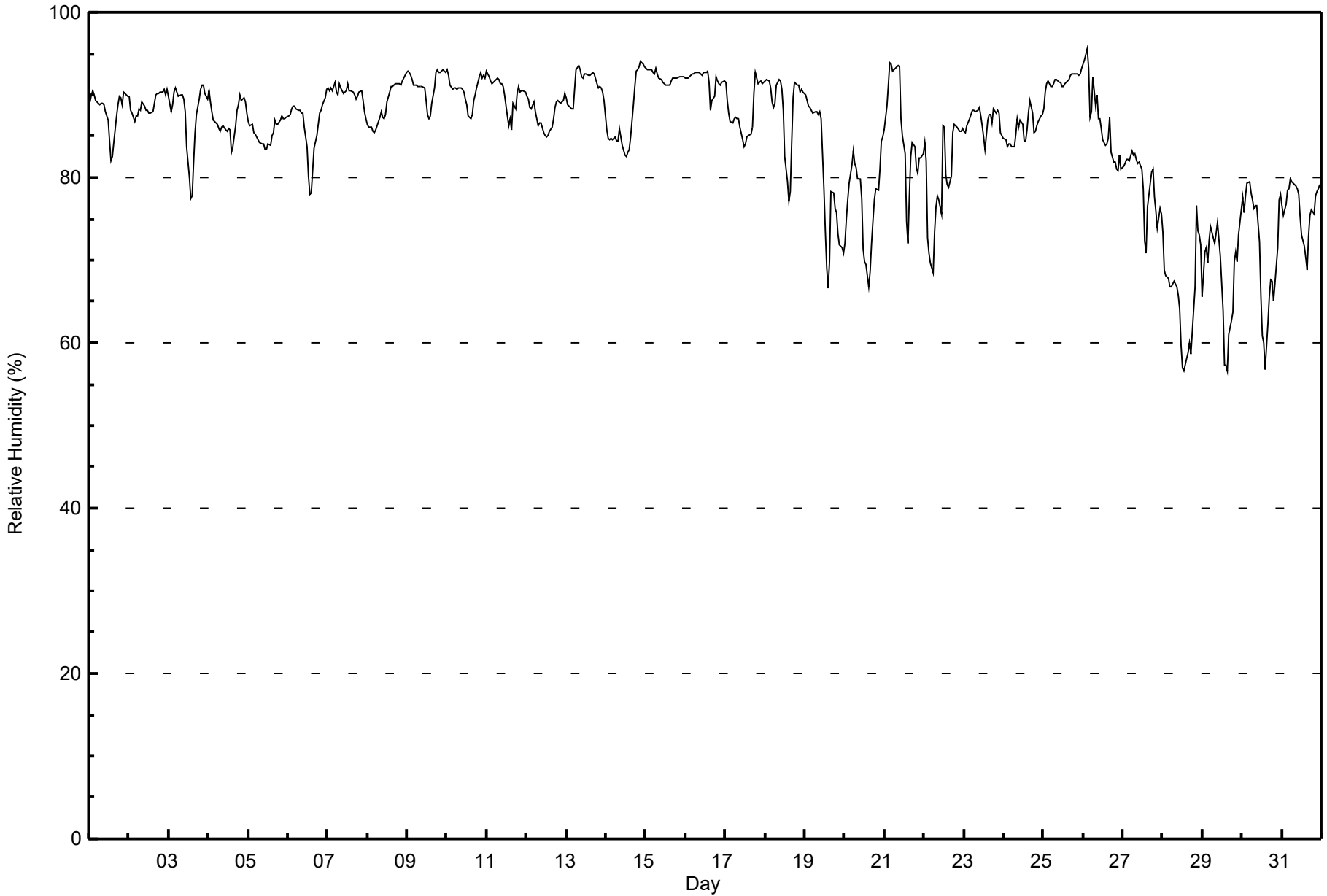
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Buffalo Viewpoint - January 2023

Maximum Value: 95.6 % on Jan 26 03:00 Maximum Daily Average: 92.2 % on Jan 15 Minimum Value: 56.5 % on Jan 29 16:00 Minimum Daily Average: 65.6 % on Jan 28 Maximum Diurnal Average: 86.5 % at hour 1 Minimum Diurnal Average: 80.3 % at hour 15 Monthly Average: 85.03 % Percentiles: P ₁ = 58.8 P ₁₀ = 73.0 Q ₁ = 82.3 Median = 87.5 Q ₃ = 90.7 P ₉₀ = 92.2 P ₉₉ = 93.6																								Hours in Service:	744																								
																								Hours of Data:	744																								
																								Hours of Missing Data:	0																								
																								Hours of Calibration:	0																								
																								Percent Operational Time:	100.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	89.1	90.0	90.5	90.1	89.3	89.0	88.9	89.0	88.9	88.7	88.0	87.0	84.4	82.0	82.5	84.3	87.4	88.8	89.8	89.7	88.8	90.3	90.0	89.9	88.2	90.5																							
2-Jan	89.8	88.1	87.9	86.8	87.5	87.5	88.3	88.1	89.1	88.7	88.2	88.1	87.8	87.7	87.9	89.0	90.1	90.2	90.2	90.3	90.3	90.7	90.0	90.7	88.9	90.7																							
3-Jan	89.8	88.1	88.8	90.3	90.8	90.4	89.8	90.0	90.1	89.5	87.9	83.7	80.0	77.5	77.8	81.8	85.5	87.7	89.4	90.6	91.2	91.2	90.2	89.5	87.6	91.2																							
4-Jan	90.6	89.2	88.0	87.0	86.8	86.5	86.0	85.5	86.2	86.3	85.7	85.6	86.0	85.7	83.0	83.8	86.2	88.1	88.9	89.9	89.2	89.7	89.1	87.8	87.1	90.6																							
5-Jan	86.8	86.2	86.5	85.4	85.3	84.9	84.6	84.2	84.0	84.1	83.4	83.4	84.0	83.9	85.1	85.5	87.0	86.5	86.5	86.9	87.5	87.1	87.1	87.4	85.5	87.5																							
6-Jan	87.4	87.6	88.4	88.7	88.7	88.2	88.2	88.1	87.8	87.7	86.0	83.8	80.2	78.0	78.2	80.8	83.5	85.0	86.5	87.8	88.1	88.9	89.6	90.7	86.2	90.7																							
7-Jan	90.8	90.5	90.8	90.6	91.5	90.3	90.0	91.4	90.9	90.2	90.4	90.5	91.3	90.5	90.5	90.4	90.0	89.5	89.9	90.4	90.4	89.4	88.0	87.2	90.2	91.5																							
8-Jan	86.5	86.2	86.1	85.7	85.4	85.7	86.4	87.3	87.9	87.3	87.2	87.6	89.1	90.4	91.1	91.1	91.1	91.4	91.3	91.4	91.3	91.6	92.1	92.7	88.9	92.7																							
9-Jan	92.9	92.7	92.4	91.8	91.2	91.2	91.0	91.1	91.1	91.0	90.9	89.2	87.6	87.1	87.5	89.0	90.9	92.7	93.0	92.8	92.8	93.0	92.9	92.8	91.2	93.0																							
10-Jan	93.0	92.3	91.2	90.7	90.8	90.8	90.7	90.9	90.8	90.7	90.4	89.6	88.8	87.4	87.2	87.7	89.4	90.0	90.8	92.1	92.7	92.1	92.3	92.1	90.6	93.0																							
11-Jan	92.8	92.3	91.7	91.4	91.6	91.7	92.0	91.9	91.4	91.4	91.0	90.0	87.5	86.3	87.1	85.8	89.0	88.4	90.2	91.0	90.4	90.5	90.5	90.4	90.3	92.8																							
12-Jan	89.9	89.5	88.4	88.3	89.1	88.0	87.1	86.2	86.6	86.6	85.5	85.0	85.0	85.1	85.6	86.2	87.2	88.6	89.1	89.4	89.1	89.1	89.3	90.1	87.7	90.1																							
13-Jan	89.7	88.8	88.5	88.3	88.3	90.7	93.0	93.5	93.0	92.2	92.1	92.5	92.5	92.4	92.4	92.5	92.7	92.6	91.4	90.9	91.0	90.8	90.3	89.4	91.2	93.5																							
14-Jan	85.8	84.7	84.5	84.7	84.6	84.9	84.4	84.4	86.0	84.9	83.8	82.7	82.6	83.0	83.4	84.9	88.8	91.1	92.9	93.1	93.4	94.1	93.7	93.4	87.1	94.1																							
15-Jan	93.2	93.1	93.0	93.0	92.7	92.5	93.2	92.6	92.1	91.9	91.6	91.3	91.2	91.2	91.2	91.6	92.0	92.1	92.1	92.1	92.2	92.2	92.2	92.2	92.2	93.2																							
16-Jan	92.1	92.1	92.2	92.4	92.5	92.6	92.8	92.7	92.7	92.6	92.4	92.7	92.7	92.9	91.5	88.1	89.4	89.8	92.2	91.7	91.4	91.3	91.5	91.6	91.8	92.9																							
17-Jan	91.5	89.3	87.7	86.8	86.6	87.1	87.3	87.1	87.1	86.1	84.6	83.7	84.0	84.9	85.0	85.2	86.2	90.1	92.7	92.0	91.4	91.8	91.4	91.6	88.0	92.7																							
18-Jan	91.7	91.9	91.7	90.8	89.2	88.6	89.0	91.2	91.8	91.7	90.7	88.1	82.6	79.5	77.1	78.2	84.3	89.7	91.5	91.2	91.2	90.4	90.6	90.4	88.5	91.9																							
19-Jan	90.1	89.4	88.6	88.4	88.1	87.8	88.0	88.0	87.6	87.9	87.0	78.7	73.6	69.1	66.6	69.9	78.3	78.1	76.3	75.8	73.2	71.9	71.5	70.9	80.2	90.1																							
20-Jan	72.1	74.8	77.3	79.2	81.5	83.2	81.7	81.2	79.9	79.8	77.4	71.4	69.8	69.5	66.7	68.7	72.0	74.8	77.2	78.7	78.5	81.0	84.5	84.9	76.9	84.9																							
21-Jan	85.8	88.6	91.2	93.9	93.7	92.9	93.1	93.3	93.6	93.3	87.1	85.0	83.0	74.7	72.0	77.7	82.5	84.3	83.7	81.2	80.6	82.4	82.3	82.9	85.8	93.9																							
22-Jan	84.3	82.1	72.8	70.9	69.7	68.4	73.3	76.5	77.7	77.3	75.5	86.2	86.2	80.4	79.1	78.8	80.2	85.4	86.4	86.3	86.1	85.5	85.6	85.9	80.0	86.4																							
23-Jan	85.6	85.4	86.3	87.2	87.6	88.2	88.0	88.2	88.6	88.6	87.4	86.3	84.9	83.4	87.0	87.6	87.6	86.6	88.3	87.8	88.1	87.8	85.4	85.1	86.9	88.6																							
24-Jan	84.8	84.5	83.7	84.0	84.1	83.8	83.7	85.2	87.2	86.1	86.9	86.5	84.5	84.4	85.7	87.8	89.3	87.8	85.5	85.6	86.3	86.8	87.4	87.6	85.8	89.3																							
25-Jan	88.2	90.3	91.4	91.7	91.1	90.9	91.3	91.8	91.8	91.5	91.6	91.0	91.1	91.3	91.5	91.8	92.3	92.5	92.5	92.5	92.5	92.4	92.6	93.2	91.6	93.2																							
26-Jan	93.7	94.3	95.6	93.2	87.3	87.9	92.3	88.6	89.9	87.2	87.1	85.9	84.6	84.0	84.0	84.8	87.2	83.1	81.8	81.9	81.0	80.9	82.6	81.0	86.7	95.6																							
27-Jan	81.4	81.7	82.3	82.1	82.0	83.2	82.7	82.9	82.3	81.8	81.9	80.9	78.6	72.4	70.9	76.5	79.4	80.7	80.9	77.6	76.0	73.8	76.2	75.7	79.3	83.2																							
28-Jan	73.3	68.9	68.1	67.7	66.8	66.7	67.0	67.5	66.8	65.8	64.1	59.6	57.0	56.6	58.1	58.8	60.0	58.7	61.3	66.7	76.6	73.6	73.1	71.9	65.6	76.6																							
29-Jan	65.6	71.1	71.5	69.7	72.4	74.0	72.7	72.0	73.2	74.6	72.6	70.5	63.8	57.4	57.4	56.5	61.1	62.8	63.7	69.9	71.0	69.8	73.0	76.1	68.4	76.1																							
30-Jan	77.7	75.8	77.9	79.3	79.4	78.2	77.3	76.3	76.6	76.5	72.2	65.6	60.9	59.9	56.8	62.3	65.6	67.7	67.4	65.2	67.0	71.5	77.2	78.0	71.3	79.4																							
31-Jan	76.6	75.5	76.8	78.4	78.6	79.7	79.4	79.3	78.9	78.7	77.9	75.3	73.1	71.6	70.3	68.8	72.9	75.5	76.1	75.6	77.8	78.3	78.6	79.2	76.4	79.7																							
																								86.5	86.3	86.2	86.1	85.9	86.0	86.2	86.3	86.5	86.1	85.1	83.8	82.2	80.7	80.3	81.5	83.8	84.8	85.5	85.7	86.0	86.1	86.5	86.5	Diurnal Average	
																								93.7	94.3	95.6	93.9	93.7	92.9	93.2	93.5	93.6	93.3	92.4	92.7	92.7	92.9	92.4	92.5	92.7	92.7	93.0	93.1	93.4	94.1	93.7	93.4	93.4	Diurnal Maximum





Maximum Speed: 30 km/h on Jan 26 08:00	Maximum Daily Speed Average: 15.6 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 13 05:00	Minimum Daily Speed Average: 0.5 km/h on Jan 7	Hours of Data: 730
Maximum Diurnal Speed Average: 2.5 km/h at hour 5	Minimum Diurnal Speed Average: 0.8 km/h at hour 22	Hours of Missing Data: 14
Monthly Average Velocity: 1.5 km/h 180.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 9 P ₉₀ = 13 P ₉₉ = 21	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SSE6	S6	SW8	WSW8	WSW7	SSW4	SSE5	S5	S5	SSE5	S4	SSE5	SSE5	SSW4	S3	SSW5	SSW7	SSE7	SSE7	S7	SSE8	SSE6	SE8	SSE6	S5.1	WSW8	
2-Jan	SSE6	SSE6	SSE6	SSE7	SSE7	SE8	SSE6	SSE6	S6	SSE6	SSE6	SSE6	SSE6	SSE6	SE6	SE6	SSE4	S8	SSE8	SSE8	SSE7	S9	SSE8	SSE6.5	S9		
3-Jan	SSE8	SSE8	S4	ESE4	SSE8	SSE9	SSE6	SE5	SSE6	SSE7	SSE6	SSE6	SSE7	SE6	SSE6	SE8	SSE8	SE9	SE9	SE8	SSE7	SSE5	SE7	SE8	SSE6.8	SE9	
4-Jan	S7	SSE8	SSE8	SSE7	SSE8	SSE7	SE8	SSE7	SSE7	S7	SSE6	SSE6	SSE5	SSE5	SSE6	SSE6	SSE6	SE7	SE7	SSE7	SSE7	SE8	SSE6	SSE6.7	SSE8		
5-Jan	SSE6	SSE6	SSE6	SSE6	SSE5	SE5	SE5	SE5	S4	SSE3	SSE4	SSE3	SE3	SSE4	SSE5	SSE4	SE4	SSE3	SSE4	SSE4	SSE5	SSE5	SSE7	SSE5	SSE4.6	SSE7	
6-Jan	SSE4	SSE3	UO	UO	UO	S4	S5	S5	S5	S5	SSE6	SSE6	SSE7	SSE9	SSE8	SSE7	SSE8	SSE8	SSE8	SSE9	SSE7	SSE8	SSE5	S7	SSE6.3	SSE9	
7-Jan	S9	SSE8	SE9	SE8	SSE4	SSW5	SSE5	N4	NW7	NW5	NW4	WNW3	N4	ENE3	SW2	N3	N4	N5	N5	UO	SSW3	SSW3	SE3	UO	SSE0.5	SE9	
8-Jan	S4	SSE3	S4	SSE5	SSE4	SSE4	SSE6	SE7	SSE5	SE4	SSE3	S4	S3	SE3	SE3	SE4	UO	UO	NE4	NE6	NNE4	UO	UO	E2	SE2.9	SE7	
9-Jan	SE5	SSE4	SE3	ESE4	ESE4	ESE3	E3	UO	SSE3	SSE3	UO	ESE3	SE4	SSE5	SSE5	S5	S6	S5	S3	S3	S4	SSW4	SSW2	S2	SSE3.3	S6	
10-Jan	SSE4	SSE4	SE6	SE6	SSE4	SSE3	SSE2	SSE3	S3	S3	S2	SSW2	SW3	WSW3	SW3	W2	UO	UO	SW3	SSW3	WSW2	NNW5	N6	N5	S1.5	SE6	
11-Jan	NNW2	NW3	NNW3	N4	NNE4	NNE4	NNE2	SSW3	S2	SSE3	SSE3	SSE3	S4	SSE5	SE7	SSE7	SSE7	SSE5	SE4	SSE6	SSE9	SSE10	SSE9	SSE8	SSE3.0	SSE10	
12-Jan	SSE8	SSE9	SSE12	SSE11	S11	SSE9	SSE10	SSE10	SSE9	SSE10	SSE10	SSE11	SSE11	SSE10	SSE9	SSE9	SSE7	SSE6	SSE6	SSW7	S5	SW5	S3	SE5	SSE8.2	SSE12	
13-Jan	SE6	SE7	SE5	SE3	N0	N2	NNE5	NNE6	NNE7	NE5	ENE3	E3	NNE4	NE5	NNE7	NNE8	NE6	ENE5	ESE5	E5	E7	E6	ESE9	ESE8	ENE4.0	ESE9	
14-Jan	SE8	SE9	SE9	SE9	SSE11	SSE10	SSE11	SSE11	SSE10	SSE10	SSE8	S7	SSE6	SSE4	S4	SSW4	SW5	SW4	SSW4	SE3	SSW3	S3	SSE3	SE3	SSE6.1	SSE11	
15-Jan	SE3	ESE1	ENE1	UO	N3	N4	N6	N5	N4	N3	N3	N2	NNE3	NNE4	NNE4	NNE5	N5	N4	N3	N4	NNE4	NNE4	NNE5	N4	NNE3.3	N6	
16-Jan	N4	NNE4	NNE4	N3	NNE5	NNE6	NNE6	NNE6	NNE7	NNE6	NE7	NE7	NE7	NE7	E5	ESE9	ESE6	ESE6	SE5	SE7	SSE7	SSE7	SSE6	SSE6	ENE3.3	ESE9	
17-Jan	S7	SSW9	SSW9	S9	S10	S8	SSE8	SSE8	SSE8	SSE9	SSE10	S9	SSW8	SSW8	S8	S8	SSW10	S4	SSE6	SSE7	S6	SSE6	SSE8	SSE8	S7.7	SSE10	
18-Jan	S7	SSE6	SSE7	SSE8	SSE11	SSE11	SSE11	S9	SSE9	S8	S8	S8	SSE10	SSE10	SSE9	SSE7	SSE5	SE6	SSE4	S5	S6	S5	SSE7	S6	SSE7.4	SSE11	
19-Jan	S7	S8	SSE9	SSE9	SSE10	SSE10	SSE10	SSE8	SSE7	SSE7	S7WSW15	W10	W7	SW10	SSW9	S8	SW9WSW12WSW11WSW14	SW13	SW9WSW10						SSW7.2	WSW15	
20-Jan	WSW11WSW14WSW15WSW13WSW11	WSW9WSW11WSW18WSW20	W16	W10	WSW8WSW11	W19WSW15WSW13	SW12	SW12WSW16WSW22WSW25	WNW9	W10	W9	WSW13.4	WSW25														
21-Jan	WSW7	SSW9	S8	SE11	SSE8	SE8	SSE7	SSE7	SSE7	SE8	SSE8	SSE8	SE8	SE6	S5	SSW8	SSW7	S7	WSW7WSW17WSW21	W21WSW20WSW18					SSW6.6	WSW21	
22-Jan	W16	W14	W15	W16	W19	W15WSW18	W22	W21WNW14	N18	NNE19	N12	N15	N14	NNE11	N11	N6	NE7	N9	N11	NNE7	N3	NW0			NW8.3	W22	
23-Jan	W1	NE2	SE3	SE4	SE7	SE6	SE6	SE6	SSE4	ESE7	ESE10	ESE10	ESE8	ESE6	NE6	NE5	NE5	NNE2	N3	NE4	S2	SE5	SSE6	SSE7	ESE3.9	ESE10	
24-Jan	SSE7	SSE7	SSE7	SE9	SSE10	SSE9	SSE8	SSE9	SSE9	SSE9	SSE8	S7	E2	NNE8	N9	NNE10	NNE12	NNE11	NNE9	NNE7	N5	N4	NNW5		ESE2.8	NNE12	
25-Jan	N7	NNE6	NE3	N3	N4	N3	NNW1	N3	NE3	NNE4	SSW2	SW2	N5	NNW1	SSW3	NNE1	SE5	SSE8	SSE8	SSE8	SSE8	SSE10	SSE10	S9	SE1.6	SSE10	
26-Jan	S7	SE10	SW8	W18	W21WNW17	N21	N30	N23	N24	N21	N17	N9	NNE9	NNE6	NNE8	NNE12	N16	NNE17	NNE17	NNE18	NNE19	N17	NNE17		N12.0	N30	
27-Jan	N18	NNE19	NNE18	NNE18	N11	N10	N10	N8	NNE11	N14	N11	N8	N5	W5	WNW3	NNE5	N8	NNW6	N8	NNW11	NW9	WNW9	WNW9WNW11		N8.8	NNE19	
28-Jan	WNW12WNW16WNW14WNW15WNW13WNW13WNW14	NW17WNW15WNW16	NW19	NW19	NW19	NW20	NW21	NW16	NW21	NW23	NW20	NNW16	N16	N19	N15	NNW13									NW15.6	NW23	
29-Jan	NW11	WNW2	WSW6	W12	W10	W8WSW10	SW9	S9	SE9	SE7	S5	S5	SSE8	SSE10	SSW10	SSW8	W4WNW10	NW13	NNW14	NNW13	N9	NNW7			W3.7	NNW14	
30-Jan	NW10	NW10	N8	N5	S4	SSE7	SSW6	S6	SSW5	WSW5	SW5	WSW4	W8	WSW5	SSW3	SE6	SSE6	SSE4	SE4	ESE2	S3	NNE2	N6	N10	WSW1.2	N10	
31-Jan	N11	NNE13	NNE9	NNE11	NNE9	NE8	NE6	NE7	NE4	ENE4	SSW0	N2	NNE5	NNE5	NE5	ESE3	SE5	SSE5	SSE6	SE5	NNE6	NNE1	N5	NNW6	NE4.3	NNE13	
SSW1.7 S2.1 S2.4SSW1.9SSW2.5 S2.2 S2.0SSW1.5 S1.9 SSE1.4 SSE1.2 SSE1.5 SSE1.2 S1.1 SSE1.5 SSE1.8 SSE1.7 SSE1.1 S0.9SSW1.0 SW1.3SSW0.8 S1.1SSW1.0																								Diurnal Average			
N18 NNE19 NNE18 W18 W21WNW17 N21 N30 N23 N24 N21 NNE19 NW19 NW20 NW21 NW16 NW21 NW23 NW20 WSW22WSW25WSW21WSW20WSW18																								Diurnal Maximum			

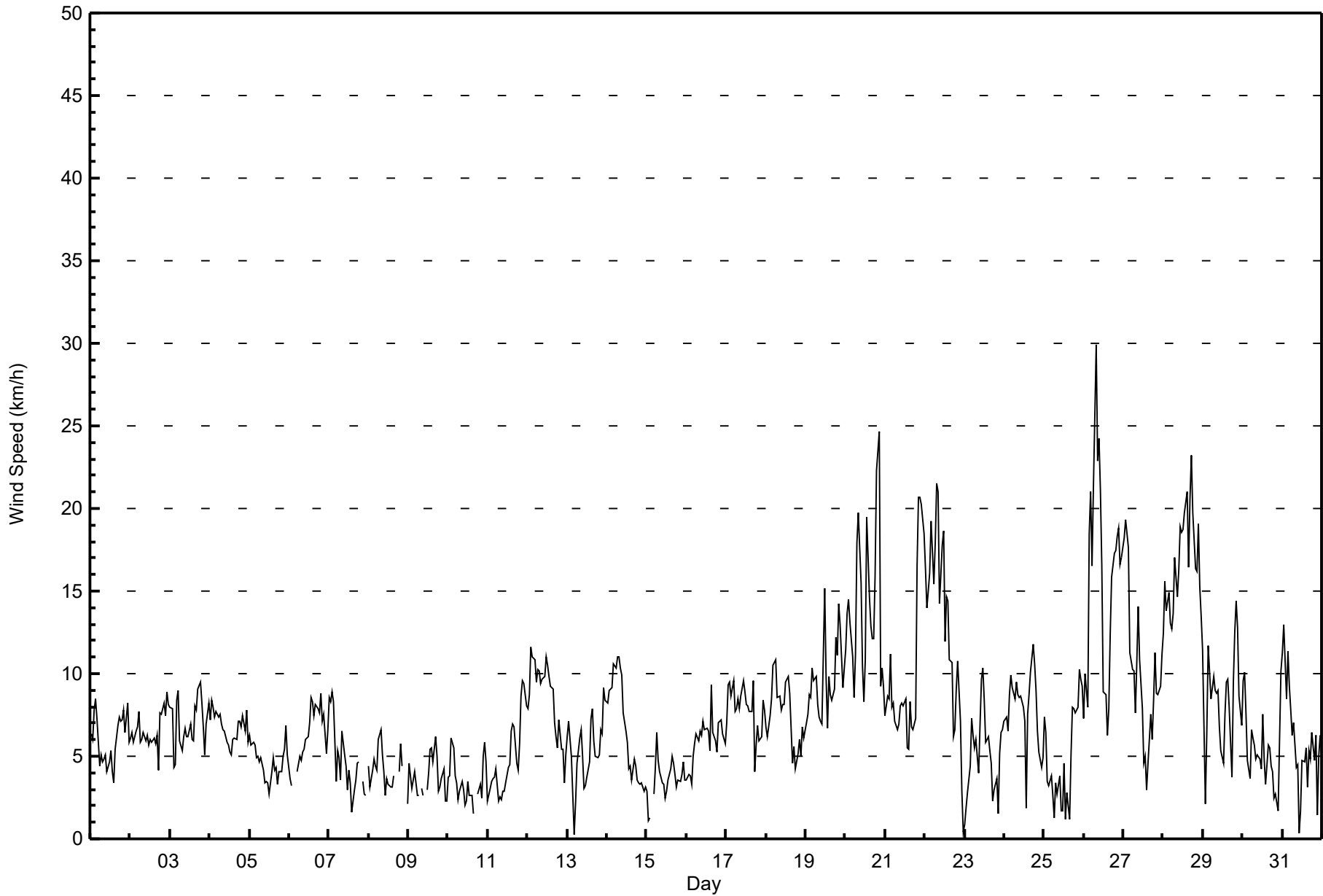
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Buffalo Viewpoint - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 09:00 Minimum Value: 0 km/h on Jan 11 08:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 730 Hours of Missing Data: 14 Hours of Calibration: 0 Percent Operational Time: 98.1								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	1	2	2	3	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	3
2-Jan	1	1	1	1	1	2	1	1	2	2	2	1	1	1	1	2	1	1	1	1	2	2	2	2	2
3-Jan	2	2	1	2	2	2	2	2	1	1	1	2	2	2	1	1	2	2	2	2	2	2	2	2	2
4-Jan	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
5-Jan	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2
6-Jan	1	1	UO	UO	UO	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2
7-Jan	1	2	2	2	1	1	1	2	2	2	1	1	2	1	2	2	1	1	2	UO	1	1	1	UO	2
8-Jan	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	UO	UO	1	1	1	UO	UO	1	2
9-Jan	1	1	1	1	1	1	1	UO	1	1	UO	1	1	2	2	2	2	2	1	1	1	1	1	1	2
10-Jan	1	1	2	2	1	1	1	1	1	1	1	1	1	1	0	1	UO	UO	0	1	1	2	1	1	2
11-Jan	1	1	1	1	1	1	1	0	1	0	1	1	1	2	2	2	3	1	1	2	3	3	3	2	3
12-Jan	2	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	1	2	1	1	4
13-Jan	1	1	2	1	1	1	1	2	2	2	1	1	1	1	2	2	1	1	1	2	2	2	2	2	2
14-Jan	2	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1	1	1	1	1	0	3
15-Jan	1	1	1	UO	0	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	2
16-Jan	0	1	1	1	1	1	1	1	2	1	2	2	1	1	2	3	2	1	1	2	2	2	2	2	3
17-Jan	3	3	2	2	3	3	2	2	2	3	3	3	2	2	2	2	3	1	1	2	1	2	2	2	3
18-Jan	2	2	2	2	3	3	3	2	2	2	2	3	3	3	3	2	1	1	1	1	1	1	2	1	3
19-Jan	2	2	2	2	3	2	2	3	2	2	2	4	4	2	2	2	2	4	4	4	4	4	4	3	4
20-Jan	3	4	3	4	3	2	4	4	5	5	3	3	4	4	5	4	3	3	4	4	4	5	3	4	5
21-Jan	2	2	2	1	1	2	2	2	2	2	2	2	2	1	2	2	1	2	3	5	4	4	4	4	5
22-Jan	3	4	5	4	5	4	4	4	5	6	6	6	3	3	3	3	2	1	2	2	2	2	1	1	6
23-Jan	1	1	1	2	2	2	2	2	2	3	3	3	2	2	2	1	1	1	1	1	1	1	2	2	3
24-Jan	2	2	2	2	2	2	2	2	2	2	2	2	1	1	3	3	3	3	2	3	2	1	2	2	3
25-Jan	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3	2	3
26-Jan	2	2	6	4	5	5	7	6	7	6	5	4	3	2	2	2	3	4	4	5	5	4	4	4	7
27-Jan	4	5	4	4	3	2	2	2	2	3	4	2	2	1	1	1	2	2	2	3	2	2	2	2	5
28-Jan	4	4	3	4	3	3	4	4	4	5	5	5	5	6	4	5	6	5	4	4	4	4	3	4	6
29-Jan	4	1	3	2	2	3	3	3	2	1	3	2	1	3	3	3	3	2	2	3	3	4	2	2	4
30-Jan	2	2	2	2	2	1	2	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	2	2	2
31-Jan	3	4	3	3	3	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	4
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Buffalo Viewpoint - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	265	36.30	36.30
6 - 11	374	51.23	87.53
12 - 19	72	9.86	97.40
20 - 28	18	2.47	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 730

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Buffalo Viewpoint - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	36	25	11	5	6	9	29	55	39	19	9	5	4	3	4	6	265
6 - 11	22	25	11	0	2	10	43	167	38	14	6	14	8	5	5	4	374
12 - 19	12	12	0	0	0	0	0	1	0	0	3	13	10	11	6	4	72
20 - 28	4	0	0	0	0	0	0	0	0	0	0	6	3	0	5	0	18
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	62	22	5	8	19	72	223	77	33	18	38	25	19	20	14	730

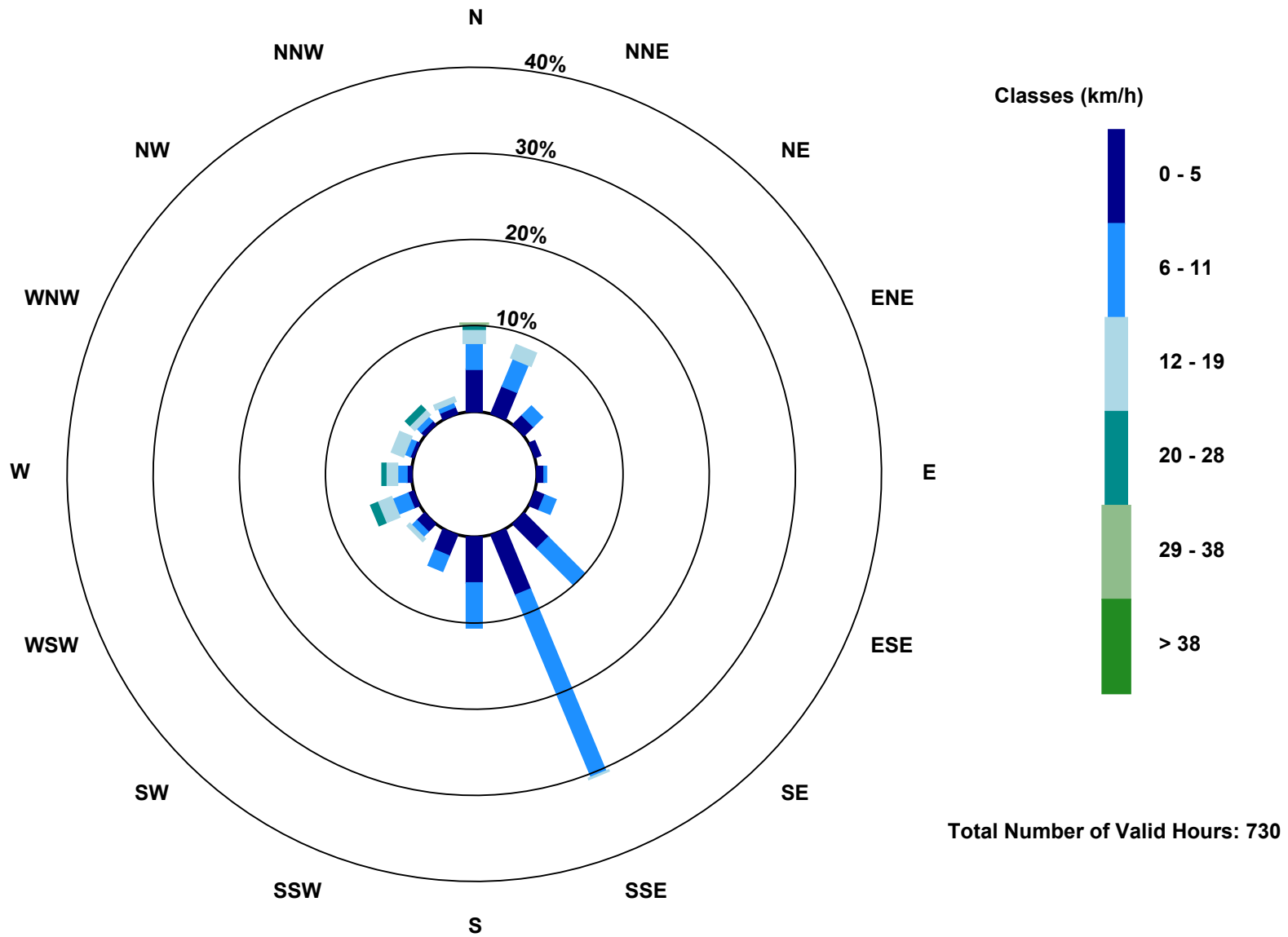
Total Number of Valid Hours: 730

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Buffalo Viewpoint





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Buffalo Viewpoint - January 2023

Direction of Maximum Speed: 2 deg on Jan 26 08:00																				Hours in Service: 744							
Direction of Maximum Daily Speed Average: 317.2 deg on Jan 28																				Hours of Data: 730							
Direction of Minimum Speed: 352 deg on Jan 13 05:00										Direction of Minimum Daily Speed Average: 0.5 deg on Jan 7										Hours of Missing Data: 14							
Monthly Average Direction: 180.4 deg																				Percent Operational Time: 98.1							
Day	Hourly Period Ending At (MST)																								Daily Average		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	166	189	214	248	248	203	157	182	178	160	173	160	160	198	172	209	198	163	156	188	161	160	125	157	180.0		
2-Jan	149	160	154	159	156	146	156	168	173	166	156	154	150	156	156	143	141	168	171	152	167	153	171	156	157.7		
3-Jan	157	163	170	111	154	162	165	143	156	162	158	151	157	145	148	138	158	141	136	141	147	148	132	143	149.5		
4-Jan	170	147	164	163	155	162	143	157	159	169	163	168	168	147	154	149	159	140	141	156	162	157	141	149	155.8		
5-Jan	149	167	160	147	168	140	144	145	172	160	160	154	146	149	158	155	142	159	157	157	155	159	158	150	154.6		
6-Jan	150	159	UO	UO	UO	174	174	174	170	179	168	162	166	160	154	153	165	163	162	159	157	148	160	169	162.5		
7-Jan	170	157	146	136	154	211	160	356	325	314	323	291	6	57	221	353	5	354	355	UO	206	209	126	UO	162.8		
8-Jan	185	161	177	164	161	155	150	145	157	137	168	177	170	144	133	128	UO	UO	38	36	25	UO	UO	93	143.4		
9-Jan	139	152	130	113	120	110	86	UO	158	155	UO	119	134	159	164	175	182	177	172	178	175	195	203	176	156.0		
10-Jan	160	163	142	129	153	150	160	154	179	170	169	196	218	240	228	269	UO	UO	217	212	248	348	1	355	177.8		
11-Jan	327	320	333	350	13	24	22	198	183	148	164	157	178	153	142	158	165	162	145	164	163	158	167	160	157.2		
12-Jan	153	163	163	162	178	161	151	158	155	153	158	154	150	147	151	154	153	168	164	193	190	216	171	137	160.6		
13-Jan	133	130	137	138	352	11	24	17	23	43	61	85	29	46	32	33	41	69	108	95	97	97	111	111	74.6		
14-Jan	128	135	135	143	147	155	156	158	155	161	162	171	157	166	178	196	233	230	207	140	196	184	151	141	159.0		
15-Jan	133	121	65	UO	4	355	10	0	354	10	8	6	16	20	16	16	8	5	357	6	16	12	17	358	11.3		
16-Jan	359	22	25	8	16	14	23	17	18	25	34	35	45	50	87	113	114	111	129	146	151	162	166	166	71.0		
17-Jan	185	194	192	188	187	186	166	167	168	167	164	177	192	196	186	188	195	184	151	166	176	168	167	160	178.6		
18-Jan	170	155	156	157	164	160	161	171	167	178	175	173	168	164	166	162	154	134	159	169	178	170	168	174	165.1		
19-Jan	172	172	158	154	153	158	152	154	162	156	179	253	272	267	218	195	183	220	240	241	245	232	222	250	205.3		
20-Jan	244	250	251	256	258	252	256	256	256	264	276	254	253	262	251	240	222	231	246	258	258	295	280	268	255.3		
21-Jan	252	197	169	135	147	139	161	158	158	143	148	154	138	145	187	202	194	187	243	250	258	259	255	256	205.1		
22-Jan	265	267	278	279	275	278	258	266	263	282	349	28	2	360	8	22	6	7	41	7	8	28	11	316	313.4		
23-Jan	279	53	137	143	127	142	143	134	149	119	119	119	112	104	34	51	50	19	357	41	184	132	160	153	115.7		
24-Jan	149	157	162	145	155	164	150	151	150	159	160	161	170	83	25	8	12	30	23	14	13	6	358	346	109.5		
25-Jan	358	30	40	11	355	3	340	5	43	20	210	217	9	347	212	25	134	151	156	153	158	165	162	177	128.3		
26-Jan	181	138	236	265	280	303	358	2	2	4	5	7	11	19	13	17	17	8	15	21	19	15	7	12	358.9		
27-Jan	9	17	16	15	9	3	7	356	23	10	11	7	1	281	296	27	353	343	353	333	309	294	287	296	355.4		
28-Jan	302	295	291	296	292	295	302	307	297	297	306	312	321	321	318	305	322	325	324	337	7	3	0	342	317.2		
29-Jan	324	284	241	267	274	278	247	225	176	143	138	171	170	162	164	206	199	269	285	315	328	339	350	334	259.9		
30-Jan	315	317	1	356	183	163	197	182	212	242	236	256	274	257	195	129	149	150	137	118	177	24	356	0	249.6		
31-Jan	10	18	13	22	33	37	41	40	50	66	209	354	27	23	40	102	141	159	160	137	31	31	356	333	35.4		
	195.2	174.9	184.6	193.3	199.5	185.7	169.7	192.2	190.9	166.8	154.6	163.0	163.9	172.3	164.8	154.1	159.9	157.2	175.1	211.0	224.7	201.4	173.6	203.4			
Diurnal Average																											
UO - Unstable Operation																											
All monthly, daily, and diurnal averages have been calculated using vector methods																											



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

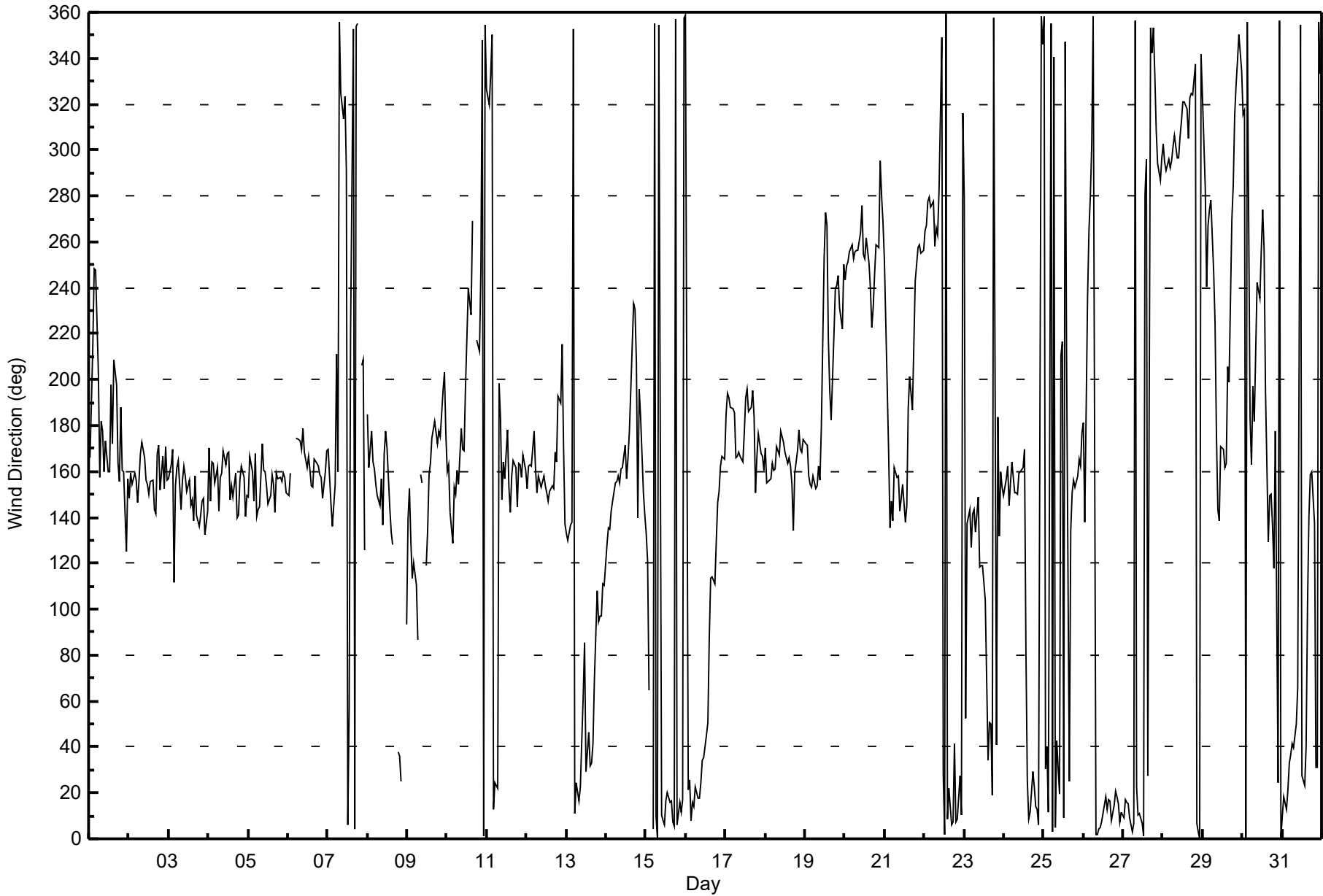
Wind Direction (WD) - deg
Buffalo Viewpoint - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 95 deg on Jan 13 05:00	Hours of Data: 730
Minimum Value: 6 deg on Jan 31 19:00	Hours of Missing Data: 14
Percentiles: P ₁ = 8 P ₁₀ = 13 Q ₁ = 17 Median = 21 Q ₃ = 26 P ₉₀ = 32 P ₉₉ = 80	Hours of Calibration: 0
	Percent Operational Time: 98.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	14	24	14	18	19	28	18	22	26	22	28	27	23	34	50	25	22	22	18	20	18	18	7	21	50
2-Jan	14	11	17	14	20	19	12	15	21	22	18	20	22	18	14	17	12	27	18	13	24	15	15	14	27
3-Jan	21	26	25	36	16	16	23	19	11	8	13	20	20	21	19	14	21	13	11	13	11	20	11	15	36
4-Jan	8	11	13	18	11	9	8	15	12	10	11	22	26	17	21	15	15	10	11	15	8	10	12	9	26
5-Jan	11	11	12	11	12	8	9	14	10	15	12	15	18	18	15	14	14	15	13	19	22	31	30	27	31
6-Jan	26	25	UO	UO	UO	17	25	24	23	19	23	22	25	22	25	23	25	22	21	18	25	23	26	10	26
7-Jan	15	24	12	14	40	33	29	45	18	26	30	43	41	29	82	61	26	13	11	UO	17	31	28	UO	82
8-Jan	18	56	11	12	16	13	12	18	20	23	19	16	18	19	23	11	UO	UO	10	14	13	UO	UO	53	56
9-Jan	24	24	19	17	14	25	30	UO	38	24	UO	42	31	31	26	27	24	27	28	18	23	17	21	24	42
10-Jan	29	30	24	23	23	25	14	17	23	23	31	34	16	19	28	25	UO	UO	13	10	39	31	18	17	39
11-Jan	15	15	25	23	14	18	46	24	23	17	27	26	27	32	29	26	28	22	21	28	28	26	28	29	46
12-Jan	30	26	28	28	27	28	26	27	28	30	27	28	26	28	29	29	28	26	28	24	23	27	37	23	37
13-Jan	20	14	23	46	95	73	22	18	21	30	26	52	24	20	20	25	18	23	18	18	19	20	20	23	95
14-Jan	26	26	26	27	29	28	28	26	27	26	28	29	30	32	29	40	17	19	15	17	17	14	19	17	40
15-Jan	15	47	25	UO	14	16	18	19	18	15	18	22	17	16	12	14	10	9	14	12	8	7	7	16	47
16-Jan	13	22	16	13	9	12	15	16	14	14	15	16	16	15	38	20	22	18	26	26	27	28	25	25	38
17-Jan	26	22	21	23	23	25	26	25	27	25	26	26	24	21	26	24	22	36	19	26	26	33	26	26	36
18-Jan	27	24	27	27	26	26	28	24	25	24	25	30	30	29	28	25	24	17	21	24	18	22	24	22	30
19-Jan	24	23	23	26	26	24	22	28	31	19	31	18	28	25	18	18	19	24	19	20	19	19	22	21	31
20-Jan	19	16	14	14	15	21	18	12	14	20	23	25	23	12	16	19	17	16	17	12	11	35	20	17	35
21-Jan	21	18	19	8	10	15	18	22	20	18	21	20	15	19	34	15	17	24	27	15	12	12	12	13	34
22-Jan	12	19	21	18	16	18	14	12	11	22	39	20	19	19	19	19	18	15	21	14	17	16	26	90	90
23-Jan	57	34	32	29	23	32	32	29	34	26	23	22	20	33	22	16	18	52	39	31	49	20	27	22	57
24-Jan	23	28	27	21	21	19	20	17	21	20	21	20	16	70	23	18	17	20	18	18	24	19	29	19	70
25-Jan	14	23	29	29	27	18	58	36	38	34	82	57	22	69	59	87	42	27	28	27	29	28	29	24	87
26-Jan	22	16	64	13	18	21	24	22	21	21	21	19	22	21	23	22	17	20	20	20	19	20	22	19	64
27-Jan	19	19	20	18	15	15	14	15	17	18	19	17	35	29	56	23	18	16	15	23	18	16	15	16	56
28-Jan	19	19	19	19	20	19	21	19	19	20	19	19	20	18	19	20	19	17	17	25	19	18	17	18	25
29-Jan	18	77	26	14	16	17	23	20	24	23	25	30	31	29	25	25	23	41	19	16	17	21	20	18	77
30-Jan	16	16	20	44	51	9	18	24	36	24	36	41	23	40	39	15	21	21	20	32	28	90	16	17	90
31-Jan	20	18	23	18	17	16	18	20	19	39	88	76	16	24	16	38	15	11	6	45	12	89	19	15	89
	57	77	64	46	95	73	58	45	38	39	88	76	41	70	82	87	42	52	39	45	49	90	37	90	

Diurnal Maximum

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS05
MANNIX
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	36	36	100	42.7	0	4.7	0
H2S (ppb) Average	707	37	37	100	46	7	10.2	1
THC (ppm) Average	708	36	36	100	4.7	-	3.1	-
NMHC(ppm) Average	708	36	36	100	1.064	-	0.265	-
CH4(ppm) Average	708	36	36	100	4.4	-	2.9	-
Temperature 2 m (C) Average	744	0	0	100	2.5	-	-2.8	-
Temperature 20 m (C) Average	744	0	0	100	3.3	-	-1.7	-
Temperature 45 m (C) Average	744	0	0	100	3.5	-	-1.1	-
Temperature 75 m (C) Average	744	0	0	100	3.4	-	-0.1	-
Temperature 90 m (C) Average	744	0	0	100	3.4	-	0.1	-
Relative Humidity 2 m (%) Average	744	0	0	100	94	-	91	-
Relative Humidity 20 m (%) Average	744	0	0	100	100	-	94	-
Relative Humidity 45 m (%) Average	744	0	0	100	98	-	92	-
Relative Humidity 75 m (%) Average	744	0	0	100	97	-	93	-
Relative Humidity 90 m (%) Average	744	0	0	100	100	-	94	-
Wind Speed 20 m (km/h) Average	739	0	5	99.33	30	-	21	-
Wind Speed 45 m (km/h) Average	696	0	48	93.55	38	-	27	-
Wind Speed 75 m (km/h) Average	695	0	49	93.41	43	-	30	-
Wind Speed 90 m (km/h) Average	662	0	82	88.98	44	-	31	-
Wind Direction 20 m (deg) Average	739	0	5	99.33	-	-	-	-
Wind Direction 45 m (deg) Average	696	0	48	93.55	-	-	-	-
Wind Direction 75 m (deg) Average	695	0	49	93.41	-	-	-	-
Wind Direction 90 m (deg) Average	662	0	82	88.98	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	739	0	5	99.33	1.7	-	0.8	-
Vertical Wind Speed 45 m (km/h) Average	696	0	48	93.55	1.5	-	0.6	-
Vertical Wind Speed 75 m (km/h) Average	695	0	49	93.41	1.8	-	0.6	-
Vertical Wind Speed 90 m (km/h) Average	662	0	82	88.98	3	-	0.8	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	0.96	2.7	-	0	0.1	0.1	0.2	0.6	2.5	42.7
H2S (ppb) Average	707	0.77	3	-	0	0.1	0.2	0.3	0.5	1.1	45.9
THC (ppm) Average	708	2.31	0.4	-	2	2.1	2.1	2.2	2.3	2.7	4.7
NMHC(ppm) Average	708	0.064	0.13	-	0	0	0	0	0.1	0.2	1.064
CH4(ppm) Average	708	2.25	0.3	-	2	2.1	2.1	2.2	2.3	2.5	4.4
Temperature 2 m (C) Average	744	-10.29	5.5	-	-27.9	-18.7	-12.4	-9.2	-7.2	-4.7	2.5
Temperature 20 m (C) Average	744	-9.88	5.5	-	-26.5	-18.9	-11.7	-8.9	-7.1	-4.1	3.3
Temperature 45 m (C) Average	744	-9.65	5.5	-	-25.3	-19	-11.4	-8.9	-6.9	-3.8	3.5
Temperature 75 m (C) Average	744	-9.38	5.7	-	-24.7	-19.4	-10.7	-8.6	-6.6	-2.9	3.4
Temperature 90 m (C) Average	744	-9.31	5.7	-	-24.7	-19.4	-10.6	-8.5	-6.6	-2.6	3.4
Relative Humidity 2 m (%) Average	744	83.8	7	-	57	74	81	86	89	91	94
Relative Humidity 20 m (%) Average	744	84.5	8	-	57	72	80	86	91	93	100
Relative Humidity 45 m (%) Average	744	83.8	8	-	58	72	80	86	90	92	98
Relative Humidity 75 m (%) Average	744	84	8	-	58	71	80	86	90	92	97
Relative Humidity 90 m (%) Average	744	84.8	9	-	58	71	80	87	92	94	100
Wind Speed 20 m (km/h) Average	739	10.2	5	-	0	3	6	10	13	17	30
Wind Speed 45 m (km/h) Average	696	14.4	8	-	0	4	8	15	20	24	38
Wind Speed 75 m (km/h) Average	695	16.3	9	-	1	4	9	16	23	28	43
Wind Speed 90 m (km/h) Average	662	16.8	9	-	1	4	9	16	24	29	44
Wind Direction 20 m (deg) Average	739	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	696	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	695	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	662	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	739	0.26	0.4	-	-1.3	-0.3	0	0.3	0.6	0.8	1.7
Vertical Wind Speed 45 m (km/h) Average	696	0.12	0.4	-	-1.3	-0.5	-0.2	0.1	0.5	0.7	1.5
Vertical Wind Speed 75 m (km/h) Average	695	0.23	0.4	-	-2.4	-0.2	0	0.2	0.4	0.7	1.8
Vertical Wind Speed 90 m (km/h) Average	662	0	0.5	-	-1.2	-0.5	-0.3	0	0.2	0.6	3

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
JANUARY 2023

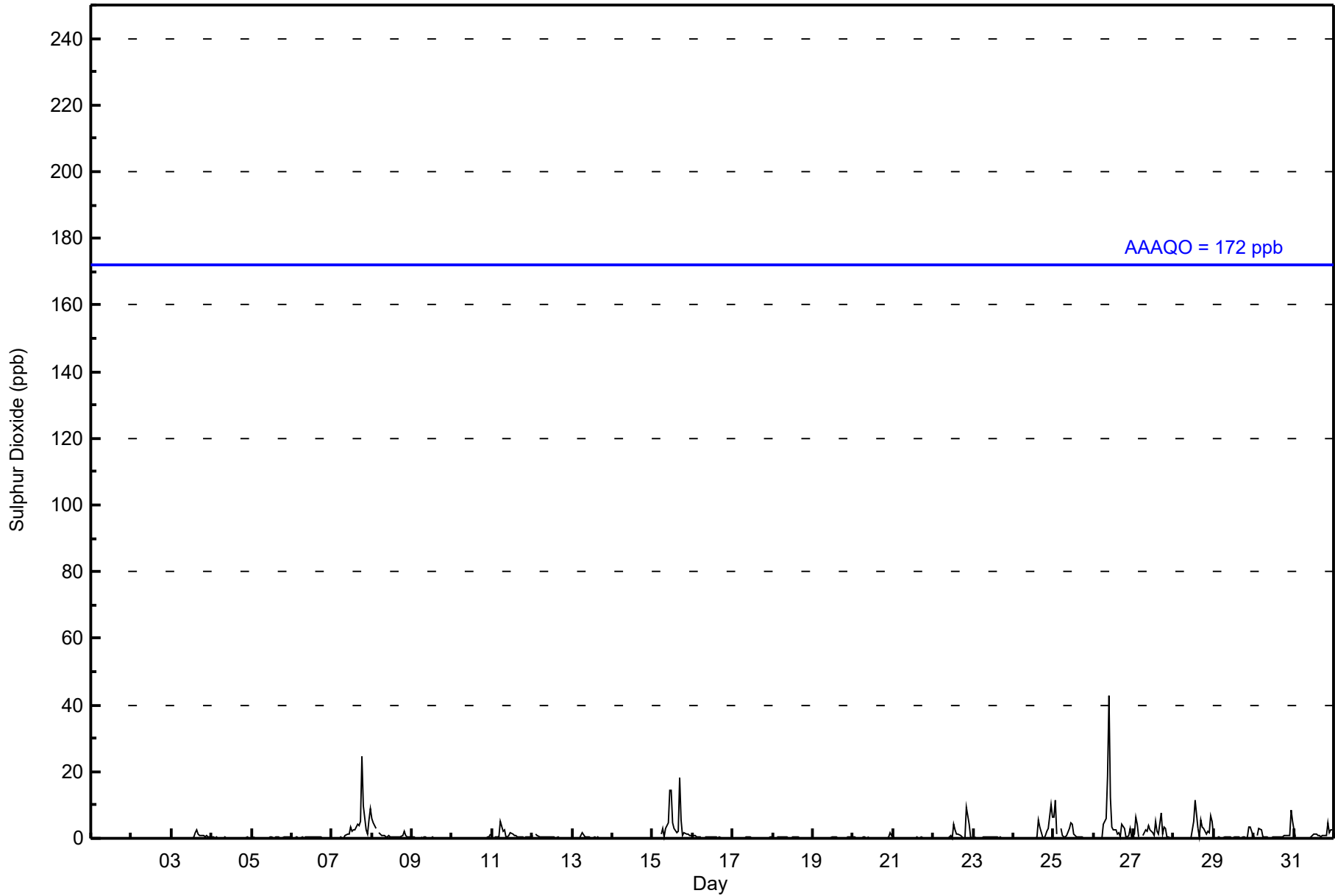
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction, Vertical Wind Speed at 20m	08 Jan 2023 02:00	08 Jan 2023 03:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 20m	08 Jan 2023 05:00	08 Jan 2023 05:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 20m	08 Jan 2023 10:00	08 Jan 2023 11:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	05 Jan 2023 09:00	05 Jan 2023 20:00	12	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	08 Jan 2023 05:00	08 Jan 2023 13:00	9	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	13 Jan 2023 08:00	14 Jan 2023 02:00	19	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	22 Jan 2023 13:00	22 Jan 2023 13:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 45m	25 Jan 2023 21:00	26 Jan 2023 03:00	7	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 75m	11 Jan 2023 04:00	26 Jan 2023 03:00	49	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction, Vertical Wind Speed at 90m	01 Jan 2023 01:00	26 Jan 2023 03:00	82	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mannix - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	699	98.73	98.73
11 - 20	7	0.99	99.72
21 - 60	2	0.28	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mannix - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	26	54	15	7	10	15	76	279	40	29	22	28	24	26	20	23	694
11 - 20	3	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	7
21 - 60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	55	15	7	10	15	76	279	40	29	22	28	24	27	21	25	703

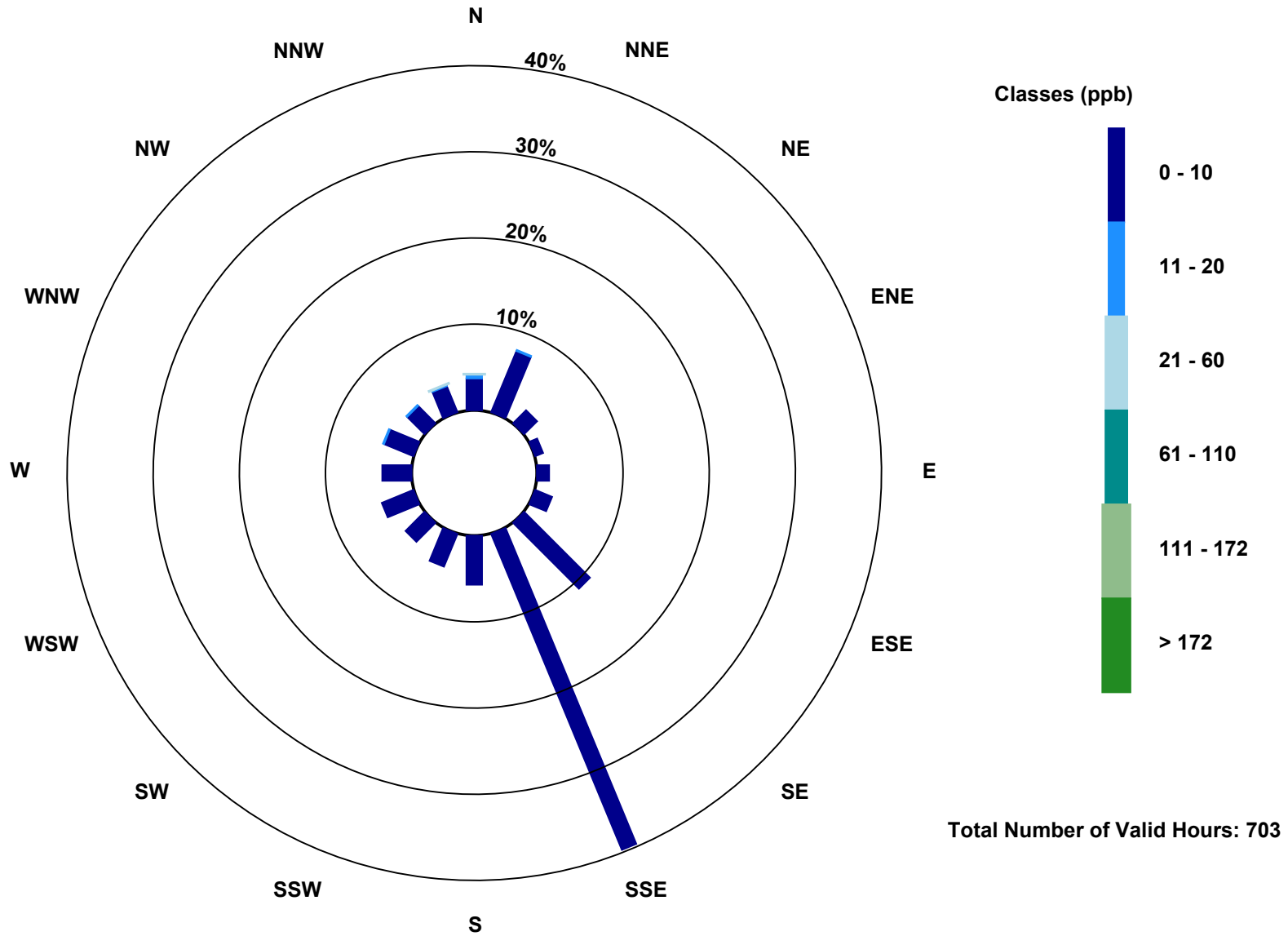
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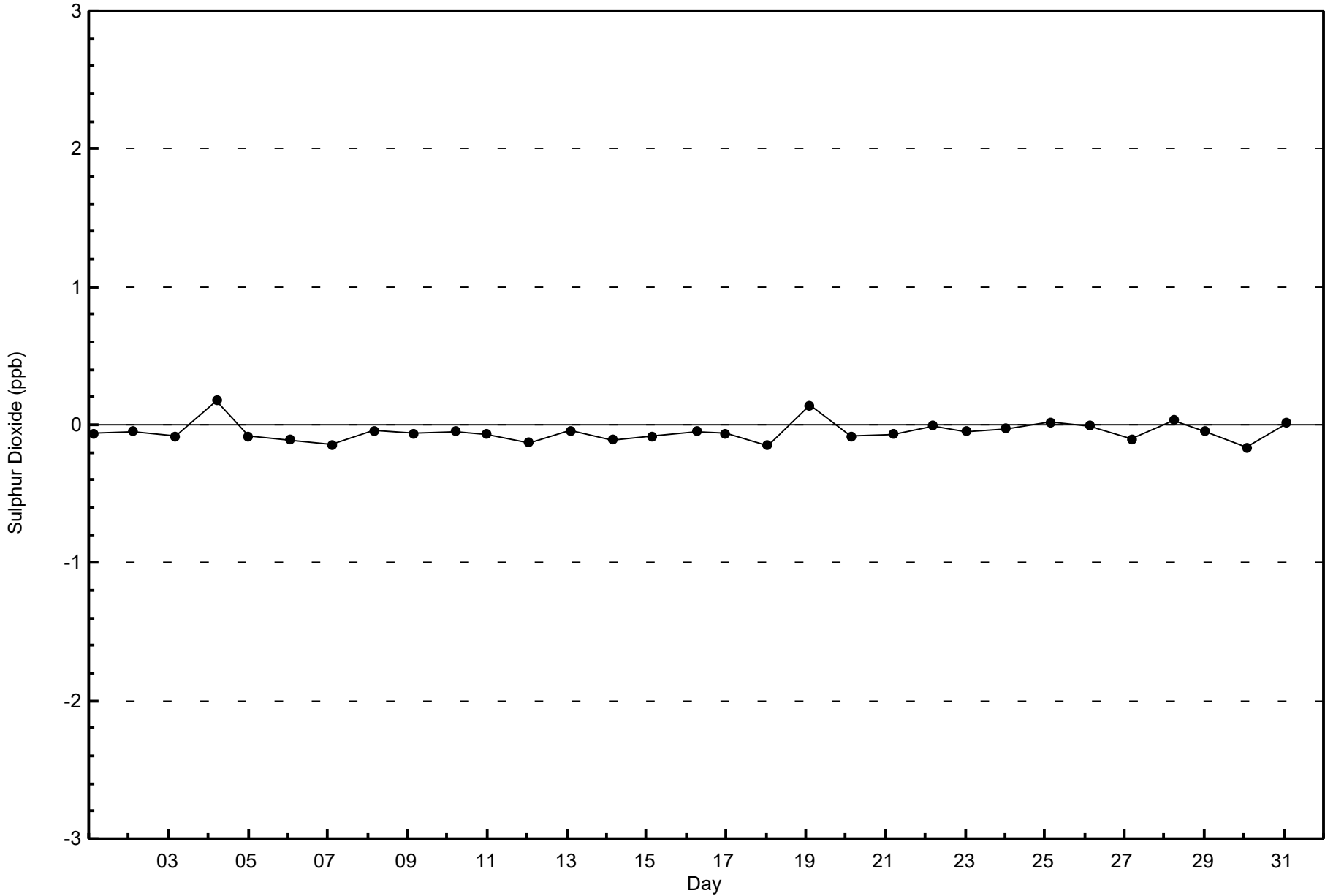
Total Number of Hours: 744

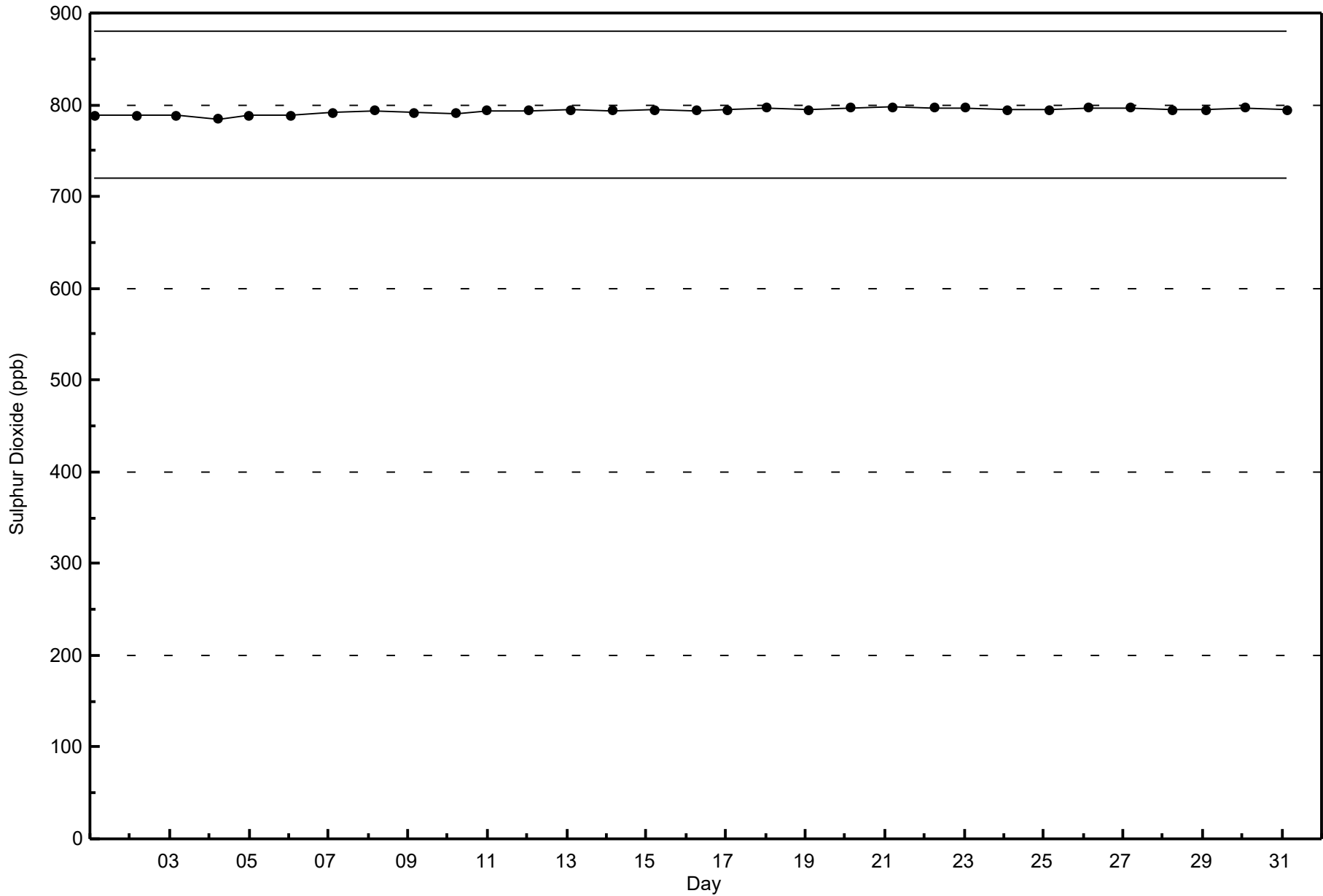


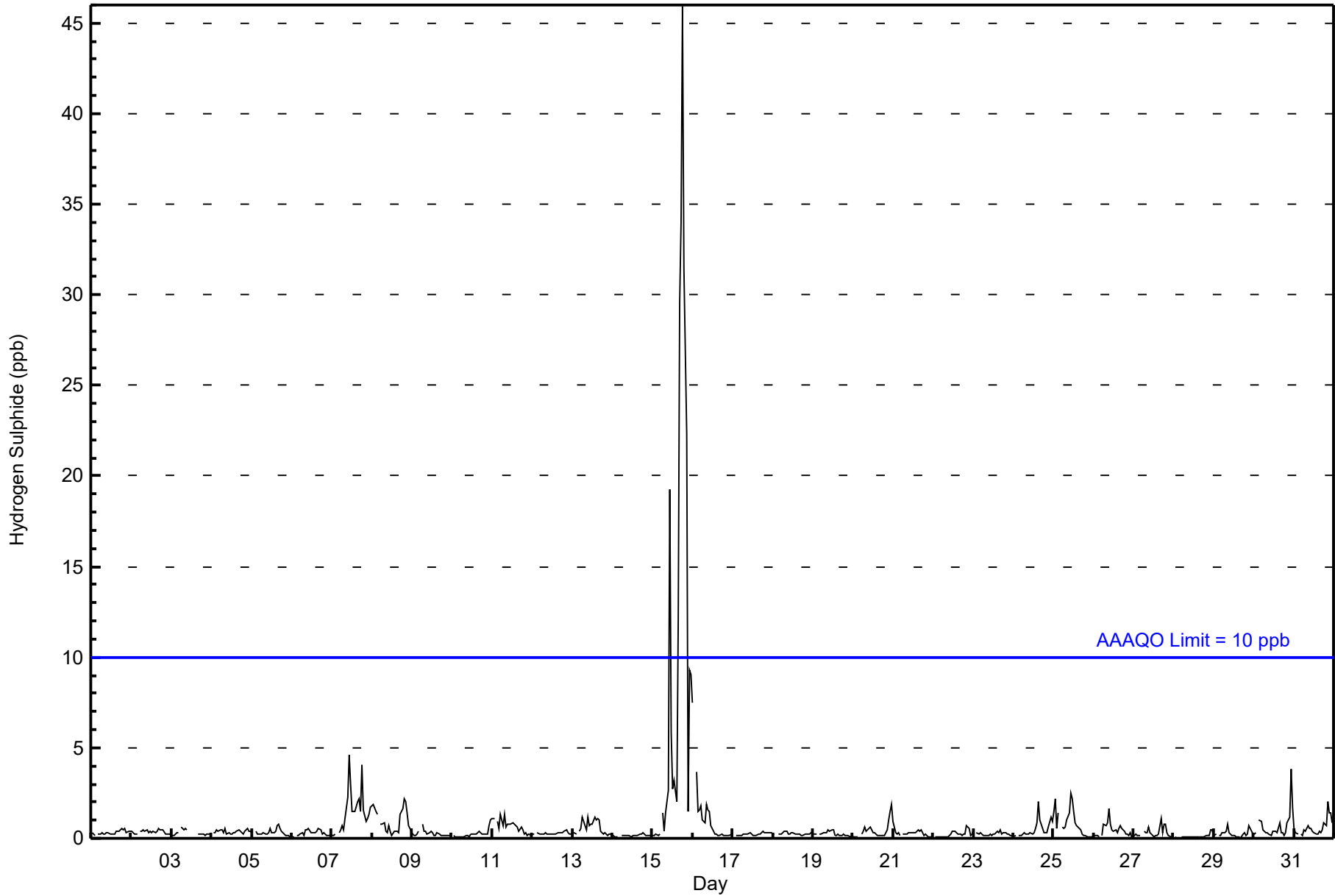
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Mannix











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	687	97.17	97.17
3 - 4	8	1.13	98.30
5 - 7	2	0.28	98.59
8 - 11	3	0.42	99.01
> 11	7	0.99	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	24	53	16	7	8	16	78	269	44	28	21	30	23	24	21	21	683
3 - 4	0	0	0	0	1	0	0	0	0	0	0	1	1	2	1	2	8
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
8 - 11	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
> 11	4	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	7
Totals	29	55	16	7	9	16	79	269	44	28	21	31	25	27	22	25	703

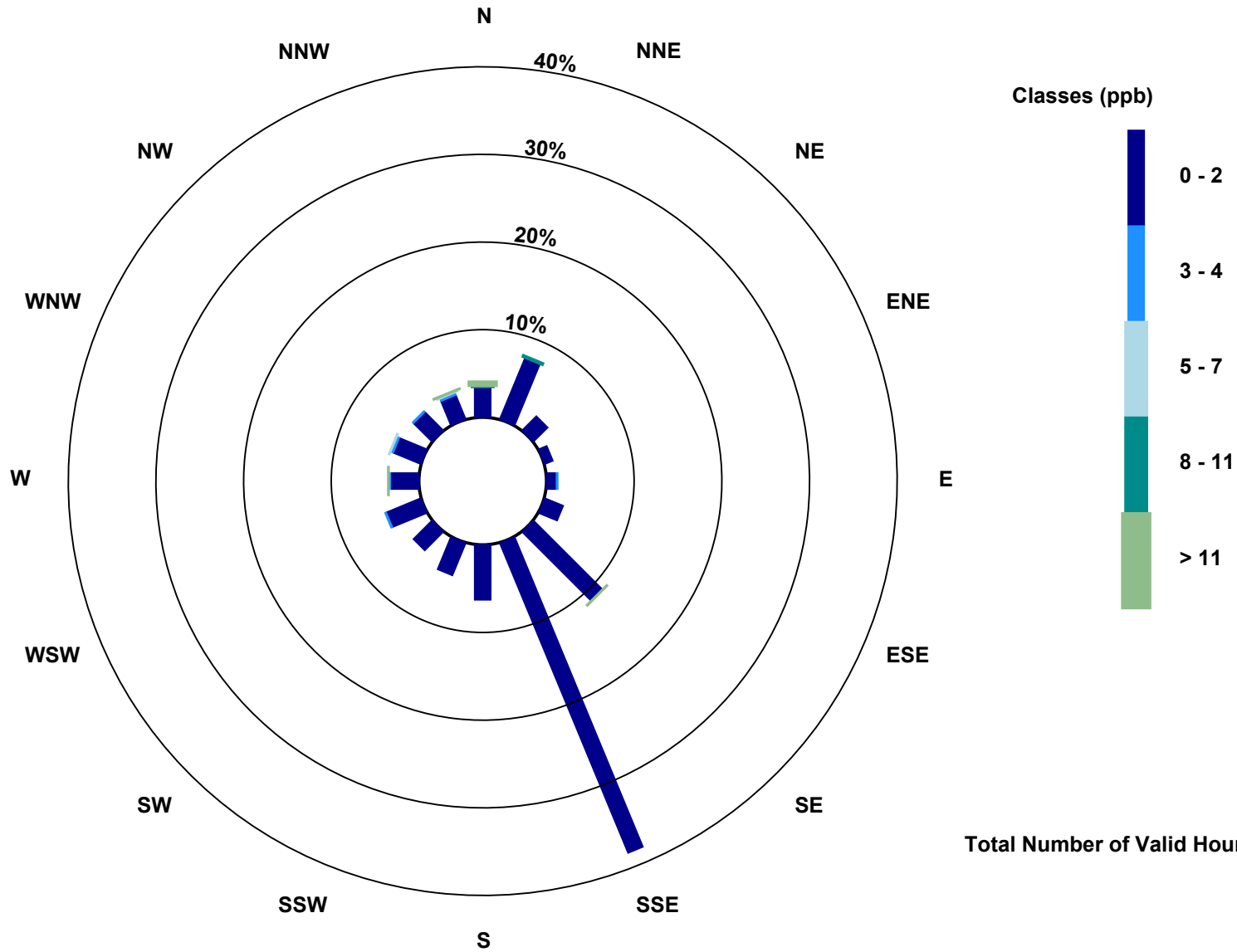
Total Number of Valid Hours: 703

Total Number of Hours: 744

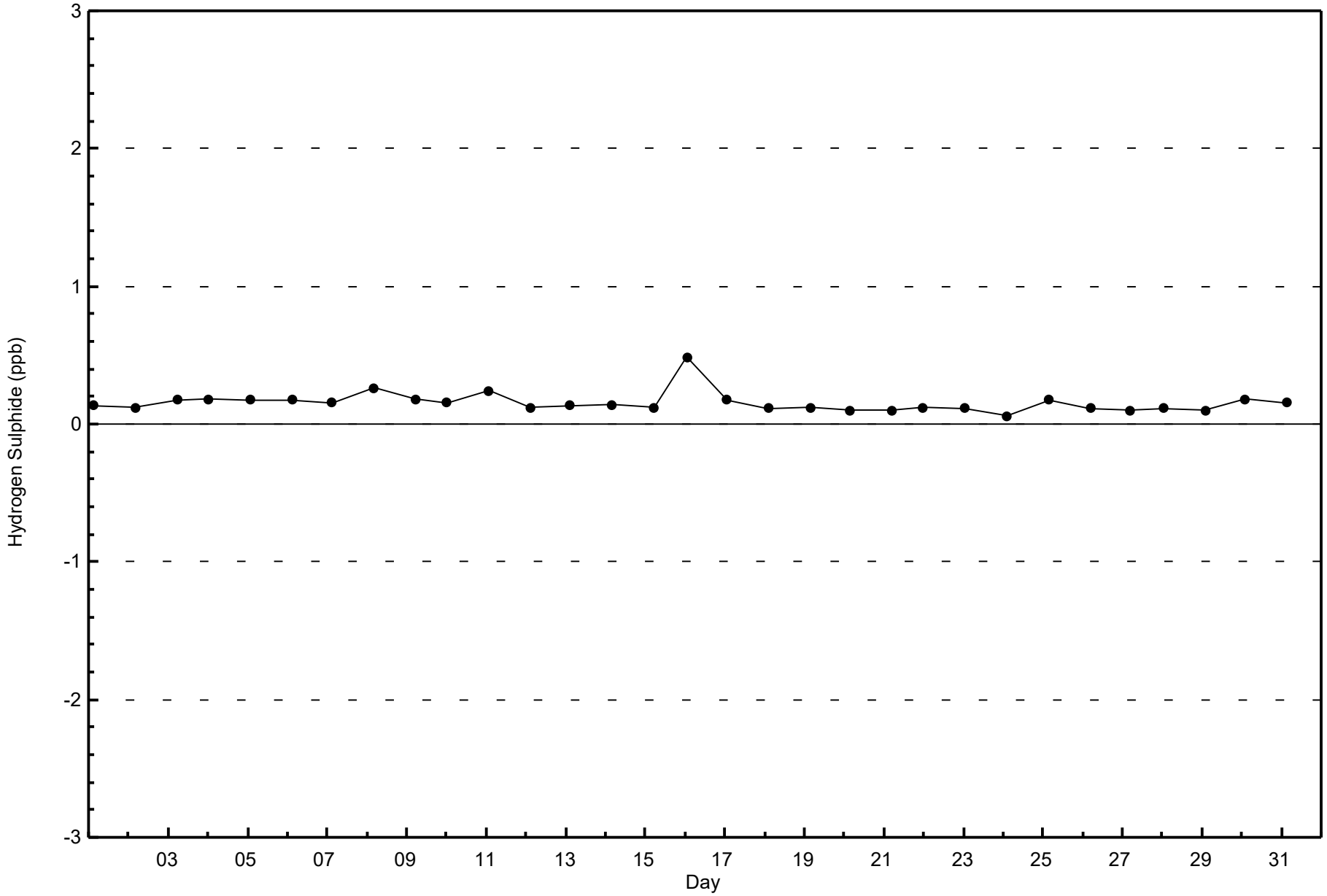


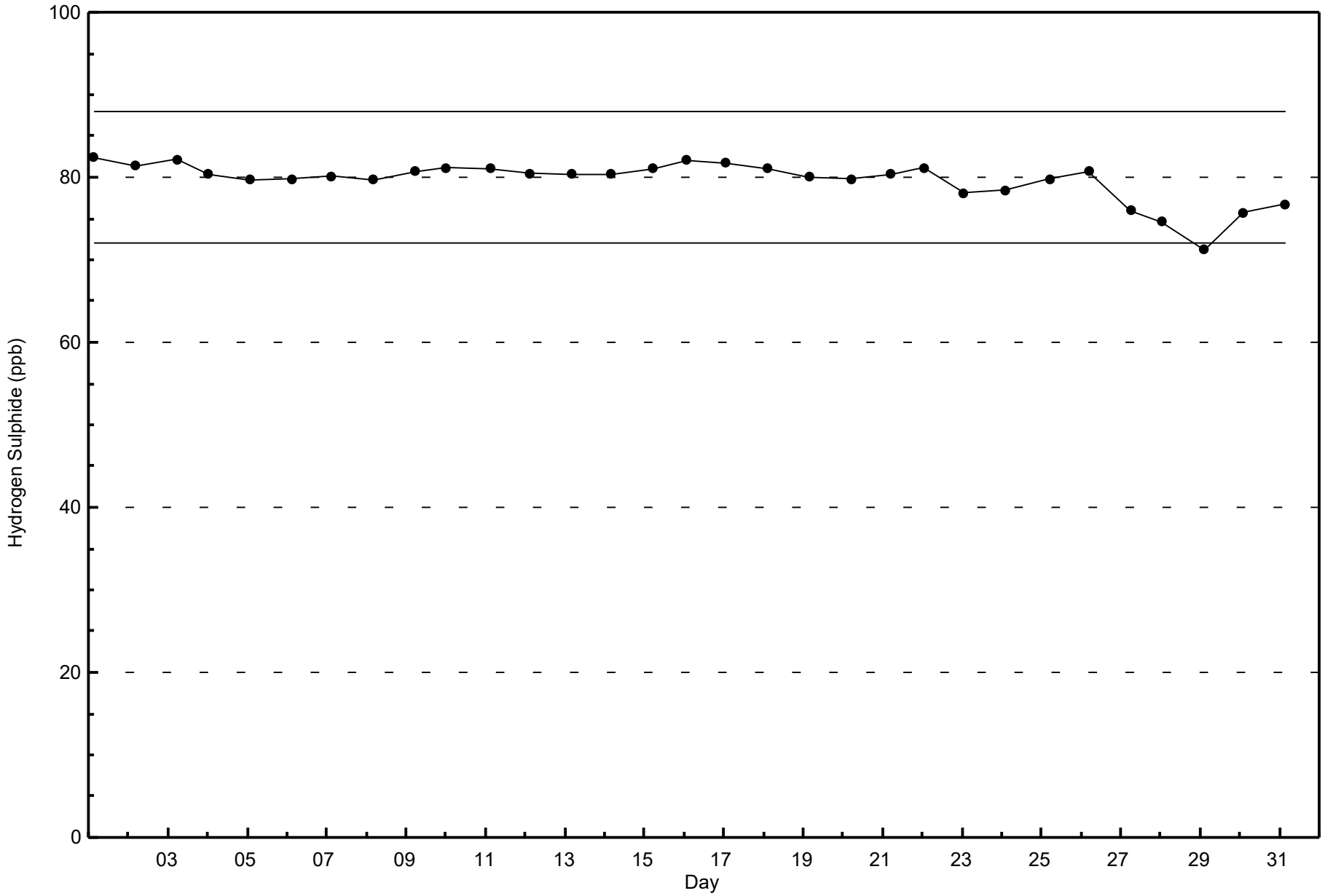
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Mannix



Total Number of Valid Hours: 703

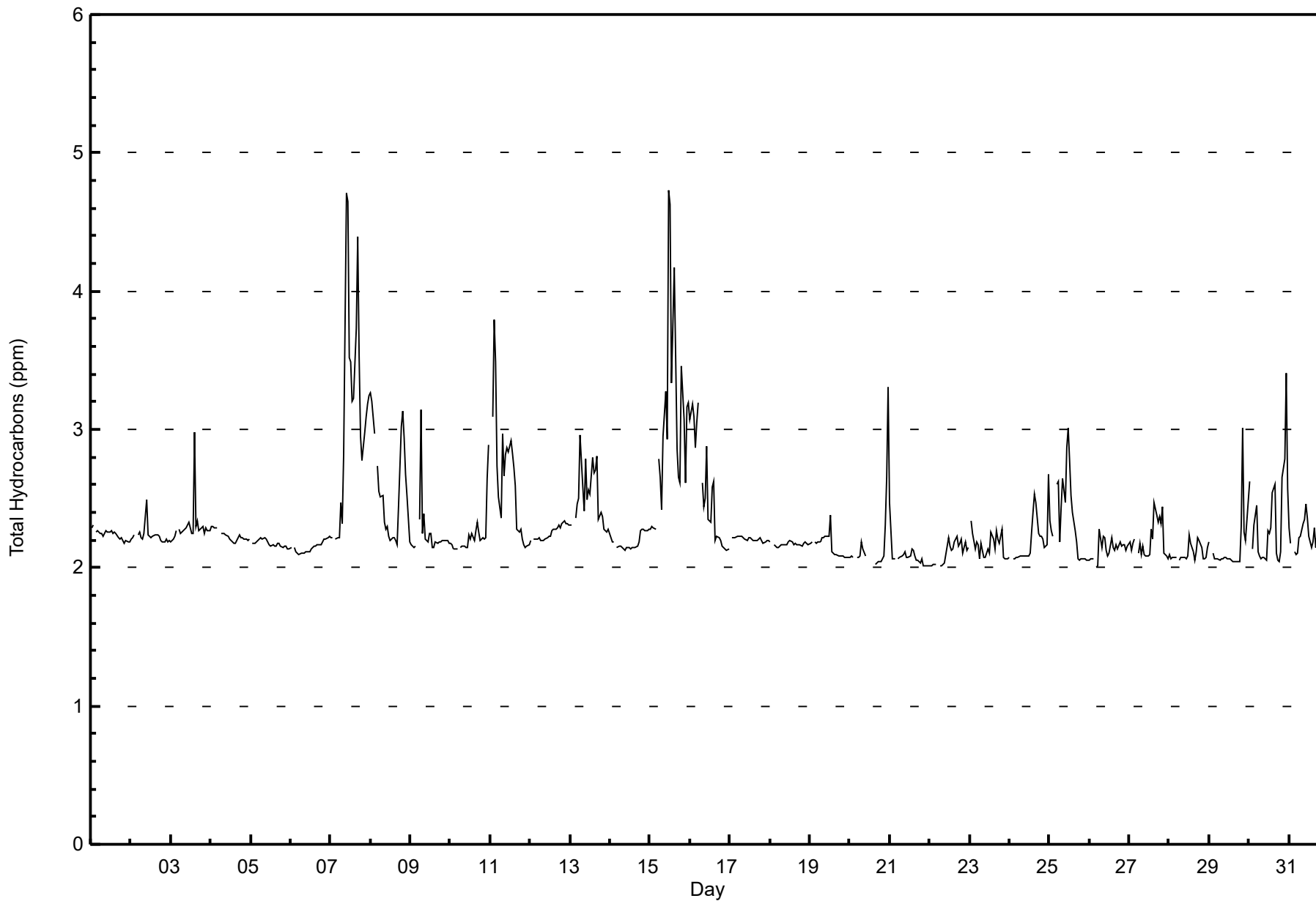






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mannix - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	28	3.95	3.95
2.1 - 3.0	644	90.96	94.92
3.1 - 10.0	36	5.08	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mannix - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	3	2	1	0	6	12	4	0	0	28
2.1 - 3.0	28	49	15	6	8	14	75	275	36	27	21	22	10	18	14	22	640
3.1 - 10.0	2	6	0	1	2	1	1	1	2	1	1	0	2	5	7	3	35
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	55	15	7	10	15	76	279	40	29	22	28	24	27	21	25	703

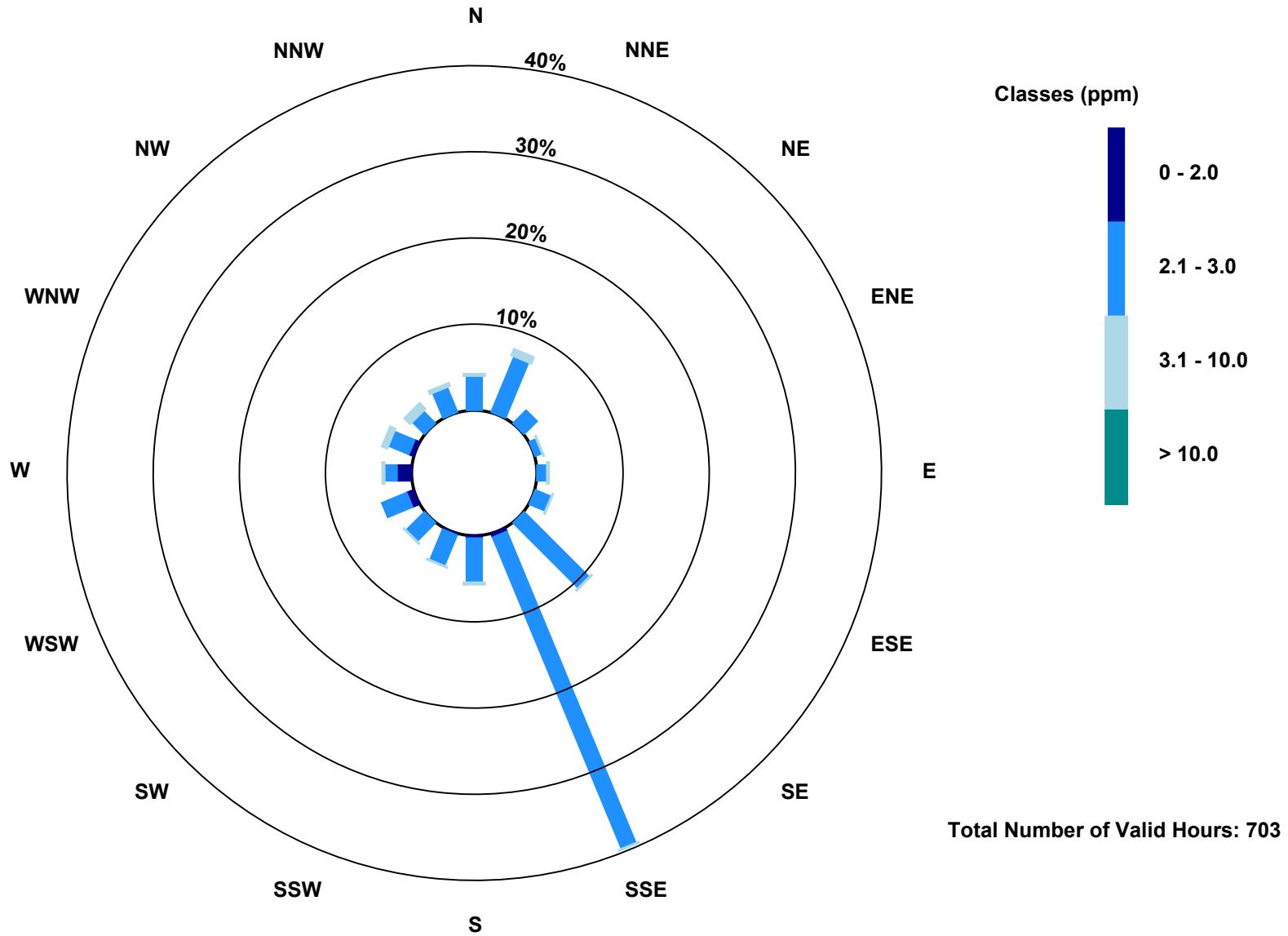
Total Number of Valid Hours: 703

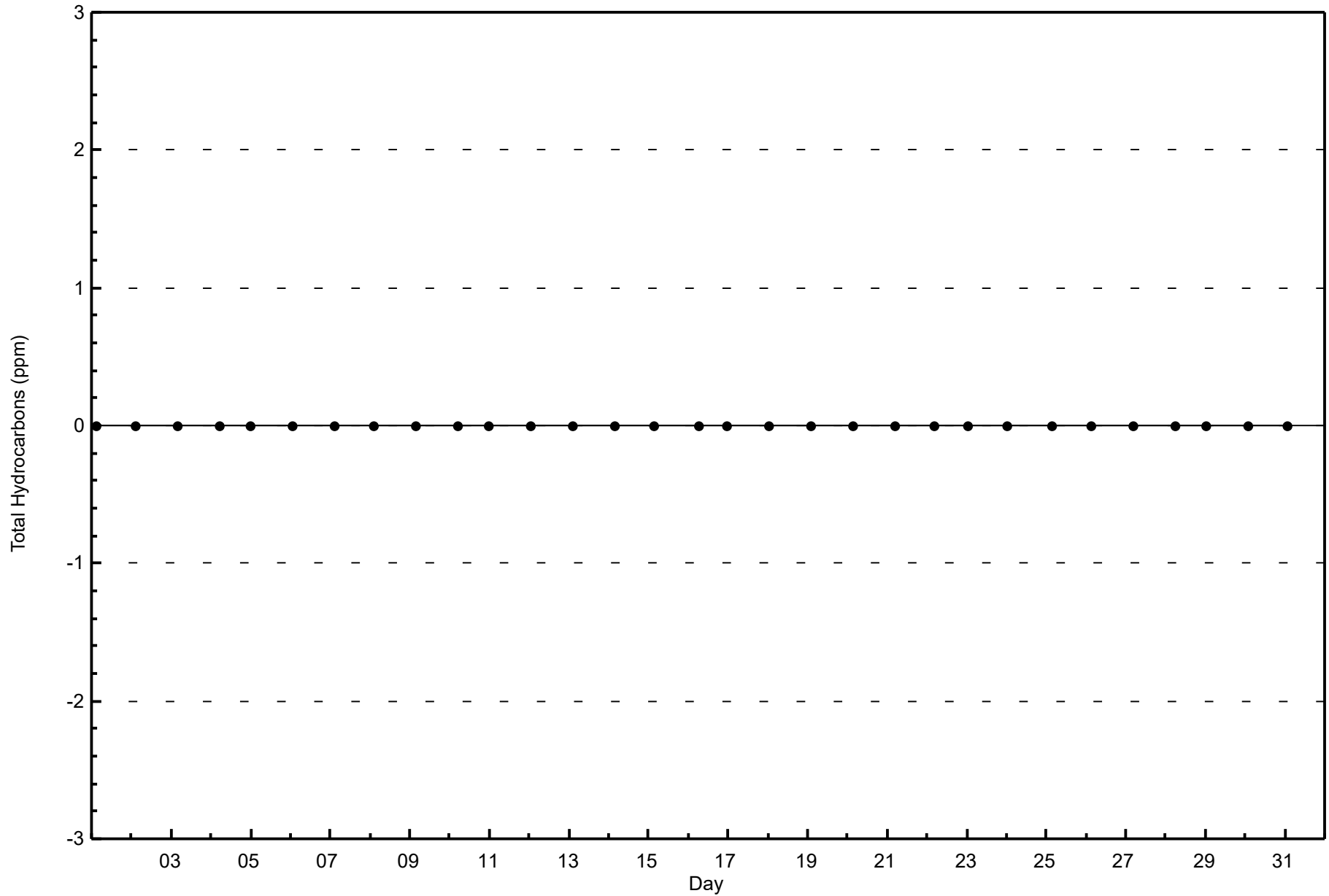
Total Number of Hours: 744

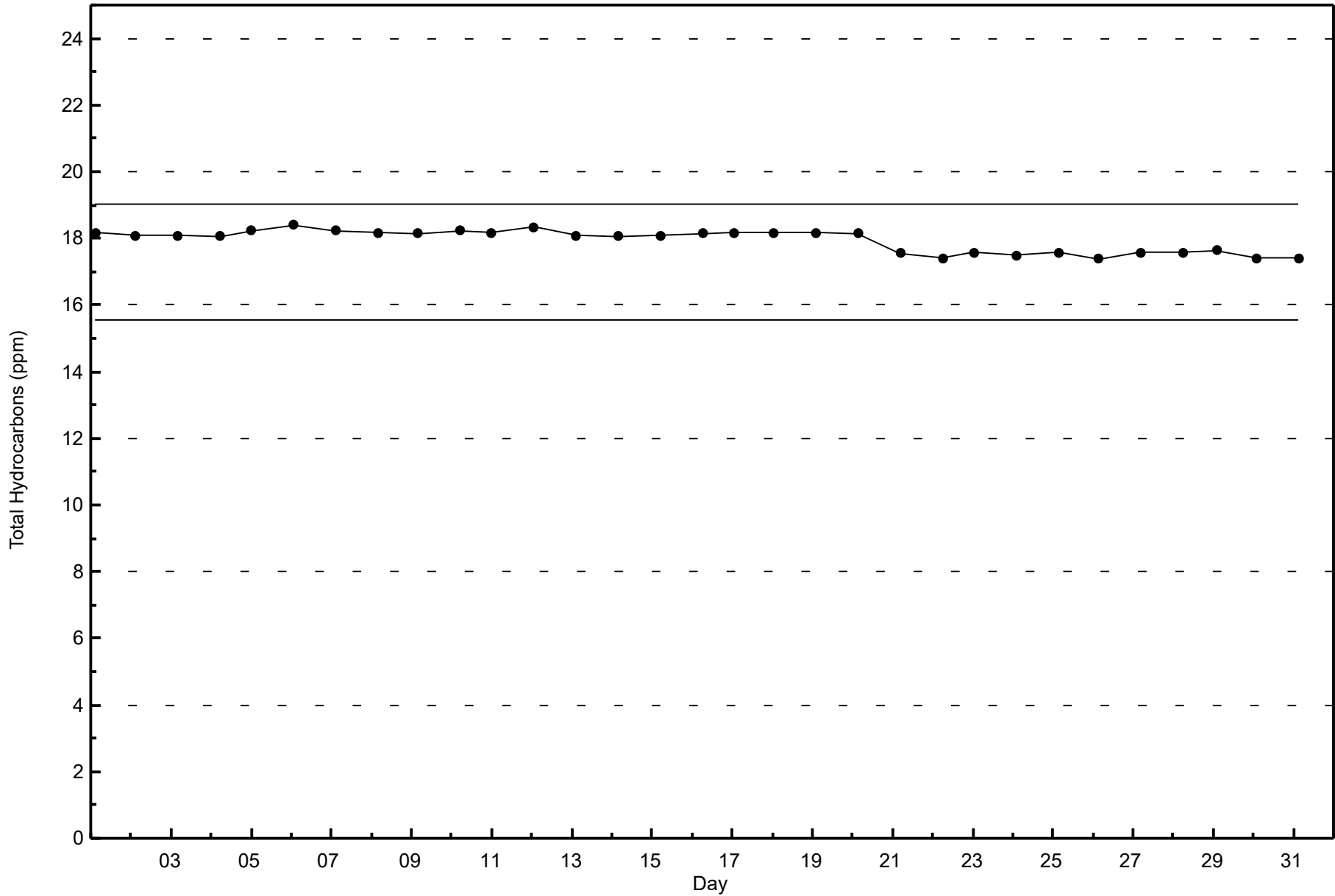


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Mannix





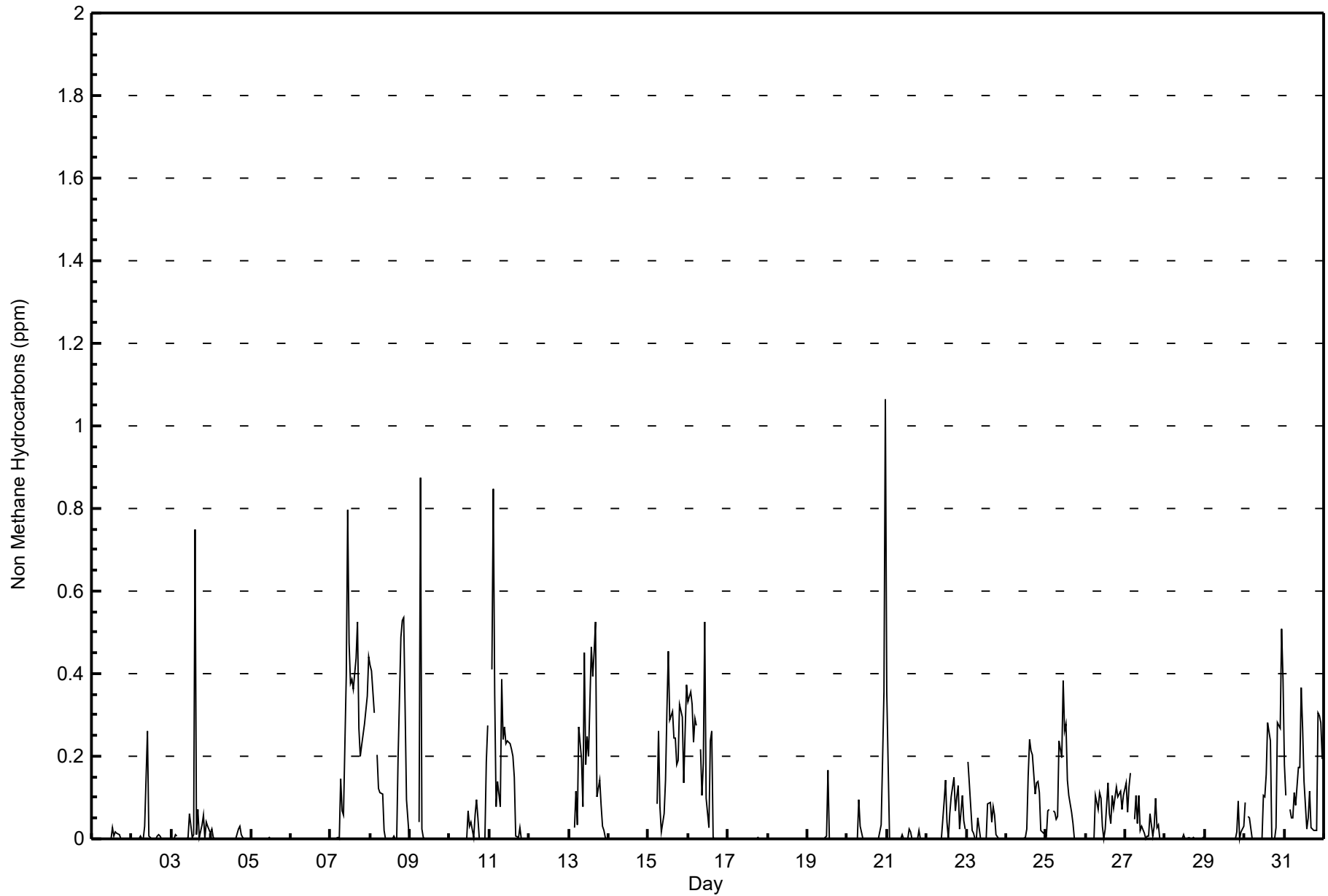




Summary of Hour Averages

Mannix - January 2023

Maximum Value: 1.064 ppm on Jan 21 00:00		Maximum Daily Average: 0.265 ppm on Jan 7		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Jan 1 01:00		Minimum Daily Average: 0.000 ppm on Jan 6		Hours of Data:	708																						
Maximum Diurnal Average: 0.108 ppm at hour 15		Minimum Diurnal Average: 0.032 ppm at hour 5		Hours of Missing Data:	36																						
Monthly Average: 0.064 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.2 P ₉₉ = 0.5		Hours of Calibration:	36																						
				Percent Operational Time:	100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.008	0.017	0.014	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.027	
2-Jan	0.000	0.000	0.000	Z	0.000	0.005	0.000	0.000	0.032	0.262	0.006	0.005	0.000	0.000	0.000	0.008	0.010	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.262	
3-Jan	0.000	0.000	0.011	0.008	Z	0.000	0.000	0.000	0.000	0.000	0.003	0.059	0.003	0.009	0.751	0.009	0.071	0.003	0.032	0.058	0.000	0.042	0.029	0.015	0.048	0.751	
4-Jan	0.024	0.003	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.031	0.011	0.003	0.000	0.000	0.000	0.000	0.004	0.031	
5-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	
6-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Jan	0.000	0.000	Z	0.000	0.005	0.000	0.146	0.068	0.058	0.396	0.798	0.475	0.375	0.387	0.363	0.437	0.525	0.269	0.201	0.226	0.279	0.310	0.346	0.439	0.265	0.798	
8-Jan	0.420	0.408	0.306	Z	0.203	0.123	0.111	0.110	0.020	0.000	0.001	0.000	0.000	0.000	0.007	0.000	0.000	0.196	0.489	0.529	0.536	0.320	0.093	0.000	0.168	0.536	
9-Jan	0.000	0.000	0.000	0.000	Z	0.042	0.876	0.023	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.876	
10-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.067	0.030	0.041	0.005	0.057	0.095	0.050	0.000	0.000	0.000	0.000	0.188	0.274	0.035	0.274	
11-Jan	Z	0.410	0.848	0.349	0.077	0.141	0.079	0.386	0.240	0.271	0.231	0.237	0.232	0.218	0.201	0.150	0.006	0.004	0.028	0.000	0.000	0.000	0.000	0.000	0.179	0.848	
12-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Jan	0.000	0.000	Z	0.027	0.117	0.035	0.272	0.195	0.078	0.451	0.180	0.247	0.200	0.465	0.394	0.450	0.525	0.100	0.142	0.082	0.030	0.019	0.002	0.002	0.174	0.525	
14-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Jan	0.000	0.000	0.000	0.000	Z	0.085	0.261	0.079	0.017	0.061	0.143	0.313	0.456	0.288	0.310	0.245	0.243	0.179	0.190	0.327	0.296	0.134	0.261	0.372	0.185	0.456	
16-Jan	0.332	0.356	0.327	0.234	0.291	0.275	Z	0.216	0.107	0.184	0.526	0.098	0.027	0.237	0.260	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.151	0.526	
17-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.002	
18-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.166	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.166	
20-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.095	0.030	0.000	C	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.035	0.190	0.357	1.064	0.098	1.064	
21-Jan	0.356	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.023	0.018	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.019	0.356	
22-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.090	0.143	0.041	0.000	0.059	0.103	0.149	0.069	0.100	0.129	0.023	0.104	0.046	0.023	0.047	0.149	
23-Jan	Z	0.185	0.132	0.021	0.013	0.001	0.000	0.052	0.000	0.000	0.000	0.000	0.000	0.084	0.089	0.042	0.077	0.056	0.010	0.000	0.000	0.000	0.000	0.000	0.033	0.185	
24-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.025	0.151	0.241	0.213	0.202	0.108	0.136	0.139	0.111	0.021	0.014	0.016	0.060	0.241	
25-Jan	0.006	0.069	0.070	Z	0.066	0.064	0.047	0.053	0.237	0.195	0.384	0.259	0.276	0.143	0.107	0.065	0.037	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.090	0.384	
26-Jan	0.000	0.000	0.001	Z	0.000	0.000	0.104	0.071	0.111	0.097	0.029	0.000	0.023	0.135	0.062	0.037	0.104	0.075	0.126	0.100	0.109	0.114	0.072	0.107	0.064	0.135	
27-Jan	0.136	0.065	0.126	0.158	Z	0.048	0.104	0.037	0.105	0.021	0.029	0.014	0.000	0.006	0.008	0.061	0.007	0.029	0.098	0.029	0.034	0.000	0.000	0.000	0.049	0.158	
28-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.003	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.011	
29-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.091	0.001	0.018	0.029	0.007	0.091	
30-Jan	0.087	Z	0.054	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.106	0.101	0.155	0.282	0.238	0.000	0.000	0.000	0.026	0.282	0.268	0.509	0.387	0.111	0.509	
31-Jan	0.179	0.105	Z	0.072	0.052	0.051	0.113	0.080	0.173	0.173	0.367	0.267	0.138	0.023	0.051	0.116	0.027	0.023	0.020	0.019	0.306	0.297	0.280	0.192	0.136	0.367	
		0.057	0.064	0.072	0.037	0.032	0.032	0.070	0.047	0.039	0.068	0.093	0.077	0.071	0.079	0.108	0.072	0.068	0.039	0.051	0.055	0.069	0.059	0.071	0.094	Diurnal Average	
		0.420	0.410	0.848	0.349	0.291	0.275	0.876	0.386	0.240	0.451	0.798	0.475	0.456	0.465	0.751	0.450	0.525	0.269	0.489	0.529	0.536	0.320	0.509	1.064	Diurnal Maximum	
Z - zerospan		C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Mannix - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	427	60.31	60.31
0.006 - 0.05	89	12.57	72.88
0.06 - 0.1	85	12.01	84.89
> 0.1	107	15.11	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Mannix - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	2	0	0	0	0	3	55	227	29	23	19	22	18	14	6	7	425
0.006 - 0.05	9	5	0	1	5	0	9	31	4	4	0	1	3	5	4	8	89
0.06 - 0.1	11	30	2	3	2	5	6	9	3	1	0	1	1	3	4	4	85
> 0.1	8	20	13	3	3	7	6	12	4	1	3	4	2	5	7	6	104
Totals	30	55	15	7	10	15	76	279	40	29	22	28	24	27	21	25	703

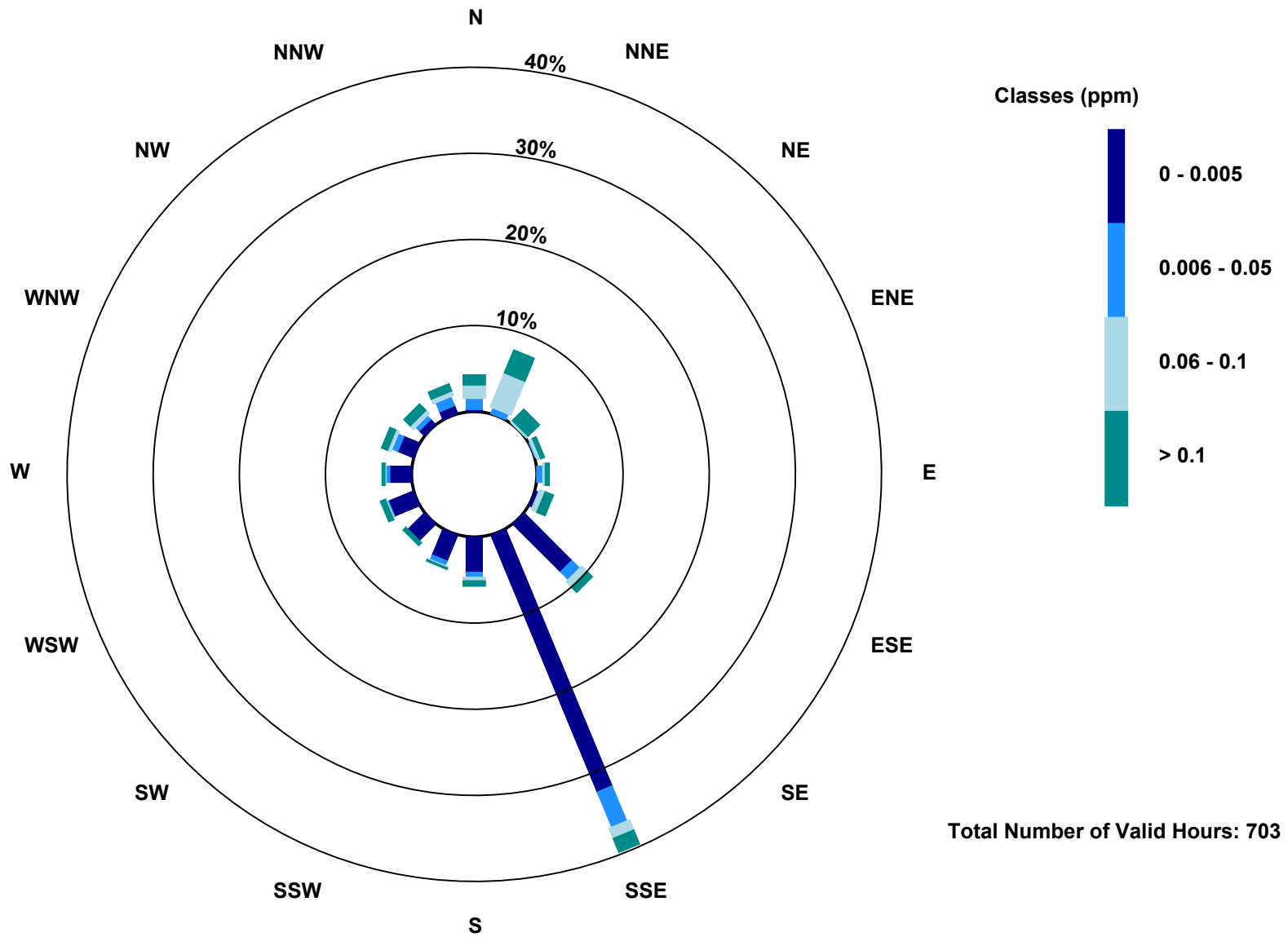
Total Number of Valid Hours: 703

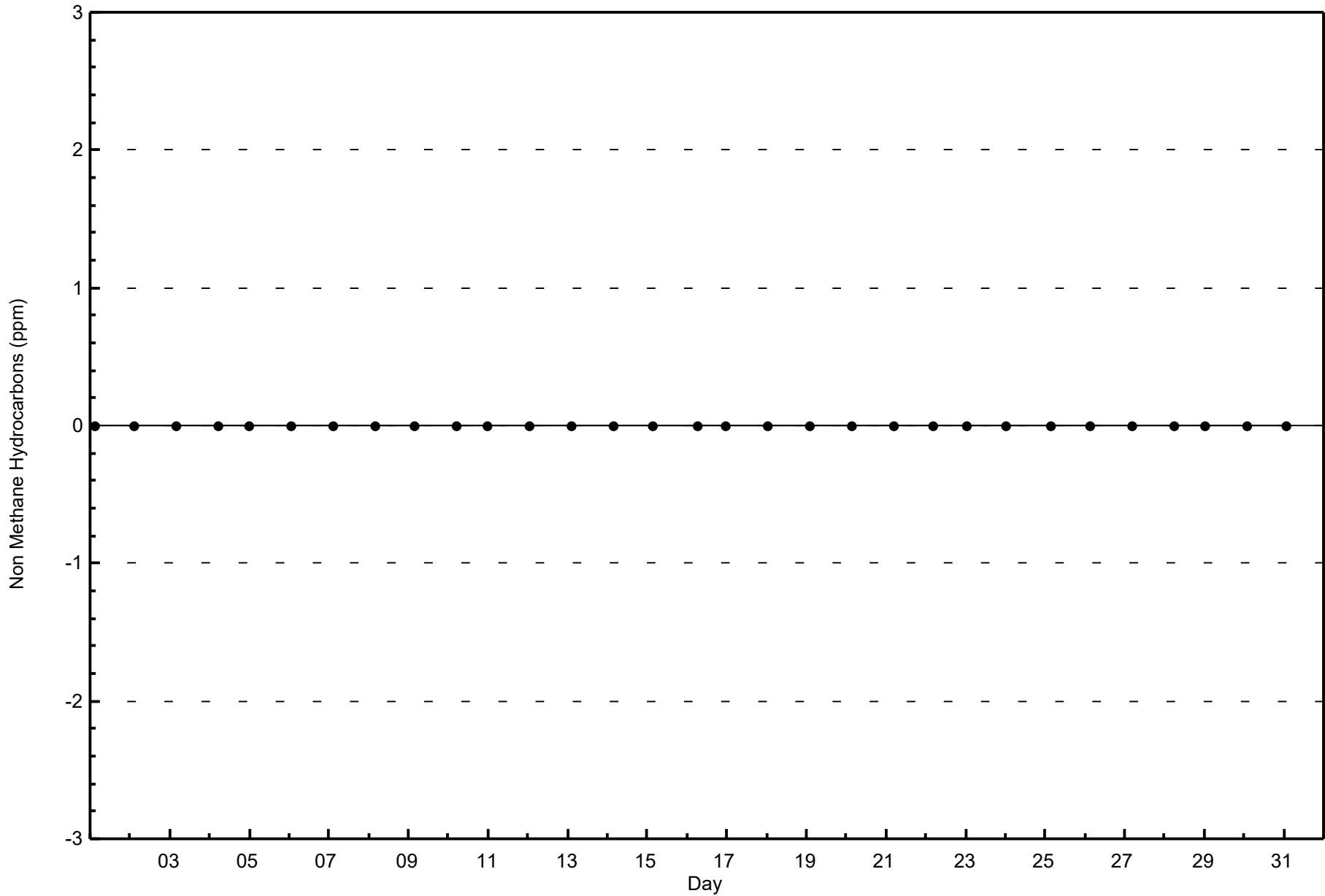
Total Number of Hours: 744

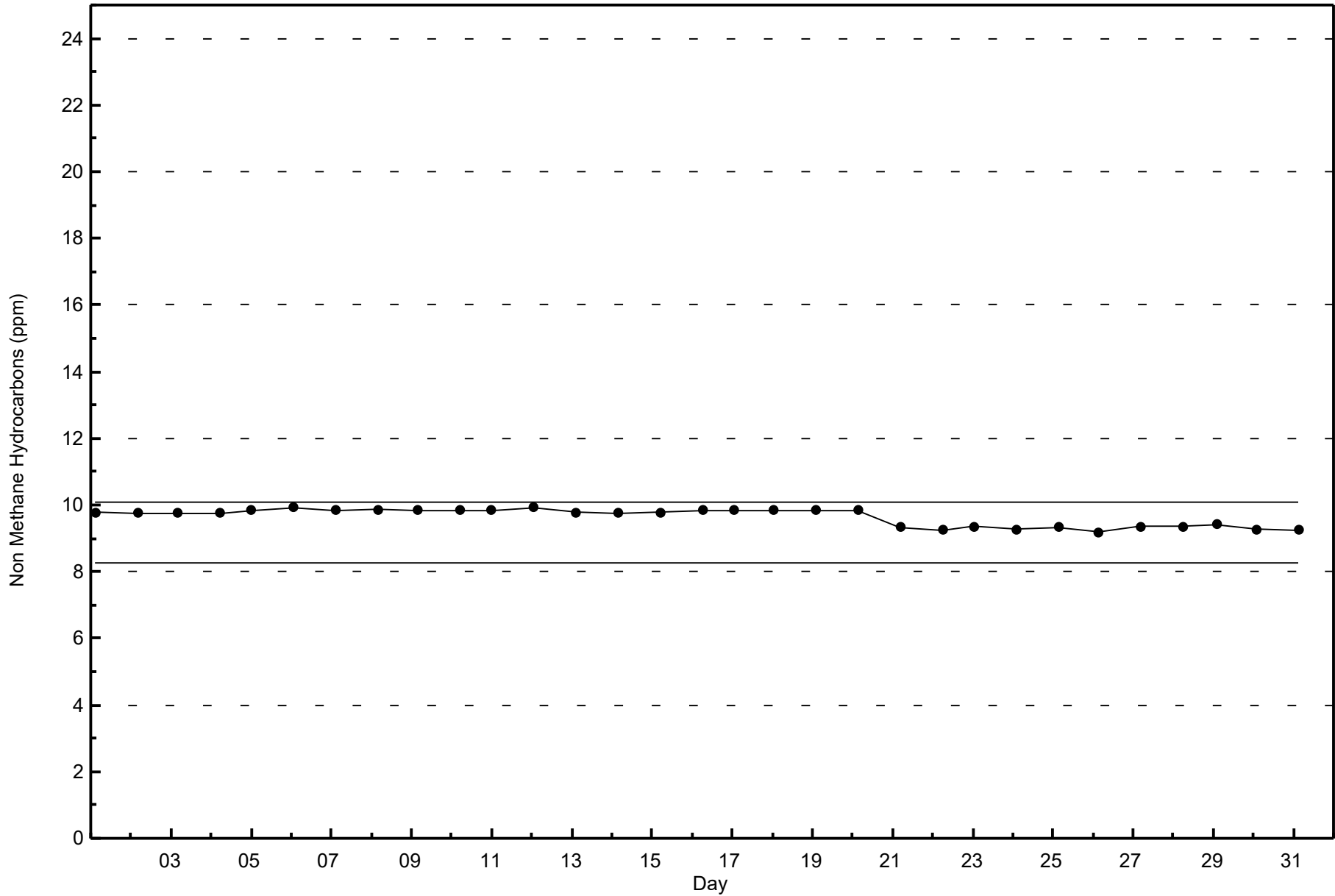


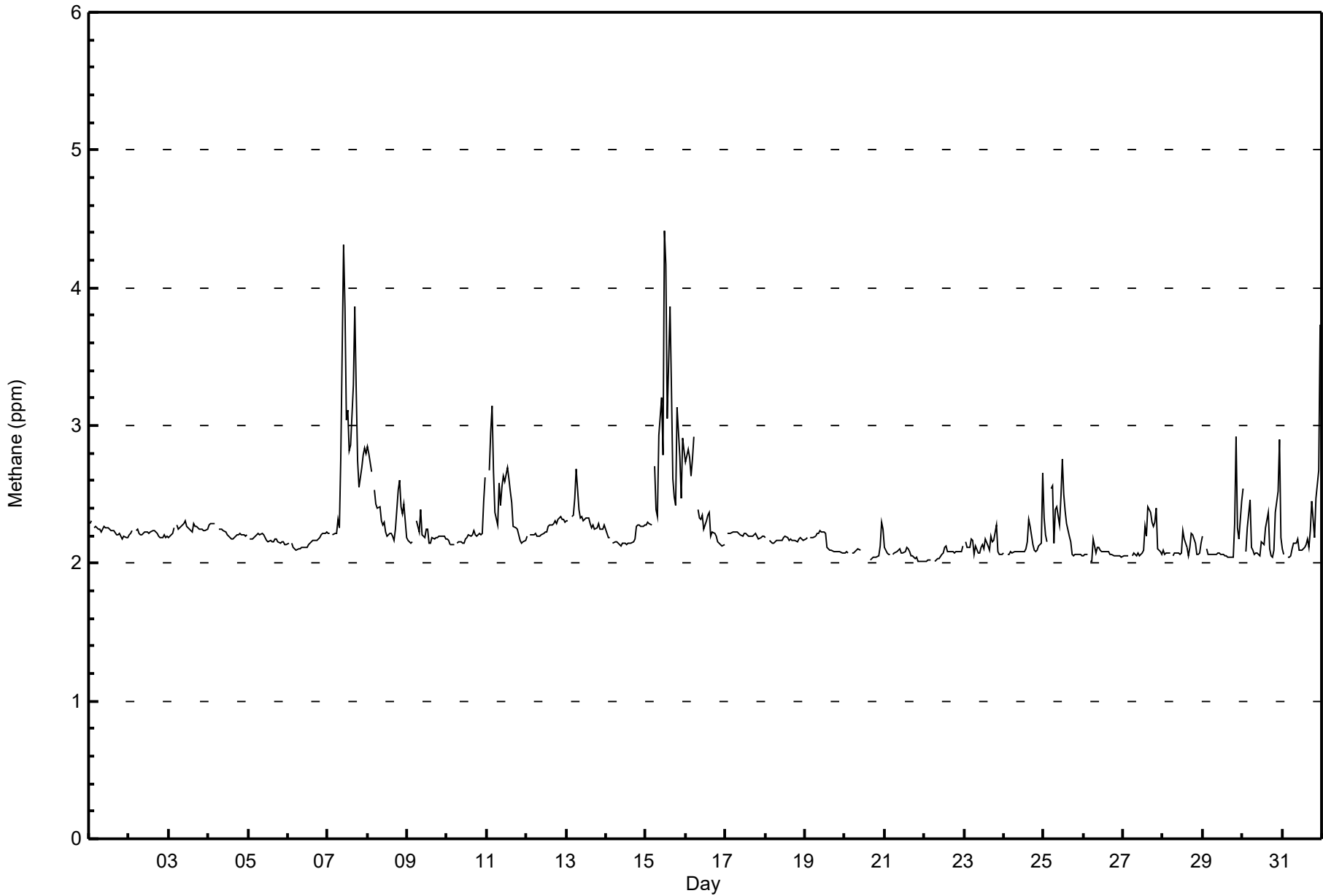
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mannix











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mannix - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	31	4.38	4.38
2.1 - 3.0	663	93.64	98.02
3.1 - 10.0	14	1.98	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Mannix - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	4	0	0	0	0	0	3	2	1	0	6	12	3	0	0	31
2.1 - 3.0	29	50	15	7	10	15	76	276	38	28	22	22	11	22	14	23	658
3.1 - 10.0	1	1	0	0	0	0	0	0	0	0	0	0	1	2	7	2	14
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	55	15	7	10	15	76	279	40	29	22	28	24	27	21	25	703

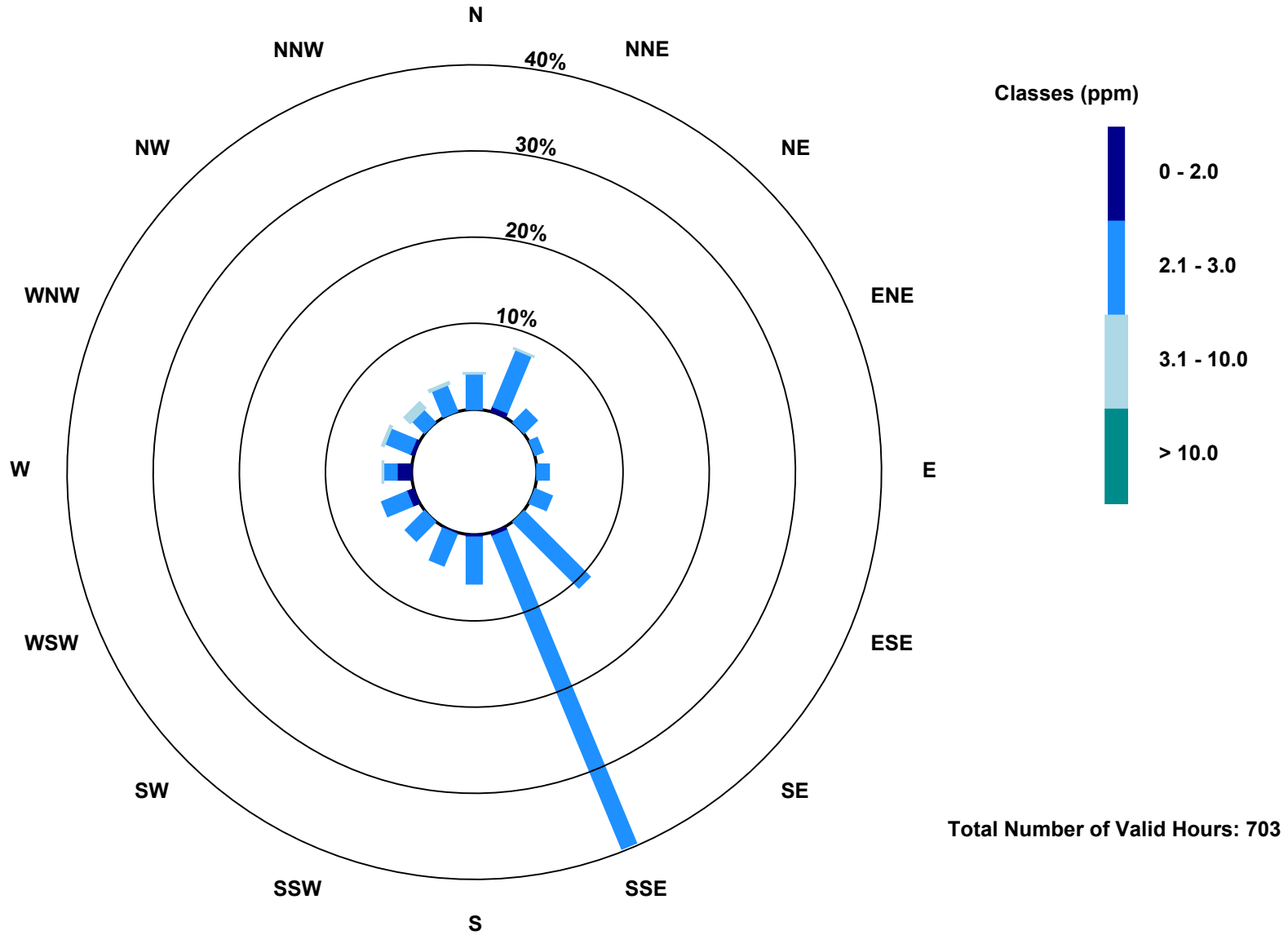
Total Number of Valid Hours: 703

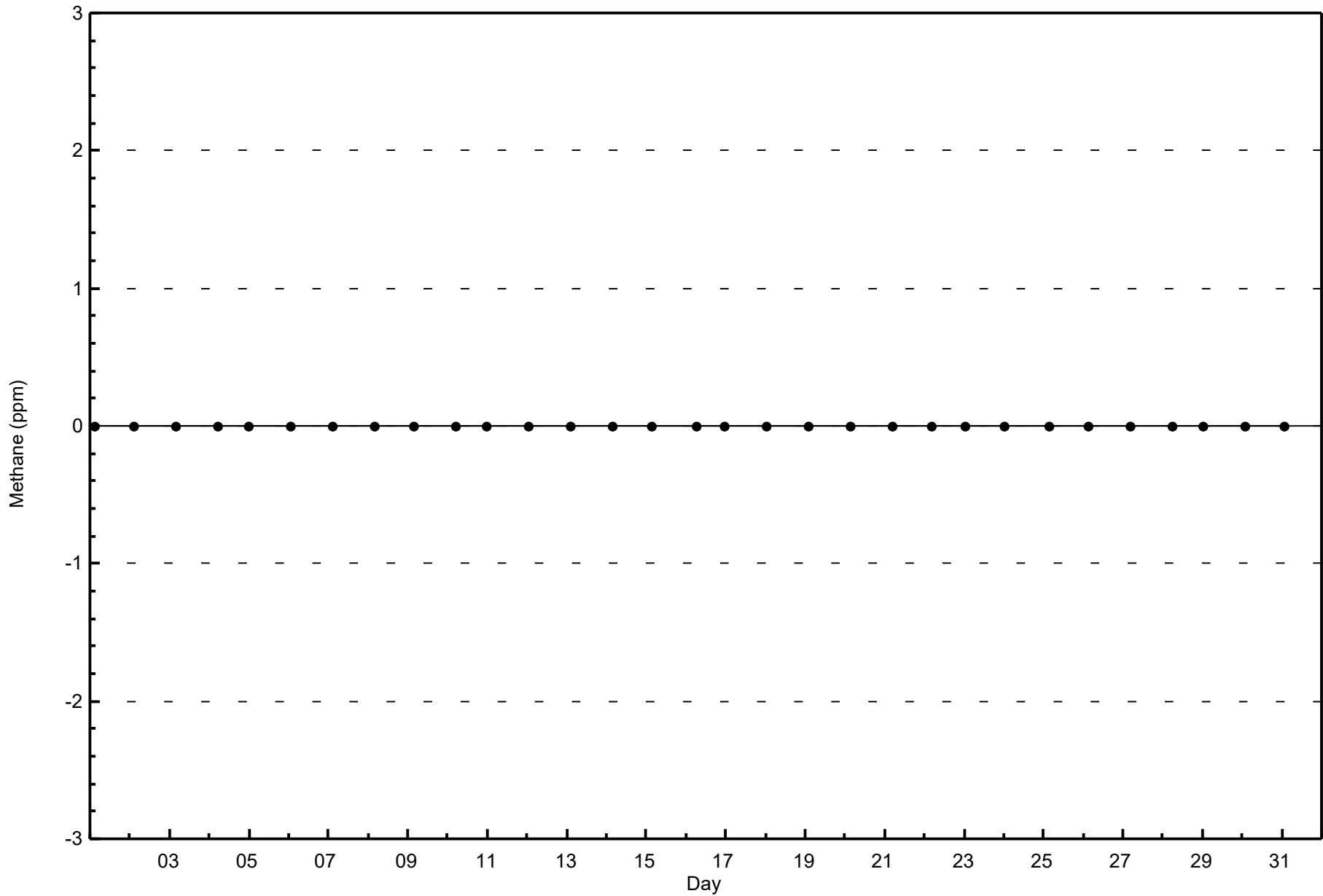
Total Number of Hours: 744

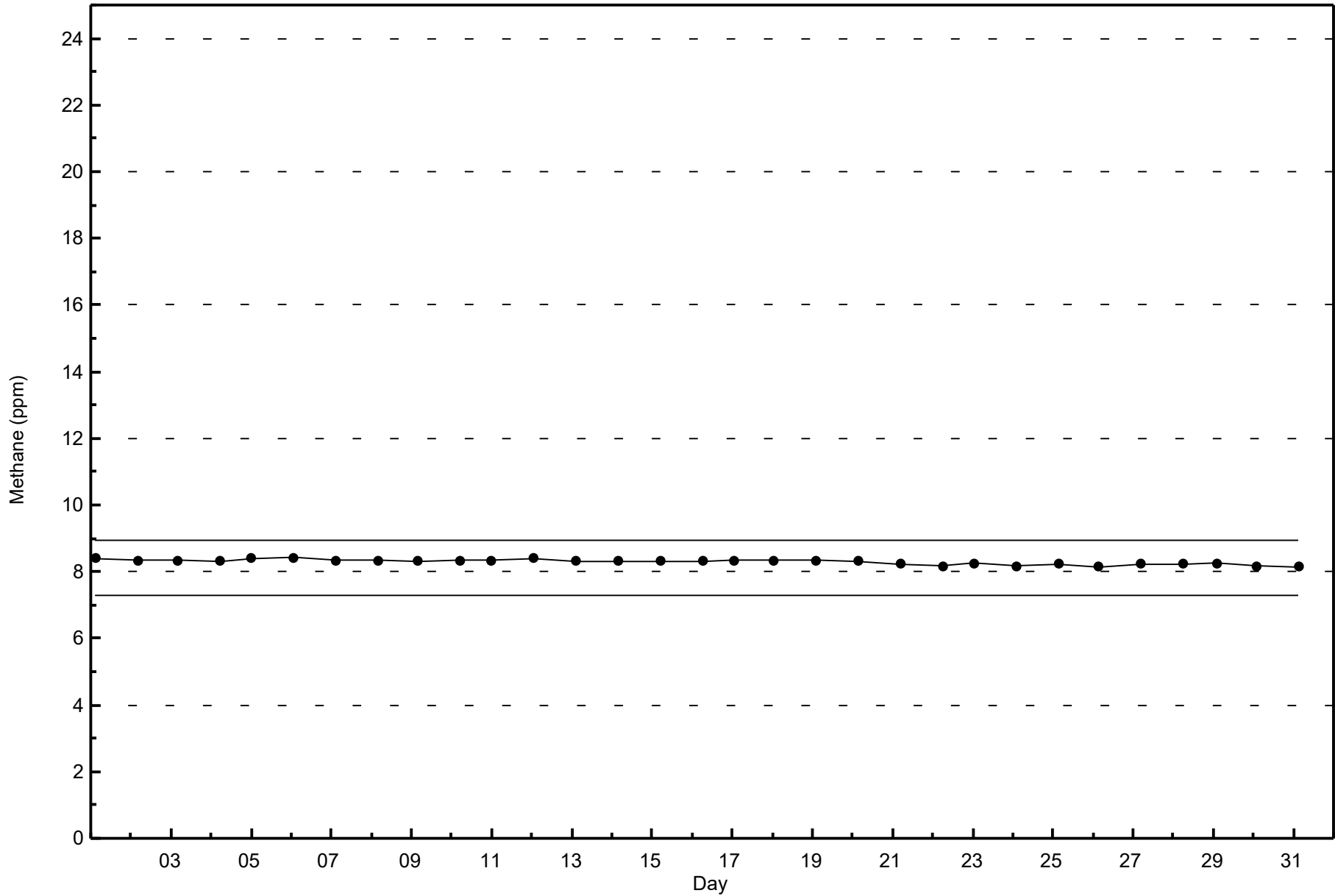


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Mannix

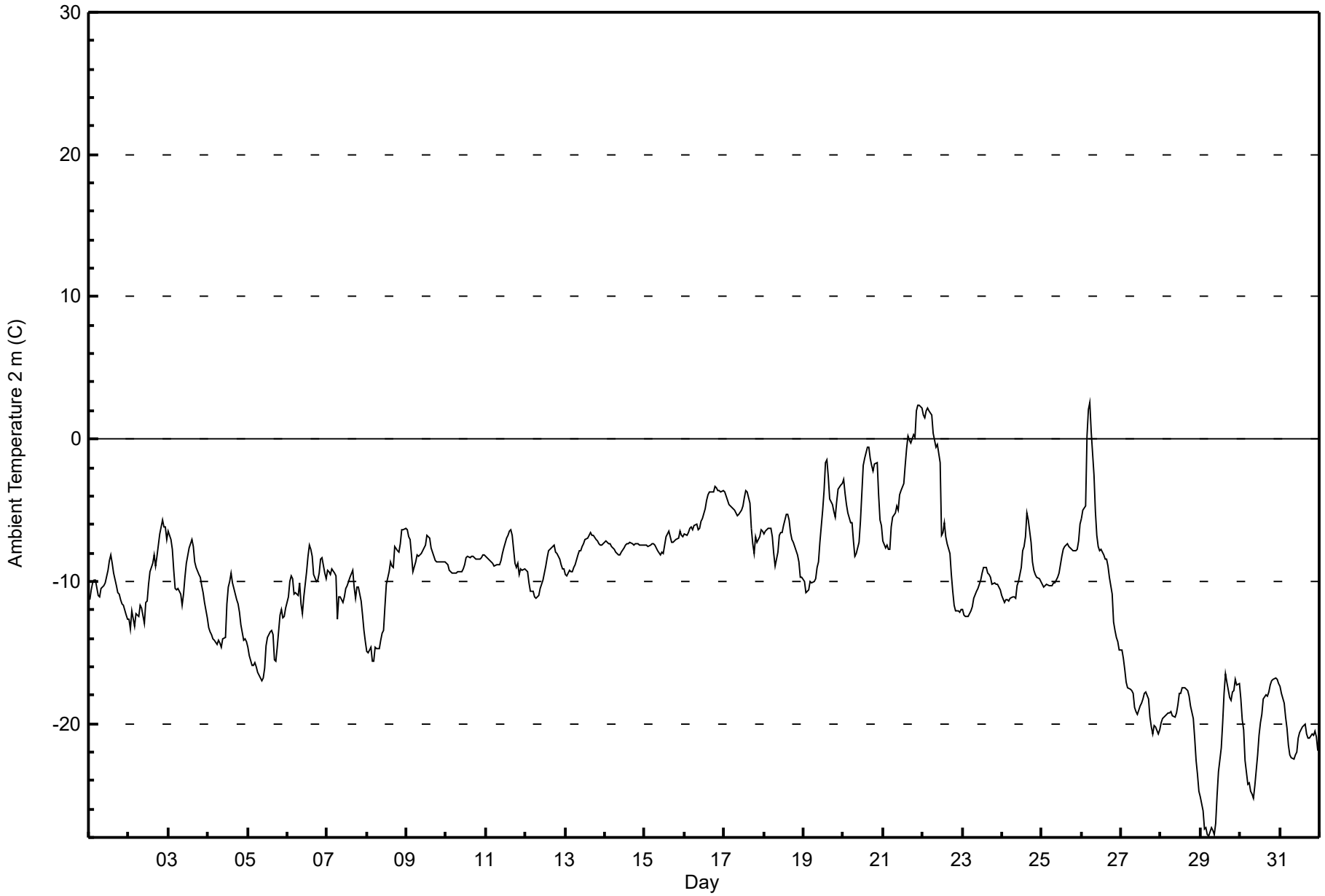








Maximum Value: 2.5 C on Jan 26 06:00 Maximum Daily Average: -2.8 C on Jan 21																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -27.9 C on Jan 29 06:00 Minimum Daily Average: -22.3 C on Jan 29																						Hours of Missing Data: 0 Hours of Calibration: 0				
Maximum Diurnal Average: -8.7 C at hour 15 Minimum Diurnal Average: -11.5 C at hour 9																						Percent Operational Time: 100.0				
Monthly Average: -10.29 C Percentiles: P ₁ = -26.6 P ₁₀ = -18.7 Q ₁ = -12.4 Median = -9.2 Q ₃ = -7.2 P ₉₀ = -4.7 P ₉₉ = 2.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-11.2	-10.6	-10.1	-9.9	-9.9	-11.0	-11.1	-10.5	-10.4	-10.3	-10.1	-9.2	-8.5	-8.1	-8.7	-9.4	-10.3	-10.8	-10.9	-11.3	-11.6	-11.7	-12.4	-12.7	-10.4	-8.1
2-Jan	-12.7	-13.3	-12.1	-13.2	-12.3	-12.3	-12.5	-11.6	-11.8	-12.9	-11.5	-11.3	-10.2	-9.3	-8.7	-8.2	-8.9	-8.2	-7.5	-6.6	-5.7	-6.2	-6.2	-7.0	-10.0	-5.7
3-Jan	-6.5	-7.0	-7.7	-9.3	-10.5	-10.6	-10.5	-10.8	-11.6	-10.8	-9.7	-8.7	-7.7	-7.3	-7.1	-7.6	-8.6	-9.1	-9.6	-9.7	-10.3	-10.8	-11.5	-12.5	-9.4	-6.5
4-Jan	-13.2	-13.6	-13.8	-14.1	-14.2	-14.5	-14.1	-14.3	-14.6	-14.0	-13.9	-11.5	-10.4	-10.0	-9.4	-10.1	-10.9	-11.3	-11.6	-12.1	-13.1	-14.1	-14.0	-14.2	-12.8	-9.4
5-Jan	-14.6	-15.2	-15.9	-16.0	-15.7	-16.0	-16.4	-16.6	-17.0	-16.8	-16.1	-14.6	-13.9	-13.5	-13.7	-15.5	-15.6	-14.7	-12.4	-11.9	-12.6	-12.4	-11.9	-14.7	-11.9	
6-Jan	-11.1	-10.0	-9.6	-9.8	-10.9	-10.8	-11.0	-10.1	-11.6	-12.3	-11.1	-9.3	-8.2	-7.4	-7.8	-8.3	-9.6	-10.0	-9.9	-9.4	-8.4	-8.4	-9.4	-9.8	-9.8	-7.4
7-Jan	-9.2	-9.3	-9.5	-9.1	-9.4	-9.7	-12.6	-11.1	-11.1	-11.5	-11.1	-10.5	-10.3	-10.0	-9.7	-9.2	-10.4	-11.2	-10.4	-10.4	-11.4	-12.4	-13.4	-14.3	-10.7	-9.1
8-Jan	-14.9	-15.1	-14.6	-15.6	-15.6	-14.6	-14.8	-14.7	-14.2	-13.6	-13.5	-11.8	-10.2	-9.3	-8.6	-9.0	-9.1	-7.6	-7.8	-7.9	-7.4	-6.4	-6.3	-6.3	-11.2	-6.3
9-Jan	-6.3	-6.8	-7.1	-8.2	-9.4	-8.7	-8.2	-8.2	-8.2	-8.1	-7.7	-7.5	-6.7	-6.9	-7.0	-7.7	-8.3	-8.5	-8.6	-8.6	-8.6	-8.6	-8.6	-8.6	-8.0	-6.3
10-Jan	-8.7	-8.8	-9.2	-9.4	-9.4	-9.4	-9.4	-9.4	-9.3	-9.3	-9.2	-8.8	-8.4	-8.3	-8.3	-8.3	-8.2	-8.4	-8.4	-8.5	-8.4	-8.4	-8.2	-8.2	-8.8	-8.2
11-Jan	-8.2	-8.5	-8.6	-8.7	-8.8	-8.9	-8.8	-8.8	-8.8	-8.6	-8.1	-7.7	-7.0	-6.7	-6.5	-6.4	-6.8	-8.7	-9.1	-8.7	-9.5	-9.1	-9.2	-9.1	-8.3	-6.4
12-Jan	-9.2	-9.3	-10.1	-10.7	-10.7	-11.1	-11.2	-11.1	-11.0	-10.5	-9.9	-9.5	-8.9	-8.3	-7.9	-7.6	-7.5	-7.4	-7.9	-8.0	-8.4	-8.8	-9.2	-9.2	-9.3	-7.4
13-Jan	-9.5	-9.6	-9.3	-9.3	-9.3	-9.0	-8.8	-8.1	-7.9	-7.9	-7.5	-7.3	-7.1	-7.0	-6.8	-6.6	-6.7	-6.8	-7.1	-7.2	-7.4	-7.4	-7.5	-7.4	-7.9	-6.6
14-Jan	-7.2	-7.2	-7.3	-7.3	-7.6	-7.8	-7.9	-8.1	-8.2	-8.2	-7.9	-7.7	-7.4	-7.4	-7.3	-7.3	-7.4	-7.4	-7.4	-7.4	-7.4	-7.5	-7.5	-7.5	-7.5	-7.2
15-Jan	-7.4	-7.5	-7.6	-7.5	-7.4	-7.3	-7.5	-7.6	-7.8	-8.2	-8.0	-8.0	-7.5	-6.8	-6.5	-6.9	-7.2	-7.3	-7.1	-7.0	-6.9	-6.5	-6.8	-6.8	-7.3	-6.5
16-Jan	-6.7	-6.7	-6.6	-6.3	-6.2	-6.4	-6.1	-6.0	-6.4	-6.2	-5.7	-5.6	-4.9	-4.3	-3.9	-3.7	-3.7	-3.7	-3.3	-3.4	-3.6	-3.6	-3.7	-3.7	-5.0	-3.3
17-Jan	-3.7	-4.0	-4.3	-4.6	-4.8	-4.9	-5.0	-5.2	-5.4	-5.3	-5.0	-4.7	-4.1	-3.6	-3.7	-4.5	-6.3	-7.3	-8.0	-6.9	-7.3	-6.8	-6.4	-6.5	-5.3	-3.6
18-Jan	-6.7	-6.5	-6.3	-6.3	-6.3	-6.9	-8.0	-9.0	-7.9	-6.8	-6.6	-6.6	-6.0	-5.3	-5.3	-5.7	-6.6	-7.1	-7.2	-7.9	-8.1	-8.6	-9.7	-9.8	-7.1	-5.3
19-Jan	-10.0	-10.8	-10.7	-10.6	-10.0	-10.1	-10.0	-9.8	-9.0	-8.7	-7.2	-5.0	-3.7	-1.7	-1.5	-2.6	-4.3	-4.6	-5.1	-5.5	-4.4	-3.5	-3.3	-3.1	-6.5	-1.5
20-Jan	-2.9	-3.8	-4.6	-5.2	-5.9	-5.9	-7.1	-8.3	-8.0	-7.2	-5.8	-3.8	-1.9	-1.3	-0.5	-0.6	-1.3	-1.9	-2.2	-1.7	-1.7	-4.0	-5.7	-6.0	-4.1	-0.5
21-Jan	-7.2	-7.6	-7.5	-7.7	-7.8	-6.1	-5.5	-5.2	-4.7	-5.0	-3.9	-3.6	-3.1	-1.8	-0.7	0.2	-0.1	-0.3	0.3	0.2	1.9	2.3	2.4	2.2	-2.8	2.4
22-Jan	1.7	1.5	2.0	2.2	2.0	1.7	0.4	0.0	-0.6	-0.4	-1.7	-6.8	-6.6	-5.9	-6.9	-7.4	-8.0	-9.5	-10.7	-11.7	-12.1	-12.1	-12.2	-11.9	-4.7	2.2
23-Jan	-12.0	-12.4	-12.5	-12.5	-12.3	-12.0	-11.7	-11.2	-10.7	-10.5	-10.2	-9.9	-9.4	-9.1	-9.1	-9.4	-9.5	-9.7	-10.2	-10.1	-10.2	-10.2	-10.4	-10.6	-10.7	-9.1
24-Jan	-11.0	-11.5	-11.2	-11.2	-11.4	-11.1	-11.1	-11.2	-10.3	-10.0	-9.0	-7.8	-7.6	-6.9	-5.2	-5.7	-7.2	-8.7	-9.2	-9.5	-9.7	-9.9	-10.0	-10.0	-9.5	-5.2
25-Jan	-10.2	-10.4	-10.3	-10.2	-10.3	-10.3	-10.3	-10.1	-10.1	-9.7	-9.4	-8.9	-8.2	-7.8	-7.5	-7.3	-7.5	-7.6	-7.8	-7.8	-7.8	-7.8	-7.2	-6.0	-8.8	-6.0
26-Jan	-5.6	-5.0	-4.7	0.2	2.1	2.5	0.5	-2.5	-5.1	-6.8	-7.5	-7.9	-7.7	-8.1	-8.4	-8.5	-8.9	-9.7	-10.9	-12.9	-13.4	-13.9	-14.3	-14.8	-7.2	2.5
27-Jan	-14.8	-15.4	-16.2	-17.1	-17.5	-17.5	-17.7	-17.9	-18.9	-19.2	-19.4	-18.8	-18.5	-18.3	-17.9	-17.8	-18.3	-19.6	-20.2	-20.7	-20.1	-20.3	-20.7	-20.4	-18.5	-14.8
28-Jan	-20.0	-19.6	-19.5	-19.4	-19.3	-19.2	-19.1	-19.5	-19.5	-19.3	-18.7	-17.9	-17.8	-17.5	-17.4	-17.6	-17.7	-18.1	-18.8	-19.7	-21.1	-22.6	-23.6	-24.8	-19.5	-17.4
29-Jan	-25.1	-26.1	-27.4	-27.3	-27.8	-27.9	-27.3	-27.5	-27.8	-27.0	-25.1	-23.4	-21.7	-19.9	-17.9	-16.5	-17.1	-18.2	-18.4	-17.7	-17.6	-16.9	-17.3	-17.2	-22.3	-16.5
30-Jan	-18.2	-19.7	-20.5	-22.6	-24.3	-24.2	-24.7	-25.0	-25.2	-24.4	-22.2	-20.8	-19.9	-19.4	-18.3	-18.0	-18.0	-17.8	-17.2	-17.0	-16.9	-16.8	-16.9	-17.2	-20.2	-16.8
31-Jan	-17.4	-17.8	-18.6	-19.5	-20.3	-21.5	-22.2	-22.4	-22.5	-22.2	-22.0	-21.0	-20.6	-20.2	-20.1	-20.0	-20.7	-21.0	-21.0	-20.7	-20.8	-20.5	-20.9	-22.0	-20.7	-17.4
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2 m (AT2m) - C
Mannix - January 2023**

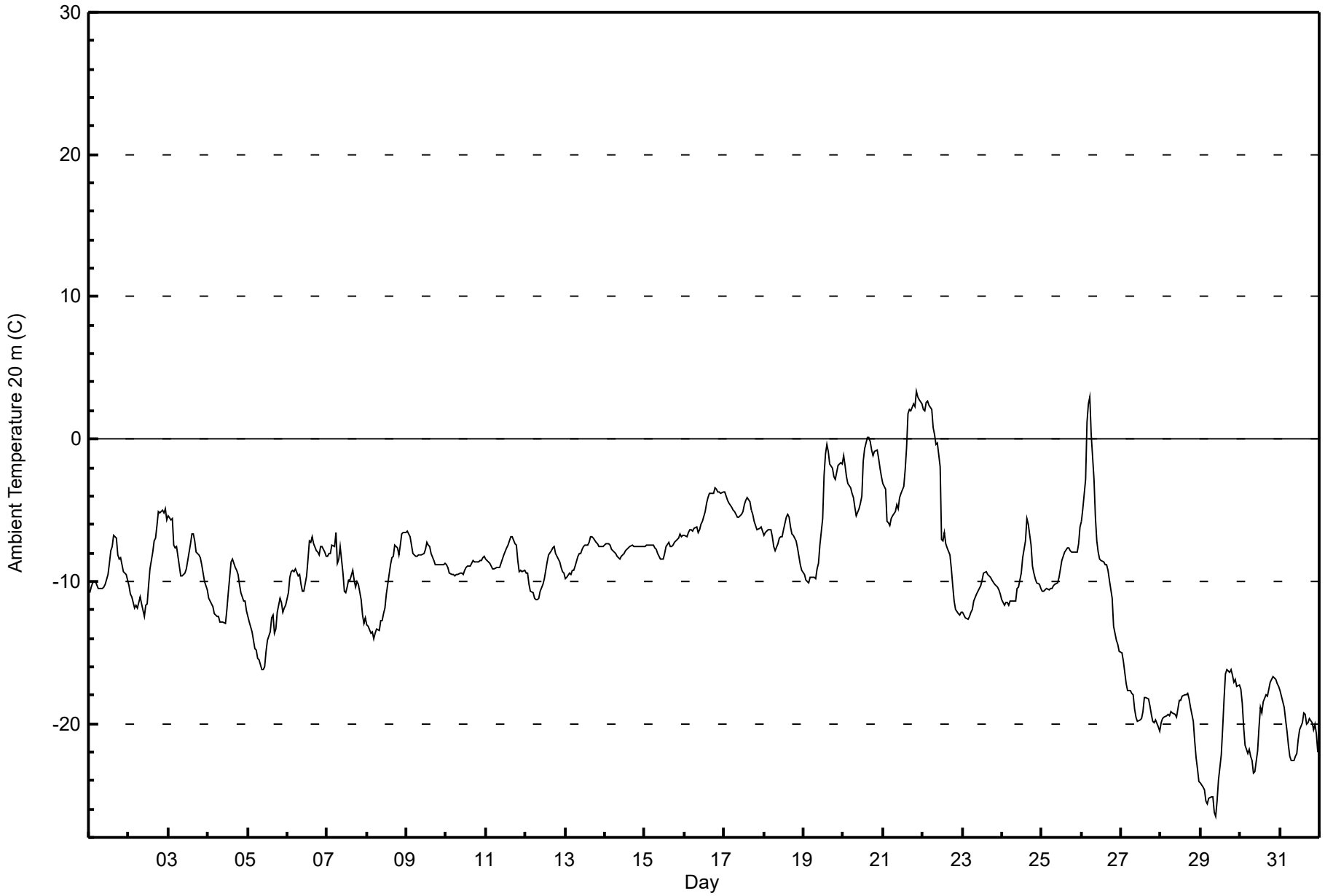
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	53	7.12	7.12
-20 - 0	673	90.46	97.58
0 - 10	18	2.42	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 3.3 C on Jan 21 21:00 Maximum Daily Average: -1.7 C on Jan 21																					Hours in Service: 744 Hours of Data: 744					
Minimum Value: -26.5 C on Jan 29 10:00 Minimum Daily Average: -21.4 C on Jan 29 Maximum Diurnal Average: -8.4 C at hour 16 Minimum Diurnal Average: -11.1 C at hour 10 Monthly Average: -9.88 C Percentiles: P ₁ = -24.9 P ₁₀ = -18.9 Q ₁ = -11.7 Median = -8.9 Q ₃ = -7.1 P ₉₀ = -4.1 P ₉₉ = 2.5																					Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.8	-10.4	-10.1	-10.0	-10.0	-10.5	-10.5	-10.5	-10.5	-10.4	-10.2	-9.5	-8.8	-7.9	-7.6	-6.7	-7.0	-8.1	-8.5	-8.3	-8.9	-9.4	-9.5	-9.9	-9.3	-6.7
2-Jan	-10.3	-10.9	-11.1	-11.9	-11.7	-11.9	-11.5	-11.1	-11.6	-12.5	-11.7	-11.5	-10.3	-9.1	-8.0	-7.2	-7.0	-6.1	-5.1	-5.2	-5.0	-5.2	-4.9	-5.7	-9.0	-4.9
3-Jan	-5.4	-5.7	-5.5	-7.4	-7.7	-7.6	-8.2	-9.6	-9.6	-9.5	-9.4	-9.1	-7.9	-7.3	-6.7	-6.7	-7.2	-7.9	-8.2	-8.3	-8.8	-9.5	-10.0	-10.6	-8.1	-5.4
4-Jan	-11.1	-11.4	-11.6	-11.8	-12.3	-12.4	-12.5	-12.8	-12.9	-12.9	-13.0	-11.9	-10.8	-9.7	-8.6	-8.5	-9.0	-9.2	-9.5	-10.2	-10.8	-11.4	-11.4	-12.1	-11.2	-8.5
5-Jan	-12.5	-12.8	-13.6	-14.1	-14.8	-14.8	-15.4	-15.6	-16.2	-16.3	-16.0	-14.9	-14.1	-13.5	-12.6	-12.4	-13.7	-13.4	-12.2	-11.2	-11.4	-12.1	-11.9	-11.7	-13.6	-11.2
6-Jan	-10.8	-9.8	-9.3	-9.2	-9.3	-9.2	-9.6	-9.5	-10.2	-10.7	-10.7	-9.7	-8.4	-7.2	-7.2	-6.9	-7.3	-7.8	-8.0	-8.1	-7.6	-7.5	-8.0	-8.3	-8.8	-6.9
7-Jan	-8.2	-8.1	-8.0	-7.5	-7.6	-6.6	-8.8	-8.5	-7.5	-9.5	-10.7	-10.8	-10.4	-9.9	-9.9	-9.3	-9.9	-10.4	-10.0	-10.2	-11.3	-12.4	-13.0	-12.6	-9.6	-6.6
8-Jan	-13.1	-13.2	-13.7	-13.5	-14.0	-13.7	-13.3	-13.5	-12.7	-12.8	-12.3	-11.8	-10.9	-9.5	-8.8	-8.3	-8.3	-7.4	-7.7	-8.1	-7.4	-6.7	-6.6	-6.5	-10.6	-6.5
9-Jan	-6.5	-6.7	-6.9	-7.5	-8.1	-8.3	-8.2	-8.1	-8.1	-8.1	-8.0	-7.7	-7.2	-7.5	-7.6	-8.1	-8.6	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8	-8.7	-8.0	-6.5
10-Jan	-8.8	-9.0	-9.4	-9.6	-9.6	-9.6	-9.6	-9.5	-9.4	-9.4	-9.5	-9.2	-9.0	-8.9	-8.9	-8.7	-8.6	-8.6	-8.7	-8.6	-8.5	-8.5	-8.3	-8.3	-9.0	-8.3
11-Jan	-8.4	-8.7	-8.7	-8.9	-9.1	-9.2	-9.0	-9.0	-9.0	-8.8	-8.4	-8.2	-7.7	-7.4	-7.2	-6.9	-6.9	-7.3	-7.5	-8.5	-9.4	-9.2	-9.4	-9.2	-8.4	-6.9
12-Jan	-9.4	-9.4	-10.2	-10.7	-10.8	-11.1	-11.3	-11.3	-11.2	-10.7	-10.2	-9.8	-9.3	-8.6	-8.1	-7.8	-7.7	-7.5	-8.1	-8.2	-8.6	-9.0	-9.4	-9.4	-9.5	-7.5
13-Jan	-9.8	-9.8	-9.4	-9.5	-9.2	-9.3	-8.9	-8.2	-8.0	-8.1	-7.8	-7.6	-7.5	-7.4	-7.2	-6.9	-6.9	-7.0	-7.3	-7.3	-7.6	-7.6	-7.6	-7.5	-8.1	-6.9
14-Jan	-7.3	-7.4	-7.4	-7.5	-7.8	-7.9	-8.1	-8.2	-8.3	-8.4	-8.3	-8.1	-7.8	-7.7	-7.6	-7.5	-7.5	-7.5	-7.6	-7.6	-7.6	-7.6	-7.5	-7.6	-7.7	-7.3
15-Jan	-7.5	-7.5	-7.5	-7.5	-7.5	-7.4	-7.7	-7.8	-8.0	-8.5	-8.4	-8.4	-8.0	-7.6	-7.3	-7.5	-7.6	-7.4	-7.3	-7.1	-7.0	-6.7	-6.9	-6.8	-7.5	-6.7
16-Jan	-6.8	-6.8	-6.6	-6.3	-6.3	-6.5	-6.3	-6.2	-6.6	-6.4	-6.0	-5.8	-5.1	-4.5	-4.1	-3.8	-3.8	-3.8	-3.4	-3.5	-3.7	-3.7	-3.8	-3.7	-5.1	-3.4
17-Jan	-3.7	-4.0	-4.3	-4.5	-4.8	-5.0	-5.1	-5.3	-5.5	-5.5	-5.3	-5.1	-4.6	-4.3	-4.1	-4.4	-5.0	-5.3	-5.8	-6.1	-6.4	-6.2	-6.2	-6.5	-5.1	-3.7
18-Jan	-6.7	-6.6	-6.4	-6.4	-6.4	-6.9	-7.6	-7.8	-7.4	-6.9	-6.8	-6.9	-6.4	-5.5	-5.3	-5.5	-6.1	-6.7	-6.7	-7.1	-7.6	-8.3	-8.8	-9.3	-6.9	-5.3
19-Jan	-9.6	-10.0	-10.1	-10.1	-9.7	-9.7	-9.7	-9.8	-9.1	-8.8	-7.4	-5.6	-2.5	-1.1	-0.4	-0.9	-1.8	-2.1	-2.7	-2.8	-2.4	-1.8	-1.7	-1.8	-5.5	-0.4
20-Jan	-1.2	-1.8	-2.6	-3.1	-3.4	-3.9	-4.1	-4.8	-5.3	-4.9	-4.6	-4.0	-1.6	-0.7	0.1	0.1	-0.2	-0.8	-1.2	-0.8	-0.7	-1.3	-2.1	-2.6	-2.3	0.1
21-Jan	-3.2	-3.5	-5.7	-5.9	-6.1	-5.6	-5.4	-5.1	-4.6	-4.9	-4.1	-3.8	-3.4	-2.1	-0.6	1.8	2.1	2.0	2.5	2.3	3.3	3.0	2.8	2.5	-1.7	3.3
22-Jan	2.1	2.0	2.6	2.7	2.4	2.1	0.8	0.3	-0.3	-0.3	-1.9	-7.1	-7.2	-6.6	-7.3	-7.7	-8.1	-9.1	-10.3	-11.4	-12.0	-12.3	-12.4	-12.2	-4.6	2.7
23-Jan	-12.2	-12.4	-12.6	-12.7	-12.5	-12.2	-11.9	-11.4	-10.9	-10.7	-10.5	-10.3	-9.9	-9.4	-9.3	-9.5	-9.6	-9.8	-9.9	-10.2	-10.3	-10.4	-10.6	-10.9	-10.8	-9.3
24-Jan	-11.3	-11.7	-11.5	-11.5	-11.6	-11.4	-11.4	-11.4	-11.4	-10.5	-10.4	-9.5	-8.3	-7.8	-7.1	-5.6	-6.0	-7.5	-8.9	-9.5	-9.8	-10.1	-10.2	-10.5	-9.8	-5.6
25-Jan	-10.7	-10.7	-10.6	-10.5	-10.6	-10.5	-10.5	-10.3	-10.2	-10.1	-9.7	-9.2	-8.5	-8.3	-7.9	-7.6	-7.7	-7.8	-7.9	-7.9	-8.0	-8.0	-7.4	-6.1	-9.0	-6.1
26-Jan	-5.8	-4.8	-2.9	1.2	2.5	2.9	0.3	-2.9	-5.5	-7.1	-8.0	-8.4	-8.6	-8.7	-8.9	-8.8	-9.2	-9.9	-11.2	-13.1	-13.7	-14.1	-14.5	-14.9	-7.2	2.9
27-Jan	-15.0	-15.6	-16.4	-17.2	-17.7	-17.7	-17.8	-18.0	-19.0	-19.6	-19.9	-19.7	-19.6	-19.1	-18.2	-18.1	-18.3	-18.7	-19.4	-19.9	-20.0	-19.8	-20.2	-20.5	-18.6	-15.0
28-Jan	-20.0	-19.7	-19.6	-19.4	-19.4	-19.4	-19.1	-19.3	-19.4	-19.5	-19.0	-18.4	-18.4	-18.1	-17.9	-17.9	-17.9	-18.2	-18.8	-19.9	-21.2	-22.4	-23.2	-24.1	-19.6	-17.9
29-Jan	-24.1	-24.5	-24.7	-25.4	-25.7	-25.3	-25.2	-25.2	-26.2	-26.5	-25.4	-23.9	-22.2	-20.4	-18.2	-16.5	-16.2	-16.4	-16.2	-16.6	-17.0	-16.9	-17.3	-17.2	-21.4	-16.2
30-Jan	-17.6	-18.6	-20.3	-21.5	-22.1	-21.8	-22.3	-22.5	-23.5	-23.4	-21.9	-20.3	-18.9	-19.2	-18.5	-18.0	-18.0	-17.5	-17.1	-16.9	-16.7	-16.9	-17.2	-17.4	-19.5	-16.7
31-Jan	-17.6	-18.1	-18.8	-19.7	-20.6	-21.6	-22.3	-22.6	-22.6	-22.3	-22.1	-21.1	-20.4	-19.9	-19.3	-19.3	-20.0	-19.9	-19.7	-19.9	-20.4	-20.1	-20.7	-22.0	-20.5	-17.6
	-9.8	-9.9	-10.1	-10.2	-10.4	-10.4	-10.6	-10.8	-11.0	-11.1	-10.9	-10.6	-9.8	-9.2	-8.7	-8.4	-8.7	-8.9	-9.1	-9.3	-9.5	-9.7	-9.9	-10.1	Diurnal Average	
	2.1	2.0	2.6	2.7	2.5	2.9	0.8	0.3	-0.3	-0.3	-1.9	-3.8	-1.6	-0.7	0.1	1.8	2.1	2.0	2.5	2.3	3.3	3.0	2.8	2.5	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 20 m (AT20m) - C
Mannix - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	44	5.91	5.91
-20 - 0	677	90.99	96.91
0 - 10	23	3.09	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

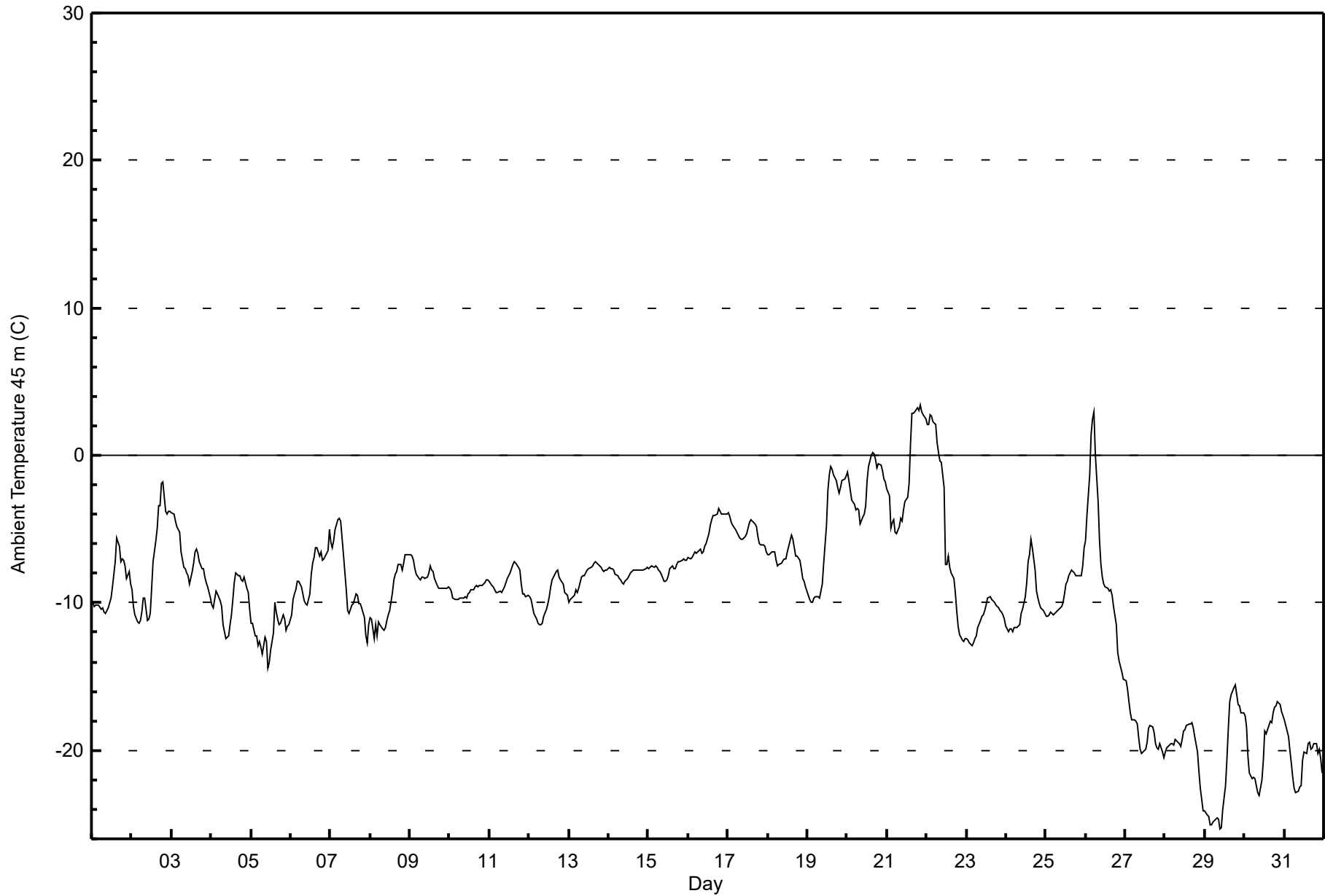


Maximum Value: 3.5 C on Jan 21 21:00 Maximum Daily Average: -1.1 C on Jan 21																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -25.3 C on Jan 29 10:00 Minimum Daily Average: -21.1 C on Jan 29 Maximum Diurnal Average: -8.3 C at hour 16 Minimum Diurnal Average: -10.8 C at hour 10 Monthly Average: -9.65 C Percentiles: P ₁ = -24.5 P ₁₀ = -19.0 Q ₁ = -11.4 Median = -8.9 Q ₃ = -6.9 P ₉₀ = -3.8 P ₉₉ = 2.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.0	-10.2	-10.1	-10.2	-10.2	-10.4	-10.3	-10.7	-10.7	-10.5	-10.3	-9.7	-8.9	-8.1	-7.2	-5.6	-6.1	-7.2	-7.0	-7.1	-7.5	-8.4	-7.9	-8.7	-8.9	-5.6
2-Jan	-9.1	-10.2	-10.8	-11.3	-11.4	-11.2	-10.7	-9.7	-9.7	-11.2	-11.1	-10.7	-9.0	-7.2	-5.7	-5.0	-3.4	-3.4	-1.9	-1.8	-3.8	-3.9	-3.8	-3.8	-7.5	-1.8
3-Jan	-3.9	-4.0	-4.5	-4.8	-5.1	-5.2	-6.5	-7.6	-7.6	-7.9	-8.2	-8.7	-7.9	-7.3	-6.5	-6.4	-6.6	-7.2	-7.6	-7.7	-8.2	-8.6	-9.0	-9.6	-6.9	-3.9
4-Jan	-10.1	-10.4	-9.8	-9.2	-9.4	-9.9	-10.2	-11.5	-12.0	-12.4	-12.3	-11.5	-10.8	-9.8	-8.7	-8.0	-8.2	-8.1	-8.5	-8.5	-8.3	-9.0	-9.3	-10.5	-9.8	-8.0
5-Jan	-11.4	-11.4	-12.2	-12.2	-12.9	-12.6	-13.0	-13.5	-12.3	-12.6	-14.4	-14.0	-13.2	-12.0	-9.9	-10.7	-11.1	-11.4	-11.4	-10.8	-11.1	-11.9	-11.6	-11.5	-12.0	-9.9
6-Jan	-10.8	-9.8	-9.4	-9.1	-8.5	-8.5	-9.0	-9.4	-9.8	-10.1	-10.2	-9.4	-8.0	-7.3	-7.0	-6.3	-6.2	-6.8	-6.6	-7.1	-7.0	-6.9	-6.4	-5.1	-8.1	-5.1
7-Jan	-5.9	-6.3	-5.7	-5.0	-4.4	-4.3	-4.5	-5.5	-6.7	-9.1	-10.6	-10.7	-10.5	-10.2	-10.1	-9.4	-9.5	-10.0	-10.1	-10.3	-11.0	-12.3	-12.7	-11.5	-8.6	-4.3
8-Jan	-11.0	-11.1	-12.4	-11.5	-12.2	-11.2	-11.4	-11.7	-11.8	-11.7	-11.2	-10.8	-10.5	-9.3	-8.4	-8.0	-7.9	-7.4	-7.4	-7.7	-7.3	-6.8	-6.8	-6.7	-9.7	-6.7
9-Jan	-6.7	-6.9	-7.1	-7.6	-8.1	-8.3	-8.4	-8.3	-8.3	-8.3	-8.2	-8.0	-7.5	-7.8	-7.9	-8.3	-8.8	-9.1	-9.0	-9.0	-9.0	-9.0	-9.0	-8.9	-8.2	-6.7
10-Jan	-9.0	-9.2	-9.7	-9.8	-9.8	-9.8	-9.7	-9.7	-9.6	-9.6	-9.7	-9.4	-9.3	-9.1	-9.1	-8.9	-8.8	-8.9	-8.9	-8.8	-8.7	-8.7	-8.4	-8.4	-9.2	-8.4
11-Jan	-8.5	-8.8	-8.9	-9.1	-9.3	-9.3	-9.2	-9.3	-9.1	-8.9	-8.6	-8.4	-7.9	-7.7	-7.4	-7.2	-7.3	-7.6	-7.8	-8.7	-9.4	-9.4	-9.6	-9.5	-8.6	-7.2
12-Jan	-9.6	-9.7	-10.2	-10.7	-11.1	-11.4	-11.5	-11.5	-11.4	-11.0	-10.4	-10.1	-9.6	-8.9	-8.4	-8.0	-7.9	-7.7	-8.3	-8.4	-8.7	-9.3	-9.4	-9.5	-9.7	-7.7
13-Jan	-10.0	-9.8	-9.6	-9.5	-9.1	-9.3	-9.0	-8.3	-8.2	-8.2	-7.9	-7.8	-7.7	-7.6	-7.5	-7.3	-7.2	-7.3	-7.5	-7.6	-7.8	-7.8	-7.8	-7.8	-8.2	-7.2
14-Jan	-7.6	-7.6	-7.6	-7.8	-8.0	-8.2	-8.3	-8.5	-8.6	-8.7	-8.5	-8.3	-8.1	-8.0	-7.9	-7.8	-7.7	-7.7	-7.8	-7.8	-7.8	-7.8	-7.7	-7.6	-8.0	-7.6
15-Jan	-7.7	-7.5	-7.5	-7.6	-7.5	-7.6	-7.8	-7.9	-8.1	-8.5	-8.5	-8.4	-8.1	-7.7	-7.5	-7.7	-7.6	-7.4	-7.2	-7.2	-7.1	-7.0	-7.1	-7.1	-7.6	-7.0
16-Jan	-6.9	-7.0	-6.9	-6.7	-6.6	-6.6	-6.5	-6.4	-6.7	-6.5	-6.2	-6.0	-5.3	-4.7	-4.3	-4.1	-4.1	-4.0	-3.6	-3.8	-4.0	-4.0	-4.0	-3.9	-5.4	-3.6
17-Jan	-3.9	-4.2	-4.6	-4.8	-5.0	-5.2	-5.4	-5.6	-5.7	-5.7	-5.5	-5.3	-4.9	-4.6	-4.4	-4.5	-4.6	-4.9	-5.5	-6.0	-6.1	-6.1	-6.2	-6.6	-5.2	-3.9
18-Jan	-6.8	-6.7	-6.5	-6.6	-6.5	-7.1	-7.5	-7.4	-7.3	-7.1	-7.1	-7.0	-6.6	-5.7	-5.4	-5.6	-6.2	-6.8	-6.8	-7.1	-7.7	-8.3	-8.5	-8.9	-7.0	-5.4
19-Jan	-9.5	-9.8	-9.9	-9.9	-9.6	-9.6	-9.6	-9.7	-9.2	-8.7	-7.3	-4.7	-2.3	-1.3	-0.7	-1.0	-1.4	-1.7	-2.2	-2.5	-2.2	-1.7	-1.6	-1.4	-5.3	-0.7
20-Jan	-1.1	-1.7	-2.4	-3.0	-3.3	-3.7	-3.6	-3.7	-4.6	-4.2	-4.0	-3.4	-1.7	-0.8	0.0	0.2	0.1	-0.3	-0.8	-0.6	-0.7	-1.0	-1.6	-1.8	-2.0	0.2
21-Jan	-2.3	-2.7	-4.9	-4.6	-4.4	-5.2	-5.3	-4.9	-4.3	-4.4	-3.7	-3.1	-2.9	-1.9	0.8	2.9	2.8	3.0	3.2	3.0	3.5	3.0	2.7	2.5	-1.1	3.5
22-Jan	2.1	2.1	2.7	2.6	2.3	2.0	0.9	0.2	-0.4	-0.4	-2.2	-7.4	-7.4	-6.8	-7.6	-8.0	-8.3	-9.2	-10.5	-11.5	-12.1	-12.6	-12.6	-12.4	-4.8	2.7
23-Jan	-12.4	-12.6	-12.7	-12.9	-12.7	-12.5	-12.2	-11.7	-11.1	-10.9	-10.8	-10.5	-10.1	-9.7	-9.6	-9.8	-9.9	-10.0	-10.1	-10.3	-10.5	-10.6	-10.8	-11.1	-11.1	-9.6
24-Jan	-11.5	-12.0	-11.8	-11.8	-11.9	-11.7	-11.6	-11.6	-11.5	-10.7	-10.5	-9.6	-8.6	-7.2	-6.7	-5.7	-6.2	-7.8	-9.2	-9.7	-10.0	-10.4	-10.5	-10.7	-10.0	-5.7
25-Jan	-10.9	-10.9	-10.8	-10.7	-10.8	-10.7	-10.7	-10.5	-10.4	-10.2	-9.9	-9.4	-8.7	-8.5	-8.1	-7.8	-7.9	-8.0	-8.1	-8.1	-8.2	-8.2	-7.4	-6.2	-9.2	-6.2
26-Jan	-5.8	-4.1	-1.3	1.4	2.5	2.9	0.1	-3.1	-5.8	-7.4	-8.2	-8.7	-8.9	-9.0	-9.2	-9.1	-9.5	-10.2	-11.5	-13.4	-13.9	-14.3	-14.7	-15.1	-7.3	2.9
27-Jan	-15.3	-15.9	-16.7	-17.5	-17.9	-17.9	-18.1	-18.2	-19.2	-19.9	-20.2	-20.0	-19.9	-19.4	-18.5	-18.3	-18.4	-18.8	-19.5	-19.8	-19.9	-19.6	-20.1	-20.5	-18.7	-15.3
28-Jan	-20.1	-19.8	-19.8	-19.6	-19.6	-19.6	-19.3	-19.4	-19.5	-19.7	-19.3	-18.7	-18.6	-18.3	-18.2	-18.2	-18.2	-18.5	-19.0	-20.1	-21.4	-22.6	-23.3	-24.1	-19.8	-18.2
29-Jan	-24.1	-24.4	-24.5	-25.0	-25.1	-24.8	-24.7	-24.5	-24.7	-25.3	-25.2	-24.0	-22.4	-20.6	-18.5	-16.7	-16.2	-15.8	-15.5	-16.2	-16.9	-17.0	-17.5	-17.4	-21.1	-15.5
30-Jan	-17.6	-18.4	-20.4	-21.5	-21.9	-21.8	-21.9	-22.4	-22.9	-23.1	-22.0	-20.7	-18.7	-18.9	-18.6	-18.0	-18.1	-17.5	-17.1	-17.0	-16.7	-16.8	-17.3	-17.6	-19.5	-16.7
31-Jan	-17.9	-18.4	-19.1	-20.0	-20.8	-21.8	-22.5	-22.8	-22.8	-22.5	-22.3	-20.6	-20.1	-20.2	-19.5	-19.5	-19.9	-19.8	-19.6	-19.5	-20.3	-19.9	-20.6	-21.5	-20.5	-17.9
	-9.5	-9.7	-9.8	-9.9	-9.9	-10.0	-10.2	-10.5	-10.6	-10.8	-10.8	-10.5	-9.8	-9.2	-8.6	-8.3	-8.4	-8.6	-8.8	-9.1	-9.3	-9.6	-9.7	-9.8	Diurnal Average	
	2.1	2.1	2.7	2.6	2.5	2.9	0.9	0.2	-0.4	-0.4	-2.2	-3.1	-1.7	-0.8	0.8	2.9	2.8	3.0	3.2	3.0	3.5	3.0	2.7	2.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 45 m (AT45m) - C
Mannix - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 45 m (AT45m) - C
Mannix - January 2023**

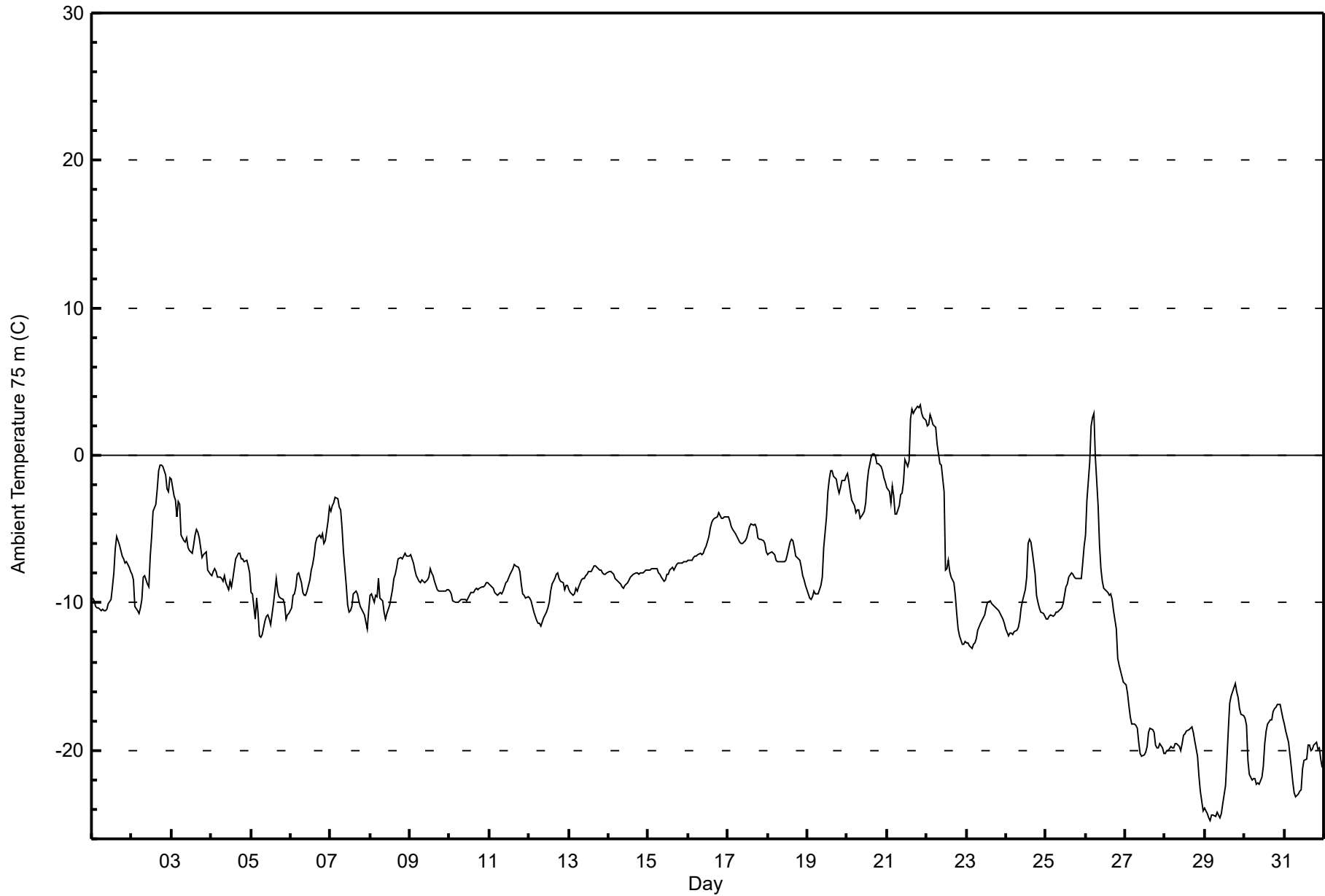
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	47	6.32	6.32
-20 - 0	672	90.32	96.64
0 - 10	25	3.36	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 3.4 C on Jan 21 21:00 Maximum Daily Average: -0.1 C on Jan 21																						Hours in Service:	744			
Minimum Value: -24.7 C on Jan 29 04:00 Minimum Daily Average: -20.9 C on Jan 29																						Hours of Data:	744			
Maximum Diurnal Average: -8.2 C at hour 16 Minimum Diurnal Average: -10.4 C at hour 10																						Hours of Missing Data:	0			
Monthly Average: -9.38 C Percentiles: P ₁ = -24.3 P ₁₀ = -19.4 Q ₁ = -10.7 Median = -8.6 Q ₃ = -6.6 P ₉₀ = -2.9 P ₉₉ = 2.8																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-9.7	-9.9	-10.2	-10.3	-10.3	-10.5	-10.4	-10.6	-10.5	-10.5	-10.1	-9.8	-9.0	-7.9	-6.4	-5.5	-6.1	-6.5	-6.8	-7.1	-7.3	-7.2	-7.5	-7.9	-8.7	-5.5
2-Jan	-8.1	-8.5	-10.2	-10.6	-10.7	-10.4	-9.8	-8.3	-8.1	-8.7	-8.9	-6.9	-5.5	-3.8	-3.3	-2.3	-1.0	-0.7	-0.7	-0.7	-1.3	-2.3	-2.5	-1.6	-5.6	-0.7
3-Jan	-1.6	-2.7	-3.0	-4.2	-3.1	-3.3	-5.4	-5.8	-5.9	-5.6	-6.3	-6.5	-6.6	-6.1	-5.4	-5.0	-5.3	-5.6	-6.9	-6.7	-6.6	-6.6	-7.7	-8.1	-5.4	-1.6
4-Jan	-8.1	-7.9	-7.7	-7.8	-8.2	-8.2	-8.4	-8.5	-8.1	-8.6	-9.1	-8.5	-9.0	-8.3	-7.7	-7.1	-6.7	-6.6	-7.0	-7.0	-7.2	-7.1	-7.5	-8.0	-7.8	-6.6
5-Jan	-9.3	-9.4	-11.1	-9.6	-10.8	-12.2	-12.3	-12.1	-11.2	-10.9	-10.9	-11.1	-11.4	-10.1	-9.2	-8.4	-9.2	-9.5	-9.7	-9.8	-10.2	-11.1	-10.8	-10.7	-10.5	-8.4
6-Jan	-10.4	-9.5	-9.4	-8.9	-8.1	-8.0	-8.6	-9.3	-9.5	-9.5	-9.2	-8.4	-7.8	-7.4	-6.8	-6.0	-5.6	-5.4	-5.6	-5.3	-6.0	-5.8	-4.4	-3.5	-7.4	-3.5
7-Jan	-3.8	-3.4	-3.3	-2.9	-3.0	-3.5	-3.7	-4.9	-6.6	-8.8	-10.2	-10.7	-10.5	-10.3	-9.4	-9.2	-9.4	-9.8	-10.2	-10.4	-10.8	-11.3	-11.8	-10.6	-7.8	-2.9
8-Jan	-9.5	-9.4	-10.0	-9.5	-9.5	-8.3	-9.6	-9.8	-10.7	-11.1	-10.7	-10.4	-10.2	-9.1	-8.3	-8.0	-7.6	-7.0	-6.9	-7.0	-6.8	-6.6	-6.8	-6.8	-8.7	-6.6
9-Jan	-6.8	-7.0	-7.3	-7.8	-8.2	-8.5	-8.7	-8.4	-8.5	-8.6	-8.5	-8.2	-7.7	-8.0	-8.1	-8.5	-9.1	-9.2	-9.2	-9.2	-9.2	-9.2	-9.1	-9.1	-8.4	-6.8
10-Jan	-9.2	-9.4	-9.9	-10.0	-10.0	-10.0	-9.9	-9.8	-9.8	-9.8	-9.9	-9.6	-9.5	-9.3	-9.3	-9.1	-9.0	-9.1	-9.0	-9.0	-8.9	-8.8	-8.6	-8.6	-9.4	-8.6
11-Jan	-8.7	-8.9	-9.0	-9.3	-9.4	-9.5	-9.3	-9.4	-9.2	-9.0	-8.7	-8.5	-8.1	-7.8	-7.6	-7.4	-7.5	-7.6	-7.9	-8.8	-9.4	-9.5	-9.6	-9.6	-8.7	-7.4
12-Jan	-9.7	-9.9	-10.2	-10.6	-11.2	-11.4	-11.4	-11.6	-11.3	-11.0	-10.6	-10.4	-9.9	-9.2	-8.7	-8.3	-8.1	-8.0	-8.3	-8.5	-8.6	-9.1	-8.8	-8.9	-9.7	-8.0
13-Jan	-9.1	-9.3	-9.5	-9.4	-9.0	-9.2	-8.9	-8.4	-8.4	-8.3	-8.1	-8.0	-7.9	-7.9	-7.7	-7.5	-7.5	-7.6	-7.8	-7.8	-8.0	-8.0	-8.0	-8.0	-8.3	-7.5
14-Jan	-7.9	-7.9	-7.9	-8.1	-8.3	-8.5	-8.6	-8.8	-8.9	-9.0	-8.8	-8.6	-8.4	-8.3	-8.2	-8.1	-8.0	-8.0	-8.1	-8.0	-7.9	-8.0	-7.8	-7.8	-8.2	-7.8
15-Jan	-7.7	-7.7	-7.7	-7.7	-7.6	-7.7	-8.0	-8.1	-8.2	-8.5	-8.4	-8.0	-8.1	-7.8	-7.6	-7.7	-7.6	-7.4	-7.3	-7.3	-7.3	-7.2	-7.2	-7.2	-7.7	-7.2
16-Jan	-7.1	-7.1	-7.1	-6.9	-6.8	-6.8	-6.8	-6.7	-6.7	-6.6	-6.4	-6.1	-5.5	-5.0	-4.6	-4.3	-4.3	-4.2	-3.9	-4.1	-4.3	-4.2	-4.2	-4.2	-5.6	-3.9
17-Jan	-4.1	-4.5	-4.8	-5.0	-5.3	-5.5	-5.7	-5.8	-6.0	-6.0	-5.8	-5.6	-5.2	-4.9	-4.7	-4.8	-4.7	-4.9	-5.6	-5.7	-5.7	-5.8	-6.0	-6.5	-5.4	-4.1
18-Jan	-6.7	-6.7	-6.6	-6.7	-6.7	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2	-7.1	-6.7	-5.9	-5.7	-5.8	-6.2	-6.8	-6.9	-7.1	-7.6	-8.2	-8.5	-8.9	-7.0	-5.7
19-Jan	-9.4	-9.7	-9.8	-9.6	-9.2	-9.4	-9.4	-9.1	-8.8	-8.2	-6.3	-4.2	-2.5	-1.6	-1.0	-1.1	-1.4	-1.6	-2.2	-2.5	-2.2	-1.7	-1.7	-1.4	-5.2	-1.0
20-Jan	-1.3	-1.8	-2.5	-3.1	-3.4	-3.9	-3.7	-3.7	-4.2	-4.0	-3.8	-3.2	-1.9	-1.0	-0.1	0.1	0.1	-0.1	-0.6	-0.5	-0.7	-1.0	-1.5	-1.8	-2.0	0.1
21-Jan	-2.1	-2.4	-3.3	-2.1	-2.7	-4.0	-3.9	-3.4	-2.6	-2.5	-1.8	-0.3	-0.8	-0.4	2.4	3.1	2.8	3.1	3.3	3.2	3.4	2.8	2.6	2.3	-0.1	3.4
22-Jan	2.0	2.1	2.7	2.5	2.1	1.9	0.8	0.1	-0.5	-0.6	-2.4	-7.8	-7.7	-7.1	-7.8	-8.2	-8.6	-9.5	-10.7	-11.8	-12.3	-12.8	-12.8	-12.6	-5.0	2.7
23-Jan	-12.7	-12.7	-12.9	-13.1	-12.8	-12.7	-12.4	-11.9	-11.4	-11.2	-11.0	-10.8	-10.4	-9.9	-9.8	-10.0	-10.1	-10.2	-10.4	-10.5	-10.7	-10.9	-11.1	-11.4	-11.3	-9.8
24-Jan	-11.8	-12.2	-12.0	-12.0	-12.2	-11.9	-11.8	-11.6	-11.2	-10.4	-9.9	-9.1	-8.2	-6.0	-5.7	-5.8	-6.5	-8.1	-9.5	-10.0	-10.3	-10.6	-10.7	-10.9	-9.9	-5.7
25-Jan	-11.1	-11.1	-10.9	-10.8	-10.9	-10.8	-10.6	-10.7	-10.5	-10.4	-10.1	-9.5	-8.9	-8.7	-8.3	-8.0	-8.0	-8.2	-8.3	-8.3	-8.4	-8.3	-7.3	-6.1	-9.4	-6.1
26-Jan	-5.4	-3.1	-0.4	2.0	2.5	2.9	-0.1	-3.4	-6.1	-7.7	-8.5	-9.0	-9.1	-9.3	-9.5	-9.4	-9.8	-10.5	-11.8	-13.7	-14.3	-14.6	-15.0	-15.4	-7.4	2.9
27-Jan	-15.6	-16.2	-17.0	-17.8	-18.2	-18.2	-18.3	-18.5	-19.5	-20.2	-20.4	-20.3	-20.1	-19.7	-18.8	-18.5	-18.6	-18.8	-19.7	-19.8	-19.8	-19.5	-19.8	-20.2	-18.9	-15.6
28-Jan	-20.2	-20.0	-20.0	-19.8	-19.8	-19.8	-19.5	-19.6	-19.7	-20.0	-19.6	-19.0	-18.9	-18.7	-18.6	-18.5	-18.5	-18.8	-19.3	-20.4	-21.7	-22.8	-23.5	-24.1	-20.0	-18.5
29-Jan	-23.9	-24.3	-24.6	-24.7	-24.4	-24.4	-24.4	-24.2	-24.4	-24.6	-24.3	-23.6	-22.4	-20.6	-18.6	-16.8	-16.3	-15.8	-15.5	-16.0	-16.4	-17.2	-17.6	-17.6	-20.9	-15.5
30-Jan	-17.8	-18.3	-20.6	-21.7	-22.0	-22.0	-22.0	-22.3	-22.2	-22.3	-21.8	-21.1	-19.6	-18.7	-18.2	-18.0	-17.9	-17.4	-17.2	-17.1	-16.9	-16.9	-17.3	-17.8	-19.5	-16.9
31-Jan	-18.2	-18.7	-19.4	-20.3	-21.1	-22.1	-22.8	-23.1	-23.0	-22.8	-22.7	-21.3	-20.7	-20.5	-19.7	-19.6	-20.0	-19.9	-19.6	-19.4	-19.9	-19.9	-20.6	-21.2	-20.7	-18.2
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 75 m (AT75m) - C
Mannix - January 2023**

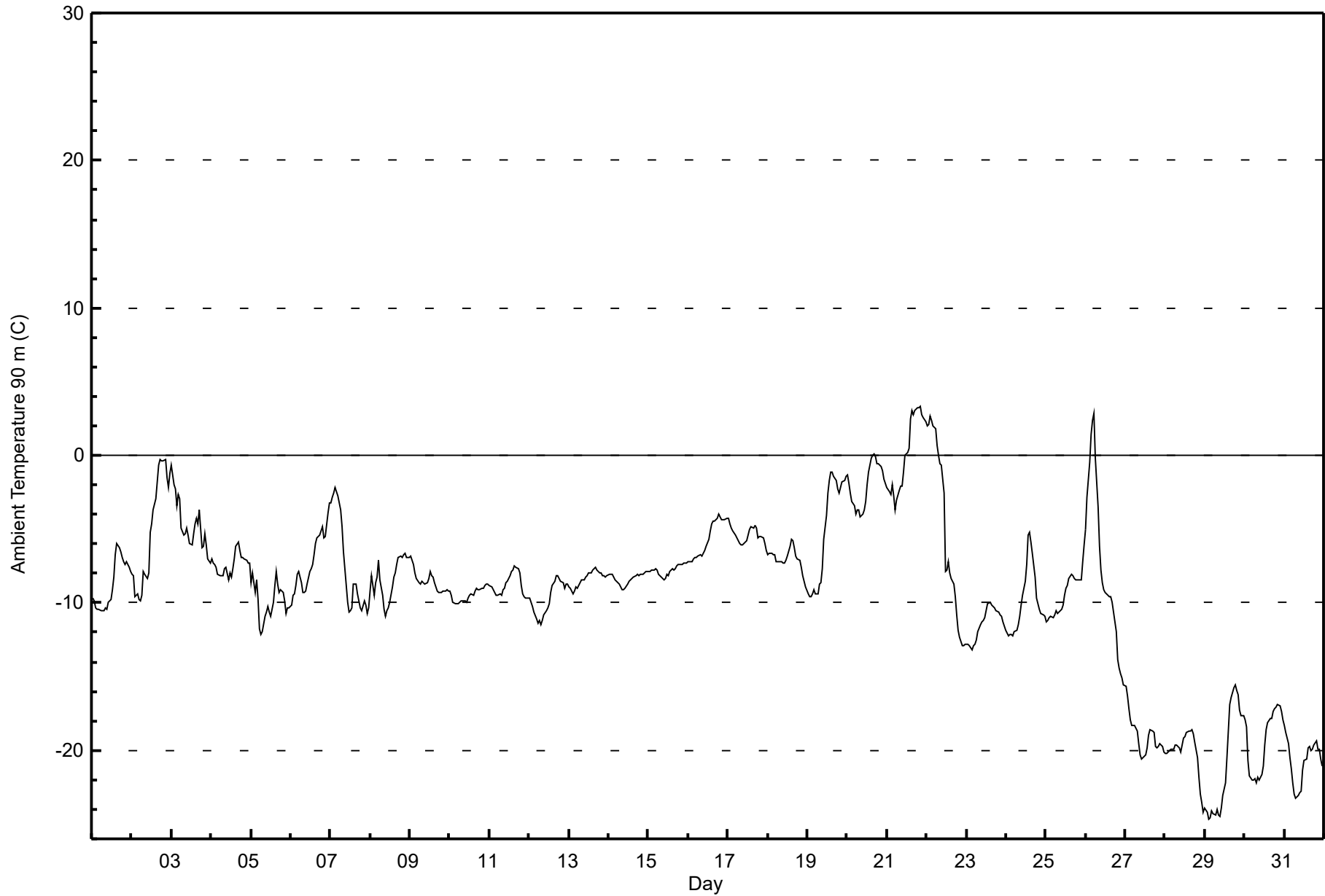
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	50	6.72	6.72
-20 - 0	671	90.19	96.91
0 - 10	23	3.09	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 3.4 C on Jan 21 21:00 Maximum Daily Average: 0.1 C on Jan 21																					Hours in Service: 744 Hours of Data: 744					
Minimum Value: -24.7 C on Jan 29 03:00 Minimum Daily Average: -20.9 C on Jan 29 Maximum Diurnal Average: -8.2 C at hour 16 Minimum Diurnal Average: -10.3 C at hour 10 Monthly Average: -9.31 C Percentiles: P ₁ = -24.1 P ₁₀ = -19.4 Q ₁ = -10.6 Median = -8.5 Q ₃ = -6.6 P ₉₀ = -2.6 P ₉₉ = 2.7																					Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-9.7	-9.8	-10.3	-10.4	-10.4	-10.6	-10.5	-10.5	-10.3	-10.4	-10.0	-9.8	-9.1	-8.2	-6.7	-6.0	-6.3	-6.6	-7.0	-7.2	-7.4	-7.2	-7.6	-7.9	-8.7	-6.0
2-Jan	-8.0	-8.2	-9.5	-9.4	-9.7	-9.9	-9.5	-7.9	-8.0	-8.3	-8.0	-5.3	-4.6	-3.7	-3.0	-1.8	-0.6	-0.3	-0.4	-0.4	-0.3	-1.5	-2.2	-1.2	-5.1	-0.3
3-Jan	-0.7	-2.0	-2.3	-3.4	-2.7	-2.9	-5.0	-5.4	-5.3	-4.9	-5.4	-6.0	-6.0	-5.3	-4.7	-4.3	-4.6	-3.7	-6.3	-6.1	-5.3	-6.1	-7.0	-7.3	-4.7	-0.7
4-Jan	-7.0	-7.3	-7.4	-7.6	-8.1	-8.2	-8.2	-8.2	-7.7	-7.5	-8.4	-8.0	-8.2	-7.7	-7.0	-6.2	-5.9	-6.4	-6.9	-7.0	-7.1	-7.1	-7.3	-7.3	-7.4	-5.9
5-Jan	-8.7	-8.0	-9.3	-8.4	-9.7	-11.8	-12.1	-12.0	-11.0	-10.6	-10.3	-10.7	-10.9	-9.9	-8.8	-7.9	-8.7	-9.3	-9.1	-9.3	-9.9	-10.7	-10.3	-10.4	-9.9	-7.9
6-Jan	-10.2	-9.5	-9.4	-8.8	-8.0	-7.9	-8.6	-9.2	-9.3	-9.2	-8.7	-7.9	-7.7	-7.4	-6.8	-6.0	-5.6	-5.4	-5.2	-4.8	-5.6	-5.5	-3.9	-3.2	-7.2	-3.2
7-Jan	-3.2	-2.9	-2.6	-2.1	-2.7	-3.2	-3.7	-4.9	-6.5	-8.8	-10.0	-10.6	-10.5	-10.3	-8.7	-8.8	-9.4	-9.9	-10.3	-10.5	-9.8	-10.2	-10.7	-10.3	-7.5	-2.1
8-Jan	-9.2	-8.2	-9.4	-8.7	-8.2	-7.1	-8.5	-9.4	-10.4	-10.9	-10.6	-10.4	-10.0	-9.0	-8.2	-8.0	-7.4	-6.9	-6.8	-6.9	-6.7	-6.7	-6.9	-6.9	-8.4	-6.7
9-Jan	-6.9	-7.1	-7.4	-7.9	-8.3	-8.6	-8.7	-8.5	-8.6	-8.7	-8.6	-8.3	-7.9	-8.2	-8.3	-8.6	-9.2	-9.3	-9.3	-9.3	-9.2	-9.2	-9.1	-9.2	-8.5	-6.9
10-Jan	-9.2	-9.5	-10.0	-10.1	-10.1	-10.0	-10.0	-9.9	-9.9	-9.9	-9.9	-9.7	-9.5	-9.4	-9.4	-9.2	-9.0	-9.1	-9.1	-9.1	-9.0	-8.8	-8.7	-8.7	-9.5	-8.7
11-Jan	-8.8	-8.9	-9.1	-9.3	-9.5	-9.5	-9.4	-9.5	-9.2	-9.0	-8.7	-8.5	-8.1	-7.9	-7.7	-7.5	-7.6	-7.7	-8.0	-8.8	-9.4	-9.6	-9.7	-9.7	-8.8	-7.5
12-Jan	-9.7	-10.0	-10.2	-10.6	-11.1	-11.4	-11.2	-11.5	-11.2	-10.8	-10.5	-10.3	-10.1	-9.3	-8.8	-8.5	-8.2	-8.1	-8.4	-8.5	-8.6	-9.0	-8.8	-8.7	-9.7	-8.1
13-Jan	-8.9	-9.1	-9.4	-9.2	-8.9	-9.1	-8.8	-8.4	-8.4	-8.4	-8.2	-8.1	-8.0	-7.8	-7.6	-7.6	-7.8	-7.9	-8.0	-8.1	-8.1	-8.2	-8.2	-8.2	-8.3	-7.6
14-Jan	-8.1	-8.1	-8.1	-8.2	-8.5	-8.7	-8.8	-8.9	-9.1	-9.1	-9.0	-8.8	-8.5	-8.4	-8.3	-8.2	-8.1	-8.1	-8.2	-8.1	-8.0	-8.1	-7.9	-7.9	-8.4	-7.9
15-Jan	-7.8	-7.8	-7.8	-7.8	-7.7	-7.8	-8.1	-8.2	-8.3	-8.5	-8.4	-8.1	-8.1	-7.9	-7.7	-7.7	-7.7	-7.5	-7.4	-7.4	-7.4	-7.3	-7.3	-7.3	-7.8	-7.3
16-Jan	-7.2	-7.2	-7.2	-7.0	-6.9	-6.9	-6.9	-6.8	-6.8	-6.7	-6.5	-6.2	-5.7	-5.1	-4.7	-4.4	-4.4	-4.3	-4.0	-4.2	-4.4	-4.4	-4.3	-4.3	-5.7	-4.0
17-Jan	-4.3	-4.6	-5.0	-5.2	-5.4	-5.6	-5.8	-6.0	-6.1	-6.1	-5.9	-5.8	-5.4	-5.0	-4.8	-4.9	-4.8	-5.0	-5.6	-5.5	-5.5	-5.6	-6.0	-6.5	-5.4	-4.3
18-Jan	-6.7	-6.7	-6.6	-6.7	-6.8	-7.2	-7.2	-7.2	-7.3	-7.3	-7.3	-7.2	-6.8	-6.1	-5.7	-5.8	-6.2	-6.9	-7.0	-7.1	-7.6	-8.1	-8.5	-8.9	-7.0	-5.7
19-Jan	-9.4	-9.6	-9.5	-9.4	-9.1	-9.4	-9.4	-8.7	-8.7	-7.7	-5.7	-4.1	-2.6	-1.7	-1.1	-1.2	-1.5	-1.7	-2.2	-2.6	-2.2	-1.8	-1.7	-1.4	-5.1	-1.1
20-Jan	-1.4	-1.8	-2.5	-3.1	-3.5	-4.0	-3.7	-3.7	-4.2	-4.0	-3.7	-3.1	-2.0	-1.1	-0.2	0.0	0.1	0.0	-0.6	-0.5	-0.7	-1.0	-1.6	-1.9	-2.0	0.1
21-Jan	-2.2	-2.4	-2.6	-2.0	-2.7	-3.7	-3.0	-2.3	-2.1	-2.0	-1.1	0.0	0.2	0.5	2.4	3.1	2.7	3.0	3.3	3.2	3.4	2.8	2.5	2.3	0.1	3.4
22-Jan	2.0	2.1	2.7	2.4	2.0	1.8	0.7	0.0	-0.6	-0.7	-2.6	-7.9	-7.8	-7.2	-7.9	-8.4	-8.7	-9.6	-10.8	-11.9	-12.4	-12.9	-12.9	-12.8	-5.1	2.7
23-Jan	-12.8	-12.8	-12.9	-13.2	-12.9	-12.8	-12.5	-12.0	-11.5	-11.3	-11.2	-11.0	-10.5	-10.0	-10.0	-10.2	-10.3	-10.4	-10.5	-10.7	-10.8	-10.9	-11.3	-11.5	-11.4	-10.0
24-Jan	-11.9	-12.3	-12.2	-12.1	-12.3	-12.0	-11.8	-11.5	-10.9	-10.2	-9.5	-8.5	-7.4	-5.4	-5.2	-5.9	-6.6	-8.3	-9.6	-10.1	-10.4	-10.8	-10.8	-10.9	-9.9	-5.2
25-Jan	-11.2	-11.2	-11.0	-10.9	-11.0	-10.8	-10.5	-10.7	-10.6	-10.5	-10.2	-9.5	-9.0	-8.8	-8.4	-8.1	-8.1	-8.3	-8.4	-8.5	-8.5	-8.4	-7.2	-6.0	-9.4	-6.0
26-Jan	-5.0	-2.8	-0.5	1.4	2.4	2.8	-0.2	-3.5	-6.2	-7.8	-8.7	-9.1	-9.3	-9.4	-9.6	-9.6	-9.9	-10.7	-11.9	-13.9	-14.4	-14.8	-15.1	-15.5	-7.6	2.8
27-Jan	-15.7	-16.3	-17.1	-17.9	-18.3	-18.3	-18.5	-18.7	-19.6	-20.3	-20.6	-20.4	-20.3	-19.9	-19.0	-18.6	-18.7	-18.8	-19.8	-19.9	-19.8	-19.6	-19.8	-20.1	-19.0	-15.7
28-Jan	-20.2	-20.2	-20.1	-19.9	-19.9	-20.0	-19.6	-19.7	-19.9	-20.1	-19.7	-19.1	-19.1	-18.8	-18.7	-18.7	-18.6	-18.9	-19.5	-20.5	-21.8	-22.9	-23.5	-24.2	-20.1	-18.6
29-Jan	-23.9	-24.2	-24.7	-24.6	-24.1	-24.3	-24.4	-24.0	-24.4	-24.5	-23.9	-23.1	-22.2	-20.5	-18.7	-16.9	-16.4	-15.8	-15.5	-15.9	-16.2	-17.2	-17.6	-17.7	-20.9	-15.5
30-Jan	-17.9	-18.4	-20.7	-21.7	-22.0	-22.0	-21.9	-22.2	-21.8	-22.0	-21.6	-21.1	-19.6	-18.6	-18.1	-17.8	-17.9	-17.3	-17.2	-17.1	-16.9	-17.0	-17.3	-17.9	-19.4	-16.9
31-Jan	-18.3	-18.8	-19.6	-20.5	-21.3	-22.2	-23.0	-23.2	-23.0	-22.9	-22.8	-21.3	-20.7	-20.6	-19.8	-19.7	-20.1	-19.9	-19.6	-19.4	-19.9	-19.9	-20.6	-21.1	-20.8	-18.3
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 90 m (AT90m) - C
Mannix - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	52	6.99	6.99
-20 - 0	666	89.52	96.51
0 - 10	26	3.49	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



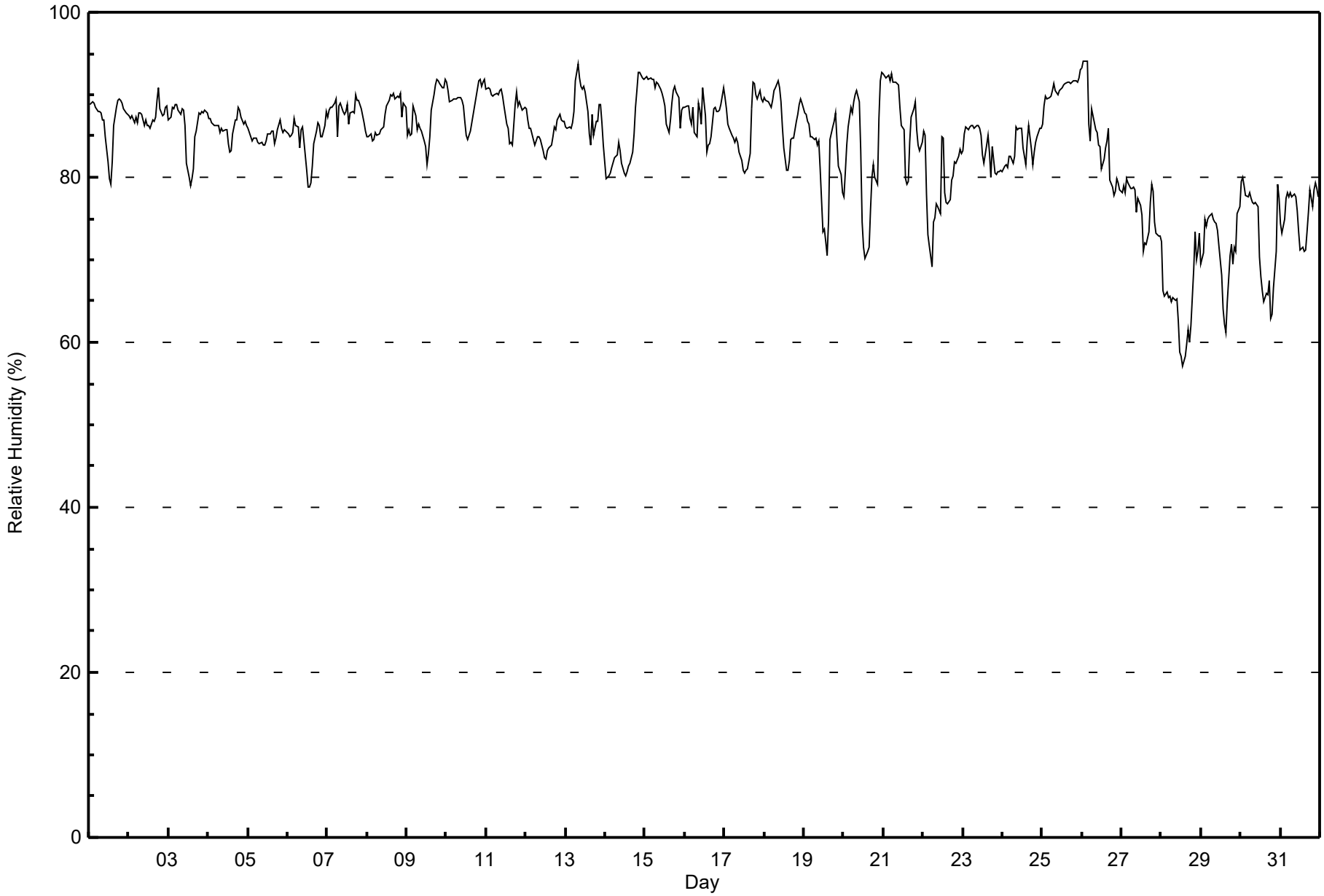
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Mannix - January 2023

Maximum Value: 94 % on Jan 26 03:00														Maximum Daily Average: 90.7 % on Jan 25														Hours in Service: 744	
Minimum Value: 57 % on Jan 28 14:00														Minimum Daily Average: 64.9 % on Jan 28														Hours of Data: 744	
Maximum Diurnal Average: 85.3 % at hour 23														Minimum Diurnal Average: 79.7 % at hour 14														Hours of Missing Data: 0	
Monthly Average: 83.8 %														Percentiles: P ₁ = 62 P ₁₀ = 74 Q ₁ = 81 Median = 86 Q ₃ = 89 P ₉₀ = 91 P ₉₉ = 93														Hours of Calibration: 0	
																												Percent Operational Time: 100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	89	89	89	89	88	88	88	88	87	87	85	82	80	79	82	86	89	89	89	89	89	88	88	88	86.9	89			
2-Jan	87	87	87	87	87	87	88	88	88	86	87	86	86	86	87	87	87	89	91	88	88	88	88	89	87.5	91			
3-Jan	87	87	88	88	89	89	88	88	88	88	86	82	80	79	80	81	85	86	88	88	88	88	88	88	86.1	89			
4-Jan	87	87	87	86	86	86	86	85	86	86	86	86	84	83	83	85	87	87	89	88	87	86	87	86	86.2	89			
5-Jan	86	85	84	85	85	85	84	84	84	84	84	84	85	85	86	86	84	85	86	87	86	85	86	86	85.0	87			
6-Jan	85	85	85	85	87	86	86	84	86	86	84	81	79	79	79	81	84	86	87	86	85	85	86	88	84.4	88			
7-Jan	87	88	89	89	89	89	85	89	89	88	88	88	89	86	88	88	88	90	89	89	88	87	87	86	88.0	90			
8-Jan	85	85	85	84	85	85	85	85	86	86	86	88	89	89	90	90	90	90	90	90	90	87	89	88	87.4	90			
9-Jan	85	86	85	85	89	87	86	86	86	86	84	84	82	83	85	88	90	91	92	92	91	91	91	92	87.3	92			
10-Jan	92	90	89	89	89	89	90	90	90	89	89	87	85	85	86	87	88	89	90	92	92	91	92	92	89.1	92			
11-Jan	91	91	91	90	90	90	90	90	91	91	90	89	87	86	84	84	84	89	90	89	89	89	88	89	88.7	91			
12-Jan	88	87	86	86	85	84	84	85	85	84	83	82	82	83	84	84	85	86	86	87	88	87	87	87	85.2	88			
13-Jan	86	86	86	86	87	88	92	94	92	91	91	91	90	88	85	84	88	85	87	87	89	89	87	84	87.9	94			
14-Jan	80	80	80	81	81	82	83	83	84	83	82	81	80	81	81	82	83	85	89	91	93	93	92	92	84.2	93			
15-Jan	92	92	92	92	92	92	91	91	91	91	90	90	89	86	85	87	89	90	91	90	90	86	88	88	89.8	92			
16-Jan	89	89	89	87	86	88	85	85	89	88	86	91	87	83	84	84	85	88	89	88	88	88	89	91	87.3	91			
17-Jan	90	88	86	86	85	85	84	85	84	83	82	81	81	81	81	83	88	91	91	90	89	90	90	89	86.0	91			
18-Jan	90	89	89	89	88	89	91	91	92	91	89	86	84	81	81	82	85	85	85	87	88	89	90	89	87.4	92			
19-Jan	88	88	87	87	85	85	85	85	84	84	81	73	74	72	70	75	85	86	87	88	85	81	80	78	82.1	88			
20-Jan	78	81	84	86	89	88	89	90	91	89	83	75	71	70	71	72	76	80	82	80	79	87	92	93	82.2	93			
21-Jan	93	92	92	92	92	93	91	91	91	91	89	86	86	80	79	80	84	87	88	89	86	84	83	84	87.7	93			
22-Jan	86	85	78	73	72	69	75	75	77	76	76	85	85	78	77	77	77	80	80	82	82	83	83	83	78.8	86			
23-Jan	83	85	86	86	86	86	86	86	86	86	86	85	83	82	84	85	83	80	84	80	80	81	81	81	83.8	86			
24-Jan	81	81	82	81	83	83	82	83	86	86	86	86	84	83	82	84	86	83	82	83	84	85	86	86	83.5	86			
25-Jan	87	89	90	89	90	90	91	91	91	90	91	91	91	91	91	92	92	91	92	92	92	91	92	93	90.7	93			
26-Jan	93	94	94	94	86	84	88	87	86	85	84	84	81	82	83	84	86	80	79	78	78	80	79	78	84.6	94			
27-Jan	78	79	78	80	79	79	79	79	78	76	77	77	75	71	72	72	73	77	79	78	75	73	73	73	76.3	80			
28-Jan	72	66	66	66	65	66	65	65	65	65	62	59	58	57	58	60	62	60	62	69	73	70	71	73	64.9	73			
29-Jan	70	71	75	74	75	75	76	75	75	74	74	72	68	64	62	61	65	70	72	69	72	71	76	76	71.3	76			
30-Jan	79	80	79	78	78	78	77	77	77	77	76	70	68	66	65	66	66	67	63	63	67	71	79	78	72.7	80			
31-Jan	74	73	75	77	78	78	78	78	78	78	76	73	71	72	71	71	73	76	78	76	78	79	79	78	75.8	79			
	85.0	85.1	84.9	84.8	84.7	84.6	84.7	84.9	85.2	84.7	83.6	82.3	81.0	79.7	79.9	80.9	82.8	83.8	84.6	84.7	84.8	84.6	85.3	85.3	Diurnal Average				
	93	94	94	94	92	93	92	94	92	91	91	91	91	91	91	92	92	91	92	92	93	93	92	93	Diurnal Maximum				





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Mannix - January 2023

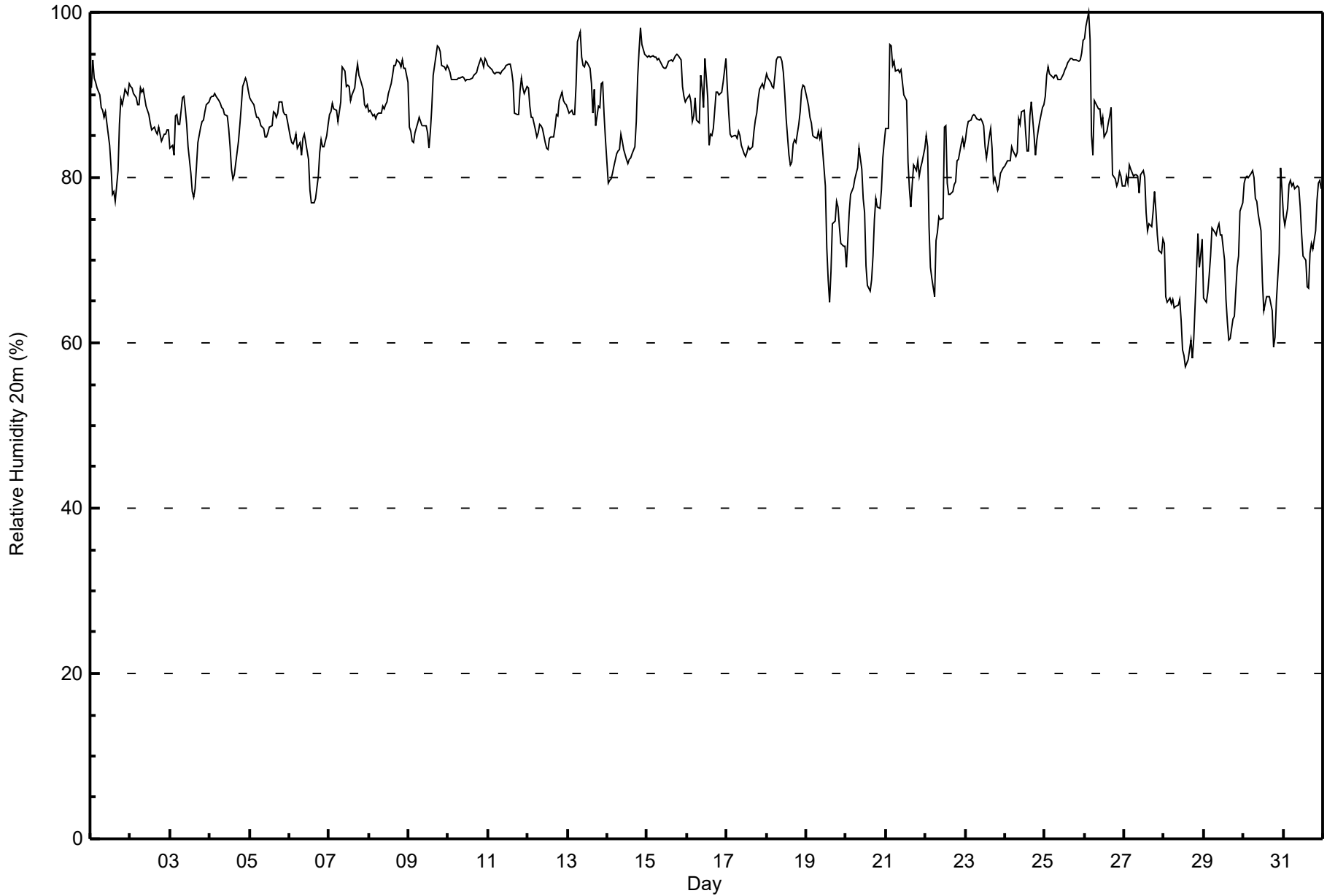
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	6	0.81	0.81
60 - 80	163	21.91	22.72
80 - 100	575	77.28	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 100 % on Jan 26 03:00																			Maximum Daily Average: 93.7 % on Jan 15						Hours in Service: 744																			
Minimum Value: 57 % on Jan 28 14:00																			Minimum Daily Average: 64.4 % on Jan 28						Hours of Data: 744																			
Maximum Diurnal Average: 86.4 % at hour 9																			Minimum Diurnal Average: 80.9 % at hour 15						Hours of Missing Data: 0																			
Monthly Average: 84.5 %																			Percentiles: P ₁ = 60 P ₁₀ = 72 Q ₁ = 80 Median = 86 Q ₃ = 91 P ₉₀ = 93 P ₉₉ = 96						Hours of Calibration: 0																			
																									Percent Operational Time: 100.0																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																				
1-Jan	91	94	92	92	91	90	88	88	87	88	87	84	81	78	78	77	81	86	90	89	90	91	90	91	87.2	94																		
2-Jan	91	91	90	90	89	89	91	90	91	89	88	88	87	86	86	86	85	86	85	84	85	85	86	86	87.6	91																		
3-Jan	84	84	83	87	88	86	86	90	90	88	87	84	81	78	78	79	81	84	86	87	87	88	89	89	85.1	90																		
4-Jan	90	90	90	90	90	89	89	89	89	88	88	86	84	81	80	80	83	84	86	89	91	92	92	90	87.4	92																		
5-Jan	90	89	89	88	87	87	87	86	86	85	85	85	86	86	88	88	87	88	89	89	88	88	88	87	87.3	90																		
6-Jan	85	84	84	85	85	84	84	83	85	85	84	82	79	77	77	77	78	80	83	85	84	84	85	86	82.6	86																		
7-Jan	88	88	89	88	88	87	88	89	93	93	91	91	91	89	90	91	93	94	92	92	91	89	88	89	90.0	94																		
8-Jan	88	88	87	88	87	88	88	88	89	88	89	89	90	91	92	93	94	94	94	93	94	93	93	91	90.4	94																		
9-Jan	86	86	84	84	86	87	87	87	86	86	86	85	83	86	88	92	95	96	96	95	94	93	93	93	89.0	96																		
10-Jan	93	93	92	92	92	92	92	92	92	92	92	92	92	92	92	92	93	93	93	94	94	93	94	94	92.6	94																		
11-Jan	94	93	93	93	93	93	93	93	93	93	93	93	94	94	93	92	88	88	88	90	92	91	90	91	91.9	94																		
12-Jan	91	89	87	87	86	85	86	86	86	86	84	84	83	85	85	85	86	88	88	89	90	89	89	89	86.8	91																		
13-Jan	88	88	88	88	88	91	96	98	95	93	93	94	94	93	91	88	91	86	89	88	91	92	88	85	90.7	98																		
14-Jan	79	80	80	80	81	83	83	83	85	84	83	82	82	82	82	83	84	87	92	95	98	96	95	95	85.7	98																		
15-Jan	95	95	95	95	95	95	94	94	94	93	93	93	94	94	94	94	94	95	95	95	94	91	90	89	93.7	95																		
16-Jan	89	90	89	87	87	90	87	87	92	91	89	94	90	84	85	85	86	90	90	90	90	90	92	94	89.1	94																		
17-Jan	91	88	85	85	85	85	85	86	85	84	83	82	83	84	83	84	86	87	88	90	91	91	91	92	86.3	92																		
18-Jan	93	92	92	91	91	92	94	95	95	94	93	90	87	83	81	82	84	84	84	86	88	91	91	91	89.3	95																		
19-Jan	89	89	87	87	85	85	85	86	85	86	83	79	72	68	65	69	74	75	77	76	74	72	72	72	78.7	89																		
20-Jan	69	72	76	78	79	80	80	81	84	81	77	76	69	67	66	68	70	75	78	76	76	78	82	84	76.0	84																		
21-Jan	86	86	96	96	94	94	93	93	93	93	92	90	89	82	79	77	79	81	81	82	80	81	82	84	86.7	96																		
22-Jan	85	84	74	69	68	66	72	73	75	75	75	86	86	79	78	78	78	79	80	82	82	84	85	84	78.2	86																		
23-Jan	85	86	87	87	87	88	88	87	87	87	87	86	84	82	85	86	84	79	80	79	79	81	81	81	84.2	88																		
24-Jan	81	82	82	82	84	83	82	83	87	86	88	88	85	83	83	87	89	85	83	85	86	87	88	89	85.0	89																		
25-Jan	90	92	93	93	92	92	92	92	92	92	92	92	93	93	94	94	94	94	94	94	94	94	95	97	93.2	97																		
26-Jan	97	98	100	97	85	83	89	89	88	88	87	87	85	86	87	88	88	80	80	79	79	81	80	79	86.6	100																		
27-Jan	79	80	79	82	81	80	80	80	80	78	80	81	80	76	73	74	74	76	78	76	73	71	71	73	77.4	82																		
28-Jan	72	66	65	65	65	65	64	64	65	65	63	59	58	57	58	59	60	58	61	69	73	69	71	73	64.4	73																		
29-Jan	65	65	66	68	70	74	73	73	74	74	73	73	70	65	63	60	61	63	63	66	69	70	76	77	68.9	77																		
30-Jan	79	80	80	80	80	81	80	78	77	76	74	68	64	65	66	66	65	64	60	61	65	71	81	78	72.3	81																		
31-Jan	75	74	76	79	80	79	79	79	79	79	77	73	70	70	67	67	71	72	71	74	77	79	80	79	75.2	80																		
																			85.7	85.6	85.5	85.5	85.1	85.2	85.8	85.8	86.4	85.9	85.0	84.5	82.8	81.2	80.9	81.3	82.4	83.0	83.6	84.5	85.2	85.4	86.0	86.2	Diurnal Average	
																			97	98	100	97	95	95	96	98	95	94	93	94	94	94	94	94	95	96	96	95	98	96	95	97	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 20m (RH20m) - %
Mannix - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	7	0.94	0.94
60 - 80	170	22.85	23.79
80 - 100	566	76.08	99.87

Total Number of Valid Hours: 744

Total Number of Hours: 744

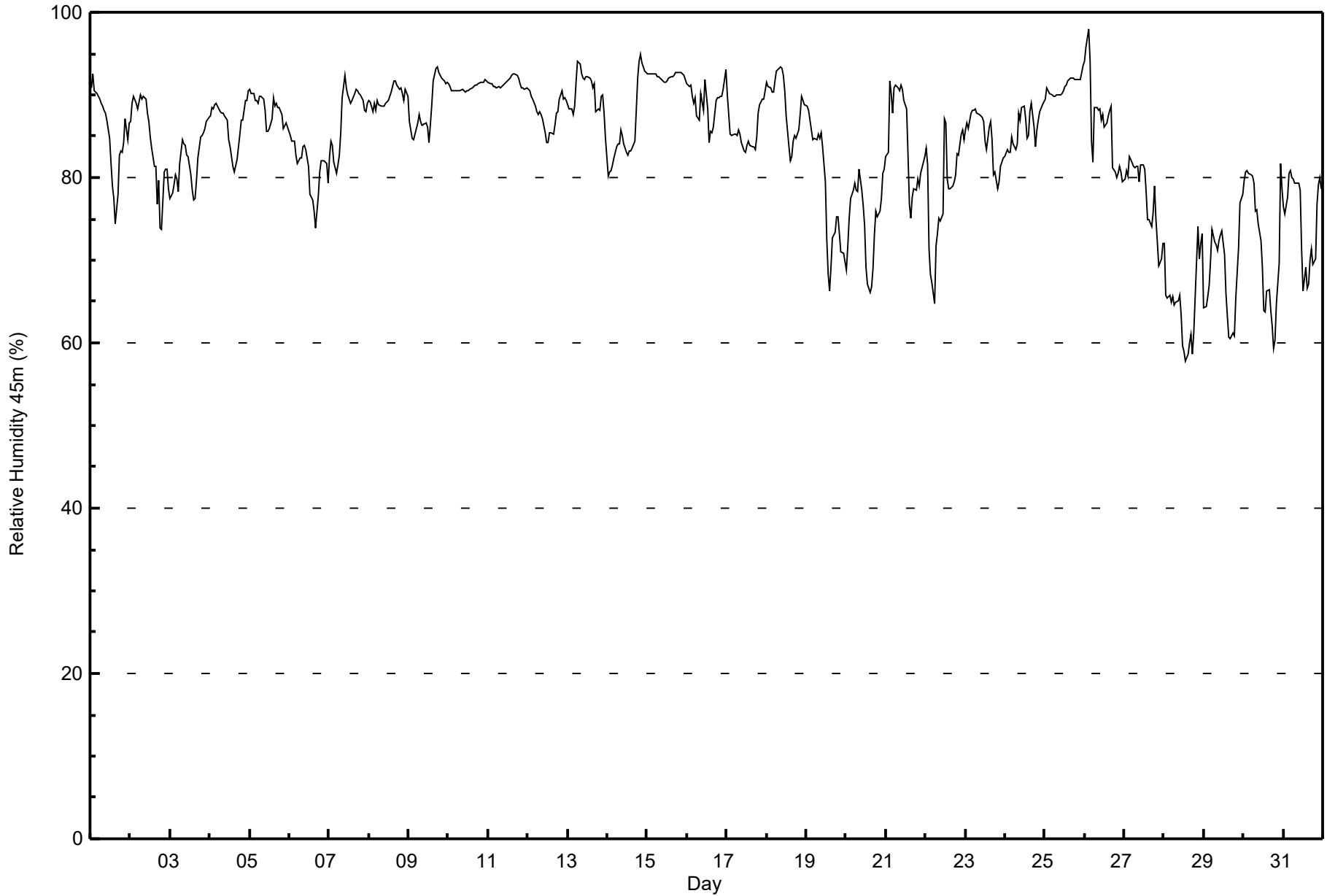


Maximum Value: 98 % on Jan 26 03:00 Maximum Daily Average: 92.3 % on Jan 15																		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 58 % on Jan 28 14:00 Minimum Daily Average: 64.9 % on Jan 28 Maximum Diurnal Average: 85.6 % at hour 9 Minimum Diurnal Average: 80.9 % at hour 15 Monthly Average: 83.8 % Percentiles: P ₁ = 60 P ₁₀ = 72 Q ₁ = 80 Median = 86 Q ₃ = 90 P ₉₀ = 92 P ₉₉ = 94																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	91	93	91	90	90	90	89	89	88	88	87	85	82	79	78	74	78	83	83	83	84	87	84	87	85.5	93
2-Jan	87	89	90	89	88	89	90	90	90	90	88	87	85	84	81	81	77	80	74	74	81	81	81	79	84.2	90
3-Jan	78	78	79	80	80	78	82	85	84	84	83	83	80	79	77	78	80	82	85	85	85	86	87	87	81.8	87
4-Jan	87	88	88	89	89	88	88	88	88	88	87	85	84	83	81	81	82	84	85	87	87	89	89	91	86.5	91
5-Jan	91	90	90	89	89	89	90	90	90	88	86	86	86	87	90	89	89	88	88	86	86	87	86	88.2	91	
6-Jan	85	84	84	84	83	82	82	82	84	84	83	81	78	78	77	76	74	78	81	82	82	82	79	81.2	85	
7-Jan	83	84	84	82	80	82	83	85	90	92	91	90	89	89	89	90	91	90	90	90	89	88	88	89	87.5	92
8-Jan	89	89	88	89	88	89	89	89	89	89	89	89	89	90	91	92	92	91	91	91	90	89	91	90	89.7	92
9-Jan	87	86	85	85	85	87	88	87	86	87	87	86	84	86	89	92	93	93	93	92	92	92	91	92	88.5	93
10-Jan	91	91	91	90	91	90	91	91	91	91	90	91	91	91	91	91	91	91	91	91	91	91	92	92	90.9	92
11-Jan	92	91	91	91	91	91	91	91	91	91	91	92	92	92	92	93	93	92	92	91	91	91	91	91	91.4	93
12-Jan	91	90	90	89	89	88	88	88	88	87	85	84	84	85	85	85	86	88	88	89	91	90	89	89	87.8	91
13-Jan	89	88	88	88	89	92	94	94	92	92	92	92	92	92	91	91	88	88	88	90	90	88	85	90.2	94	
14-Jan	80	81	81	81	82	84	84	84	86	85	84	83	83	83	84	84	88	92	94	95	94	93	93	85.9	95	
15-Jan	93	93	93	92	93	93	92	92	92	92	92	92	92	92	92	92	92	93	93	93	93	92	92	92	92.3	93
16-Jan	91	91	91	90	89	90	87	87	90	89	88	92	88	84	86	85	86	89	90	90	90	90	91	93	89.1	93
17-Jan	90	88	85	85	85	85	85	86	85	84	83	83	84	84	84	84	83	85	88	89	89	89	91	85.8	91	
18-Jan	92	91	91	90	90	92	93	93	93	93	92	91	87	84	82	83	84	85	85	86	88	90	89	89	88.8	93
19-Jan	89	88	87	86	85	85	85	85	85	86	84	80	72	68	66	69	73	73	75	75	73	71	71	70	78.3	89
20-Jan	69	72	75	77	78	79	78	78	81	78	77	74	69	67	66	67	69	73	76	75	76	78	80	81	74.8	81
21-Jan	83	83	92	90	88	91	91	91	91	91	91	89	88	83	77	75	78	79	79	80	79	81	81	83	84.6	92
22-Jan	84	82	71	68	67	65	72	73	75	75	76	87	87	80	79	79	79	80	80	83	83	85	86	85	78.3	87
23-Jan	86	87	86	88	88	88	88	88	88	87	87	87	84	83	86	87	84	80	81	79	80	81	82	82	84.9	88
24-Jan	83	83	83	83	85	84	83	84	88	87	88	89	87	85	85	88	89	86	84	86	87	88	89	89	85.9	89
25-Jan	90	91	91	90	90	90	90	90	90	90	90	91	91	91	92	92	92	92	92	92	92	93	94	91.1	94	
26-Jan	94	96	98	94	84	82	88	88	88	88	87	88	86	87	87	88	89	81	81	80	81	81	81	80	86.5	98
27-Jan	80	81	80	83	82	81	81	81	81	80	81	81	81	78	75	75	74	76	79	75	72	69	70	72	77.9	83
28-Jan	72	66	65	66	65	66	65	65	65	66	63	60	59	58	59	60	61	59	61	70	74	70	72	73	64.9	74
29-Jan	64	64	66	67	70	74	72	72	71	72	73	74	71	66	63	61	60	61	61	65	69	72	77	78	68.5	78
30-Jan	80	81	81	80	80	80	79	76	76	74	72	69	64	64	66	66	64	62	59	60	65	70	82	79	72.1	82
31-Jan	76	76	78	81	81	80	80	79	79	79	79	71	66	69	67	67	70	71	69	70	77	79	80	79	75.1	81
	84.9	85.0	84.9	84.8	84.4	84.6	85.1	85.2	85.6	85.4	84.7	84.2	82.5	81.3	80.9	81.1	81.6	82.0	82.3	83.0	83.8	84.4	85.1	85.0	Diurnal Average	
	94	96	98	94	93	93	94	94	93	93	92	92	92	92	92	93	93	93	93	94	95	94	93	94	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 45m (RH45m) - %
Mannix - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 45m (RH45m) - %
Mannix - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	7	0.94	0.94
60 - 80	177	23.79	24.73
80 - 100	560	75.27	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

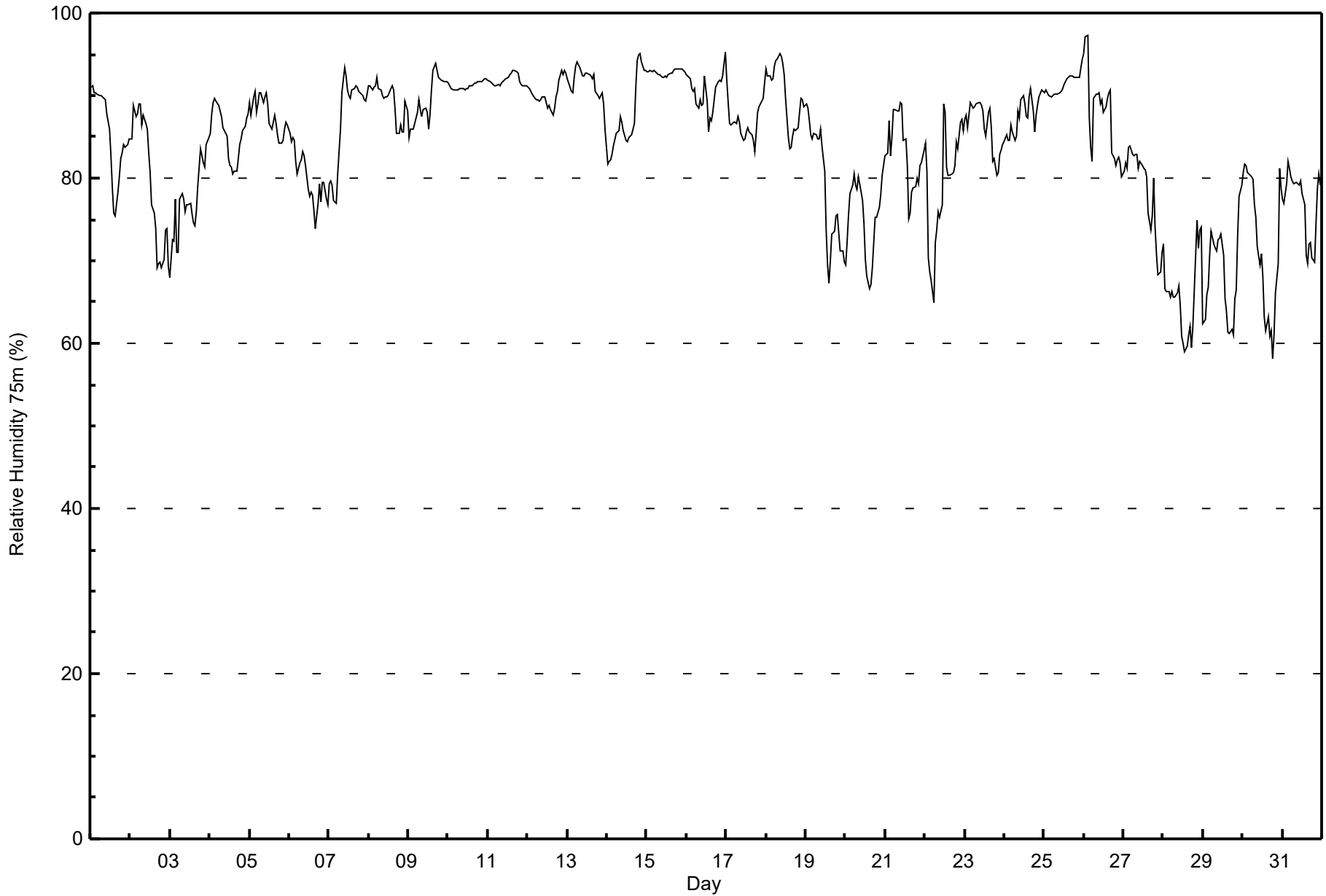


Maximum Value: 97 % on Jan 26 03:00 Maximum Daily Average: 92.8 % on Jan 15																		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Minimum Value: 58 % on Jan 30 19:00 Minimum Daily Average: 65.9 % on Jan 28 Maximum Diurnal Average: 85.8 % at hour 9 Minimum Diurnal Average: 81.5 % at hour 15 Monthly Average: 84.0 % Percentiles: P ₁ = 61 P ₁₀ = 71 Q ₁ = 80 Median = 86 Q ₃ = 90 P ₉₀ = 92 P ₉₉ = 95																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	91	91	90	90	90	90	90	90	90	90	88	86	83	79	76	75	78	80	82	83	84	84	84	85	85.4	91
2-Jan	85	85	89	87	88	89	89	86	88	87	86	83	81	77	76	74	69	70	70	69	70	74	74	69	79.7	89
3-Jan	68	73	72	77	71	71	77	78	77	76	77	77	76	75	74	76	79	83	83	82	81	84	85	77.1	85	
4-Jan	85	88	89	90	89	89	88	87	86	86	85	82	82	81	81	81	82	84	85	86	86	87	88	85.3	90	
5-Jan	89	88	90	90	88	89	90	90	89	90	90	89	87	86	87	88	87	85	84	84	84	86	87	86	87.6	90
6-Jan	85	84	85	84	82	81	82	82	83	83	82	79	78	78	76	74	77	79	77	80	80	77	77	80.1	85	
7-Jan	79	80	79	77	77	80	83	86	90	93	92	91	90	90	91	91	91	91	90	90	90	89	90	87.2	93	
8-Jan	91	91	91	91	91	92	91	91	90	90	90	90	90	91	91	91	88	85	85	87	86	86	89	88	89.4	92
9-Jan	85	86	86	86	87	88	90	88	87	88	88	88	86	88	91	93	94	93	92	92	92	92	92	92	89.3	94
10-Jan	92	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92	92	92	92	92	92	92	91.2	92
11-Jan	92	92	92	91	91	91	91	91	91	92	92	92	92	93	93	93	93	93	93	92	91	91	91	91	91.8	93
12-Jan	91	91	91	90	90	89	90	89	90	90	90	89	88	89	88	88	89	90	90	92	93	92	93	93	90.2	93
13-Jan	92	91	90	90	92	94	94	93	93	92	92	93	92	92	92	93	90	90	90	90	90	89	86	91.5	94	
14-Jan	82	82	82	83	84	85	86	86	87	87	86	85	84	85	85	85	87	91	94	95	95	94	93	93	87.3	95
15-Jan	93	93	93	93	93	93	93	93	92	92	92	92	92	93	93	93	93	93	93	93	93	93	93	93	92.8	93
16-Jan	93	92	92	91	91	91	89	89	90	89	89	92	89	86	87	87	88	91	91	92	92	92	92	95	90.3	95
17-Jan	92	89	87	86	87	87	87	87	87	86	85	85	86	86	86	85	85	83	85	88	89	89	90	92	86.9	92
18-Jan	93	92	92	92	92	94	94	94	95	95	94	92	90	85	84	84	85	86	86	86	88	90	90	89	90.0	95
19-Jan	89	88	87	85	85	85	85	85	85	86	84	81	74	69	67	70	73	73	76	76	73	71	71	70	78.7	89
20-Jan	69	72	76	78	79	80	79	79	80	78	77	75	70	68	67	67	69	72	75	75	76	78	80	81	75.1	81
21-Jan	83	83	87	83	85	88	88	88	88	89	89	85	85	81	75	76	78	79	79	80	79	81	82	83	83.1	89
22-Jan	84	81	70	69	68	65	72	74	76	75	77	89	88	81	80	80	81	81	82	84	84	87	87	86	79.2	89
23-Jan	87	88	86	89	89	89	89	89	89	89	89	88	86	85	88	88	86	82	82	80	81	83	83	84	86.2	89
24-Jan	84	85	85	85	86	86	85	85	88	87	90	90	89	87	87	90	91	88	86	88	89	90	91	90	87.5	91
25-Jan	90	91	90	90	90	90	90	90	90	90	90	91	91	92	92	92	92	92	92	92	92	92	93	94	91.4	94
26-Jan	95	97	97	87	84	82	90	90	90	90	89	89	88	89	90	90	91	83	82	82	82	82	82	80	87.6	97
27-Jan	81	82	81	84	84	83	83	83	83	81	82	82	81	81	80	76	74	75	80	74	71	68	69	71	78.7	84
28-Jan	72	67	66	66	66	66	66	66	66	66	67	64	61	60	59	60	61	62	59	62	71	75	72	74	65.9	75
29-Jan	62	63	66	67	71	73	72	71	71	73	73	73	71	65	64	61	61	62	61	65	66	73	78	79	68.4	79
30-Jan	81	82	82	81	80	80	80	77	75	72	69	71	68	63	61	63	61	61	58	61	66	70	81	79	71.8	82
31-Jan	77	77	79	82	81	80	80	79	79	79	79	80	78	77	71	70	72	72	70	70	75	79	80	79	76.9	82
84.9 85.0 84.9 84.7 84.5 84.9 85.5 85.4 85.8 85.5 85.2 84.8 83.4 82.0 81.5 81.5 81.7 81.7 82.3 82.8 83.4 84.1 85.1 85.0																		Diurnal Average								
95 97 97 93 93 94 94 94 95 95 94 93 93 93 93 93 94 93 94 95 95 94 93 95																		Diurnal Maximum								



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 75m (RH75m) - %
Mannix - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 75m (RH75m) - %
Mannix - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	4	0.54	0.54
60 - 80	189	25.40	25.94
80 - 100	551	74.06	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

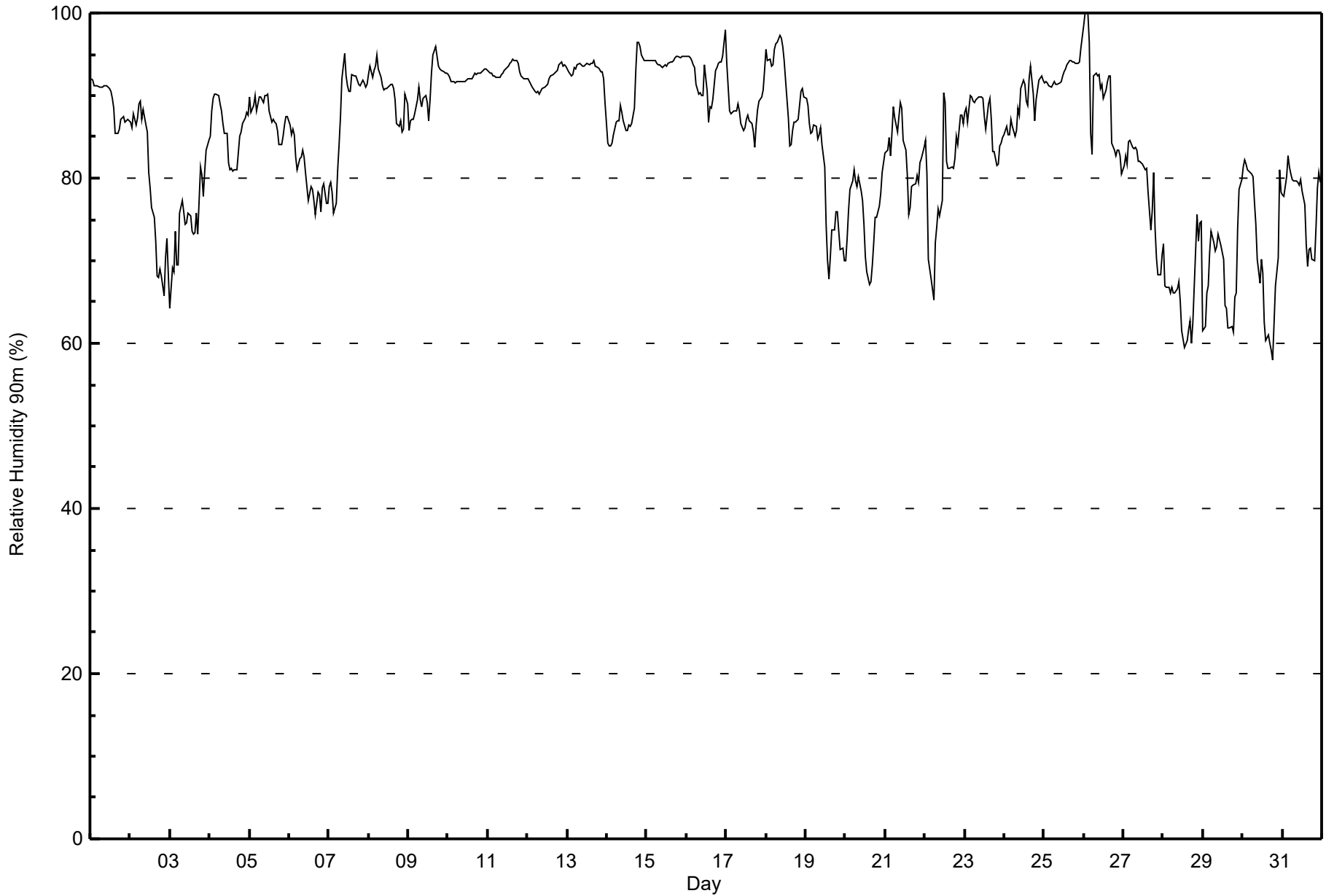


Maximum Value: 100 % on Jan 26 02:00														Maximum Daily Average: 94.2 % on Jan 15														Hours in Service: 744																					
Minimum Value: 58 % on Jan 30 19:00														Minimum Daily Average: 66.4 % on Jan 28														Hours of Data: 744																					
Maximum Diurnal Average: 86.5 % at hour 9														Minimum Diurnal Average: 82.5 % at hour 18														Hours of Missing Data: 0																					
Monthly Average: 84.8 %														Percentiles: P ₁ = 61 P ₁₀ = 71 Q ₁ = 80 Median = 87 Q ₃ = 92 P ₉₀ = 94 P ₉₉ = 96														Hours of Calibration: 0																					
																												Percent Operational Time: 100.0																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	92	92	91	91	91	91	91	91	91	91	91	91	90	90	89	85	85	86	87	87	87	87	87	87	87	89.3	92																						
2-Jan	87	86	88	86	87	89	89	87	88	87	86	81	79	76	75	72	68	68	69	68	66	70	73	68	78.9	89																							
3-Jan	64	69	69	74	70	69	76	77	76	74	75	76	75	74	73	73	76	73	81	80	78	81	83	85	75.0	85																							
4-Jan	85	88	90	90	90	90	89	88	87	85	85	82	81	81	81	81	83	85	86	87	87	88	88	88	85.8	90																							
5-Jan	90	88	89	90	88	89	90	90	89	90	90	90	88	87	87	87	86	84	84	85	86	87	87	87	87.8	90																							
6-Jan	86	85	86	85	83	81	82	83	83	82	81	77	78	79	79	77	76	78	78	76	79	79	77	77	80.3	86																							
7-Jan	79	79	78	76	77	81	84	87	92	95	92	91	91	91	91	91	91	89	87	86	87	86	86	90	89	90.6	95																						
8-Jan	93	94	92	93	94	95	93	92	91	91	91	91	91	91	91	91	89	87	86	87	86	86	90	89	90.6	95																							
9-Jan	86	87	87	87	88	89	91	90	89	90	90	89	87	90	93	95	96	95	94	93	93	93	93	93	90.6	96																							
10-Jan	93	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	93	93	93	93	93	93	93	93	92.2	93																							
11-Jan	93	93	93	92	92	92	92	92	93	93	93	93	94	94	94	94	94	94	94	93	92	92	92	92	93.0	94																							
12-Jan	92	92	91	91	91	90	90	90	91	91	91	91	91	92	92	92	93	93	93	94	94	94	94	94	92.0	94																							
13-Jan	93	93	92	92	93	93	94	94	94	94	94	94	94	94	94	94	94	93	93	93	93	92	89	89	93.2	94																							
14-Jan	84	84	84	84	85	87	87	87	89	88	87	86	86	86	86	87	88	93	96	96	96	95	94	94	88.8	96																							
15-Jan	94	94	94	94	94	94	94	94	94	93	94	94	94	94	94	94	95	95	95	95	95	95	95	95	94.2	95																							
16-Jan	95	95	95	94	94	93	91	90	90	90	90	94	91	87	89	88	90	93	93	94	94	94	95	98	92.3	98																							
17-Jan	94	91	88	88	88	88	88	89	88	87	86	86	87	88	87	87	86	84	86	88	89	90	91	93	88.2	94																							
18-Jan	96	94	94	94	94	96	96	96	96	97	97	96	94	92	87	84	84	86	87	87	87	89	90	91	90	91.6	97																						
19-Jan	90	89	87	85	86	86	86	85	85	86	84	81	74	70	68	71	74	74	76	76	74	71	72	70	79.1	90																							
20-Jan	70	73	76	79	80	81	80	79	80	79	77	74	71	69	67	67	70	72	75	75	77	78	81	82	75.4	82																							
21-Jan	83	83	85	83	85	89	87	86	88	89	88	85	83	80	76	76	79	79	79	80	79	82	82	84	83.0	89																							
22-Jan	85	80	70	69	68	65	72	74	76	75	77	90	89	82	81	81	81	81	82	85	84	88	88	87	79.7	90																							
23-Jan	88	88	87	90	90	89	89	89	90	90	90	90	88	86	89	90	87	83	83	81	82	84	84	85	87.2	90																							
24-Jan	85	86	85	85	87	86	85	86	88	88	91	92	91	89	89	92	93	90	87	89	91	92	92	92	88.9	93																							
25-Jan	91	92	91	91	91	91	92	91	91	91	92	92	93	93	94	94	94	94	94	94	94	94	96	97	92.9	97																							
26-Jan	98	100	100	96	86	83	92	93	92	93	91	91	90	91	92	92	92	84	83	83	83	83	83	81	89.7	100																							
27-Jan	82	83	82	84	85	84	84	84	83	82	82	82	81	81	81	78	74	76	81	74	70	68	68	71	79.1	85																							
28-Jan	72	67	67	67	66	67	66	66	66	67	67	65	61	61	60	60	62	63	60	63	71	76	72	75	75	66.4	76																						
29-Jan	61	62	66	67	71	74	72	71	72	73	72	72	70	65	64	62	62	62	61	66	66	74	79	80	68.5	80																							
30-Jan	81	82	82	81	81	81	80	77	74	70	67	70	68	62	60	61	60	59	58	62	67	70	81	78	71.5	82																							
31-Jan	78	78	80	83	81	80	80	80	80	80	79	80	78	77	72	69	71	71	70	70	74	79	81	79	77.1	83																							
																								85.8	85.8	85.5	85.6	85.4	85.7	86.3	86.1	86.5	86.2	85.8	85.6	84.4	83.1	82.8	82.7	82.9	82.5	83.2	83.6	84.0	84.9	86.0	85.9	Diurnal Average	
																								98	100	100	96	94	96	96	96	97	97	96	94	94	94	94	95	96	95	96	96	96	95	96	98	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity 90m (RH90m) - %
Mannix - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity 90m (RH90m) - %
Mannix - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	5	0.67	0.67
60 - 80	182	24.46	25.13
80 - 100	555	74.60	99.73

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 30 km/h on Jan 26 08:00	Maximum Daily Speed Average: 19.0 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 13 05:00	Minimum Daily Speed Average: 1.4 km/h on Jan 15	Hours of Data: 739
Maximum Diurnal Speed Average: 5.3 km/h at hour 6	Minimum Diurnal Speed Average: 2.5 km/h at hour 19	Hours of Missing Data: 5
Monthly Average Velocity: 4.1 km/h 163.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 10 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 25	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	S6	SSW5	SW10	SW9	WSW9	SSW6	SSE8	SSE10	SSE12	SSE12	SSE14	SSE13	SSE10	SSE10	SSE8	S7	S9	SSE11	SSE11	S8	SSE12	SSE12	SSE10	SSE11	S9.0	SSE14	
2-Jan	SSE11	SSE12	SSE12	SSE12	SSE13	SSE9	SSE10	SSE13	SSE14	SSE13	SSE11	SSE12	SSE15	SSE12	SSE14	SSE12	SSE12	SSE10	S10	SSE13	SSE14	SSE13	SSE13	SSE13	SSE12.1	SSE15	
3-Jan	SSE16	SSE13	SSE11	SSE8	SSE13	SSE15	SSE15	SSE13	SSE13	SSE12	SSE12	SSE14	SSE14	SSE13	SSE13	SSE14	SSE14	SSE14	SSE12	SSE15	SSE11	SSE11	SE8	SE8	SSE12.5	SSE16	
4-Jan	SSE10	SSE8	SSE9	SSE10	SSE11	SSE12	SSE12	SSE11	SSE11	SSE11	SSE11	SSE11	SSE11	SSE11	SSE9	SSE9	SSE8	SE8	SE6	SE5	SE6	SSE11	SSE11	SSE10	SE9	SSE9.5	SSE12
5-Jan	SE8	SSE11	SSE11	SSE10	SSE11	SE12	SSE12	SSE10	SSE15	SE13	SSE12	SE10	SSE9	SSE12	SSE10	SSE9	SSE8	S8	SSE10	SSE14	SE16	SE14	SE15	SE20	SSE11.6	SE20	
6-Jan	SE23	SE22	SE18	SE13	SSE10	SSE14	SSE14	SSE16	SSE13	SSE12	SSE11	SSE12	SSE13	SSE12	SSE14	SSE14	SSE13	SSE12	SSE13	SSE17	SSE18	SSE17	SSE13	SSE13	SSE14.2	SE23	
7-Jan	SSE16	SSE13	SSE13	SSE14	SSE11	SSE12	SE6	SE5	NW4	NW4	NNW3	WNW3	NNE3	ESE1	SSW3	NW3	NW6	NNW6	NNW5	NNW1	SW5	SW4	SSE4	E3	SSE2.8	SSE16	
8-Jan	S4	UO	UO	SE7	UO	SSE13	SSE11	S8	S8	UO	UO	S6	SSW5	S4	SSE5	S5	SSE3	ESE3	NNE4	NNE5	NE2	SE7	SE8	SE9	SSE4.8	SSE13	
9-Jan	SE11	SE11	SE11	SE8	ESE3	E5	ENE7	SE5	SSE9	SE7	SE7	ESE4	SE6	SSE10	SSE6	S8	S7	SSW5	SW3	SW5	SSW3	SSW5	SSW3	S3	SSE5.4	SE11	
10-Jan	S5	SSE10	SE13	SSE9	SSE9	SSE9	SSE6	SSE6	SSE8	SSE7	SSE5	ESE3	SSW3	SSW2	WSW4	W3	WSW3	SSW4	SW5	SW5	WSW5	W3	NNE5	NNE5	S3.7	SE13	
11-Jan	NNW3	WNW5	WNW5	NW5	NNW5	N5	N2	WSW4	WSW4	SSE4	SSE5	SSE5	SSE7	SSE8	SE9	SSE9	SSE9	SSE7	SE8	SSE10	SSE16	SSE16	SSE16	SSE14	SSE4.9	SSE16	
12-Jan	SSE13	S16	SSE13	SSE13	SSE16	SSE13	SSE15	SSE13	SSE16	SSE18	SSE20	SSE21	SSE20	SSE16	SSE15	SSE16	SSE14	SSE12	SSE12	SSE11	SSE9	SSE10	SSE8	SSE7	SSE14.1	SSE21	
13-Jan	SSE7	SE7	S3	SSE3	SE0	W3	NNE2	NNE9	NNE10	NE5	NE5	NNE4	NE1	NE5	NE6	NE7	NE7	ESE7	E9	ESE9	E12	E10	ESE11	ESE11	E4.3	E12	
14-Jan	SE15	SE15	SE15	SE15	SE17	SE14	SE14	SE14	SE13	SSE12	SSE12	SSE11	SSE9	SSE9	S6	S6	SSW4	WSW4	S2	SW3	SSW2	SSW3	SSW3	SSW3	SSE9.0	SE17	
15-Jan	SSW2	W2	SW1	WSW2	WNW1	NNW2	NNE4	N4	NNW4	NW3	NNW3	WNW3	WNW2	W2	NW2	N4	N4	N4	N2	W1	SE2	SE5	NNE4	NNE2	NNW1.4	SE5	
16-Jan	N2	NNE3	E0	SE2	NNE1	NNE3	NE8	NE7	NNE7	NNE7	ENE9	ENE8	E7	ESE11	ESE13	SE16	SE14	SE11	SE15	SE18	SE18	SE13	SSE11	SSE10	ESE6.6	SE18	
17-Jan	S10	SSW11	SSW11	SSW13	S13	S12	SSE16	SSE15	SSE15	SSE15	SSE15	SSE14	S10	SSW10	S9	S11	S10	S8	S8	SSE14	SSE13	SSE12	SSE14	SSE16	S12.0	SSE16	
18-Jan	SSE14	SSE15	SSE15	SSE12	SSE16	SSE13	SSE14	SSE14	SSE14	SSE14	SSE13	SSE14	SSE12	SSE11	SE12	SE12	SE14	SE15	SE12	SE12	SE11	SE11	SSE12	SSE13	SSE12.8	SSE16	
19-Jan	SSE14	SSE13	SSE14	SSE15	SSE16	SSE17	SSE17	SSE15	SSE15	SSE12	SSE12	S6	SW7WSW10	SSW6	S9	SSW12	SW14	SSW8	SW13	SW10	SSW10	SSW9	S7	S10.3	SSE17		
20-Jan	SW10WSW13WSW11WSW10	SW8	SW6	SSW7	S6	SSE7	SSE9	SE3	S4	WSW8	WSW9WSW15WSW18WSW18WSW18WSW14WSW17	W7	S1	SSE2	S4	WSW8.2	WSW18										
21-Jan	S6	SW10	SSE11	SSE11	S10	SSE12	SSE14	SSE13	SSE12	SSE10	SSE13	SSE12	SSE12	SSE9	SSE9	S9	S8	S7	SSE8	SSE8WSW13	W15	W17	W19	S8.2	W19		
22-Jan	W18	W16	W14WNW16WNW16WNW21	W21	W27	W26	W27	NNW20	NNE26	N13	NNW16	N16	NNE11	N9	N10	NNE10	NNE10	N17	NNE11	NNE6	N4	NW10.9	W27				
23-Jan	NNE2	SSE3	S7	SSE9	SE11	SE12	SE10	SE13	SE15	SE16	SE13	SE13	SE10	SE6	ENE6	ENE6	ENE6	E5	SSE2	SSE7	SSE6	SSE9	SSE8	SE8	SE7.7	SE16	
24-Jan	SE8	SE8	SSE11	SSE10	SE10	SSE10	SE11	SSE11	SSE13	SSE13	SSE11	SSE9	SSE6	ESE2	NE4	N9	N12	NNE11	NNE13	NNE11	NNE7	NNW5	NNW5	NW8	ESE3.2	SSE13	
25-Jan	NNW6	NNE5	N3	WNW3	WNW6	WNW4	WSW3	WNW3	NNE1	N3	WSW3	SSE2	WSW0	SSW3	SSE5	SSE6	SSE9	SSE12	SE12	SE11	SE12	SSE14	SSE12	SSE12	SSE3.4	SSE14	
26-Jan	SSE11	SSE12	SSE8	W22	W24WNW21	N25	N30	N24	N28	N24	N17	N11	NNE9	NNE7	NNE7	NNE13	NNE14	NNE22	NNE23	NNE18	NNE19	NNE18	NNE20	N12.5	N30		
27-Jan	NNE20	NNE19	NNE18	NNE18	NNE11	NNE8	NNE9	N11	NNE21	N17	N15	NNW9	NW10	NW6	W6	NW9	NW11	NNW10	N9	NNW9	WNW8	W12WNW10WNW12	N9.8	NNE21			
28-Jan	WNW12WNW21	W20	W20	W20	W17WNW19WNW19WNW21WNW21WNW22WNW25	NW25	NW24	WNW22WNW20	NW24	NW28	NW27	NNW21	N20	NNW19	NNW15	NNW12	WNW19.0	NW28									
29-Jan	NNW11	W8WSW11	WSW8	WSW7	SW7WSW10	SW9	SSE11	SSE13	SSE12	SSE16	SE11	SSE13	SSE16	S11	SSW9	S6	W9WNW12	NW15	NNW16	NNW16	NW11	WSW3.9	NNW16				
30-Jan	WNW10	NW10	N12	WNW1	WSW4	SW4	SW8	SW9	WSW9	WSW9	WSW4	SSE1	ESE1	ESE3	ESE3	SE4	SSE7	SSE7	SSE3	E2	SE2	NW1	NNW4	NNE9	WSW1.5	N12	
31-Jan	NNE14	NNE17	NNE15	NNE14	NNE11	NNE8	NE7	NE8	NE7	NE7	ENE8	E3	SSE3	SSE3	SE3	ESE3	SSE6	SSE6	SSE6	SSW3	NNE7	NE1	NNW5	NW8	NE4.6	NNE17	

SSE4.4	S4.6	SSE5.0	S4.6	S4.8	S5.3	SSE5.0	SSE4.5	SSE4.7	SSE4.6	SSE4.4	SSE4.6	SSE4.3	SSE4.0	SSE4.3	SSE4.0	S3.6	SSE3.3	SSE2.5	SSE3.2	SSE3.3	SSE3.8	SSE3.2	SSE3.3	Diurnal Average
SE23	SE22	W20	W22	W24WNW21	N25	N30	W26	N28	N24	NNE26	NW25	NW24	WNW22WNW20	NW24	NW28	NW27	NNE23	N20	NNW19	NNE18	SE20	Diurnal Maximum		

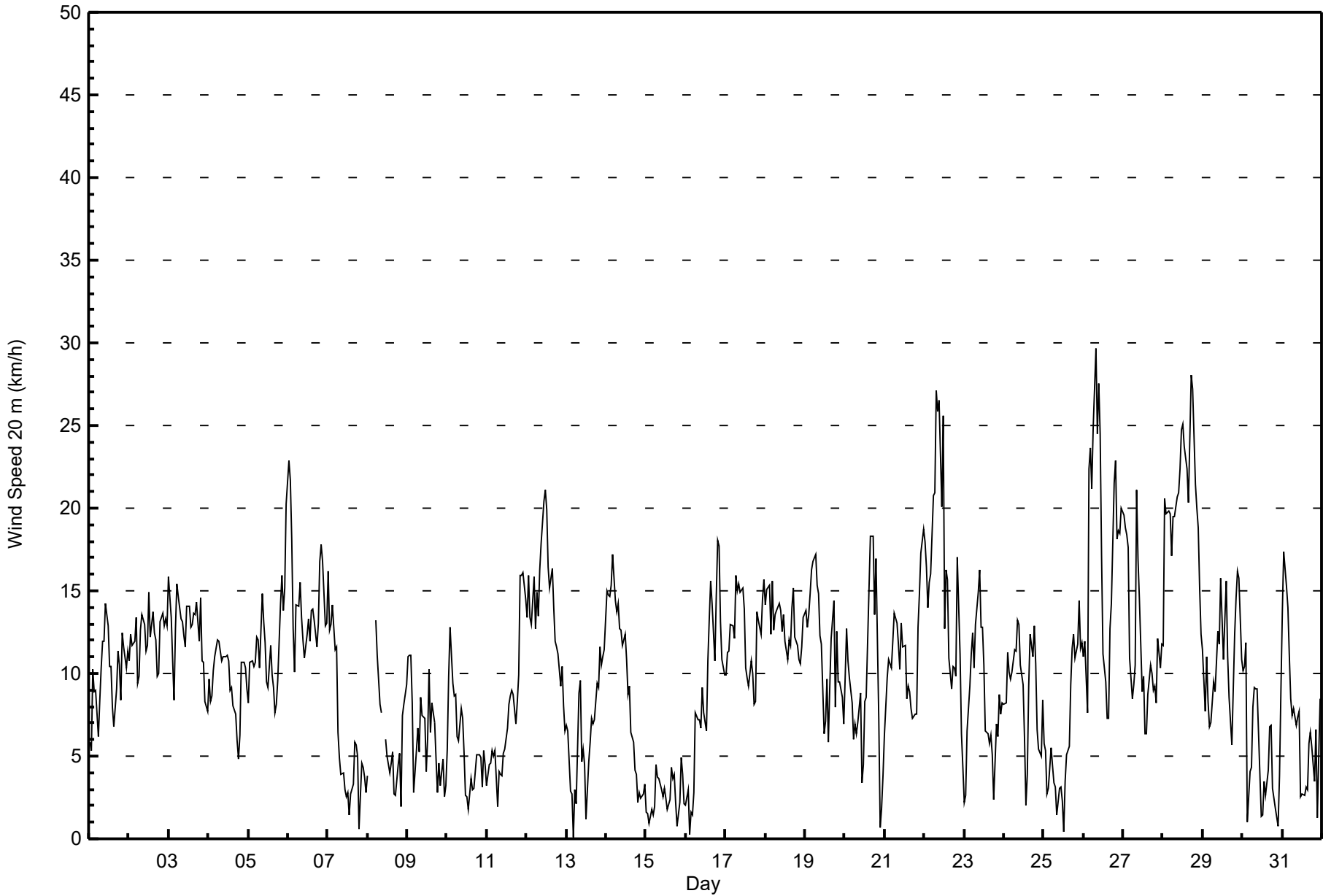
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 15 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																	Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	2	2	2	2	1	1	2	2	2	2	3	2	2	1	2	2	1	2	2	3	2	1	1	3
2-Jan	1	2	2	3	3	3	2	4	2	3	3	3	2	2	2	2	3	2	2	2	4	2	2	2	4
3-Jan	3	2	4	2	2	2	3	2	2	3	2	3	3	3	3	3	2	3	2	2	2	3	2	3	4
4-Jan	1	1	2	1	1	1	1	2	2	2	2	2	1	2	2	2	2	2	1	3	1	1	1	2	3
5-Jan	3	1	2	2	2	3	3	2	3	2	2	2	2	3	2	2	1	2	3	3	4	3	4	4	4
6-Jan	6	5	5	4	3	3	2	3	2	2	3	2	2	2	2	2	1	2	2	3	3	3	2	2	6
7-Jan	3	4	3	2	3	1	2	3	2	1	1	2	2	1	3	2	1	1	2	2	2	1	2	3	4
8-Jan	2	UO	UO	2	UO	4	2	2	2	UO	UO	2	2	1	1	1	2	2	1	1	1	3	3	3	4
9-Jan	3	2	3	3	1	3	2	2	2	2	2	3	2	2	2	2	3	2	1	1	2	2	2	2	3
10-Jan	2	3	4	2	2	1	2	2	2	1	2	2	2	1	1	1	1	1	1	1	1	2	2	2	4
11-Jan	1	1	1	1	1	2	2	1	1	1	2	1	2	2	2	2	2	1	3	3	3	3	3	3	3
12-Jan	3	4	3	3	3	3	3	3	3	4	4	4	4	3	3	3	3	3	2	3	2	2	1	1	4
13-Jan	2	2	2	1	1	2	1	2	2	2	2	1	1	1	2	2	2	3	2	3	3	3	4	4	4
14-Jan	5	4	4	4	5	4	4	3	3	3	3	2	2	2	2	2	1	2	1	1	1	1	1	1	5
15-Jan	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	2
16-Jan	1	1	1	1	1	2	2	2	2	1	3	2	3	4	4	5	4	4	5	5	4	3	2	2	5
17-Jan	3	3	4	4	4	3	3	3	3	3	3	3	4	4	3	3	2	2	1	3	3	2	2	3	4
18-Jan	3	3	3	2	3	2	2	2	3	3	3	2	2	3	3	3	3	4	3	2	2	2	2	2	4
19-Jan	2	2	2	3	3	3	3	3	3	3	3	1	6	3	3	3	3	3	3	3	3	3	3	2	6
20-Jan	3	3	3	4	2	2	1	2	2	2	2	3	4	6	3	3	3	3	2	3	7	2	1	1	7
21-Jan	2	3	2	2	1	2	3	3	3	3	3	2	3	3	2	2	2	1	1	2	4	3	3	3	4
22-Jan	3	3	2	3	4	4	4	6	5	6	6	6	4	4	4	3	3	2	3	3	4	3	3	2	6
23-Jan	2	3	2	2	3	4	3	5	5	4	4	4	3	3	2	2	2	3	1	1	2	2	2	2	5
24-Jan	2	2	2	3	2	3	3	3	3	3	3	2	2	1	1	4	3	4	4	3	2	3	2	2	4
25-Jan	2	2	2	1	1	2	2	1	1	1	2	1	1	2	1	2	2	3	3	3	3	3	3	4	4
26-Jan	3	3	3	6	4	5	7	8	7	8	7	5	4	2	2	2	5	5	6	6	5	6	5	5	8
27-Jan	6	5	5	5	4	3	4	4	6	5	4	3	3	2	1	2	3	2	2	2	2	1	2	2	6
28-Jan	3	4	3	3	3	2	3	4	4	4	4	5	6	6	7	6	5	6	8	7	6	5	5	3	8
29-Jan	3	1	1	2	2	2	2	2	2	3	3	2	2	3	3	3	3	1	4	2	4	5	4	3	5
30-Jan	2	2	4	2	3	2	2	1	1	4	3	1	1	1	1	3	2	2	2	1	1	2	1	3	4
31-Jan	5	4	4	3	2	3	2	2	2	2	2	2	1	1	1	1	2	2	2	1	3	1	2	2	5
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Mannix - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	161	21.79	21.79
6 - 11	287	38.84	60.62
12 - 19	248	33.56	94.18
20 - 28	42	5.68	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Mannix - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	17	7	0	6	10	11	17	10	17	9	12	6	10	7	12	161
6 - 11	6	22	9	7	3	5	33	113	32	10	12	12	4	4	9	6	287
12 - 19	8	13	0	0	1	1	34	154	3	2	2	8	8	7	1	6	248
20 - 28	5	6	0	0	0	0	3	3	0	0	0	0	9	9	5	2	42
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	30	58	16	7	10	16	81	287	45	29	23	32	27	30	22	26	739

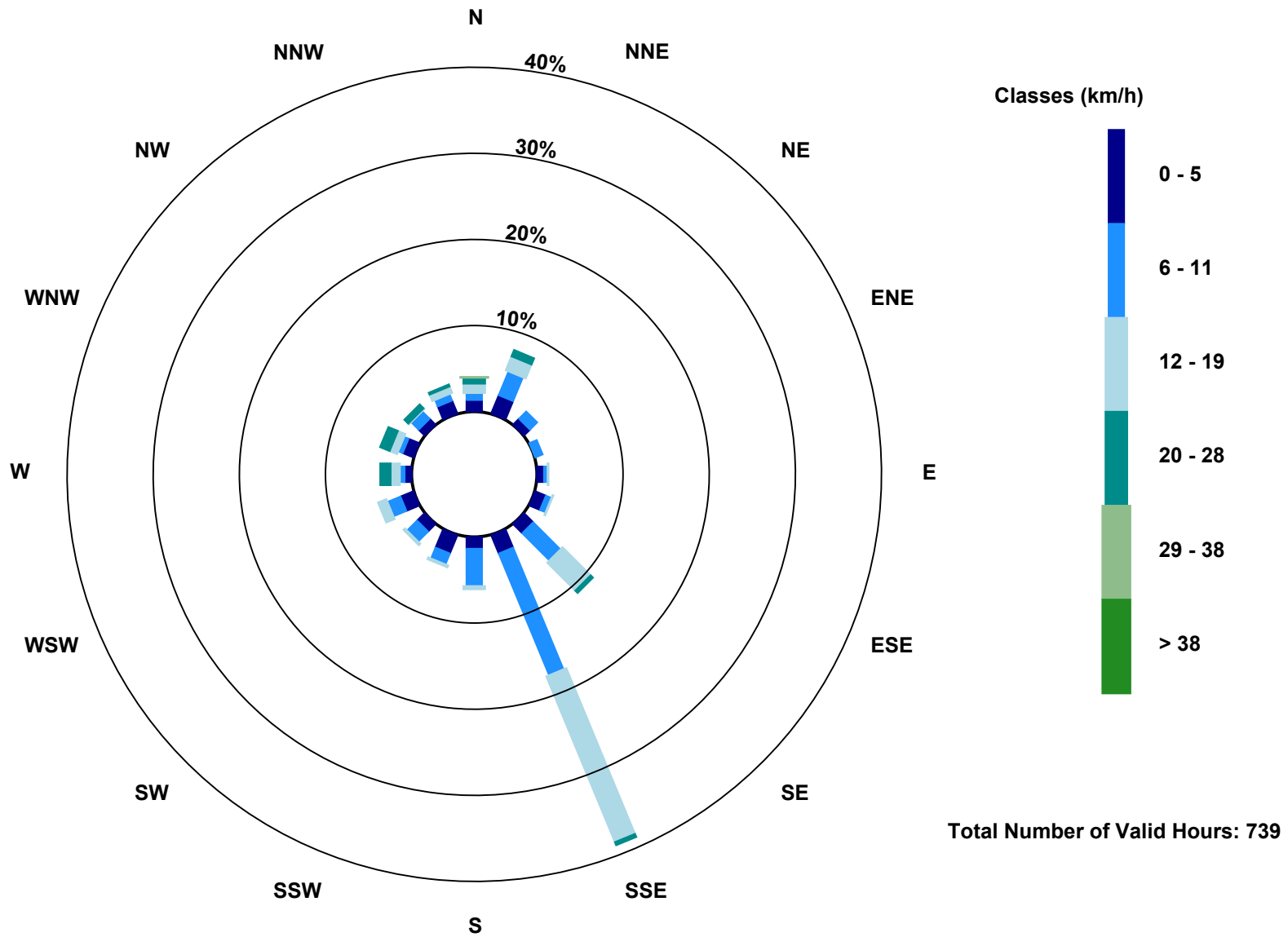
Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 20 m (WS20m) - km/h
Mannix





Maximum Speed: 38 km/h on Jan 26 08:00	Maximum Daily Speed Average: 24.4 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 15 03:00	Minimum Daily Speed Average: 1.3 km/h on Jan 15	Hours of Data: 696
Maximum Diurnal Speed Average: 7.4 km/h at hour 8	Minimum Diurnal Speed Average: 3.7 km/h at hour 19	Hours of Missing Data: 48
Monthly Average Velocity: 5.9 km/h 164.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 8 Median = 15 Q ₃ = 20 P ₉₀ = 24 P ₉₉ = 32	Percent Operational Time: 93.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SSW10	SW10	SW15	SW12	WSW12	SW9	S13	SSE15	SSE16	SSE16	SSE19	SSE17	SSE14	SSE14	S11	SW12	SSW15	S16	S12	SSW12	S17	SSE16	SSE11	SSE15	\$12.2	SSE19
2-Jan	SSE16	SSE20	SSE19	SSE21	SSE22	SSE19	SSE19	SSE23	SSE25	SSE24	SSE19	SSE21	SSE25	SSE22	SSE24	SSE22	SSE22	SSE21	S17	SSE20	SSE24	SSE23	SSE21	SSE22	SSE21.2	SSE25
3-Jan	SSE26	SSE24	S20	SSE18	SSE23	S26	SSE25	SSE24	SSE23	SSE21	SSE19	SSE21	SSE21	SSE19	SSE20	SSE22	SSE23	SSE24	SSE21	SSE24	SSE20	SSE20	SE16	SE16	SSE21.4	SSE26
4-Jan	SSE17	SSE16	SSE13	SSE11	SSE14	SSE18	SSE21	SSE20	SSE19	SSE20	SSE17	SSE13	SSE14	SSE15	SSE14	SE13	SE11	SE11	SE14	SSE18	SSE18	SSE17	SSE17	SSE15.7	SSE21	
5-Jan	SE16	SE19	SSE18	SSE21	SE23	SE23	SSE25	SSE22	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SE22	SE19	SE22	SE27	---	SE27
6-Jan	SE30	SE29	SE24	SE19	SE18	SE23	SE22	SE22	SSE21	SSE19	SSE19	SSE19	SSE19	SSE17	SSE20	SSE21	SSE23	SSE21	SSE24	SSE27	SSE28	SSE27	SSE22	SSE21	SSE21.9	SE30
7-Jan	SSE26	SSE22	SSE21	SSE20	S17	S12	S10	SSE8	NW9	NW9	NNW6	NW5	N4	ENE1	SSW3	NNW4	NW7	NNW9	NNW7	NNE1	SW5	SW5	SSE5	SSE8	\$4.0	SSE26
8-Jan	SSE14	SSE16	SSE12	SSE17	UO	UO	UO	UO	UO	UO	UO	UO	UO	SSE7	SSE8	SSE7	SE8	ESE5	NE4	NE9	ENE4	SE10	ESE10	SE11	---	SSE17
9-Jan	SE14	SE15	SE14	ESE10	ESE5	E7	ENE8	SE6	SE10	SE9	SE9	E5	SE7	SSE12	SSE8	S10	S11	S7	SSW3	SW5	S5	S7	S4	S6	SE6.9	SE15
10-Jan	S7	SE12	SE16	SSE11	SSE10	SSE10	SSE7	SE7	SSE9	SSE8	SSE6	E3	SSW3	S1	WSW4	W3	WSW3	SSW5	SW6	SW6	WSW6	WNW4	NNE6	NNE5	SSE4.3	SE16
11-Jan	NNW4	WNW5	WNW5	NW6	NNW6	N7	N3	WSW4	WSW5	S4	SSE6	SSE6	SSE7	SE9	SE10	SSE11	SSE11	SSE11	SE12	SSE15	SSE23	SSE21	SSE22	SSE19	SSE6.4	SSE23
12-Jan	SSE19	SSE21	SSE19	SSE18	SSE21	SSE18	SSE21	SSE19	SSE22	SSE24	SSE27	SSE27	SSE25	SSE21	SSE20	SSE21	SSE18	SSE16	SSE15	SSE14	SSE12	SSE13	SSE11	SSE9	SSE18.8	SSE27
13-Jan	SSE9	SE9	SSE5	SE4	NE3	WNW3	NNE5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SSE9
14-Jan	UO	UO	SE17	SE19	SE21	SE18	SE17	SE18	SE16	SE16	SE14	SSE15	SSE12	SSE10	SSE11	SSE9	S8	SSW6	WSW5	S2	SW3	S4	SSW3	S4	SSE10.4	SE21
15-Jan	S2	WNW1	ENE0	WSW2	NW2	N3	NNE5	NNE5	N3	NNW4	NNW3	WNW2	WNW2	WSW1	WNW2	N5	N5	NNE4	ENE2	SSE2	SE5	SE6	NE3	ENE3	NNE1.3	SE6
16-Jan	NE2	NE4	ENE1	ESE3	ENE2	NE3	NE10	NE9	NNE9	NE9	ENE11	ENE10	E8	E13	ESE16	SE18	SE17	ESE11	SE19	SE22	SE22	SE17	SSE15	SSE13	ESE8.8	SE22
17-Jan	S15	SSW16	SSW17	SSW20	S19	S17	SSE20	SSE19	SSE19	SSE19	SSE19	SSE18	S15	S15	S14	SSE16	S18	S14	SSE14	SSE21	SSE21	SSE19	SSE21	SSE22	SSE17.3	SSE22
18-Jan	SSE20	SSE22	SSE21	SSE17	SSE21	SSE17	SSE20	SSE21	SSE21	SSE18	SSE16	SSE18	SE16	SE13	SE16	SE16	SE19	SE21	SE18	SE18	SE16	SE15	SE19	SE21	SE17.9	SSE22
19-Jan	SSE20	SSE18	SSE19	SSE21	SSE24	SSE24	SSE25	SSE23	SSE21	SSE19	SSE17	SSW10	SW12	SW12	SSW10	S16	SSW21	SW23	SSW15	SW20	SW15	SSW16	SSW14	SSW11	\$15.3	SSE25
20-Jan	SW14	WSW18	WSW16	WSW15	WSW12	SW9	SW10	SW11	S8	SSW10	S5	SW5	WSW12	WSW12	WSW21	WSW25	SW27	WSW28	WSW23	WSW25	WSW13	WSW4	SW3	SW6	SW13.4	WSW28
21-Jan	SW9	SW14	SSE17	S17	S18	SSE18	SSE21	SSE21	SSE19	SSE18	SSE21	SSE20	SSE19	SSE13	S14	SSW15	SSW14	SSW13	SSW10	SSW9	WSW19	WSW19	WSW21	W23	\$13.1	W23
22-Jan	W23	W21	W20	W20	WNW22	W26	W27	W32	W31	W32	NW26	NNE32	UO	NNW22	N20	N14	N12	N14	NNE14	N14	N24	NNE15	NNE9	NNE5	NW14.0	NNE32
23-Jan	NE3	SE4	S10	SSE13	SE13	SE15	SE12	ESE15	SE18	SE19	SE15	SE15	SE13	ESE7	NE7	ENE6	NE7	E5	SSE3	SE8	SSE7	SE11	SE9	SE10	SE9.2	SE19
24-Jan	SE10	SE10	SSE14	SE12	SE12	SSE13	SSE14	SSE15	SSE19	SSE18	SSE15	SSE13	S7	SW2	NNE7	NNW14	N17	NNE14	NNE17	N14	N8	N7	NNW6	NW10	ESE3.9	SSE19
25-Jan	NNW7	NNE7	N3	NW3	WNW6	WNW5	W4	NW4	NNE2	N4	SW3	SE3	WSW1	SSW4	SSE6	SSE7	SSE12	SSE15	SE16	SE14	UO	UO	UO	UO	SSE1.9	SE16
26-Jan	UO	UO	UO	W30	W29	WNW29	N32	N38	N32	N37	N33	NNW23	NNW15	N11	NNE9	NNE9	NNE16	N19	NNE27	NNE29	NNE23	N25	NNE24	N27	N20.5	N38
27-Jan	N25	N25	N24	NNE23	NNE16	NNE12	NNE13	N14	N29	N22	N18	NNW11	NW11	WNW7	W7	NNW12	NNW16	NNW16	N12	NNW15	WNW12	W16	WNW16	W17	NNW13.7	N29
28-Jan	WNW16	W26	W23	W25	W24	W20	W25	WNW26	WNW27	W26	WNW28	WNW31	NW32	NW30	WNW29	WNW25	WNW31	NW36	NW35	NNW29	NNW27	NNW26	NNW22	NNW19	WNW24.4	NW36
29-Jan	NNW18	WNW10	WSW12	W15	W13	WSW12	WSW16	SW15	S14	SSE16	SSE16	SSE19	SSE13	SSE17	SSE20	S18	SSW16	SSW10	W16	WNW20	NW23	NNW23	NNW23	NW15	WSW6.5	NNW23
30-Jan	WNW14	NW16	N17	N4	W4	SSW3	SW9	WSW12	WSW15	WSW15	WSW8	SW2	WSW2	ESE2	ESE3	SE4	SSE9	SSE10	SSE4	E3	SE3	E2	N6	N12	W2.3	N17
31-Jan	NNE18	NNE21	NNE19	NNE17	NNE14	NNE11	NE9	NE9	NE9	NE9	ENE8	E2	SSE3	S3	SE3	ESE3	SE5	SE6	SSE7	SSE7	NNE8	NE4	NNW6	NNW10	NNE6.2	NNE21

SSE6.0	S6.4	SSE7.4	S7.1	S7.0	S7.0	SSE7.2	SSE7.4	SSE6.9	SSE6.5	SSE6.4	SSE6.3	SSE6.6	SSE5.5	SSE6.2	S6.0	S6.1	S5.0	SSE3.7	SSE4.1	SSE4.5	SSE5.1	SSE4.4	SSE4.7	Diurnal Average	
SE30	SE29	SE24	W30	W29	WNW29	N32	N38	N32	N37	N33	NNE32	NW32	NW30	WNW29	WNW25	WNW31	NW36	NW35	NNE29	SSE28	SSE27	NNE24	SE27	Diurnal Maximum	

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods

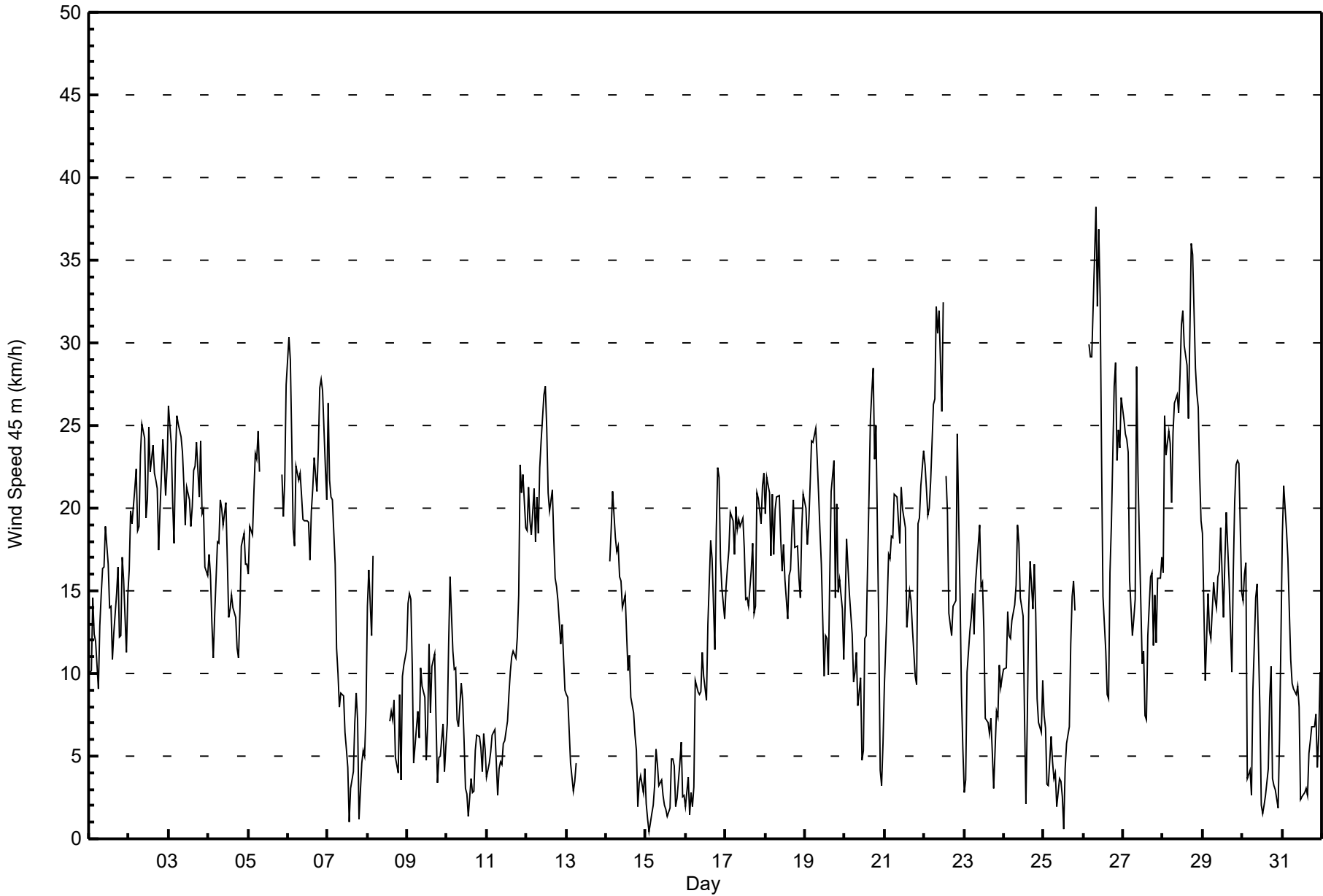


Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 45 m (WS45m) - km/h

Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Jan 20 21:00 Minimum Value: 0 km/h on Jan 15 05:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7													Hours in Service: 744 Hours of Data: 696 Hours of Missing Data: 48 Hours of Calibration: 0 Percent Operational Time: 93.6												
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	2	2	2	1	1	2	2	2	2	2	3	2	2	1	2	3	1	2	1	3	3	2	3	3
2-Jan	2	2	2	3	3	5	3	4	2	2	3	3	2	2	1	2	3	3	2	4	4	2	2	3	5
3-Jan	2	3	5	1	2	2	4	2	2	3	1	3	2	4	3	3	2	2	2	2	2	3	2	3	5
4-Jan	2	2	1	1	2	2	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2
5-Jan	3	1	2	1	2	2	2	2	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	3	4	4
6-Jan	5	4	5	3	3	3	2	3	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	3	5
7-Jan	3	5	3	3	3	1	2	3	2	1	1	2	3	1	3	3	1	1	2	2	1	1	2	2	5
8-Jan	3	3	3	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	1	1	1	2	2	1	2	2	4	3	3	4
9-Jan	3	2	3	3	2	3	2	3	2	2	2	2	3	2	2	2	2	2	1	1	1	2	2	2	3
10-Jan	1	3	3	2	1	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	3	3
11-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	1	3	3	3	3	3	3	3
12-Jan	3	4	3	3	3	2	3	4	3	4	3	3	4	3	3	2	2	2	2	2	2	2	2	2	4
13-Jan	2	3	2	2	2	1	2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	3
14-Jan	UO	UO	4	4	5	3	4	3	3	3	3	2	1	1	2	2	1	2	1	1	1	1	1	1	5
15-Jan	1	0	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	2	3	2	1	3
16-Jan	1	1	1	2	2	3	2	2	2	2	3	2	3	4	5	5	4	4	5	5	4	3	2	3	5
17-Jan	4	2	3	3	3	2	3	3	2	3	3	3	2	3	2	2	1	3	1	2	4	2	2	3	4
18-Jan	3	3	3	3	3	2	2	1	3	3	2	2	2	3	3	3	3	3	3	2	2	2	2	1	3
19-Jan	2	2	2	3	3	3	3	3	3	3	4	2	6	3	3	2	2	3	3	3	3	3	3	3	6
20-Jan	3	3	3	5	3	3	2	3	2	2	2	4	4	6	3	3	3	3	2	3	10	3	2	2	10
21-Jan	2	3	2	2	1	2	3	3	2	3	3	2	2	3	2	2	2	2	2	3	4	3	3	2	4
22-Jan	3	3	2	3	4	4	5	5	5	6	5	6	UO	4	4	3	4	2	3	4	4	3	4	2	6
23-Jan	2	3	1	2	3	4	3	6	5	4	5	4	3	3	2	2	1	3	2	2	1	2	2	2	6
24-Jan	2	2	2	3	2	2	3	3	2	3	3	2	2	3	2	3	4	3	5	3	2	2	3	2	5
25-Jan	2	2	2	1	1	2	1	1	1	1	2	2	1	2	1	2	2	2	3	3	UO	UO	UO	UO	3
26-Jan	UO	UO	UO	4	4	4	7	8	7	9	8	5	4	2	2	3	5	5	7	6	5	7	6	5	9
27-Jan	6	5	5	5	5	4	5	5	5	5	3	2	3	2	1	4	2	2	3	2	3	1	2	2	6
28-Jan	3	3	3	3	3	3	3	4	4	4	4	4	6	6	6	5	5	5	8	5	6	4	5	4	8
29-Jan	4	2	2	1	4	2	2	2	1	1	3	2	2	3	3	3	3	1	5	3	3	4	4	3	5
30-Jan	1	2	4	3	2	2	2	2	3	4	4	1	1	1	1	3	1	1	2	1	1	2	2	3	4
31-Jan	5	5	3	3	2	4	2	3	2	2	2	2	1	2	1	1	1	1	1	1	4	2	3	2	5
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	114	16.38	16.38
6 - 11	143	20.55	36.93
12 - 19	252	36.21	73.13
20 - 28	163	23.42	96.55
29 - 38	24	3.45	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 696

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 45 m (WS45m) - km/h
Mannix - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	8	9	8	7	6	6	7	7	10	7	9	10	3	9	4	4	114
6 - 11	5	9	10	5	2	4	22	36	10	9	10	2	1	3	6	9	143
12 - 19	11	13	0	0	0	3	47	102	21	11	9	16	4	5	2	8	252
20 - 28	8	5	0	0	0	0	14	94	2	2	3	6	14	6	1	8	163
29 - 38	6	2	0	0	0	0	2	0	0	0	0	0	5	4	4	1	24
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	38	18	12	8	13	92	239	43	29	31	34	27	27	17	30	696

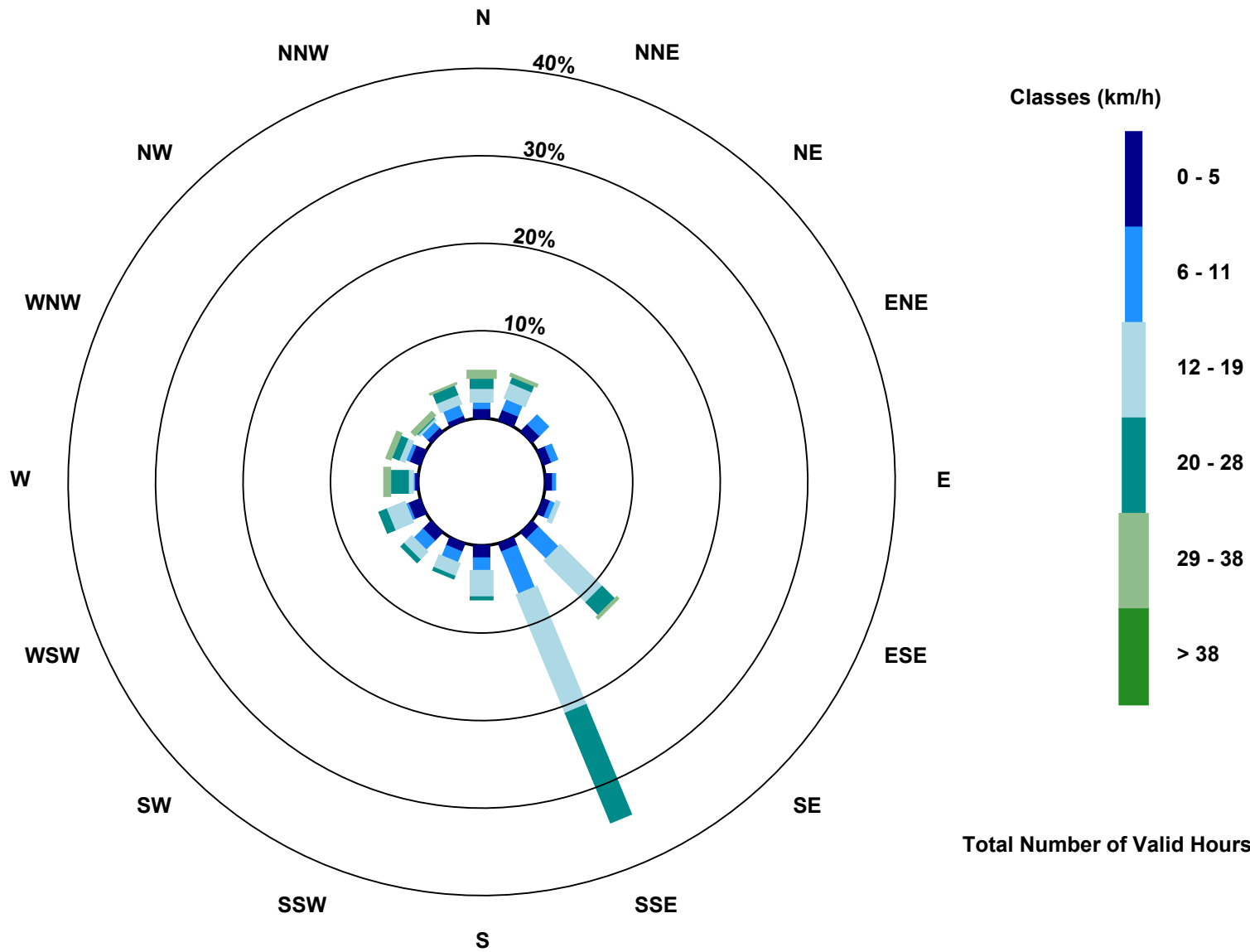
Total Number of Valid Hours: 696

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 45 m (WS45m) - km/h
Mannix





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed 75 m (WS75m) - km/h

Mannix - January 2023

Maximum Speed: 43 km/h on Jan 26 08:00	Maximum Daily Speed Average: 27.1 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 1 km/h on Jan 25 13:00	Minimum Daily Speed Average: 1.5 km/h on Jan 15	Hours of Data: 695
Maximum Diurnal Speed Average: 8.7 km/h at hour 9	Minimum Diurnal Speed Average: 3.9 km/h at hour 23	Hours of Missing Data: 49
Monthly Average Velocity: 6.6 km/h 176.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 9 Median = 16 Q ₃ = 23 P ₉₀ = 28 P ₉₉ = 36	Percent Operational Time: 93.4

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SW11	SW16	SW18	SW15	WSW14	SW11	SSW10	S14	S15	SSE17	SSE21	SSE20	SSE17	SSE15	SSW12	SW15	SSW16	SSW12	SSW11	SW15	SSW16	S13	S6	S10	SSW12.5	SSE21	
2-Jan	S10	SSE18	SSE25	SSE25	S29	SSE26	S27	SSE24	SSE31	SSE34	SSE27	S17	SSE19	S20	S20	S16	S14	S20	SW16	S12	S23	S26	S20	S20	S21.2	SSE34	
3-Jan	S27	S31	S28	S22	S17	S24	S25	SSE18	SSE19	S17	S16	SSE23	SSE25	SSE20	SSE21	SSE23	SSE29	S27	SSE26	SSE28	SSE20	SSE17	SSE18	SSE18	S22.2	S31	
4-Jan	S14	SSW7	SW8	SW8	SSW9	SSW10	SSW10	S11	S11	S14	S12	S9	SSE11	SSE14	SSE16	SSE15	SSE15	S9	S6	S7	S10	S10	SSW8	S10	S10.1	SSE16	
5-Jan	SSE15	SSE18	SSE21	S13	SSE21	SSE26	SSE31	SSE29	SSE31	SSE28	SSE29	SSE26	SSE21	SE24	SE19	SE17	SE17	SE22	SE29	SE29	SE24	SE22	SE27	SE31	SSE23.4	SE31	
6-Jan	SE35	SE31	SE26	SE22	SE24	SE31	SE28	SE28	SE25	SSE24	SSE25	SSE26	SSE25	S21	SSE24	SSE25	SSE29	SSE28	S25	S28	SSE33	SSE30	S19	S14	SSE25.3	SE35	
7-Jan	SSE17	S19	SSW20	S13	SSW18	SW14	WSW8	WSW3	NW11	NW10	NNW9	NW7	N6	N1	S1	N5	NW5	N8	N8	NE2	S3	SSE5	SSE10	SSE12	SW3.6	SSW20	
8-Jan	SSE17	SSE15	SSE17	SSE18	SSE26	SE25	SE18	SSE21	SSE22	SE14	SE14	SE17	SSE14	SSE14	SSE11	SE11	SE11	ESE6	E4	ENE11	E6	SE8	ESE9	SE10	SE13.4	SSE26	
9-Jan	SE15	SE16	SE12	ESE8	ESE5	E7	E8	SE5	SE10	SE9	SE7	E4	SE6	SSE12	SSE8	S11	S13	S8	SSW4	SW5	S7	S8	S6	S7	SSE7.2	SE16	
10-Jan	SSE8	SE13	SE16	SSE12	SSE10	SE12	SSE7	SE6	SSE11	SE9	SE6	E3	SSW2	SE1	WSW4	W3	W2	SW5	SW7	SW7	WSW7	WNW5	NNE7	NNE6	SSE4.3	SE16	
11-Jan	N4	NW4	NW5	UO	UO	UO	UO	UO	UO	SSW5	S5	UO	UO	UO	UO	SSE11	SSE12	SSE13	SE14	SSE19	SSE26	SSE23	SSE25	SSE20	----	SSE26	
12-Jan	SSE21	S23	S21	S21	SSE24	SSE21	SSE26	SSE24	SSE28	SSE30	SSE31	SSE32	SSE28	SSE25	SSE24	SSE25	SSE22	SSE19	SSE17	SSE16	SSE11	SSE15	S8	SSW8	SSE21.4	SSE32	
13-Jan	S7	SE6	SE4	ESE2	NE6	N4	NNE9	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	----	NNE9	
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	SE17	SSE18	UO	UO	SSE13	SSE11	SSE12	SSE10	S8	SW7	WSW6	SSW2	SW4	SSW5	SW2	SSW3	----	SSE18
15-Jan	S2	N1	ENE1	SSW1	NNW1	N3	NE6	NE5	NNE3	NNE3	NE2	SSE1	S2	S2	WSW1	NNE4	ENE3	SE3	SE5	SE6	SE4	E2	E3	ENE1.5	SE6		
16-Jan	E2	ENE4	ENE3	SE4	E3	ENE4	ENE11	NE10	NE10	ENE10	ENE13	E10	ESE8	ESE11	ESE12	SE14	SE14	SE9	SE20	SE23	SE22	SE19	SSE19	SSE16	ESE9.4	SE23	
17-Jan	S18	SSW19	SSW21	SSW23	S22	S20	SSE23	SSE21	SSE22	SSE22	SSE22	S19	S16	SSW16	S16	S19	S22	SSE17	SSE18	SSE27	SSE27	SSE26	SSE26	SSE28	S20.7	SSE28	
18-Jan	SSE24	SSE27	SSE26	SSE22	SSE25	SSE21	SSE26	SSE26	SSE25	SSE21	SSE19	SSE20	SSE19	SE15	SE17	SE18	SE20	SE24	SE22	SE23	SE20	SE19	SE22	SE24	SSE21.7	SSE27	
19-Jan	SSE25	SSE22	SSE25	SSE26	SSE31	SSE30	SSE28	SSE28	SSE27	S24	S21	SW14	SW16	SW15	SSW13	S20	SSW25	SW27	SW18	SW24	SW19	SW19	SW17	SW15	S18.9	SSE31	
20-Jan	SW17	WSW22	WSW21	WSW19	WSW16	SW12	SW11	SW15	SW12	SW13	SW8	WSW12	WSW15	WSW15	WSW24	WSW30	WSW32	WSW35	WSW30	WSW31	WSW18	WSW8	WSW8	WSW6	WSW17.6	WSW35	
21-Jan	WSW11	WSW19	S19	SSW21	SSW17	SSE16	S24	S26	S24	S25	S24	S20	S19	S15	SSW16	SSW19	SSW18	SW16	SW13	SW14	WSW24	WSW23	WSW25	W27	SSW16.7	W27	
22-Jan	W26	W25	W23	WNW23	WNW26	W29	W30	W36	W35	W35	NNW28	UO	UO	UO	UO	N15	N14	NNE17	NNE18	NNE18	N28	NNE18	NNE11	NE6	NW15.9	W36	
23-Jan	NE3	ESE4	S12	SSE14	SE9	SE13	SE13	SE14	SE17	SE14	SE13	SE14	SE12	ESE7	ENE7	ENE6	ENE7	E5	SSE3	SE6	SSE8	SE12	SE11	SE11	SE8.9	SE17	
24-Jan	SE12	SSE13	SSE16	SE14	SE14	SSE16	SSE17	SSE21	SSE25	SSE24	SSE22	SSE20	SSW9	W10	N11	N16	N19	NNE16	NNE19	NNE16	NNE9	N8	N7	NW9	SE5.0	SSE25	
25-Jan	NNW8	NNE8	NNE4	NNW3	NW5	WNW4	W4	NW5	NNE2	N4	SW3	SSE3	SSW1	S4	SSE7	SSE7	SSE14	SSE16	SE17	UO	UO	UO	UO	UO	SSE1.6	SE17	
26-Jan	UO	UO	UO	W34	W34	WNW34	N36	N43	N36	N41	N36	N27	N17	N12	NNE9	NNE9	NNE19	N22	NNE31	NNE32	NNE26	NNE28	NNE26	NNE30	N23.0	N43	
27-Jan	NNE29	NNE27	NNE28	NNE27	NNE19	NNE16	NNE17	N17	NNE33	N25	N19	N11	NW12	WNW8	WNW7	NNW15	NNW20	N20	N14	NNW19	NW16	WNW18	WNW21	WNW22	N16.5	NNE33	
28-Jan	WNW20	WNW29	W26	WNW28	W27	W23	WNW28	WNW31	WNW31	WNW28	WNW31	WNW34	NW35	NW32	WNW30	WNW27	NW33	NW39	NW39	NNW32	N31	N31	N26	NNW24	NW27.1	NW39	
29-Jan	NNW26	NW13	W13	W21	W20	W18	WSW21	WSW19	SW16	SSW16	S17	S21	SSE16	SSE20	SSE23	S21	SSW19	SW13	W21	WNW26	NNW30	N28	NNW28	NNW18	WSW9.2	NNW30	
30-Jan	NW16	NNW20	N19	N6	NW3	S2	SW10	WSW16	WSW21	W22	W13	W6	W5	NW1	SSE2	SSE3	SSE8	SSE11	SSE6	E3	SE3	ENE2	N7	NNE14	WNW3.8	W22	
31-Jan	NNE22	NNE24	NNE21	NNE19	NNE15	NNE12	NE11	NE10	NE11	NE11	ENE8	E2	S2	S3	SE3	SE2	SE4	SE5	S7	S7	NE4	NE7	N6	N12	NE6.9	NNE24	
S5.6 S6.2 S7.8 SSW7.6 SSW7.9 S8.0 S7.8 S7.9 SSE8.7 S8.2 SSE7.4 S8.5 S7.9 S7.8 S7.9 S6.7 S7.1 S5.8 S4.7 S4.5 S4.3 SSE4.8 S3.9 S3.9																								Diurnal Average			
SE35 SE31 S28 W34 W34WNW34 N36 N43 N36 N41 N36WNW34 NW35 NW32WNW30WSW30 NW33 NW39 NW39 NNW32 SSE33 N31 NNW28 SE31																								Diurnal Maximum			

UO - Unstable Operation

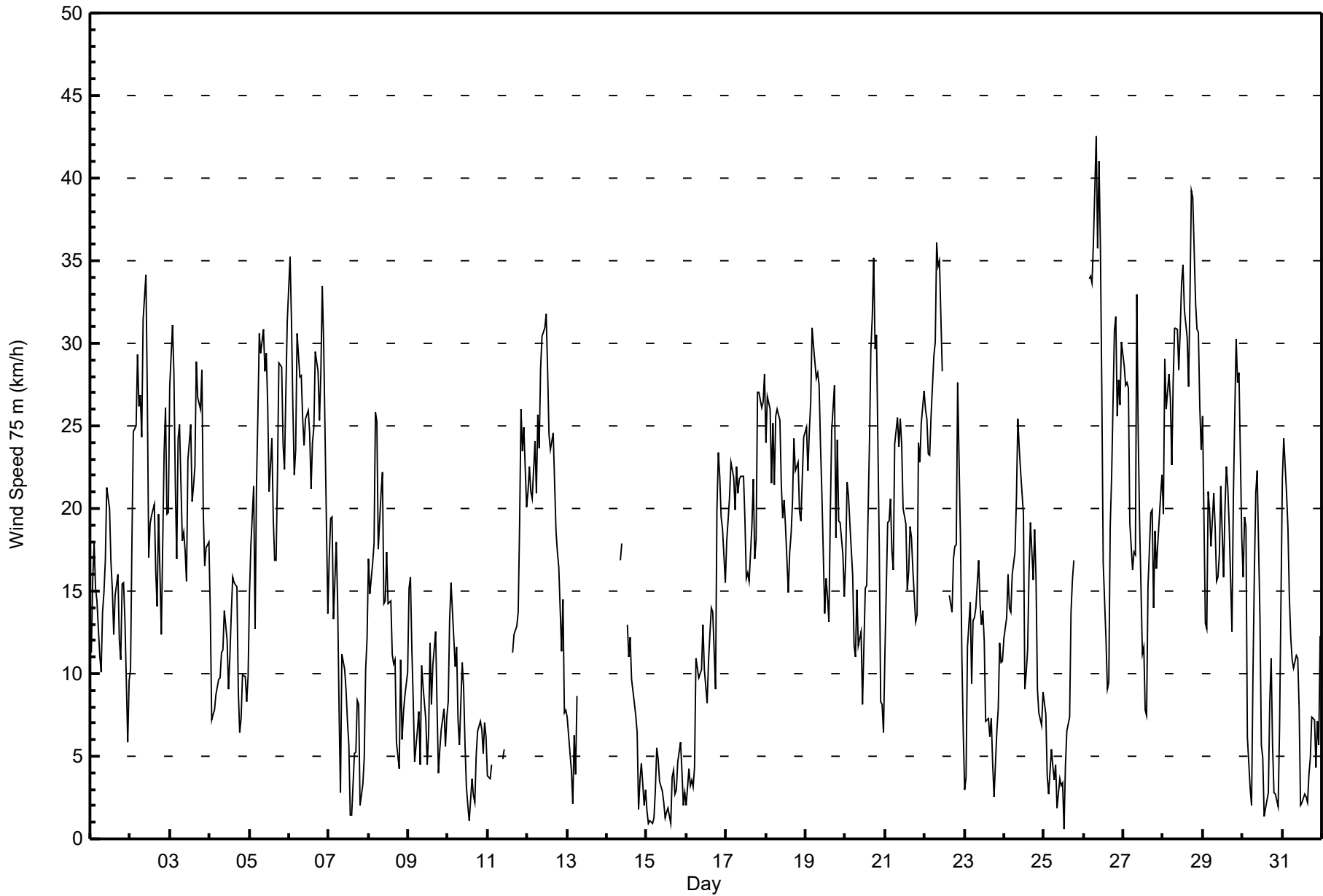
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Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 75 m (WS75m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 11 km/h on Jan 20 21:00 Minimum Value: 0 km/h on Jan 15 05:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 5 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 695 Hours of Missing Data: 49 Hours of Calibration: 0 Percent Operational Time: 93.4							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	2	2	2	2	2	1	1	2	2	1	3	2	1	1	1	2	3	1	2	2	2	5	1	4	5
2-Jan	2	3	1	2	2	5	2	3	3	1	4	2	2	2	2	2	3	3	2	3	5	2	4	3	5
3-Jan	4	1	4	2	2	2	3	2	3	4	4	3	2	2	3	3	1	2	1	2	1	2	2	1	4
4-Jan	2	2	2	1	1	1	1	2	1	1	2	2	3	1	3	2	2	2	1	2	2	1	2	2	3
5-Jan	2	3	4	2	3	1	2	1	1	1	1	1	2	1	3	2	3	5	2	4	8	7	5	3	8
6-Jan	5	6	6	5	3	2	2	3	3	2	2	2	1	2	1	2	2	1	2	2	2	2	4	3	6
7-Jan	4	4	2	2	2	1	3	3	2	2	2	1	2	1	2	3	1	2	3	2	1	2	2	3	4
8-Jan	1	1	2	1	2	3	2	2	4	1	1	2	1	1	2	1	3	2	2	1	3	3	4	4	4
9-Jan	5	3	3	3	2	3	2	3	3	3	2	2	3	2	2	2	2	2	1	1	1	2	2	2	5
10-Jan	1	3	4	2	1	1	3	3	2	2	3	1	1	2	1	1	1	1	1	1	1	1	2	3	4
11-Jan	1	1	1	UO	UO	UO	UO	UO	UO	1	1	UO	UO	UO	UO	2	2	1	3	2	3	3	3	2	3
12-Jan	2	3	3	4	4	3	2	4	3	4	2	3	3	2	2	2	2	2	2	2	2	3	2	2	4
13-Jan	2	2	3	1	4	2	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	3	3	UO	UO	1	1	1	2	1	2	1	1	1	1	2	1	3
15-Jan	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	1	3
16-Jan	1	3	1	2	2	3	2	2	2	1	3	3	3	3	5	5	5	4	6	5	5	3	2	3	6
17-Jan	4	2	3	3	3	2	3	3	2	3	3	3	2	2	2	1	3	2	2	3	1	2	2	4	
18-Jan	3	2	2	3	3	2	2	2	2	3	2	2	2	3	4	4	4	3	3	2	2	2	2	1	4
19-Jan	1	2	2	3	3	2	2	2	3	2	3	2	5	4	3	2	3	3	4	3	4	3	3	3	5
20-Jan	3	3	3	6	4	4	3	3	3	2	3	5	4	6	3	3	3	3	2	3	11	3	4	2	11
21-Jan	3	4	3	2	3	4	2	2	3	2	2	1	1	2	3	2	2	2	3	4	5	3	3	3	5
22-Jan	3	3	2	4	4	4	5	6	5	6	5	UO	UO	UO	UO	3	5	2	3	4	3	3	5	2	6
23-Jan	2	3	1	2	4	5	4	8	6	6	6	5	4	3	2	2	1	2	2	2	1	2	2	2	8
24-Jan	2	2	2	3	3	3	3	3	2	2	3	3	2	3	2	3	3	5	4	3	2	3	3	2	5
25-Jan	2	2	3	1	1	2	1	1	1	1	2	2	1	2	2	2	2	2	3	UO	UO	UO	UO	UO	3
26-Jan	UO	UO	UO	4	4	4	7	8	7	9	7	4	5	2	3	3	5	5	7	6	5	6	6	4	9
27-Jan	6	5	5	5	5	5	5	5	5	5	3	3	2	2	2	4	2	2	3	3	3	2	2	2	6
28-Jan	3	3	3	3	3	3	3	4	3	4	4	5	6	6	5	5	5	8	5	6	4	4	4	3	8
29-Jan	3	3	3	2	5	2	2	2	2	1	3	1	2	3	3	2	2	2	5	2	4	4	4	3	5
30-Jan	1	2	3	4	1	2	2	2	3	3	5	1	2	2	1	2	2	2	1	1	1	2	2	4	5
31-Jan	5	5	3	2	2	3	2	3	2	2	2	2	1	1	1	1	1	1	1	2	3	2	2	2	5
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	96	13.81	13.81
6 - 11	140	20.14	33.96
12 - 19	203	29.21	63.17
20 - 28	195	28.06	91.22
29 - 38	57	8.20	99.42
> 38	4	0.58	100.00

Total Number of Valid Hours: 695

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 75 m (WS75m) - km/h
Mannix - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	7	6	5	7	9	5	10	6	10	8	5	3	4	3	6	2	96
6 - 11	10	8	10	7	4	6	17	19	23	9	10	7	2	2	4	2	140
12 - 19	11	15	0	1	0	1	35	51	29	14	25	10	3	1	4	3	203
20 - 28	6	9	0	0	0	0	22	81	34	5	2	8	11	10	0	7	195
29 - 38	5	5	0	0	0	0	6	15	2	0	0	5	7	7	3	2	57
> 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
Totals	41	43	15	15	13	12	90	172	98	36	42	33	27	23	19	16	695

Total Number of Valid Hours: 695

Total Number of Hours: 744



Maximum Speed: 44 km/h on Jan 26 08:00	Maximum Daily Speed Average: 28.6 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 1 km/h on Jan 25 13:00	Minimum Daily Speed Average: 1.8 km/h on Jan 15	Hours of Data: 662
Maximum Diurnal Speed Average: 8.2 km/h at hour 9	Minimum Diurnal Speed Average: 2.7 km/h at hour 21	Hours of Missing Data: 82
Monthly Average Velocity: 5.9 km/h 183.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 9 Median = 16 Q ₃ = 24 P ₉₀ = 29 P ₉₉ = 37	Percent Operational Time: 89.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SSE20	SSE17	S14	SSW13	SW16	SW16	SSW12	SW11	SW17	SSW15	SSW12	SSW5	SSW9	---	SSE20
2-Jan	SSW8	SSE14	SSE22	SSE20	S28	S26	S27	S20	SSE30	S31	S22	S11	S14	S17	S17	SSW13	SSW12	SSW16	SW16	SSW11	S20	S23	SSW17	SSW18	S18.3	S31
3-Jan	S25	S32	SSW28	S20	S13	S20	S21	S13	SSE13	S12	S11	S19	S22	S17	SSE18	SSE20	S27	S20	S23	S24	S13	S11	SSE12	SSE11	S18.3	S32
4-Jan	S8	SW7	WSW10	WSW9	SW9	SW9	SSW9	SSW8	SSW9	SSW10	SSW8	SSW7	S7	S10	SSE12	S10	S11	SSW8	SSW6	SSW6	SSW7	SSW8	SW8	SSW8	SSW8.0	SSE12
5-Jan	SSE10	SSE12	SSE17	SSW9	SSE15	SSE23	SSE29	SSE29	SSE29	SSE28	SSE28	SSE24	SSE23	SE23	SE20	SE20	SE13	SE21	SE30	SE29	SE24	SE23	SE27	SE33	SSE21.6	SE33
6-Jan	SE35	SE32	SE28	SE24	SE25	SE31	SE28	SE29	SE26	SE25	SSE27	SSE29	S26	S22	S24	S25	S29	S27	S23	S23	S29	S26	S14	SSW13	SSE24.4	SE35
7-Jan	S14	SSW17	SSW18	SW13	SW20	SW16	WSW10	WNW5	NW12	NW11	NW10	WNW8	N6	NNW2	NE1	N5	NW5	N8	N10	N6	UO	UO	UO	UO	W4.9	SW20
8-Jan	UO	UO	UO	SE17	SSE24	UO	UO	UO	SE24	SE15	SE14	SE18	SSE16	SSE15	SSE11	SE11	SE11	ESE9	ESE6	E11	E8	ESE8	ESE10	SE11	SE12.7	SE24
9-Jan	SE15	SE16	SE12	ESE10	ESE7	E8	E9	ESE5	SE11	SE11	SE8	E5	SE6	SE12	SSE8	SSE10	S12	S8	S4	SW5	S7	S8	S6	UO	SE7.6	SE16
10-Jan	UO	UO	SE16	SSE13	SSE11	SE12	SE7	SE6	SE11	SE9	SE5	E3	S1	SE1	WSW4	WNW2	WNW2	SW5	UO	UO	UO	UO	NNE7	UO	---	SE16
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	SSE21	UO	SSE25	SSE26	S20	---	SSE26
12-Jan	SSE22	S21	S19	S20	SSE25	SSE22	SSE27	SSE26	SSE29	SSE33	SSE31	SSE32	SSE29	SSE25	SSE25	SSE25	SSE22	SSE19	SSE17	S16	S11	S13	S6	SSW7	SSE21.5	SSE33
13-Jan	SSW6	SE4	SE3	ENE2	NE8	N5	NNE11	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NNE11
14-Jan	UO	UO	UO	SE21	SE24	SE21	SE21	SSE20	SE19	SSE18	SE16	SSE15	SSE12	SSE11	SSE12	SSE9	S8	SW8	WSW7	SW2	SW3	SSW4	SW2	SW2	SSE11.0	SE24
15-Jan	SSW1	NNE1	ENE2	SSE1	NNW1	N3	NE6	NE5	NNE3	NE2	E2	SSE2	SSE3	SSE2	SSW1	NNE3	NE4	E3	SE3	SE6	SE6	ESE4	E2	E3	E1.8	SE6
16-Jan	ESE2	ENE4	ENE4	ESE4	E4	ENE5	ENE11	NE10	NE10	ENE10	E13	E12	ESE10	ESE14	ESE15	ESE17	ESE16	ESE12	SE21	SE25	SE23	SE20	SSE20	S16	ESE10.7	SE25
17-Jan	S19	SSW20	SSW21	SSW23	S22	S20	SSE23	SSE21	SSE22	SSE23	SSE22	S19	S16	SSW16	S15	S19	S22	SSE18	SSE19	SSE27	SSE28	SSE27	SSE27	SSE29	S21.0	SSE29
18-Jan	S25	SSE27	SSE27	SSE23	SSE26	SSE23	SSE27	SSE27	SSE26	SSE22	SSE20	SSE21	SE19	SE15	SE18	SE20	SE23	SE26	SE23	SE24	SE21	SE20	SE22	SE25	SSE22.6	SSE27
19-Jan	SSE26	SSE24	SSE28	SSE28	SSE32	SSE30	SSE27	S29	S29	S23	SSW21	WSW15	WSW17	WSW16	SW14	SSW20	SSW26	SW29	SW19	SW26	SW21	SW20	SW18	SW16	SSW19.7	SSE32
20-Jan	SW18	WSW23	WSW22	WSW21	WSW17	WSW13	SW11	SW17	SW14	SW14	WSW10	WSW14	WSW16	WSW16	WSW25	WSW31	WSW33	WSW37	WSW32	WSW32	W19	WSW10	WSW10	WSW8	WSW19.2	WSW37
21-Jan	WSW13	WSW21	SSW16	SSW19	SW18	S13	S18	S23	SSW24	S25	S22	SSW18	S16	SSW16	SSW17	SSW20	SSW19	SW18	SW14	SW16	WSW26	WSW24	W27	W29	SW17.2	W29
22-Jan	W28	W27	WNW25	WNW25	WNW27	W31	W32	W38	W36	W37	NNW29	NNE39	UO	UO	UO	N16	N14	N18	NNE19	NNE19	N28	NNE20	NNE12	NE7	NW16.9	NNE39
23-Jan	ENE3	ESE4	SSE11	SSE15	ESE11	SE15	SE15	SE16	SE19	ESE16	SE14	SE16	SE12	ESE7	NE7	ENE6	ENE7	E5	SE2	SE5	SSE7	SSE12	SSE11	SSE11	SE9.4	SE19
24-Jan	SSE13	SSE14	SSE17	SE15	SE15	SSE17	SSE19	SSE22	SSE27	SSE26	SSE25	S19	SW10	W14	NNW13	N17	N20	NNE16	NNE20	N17	NNE9	N8	N8	NW8	SE4.8	SSE27
25-Jan	NNW9	NNE8	NNE4	N3	NW5	WNW4	W3	NW5	NNE2	N4	SW3	SE4	SSW1	S4	SSE7	SSE7	SSE14	UO	UO	UO	UO	UO	UO	UO	---	SSE14
26-Jan	UO	UO	UO	W36	W36	WNW36	N38	N44	N37	N42	N37	N29	N18	N12	N9	N10	NNE20	N23	NNE31	NNE32	NNE26	N29	NNE27	N31	N24.1	N44
27-Jan	N29	N28	N29	NNE28	NNE21	NNE18	NNE19	N18	N34	N25	N19	NNW12	NW12	WNW8	WNW8	NNW16	NNW22	N21	N15	NNW20	NW19	WNW19	WNW22	WNW24	N17.7	N34
28-Jan	WNW21	WNW31	W27	WNW30	W28	W24	WNW29	WNW33	WNW33	WNW30	WNW32	WNW35	NW36	NW33	WNW31	WNW28	NW34	NW40	NW40	NNW34	N32	N33	N28	NNW25	NW28.6	NW40
29-Jan	NNW29	NW16	W13	W24	W24	W20	WSW23	WSW21	SW17	SSW16	S17	S22	S17	SSE21	SSE23	S22	SSW20	WSW14	W22	WNW28	NNW32	N30	NNW30	NNW20	W11.0	NNW32
30-Jan	NW16	NNW21	N20	N8	NW4	SSE1	WSW11	WSW19	W24	W24	W16	W7	W6	WNW3	SW2	S3	SSE7	SSE10	SSE6	ESE3	ESE3	ENE2	N7	N15	WNW4.9	W24
31-Jan	NNE23	NNE25	NNE22	NNE19	NNE15	NNE13	NE11	NE11	NE12	NE12	NE8	ENE2	S2	SSW2	SE3	ESE2	SE4	SSE5	S7	SSW6	NE3	NE8	N6	N13	NNE7.3	NNE25

SSW4.4	SSW5.2	S7.1	SSW7.0	S7.5	S7.4	S7.2	S7.1	S8.2	S7.4	S6.5	S6.6	S7.4	S7.4	S7.5	S6.3	S6.4	SSW4.9	SSW3.9	S3.8	S2.7	S4.0	S2.7	SSW3.1	Diurnal Average
SE35	S32	NNE29	W36	W36	WNW36	N38	N44	N37	N42	N37	NNE39	NW36	NW33	WNW31	WSW31	NW34	NW40	NW40	NNW34	NNW32	N33	NNW30	SE33	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

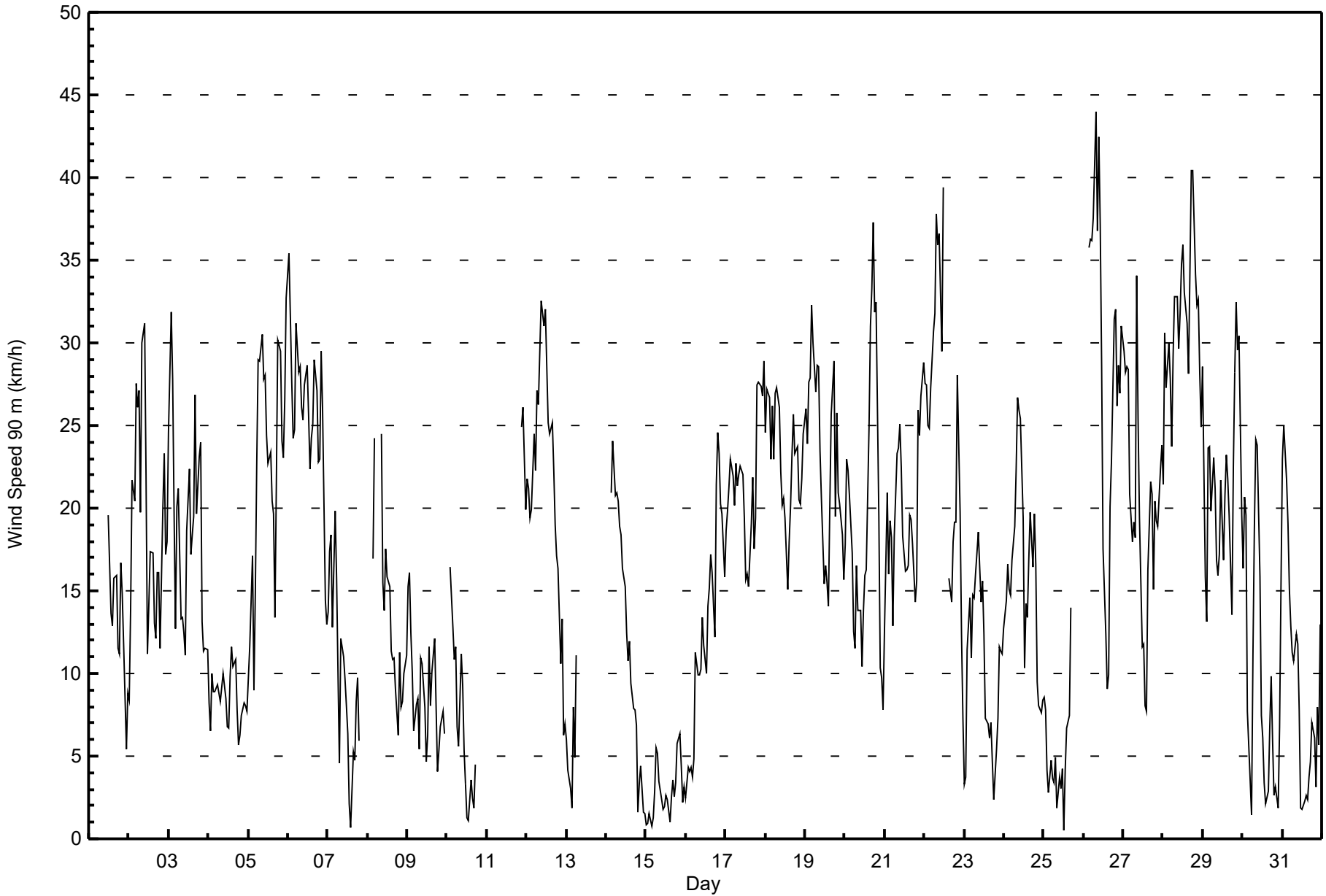
Wind Speed 90 m (WS90m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 12 km/h on Jan 20 21:00 Minimum Value: 0 km/h on Jan 15 05:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																	Hours in Service: 744 Hours of Data: 662 Hours of Missing Data: 82 Hours of Calibration: 0 Percent Operational Time: 89.0									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	1	2	2	2	3	1	2	2	1	4	1	3	4	
2-Jan	2	3	2	4	4	4	4	3	3	2	5	1	1	2	2	2	2	3	1	2	5	2	4	4	5	
3-Jan	4	2	4	3	2	2	3	2	3	3	4	4	2	2	2	3	2	4	2	2	2	2	2	1	4	
4-Jan	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	3	3	2	1	1	1	1	2	1	3	
5-Jan	2	2	3	2	4	2	2	1	1	1	1	1	1	2	3	2	5	7	3	4	7	7	6	4	7	
6-Jan	5	6	5	4	3	2	2	2	3	3	2	2	1	2	1	2	2	2	2	2	3	3	3	2	6	
7-Jan	3	4	2	2	2	1	4	3	1	1	2	1	2	1	2	3	1	3	3	2	UO	UO	UO	UO	4	
8-Jan	UO	UO	UO	2	3	UO	UO	UO	6	1	2	3	1	1	1	1	2	2	2	1	3	2	2	3	6	
9-Jan	5	3	2	3	2	3	2	2	2	2	2	1	3	2	2	2	2	1	1	1	1	2	2	UO	5	
10-Jan	UO	UO	3	1	1	1	2	3	2	1	2	1	1	2	1	1	1	1	1	UO	UO	UO	UO	2	UO	3
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2	UO	3	4	3	4
12-Jan	2	4	3	5	4	3	2	3	3	3	2	3	3	2	2	2	2	2	1	2	2	3	2	2	5	
13-Jan	2	2	2	1	4	3	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	
14-Jan	UO	UO	UO	4	5	3	4	3	3	3	2	2	1	1	1	2	1	1	1	1	1	1	2	1	5	
15-Jan	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	1	3	
16-Jan	1	3	1	2	2	2	2	2	2	1	2	3	3	4	4	4	4	3	4	4	4	3	2	3	4	
17-Jan	4	2	3	3	2	2	2	3	2	3	2	3	2	2	2	1	1	3	2	2	2	1	2	1	4	
18-Jan	2	1	2	3	2	2	2	2	2	3	2	2	2	3	3	2	3	2	2	2	2	1	2	1	3	
19-Jan	1	1	2	2	2	2	2	4	3	2	2	2	5	4	3	2	3	3	4	3	4	3	3	3	5	
20-Jan	4	3	3	6	4	4	3	3	3	2	3	4	4	6	3	3	3	3	2	3	12	3	4	2	12	
21-Jan	4	4	2	2	3	3	2	2	4	2	2	1	2	2	3	2	2	2	3	4	5	4	3	3	5	
22-Jan	3	3	2	4	4	4	5	6	6	6	4	5	UO	UO	UO	4	5	2	3	4	2	3	5	2	6	
23-Jan	2	2	2	2	2	4	3	7	4	4	5	3	3	3	1	2	1	2	2	2	1	2	2	2	7	
24-Jan	2	2	2	2	2	3	3	2	2	2	2	4	2	3	2	2	3	5	4	2	2	3	4	2	5	
25-Jan	1	2	3	1	1	2	1	2	1	1	2	2	1	2	2	2	2	UO	UO	UO	UO	UO	UO	UO	3	
26-Jan	UO	UO	UO	4	4	4	7	8	7	9	7	4	5	2	3	3	5	5	6	6	4	6	6	3	9	
27-Jan	5	5	4	4	5	6	6	5	4	5	3	3	2	2	2	4	2	2	3	4	4	2	1	2	6	
28-Jan	3	3	3	3	3	2	3	4	3	4	4	5	6	6	5	5	5	8	5	6	4	4	4	3	8	
29-Jan	3	3	3	2	4	2	2	3	3	1	3	1	2	3	3	2	2	2	5	3	3	4	4	3	5	
30-Jan	1	2	3	4	1	2	3	2	2	2	4	1	1	2	1	1	2	2	1	1	1	2	3	4	4	
31-Jan	5	4	3	2	2	3	2	3	2	2	2	2	1	1	1	1	1	1	1	2	2	2	1	3	5	
Diurnal Maximum																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 90 m (WS90m) - km/h
Mannix - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 90 m (WS90m) - km/h
Mannix - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	87	13.14	13.14
6 - 11	133	20.09	33.23
12 - 19	175	26.44	59.67
20 - 28	190	28.70	88.37
29 - 38	72	10.88	99.24
> 38	5	0.76	100.00

Total Number of Valid Hours: 662

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 90 m (WS90m) - km/h
Mannix - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	5	5	5	8	8	9	9	6	5	6	8	1	1	5	4	2	87
6 - 11	11	4	10	4	4	9	13	17	16	19	7	10	2	3	3	1	133
12 - 19	12	9	2	0	2	6	24	29	27	21	19	11	4	1	5	3	175
20 - 28	8	10	0	0	0	0	31	57	36	10	4	10	11	8	0	5	190
29 - 38	11	3	0	0	0	0	7	13	6	0	1	5	8	10	3	5	72
> 38	2	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5
Totals	49	32	17	12	14	24	84	122	90	56	39	37	26	27	17	16	662

Total Number of Valid Hours: 662

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - January 2023

Direction of Maximum Speed: 360 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 302.7 deg on Jan 28	Hours of Data: 739
Direction of Minimum Speed: 124 deg on Jan 13 05:00	Hours of Missing Data: 5
Direction of Minimum Daily Speed Average: 1.4 deg on Jan 15	Percent Operational Time: 99.3
Monthly Average Direction: 163.0 deg	

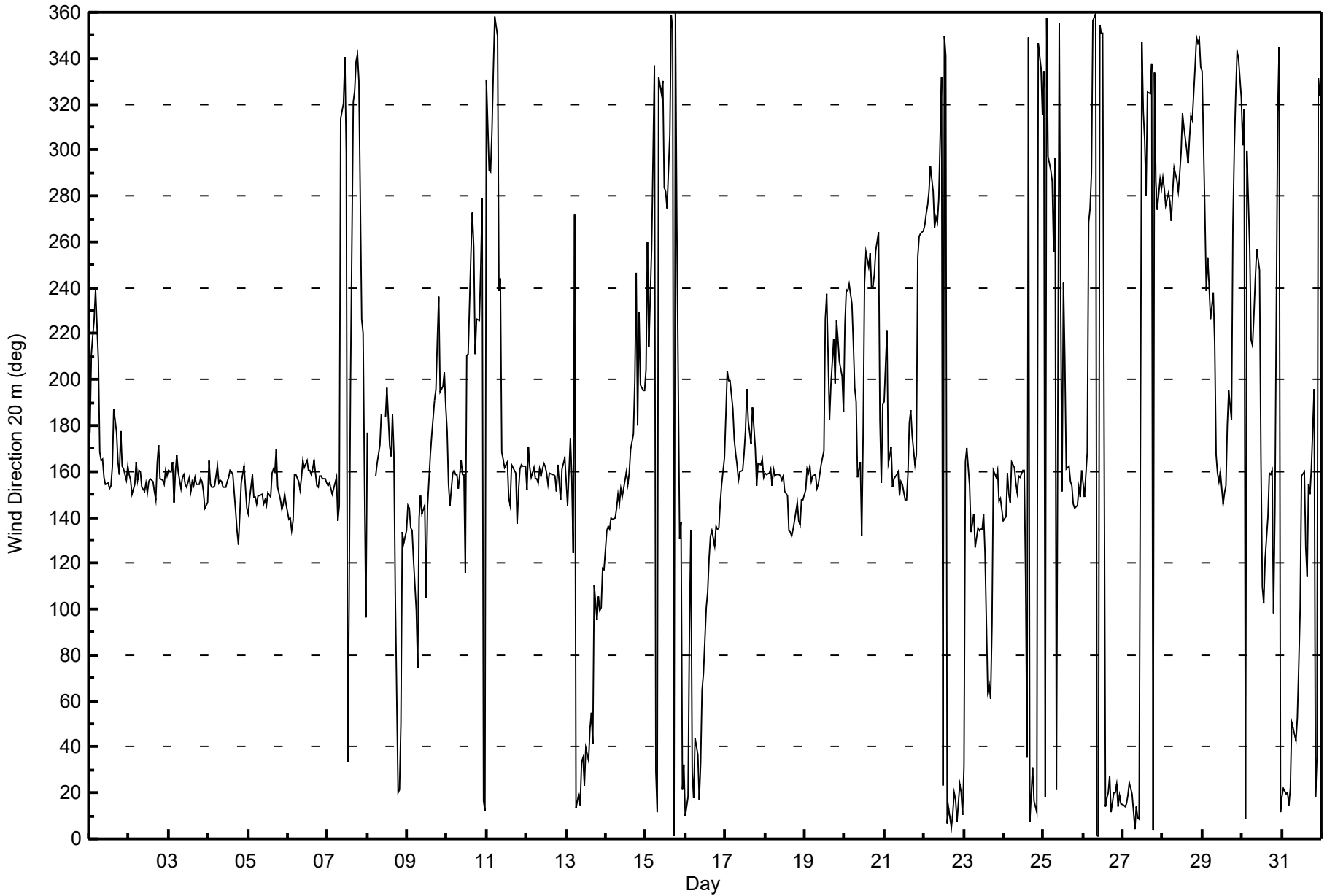
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	177	211	219	227	239	209	168	165	165	158	155	155	153	154	162	187	177	164	159	178	162	161	156	162	171.7
2-Jan	159	156	150	155	164	156	161	160	153	151	155	151	155	157	156	151	148	163	171	157	156	155	160	158	156.5
3-Jan	160	160	164	147	160	167	160	153	158	159	155	153	157	151	156	154	157	155	155	157	155	151	144	146	156.1
4-Jan	165	155	153	153	154	162	155	156	156	153	153	155	158	160	160	159	143	134	128	142	155	162	153	144	154.2
5-Jan	142	148	159	149	149	146	149	149	150	146	147	145	151	149	160	161	160	169	153	148	143	146	150	146	149.8
6-Jan	139	140	134	139	158	159	156	152	157	165	162	165	160	161	159	161	165	154	153	158	158	157	157	155	154.0
7-Jan	154	155	152	150	155	158	139	145	314	320	340	298	33	102	196	321	326	339	342	330	227	220	156	96	158.8
8-Jan	177	UO	UO	165	UO	158	164	171	185	UO	UO	184	196	171	166	185	168	106	20	21	50	133	129	134	156.3
9-Jan	145	144	135	134	121	99	74	140	149	141	145	105	145	156	167	175	191	196	216	236	195	197	203	188	152.8
10-Jan	178	154	145	159	160	158	158	153	165	159	159	116	211	211	255	273	258	211	226	226	249	279	17	12	174.3
11-Jan	330	291	290	308	335	358	349	239	244	168	165	162	164	148	146	163	162	159	137	152	161	163	162	162	166.2
12-Jan	152	171	162	157	162	157	157	155	161	158	163	162	159	154	159	159	159	158	152	163	148	161	163	166	159.2
13-Jan	155	145	175	157	124	272	13	19	15	34	35	23	39	34	48	55	42	110	95	105	99	101	118	117	82.7
14-Jan	134	136	135	140	139	140	144	150	146	152	149	156	160	154	159	170	176	200	246	180	229	197	195	195	151.4
15-Jan	204	260	214	257	296	337	29	11	332	325	330	284	282	275	307	359	353	1	360	268	131	138	21	33	340.9
16-Jan	10	18	90	134	29	18	44	37	17	33	65	72	100	108	122	132	134	128	136	135	135	146	154	166	115.1
17-Jan	185	204	200	199	187	174	168	163	156	160	160	168	177	196	182	172	188	179	170	154	163	163	165	157	172.9
18-Jan	159	158	159	161	154	161	158	158	159	158	156	158	151	150	134	134	132	135	139	146	138	137	148	148	150.1
19-Jan	152	161	159	162	155	158	158	153	154	158	163	169	227	238	211	182	198	218	198	226	218	208	201	186	178.4
20-Jan	224	239	239	242	233	216	197	190	157	164	132	176	242	256	249	255	241	240	246	256	264	182	155	189	232.7
21-Jan	191	222	164	166	171	153	157	159	160	150	156	154	148	148	159	181	187	176	163	167	253	262	264	265	183.1
22-Jan	267	272	276	282	293	282	266	271	269	279	332	23	350	341	7	13	5	11	20	17	7	24	20	11	315.9
23-Jan	32	164	170	154	134	137	142	127	135	134	135	135	141	124	64	67	61	94	161	158	160	147	148	144	133.6
24-Jan	138	140	159	150	146	164	162	155	151	158	157	160	160	113	36	349	8	31	17	14	12	347	336	315	122.1
25-Jan	334	18	358	297	291	286	256	297	22	355	237	151	242	209	161	163	156	154	146	144	145	153	149	161	160.9
26-Jan	155	149	168	269	275	290	356	360	1	1	354	351	351	14	17	20	27	12	20	20	24	14	19	15	358.7
27-Jan	15	14	16	19	25	20	12	4	14	9	9	347	316	304	280	325	325	338	3	334	286	274	287	283	350.3
28-Jan	288	283	276	281	278	269	282	292	287	282	290	299	316	310	300	294	305	315	313	336	349	347	348	336	302.7
29-Jan	334	272	239	253	241	226	238	215	167	159	156	160	146	151	154	180	195	183	267	301	324	343	340	323	223.4
30-Jan	302	318	8	300	257	217	215	228	244	257	248	166	110	103	122	141	159	159	160	99	143	316	345	12	252.2
31-Jan	18	22	20	20	15	22	51	48	43	52	75	100	158	160	127	114	154	150	161	196	18	35	331	324	37.9

162.0 171.9 168.5 179.8 182.7 176.3 164.0 163.3 161.1 158.7 148.8 149.2 163.5 160.9 160.4 167.1 169.0 163.1 149.0 155.5 151.5 155.7 152.4 157.5
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Jan 20 22:00																	Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3								
Minimum Value: 4 deg on Jan 4 04:00																									
Percentiles: P ₁ = 5 P ₁₀ = 7 Q ₁ = 8 Median = 11 Q ₃ = 17 P ₉₀ = 33 P ₉₉ = 82																									
Day	Hourly Period Ending At (MST)																							Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		24
1-Jan	11	16	10	11	8	13	8	8	9	7	7	7	9	9	10	22	18	6	7	15	6	6	7	5	22
2-Jan	6	5	9	9	14	22	10	10	7	9	10	10	6	7	6	7	9	14	7	5	10	7	5	7	22
3-Jan	7	6	17	8	7	5	7	7	7	9	6	7	8	8	7	7	7	8	8	6	7	7	8	12	17
4-Jan	6	10	11	4	6	4	6	7	7	7	7	7	7	8	14	9	17	12	14	5	6	5	7	17	
5-Jan	12	5	7	8	8	6	6	7	7	6	7	8	9	7	10	7	7	8	14	8	10	9	12	10	14
6-Jan	9	9	7	13	9	9	10	8	6	7	10	8	7	8	6	5	5	6	5	5	7	6	6	7	13
7-Jan	6	11	10	6	12	8	13	48	40	23	43	70	64	85	67	50	13	12	17	83	17	22	30	63	85
8-Jan	61	UO	UO	26	UO	7	9	11	16	UO	UO	25	20	12	13	16	44	38	12	10	60	14	14	10	61
9-Jan	11	11	8	13	57	40	19	20	9	12	16	24	24	11	17	14	17	20	33	15	57	16	35	24	57
10-Jan	12	13	10	10	9	6	11	11	10	9	14	47	42	77	19	19	22	13	12	12	15	33	18	29	77
11-Jan	26	11	8	17	14	13	62	15	21	16	15	11	14	10	11	10	9	14	8	17	8	9	8	9	62
12-Jan	10	13	11	9	8	11	10	9	8	8	7	7	8	8	8	9	9	10	7	9	9	8	12	17	17
13-Jan	16	13	53	33	98	36	40	12	13	19	38	16	83	14	18	18	13	19	8	14	10	12	15	16	98
14-Jan	10	9	9	9	10	10	10	10	10	9	10	9	8	8	8	14	12	16	17	33	16	20	20	17	33
15-Jan	30	20	58	26	25	35	18	17	23	23	24	21	24	35	32	11	12	17	68	78	65	18	27	59	78
16-Jan	16	45	85	49	76	42	10	13	12	13	12	11	23	10	16	10	9	11	10	8	8	10	12	7	85
17-Jan	19	13	14	14	14	11	9	8	7	9	8	10	15	16	17	11	13	17	9	7	7	6	6	8	19
18-Jan	9	7	7	7	8	7	7	5	7	9	8	8	8	9	9	9	7	8	9	7	8	7	7	6	9
19-Jan	7	6	6	6	8	7	6	9	8	11	12	12	41	12	23	14	12	10	19	12	14	17	16	29	41
20-Jan	16	10	8	18	16	30	18	33	20	11	26	42	25	29	10	9	7	7	9	8	81	99	49	18	99
21-Jan	17	30	7	9	9	8	8	11	10	13	8	8	8	9	10	18	14	7	13	22	13	9	8	7	30
22-Jan	6	6	7	12	11	8	9	7	7	9	41	11	24	14	14	12	13	11	12	15	11	14	17	22	41
23-Jan	42	82	15	14	11	10	13	16	10	8	9	9	12	25	20	18	18	19	21	6	9	10	16	12	82
24-Jan	13	12	10	10	11	10	9	12	9	10	8	12	14	44	27	16	14	19	11	13	21	23	24	10	44
25-Jan	16	29	53	29	15	20	28	44	54	27	64	53	90	34	15	12	11	13	10	10	10	11	9	14	90
26-Jan	14	11	32	11	10	9	17	15	13	13	13	12	16	14	15	20	13	18	12	12	13	12	13	11	32
27-Jan	10	14	11	13	18	31	22	15	11	12	10	27	11	20	15	12	11	13	10	15	20	7	10	9	31
28-Jan	11	8	7	8	8	8	10	9	8	9	10	12	9	12	12	10	11	10	9	15	12	12	13	11	15
29-Jan	13	17	11	8	25	20	9	22	9	7	9	6	10	8	8	16	14	11	29	16	11	12	12	17	29
30-Jan	7	19	11	83	44	36	9	10	12	18	69	67	57	14	22	25	9	13	39	31	38	80	24	13	83
31-Jan	15	11	11	11	10	16	14	11	11	11	11	39	31	34	33	26	16	9	19	35	18	77	21	9	77
																	61 82 85 83 98 42 62 48 54 27 69 70 90 85 67 50 44 38 68 83 81 99 49 63								
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - January 2023

Direction of Maximum Speed: 356 deg on Jan 26 08:00																						Hours in Service: 744				
Direction of Maximum Daily Speed Average: 300.0 deg on Jan 28																						Hours of Data: 696				
Direction of Minimum Speed: 78 deg on Jan 15 03:00											Direction of Minimum Daily Speed Average: 1.3 deg on Jan 15											Hours of Missing Data: 48				
Monthly Average Direction: 164.8 deg																						Percent Operational Time: 93.6				
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	199	222	219	225	240	218	175	163	165	155	151	150	148	150	169	215	194	171	172	210	173	165	160	158	178.2	
2-Jan	155	153	147	155	164	158	163	158	151	151	153	153	153	160	157	151	150	164	186	161	155	158	161	165	157.3	
3-Jan	164	165	170	162	166	170	160	156	157	163	158	152	154	149	154	151	156	155	154	155	155	151	142	143	157.3	
4-Jan	157	154	158	168	167	163	156	152	153	150	149	152	152	151	153	151	142	143	140	148	154	157	157	147	153.2	
5-Jan	133	145	156	147	146	143	147	153	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	135	137	140	137	--	
6-Jan	132	132	128	131	143	144	143	144	148	153	155	162	162	163	161	161	163	154	156	156	155	155	158	160	150.3	
7-Jan	151	161	163	154	173	188	173	155	324	319	328	306	11	57	205	338	312	342	346	26	223	226	151	151	174.1	
8-Jan	163	161	161	165	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	167	158	160	142	109	48	40	76	126	121	126	--
9-Jan	136	135	127	123	111	88	76	125	133	129	133	96	137	149	159	170	184	189	207	228	187	189	191	177	144.7	
10-Jan	169	144	138	151	155	151	151	140	155	147	148	99	204	182	245	270	250	206	217	220	243	283	15	13	163.2	
11-Jan	341	293	295	305	333	355	358	237	243	175	162	156	160	142	139	156	155	151	133	148	157	158	158	160	159.0	
12-Jan	150	168	166	160	158	154	151	151	154	153	158	156	155	150	154	154	155	156	150	159	147	157	159	165	155.7	
13-Jan	154	135	154	134	46	301	12	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
14-Jan	UO	UO	126	134	134	136	139	145	141	146	143	150	155	149	154	164	171	204	244	187	226	190	199	190	149.1	
15-Jan	187	291	78	248	321	353	30	20	351	341	346	290	285	243	293	359	3	24	78	153	129	131	43	61	15.6	
16-Jan	54	37	69	121	71	42	46	38	26	41	64	78	98	101	116	124	127	120	130	130	130	142	150	163	110.7	
17-Jan	181	197	194	194	182	172	164	158	152	156	156	165	174	190	176	168	180	169	161	150	156	155	159	153	168.3	
18-Jan	158	153	154	154	148	153	151	150	151	151	150	153	146	144	129	128	125	129	134	140	134	132	146	144	144.5	
19-Jan	148	151	152	157	152	154	155	153	154	160	166	201	232	235	208	184	199	218	209	226	224	210	205	208	180.2	
20-Jan	226	237	238	245	238	228	218	216	186	196	172	220	239	249	245	250	235	237	241	252	257	241	221	224	235.9	
21-Jan	227	234	163	174	182	152	155	160	161	155	157	156	152	151	171	198	201	205	198	204	250	258	258	259	187.9	
22-Jan	265	270	274	279	286	278	262	266	264	275	326	18	UO	343	1	7	360	8	17	11	3	21	23	21	312.3	
23-Jan	35	140	169	147	125	129	134	121	129	126	127	128	133	116	56	63	55	84	150	143	156	141	142	140	127.1	
24-Jan	136	139	154	143	139	161	158	153	148	155	157	160	170	221	13	347	5	24	15	11	8	349	341	311	118.9	
25-Jan	332	12	359	310	295	295	268	309	17	355	226	146	240	194	153	156	150	147	141	138	UO	UO	UO	UO	156.8	
26-Jan	UO	UO	UO	265	271	286	353	356	358	357	351	348	347	9	12	15	20	6	15	14	19	10	13	10	351.9	
27-Jan	10	9	11	14	18	13	12	3	9	4	5	345	315	299	277	327	328	338	0	332	298	279	283	281	347.1	
28-Jan	286	279	272	278	275	267	279	288	283	279	286	294	311	305	296	289	301	311	309	333	347	345	348	336	300.0	
29-Jan	330	291	249	260	259	249	247	230	190	168	157	162	147	148	153	180	196	211	269	296	323	343	340	323	241.4	
30-Jan	303	324	6	1	270	196	219	238	250	257	257	233	245	105	122	129	154	152	153	94	133	88	350	7	274.4	
31-Jan	15	18	17	16	14	20	46	38	39	45	62	79	162	169	128	114	136	135	156	164	21	49	336	344	33.2	
163.9 171.0 165.4 176.7 179.1 174.3 162.1 163.4 160.3 160.3 151.7 150.8 163.9 162.9 163.2 170.2 172.3 171.1 167.0 164.8 157.3 156.2 155.3 160.4																										
Diurnal Average																										
UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										

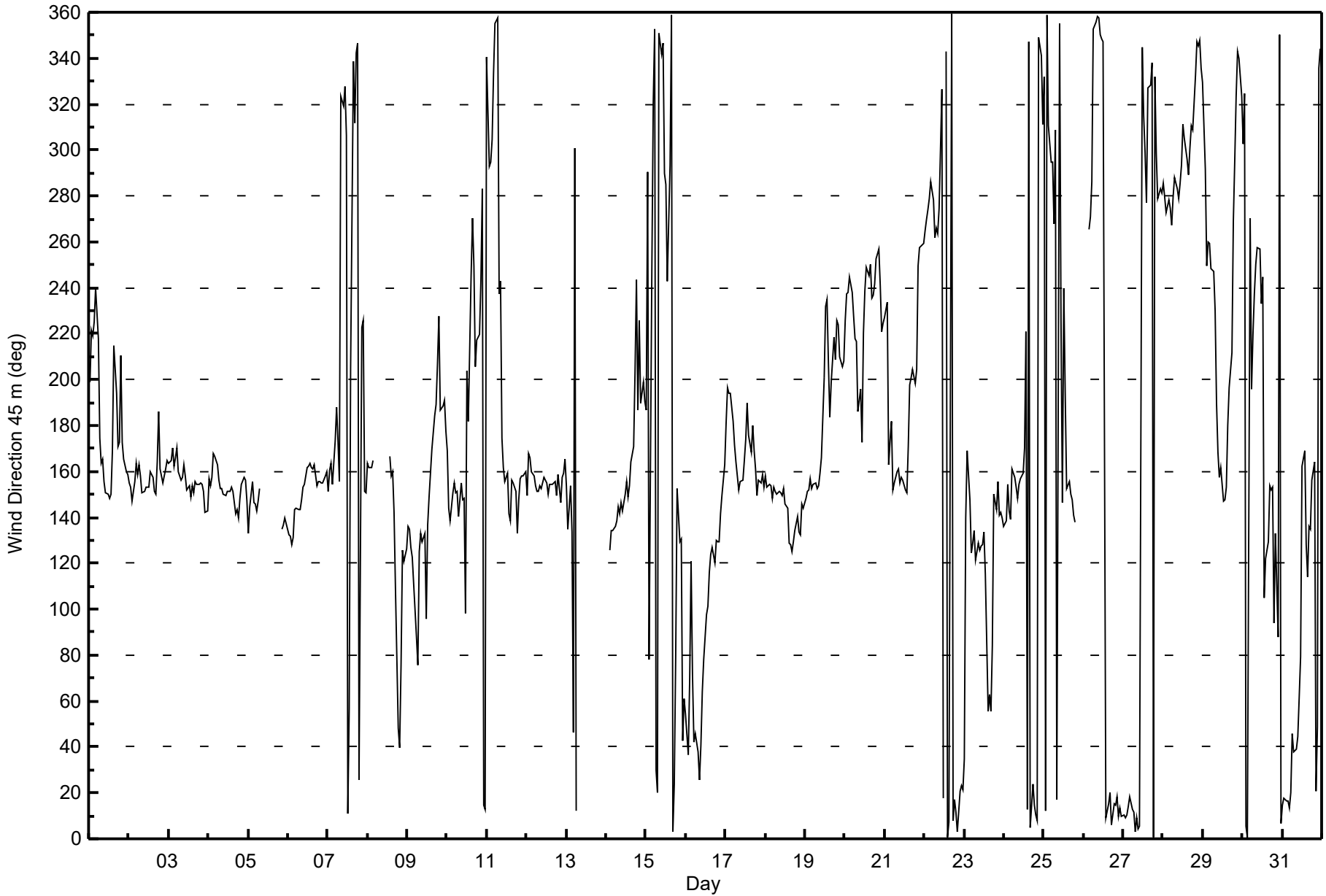


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 93 deg on Jan 7 20:00	Hours of Data: 696
Minimum Value: 2 deg on Jan 5 02:00	Hours of Missing Data: 48
Percentiles: P ₁ = 3 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 13 P ₉₀ = 26 P ₉₉ = 68	Hours of Calibration: 0
	Percent Operational Time: 93.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	9	9	8	8	6	11	7	6	6	5	4	5	6	5	23	14	14	6	11	13	12	11	11	4	23
2-Jan	5	3	6	4	10	12	5	7	3	5	6	5	3	2	3	4	5	7	6	7	6	4	4	5	12
3-Jan	6	5	5	5	3	3	6	3	3	5	5	3	4	6	3	3	4	4	3	3	3	3	4	8	8
4-Jan	4	6	11	9	8	3	5	4	3	3	2	3	6	5	5	9	6	12	8	7	3	8	6	7	12
5-Jan	5	2	6	6	2	2	5	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	7	5	8	7	8
6-Jan	7	6	5	8	5	5	6	5	3	5	4	6	5	6	3	4	3	4	3	3	4	3	4	6	8
7-Jan	3	6	6	6	12	8	19	41	15	12	28	30	37	87	65	45	12	10	15	93	9	19	27	8	93
8-Jan	3	4	13	3	UO	UO	UO	UO	UO	UO	UO	UO	UO	8	9	7	13	23	16	9	40	10	12	8	40
9-Jan	8	8	5	12	12	17	14	15	7	9	11	20	21	9	14	10	8	9	26	14	12	7	14	9	26
10-Jan	7	8	7	8	6	4	11	10	7	8	14	47	42	78	14	22	24	6	7	7	11	34	13	19	78
11-Jan	26	10	8	15	10	11	57	10	15	18	13	11	9	9	9	7	6	10	6	13	6	7	7	7	57
12-Jan	8	10	8	9	6	8	7	7	5	6	4	5	5	6	6	6	7	8	6	6	6	5	8	13	13
13-Jan	17	11	23	31	50	45	23	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	50
14-Jan	UO	UO	12	8	8	8	8	7	8	7	8	7	6	7	9	9	16	9	32	11	12	25	15	32	
15-Jan	27	39	72	34	12	17	17	12	21	23	20	42	40	51	40	11	11	19	53	55	26	11	30	32	72
16-Jan	29	18	57	30	74	55	9	12	8	8	10	10	18	9	14	9	8	9	7	6	6	8	9	5	74
17-Jan	15	8	8	8	7	6	7	6	6	7	6	7	9	8	11	6	8	10	6	4	4	4	4	5	15
18-Jan	7	4	5	5	6	6	5	3	5	6	6	5	6	7	6	5	4	5	7	5	5	5	4	2	7
19-Jan	4	4	4	4	4	5	4	7	6	9	8	12	13	10	18	9	8	7	10	9	10	11	11	20	20
20-Jan	12	8	6	11	11	19	17	21	23	15	40	40	11	14	6	6	4	3	5	5	67	63	56	21	67
21-Jan	12	24	10	17	10	5	5	9	9	10	5	5	4	6	19	9	7	7	16	22	9	7	6	6	24
22-Jan	5	5	6	9	9	6	7	6	7	9	40	8	UO	9	10	11	11	7	9	10	5	12	11	18	40
23-Jan	32	57	12	13	9	9	11	13	9	6	9	8	10	26	16	15	13	18	35	4	7	8	14	10	57
24-Jan	10	9	7	9	8	7	6	11	6	7	6	9	9	76	22	10	10	13	8	10	15	19	24	8	76
25-Jan	14	26	52	27	10	14	19	29	46	34	62	50	93	24	13	12	9	11	7	8	UO	UO	UO	UO	93
26-Jan	UO	UO	UO	8	8	8	16	13	9	10	10	9	13	11	12	20	9	14	8	8	10	9	9	7	20
27-Jan	7	11	8	9	12	26	17	11	8	8	7	24	8	19	11	12	9	8	9	12	15	5	5	6	26
28-Jan	10	6	6	6	6	6	9	7	6	8	8	10	8	11	10	8	10	7	7	14	8	8	9	7	14
29-Jan	8	17	9	7	12	7	7	13	12	5	8	4	9	6	7	10	8	15	12	15	9	9	9	15	17
30-Jan	6	17	6	64	54	61	18	7	7	7	29	50	58	55	13	18	8	12	31	25	21	68	17	11	68
31-Jan	10	8	8	7	7	12	10	9	9	9	11	44	34	37	36	25	9	7	10	14	30	14	37	8	44
	32	57	72	64	74	61	57	41	46	34	62	50	93	87	65	45	24	23	53	93	67	68	56	32	

Diurnal Maximum

UO - Unstable Operation





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - January 2023

Direction of Maximum Speed: 359 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 304.3 deg on Jan 28	Hours of Data: 695
Direction of Minimum Speed: 197 deg on Jan 25 13:00	Hours of Missing Data: 49
Direction of Minimum Daily Speed Average: 1.5 deg on Jan 15	Percent Operational Time: 93.4
Monthly Average Direction: 176.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	220	231	222	230	243	230	192	172	178	167	159	157	157	162	198	229	207	197	206	228	193	186	187	186	195.9	
2-Jan	174	162	153	165	171	168	170	168	161	164	166	169	164	183	178	181	178	186	217	187	175	178	185	188	172.8	
3-Jan	181	179	185	174	179	177	173	165	167	178	176	165	165	162	164	159	167	170	165	164	166	162	155	155	169.3	
4-Jan	170	195	219	224	212	203	196	172	176	173	174	182	159	159	156	165	168	179	180	186	174	185	196	181	179.1	
5-Jan	148	154	165	169	151	151	155	162	159	160	158	153	148	143	143	135	135	137	139	137	133	134	136	136	147.6	
6-Jan	135	134	133	135	140	141	140	143	143	147	151	160	168	170	168	166	166	168	171	171	164	164	174	188	154.5	
7-Jan	167	189	194	191	210	222	237	255	322	315	329	306	5	351	189	357	316	357	359	46	175	165	156	164	218.0	
8-Jan	167	152	154	148	157	140	138	150	149	144	136	143	157	163	162	146	134	112	100	76	90	128	123	129	143.6	
9-Jan	136	136	130	123	109	96	84	124	132	132	133	92	138	148	158	169	185	185	196	221	184	185	178	172	147.3	
10-Jan	162	142	139	151	156	145	148	137	150	143	144	95	195	143	241	278	265	214	218	229	249	302	20	17	159.4	
11-Jan	359	319	312	UO	UO	UO	UO	UO	UO	201	173	UO	UO	UO	UO	155	153	150	138	150	158	161	161	167	--	
12-Jan	157	173	176	170	163	158	154	155	157	156	161	159	159	155	157	158	160	161	160	168	164	168	179	196	161.4	
13-Jan	186	140	146	110	44	351	16	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	129	150	UO	UO	161	154	157	166	179	218	245	208	230	195	220	205	--
15-Jan	187	2	72	192	332	9	40	38	19	19	40	149	172	177	239	18	33	69	142	142	131	127	79	81	73.0	
16-Jan	98	60	71	124	87	62	60	50	44	64	76	90	104	105	120	126	128	124	134	135	134	145	153	168	115.4	
17-Jan	185	197	195	194	184	174	167	162	156	159	160	169	177	192	177	171	180	167	161	153	162	161	165	159	170.9	
18-Jan	166	158	160	155	150	153	150	150	151	150	150	152	147	145	135	134	133	135	139	142	138	139	145	144	147.3	
19-Jan	148	151	155	163	160	161	164	165	165	172	187	230	235	235	213	190	206	224	219	231	233	220	216	223	188.7	
20-Jan	233	241	243	250	244	235	229	229	221	223	233	248	240	251	247	250	238	239	244	254	258	249	246	245	242.4	
21-Jan	247	245	184	194	213	167	170	179	182	174	177	182	172	178	201	207	209	219	220	229	253	258	258	260	206.4	
22-Jan	268	274	280	282	286	281	264	267	265	278	329	UO	UO	UO	UO	9	3	12	21	14	7	26	33	38	304.7	
23-Jan	54	123	170	149	126	132	137	128	132	127	129	131	133	114	59	67	66	89	149	144	160	146	146	146	130.5	
24-Jan	145	147	158	144	142	163	160	158	152	156	160	164	195	260	357	354	9	26	18	13	14	1	356	318	131.4	
25-Jan	338	19	16	343	305	299	279	320	25	3	219	147	197	183	151	160	153	148	142	UO	UO	UO	UO	UO	148.6	
26-Jan	UO	UO	UO	266	275	291	356	359	1	0	354	353	353	11	14	15	21	8	17	17	20	13	16	13	354.3	
27-Jan	13	12	14	17	20	15	15	8	12	8	9	349	321	299	283	335	339	349	2	334	315	290	288	290	351.2	
28-Jan	291	282	277	282	279	274	283	292	286	282	289	297	314	308	299	292	305	314	313	337	352	351	353	343	304.3	
29-Jan	334	317	263	264	270	262	254	243	216	199	179	176	163	157	162	186	205	231	274	298	333	350	348	335	258.6	
30-Jan	311	337	9	7	304	172	230	250	257	266	270	261	271	312	157	148	157	159	158	99	132	77	3	13	286.9	
31-Jan	19	21	20	20	19	24	48	40	41	45	58	79	178	188	141	124	137	146	169	178	38	45	350	353	33.9	

178.6 183.2 179.6 193.1 192.5 181.6 171.0 175.2 166.8 170.5 165.7 169.1 172.2 174.1 175.5 177.4 178.6 182.5 179.2 179.4 171.4 165.6 169.0 178.1
Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



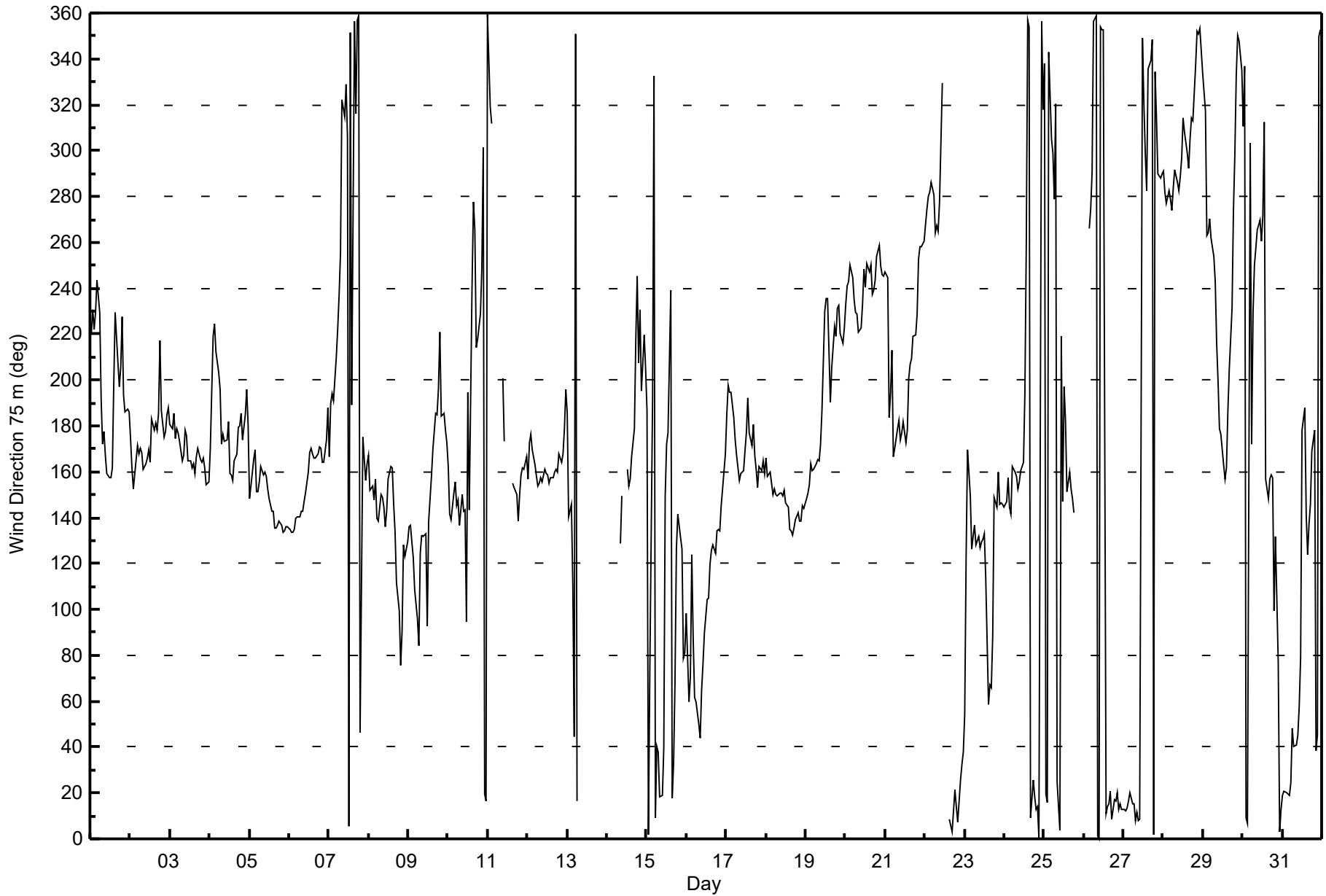
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 75 m (WD75m) - deg
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 92 deg on Jan 7 15:00	Hours of Data: 695
Minimum Value: 1 deg on Jan 5 06:00	Hours of Missing Data: 49
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 13 P ₉₀ = 24 P ₉₉ = 63	Hours of Calibration: 0
	Percent Operational Time: 93.4

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	7	5	6	7	4	11	11	7	8	3	4	4	5	8	27	11	9	9	11	8	17	20	23	11	27
2-Jan	14	4	4	3	6	7	3	8	2	3	5	8	6	6	5	8	14	8	8	15	10	4	9	7	15
3-Jan	5	3	4	5	9	5	5	4	3	6	9	5	3	6	7	4	4	4	3	3	4	5	3	4	9
4-Jan	9	16	11	9	13	7	13	11	8	7	7	10	5	6	4	5	7	18	18	13	9	19	20	15	20
5-Jan	5	4	6	9	3	1	4	3	3	4	2	2	3	3	5	3	4	4	3	5	4	5	4	9	
6-Jan	3	3	4	6	4	3	3	4	3	6	4	6	3	5	3	3	3	2	2	2	4	3	11	18	18
7-Jan	9	14	6	11	10	8	21	55	11	12	21	23	25	71	92	39	23	8	12	63	26	22	12	7	92
8-Jan	4	6	7	7	5	3	3	6	8	9	2	2	8	5	10	5	8	16	17	8	23	11	13	9	23
9-Jan	7	6	7	14	15	18	15	16	7	8	10	19	20	8	11	9	5	7	18	13	11	6	11	7	20
10-Jan	8	7	5	8	4	3	16	13	7	9	13	36	49	77	11	26	27	8	5	7	7	33	11	12	77
11-Jan	17	10	12	UO	UO	UO	UO	UO	UO	13	20	UO	UO	UO	UO	6	5	6	5	8	7	7	7	7	20
12-Jan	7	10	7	9	6	6	4	5	3	4	4	3	4	4	4	5	6	7	6	5	9	12	12	13	13
13-Jan	26	11	20	37	25	57	10	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	57
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	7	6	UO	UO	6	6	7	8	17	7	47	11	9	58	14	58	
15-Jan	49	46	49	51	17	15	17	10	18	17	36	50	64	48	72	27	11	30	29	26	19	14	40	33	72
16-Jan	26	21	27	22	37	29	8	14	9	8	9	10	17	13	15	11	10	12	7	5	6	6	7	6	37
17-Jan	12	7	6	7	6	6	6	5	5	5	5	7	9	7	9	5	6	10	4	2	3	3	4	3	12
18-Jan	6	3	4	4	4	4	4	3	4	5	5	3	5	6	5	5	5	3	5	3	3	4	3	2	6
19-Jan	3	4	3	6	4	4	4	5	4	9	11	8	9	9	16	7	8	7	8	8	9	10	10	14	16
20-Jan	11	7	6	8	9	16	14	11	14	12	27	16	10	10	5	6	3	2	4	4	24	17	30	17	30
21-Jan	9	13	14	14	7	14	4	8	6	9	6	6	7	7	13	5	8	7	10	14	8	7	6	6	14
22-Jan	4	6	6	8	9	7	7	6	6	9	40	UO	UO	UO	UO	10	9	6	8	9	3	9	10	16	40
23-Jan	31	33	10	12	11	10	10	12	11	10	11	10	9	26	13	14	11	23	40	6	6	8	13	8	40
24-Jan	7	7	6	9	8	5	5	7	3	3	4	6	15	20	21	6	7	13	6	7	13	15	25	10	25
25-Jan	13	24	54	36	10	13	20	21	48	33	59	37	90	26	12	12	6	9	8	UO	UO	UO	UO	UO	90
26-Jan	UO	UO	UO	7	8	7	14	11	8	8	9	7	11	10	13	20	8	13	6	7	8	7	7	5	20
27-Jan	6	9	6	6	10	20	12	9	6	6	6	23	8	19	11	13	6	5	9	9	11	8	5	6	23
28-Jan	10	6	6	6	5	6	8	6	5	7	8	10	7	10	9	7	10	6	6	14	6	6	6	8	14
29-Jan	4	11	11	6	7	4	7	8	8	5	15	5	9	6	7	9	6	17	6	15	9	7	6	13	17
30-Jan	8	14	5	50	60	63	23	7	3	4	6	15	20	80	46	32	7	9	17	23	13	62	11	9	80
31-Jan	8	6	6	6	6	10	8	8	8	9	9	42	45	41	36	22	9	10	6	12	46	12	32	6	46
Diurnal Maximum																									
49 46 54 51 60 63 23 55 48 33 59 50 90 80 92 39 27 30 40 63 46 62 58 33																									

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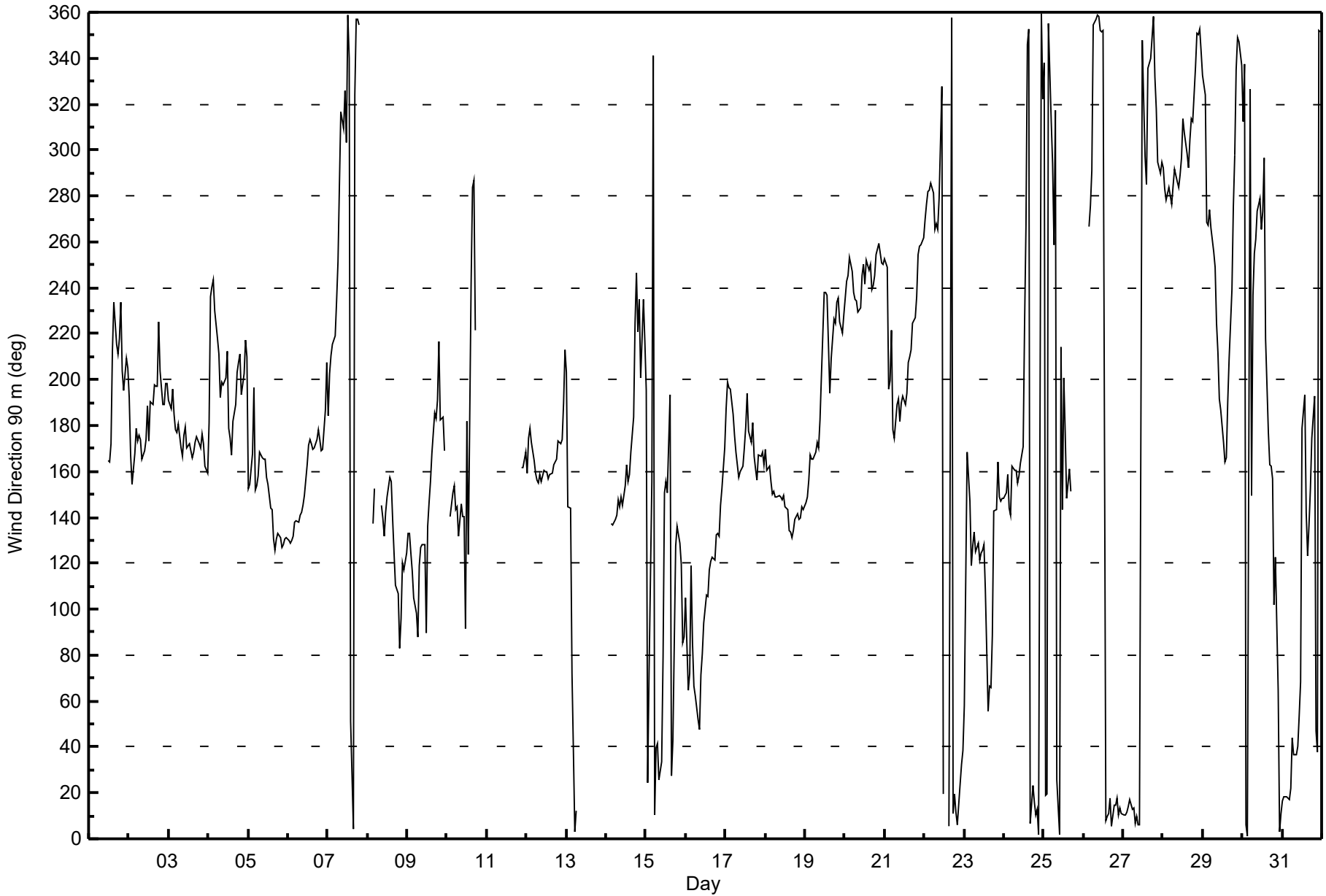


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 103 deg on Jan 7 15:00	Hours of Data: 662
Minimum Value: 2 deg on Jan 19 00:00	Hours of Missing Data: 82
Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 23 P ₉₉ = 69	Hours of Calibration: 0
	Percent Operational Time: 89.0

Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	5	14	23	9	7	9	8	6	18	21	23	14	23	
2-Jan	17	9	4	3	6	8	4	11	2	4	9	9	7	6	8	10	19	12	5	13	11	5	10	8	19	
3-Jan	6	3	4	5	14	7	5	7	3	5	9	4	3	7	8	5	6	6	4	3	9	9	7	7	14	
4-Jan	17	13	5	5	15	6	9	16	11	10	12	15	12	10	11	8	10	17	20	17	14	18	19	13	20	
5-Jan	11	8	8	16	6	2	5	3	3	3	2	3	3	3	5	2	5	4	3	2	6	5	6	4	16	
6-Jan	3	4	4	6	4	2	3	3	2	6	2	5	3	4	3	4	4	3	4	3	3	4	16	18	18	
7-Jan	13	16	7	9	7	7	14	35	10	10	21	19	22	60	103	40	28	9	7	23	UO	UO	UO	UO	103	
8-Jan	UO	UO	UO	4	5	UO	UO	UO	8	7	4	2	6	6	10	4	6	10	13	8	16	8	9	7	16	
9-Jan	8	6	6	11	11	14	13	12	7	6	10	18	20	9	11	10	4	7	15	12	10	5	8	UO	20	
10-Jan	UO	UO	11	7	4	2	14	12	7	8	14	30	63	80	11	30	28	10	UO	UO	UO	UO	13	UO	80	
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	7	UO	6	7	7	7
12-Jan	7	11	8	10	6	6	3	4	4	3	4	3	3	4	4	4	6	7	6	5	10	13	14	8	14	
13-Jan	24	22	50	54	19	50	8	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	54
14-Jan	UO	UO	UO	7	7	6	6	7	6	6	7	7	6	5	6	8	9	17	7	59	12	9	92	49	92	
15-Jan	74	54	34	66	16	15	16	10	15	14	47	28	44	36	83	37	15	29	25	16	15	13	48	30	83	
16-Jan	22	24	21	20	30	25	8	14	10	9	8	9	14	10	11	9	9	9	6	5	5	6	7	7	30	
17-Jan	11	6	6	6	6	5	6	5	5	5	5	7	9	7	10	5	5	10	4	3	4	3	3	3	11	
18-Jan	5	3	4	4	4	4	3	3	4	4	5	4	4	7	5	4	3	3	5	3	3	3	2	2	7	
19-Jan	2	4	3	7	4	4	4	4	3	13	11	6	8	10	14	7	7	6	8	7	9	9	9	13	14	
20-Jan	11	7	6	8	9	14	12	9	12	11	20	13	9	8	4	6	3	2	4	4	17	12	23	14	23	
21-Jan	8	9	14	13	7	18	7	8	5	8	7	6	8	7	10	4	9	6	8	11	7	7	6	6	18	
22-Jan	4	6	6	7	8	6	6	5	6	9	39	6	UO	UO	UO	10	10	5	7	8	3	8	8	13	39	
23-Jan	32	31	11	14	7	9	9	9	10	7	9	9	8	25	14	14	11	26	40	10	8	10	13	8	40	
24-Jan	6	7	6	9	7	5	5	5	4	3	3	8	17	16	20	5	6	10	6	7	13	14	22	12	22	
25-Jan	13	23	52	34	14	24	22	18	49	33	58	36	94	28	13	12	5	UO	UO	UO	UO	UO	UO	UO	94	
26-Jan	UO	UO	UO	6	7	7	14	10	8	8	8	7	10	9	13	19	7	12	6	6	7	7	7	5	19	
27-Jan	5	9	6	5	9	19	10	8	5	6	6	21	7	18	13	13	5	4	9	8	9	8	6	6	21	
28-Jan	10	5	5	5	5	5	8	5	4	6	7	9	6	9	9	7	9	5	5	14	6	6	5	8	14	
29-Jan	3	9	11	5	6	4	7	5	7	5	15	5	8	7	8	9	5	17	5	14	9	6	5	12	17	
30-Jan	8	13	5	38	56	73	23	5	2	6	4	10	17	50	54	39	10	7	14	19	12	61	9	8	73	
31-Jan	7	6	6	5	5	9	7	6	7	9	8	56	51	45	34	22	10	12	6	18	49	12	25	6	56	
	74	54	52	66	56	73	23	35	49	33	58	56	94	80	103	40	28	29	40	59	49	61	92	49		

Diurnal Maximum

UO - Unstable Operation





Maximum Value: 1.7 km/h on Jan 8 01:00		Maximum Daily Average: 0.8 km/h on Jan 12		Hours in Service: 744																							
Minimum Value: -1.3 km/h on Jan 26 08:00		Minimum Daily Average: -0.4 km/h on Jan 28		Hours of Data: 739																							
Maximum Diurnal Average: 0.3 km/h at hour 13		Minimum Diurnal Average: 0.1 km/h at hour 19		Hours of Missing Data: 5																							
Monthly Average: 0.26 km/h		Percentiles: P ₁ = -0.8 P ₁₀ = -0.3 Q ₁ = 0.0 Median = 0.3 Q ₃ = 0.6 P ₉₀ = 0.8 P ₉₉ = 1.1		Hours of Calibration: 0																							
				Percent Operational Time: 99.3																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.1	0.1	-0.1	0.0	-0.1	0.0	0.3	0.5	0.5	0.7	0.8	0.8	0.6	0.6	0.2	0.0	0.2	0.4	0.3	0.1	0.5	0.5	0.5	0.4	0.3	0.8	
2-Jan	0.4	0.7	0.7	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.6	0.7	0.4	0.5	0.3	0.1	0.4	0.8	0.8	0.7	0.6	0.6	0.8	
3-Jan	0.8	0.7	0.4	0.3	0.5	0.7	0.9	0.8	0.7	0.6	0.6	0.8	0.8	0.8	0.8	1.0	1.1	0.8	1.1	0.8	0.6	0.4	0.4	0.7	1.1		
4-Jan	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.5	0.4	0.4	0.3	0.4	0.5	
5-Jan	0.4	0.5	0.5	0.4	0.5	0.6	0.5	0.2	0.5	0.5	0.6	0.5	0.4	0.3	0.1	0.5	0.4	0.3	0.5	0.7	0.7	0.8	0.9	0.5	0.9	0.9	
6-Jan	1.0	0.9	0.8	0.5	0.4	0.6	0.7	0.8	0.7	0.6	0.5	0.6	0.8	0.7	0.8	0.8	0.6	0.7	0.7	0.9	1.1	1.2	0.7	0.5	0.7	1.2	
7-Jan	0.9	0.6	0.5	0.5	0.3	0.2	0.2	0.2	-0.1	-0.1	0.0	0.0	0.2	0.2	0.1	-0.2	-0.2	-0.3	-0.1	0.0	0.0	0.0	0.3	1.0	0.2	1.0	
8-Jan	1.7	UO	UO	1.0	UO	1.0	0.4	0.3	0.9	UO	UO	0.3	0.0	0.0	0.0	0.2	0.3	0.0	-0.2	-0.2	0.0	0.4	0.4	0.5	0.4	1.7	
9-Jan	0.5	0.4	0.3	0.7	0.2	0.3	0.4	0.5	0.4	0.4	0.2	0.2	0.4	0.4	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.7	
10-Jan	0.1	0.4	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.0	0.0	-0.1	0.0	-0.1	0.1	0.1	0.1	0.0	-0.1	-0.1	0.2	0.6	
11-Jan	-0.1	0.0	0.0	-0.1	-0.1	-0.2	0.1	-0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.5	0.6	0.3	0.5	0.6	0.9	0.8	1.0	0.8	0.3	1.0	
12-Jan	1.0	0.6	0.8	0.8	0.9	0.7	0.7	0.9	0.9	1.1	1.1	1.2	1.3	1.0	0.9	1.0	0.8	0.8	0.7	0.6	0.7	0.6	0.3	0.3	0.8	1.3	
13-Jan	0.3	0.5	0.1	0.2	0.1	0.0	0.1	-0.4	-0.3	0.0	-0.2	0.1	0.1	0.2	0.0	0.2	-0.1	0.5	0.2	0.6	0.3	0.7	1.2	1.0	0.2	1.2	
14-Jan	0.7	0.6	0.6	0.6	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.6	0.4	0.4	0.6	0.3	0.1	0.0	-0.1	0.1	-0.1	0.1	-0.1	0.0	0.4	0.9	
15-Jan	0.1	0.0	0.1	0.1	0.0	0.0	0.0	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	-0.3	-0.2	0.0	0.1	0.6	0.7	0.0	0.0	0.7	
16-Jan	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.2	-0.1	0.1	0.4	0.4	0.7	0.6	0.7	0.8	0.5	0.8	0.7	0.7	0.8	0.8	0.8	0.5	0.4	0.8	
17-Jan	0.3	0.2	0.2	0.2	0.1	0.4	0.6	0.8	0.8	0.8	0.8	0.6	0.4	0.2	0.3	0.4	0.1	0.1	0.2	0.8	0.6	0.5	0.6	0.8	0.5	0.8	
18-Jan	0.8	0.8	0.8	0.7	0.9	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.7	0.6	0.8	0.8	0.5	0.7	0.6	0.5	0.6	0.5	0.7	0.7	0.7	0.9	
19-Jan	0.8	0.7	0.8	0.8	1.0	1.0	1.1	1.1	0.9	0.8	0.5	0.1	0.2	-0.1	0.3	0.3	0.1	-0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.5	1.1	
20-Jan	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.2	0.3	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.1	0.1	0.1	0.0	0.3	
21-Jan	0.1	-0.1	0.3	0.3	0.2	0.7	0.8	0.7	0.6	0.6	0.8	0.7	0.6	0.5	0.4	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.3	0.8	
22-Jan	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.6	-0.5	-0.4	-0.8	-0.5	-0.3	-0.2	-0.4	-0.3	-0.3	-0.7	-0.2	-0.1	0.0	-0.3	0.0	
23-Jan	0.1	0.3	0.3	0.5	0.6	0.5	0.5	1.1	0.6	0.5	0.6	0.6	0.7	0.5	0.4	0.3	0.5	0.3	0.2	0.3	0.3	0.6	0.7	0.6	0.5	1.1	
24-Jan	0.5	0.8	0.7	0.7	0.5	0.6	0.6	0.7	0.8	0.6	0.5	0.4	0.2	0.2	0.1	-0.4	-0.4	-0.2	-0.2	-0.4	-0.1	-0.2	-0.1	-0.2	0.2	0.8	
25-Jan	-0.1	-0.1	0.2	0.1	0.0	-0.1	-0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	-0.1	0.1	0.3	0.6	0.5	0.6	0.7	0.6	0.6	0.4	0.2	0.7	
26-Jan	0.4	0.5	0.0	-0.1	-0.1	-0.3	-1.2	-1.3	-0.9	-0.9	-0.9	-0.8	-0.3	-0.3	-0.3	-0.1	0.1	-0.2	-0.7	-0.7	-0.2	-0.5	-0.6	-0.7	-0.4	0.5	
27-Jan	-0.8	-0.6	-0.7	-0.5	0.0	0.0	-0.1	-0.3	-0.6	-0.6	-0.6	-0.6	-0.3	-0.3	-0.1	-0.1	-0.4	-0.3	-0.4	-0.4	-0.5	-0.1	0.0	-0.2	-0.1	-0.3	0.0
28-Jan	-0.2	-0.2	0.0	-0.1	-0.1	-0.1	-0.2	-0.4	-0.3	-0.2	-0.3	-0.4	-0.9	-0.6	-0.4	-0.3	-0.7	-0.8	-0.8	-1.0	-0.8	-0.6	-0.4	-0.6	-0.4	0.0	
29-Jan	-0.5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.2	0.5	0.6	1.0	0.6	0.8	0.9	0.3	0.2	0.1	0.0	-0.3	-0.7	-0.6	-0.5	-0.4	0.1	1.0	
30-Jan	-0.2	-0.4	-0.4	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.1	0.0	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.1	0.2	0.2	-0.1	-0.1	-0.2	0.0	0.4	
31-Jan	-0.3	-0.4	-0.2	-0.3	-0.3	0.1	0.2	-0.1	0.0	0.2	0.5	0.1	0.3	0.5	0.5	0.3	0.5	0.5	0.2	0.0	-0.2	0.0	0.0	-0.3	0.1	0.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								UO - Unstable Operation			



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 20 m (VW20m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.0 km/h on Jan 26 08:00 Minimum Value: 0.1 km/h on Jan 15 02:00 Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 1.0 Q ₃ = 1.3 P ₉₀ = 1.8 P ₉₉ = 2.8																				Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	0.4	0.7	1.1	1.0	0.7	0.4	0.5	0.9	1.1	1.0	1.1	1.1	1.0	0.9	0.6	0.4	0.5	0.4	0.5	0.4	0.6	0.5	0.4	0.4	1.1
2-Jan	0.4	0.7	1.0	1.0	1.3	1.1	0.9	1.0	1.1	1.1	1.1	1.2	1.1	0.8	0.8	0.9	0.9	0.6	0.5	0.7	1.2	1.0	0.6	0.7	1.3
3-Jan	1.0	0.8	0.9	0.6	0.6	0.5	0.7	1.0	0.7	0.7	0.8	1.2	1.3	1.3	1.1	1.1	1.0	1.2	1.1	1.1	0.9	0.9	0.7	0.6	1.3
4-Jan	0.4	0.5	0.4	0.3	0.4	0.4	0.6	0.7	0.8	0.9	0.8	1.0	0.8	0.6	0.7	0.5	0.6	0.6	0.6	0.5	0.3	0.4	0.3	0.5	1.0
5-Jan	0.7	0.6	0.6	0.7	0.9	1.0	1.0	0.8	1.4	1.0	1.1	1.0	0.8	1.0	0.6	0.5	0.4	0.6	1.0	1.4	1.7	1.3	1.5	1.9	1.9
6-Jan	2.4	2.2	1.9	1.3	0.6	1.0	1.0	1.4	0.7	0.7	0.9	1.0	1.0	1.0	0.9	0.7	0.6	0.7	0.8	1.1	1.3	1.3	0.8	0.8	2.4
7-Jan	1.1	0.9	0.8	0.9	0.6	0.4	0.5	0.5	0.3	0.3	0.4	0.5	0.6	0.5	0.7	0.4	0.4	0.5	0.7	0.3	0.4	0.4	0.8	2.0	2.0
8-Jan	2.2	UO	UO	1.4	UO	1.4	0.6	0.7	1.6	UO	UO	1.0	0.6	0.4	0.4	0.3	0.5	0.6	0.3	0.4	0.5	0.9	1.1	1.1	2.2
9-Jan	1.3	1.0	1.2	1.2	0.6	0.7	0.9	0.7	0.9	0.9	0.9	0.7	1.0	1.1	0.8	1.0	1.1	0.9	0.6	0.5	0.6	0.8	0.5	0.7	1.3
10-Jan	0.7	1.1	1.5	0.9	0.8	0.6	0.6	0.6	0.8	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.6	0.6	0.6	0.6	0.3	0.7	0.6	1.5
11-Jan	0.4	0.3	0.4	0.5	0.6	0.7	0.5	0.5	0.4	0.4	0.6	0.5	0.8	0.9	1.0	0.9	0.8	0.5	0.9	1.2	1.3	1.4	1.5	1.3	1.5
12-Jan	1.4	1.8	1.3	1.1	1.5	1.2	1.4	1.4	1.4	1.7	1.7	1.8	1.7	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.9	0.7	0.7	1.8
13-Jan	0.8	0.7	0.5	0.4	0.4	0.5	0.6	1.2	1.1	0.8	0.8	0.7	0.5	0.7	0.8	1.0	0.9	1.0	0.9	1.3	1.3	1.4	1.7	1.7	1.7
14-Jan	1.9	1.8	1.8	1.8	2.0	1.7	1.6	1.5	1.5	1.3	1.3	1.1	0.8	0.8	0.8	0.7	0.5	0.5	0.4	0.3	0.5	0.4	0.4	0.4	2.0
15-Jan	0.3	0.1	0.2	0.1	0.2	0.4	0.6	0.5	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.7	0.7	0.4	0.4	0.7
16-Jan	0.3	0.3	0.5	0.5	0.6	0.5	0.9	0.9	0.7	0.8	1.1	1.0	1.2	1.6	1.6	2.0	1.7	1.5	1.7	2.0	1.9	1.5	1.2	0.8	2.0
17-Jan	1.4	1.5	1.6	1.8	1.8	1.5	1.4	1.3	1.3	1.4	1.3	1.3	1.4	1.4	1.4	1.1	0.9	0.6	0.5	1.1	0.8	0.8	1.1	1.4	1.8
18-Jan	1.1	1.3	1.3	1.0	1.5	1.1	1.0	0.8	1.1	1.2	1.0	1.1	1.2	1.2	1.5	1.5	1.4	1.7	1.3	1.1	1.2	1.1	0.9	1.0	1.7
19-Jan	1.1	0.8	0.9	1.0	1.4	1.3	1.4	1.5	1.3	1.1	1.0	0.6	1.1	1.2	1.2	1.1	1.3	1.6	0.9	1.5	1.3	1.4	1.3	1.1	1.6
20-Jan	1.5	1.3	1.1	1.2	1.1	1.0	0.5	0.8	0.8	0.7	0.6	0.7	1.2	1.2	1.7	1.9	1.6	1.6	1.4	1.7	1.6	0.7	0.6	0.4	1.9
21-Jan	0.6	0.7	0.6	0.6	0.5	1.0	1.1	1.2	1.1	1.1	1.2	0.9	1.2	1.0	0.8	0.7	0.7	0.4	0.5	0.8	1.8	1.4	1.4	1.3	1.8
22-Jan	1.1	0.8	1.0	1.5	1.9	1.6	1.7	2.0	1.8	2.2	2.8	3.3	2.1	2.3	2.0	1.5	1.3	1.1	1.3	1.6	2.3	1.5	1.0	0.7	3.3
23-Jan	0.6	0.5	0.7	1.0	1.4	1.6	1.2	1.8	1.8	1.9	1.5	1.6	1.3	1.0	1.0	0.8	0.8	0.7	0.4	0.5	0.5	0.9	1.0	0.9	1.9
24-Jan	0.9	1.1	1.0	1.0	1.1	1.1	1.0	1.3	1.4	1.1	0.9	1.0	0.7	0.5	0.6	1.3	1.7	1.7	1.7	1.4	1.0	0.8	0.6	0.7	1.7
25-Jan	0.8	0.9	0.7	0.4	0.5	0.6	0.6	0.6	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.9	1.1	1.3	1.3	1.3	1.4	1.3	1.2	1.4
26-Jan	1.2	1.1	0.9	1.7	1.8	2.1	3.3	4.0	3.4	4.0	3.6	2.5	1.7	1.3	1.1	1.2	1.8	2.3	2.6	2.8	2.3	2.6	2.3	2.5	4.0
27-Jan	2.3	2.3	2.3	2.4	2.0	1.7	1.8	1.7	2.7	2.4	1.7	1.4	1.1	0.9	0.7	1.1	1.4	1.2	0.9	1.0	0.7	0.4	0.7	0.9	2.7
28-Jan	1.0	1.8	1.4	1.7	1.4	1.1	1.6	2.1	2.1	1.9	2.3	2.4	2.6	2.5	2.4	2.1	2.4	2.8	2.9	2.7	2.8	2.7	2.3	1.5	2.9
29-Jan	1.6	0.5	0.4	0.5	0.6	0.4	0.5	0.4	0.5	0.8	1.1	1.1	1.2	1.3	1.4	1.6	1.1	0.4	0.6	1.1	1.7	2.2	2.2	1.3	2.2
30-Jan	0.8	0.9	1.4	0.5	0.2	0.2	0.4	0.3	0.4	0.6	0.5	0.6	0.4	0.5	0.6	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.4	1.3	1.4
31-Jan	2.1	2.3	1.7	1.6	1.3	1.1	1.1	1.0	0.9	1.0	1.0	0.9	1.0	0.9	0.8	0.5	0.5	0.5	0.2	0.3	0.5	0.2	0.4	0.6	2.3
2.4 2.3 2.3 2.4 2.0 2.1 3.3 4.0 3.4 4.0 3.6 3.3 2.6 2.5 2.4 2.1 2.4 2.8 2.9 2.8 2.8 2.7 2.3 2.5																								Diurnal Maximum	
UO - Unstable Operation																									



Maximum Value: 1.5 km/h on Jan 23 08:00		Maximum Daily Average: 0.6 km/h on Jan 12		Hours in Service: 744																						
Minimum Value: -1.3 km/h on Jan 22 14:00		Minimum Daily Average: -0.7 km/h on Jan 28		Hours of Data: 696																						
Maximum Diurnal Average: 0.3 km/h at hour 13		Minimum Diurnal Average: 0.0 km/h at hour 20		Hours of Missing Data: 48																						
Monthly Average: 0.12 km/h		Percentiles: P ₁ = -0.9 P ₁₀ = -0.5 Q ₁ = -0.2 Median = 0.1 Q ₃ = 0.5 P ₉₀ = 0.7 P ₉₉ = 1.0		Hours of Calibration: 0																						
				Percent Operational Time: 93.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-0.4	-0.5	-0.8	-0.5	-0.6	-0.5	0.0	0.4	0.2	0.5	0.7	0.6	0.6	0.6	0.1	-0.3	-0.2	0.0	-0.1	-0.4	0.2	0.1	0.3	0.2	0.0	0.7
2-Jan	0.2	0.6	0.8	0.7	0.5	0.6	0.4	0.5	0.7	0.7	0.5	0.7	0.6	0.2	0.5	0.4	0.7	0.1	-0.3	0.0	0.7	0.7	0.5	0.2	0.5	0.8
3-Jan	0.5	0.6	0.2	0.3	0.2	0.1	0.7	0.6	0.6	0.4	0.4	0.8	0.8	0.6	0.8	1.0	1.0	1.2	0.9	1.0	0.8	0.7	0.6	0.6	0.6	1.2
4-Jan	0.3	0.4	0.2	0.1	0.0	-0.1	0.2	0.5	0.4	0.5	0.5	0.4	0.3	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.6	0.3	0.6
5-Jan	0.5	0.6	0.4	0.5	0.8	1.2	0.7	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0	0.1	0.3	0.7	--	1.2
6-Jan	0.8	0.9	0.7	0.5	0.4	0.5	0.6	0.6	0.5	0.5	0.6	0.4	0.6	0.4	0.6	0.6	0.3	0.6	0.5	0.6	0.9	1.2	0.5	0.3	0.6	1.2
7-Jan	0.8	0.4	0.0	0.3	-0.1	-0.2	0.1	0.3	-0.4	-0.3	-0.3	-0.2	0.2	0.1	-0.1	-0.1	-0.2	-0.3	-0.2	0.0	-0.2	-0.3	0.0	0.2	0.0	0.8
8-Jan	0.5	0.6	0.4	0.6	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.1	0.1	0.3	0.7	0.0	0.0	0.2	-0.1	0.4	0.6	0.4	--	0.7
9-Jan	0.5	0.3	0.1	0.8	0.2	0.4	0.5	0.6	0.1	0.1	-0.1	0.4	0.6	0.1	0.0	0.1	0.1	0.0	-0.2	-0.3	0.0	0.0	0.1	0.1	0.2	0.8
10-Jan	-0.1	0.2	0.3	0.2	0.2	0.0	0.2	0.4	0.2	0.0	0.2	0.2	0.0	0.1	0.0	-0.2	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	0.0	0.4
11-Jan	-0.1	-0.1	0.0	-0.1	-0.2	-0.3	0.1	-0.2	-0.1	0.1	0.0	0.1	0.3	0.1	0.0	0.2	0.4	0.1	0.5	0.5	0.7	0.7	0.7	0.8	0.2	0.8
12-Jan	0.8	0.6	0.5	0.6	0.7	0.6	0.7	0.8	0.8	1.1	0.7	0.9	1.0	0.8	0.6	0.8	0.6	0.7	0.6	0.4	0.5	0.3	0.2	0.2	0.6	1.1
13-Jan	0.1	0.5	0.1	0.1	0.0	-0.1	0.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.5
14-Jan	UO	UO	0.5	0.5	0.7	0.7	0.8	0.6	0.5	0.6	0.5	0.4	0.3	0.2	0.4	0.1	0.0	-0.1	-0.2	0.0	-0.2	0.0	-0.2	-0.1	0.3	0.8
15-Jan	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	0.0	-0.4	-0.2	0.2	0.3	0.6	0.9	0.0	-0.2	0.0	0.9
16-Jan	0.0	0.0	-0.1	0.3	0.2	0.0	0.1	0.3	0.2	0.3	0.6	0.5	1.1	0.8	0.5	0.4	0.1	0.6	0.4	0.5	0.5	0.6	0.7	0.4	0.4	1.1
17-Jan	0.1	-0.3	-0.1	-0.3	-0.2	0.3	0.4	0.7	0.6	0.6	0.6	0.5	0.2	-0.2	0.1	0.2	-0.1	0.1	0.2	0.8	0.6	0.4	0.5	0.8	0.3	0.8
18-Jan	0.6	0.8	0.7	0.6	0.7	0.6	0.5	0.6	0.5	0.4	0.5	0.6	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.5	0.8
19-Jan	0.5	0.5	0.6	0.7	1.0	0.9	1.0	0.8	1.0	0.6	0.3	-0.3	-0.3	-0.5	0.0	0.1	-0.5	-0.6	-0.2	-0.4	-0.3	-0.2	-0.3	-0.3	0.2	1.0
20-Jan	-0.5	-0.6	-0.6	-0.5	-0.4	-0.3	-0.3	-0.1	-0.1	-0.2	0.0	-0.1	0.0	-0.1	-0.7	-1.0	-0.8	-0.8	-0.7	-0.8	0.0	-0.2	-0.1	-0.2	-0.4	0.0
21-Jan	-0.3	-0.7	0.1	0.0	-0.1	0.7	0.6	0.5	0.4	0.5	0.7	0.6	0.7	0.3	0.1	-0.4	-0.4	-0.5	-0.3	-0.3	-0.6	-0.6	-0.4	-0.5	0.0	0.7
22-Jan	-0.4	-0.5	-0.4	-0.5	-0.5	-0.8	-0.6	-0.8	-0.7	-0.7	-0.5	0.0	UO	-1.3	-0.4	-0.1	0.0	-0.5	-0.1	-0.1	-0.5	-0.1	0.0	0.1	-0.4	0.1
23-Jan	0.1	0.3	0.0	0.2	0.4	0.1	0.3	1.5	0.2	-0.1	0.4	0.0	0.5	0.6	0.6	0.4	0.8	0.3	0.2	0.0	0.1	0.3	0.7	0.4	0.4	1.5
24-Jan	0.4	0.7	0.5	0.5	0.3	0.5	0.5	0.6	0.7	0.5	0.4	0.3	0.1	0.0	-0.1	-0.6	0.1	0.2	0.3	-0.1	-0.1	-0.3	-0.1	-0.2	0.2	0.7
25-Jan	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.2	-0.1	0.0	0.0	0.2	0.0	-0.3	0.0	0.1	0.4	0.4	0.5	UO	UO	UO	UO	0.0	0.5
26-Jan	UO	UO	UO	-0.5	-0.7	-0.8	-0.9	-0.8	0.2	0.4	-0.7	-0.6	-0.2	-0.1	-0.2	0.0	0.5	0.3	-0.1	-0.1	0.2	-0.3	-0.4	-0.6	-0.3	0.5
27-Jan	-0.3	-0.3	-0.1	-0.2	0.3	0.3	0.2	-0.1	-0.2	-0.5	-0.3	-0.3	-0.4	-0.4	-0.2	-0.5	-0.6	-0.5	-0.2	-0.7	-0.5	-0.4	-0.6	-0.4	-0.3	0.3
28-Jan	-0.5	-0.7	-0.6	-0.5	-0.5	-0.6	-0.7	-0.8	-0.8	-0.6	-0.7	-0.7	-1.0	-0.6	-0.5	-0.4	-0.9	-1.0	-0.9	-1.0	-0.7	-0.8	-0.3	-0.9	-0.7	-0.3
29-Jan	-0.7	-0.4	-0.4	-0.6	-0.3	-0.5	-0.6	-0.6	-0.2	0.1	0.5	0.6	0.5	0.6	0.7	0.1	-0.3	-0.3	-0.4	-0.7	-1.0	-0.7	-0.7	-0.4	-0.2	0.7
30-Jan	-0.4	-0.5	-0.2	-0.2	-0.1	-0.1	-0.3	-0.6	-0.7	-0.3	-0.3	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.0	0.1	0.2	0.0	-0.2	-0.1	-0.1	0.3
31-Jan	0.1	0.3	0.2	0.1	-0.1	0.4	0.2	0.1	0.0	0.2	0.4	-0.2	-0.1	0.3	0.3	0.3	0.5	0.4	0.0	0.1	0.0	0.0	-0.1	-0.3	0.1	0.5
																								Diurnal Average		
																								Diurnal Maximum		
0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.1 0.1 0.1 0.1 0.0 0.0 0.0 0.1 0.1 0.1 0.1 0.8 0.9 0.8 0.8 1.0 1.2 1.0 1.5 1.0 1.1 0.7 0.9 1.1 0.8 0.8 1.0 1.0 1.2 0.9 1.0 0.9 1.2 0.7 0.8																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 45 m (VW45m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.2 km/h on Jan 26 10:00 Minimum Value: 0.1 km/h on Jan 15 02:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.4 P ₉₀ = 1.9 P ₉₉ = 3.1		Hours in Service: 744 Hours of Data: 696 Hours of Missing Data: 48 Hours of Calibration: 0 Percent Operational Time: 93.6																							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	0.4	0.7	1.1	1.0	0.7	0.3	0.5	0.7	0.9	0.8	1.0	1.0	1.0	0.9	0.6	0.4	0.4	0.4	0.7	0.6	0.6	0.5	0.6	0.6	1.1
2-Jan	0.6	0.6	0.8	0.8	1.1	0.9	0.7	0.7	0.7	1.0	1.0	0.8	0.8	0.6	0.5	0.5	0.7	0.4	0.4	0.5	1.0	0.6	0.6	0.6	1.1
3-Jan	0.7	0.7	0.8	0.4	0.5	0.5	0.7	0.7	0.5	0.5	0.6	1.0	1.1	1.1	0.9	0.9	0.9	0.8	0.8	0.9	0.7	0.6	0.7	0.9	1.1
4-Jan	0.4	0.4	0.5	0.3	0.4	0.3	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5	0.6	0.5	0.7	0.9	0.8	0.7	0.3	0.5	0.5	0.6	0.9
5-Jan	0.8	0.4	0.3	0.5	0.5	0.6	0.7	0.6	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.7	1.6	1.8	1.8	1.8
6-Jan	2.5	2.1	1.7	1.3	0.6	1.2	1.2	1.6	0.7	0.5	0.6	1.0	0.7	1.1	0.7	0.5	0.6	0.7	0.7	1.0	1.4	1.1	0.7	0.9	2.5
7-Jan	0.9	0.7	0.4	0.6	0.9	0.4	0.7	0.9	0.5	0.4	0.4	0.5	0.7	0.6	0.5	0.5	0.3	0.3	0.7	0.4	0.2	0.2	0.4	0.4	0.9
8-Jan	0.2	0.4	0.5	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.4	0.2	0.3	0.7	0.9	0.4	0.6	0.5	0.9	1.2	1.1	1.2
9-Jan	1.4	1.1	1.2	1.3	0.8	0.8	1.0	1.0	1.2	1.1	1.1	0.9	1.3	1.4	1.0	0.9	1.0	0.8	0.6	0.4	0.6	0.6	0.5	0.5	1.4
10-Jan	0.5	1.2	1.7	0.9	0.8	0.5	0.8	0.8	0.8	0.7	0.8	0.8	0.6	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.6	0.3	0.7	0.6	1.7
11-Jan	0.3	0.2	0.3	0.5	0.5	0.6	0.4	0.3	0.2	0.4	0.5	0.5	0.8	1.1	1.1	0.9	0.9	0.4	0.9	1.4	1.3	1.5	1.4	1.3	1.5
12-Jan	1.4	1.7	1.4	1.2	1.3	1.1	1.3	1.5	1.5	1.8	1.6	1.8	1.8	1.6	1.5	1.4	1.3	1.2	1.0	0.9	0.9	0.7	0.5	0.6	1.8
13-Jan	0.7	0.8	0.5	0.4	0.6	0.5	0.9	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.9
14-Jan	UO	UO	1.9	2.1	2.4	2.0	2.2	1.8	1.9	1.6	1.6	1.2	0.9	0.9	0.9	0.7	0.5	0.5	0.4	0.6	0.3	0.4	0.4	0.2	2.4
15-Jan	0.3	0.1	0.2	0.2	0.1	0.4	0.6	0.5	0.3	0.2	0.2	0.3	0.4	0.3	0.5	0.4	0.5	0.6	0.7	0.9	1.0	0.7	0.6	0.6	1.0
16-Jan	0.4	0.5	0.7	0.8	0.8	0.7	0.8	0.8	0.8	0.8	1.2	1.3	1.5	1.9	2.0	2.3	2.0	1.8	2.0	2.0	1.9	1.7	1.3	0.8	2.3
17-Jan	1.4	1.4	1.6	1.7	1.6	1.3	1.5	1.4	1.5	1.5	1.4	1.4	1.3	1.2	1.1	0.9	0.4	0.4	0.4	1.0	0.7	0.9	0.9	1.3	1.7
18-Jan	1.0	1.1	1.3	1.1	1.7	1.1	0.8	0.8	1.1	1.3	1.3	0.9	1.2	1.4	1.5	1.4	1.2	1.6	1.4	1.1	1.1	1.0	0.6	0.6	1.7
19-Jan	1.0	0.8	1.0	0.8	1.3	1.3	1.1	1.2	1.4	1.1	1.0	0.6	1.5	1.6	1.3	1.0	1.0	1.5	1.1	1.4	1.8	1.6	1.5	1.6	1.8
20-Jan	1.8	1.6	1.4	1.5	1.7	1.3	0.5	1.0	1.2	1.1	1.1	1.1	1.5	1.5	1.5	1.7	1.3	1.1	1.3	1.6	1.7	1.1	1.0	0.8	1.8
21-Jan	0.7	0.9	0.5	0.5	0.6	0.8	1.0	0.9	0.9	1.1	0.9	0.7	0.8	0.8	0.7	0.7	0.8	0.6	0.9	1.2	2.1	1.7	1.7	1.5	2.1
22-Jan	1.2	1.0	1.2	1.9	2.3	1.8	1.7	2.4	2.2	2.5	2.9	3.3	UO	2.4	1.8	1.6	1.3	1.2	1.5	1.7	1.7	1.4	1.0	0.9	3.3
23-Jan	0.7	0.6	0.5	0.9	1.5	1.7	1.5	2.3	2.1	2.1	1.9	1.8	1.7	1.3	1.2	1.0	1.1	0.8	0.5	0.4	0.5	1.0	1.4	1.1	2.3
24-Jan	1.0	1.3	1.1	1.2	1.2	1.2	1.1	1.3	1.2	1.0	0.8	1.0	0.7	0.4	0.4	1.2	1.5	1.8	1.7	1.5	1.0	0.7	0.7	0.7	1.8
25-Jan	0.7	0.9	0.8	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.7	0.6	0.6	0.6	0.7	0.8	0.8	1.2	1.4	1.6	UO	UO	UO	UO	1.6
26-Jan	UO	UO	UO	2.0	2.0	2.2	3.3	4.1	3.9	4.2	3.8	2.6	1.9	1.5	1.2	1.4	2.0	2.4	2.7	2.8	2.5	2.5	2.2	2.3	4.2
27-Jan	2.3	2.3	2.3	2.2	2.2	2.2	2.1	1.8	2.8	2.3	1.6	1.8	1.2	1.1	0.8	1.1	1.5	1.1	1.0	1.0	1.1	0.4	0.7	0.8	2.8
28-Jan	1.1	1.9	1.6	1.7	1.5	1.2	1.6	2.3	2.0	2.0	2.5	2.8	2.7	2.7	2.6	2.2	2.5	3.1	3.1	2.8	2.8	2.8	2.4	1.4	3.1
29-Jan	1.7	0.7	0.4	0.5	0.4	0.4	0.5	0.4	0.6	0.4	1.0	0.8	1.1	1.3	1.6	1.4	0.8	0.4	0.7	0.9	1.9	2.5	2.4	1.5	2.5
30-Jan	0.7	1.0	1.2	0.6	0.2	0.3	0.3	0.5	0.4	0.7	0.6	0.6	0.6	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.4	0.4	0.4	1.5	1.5
31-Jan	2.3	2.5	2.0	1.7	1.4	1.3	1.3	1.0	0.9	1.1	1.2	0.7	1.2	1.0	0.9	0.6	0.5	0.6	0.2	0.2	0.4	0.4	0.4	0.5	2.5
Diurnal Maximum																									
2.5 2.5 2.3 2.2 2.4 2.2 3.3 4.1 3.9 4.2 3.8 3.3 2.7 2.7 2.6 2.3 2.5 3.1 3.1 2.8 2.8 2.8 2.4 2.3																									
UO - Unstable Operation																									



Maximum Value: 1.8 km/h on Jan 1 09:00		Maximum Daily Average: 0.6 km/h on Jan 3		Hours in Service: 744																							
Minimum Value: -2.4 km/h on Jan 14 09:00		Minimum Daily Average: 0.0 km/h on Jan 29		Hours of Data: 695																							
Maximum Diurnal Average: 0.4 km/h at hour 8		Minimum Diurnal Average: 0.1 km/h at hour 20		Hours of Missing Data: 49																							
Monthly Average: 0.23 km/h		Percentiles: P ₁ = -0.5 P ₁₀ = -0.2 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 1.3		Hours of Calibration: 0																							
				Percent Operational Time: 93.4																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-0.4	-0.5	-0.8	-0.5	-0.5	-0.5	0.7	1.4	1.8	1.5	1.1	0.6	0.8	0.5	0.2	0.0	0.0	0.0	-0.1	-0.1	0.2	0.1	0.2	0.1	0.2	1.8	
2-Jan	0.1	0.6	0.7	0.7	0.6	0.6	0.5	0.6	0.9	0.7	0.4	0.6	0.4	0.0	0.2	0.3	0.4	0.1	-0.2	-0.1	0.5	0.5	0.3	0.1	0.4	0.9	
3-Jan	0.4	0.7	0.2	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.2	0.8	0.7	0.6	0.7	0.9	0.9	0.8	0.9	1.0	0.7	0.7	0.7	0.8	1.0	0.6	
4-Jan	0.4	0.2	0.0	0.1	0.0	-0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.4	0.4	0.4	0.2	
5-Jan	0.5	0.8	0.5	0.4	0.8	1.3	1.0	0.8	0.8	0.5	1.0	0.3	0.0	-0.1	0.0	0.0	0.1	-0.1	0.2	-0.1	-0.3	-0.2	-0.3	-0.3	1.3	0.3	
6-Jan	-0.6	-0.2	-0.4	-0.3	-0.1	-0.4	-0.4	-0.3	-0.2	0.2	0.6	0.6	0.5	0.4	0.5	0.6	0.4	0.4	0.1	0.1	0.7	1.0	0.3	0.1	1.0	0.1	
7-Jan	0.4	0.3	-0.1	-0.1	-0.1	-0.1	0.1	0.3	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.1	0.5	1.2	1.2	0.2	
8-Jan	1.1	1.1	1.3	0.9	1.8	0.1	0.0	0.6	0.2	0.2	-0.2	0.0	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.5	0.0	0.2	0.7	0.0	1.8	0.4	
9-Jan	-0.1	-0.3	-0.7	0.5	0.7	0.5	0.5	0.5	-0.3	-0.3	-0.4	0.5	0.6	-0.1	-0.1	0.2	0.2	0.2	0.0	-0.2	0.3	0.3	0.5	0.3	0.7	0.1	
10-Jan	0.2	0.2	0.0	0.3	0.4	-0.2	0.2	0.5	0.2	-0.1	0.2	0.3	0.3	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.5	0.1	
11-Jan	0.0	0.3	0.4	UO	UO	UO	UO	UO	UO	0.3	0.2	UO	UO	UO	UO	0.4	0.4	0.1	-0.4	-0.1	0.4	0.5	0.4	0.6	0.6	--	
12-Jan	0.3	0.3	0.4	0.3	0.3	0.3	0.6	0.9	0.9	1.1	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.4	0.4	0.4	0.2	0.2	1.1	0.5	
13-Jan	0.2	0.2	0.2	0.1	0.1	0.1	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.2	0.2	--
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	-2.4	0.6	UO	UO	0.3	0.3	0.4	0.2	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.1	0.6	0.6	--
15-Jan	0.1	0.1	0.1	0.2	0.1	0.1	0.2	-0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.3	0.0	0.0	0.3	0.5	0.5	0.9	0.1	-0.1	0.9	0.2	
16-Jan	0.1	0.3	-0.2	0.4	0.5	-0.1	0.3	0.4	0.4	0.5	0.4	0.5	1.4	0.8	0.3	-0.1	-0.7	0.2	-0.4	-0.5	-0.4	0.2	0.5	0.5	1.4	0.2	
17-Jan	0.1	-0.1	0.0	-0.1	0.0	0.4	0.4	0.7	0.7	0.6	0.6	0.5	0.5	-0.1	0.3	0.2	0.1	0.3	0.5	0.6	0.7	0.5	0.5	0.8	0.8	0.4	
18-Jan	0.5	0.8	0.8	0.6	0.4	0.5	0.1	0.2	0.3	0.3	0.3	0.4	0.1	0.2	-0.1	-0.1	-0.2	-0.3	-0.3	-0.1	-0.1	-0.1	0.1	-0.1	0.8	0.2	
19-Jan	0.1	0.3	0.5	0.6	0.9	0.9	0.8	0.7	1.0	0.6	0.2	-0.1	0.2	-0.4	0.2	0.2	-0.3	-0.1	0.1	0.1	0.3	0.3	0.1	0.3	1.0	0.3	
20-Jan	0.0	-0.1	-0.2	0.2	0.1	0.2	0.0	0.3	0.1	-0.1	0.3	0.4	0.5	0.4	-0.1	-0.3	-0.1	-0.2	-0.1	0.0	0.6	0.2	0.2	0.1	0.6	0.1	
21-Jan	0.2	-0.3	0.1	0.0	-0.1	0.6	0.4	0.2	0.3	0.4	0.4	0.3	0.4	0.2	0.0	-0.2	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.1	0.6	0.1	
22-Jan	0.2	0.1	0.4	0.2	0.3	0.1	0.1	0.1	-0.1	0.2	0.5	UO	UO	UO	UO	0.5	1.1	-0.4	0.1	0.4	-0.2	0.0	0.1	0.2	1.1	0.2	
23-Jan	0.2	0.7	0.2	0.0	-0.1	-0.3	-0.2	1.0	-0.3	-0.7	0.0	-0.5	0.0	0.6	0.8	0.8	1.1	0.4	0.4	0.0	0.2	0.1	0.4	0.4	1.1	0.2	
24-Jan	0.2	0.4	0.6	0.3	0.2	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.2	0.1	0.0	-0.2	0.7	0.3	0.6	0.2	0.3	0.0	0.2	0.2	0.7	0.3	
25-Jan	0.2	0.1	0.2	0.3	0.4	0.2	0.1	0.2	0.3	0.1	0.2	0.2	0.5	0.2	-0.2	0.0	0.3	0.3	-0.1	UO	UO	UO	UO	UO	0.5	0.2	
26-Jan	UO	UO	UO	0.4	0.3	0.3	-0.3	0.0	1.2	1.4	-0.1	0.0	0.2	0.3	0.0	0.3	0.5	0.7	-0.1	-0.4	0.2	-0.1	-0.2	-0.5	1.4	0.2	
27-Jan	-0.1	-0.1	0.2	0.1	0.7	0.4	0.9	0.3	-0.1	0.0	0.1	0.2	-0.2	0.0	0.1	-0.2	0.0	0.1	0.3	-0.2	0.1	0.1	0.0	0.3	0.9	0.1	
28-Jan	0.2	0.1	0.2	0.4	0.3	0.1	0.3	0.4	0.2	0.3	0.4	0.5	0.2	0.7	0.7	0.5	0.5	0.2	0.2	-0.5	-0.3	-0.4	0.2	-0.4	0.7	0.2	
29-Jan	-0.3	-0.1	0.0	-0.1	0.2	0.1	-0.1	-0.2	-0.1	-0.1	0.3	0.4	0.4	0.5	0.6	0.2	-0.2	0.0	0.2	0.2	-0.4	0.1	-0.3	0.0	0.6	0.0	
30-Jan	0.2	0.1	0.1	0.2	0.1	0.1	-0.1	-0.2	-0.2	0.4	0.2	0.3	0.2	0.3	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.1	0.2	0.4	0.1	
31-Jan	0.4	0.4	0.1	0.0	0.0	0.5	0.1	0.1	0.0	0.2	0.3	-0.2	0.0	0.5	0.4	0.4	0.4	0.3	0.1	0.2	0.1	0.1	0.2	-0.2	0.5	0.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.2 1.1			
																								0.2 1.1			
																								0.2 1.3			
																								0.2 0.9			
																								0.3 1.8			
																								0.2 1.3			
																								0.3 1.0			
																								0.4 1.4			
																								0.2 1.8			
																								0.3 1.5			
																								0.3 1.1			
																								0.3 0.8			
																								0.3 1.4			
																								0.3 0.8			
																								0.2 0.8			
																								0.2 0.9			
																								0.2 1.1			
																								0.2 0.8			
																								0.1 0.9			
																								0.1 1.0			
																								0.2 0.7			
																								0.2 1.0			
																								0.2 0.7			
																								0.2 1.2			

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 75 m (VW75m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 4.5 km/h on Jan 26 10:00																				Hours of Data: 695					
Minimum Value: 0.1 km/h on Jan 15 05:00																				Hours of Missing Data: 49					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.3 P ₉₀ = 1.9 P ₉₉ = 2.9																				Hours of Calibration: 0					
																				Percent Operational Time: 93.4					
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	0.5	0.5	0.9	0.8	0.6	0.4	0.9	0.8	0.9	0.7	0.9	0.7	0.7	0.8	0.6	0.5	0.6	0.7	0.9	0.7	0.6	0.5	0.5	0.7	0.9
2-Jan	0.8	0.6	0.6	0.6	0.7	0.7	0.6	0.5	0.5	0.7	0.9	0.5	0.5	0.3	0.4	0.5	0.6	0.4	0.3	0.4	0.9	0.5	0.8	0.5	0.9
3-Jan	0.5	0.5	0.5	0.4	0.6	0.4	0.6	0.7	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.8	0.7	0.6	0.7	0.6	0.5	0.8
4-Jan	0.4	0.4	0.5	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.5	0.7	0.6	0.5	0.5	0.7	0.6	0.8	0.6	0.6	0.6	0.5	0.6	0.5	0.8
5-Jan	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.5	0.3	0.4	0.6	0.4	0.4	0.4	0.6	0.7	0.7	1.0	1.3	1.4	1.4	1.6	1.2	1.6
6-Jan	1.7	1.7	1.5	1.4	0.8	0.9	0.9	1.3	0.7	0.7	0.7	1.0	0.6	1.0	0.6	0.4	0.6	0.6	0.4	0.5	0.8	0.9	0.8	1.3	1.7
7-Jan	0.9	0.8	0.7	0.6	1.0	0.4	0.8	0.9	0.4	0.3	0.4	0.5	0.6	0.4	0.4	0.4	0.3	0.3	0.5	0.4	0.4	0.2	0.5	0.4	1.0
8-Jan	0.4	0.3	0.4	0.5	0.4	0.5	0.4	0.4	0.7	0.4	0.4	0.3	0.4	0.4	0.3	0.5	1.0	1.4	1.0	0.7	0.9	1.2	1.7	1.3	1.7
9-Jan	1.3	1.1	1.2	1.7	1.2	1.2	1.0	1.1	1.1	1.1	1.2	1.2	1.5	1.2	1.1	0.9	0.8	0.7	0.6	0.3	0.7	0.5	0.4	0.5	1.7
10-Jan	0.5	1.7	1.4	0.7	0.4	0.2	0.8	0.7	0.7	0.6	0.8	0.9	0.6	0.7	0.5	0.4	0.4	0.2	0.2	0.2	0.5	0.3	0.6	0.5	1.7
11-Jan	0.4	0.2	0.3	UO	UO	UO	UO	UO	UO	0.3	0.3	UO	UO	UO	UO	0.7	0.7	0.3	0.6	1.0	0.9	1.3	0.9	1.1	1.3
12-Jan	0.8	1.7	1.4	1.0	0.9	0.7	0.8	1.2	1.0	1.3	1.2	1.3	1.3	1.2	1.1	1.2	1.0	1.1	0.9	0.8	0.8	0.6	0.3	0.4	1.7
13-Jan	0.4	0.6	0.5	0.5	0.9	0.7	1.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.0
14-Jan	UO	UO	UO	UO	UO	UO	UO	UO	2.0	1.5	UO	UO	0.9	0.7	0.8	0.6	0.5	0.5	0.4	0.7	0.2	0.3	0.5	0.1	2.0
15-Jan	0.2	0.2	0.3	0.2	0.1	0.3	0.5	0.5	0.4	0.2	0.4	0.4	0.3	0.4	0.5	0.4	0.4	0.6	0.8	0.8	0.9	1.0	0.8	0.7	1.0
16-Jan	0.6	0.6	0.7	1.0	1.0	1.0	0.7	0.8	0.6	0.8	1.2	1.7	2.1	3.0	2.7	2.5	2.0	2.0	1.8	1.8	1.8	1.4	1.1	0.7	3.0
17-Jan	1.3	1.3	1.6	1.6	1.4	1.2	1.3	1.3	1.3	1.4	1.2	1.4	1.3	1.1	1.1	0.8	0.3	0.5	0.4	0.7	0.6	0.6	0.7	0.9	1.6
18-Jan	0.9	0.7	1.0	1.0	1.3	1.0	0.7	0.8	1.0	1.2	1.1	0.7	0.9	1.3	1.3	1.2	1.2	1.1	1.3	0.9	0.7	0.7	0.4	0.4	1.3
19-Jan	0.7	0.7	0.9	0.9	0.9	0.9	0.7	0.8	1.0	1.0	1.1	0.8	1.7	1.9	1.4	1.0	1.2	1.7	1.5	1.7	2.2	1.9	1.8	1.7	2.2
20-Jan	2.1	1.8	1.6	1.6	2.0	1.7	0.8	1.3	1.5	1.3	1.6	1.3	1.5	1.5	1.4	1.7	1.3	1.0	1.1	1.7	2.0	1.4	1.3	1.2	2.1
21-Jan	1.1	0.9	0.8	0.4	0.7	0.8	0.7	0.5	0.6	0.6	0.5	0.4	0.5	0.5	0.6	0.7	1.0	0.8	1.1	1.4	2.2	2.1	1.9	1.6	2.2
22-Jan	1.2	1.1	1.4	2.2	2.6	1.8	1.8	2.7	2.4	2.9	2.8	UO	UO	UO	UO	1.9	1.7	1.0	1.5	1.6	1.1	1.2	0.9	0.9	2.9
23-Jan	0.7	0.7	0.4	0.8	1.7	1.7	1.5	2.6	2.1	2.0	1.9	1.8	1.6	1.5	1.3	1.1	1.2	0.9	0.6	0.4	0.3	0.7	1.1	0.9	2.6
24-Jan	0.8	1.0	0.9	1.1	1.1	0.9	0.9	0.9	0.7	0.6	0.8	1.2	0.6	0.6	0.4	0.9	1.3	1.7	1.6	1.5	1.2	0.8	0.8	0.5	1.7
25-Jan	0.7	0.7	0.7	0.4	0.5	0.4	0.2	0.4	0.4	0.4	0.6	0.7	0.7	0.6	0.6	0.8	0.6	0.9	1.5	UO	UO	UO	UO	UO	1.5
26-Jan	UO	UO	UO	2.3	2.1	2.1	3.2	3.9	3.9	4.5	4.0	2.4	1.7	1.6	1.2	1.3	2.0	2.4	2.4	2.6	2.5	2.4	2.1	2.0	4.5
27-Jan	2.1	2.0	2.1	1.8	2.2	2.1	2.2	1.8	2.2	2.2	1.7	1.8	1.2	1.2	0.8	0.8	1.2	0.8	1.1	0.7	1.4	0.7	0.5	0.7	2.2
28-Jan	1.1	1.8	1.6	1.8	1.4	1.3	1.7	2.3	2.0	1.9	2.5	2.9	2.8	2.8	2.6	2.3	2.5	2.8	2.9	2.3	2.5	2.5	2.3	0.9	2.9
29-Jan	1.2	0.8	0.5	0.5	0.5	0.3	0.5	0.4	0.7	0.5	0.7	0.7	0.8	1.0	1.3	1.3	0.7	0.6	0.8	0.8	1.3	2.4	1.9	1.3	2.4
30-Jan	0.7	0.9	1.1	0.6	0.3	0.4	0.4	0.6	0.3	0.8	0.6	0.5	0.6	0.4	0.4	0.4	0.3	0.2	0.5	0.5	0.5	0.4	0.5	1.4	1.4
31-Jan	2.3	2.3	1.8	1.6	1.2	1.4	1.0	0.9	0.8	0.8	1.2	0.6	1.1	1.1	1.0	0.8	0.6	0.4	0.1	0.3	0.4	0.3	0.4	0.6	2.3
2.3 2.3 2.1 2.3 2.6 2.1 3.2 3.9 3.9 4.5 4.0 2.9 2.8 3.0 2.7 2.5 2.5 2.8 2.9 2.6 2.5 2.5 2.3 2.0																									
Diurnal Maximum																									
UO - Unstable Operation																									



Maximum Value: 3.0 km/h on Jan 26 10:00		Maximum Daily Average: 0.8 km/h on Jan 26		Hours in Service: 744																						
Minimum Value: -1.2 km/h on Jan 12 05:00		Minimum Daily Average: -0.5 km/h on Jan 21		Hours of Data: 662																						
Maximum Diurnal Average: 0.1 km/h at hour 19		Minimum Diurnal Average: -0.1 km/h at hour 3		Hours of Missing Data: 82																						
Monthly Average: 0.00 km/h		Percentiles: P ₁ = -1.1 P ₁₀ = -0.5 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.2 P ₉₀ = 0.6 P ₉₉ = 1.3		Hours of Calibration: 0																						
				Percent Operational Time: 89.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.1	0.4	0.0	-0.3	-0.4	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.1	-0.3	--	0.4
2-Jan	-0.3	0.0	0.4	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.3	-0.4	-0.1	-0.1	-0.5	-0.4	-0.4	-0.2	-0.5	-0.6	-0.5	-0.2	-0.4	-0.4	-0.6	-0.3	0.4
3-Jan	-0.6	-0.5	-0.7	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0	-0.2	0.0	-0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.2	-0.1	0.2
4-Jan	-0.1	-0.2	-0.3	-0.2	-0.2	-0.4	-0.3	-0.1	-0.2	-0.2	-0.3	-0.3	-0.1	-0.3	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1
5-Jan	0.2	0.3	0.0	-0.1	0.4	0.8	0.3	-0.3	-0.3	-0.5	-0.1	-0.1	0.1	0.2	0.3	0.3	-0.2	0.1	0.8	0.4	-0.4	-0.3	-0.3	0.1	0.1	0.8
6-Jan	-0.2	-0.2	-0.1	0.1	0.5	0.8	0.6	0.4	0.3	0.4	0.5	0.0	-0.2	-0.1	-0.1	-0.1	-0.4	-0.3	-0.3	-0.5	-0.4	0.0	-0.3	-0.3	0.0	0.8
7-Jan	-0.2	-0.4	-0.7	-0.6	-0.6	-0.4	-0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.7	2.6	UO	UO	UO	UO	0.0	2.6
8-Jan	UO	UO	UO	0.7	0.9	UO	UO	UO	-0.8	0.2	0.2	0.2	0.1	0.0	0.0	0.3	0.1	0.2	0.2	0.5	-0.1	0.0	0.5	-0.2	0.2	0.9
9-Jan	0.2	-0.1	-1.1	0.4	0.8	0.5	0.6	0.4	-0.5	-0.5	-0.7	0.5	0.6	-0.3	-0.4	-0.2	-0.2	0.0	-0.2	-0.5	0.1	0.0	0.3	UO	0.0	0.8
10-Jan	UO	UO	0.0	0.1	0.0	-0.1	0.3	0.5	0.0	-0.3	0.2	0.2	0.2	0.2	-0.1	-0.1	0.0	-0.2	UO	UO	UO	UO	-0.1	UO	--	0.5
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	-1.0	UO	-1.1	-1.1	-0.7	--	-0.7
12-Jan	-0.9	-0.2	0.0	-0.5	-1.2	-1.0	-1.2	-0.8	-0.8	-0.7	-0.7	-0.3	-0.1	0.2	0.2	0.2	0.1	0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.3	0.2
13-Jan	-0.1	0.1	0.0	0.0	0.2	0.1	0.4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.4
14-Jan	UO	UO	UO	0.3	0.2	0.5	0.4	0.4	0.3	0.3	0.2	0.0	-0.1	0.0	0.1	-0.1	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.1	0.0	0.0	0.5
15-Jan	0.0	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	-0.1	0.1	0.3	0.4	1.0	-0.2	-0.2	0.1	1.0
16-Jan	0.0	0.3	-0.2	0.5	0.6	-0.1	0.5	0.6	0.6	0.6	0.7	0.8	1.4	1.2	0.2	-0.4	-1.1	0.0	-0.2	0.0	-0.1	0.3	0.4	0.0	0.3	1.4
17-Jan	-0.4	-0.7	-0.6	-0.7	-0.5	-0.1	-0.2	0.2	0.3	0.2	0.0	0.0	0.0	-0.6	-0.2	-0.3	-0.5	-0.1	0.0	0.2	-0.2	-0.3	-0.2	0.0	-0.2	0.3
18-Jan	-0.2	0.2	0.1	0.2	0.3	0.2	0.0	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.3	0.0	0.3	0.2	0.3	0.5	0.5	0.3	0.2	0.2	0.5
19-Jan	0.2	0.1	0.0	-0.1	0.1	0.1	-0.1	-0.2	0.1	-0.2	-0.5	-0.6	-0.4	-0.9	-0.2	-0.4	-1.1	-0.9	-0.4	-0.7	-0.4	-0.4	-0.5	-0.1	-0.3	0.2
20-Jan	-0.6	-0.8	-0.8	-0.3	-0.3	-0.3	-0.3	-0.1	-0.2	-0.5	0.0	0.0	-0.1	0.0	-0.7	-1.1	-1.1	-1.2	-0.9	-0.8	0.1	-0.1	-0.1	-0.2	-0.4	0.1
21-Jan	-0.1	-0.8	-0.5	-0.6	-0.6	-0.1	-0.1	-0.5	-0.5	-0.3	-0.4	-0.4	-0.1	-0.4	-0.5	-0.8	-0.7	-0.8	-0.5	-0.4	-0.6	-0.6	-0.6	-0.6	-0.5	-0.1
22-Jan	-0.3	-0.4	-0.1	-0.3	-0.2	-0.5	-0.6	-0.6	-0.8	-0.5	0.8	1.2	UO	UO	UO	0.4	1.1	0.1	0.7	1.0	0.6	0.5	0.4	0.3	0.1	1.2
23-Jan	0.2	0.7	-0.1	-0.2	-0.5	-0.4	-0.1	0.8	-0.3	-1.2	0.1	-0.7	-0.1	0.7	1.0	1.0	1.2	0.5	0.3	-0.1	-0.1	0.1	0.3	0.3	0.1	1.2
24-Jan	0.2	0.3	0.2	0.3	0.4	0.2	0.1	0.3	0.3	0.1	-0.1	-0.1	-0.2	-0.2	0.2	0.1	1.3	0.7	1.2	0.7	0.5	0.1	0.3	0.1	0.3	1.3
25-Jan	0.2	0.2	0.2	0.2	0.2	0.0	-0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.0	-0.4	-0.2	0.1	UO	UO	UO	UO	UO	UO	UO	--	0.2
26-Jan	UO	UO	UO	-0.2	-0.3	-0.1	0.5	1.3	2.6	3.0	0.7	0.5	0.6	0.6	0.1	0.5	0.9	1.4	0.8	0.6	0.8	0.6	0.5	0.3	0.8	3.0
27-Jan	0.8	0.8	1.0	1.1	1.3	1.0	1.6	1.0	0.9	0.7	0.5	0.3	-0.3	-0.3	-0.1	-0.1	0.2	0.4	0.7	0.0	0.0	-0.1	-0.3	0.0	0.5	1.6
28-Jan	-0.1	-0.5	-0.4	-0.3	-0.3	-0.3	-0.3	0.0	-0.3	-0.2	-0.2	0.1	0.2	0.5	0.4	0.1	0.2	0.3	0.3	0.0	0.4	0.2	0.8	0.0	0.0	0.8
29-Jan	-0.1	-0.2	-0.3	-0.6	-0.3	-0.3	-0.7	-0.7	-0.6	-0.6	-0.3	-0.3	0.0	0.0	0.1	-0.5	-0.8	-0.3	-0.2	-0.1	0.0	0.7	0.2	0.2	-0.2	0.7
30-Jan	0.0	0.4	0.6	0.4	0.1	0.0	-0.4	-0.7	-0.8	0.0	0.0	0.1	0.0	0.2	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.8	0.0	0.8
31-Jan	1.2	1.1	0.6	0.5	0.3	0.8	0.3	0.3	0.3	0.4	0.4	-0.2	-0.3	0.2	0.2	0.1	0.2	0.1	-0.1	-0.1	0.1	0.3	0.2	-0.1	0.3	1.2
																								Diurnal Average		
																								Diurnal Maximum		
-0.1 0.0 -0.1 0.0 0.0 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.1 0.0 0.0 -0.1 0.0 0.0 0.1 0.0 0.0 0.0 0.0 0.0 1.2 1.1 1.0 1.1 1.3 1.0 1.6 1.3 2.6 3.0 0.8 1.2 1.4 1.2 1.0 1.0 1.3 1.4 1.2 2.6 0.8 1.0 0.8 0.8																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Vertical Wind Speed 90 m (VW90m) - km/h
Mannix - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.8 km/h on Jan 26 10:00 Minimum Value: 0.1 km/h on Jan 31 19:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.3 P ₉₀ = 1.9 P ₉₉ = 2.9		Hours in Service: 744 Hours of Data: 662 Hours of Missing Data: 82 Hours of Calibration: 0 Percent Operational Time: 89.0																								
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.7	0.7	0.8	0.6	0.6	0.7	0.7	0.9	0.7	0.6	0.6	0.6	0.7	0.9	0.9
2-Jan	1.0	0.6	0.5	0.4	0.6	0.6	0.5	0.5	0.4	0.7	0.8	0.4	0.5	0.4	0.5	0.5	0.6	0.4	0.3	0.5	1.0	0.5	0.8	0.5	1.0	1.0
3-Jan	0.5	0.4	0.5	0.5	0.7	0.4	0.7	0.7	0.4	0.3	0.4	0.5	0.5	0.6	0.7	0.4	0.5	0.7	0.8	0.5	0.6	0.8	0.7	0.6	0.8	0.8
4-Jan	0.5	0.5	0.5	0.3	0.3	0.4	0.3	0.5	0.5	0.6	0.5	0.7	0.6	0.6	0.5	0.7	0.7	0.8	0.6	0.7	0.6	0.6	0.5	0.4	0.8	0.8
5-Jan	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.4	0.7	0.6	0.9	0.9	1.2	1.2	1.4	1.0	1.4	1.4
6-Jan	1.4	1.4	1.3	1.3	0.7	0.9	0.9	1.2	0.7	0.6	0.6	0.9	0.5	0.8	0.4	0.3	0.6	0.5	0.4	0.5	0.7	0.8	0.9	1.3	1.4	1.4
7-Jan	0.9	0.8	0.9	0.7	1.0	0.5	0.9	1.0	0.5	0.3	0.3	0.5	0.5	0.4	0.4	0.4	0.3	0.2	1.3	1.3	UO	UO	UO	UO	1.3	1.3
8-Jan	UO	UO	UO	0.5	0.4	UO	UO	UO	1.8	0.3	0.5	0.4	0.4	0.4	0.3	0.5	1.1	1.2	0.8	0.7	1.0	1.2	1.7	1.3	1.8	1.8
9-Jan	1.3	1.1	1.1	1.8	1.2	1.2	0.9	1.2	1.0	1.0	1.2	1.1	1.7	1.3	1.1	0.8	0.7	0.7	0.5	0.4	0.7	0.4	0.4	UO	1.8	1.8
10-Jan	UO	UO	0.5	0.8	0.4	0.3	0.9	0.7	0.6	0.6	0.9	0.7	0.7	0.7	0.5	0.4	0.4	0.2	UO	UO	UO	UO	0.6	UO	0.9	0.9
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.7	UO	1.4	1.0	1.3	1.4	1.4
12-Jan	0.9	2.0	1.7	1.4	0.9	0.8	0.7	1.1	0.9	1.1	0.9	1.1	1.2	1.1	1.0	1.1	0.9	1.1	0.8	0.7	0.8	0.5	0.3	0.3	2.0	2.0
13-Jan	0.4	0.5	0.4	0.5	0.9	0.7	1.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1.0	1.0
14-Jan	UO	UO	UO	1.8	2.2	1.8	1.8	1.7	1.7	1.5	1.5	1.0	0.9	0.7	0.6	0.6	0.5	0.5	0.4	0.7	0.2	0.3	0.6	0.2	2.2	2.2
15-Jan	0.2	0.1	0.3	0.3	0.1	0.3	0.4	0.6	0.5	0.2	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.6	0.9	0.9	0.9	1.1	0.9	0.8	1.1	1.1
16-Jan	0.7	0.7	0.7	1.1	1.0	1.1	0.7	0.7	0.5	0.9	1.2	1.5	2.0	2.5	2.6	2.6	2.1	2.1	1.6	1.7	1.7	1.4	1.1	0.7	2.6	2.6
17-Jan	1.2	1.2	1.5	1.6	1.4	1.2	1.3	1.4	1.3	1.4	1.2	1.3	1.4	1.1	1.1	0.8	0.3	0.5	0.3	0.5	0.5	0.4	0.5	0.7	1.6	1.6
18-Jan	0.7	0.6	0.9	1.0	1.2	1.0	0.5	0.7	0.9	1.1	1.0	0.6	0.8	1.3	1.1	0.8	0.8	0.8	1.3	1.0	0.8	0.7	0.5	0.4	1.3	1.3
19-Jan	0.5	0.7	0.8	0.9	0.8	0.9	0.7	0.7	0.8	1.0	1.0	0.9	1.7	2.1	1.4	1.0	1.3	1.8	1.6	1.7	2.4	2.1	1.9	1.8	2.4	2.4
20-Jan	2.3	2.0	1.7	1.8	2.1	1.8	0.9	1.5	1.7	1.5	1.8	1.4	1.4	1.6	1.4	1.7	1.4	0.9	1.1	1.6	2.1	1.6	1.6	1.4	2.3	2.3
21-Jan	1.1	1.0	0.9	0.4	0.8	0.9	0.5	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.7	0.8	1.1	1.0	1.3	1.6	2.4	2.1	1.9	1.6	2.4	2.4
22-Jan	1.2	1.1	1.4	2.3	2.7	1.8	1.7	2.6	2.5	2.8	2.8	2.7	UO	UO	UO	1.9	1.5	1.0	1.5	1.7	1.0	1.0	0.8	1.0	2.8	2.8
23-Jan	0.7	0.7	0.4	0.7	1.7	1.6	1.4	2.5	2.1	1.9	2.0	1.8	1.7	1.5	1.4	1.1	1.3	0.8	0.6	0.5	0.3	0.6	1.0	0.8	2.5	2.5
24-Jan	0.7	0.7	0.9	0.9	0.9	0.7	0.8	0.7	0.5	0.5	0.7	1.2	0.6	0.7	0.5	1.0	1.3	1.8	1.6	1.5	1.3	0.8	0.9	0.5	1.8	1.8
25-Jan	0.6	0.6	0.8	0.5	0.5	0.3	0.1	0.4	0.4	0.4	0.6	0.7	0.7	0.6	0.6	0.8	0.5	UO	UO	UO	UO	UO	UO	UO	0.8	0.8
26-Jan	UO	UO	UO	2.2	2.0	2.1	3.3	4.0	4.1	4.8	4.1	2.4	1.6	1.7	1.2	1.3	1.9	2.5	2.3	2.6	2.5	2.3	2.1	1.8	4.8	4.8
27-Jan	2.0	2.0	1.9	1.7	2.1	2.1	2.2	1.9	2.1	2.1	1.8	1.8	1.1	1.3	0.8	0.7	1.1	0.8	1.2	0.8	1.5	0.8	0.5	0.8	2.2	2.2
28-Jan	1.1	1.7	1.6	1.8	1.3	1.3	1.6	2.2	1.9	1.9	2.6	2.9	2.7	2.9	2.8	2.4	2.5	2.7	2.9	2.2	2.4	2.4	2.2	0.9	2.9	2.9
29-Jan	0.9	0.7	0.5	0.5	0.6	0.3	0.5	0.6	0.8	0.6	0.6	0.7	0.7	0.9	1.2	1.3	0.7	0.7	0.8	0.7	1.2	2.4	1.8	1.2	2.4	2.4
30-Jan	0.8	1.0	1.2	0.7	0.4	0.4	0.3	0.6	0.3	0.8	0.6	0.4	0.6	0.4	0.3	0.3	0.2	0.2	0.4	0.3	0.4	0.5	0.5	1.4	1.4	1.4
31-Jan	2.1	2.3	1.7	1.6	1.2	1.3	1.0	0.9	0.7	0.8	1.2	0.7	1.1	1.1	1.1	0.8	0.5	0.3	0.1	0.3	0.4	0.3	0.4	0.7	2.3	2.3
Diurnal Maximum																										
2.3 2.3 1.9 2.3 2.7 2.1 3.3 4.0 4.1 4.8 4.1 2.9 2.7 2.9 2.8 2.6 2.5 2.7 2.9 2.6 2.5 2.4 2.2 1.8																										
UO - Unstable Operation																										



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06 PATRICIA MCINNES JANUARY 2023

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

August 30, 2023

Revision 01

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	28.5	0	2.8	0
H2S(ppb) Average	653	32	32	100	1.9	0	0.8	0
TRS (ppb) Average	27	2	2	100	0.3	0	0.2	0
THC (ppm) Average	709	35	35	100	3.3	-	2.6	-
NMHC(ppm) Average	709	35	35	100	0.345	-	0.122	-
CH4(ppm) Average	709	35	35	100	2.9	-	2.5	-
O3 (ppb) Average	709	35	35	100	40	0	37.6	-
NO2 (ppb) Average	708	36	36	100	38.8	0	20.1	-
NO (ppb) Average	708	36	36	100	66.5	-	25.8	-
NOX (ppb) Average	708	36	36	100	103.7	-	43.2	-
NH3 (ppb) Average	652	38	92	92.74	0	0	0	-
PM2.5 (ug/m3) Average	743	1	1	100	69.1	0	26.1	0
Temperature 2 m (C) Average	744	0	0	100	4.1	-	-1.6	-
Relative Humidity (%) Average	744	0	0	100	94.8	-	91.3	-
Wind Speed 10 m (km/h) Average	744	0	0	100	32	-	19	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)

JANUARY 2023

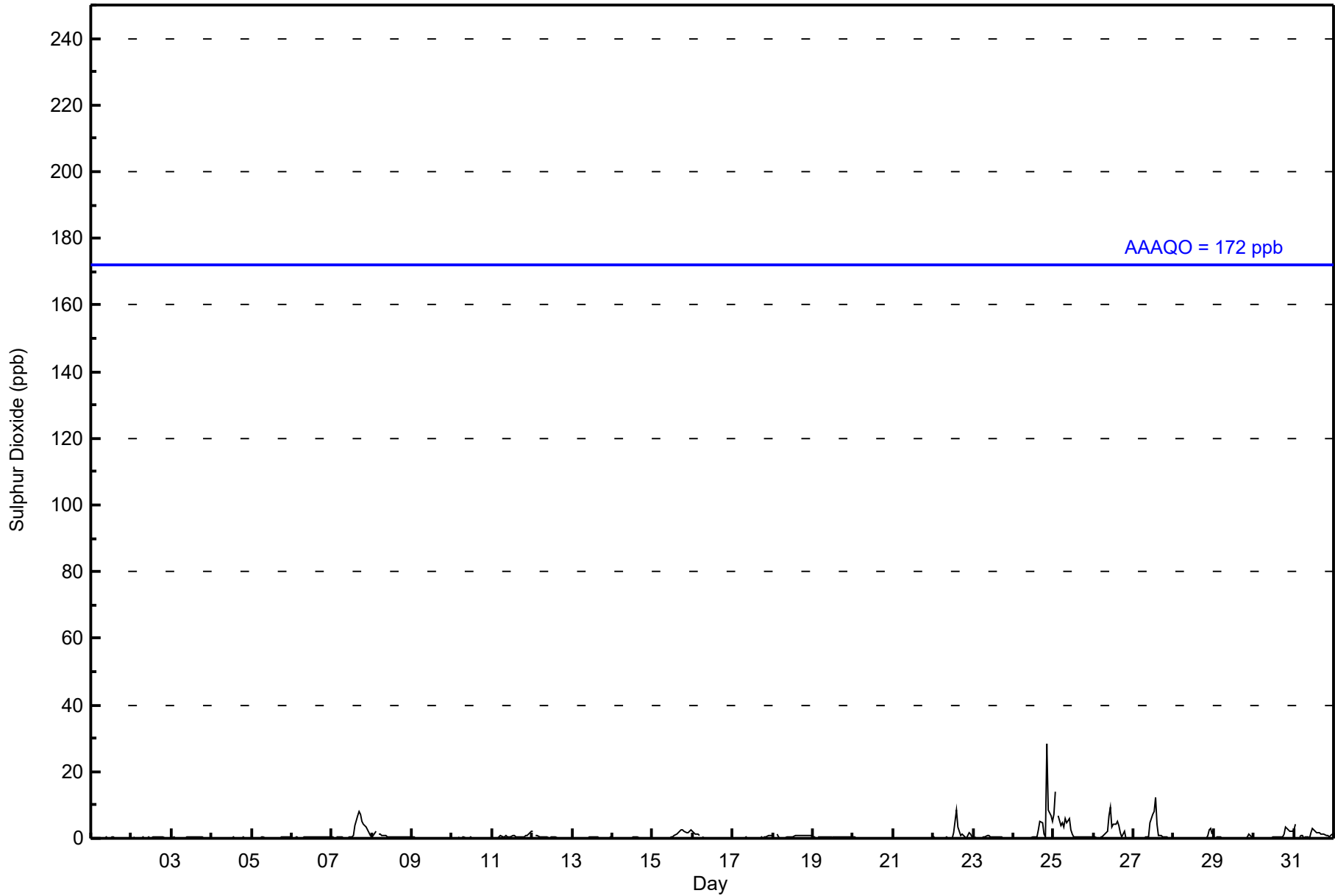
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.71	1.8	-	0	0	0.1	0.2	0.5	1.6	28.5
H2S(ppb) Average	653	0.21	0.2	-	0	0.1	0.1	0.1	0.2	0.4	1.9
TRS (ppb) Average	27	0.21	0	-	0.1	0.2	0.2	0.2	0.2	0.3	0.3
THC (ppm) Average	709	2.11	0.2	-	2	2	2	2.1	2.1	2.2	3.3
NMHC(ppm) Average	709	0.008	0.038	-	0	0	0	0	0	0	0.345
CH4(ppm) Average	709	2.11	0.1	-	2	2	2	2.1	2.1	2.2	2.9
O3 (ppb) Average	709	21.08	9.1	-	1.5	7.8	15.5	21.4	26.6	34.2	40
NO2 (ppb) Average	708	9.7	7.9	-	0	2.1	3.8	7.5	13.2	22.7	38.8
NO (ppb) Average	708	4.71	9.7	-	0	0.2	0.5	1.4	3.5	12.2	66.5
NOX (ppb) Average	708	14.41	16.2	-	0	2.5	4.6	9.1	16.8	34.5	103.7
NH3 (ppb) Average	652	0	0	-	0	0	0	0	0	0	0
PM2.5 (ug/m3) Average	743	9.38	8.4	-	0.4	1.5	3.8	7.4	12	18.6	69.1
Temperature 2 m (C) Average	744	-9.84	5.6	-	-29.9	-18.2	-12	-8.9	-6.7	-4.1	4.1
Relative Humidity (%) Average	744	83.47	7.8	-	56.2	72	80.3	85.6	89	91.4	94.8
Wind Speed 10 m (km/h) Average	744	8.7	5	-	0	4	5	8	11	15	32
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	01 Jan 2023 01:00	03 Jan 2023 11:00	59	Not in Service
TRS	02 Jan 2023 06:00	01 Feb 2023 00:00	715	Not in Service
NH3	01 Jan 2023 07:00	31 Jan 2023 08:00	53	Stabilization after daily span
NH3	02 Jan 2023 20:00	02 Jan 2023 20:00	1	Unstable Operation - excessive baseline drift





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	706	99.58	99.58
11 - 20	2	0.28	99.86
21 - 60	1	0.14	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	44	33	16	12	25	72	85	83	74	54	60	55	22	19	19	33	706
11 - 20	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
21 - 60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	34	16	12	25	72	85	83	74	54	60	55	22	19	19	34	709

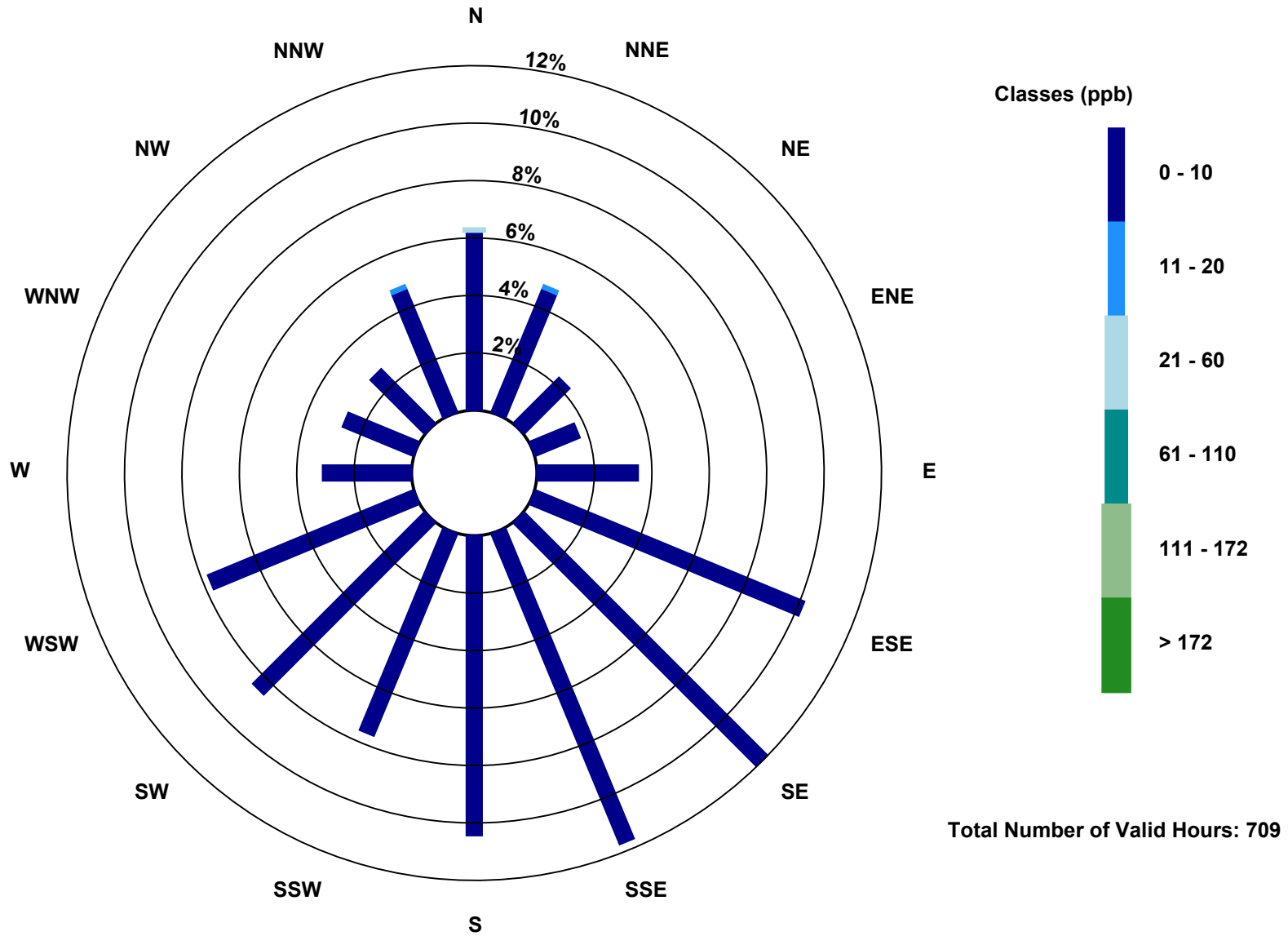
Total Number of Valid Hours: 709

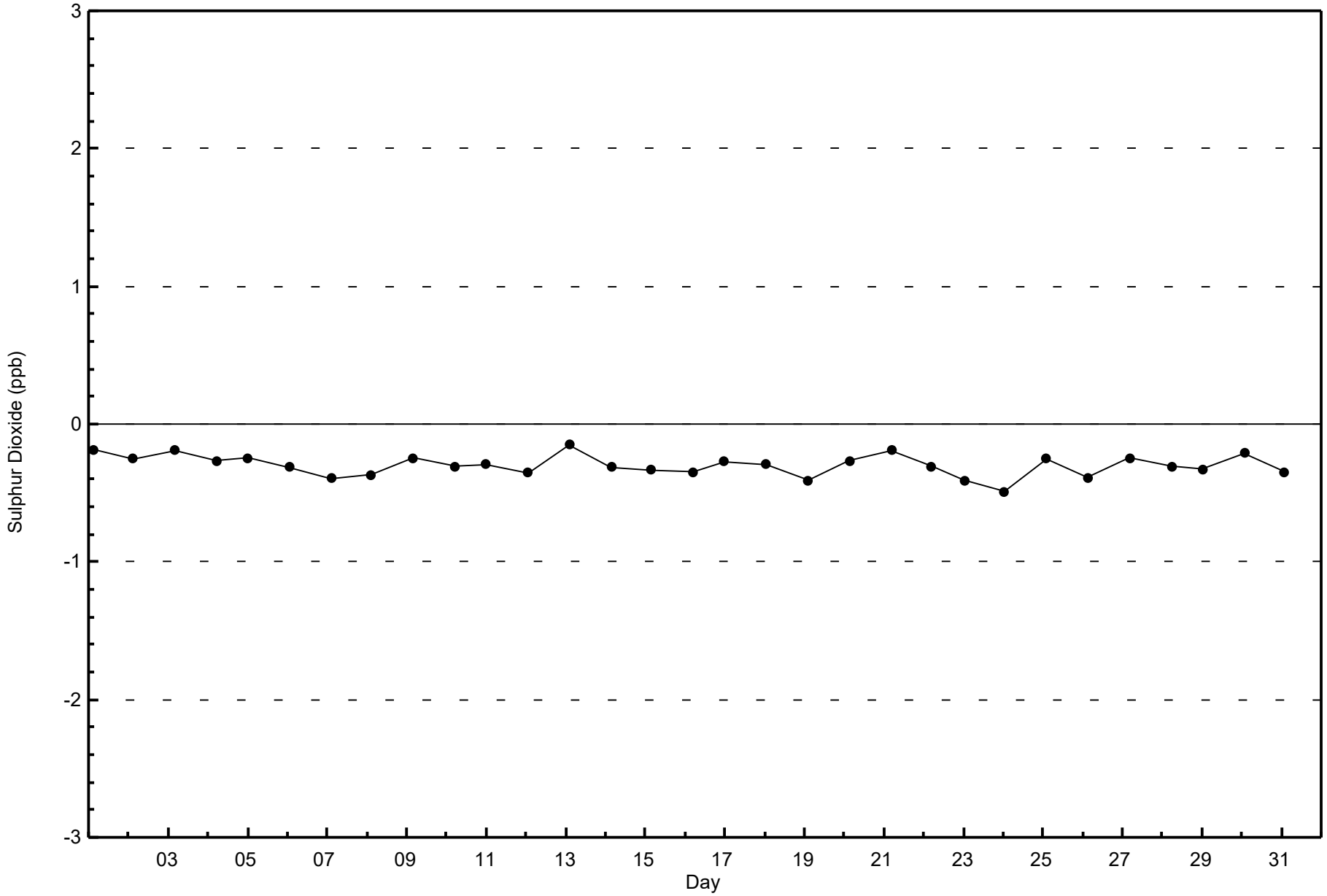
Total Number of Hours: 744

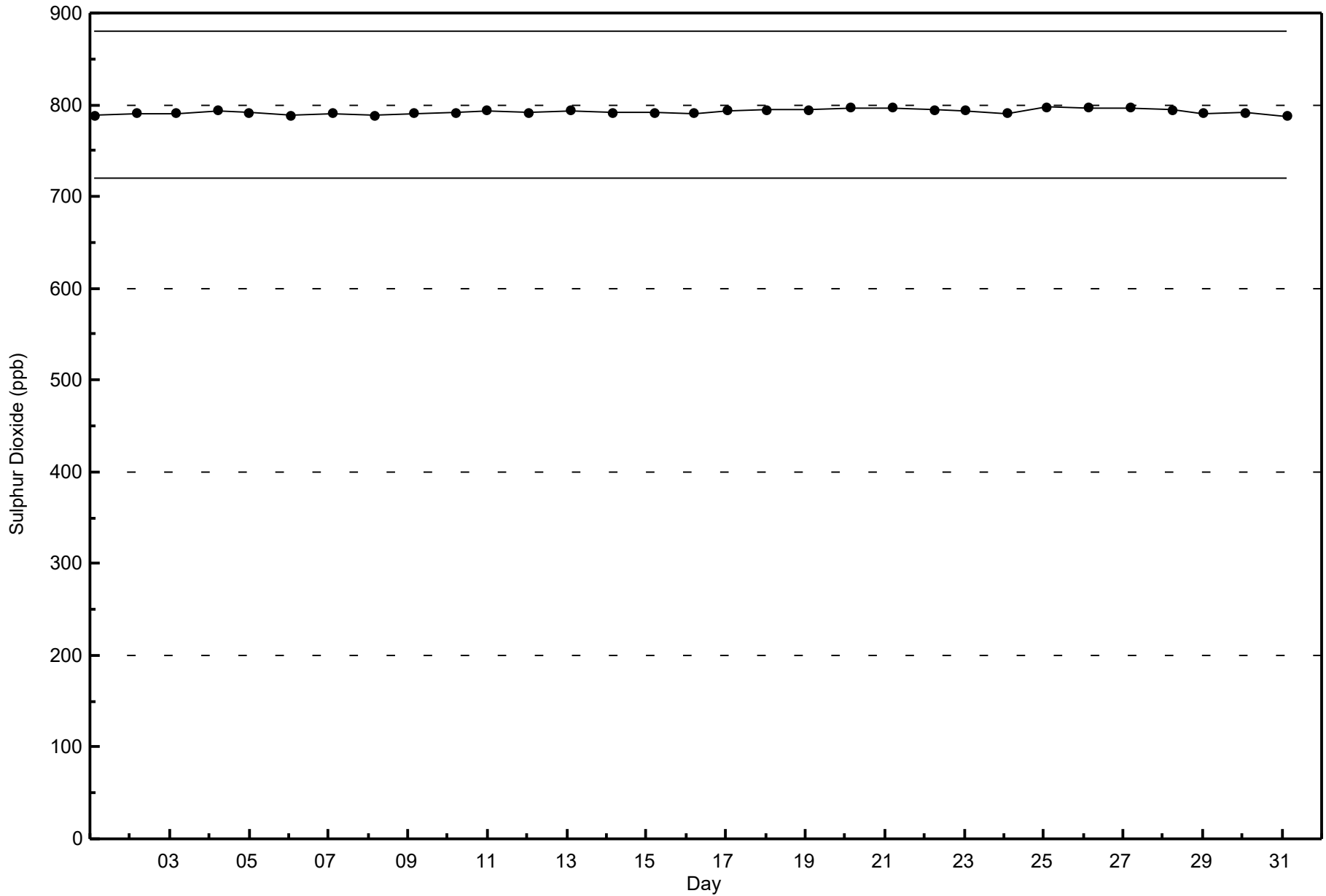


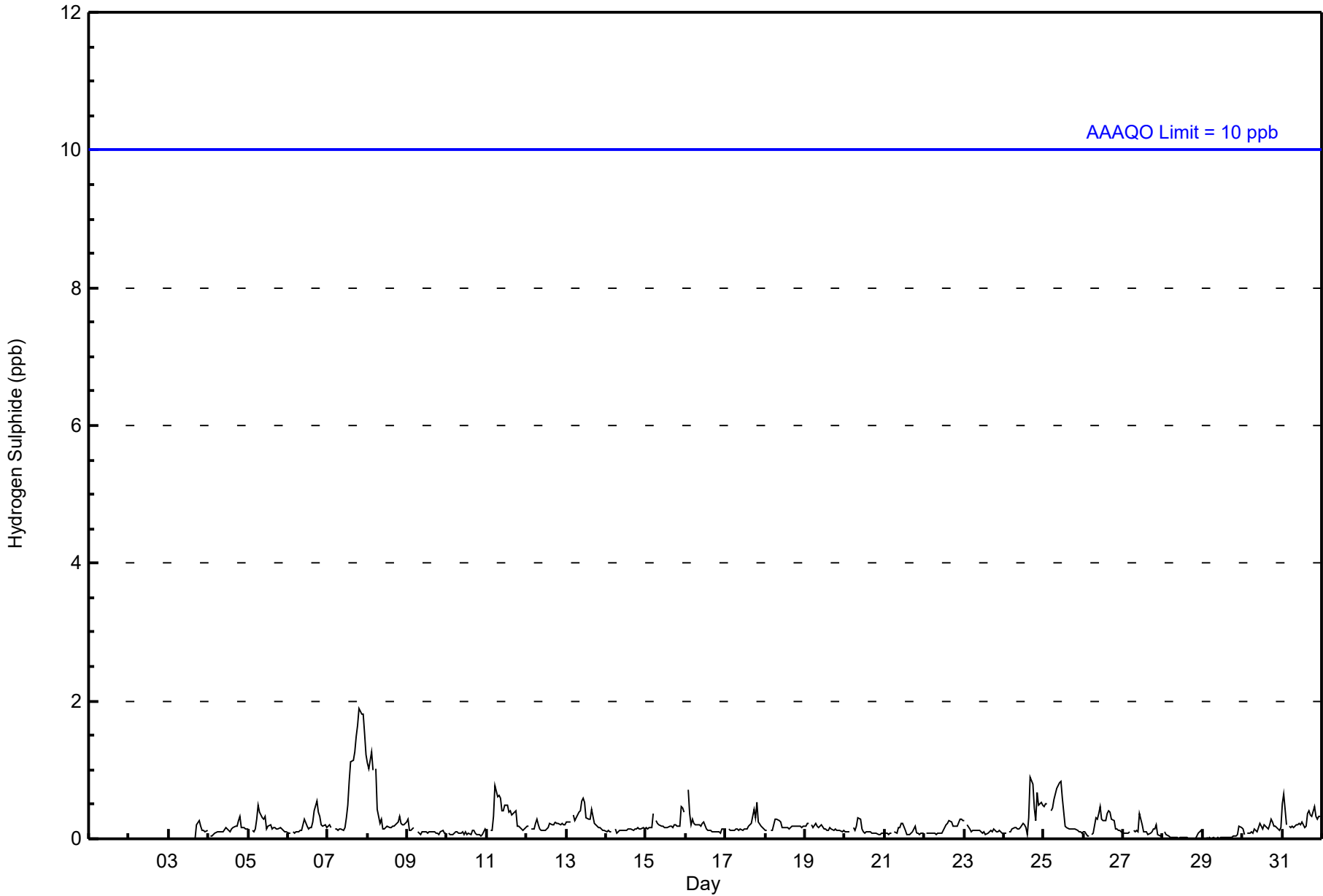
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Patricia McInnes











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	653	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 653

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	46	31	17	13	26	72	84	72	57	43	47	51	21	22	17	34	653
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	31	17	13	26	72	84	72	57	43	47	51	21	22	17	34	653

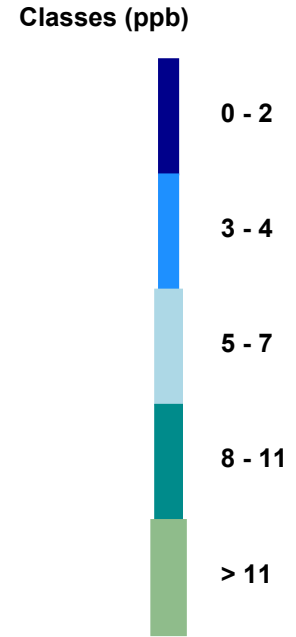
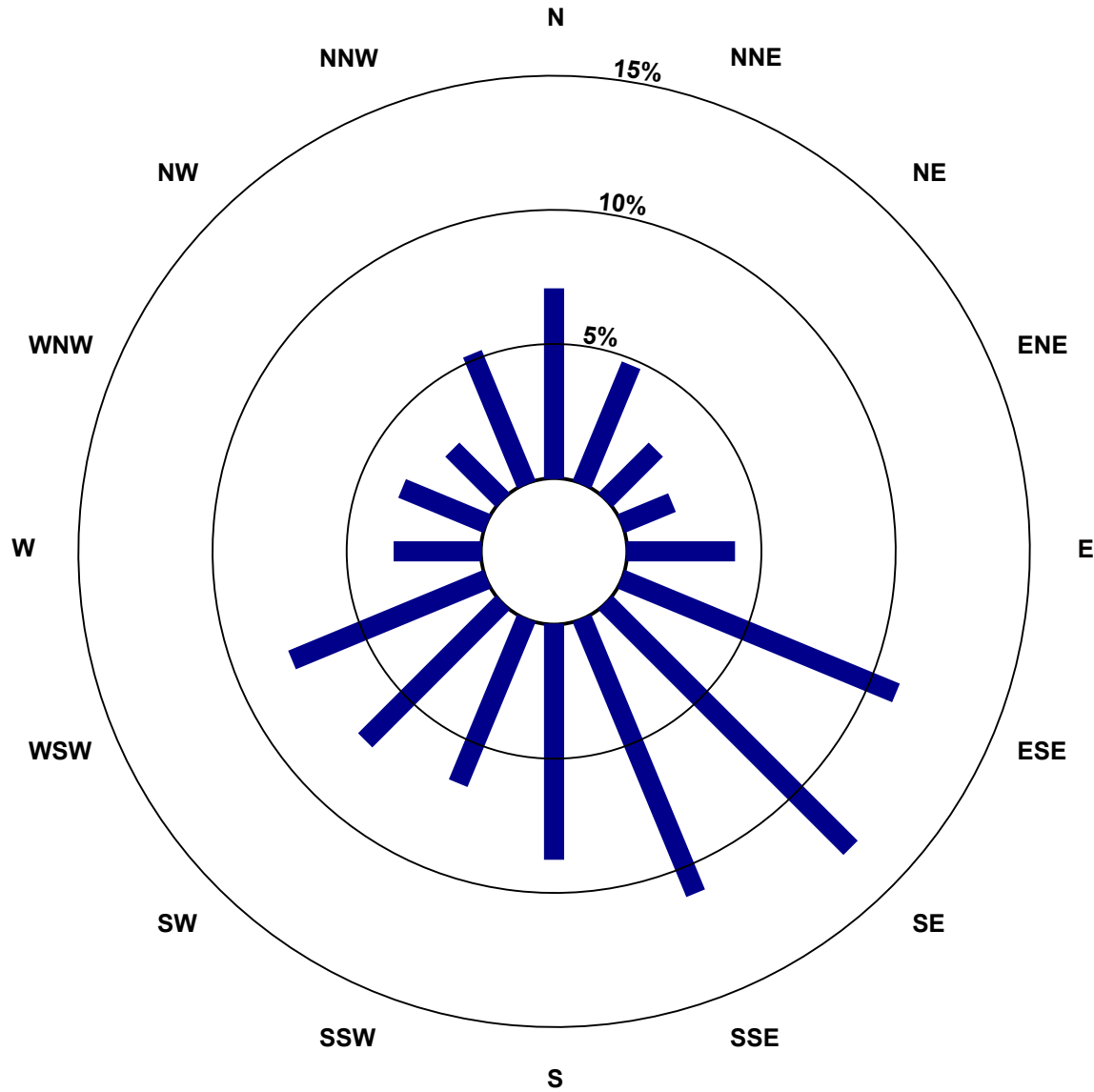
Total Number of Valid Hours: 653

Total Number of Hours: 744

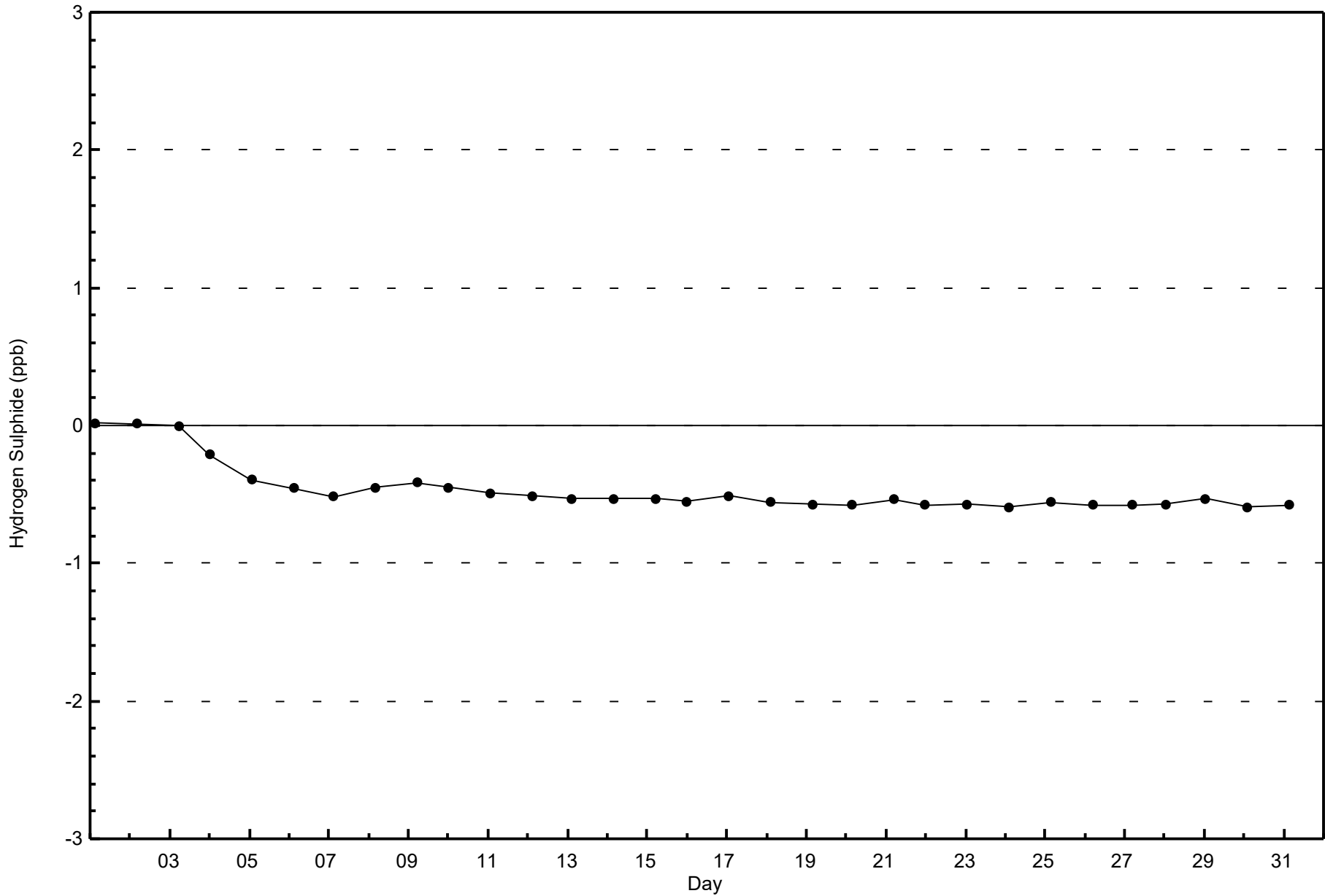


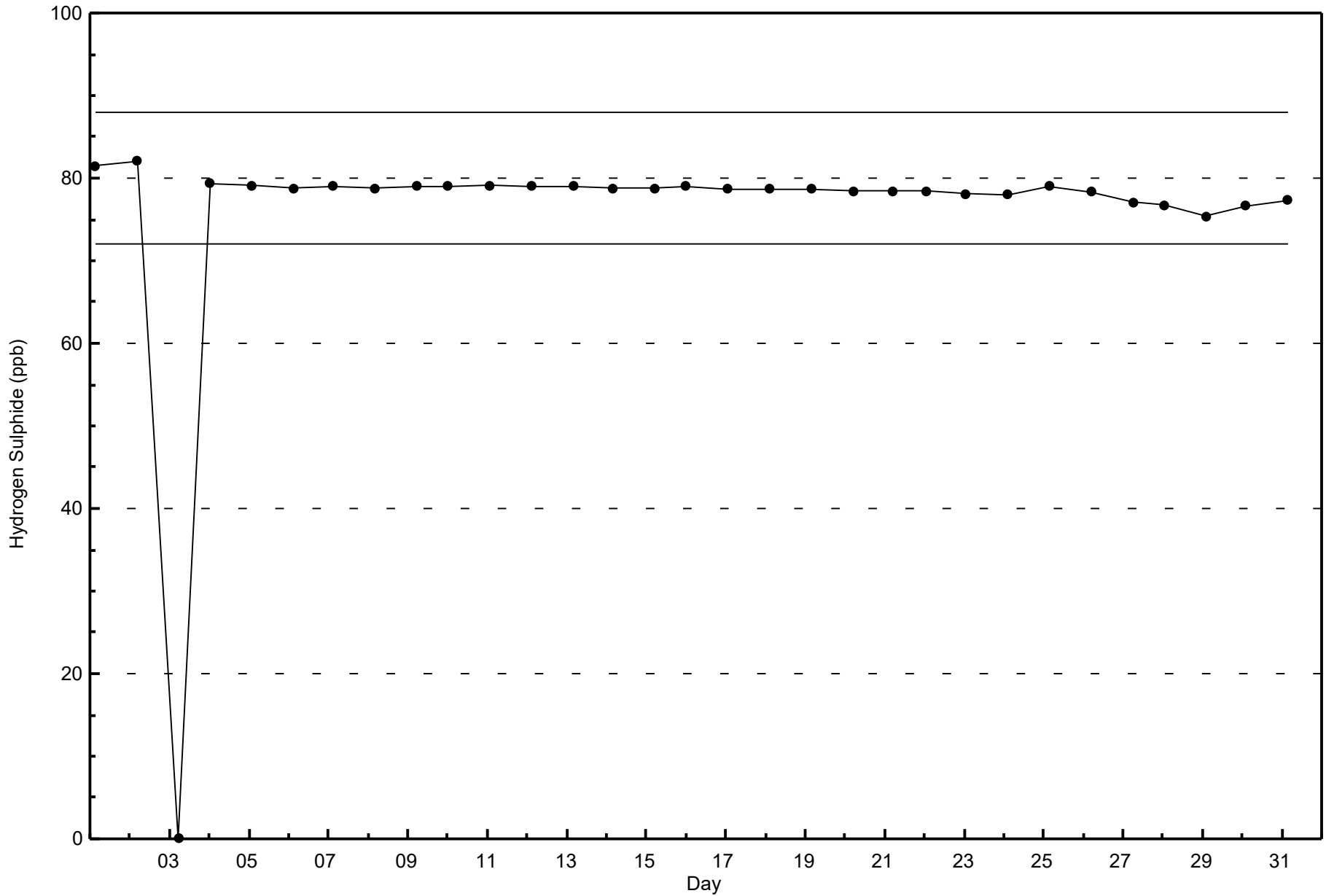
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Patricia McInnes



Total Number of Valid Hours: 653

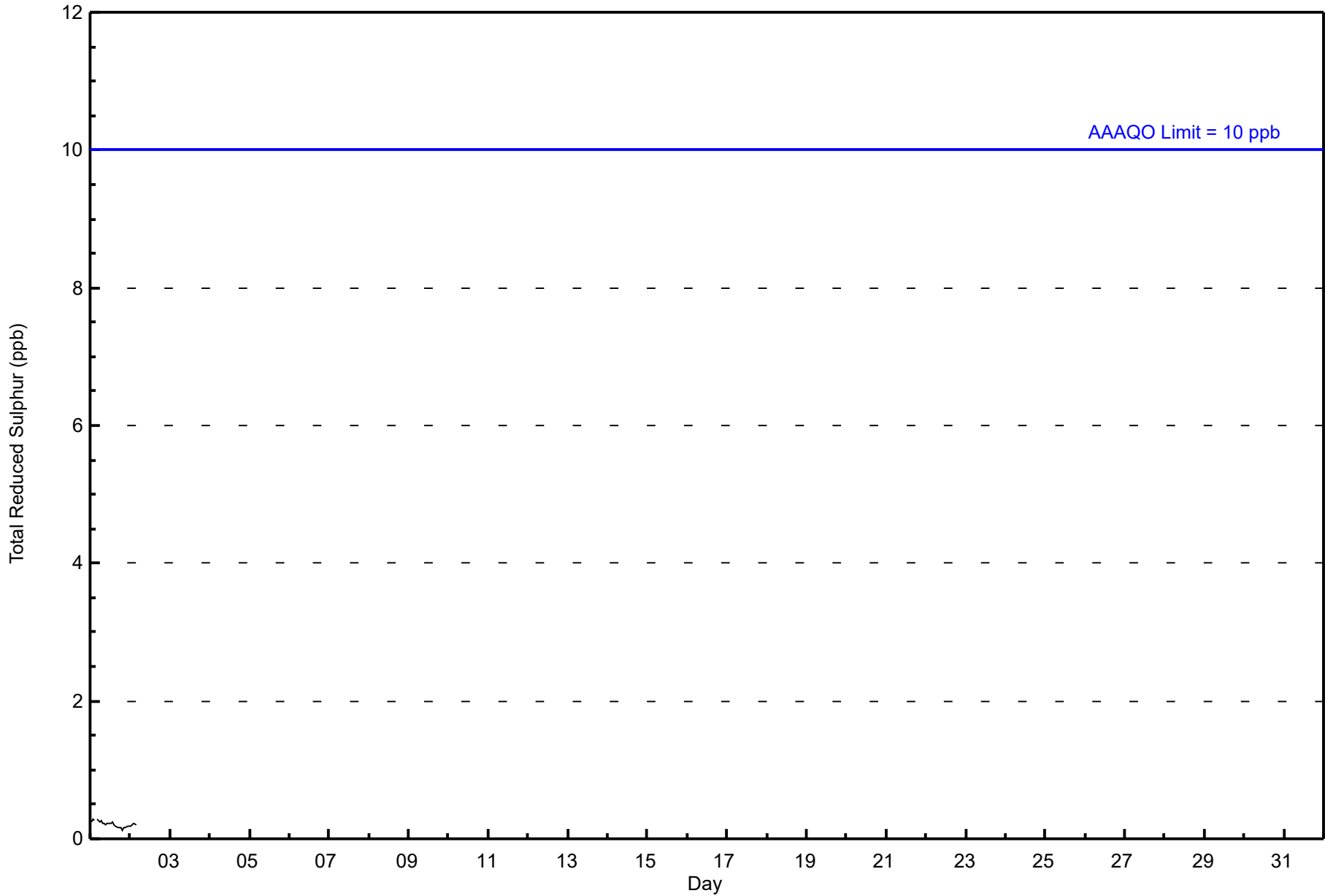






Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	27	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 27
Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	0	0	0	0	0	0	0	1	3	5	14	4	0	0	0	0	27
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	1	3	5	14	4	0	0	0	0	27

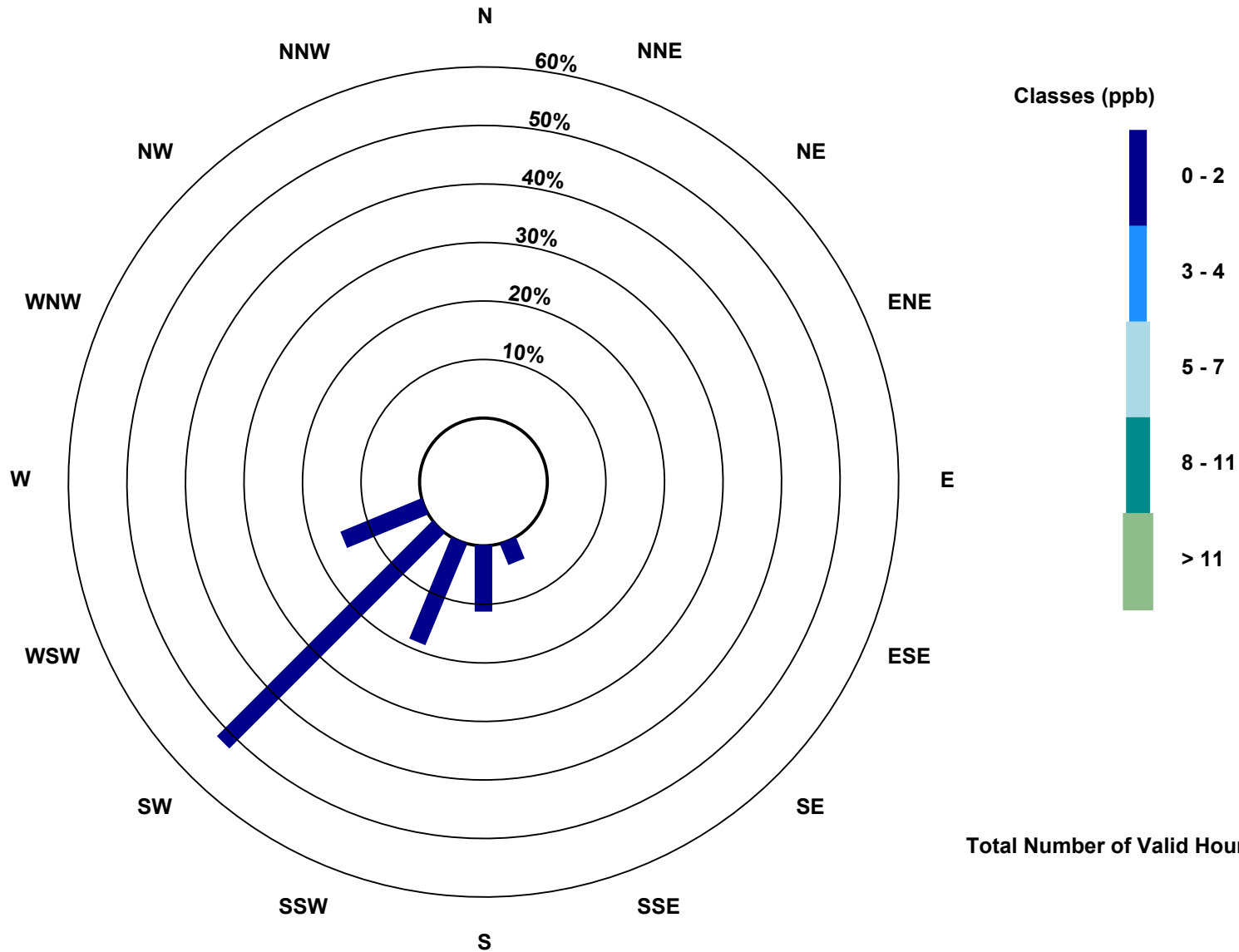
Total Number of Valid Hours: 27

Total Number of Hours: 744

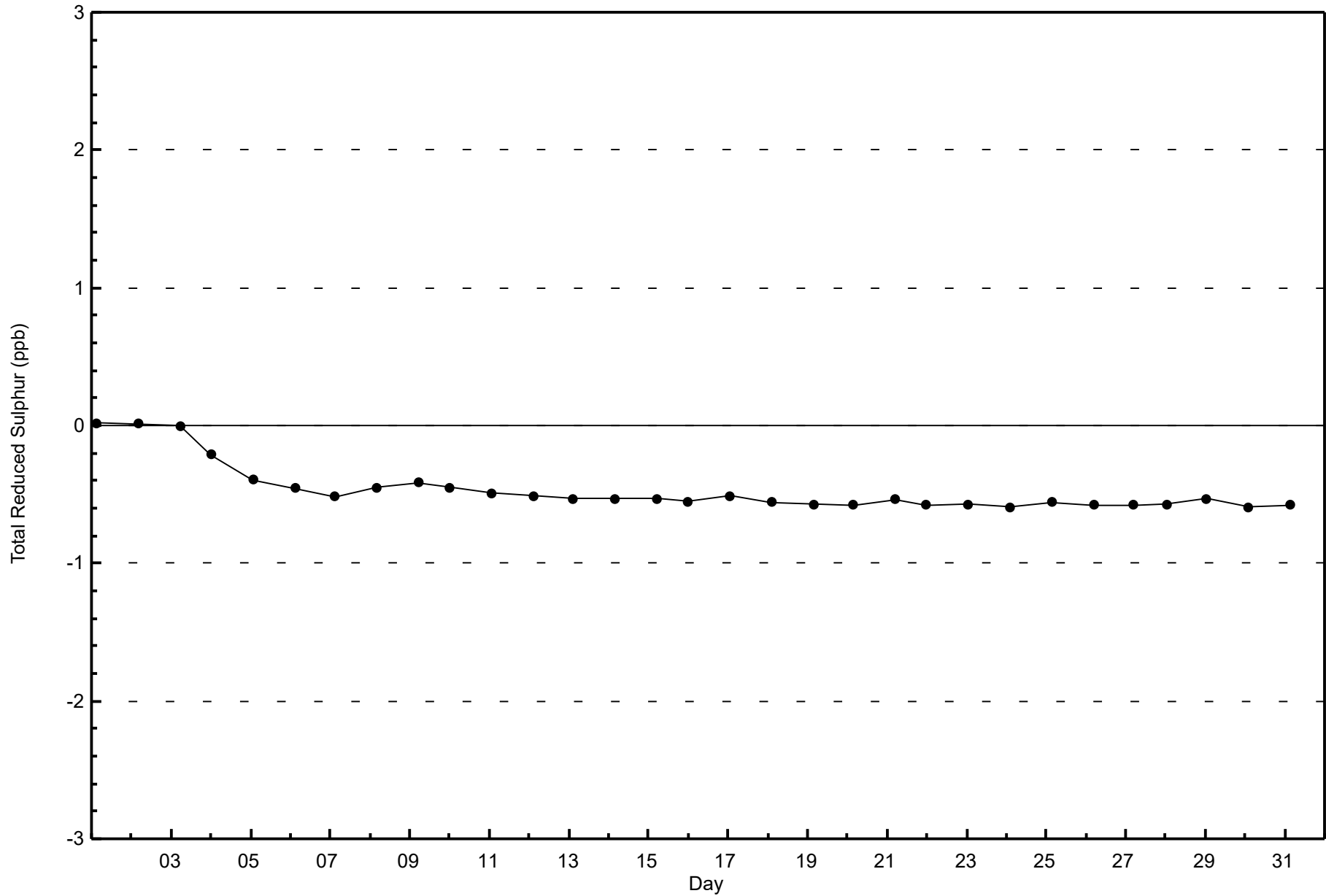


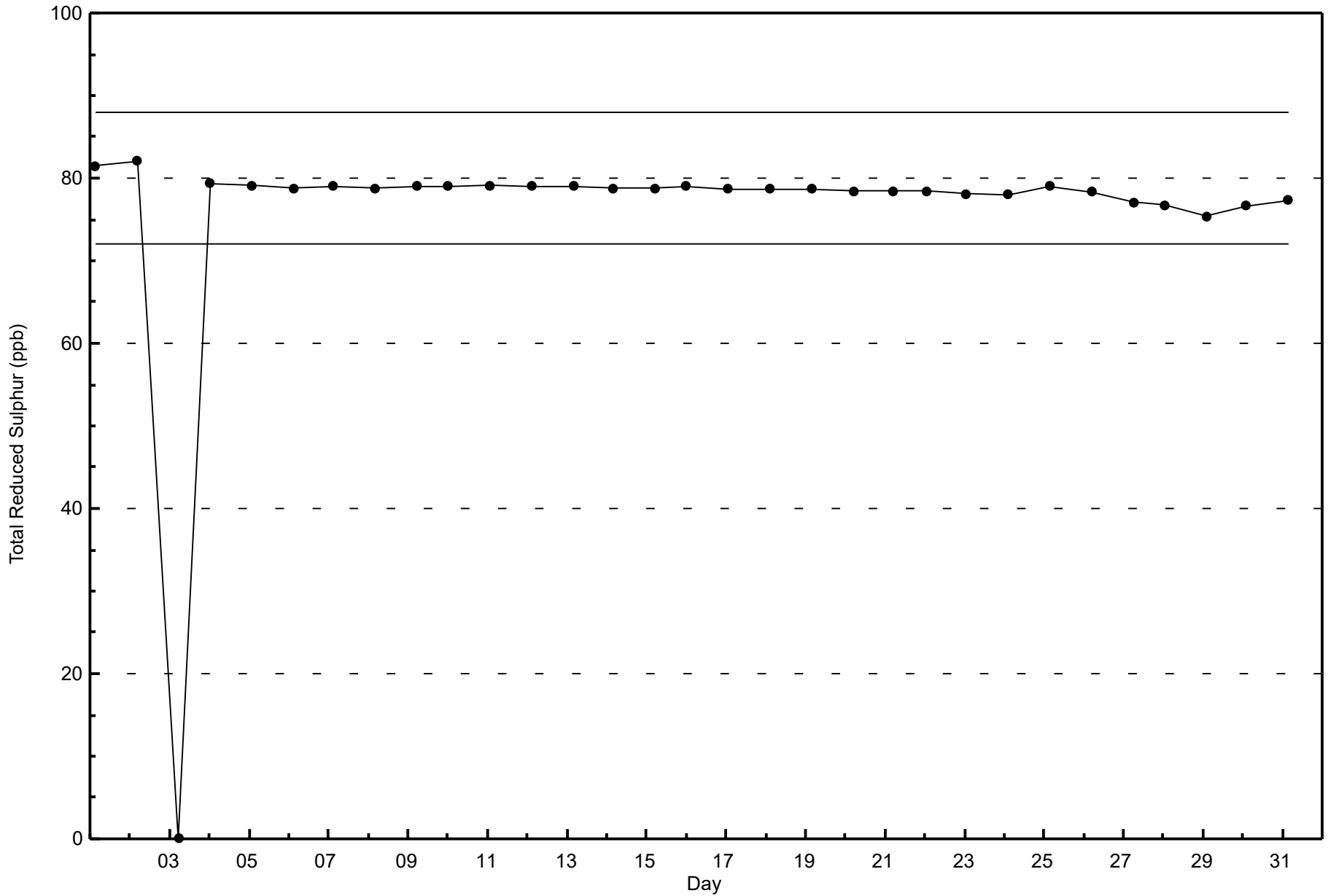
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes



Total Number of Valid Hours: 27

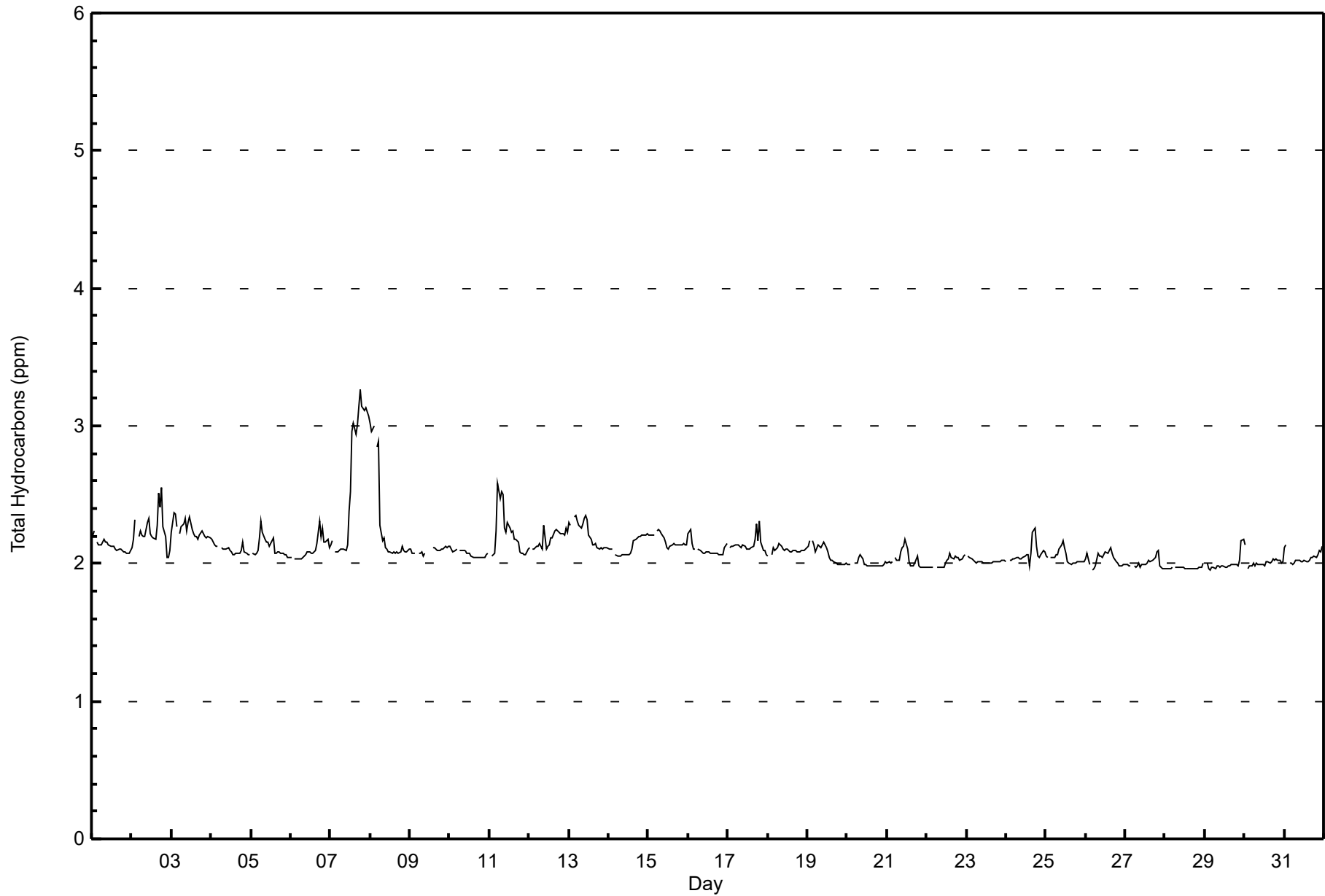






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Patricia McInnes - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	255	35.97	35.97
2.1 - 3.0	447	63.05	99.01
3.1 - 10.0	7	0.99	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	18	18	5	4	7	24	26	7	8	14	25	31	14	17	17	20	255
2.1 - 3.0	25	15	11	8	18	48	59	76	64	39	35	24	7	2	2	14	447
3.1 - 10.0	2	1	0	0	0	0	0	0	2	1	0	0	1	0	0	0	7
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	34	16	12	25	72	85	83	74	54	60	55	22	19	19	34	709

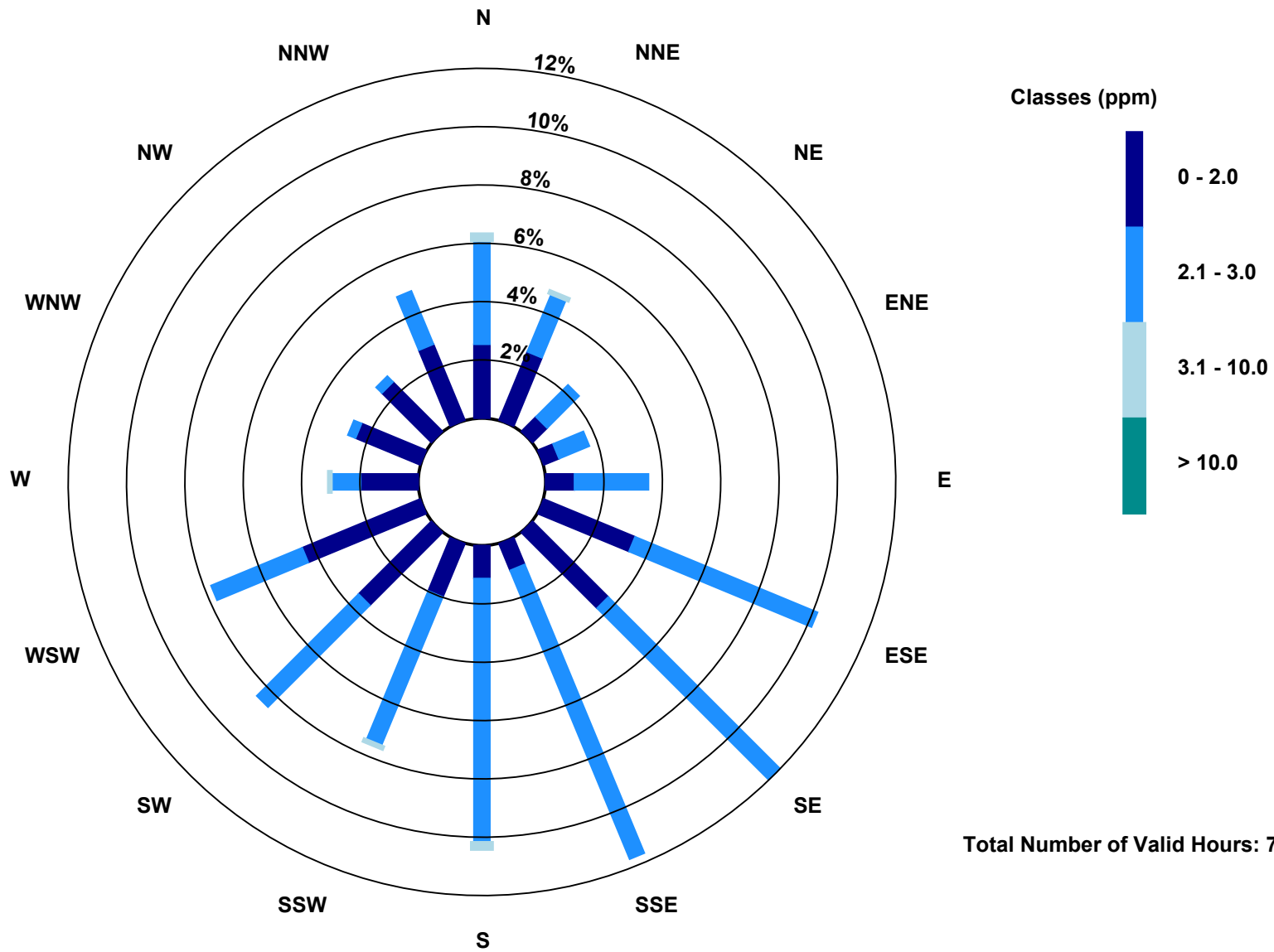
Total Number of Valid Hours: 709

Total Number of Hours: 744

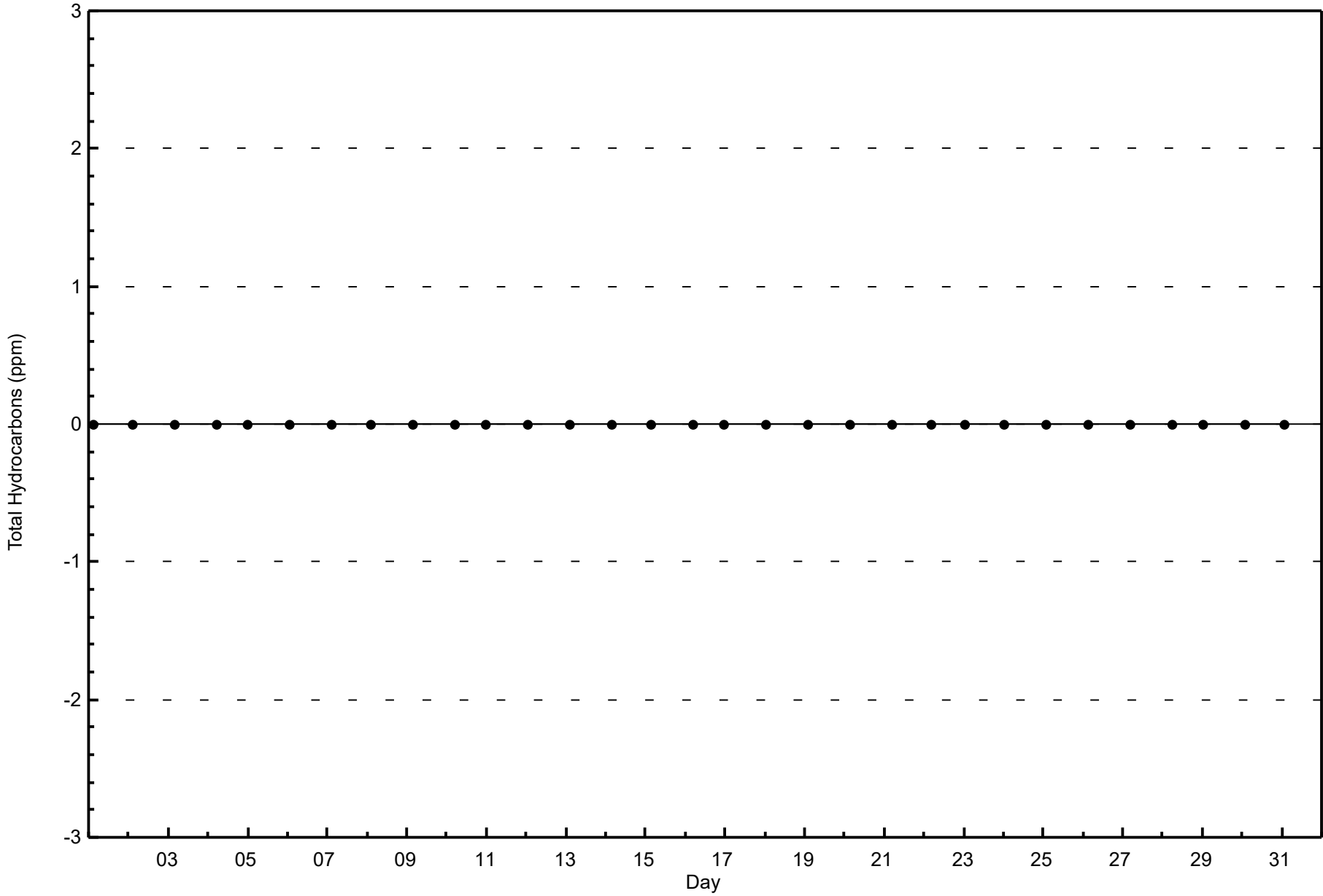


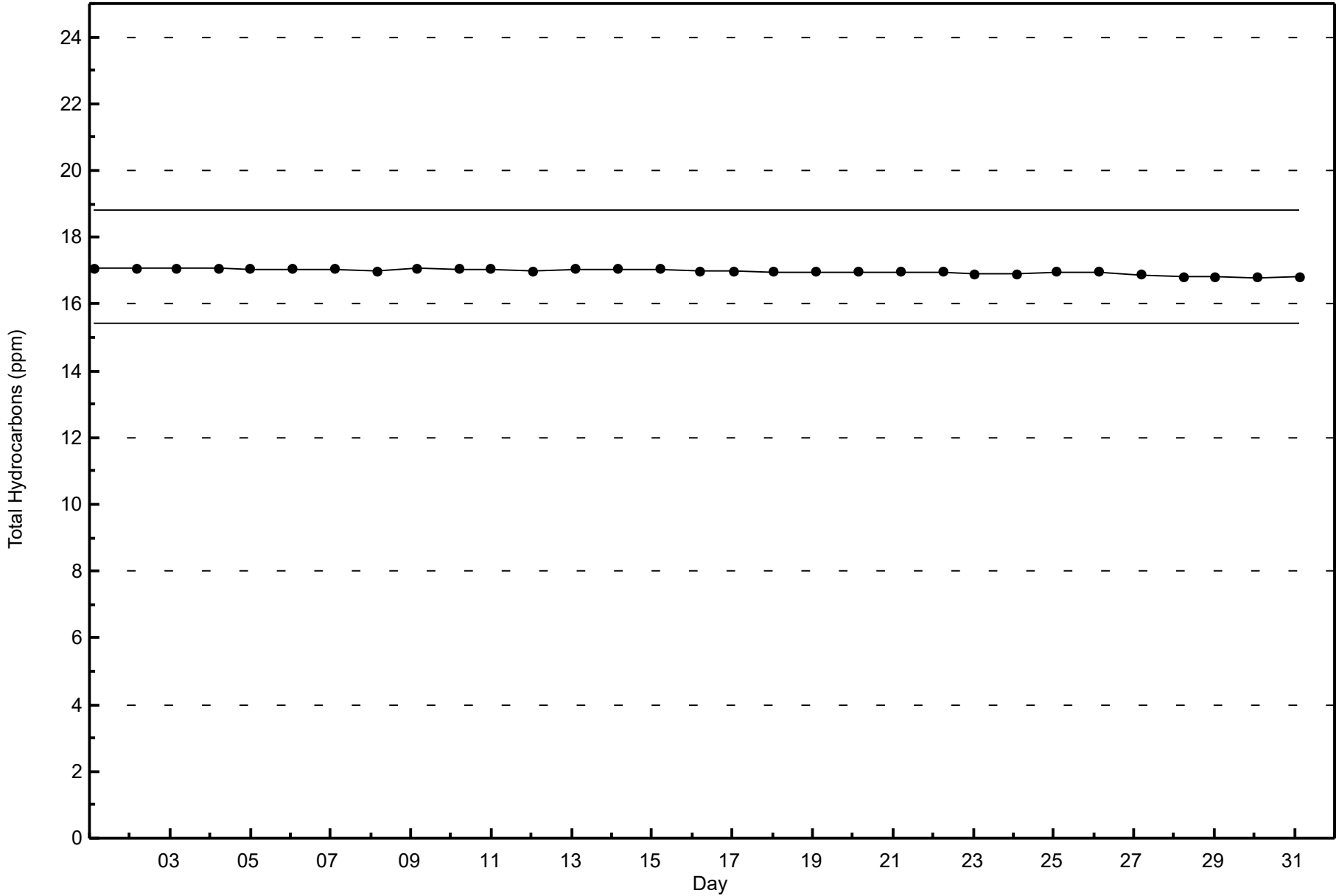
Wood Buffalo Environmental Association
Wind Rose Jan 2023

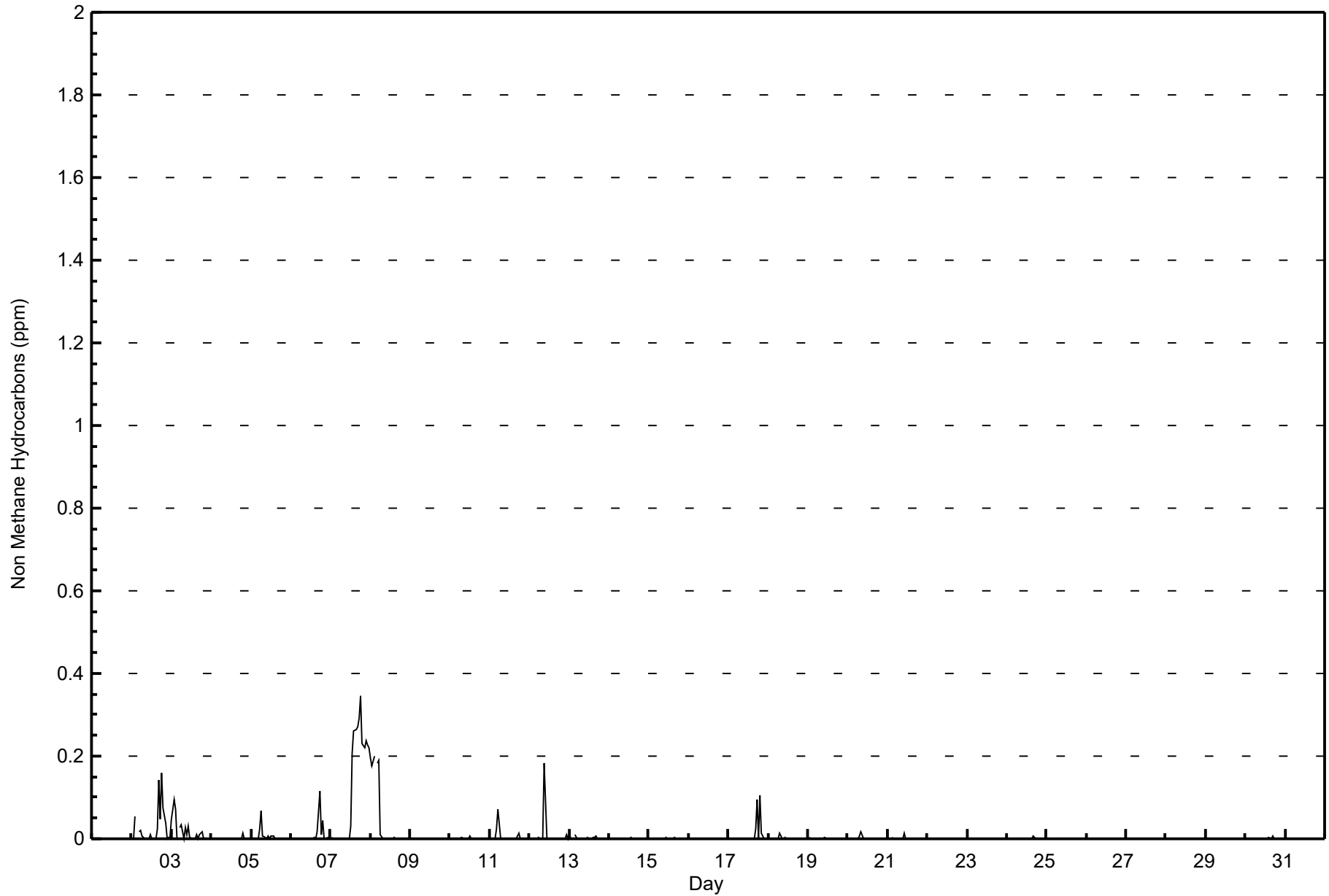
Total Hydrocarbons (THC) - ppm
Patricia McInnes



Total Number of Valid Hours: 709









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	642	90.55	90.55
0.006 - 0.05	40	5.64	96.19
0.06 - 0.1	9	1.27	97.46
> 0.1	18	2.54	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	41	31	14	11	25	71	78	63	55	48	60	55	21	19	18	32	642
0.006 - 0.05	1	0	2	1	0	1	6	13	12	3	0	0	0	0	0	1	40
0.06 - 0.1	0	1	0	0	0	0	1	4	2	1	0	0	0	0	0	0	9
> 0.1	3	2	0	0	0	0	0	3	5	2	0	0	1	0	1	1	18
Totals	45	34	16	12	25	72	85	83	74	54	60	55	22	19	19	34	709

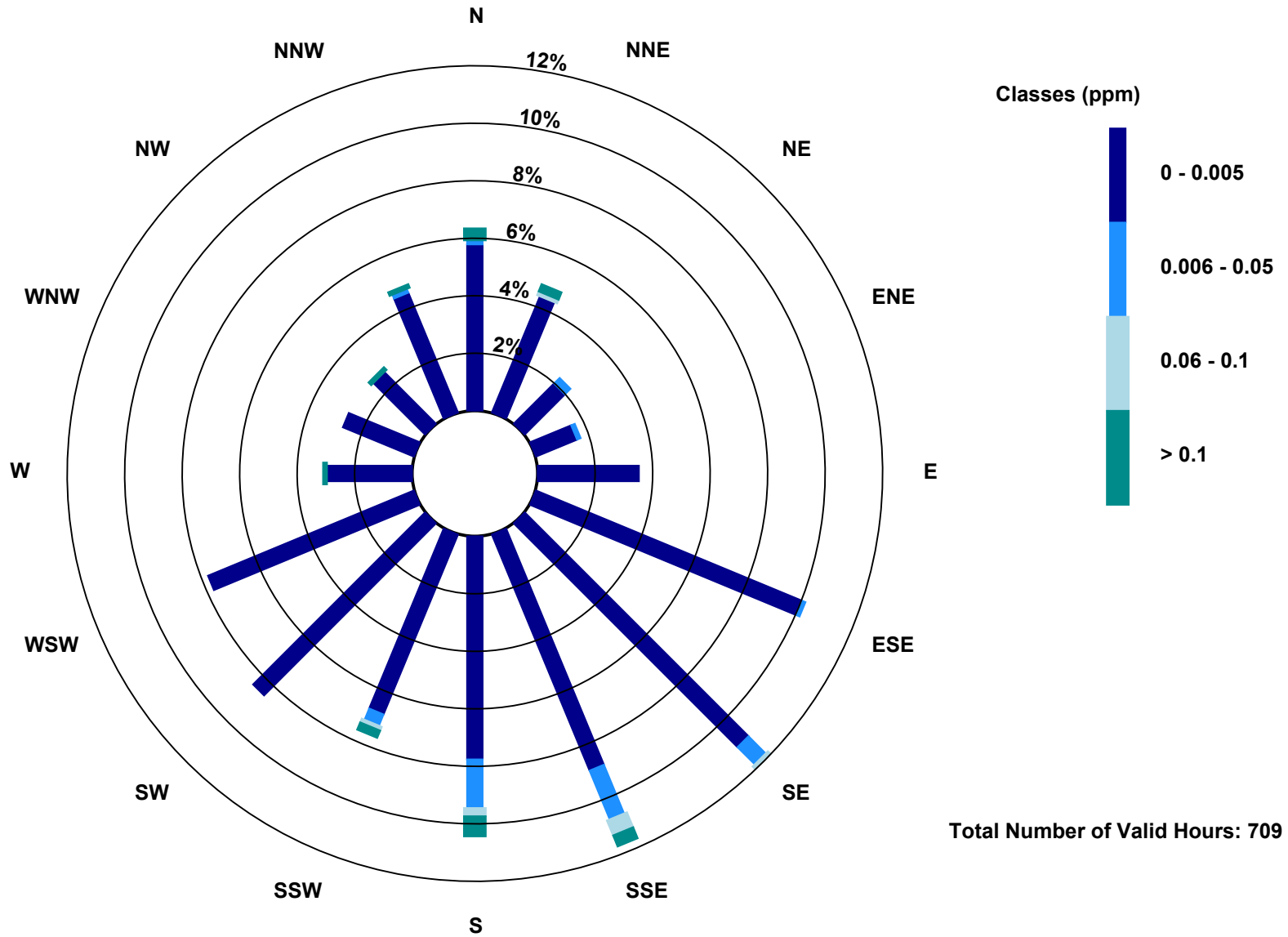
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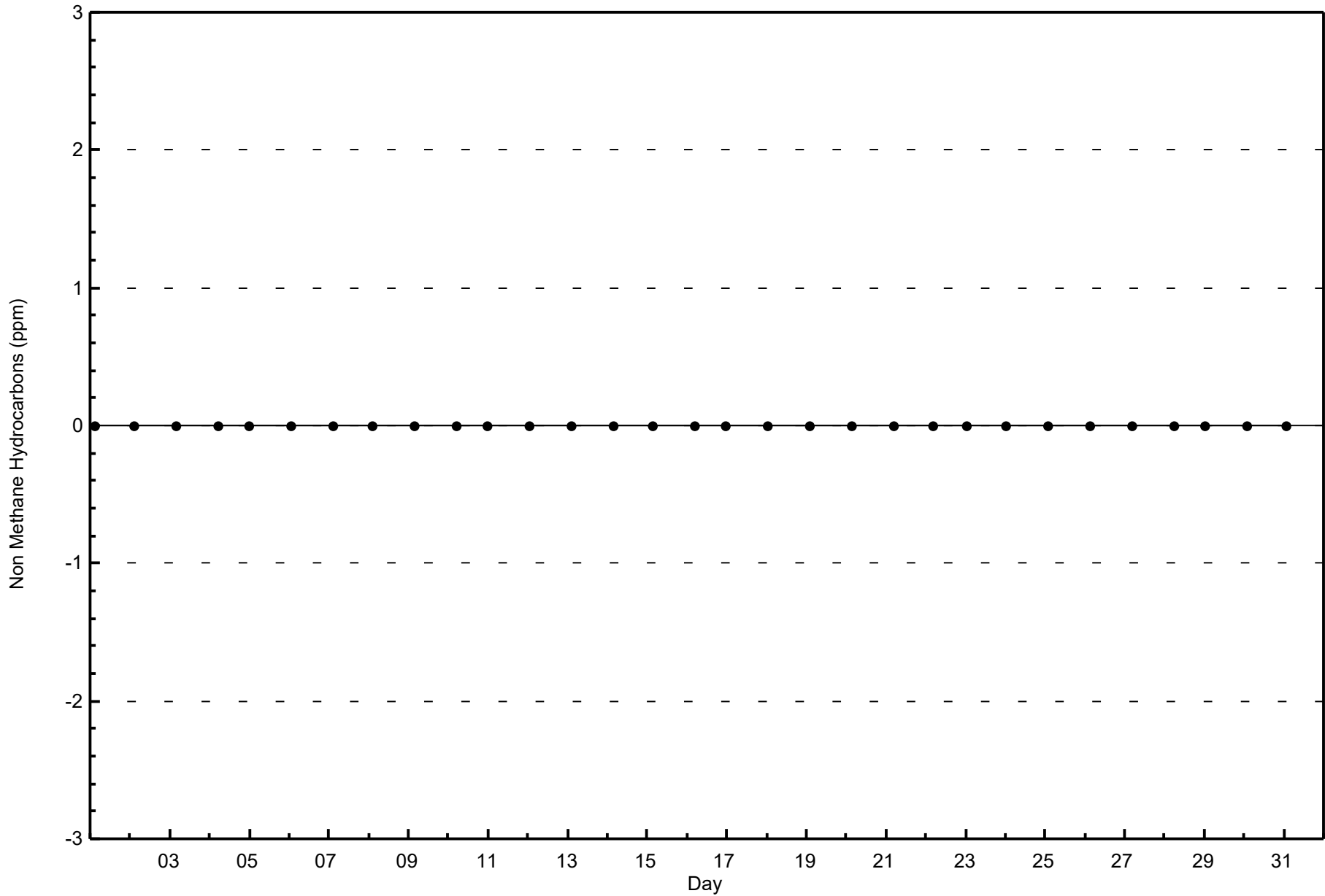
Total Number of Hours: 744

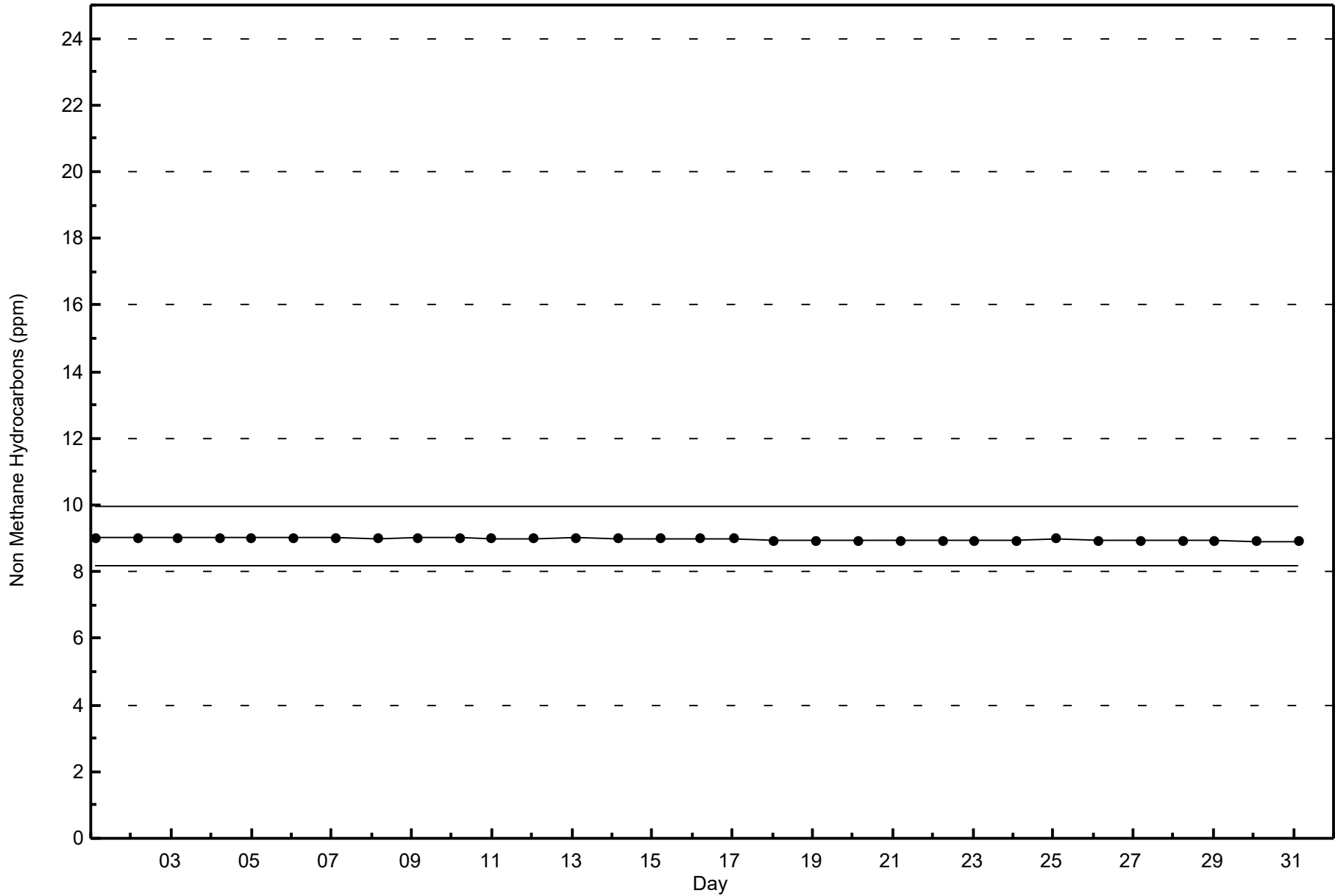


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes



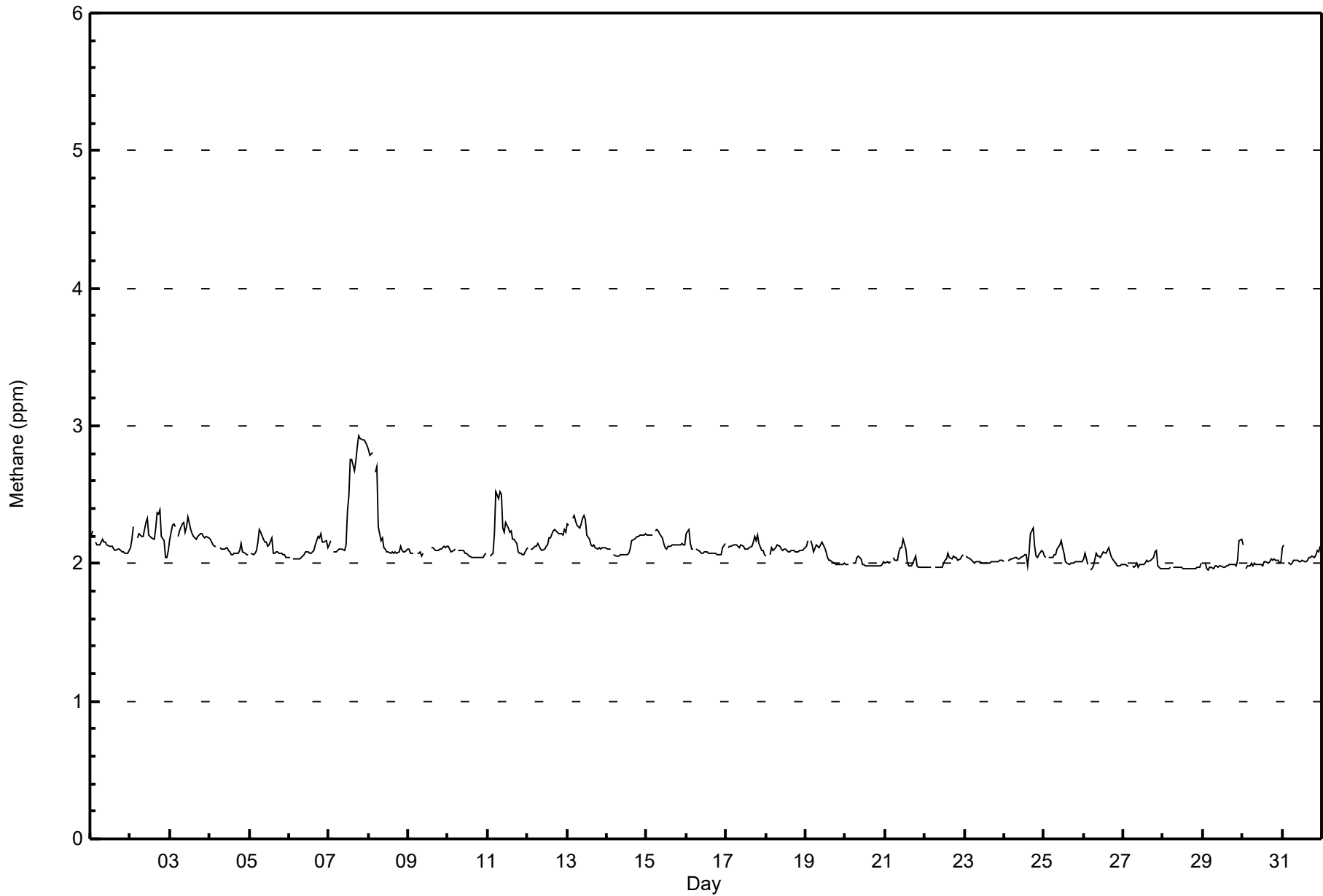






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Patricia McInnes - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	256	36.11	36.11
2.1 - 3.0	453	63.89	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Patricia McInnes - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	18	18	5	4	7	24	26	8	8	14	25	31	14	17	17	20	256
2.1 - 3.0	27	16	11	8	18	48	59	75	66	40	35	24	8	2	2	14	453
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	34	16	12	25	72	85	83	74	54	60	55	22	19	19	34	709

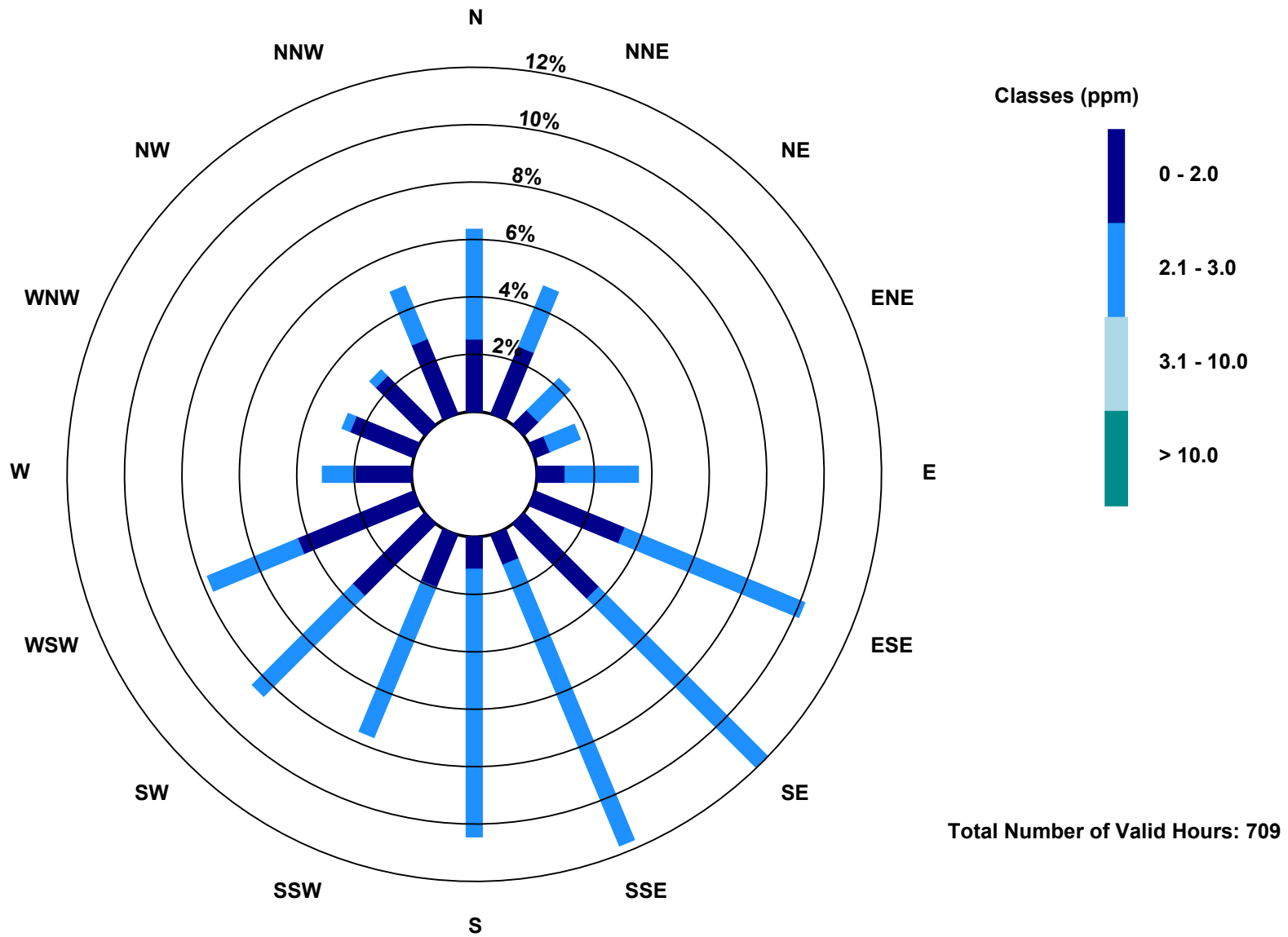
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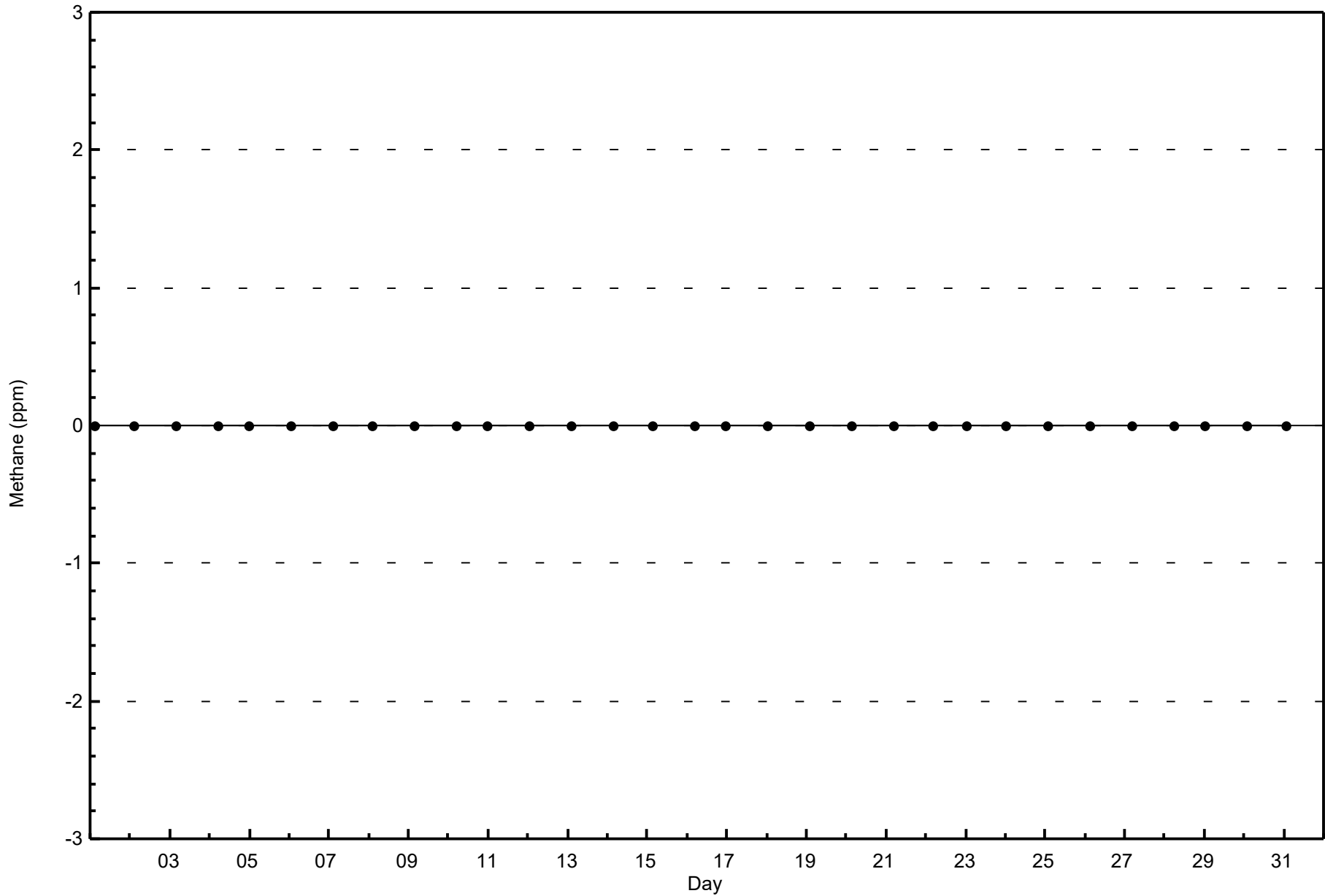
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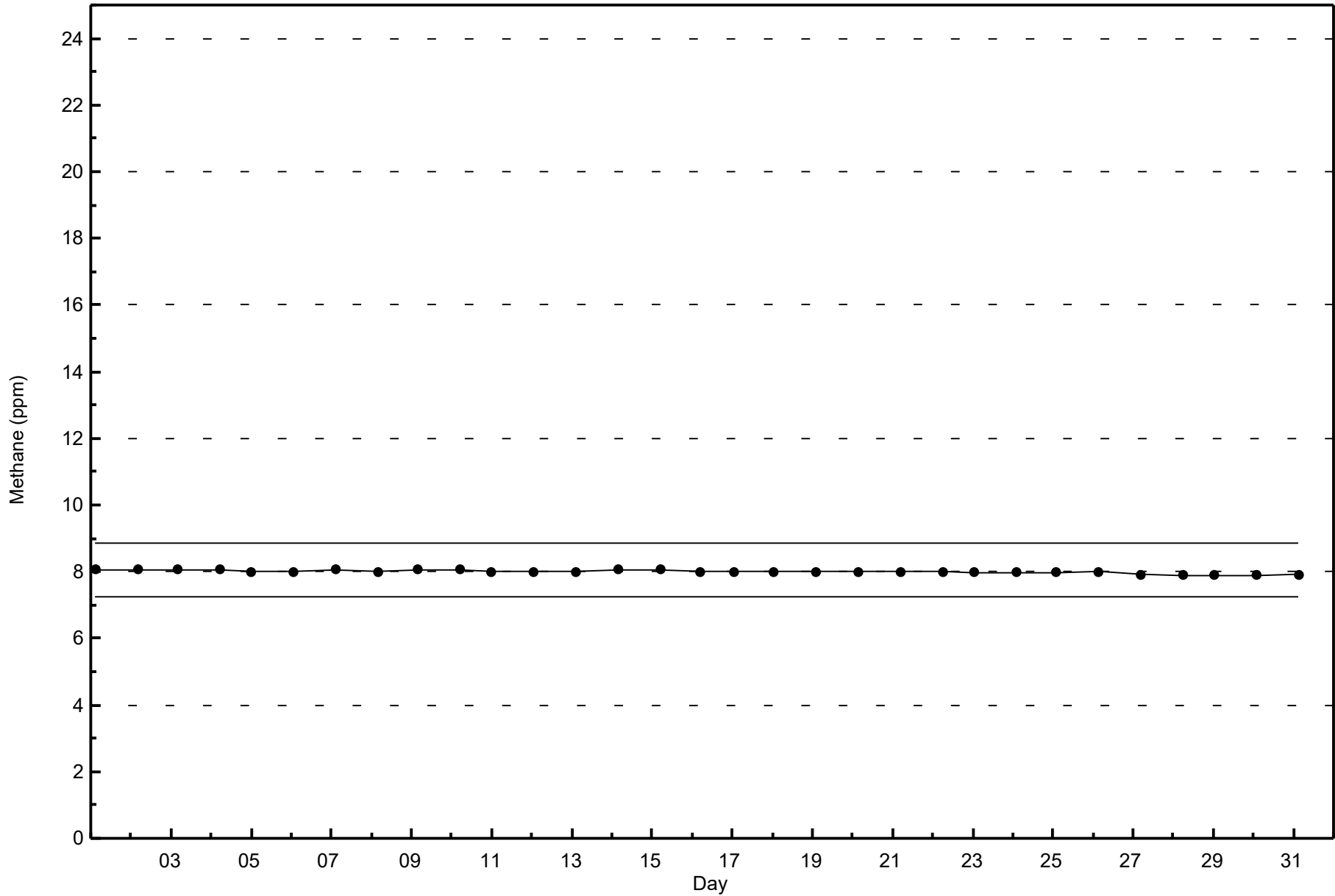


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Patricia McInnes









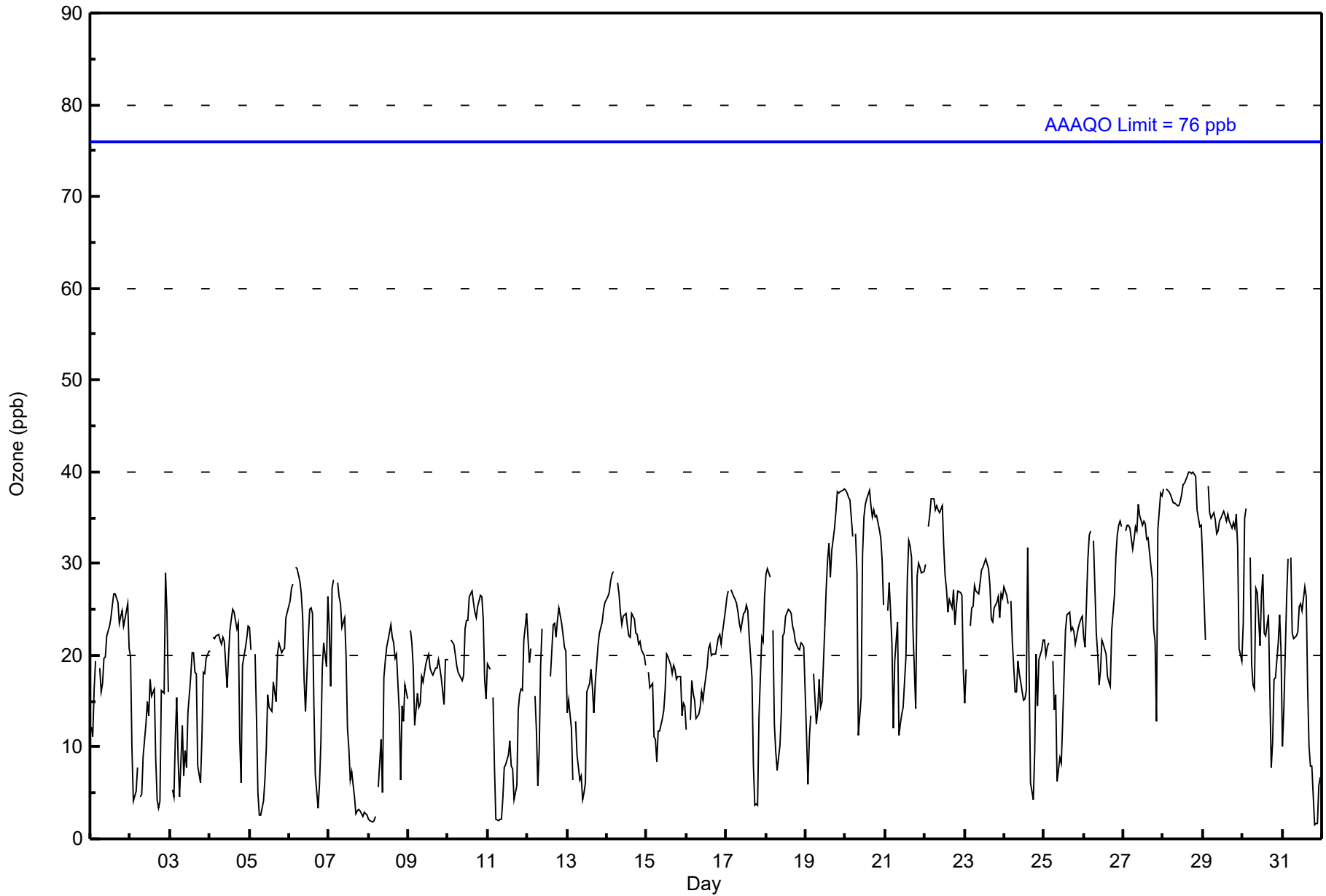
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Patricia McInnes - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 40.0 ppb on Jan 28 17:00		Maximum Daily Average: 37.6 ppb on Jan 28																	Hours of Data:	709							
Minimum Value: 1.5 ppb on Jan 31 20:00		Minimum Daily Average: 10.6 ppb on Jan 11																	Hours of Missing Data:	35							
Maximum Diurnal Average: 24.0 ppb at hour 15		Minimum Diurnal Average: 18.1 ppb at hour 9																	Hours of Calibration:	35							
Monthly Average: 21.08 ppb		Percentiles: P ₁ = 2.1 P ₁₀ = 7.8 Q ₁ = 15.5 Median = 21.4 Q ₃ = 26.6 P ₉₀ = 34.2 P ₉₉ = 38.6																	Percent Operational Time:	100.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	12.2	11.2	16.3	19.3	Z	18.6	16.0	16.9	19.7	19.9	22.2	23.2	24.1	25.5	26.6	26.7	25.7	23.5	24.3	24.9	23.2	23.9	25.6	20.8	21.3	26.7	
2-Jan	19.8	9.9	4.2	5.2	7.8	Z	4.6	4.9	9.0	12.6	14.9	13.4	17.3	15.6	16.4	8.7	4.3	3.4	4.1	16.2	15.9	29.0	24.8	16.0	12.1	29.0	
3-Jan	Z	5.3	4.5	11.0	15.4	8.7	4.6	12.3	6.9	9.6	7.8	13.7	17.7	20.3	20.3	18.1	17.9	8.0	6.0	11.0	18.1	18.0	19.7	20.5	12.8	20.5	
4-Jan	20.4	Z	21.9	21.8	22.1	22.3	21.6	21.2	21.9	21.5	16.5	19.8	22.8	24.0	25.0	24.6	22.9	23.6	10.9	6.1	18.9	20.7	21.8	23.2	20.7	25.0	
5-Jan	23.0	20.6	Z	20.2	13.1	5.0	2.6	2.5	4.1	6.3	10.0	15.7	14.3	13.9	17.2	16.1	14.9	20.2	21.4	20.2	20.6	20.7	24.1	24.7	15.3	24.7	
6-Jan	25.9	27.3	27.8	Z	29.5	29.4	28.0	26.7	24.2	17.4	13.9	21.8	25.0	25.2	24.5	14.6	7.0	3.4	6.0	10.6	18.6	21.3	18.7	26.4	20.6	29.5	
7-Jan	22.9	16.6	27.3	28.2	Z	27.9	26.4	25.7	23.0	24.1	19.9	12.1	9.8	6.4	7.3	4.6	2.7	3.0	3.2	3.1	2.4	2.8	2.7	2.5	13.2	28.2	
8-Jan	2.2	1.9	1.9	1.9	2.5	Z	5.6	10.8	5.1	17.5	19.3	20.9	21.6	23.3	21.9	21.4	19.7	20.1	13.9	6.5	14.4	12.8	16.8	15.2	12.9	23.3	
9-Jan	Z	22.7	21.3	18.6	12.3	15.9	14.3	14.8	17.8	17.1	19.1	19.7	20.1	18.6	18.1	17.9	18.6	18.6	19.5	18.7	17.6	14.7	19.5	19.5	18.0	22.7	
10-Jan	19.6	Z	21.7	21.2	20.1	18.9	18.2	17.9	17.2	17.8	22.9	23.8	23.8	26.3	27.0	25.7	24.7	24.1	25.4	26.6	26.4	23.9	17.4	15.2	22.0	27.0	
11-Jan	19.1	18.4	Z	15.3	8.0	2.2	2.0	2.1	2.1	4.4	7.7	8.1	9.2	10.7	7.9	7.7	4.3	5.8	14.0	15.7	16.3	16.1	21.6	24.6	10.6	24.6	
12-Jan	21.9	19.2	20.7	Z	15.6	11.7	5.8	9.8	19.0	22.9	C	C	C	C	17.6	23.3	23.5	22.0	23.8	25.2	23.5	22.3	20.9	20.4	19.4	25.2	
13-Jan	13.7	15.0	12.0	6.4	Z	12.8	9.1	6.5	6.9	4.2	5.0	6.1	15.9	16.9	18.4	16.4	13.7	17.0	21.1	22.5	23.0	23.7	25.0	25.8	14.7	25.8	
14-Jan	26.3	26.9	28.1	28.8	29.2	Z	28.0	26.7	24.6	23.3	24.2	24.6	23.1	22.2	21.9	24.5	24.0	22.4	22.3	21.2	21.5	20.6	20.0	18.9	24.1	29.2	
15-Jan	Z	18.2	16.5	16.9	11.1	10.8	8.3	11.8	11.8	13.1	14.1	16.3	20.2	19.8	19.0	18.0	18.9	18.4	17.5	17.7	17.7	13.4	14.8	14.6	15.6	20.2	
16-Jan	11.8	Z	13.0	17.2	15.9	15.1	13.1	13.6	14.3	16.1	15.1	16.4	18.8	20.7	21.1	20.0	20.2	20.1	21.0	22.0	22.3	21.2	22.6	24.9	18.1	24.9	
17-Jan	26.2	27.0	Z	27.1	26.4	26.1	25.6	24.7	23.5	22.7	24.6	24.6	25.5	24.8	22.1	17.6	8.1	3.7	3.8	3.6	13.3	21.9	21.5	26.4	20.5	27.1	
18-Jan	28.8	29.4	28.6	Z	22.7	12.4	9.5	7.5	10.3	13.9	22.1	22.4	24.3	25.0	24.8	24.6	23.2	22.6	21.4	20.8	20.7	21.3	21.1	20.9	20.8	29.4	
19-Jan	11.2	5.9	10.9	13.4	Z	18.0	12.6	14.1	17.3	14.3	14.9	22.9	27.2	30.4	32.2	28.6	31.5	33.9	35.6	37.8	37.7	37.9	37.9	38.2	24.5	38.2	
20-Jan	38.1	37.7	37.2	36.9	32.9	Z	33.2	29.1	11.3	15.5	30.9	35.0	36.4	37.1	37.9	36.4	35.1	35.8	35.0	35.2	33.7	32.8	30.3	25.5	32.6	38.1	
21-Jan	Z	24.9	27.9	24.8	21.2	12.0	19.4	23.6	11.2	12.4	13.5	14.3	19.9	28.3	32.4	31.9	30.7	22.8	14.2	28.7	30.0	29.5	28.9	29.2	23.1	32.4	
22-Jan	29.9	Z	34.1	35.3	37.1	37.0	35.9	36.3	35.9	35.6	36.3	31.9	28.8	27.2	24.7	26.0	25.2	27.1	23.4	25.3	26.9	26.9	26.5	18.3	30.1	37.1	
23-Jan	14.7	18.4	Z	23.2	25.2	25.3	27.7	27.0	26.7	27.9	29.2	29.6	30.0	30.5	29.4	27.6	24.0	23.6	25.2	25.8	26.4	24.1	26.6	26.2	25.8	30.5	
24-Jan	27.5	26.6	25.6	Z	25.9	21.5	16.1	16.1	19.4	17.9	17.2	15.1	15.3	16.1	31.7	18.3	6.1	4.3	9.5	20.1	14.5	19.6	20.5	21.7	18.5	31.7	
25-Jan	21.6	20.0	20.9	21.4	Z	19.3	14.1	15.7	6.3	8.8	8.2	12.8	17.9	22.7	24.3	24.7	22.7	23.0	22.5	21.2	22.9	23.4	24.0	24.3	19.3	24.7	
26-Jan	22.0	20.9	30.6	33.2	33.5	Z	32.5	22.4	20.2	16.7	18.3	21.6	21.2	20.2	17.8	17.1	16.6	22.7	26.5	30.9	33.1	34.1	34.6	34.0	25.3	34.6	
27-Jan	Z	33.6	34.1	34.1	33.9	31.6	32.6	34.0	33.5	36.5	35.3	34.2	34.6	34.4	32.6	32.7	29.7	28.4	22.9	21.5	12.8	33.8	37.7	37.4	31.8	37.7	
28-Jan	38.2	Z	38.2	37.9	37.5	37.0	36.7	36.5	36.3	36.2	36.8	37.5	38.6	38.8	39.5	40.0	40.0	39.8	39.9	39.4	35.9	35.0	34.0	34.2	37.6	40.0	
29-Jan	30.4	21.7	Z	38.4	35.5	35.0	35.5	34.8	33.3	33.6	34.7	34.9	35.7	35.3	34.6	35.4	34.6	33.8	34.5	33.9	35.3	31.9	20.7	19.3	32.7	38.4	
30-Jan	23.5	34.9	36.0	Z	30.7	19.0	16.8	16.3	27.2	26.9	21.0	26.6	28.8	22.4	22.1	24.4	16.1	7.7	10.6	17.3	17.5	21.3	24.5	20.4	22.3	36.0	
31-Jan	10.0	14.0	26.3	30.5	Z	30.6	22.4	21.8	22.1	22.6	25.3	25.7	24.9	27.4	26.3	16.7	10.0	8.0	8.0	1.5	1.6	1.7	5.8	6.7	17.0	30.6	
		21.6	20.3	22.6	22.6	22.6	20.2	18.7	18.8	18.1	19.0	20.0	21.5	23.1	23.7	24.0	22.3	19.9	19.1	19.0	20.4	21.4	22.6	22.9	22.4	Diurnal Average	
		38.2	37.7	38.2	38.4	37.5	37.0	36.7	36.5	36.3	36.5	36.8	37.5	38.6	38.8	39.5	40.0	40.0	39.8	39.9	39.4	37.7	37.9	37.9	38.2	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 76 ppb																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	320	45.13	45.13
21 - 50	389	54.87	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	22	17	13	9	18	34	27	62	48	28	11	10	6	2	2	11	320
21 - 50	22	18	5	4	8	40	55	15	28	28	49	45	15	19	17	21	389
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	35	18	13	26	74	82	77	76	56	60	55	21	21	19	32	709

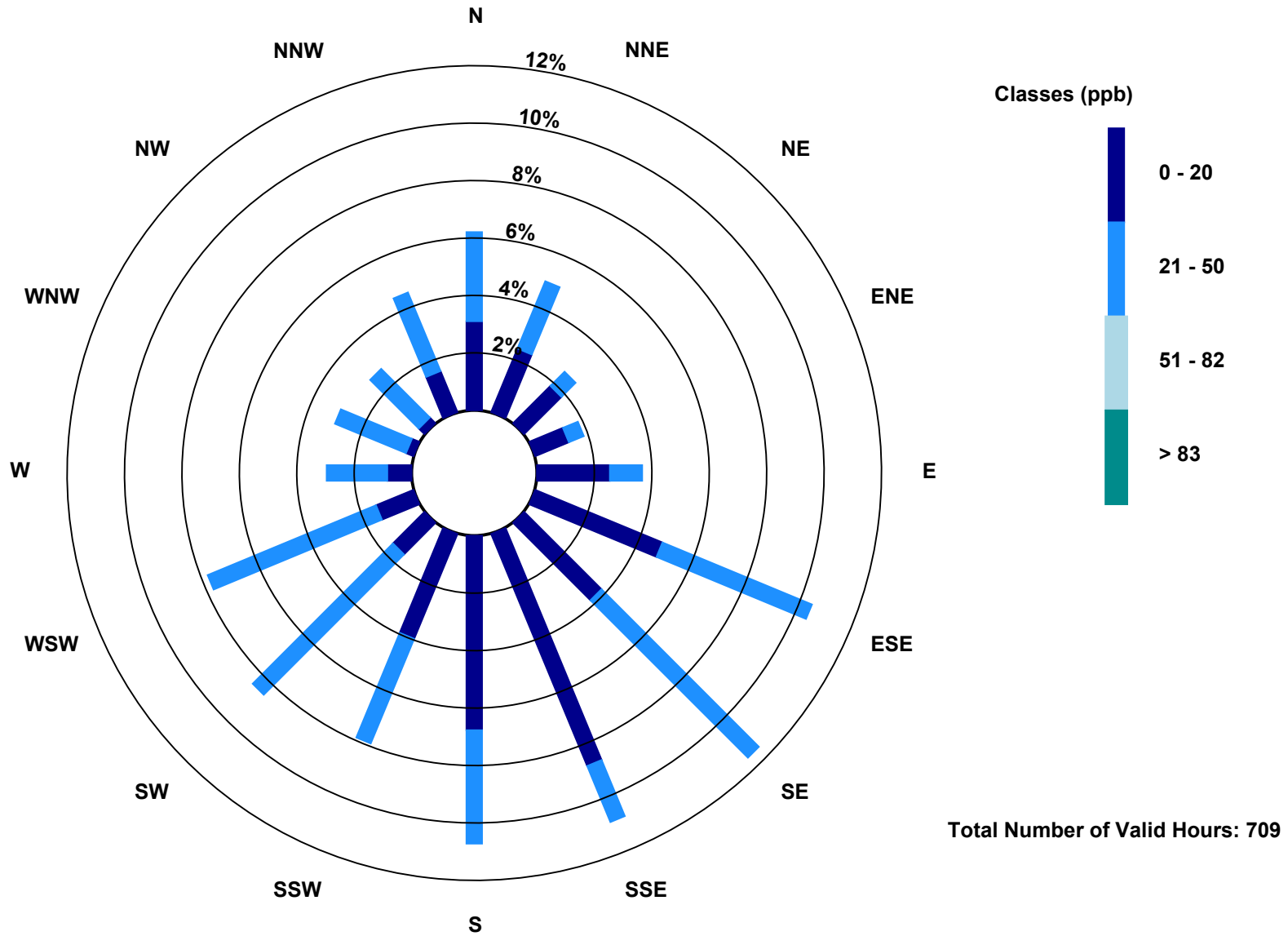
Total Number of Valid Hours: 709

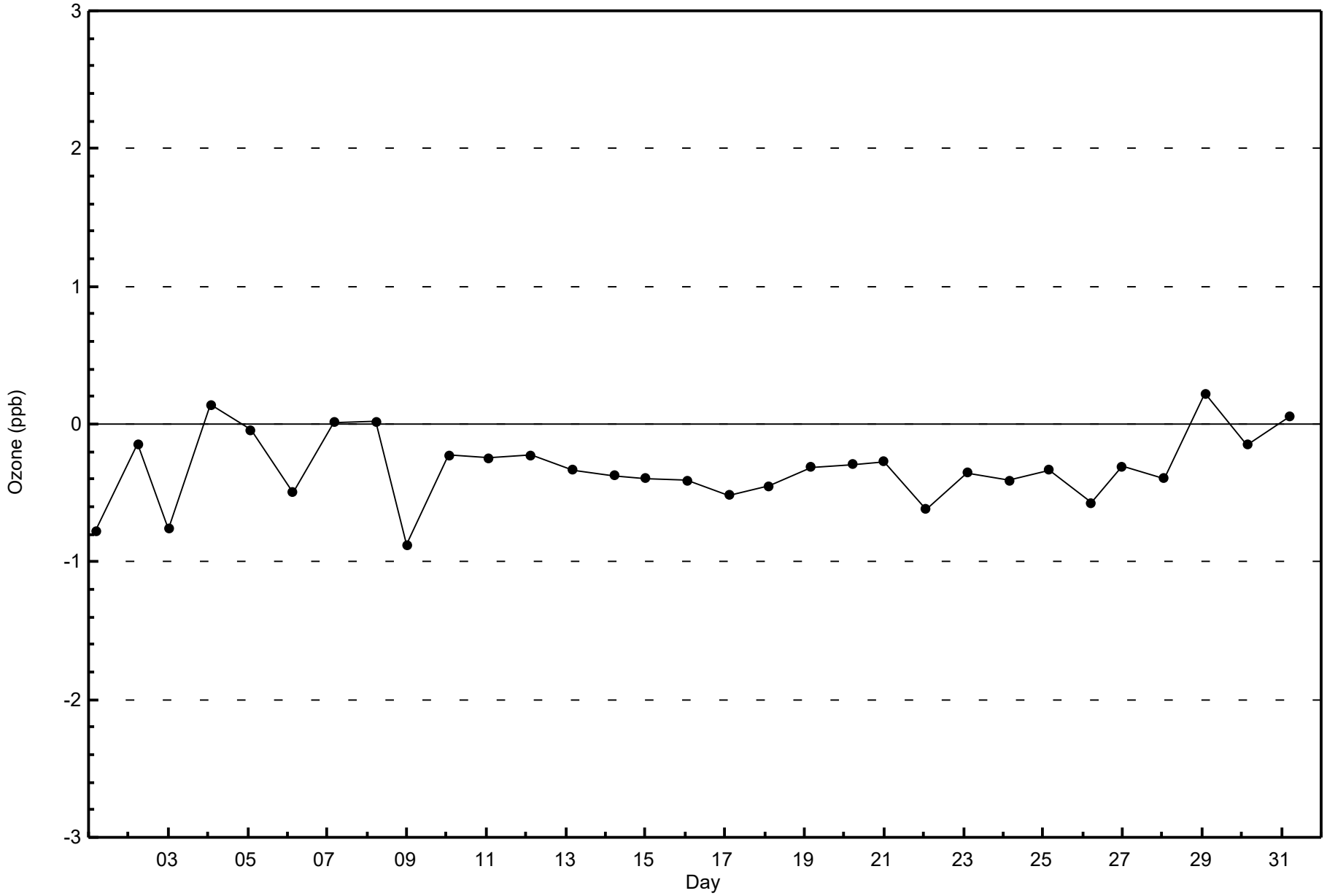
Total Number of Hours: 744

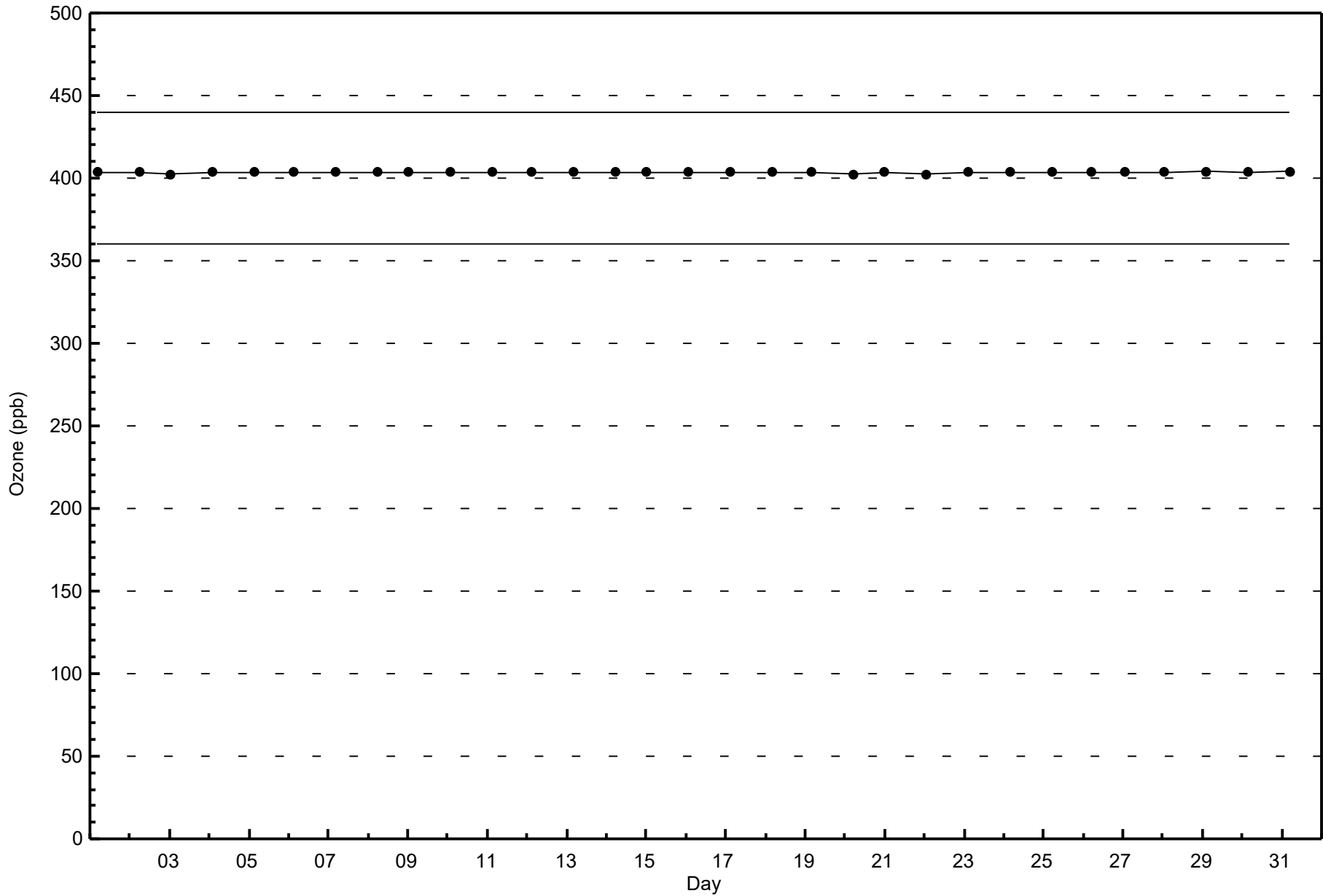


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Patricia McInnes







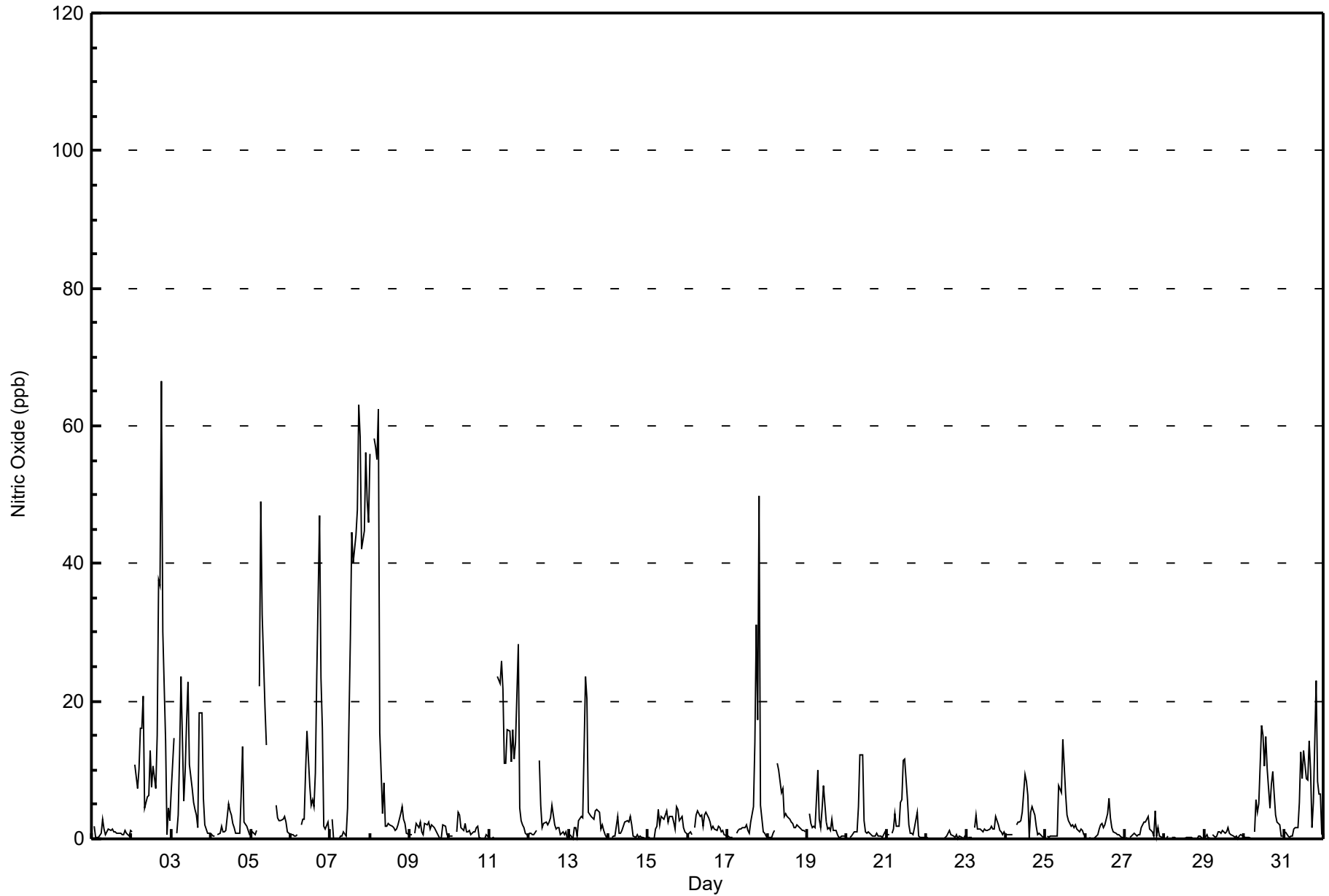


Maximum Value: 66.5 ppb on Jan 2 19:00																				Maximum Daily Average: 25.8 ppb on Jan 7					Hours in Service: 744		
Minimum Value: 0.0 ppb on Jan 9 19:00																				Minimum Daily Average: 0.1 ppb on Jan 28					Hours of Data: 708		
Maximum Diurnal Average: 8.7 ppb at hour 18																				Minimum Diurnal Average: 1.3 ppb at hour 2					Hours of Missing Data: 36		
Monthly Average: 4.71 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.4 Q ₃ = 3.5 P ₉₀ = 12.2 P ₉₉ = 55.8					Hours of Calibration: 36		
																									Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	Z	1.7	0.2	0.2	0.2	0.9	2.9	1.3	0.7	1.0	1.3	1.3	1.5	1.1	0.9	0.8	0.8	0.9	0.7	0.5	1.3	0.8	0.4	1.2	1.0	2.9	
2-Jan	1.0	Z	10.8	7.4	10.1	16.1	16.0	20.8	4.5	6.1	6.3	12.9	7.5	10.6	7.3	15.1	37.7	36.8	66.5	30.1	14.3	0.6	4.5	2.6	15.0	66.5	
3-Jan	6.9	14.6	Z	0.8	3.4	12.2	23.6	5.5	10.0	17.0	22.9	10.9	7.2	5.2	4.4	3.4	1.6	18.4	18.3	5.8	1.9	1.4	0.8	0.8	8.6	23.6	
4-Jan	0.6	0.5	0.5	Z	0.6	0.8	1.7	1.0	0.9	1.1	5.1	4.1	3.5	2.3	1.6	0.8	0.9	0.7	6.5	13.5	2.4	1.8	1.2	0.7	2.3	13.5	
5-Jan	0.5	1.0	0.6	1.2	Z	22.2	49.0	32.5	19.1	13.6	C	C	C	C	C	4.8	3.1	2.6	2.7	2.8	3.2	2.4	1.0	0.9	9.1	49.0	
6-Jan	0.6	0.5	0.4	0.5	0.5	Z	2.1	2.8	2.9	9.9	15.6	7.8	4.9	5.7	4.8	9.6	23.8	47.0	23.4	16.0	1.9	1.3	2.4	0.5	8.0	47.0	
7-Jan	Z	2.9	0.1	0.1	0.1	0.0	0.4	0.4	1.0	0.5	4.5	17.1	29.1	44.4	40.1	44.2	47.8	63.1	58.5	42.0	44.8	56.2	49.2	46.0	25.8	63.1	
8-Jan	55.9	Z	58.1	57.0	55.2	62.4	15.4	3.6	8.2	1.8	1.8	2.3	2.0	1.8	1.6	1.1	1.4	2.0	3.7	4.7	2.9	2.2	0.9	0.6	15.1	62.4	
9-Jan	0.6	0.5	Z	0.9	2.2	1.7	2.5	1.1	0.7	2.2	2.1	2.3	1.5	2.0	1.9	1.6	0.9	0.3	0.0	0.2	2.0	1.8	0.6	0.5	1.3	2.5	
10-Jan	0.4	0.4	0.4	Z	1.1	3.9	3.5	1.6	1.2	2.3	1.1	1.1	1.2	0.7	0.9	0.9	1.7	1.8	0.2	0.0	0.0	0.1	0.5	0.3	1.1	3.9	
11-Jan	0.1	0.1	0.2	0.1	Z	23.5	22.7	25.9	21.8	10.9	10.9	15.8	15.6	11.2	15.9	11.7	14.1	28.4	4.5	2.6	2.0	1.6	0.7	0.4	10.5	28.4	
12-Jan	0.9	0.9	0.6	0.6	1.1	Z	11.4	5.0	1.7	2.3	2.4	2.0	2.5	3.0	4.9	2.0	1.5	1.7	1.6	0.7	1.0	0.6	0.9	0.0	2.1	11.4	
13-Jan	Z	0.7	0.1	1.6	1.7	0.4	2.6	3.2	3.0	13.2	23.6	20.3	3.8	3.2	3.1	2.9	4.0	4.3	3.9	1.4	2.0	1.1	0.5	0.3	4.4	23.6	
14-Jan	0.4	Z	0.3	0.3	0.4	3.3	0.9	0.9	1.1	1.8	2.4	2.6	2.4	3.2	2.1	0.4	0.1	0.6	0.2	0.3	0.2	0.2	0.1	0.2	1.1	3.3	
15-Jan	0.2	0.2	Z	0.1	1.5	1.9	4.3	2.0	3.2	2.9	3.4	4.0	2.5	3.2	3.2	2.4	1.5	4.7	4.2	2.7	3.2	1.7	1.0	0.8	2.4	4.7	
16-Jan	0.6	1.0	0.7	Z	1.6	3.4	4.1	3.3	3.6	1.8	3.6	3.8	3.1	2.4	1.5	1.9	1.4	1.2	1.8	1.6	1.1	1.2	0.6	0.4	2.0	4.1	
17-Jan	0.4	0.1	0.3	0.3	Z	0.8	1.2	1.5	1.3	1.6	1.6	2.0	1.2	0.9	2.4	4.6	14.0	31.2	17.3	49.8	4.9	1.0	0.8	0.4	6.1	49.8	
18-Jan	0.2	0.2	0.2	0.8	1.3	Z	11.0	10.0	6.7	7.3	3.3	3.7	3.2	2.8	2.4	2.2	1.7	1.7	2.0	1.6	1.5	1.2	1.1	1.0	2.9	11.0	
19-Jan	Z	3.6	2.2	1.7	1.9	1.7	10.0	2.8	1.6	4.3	7.8	2.4	1.4	1.6	1.3	2.8	1.3	1.2	0.7	0.3	0.3	0.3	0.3	0.3	2.2	10.0	
20-Jan	0.0	Z	0.2	0.4	1.0	1.0	1.0	4.7	12.2	12.2	2.6	1.1	0.9	1.0	0.5	0.5	0.3	0.3	0.8	0.5	0.4	0.2	0.7	1.1	1.9	12.2	
21-Jan	0.6	0.6	Z	0.8	1.5	3.7	1.8	1.8	5.3	5.6	11.4	11.5	5.8	2.1	0.8	0.7	0.5	1.6	3.9	0.4	0.2	0.1	0.3	0.2	2.7	11.5	
22-Jan	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.2	0.7	0.5	0.1	0.7	0.0	0.4	0.2	0.0	0.5	0.3	1.2
23-Jan	0.6	0.1	0.2	0.3	Z	1.6	3.5	1.4	1.4	1.2	1.0	1.5	1.3	1.2	1.4	1.8	1.4	1.4	3.2	2.1	1.3	1.0	0.7	1.0	1.3	3.5	
24-Jan	0.6	0.6	0.5	0.6	0.6	Z	2.0	2.3	2.5	2.6	3.9	9.3	8.2	6.3	0.3	3.8	4.7	3.4	1.8	0.6	0.8	0.6	0.2	0.2	2.5	9.3	
25-Jan	Z	0.5	0.3	0.4	0.3	0.4	0.3	0.4	7.6	6.8	14.4	10.5	6.4	3.5	2.7	1.9	2.0	1.6	2.0	1.3	1.0	1.5	1.2	0.7	2.9	14.4	
26-Jan	0.5	Z	0.1	0.0	0.0	0.1	0.2	0.6	1.3	2.0	2.3	1.5	2.1	3.7	5.8	3.0	1.5	1.1	0.8	0.6	0.6	0.3	0.1	0.2	1.2	5.8	
27-Jan	0.1	0.2	Z	0.2	0.5	0.8	0.7	0.4	0.6	0.6	1.7	2.4	2.5	2.9	3.2	1.5	1.1	0.5	4.1	0.5	1.7	0.4	0.2	0.3	1.2	4.1	
28-Jan	0.0	0.0	0.3	Z	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.4	0.3	0.2	0.0	0.1	0.4	
29-Jan	0.0	0.5	0.0	0.1	Z	0.7	0.3	0.4	1.0	1.1	0.8	1.2	0.8	1.1	1.6	0.8	0.7	0.4	0.3	0.4	0.1	0.4	0.6	0.4	0.6	1.6	
30-Jan	0.2	0.2	0.1	0.1	0.0	Z	0.9	5.6	3.8	5.2	16.4	15.0	10.7	14.8	10.1	4.5	7.9	9.8	6.6	3.5	2.4	1.9	0.5	0.4	5.2	16.4	
31-Jan	Z	0.9	0.4	0.3	0.3	0.4	1.5	1.6	1.6	5.2	12.7	8.7	12.8	8.7	8.6	14.3	10.1	1.5	5.3	22.9	8.4	6.6	6.5	0.6	6.1	22.9	
																								Diurnal Average			
																								Diurnal Maximum			
2.9 1.3 3.0 3.0 3.4 6.3 6.4 4.7 4.2 4.6 6.2 6.0 4.9 5.0 4.6 4.7 6.1 8.7 7.9 6.8 3.5 2.9 2.5 2.0																											
55.9 14.6 58.1 57.0 55.2 62.4 49.0 32.5 21.8 17.0 23.6 20.3 29.1 44.4 40.1 44.2 47.8 63.1 66.5 49.8 44.8 56.2 49.2 46.0																											
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Patricia McInnes - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	669	94.49	94.49
21 - 40	20	2.82	97.32
41 - 80	19	2.68	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	43	30	17	13	25	70	81	70	64	54	56	56	20	21	18	31	669
21 - 40	1	3	1	0	0	1	2	4	4	1	1	1	1	0	0	0	20
11 - 80	2	2	0	0	0	0	0	5	5	2	0	0	1	0	1	1	19
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	35	18	13	25	71	83	79	73	57	57	57	22	21	19	32	708

Total Number of Valid Hours: 708

Total Number of Hours: 744

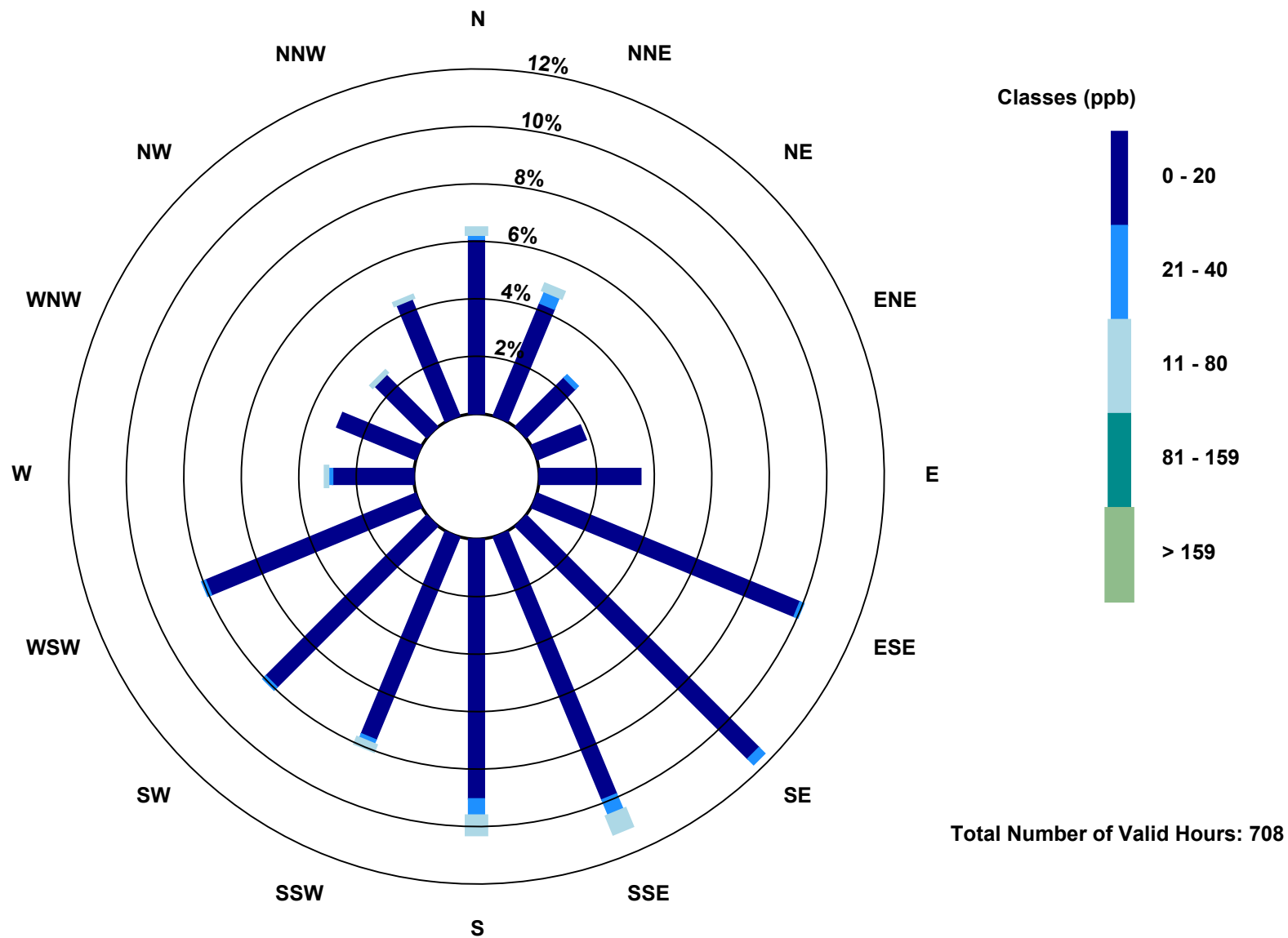


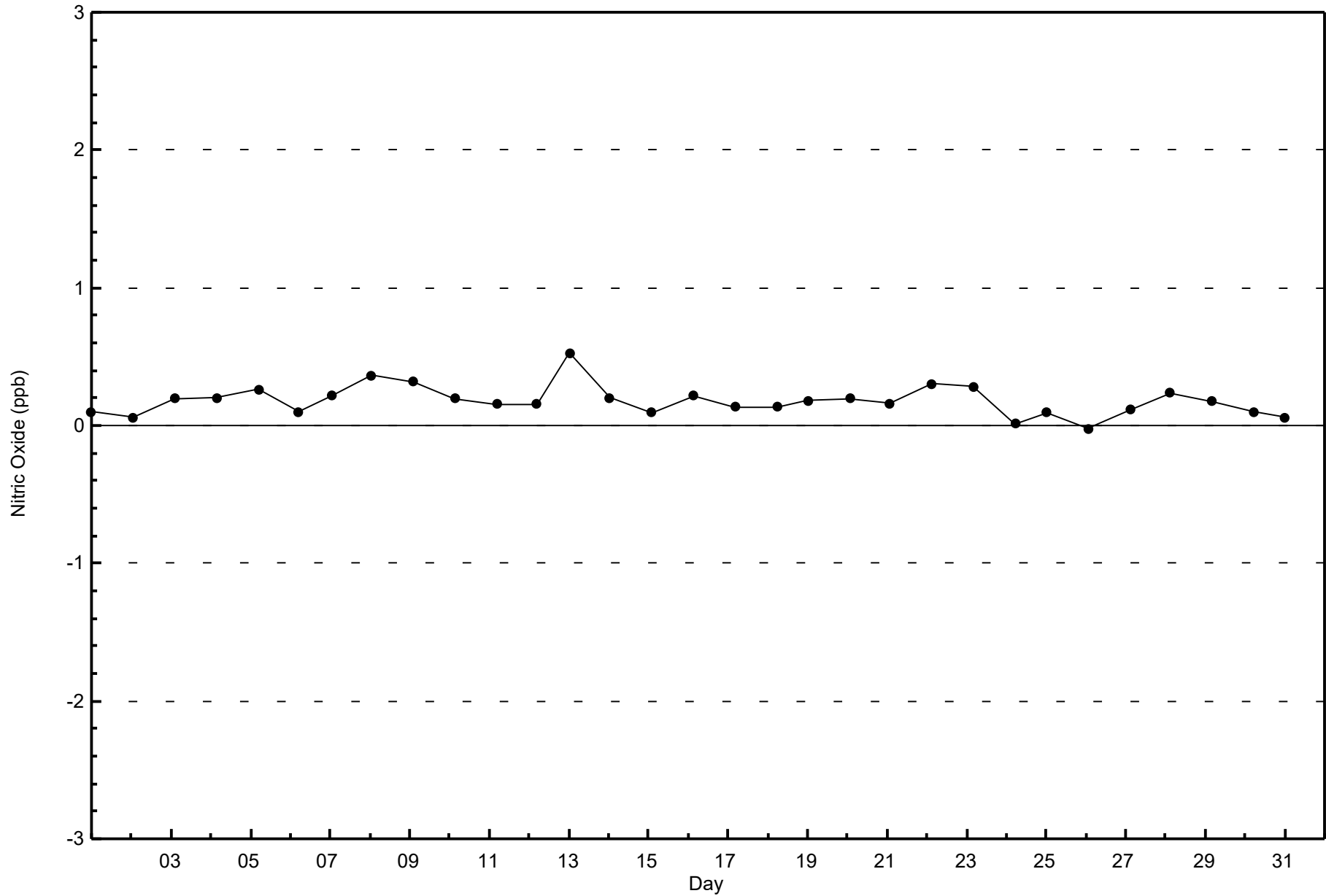
Wood Buffalo Environmental Association

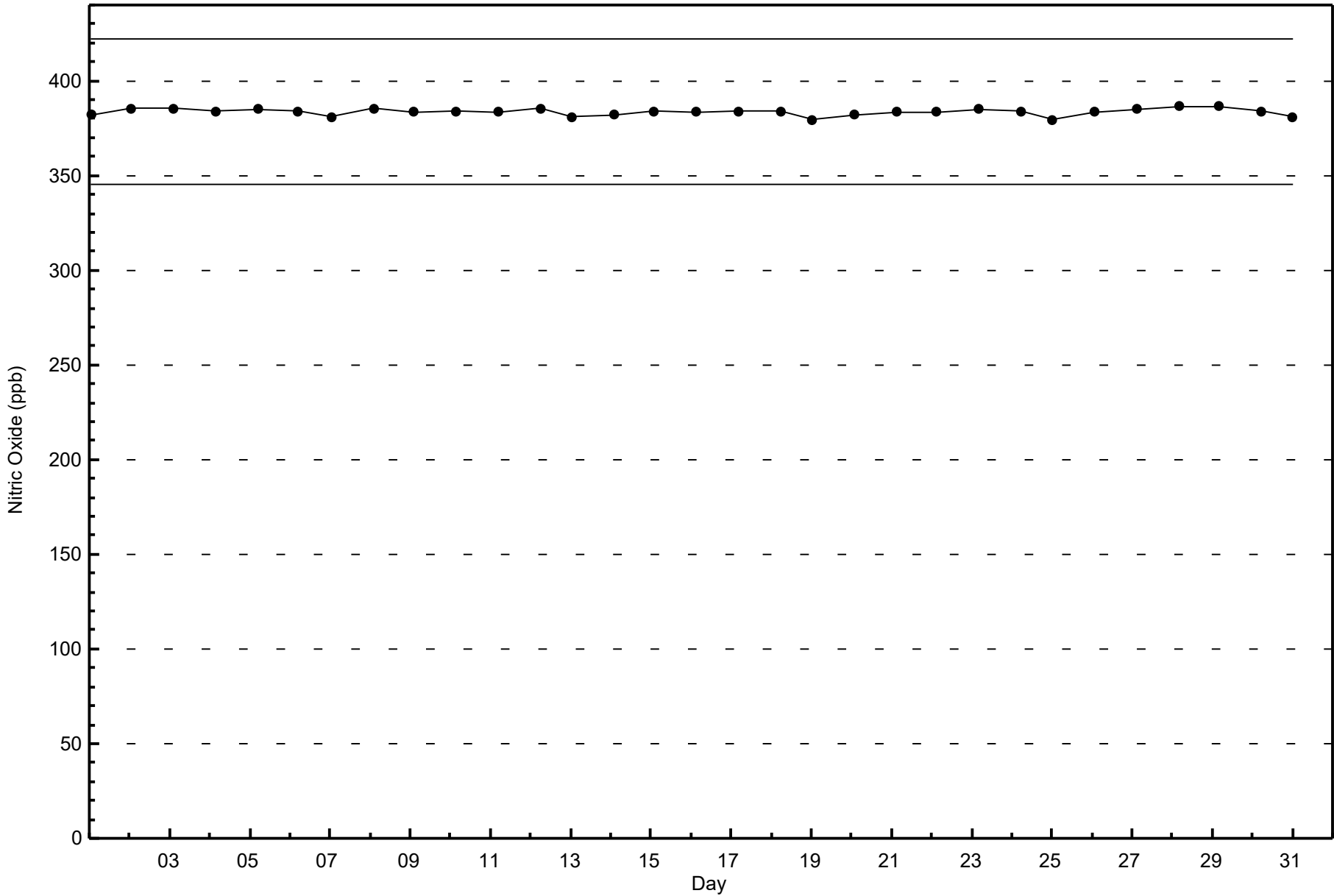
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb

Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 38.8 ppb on Jan 6 18:00	Maximum Daily Average: 20.1 ppb on Jan 31		Hours of Data:	708
Minimum Value: 0.0 ppb on Jan 22 07:00	Minimum Daily Average: 1.1 ppb on Jan 28		Hours of Missing Data:	36
Maximum Diurnal Average: 13.6 ppb at hour 18	Minimum Diurnal Average: 6.9 ppb at hour 1		Hours of Calibration:	36
Monthly Average: 9.70 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 2.1 Q ₁ = 3.8 Median = 7.5 Q ₃ = 13.2 P ₉₀ = 22.7 P ₉₉ = 32.6		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	Z	7.9	3.9	2.8	3.0	5.4	8.8	6.8	4.1	4.8	4.1	3.3	2.9	2.9	3.1	3.5	4.7	6.6	5.5	4.9	7.0	5.4	3.2	8.0	4.9	8.8
2-Jan	9.0	Z	26.8	23.5	15.3	22.9	24.7	23.4	18.1	14.5	12.3	15.9	10.6	14.8	15.5	26.0	33.6	30.6	37.2	21.2	19.8	5.2	10.7	16.8	19.5	37.2
3-Jan	25.0	30.4	Z	14.2	9.5	13.8	25.6	16.2	23.0	21.9	21.9	13.1	11.3	10.3	11.4	14.0	12.7	25.3	27.6	19.2	9.0	9.1	6.8	5.4	16.4	30.4
4-Jan	4.9	3.8	3.2	Z	3.7	3.4	4.2	4.3	3.5	4.2	9.7	6.7	5.2	4.1	3.9	4.1	5.9	4.7	20.3	27.0	8.6	6.6	4.9	3.5	6.5	27.0
5-Jan	3.8	6.0	4.0	6.3	Z	25.3	30.3	27.0	24.3	21.6	C	C	C	C	C	10.9	11.6	8.4	7.5	7.8	7.9	7.4	3.2	2.7	12.0	30.3
6-Jan	2.2	2.0	2.1	2.1	2.2	Z	5.3	9.2	9.9	18.3	22.1	14.2	9.3	10.0	11.2	21.9	33.0	38.8	30.5	26.8	14.6	11.4	15.3	5.5	13.8	38.8
7-Jan	Z	16.0	3.3	2.8	2.5	2.6	3.4	3.2	5.1	3.2	8.1	17.9	19.8	26.1	27.4	31.9	31.4	33.0	30.8	29.1	28.6	30.3	24.8	19.9	17.4	33.0
8-Jan	18.7	Z	25.1	21.5	25.7	24.6	20.3	13.1	19.8	6.8	5.4	4.8	4.4	3.6	4.7	5.6	7.4	6.6	13.8	22.7	11.3	14.6	10.1	11.6	13.1	25.7
9-Jan	9.8	3.7	Z	8.7	15.7	10.6	12.6	9.7	3.7	8.2	6.1	5.1	4.2	5.0	4.8	5.1	4.4	4.1	2.1	3.5	7.1	8.9	4.1	4.4	6.6	15.7
10-Jan	4.2	3.7	3.3	Z	4.9	7.7	7.1	7.8	8.4	8.1	3.7	3.4	4.0	2.6	3.3	5.2	6.4	6.9	4.0	1.7	1.6	4.1	10.8	14.0	5.5	14.0
11-Jan	7.5	6.9	9.1	9.0	Z	24.4	24.0	23.8	22.7	20.1	17.0	17.4	16.8	15.3	18.8	18.7	23.8	26.5	13.9	12.3	11.5	11.7	6.4	4.7	15.8	26.5
12-Jan	7.2	8.2	5.2	5.7	8.7	Z	23.0	17.5	9.7	7.5	6.8	6.7	7.1	7.9	13.8	9.1	9.2	11.0	9.2	6.7	8.5	9.1	9.9	10.1	9.5	23.0
13-Jan	Z	14.2	16.8	23.3	23.2	14.8	19.9	23.7	22.1	24.3	23.7	23.2	12.9	12.5	15.8	19.1	14.6	10.6	7.0	6.4	5.4	3.6	2.7	15.3	24.3	
14-Jan	2.6	Z	2.5	2.3	2.6	6.6	3.8	4.9	6.8	8.0	6.8	6.0	7.5	8.6	8.3	3.4	3.1	4.3	3.6	4.3	2.9	3.2	3.5	4.3	4.8	8.6
15-Jan	4.0	4.2	Z	4.3	12.5	13.5	16.9	12.0	11.7	10.4	9.7	9.1	6.6	6.8	7.9	8.7	7.7	9.0	9.5	8.5	8.5	12.8	10.0	9.5	9.3	16.9
16-Jan	11.2	13.6	10.4	Z	8.6	11.0	13.0	11.0	10.4	8.5	9.4	7.8	5.4	4.4	3.7	5.0	5.1	5.3	5.2	3.9	3.6	4.7	4.7	3.5	7.4	13.6
17-Jan	3.0	2.8	2.8	3.0	Z	4.5	5.7	6.5	7.2	8.2	5.2	4.2	2.9	2.9	5.5	10.9	23.9	28.2	21.5	25.6	15.3	5.5	5.9	3.6	8.9	28.2
18-Jan	2.6	2.6	3.7	6.1	8.4	Z	27.1	27.6	23.7	18.8	8.1	7.4	5.5	5.1	5.4	6.1	7.6	7.7	9.1	8.9	9.2	8.4	8.5	9.1	9.9	27.6
19-Jan	Z	18.6	16.6	14.7	11.3	9.4	15.5	12.0	8.0	10.9	10.6	4.1	3.1	3.2	3.7	8.9	6.9	5.9	4.2	2.0	1.9	1.7	1.8	1.5	7.7	18.6
20-Jan	1.3	Z	1.4	1.7	6.0	8.1	5.6	15.0	32.7	26.5	7.2	2.6	1.7	1.7	0.9	1.6	2.7	2.2	2.4	0.9	1.0	1.2	3.7	7.9	5.9	32.7
21-Jan	5.0	8.5	Z	7.8	10.1	19.7	11.4	7.1	20.3	17.9	16.3	15.0	9.4	3.8	1.6	2.5	3.1	11.6	21.1	3.3	1.4	1.4	1.3	1.5	8.7	21.1
22-Jan	1.2	0.9	0.4	Z	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.2	2.8	4.2	7.5	6.9	8.1	5.7	10.8	7.0	6.5	6.8	5.3	14.5	4.0	14.5
23-Jan	17.6	12.9	11.2	8.7	Z	6.9	5.8	5.6	4.6	3.7	3.3	2.9	2.6	4.1	5.8	10.1	10.2	8.5	7.1	6.0	8.1	4.4	3.9	7.0	17.6	
24-Jan	2.5	3.3	3.8	2.9	3.0	Z	13.7	13.2	9.8	10.6	10.9	14.0	12.4	10.7	0.6	11.2	20.5	21.3	17.8	8.6	16.0	9.8	8.7	7.2	10.1	21.3
25-Jan	Z	8.6	7.2	6.9	7.1	7.9	13.2	10.7	22.4	19.3	20.4	16.3	11.9	7.8	6.4	6.1	8.0	7.0	8.1	7.8	5.5	5.1	3.8	3.1	9.6	22.4
26-Jan	5.4	Z	2.3	1.1	0.7	0.6	2.1	7.2	7.6	9.6	8.0	4.8	5.9	7.6	11.2	11.9	12.8	8.1	6.7	3.9	3.4	3.0	2.2	3.3	5.6	12.8
27-Jan	2.9	3.9	Z	4.7	4.8	8.5	6.4	4.2	5.3	2.9	4.6	5.6	5.1	5.3	6.7	6.3	9.7	10.0	15.9	15.1	23.6	4.3	0.8	0.4	6.8	23.6
28-Jan	0.0	0.1	0.1	Z	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.1	4.0	5.6	6.9	6.0	1.1	6.9
29-Jan	7.3	11.7	1.7	0.2	Z	2.2	0.5	0.9	2.8	2.5	1.5	1.7	1.4	2.0	3.2	2.7	3.0	3.3	2.0	2.3	0.9	5.4	16.9	17.3	4.1	17.3
30-Jan	12.7	1.2	0.5	3.4	1.1	Z	7.5	13.1	10.2	9.9	18.0	11.7	9.7	16.7	16.4	13.7	23.9	34.5	30.6	22.3	22.1	16.8	12.7	15.3	14.1	34.5
31-Jan	Z	22.4	11.5	8.6	8.6	8.4	17.9	18.2	16.4	16.5	16.7	15.3	16.7	12.7	13.8	25.5	31.6	30.3	28.8	34.1	28.6	25.0	28.0	25.9	20.1	34.1

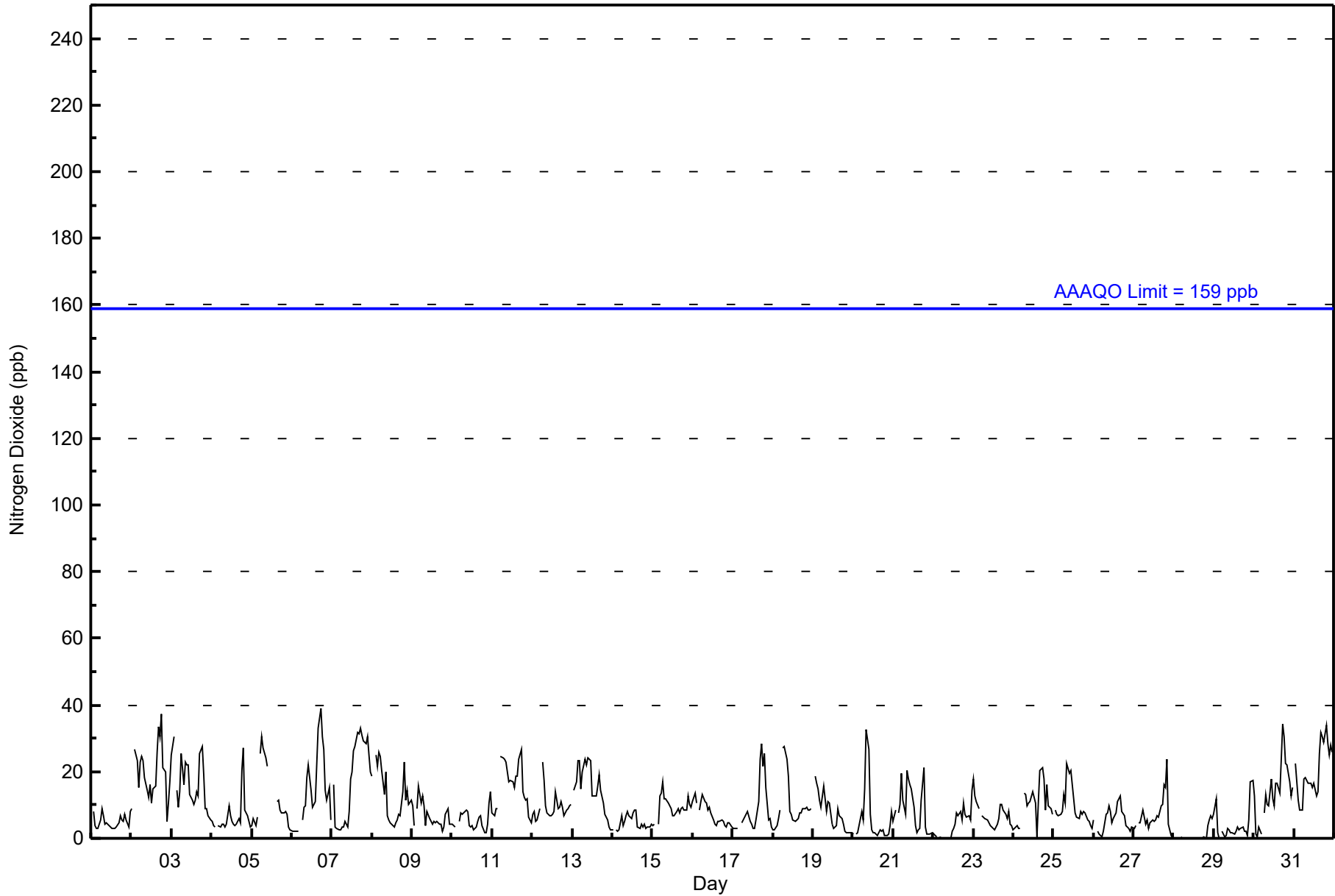
6.9	8.4	6.9	7.6	7.7	10.1	12.1	11.5	12.1	11.2	9.9	8.8	7.3	7.4	7.9	10.0	12.6	13.6	13.5	11.5	9.8	8.3	7.8	8.0	Diurnal Average	
25.0	30.4	26.8	23.5	25.7	25.3	30.3	27.6	32.7	26.5	23.7	23.2	19.8	26.1	27.4	31.9	33.6	38.8	37.2	34.1	28.6	30.3	28.0	25.9	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	620	87.57	87.57
21 - 40	88	12.43	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	27	15	12	22	68	78	54	61	49	56	55	19	21	17	29	620
21 - 40	9	8	3	1	3	3	5	25	12	8	1	2	3	0	2	3	88
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	35	18	13	25	71	83	79	73	57	57	57	22	21	19	32	708

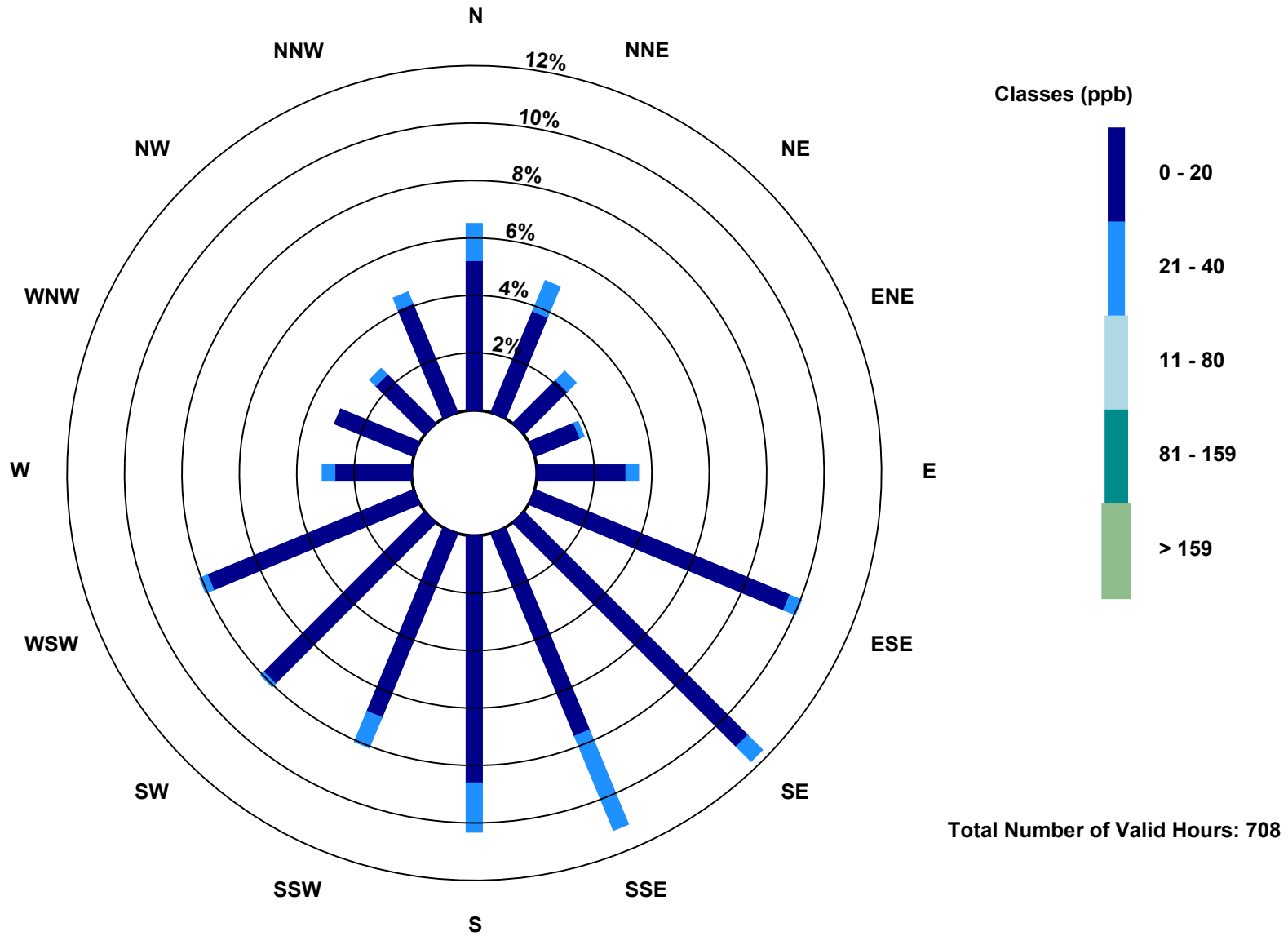
Total Number of Valid Hours: 708

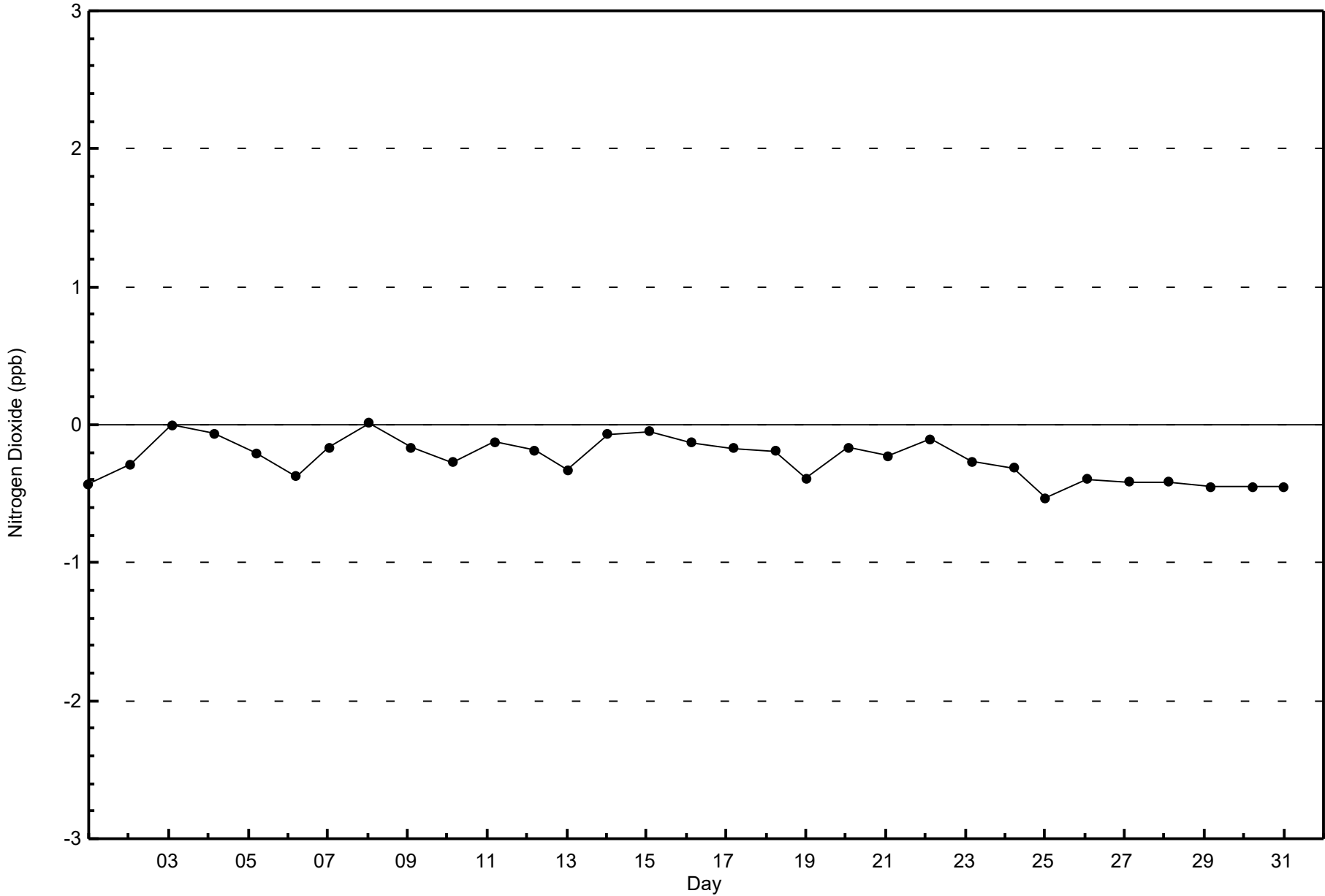
Total Number of Hours: 744

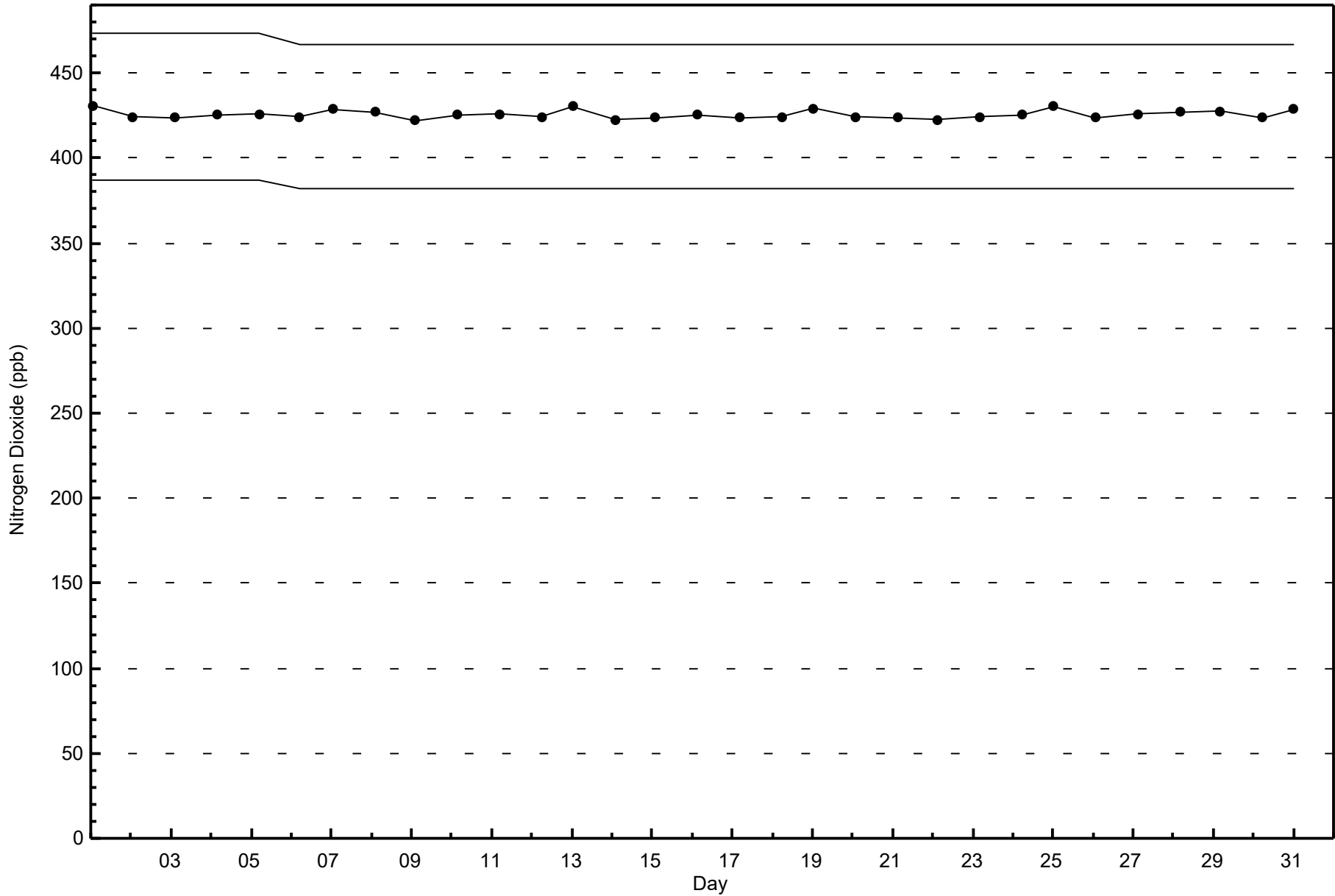


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

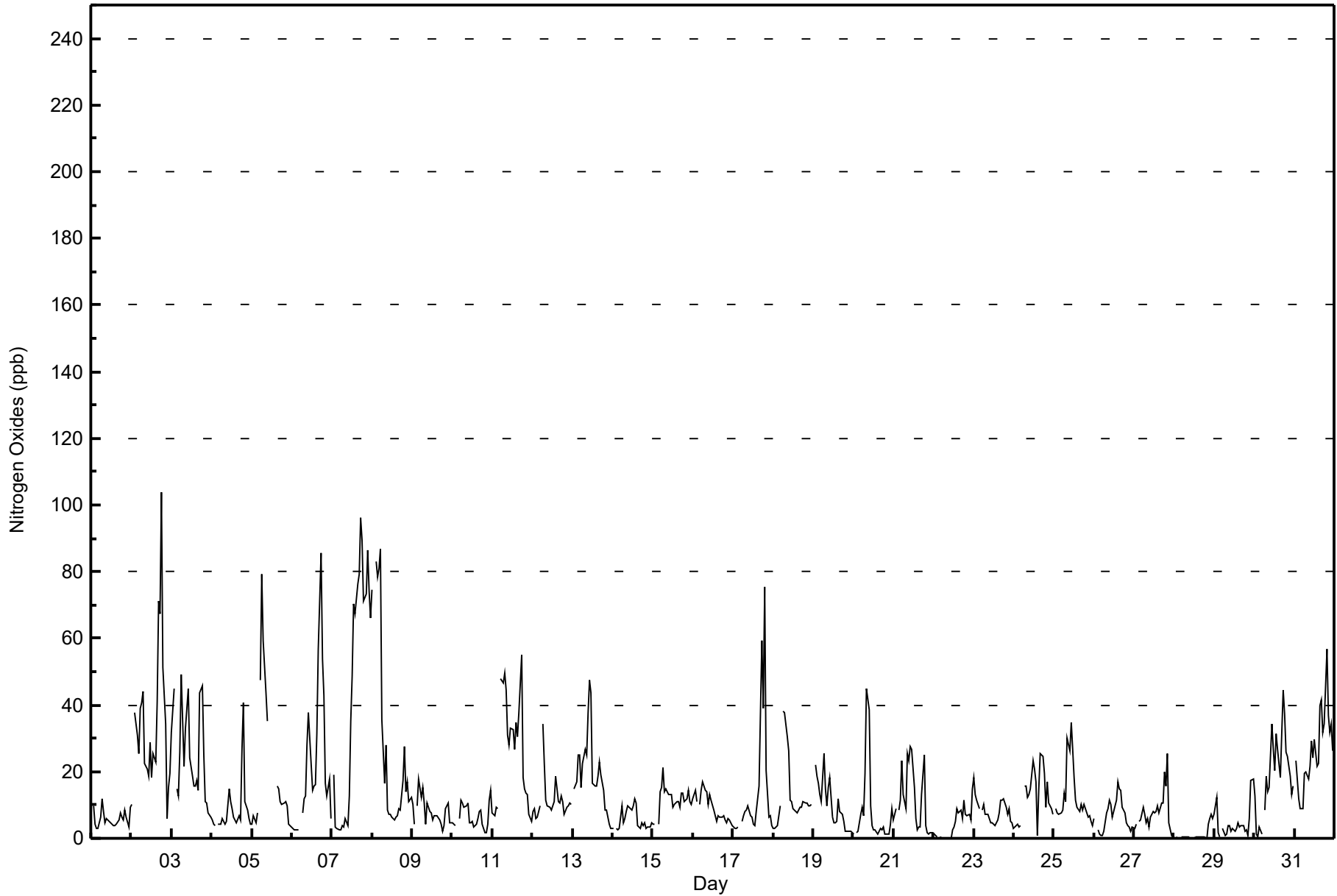
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - January 2023

Maximum Value: 103.7 ppb on Jan 2 19:00		Maximum Daily Average: 43.2 ppb on Jan 7		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Jan 22 08:00		Minimum Daily Average: 1.2 ppb on Jan 28		Hours of Data: 708																						
Maximum Diurnal Average: 22.3 ppb at hour 18		Minimum Diurnal Average: 9.6 ppb at hour 2		Hours of Missing Data: 36																						
Monthly Average: 14.41 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 2.5 Q ₁ = 4.6 Median = 9.1 Q ₃ = 16.8 P ₉₀ = 34.5 P ₉₉ = 80.8		Hours of Calibration: 36																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	Z	9.6	4.1	3.0	3.2	6.3	11.7	8.1	4.8	5.8	5.4	4.6	4.4	4.0	4.0	4.3	5.5	7.5	6.2	5.4	8.3	6.2	3.6	9.2	5.9	11.7
2-Jan	10.0	Z	37.6	30.9	25.4	39.0	40.7	44.2	22.6	20.6	18.6	28.8	18.1	25.4	22.8	41.1	71.3	67.4	103.7	51.3	34.1	5.8	15.2	19.4	34.5	103.7
3-Jan	31.9	45.0	Z	15.0	12.9	26.0	49.2	21.7	33.0	38.9	44.8	24.0	18.5	15.5	15.8	17.4	14.3	43.7	45.9	25.0	10.9	10.5	7.6	6.2	24.9	49.2
4-Jan	5.5	4.3	3.7	Z	4.3	4.2	5.9	5.3	4.4	5.3	14.8	10.8	8.7	6.4	5.5	4.9	6.8	5.4	26.8	40.5	11.0	8.4	6.1	4.2	8.8	40.5
5-Jan	4.3	7.0	4.6	7.5	Z	47.5	79.3	59.5	43.4	35.2	C	C	C	C	C	15.7	14.7	11.0	10.2	10.6	11.1	9.8	4.2	3.6	21.1	79.3
6-Jan	2.8	2.5	2.5	2.6	2.7	Z	7.4	12.0	12.8	28.2	37.7	22.0	14.2	15.7	16.0	31.5	56.8	85.8	53.9	42.8	16.5	12.7	17.7	6.0	21.9	85.8
7-Jan	Z	18.9	3.4	2.9	2.6	2.6	3.8	3.6	6.1	3.7	12.6	35.0	48.9	70.5	67.5	76.1	79.2	96.1	89.3	71.1	73.4	86.5	74.0	65.9	43.2	96.1
8-Jan	74.6	Z	83.2	78.5	80.9	87.0	35.7	16.7	28.0	8.6	7.2	7.1	6.4	5.4	6.3	6.7	8.8	8.6	17.5	27.4	14.2	16.8	11.0	12.2	28.2	87.0
9-Jan	10.4	4.2	Z	9.6	17.9	12.3	15.1	10.8	4.4	10.4	8.2	7.4	5.7	7.0	6.7	6.7	5.3	4.4	2.1	3.7	9.1	10.7	4.7	4.9	7.9	17.9
10-Jan	4.6	4.1	3.7	Z	6.0	11.6	10.6	9.4	9.6	10.4	4.8	4.5	5.2	3.3	4.2	6.1	8.1	8.7	4.2	1.7	1.6	4.2	11.3	14.3	6.6	14.3
11-Jan	7.6	7.0	9.3	9.1	Z	47.9	46.7	49.7	44.5	31.0	27.9	33.2	32.4	26.5	34.7	30.4	37.9	54.9	18.4	14.9	13.5	13.3	7.1	5.1	26.2	54.9
12-Jan	8.1	9.1	5.8	6.3	9.8	Z	34.4	22.5	11.4	9.8	9.2	8.7	9.6	10.9	18.7	11.1	10.7	12.7	10.8	7.4	9.5	9.7	10.8	10.1	11.6	34.4
13-Jan	Z	14.9	16.9	24.9	24.9	15.2	22.5	26.9	25.1	37.5	47.3	43.5	16.7	15.7	15.6	18.7	23.1	18.9	14.5	8.4	8.4	6.5	4.1	3.0	19.7	47.3
14-Jan	3.0	Z	2.8	2.6	3.0	9.9	4.7	5.8	7.9	9.8	9.2	8.6	9.9	11.8	10.4	3.8	3.2	4.9	3.8	4.6	3.1	3.4	3.6	4.5	5.8	11.8
15-Jan	4.2	4.4	Z	4.4	14.0	15.4	21.2	14.0	14.9	13.3	13.1	13.1	9.1	10.0	11.1	11.1	9.2	13.7	13.7	11.2	11.7	14.5	11.0	10.3	11.7	21.2
16-Jan	11.8	14.6	11.1	Z	10.2	14.4	17.1	14.3	14.0	10.3	13.0	11.6	8.5	6.8	5.2	6.9	6.5	6.5	7.0	5.5	4.7	5.9	5.3	3.9	9.4	17.1
17-Jan	3.4	2.9	3.1	3.3	Z	5.3	6.9	8.0	8.5	9.8	6.8	6.2	4.1	3.8	7.9	15.5	37.9	59.4	38.8	75.4	20.2	6.5	6.7	4.0	15.0	75.4
18-Jan	2.8	2.8	3.9	6.9	9.7	Z	38.1	37.6	30.4	26.1	11.4	11.1	8.7	7.9	7.8	8.3	9.3	9.4	11.1	10.5	10.7	9.6	9.6	10.1	12.8	38.1
19-Jan	Z	22.2	18.8	16.4	13.2	11.1	25.5	14.8	9.6	15.2	18.4	6.5	4.5	4.8	5.0	11.7	8.2	7.1	4.9	2.3	2.2	2.0	2.1	1.8	9.9	25.5
20-Jan	1.3	Z	1.6	2.1	7.0	9.1	6.6	19.7	44.9	38.7	9.8	3.7	2.6	2.7	1.4	2.1	3.0	2.5	3.2	1.4	1.4	1.4	4.4	9.0	7.8	44.9
21-Jan	5.6	9.1	Z	8.6	11.6	23.4	13.2	8.9	25.6	23.5	27.7	26.5	15.2	5.9	2.4	3.2	3.6	13.2	25.0	3.7	1.6	1.5	1.6	1.7	11.4	27.7
22-Jan	1.3	0.9	0.4	Z	0.3	0.1	0.0	0.0	0.0	0.0	0.0	2.4	3.2	4.9	8.7	7.6	8.6	5.8	11.5	7.0	6.9	7.0	5.3	15.0	4.2	15.0
23-Jan	18.2	13.0	11.4	9.0	Z	8.5	10.0	7.2	7.0	5.8	4.7	4.8	4.2	3.8	5.5	7.6	11.5	11.6	11.7	9.2	7.3	9.1	5.1	4.9	8.3	18.2
24-Jan	3.1	3.9	4.3	3.5	3.6	Z	15.7	15.5	12.3	13.2	14.8	23.3	20.6	17.0	0.9	15.0	25.2	24.7	19.6	9.2	16.8	10.4	8.9	7.4	12.6	25.2
25-Jan	Z	9.1	7.5	7.3	7.4	8.3	13.5	11.1	30.0	26.1	34.8	26.8	18.3	11.3	9.1	8.0	10.0	8.6	10.1	9.1	6.5	6.6	5.0	3.8	12.5	34.8
26-Jan	5.9	Z	2.4	1.1	0.7	0.7	2.3	7.8	8.9	11.6	10.3	6.3	8.0	11.3	17.0	14.9	14.3	9.2	7.5	4.5	4.0	3.3	2.3	3.5	6.9	17.0
27-Jan	3.0	4.1	Z	4.9	5.3	9.3	7.1	4.6	5.9	3.5	6.3	8.0	7.6	8.2	9.9	7.8	10.8	10.5	20.0	15.6	25.3	4.7	1.0	0.7	8.0	25.3
28-Jan	0.0	0.1	0.4	Z	0.6	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.3	0.3	0.1	4.4	5.9	7.1	6.0	1.2	7.1
29-Jan	7.3	12.2	1.7	0.3	Z	2.9	0.8	1.3	3.8	3.6	2.3	2.9	2.2	3.1	4.8	3.5	3.7	3.7	2.3	2.7	1.0	5.8	17.5	17.7	4.7	17.7
30-Jan	12.9	1.4	0.6	3.5	1.1	Z	8.4	18.7	14.0	15.1	34.4	26.7	20.4	31.5	26.5	18.2	31.8	44.3	37.2	25.8	24.5	18.7	13.2	15.7	19.3	44.3
31-Jan	Z	23.3	11.9	8.9	8.9	8.8	19.4	19.8	18.0	21.7	29.4	24.0	29.5	21.4	22.4	39.8	41.7	31.8	34.1	57.0	37.0	31.6	34.5	26.5	26.2	57.0
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	566	79.94	79.94
21 - 40	91	12.85	92.80
41 - 80	43	6.07	98.87
81 - 159	7	0.99	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	26	13	10	19	64	75	37	44	48	56	55	19	21	16	28	566
21 - 40	8	4	3	3	5	6	4	29	18	4	0	1	1	0	2	3	91
11 - 80	2	4	2	0	1	1	4	10	9	4	1	1	2	0	1	1	43
81 - 159	1	1	0	0	0	0	0	3	1	1	0	0	0	0	0	0	7
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	35	18	13	25	71	83	79	72	57	57	57	22	21	19	32	707

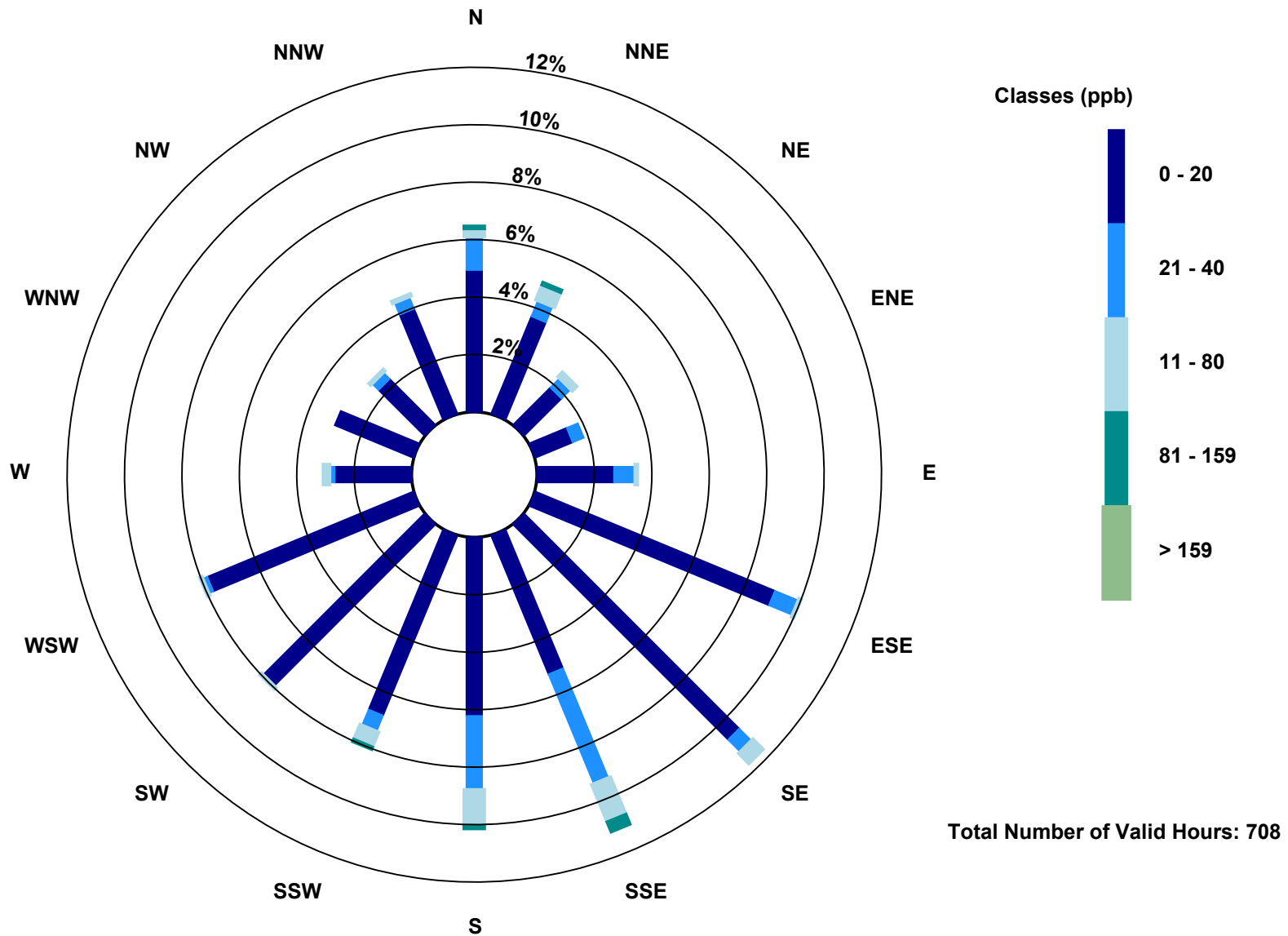
Total Number of Valid Hours: 708

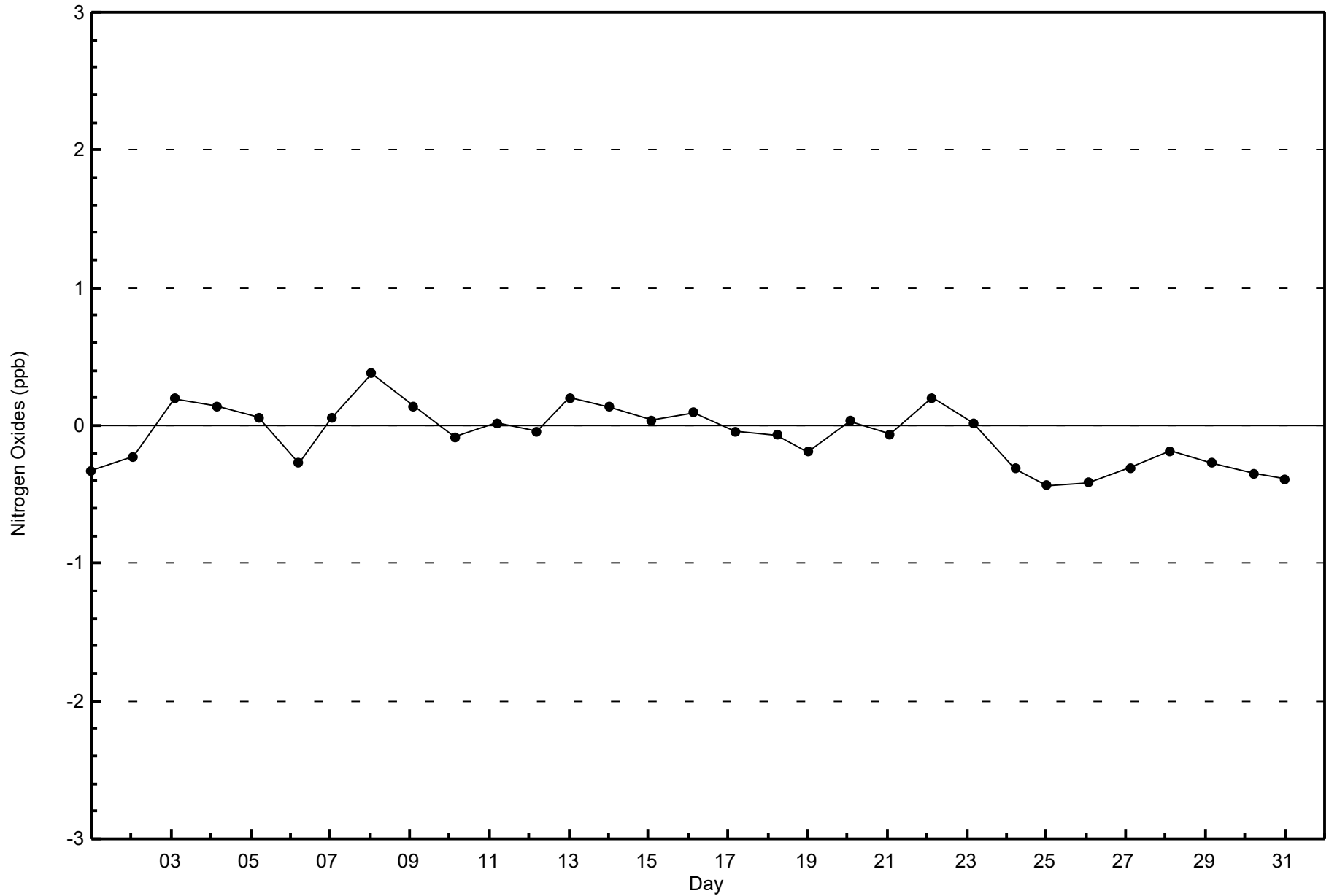
Total Number of Hours: 744

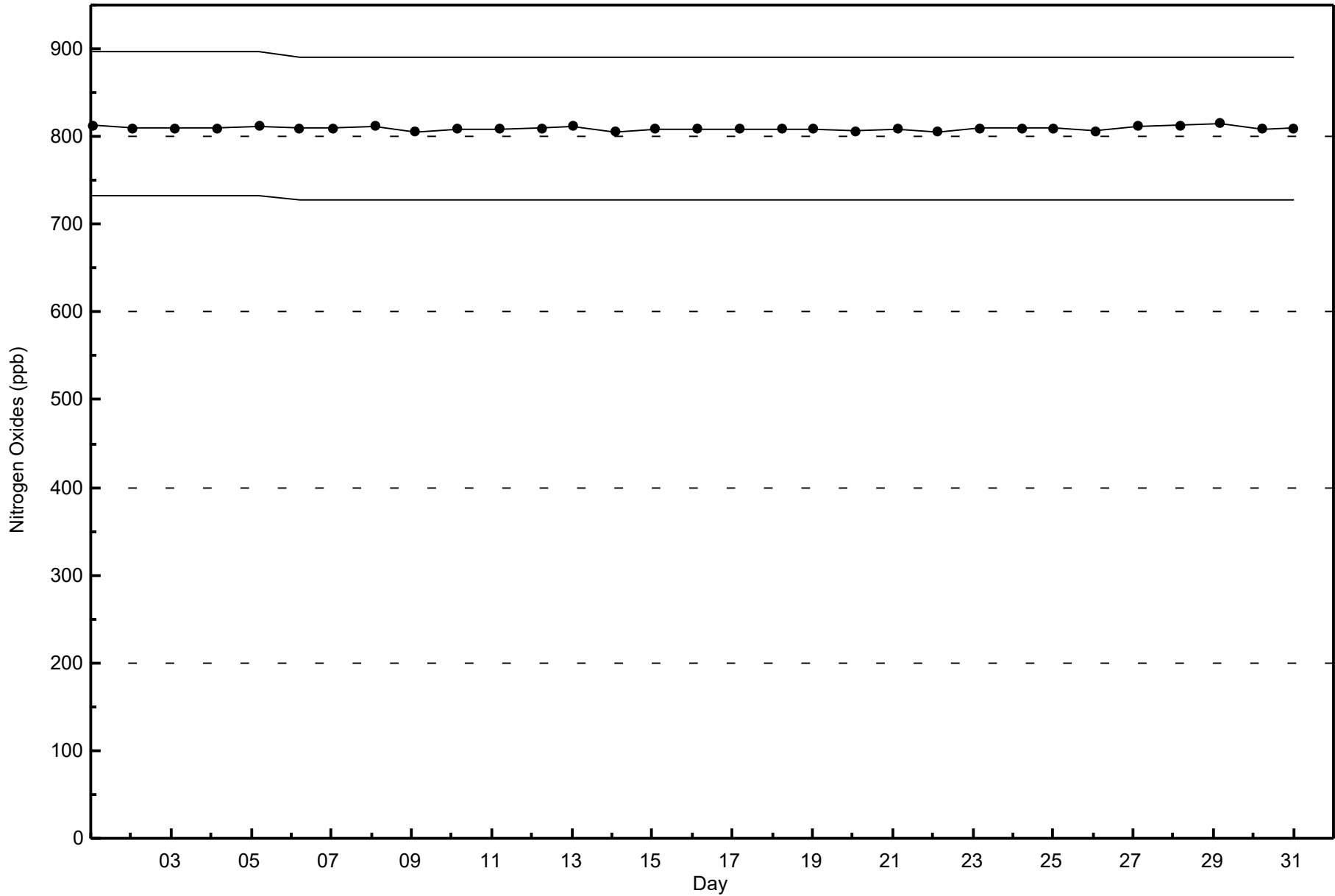


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH₃) - ppb

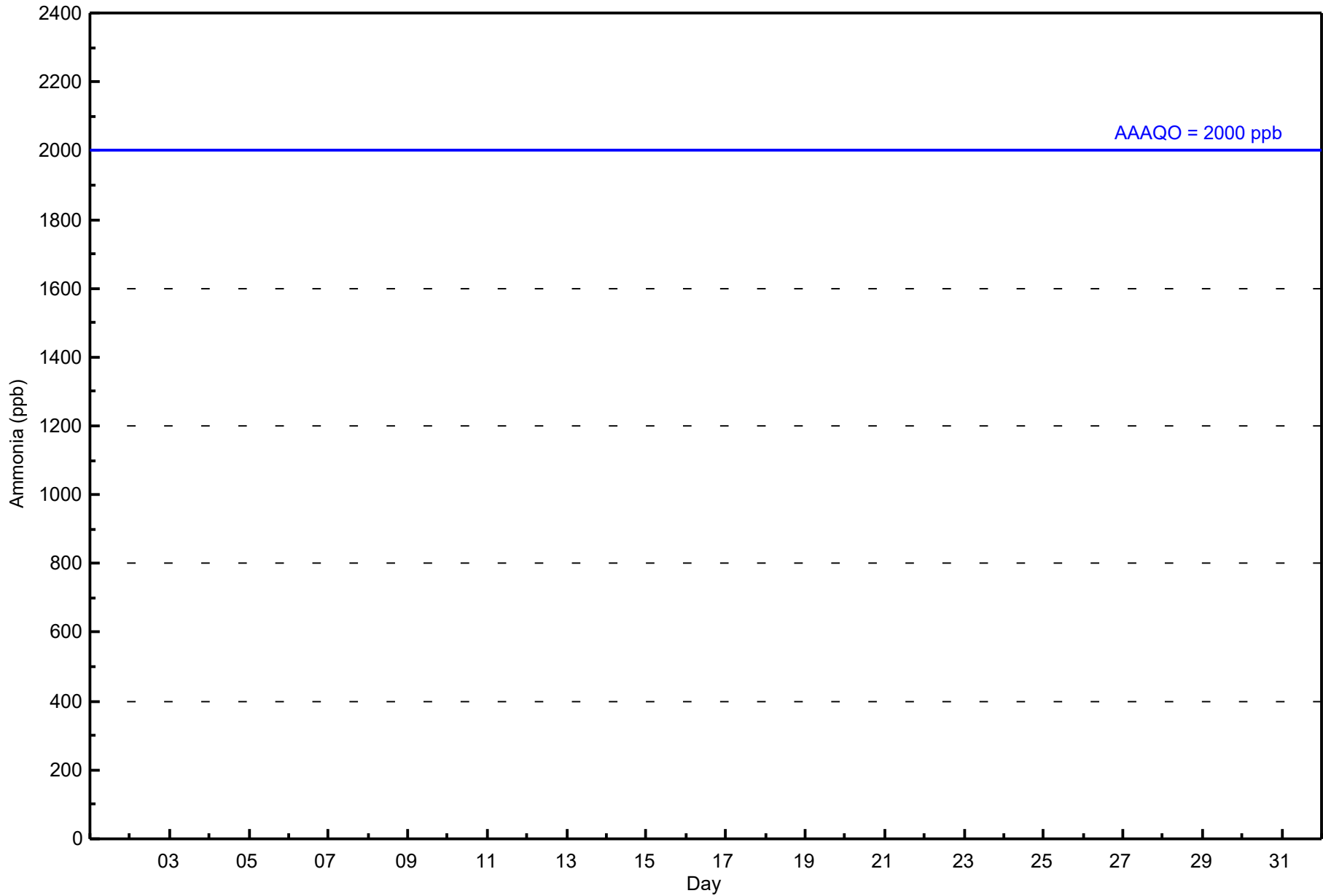
Patricia McInnes - January 2023

Number of Exceedences (AAAQO): 1-hr: 0		Maximum Value: 0.0 ppb on Jan 1 01:00																			Maximum Daily Average: 0.0 ppb on Jan 1					Hours in Service: 744								
Minimum Value: 0.0 ppb on Jan 1 01:00		Minimum Daily Average: 0.0 ppb on Jan 1																			Minimum Diurnal Average: 0.0 ppb at hour 1					Hours of Data: 652								
Maximum Diurnal Average: 0.0 ppb at hour 1		Minimum Diurnal Average: 0.0 ppb at hour 1																			Hours of Missing Data: 92					Hours of Calibration: 38								
Monthly Average: 0.00 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0																			Percent Operational Time: 92.7													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2-Jan	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	UO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3-Jan	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4-Jan	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5-Jan	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6-Jan	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8-Jan	Z	RE	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9-Jan	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10-Jan	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11-Jan	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	C	C	C	C	C	C	C	RE	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
12-Jan	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Jan	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15-Jan	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16-Jan	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Jan	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18-Jan	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20-Jan	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21-Jan	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22-Jan	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23-Jan	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24-Jan	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26-Jan	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27-Jan	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28-Jan	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29-Jan	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30-Jan	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31-Jan	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
																								Diurnal Average										
																								Diurnal Maximum										
Z - zerospan C - Calibration UO - Unstable Operation RE - Recovery																																		
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb																																		



Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	652	100.00	100.00
6 - 10	0	0.00	100.00
11 - 15	0	0.00	100.00
16 - 20	0	0.00	100.00
21 - 25	0	0.00	100.00
> 26	0	0.00	100.00

Total Number of Valid Hours: 652

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ammonia (NH₃) - ppb
Patricia McInnes - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	45	30	16	13	24	66	77	73	64	52	54	53	18	19	18	30	652
6 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	30	16	13	24	66	77	73	64	52	54	53	18	19	18	30	652

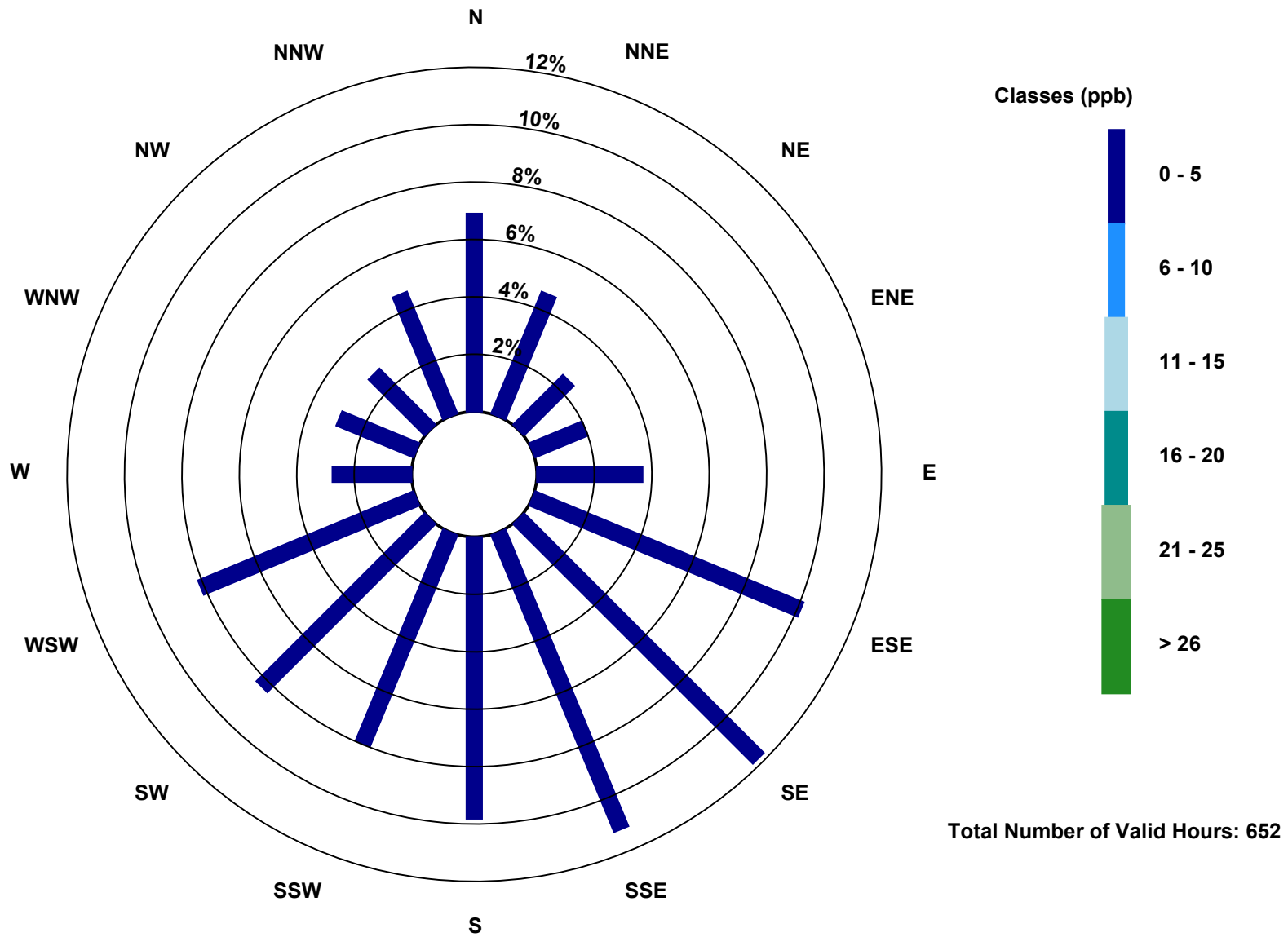
Total Number of Valid Hours: 652

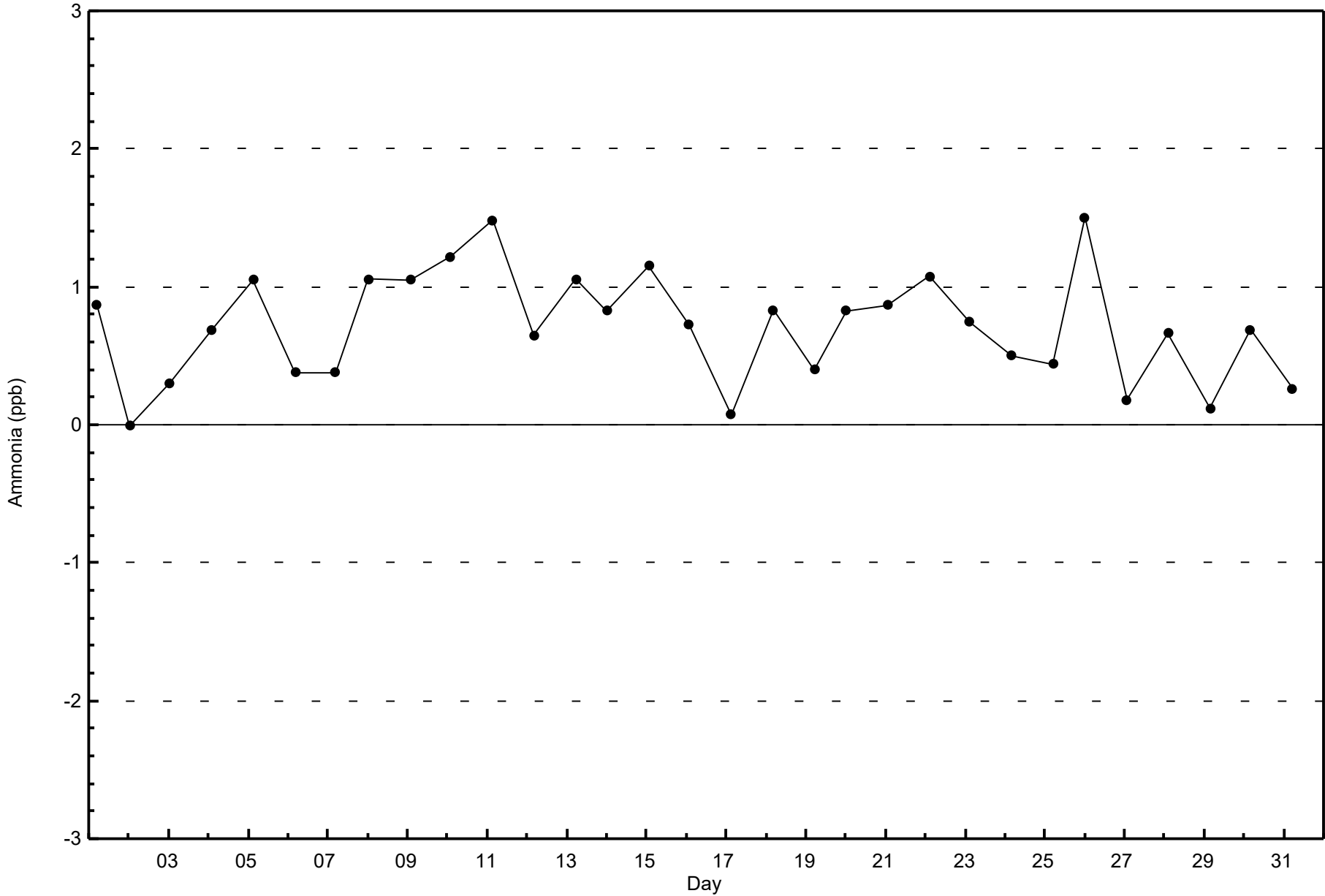
Total Number of Hours: 744

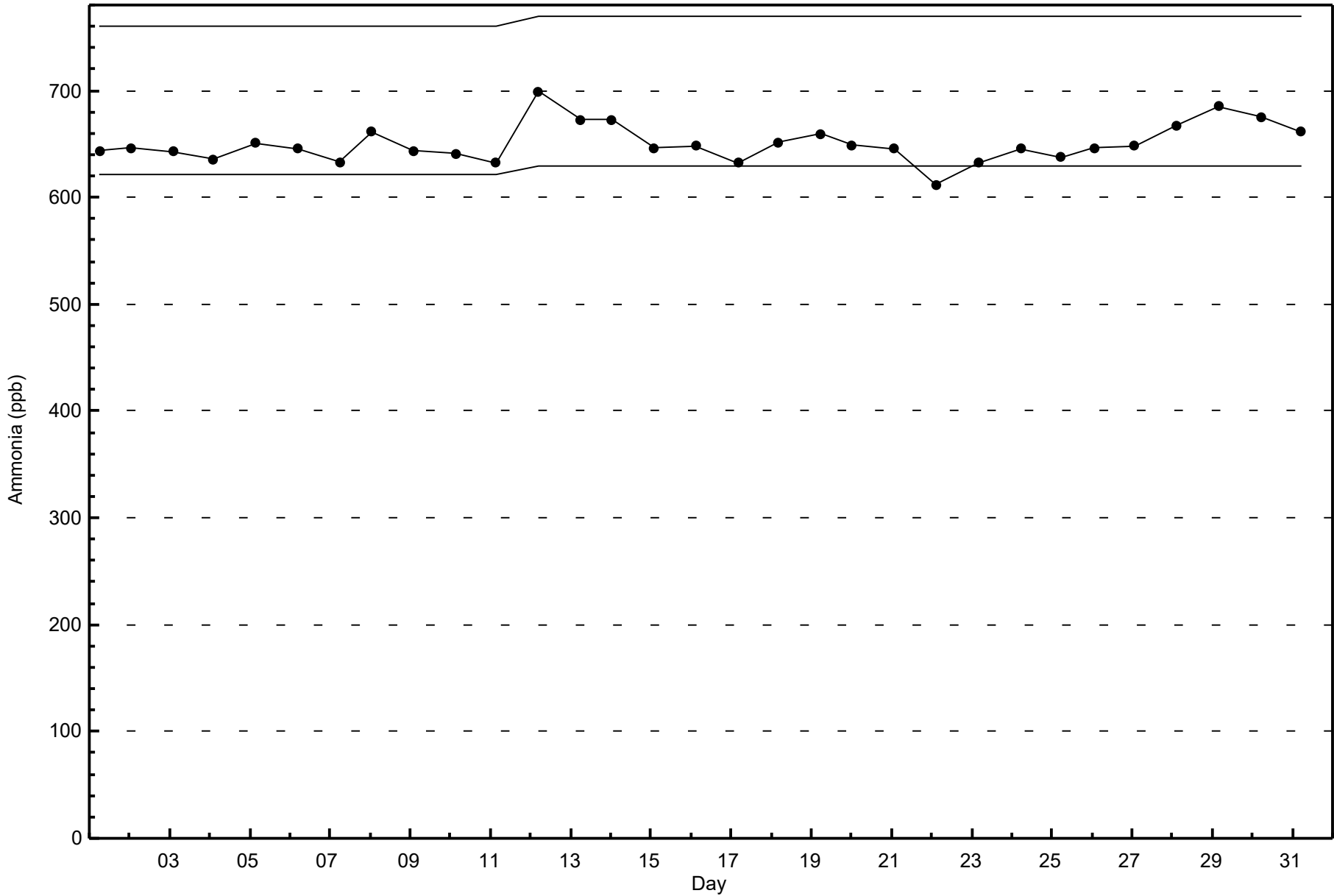


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ammonia (NH₃) - ppb
Patricia McInnes





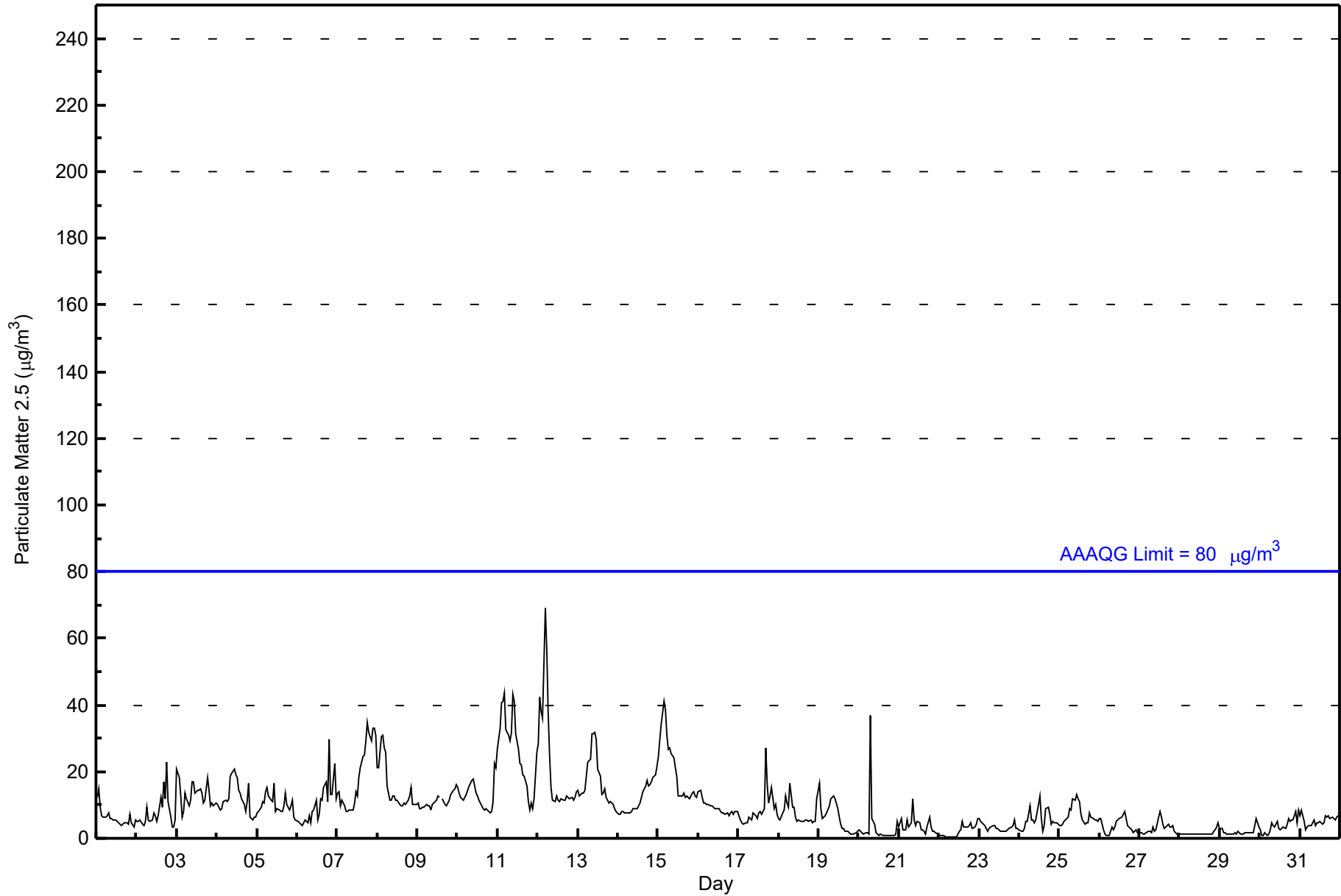




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 69.1 µg/m ³ on Jan 12 05:00	Maximum Daily Average: 26.1 µg/m ³ on Jan 11		Hours of Data:	743
Minimum Value: 0.4 µg/m ³ on Jan 22 11:00	Minimum Daily Average: 1.6 µg/m ³ on Jan 28		Hours of Missing Data:	1
Maximum Diurnal Average: 11.0 µg/m ³ at hour 5	Minimum Diurnal Average: 8.0 µg/m ³ at hour 15		Hours of Calibration:	1
Monthly Average: 9.38 µg/m ³	Percentiles: P ₁ = 0.7 P ₁₀ = 1.5 Q ₁ = 3.8 Median = 7.4 Q ₃ = 12.0 P ₉₀ = 18.6 P ₉₉ = 40.8		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	12.4	15.0	9.3	6.9	6.4	6.4	6.9	7.4	5.9	5.9	5.6	5.5	5.2	4.7	4.1	3.9	4.6	4.8	4.9	4.4	7.1	4.6	3.3	5.7	6.3	15.0																							
2-Jan	4.9	5.2	5.5	4.4	3.9	5.2	9.5	5.4	5.2	5.4	7.5	6.7	5.2	6.7	12.3	9.4	17.1	11.9	23.1	11.0	6.5	3.5	3.6	5.5	7.7	23.1																							
3-Jan	20.6	18.2	12.8	6.5	8.2	13.4	11.8	9.8	11.5	17.0	16.7	13.7	14.4	14.5	14.9	13.8	10.4	11.5	18.4	14.4	9.9	10.4	9.9	10.6	13.1	20.6																							
4-Jan	10.1	9.2	8.4	9.0	11.0	11.4	11.2	11.9	18.5	19.5	20.6	19.0	18.0	14.3	13.5	12.0	10.2	7.9	10.9	16.6	6.3	5.4	6.3	6.4	12.0	20.6																							
5-Jan	7.8	8.2	9.3	10.9	10.6	14.0	15.3	12.5	11.6	11.1	16.4	7.9	9.0	8.4	8.0	7.9	9.9	13.7	10.0	8.5	9.7	11.4	6.2	5.5	10.2	16.4																							
6-Jan	4.9	4.7	4.4	4.0	4.6	5.4	4.8	6.8	4.8	8.2	8.4	11.5	5.5	7.2	11.9	11.4	15.1	17.1	10.9	29.8	12.9	13.3	22.6	12.0	10.1	29.8																							
7-Jan	13.5	14.1	9.8	11.3	9.9	8.1	8.2	8.5	8.5	8.4	10.8	13.9	12.8	18.2	21.3	24.6	25.1	29.4	34.6	31.7	29.4	32.9	32.9	31.0	18.7	34.6																							
8-Jan	21.3	21.4	30.4	31.0	27.3	25.7	15.7	11.6	11.4	12.5	12.6	11.6	11.5	10.2	9.9	9.7	10.5	10.1	11.3	12.8	15.1	10.2	10.2	10.3	15.2	31.0																							
9-Jan	10.5	9.1	8.9	9.2	9.5	10.1	9.8	9.9	8.5	10.2	10.9	11.6	12.7	12.2	C	11.7	10.1	9.6	10.5	11.6	13.0	14.5	14.7	16.3	11.1	16.3																							
10-Jan	15.4	13.5	12.5	11.5	12.4	13.2	14.4	15.6	17.3	17.8	15.8	13.7	12.7	11.2	9.7	8.8	8.3	8.9	8.3	7.8	7.9	11.2	22.7	21.1	13.0	22.7																							
11-Jan	26.7	33.1	40.5	41.1	43.7	32.5	30.8	29.0	31.8	43.2	41.3	31.3	26.8	22.5	22.0	19.0	18.6	15.7	11.0	8.3	10.5	9.0	11.7	25.8	26.1	43.7																							
12-Jan	28.5	42.3	38.1	36.2	69.1	56.6	37.5	24.9	15.2	11.6	10.8	12.7	11.6	11.2	11.7	11.4	11.3	12.8	12.4	12.0	12.3	11.6	12.3	14.1	22.0	69.1																							
13-Jan	14.3	12.7	13.7	13.6	14.6	18.7	23.0	23.7	31.2	31.4	32.0	29.8	20.6	18.5	12.9	13.4	14.7	12.5	10.5	11.0	10.8	10.1	9.0	8.0	17.1	32.0																							
14-Jan	7.2	7.2	8.0	8.1	7.6	7.8	7.4	7.5	8.2	8.8	8.8	8.9	9.6	10.7	12.1	14.0	15.6	17.2	15.9	16.3	16.9	18.3	18.9	21.8	11.8	21.8																							
15-Jan	24.6	29.7	34.1	41.0	38.6	30.7	26.7	27.2	25.4	24.4	21.0	18.8	12.8	12.5	12.5	13.6	12.3	12.7	12.2	12.1	13.6	14.2	12.6	12.2	20.6	41.0																							
16-Jan	13.8	14.3	12.2	10.6	10.7	10.3	10.2	9.7	9.6	9.2	9.1	9.0	8.8	8.2	7.4	7.4	7.1	7.5	6.8	7.6	7.9	7.4	8.1	8.0	9.2	14.3																							
17-Jan	6.6	5.3	4.8	4.4	4.5	4.8	6.5	5.8	5.3	7.8	6.8	6.0	7.7	8.0	7.0	8.8	27.1	16.0	10.7	12.5	15.2	8.8	10.1	7.4	8.7	27.1																							
18-Jan	6.1	5.4	7.7	8.3	12.8	10.6	9.5	16.7	9.5	9.5	6.2	5.3	5.3	5.1	4.9	5.2	5.6	5.6	5.2	5.5	4.7	4.9	5.1	11.7	7.4	16.7																							
19-Jan	16.7	8.7	5.9	6.2	6.8	7.4	9.5	11.7	12.3	12.9	11.8	9.1	6.2	4.2	3.2	3.0	1.9	2.3	1.8	1.2	1.4	1.3	1.6	2.1	6.2	16.7																							
20-Jan	2.3	1.9	1.6	1.4	1.5	1.5	1.4	36.9	5.8	4.1	1.8	1.1	1.0	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7	1.4	5.3	3.2	36.9																							
21-Jan	3.5	5.8	2.4	2.3	2.6	5.6	3.4	4.5	11.7	5.3	4.0	4.9	4.6	2.4	2.5	2.1	1.4	3.6	6.6	3.3	2.1	2.1	1.8	1.3	3.7	11.7																							
22-Jan	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	1.4	2.3	2.4	5.0	3.3	3.4	3.6	3.7	4.8	3.1	3.3	4.2	6.0	2.2	6.0																							
23-Jan	6.1	5.3	4.8	3.6	2.9	2.3	3.0	3.3	3.8	3.7	2.9	2.9	2.4	2.3	1.9	2.2	2.2	2.7	3.1	3.5	3.6	5.7	3.2	3.0	3.4	6.1																							
24-Jan	2.4	2.3	2.3	3.1	5.1	5.2	9.7	5.3	5.3	4.6	5.4	10.2	12.5	5.8	2.2	4.0	8.7	9.4	7.1	4.2	5.0	4.6	4.7	4.4	5.6	12.5																							
25-Jan	3.7	3.6	4.1	4.9	5.9	6.3	8.9	8.4	12.0	11.3	13.0	12.0	10.9	7.3	5.4	4.4	4.6	4.5	7.6	6.3	5.9	5.6	5.7	5.0	7.0	13.0																							
26-Jan	5.8	5.8	2.4	1.1	0.9	0.7	0.8	3.4	2.6	3.2	4.9	5.7	5.8	6.2	7.3	8.1	5.9	3.8	3.1	2.4	1.8	2.0	2.6	1.7	3.7	8.1																							
27-Jan	1.8	1.7	1.4	1.4	1.6	2.3	2.2	1.8	3.3	2.3	2.4	6.5	8.2	6.4	4.1	3.2	3.8	4.2	3.5	3.5	3.8	2.0	1.2	1.2	3.1	8.2																							
28-Jan	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.3	1.4	1.4	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	2.3	2.4	3.3	1.6	4.6																							
29-Jan	3.1	3.0	1.8	1.7	1.4	1.3	1.2	1.2	1.3	1.6	1.3	2.0	1.3	1.3	1.4	1.5	1.7	1.5	1.5	1.8	1.5	3.7	6.0	3.5	2.0	6.0																							
30-Jan	2.7	1.0	0.9	1.7	1.0	1.3	2.4	4.8	3.8	3.3	5.0	3.0	2.6	2.9	3.3	3.1	4.1	5.8	5.1	5.6	5.4	8.1	4.8	8.7	3.8	8.7																							
31-Jan	6.7	8.4	4.9	2.5	3.6	3.9	3.9	3.8	5.4	3.9	4.5	4.8	5.3	4.3	4.7	6.7	6.2	6.8	5.9	6.6	5.8	5.5	6.6	6.8	5.3	8.4																							
																								9.9	10.3	9.8	9.7	11.0	10.5	9.9	10.7	10.0	10.3	10.3	9.7	8.9	8.1	8.0	8.1	9.0	8.9	9.0	8.1	8.0	8.6	9.3	Diurnal Average		
																								28.5	42.3	40.5	41.1	69.1	56.6	37.5	36.9	31.8	43.2	41.3	31.3	26.8	22.5	22.0	24.6	27.1	29.4	34.6	31.7	29.4	32.9	32.9	31.0	Diurnal Maximum	

C - Calibration
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	289	38.90	38.90
6 - 15	351	47.24	86.14
16 - 25	57	7.67	93.81
26 - 80	46	6.19	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Patricia McInnes - January 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	26	20	3	2	6	20	30	12	14	19	33	32	15	21	16	20	289
6 - 15	17	9	13	11	15	45	51	55	45	33	23	18	2	1	2	11	351
16 - 25	1	2	2	0	3	7	5	12	7	4	4	6	1	0	1	2	57
26 - 80	3	5	0	0	2	3	1	6	11	4	1	3	5	1	0	1	46
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	36	18	13	26	75	87	85	77	60	61	59	23	23	19	34	743

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

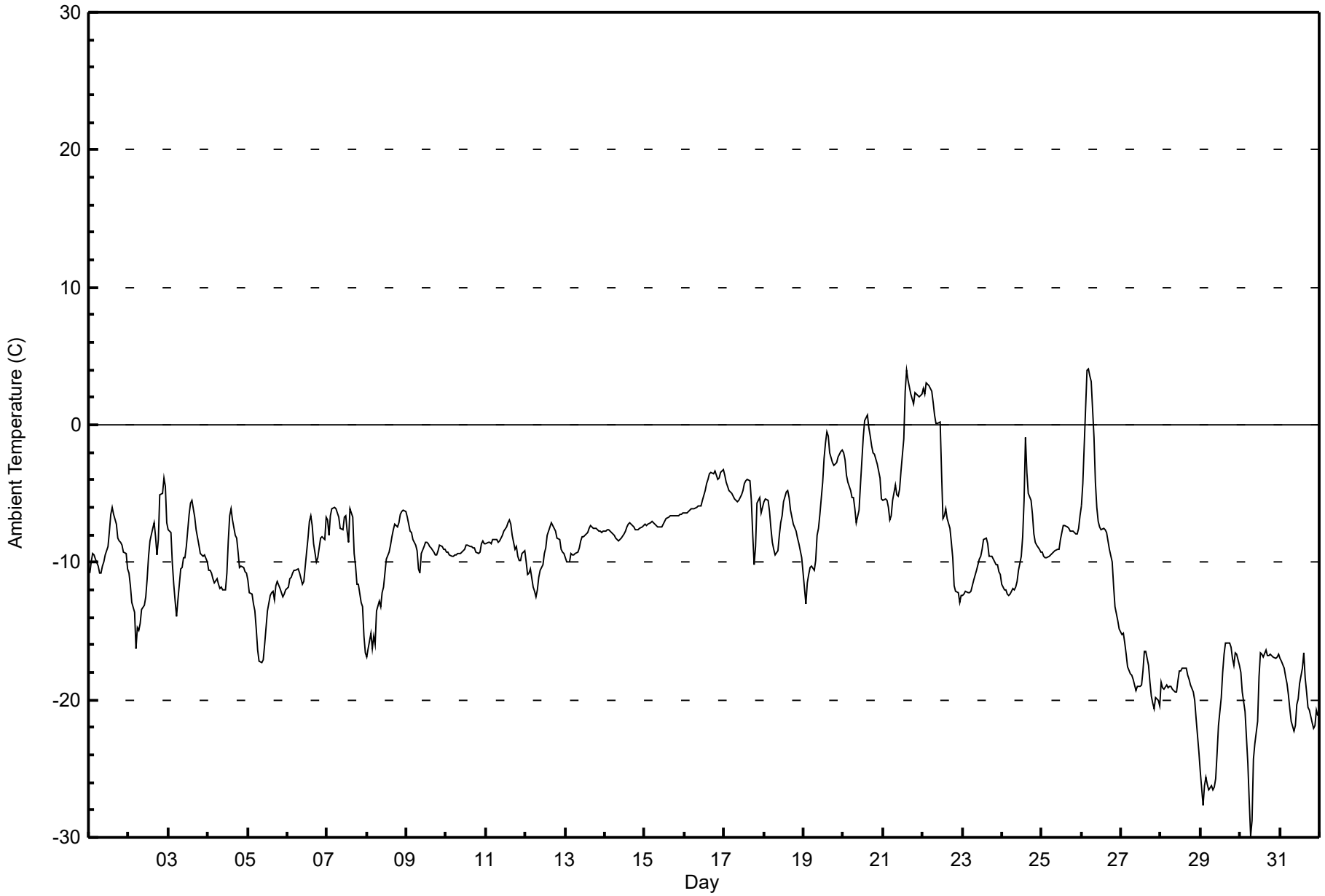
Ambient Temperature (AT) - C
Patricia McInnes - January 2023

Maximum Value: 4.1 C on Jan 26 05:00		Maximum Daily Average: -1.6 C on Jan 21		Hours in Service: 744																																												
Minimum Value: -29.9 C on Jan 30 07:00		Minimum Daily Average: -21.3 C on Jan 29		Hours of Data: 744																																												
Maximum Diurnal Average: -7.6 C at hour 15		Minimum Diurnal Average: -11.3 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: -9.84 C		Percentiles: P ₁ = -26.2 P ₁₀ = -18.2 Q ₁ = -12.0 Median = -8.9 Q ₃ = -6.7 P ₉₀ = -4.1 P ₉₉ = 2.9		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-10.8	-9.9	-9.4	-9.5	-9.8	-10.3	-10.8	-10.8	-10.3	-10.0	-9.5	-8.8	-7.8	-6.5	-6.0	-6.5	-7.3	-8.3	-8.5	-8.6	-8.7	-9.3	-9.3	-10.5	-9.0	-6.0																						
2-Jan	-10.7	-11.7	-12.9	-13.7	-16.3	-14.8	-15.0	-14.4	-13.4	-13.1	-12.5	-11.2	-9.5	-8.5	-7.6	-7.1	-8.1	-9.4	-8.3	-5.0	-4.9	-3.9	-4.4	-7.1	-10.1	-3.9																						
3-Jan	-7.6	-7.8	-10.1	-11.6	-12.8	-13.9	-12.7	-10.5	-10.4	-9.7	-9.7	-8.8	-6.5	-5.7	-5.5	-6.1	-6.7	-7.6	-8.7	-9.4	-9.4	-9.5	-9.5	-10.0	-9.2	-5.5																						
4-Jan	-10.5	-10.6	-10.8	-11.2	-11.5	-11.2	-11.6	-11.9	-11.8	-12.0	-10.8	-8.5	-6.6	-6.1	-7.0	-8.0	-8.2	-9.3	-10.3	-10.2	-10.4	-10.7	-10.8	-10.1	-6.1																							
5-Jan	-11.3	-12.2	-12.3	-13.0	-13.6	-14.8	-16.3	-17.2	-17.3	-17.1	-15.9	-14.7	-13.6	-12.4	-12.2	-12.1	-12.7	-11.7	-11.4	-11.9	-12.2	-12.5	-12.3	-12.0	-13.4	-11.3																						
6-Jan	-11.8	-11.2	-11.1	-10.8	-10.6	-10.5	-10.4	-10.8	-11.2	-11.5	-11.4	-9.2	-8.2	-7.0	-6.6	-7.4	-8.6	-10.0	-9.6	-8.9	-8.2	-8.1	-8.4	-6.7	-9.5	-6.6																						
7-Jan	-6.9	-8.1	-6.6	-6.1	-6.0	-6.1	-6.4	-6.8	-7.5	-7.6	-6.7	-6.6	-7.7	-8.6	-6.1	-6.7	-9.3	-10.3	-11.5	-11.6	-12.9	-13.2	-15.4	-16.6	-8.8	-6.0																						
8-Jan	-16.9	-16.2	-15.2	-16.3	-15.4	-16.0	-13.5	-12.8	-13.2	-12.2	-11.8	-10.8	-9.7	-9.3	-8.8	-8.1	-7.7	-7.2	-7.4	-7.1	-6.6	-6.4	-6.2	-6.3	-10.9	-6.2																						
9-Jan	-6.7	-7.3	-7.7	-7.8	-8.4	-8.8	-9.1	-10.5	-10.8	-9.3	-8.9	-8.6	-8.6	-8.7	-8.8	-8.9	-9.2	-9.4	-9.4	-9.1	-8.8	-8.9	-9.1	-9.1	-8.8	-6.7																						
10-Jan	-9.2	-9.3	-9.5	-9.5	-9.5	-9.5	-9.4	-9.4	-9.4	-9.3	-9.2	-9.1	-8.8	-8.7	-8.8	-8.8	-8.9	-9.0	-9.2	-9.3	-9.3	-8.7	-8.4	-8.6	-9.1	-8.4																						
11-Jan	-8.7	-8.6	-8.6	-8.7	-8.4	-8.3	-8.3	-8.5	-8.4	-8.3	-8.0	-7.8	-7.4	-7.1	-6.9	-7.3	-8.0	-9.0	-8.8	-9.6	-9.9	-9.8	-9.4	-9.1	-8.5	-6.9																						
12-Jan	-10.0	-10.9	-10.7	-10.4	-11.8	-12.1	-12.5	-12.0	-11.1	-10.6	-10.2	-9.4	-9.0	-8.1	-7.8	-7.2	-7.3	-7.6	-7.7	-8.2	-8.4	-9.1	-9.2	-9.3	-9.6	-7.2																						
13-Jan	-9.6	-9.9	-10.0	-9.3	-9.5	-9.4	-9.4	-9.3	-8.9	-8.4	-8.2	-8.1	-8.0	-7.9	-7.5	-7.3	-7.5	-7.5	-7.5	-7.7	-7.7	-7.7	-7.8	-7.7	-8.4	-7.3																						
14-Jan	-7.7	-7.6	-7.6	-7.7	-7.8	-8.0	-8.2	-8.3	-8.4	-8.4	-8.2	-8.0	-7.7	-7.5	-7.2	-7.1	-7.3	-7.5	-7.6	-7.6	-7.6	-7.5	-7.4	-7.3	-7.7	-7.1																						
15-Jan	-7.2	-7.3	-7.2	-7.1	-7.0	-7.2	-7.2	-7.4	-7.4	-7.5	-7.5	-7.2	-7.0	-6.8	-7.2	-6.6	-6.6	-6.6	-6.6	-6.6	-6.6	-6.5	-6.5	-6.4	-6.9	-6.4																						
16-Jan	-6.4	-6.4	-6.3	-6.2	-6.1	-6.1	-6.1	-6.0	-5.9	-5.9	-5.9	-5.5	-4.8	-4.2	-3.9	-3.6	-3.4	-3.5	-3.3	-3.7	-4.0	-3.9	-3.4	-3.2	-4.9	-3.2																						
17-Jan	-3.7	-4.2	-4.5	-4.8	-5.0	-5.2	-5.3	-5.4	-5.6	-5.5	-5.1	-4.8	-4.3	-4.1	-4.0	-4.0	-5.4	-8.1	-10.2	-8.8	-5.7	-5.3	-6.4	-6.0	-5.5	-3.7																						
18-Jan	-5.6	-5.4	-5.5	-6.3	-7.5	-8.6	-9.0	-9.4	-9.1	-8.0	-7.1	-6.6	-5.6	-4.9	-4.8	-5.3	-6.2	-6.7	-7.2	-7.8	-8.3	-8.7	-9.2	-9.7	-7.2	-4.8																						
19-Jan	-11.9	-13.1	-11.5	-10.9	-10.4	-10.2	-10.6	-9.8	-8.0	-7.5	-6.5	-4.1	-2.4	-1.3	-0.5	-0.8	-2.0	-2.7	-2.9	-2.9	-2.7	-2.3	-2.0	-1.8	-5.8	-0.5																						
20-Jan	-2.0	-2.6	-3.7	-4.1	-4.8	-5.3	-5.3	-6.1	-7.1	-6.2	-4.4	-2.7	-1.0	0.3	0.7	-0.2	-0.8	-1.5	-2.0	-2.1	-2.8	-3.4	-3.9	-5.4	-3.2	0.7																						
21-Jan	-5.5	-5.4	-5.5	-6.0	-6.9	-6.6	-5.4	-4.3	-5.1	-5.2	-4.7	-3.4	-1.0	2.4	4.0	3.3	2.8	2.2	1.6	2.3	2.3	2.1	2.1	2.3	-1.6	4.0																						
22-Jan	2.6	2.3	3.0	2.9	2.9	2.4	1.6	0.8	0.1	0.1	0.2	-3.4	-6.8	-6.6	-6.1	-6.8	-7.5	-8.6	-9.7	-11.7	-12.1	-12.3	-12.9	-12.5	-4.1	3.0																						
23-Jan	-12.4	-12.3	-12.1	-12.2	-12.2	-12.1	-11.7	-11.2	-10.6	-10.1	-9.7	-9.5	-9.0	-8.3	-8.3	-8.7	-9.6	-9.6	-9.6	-10.0	-10.2	-10.2	-10.6	-10.9	-10.5	-8.3																						
24-Jan	-11.6	-12.0	-12.0	-12.3	-12.4	-12.3	-11.9	-12.0	-11.8	-11.4	-10.6	-9.5	-8.1	-5.5	-1.0	-3.5	-5.0	-5.5	-6.5	-7.9	-8.5	-8.8	-9.1	-9.2	-9.1	-1.0																						
25-Jan	-9.2	-9.5	-9.7	-9.6	-9.6	-9.4	-9.3	-9.3	-9.1	-9.0	-9.0	-8.3	-7.8	-7.3	-7.3	-7.4	-7.5	-7.7	-7.7	-7.7	-8.0	-7.9	-7.6	-6.6	-8.4	-6.6																						
26-Jan	-5.9	-4.3	1.2	4.0	4.1	3.5	3.1	-0.9	-4.2	-6.0	-7.0	-7.4	-7.6	-7.6	-7.6	-7.8	-8.4	-9.0	-10.0	-11.7	-13.2	-13.7	-14.3	-14.8	-6.1	4.1																						
27-Jan	-15.2	-15.1	-15.9	-16.7	-17.6	-18.1	-18.2	-18.5	-18.9	-19.3	-19.1	-19.1	-19.0	-17.9	-16.5	-16.5	-17.5	-18.7	-19.8	-20.3	-20.6	-19.8	-20.1	-20.5	-18.3	-15.1																						
28-Jan	-18.8	-19.1	-19.2	-18.9	-19.1	-19.0	-19.0	-19.2	-19.5	-19.4	-18.6	-17.9	-17.9	-17.7	-17.7	-17.7	-18.2	-18.5	-18.9	-19.5	-20.1	-21.4	-22.6	-23.8	-19.2	-17.7																						
29-Jan	-25.3	-27.6	-26.2	-25.6	-26.1	-26.6	-26.2	-26.6	-26.4	-25.7	-23.9	-21.9	-19.8	-18.0	-16.7	-15.9	-15.9	-15.8	-16.1	-17.0	-17.4	-16.6	-16.7	-17.5	-21.3	-15.8																						
30-Jan	-18.0	-19.4	-20.1	-20.9	-24.6	-27.4	-29.9	-28.8	-24.3	-23.2	-21.6	-18.3	-16.6	-16.6	-16.8	-16.4	-16.8	-16.8	-16.8	-16.7	-16.8	-16.8	-16.9	-16.7	-19.9	-16.4																						
31-Jan	-17.0	-17.2	-17.7	-18.3	-18.8	-19.6	-20.6	-21.5	-22.3	-21.8	-20.3	-19.9	-18.9	-17.7	-16.6	-18.4	-19.5	-20.5	-20.7	-21.6	-22.0	-21.9	-20.7	-21.1	-19.8	-16.6																						
																								-10.0	-10.3	-10.2	-10.3	-10.7	-11.0	-11.1	-11.3	-11.2	-10.9	-10.4	-9.7	-9.0	-8.2	-7.6	-7.9	-8.5	-9.0	-9.4	-9.6	-9.7	-9.8	-9.9	-10.2	Diurnal Average
																								2.6	2.3	3.0	4.0	4.1	3.5	3.1	0.8	0.1	0.1	0.2	-2.7	-1.0	2.4	4.0	3.3	2.8	2.2	1.6	2.3	2.3	2.1	2.1	2.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Patricia McInnes - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Patricia McInnes - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	41	5.51	5.51
-20 - 0	674	90.59	96.10
0 - 10	29	3.90	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

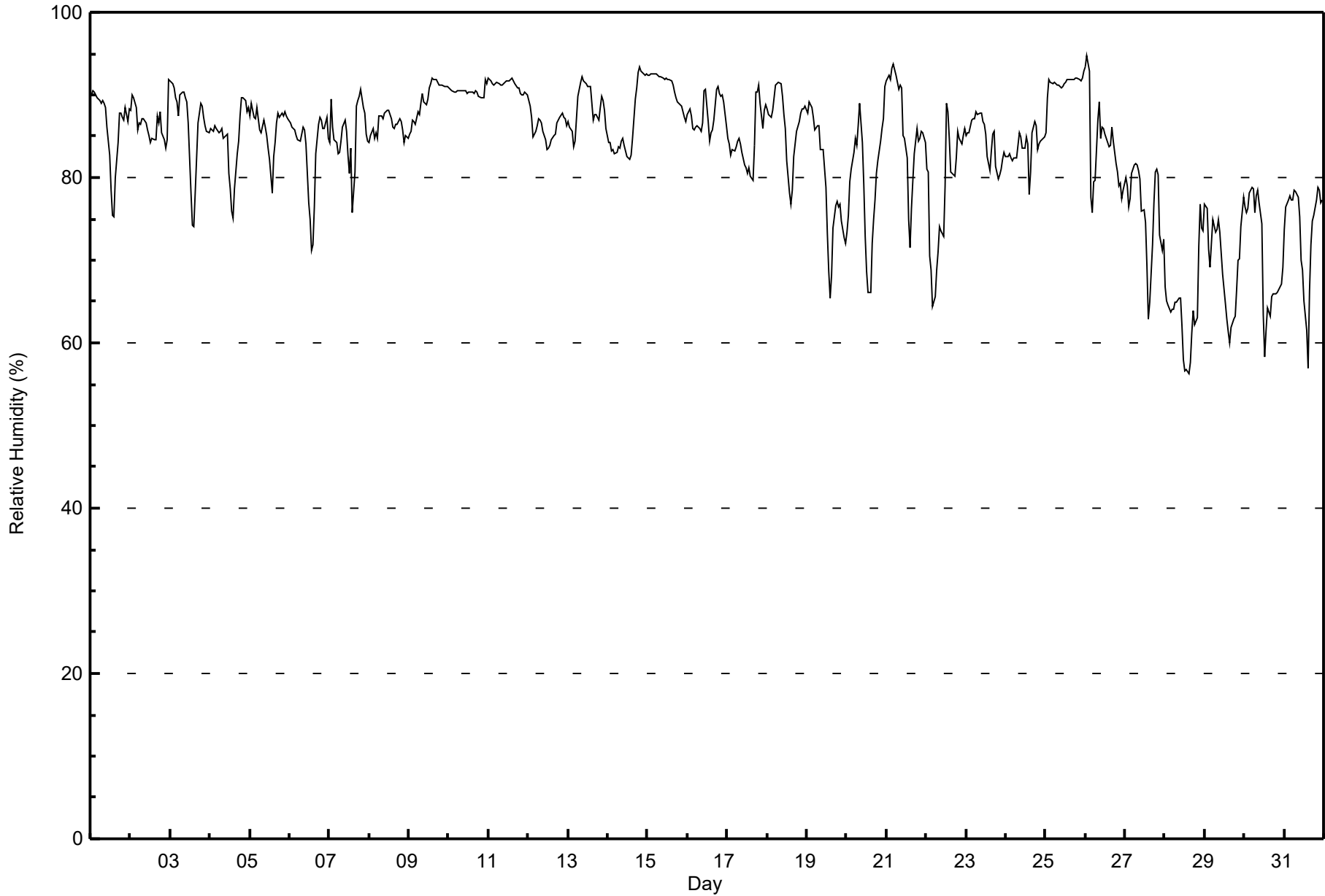
Patricia McInnes - January 2023

Maximum Value: 94.8 % on Jan 26 02:00 Maximum Daily Average: 91.3 % on Jan 25																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 56.2 % on Jan 28 15:00 Minimum Daily Average: 64.3 % on Jan 28 Maximum Diurnal Average: 85.6 % at hour 9 Minimum Diurnal Average: 77.9 % at hour 15 Monthly Average: 83.47 % Percentiles: P ₁ = 60.5 P ₁₀ = 72.0 Q ₁ = 80.3 Median = 85.6 Q ₃ = 89.0 P ₉₀ = 91.4 P ₉₉ = 92.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	90.0	90.5	90.4	90.1	89.7	89.4	89.0	89.3	88.9	88.4	86.0	82.6	78.6	75.4	75.2	80.0	84.2	87.9	87.8	87.2	87.0	88.5	86.7	88.3	86.3	90.5
2-Jan	88.2	89.9	89.7	88.4	85.8	86.6	86.4	87.2	87.1	86.6	85.8	85.1	84.3	84.7	84.6	84.6	87.4	86.7	87.9	85.3	84.6	83.6	84.5	91.8	86.5	91.8
3-Jan	91.7	91.3	90.9	89.6	89.2	87.5	90.1	90.4	90.3	89.7	89.2	86.6	78.1	74.2	74.2	78.2	82.4	86.6	89.0	88.7	87.2	86.3	85.6	85.4	86.3	91.7
4-Jan	86.0	85.7	85.7	86.3	85.9	85.4	85.7	85.9	84.7	84.9	85.3	80.5	78.6	75.9	75.0	78.7	82.8	84.4	87.5	89.7	89.7	89.3	88.1	88.4	84.6	89.7
5-Jan	87.4	88.9	87.2	87.1	88.4	87.2	85.8	85.5	86.9	86.1	85.1	83.6	82.2	78.1	82.6	84.2	86.7	87.7	87.3	87.7	87.5	87.9	87.5	87.2	86.1	88.9
6-Jan	86.6	86.1	86.0	85.7	85.1	84.6	84.4	85.3	86.1	85.8	84.1	76.9	74.8	71.1	71.9	76.4	82.9	86.5	87.3	86.9	86.0	85.9	87.3	84.7	83.3	87.3
7-Jan	84.3	89.6	86.2	84.6	84.3	82.9	83.1	84.4	86.2	87.0	85.5	82.7	80.6	83.6	75.7	80.6	88.6	89.4	89.8	90.6	88.5	87.8	85.2	84.4	85.2	90.6
8-Jan	84.3	85.2	85.9	84.7	85.5	84.8	87.5	87.5	87.2	87.8	87.9	88.2	88.1	87.1	86.2	86.0	86.5	86.5	87.1	86.8	85.8	84.3	85.0	84.8	86.3	88.2
9-Jan	85.2	85.6	86.9	86.8	86.4	88.0	87.6	89.0	90.1	89.1	88.8	89.6	90.8	91.4	92.0	91.8	91.9	91.5	91.1	91.2	91.2	91.1	91.0	90.9	89.5	92.0
10-Jan	90.9	90.6	90.5	90.4	90.4	90.5	90.5	90.5	90.5	90.6	90.5	90.2	90.4	90.3	90.3	90.2	90.5	90.3	89.9	89.7	89.7	89.6	91.9	91.4	90.4	91.9
11-Jan	92.0	91.7	91.4	91.1	91.4	91.5	91.3	91.1	91.3	91.4	91.5	91.6	91.7	91.9	92.0	91.7	91.4	90.8	90.8	90.2	90.0	89.9	90.3	90.0	91.2	92.0
12-Jan	89.3	88.7	87.3	84.9	85.6	86.3	87.1	87.0	86.6	85.6	84.6	83.4	83.6	83.9	84.5	85.0	85.3	86.5	86.9	87.3	87.8	87.3	87.1	86.2	86.2	89.3
13-Jan	86.7	86.1	85.5	83.7	84.4	87.2	89.9	91.4	92.2	91.7	91.5	91.4	91.1	91.0	89.0	87.0	87.6	87.6	87.0	88.5	89.9	89.4	88.2	85.9	88.5	92.2
14-Jan	84.3	84.2	83.3	83.4	83.0	83.0	83.7	83.6	84.4	84.8	83.9	82.6	82.4	82.1	82.7	84.8	89.6	90.9	92.7	93.4	92.9	92.7	92.4	92.5	86.4	93.4
15-Jan	92.4	92.4	92.5	92.5	92.5	92.5	92.4	92.3	92.2	92.1	91.9	92.0	91.9	91.9	91.7	91.2	90.3	89.7	89.2	88.9	88.7	88.0	87.3	86.8	91.0	92.5
16-Jan	87.6	88.3	87.4	86.0	85.7	86.0	86.3	86.0	85.6	86.6	90.5	90.7	86.9	84.4	85.4	85.8	87.0	90.7	91.0	90.2	89.8	90.0	89.2	86.3	87.6	91.0
17-Jan	84.7	84.0	82.8	83.4	83.3	83.8	84.4	84.7	84.1	83.1	81.6	81.2	80.5	81.1	80.1	79.7	83.9	90.3	90.3	91.2	89.0	85.9	88.2	88.8	84.6	91.2
18-Jan	88.3	87.7	87.3	88.2	89.7	91.2	91.4	91.5	91.4	89.8	87.6	85.9	82.0	78.2	76.8	78.5	82.5	84.1	85.7	86.8	87.8	88.2	88.3	88.6	86.6	91.5
19-Jan	87.9	89.1	88.9	88.4	87.3	85.7	86.3	86.3	83.3	83.3	83.4	78.8	73.1	68.6	65.4	68.1	73.9	76.6	77.2	76.4	76.7	74.8	72.7	72.0	79.3	89.1
20-Jan	73.4	75.5	79.5	81.0	83.0	84.8	84.0	86.3	88.9	84.2	79.2	72.9	68.7	66.1	66.0	72.1	75.0	77.2	80.5	82.1	84.4	85.9	87.1	91.0	79.5	91.0
21-Jan	91.8	92.4	91.9	93.2	93.7	93.0	92.4	90.7	91.1	90.9	85.2	84.7	82.4	75.0	71.6	76.3	79.6	82.8	85.9	84.5	84.8	85.5	85.4	84.3	86.2	93.7
22-Jan	81.1	80.7	70.5	68.8	64.4	65.6	68.8	71.1	74.1	73.5	72.9	79.0	88.9	88.0	84.7	80.7	80.3	80.2	82.4	85.7	84.7	84.1	85.1	85.9	78.4	88.9
23-Jan	85.1	85.5	85.4	87.0	87.1	87.0	87.9	87.6	87.8	87.8	86.7	86.5	85.2	82.6	80.9	83.3	85.2	85.6	81.4	79.9	80.4	81.1	82.2	83.0	84.7	87.9
24-Jan	82.6	82.6	82.9	82.4	82.0	82.3	82.5	83.9	85.4	85.0	83.5	83.5	84.9	84.1	78.0	80.6	85.5	86.8	86.2	83.4	84.1	84.5	84.7	85.0	83.6	86.8
25-Jan	85.4	89.7	91.9	91.5	91.3	91.5	91.3	91.2	91.2	90.9	91.1	91.3	91.5	91.9	91.8	91.8	91.9	91.8	92.0	92.1	91.8	91.8	92.1	92.8	91.3	92.8
26-Jan	93.4	94.8	92.9	77.7	75.8	79.4	79.7	86.9	89.2	84.7	86.1	85.9	85.2	84.3	83.7	83.9	86.2	84.4	81.7	80.7	79.0	79.3	77.4	78.5	83.8	94.8
27-Jan	80.1	78.9	76.5	77.4	80.5	81.5	81.6	81.5	80.9	79.8	76.0	76.1	74.6	69.4	62.9	65.0	71.8	76.9	80.6	81.1	80.3	73.1	71.2	72.5	76.3	81.6
28-Jan	66.7	65.0	64.6	63.7	64.1	64.1	64.9	65.0	65.5	65.4	62.0	57.9	56.6	56.8	56.2	57.7	61.3	63.9	62.2	63.1	71.7	76.7	73.9	73.5	64.3	76.7
29-Jan	76.8	76.3	71.3	69.1	72.1	74.9	73.4	73.7	74.8	73.4	70.8	68.2	64.7	62.9	61.4	60.0	61.9	62.9	63.3	66.4	70.1	70.2	74.0	77.6	69.6	77.6
30-Jan	76.4	75.8	76.2	78.2	78.7	78.6	75.7	77.7	78.5	76.9	74.5	63.4	58.4	61.5	64.3	63.2	65.5	65.9	66.0	65.9	66.1	66.8	67.2	69.2	70.4	78.7
31-Jan	73.8	76.4	77.3	77.8	77.3	77.2	78.5	78.4	77.5	75.3	70.0	68.7	65.1	61.6	56.9	66.3	71.9	74.8	75.5	77.3	78.9	78.5	76.9	77.2	73.7	78.9
85.0 85.5 84.7 84.0 84.0 84.3 84.6 85.3 85.6 84.9 83.6 82.0 80.5 79.0 77.9 79.5 82.3 83.8 84.3 84.5 84.7 84.4 84.3 84.7																								Diurnal Average		
93.4 94.8 92.9 93.2 93.7 93.0 92.4 92.3 92.2 92.1 91.9 92.0 91.9 92.0 91.8 91.9 91.8 91.9 91.8 92.7 93.4 92.9 92.7 92.4 92.8																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Patricia McInnes - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Patricia McInnes - January 2023

Maximum Speed: 32 km/h on Jan 26 05:00	Maximum Daily Speed Average: 17.8 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 9 09:00	Minimum Daily Speed Average: 0.3 km/h on Jan 30	Hours of Data: 744
Maximum Diurnal Speed Average: 2.7 km/h at hour 3	Minimum Diurnal Speed Average: 1.4 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 2.0 km/h 195.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 5 Median = 8 Q ₃ = 11 P ₉₀ = 15 P ₉₉ = 26	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SW7	SW6	WSW10	WSW8	WSW8	SW8	SW7	SSW9	SW10	SSW8	SSW8	SSW11	SW11	SW12	SW11	WSW14	SW15	SW10	SW10	SW8	SW10	SW12	SW11	SSW5	SW9.2	SW15	
2-Jan	S6	S5	SSE4	S4	S5	SSE3	SSW3	SSE4	S6	SSE7	SSE8	SSE6	S9	S8	S6	SE7	SE5	ESE3	SSE3	SSW7	S4	SSW8	WSW5	SSE0	S4.8	S9	
3-Jan	S4	SSE5	S4	SSW3	NNE2	S4	S7	S8	S5	SSW6	S6	S7	S6	S8	S8	S9	SSW9	SSW6	S7	S8	SSW9	SSW8	SSW9	SW10	S6.3	SW10	
4-Jan	SSW11	SW14	SW14	SW11	SW12	SW15	SW14	SW12	SW16	SW15	S8	S7	SSW9	SSW8	SSW9	SW11	SW9	SW9	S5	SSE7	SSW10	SW10	SSW12	SW13	SW10.4	SW16	
5-Jan	SW9	SSW7	SSW10	SSW8	SSW7	SSE6	SSE4	SSE5	SSE5	S4	SSE4	SE6	SSE5	SE5	SSE6	SSE7	SSE7	SE10	SE11	SE9	SE8	SE8	SE13	SE15	SSW6.7	SE15	
6-Jan	SE17	SE19	SE19	SE19	SE16	SE15	SE13	SE10	SE8	SSE6	SSE6	SSE7	SSE8	SSE6	SSE7	SSE6	SSE5	SSE6	S8	S8	S9	S10	SSW7	SW12	SSE9.4	SE19	
7-Jan	SSW9	SW7	WSW12	WSW15	WSW12	WSW15	WSW16	WSW12	WSW7	W10	NNW4	NNE5	NE6	NNE6	N5	NNW3	NW4	NNE5	N6	N7	W2	SSW3	S2	S2	WSW4.1	WSW16	
8-Jan	S2	SSW2	S1	SSW3	S3	SSE2	SSE5	SSE7	SSE4	SE8	SE8	SE9	SE10	SE10	SE7	SE7	SE7	ESE8	E4	NNE5	N5	ENE6	E4	E6	SE4.3	SE10	
9-Jan	ESE6	ESE8	E5	ENE5	NE4	NNE7	NNE6	N4	N0	SE6	ESE6	ESE5	S5	SSE7	SE7	SE6	S7	SW6	WNN3	WSW1	SE6	S6	SSE4	SSE5	SE2.9	ESE8	
10-Jan	SSE5	SE6	SE7	ESE6	ESE4	ESE5	E5	ESE4	SE4	ESE5	E5	NE4	ENE3	NNE4	NE4	ENE4	ESE4	SSE3	SW5	WSW4	W3	NNW3	NE3	S2	ESE2.4	SE7	
11-Jan	WSW5	WSW4	WSW4	W2	NNW2	NNE5	NNE3	W2	SW2	S3	S4	SSE4	SSE5	SSE5	ESE6	SE5	SE5	SE5	ESE7	SE8	SSE8	SSE7	S9	S11	SSE3.1	S11	
12-Jan	S8	SSW6	SSW7	S8	SSE8	SE6	SSE6	SSE7	SSE8	SSE10	SSE11	SSE12	SSE11	SSE10	SE7	S10	S9	S8	S8	S8	S5	SSE6	SE5	SSE1	SSE7.4	SSE12	
13-Jan	SE4	ESE4	ENE1	NE2	N2	NNW3	NE3	NNE4	NNE5	E3	E4	E4	ENE7	E8	ESE6	ESE6	E8	E10	E9	ESE11	ESE12	ESE14		E4.8	ESE14		
14-Jan	ESE11	ESE13	ESE13	SE13	SE14	SE12	SE11	SE10	ESE7	ESE8	SE8	ESE7	ESE7	SSE5	WSW6	WSW7	SW7	WSW6	WSW4	W5	WSW4	WSW3	SW3		SE5.5	SE14	
15-Jan	WSW1	W3	W2	WNN1	E1	ESE3	ESE4	ESE2	ESE3	ESE4	ESE5	ESE6	ESE6	ESE6	ESE6	E7	E6	ESE6	ESE6	ESE5	ENE5	ENE5	NE4		E3.5	E7	
16-Jan	NNE5	NNE6	NE5	E5	E5	NE7	NE6	NE7	ENE6	NE8	ENE8	E8	ESE9	ESE14	ESE14	ESE13	ESE12	ESE12	SE13	ESE15	ESE12	SE9	SSW7	SSW9	ESE6.9	ESE15	
17-Jan	SSW11	SSW10	SSW10	SSW11	S11	S11	S10	SSE10	SSE9	SSE10	S11	S10	SSW12	SW10	SSW7	S7	SSE4	S4	SSE3	SSE5	S7	S11	S10	S11	S8.6	SSW12	
18-Jan	S12	S11	SSE10	SE8	SE8	SSE7	SSE7	SSE7	SSE7	SSE8	SE12	SE11	SE12	SE14	SE13	SE14	SE13	SE14	SE13	SE12	SE12	SE11	SE9	SE8	SE10.1	SE14	
19-Jan	SSE4	SSE5	SSE7	SSE7	SSE9	SSE10	SSE8	S10	S12	S9	SSW8	WSW14	WSW17	SW15	SW11	SSW9	SW12	SSW11	SW12	WSW15	WSW14	SW15	SW14	WSW13	SSW9.3	WSW17	
20-Jan	WSW12	WSW13	WSW15	WSW10	SW8	SSW10	SSW9	S7	SSE6	SSW7	SW9	SW11	SW11	WSW12	WSW19	WSW14	WSW12	WSW11	WSW14	WSW20	WSW18	WSW14	SW7	S8	SW10.6	WSW20	
21-Jan	SSW7	S9	SW9	SW6	SSW6	S6	SSW7	S7	SSE6	SSE6	SE6	SSE7	S8	SSW9	SW14	SW13	SW12	SSW8	SSE6	WSW13	WSW14	WSW16	WSW15	WSW13	SSW8.0	WSW16	
22-Jan	W14	W9	NNW10	NNW16	NNW27	NNW20	NNW21	W24	W26	W22	NNW24	N22	N17	NNW12	N12	NNE12	NNE8	NNW10	N7	NNW7	NNW11	N9	NNW5	E2	NW11.7	NNW27	
23-Jan	SSW2	SSW3	SE5	ESE7	ESE8	ESE8	SE13	ESE11	ESE12	ESE14	ESE15	ESE14	ESE12	E11	E9	NE8	NE7	NE6	ESE5	ESE5	ESE4	ESE7	SE7	ESE7	ESE7.4	ESE15	
24-Jan	SE9	SE7	ESE7	SE8	SE9	SSE5	SE4	SE6	SE8	SSE8	SSE5	SSE6	S5	WSW3	NNW18	N12	N12	N13	N13	N13	N12	N8	N7	NNW6	NNE2.0	NNW18	
25-Jan	N6	NNE6	N6	N5	NNW3	NNW3	NNW2	NNW2	NE4	N5	E1	SE4	ESE4	ESE5	SE7	ESE5	ESE7	SE8	SE8	SE9	SE8	SE7	SSE8		E2.9	SE9	
26-Jan	S5	S8	W18	W29	WNN3	W2	NNW30	NW27	N29	NNE24	NNE23	N20	N17	N12	N9	N11	N8	NNE10	NNE15	NNE14	NNE21	NNE20	NNE20	N17	NNE16	NNW13.4	NNW32
27-Jan	N13	NNE17	NNE17	NNE16	NNE14	NNE10	NNW8	NNW7	N8	NNW11	N13	NNW12	NW11	NNW8	NNW6	N8	N10	NNW9	NNW7	NNW6	W6	NNW9	W9	W11	NNW8.9	NNE17	
28-Jan	NW19	NNW18	NNW19	NNW19	NNW16	NNW15	NNW13	NW18	NNW18	NNW19	NNW22	NW24	NW28	NW25	NW24	NW22	NNW21	NW19	NW21	NW20	N15	NNE16	N12	NNW8	NW17.8	NW28	
29-Jan	NNW4	W5	W10	W10	WSW12	WSW12	WSW17	WSW13	SW12	SW15	SW15	SW16	SW15	SSW11	SSW13	SW13	SW12	WSW11	WSW10	W8	NNW13	NNW13	N12	NNW9	WSW8.9	WSW17	
30-Jan	NW7	NNW8	NW9	NNW5	W4	SW3	SSW4	WSW6	WSW9	SW5	S4	ESE5	ESE4	E5	ENE5	E4	ESE5	SE4	ESE4	E6	E5	ESE5	SSE1	NNW7	SSE0.3	NW9	
31-Jan	N9	N12	N13	NNE12	N12	N10	NNE7	NNE9	N6	N5	ENE3	NW2	NNW1	S1	E4	ENE5	NE1	NW4	WSW1	WSW3	SSW2	N1	NNW6	NW5	N4.6	N13	

SSW2.7	SSW2.5	SW2.7	SW2.2	SW2.2	SW2.1	SSW2.3	SSW1.9	SSW2.5	S2.4	SSE2.1	SSE2.2	S2.6	S2.4	S1.8	S2.0	S2.1	S1.5	S1.5	SSW1.4	SSW1.4	S1.8	S2.1	SSW2.4		Diurnal Average
NW19	SE19	NNW19	W29	WNN3	W2	NNW30	NW27	N29	W26	NNE23	NNW24	NW24	NW28	NW25	NW24	NW22	NNW21	NW19	NW21	NNE21	NNE20	NNE20	N17	NNE16	Diurnal Maximum

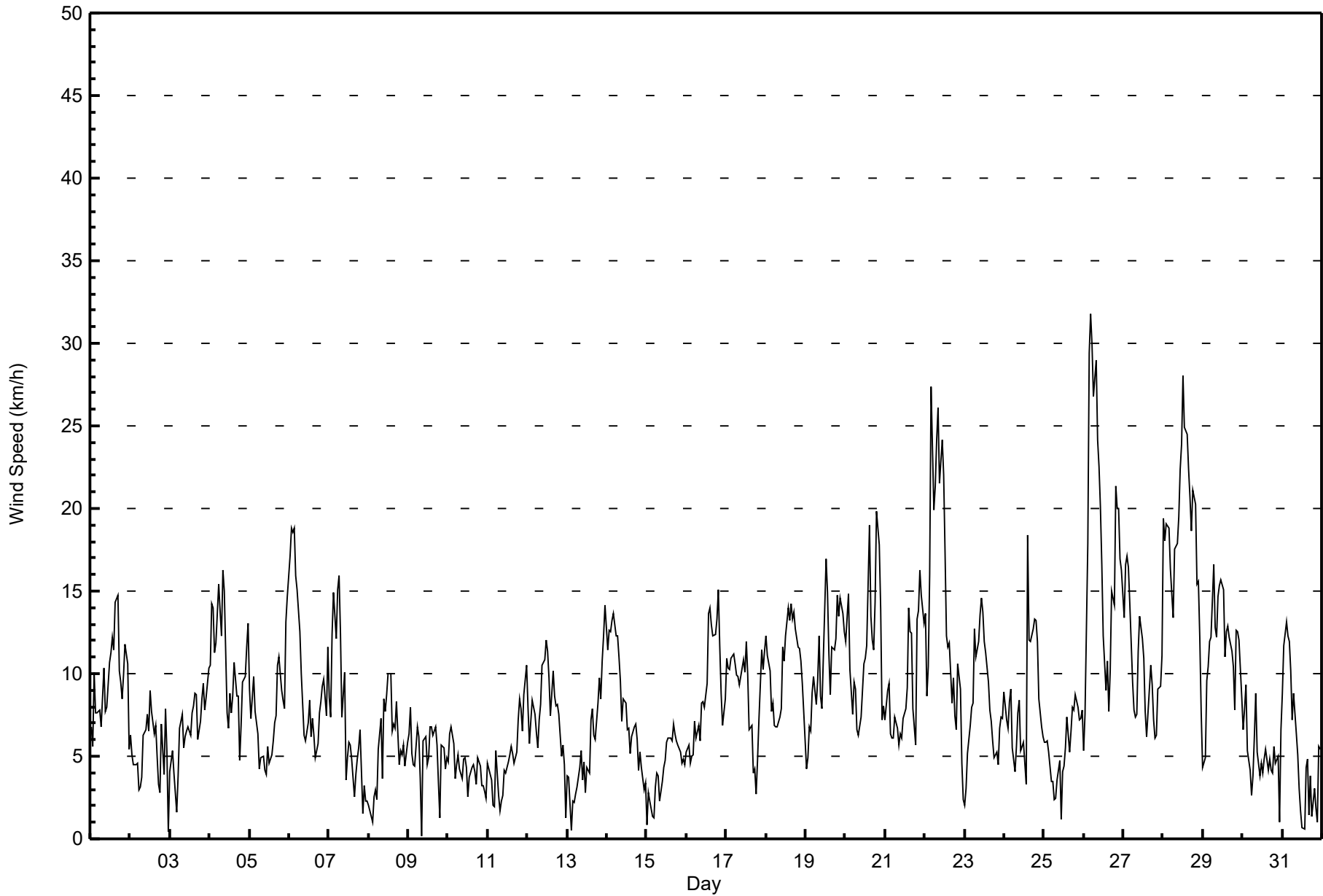
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Patricia McInnes - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 03:00 Minimum Value: 0 km/h on Jan 15 03:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	1	3	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	4	3	3	2	4
2-Jan	2	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	4	2	2	2	1	4
3-Jan	2	1	1	1	1	1	3	2	2	1	1	1	1	1	1	2	1	1	1	2	2	2	2	3	
4-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	2	2	2	2	2
5-Jan	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	2	3	3	4	4	4
6-Jan	4	4	4	4	4	3	4	2	2	2	1	2	2	1	1	1	1	2	1	1	1	1	1	2	4
7-Jan	4	2	2	2	2	2	2	2	3	2	1	2	2	2	2	1	1	1	2	2	1	1	1	0	4
8-Jan	1	1	1	1	1	1	1	2	2	2	2	3	2	3	1	2	2	2	1	1	1	2	1	1	3
9-Jan	1	2	1	1	1	1	1	1	1	2	2	1	2	2	1	1	2	1	1	1	1	1	1	1	2
10-Jan	1	2	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
11-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2
12-Jan	2	1	2	2	2	1	1	1	2	2	2	3	3	2	2	2	2	2	2	2	2	1	1	1	3
13-Jan	1	1	1	1	1	1	2	1	2	1	1	1	1	1	2	2	1	1	2	2	2	3	3	3	3
14-Jan	3	3	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	3
15-Jan	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16-Jan	1	1	1	1	1	2	2	1	2	2	2	2	3	3	3	3	3	2	3	3	3	2	3	2	3
17-Jan	3	2	2	2	2	2	2	2	2	2	2	2	3	2	1	1	1	2	1	1	1	2	2	3	3
18-Jan	3	2	2	2	1	1	1	1	1	1	3	3	3	3	3	3	3	3	3	2	2	2	2	2	3
19-Jan	1	1	1	1	2	2	2	4	2	2	2	3	3	3	3	2	2	2	2	3	3	3	3	3	4
20-Jan	3	2	2	3	1	2	2	1	1	2	2	3	2	5	4	3	2	2	3	3	3	3	2	1	5
21-Jan	3	2	2	1	1	1	2	2	2	1	1	1	1	2	3	2	2	1	1	4	2	3	2	2	4
22-Jan	2	3	3	6	5	5	4	5	5	4	5	6	4	3	2	3	2	2	1	1	2	2	1	1	6
23-Jan	1	1	2	1	1	2	3	3	3	3	3	3	3	3	2	2	2	2	2	1	2	3	2	1	3
24-Jan	2	2	1	2	2	2	1	1	2	2	1	1	1	4	4	3	2	2	3	3	2	1	1	1	4
25-Jan	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2	3	3
26-Jan	2	2	8	5	7	6	6	6	5	6	5	4	3	2	2	2	2	3	3	5	4	4	3	3	8
27-Jan	3	4	4	4	3	4	2	1	2	3	2	2	2	2	2	2	3	1	1	1	1	1	1	3	4
28-Jan	4	4	5	3	3	3	3	3	3	4	5	5	5	6	5	5	4	4	4	4	4	3	3	2	6
29-Jan	1	2	2	2	2	3	2	2	2	3	3	4	3	4	3	3	2	2	2	1	3	2	2	3	4
30-Jan	2	1	3	3	2	1	1	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3
31-Jan	2	3	3	3	2	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	3	3
																	Diurnal Maximum								





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Patricia McInnes - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	209	28.09	28.09
6 - 11	352	47.31	75.40
12 - 19	154	20.70	96.10
20 - 28	25	3.36	99.46
29 - 38	4	0.54	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Patricia McInnes - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	11	10	9	16	28	12	33	24	10	5	13	9	3	3	13	209
6 - 11	16	10	8	4	10	31	51	51	51	47	28	14	8	2	4	17	352
12 - 19	18	10	0	0	0	16	25	1	2	3	28	31	2	10	4	4	154
20 - 28	2	5	0	0	0	0	0	0	0	0	0	1	3	6	8	0	25
29 - 38	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	4
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	47	36	18	13	26	75	88	85	77	60	61	59	23	23	19	34	744

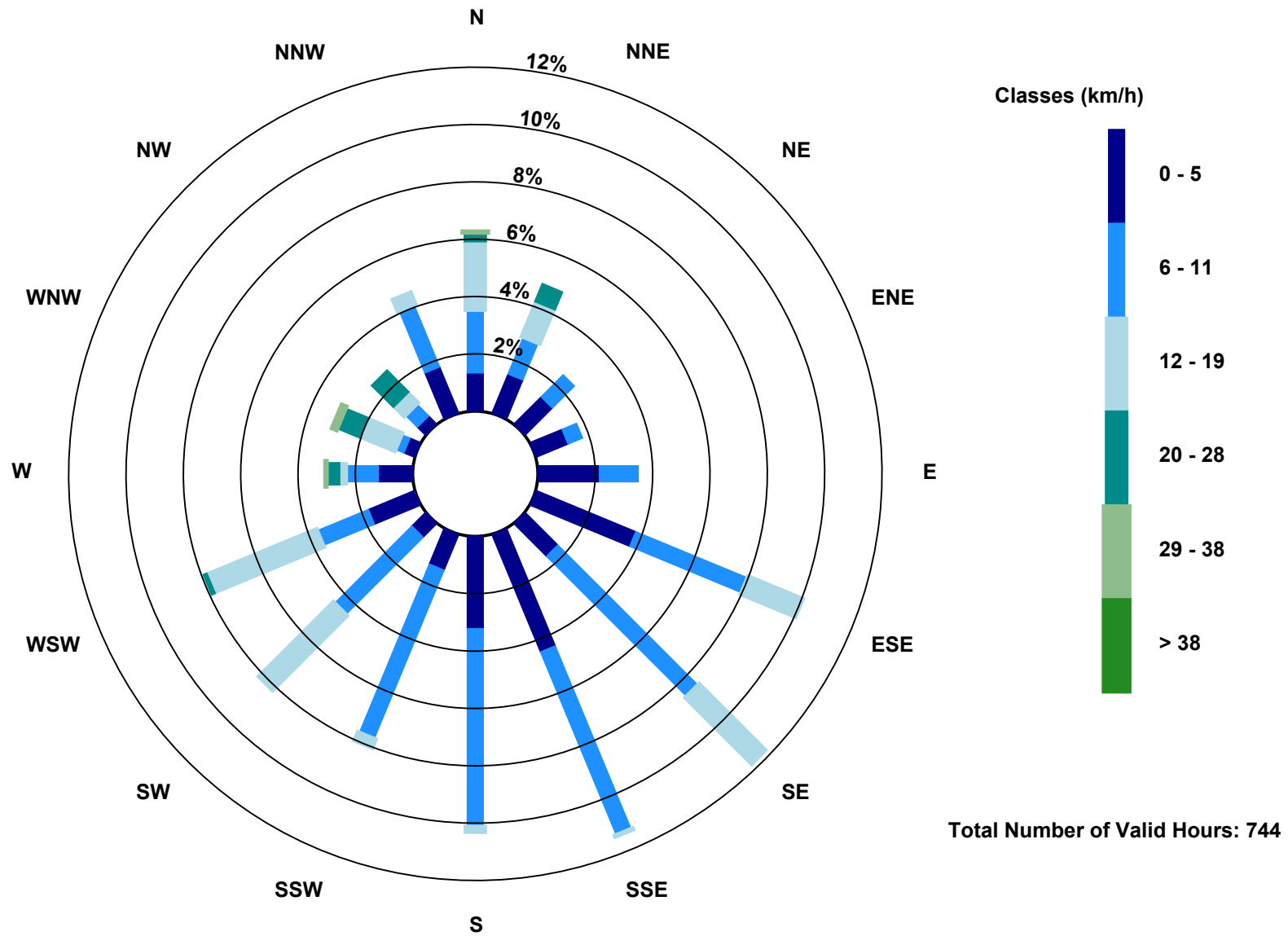
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Patricia McInnes





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Patricia McInnes - January 2023

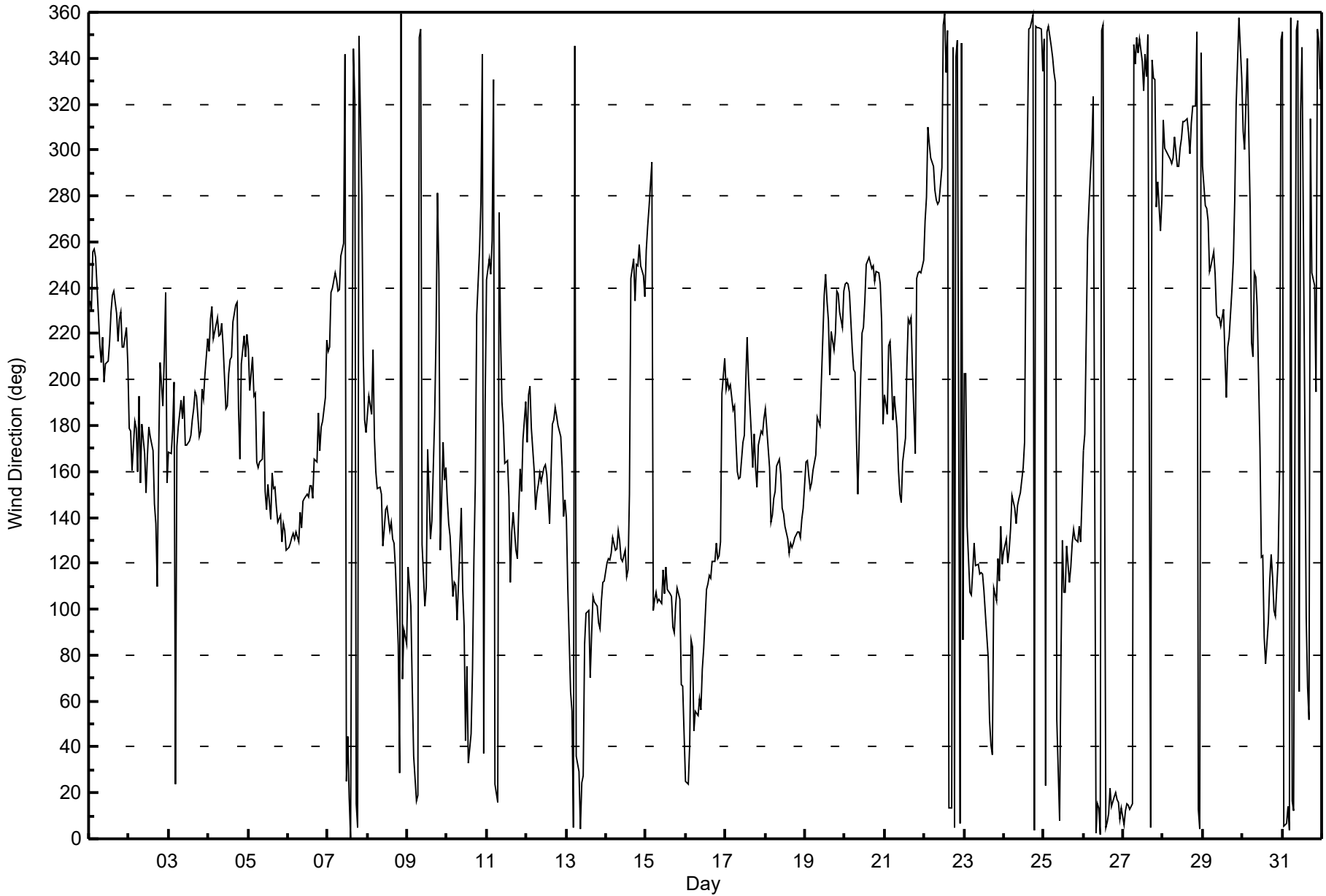
Direction of Maximum Speed: 290 deg on Jan 26 05:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 310.7 deg on Jan 28																						Hours of Data: 744			
Direction of Minimum Speed: 353 deg on Jan 9 09:00											Direction of Minimum Daily Speed Average: 0.3 deg on Jan 30											Hours of Missing Data: 0			
Monthly Average Direction: 195.5 deg																						Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	234	230	256	257	253	228	215	207	219	199	207	208	217	230	236	238	229	217	226	230	214	214	223	207	225.1
2-Jan	179	177	161	182	179	160	193	155	181	168	150	167	179	175	169	146	137	110	168	207	189	209	238	155	174.4
3-Jan	169	168	178	199	24	171	180	191	183	193	172	172	173	176	182	187	195	193	175	177	196	192	202	218	185.8
4-Jan	212	226	232	218	221	227	219	220	225	215	188	189	203	209	210	225	233	233	187	165	207	219	210	220	216.2
5-Jan	214	195	210	193	194	164	162	164	165	186	152	144	155	139	159	153	153	145	138	141	130	137	134	125	157.5
6-Jan	127	129	131	133	130	133	129	142	135	147	148	150	149	154	154	149	166	164	185	169	180	182	192	217	148.1
7-Jan	212	214	238	240	247	244	239	239	254	259	342	25	44	18	0	344	321	15	5	349	280	211	183	177	258.2
8-Jan	185	193	185	213	174	160	153	153	150	128	135	144	145	134	138	131	129	117	84	29	359	70	91	85	128.2
9-Jan	119	110	101	66	36	17	19	349	353	128	102	110	170	150	130	139	184	221	282	246	126	173	156	162	125.2
10-Jan	148	137	132	106	112	110	95	111	144	108	93	43	75	33	46	74	122	155	228	256	277	342	37	188	109.4
11-Jan	243	253	246	261	331	24	16	273	220	190	181	163	165	149	112	134	142	126	122	143	161	152	174	190	163.1
12-Jan	173	194	197	179	161	143	151	155	159	155	162	163	159	149	137	181	183	188	185	180	175	162	140	148	166.4
13-Jan	140	109	64	56	5	345	36	29	4	25	27	85	98	99	70	89	106	103	101	94	92	104	112	112	87.6
14-Jan	120	122	122	125	131	126	126	134	130	122	121	126	114	117	150	244	253	234	250	250	259	249	245	236	142.6
15-Jan	256	266	275	295	100	104	107	103	104	103	117	107	118	108	107	106	92	90	102	109	104	67	67	46	99.0
16-Jan	25	24	41	87	84	47	56	54	61	56	74	83	109	111	115	113	121	121	129	122	123	129	194	209	102.8
17-Jan	196	200	196	198	187	188	173	160	157	157	173	176	199	218	200	177	162	177	161	153	171	178	176	183	181.9
18-Jan	187	179	162	138	141	148	151	162	165	159	144	142	136	131	124	129	127	129	131	134	134	131	139	144	142.5
19-Jan	164	165	158	152	155	160	167	184	182	180	200	237	246	234	226	202	221	213	220	239	237	230	223	238	210.7
20-Jan	242	242	241	238	214	204	203	174	150	199	220	223	234	250	253	251	248	249	243	247	247	242	225	181	233.6
21-Jan	194	185	215	217	202	182	193	179	161	150	146	164	174	205	227	225	227	204	168	244	246	247	247	252	213.0
22-Jan	269	280	310	303	297	293	283	278	276	277	293	355	359	334	352	13	13	345	5	340	348	7	346	87	311.9
23-Jan	202	203	136	108	106	116	129	119	120	115	116	115	108	98	79	52	41	37	109	104	122	113	136	120	109.3
24-Jan	125	130	120	126	135	149	144	137	145	148	151	162	172	257	303	353	353	359	4	354	353	354	352	335	33.4
25-Jan	349	23	352	354	345	341	334	329	52	8	80	130	107	107	128	112	119	129	135	130	129	136	129	149	100.5
26-Jan	169	176	261	277	290	301	323	2	15	14	2	352	355	5	7	11	22	14	18	20	17	16	8	13	348.1
27-Jan	6	12	15	15	13	15	346	337	349	342	349	338	326	342	332	350	5	339	331	331	275	286	265	278	345.3
28-Jan	313	301	299	297	296	294	297	306	293	293	301	305	312	313	314	308	299	312	319	319	352	13	5	342	310.7
29-Jan	293	276	274	269	247	250	255	246	228	227	227	224	231	210	192	214	219	239	252	278	320	339	358	331	249.7
30-Jan	308	300	322	340	275	216	210	246	245	232	170	123	123	88	77	95	113	124	114	99	97	122	161	348	161.6
31-Jan	351	5	7	14	4	358	17	12	352	356	64	317	345	183	96	66	52	313	246	241	195	353	347	326	3.7
204.0	197.3	228.6	230.9	234.8	223.4	211.5	205.0	199.5	186.4	167.9	166.5	179.8	173.2	178.6	171.9	186.8	182.1	174.3	198.0	202.1	186.7	188.2	198.6		
Diurnal Average																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Patricia McInnes - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 744																								
Maximum Value: 100 deg on Jan 31 14:00											Hours of Data: 744																								
Minimum Value: 7 deg on Jan 18 08:00											Hours of Missing Data: 0																								
Percentiles: P ₁ = 8 P ₁₀ = 10 Q ₁ = 12 Median = 14 Q ₃ = 19 P ₉₀ = 30 P ₉₉ = 77											Hours of Calibration: 0																								
											Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Maximum										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Jan	9	13	15	10	13	14	17	15	12	16	14	12	12	12	12	12	8	11	12	16	14	13	14	30	30										
2-Jan	29	29	30	10	16	36	41	37	12	22	14	18	12	10	16	21	43	40	55	64	61	13	20	85	85										
3-Jan	13	19	22	49	63	26	15	19	19	16	15	13	16	11	12	9	11	8	9	8	12	17	14	11	63										
4-Jan	12	9	8	10	11	8	9	10	9	10	12	14	17	15	12	10	10	15	25	15	15	10	11	8	25										
5-Jan	17	13	16	13	11	8	11	17	20	16	19	15	20	16	18	15	11	13	14	15	19	21	13	13	21										
6-Jan	13	13	14	12	13	15	15	12	13	13	14	13	10	12	12	9	10	14	17	10	9	9	18	12	18										
7-Jan	25	24	9	9	13	10	9	11	33	15	28	27	23	31	23	52	16	20	12	14	62	12	42	31	62										
8-Jan	27	41	75	15	19	29	15	14	31	15	14	13	14	14	17	17	14	21	22	21	15	17	14	75											
9-Jan	17	12	16	20	18	12	13	24	96	21	19	29	25	17	15	20	22	18	20	75	15	23	24	19	96										
10-Jan	20	15	18	16	22	14	16	14	21	14	25	26	31	30	32	22	24	44	17	8	30	12	37	40	44										
11-Jan	13	8	17	17	52	13	45	38	30	26	17	19	18	18	15	18	18	16	12	14	12	11	18	15	52										
12-Jan	18	18	14	19	12	13	13	14	15	13	13	14	13	12	14	14	14	16	17	19	34	19	25	76	76										
13-Jan	28	25	89	43	50	38	62	22	30	23	13	48	19	20	17	12	21	16	14	12	12	14	13	13	89										
14-Jan	14	12	13	13	14	15	14	14	12	11	13	12	15	10	26	21	11	17	10	8	11	9	14	18	26										
15-Jan	70	9	10	37	71	14	13	16	21	14	12	14	13	15	14	14	12	14	17	13	18	17	13	18	71										
16-Jan	9	8	22	21	19	13	15	15	16	12	13	15	15	13	12	13	13	12	11	12	13	12	38	15	38										
17-Jan	13	13	13	13	12	13	14	13	12	12	14	14	16	14	16	17	12	27	45	19	15	15	12	14	45										
18-Jan	13	17	16	13	9	7	7	7	10	13	12	13	14	13	14	12	13	13	12	12	12	12	12	13	17										
19-Jan	19	13	16	14	18	12	14	22	12	11	15	13	11	12	14	14	10	11	13	11	11	10	11	14	22										
20-Jan	13	10	9	15	24	11	12	17	20	18	14	16	13	18	11	10	10	16	9	8	8	9	36	21	36										
21-Jan	34	18	13	9	17	11	15	27	18	15	11	10	13	20	12	10	9	18	18	18	10	11	9	11	34										
22-Jan	11	20	16	15	10	10	12	12	10	11	12	31	16	11	18	19	17	12	14	13	12	15	23	61	61										
23-Jan	61	46	38	12	11	19	16	13	15	13	13	14	14	15	14	17	11	17	30	16	18	19	15	13	61										
24-Jan	13	14	14	13	14	20	34	17	13	11	17	15	18	59	11	33	14	15	13	13	15	15	17	20	59										
25-Jan	18	21	21	21	30	34	44	52	34	18	84	30	22	17	14	19	15	13	14	14	12	14	18	27	84										
26-Jan	37	19	48	11	11	11	22	18	12	13	16	15	16	15	12	23	14	11	14	12	12	13	13	12	48										
27-Jan	12	13	12	12	12	16	17	14	18	15	14	13	13	16	17	24	16	9	10	12	10	9	8	22	24										
28-Jan	10	11	10	10	11	10	11	9	11	10	10	11	11	10	11	11	10	11	10	10	23	12	16	13	23										
29-Jan	23	15	9	9	8	8	8	10	10	11	10	12	14	19	13	13	12	10	11	21	15	10	14	19	23										
30-Jan	9	9	15	29	20	38	18	16	17	35	30	22	30	20	13	16	20	17	24	11	20	19	78	20	78										
31-Jan	13	13	14	12	14	14	18	16	15	26	52	54	94	100	38	19	86	9	56	23	35	69	26	13	100										
											70	46	89	49	71	38	62	52	96	35	84	54	94	100	38	52	86	44	56	75	62	69	78	85	
											Diurnal Maximum																								





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07 ATHABASCA VALLEY JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	12.7	0	1.5	0
TRS (ppb) Average	709	35	35	100	4.5	0	0.9	0
THC (ppm) Average	709	35	35	100	4.2	-	2.8	-
NMHC (ppm) Average	709	35	35	100	1.307	-	0.232	-
CH4(ppm) Average	709	35	35	100	2.9	-	2.5	-
O3 (ppb) Average	709	35	35	100	37.6	0	33.6	-
NO2 (ppb) Average	708	36	36	100	36.6	0	21.5	-
NO (ppb) Average	708	36	36	100	94.1	-	38.1	-
NOX (ppb) Average	708	36	36	100	125	-	58.9	-
PM2.5 (ug/m3) Average	743	1	1	100	73.8	0	21.6	0
CO(ppm) Average	710	34	34	100	0.6	0	0.3	-
Temperature 2 m (C) Average	744	0	0	100	4.9	-	-3.9	-
Relative Humidity (%) Average	744	0	0	100	91.3	-	87.6	-
Barometric Pressure (inHg) Average	744	0	0	100	29.7	-	29.6	-
Wind Speed 10 m (km/h) Average	744	0	0	100	30	-	20	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

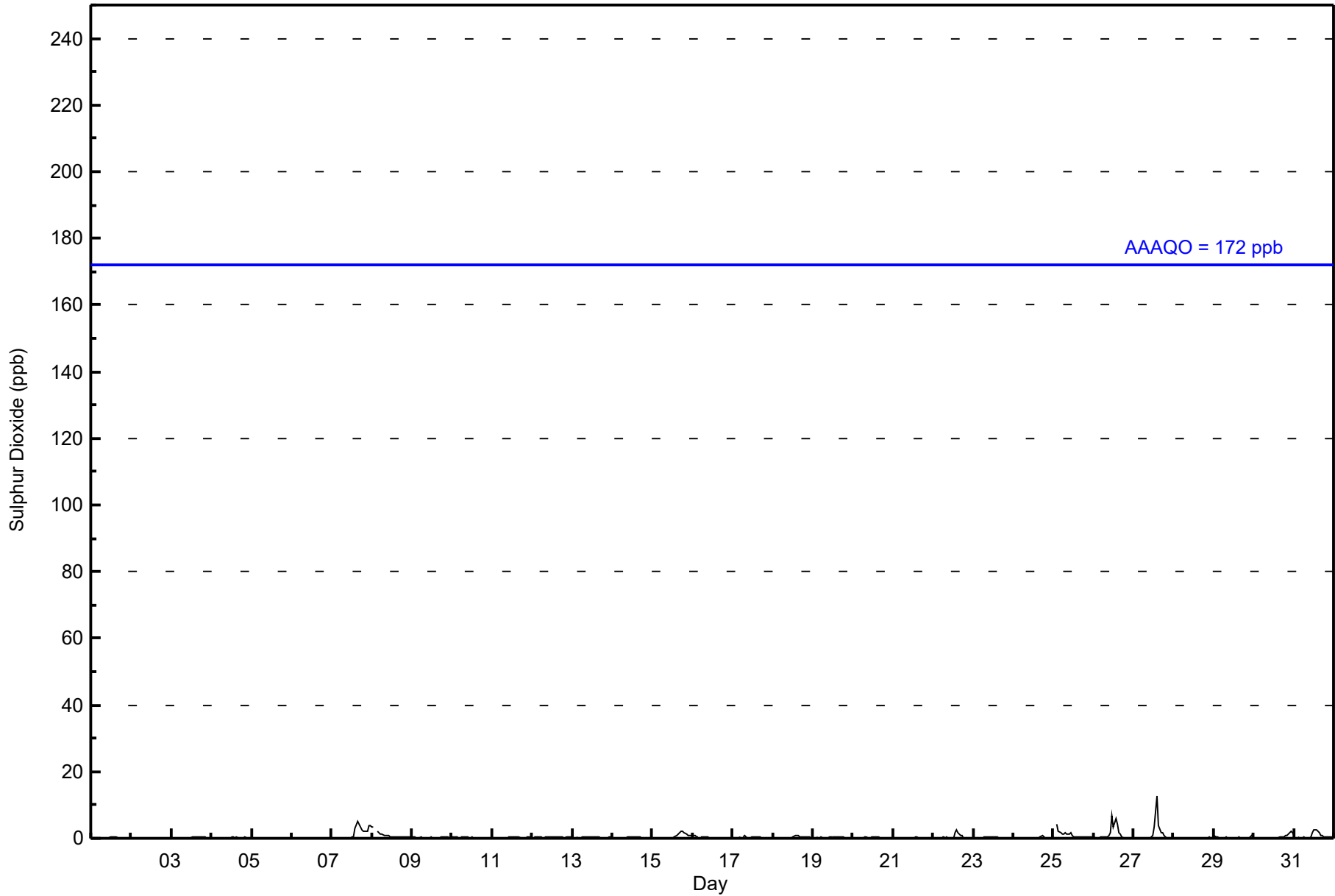
Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.41	0.9	-	0	0.1	0.1	0.2	0.3	0.7	12.7
TRS (ppb) Average	709	0.28	0.4	-	0	0.1	0.2	0.2	0.3	0.4	4.5
THC (ppm) Average	709	2.22	0.2	-	2	2.1	2.1	2.2	2.3	2.4	4.2
NMHC (ppm) Average	709	0.026	0.094	-	0	0	0	0	0	0.1	1.307
CH4(ppm) Average	709	2.2	0.1	-	2	2.1	2.1	2.2	2.3	2.4	2.9
O3 (ppb) Average	709	13.99	8.3	-	0.8	3.5	7.3	13.3	19.1	25	37.6
NO2 (ppb) Average	708	12.32	7.2	-	1.1	4	6.7	11	17.1	22.2	36.6
NO (ppb) Average	708	7.12	11.8	-	0	0.2	1	2.9	8.2	17.5	94.1
NOX (ppb) Average	708	19.44	17.3	-	1.1	4.5	8.2	14	24.8	39.5	125
PM2.5 (ug/m3) Average	743	9.66	8.6	-	0.6	2.6	4.5	7.2	11.4	20.4	73.8
CO(ppm) Average	710	0.2	0.1	-	0.1	0.1	0.2	0.2	0.2	0.3	0.6
Temperature 2 m (C) Average	744	-10.91	5.7	-	-29.8	-18.2	-14.6	-9.9	-7	-4.6	4.9
Relative Humidity (%) Average	744	78.85	7.4	-	51.1	69.6	75.4	80.4	83.9	86.5	91.3
Barometric Pressure (inHg) Average	744	28.98	0.2	-	28.6	28.7	28.8	28.9	29.1	29.3	29.7
Wind Speed 10 m (km/h) Average	744	6.8	5	-	0	2	4	6	9	12	30
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
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No operational issues to report





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



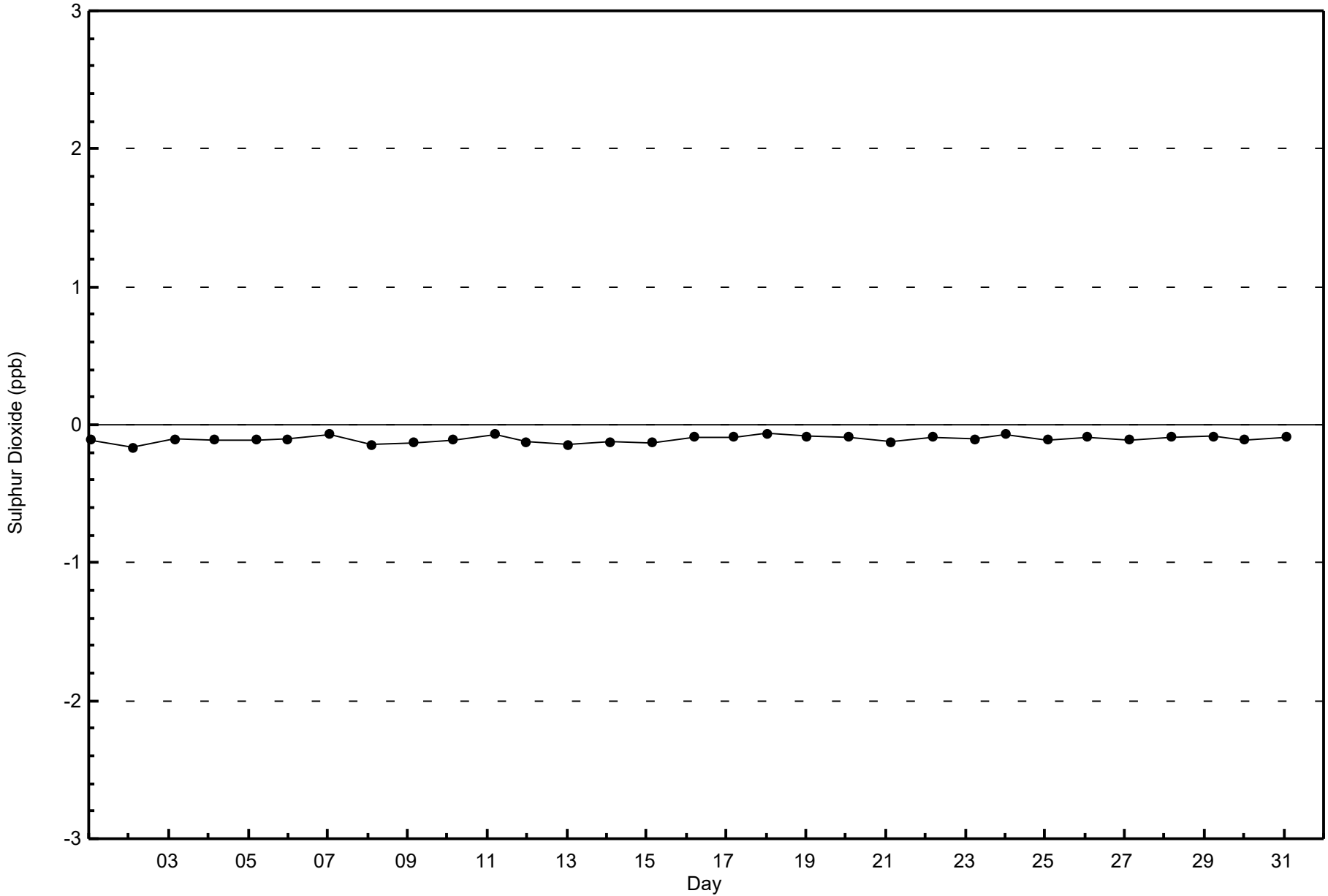
**Wood Buffalo Environmental Association
Frequency Distribution**

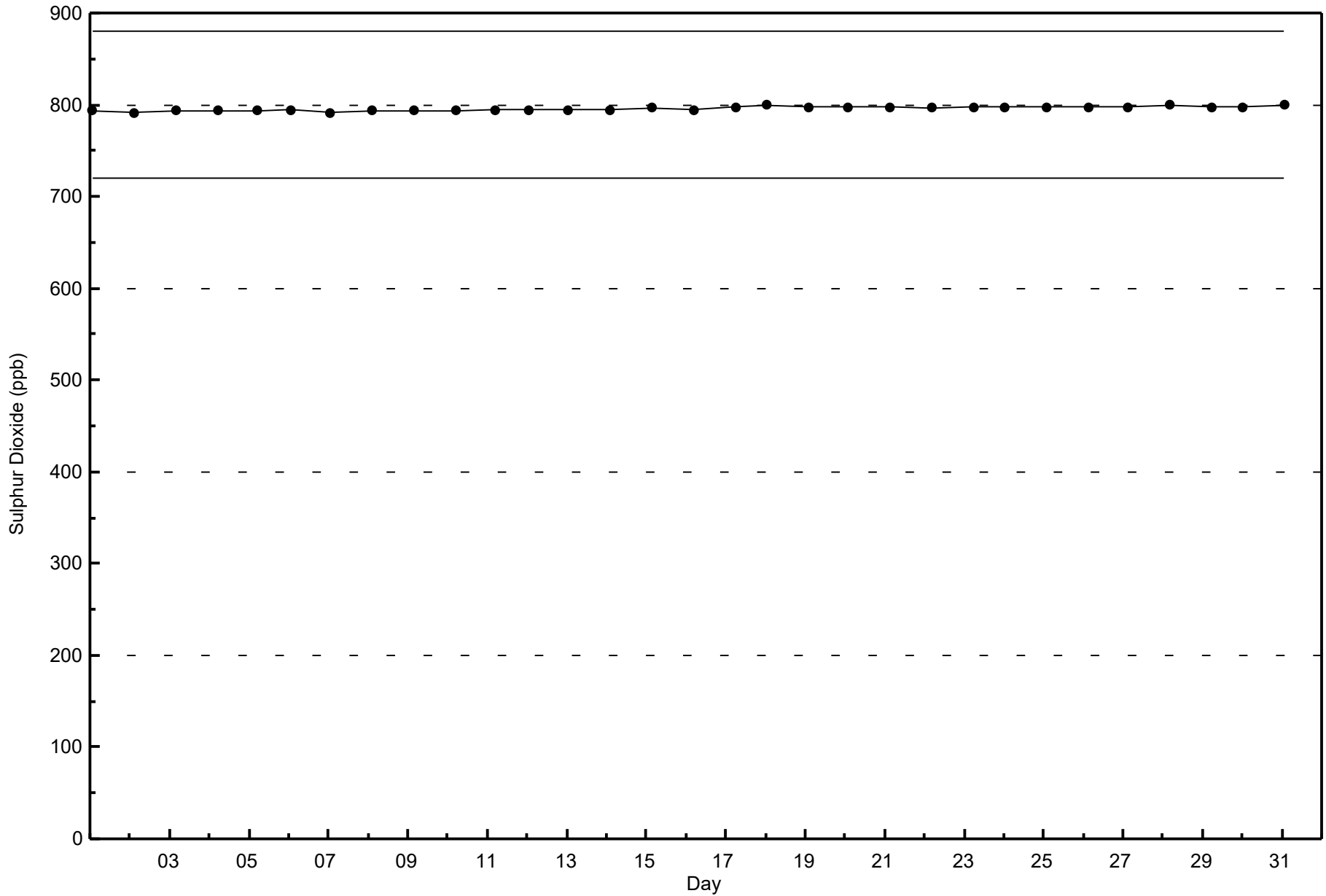
**Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - January 2023**

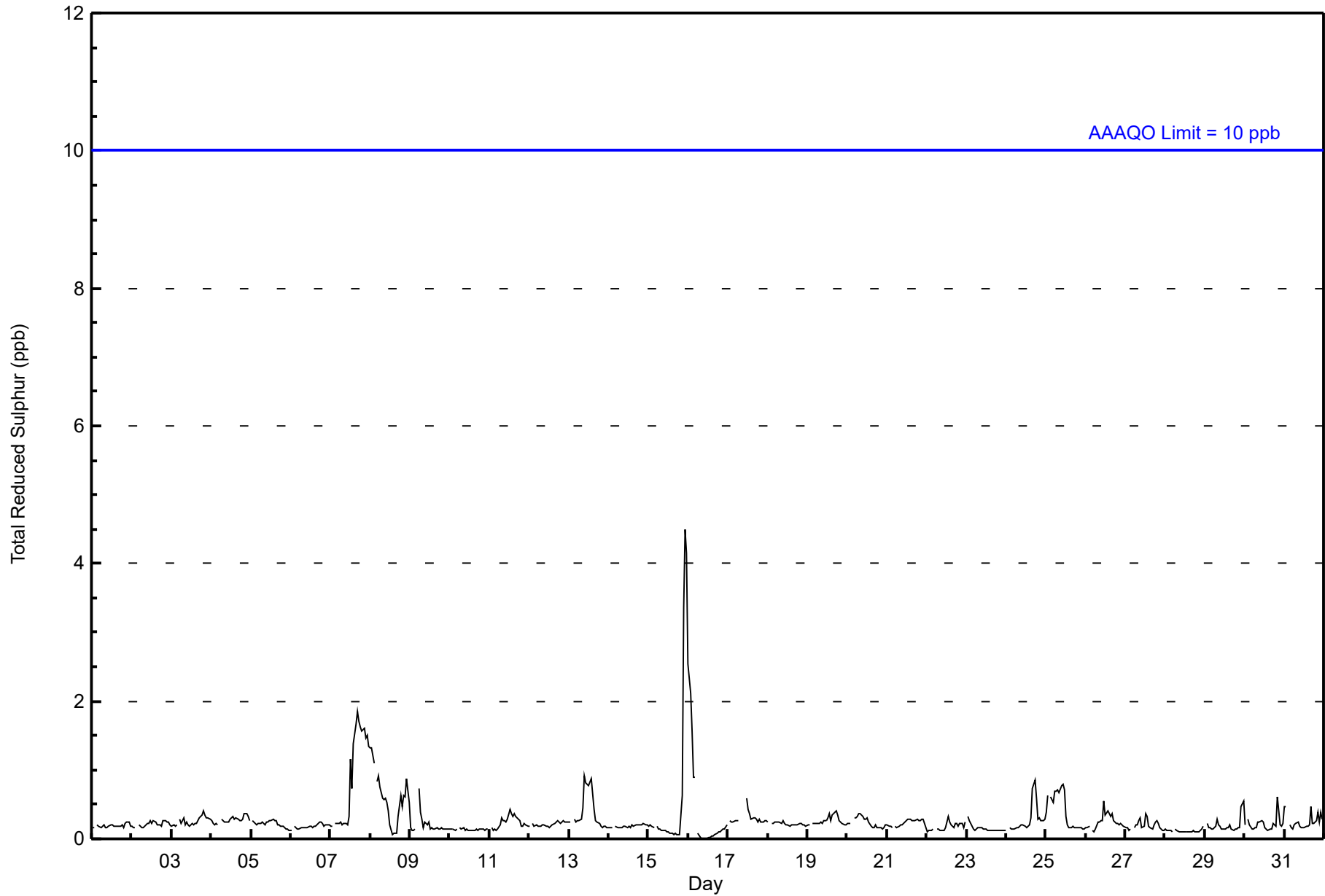
Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	54	12	10	20	40	39	186	95	50	36	46	16	20	23	17	44	708
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	10	20	40	39	186	95	50	36	46	16	20	23	18	44	709

Total Number of Valid Hours: 709

Total Number of Hours: 744









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	99.44	99.44
3 - 4	4	0.56	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	53	11	11	20	39	39	188	95	48	36	46	16	20	21	19	43	705
3 - 4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	11	11	20	39	39	188	95	48	36	46	16	20	21	19	45	709

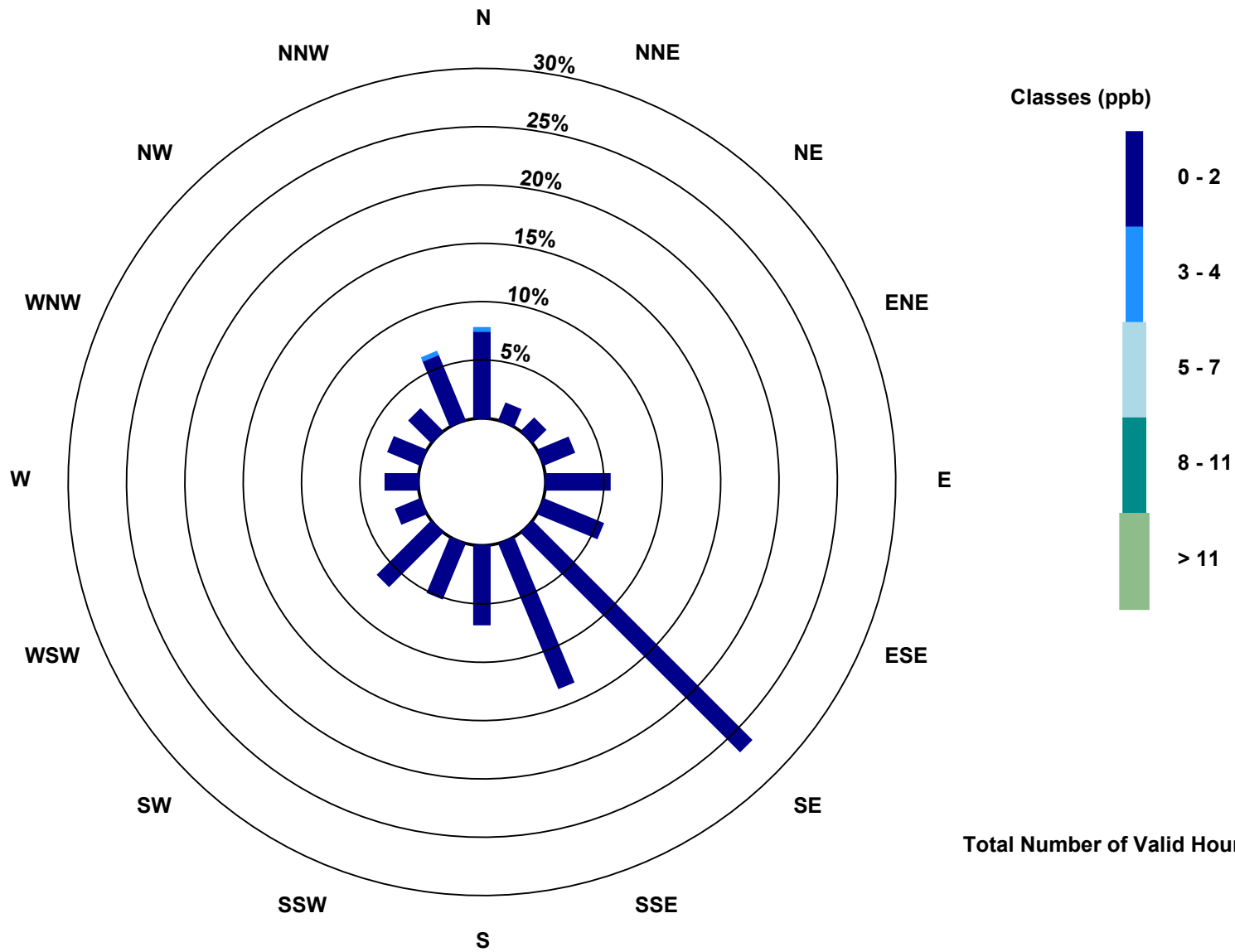
Total Number of Valid Hours: 709

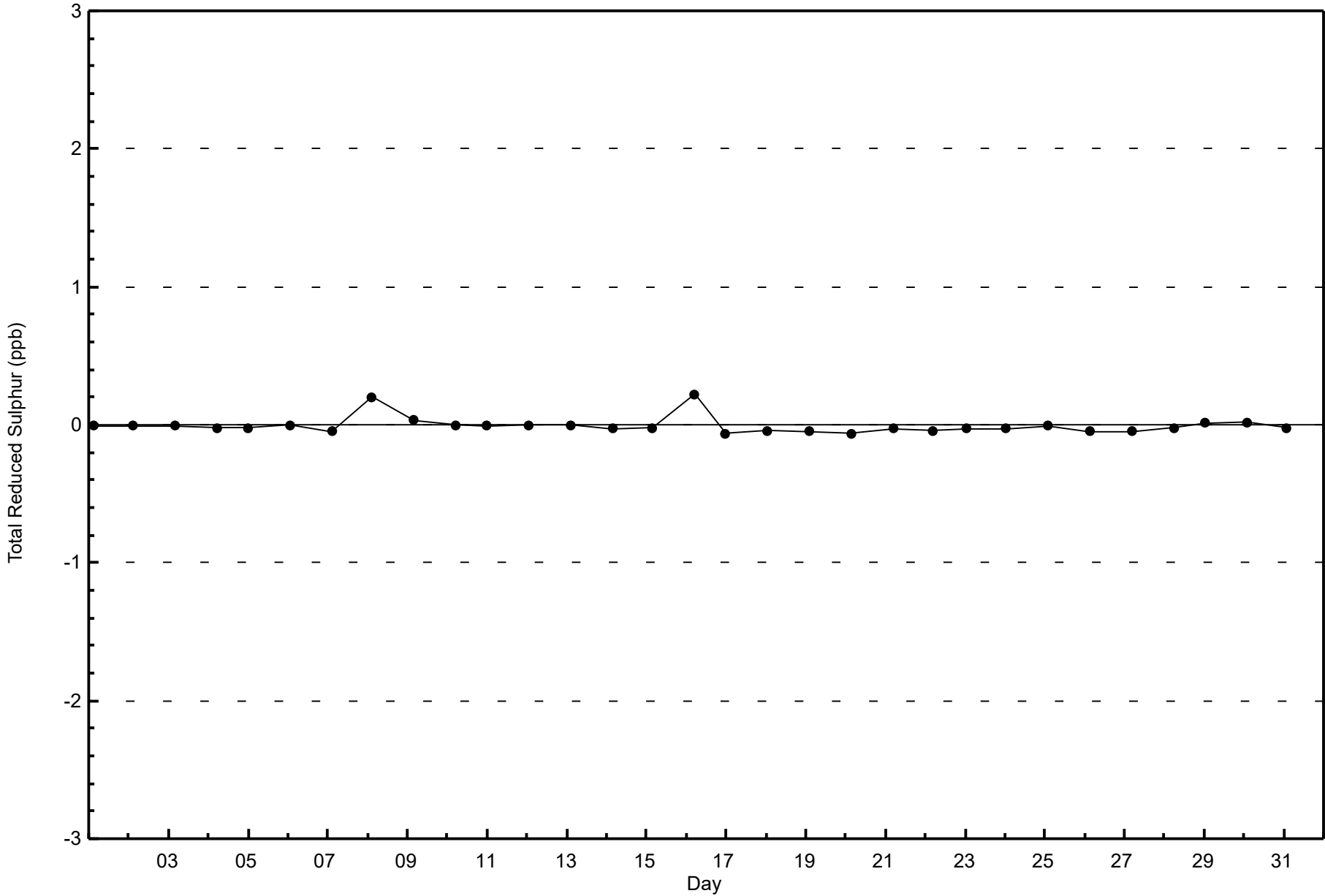
Total Number of Hours: 744

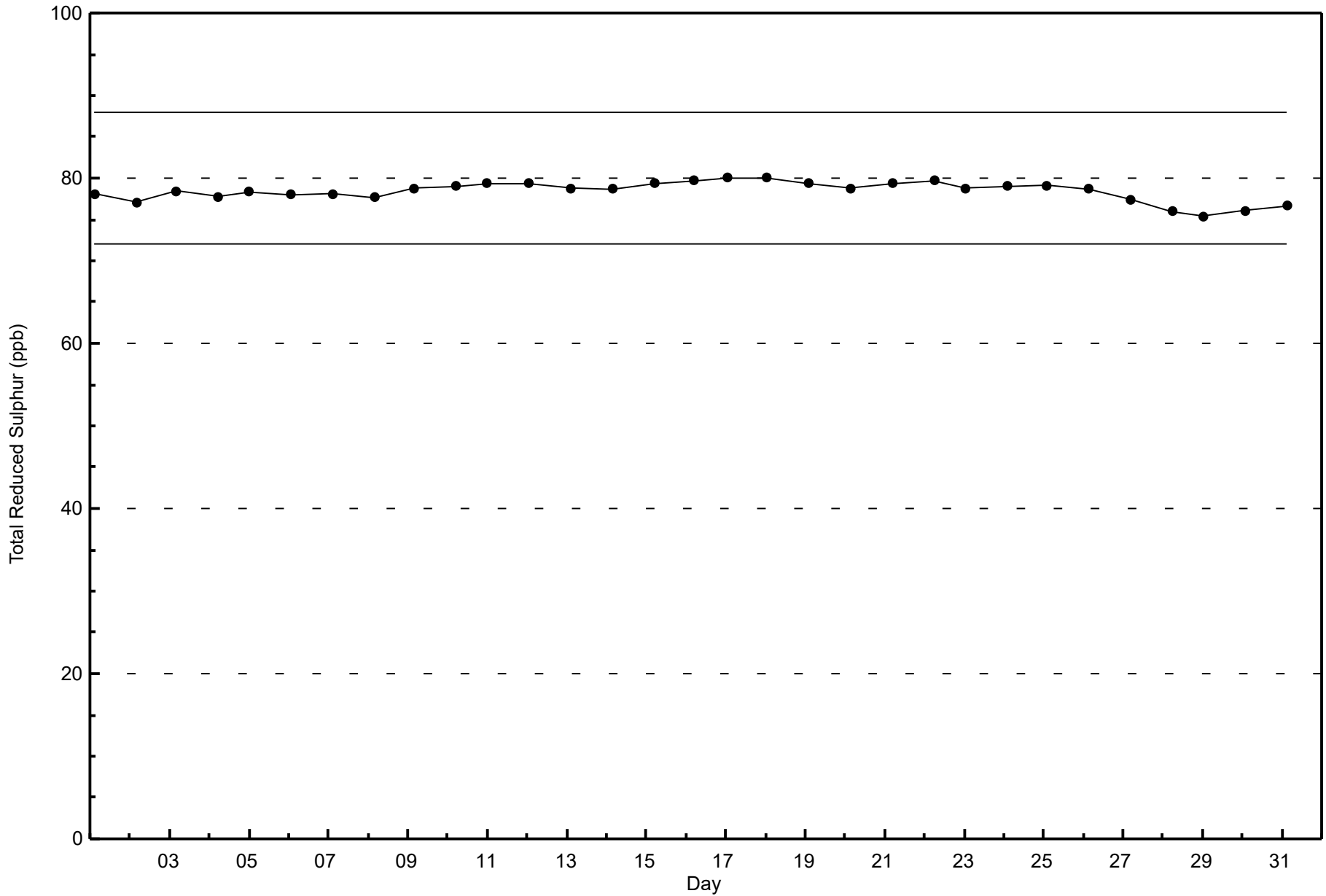


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

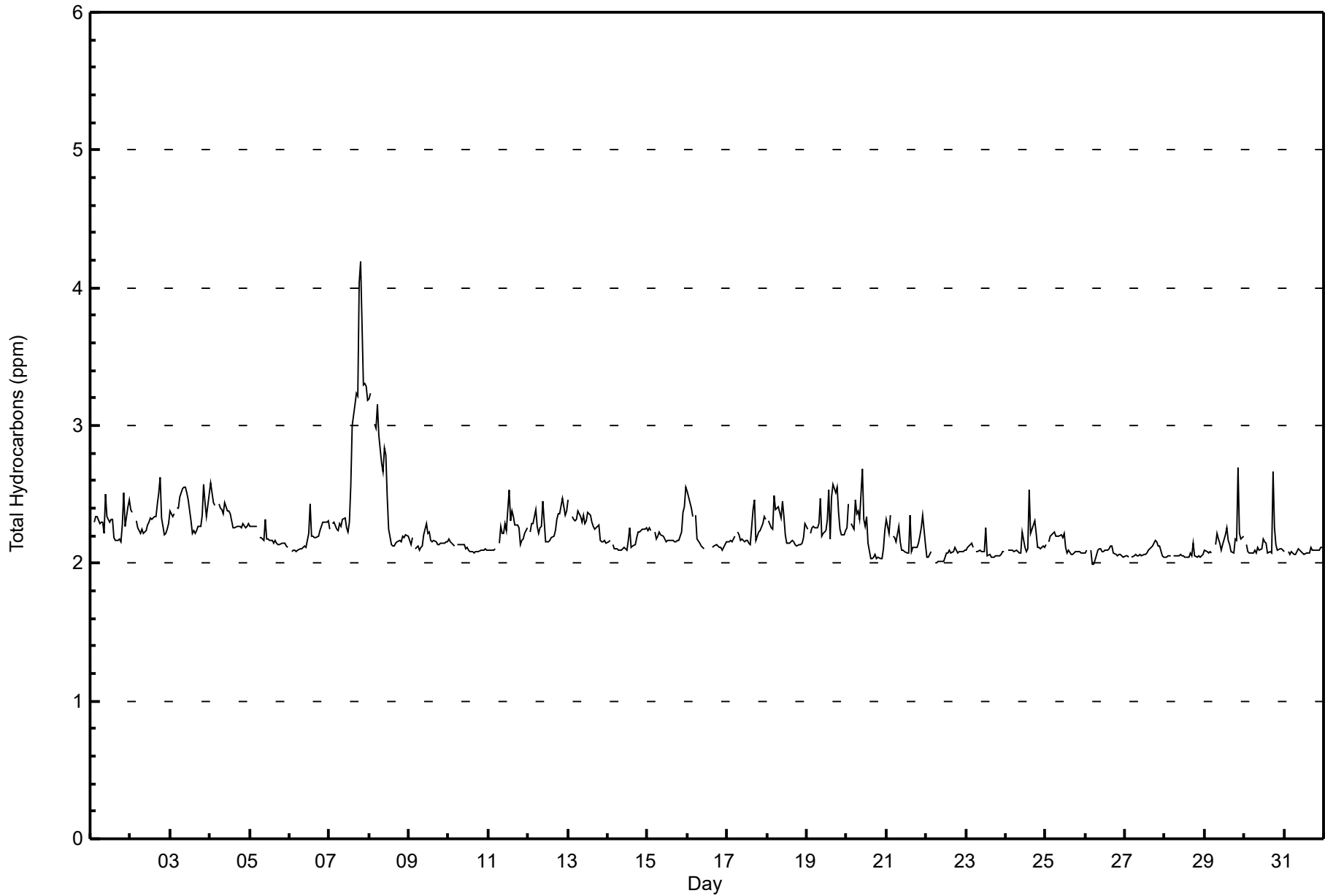
Total Hydrocarbons (THC) - ppm
Athabasca Valley - January 2023

Maximum Value: 4.2 ppm on Jan 7 20:00		Maximum Daily Average: 2.8 ppm on Jan 7		Hours in Service: 744																						
Minimum Value: 2.0 ppm on Jan 26 05:00		Minimum Daily Average: 2.1 ppm on Jan 28		Hours of Data: 709																						
Maximum Diurnal Average: 2.3 ppm at hour 1		Minimum Diurnal Average: 2.2 ppm at hour 14		Hours of Missing Data: 35																						
Monthly Average: 2.22 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 3.2		Hours of Calibration: 35																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.5	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.3	2.4	2.5	2.3	2.5
2-Jan	2.4	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.6	2.3	2.2	2.2	2.2	2.3	2.3	2.6
3-Jan	2.4	2.3	2.4	Z	2.4	2.4	2.5	2.5	2.6	2.6	2.5	2.5	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.6	2.4	2.3	2.5	2.4	2.6
4-Jan	2.6	2.5	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6
5-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
6-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.4
7-Jan	2.2	Z	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.6	3.0	3.2	3.2	3.2	4.0	4.2	3.3	3.3	3.3	3.2	2.8	4.2
8-Jan	3.2	3.2	Z	3.0	3.0	3.2	2.9	2.7	2.7	2.8	2.8	2.5	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	3.2
9-Jan	2.2	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3
10-Jan	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
11-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.3	2.2	2.2	2.3	2.2	2.5	2.3	2.4	2.3	2.3	2.3	2.3	2.1	2.2	2.2	2.2	2.3	2.2	2.5
12-Jan	Z	2.2	2.3	2.3	2.4	2.3	2.2	2.3	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.4	2.3	2.4	2.3	2.5
13-Jan	2.5	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5
14-Jan	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3
15-Jan	2.2	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.2	2.5
16-Jan	2.5	2.4	2.4	2.3	Z	2.3	2.2	2.1	2.1	2.1	2.1	C	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5
17-Jan	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.4	2.5	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.5
18-Jan	Z	2.3	2.3	2.2	2.5	2.4	2.4	2.4	2.3	2.5	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.5
19-Jan	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.5	2.2	2.2	2.2	2.3	2.5	2.2	2.5	2.6	2.5	2.6	2.4	2.2	2.2	2.2	2.2	2.3	2.6
20-Jan	2.3	2.4	Z	2.3	2.2	2.5	2.4	2.4	2.3	2.7	2.3	2.3	2.3	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.7
21-Jan	2.3	2.2	2.3	Z	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.4	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.1	2.2	2.4
22-Jan	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3
24-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.5	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.5
25-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
26-Jan	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1
27-Jan	2.1	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.2
28-Jan	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.2
29-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.7	2.2	2.2	2.2	2.2	2.7
30-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.7	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.7
31-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Athabasca Valley - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	36	5.08	5.08
2.1 - 3.0	661	93.23	98.31
3.1 - 10.0	12	1.69	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	1	2	0	1	0	0	0	1	2	4	2	5	7	6	2	36
2.1 - 3.0	50	9	8	18	38	37	185	95	48	34	41	14	14	16	12	42	661
3.1 - 10.0	1	2	0	2	1	2	1	0	1	0	1	0	1	0	0	0	12
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	10	20	40	39	186	95	50	36	46	16	20	23	18	44	709

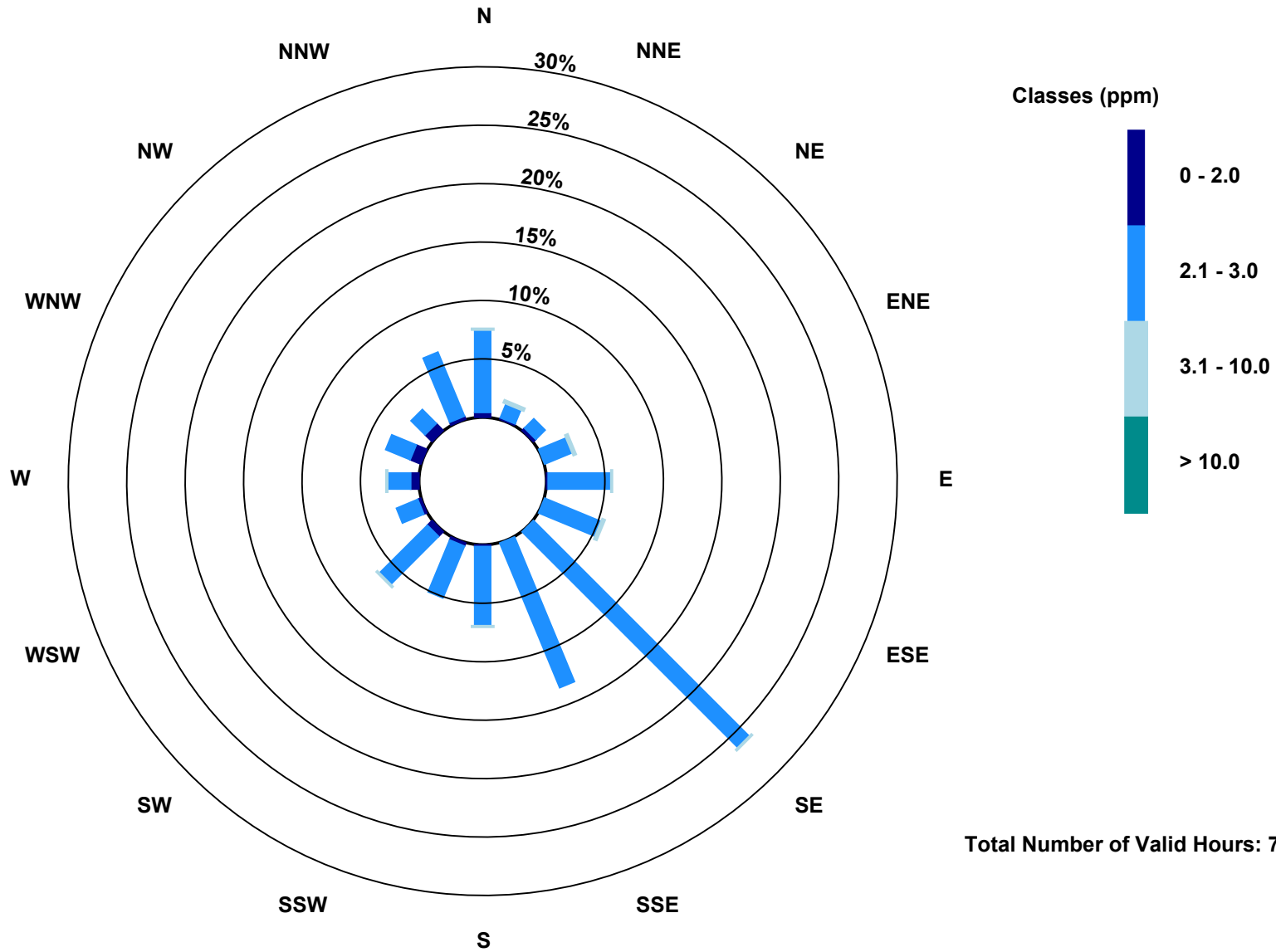
Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

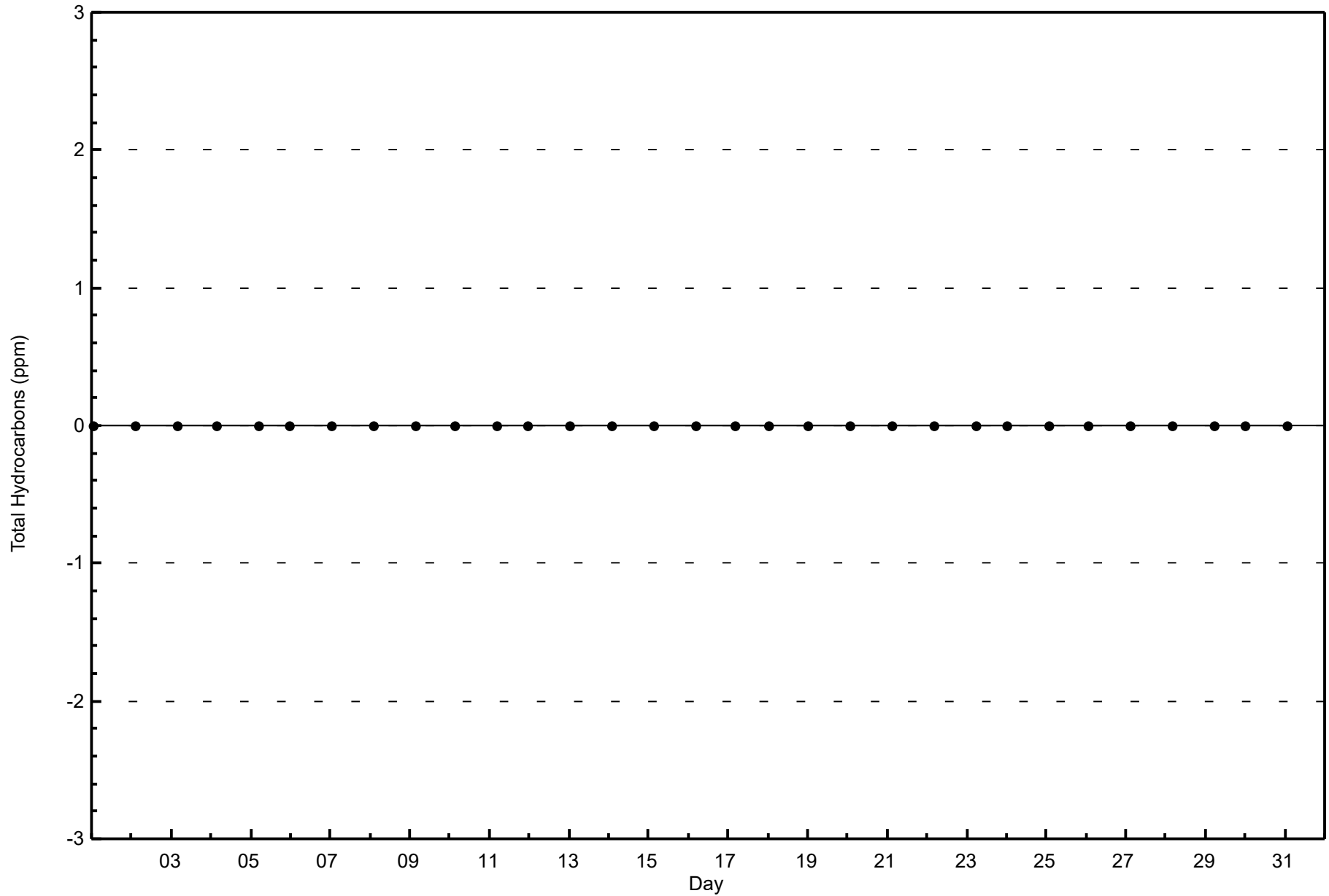
Total Hydrocarbons (THC) - ppm
Athabasca Valley

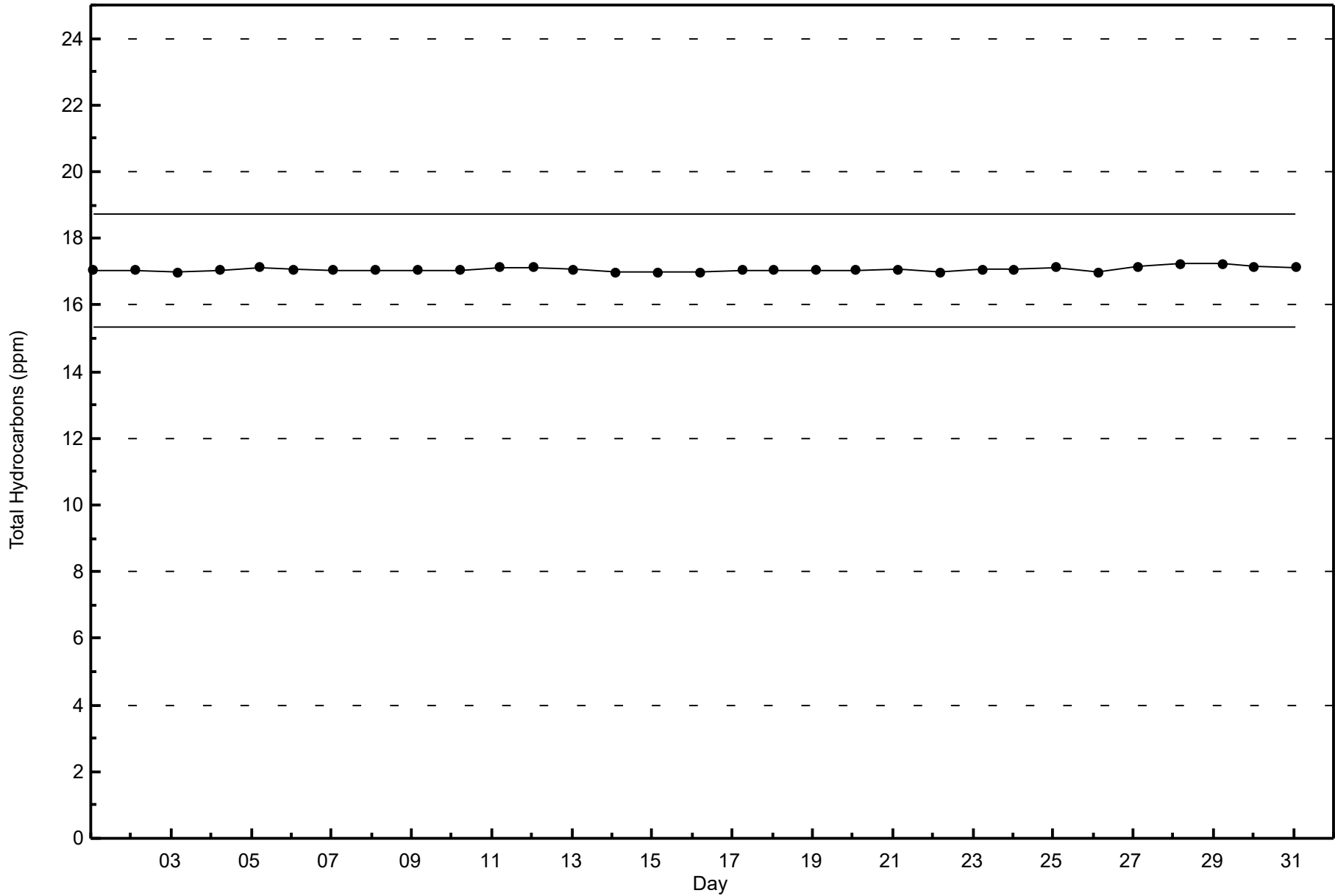




Wood Buffalo Environmental Association
Zero Responses

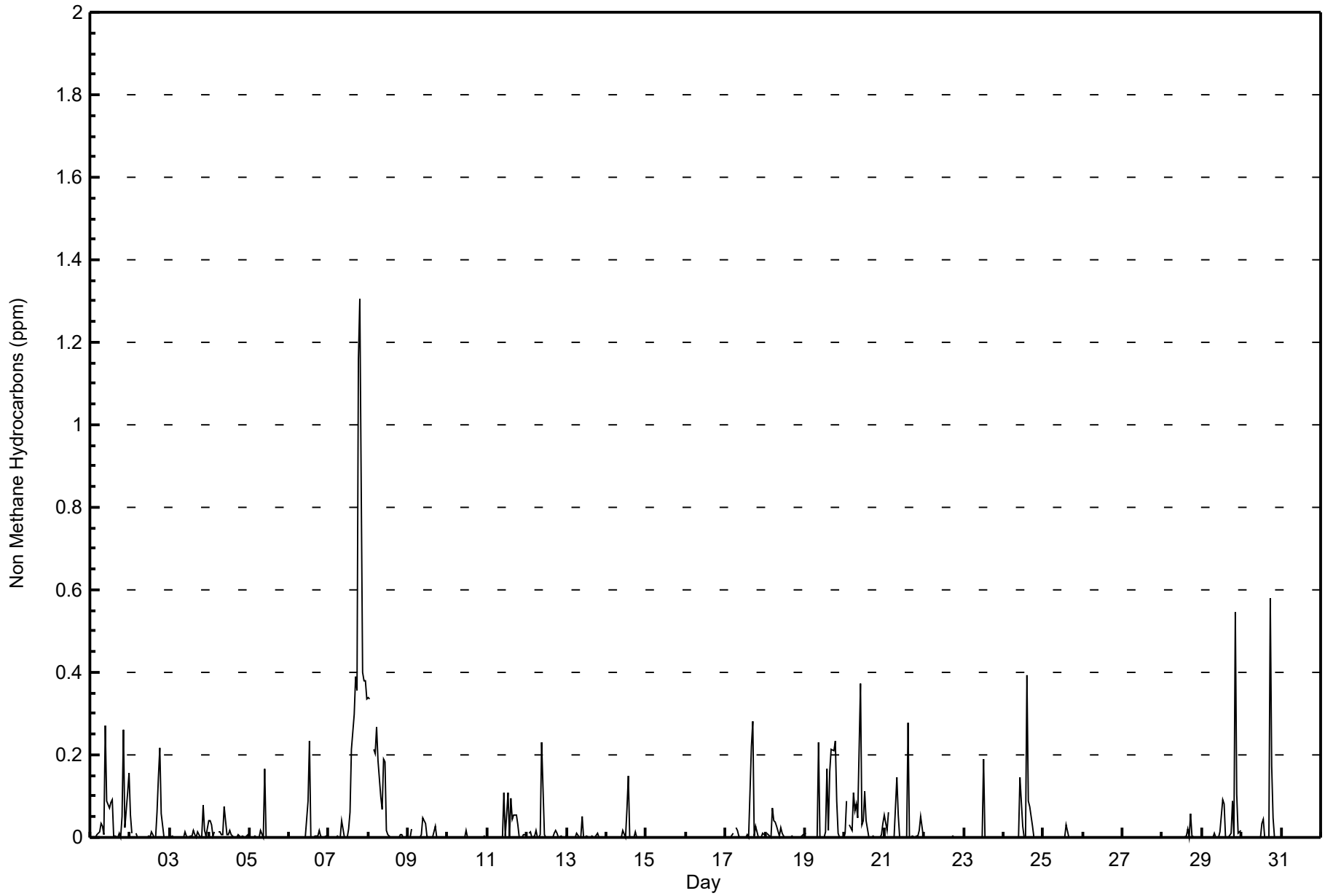
Total Hydrocarbons (THC) - ppm
Athabasca Valley - January 2023







Maximum Value: 1.307 ppm on Jan 7 20:00																				Maximum Daily Average: 0.232 ppm on Jan 7					Hours in Service: 744		
Minimum Value: 0.000 ppm on Jan 1 01:00																				Minimum Daily Average: 0.000 ppm on Jan 15					Hours of Data: 709		
Maximum Diurnal Average: 0.064 ppm at hour 19																				Minimum Diurnal Average: 0.004 ppm at hour 3					Hours of Missing Data: 35		
Monthly Average: 0.026 ppm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.4					Hours of Calibration: 35		
																									Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.000	Z	0.000	0.000	0.007	0.013	0.035	0.027	0.005	0.272	0.090	0.071	0.084	0.092	0.002	0.002	0.000	0.009	0.000	0.052	0.261	0.024	0.108	0.157	0.057	0.272	
2-Jan	0.055	0.010	Z	0.009	0.000	0.001	0.000	0.000	0.000	0.002	0.002	0.004	0.000	0.014	0.000	0.000	0.060	0.144	0.218	0.059	0.000	0.000	0.000	0.000	0.025	0.218	
3-Jan	0.000	0.003	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.012	0.004	0.000	0.002	0.002	0.015	0.006	0.000	0.012	0.000	0.004	0.077	0.016	0.003	0.040	0.009	0.077	
4-Jan	0.039	0.032	0.002	0.012	Z	0.015	0.013	0.006	0.008	0.076	0.006	0.007	0.016	0.006	0.004	0.000	0.000	0.006	0.004	0.001	0.004	0.000	0.002	0.006	0.012	0.076	
5-Jan	0.001	0.001	0.001	0.004	0.000	Z	0.000	0.016	0.000	0.165	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.165	
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.089	0.233	0.000	0.000	0.000	0.004	0.002	0.016	0.005	0.000	0.000	0.004	0.005	0.016	0.233	
7-Jan	0.000	Z	0.002	0.000	0.000	0.003	0.000	0.000	0.039	0.000	0.000	0.000	0.021	0.060	0.215	0.298	0.391	0.357	1.160	1.307	0.401	0.380	0.379	0.335	0.232	1.307	
8-Jan	0.337	0.336	Z	0.215	0.203	0.267	0.187	0.099	0.067	0.189	0.182	0.018	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.006	0.000	0.000	0.003	0.092	0.337	
9-Jan	0.001	0.000	0.020	Z	0.001	0.000	0.000	0.000	0.006	0.049	0.033	0.005	0.000	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.049	
10-Jan	0.000	0.002	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.016	
11-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.108	0.003	0.107	0.000	0.095	0.043	0.053	0.054	0.031	0.000	0.000	0.000	0.007	0.007	0.022	0.108	
12-Jan	Z	0.011	0.013	0.000	0.002	0.018	0.002	0.000	0.007	0.230	0.007	0.000	0.000	0.000	0.000	0.000	0.011	0.017	0.012	0.000	0.004	0.000	0.000	0.000	0.014	0.230	
13-Jan	0.007	Z	0.002	0.000	0.000	0.000	0.011	0.000	0.000	0.052	0.000	0.000	0.002	0.000	0.000	0.005	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.004	0.052	
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.067	0.150	0.000	0.000	0.000	0.015	0.001	0.000	0.000	0.000	0.000	0.000	0.011	0.150	
15-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
16-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.001	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	
17-Jan	0.000	0.000	0.000	0.000	0.011	Z	0.025	0.018	0.002	0.002	0.000	0.000	0.000	0.008	0.000	0.221	0.281	0.002	0.028	0.015	0.000	0.000	0.009	0.006	0.027	0.281	
18-Jan	Z	0.009	0.004	0.000	0.071	0.042	0.037	0.027	0.002	0.025	0.011	0.005	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.007	0.011	0.071	
19-Jan	0.009	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.230	0.000	0.000	0.001	0.014	0.167	0.017	0.160	0.215	0.212	0.233	0.089	0.009	0.000	0.000	0.001	0.059	0.233	
20-Jan	0.009	0.089	Z	0.032	0.018	0.109	0.066	0.080	0.047	0.374	0.031	0.040	0.111	0.040	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.007	0.034	0.047	0.374	
21-Jan	0.053	0.019	0.061	Z	0.000	0.002	0.000	0.145	0.055	0.000	0.000	0.000	0.000	0.000	0.277	0.000	0.000	0.003	0.000	0.002	0.004	0.018	0.051	0.001	0.030	0.277	
22-Jan	0.000	0.000	0.002	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
23-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.190	
24-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.145	0.027	0.000	0.000	0.393	0.089	0.075	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.393	
25-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.030	
26-Jan	0.001	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
27-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
28-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.020	0.000	0.058	0.002	0.000	0.000	0.000	0.000	0.000	0.004	0.058	
29-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.011	0.001	0.000	0.000	0.014	0.091	0.081	0.000	0.000	0.000	0.009	0.087	0.001	0.547	0.105	0.010	0.018	0.042	0.547	
30-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.035	0.043	0.000	0.000	0.000	0.579	0.173	0.049	0.000	0.000	0.000	0.000	0.038	0.579	
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
																				0.020 0.020 0.004 0.011 0.012 0.018 0.012 0.014 0.015 0.047 0.020 0.010 0.033 0.022 0.035 0.027 0.036 0.049 0.064 0.051 0.042 0.017 0.019 0.020					Diurnal Average		
																				0.337 0.336 0.061 0.215 0.203 0.267 0.187 0.145 0.230 0.374 0.182 0.089 0.233 0.167 0.393 0.298 0.391 0.579 1.160 1.307 0.547 0.380 0.379 0.335					Diurnal Maximum		
Z - zerospan																				C - Calibration							





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	526	74.19	74.19
0.006 - 0.05	105	14.81	89.00
0.06 - 0.1	37	5.22	94.22
> 0.1	41	5.78	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	47	9	9	11	37	25	126	63	33	27	35	12	15	22	15	40	526
0.006 - 0.05	3	1	1	5	2	9	34	18	10	6	6	3	2	0	3	2	105
0.06 - 0.1	1	0	0	0	0	3	13	10	3	0	2	1	1	1	0	2	37
> 0.1	3	2	0	4	1	2	13	4	4	3	3	0	2	0	0	0	41
Totals	54	12	10	20	40	39	186	95	50	36	46	16	20	23	18	44	709

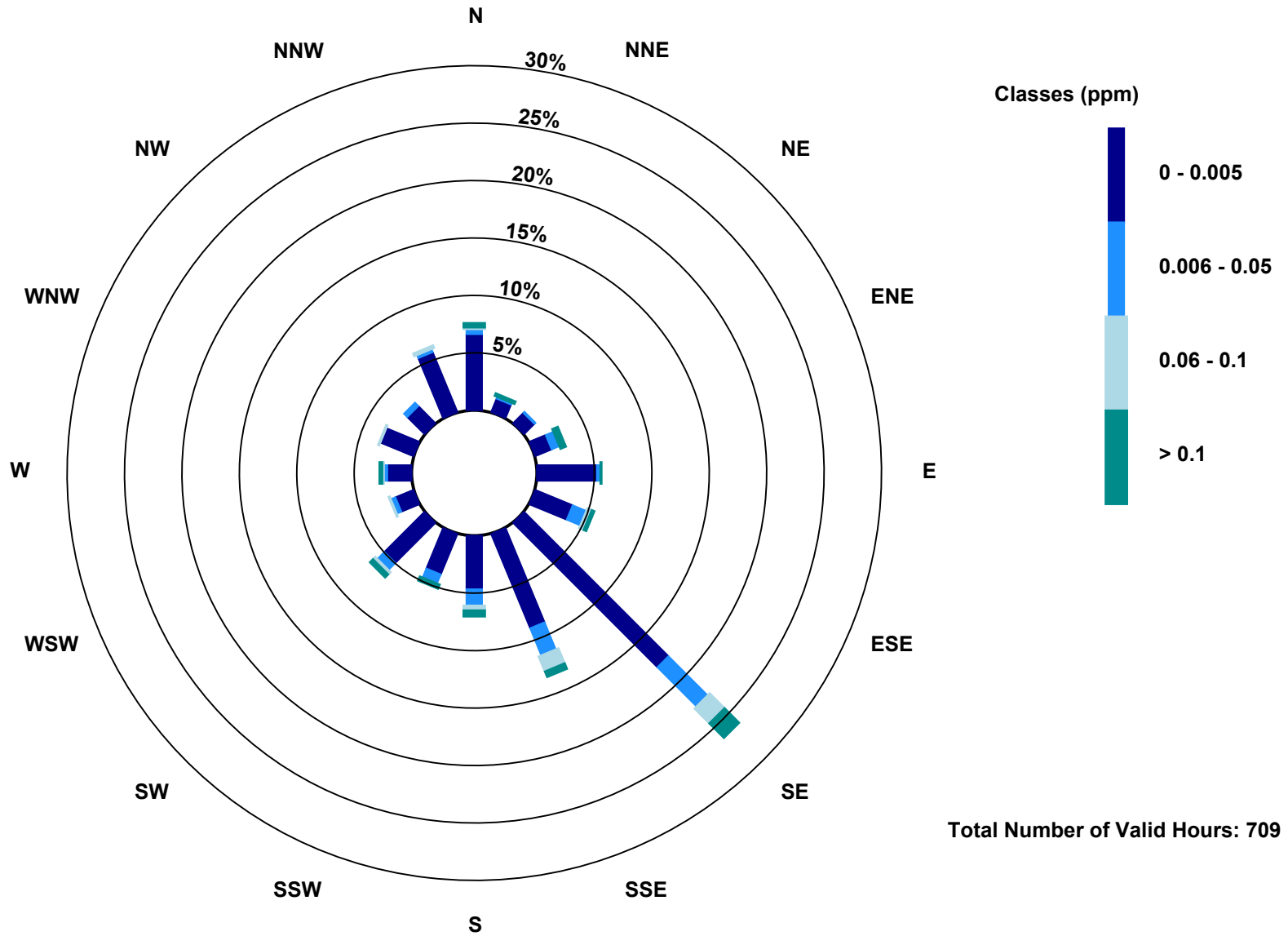
Total Number of Valid Hours: 709

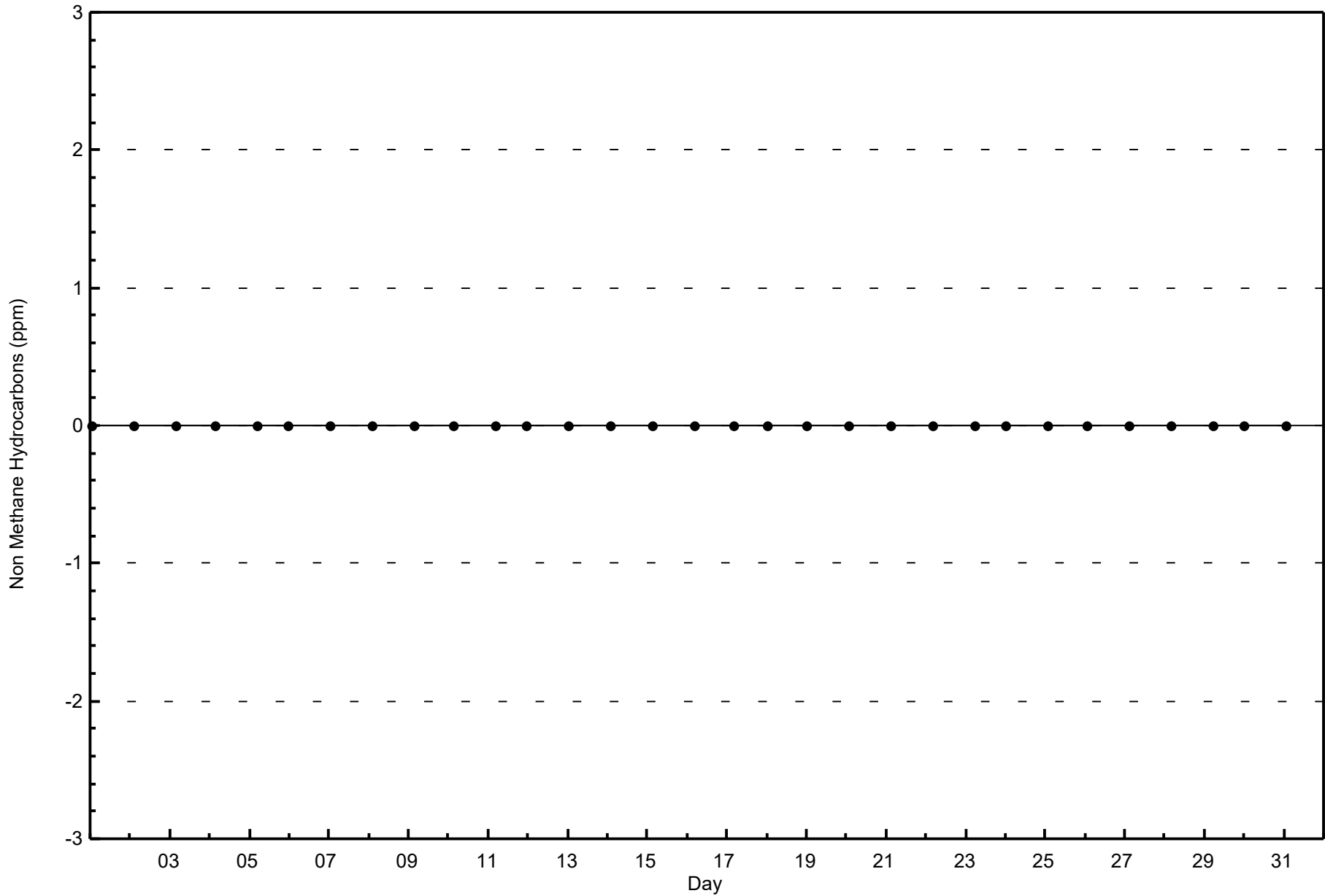
Total Number of Hours: 744

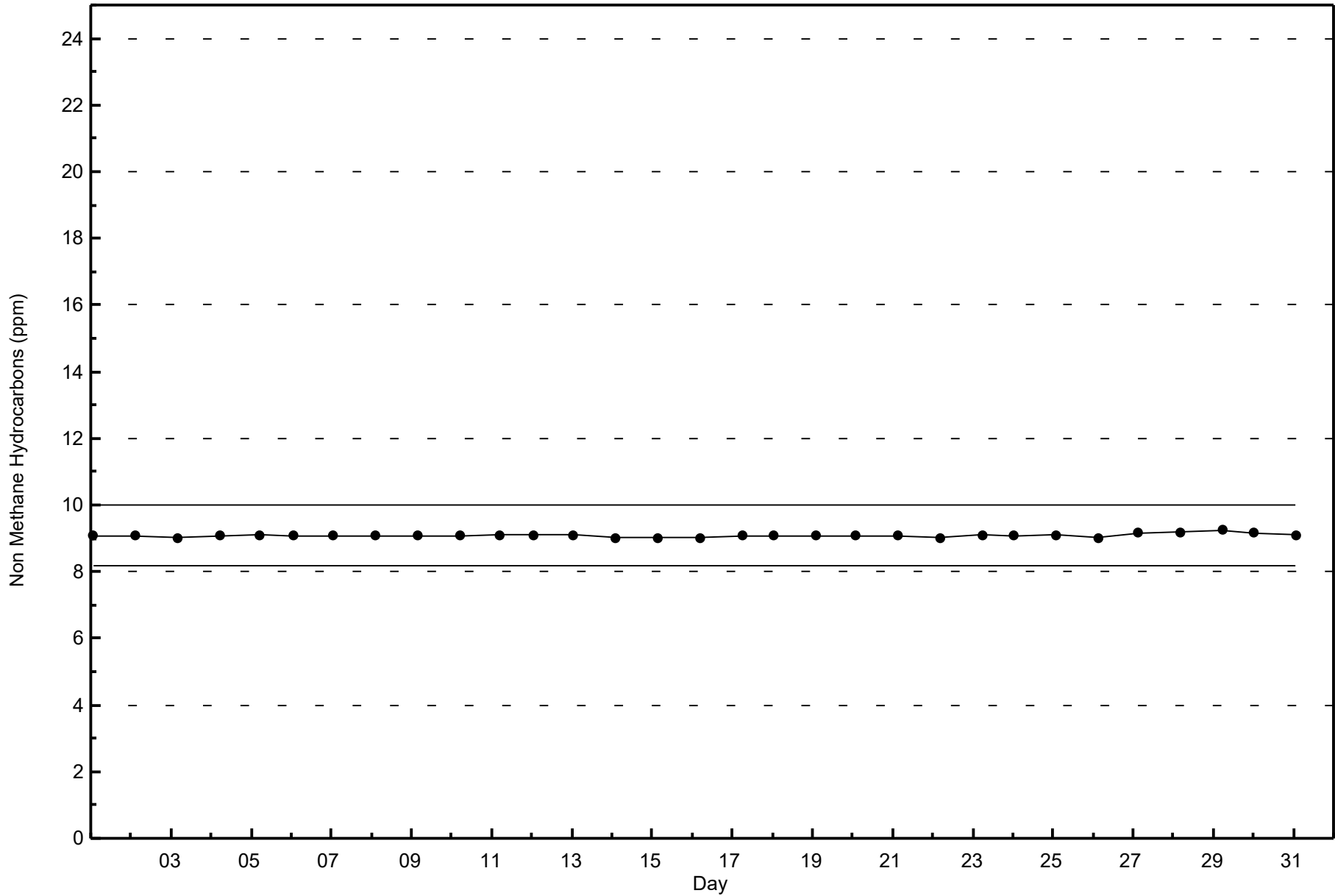


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley

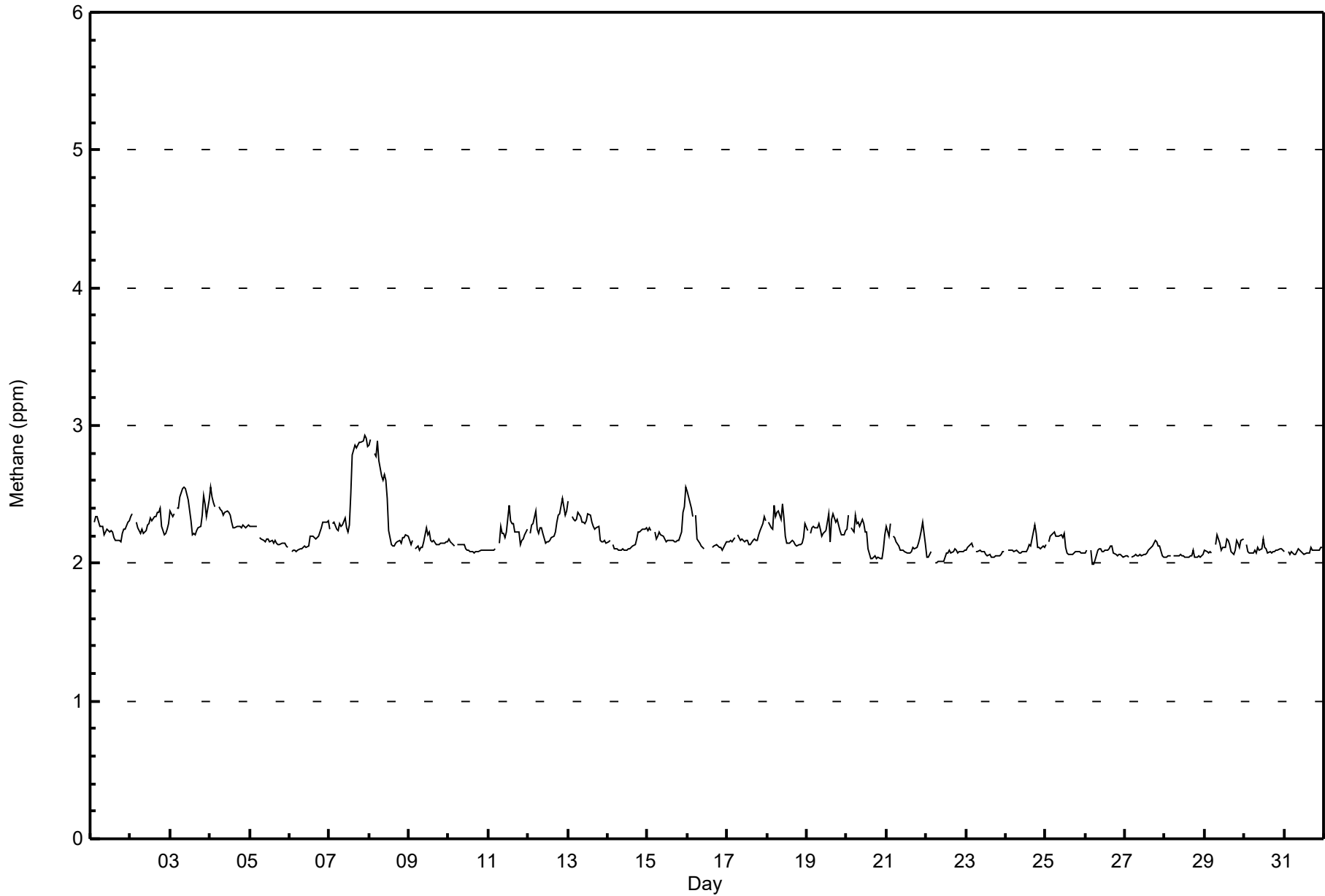








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																														
Maximum Value: 2.9 ppm on Jan 7 22:00		Maximum Daily Average: 2.5 ppm on Jan 7		Hours of Data: 709														709																																
Minimum Value: 2.0 ppm on Jan 26 05:00		Minimum Daily Average: 2.1 ppm on Jan 28		Hours of Missing Data: 35														35																																
Maximum Diurnal Average: 2.2 ppm at hour 1		Minimum Diurnal Average: 2.2 ppm at hour 15		Hours of Calibration: 35														35																																
Monthly Average: 2.20 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.4 P ₉₉ = 2.9		Percent Operational Time: 100.0														100.0																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2																								
2-Jan	2.3	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3																							
3-Jan	2.4	2.3	2.4	Z	2.4	2.4	2.5	2.5	2.6	2.5	2.5	2.5	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.4	2.3	2.5	2.4	2.6																								
4-Jan	2.5	2.5	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5																								
5-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3																							
6-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3																							
7-Jan	2.2	Z	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.5	2.8	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.5	2.9																							
8-Jan	2.9	2.9	Z	2.8	2.8	2.9	2.7	2.6	2.6	2.6	2.6	2.5	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.9																							
9-Jan	2.2	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3																							
10-Jan	2.2	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
11-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.3	2.2	2.2	2.2	2.2	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.4																							
12-Jan	Z	2.2	2.3	2.3	2.4	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.4	2.3	2.4	2.3	2.5																							
13-Jan	2.5	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5																							
14-Jan	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3																							
15-Jan	2.2	2.3	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.5	2.2	2.5																								
16-Jan	2.5	2.4	2.4	2.3	Z	2.3	2.2	2.1	2.1	2.1	2.1	C	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5																							
17-Jan	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3																							
18-Jan	Z	2.3	2.3	2.2	2.4	2.3	2.4	2.4	2.3	2.4	2.3	2.2	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.4																							
19-Jan	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4																							
20-Jan	2.2	2.3	Z	2.3	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4																							
21-Jan	2.3	2.2	2.3	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.3	2.3																							
22-Jan	2.0	2.0	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
23-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																						
24-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
25-Jan	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
26-Jan	2.1	2.1	Z	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1																							
27-Jan	2.1	2.1	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.2																							
28-Jan	2.0	2.0	2.0	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1																							
29-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.2																							
30-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
31-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
																								2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average
																								2.9	2.9	2.4	2.8	2.8	2.9	2.7	2.6	2.6	2.6	2.6	2.5	2.4	2.5	2.8	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	Diurnal Maximum
Z - zerospan																								C - Calibration																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	37	5.22	5.22
2.1 - 3.0	672	94.78	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



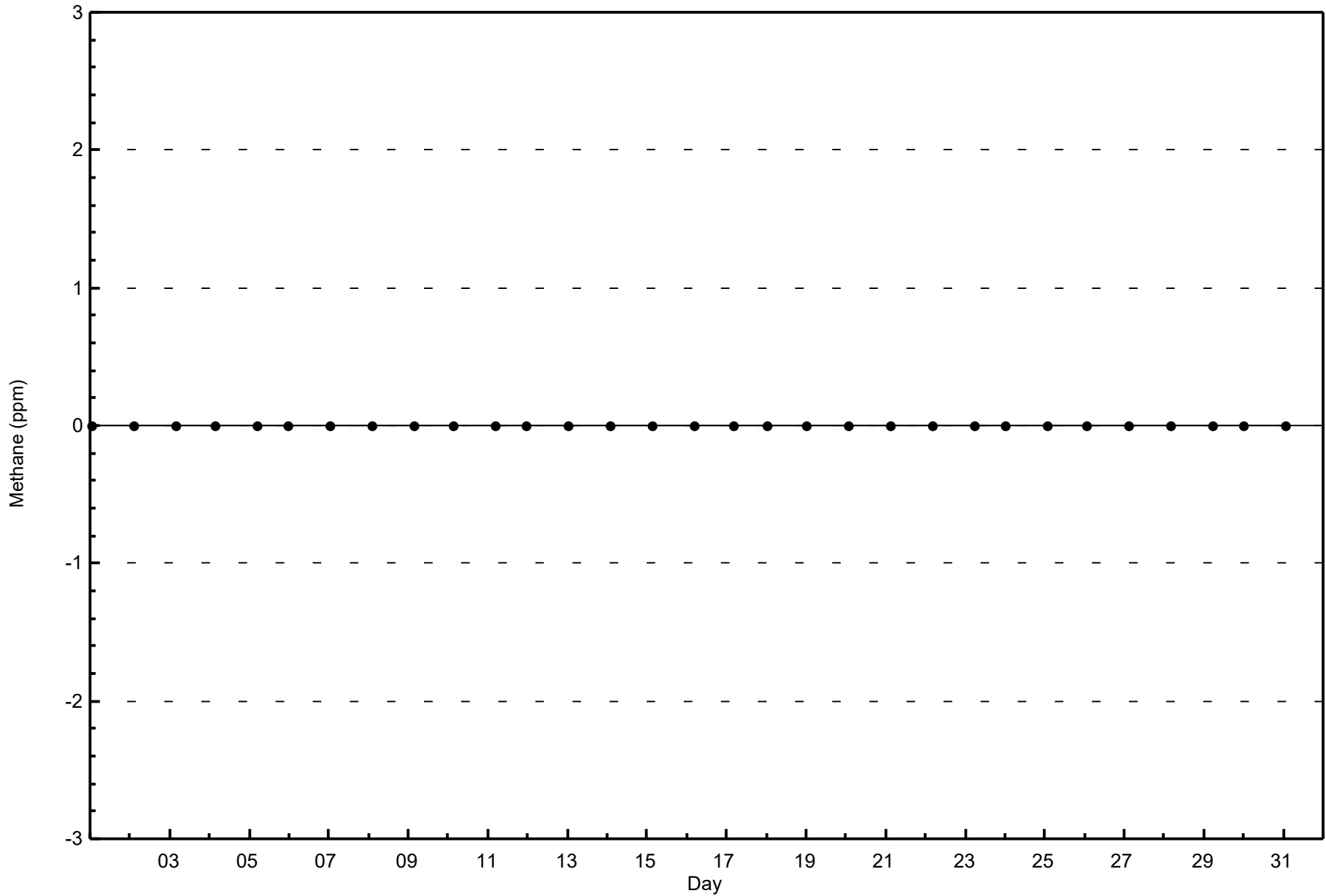
**Wood Buffalo Environmental Association
Frequency Distribution**

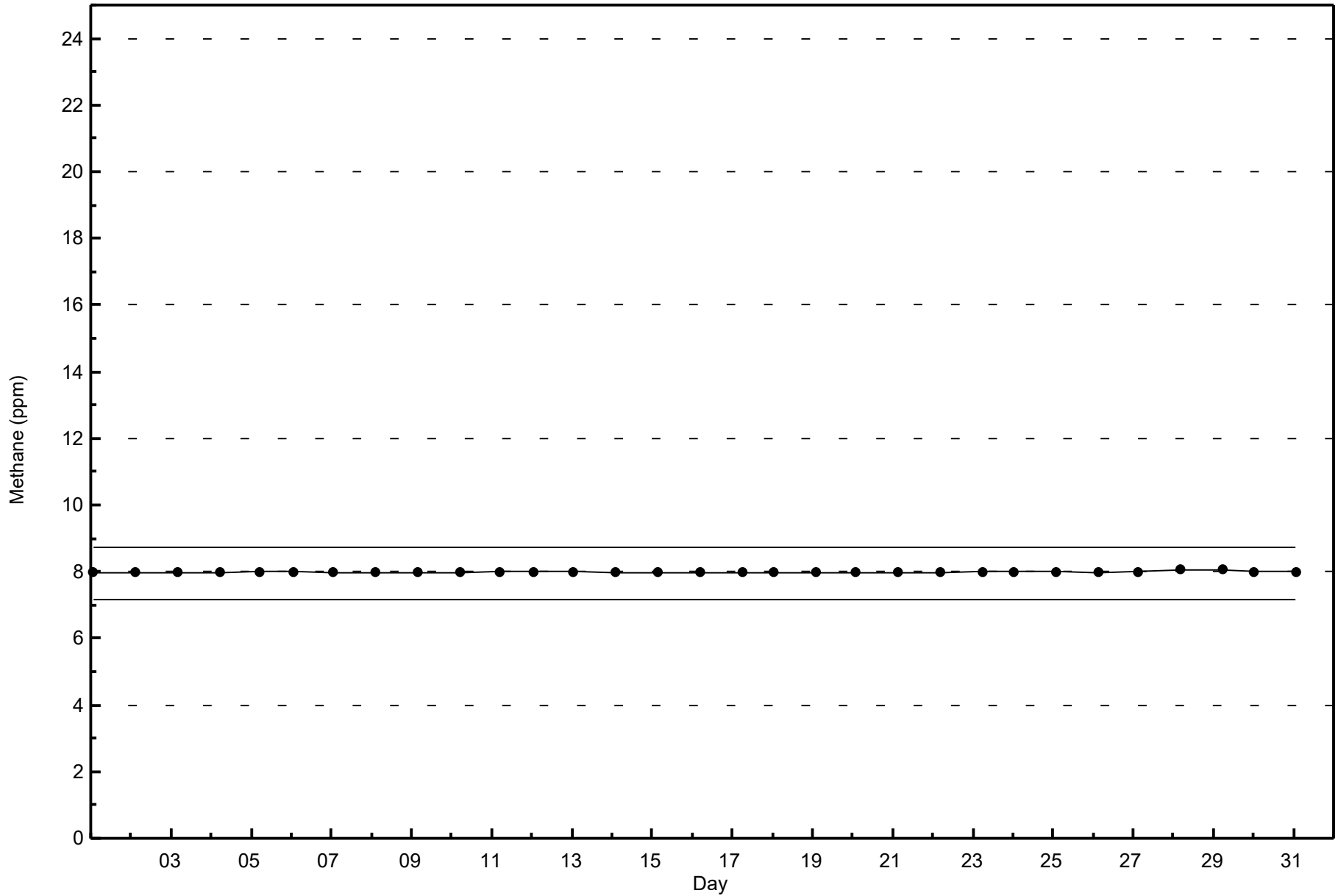
**Methane (CH₄) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	3	1	2	0	1	0	0	0	1	2	4	2	5	7	7	2	37
2.1 - 3.0	51	11	8	20	39	39	186	95	49	34	42	14	15	16	11	42	672
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	10	20	40	39	186	95	50	36	46	16	20	23	18	44	709

Total Number of Valid Hours: 709

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

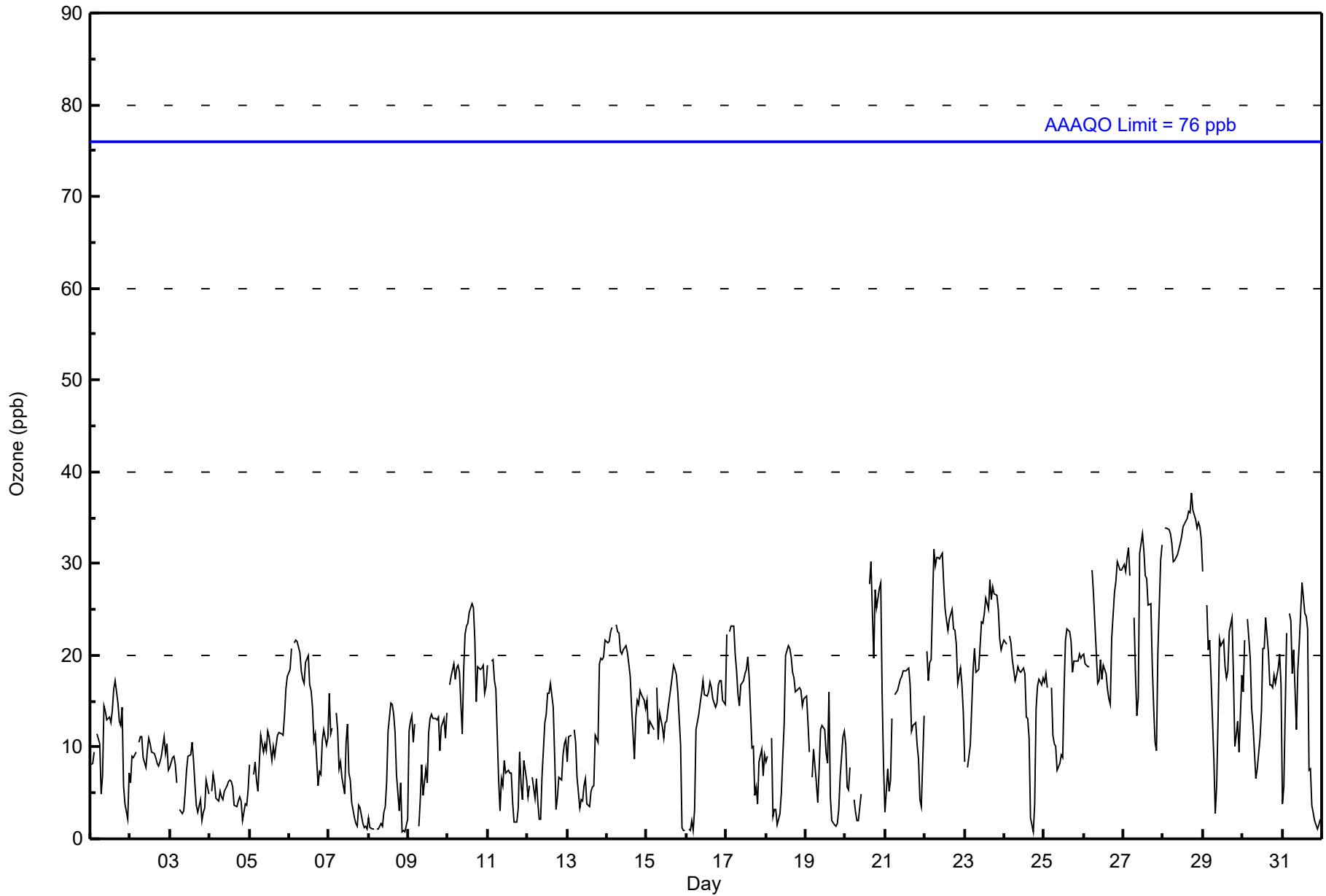
Ozone (O₃) - ppb

Athabasca Valley - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 37.6 ppb on Jan 28 18:00	Maximum Daily Average: 33.6 ppb on Jan 28		Hours of Data:	709
Minimum Value: 0.8 ppb on Jan 24 18:00	Minimum Daily Average: 4.8 ppb on Jan 8		Hours of Missing Data:	35
Maximum Diurnal Average: 17.2 ppb at hour 15	Minimum Diurnal Average: 11.3 ppb at hour 9		Hours of Calibration:	35
Monthly Average: 13.99 ppb	Percentiles: P ₁ = 1.0 P ₁₀ = 3.5 Q ₁ = 7.3 Median = 13.3 Q ₃ = 19.1 P ₉₀ = 25.0 P ₉₉ = 34.3		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	8.1	8.2	9.5	Z	11.5	10.4	4.9	6.9	14.5	13.9	12.9	13.3	12.7	14.1	16.4	17.2	14.8	12.8	12.3	14.3	5.7	3.9	2.2	7.1	10.8	17.2																							
2-Jan	6.1	9.1	8.9	9.4	Z	10.5	11.1	11.2	8.8	7.8	9.6	10.9	10.4	9.4	9.3	8.8	8.2	8.0	8.4	9.0	11.1	9.4	10.4	7.4	9.3	11.2																							
3-Jan	7.7	8.8	9.1	8.1	6.1	Z	3.2	2.7	3.0	5.0	7.5	9.0	9.2	10.5	8.6	5.9	3.6	2.9	4.2	2.0	2.9	3.3	6.4	4.9	5.9	10.5																							
4-Jan	Z	5.2	7.1	6.2	4.5	4.2	5.2	4.6	4.3	5.2	5.8	6.3	6.4	6.2	5.6	3.6	3.5	4.2	4.5	4.1	2.0	3.9	3.6	5.4	4.9	7.1																							
5-Jan	8.0	Z	7.0	8.4	6.4	5.2	8.3	11.2	9.4	10.4	9.7	11.7	11.2	8.6	10.0	9.0	10.2	11.3	11.5	11.4	11.3	13.3	16.4	17.7	10.3	17.7																							
6-Jan	18.5	20.8	Z	21.4	21.6	21.5	20.2	18.3	17.3	16.9	19.2	19.9	16.7	16.2	14.3	10.6	11.5	5.8	7.3	7.0	10.7	11.8	10.2	11.0	15.2	21.6																							
7-Jan	15.9	11.4	12.1	Z	13.8	11.8	7.7	8.4	6.8	4.9	10.5	12.5	7.2	6.4	4.0	2.3	1.6	1.3	3.7	3.3	1.7	1.3	1.4	1.1	6.6	15.9																							
8-Jan	2.2	1.2	1.1	1.1	Z	1.0	1.1	1.7	1.4	2.9	3.5	6.3	11.7	14.8	14.6	13.6	11.5	7.1	3.1	6.1	0.8	0.9	0.8	2.1	4.8	14.8																							
9-Jan	11.8	12.8	13.4	10.6	12.5	Z	1.3	4.2	8.1	4.8	7.7	6.1	11.6	13.1	13.5	13.2	13.1	13.0	13.2	9.7	12.2	13.1	11.0	13.8	10.6	13.8																							
10-Jan	Z	16.8	17.7	19.1	17.4	18.5	18.9	18.2	11.4	18.3	22.3	23.1	23.5	24.8	25.7	25.2	21.7	15.0	18.8	18.5	18.7	18.9	15.9	16.6	19.3	25.7																							
11-Jan	18.9	Z	19.4	19.5	17.3	16.4	6.4	3.1	6.5	5.8	8.5	7.1	7.5	7.2	7.2	4.0	1.9	1.8	3.3	9.4	5.9	4.3	8.5	6.4	8.5	19.5																							
12-Jan	4.6	5.8	Z	6.6	4.4	6.6	3.9	2.2	2.2	6.8	12.6	13.6	15.8	15.8	16.9	14.4	9.1	3.2	4.5	6.8	6.3	9.1	10.4	10.8	8.4	16.9																							
13-Jan	8.4	11.2	11.3	Z	12.0	10.6	6.7	3.3	4.3	4.0	5.8	6.5	3.9	3.5	5.1	5.7	5.9	11.3	10.5	19.1	19.7	19.5	19.9	21.6	10.0	21.6																							
14-Jan	21.3	21.4	22.6	23.0	Z	23.3	22.5	22.4	20.5	20.1	20.5	21.0	20.3	19.0	17.6	14.3	8.6	13.3	15.2	14.6	16.1	15.7	15.0	14.1	18.4	23.3																							
15-Jan	15.1	11.5	12.8	12.3	11.9	Z	16.4	10.9	13.7	12.2	11.0	12.7	12.9	14.1	16.5	17.7	18.9	18.4	17.8	16.0	10.2	1.2	0.9	0.9	12.4	18.9																							
16-Jan	Z	1.0	1.0	2.0	0.8	3.2	11.9	13.6	14.8	15.8	17.2	15.7	15.6	16.0	17.0	16.4	15.2	14.4	14.8	16.8	17.2	17.3	15.1	14.6	12.5	17.3																							
17-Jan	22.3	Z	22.5	23.2	23.2	20.1	18.3	15.7	14.5	16.9	17.3	18.0	18.5	19.9	17.5	9.9	10.1	4.7	5.7	3.9	8.4	9.8	6.9	9.2	14.6	23.2																							
18-Jan	8.4	9.0	Z	11.0	2.4	3.2	3.3	1.5	2.7	5.0	9.0	12.5	20.0	21.0	20.7	19.9	18.2	17.6	16.1	16.3	16.4	16.2	14.5	15.2	12.2	21.0																							
19-Jan	15.5	12.6	9.5	Z	6.8	9.7	6.2	3.9	7.6	12.0	12.3	11.8	9.3	8.2	16.0	4.5	1.9	1.6	1.4	1.7	3.2	6.8	11.2	11.7	8.1	16.0																							
20-Jan	10.2	5.6	5.3	7.8	Z	4.2	2.9	1.9	2.0	4.9	C	C	C	C	27.8	30.2	24.8	19.6	27.2	25.2	27.3	27.9	15.7	7.9	14.7	30.2																							
21-Jan	2.8	7.6	5.2	6.4	13.1	Z	15.7	16.2	16.8	17.4	17.7	18.2	18.4	18.5	18.6	16.8	11.7	12.3	12.6	10.3	8.7	4.2	3.5	13.5	12.4	18.6																							
22-Jan	Z	20.4	17.2	19.3	19.5	31.6	29.7	30.6	30.6	30.5	31.1	27.8	25.0	23.9	22.7	23.9	25.0	22.9	22.7	21.2	17.0	18.6	16.8	13.8	23.6	31.6																							
23-Jan	8.3	Z	7.8	10.3	14.3	18.5	20.7	18.2	18.4	21.0	23.6	23.5	24.6	26.2	25.0	28.3	26.1	27.4	26.7	26.5	25.1	21.8	20.6	21.2	21.1	28.3																							
24-Jan	21.7	21.2	Z	22.1	21.4	19.5	17.2	17.8	18.8	18.3	18.2	18.6	18.0	13.3	13.0	11.0	2.3	0.8	3.8	14.2	16.6	17.4	16.8	17.6	15.6	22.1																							
25-Jan	17.0	18.0	16.5	Z	16.5	11.2	10.4	10.0	7.5	8.2	9.2	8.8	16.3	21.6	22.9	22.6	21.5	18.1	19.4	19.4	19.4	20.2	19.7	20.0	16.3	22.9																							
26-Jan	20.2	19.1	18.8	18.7	Z	29.3	26.6	20.3	16.9	17.2	19.5	17.4	19.0	17.9	16.4	15.2	14.6	21.7	26.9	28.0	30.3	29.7	29.3	29.3	21.8	30.3																							
27-Jan	29.8	29.1	30.6	31.7	28.7	Z	24.2	18.0	13.4	15.4	31.1	33.2	31.4	28.7	28.3	25.5	25.6	19.0	14.3	10.5	9.7	20.3	30.4	32.1	24.4	33.2																							
28-Jan	Z	33.9	33.8	33.7	33.3	32.3	30.3	30.4	31.0	31.6	32.2	32.9	34.1	34.4	34.9	35.7	35.5	37.6	35.8	34.7	33.8	34.5	34.0	32.6	33.6	37.6																							
29-Jan	29.1	Z	25.4	20.6	21.6	17.6	8.7	2.7	5.7	12.9	21.8	21.0	21.7	18.7	17.6	18.4	22.6	24.2	17.6	10.1	11.3	12.8	9.5	17.8	16.9	29.1																							
30-Jan	16.0	21.7	Z	24.0	19.7	14.2	12.3	9.5	6.5	7.6	11.0	13.9	20.7	20.7	24.1	20.3	16.8	16.8	16.4	17.9	16.9	18.7	20.2	16.7	16.6	24.1																							
31-Jan	3.9	5.7	22.4	Z	24.6	23.8	18.0	20.6	11.9	18.4	21.2	24.5	27.9	24.6	24.3	22.9	7.5	7.6	3.7	1.9	1.6	1.0	1.5	2.2	14.0	27.9																							
																								13.5	13.4	14.2	15.1	14.8	14.5	12.7	11.6	11.3	12.6	15.3	15.9	16.7	16.6	17.2	15.7	13.7	12.8	13.0	13.2	12.8	13.1	12.9	13.4	Diurnal Average	
																								29.8	33.9	33.8	33.7	33.3	32.3	30.3	30.6	31.0	31.6	32.2	33.2	34.1	34.4	34.9	35.7	35.5	37.6	35.8	34.7	33.8	34.5	34.0	32.6	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	564	79.55	79.55
21 - 50	145	20.45	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	41	8	8	17	30	36	161	92	41	32	38	13	13	5	6	23	564
21 - 50	14	3	3	3	8	4	28	5	6	4	6	3	6	18	12	22	145
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	55	11	11	20	38	40	189	97	47	36	44	16	19	23	18	45	709

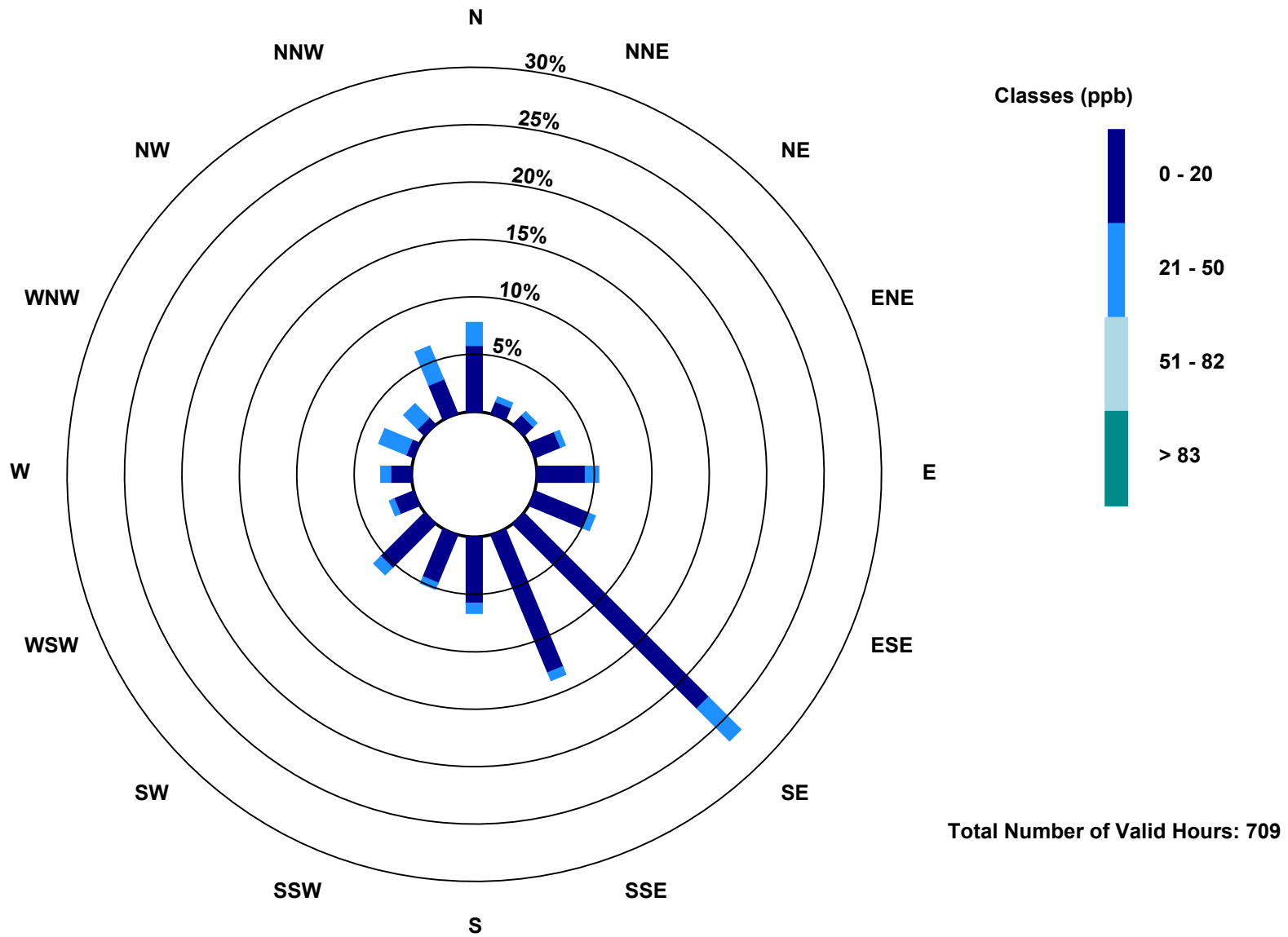
Total Number of Valid Hours: 709

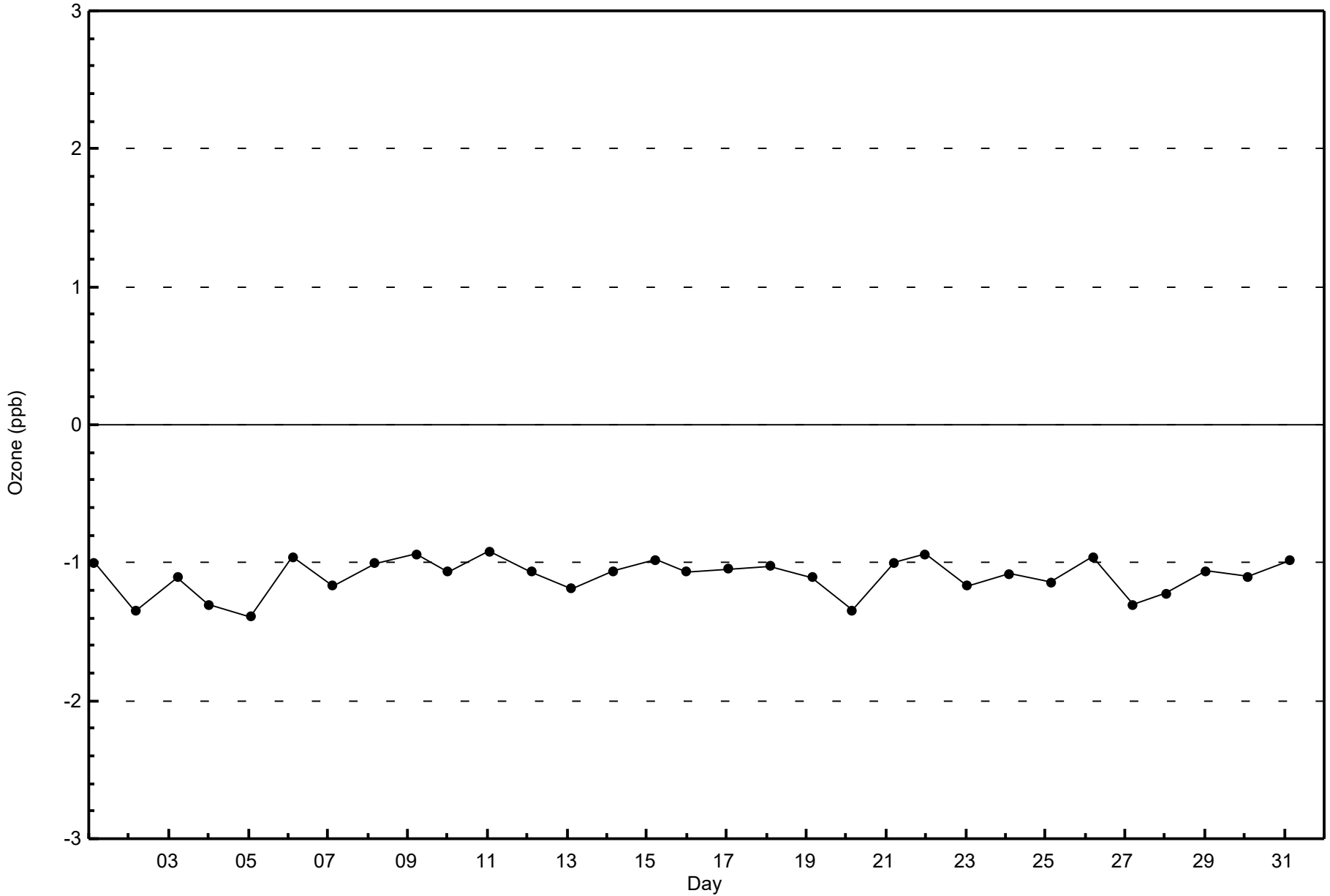
Total Number of Hours: 744

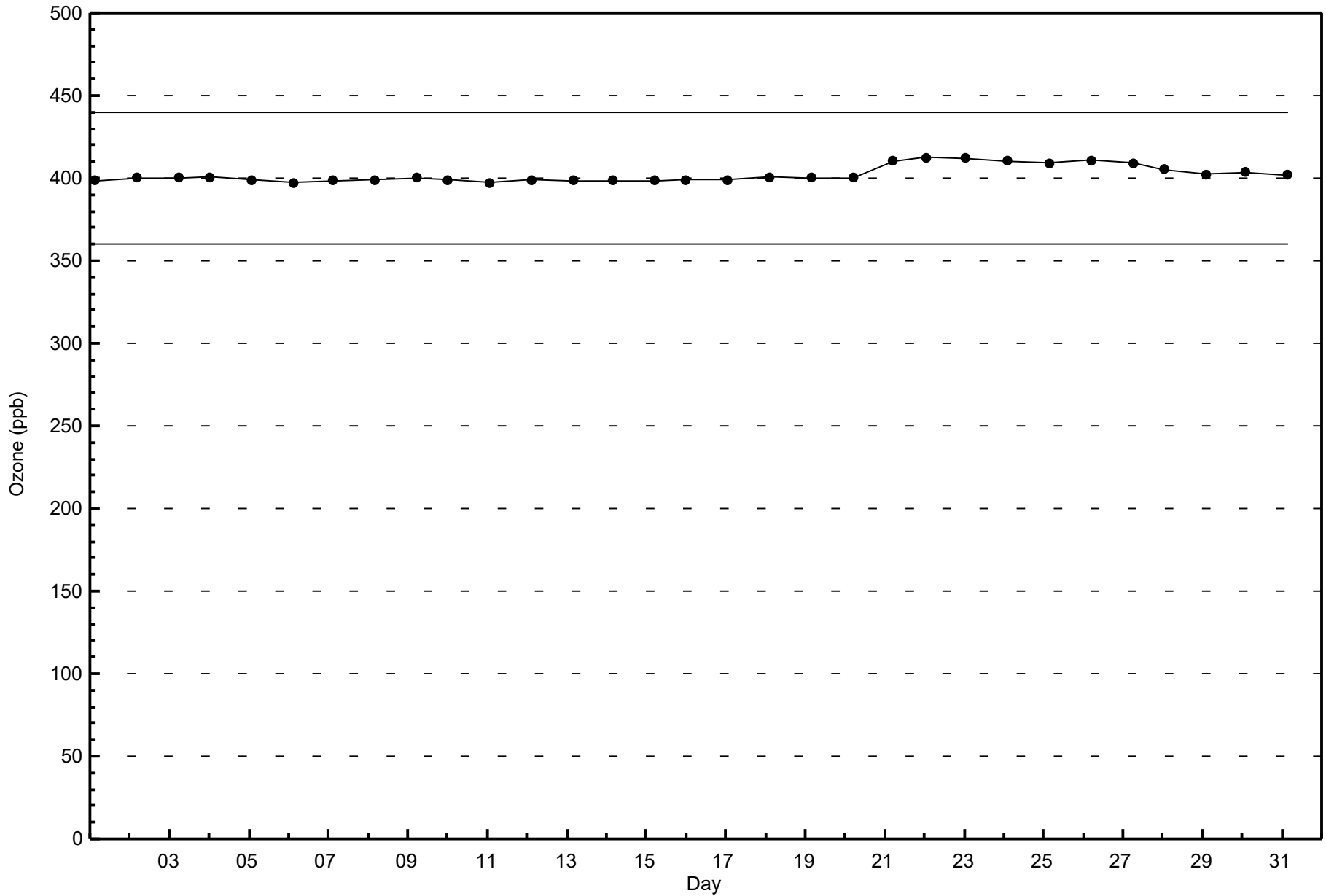


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Athabasca Valley





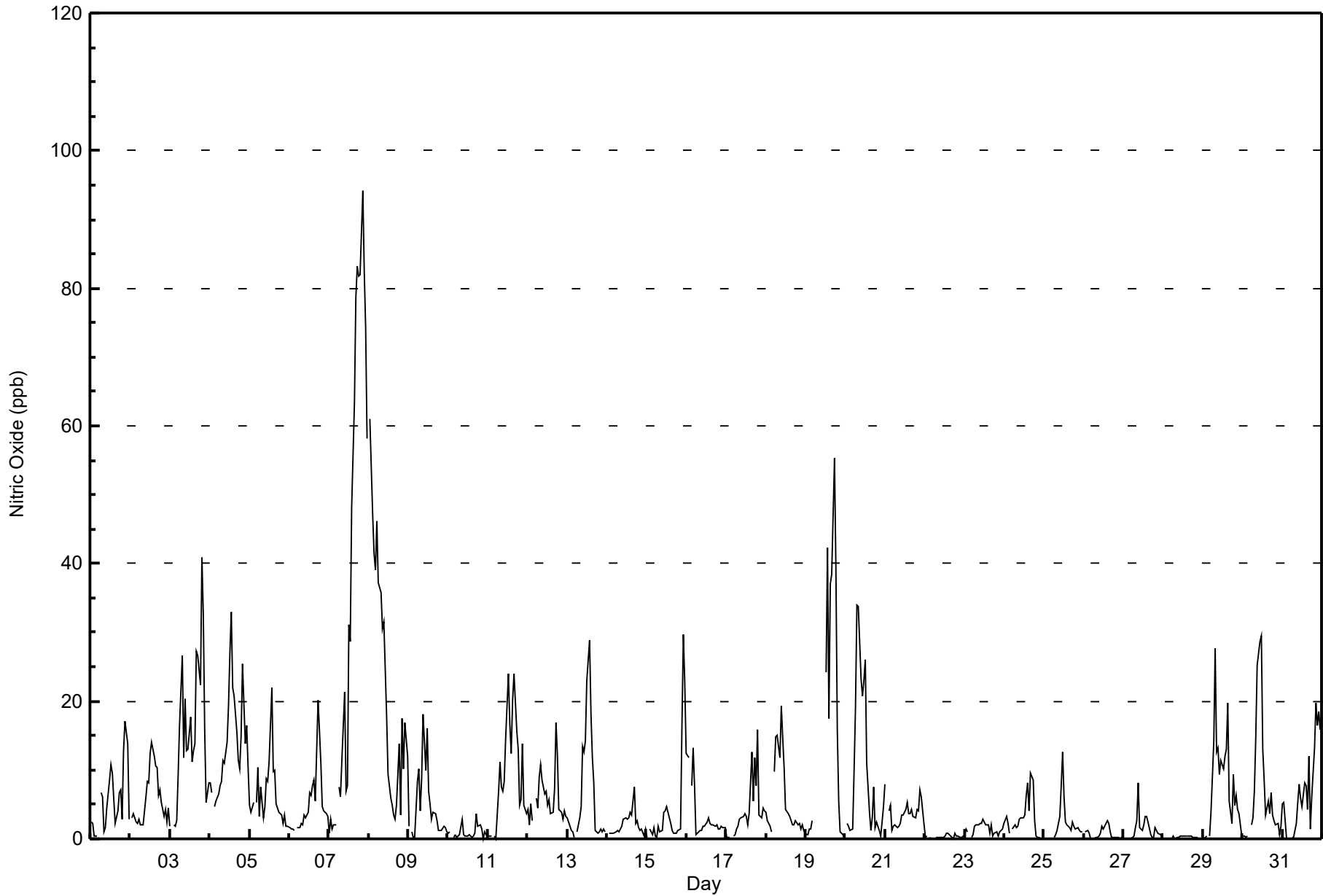




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitric Oxide (NO) - ppb
Athabasca Valley - January 2023

Maximum Value: 94.1 ppb on Jan 7 21:00		Maximum Daily Average: 38.1 ppb on Jan 7		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Jan 27 01:00		Minimum Daily Average: 0.2 ppb on Jan 28		Hours of Data: 708																																													
Maximum Diurnal Average: 10.0 ppb at hour 18		Minimum Diurnal Average: 2.5 ppb at hour 1		Hours of Missing Data: 36																																													
Monthly Average: 7.12 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 1.0 Median = 2.9 Q ₃ = 8.2 P ₉₀ = 17.5 P ₉₉ = 63.3		Hours of Calibration: 36																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.5	2.3	0.5	0.4	0.4	Z	6.8	6.1	1.1	1.7	4.6	8.5	10.9	9.5	5.9	2.2	4.0	6.6	7.0	2.8	12.8	17.0	13.8	2.9	5.7	17.0																							
2-Jan	Z	3.1	3.7	2.4	2.3	2.9	2.1	2.0	2.0	6.2	8.4	8.1	12.4	14.1	12.0	10.5	10.5	6.3	7.1	5.4	3.3	4.3	2.4	4.4	5.9	14.1																							
3-Jan	1.9	Z	1.9	1.8	2.6	9.1	16.4	26.7	11.9	20.3	12.8	13.0	17.8	11.1	12.8	13.8	27.2	26.7	22.3	40.9	32.5	15.7	5.2	8.1	15.3	40.9																							
4-Jan	8.2	6.7	Z	4.7	5.5	6.6	7.8	8.3	11.3	10.9	14.0	19.4	27.1	32.9	22.0	20.8	15.5	11.3	10.3	14.9	25.4	13.8	16.4	10.5	14.1	32.9																							
5-Jan	4.9	3.9	5.2	Z	5.3	10.4	3.3	7.5	3.0	4.6	8.8	8.3	11.1	22.1	9.8	9.9	5.0	4.5	3.9	3.5	2.2	3.4	1.9	1.9	6.3	22.1																							
6-Jan	1.6	1.5	1.4	1.3	Z	1.6	1.6	2.3	2.0	3.4	3.0	3.9	6.8	6.3	7.7	8.6	5.6	20.1	15.6	11.0	4.7	4.0	3.8	3.4	5.3	20.1																							
7-Jan	0.7	2.9	1.5	2.0	2.0	Z	7.5	6.2	11.4	21.4	7.0	7.8	31.0	28.7	48.2	63.4	78.8	83.2	81.8	81.9	94.1	82.5	74.3	58.1	38.1	94.1																							
8-Jan	Z	61.1	47.1	41.5	39.0	46.1	37.3	35.7	30.6	31.5	24.5	17.6	9.3	5.8	4.9	3.4	2.9	4.9	13.8	3.5	17.5	10.3	16.9	11.9	22.5	61.1																							
9-Jan	1.9	Z	1.0	0.2	0.2	8.3	10.2	4.1	8.8	18.2	9.9	16.1	6.9	5.0	2.8	3.8	3.6	2.6	1.2	1.2	1.2	1.9	1.6	1.0	4.8	18.2																							
10-Jan	0.7	0.9	Z	0.2	0.6	0.2	0.4	0.5	2.9	0.6	0.5	0.4	0.5	0.6	0.3	0.4	0.7	3.6	1.8	2.0	1.4	0.1	1.1	0.7	0.9	3.6																							
11-Jan	0.4	0.3	0.4	Z	0.3	0.1	6.8	11.3	7.5	6.9	8.3	14.5	24.0	16.8	12.3	20.2	24.0	15.7	13.0	5.0	5.7	13.8	4.9	3.6	9.4	24.0																							
12-Jan	4.3	2.0	5.0	2.6	Z	5.9	4.4	9.0	10.7	8.5	6.5	6.9	4.9	5.8	3.7	3.9	7.2	16.8	12.3	4.2	3.9	2.9	4.0	3.3	6.0	16.8																							
13-Jan	3.1	2.5	1.1	0.9	0.2	Z	1.0	3.0	4.8	13.5	12.5	14.3	22.9	28.9	18.0	11.8	8.2	1.2	0.7	1.0	1.4	1.1	1.4	1.0	6.7	28.9																							
14-Jan	Z	0.9	0.8	0.8	0.8	1.0	1.2	1.0	1.5	1.8	2.8	3.1	2.9	3.1	4.0	3.4	7.5	2.3	2.7	1.7	1.2	1.5	0.4	1.4	2.1	7.5																							
15-Jan	0.2	Z	1.5	0.7	1.6	0.4	0.1	1.8	0.9	1.2	3.9	4.0	4.8	3.8	2.2	1.2	0.8	0.8	0.8	1.3	1.4	16.5	29.7	22.8	4.5	29.7																							
16-Jan	12.4	11.7	Z	7.8	13.2	7.7	0.6	1.1	1.2	1.3	1.8	1.7	2.5	3.0	2.2	2.1	2.0	1.9	2.0	1.5	1.4	1.8	1.6	1.6	3.7	13.2																							
17-Jan	0.2	0.2	0.1	Z	0.3	0.7	1.4	1.9	2.9	3.0	3.2	3.6	3.2	2.1	3.7	12.6	5.5	11.8	7.7	15.8	3.4	3.1	4.5	4.0	4.1	15.8																							
18-Jan	3.8	2.6	1.8	1.0	Z	9.9	14.9	15.1	11.7	19.3	14.6	10.3	4.3	3.6	3.3	2.6	2.1	2.1	2.6	2.1	2.3	1.4	2.0	1.2	5.8	19.3																							
19-Jan	0.6	0.7	1.5	1.4	2.6	Z	6.7	C	C	C	C	C	24.2	42.3	17.5	37.1	38.4	55.4	39.3	15.9	5.5	1.0	0.5	0.3	16.2	55.4																							
20-Jan	Z	2.2	1.9	1.2	1.5	9.9	19.2	33.9	33.7	23.3	20.7	22.9	26.1	11.1	3.8	1.2	3.0	7.6	1.6	2.5	1.2	0.4	2.4	4.7	10.3	33.9																							
21-Jan	7.9	Z	4.1	4.9	1.1	1.8	2.1	1.5	1.8	2.3	3.5	3.5	4.3	5.2	3.7	3.6	4.3	3.3	3.1	4.2	4.0	7.1	6.0	2.0	3.7	7.9																							
22-Jan	0.2	0.5	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.5	0.9	0.9	0.7	0.2	0.1	0.8	0.3	0.3	0.2	0.2	0.5	0.3	0.9																							
23-Jan	0.6	1.4	1.0	Z	0.2	0.7	1.7	2.0	2.0	2.2	2.2	2.8	2.5	2.0	2.1	0.7	2.0	0.4	0.8	1.0	0.5	1.0	1.2	1.5	1.4	2.8																							
24-Jan	2.2	3.2	2.2	0.9	Z	1.4	2.0	1.7	1.9	2.9	3.0	3.1	3.5	6.4	8.2	4.2	9.6	8.5	2.6	0.4	0.2	0.1	0.0	0.1	3.0	9.6																							
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.7	1.3	3.3	7.8	12.7	6.2	2.5	2.0	1.6	1.2	2.3	1.8	1.5	1.6	1.3	1.0	1.0	2.2	12.7																							
26-Jan	Z	1.1	1.2	0.8	0.0	0.0	0.0	0.1	0.3	0.5	0.7	1.9	1.5	2.2	2.6	2.3	1.0	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.7	2.6																							
27-Jan	0.0	Z	0.0	0.0	0.0	0.2	0.3	1.6	2.7	8.2	1.5	1.1	2.0	3.3	3.3	2.5	0.5	0.2	0.2	1.5	1.3	0.8	0.5	0.2	1.4	8.2																							
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.1	0.1	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.3	0.1	0.1	0.2	0.1	0.0	0.1	0.2	0.5																							
29-Jan	0.1	0.3	0.5	Z	0.5	3.8	14.0	27.8	12.5	13.1	9.4	11.4	10.1	12.1	12.9	19.7	5.4	2.2	9.3	4.9	6.4	4.3	3.7	0.4	8.0	27.8																							
30-Jan	0.5	0.5	0.2	0.5	Z	2.0	3.0	7.0	14.6	25.2	28.8	29.5	13.0	8.6	3.5	5.6	3.7	6.8	3.5	2.6	2.1	2.2	0.7	1.8	7.2	29.5																							
31-Jan	5.2	5.4	0.0	0.0	0.0	Z	0.3	0.2	2.3	5.3	7.9	5.8	4.7	8.2	7.7	4.3	11.9	1.4	6.0	13.2	19.6	16.5	18.6	15.8	7.0	19.6																							
																								2.5	4.5	3.3	3.0	3.1	5.2	5.6	7.3	6.7	8.7	7.8	8.6	9.7	9.9	7.9	9.0	9.4	10.0	8.9	8.0	8.4	7.4	7.1	5.5	Diurnal Average	
																								12.4	61.1	47.1	41.5	39.0	46.1	37.3	35.7	33.7	31.5	28.8	29.5	31.0	42.3	48.2	63.4	78.8	83.2	81.8	81.9	94.1	82.5	74.3	58.1	Diurnal Maximum	
Z - zerospan																								C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	651	91.95	91.95
21 - 40	40	5.65	97.60
41 - 80	12	1.69	99.29
81 - 159	5	0.71	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	49	8	11	16	36	37	175	80	47	32	41	15	18	22	19	45	651
21 - 40	3	2	0	2	1	2	8	12	1	2	3	1	1	1	0	1	40
41 - 80	2	1	0	1	0	1	1	1	3	1	0	0	1	0	0	0	12
81 - 159	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	11	20	38	41	184	93	51	35	45	16	20	23	19	46	708

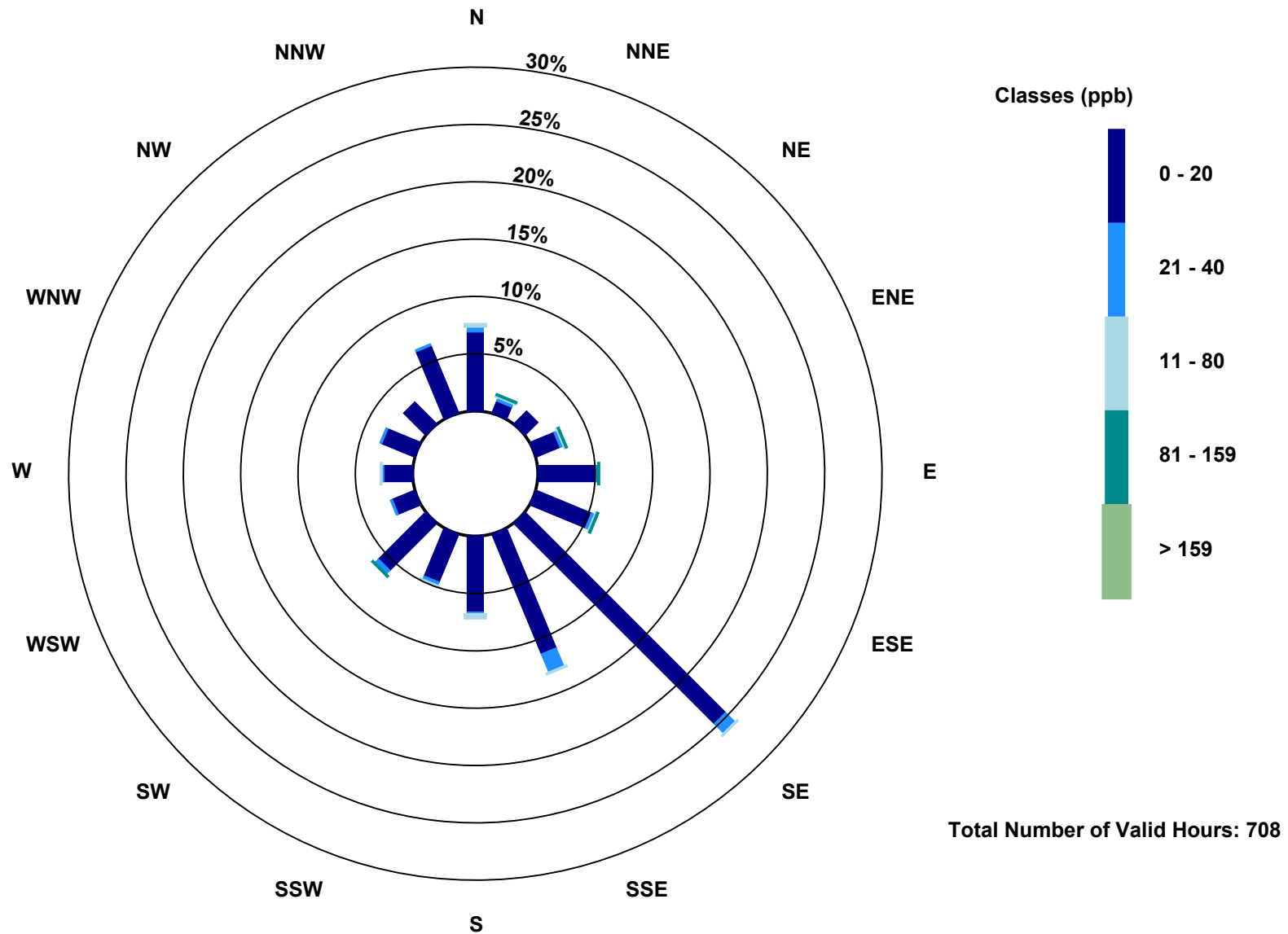
Total Number of Valid Hours: 708

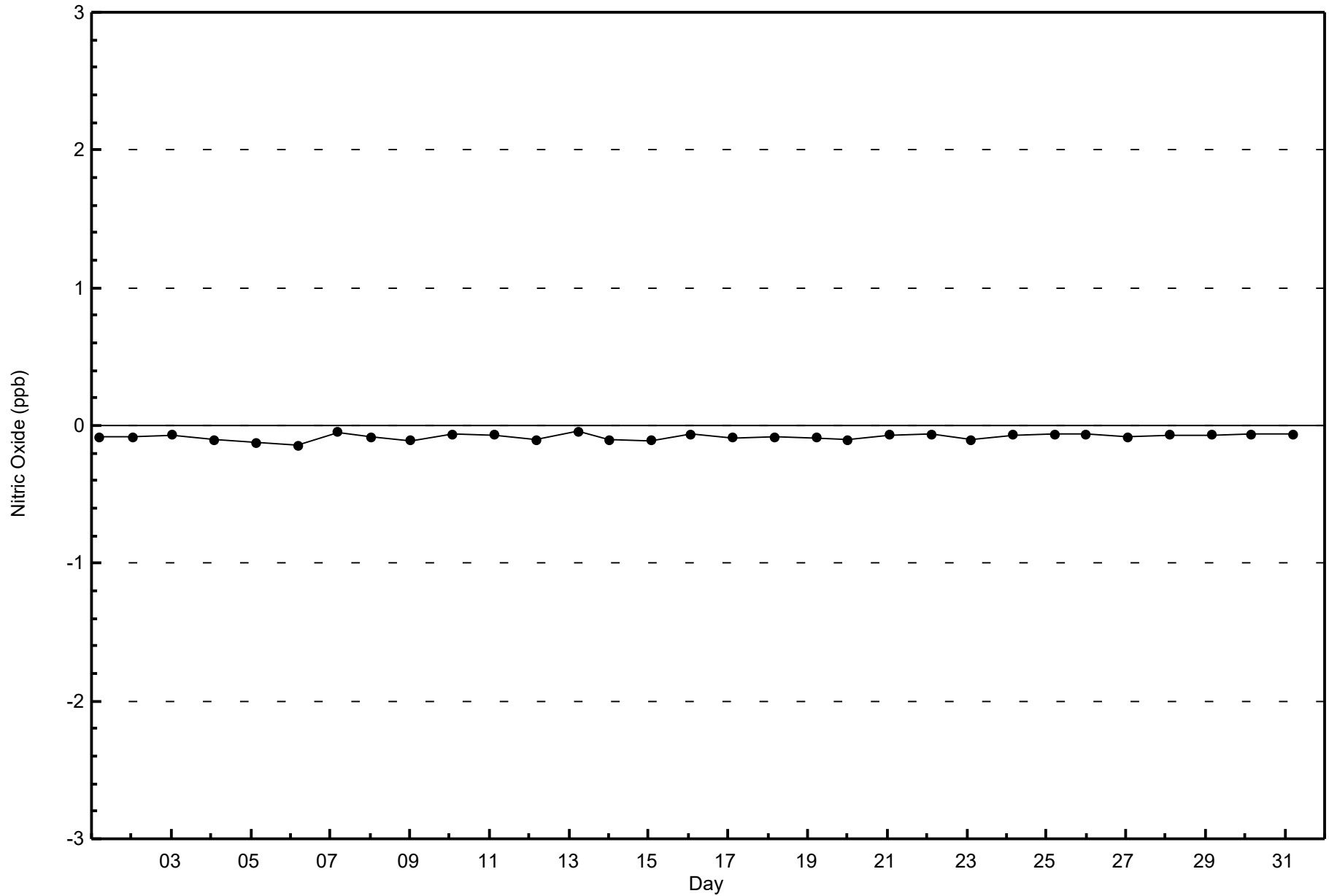
Total Number of Hours: 744

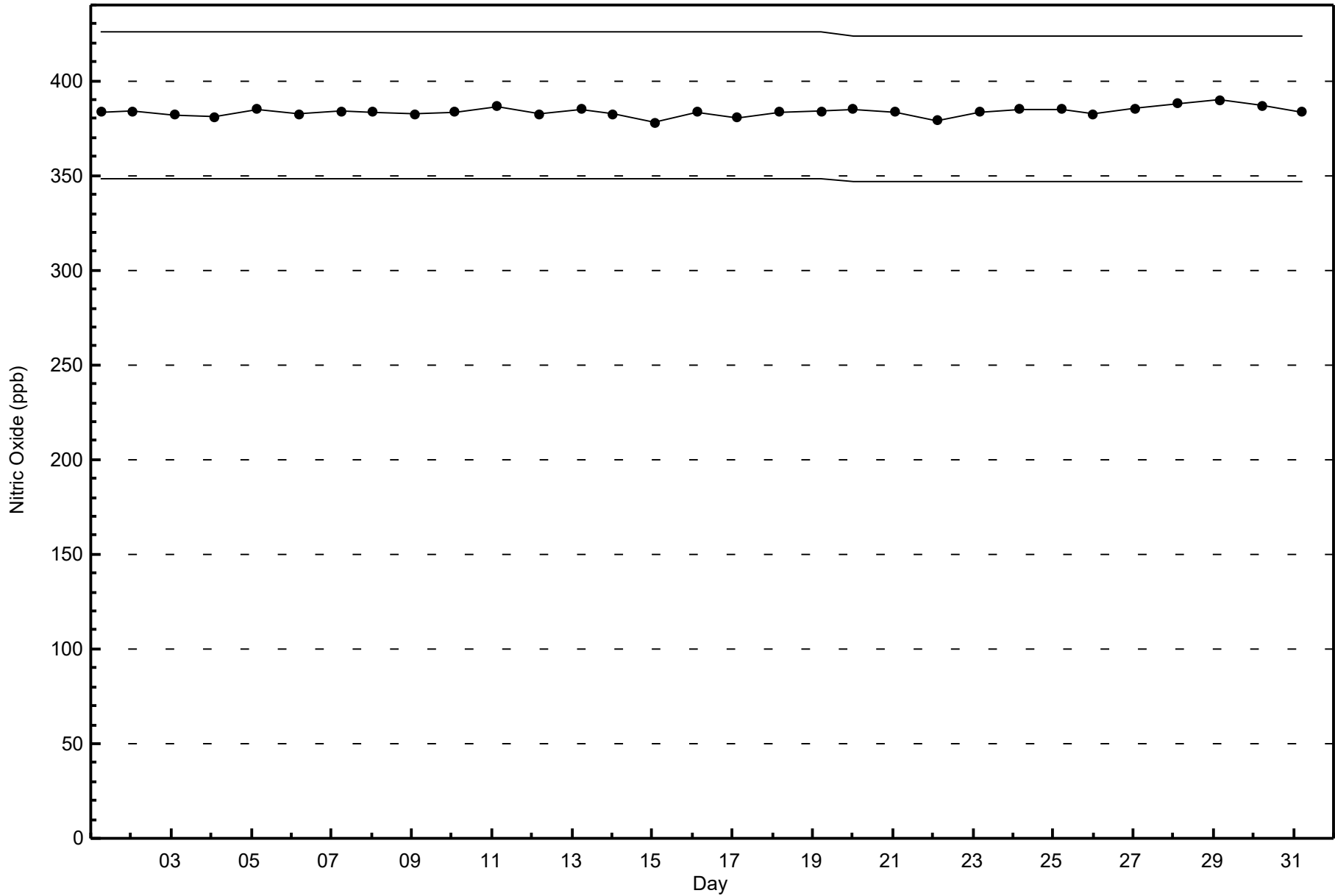


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

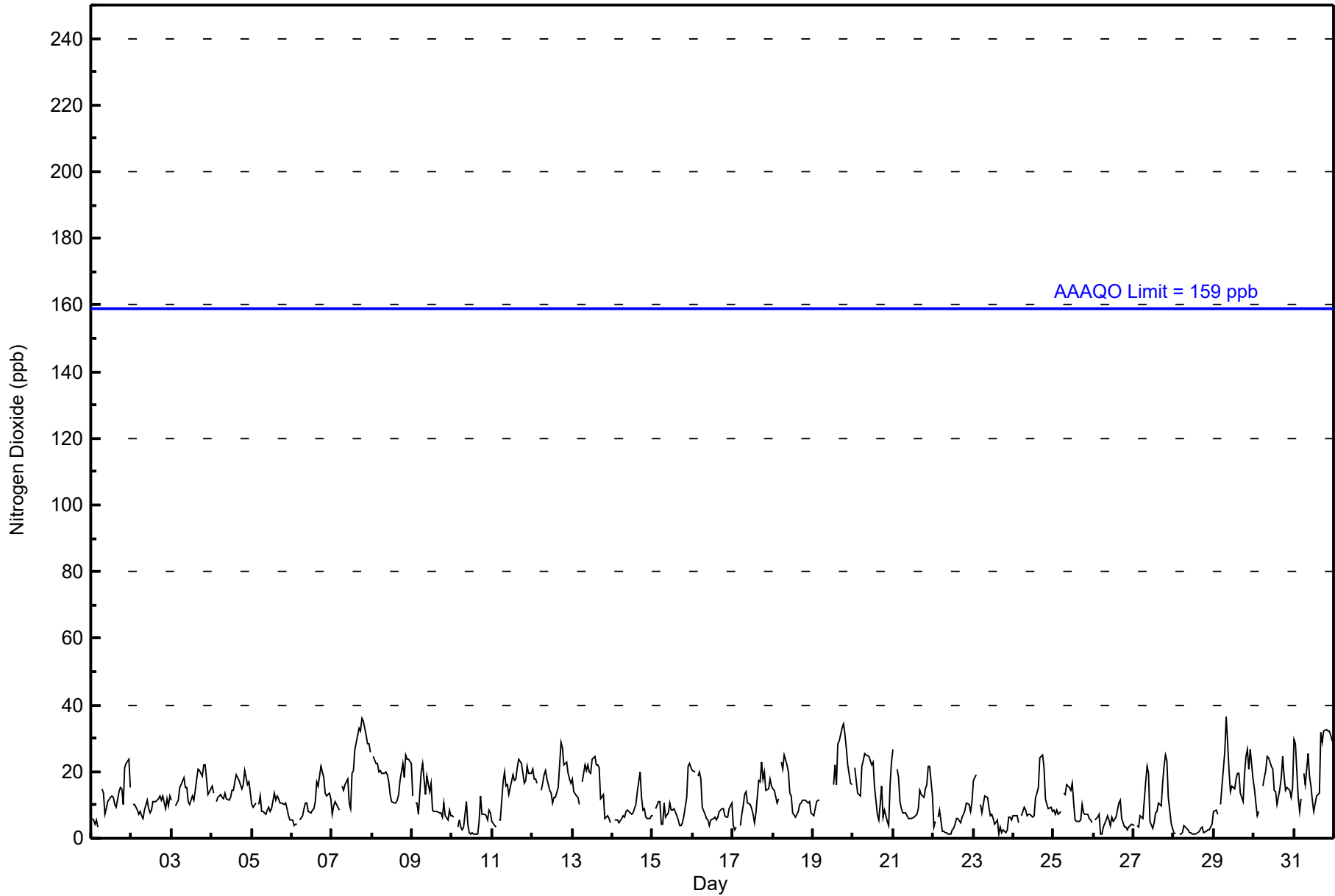
Nitrogen Dioxide (NO₂) - ppb Athabasca Valley - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum				
Maximum Value: 36.6 ppb on Jan 29 08:00		Maximum Daily Average: 21.5 ppb on Jan 31		Hours of Data: 708																	Hours of Missing Data: 36		Hours of Calibration: 36				
Minimum Value: 1.1 ppb on Jan 28 05:00		Minimum Daily Average: 2.2 ppb on Jan 28		Hours of Operational Time: 100.0																							
Maximum Diurnal Average: 15.6 ppb at hour 18		Minimum Diurnal Average: 9.0 ppb at hour 5		Percentiles: P ₁ = 1.3 P ₁₀ = 4.0 Q ₁ = 6.7 Median = 11.0 Q ₃ = 17.1 P ₉₀ = 22.2 P ₉₉ = 32.2																							
Monthly Average: 12.32 ppb																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	6.0	5.6	4.3	5.4	3.6	Z	14.9	13.5	7.1	8.9	10.9	12.1	12.5	12.1	10.1	9.5	13.9	15.4	15.0	10.1	21.0	22.4	23.7	15.2	11.9	23.7	
2-Jan	Z	10.1	10.0	8.6	7.4	8.1	6.7	5.8	8.6	11.3	8.7	7.6	8.4	11.0	10.9	11.4	12.0	12.7	11.5	12.7	9.1	11.8	9.8	12.7	9.9	12.7	
3-Jan	11.3	Z	9.7	10.6	11.3	15.1	16.2	18.1	15.3	15.2	11.2	10.1	12.6	11.6	14.2	17.7	20.8	20.3	18.8	22.1	22.0	17.6	13.0	14.8	15.2	22.1	
4-Jan	15.5	13.4	Z	11.2	12.4	13.1	12.3	11.8	13.7	11.7	11.6	12.2	14.5	17.0	19.2	17.2	16.0	14.8	16.3	20.2	16.0	17.0	13.4	14.6	14.6	20.2	
5-Jan	10.0	9.5	10.5	Z	10.2	12.9	8.1	8.1	7.4	8.3	9.5	7.9	8.7	13.5	11.4	12.8	11.8	10.4	10.4	10.5	9.0	6.9	5.7	9.7	9.7	13.5	
6-Jan	5.6	3.9	4.3	4.3	Z	5.7	6.6	8.8	10.5	10.8	8.2	7.5	8.3	9.1	11.2	16.9	15.7	21.5	20.1	18.1	13.4	12.7	13.4	11.8	10.8	21.5	
7-Jan	7.1	9.8	10.9	10.2	8.5	Z	15.8	14.6	16.3	17.9	10.4	8.8	19.4	20.4	26.8	30.8	33.1	32.0	36.0	35.3	30.9	28.5	28.6	26.0	20.8	36.0	
8-Jan	Z	24.4	22.6	22.3	20.1	20.5	19.4	19.5	19.8	19.2	16.9	13.2	11.2	10.5	10.5	11.4	13.3	17.2	22.4	18.3	24.8	23.7	23.9	22.6	18.6	24.8	
9-Jan	12.6	Z	10.7	10.6	7.4	20.1	22.6	17.7	13.3	18.7	13.8	16.5	8.5	7.9	8.1	7.9	7.6	7.5	6.5	10.5	6.9	5.7	8.5	6.6	11.1	22.6	
10-Jan	6.7	6.2	Z	3.3	5.3	3.4	2.7	3.2	11.2	4.3	1.7	1.4	1.5	1.3	1.2	1.4	5.0	12.7	7.3	7.0	6.7	5.7	8.6	7.5	5.0	12.7	
11-Jan	5.1	3.9	3.5	Z	5.7	5.5	17.1	20.1	15.8	16.3	13.3	15.1	18.9	17.5	17.8	21.1	23.7	22.5	19.7	16.5	17.2	21.4	19.4	19.4	15.5	23.7	
12-Jan	20.9	18.0	17.8	16.6	Z	14.3	16.5	19.1	20.2	18.0	14.6	13.6	10.5	12.2	12.2	15.2	22.2	28.7	27.0	22.1	22.7	19.6	17.7	16.5	18.1	28.7	
13-Jan	17.7	14.1	12.7	12.2	10.1	Z	17.0	22.1	20.4	22.1	20.0	19.6	23.6	24.6	21.9	22.2	21.0	12.0	13.2	6.1	6.2	6.6	5.9	4.5	15.5	24.6	
14-Jan	Z	5.4	5.5	5.7	4.7	5.8	6.6	6.4	8.2	8.6	8.1	7.0	7.6	9.1	10.0	13.9	19.8	12.1	8.5	8.8	6.2	6.0	6.1	6.8	8.1	19.8	
15-Jan	6.8	Z	8.8	11.0	11.1	4.1	4.1	10.6	6.4	7.8	10.8	8.5	8.4	8.8	6.8	5.4	3.8	3.9	4.5	6.6	12.2	21.8	22.4	21.0	9.4	22.4	
16-Jan	20.2	19.9	Z	18.7	19.8	18.0	9.2	7.2	5.8	5.3	4.0	5.6	5.8	6.5	5.4	6.4	7.9	9.1	9.0	6.6	6.5	6.3	8.9	10.4	9.7	20.2	
17-Jan	3.8	2.6	3.4	Z	3.7	7.3	9.7	13.2	14.0	10.7	10.1	8.8	7.0	4.8	7.5	17.5	17.1	22.7	18.0	19.8	14.6	14.9	17.8	15.5	11.5	22.7	
18-Jan	14.7	14.5	10.7	11.9	Z	22.7	20.9	24.8	22.0	20.0	13.7	12.5	7.7	6.5	7.2	8.2	10.2	10.4	11.4	11.5	11.2	10.6	11.1	7.8	13.1	24.8	
19-Jan	6.9	8.7	11.1	11.6	11.6	Z	13.1	C	C	C	C	C	15.9	21.9	16.2	28.5	29.3	33.2	34.5	31.5	27.2	22.1	16.7	16.1	19.8	34.5	
20-Jan	Z	21.0	17.2	13.5	12.9	21.4	23.5	25.5	24.8	24.5	23.3	21.9	23.0	15.3	7.2	5.4	10.3	15.8	6.3	8.4	5.1	3.7	16.3	23.0	16.1	25.5	
21-Jan	26.5	Z	20.6	18.4	11.2	8.7	7.5	7.6	6.7	5.9	6.0	5.8	6.3	6.7	7.1	8.8	14.4	13.0	12.1	14.7	16.1	21.7	21.6	12.8	12.2	26.5	
22-Jan	3.2	5.0	Z	6.3	8.3	2.0	2.2	1.9	1.5	1.4	1.2	2.4	3.0	4.2	5.9	5.8	4.7	6.5	7.4	8.3	10.8	10.0	7.9	11.2	5.3	11.2	
23-Jan	17.3	18.4	18.9	Z	10.2	7.7	10.0	12.6	12.3	9.5	6.9	7.2	6.1	4.2	5.4	1.3	3.3	1.8	2.6	1.8	2.7	6.5	6.5	5.7	7.8	18.9	
24-Jan	6.6	6.8	6.8	4.8	Z	6.7	9.2	8.3	6.8	7.3	7.0	6.3	6.9	12.4	13.4	15.1	24.3	24.8	21.3	11.7	10.0	8.9	9.2	8.2	10.6	24.8	
25-Jan	8.6	7.2	8.4	7.3	7.9	Z	13.4	13.3	16.0	15.2	14.6	16.6	10.6	5.4	5.1	5.2	5.6	10.1	7.7	7.2	7.1	6.1	5.7	4.7	9.1	16.6	
26-Jan	Z	5.5	6.4	7.4	1.2	1.4	3.4	5.5	6.6	5.7	3.7	6.3	5.1	6.5	8.6	10.5	11.4	6.1	3.3	3.4	2.6	3.6	3.9	4.2	5.3	11.4	
27-Jan	4.0	Z	3.9	3.2	6.9	6.1	11.5	17.1	21.7	19.4	4.9	3.0	4.6	7.5	7.9	10.7	9.8	16.7	21.7	24.8	23.4	12.3	4.7	3.1	10.8	24.8	
28-Jan	1.8	1.3	Z	1.2	1.1	1.9	3.7	3.4	2.6	1.7	1.5	1.4	1.3	1.3	1.5	2.2	3.1	3.3	1.9	2.1	2.6	2.4	3.3	4.4	2.2	4.4	
29-Jan	7.9	8.6	7.2	Z	10.1	15.8	26.0	36.6	29.0	20.3	14.0	15.5	14.8	18.0	19.3	19.5	13.6	11.2	19.4	24.6	26.9	20.6	26.5	17.6	18.4	36.6	
30-Jan	15.0	10.8	6.6	7.9	Z	15.5	18.2	20.2	24.6	24.1	21.5	20.8	14.2	13.8	10.2	14.8	18.3	24.4	18.6	14.4	15.3	14.3	12.3	15.1	16.1	24.6	
31-Jan	29.5	28.5	12.4	8.2	12.0	Z	19.4	16.1	25.6	18.5	15.5	11.3	8.2	12.8	13.2	13.7	31.6	29.0	32.1	32.5	32.2	32.0	31.0	29.3	21.5	32.5	
		11.2	10.9	10.2	9.7	9.0	10.6	12.5	13.8	13.8	13.0	10.6	10.2	10.2	10.7	10.7	12.6	14.7	15.6	14.9	14.3	14.3	13.7	13.8	12.7	Diurnal Average	
		29.5	28.5	22.6	22.3	20.1	22.7	26.0	36.6	29.0	24.5	23.3	21.9	23.6	24.6	26.8	30.8	33.1	33.2	36.0	35.3	32.2	32.0	31.0	29.3	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 159 ppb																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	605	85.45	85.45
21 - 40	103	14.55	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	43	9	11	13	36	29	166	80	44	32	42	15	15	19	15	36	605
21 - 40	11	3	0	7	2	12	18	13	7	3	3	1	5	4	4	10	103
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	11	20	38	41	184	93	51	35	45	16	20	23	19	46	708

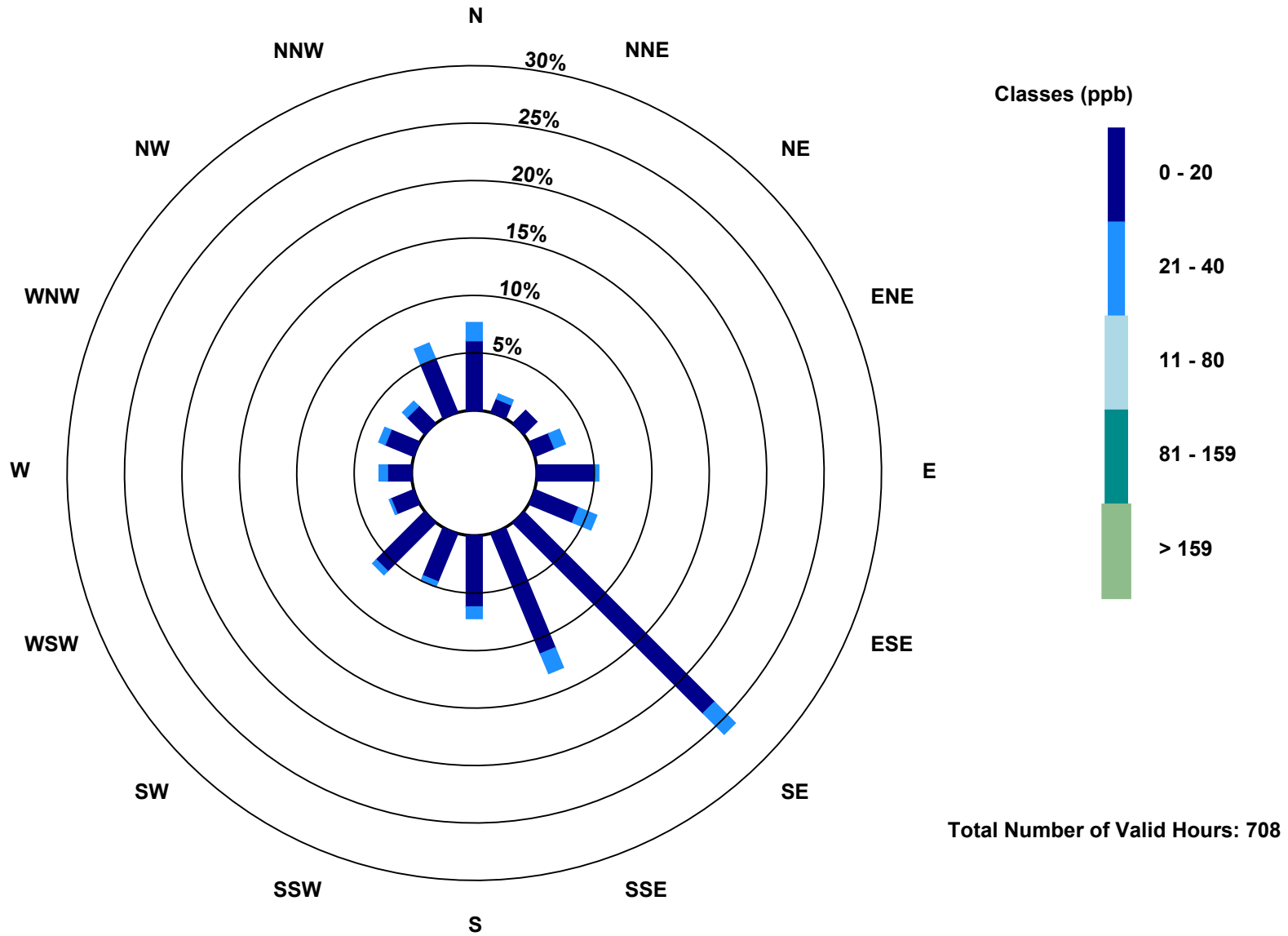
Total Number of Valid Hours: 708

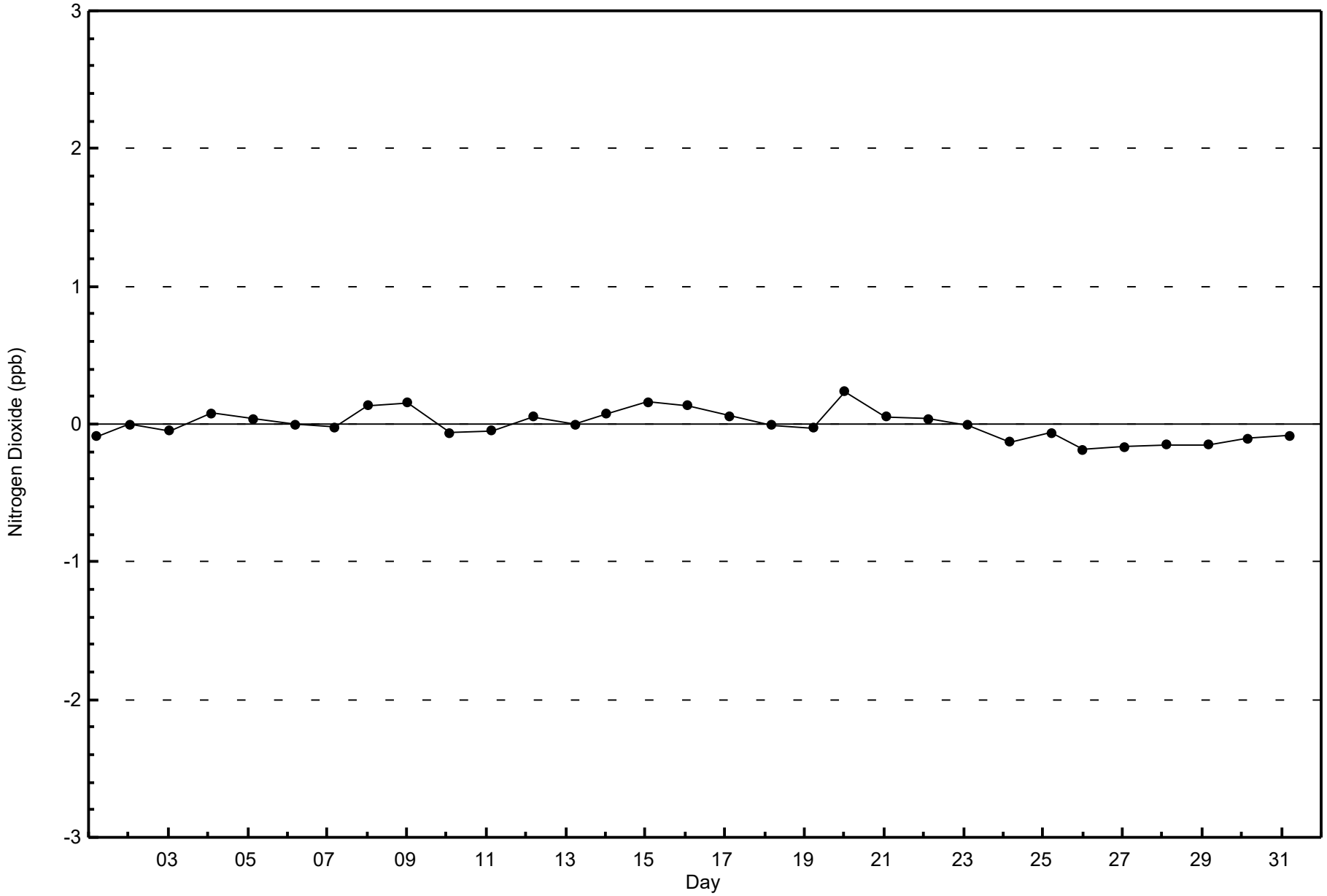
Total Number of Hours: 744

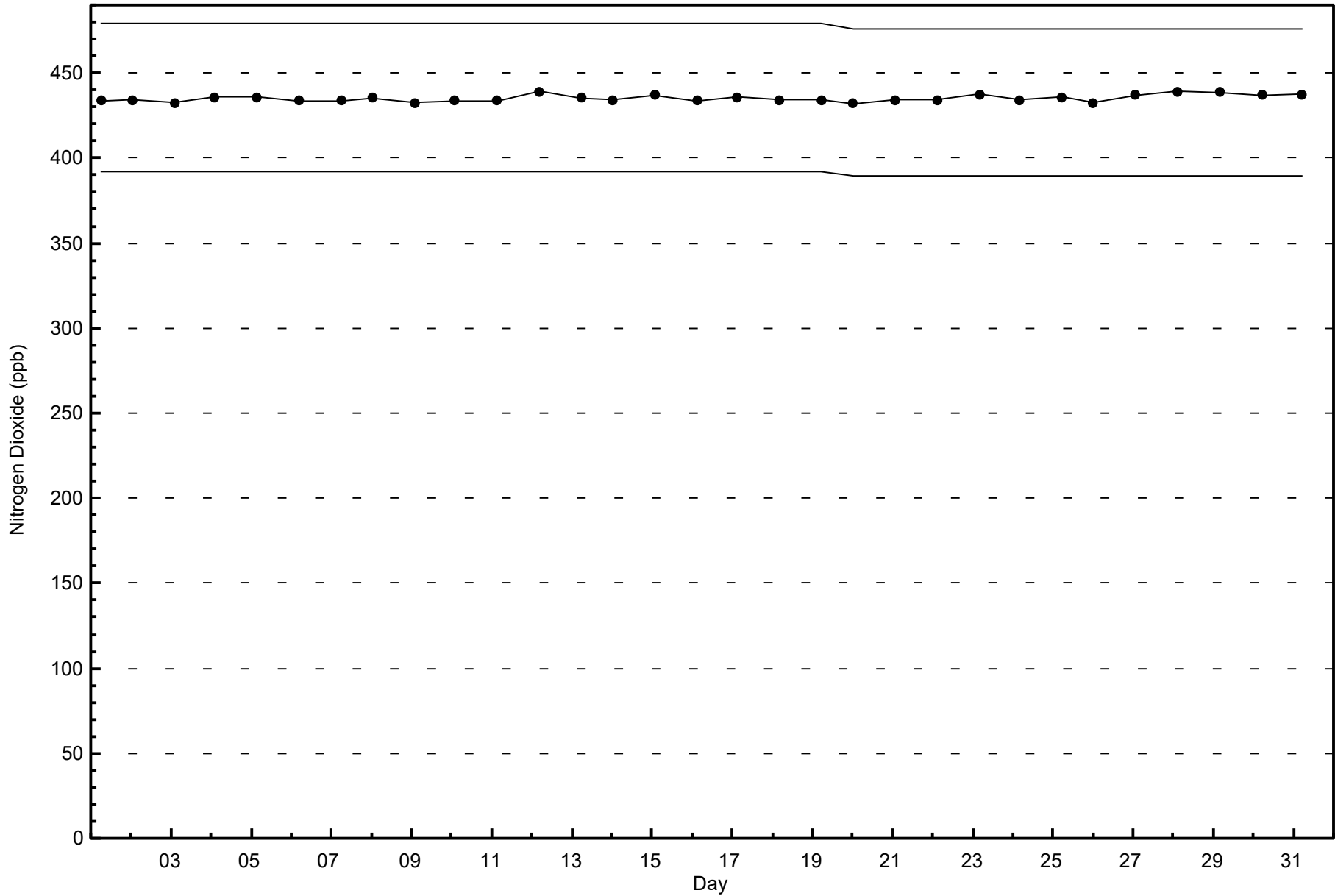


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

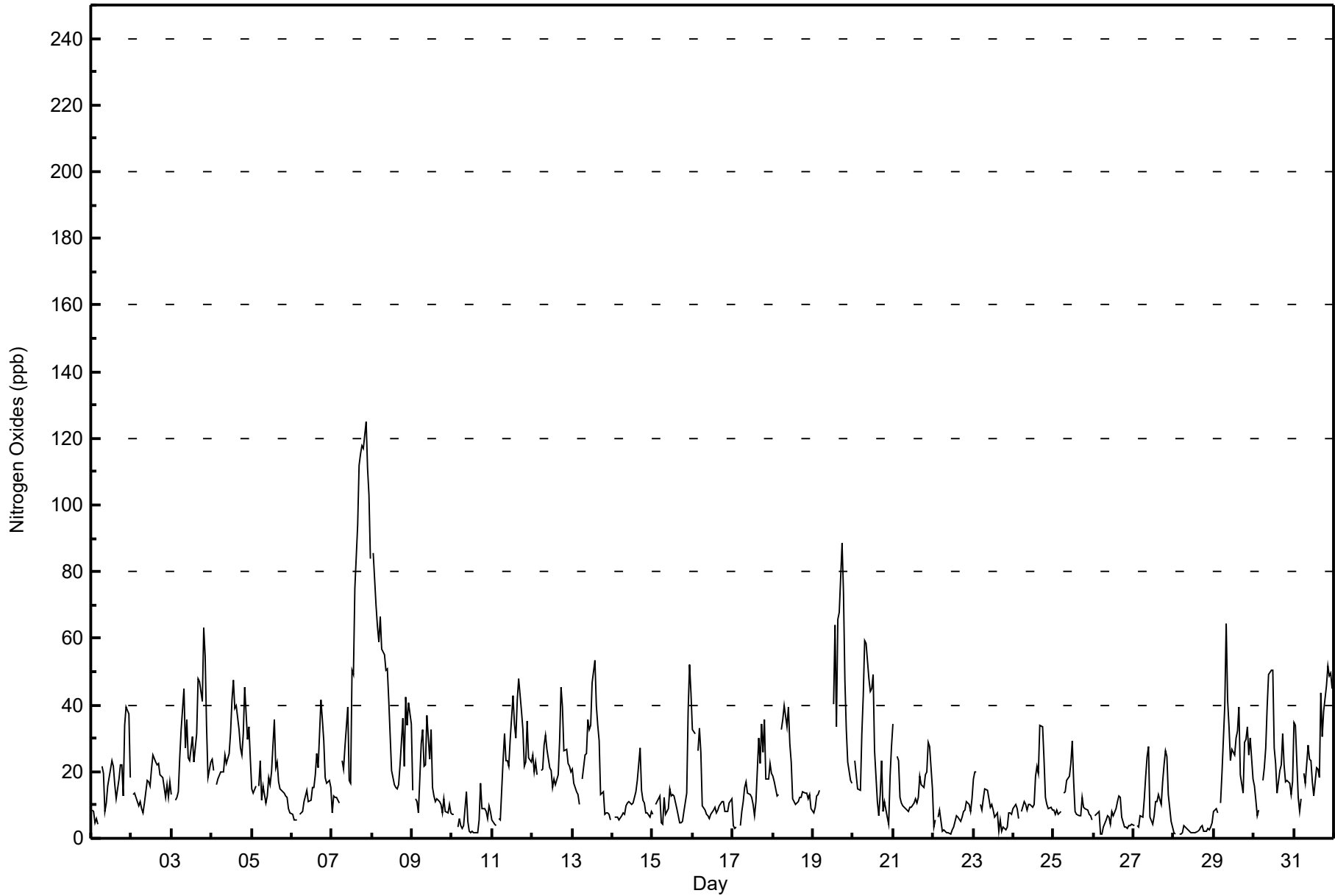
Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - January 2023

Maximum Value: 125.0 ppb on Jan 7 21:00 Maximum Daily Average: 58.9 ppb on Jan 7																						Hours in Service: 744 Hours of Data: 708																											
Minimum Value: 1.1 ppb on Jan 28 05:00 Minimum Daily Average: 2.4 ppb on Jan 28 Maximum Diurnal Average: 25.6 ppb at hour 18 Minimum Diurnal Average: 12.1 ppb at hour 5 Monthly Average: 19.44 ppb Percentiles: P ₁ = 1.6 P ₁₀ = 4.5 Q ₁ = 8.2 Median = 14.0 Q ₃ = 24.8 P ₉₀ = 39.5 P ₉₉ = 93.8																						Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	8.5	7.9	4.8	5.8	4.0	Z	21.7	19.6	8.2	10.6	15.5	20.6	23.4	21.6	16.0	11.7	17.9	22.0	22.0	12.9	33.8	39.4	37.5	18.1	17.6	39.4																							
2-Jan	Z	13.2	13.7	11.0	9.7	11.0	8.8	7.8	10.6	17.5	17.1	15.7	20.8	25.1	22.9	21.9	22.5	19.0	18.6	18.1	12.4	16.1	12.2	17.1	15.8	25.1																							
3-Jan	13.2	Z	11.6	12.4	13.9	24.2	32.6	44.8	27.2	35.5	24.0	23.1	30.4	22.7	27.0	31.5	48.0	47.0	41.1	63.0	54.5	33.3	18.2	22.9	30.5	63.0																							
4-Jan	23.7	20.1	Z	15.9	17.9	19.7	20.1	20.1	25.0	22.6	25.6	31.6	41.6	47.4	39.0	40.0	32.7	27.3	25.1	31.2	45.6	29.8	33.4	23.9	28.7	47.4																							
5-Jan	14.9	13.4	15.7	Z	15.5	23.3	11.4	15.6	10.4	12.9	18.3	16.2	19.8	35.6	21.2	22.7	16.8	14.9	14.3	13.5	12.7	12.4	8.8	7.6	16.0	35.6																							
6-Jan	7.2	5.4	5.7	5.6	Z	7.3	8.2	11.1	12.5	14.2	11.2	11.4	15.1	15.4	18.9	25.5	21.3	41.6	35.7	29.1	18.1	16.7	17.2	15.2	16.1	41.6																							
7-Jan	7.8	12.7	12.4	12.2	10.5	Z	23.3	20.8	27.7	39.3	17.4	16.6	50.4	49.1	75.0	94.2	111.9	115.2	117.8	117.2	125.0	111.0	102.9	84.1	58.9	125.0																							
8-Jan	Z	85.5	69.7	63.8	59.1	66.6	56.7	55.2	50.4	50.7	41.4	30.8	20.5	16.3	15.4	14.8	16.2	22.1	36.2	21.8	42.3	34.0	40.8	34.5	41.1	85.5																							
9-Jan	14.5	Z	11.7	10.8	7.6	28.4	32.8	21.8	22.1	36.9	23.7	32.6	15.4	12.9	10.9	11.7	11.2	10.1	7.7	11.7	8.1	7.6	10.1	7.6	16.0	36.9																							
10-Jan	7.4	7.1	Z	3.5	5.9	3.6	3.1	3.7	14.1	4.9	2.2	1.8	2.0	1.9	1.5	1.8	5.7	16.3	9.1	9.0	8.1	5.8	9.7	8.2	5.9	16.3																							
11-Jan	5.5	4.2	3.9	Z	6.0	5.6	23.9	31.4	23.3	23.2	21.6	29.6	42.9	34.3	30.1	41.3	47.7	38.2	32.7	21.5	22.9	35.2	24.3	23.0	24.9	47.7																							
12-Jan	25.2	20.0	22.8	19.2	Z	20.2	20.9	28.1	30.9	26.5	21.1	20.5	15.4	18.0	15.9	19.1	29.4	45.5	39.3	26.3	26.6	22.5	21.7	19.8	24.1	45.5																							
13-Jan	20.8	16.6	13.8	13.1	10.3	Z	18.0	25.1	25.2	35.6	32.5	33.9	46.5	53.5	39.9	34.0	29.2	13.2	13.9	7.1	7.6	7.7	7.3	5.5	22.2	53.5																							
14-Jan	Z	6.3	6.3	6.5	5.5	6.8	7.8	7.4	9.7	10.4	10.9	10.1	10.5	12.2	14.0	17.3	27.3	14.4	11.2	10.5	7.4	7.5	6.5	8.2	10.2	27.3																							
15-Jan	7.0	Z	10.3	11.7	12.7	4.5	4.2	12.4	7.3	9.0	14.7	12.5	13.2	12.6	9.0	6.6	4.6	4.7	5.3	7.9	13.6	38.3	52.1	43.8	13.8	52.1																							
16-Jan	32.6	31.6	Z	26.5	33.0	25.7	9.8	8.3	7.0	6.6	5.8	7.3	8.3	9.5	7.6	8.5	9.9	11.0	11.0	8.1	7.9	8.1	10.5	12.0	13.3	33.0																							
17-Jan	4.0	2.8	3.5	Z	4.0	8.0	11.1	15.1	16.9	13.7	13.3	12.4	10.2	6.9	11.2	30.1	22.6	34.5	25.7	35.6	18.0	18.0	22.3	19.5	15.6	35.6																							
18-Jan	18.5	17.1	12.5	12.9	Z	32.6	35.8	39.9	33.7	39.3	28.3	22.8	12.0	10.1	10.5	10.8	12.3	12.5	14.0	13.6	13.5	12.0	13.1	9.0	19.0	39.9																							
19-Jan	7.5	9.4	12.6	13.0	14.2	Z	19.8	C	C	C	C	C	40.1	64.2	33.7	65.6	67.7	88.6	73.8	47.4	32.7	23.1	17.2	16.4	35.9	88.6																							
20-Jan	Z	23.2	19.1	14.7	14.4	31.3	42.7	59.4	58.5	47.8	44.0	44.8	49.1	26.4	11.0	6.6	13.3	23.4	7.9	10.9	6.3	4.1	18.7	27.7	26.3	59.4																							
21-Jan	34.4	Z	24.7	23.3	12.3	10.5	9.6	9.1	8.5	8.2	9.5	9.3	10.6	11.9	10.8	12.4	18.7	16.3	15.2	18.9	20.1	28.8	27.6	14.8	15.9	34.4																							
22-Jan	3.4	5.5	Z	6.5	8.4	2.1	2.3	2.0	1.7	1.6	1.3	2.6	3.5	5.1	6.8	6.5	4.9	6.6	8.2	8.6	11.1	10.2	8.1	11.7	5.6	11.7																							
23-Jan	17.9	19.8	19.9	Z	10.4	8.4	11.7	14.6	14.3	11.7	9.1	10.0	8.6	6.2	7.5	2.0	5.3	2.2	3.4	2.8	3.2	7.5	7.7	7.2	9.2	19.9																							
24-Jan	8.8	10.0	9.0	5.7	Z	8.1	11.2	10.0	8.7	10.2	10.0	9.4	10.4	18.8	21.6	19.3	33.9	33.3	23.9	12.1	10.2	9.0	9.2	8.3	13.5	33.9																							
25-Jan	8.6	7.2	8.4	7.3	7.9	Z	13.5	14.0	17.3	18.5	22.4	29.3	16.8	7.9	7.1	6.8	6.8	12.4	9.5	8.7	8.7	7.4	6.7	5.7	11.3	29.3																							
26-Jan	Z	6.6	7.6	8.2	1.2	1.4	3.4	5.6	6.9	6.2	4.4	8.2	6.6	8.7	11.2	12.8	12.4	6.3	3.4	3.6	2.8	3.7	3.9	4.3	6.1	12.8																							
27-Jan	4.0	Z	3.9	3.2	6.9	6.3	11.9	18.7	24.4	27.6	6.4	4.1	6.6	10.8	11.2	13.2	10.3	16.9	21.9	26.3	24.7	13.1	5.2	3.3	12.2	27.6																							
28-Jan	1.8	1.3	Z	1.2	1.1	1.9	4.0	3.5	2.7	2.0	1.9	1.9	1.7	1.7	1.9	2.6	3.6	3.6	2.0	2.2	2.8	2.5	3.3	4.5	2.4	4.5																							
29-Jan	8.0	8.9	7.7	Z	10.6	19.6	40.0	64.4	41.5	33.4	23.4	26.9	24.9	30.1	32.2	39.2	19.0	13.4	28.7	29.5	33.3	24.9	30.2	18.0	26.4	64.4																							
30-Jan	15.5	11.3	6.8	8.4	Z	17.5	21.2	27.2	39.2	49.3	50.3	50.3	27.2	22.4	13.7	20.4	22.0	31.2	22.1	17.0	17.4	16.5	13.0	16.9	23.3	50.3																							
31-Jan	34.7	33.9	12.4	8.2	12.0	Z	19.7	16.3	27.9	23.8	23.4	17.1	12.9	21.0	20.9	18.0	43.5	30.4	38.1	45.7	51.8	48.5	49.6	45.1	28.5	51.8																							
																								13.7	15.4	13.5	12.7	12.1	15.8	18.1	21.1	20.5	21.7	18.4	18.8	19.9	20.6	18.6	21.6	24.1	25.6	23.8	22.3	22.7	21.1	20.9	18.2	Diurnal Average	
																								34.7	85.5	69.7	63.8	59.1	66.6	56.7	64.4	58.5	50.7	50.3	50.3	50.4	64.2	75.0	94.2	111.9	115.2	117.8	117.2	125.0	111.0	102.9	84.1	Diurnal Maximum	
Z - zerospan C - Calibration																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	464	65.54	65.54
21 - 40	178	25.14	90.68
41 - 80	55	7.77	98.45
81 - 159	11	1.55	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	5	10	8	33	23	136	48	31	19	34	10	9	18	13	32	464
21 - 40	13	3	1	7	4	14	39	31	16	13	6	5	6	4	6	10	178
11 - 80	5	2	0	3	0	2	9	13	3	3	4	1	5	1	0	4	55
81 - 159	1	2	0	2	1	2	0	1	1	0	1	0	0	0	0	0	11
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	54	12	11	20	38	41	184	93	51	35	45	16	20	23	19	46	708

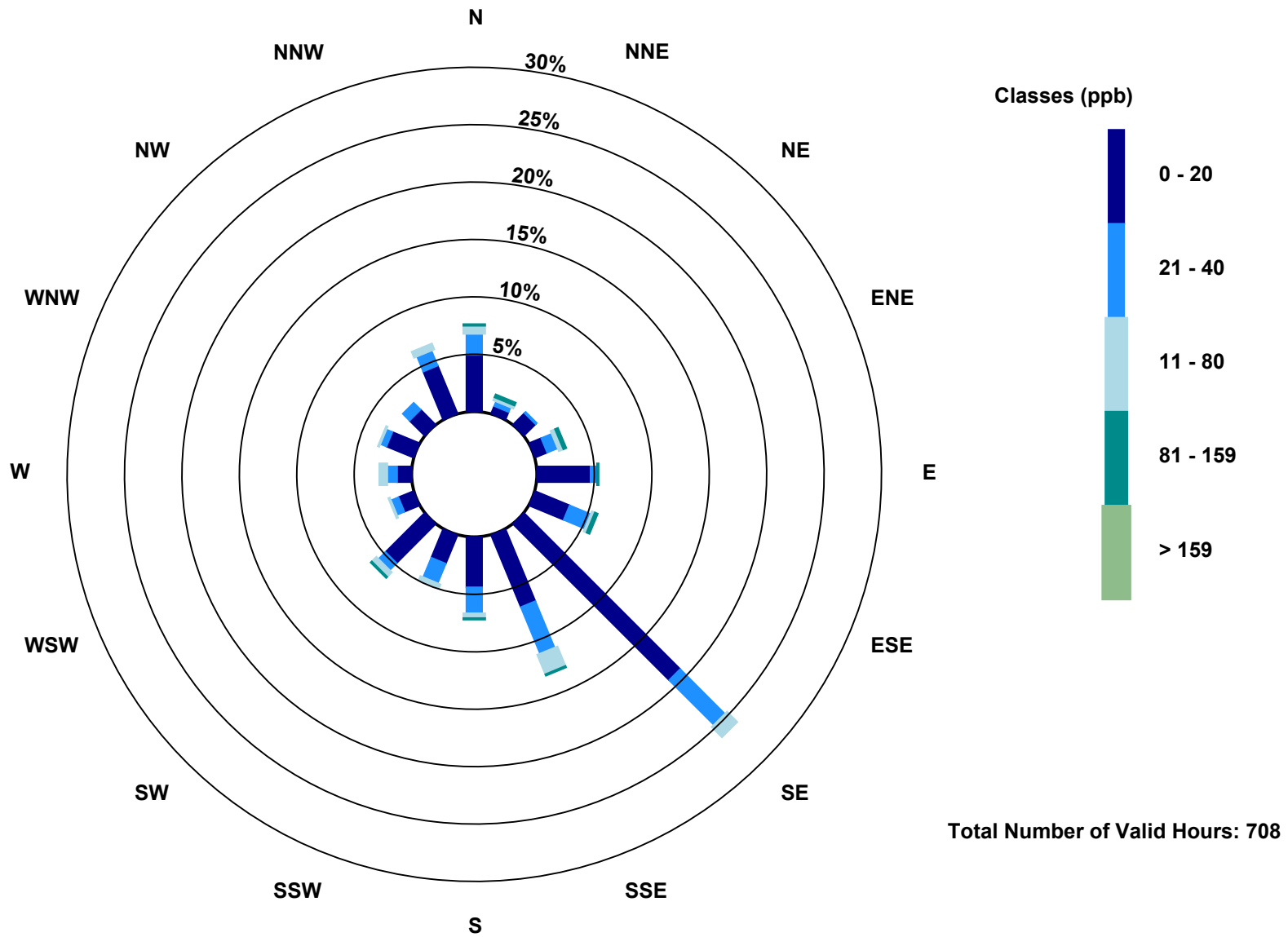
Total Number of Valid Hours: 708

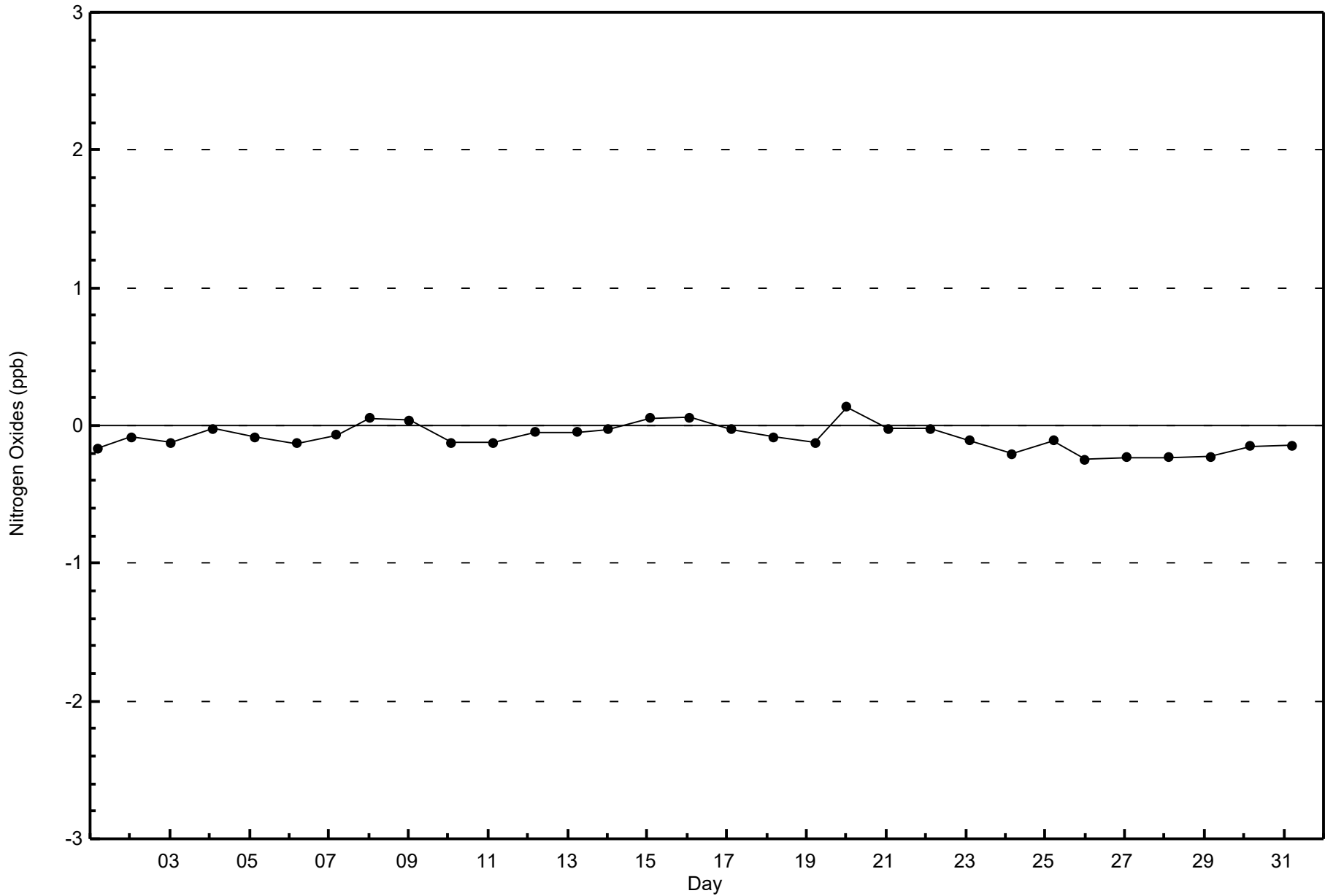
Total Number of Hours: 744

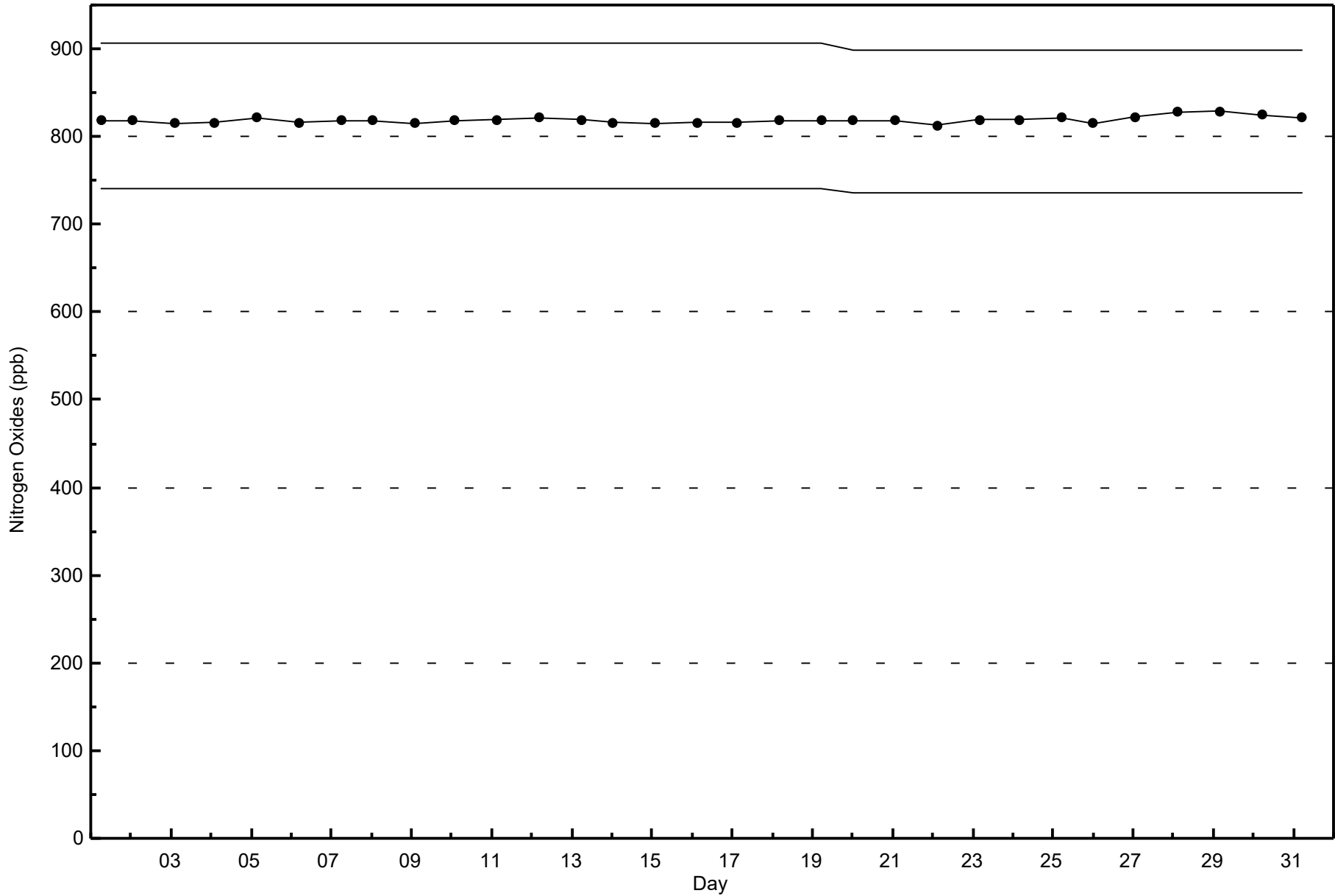


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley

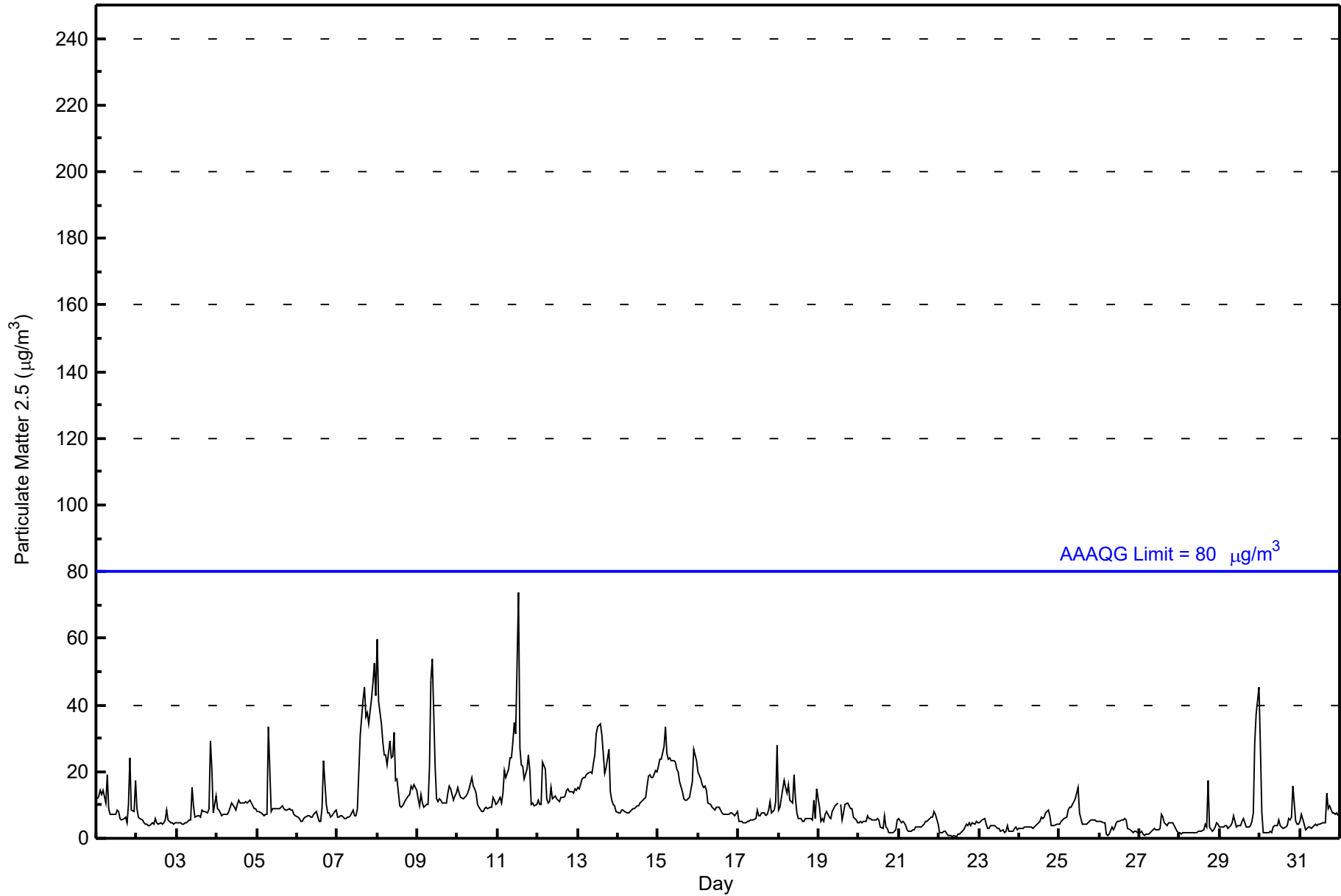








Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 73.8 µg/m ³ on Jan 11 13:00		Maximum Daily Average: 21.6 µg/m ³ on Jan 8																	Hours of Data: 743																														
Minimum Value: 0.6 µg/m ³ on Jan 22 09:00		Minimum Daily Average: 2.4 µg/m ³ on Jan 22																	Hours of Missing Data: 1																														
Maximum Diurnal Average: 11.7 µg/m ³ at hour 24		Minimum Diurnal Average: 8.2 µg/m ³ at hour 6																	Hours of Calibration: 1																														
Monthly Average: 9.66 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 2.6 Q ₁ = 4.5 Median = 7.2 Q ₃ = 11.4 P ₉₀ = 20.4 P ₉₉ = 44.2																	Percent Operational Time: 100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	12.1	12.8	14.2	13.3	14.6	10.6	19.0	9.0	7.2	7.3	7.2	7.1	8.3	8.3	6.0	5.5	6.0	6.2	4.7	10.0	24.1	8.6	8.2	17.6	10.3	24.1																							
2-Jan	8.8	6.5	5.9	5.4	4.8	4.3	4.1	3.8	4.0	4.5	4.3	6.0	4.6	4.4	4.5	4.3	4.5	5.4	8.4	5.6	4.6	4.8	4.4	4.9	5.1	8.8																							
3-Jan	4.5	4.9	4.6	4.3	4.3	4.5	4.6	5.5	5.4	15.1	9.8	6.3	6.9	6.7	6.3	8.7	7.9	8.1	7.8	8.8	29.3	20.6	7.8	12.8	8.6	29.3																							
4-Jan	9.0	8.3	7.5	7.0	7.3	7.3	7.1	7.9	9.2	10.7	9.4	8.7	10.3	11.3	10.6	10.4	10.6	10.9	10.6	11.0	11.4	9.7	9.0	9.1	9.3	11.4																							
5-Jan	8.1	8.1	7.4	7.2	6.9	7.4	7.2	33.5	8.2	9.0	8.8	9.1	8.9	9.1	9.3	9.7	9.1	8.5	8.4	8.7	8.6	8.3	7.4	6.8	9.3	33.5																							
6-Jan	6.4	5.9	5.3	5.1	5.7	6.2	6.7	6.7	6.5	6.5	7.1	7.9	6.4	5.2	5.2	9.3	23.5	10.2	7.8	7.7	6.5	6.9	8.1	8.5	7.6	23.5																							
7-Jan	6.4	6.5	6.6	6.6	6.0	5.8	6.6	6.5	6.6	8.7	6.9	6.8	8.8	20.0	30.7	41.6	45.2	36.5	37.6	34.2	42.1	46.7	52.7	42.8	21.6	52.7																							
8-Jan	59.6	41.1	34.3	28.9	25.0	25.2	21.9	29.2	24.3	24.7	31.7	17.4	17.8	9.9	9.5	9.9	10.5	11.6	12.8	13.0	15.6	14.7	16.1	14.5	21.6	59.6																							
9-Jan	11.9	9.9	13.0	10.7	9.5	10.3	10.1	21.0	47.6	53.6	21.8	11.9	11.2	11.7	11.5	10.5	10.5	10.5	13.4	15.8	14.9	11.5	12.9	13.6	15.8	53.6																							
10-Jan	15.1	13.6	12.5	11.7	12.5	12.6	13.6	14.9	18.2	15.7	14.7	13.8	10.3	9.2	8.1	8.2	8.7	9.4	8.9	9.2	9.3	12.3	11.3	10.1	11.8	18.2																							
11-Jan	10.7	12.2	10.5	13.7	20.4	18.3	21.0	24.3	24.0	29.0	34.6	31.2	73.8	27.0	22.0	21.6	17.8	20.6	25.1	20.5	10.3	10.5	9.6	10.1	21.6	73.8																							
12-Jan	11.6	10.0	10.2	22.7	20.9	11.7	10.4	11.1	15.2	11.8	12.8	12.0	11.3	11.1	12.3	12.4	12.8	14.4	14.8	13.8	14.1	13.6	14.9	14.6	13.4	22.7																							
13-Jan	15.1	15.0	17.6	18.3	18.2	19.3	19.7	19.7	19.4	22.6	25.1	31.2	33.3	34.3	31.0	25.3	19.4	21.2	26.7	13.9	11.4	10.3	9.5	8.2	20.2	34.3																							
14-Jan	7.5	7.7	8.4	8.5	7.9	7.7	7.8	7.8	8.3	8.7	9.0	9.6	9.8	10.7	11.0	11.3	12.1	15.6	18.7	19.0	18.0	18.0	20.2	20.1	11.8	20.2																							
15-Jan	21.7	23.9	23.8	27.7	33.6	25.4	23.5	24.3	23.4	22.8	20.8	19.8	16.9	13.8	12.0	11.5	11.2	11.7	12.2	16.9	26.5	25.2	23.4	20.6	20.6	33.6																							
16-Jan	20.1	17.9	16.1	15.1	15.6	14.5	10.6	10.0	9.2	9.0	8.7	9.4	9.2	8.4	7.8	7.4	7.2	7.3	7.2	7.5	7.6	7.0	6.9	7.9	10.3	20.1																							
17-Jan	5.2	5.0	5.1	4.6	4.7	5.1	5.2	5.3	5.5	5.5	5.8	8.4	6.9	6.6	7.7	7.6	6.8	7.2	8.5	10.8	7.7	8.3	11.0	27.8	7.6	27.8																							
18-Jan	8.3	9.4	14.8	17.4	15.4	13.5	16.0	11.6	10.7	19.2	11.8	7.8	6.0	6.1	5.1	5.2	5.8	5.8	5.9	6.1	5.4	11.4	6.1	14.9	10.0	19.2																							
19-Jan	9.3	5.3	5.9	5.0	7.0	7.9	6.5	5.8	7.9	9.0	9.8	10.4	C	10.3	5.7	7.8	10.1	10.7	9.8	8.9	9.1	6.5	5.5	4.6	7.8	10.7																							
20-Jan	4.6	5.0	4.6	5.0	5.1	6.6	6.0	5.9	5.4	5.5	5.3	6.0	5.5	3.2	2.9	6.7	3.6	3.2	1.8	1.9	1.6	2.2	2.6	5.5	4.4	6.7																							
21-Jan	6.1	4.7	4.9	4.7	3.7	2.6	2.0	2.2	2.3	2.7	3.2	3.4	3.4	3.5	3.8	4.2	5.2	5.3	5.8	6.2	6.3	8.0	7.1	4.0	4.4	8.0																							
22-Jan	1.8	1.6	1.7	2.2	2.2	0.8	1.0	0.8	0.6	0.6	0.6	1.3	1.1	1.6	2.2	2.6	4.1	4.0	4.7	3.7	4.6	4.3	4.9	4.8	2.4	4.9																							
23-Jan	4.6	5.1	5.6	5.8	4.2	2.9	3.0	3.6	3.9	3.9	3.4	3.1	2.9	2.2	2.7	1.8	2.0	3.8	2.2	2.1	2.1	3.0	3.3	2.6	3.3	5.8																							
24-Jan	2.9	2.8	2.8	3.3	3.3	3.2	3.2	3.3	3.1	3.5	4.0	4.5	5.0	6.3	6.1	6.4	7.8	8.6	6.6	3.9	3.8	4.0	4.4	4.2	4.4	8.6																							
25-Jan	4.3	4.9	5.5	5.9	6.4	8.6	9.5	9.4	10.2	12.0	13.6	15.0	7.8	5.8	4.0	4.1	4.0	4.9	5.2	5.4	5.4	5.4	5.3	5.3	7.0	15.0																							
26-Jan	5.0	5.1	4.7	4.6	1.2	0.9	1.4	3.2	2.6	3.2	4.5	5.3	4.9	5.3	5.5	5.7	5.5	2.8	2.4	2.2	1.7	2.1	2.1	1.7	3.5	5.7																							
27-Jan	1.7	2.2	1.3	1.0	1.5	1.4	1.9	2.2	2.6	3.1	2.4	2.6	3.0	7.3	6.3	4.9	3.8	4.7	4.5	4.5	4.6	3.8	2.1	1.7	3.1	7.3																							
28-Jan	1.6	1.5	1.6	1.6	1.6	1.8	1.8	1.9	1.8	1.8	1.8	1.9	2.1	2.1	2.7	4.2	3.3	17.3	3.5	2.1	2.7	3.3	4.7	4.3	3.0	17.3																							
29-Jan	3.3	3.6	3.4	3.9	3.7	2.8	3.8	4.9	6.7	5.0	3.5	4.0	3.8	5.1	5.8	4.5	3.3	3.5	4.0	5.1	7.6	28.8	37.4	45.3	8.4	45.3																							
30-Jan	27.4	8.1	1.7	1.7	1.7	1.6	1.9	1.8	3.3	3.8	3.8	3.8	5.4	3.8	3.4	2.8	3.3	3.9	5.7	5.3	6.4	15.6	5.0	4.4	4.4	5.3	27.4																						
31-Jan	5.1	7.2	4.1	2.5	3.0	3.2	3.5	3.1	4.0	4.2	4.0	4.0	4.0	4.8	4.5	4.7	13.5	9.0	9.8	7.6	7.4	7.2	7.8	7.0	5.6	13.5																							
																								10.3	8.9	8.6	8.9	9.0	8.2	8.4	9.7	9.9	11.1	10.1	9.4	10.4	9.0	8.6	9.1	9.7	9.8	9.8	9.3	10.7	10.8	10.7	11.7	Diurnal Average	
																								59.6	41.1	34.3	28.9	33.6	25.4	23.5	33.5	47.6	53.6	34.6	31.2	73.8	34.3	31.0	41.6	45.2	36.5	37.6	34.2	42.1	46.7	52.7	45.3	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	278	37.42	37.42
6 - 15	351	47.24	84.66
16 - 25	76	10.23	94.89
26 - 80	38	5.11	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Athabasca Valley - January 2023**

Concentration Ranges (µg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	29	5	5	5	10	12	58	30	20	11	13	6	9	19	14	32	278
6 - 15	19	2	5	8	19	20	129	61	24	19	23	4	4	3	1	10	351
16 - 25	7	2	1	4	10	6	7	8	4	5	10	3	2	1	2	4	76
26 - 80	2	3	0	3	1	3	4	2	3	2	2	4	5	1	2	1	38
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	12	11	20	40	41	198	101	51	37	48	17	20	24	19	47	743

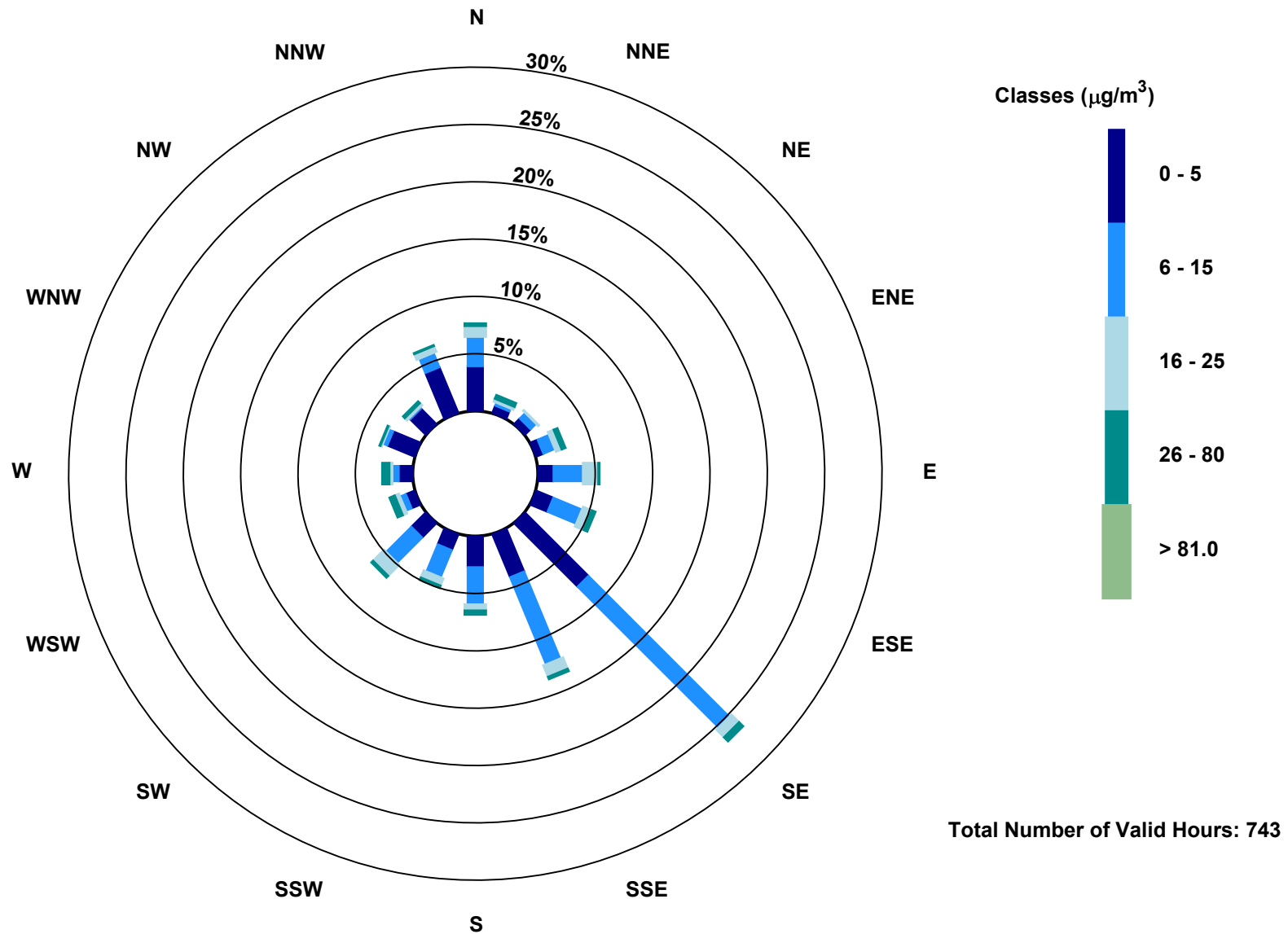
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

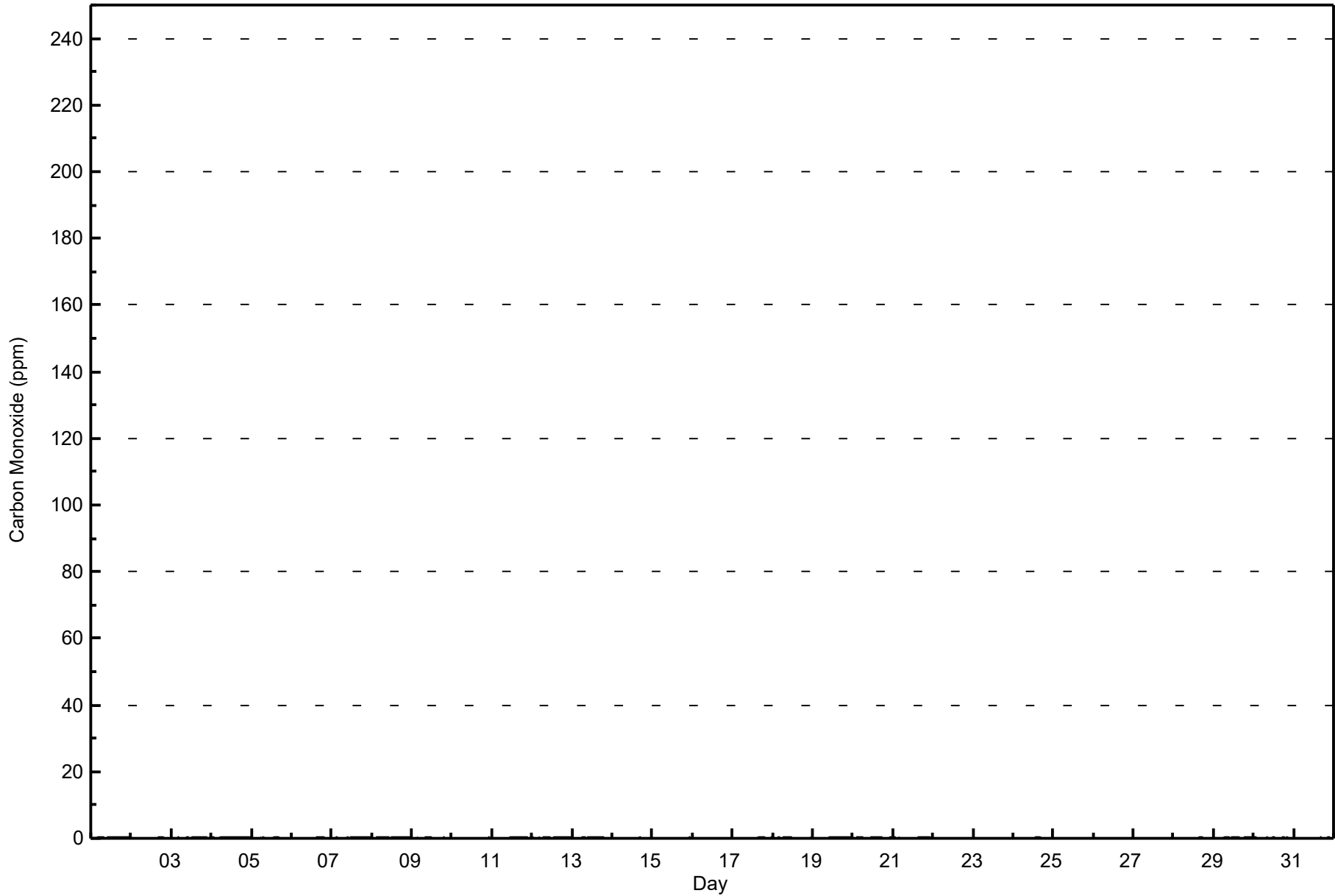
Carbon Monoxide (CO) - ppm
Athabasca Valley - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																												
Maximum Value: 0.6 ppm on Jan 19 18:00		Maximum Daily Average: 0.3 ppm on Jan 7																	Hours of Data:	710																														
Minimum Value: 0.1 ppm on Jan 27 04:00		Minimum Daily Average: 0.1 ppm on Jan 27																	Hours of Missing Data:	34																														
Maximum Diurnal Average: 0.3 ppm at hour 18		Minimum Diurnal Average: 0.2 ppm at hour 3																	Hours of Calibration:	34																														
Monthly Average: 0.20 ppm		Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.5																	Percent Operational Time:	100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Jan	Z	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.4	0.4	0.3	0.4																								
2-Jan	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
3-Jan	0.2	0.2	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.4																							
4-Jan	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4																							
5-Jan	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																							
6-Jan	0.1	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
7-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5																							
8-Jan	0.3	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4																							
9-Jan	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4																							
10-Jan	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																							
11-Jan	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.4	0.4																							
12-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4																							
13-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
14-Jan	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																							
15-Jan	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																							
16-Jan	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																							
17-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3																							
18-Jan	0.2	0.2	0.2	0.2	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3																							
19-Jan	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.5	0.3	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.6	0.6																							
20-Jan	0.3	Z	0.3	0.3	0.3	0.5	0.4	C	C	C	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5																							
21-Jan	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3																							
22-Jan	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
23-Jan	0.1	0.1	0.1	0.2	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2																							
24-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3																							
25-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
26-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
27-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2																							
28-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4																							
29-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.3	0.5																							
30-Jan	0.3	0.4	0.2	0.2	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4																							
31-Jan	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
																								0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Diurnal Average
																								0.3	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.5	0.3	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	Diurnal Maximum
Z - zerospan C - Calibration																																																		
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																																																		



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Athabasca Valley - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	675	95.07	95.07
0.4 - 0.5	33	4.65	99.72
0.6 - 0.7	2	0.28	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	54	11	11	16	37	34	182	91	44	31	45	16	18	22	18	45	675
0.4 - 0.5	2	1	0	3	1	5	6	3	4	1	2	1	2	1	1	0	33
0.6 - 0.7	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	56	12	11	19	38	39	189	95	48	32	47	17	20	23	19	45	710

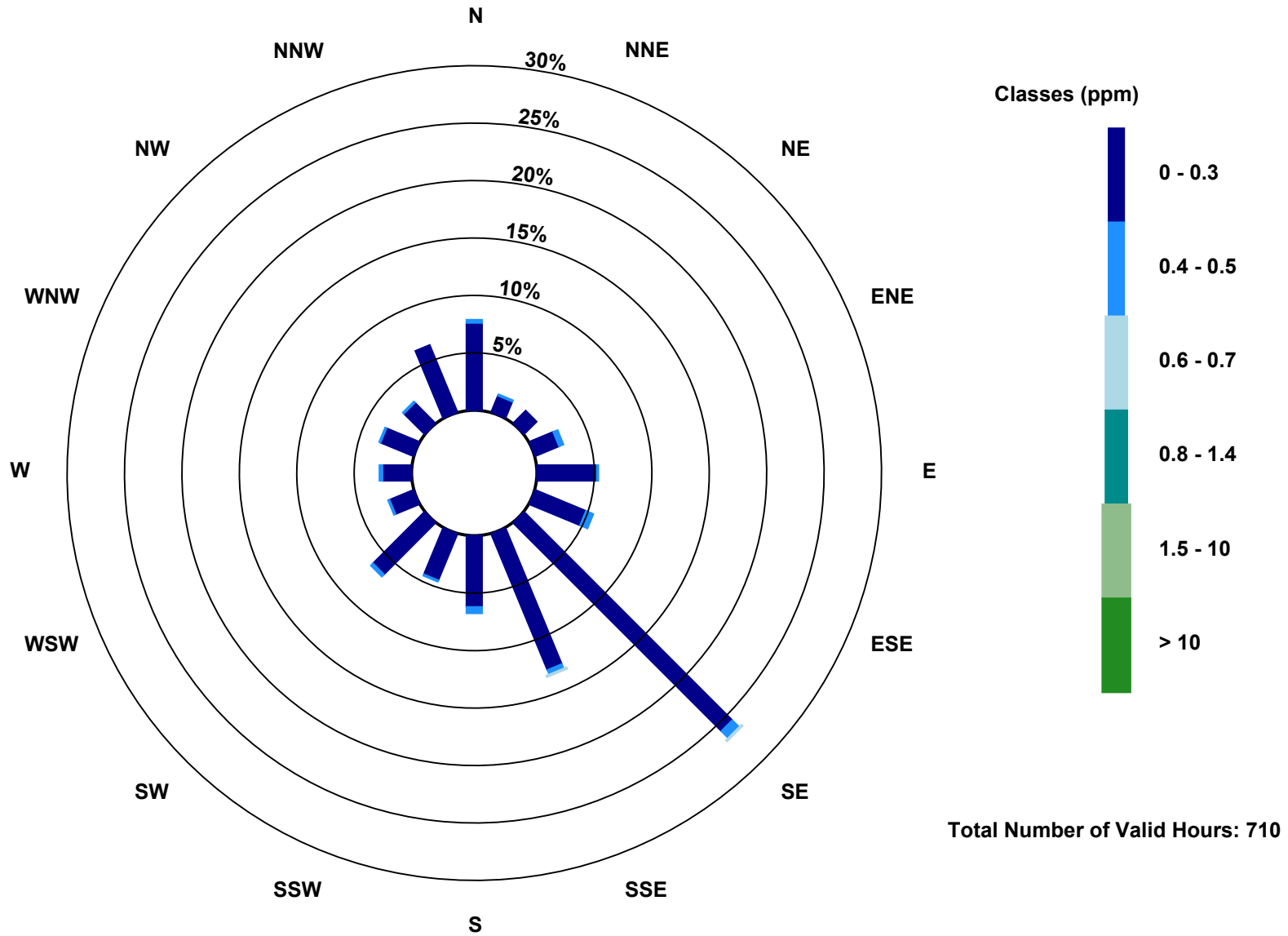
Total Number of Valid Hours: 710

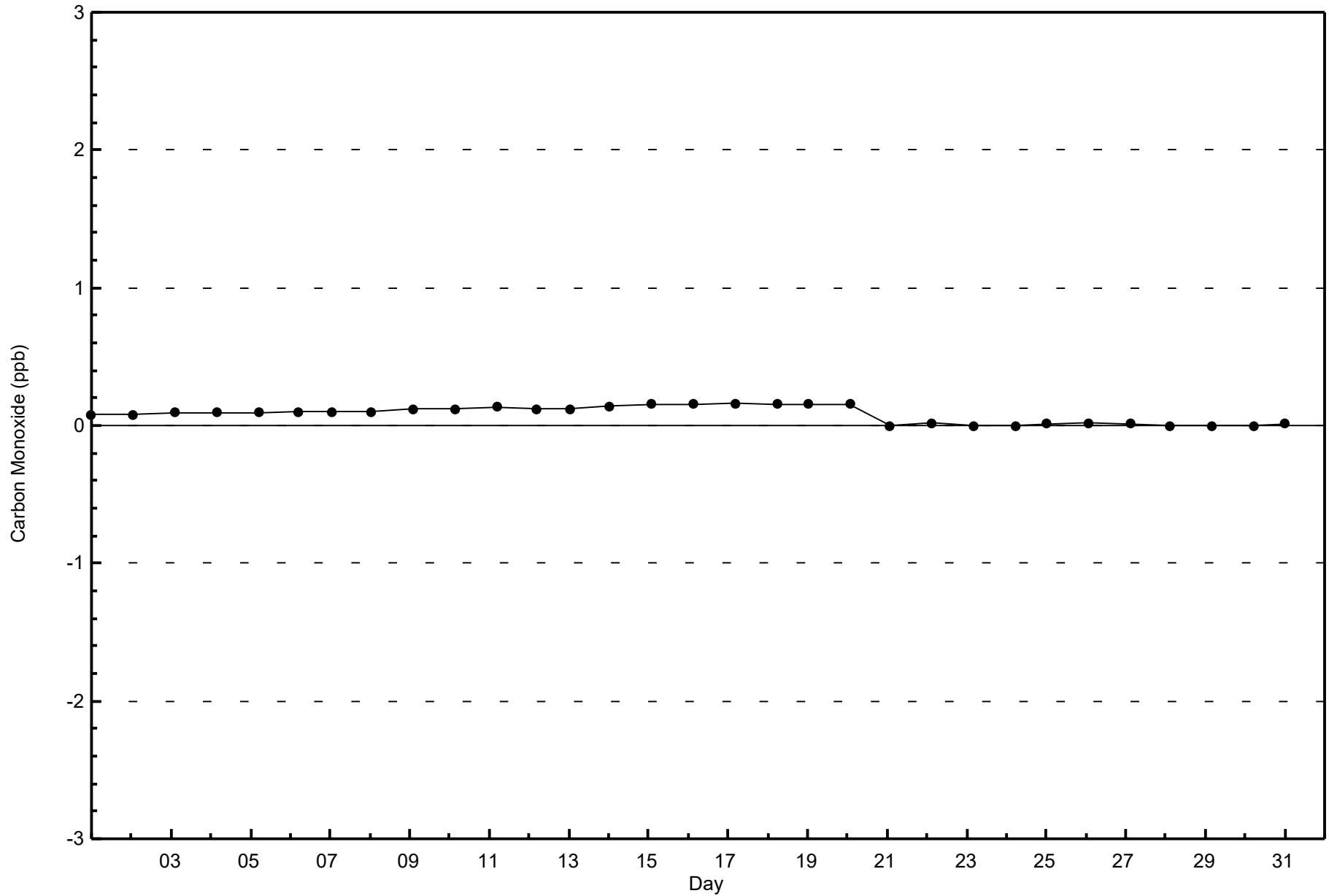
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Monoxide (CO) - ppm
Athabasca Valley

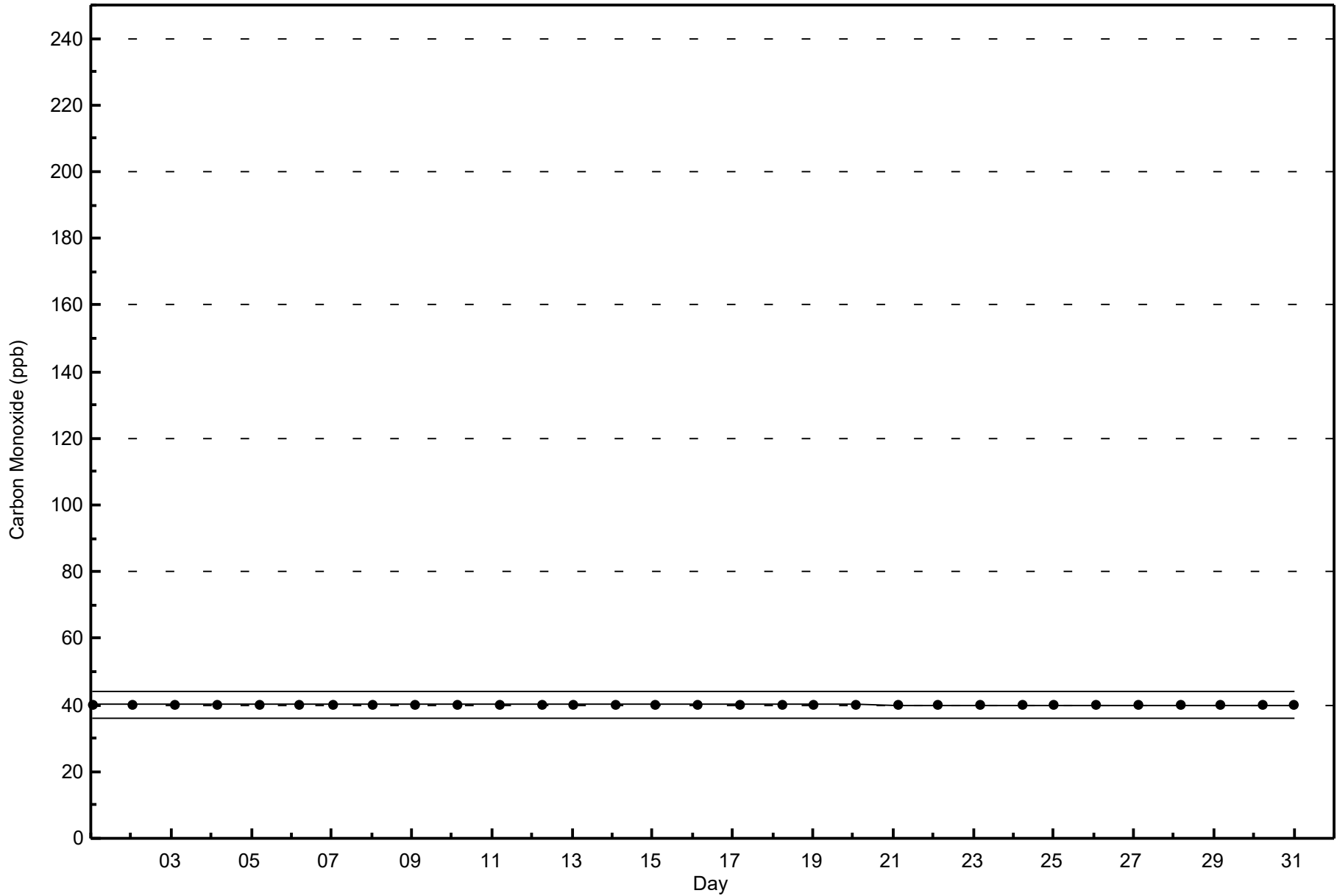






Wood Buffalo Environmental Association
Span Responses

Carbon Monoxide (CO) - ppb
Athabasca Valley - January 2023

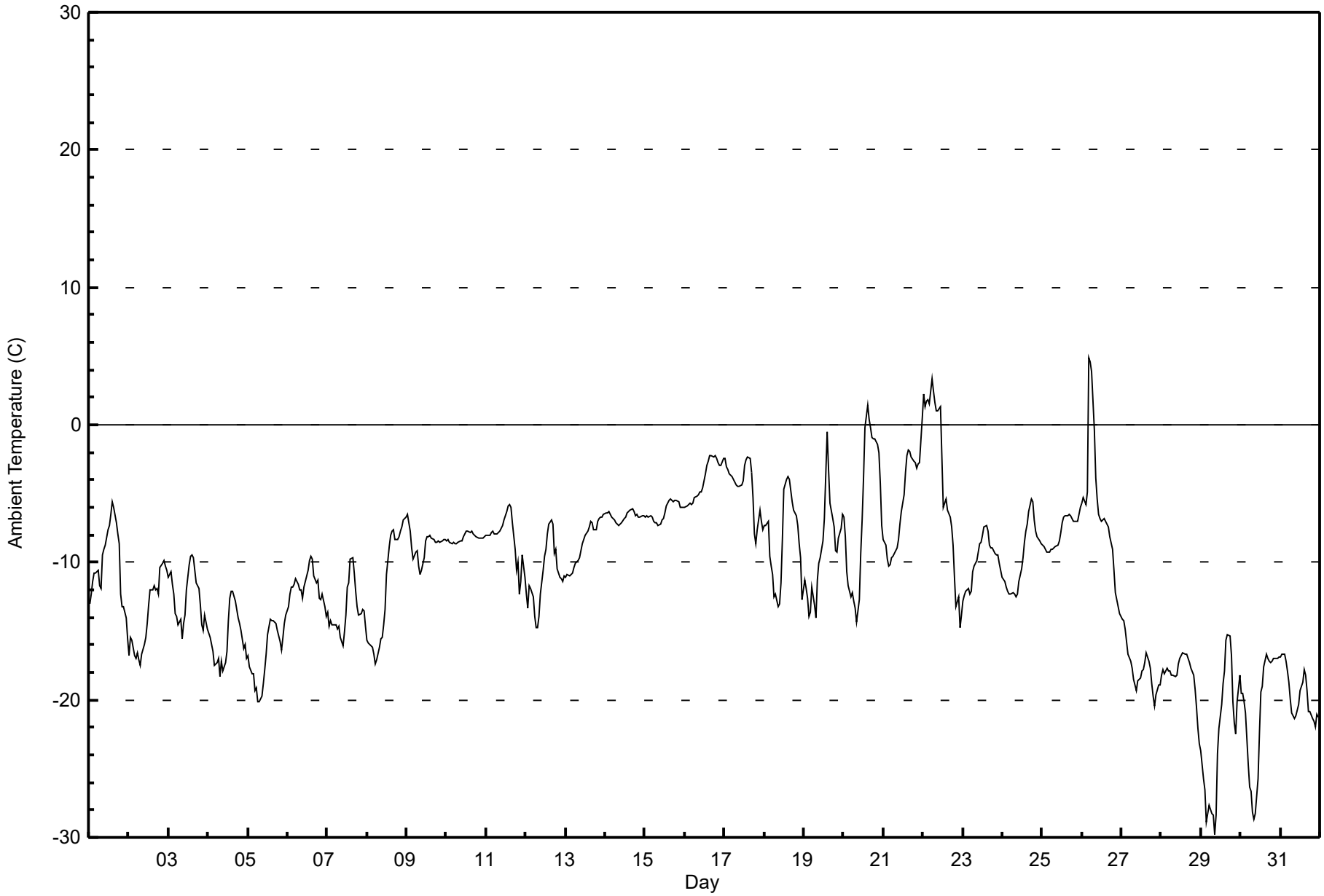




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Athabasca Valley - January 2023

Maximum Value: 4.9 C on Jan 26 05:00 Maximum Daily Average: -3.9 C on Jan 22																								Hours in Service: 744		
Minimum Value: -29.8 C on Jan 29 09:00 Minimum Daily Average: -22.7 C on Jan 29																								Hours of Data: 744		
Maximum Diurnal Average: -8.4 C at hour 15 Minimum Diurnal Average: -12.7 C at hour 9																								Hours of Missing Data: 0		
Monthly Average: -10.91 C Percentiles: P₁ = -28.2 P₁₀ = -18.2 Q₁ = -14.6 Median = -9.9 Q₃ = -7.0 P₉₀ = -4.6 P₉₉ = 1.7																								Hours of Calibration: 0		
Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-13.0	-12.3	-11.4	-10.8	-10.7	-10.6	-11.7	-11.9	-9.5	-9.0	-8.7	-7.7	-7.3	-6.5	-5.6	-6.0	-7.1	-7.9	-8.6	-12.4	-13.2	-13.3	-14.0	-15.6	-10.2	-5.6
2-Jan	-16.7	-15.4	-15.7	-16.7	-16.9	-16.5	-17.1	-17.5	-16.7	-16.0	-15.4	-14.5	-13.1	-12.0	-12.0	-11.7	-12.0	-11.9	-12.3	-10.4	-10.0	-9.9	-10.2	-10.6	-13.8	-9.9
3-Jan	-11.0	-10.7	-11.6	-12.3	-13.7	-13.9	-14.5	-14.1	-15.6	-14.5	-13.9	-12.0	-10.1	-9.6	-9.4	-9.6	-10.6	-11.5	-11.9	-13.1	-14.5	-14.9	-13.9	-14.9	-12.6	-9.4
4-Jan	-15.1	-15.5	-15.9	-16.5	-17.5	-17.3	-17.0	-18.4	-17.2	-17.9	-17.3	-16.5	-14.2	-12.6	-12.1	-12.1	-12.8	-13.4	-14.0	-14.4	-15.0	-16.2	-16.0	-17.0	-15.5	-12.1
5-Jan	-16.7	-17.5	-18.1	-18.1	-19.3	-19.2	-20.2	-20.1	-19.7	-18.9	-17.8	-16.7	-15.2	-14.1	-14.3	-14.3	-14.3	-14.5	-14.9	-15.8	-16.4	-15.5	-14.5	-13.9	-16.7	-13.9
6-Jan	-13.2	-12.3	-11.8	-11.8	-11.6	-11.2	-11.6	-11.9	-12.0	-12.6	-11.8	-11.0	-10.6	-9.9	-9.5	-9.8	-11.0	-11.5	-11.3	-12.6	-12.7	-12.3	-13.2	-13.9	-11.7	-9.5
7-Jan	-13.7	-14.7	-14.2	-14.5	-14.5	-14.5	-14.8	-14.7	-15.5	-16.0	-15.0	-13.8	-11.8	-11.5	-9.7	-9.6	-10.8	-12.1	-13.2	-13.9	-13.7	-13.4	-13.5	-14.7	-13.5	-9.6
8-Jan	-15.6	-15.9	-16.1	-16.2	-16.7	-17.4	-17.1	-16.1	-15.5	-15.5	-14.6	-13.5	-10.8	-8.8	-8.0	-7.8	-7.6	-8.3	-8.4	-8.1	-7.8	-7.4	-6.9	-6.7	-12.0	-6.7
9-Jan	-6.5	-7.1	-7.8	-9.0	-9.7	-9.3	-9.2	-10.3	-10.9	-10.6	-9.6	-8.4	-8.1	-8.1	-8.1	-8.2	-8.4	-8.6	-8.6	-8.5	-8.5	-8.5	-8.3	-8.3	-8.7	-6.5
10-Jan	-8.4	-8.4	-8.6	-8.6	-8.5	-8.7	-8.7	-8.6	-8.4	-8.4	-8.1	-7.9	-7.7	-7.8	-7.8	-7.8	-7.9	-8.0	-8.2	-8.2	-8.2	-8.2	-8.2	-8.2	-8.2	-7.7
11-Jan	-8.0	-8.0	-8.0	-7.9	-7.8	-8.0	-7.9	-7.9	-7.8	-7.6	-7.3	-6.9	-6.3	-5.9	-5.8	-6.0	-7.1	-9.1	-10.6	-10.0	-12.3	-11.4	-9.5	-11.1	-8.3	-5.8
12-Jan	-12.3	-13.3	-11.7	-11.9	-12.5	-13.9	-14.8	-14.7	-14.0	-12.3	-10.6	-9.6	-9.0	-7.9	-7.2	-6.9	-7.2	-9.4	-9.1	-10.4	-11.1	-11.2	-11.4	-11.0	-11.0	-6.9
13-Jan	-11.1	-10.9	-10.9	-10.9	-10.8	-10.4	-10.1	-9.8	-9.6	-9.2	-8.7	-8.4	-8.0	-7.8	-7.4	-7.0	-7.1	-7.6	-7.6	-7.0	-6.9	-6.8	-6.8	-6.5	-8.6	-6.5
14-Jan	-6.4	-6.4	-6.4	-6.5	-6.7	-6.9	-7.1	-7.2	-7.3	-7.2	-7.1	-6.8	-6.7	-6.4	-6.3	-6.2	-6.1	-6.3	-6.6	-6.5	-6.7	-6.7	-6.6	-6.6	-6.7	-6.1
15-Jan	-6.7	-6.6	-6.7	-6.7	-6.7	-7.0	-7.1	-7.1	-7.3	-7.2	-6.9	-6.8	-6.4	-5.9	-5.5	-5.4	-5.5	-5.5	-5.6	-5.5	-5.5	-5.6	-6.0	-6.0	-6.3	-5.4
16-Jan	-6.0	-5.9	-5.8	-5.7	-5.8	-5.7	-5.3	-5.2	-5.1	-4.9	-4.9	-4.6	-3.6	-2.9	-2.6	-2.3	-2.2	-2.4	-2.3	-2.5	-2.8	-3.0	-2.9	-2.4	-4.0	-2.2
17-Jan	-2.4	-3.0	-3.3	-3.6	-3.7	-3.9	-4.1	-4.3	-4.5	-4.5	-4.4	-4.0	-3.0	-2.6	-2.3	-2.5	-3.4	-5.3	-7.9	-8.6	-7.7	-6.2	-7.0	-7.6	-4.6	-2.3
18-Jan	-7.3	-7.3	-7.0	-9.6	-10.3	-10.9	-12.5	-12.3	-13.2	-13.0	-11.4	-8.4	-4.7	-4.0	-3.8	-4.0	-4.8	-5.6	-6.2	-6.6	-7.3	-8.7	-9.7	-12.7	-8.4	-3.8
19-Jan	-11.3	-11.9	-12.6	-14.0	-13.7	-11.8	-13.2	-14.0	-11.3	-10.1	-9.6	-8.4	-6.8	-3.7	-0.5	-3.2	-5.7	-6.8	-7.4	-9.2	-9.2	-8.3	-7.5	-6.5	-9.0	-0.5
20-Jan	-6.7	-8.1	-10.6	-11.7	-12.5	-12.2	-12.8	-13.4	-14.4	-12.8	-9.4	-6.9	-3.9	-0.2	1.5	0.4	-0.3	-0.9	-1.0	-1.0	-1.4	-2.1	-4.3	-7.3	-6.3	1.5
21-Jan	-8.3	-8.8	-9.7	-10.3	-10.2	-9.6	-9.5	-9.2	-9.0	-8.4	-7.2	-6.3	-5.1	-3.5	-2.2	-1.9	-2.0	-2.3	-2.6	-2.7	-3.2	-2.9	-2.7	0.5	-5.7	0.5
22-Jan	2.2	1.3	1.8	1.8	1.6	3.4	2.5	1.6	1.0	1.0	1.3	-2.4	-6.0	-5.7	-5.4	-6.2	-6.7	-7.5	-8.7	-11.1	-13.2	-12.5	-14.7	-13.8	-3.9	3.4
23-Jan	-12.9	-12.4	-12.1	-11.9	-12.3	-12.1	-10.7	-10.2	-9.8	-9.3	-8.7	-8.5	-8.1	-7.4	-7.3	-7.7	-8.7	-8.9	-8.9	-9.3	-9.5	-9.5	-10.0	-10.6	-9.9	-7.3
24-Jan	-11.1	-11.4	-11.8	-12.1	-12.3	-12.3	-12.2	-12.3	-12.5	-12.3	-11.4	-10.5	-9.7	-8.5	-7.7	-7.2	-6.3	-5.4	-5.6	-6.9	-7.7	-8.2	-8.4	-8.7	-9.7	-5.4
25-Jan	-8.7	-8.8	-9.1	-9.2	-9.2	-9.1	-9.0	-9.0	-8.9	-8.7	-8.5	-7.8	-7.1	-6.7	-6.6	-6.6	-6.5	-6.6	-6.8	-7.1	-7.0	-7.0	-6.6	-6.0	-7.8	-6.0
26-Jan	-5.7	-5.3	-5.8	-4.9	4.9	4.6	3.9	-0.4	-3.8	-5.4	-6.5	-6.8	-7.0	-6.8	-7.0	-7.2	-7.5	-8.1	-9.1	-10.5	-12.2	-12.7	-13.2	-13.7	-6.1	4.9
27-Jan	-14.2	-14.2	-14.9	-15.8	-16.7	-17.2	-17.7	-18.5	-18.9	-19.4	-18.7	-18.4	-17.9	-17.8	-17.3	-16.5	-17.2	-17.7	-18.8	-19.8	-20.4	-19.7	-18.9	-18.9	-17.7	-14.2
28-Jan	-18.2	-17.8	-18.1	-17.7	-17.9	-17.9	-18.2	-18.2	-18.3	-18.2	-17.4	-16.9	-16.7	-16.6	-16.6	-16.7	-17.0	-17.3	-17.6	-18.2	-19.2	-20.6	-22.1	-23.2	-18.2	-16.6
29-Jan	-23.7	-25.7	-26.6	-28.9	-28.3	-27.7	-28.3	-28.4	-29.8	-28.4	-23.9	-22.1	-20.4	-18.8	-17.9	-15.7	-15.2	-15.3	-16.8	-20.1	-21.7	-22.5	-20.2	-18.3	-22.7	-15.2
30-Jan	-19.5	-19.5	-20.2	-21.0	-24.7	-26.3	-26.6	-28.2	-28.7	-28.3	-25.7	-22.3	-19.4	-19.0	-17.6	-16.7	-17.0	-17.2	-17.3	-17.2	-17.0	-17.0	-17.0	-16.8	-20.8	-16.7
31-Jan	-16.9	-16.7	-16.7	-17.2	-17.9	-18.7	-19.9	-21.0	-21.3	-21.1	-20.7	-20.3	-19.4	-18.7	-17.8	-18.2	-19.3	-20.8	-20.8	-21.3	-21.6	-21.9	-21.0	-21.3	-19.6	-16.7
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Athabasca Valley - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	45	6.05	6.05
-20 - 0	682	91.67	97.72
0 - 10	17	2.28	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

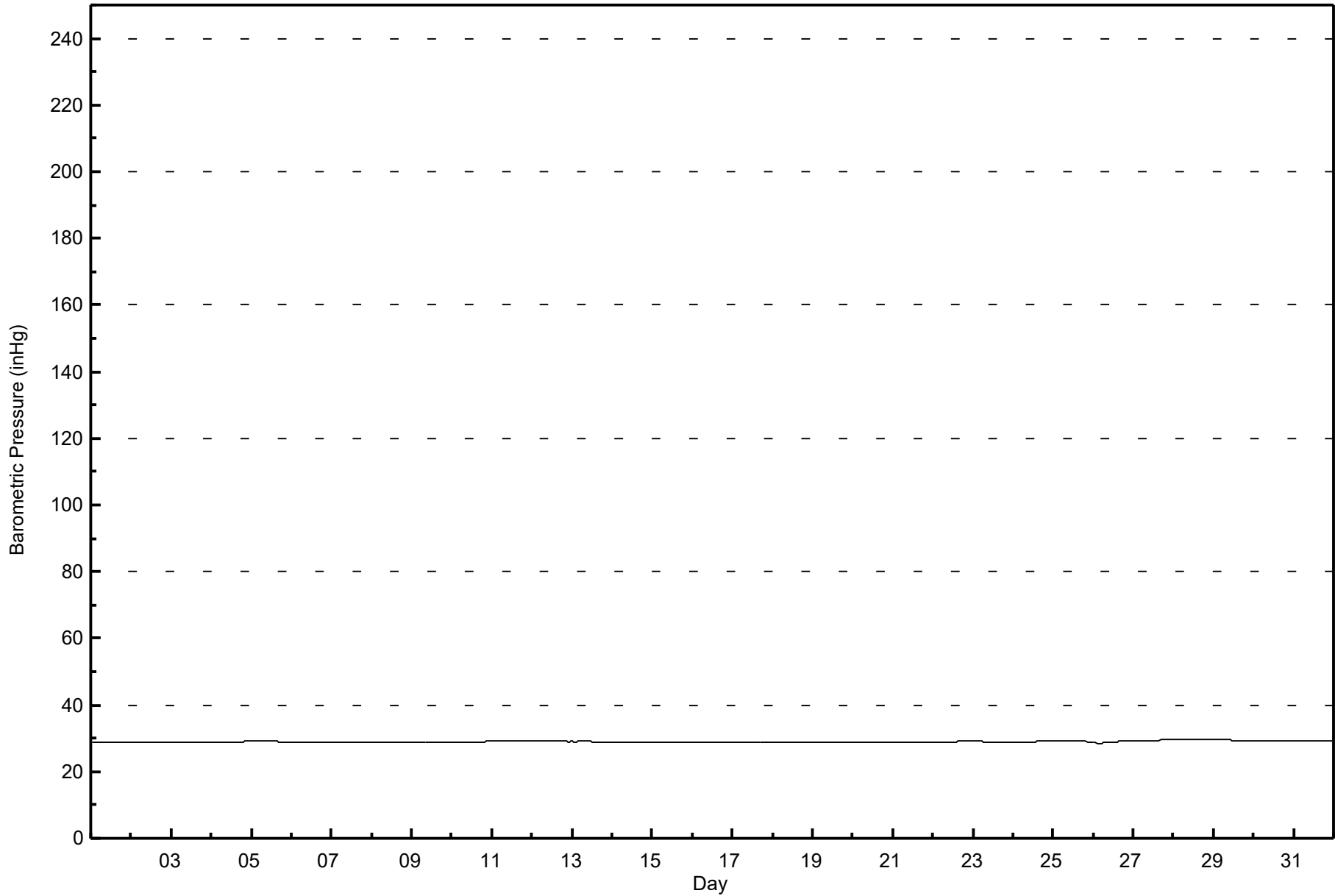
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Athabasca Valley - January 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

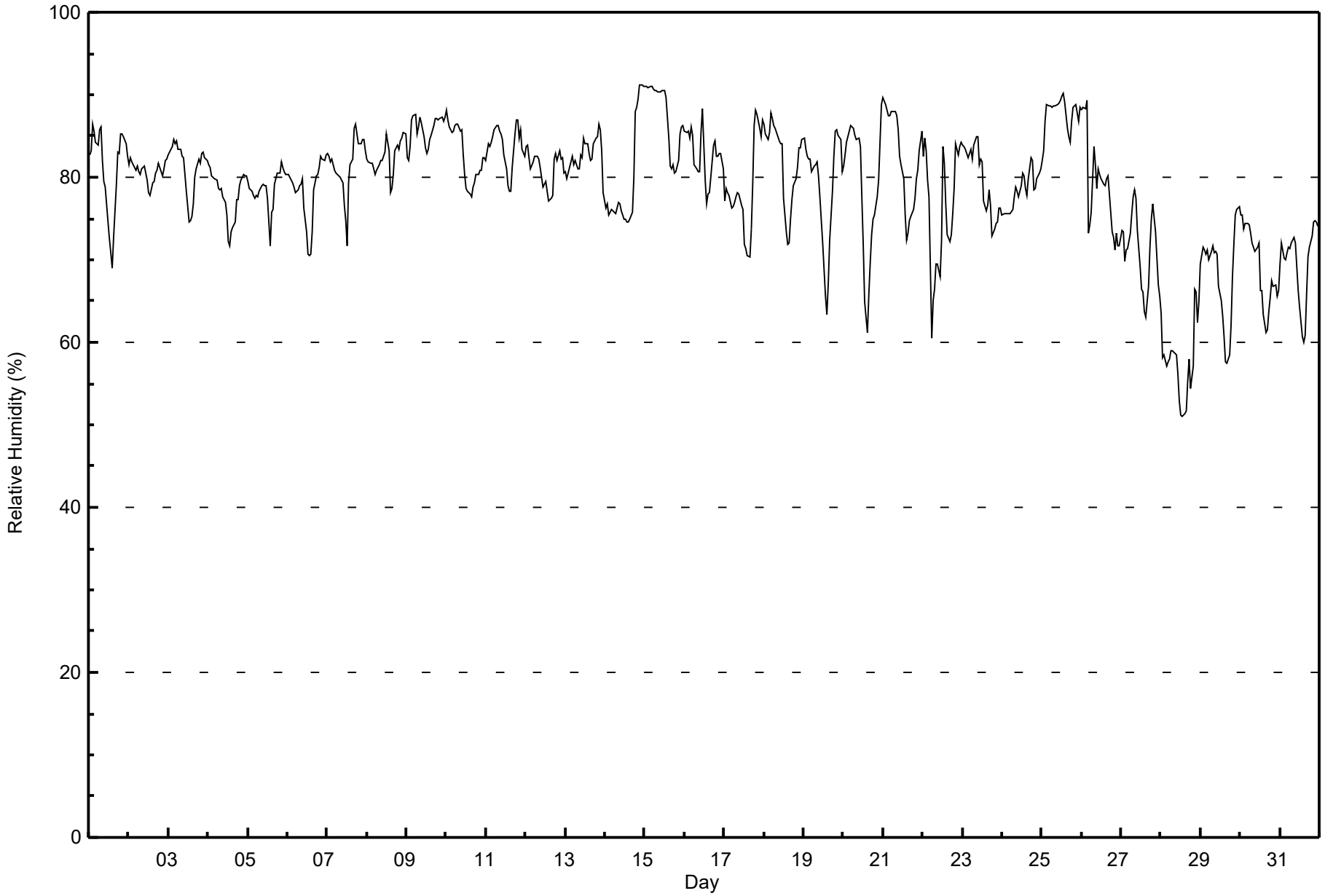
Relative Humidity (RH) - %
Athabasca Valley - January 2023

Maximum Value: 91.3 % on Jan 14 22:00 Maximum Daily Average: 87.6 % on Jan 25																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 51.1 % on Jan 28 14:00 Minimum Daily Average: 57.8 % on Jan 28 Maximum Diurnal Average: 81.1 % at hour 22 Minimum Diurnal Average: 73.5 % at hour 15 Monthly Average: 78.85 % Percentiles: P ₁ = 56.5 P ₁₀ = 69.6 Q ₁ = 75.4 Median = 80.4 Q ₃ = 83.9 P ₉₀ = 86.5 P ₉₉ = 90.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	82.6	83.3	86.4	85.6	84.2	83.9	85.7	86.2	82.0	79.4	78.8	74.6	72.5	70.9	69.0	72.7	79.1	83.0	82.9	85.3	85.2	84.9	84.0	82.5	81.0	86.4
2-Jan	81.5	82.4	81.9	81.2	80.9	81.3	80.6	80.3	81.0	81.3	80.5	79.7	78.1	77.9	79.4	79.5	80.5	80.9	81.7	81.2	80.1	81.1	82.0	82.3	80.7	82.4
3-Jan	82.7	83.4	83.8	84.5	84.1	84.3	83.5	83.4	82.6	82.3	80.4	78.3	74.6	74.8	75.2	76.8	80.0	81.0	82.2	81.7	82.9	83.0	82.5	82.0	81.2	84.5
4-Jan	81.6	81.2	80.1	80.0	79.8	79.7	78.7	78.4	78.7	77.7	76.9	75.5	72.3	71.7	73.4	74.0	74.6	77.2	77.4	79.0	79.7	80.3	80.2	80.1	77.8	81.6
5-Jan	79.5	78.7	78.3	77.9	77.4	77.7	77.6	78.3	79.0	79.2	78.9	79.0	77.4	71.6	75.8	76.2	79.2	79.8	80.6	80.5	81.9	81.2	80.6	80.3	78.6	81.9
6-Jan	80.3	79.9	79.6	79.4	78.9	78.1	78.6	79.1	79.1	79.9	76.3	73.4	70.6	70.6	70.7	73.4	78.5	80.2	80.4	81.1	82.5	82.2	82.0	82.8	78.2	82.8
7-Jan	82.9	82.6	81.8	82.2	80.9	80.5	80.3	80.2	80.0	79.4	76.5	74.7	71.8	79.3	81.5	82.1	86.0	86.4	85.3	84.1	84.1	84.6	84.5	83.2	81.5	86.4
8-Jan	82.2	81.9	81.7	81.6	81.1	80.4	80.8	81.5	82.0	82.0	82.6	83.1	85.2	83.2	78.1	78.7	80.4	83.2	84.0	83.4	84.3	84.8	85.4	85.2	82.4	85.4
9-Jan	82.3	82.0	83.7	87.0	87.5	87.6	85.3	86.1	87.3	86.5	85.0	83.6	83.0	83.4	84.6	85.1	86.3	87.1	87.1	87.0	87.1	87.2	86.8	87.2	85.7	87.6
10-Jan	88.2	87.0	86.2	85.5	85.7	86.3	86.5	86.4	85.7	85.8	82.7	80.3	78.7	78.3	78.0	77.6	78.7	79.3	80.3	80.4	80.8	80.9	82.3	82.5	82.7	88.2
11-Jan	82.0	84.1	83.7	84.2	84.9	85.7	86.4	86.3	85.5	85.3	84.6	82.7	81.0	79.0	78.3	78.4	81.2	85.2	87.0	86.9	84.7	85.8	83.4	82.5	83.7	87.0
12-Jan	83.7	83.9	82.4	81.0	81.8	82.6	82.5	82.6	82.2	81.2	78.9	79.2	79.6	78.3	77.2	77.4	77.8	82.3	82.9	82.1	83.2	82.2	82.3	80.5	81.2	83.9
13-Jan	80.7	79.9	81.1	81.9	82.6	81.5	82.1	81.0	81.0	82.7	82.4	84.8	84.1	84.0	82.8	82.0	82.3	84.0	84.7	84.9	86.5	85.8	83.3	78.2	82.7	86.5
14-Jan	76.2	76.7	75.5	75.8	76.1	75.7	75.7	76.3	76.9	76.8	76.0	75.0	74.9	74.5	74.6	74.9	75.7	80.0	87.9	88.5	89.5	91.3	91.2	91.1	79.4	91.3
15-Jan	91.0	91.0	90.9	91.0	91.1	90.7	90.6	90.6	90.4	90.4	90.5	90.5	90.4	89.6	84.8	81.4	81.1	81.5	80.6	80.7	82.0	85.2	86.1	86.2	87.4	91.1
16-Jan	85.6	85.5	85.5	84.7	86.1	85.1	81.5	81.1	80.7	80.8	85.4	88.3	79.6	76.7	77.9	78.2	80.1	83.9	84.4	82.6	82.6	82.8	82.9	81.1	82.6	88.3
17-Jan	77.0	78.6	78.2	77.8	76.2	76.5	77.0	77.6	78.1	78.0	76.7	76.1	71.8	71.4	70.5	70.4	73.8	79.3	86.3	88.1	87.6	85.9	85.0	87.0	78.5	88.1
18-Jan	86.4	85.3	84.6	85.5	87.8	87.1	86.2	86.0	85.0	84.4	84.1	84.1	77.5	73.3	71.9	72.0	74.9	77.3	78.9	79.9	81.3	83.5	83.5	84.5	81.9	87.8
19-Jan	84.8	83.3	82.6	82.2	82.2	80.7	81.3	81.6	81.8	80.2	77.6	72.1	68.8	65.6	63.4	67.1	72.5	78.4	82.5	85.6	85.8	85.1	84.5	80.8	78.8	85.8
20-Jan	81.4	82.8	84.2	84.9	86.2	86.1	86.0	85.2	84.6	84.8	83.8	77.7	71.8	64.9	61.1	65.8	69.7	73.1	74.9	75.4	77.6	79.7	84.2	88.9	78.9	88.9
21-Jan	89.7	88.9	88.1	87.4	87.5	88.0	88.0	88.0	87.5	85.8	82.5	81.5	79.9	75.4	72.3	73.2	74.8	75.2	76.0	77.5	79.9	80.9	83.2	85.6	82.4	89.7
22-Jan	82.6	84.7	83.3	79.6	77.7	60.5	65.1	66.5	69.6	69.4	68.0	72.3	83.7	81.7	76.7	73.0	72.2	73.0	75.6	78.7	84.2	82.7	83.7	84.2	76.2	84.7
23-Jan	83.8	83.8	83.4	82.4	82.9	83.4	82.2	84.0	85.0	85.0	81.6	82.2	81.9	77.0	76.0	76.6	78.5	76.6	72.9	73.8	74.4	74.5	76.3	76.3	79.8	85.0
24-Jan	75.5	75.6	75.5	75.6	75.7	75.6	76.2	77.6	78.8	78.4	77.6	79.0	80.4	80.2	78.6	77.9	79.8	82.3	82.1	78.4	78.7	79.8	80.5	81.1	78.4	82.3
25-Jan	82.0	83.2	86.8	88.8	88.6	88.6	88.6	88.6	88.6	88.8	88.9	89.3	89.8	90.2	89.1	85.9	84.9	84.3	86.7	88.5	88.8	87.8	86.9	88.5	87.6	90.2
26-Jan	88.1	88.5	88.4	89.3	73.2	74.2	75.8	83.7	81.6	78.7	81.0	80.4	79.8	79.1	79.0	79.9	80.2	77.9	73.4	72.6	71.2	73.2	71.7	71.6	78.9	89.3
27-Jan	73.6	73.4	69.8	71.2	71.3	73.1	75.6	77.6	78.5	77.4	73.5	69.2	66.5	66.1	63.7	63.0	66.8	71.5	74.9	76.8	75.2	73.4	67.0	65.6	71.4	78.5
28-Jan	63.5	58.1	58.5	57.2	57.6	57.9	59.1	59.0	58.7	58.5	56.0	52.9	51.1	51.1	51.3	51.7	55.2	58.0	54.5	57.1	66.5	66.2	62.4	65.0	57.8	66.5
29-Jan	69.6	71.5	71.2	70.7	71.1	70.1	71.0	71.7	70.9	71.1	70.7	66.7	65.0	63.2	60.7	57.6	57.5	58.5	62.0	67.9	71.9	75.4	76.1	76.5	68.3	76.5
30-Jan	75.4	75.4	73.7	74.5	74.4	74.3	73.2	72.1	71.5	71.0	71.5	72.1	66.3	66.3	63.5	61.2	61.6	63.7	65.4	67.4	66.8	66.9	65.6	66.3	69.2	75.4
31-Jan	69.5	72.0	70.1	70.0	70.8	71.4	71.4	72.0	72.8	72.1	69.2	66.3	64.2	60.6	60.0	60.9	65.8	70.4	71.5	72.9	74.6	74.8	74.6	74.1	69.7	74.8
	80.8	80.9	80.7	80.7	80.2	79.6	79.8	80.3	80.2	79.8	78.7	77.6	75.9	74.5	73.5	73.7	75.8	77.9	78.9	79.7	80.7	81.1	80.8	80.8	Diurnal Average	
	91.0	91.0	90.9	91.0	91.1	90.7	90.6	90.6	90.4	90.4	90.5	90.5	90.4	90.2	89.1	85.9	86.3	87.1	87.9	88.5	89.5	91.3	91.2	91.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Athabasca Valley - January 2023





Maximum Speed: 30 km/h on Jan 26 06:00	Maximum Daily Speed Average: 18.9 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 18 09:00	Minimum Daily Speed Average: 0.3 km/h on Jan 30	Hours of Data: 744
Maximum Diurnal Speed Average: 3.0 km/h at hour 3	Minimum Diurnal Speed Average: 1.1 km/h at hour 18	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 147.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 9 P ₉₀ = 12 P ₉₉ = 26	Percent Operational Time: 100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SW6	SW5	SSW3	S2	WSW4	SW3	S2	S4	S5	SSE5	SE5	SE6	SSE6	SSE7	S6	SSW3	S4	SSW4	SSW5	SSW2	SSW3	S4	S3	S2	S3.7	SSE7
2-Jan	SE4	SE7	SE7	SSE6	SE5	SSE5	SE4	SE2	SE1	SSE3	S4	S4	SSW5	S5	S6	S5	SSE2	S2	SSW1	SSE7	SE7	SE7	SE5	SSE5	SSE4.2	SE7
3-Jan	SE4	SSE7	S4	SSE4	SE1	S3	SSW4	SSW4	S2	S4	SSE4	S5	SSE6	SSE7	SSE8	SSE7	SSE6	SSE5	SSE7	S5	S4	SSE5	SE7	SE6	SSE4.8	SSE8
4-Jan	SE6	SE7	SE9	SE8	SE4	SE8	SE8	SE5	SE9	SE7	SE6	SE8	SSE8	SE9	SE10	SE9	SE8	SE8	SE6	SSE6	SSE5	SSE4	SSE7	SSE6	SE7.1	SE10
5-Jan	SSE9	SSE6	SSE8	SSE9	SSE5	SSE6	ESE5	ESE4	SE5	SE7	SSE6	SSE6	S3	SSE5	SSE6	SE5	SE7	SE8	SE8	SE6	SE5	SSE7	SSE9	SSE11	SE6.4	SSE11
6-Jan	SSE12	SE19	SSE17	SSE18	SE18	SE17	SE13	SSE13	SE8	SE7	SE7	SE8	S5	SSW5	SSW5	SSW4	SW2	SW4	SSW5	SSW6	S6	S8	S5	SSE6	SSE8.3	SE19
7-Jan	SE5	SSE4	SSE5	SSE7	SE7	SE7	SSE7	SE7	SSE5	E2	E5	NNE3	NNE3	NNW7	N6	NNE1	N1	ENE2	NNE1	E2	SW1	ESE1	ESE1	ENE2	ESE2.0	SE7
8-Jan	SE1	S1	SSW2	S2	SSW3	W1	SW1	WSW0	SW2	SW1	W2	NW3	SSE2	SSE8	SSE7	SSE7	SE3	N5	N5	N3	N3	E2	ENE1	WNW1	SSE0.7	SSE8
9-Jan	SSE4	SSE3	SSE3	NW3	N4	N8	NNW6	N1	WSW1	W1	NNW3	W3	SSW7	S7	SSE7	SSW7	SW6	SW6	WSW4	W2	WSW4	SW8	SW2	S4	SW2.0	N8
10-Jan	S4	SSE7	SE8	E6	SE5	E4	E5	E3	S2	E5	E6	N3	E5	E5	ENE5	ENE2	SW2	SW6	SW7	SW7	SW5	SW1	SW2	SW5	SE2.3	SE8
11-Jan	SW5	SW5	SW6	SW5	SSW2	NW2	WSW3	WSW3	SW5	SSW2	SW4	W2	SSE4	SE7	SE6	SSE6	SSE4	SW1	ESE2	SSE6	SSW3	SE5	SE9	SE4	S3.1	SE9
12-Jan	SE4	ESE4	SE9	SE6	SE3	ESE4	SE3	ESE2	E5	SE9	SE15	SE16	SE15	SE12	SE12	SE10	SE9	SE6	SE6	ESE6	ESE8	ESE8	SE9	SE8	SE7.6	SE16
13-Jan	SE7	SE8	ESE6	ESE4	E3	E1	ENE2	N1	NNE2	WSW2	ENE2	WSW1	NNE1	WNW2	NW2	SE3	SSE3	ENE3	ENE1	E5	E5	ESE7	ESE9	SE12	ESE2.8	SE12
14-Jan	SE9	SE10	SE9	SE9	SE12	SE10	SE11	SE11	SE9	SE8	SE11	SE8	SE7	SE8	SE7	SSE4	SW5	SW5	SSW3	SW5	SW5	S1	SSW3	SE6.7	SE12	
15-Jan	E3	SE2	ESE2	SE3	SSE4	E4	E4	ESE2	E2	E3	SE3	ESE3	E3	E3	E4	E6	E6	E5	E6	ESE4	NE3	NNW6	N6	N7	E2.7	N7
16-Jan	NNW7	N6	N4	ENE2	NNW2	N5	NE3	NE5	NE3	NE5	ENE4	NE2	ESE8	SE10	SE12	SE10	SE9	SE12	SE11	SE14	SE14	SE13	SE9	S6	ESE4.8	SE14
17-Jan	S9	SW12	S7	SSW10	S9	SSE9	SSE8	SE10	SE11	SE10	SE11	SE11	SSE9	SW8	SSW4	SSE6	SE9	SSW3	S1	SSW3	ESE4	SE9	SE7	SE9	SSE6.8	SW12
18-Jan	SE9	SE9	SE10	SE7	SSE4	ESE2	SE2	ENE1	SE0	SSE1	SW4	SSE4	SE13	SE15	SE15	SE15	SE14	SE13	SE14	SE11	SSE8	SE5	SSE5	SSW3	SE7.3	SE15
19-Jan	SSW5	SW6	SW7	SW8	S5	SSE8	S6	S5	SE9	SE11	SSE7	SE7	ESE6	SE5	S4	SE6	SE5	SSE5	SSE5	ESE5	ESE6	ESE7	ESE6	E6	SSE5.0	SE11
20-Jan	E5	SE6	ESE7	ESE8	SE7	SE5	SSE4	SSE3	SSE4	SE4	SE7	SE6	ESE5	S5	SW5	SW7	SW8	SW9	SW12	SSW12	SSW10	WSW3	SE3	SE5	S4.4	SW12
21-Jan	SSE4	SE4	SSE4	SSE4	SE5	SE9	SE11	SE10	SE11	SE11	SE10	SE11	SE11	SE10	SE14	SSE13	SE9	SE11	SE8	SE6	SE6	SE7	ESE4	SW3	SE8.0	SE14
22-Jan	SW5	S3	SW7	SW5	N3WNW11	W16	W16	W25	W24WNW22	NNW23	NNW17	NW14	NNW14	N10	NNW12	NNW10	N6	NNW4	N6	NNW6	NE3	WSW2	NW8.3	W25	NW8.3	W25
23-Jan	S1	E1	ESE2	ESE3	E3	ESE5	SSE8	SSE6	SE7	SE11	SE12	SE10	SE7	ESE8	ESE5	E8	NE6	NE3	E6	E6	E5	SE7	SE9	SE10	ESE5.6	SE12
24-Jan	SE10	SSE8	SSE9	SE9	SE11	SSE10	SE9	SE9	SE12	SE11	SE10	SE10	SE10	SE5	SE5	N4	NNW8	NNW12	NNW15	NNW13	N10	N8	N7	N7	ESE3.0	NNW15
25-Jan	NNW7	N6	NNW8	N5	N5	N4	N4	N4	N3	N5	WNW2	ENE2	ESE1	E5	SE10	SE8	ESE7	SE12	SE13	SE14	SE12	SE11	SSE11	SSE13	ESE3.3	SE14
26-Jan	SSE11	SE12	SE13	SSE5WNW27	WNW30	NW27	N25	NNE20	N26	NNW23	NNW21	NNW16	N9	N9	N7	N8	N12	N12	N16	N13	N12	N13	N11	NNW10.9	WNW30	
27-Jan	N9	N11	N14	N12	NNE13	NNE9	NW2	WSW4	NW3	W4	NNW11	NNW13	NNW10	NNW8	NW7	NNW5	NNW8	NNW7	NW4	WNW4	W2	SW9WSW11	W8	NNW6.0	N14	
28-Jan	NW11	WNW20	WNW18	WNW21	WNW20	WNW17	W12	WNW14	WNW18	WNW19	WNW23	WNW26	NW28	NW28	NW27	NW24	WNW23	WNW23	NW27	NW24	NNW16	NNW16	NNW12	NNW8	WNW18.9	NW28
29-Jan	WNW5	SW2	SW5	SSE1	SSW4	S6	S5	SSE5	SE5	ESE4	S5	SSE5	ESE6	SE7	SSE7	E3	S4	S2	SSE4	ESE5	N1	W3	NW3	W4	SSE2.6	SSE7
30-Jan	WSW3	WSW5	W4	WNW3	WSW4	SSW4	S3	SSW3	E1	N1	ENE1	ENE2	ENE4	NE2	NNW3	NE2	N2	ENE2	ENE2	ENE2	ENE2	E3	ENE2	N4	N0.3	WSW5
31-Jan	NNW6	NNW7	NNW12	NNW11	NNW13	NNW11	NNW9	NNW9	N7	N4	NNE1	NW3	WNW2	NW3	NNE2	NNW5	NNW5	N3	WNW2	W3	W2	NNW3	NNW5	W1	NNW5.1	NNW13

SSE2.6 SSE2.9 SSE3.0 SSE2.5 S1.5 SSE1.3 SSE1.6 SSE1.3 SSE1.8 SE1.6 SE1.7 SE1.3 SE2.2 SSE2.5 SE2.7 SE2.7 SE1.7 SSE1.1 SSE1.2 SE1.5 SE1.7 SE2.2 SE2.3 SSE2.2	Diurnal Average
SSE12WNW20WNW18WNW21WNW27WNW30 NW27 N25 W25 N26WNW23WNW26 NW28 NW28 NW27 NW24WNW23WNW23 NW27 NW24 NNW16 NNW16 N13 SSE13	Diurnal Maximum

All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

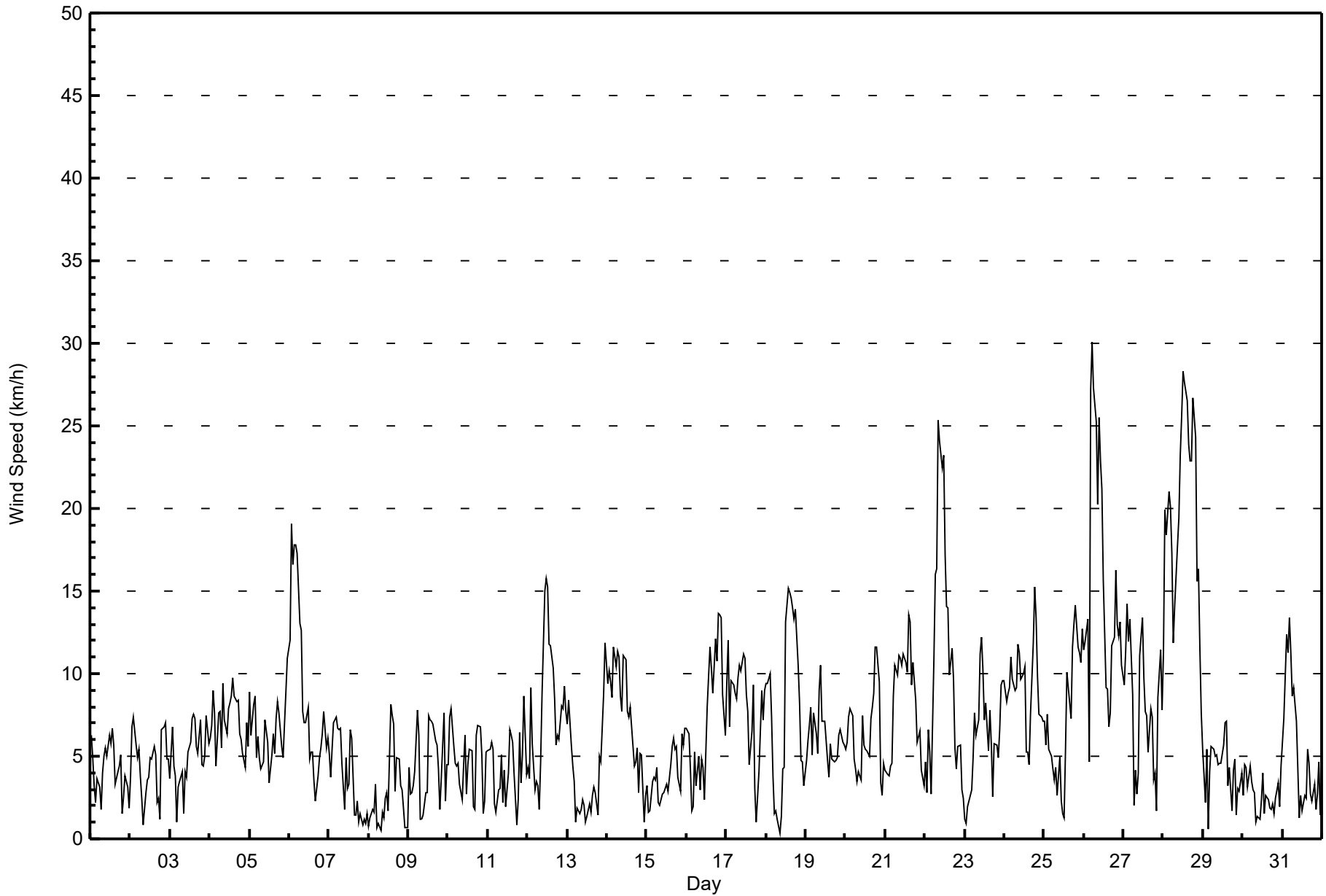
Wind Speed (WS) - km/h
Athabasca Valley - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 26 10:00 Minimum Value: 1 km/h on Jan 8 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	3	2	2	2	2	1	1	2	2	2	1	1	1	2	2	1	2	2	2	1	1	1	1	1	1	3
2-Jan	2	3	2	3	3	2	3	2	2	2	2	2	1	2	2	1	1	2	1	4	2	2	2	2	2	4
3-Jan	2	2	2	2	1	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	3	3	
4-Jan	2	3	2	2	1	3	2	2	2	2	2	1	1	2	1	1	2	3	2	3	1	2	2	2	3	
5-Jan	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3	2	3	3	
6-Jan	4	4	3	4	4	4	3	3	2	3	2	2	2	1	1	1	1	2	2	2	2	2	2	2	4	
7-Jan	2	3	2	3	3	2	2	2	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	3	
8-Jan	1	1	1	1	2	1	1	1	1	2	1	1	2	2	2	2	1	2	3	2	1	1	1	1	3	
9-Jan	2	1	2	1	2	2	3	1	1	1	1	1	2	1	2	1	1	1	1	1	2	2	1	2	3	
10-Jan	2	2	2	1	1	1	1	1	2	1	1	2	1	2	3	1	1	1	1	1	2	1	1	1	3	
11-Jan	1	1	1	1	2	1	1	1	2	1	1	1	2	2	2	1	1	1	1	2	2	2	2	1	2	
12-Jan	2	2	1	2	1	1	1	1	3	3	3	3	3	2	2	2	1	2	2	3	2	2	2	2	3	
13-Jan	1	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	1	2	1	2	2	3	3		
14-Jan	3	3	3	2	3	3	4	3	3	2	2	2	2	1	2	1	1	2	1	1	1	1	1	1	4	
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	
16-Jan	1	1	2	2	1	2	1	1	1	1	1	1	3	3	3	3	3	3	2	3	2	3	2	3	3	
17-Jan	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	2	2	3	3	3	
18-Jan	2	2	2	2	1	1	1	1	1	1	2	2	3	3	4	4	3	3	3	2	3	2	2	2	4	
19-Jan	2	2	2	2	2	3	2	2	3	2	2	2	1	1	1	1	2	2	1	2	1	1	2	2	3	
20-Jan	1	1	1	2	2	2	1	1	1	1	2	2	1	2	2	3	3	3	3	3	4	4	1	1	4	
21-Jan	1	2	1	1	2	3	2	3	4	2	2	2	2	2	2	2	3	2	2	2	2	2	2	3	4	
22-Jan	3	2	3	2	5	3	3	6	5	4	4	7	4	4	3	3	3	2	2	1	2	2	1	1	7	
23-Jan	1	1	2	2	2	3	2	2	2	3	3	3	2	3	2	2	1	1	2	1	1	2	2	2	3	
24-Jan	2	2	2	2	3	2	2	2	2	3	2	2	2	1	2	1	2	3	4	4	3	2	2	2	4	
25-Jan	2	2	2	1	1	1	1	1	2	1	2	1	1	2	2	2	2	3	3	3	2	3	3	3	3	
26-Jan	4	3	3	7	5	7	7	7	6	9	7	5	5	2	2	2	2	3	3	4	4	3	3	3	9	
27-Jan	2	3	4	3	3	3	1	1	1	1	3	3	2	2	2	1	2	2	1	1	1	3	2	3	4	
28-Jan	6	4	5	4	4	3	4	4	4	4	6	4	5	5	4	5	4	6	5	4	4	4	3	2	6	
29-Jan	2	2	3	1	2	2	2	2	1	1	2	2	2	2	1	1	2	1	2	2	1	1	1	1	3	
30-Jan	1	2	1	1	3	3	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	3	
31-Jan	1	2	3	3	3	2	2	2	2	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	3	
																	Diurnal Maximum									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Athabasca Valley - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Athabasca Valley - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	362	48.66	48.66
6 - 11	285	38.31	86.96
12 - 19	72	9.68	96.64
20 - 28	24	3.23	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Athabasca Valley - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	26	9	10	20	31	26	40	43	40	30	30	16	14	8	9	10	362
6 - 11	21	1	1	0	9	16	126	52	11	6	16	1	1	1	2	21	285
12 - 19	8	1	0	0	0	0	32	6	0	1	2	0	3	5	1	13	72
20 - 28	2	1	0	0	0	0	0	0	0	0	0	0	2	9	7	3	24
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	12	11	20	40	42	198	101	51	37	48	17	20	24	19	47	744

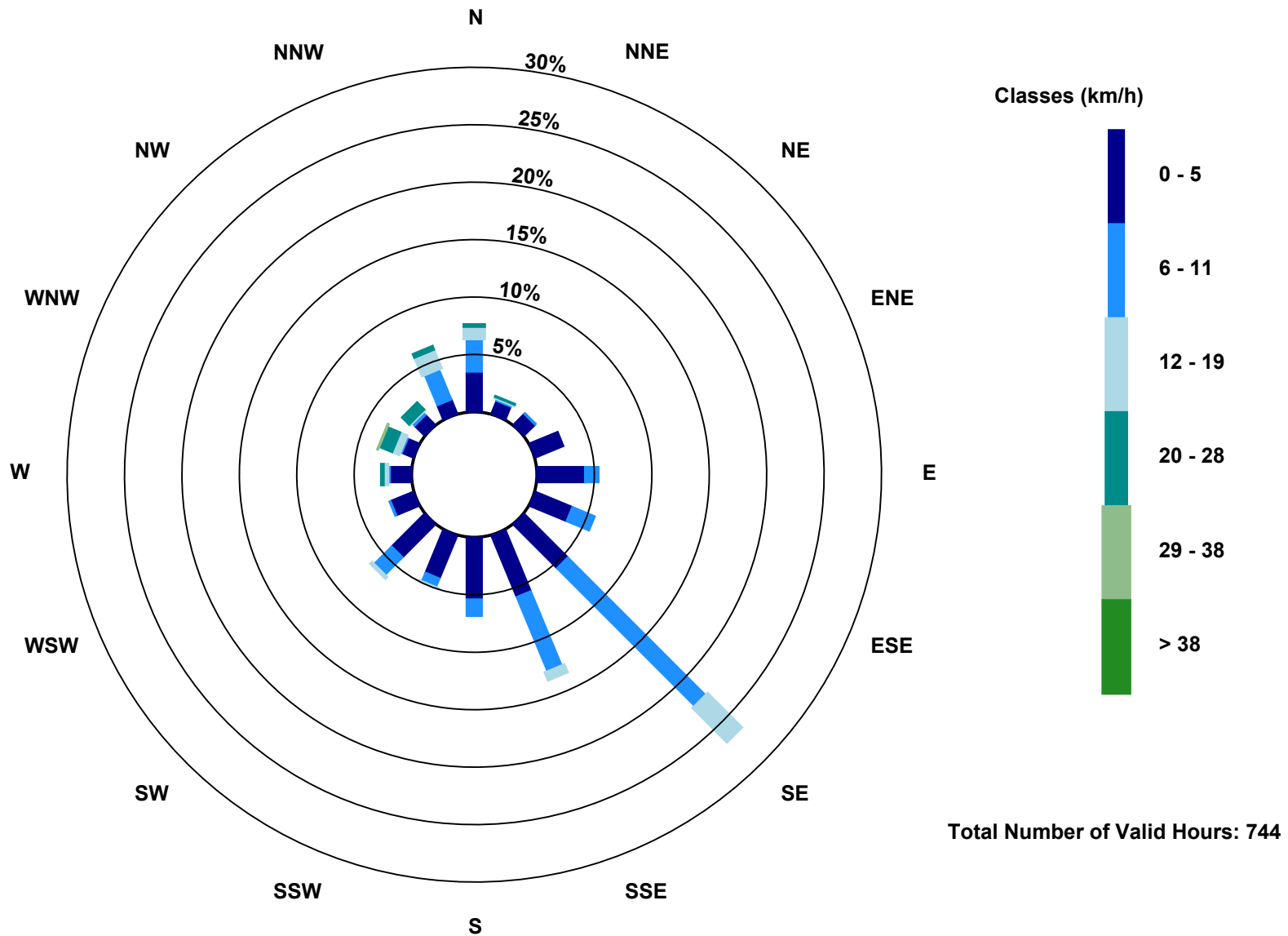
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Athabasca Valley





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Athabasca Valley - January 2023

Direction of Maximum Speed: 295 deg on Jan 26 06:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 303.4 deg on Jan 28	Hours of Data: 744
Direction of Minimum Speed: 133 deg on Jan 18 09:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.3 deg on Jan 30	Percent Operational Time: 100.0
Monthly Average Direction: 147.5 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	214	220	208	174	252	215	173	173	178	149	129	146	157	163	182	194	175	199	192	211	200	190	169	182	181.9
2-Jan	146	141	143	150	146	148	132	143	128	163	186	173	206	185	189	176	156	172	196	148	138	142	138	162	156.6
3-Jan	146	157	170	168	128	173	197	193	191	179	156	172	155	152	161	150	156	155	149	172	178	165	145	143	160.9
4-Jan	145	141	135	134	145	138	141	141	143	139	137	137	147	143	145	146	136	139	137	152	148	155	153	152	142.4
5-Jan	148	154	150	155	156	149	120	109	126	138	148	151	174	167	151	141	142	146	139	137	142	150	149	148	146.0
6-Jan	151	143	149	151	144	142	131	147	140	140	134	143	177	211	212	207	222	220	209	196	189	174	169	166	156.5
7-Jan	136	166	150	154	137	143	152	144	147	95	97	20	31	340	360	26	353	59	21	79	222	115	114	78	118.3
8-Jan	125	177	195	184	207	278	214	252	230	236	269	308	158	163	162	159	126	3	9	1	8	82	64	301	167.9
9-Jan	151	164	162	326	356	350	343	350	238	277	343	270	205	178	150	193	226	235	237	267	249	220	236	188	224.2
10-Jan	174	150	133	98	131	96	87	91	172	86	83	4	84	85	75	78	231	217	228	225	220	233	232	224	140.4
11-Jan	225	221	219	221	204	315	248	239	217	211	220	266	157	134	132	152	152	219	114	166	203	145	143	133	181.8
12-Jan	134	121	140	132	146	121	127	118	82	132	141	138	140	144	136	138	144	139	132	102	118	122	135	133	133.1
13-Jan	130	141	117	108	80	80	61	3	13	241	74	254	30	296	326	146	148	76	63	85	89	113	123	125	111.4
14-Jan	129	135	130	131	132	129	130	131	134	133	128	129	127	140	139	146	163	214	219	193	218	216	184	211	142.4
15-Jan	92	145	107	135	155	91	90	117	92	89	125	111	86	99	92	94	90	88	91	117	34	347	350	349	83.9
16-Jan	348	351	356	73	333	6	35	46	51	52	70	38	122	129	126	124	128	127	128	128	129	142	145	183	112.6
17-Jan	188	227	189	207	176	168	158	142	140	139	140	145	162	227	209	166	140	199	181	200	123	135	144	138	164.5
18-Jan	139	134	135	139	154	107	141	64	133	150	231	163	141	133	131	130	129	132	138	132	148	135	162	213	138.6
19-Jan	194	217	217	224	190	161	179	191	142	141	150	139	118	131	169	131	138	157	154	120	120	115	106	96	153.0
20-Jan	99	124	122	119	125	137	150	154	155	132	136	134	123	179	232	236	215	220	230	204	208	245	124	134	169.6
21-Jan	161	143	158	148	138	142	140	137	137	133	135	140	144	143	143	148	143	141	137	143	141	127	119	215	141.5
22-Jan	236	189	215	228	359	293	272	269	268	274	293	334	339	326	334	10	343	344	8	344	356	348	46	254	305.5
23-Jan	175	95	110	118	91	119	149	152	139	129	129	136	125	114	105	85	56	35	99	88	97	126	141	137	120.3
24-Jan	139	149	147	142	145	157	141	146	140	142	140	137	137	133	127	5	344	342	339	345	353	353	349	353	112.2
25-Jan	344	351	332	356	352	8	359	4	359	351	290	69	110	92	131	125	111	132	129	127	133	144	149	153	109.1
26-Jan	157	143	142	156	282	295	315	355	15	350	347	339	340	349	4	1	8	360	0	4	4	360	354	4	344.4
27-Jan	353	352	360	6	17	30	305	256	304	278	347	343	345	338	320	347	347	345	313	303	278	231	249	269	335.5
28-Jan	322	299	291	286	283	283	271	300	289	288	293	300	310	307	309	305	295	301	311	310	348	346	345	329	303.4
29-Jan	301	232	218	168	196	186	188	164	137	122	171	149	110	135	149	101	181	171	160	120	356	269	309	267	167.9
30-Jan	246	249	275	283	241	204	189	200	101	359	62	77	76	35	331	45	8	67	72	66	27	91	65	6	7.8
31-Jan	337	347	340	343	344	340	339	344	357	4	18	313	292	317	28	337	335	349	284	264	263	335	344	281	338.7

155.3	163.1	158.0	158.6	176.0	166.9	165.9	150.2	150.2	143.5	138.3	126.0	130.4	147.6	141.5	135.6	139.0	150.7	151.2	135.4	129.1	139.4	135.4	153.1
Diurnal Average																							

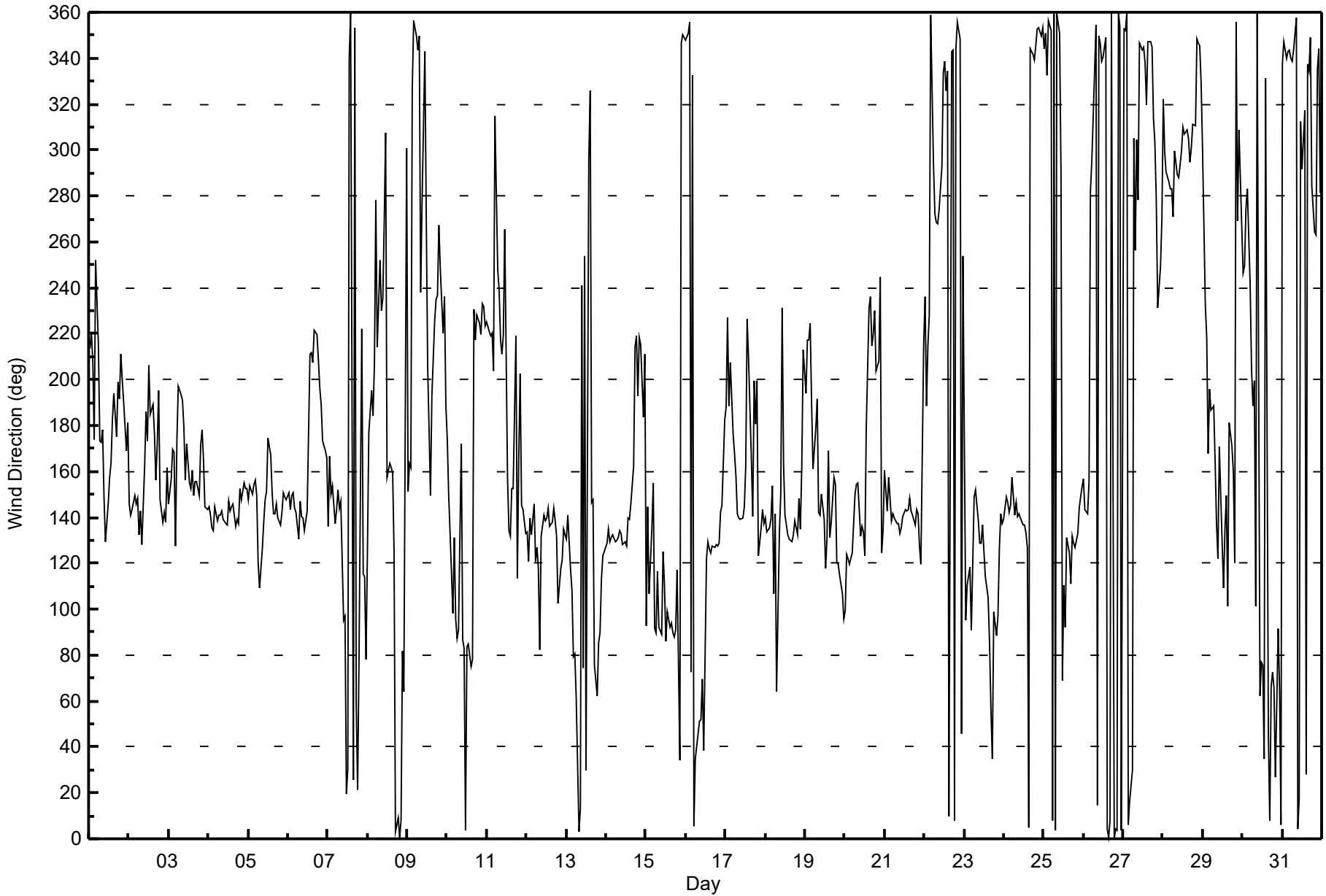
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Athabasca Valley - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 106 deg on Jan 2 09:00 Minimum Value: 6 deg on Jan 9 22:00 Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 17 Median = 24 Q ₃ = 42 P ₉₀ = 65 P ₉₉ = 96																		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	40	19	55	59	45	46	55	33	35	27	26	18	17	23	27	50	48	37	24	64	44	35	28	57	64
2-Jan	38	27	22	26	37	43	56	82	106	53	56	56	24	38	35	34	75	70	97	50	38	21	30	28	106
3-Jan	30	19	30	31	79	46	17	27	76	33	46	38	31	19	13	17	19	21	19	32	20	33	23	37	79
4-Jan	20	17	13	15	22	16	17	23	15	17	18	15	12	11	10	10	16	19	24	36	18	31	21	26	36
5-Jan	16	22	16	17	34	24	30	46	40	23	28	32	55	33	23	27	22	31	22	30	41	33	21	22	55
6-Jan	19	14	14	13	13	14	17	16	24	25	28	22	41	20	18	38	69	44	18	25	31	25	25	23	69
7-Jan	47	53	36	28	36	23	26	24	30	70	26	49	56	34	28	82	51	35	65	58	95	54	86	81	95
8-Jan	81	63	80	48	37	96	92	95	77	85	42	20	97	16	17	18	55	24	46	46	26	61	88	80	97
9-Jan	25	38	60	25	31	19	21	65	83	59	50	35	17	14	23	28	17	12	15	63	31	6	50	52	83
10-Jan	39	18	20	19	29	24	12	17	54	19	17	67	15	15	27	60	56	9	8	6	14	20	42	12	67
11-Jan	8	12	8	9	68	44	15	20	14	74	19	52	64	17	18	17	28	90	76	33	62	28	27	56	90
12-Jan	42	60	10	31	51	40	31	80	76	34	13	11	12	13	13	13	12	44	33	45	20	16	17	14	80
13-Jan	19	15	32	36	34	99	67	63	63	74	42	81	59	43	73	61	42	63	83	18	29	22	21	19	99
14-Jan	20	17	19	18	16	18	15	16	19	26	12	12	16	15	17	15	26	20	10	33	11	9	77	52	77
15-Jan	39	56	80	36	26	17	12	51	64	34	32	33	22	51	22	19	10	10	13	36	52	9	15	13	80
16-Jan	11	13	68	81	39	19	25	25	38	16	19	61	33	16	16	20	18	12	12	12	11	12	13	17	81
17-Jan	20	11	24	15	14	11	17	13	13	15	16	14	26	18	15	27	15	50	73	49	51	15	30	20	73
18-Jan	16	16	13	20	29	72	54	83	103	84	66	48	16	15	13	14	13	15	15	17	29	47	46	68	103
19-Jan	36	33	19	13	36	30	34	41	35	15	21	24	21	31	42	17	52	26	28	27	18	15	43	37	52
20-Jan	22	18	17	21	17	35	32	38	37	40	22	17	25	31	44	28	42	29	16	20	32	96	64	33	96
21-Jan	29	43	41	23	43	20	14	21	21	17	17	16	15	15	10	10	16	12	15	26	20	28	38	73	73
22-Jan	84	61	33	52	82	24	12	14	11	11	15	28	15	12	17	26	17	14	23	28	20	19	24	42	84
23-Jan	75	92	83	67	64	55	26	27	25	14	15	17	26	27	39	11	19	71	20	11	42	31	16	15	92
24-Jan	14	19	17	16	14	14	14	14	12	16	16	15	12	16	31	35	18	15	12	18	20	18	18	19	35
25-Jan	18	21	14	20	19	29	24	32	48	17	65	87	90	54	18	25	23	14	14	12	14	17	17	16	90
26-Jan	26	16	15	86	12	13	29	23	20	22	18	13	16	17	26	25	20	21	22	20	21	19	20	21	86
27-Jan	20	20	20	19	16	26	60	19	37	34	17	14	15	21	21	21	18	17	32	34	56	18	12	36	60
28-Jan	26	12	12	11	11	10	19	13	13	13	12	12	11	12	10	12	11	13	10	10	20	19	17	21	26
29-Jan	18	81	40	92	45	22	31	23	17	30	51	45	24	27	12	52	47	82	55	33	79	39	48	22	92
30-Jan	85	33	30	38	57	64	67	68	74	64	53	60	30	56	26	43	46	70	68	78	44	49	87	28	87
31-Jan	22	21	13	14	14	12	14	14	19	22	99	52	64	35	61	15	17	28	20	51	59	34	32	81	99
85 92 83 92 82 99 92 95 106 85 99 87 97 56 73 82 75 90 97 78 95 96 88 81																									
Diurnal Maximum																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08 FORT CHIPEWYAN JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	34	35	99.87	9.1	0	4.3	0
TRS (ppb) Average	708	35	36	99.87	0.5	0	0.3	0
O3(ppb) Average	708	35	36	99.87	41.4	0	39.8	-
NO2(ppb) Average	706	37	38	99.87	20	0	7.7	-
NO(ppb) Average	706	37	38	99.87	8.7	-	0.9	-
NOX(ppb) Average	706	37	38	99.87	21.8	-	8.5	-
PM2.5(ug/m3) Average	742	1	2	99.87	16.9	0	9.9	0
CO(ppm) Average	709	34	35	99.87	0.2	0	0.1	-
CO2(ppm) Average	708	35	36	99.87	443.4	-	438.5	-
Temperature 2 m (C) Average	744	0	0	100	-0.3	-	-4.6	-
Relative Humidity (%) Average	744	0	0	100	100	-	94.8	-
Wind Speed 10 m (km/h) Average	559	0	185	75.13	30	-	19	-
Wind Direction 10 m (deg) Average	559	0	185	75.13	-	-	-	-
Leaf Wetness (% of range) Average	744	0	0	100	9.7	-	9	-
Global Solar Radiation (W/m2) Average	744	0	0	100	302.7	-	58.6	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	709	0.6	1.3	-	0	0	0	0.1	0.3	2	9.1
TRS (ppb) Average	708	0.22	0.1	-	0.1	0.1	0.2	0.2	0.3	0.3	0.5
O3(ppb) Average	708	27.92	7.1	-	3.9	18.7	23.2	27.4	34.2	37.5	41.4
NO2(ppb) Average	706	2.3	2.9	-	0	0.2	0.5	1	2.7	6.8	20
NO(ppb) Average	706	0.18	0.6	-	0	0	0	0	0.1	0.3	8.7
NOX(ppb) Average	706	2.48	3.2	-	0	0.3	0.5	1.1	2.8	7.2	21.8
PM2.5(ug/m3) Average	742	3.88	3.1	-	0.3	0.6	1	3.2	5.8	8.2	16.9
CO(ppm) Average	709	0.03	0	-	0	0	0	0	0	0.1	0.2
CO2(ppm) Average	708	432.61	3.8	-	423.8	427.6	430.1	432.6	434.8	438	443.4
Temperature 2 m (C) Average	744	-13.3	5.8	-	-28.9	-22.3	-15.8	-12.6	-9.7	-6.3	-0.3
Relative Humidity (%) Average	744	86.56	6.9	-	57.2	76.8	82.7	87.9	91.5	94	100
Wind Speed 10 m (km/h) Average	559	11.9	6	-	1	4	7	12	16	21	30
Wind Direction 10 m (deg) Average	559	-	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	3.22	2.9	-	0	0.5	1.1	1.9	4.9	8.5	9.7
Global Solar Radiation (W/m2) Average	744	21.68	49	-	0	0	0	0	15.3	83.9	302.7

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
All Analyzers (except NO2)	06 Jan 2023 05:00	06 Jan 2023 05:00	1	Station power failure
NO2	06 Jan 2023 09:00	06 Jan 2023 09:00	1	Maintenance - verify daily QA response
Wind Speed, Wind Direction	04 Jan 2023 02:00	04 Jan 2023 02:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	04 Jan 2023 05:00	11 Jan 2023 19:00	183	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 10:00	15 Jan 2023 10:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Summary of Hour Averages

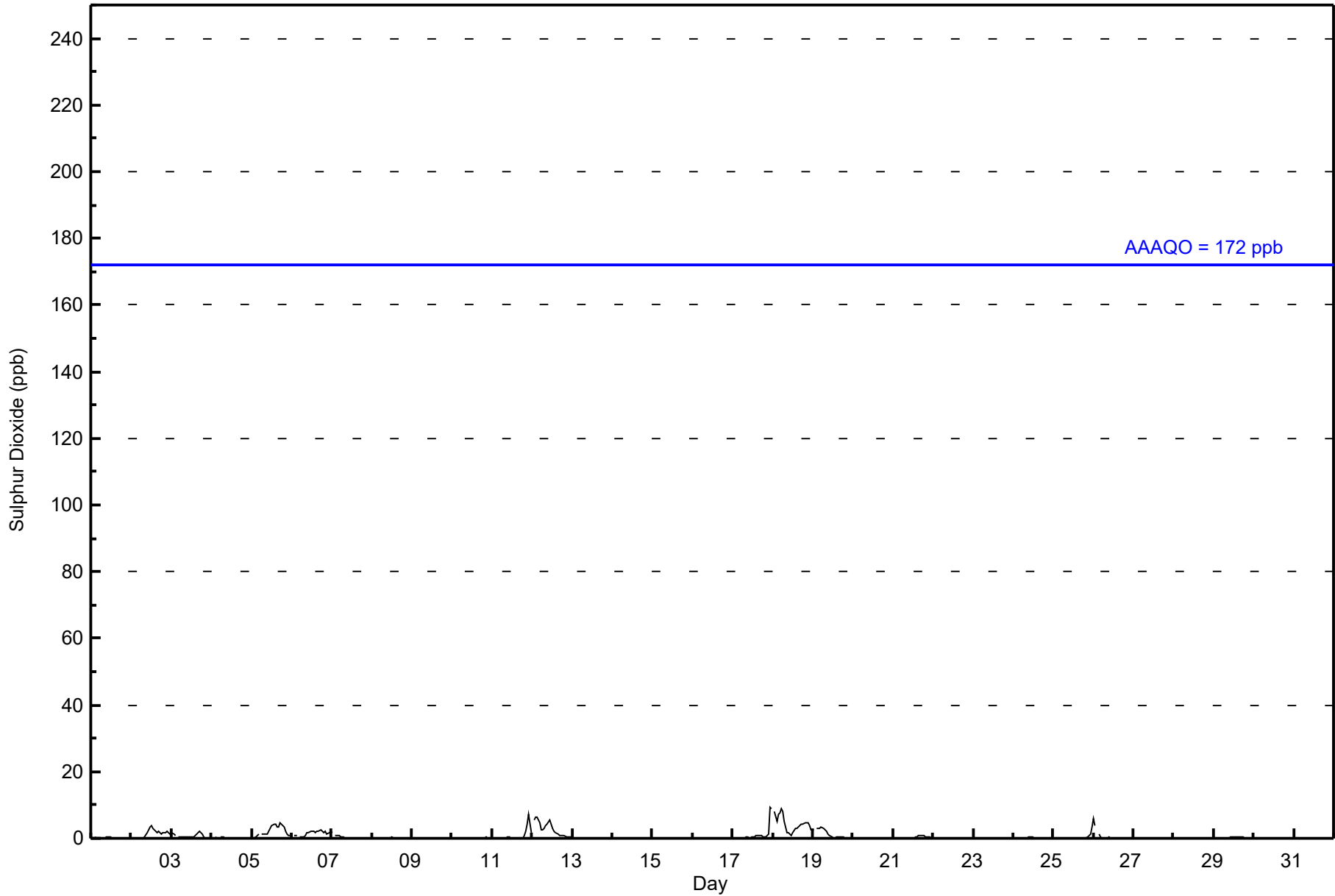
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum				
Maximum Value: 9.1 ppb on Jan 17 23:00		Maximum Daily Average: 4.3 ppb on Jan 18																	Hours of Data: 709		Hours of Missing Data: 35						
Minimum Value: 0.0 ppb on Jan 1 23:00		Minimum Daily Average: 0.0 ppb on Jan 14																	Hours of Calibration: 34		Percent Operational Time: 99.9						
Maximum Diurnal Average: 0.9 ppb at hour 23		Minimum Diurnal Average: 0.4 ppb at hour 9																									
Monthly Average: 0.60 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 2.0 P ₉₉ = 7.1																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
2-Jan	0.0	0.0	Z	0.0	0.1	0.1	0.2	0.2	0.5	1.5	2.7	3.2	3.8	3.0	1.9	1.9	2.2	1.9	1.4	1.5	1.9	2.0	1.7	1.2	1.4	3.8	
3-Jan	1.5	1.1	0.8	Z	0.6	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.5	0.7	1.2	1.6	1.9	1.1	0.4	0.2	0.1	0.0	0.0	0.6	1.9	
4-Jan	0.1	0.1	0.1	0.3	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
5-Jan	0.0	0.1	0.3	0.8	1.1	Z	1.3	1.4	1.2	1.5	2.2	2.9	3.7	4.4	4.2	3.5	3.6	4.8	4.3	3.4	2.0	1.2	1.0	1.0	2.2	4.8	
6-Jan	Z	0.8	0.7	0.7	PF	0.5	0.4	0.4	1.1	1.6	1.8	2.0	2.1	2.0	1.8	1.9	2.1	2.7	2.1	1.6	2.0	1.4	1.9	2.3	1.5	2.7	
7-Jan	1.6	Z	0.7	0.7	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.6	
8-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	
9-Jan	0.1	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	
10-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	
11-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.3	0.4	C	C	C	0.0	0.0	0.0	0.2	0.8	2.0	4.1	7.4	1.6	0.9	7.4	
12-Jan	Z	5.3	6.3	6.5	4.6	2.7	2.6	2.9	3.7	4.1	5.5	4.2	2.8	2.0	1.7	1.4	1.0	0.8	0.8	0.7	0.6	0.5	0.4	0.4	2.7	6.5	
13-Jan	0.2	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
14-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	
17-Jan	0.1	0.0	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.8	1.0	1.0	0.9	0.6	0.4	0.3	1.1	9.1	9.1	1.2	9.1	
18-Jan	Z	7.9	5.0	7.2	7.7	8.9	8.0	5.0	1.5	1.7	1.3	0.8	1.8	2.8	3.1	3.5	3.8	4.1	4.4	4.7	4.6	4.7	3.6	2.6	4.3	8.9	
19-Jan	2.6	Z	2.9	3.0	3.1	3.3	3.0	2.5	2.0	1.5	0.9	0.3	0.1	0.1	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0	1.2	3.3	
20-Jan	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
21-Jan	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.9	1.0	1.0	0.8	0.6	0.5	0.4	0.3	0.2	0.3	1.0	
22-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23-Jan	0.1	0.1	0.1	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
24-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
25-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	1.3	3.3	0.2	3.3	
26-Jan	6.1	3.9	Z	1.2	0.5	0.2	0.1	0.1	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	6.1	
27-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
28-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
29-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.4	
30-Jan	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
31-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.5	0.8	0.7	0.8	0.8	0.7	0.6	0.5	0.4	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.9	0.7	Diurnal Average	
		6.1	7.9	6.3	7.2	7.7	8.9	8.0	5.0	3.7	4.1	5.5	4.2	3.8	4.4	4.2	3.5	3.8	4.8	4.4	4.7	4.6	4.7	9.1	9.1	Diurnal Maximum	
Z - zerospan		C - Calibration		PF - Power Failure																							
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 172 ppb		24-hr 48 ppb																							



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	709	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	10	12	6	84	83	17	10	15	36	19	19	20	43	54	80	28	536
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	12	6	84	83	17	10	15	36	19	19	20	43	54	80	28	536

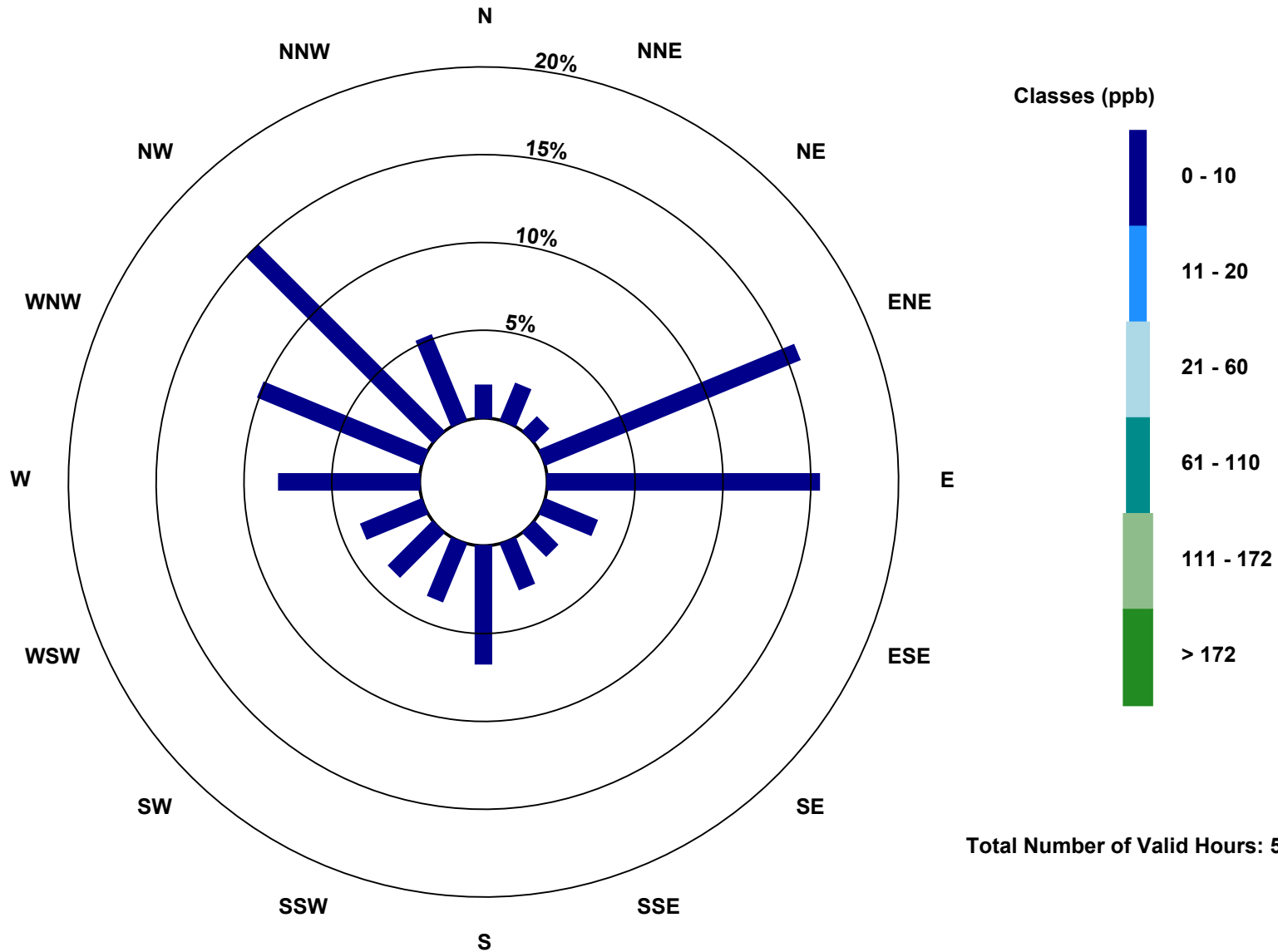
Total Number of Valid Hours: 536

Total Number of Hours: 744

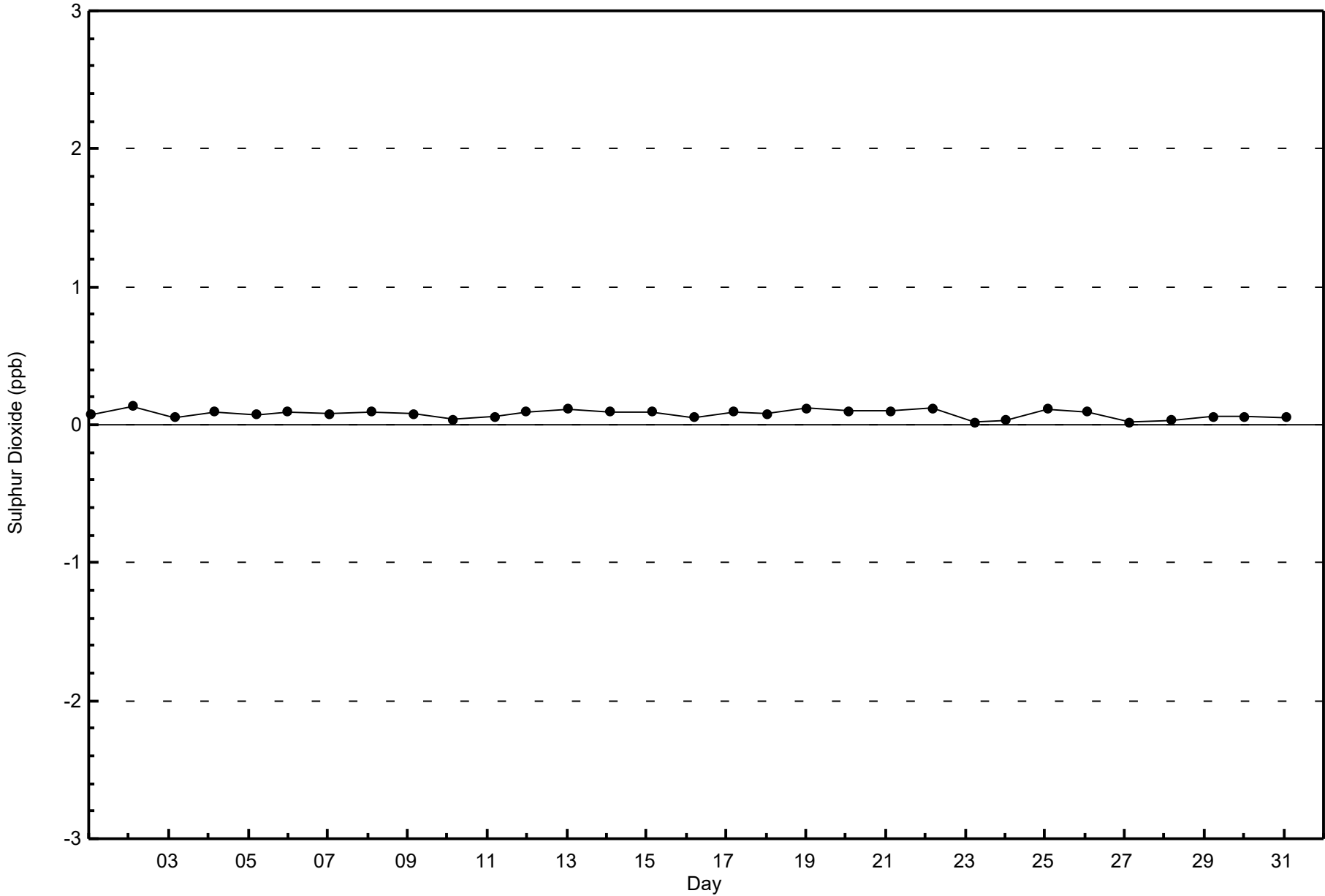


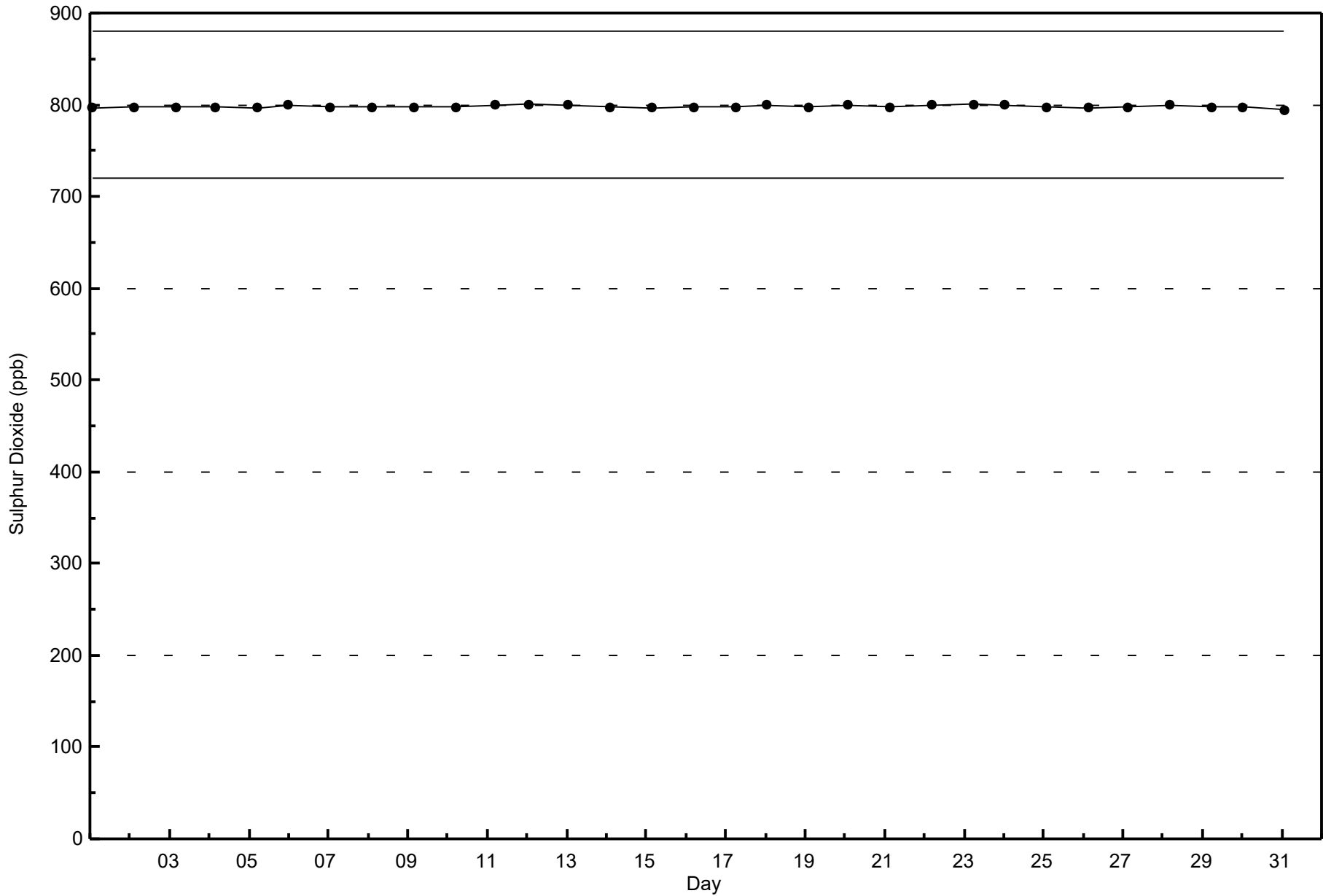
Wood Buffalo Environmental Association
Wind Rose Jan 2023

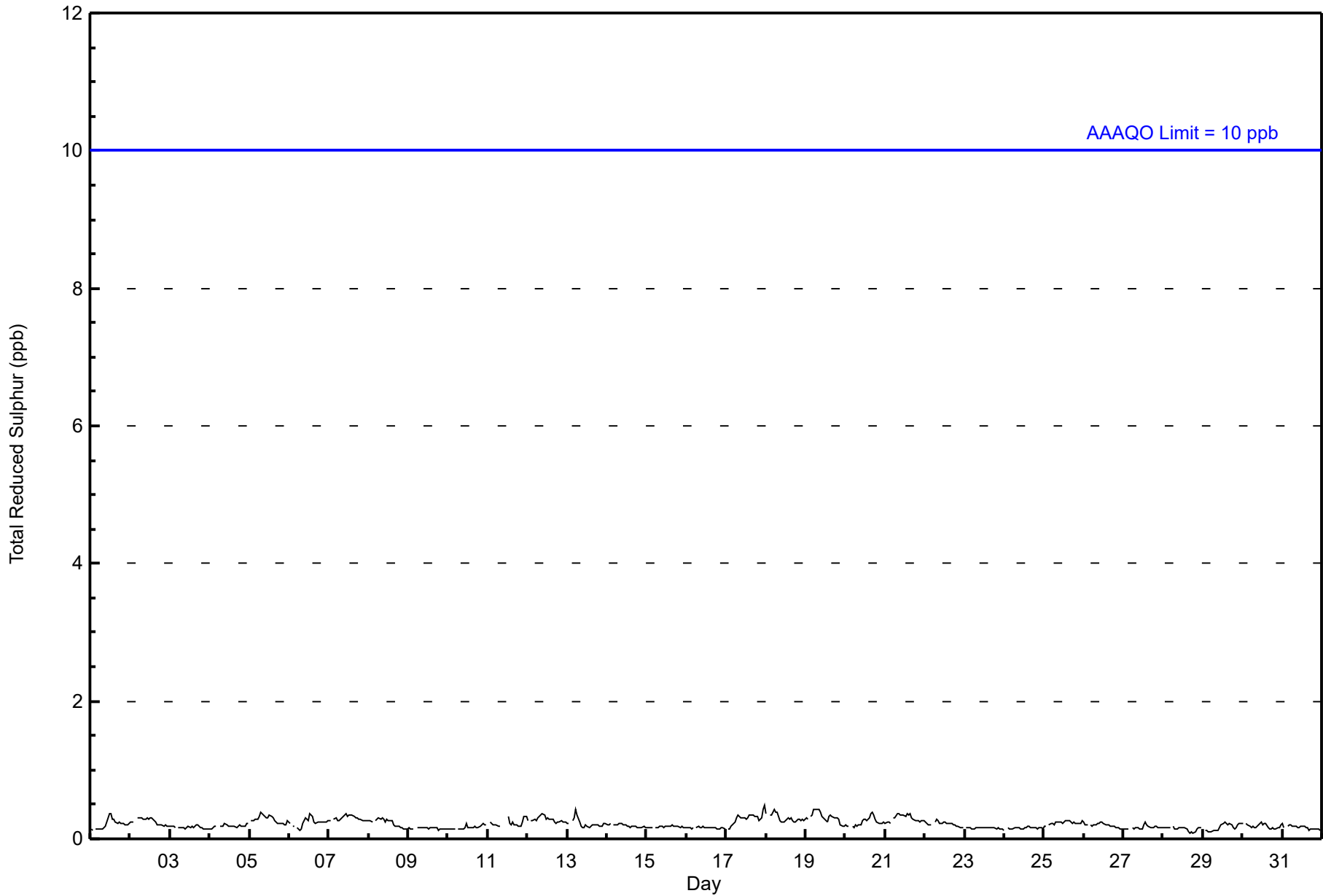
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan



Total Number of Valid Hours: 536









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



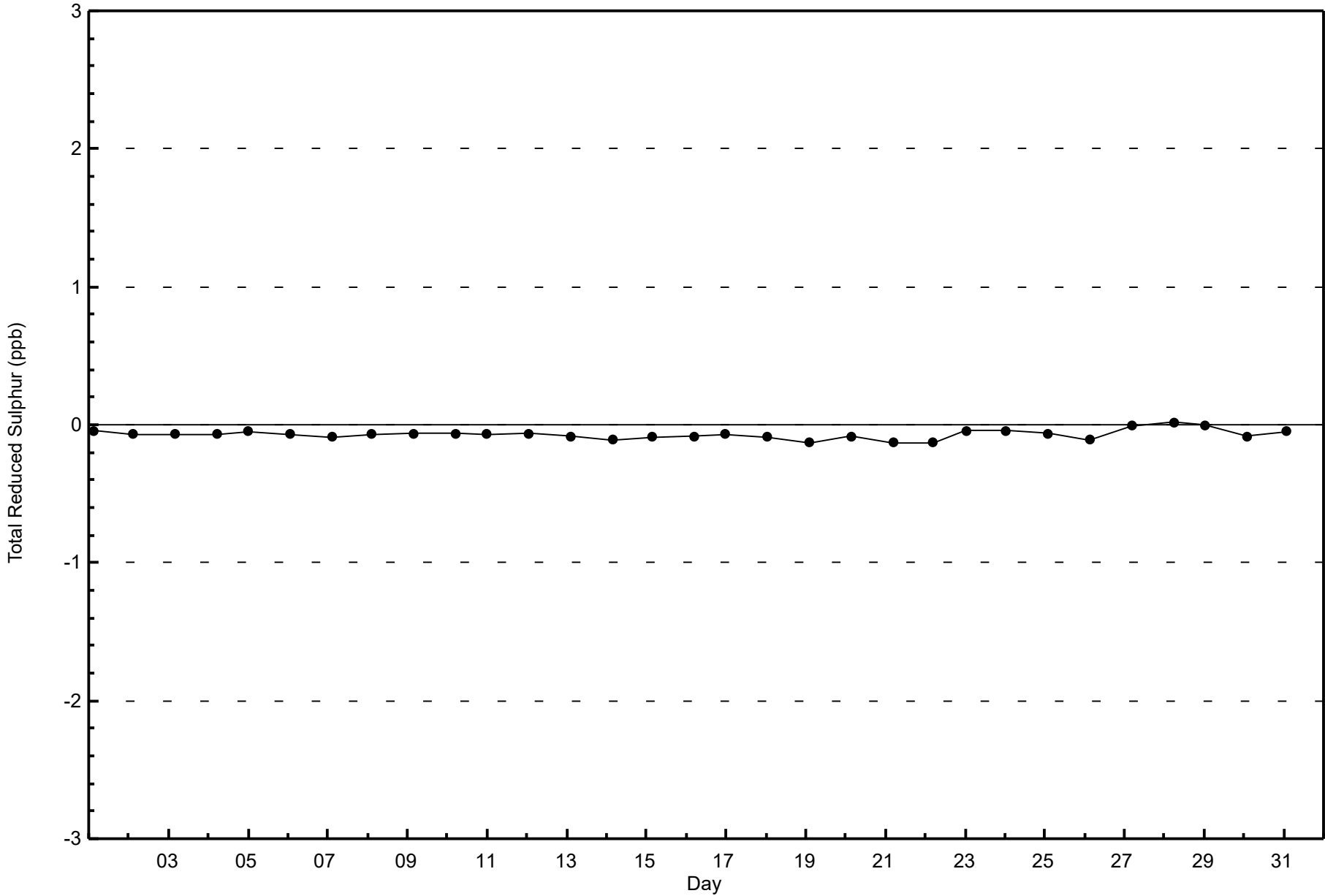
**Wood Buffalo Environmental Association
Frequency Distribution**

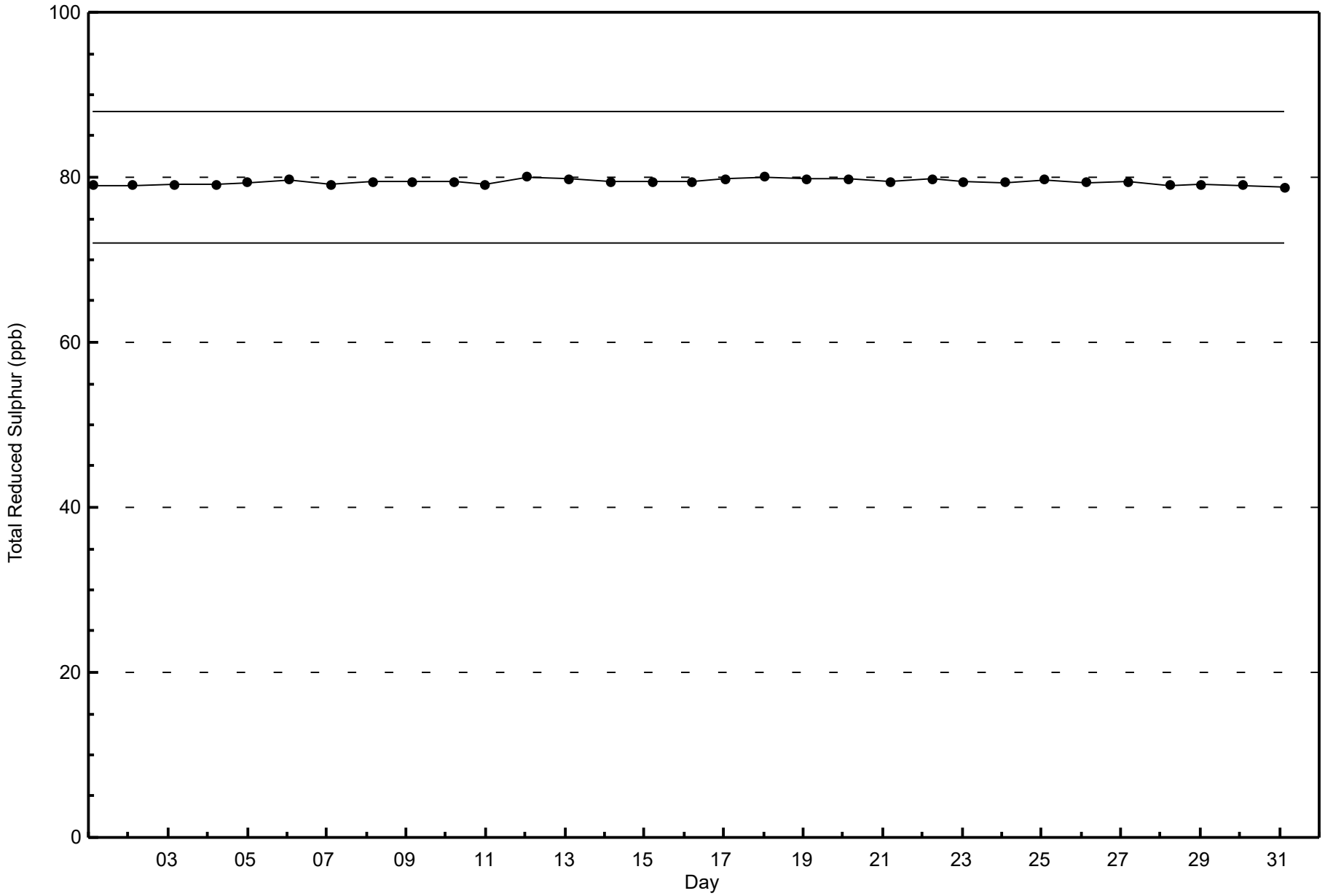
**Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	10	12	5	83	84	19	8	15	37	19	19	20	43	57	77	28	536
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	12	5	83	84	19	8	15	37	19	19	20	43	57	77	28	536

Total Number of Valid Hours: 536

Total Number of Hours: 744





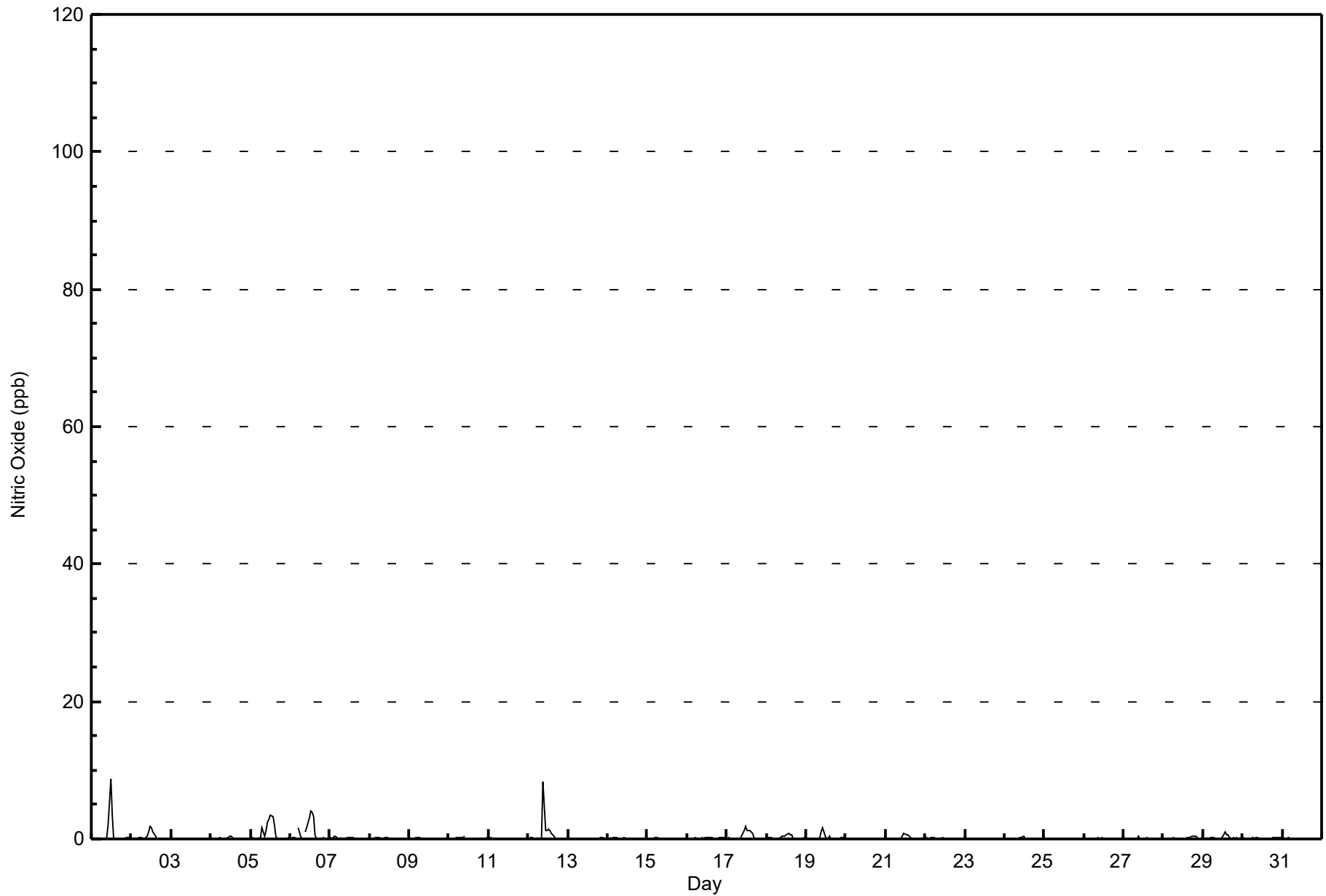


Maximum Value: 8.7 ppb on Jan 1 12:00																				Maximum Daily Average: 0.9 ppb on Jan 6					Hours in Service: 744	
Minimum Value: 0.0 ppb on Jan 1 08:00																				Minimum Daily Average: 0.0 ppb on Jan 25					Hours of Data: 706	
Maximum Diurnal Average: 0.8 ppb at hour 12																				Minimum Diurnal Average: 0.0 ppb at hour 18					Hours of Missing Data: 38	
Monthly Average: 0.18 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.3 P ₉₉ = 3.3					Hours of Calibration: 37	
																									Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.2	2.0	8.7	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.7	8.7
2-Jan	Z	0.3	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.3	1.1	1.9	1.6	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.9
3-Jan	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
4-Jan	0.0	0.0	Z	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.3	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4
5-Jan	0.0	0.3	0.1	Z	0.1	0.1	0.2	1.7	0.3	1.3	2.4	2.8	3.4	3.3	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	3.4
6-Jan	0.1	0.1	0.1	0.3	Z	1.5	0.1	0.1	M	1.0	1.7	3.1	4.0	3.9	3.3	0.6	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.9	4.0
7-Jan	0.1	0.1	0.1	0.3	0.2	Z	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
8-Jan	Z	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
9-Jan	0.0	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
10-Jan	0.0	0.0	Z	0.1	0.1	0.2	0.3	0.2	0.3	0.3	C	C	C	C	C	C	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	--	0.3
11-Jan	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
12-Jan	0.0	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	8.2	1.1	1.1	1.5	1.2	0.8	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.7	8.2
13-Jan	0.1	0.1	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.2
14-Jan	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2
15-Jan	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
16-Jan	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2
17-Jan	0.1	0.2	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.4	1.2	1.7	1.2	1.1	1.3	0.8	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	1.7
18-Jan	0.1	0.2	0.2	0.1	Z	0.1	0.0	0.1	0.1	0.4	0.4	0.5	0.6	0.8	0.7	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.8
19-Jan	0.1	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.2	1.1	1.7	0.4	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	1.7
20-Jan	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Jan	0.0	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.7
22-Jan	0.2	0.1	Z	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
23-Jan	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
24-Jan	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26-Jan	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
28-Jan	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.4
29-Jan	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.6	1.0	0.6	0.6	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.0
30-Jan	0.2	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3
31-Jan	0.1	0.0	0.0	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort Chipewyan - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	12	6	82	86	19	10	15	35	18	19	20	42	55	78	29	535
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	12	6	82	86	19	10	15	35	18	19	20	42	55	78	29	535

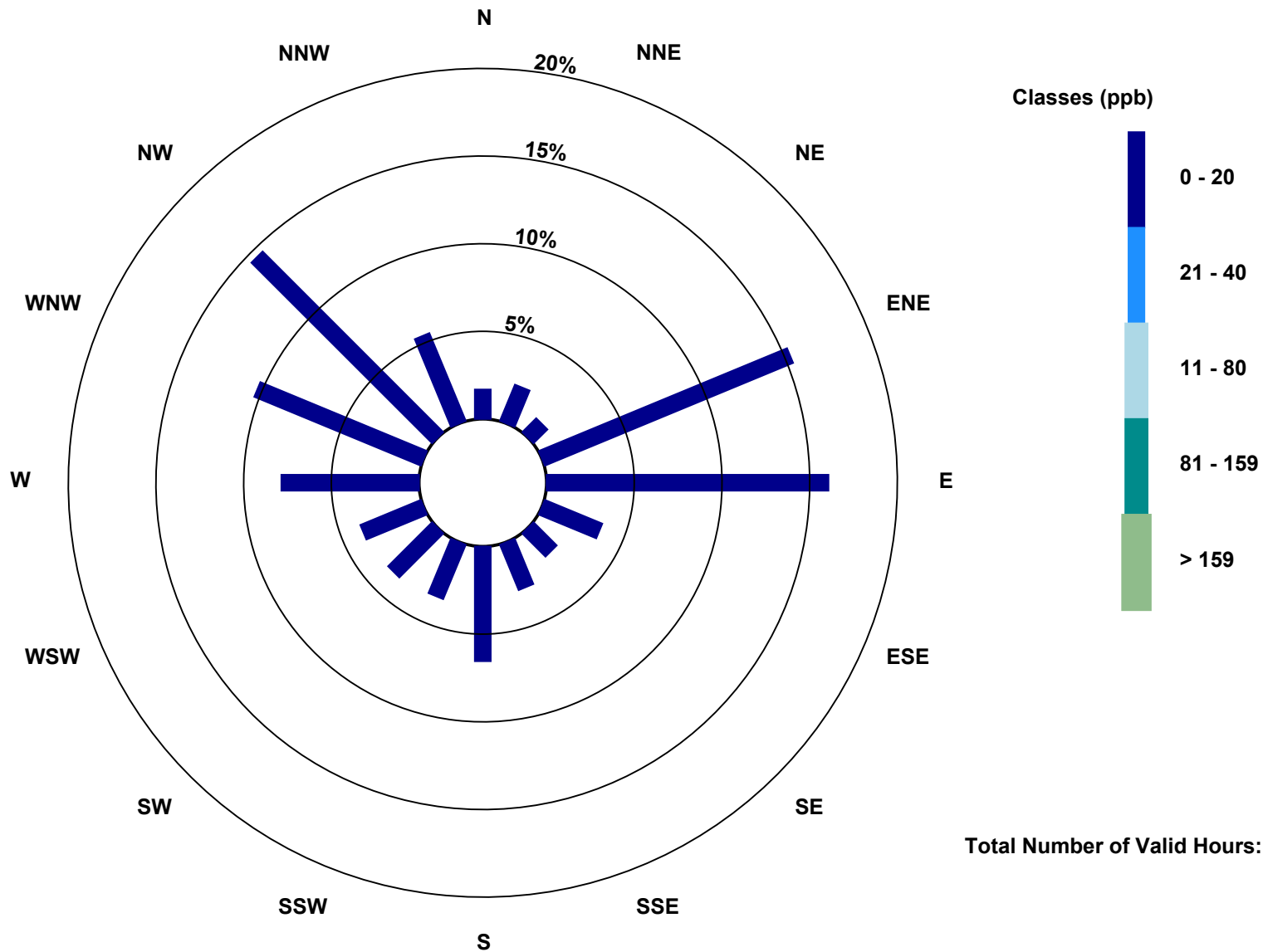
Total Number of Valid Hours: 535

Total Number of Hours: 744

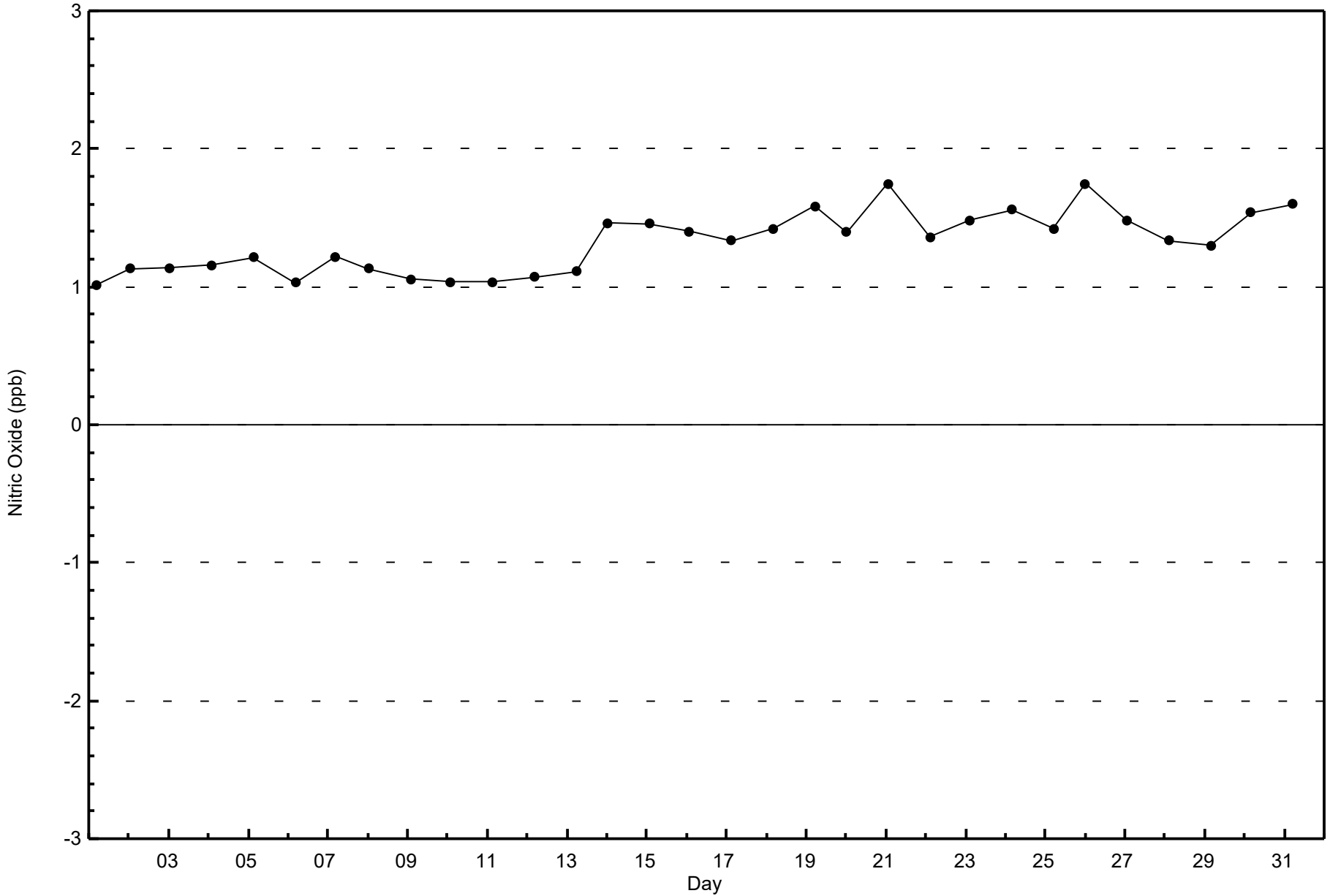


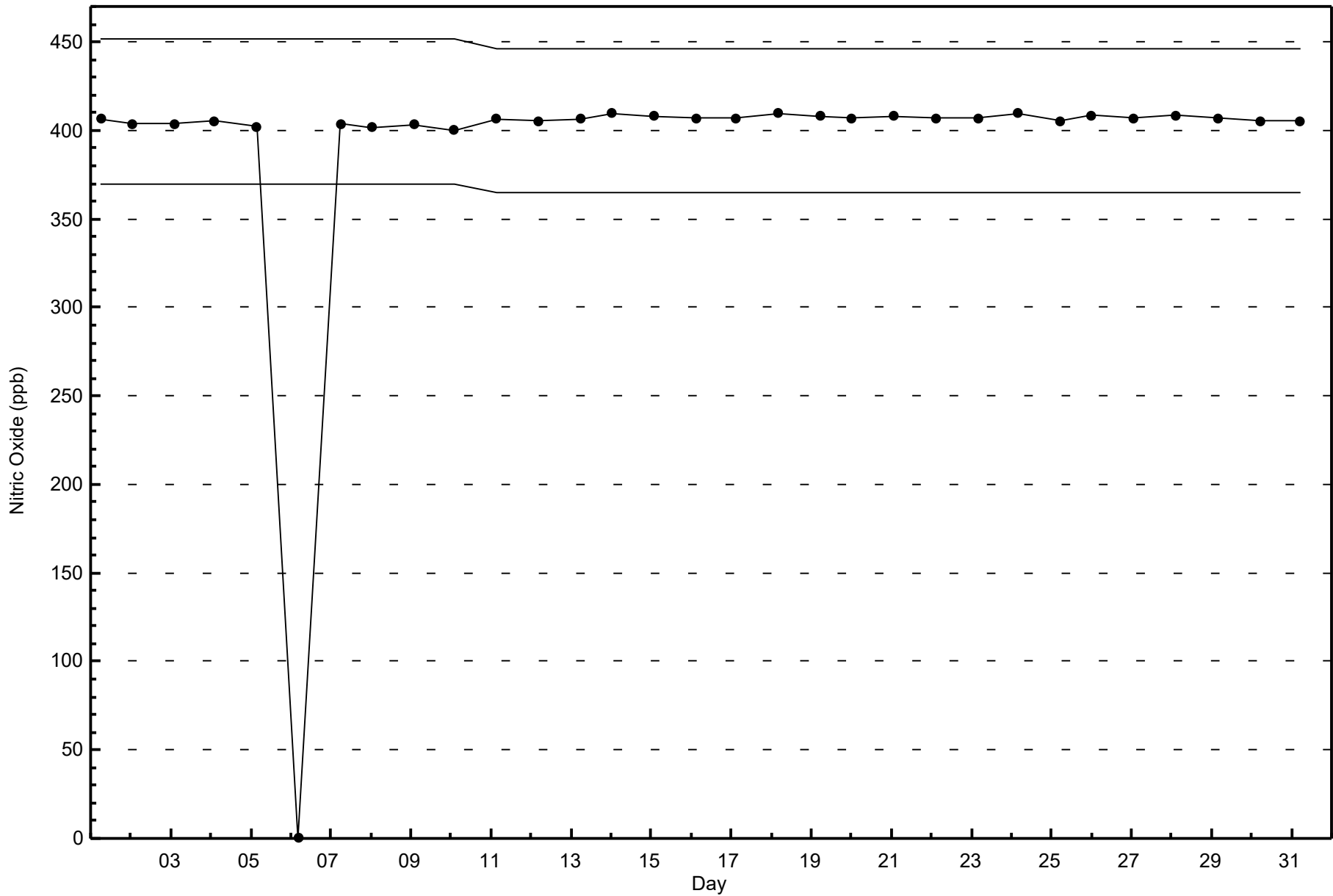
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Fort Chipewyan



Total Number of Valid Hours: 535







Wood Buffalo Environmental Association
Summary of Hour Averages

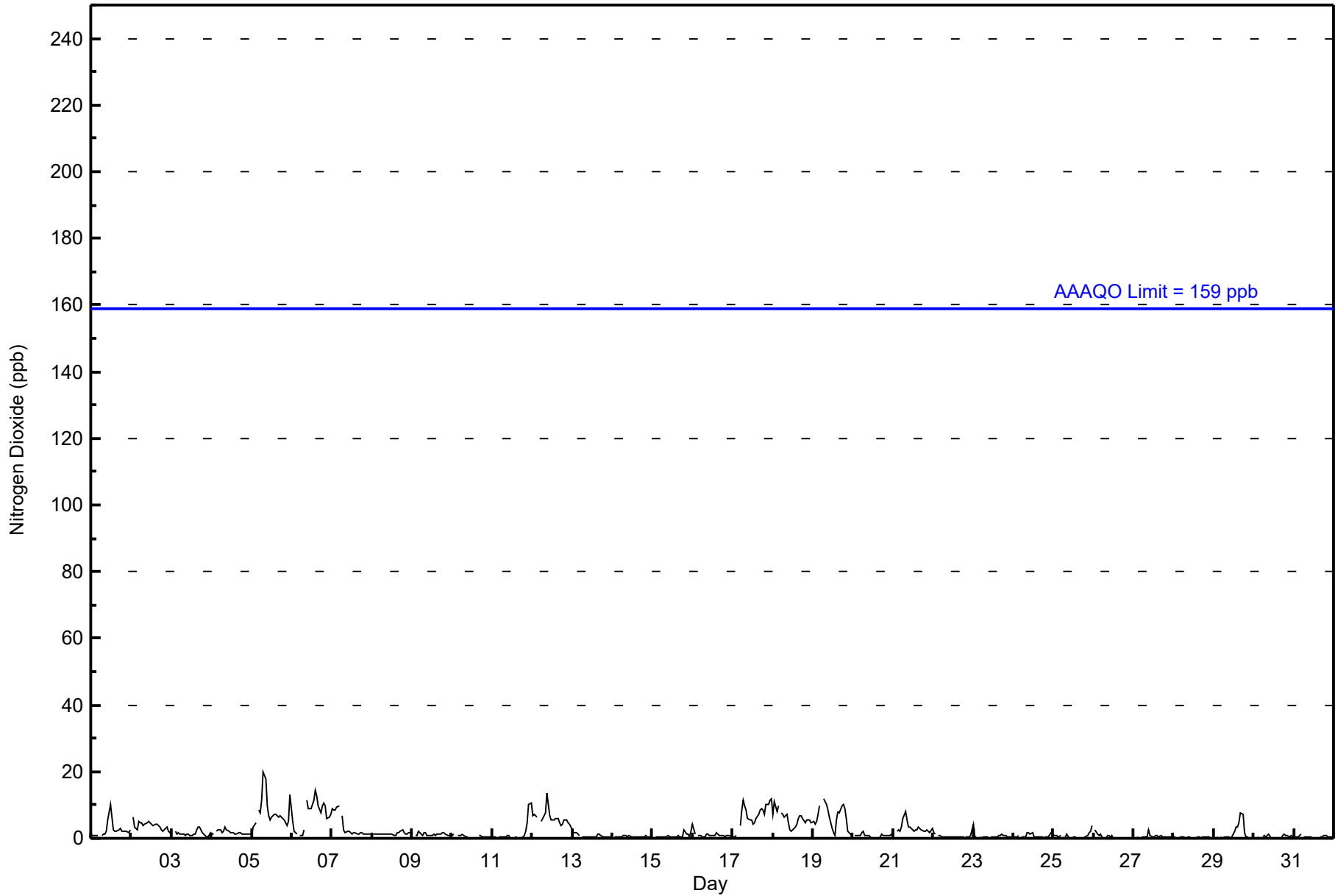
Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																																											
Maximum Value: 20.0 ppb on Jan 5 08:00		Maximum Daily Average: 7.7 ppb on Jan 5		Hours of Data: 706																																													
Minimum Value: 0.0 ppb on Jan 11 13:00		Minimum Daily Average: 0.3 ppb on Jan 28		Hours of Missing Data: 38																																													
Maximum Diurnal Average: 2.8 ppb at hour 8		Minimum Diurnal Average: 1.9 ppb at hour 13		Hours of Calibration: 37																																													
Monthly Average: 2.30 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.0 Q ₃ = 2.7 P ₉₀ = 6.8 P ₉₉ = 11.9		Percent Operational Time: 99.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.8	0.7	0.8	0.8	0.8	Z	1.0	1.1	1.4	2.0	5.3	10.1	6.5	2.4	2.0	2.2	2.5	3.0	2.2	2.2	2.2	2.1	1.9	2.7	2.5	10.1																							
2-Jan	Z	6.4	3.6	2.4	5.1	4.7	4.6	3.9	4.2	4.5	4.9	4.6	4.4	4.0	4.2	4.1	3.8	3.3	2.4	2.3	2.8	3.3	2.3	1.8	3.8	6.4																							
3-Jan	2.7	Z	2.3	1.3	1.7	1.3	1.3	1.1	0.9	1.4	1.1	0.7	0.8	1.2	1.4	2.4	3.5	3.5	1.6	1.1	0.8	0.6	0.5	1.8	1.5	3.5																							
4-Jan	1.1	1.4	Z	2.1	2.4	2.7	1.9	2.1	3.3	2.7	2.1	1.8	1.7	1.8	1.4	1.4	1.6	1.5	1.2	1.2	1.1	1.1	1.3	1.1	1.7	3.3																							
5-Jan	1.3	3.6	4.6	Z	8.6	7.8	11.3	20.0	18.0	9.8	6.6	5.5	6.3	7.0	7.2	6.8	6.4	6.6	6.2	5.7	4.8	3.7	5.1	13.2	7.7	20.0																							
6-Jan	5.1	2.0	1.7	1.3	Z	1.0	0.8	2.4	M	11.5	9.1	8.7	10.1	11.5	14.2	12.5	9.9	7.8	9.6	10.4	9.8	5.9	6.4	7.0	7.2	14.2																							
7-Jan	9.1	8.3	8.4	9.3	9.9	Z	6.6	2.6	1.9	2.2	2.0	1.6	1.3	1.5	1.5	1.4	1.4	1.6	1.5	1.2	1.1	1.2	1.2	1.1	3.4	9.9																							
8-Jan	Z	1.3	1.2	1.1	1.3	1.3	1.4	1.4	1.2	1.2	1.3	1.4	1.3	0.8	0.7	1.5	1.7	2.1	2.6	1.5	1.4	1.2	1.5	1.6	1.4	2.6																							
9-Jan	1.5	Z	0.9	1.0	2.2	1.1	0.8	1.5	1.6	0.7	0.8	0.9	1.0	1.4	1.0	1.4	1.4	1.4	1.6	1.5	1.2	0.8	0.8	1.1	1.2	2.2																							
10-Jan	0.9	1.3	Z	1.0	0.8	0.8	1.2	0.9	0.6	0.6	C	C	C	C	C	C	0.9	0.8	0.5	0.6	0.5	0.4	0.4	0.4	--	1.3																							
11-Jan	0.4	0.5	0.4	Z	0.5	0.5	0.6	0.3	0.3	1.0	0.8	0.2	0.0	0.1	0.3	0.0	0.1	0.2	0.3	1.0	2.2	4.8	10.1	10.7	1.5	10.7																							
12-Jan	6.7	7.3	6.8	6.5	Z	5.2	6.1	6.8	7.7	13.6	6.6	5.7	5.7	5.4	5.8	6.1	4.5	3.7	4.3	5.5	5.3	4.7	4.1	3.6	6.0	13.6																							
13-Jan	2.5	1.7	1.6	1.4	1.0	Z	0.6	0.4	0.3	0.3	0.3	0.5	0.4	0.5	0.4	1.2	1.4	0.8	0.5	0.6	0.6	0.6	0.4	0.5	0.8	2.5																							
14-Jan	Z	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.6	0.8	0.6	0.6	0.5	0.5	0.4	0.6	0.6	0.6	0.5	0.7	0.6	0.6	0.5	0.6	0.8																							
15-Jan	0.4	Z	0.5	0.6	0.5	0.5	0.5	0.4	0.6	0.8	0.4	0.4	0.5	0.5	0.4	0.7	0.4	0.4	0.4	0.4	2.4	1.2	1.1	0.5	2.2	0.7	2.4																						
16-Jan	4.3	1.2	Z	1.0	0.7	0.8	0.6	0.6	1.1	1.4	0.8	0.9	1.0	0.9	1.5	1.2	0.9	0.8	0.7	0.6	0.8	0.7	0.7	0.6	1.0	4.3																							
17-Jan	0.6	0.6	0.8	Z	3.8	8.5	11.6	9.8	8.3	6.0	5.7	5.3	4.2	4.5	5.9	7.3	8.4	8.7	8.3	7.1	10.0	10.1	11.3	11.9	6.9	11.9																							
18-Jan	7.0	11.2	8.1	9.6	Z	7.5	7.0	6.2	7.2	4.5	2.4	2.0	2.7	3.5	4.4	6.0	6.7	6.8	5.9	4.8	5.5	5.3	5.7	4.6	5.9	11.2																							
19-Jan	5.0	4.3	5.0	7.3	9.8	Z	11.9	11.0	10.0	8.4	6.5	2.8	1.5	0.8	5.6	7.9	7.8	9.6	10.0	9.1	6.0	2.0	1.1	0.9	6.3	11.9																							
20-Jan	Z	1.0	0.8	0.7	0.7	1.9	2.0	1.0	0.9	0.7	0.4	0.0	0.0	0.0	0.0	0.1	0.4	1.1	0.8	0.8	0.7	1.0	0.8	1.1	0.7	2.0																							
21-Jan	0.5	Z	2.3	2.4	2.2	3.6	6.0	8.0	5.7	3.6	3.3	3.0	2.2	2.6	2.5	3.3	3.1	2.7	2.1	2.0	2.4	2.3	1.8	2.8	3.1	8.0																							
22-Jan	1.5	1.1	Z	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.5	1.0	2.4	0.6	2.4																							
23-Jan	4.4	0.5	0.3	Z	0.4	0.2	0.3	0.3	0.5	0.2	0.2	0.5	0.6	0.6	0.5	0.8	1.0	1.3	0.9	0.8	0.6	0.4	0.4	0.6	0.7	4.4																							
24-Jan	0.4	0.4	0.3	0.7	Z	0.6	0.5	0.6	1.6	1.6	1.2	1.9	0.6	0.4	0.5	0.5	0.6	0.3	0.2	0.4	0.6	0.4	1.5	1.8	0.8	1.9																							
25-Jan	0.8	0.7	0.8	0.4	0.8	Z	0.6	0.2	1.1	0.1	0.1	0.2	0.4	0.4	0.1	0.0	0.1	0.0	0.2	0.5	0.8	1.9	2.2	3.7	0.7	3.7																							
26-Jan	Z	2.4	1.4	0.9	1.2	0.3	0.2	0.2	0.8	0.7	0.5	0.8	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	2.4																							
27-Jan	0.2	Z	0.3	0.2	0.2	0.3	0.6	0.4	0.6	2.6	0.7	0.4	0.3	0.8	0.8	0.4	0.8	0.3	0.5	0.3	0.3	0.4	0.3	0.3	0.5	2.6																							
28-Jan	0.3	0.3	Z	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.0	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.6	0.3	0.1	0.0	0.3	0.6																							
29-Jan	0.0	0.2	0.3	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.6	2.1	3.6	3.2	4.8	7.8	7.0	1.6	0.5	0.5	0.2	0.2	0.2	1.5	7.8																							
30-Jan	0.2	0.2	0.2	0.3	Z	0.5	0.7	0.6	0.9	1.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	1.0	1.2	0.9	0.7	0.6	0.7	0.4	0.5	1.2																							
31-Jan	0.3	0.3	0.4	1.0	1.4	Z	0.6	0.6	0.5	0.6	0.4	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.8	0.8	0.5	0.4	0.4	0.4	0.5	1.4																							
																								2.2	2.3	2.1	2.1	2.2	2.1	2.7	2.8	2.8	2.8	2.2	2.1	1.9	1.9	2.2	2.5	2.5	2.5	2.2	2.2	2.1	1.9	2.1	2.6	Diurnal Average	
																								9.1	11.2	8.4	9.6	9.9	8.5	11.9	20.0	18.0	13.6	9.1	10.1	10.1	11.5	14.2	12.5	9.9	9.6	10.0	10.4	10.0	10.1	11.3	13.2	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	12	6	82	86	19	10	15	35	18	19	20	42	55	78	29	535
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	12	6	82	86	19	10	15	35	18	19	20	42	55	78	29	535

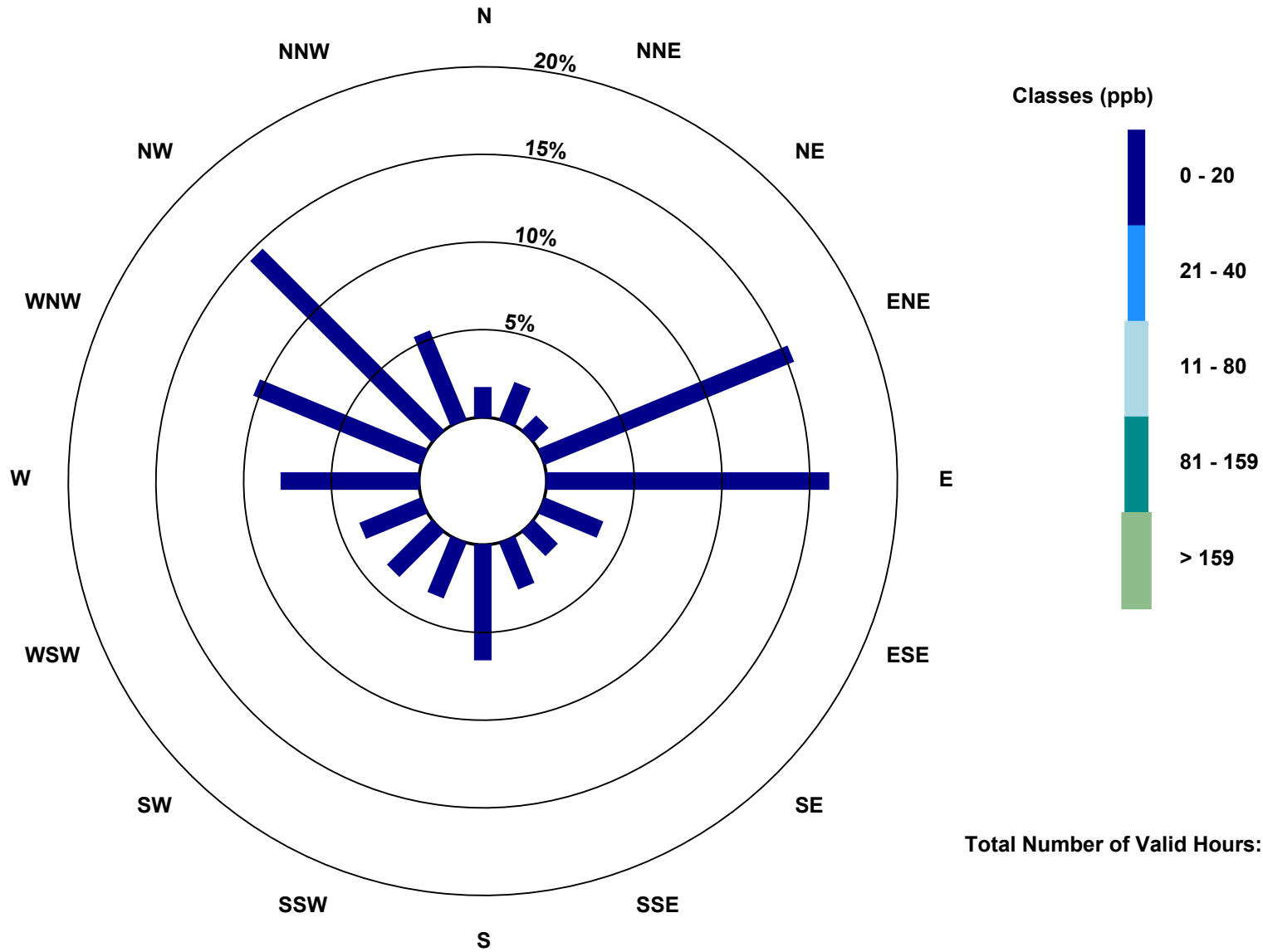
Total Number of Valid Hours: 535

Total Number of Hours: 744

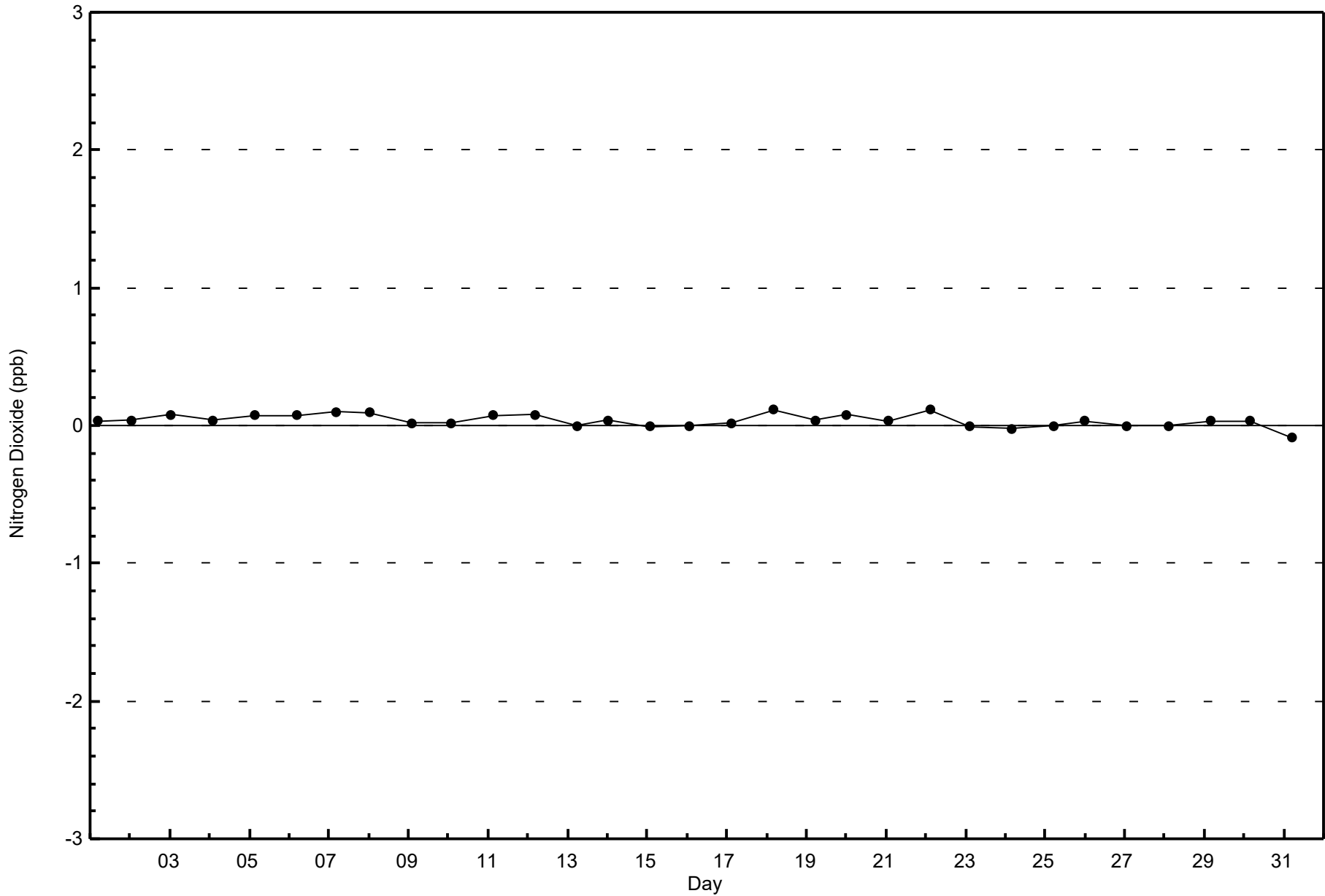


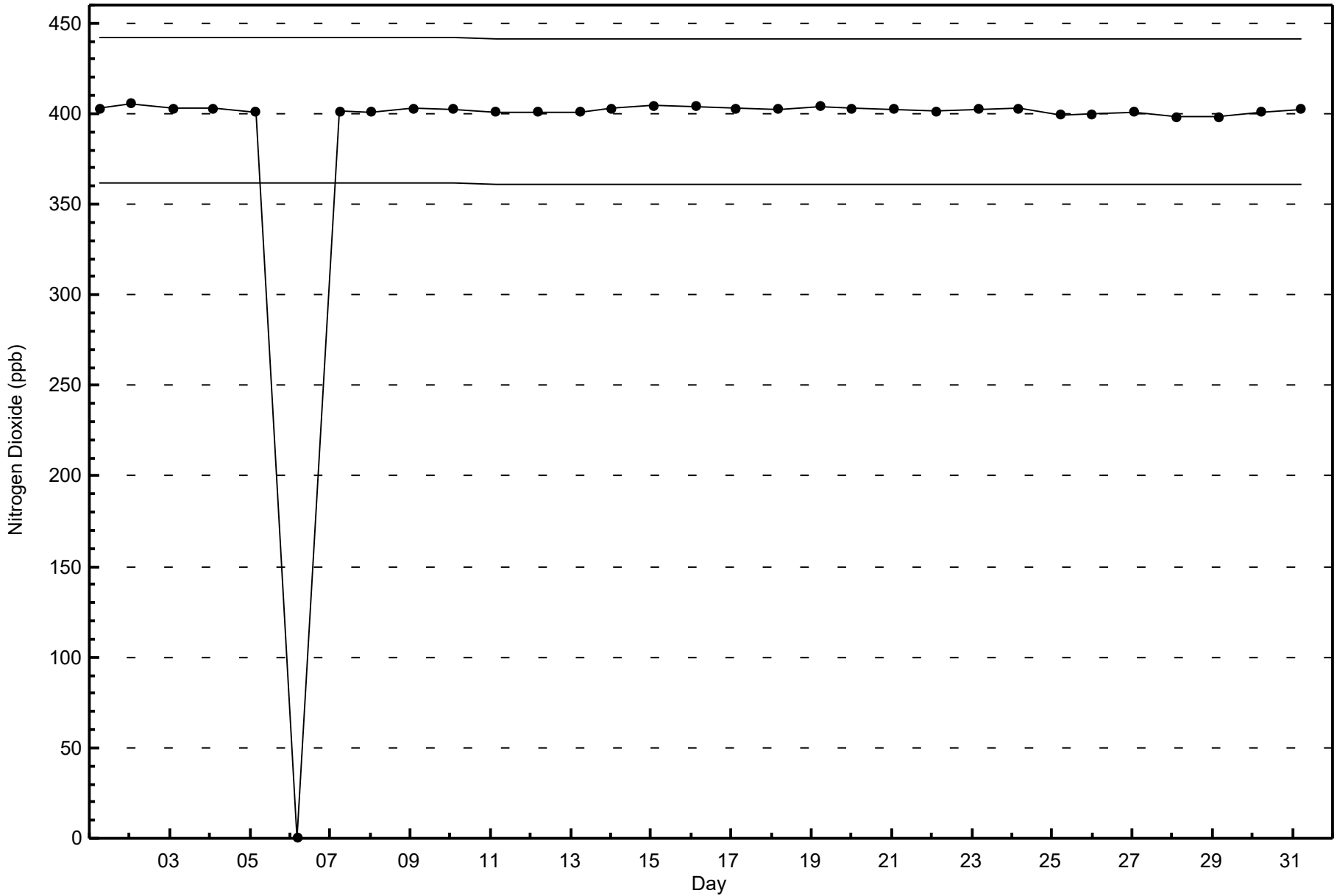
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan



Total Number of Valid Hours: 535







Wood Buffalo Environmental Association
Summary of Hour Averages

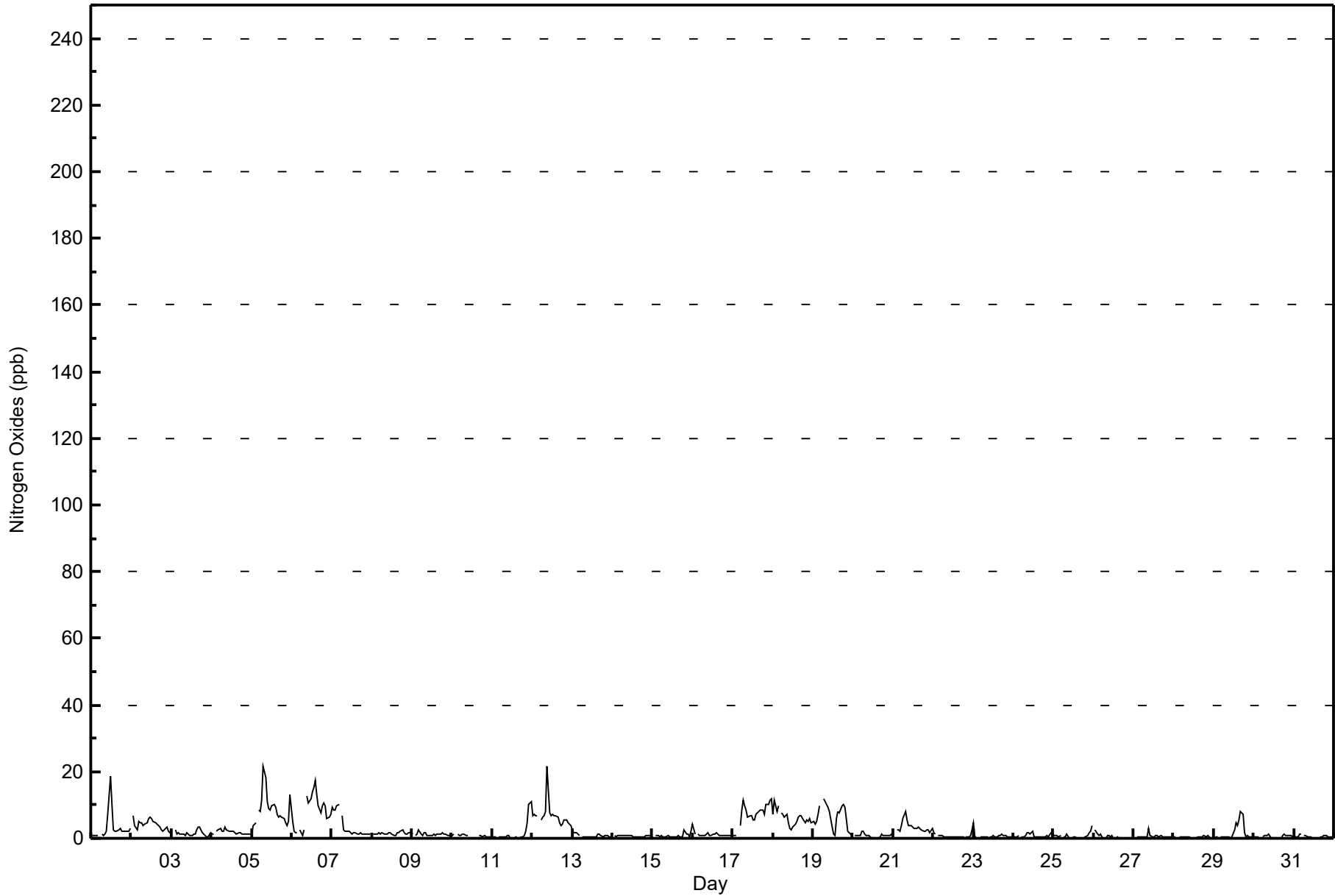
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - January 2023

Maximum Value: 21.8 ppb on Jan 12 10:00																				Maximum Daily Average: 8.5 ppb on Jan 5					Hours in Service: 744				
Minimum Value: 0.0 ppb on Jan 11 16:00																				Minimum Daily Average: 0.4 ppb on Jan 28					Hours of Data: 706				
Maximum Diurnal Average: 3.2 ppb at hour 10																				Minimum Diurnal Average: 1.9 ppb at hour 22					Hours of Missing Data: 38				
Monthly Average: 2.48 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 1.1 Q ₃ = 2.8 P ₉₀ = 7.2 P ₉₉ = 13.3					Hours of Calibration: 37				
																									Percent Operational Time: 99.9				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	0.8	0.7	0.8	0.8	0.8	Z	1.1	1.1	1.4	2.2	7.3	18.8	10.0	2.4	2.0	2.2	2.5	3.0	2.2	2.2	2.3	2.2	2.0	2.8	3.1	18.8			
2-Jan	Z	6.7	3.7	2.4	5.2	4.9	4.8	4.0	4.3	4.8	6.0	6.5	6.0	4.9	4.6	4.1	3.8	3.3	2.4	2.3	2.8	3.3	2.3	1.8	4.1	6.7			
3-Jan	2.7	Z	2.3	1.3	1.7	1.4	1.4	1.1	0.9	1.5	1.2	0.7	0.8	1.2	1.4	2.5	3.6	3.5	1.6	1.1	0.8	0.6	0.5	1.8	1.6	3.6			
4-Jan	1.1	1.4	Z	2.1	2.5	2.9	2.0	2.1	3.4	2.7	2.2	2.1	2.1	2.0	1.5	1.4	1.6	1.5	1.2	1.2	1.1	1.1	1.4	1.2	1.8	3.4			
5-Jan	1.3	3.9	4.7	Z	8.7	7.9	11.5	21.7	18.3	11.1	9.0	8.3	9.7	10.3	9.2	7.3	6.4	6.6	6.2	5.7	4.8	3.7	5.1	13.3	8.5	21.7			
6-Jan	5.2	2.1	1.8	1.6	Z	2.5	0.9	2.5	M	12.5	10.8	11.8	14.1	15.4	17.5	13.1	9.9	7.8	9.6	10.5	9.9	6.0	6.5	7.1	8.1	17.5			
7-Jan	9.2	8.4	8.5	9.6	10.1	Z	6.7	2.7	1.9	2.3	2.2	1.8	1.5	1.7	1.6	1.4	1.4	1.6	1.5	1.2	1.1	1.2	1.2	1.2	3.5	10.1			
8-Jan	Z	1.4	1.3	1.3	1.5	1.5	1.5	1.5	1.3	1.3	1.6	1.5	1.3	0.8	0.7	1.5	1.7	2.1	2.6	1.5	1.4	1.2	1.5	1.7	1.5	2.6			
9-Jan	1.5	Z	1.0	1.1	2.4	1.2	0.9	1.6	1.6	0.7	0.8	0.9	1.0	1.4	1.0	1.4	1.4	1.4	1.6	1.5	1.2	0.8	0.8	1.2	1.2	2.4			
10-Jan	0.9	1.3	Z	1.1	0.9	1.0	1.5	1.1	0.9	0.9	C	C	C	C	C	C	0.9	0.8	0.6	0.7	0.6	0.5	0.5	0.5	--	1.5			
11-Jan	0.5	0.6	0.5	Z	0.5	0.5	0.6	0.3	0.3	1.0	0.8	0.2	0.0	0.1	0.3	0.0	0.1	0.2	0.3	1.0	2.2	4.8	10.1	10.8	1.6	10.8			
12-Jan	6.7	7.4	7.0	6.6	Z	5.3	6.2	6.9	7.8	21.8	7.7	6.8	7.2	6.6	6.6	6.4	4.6	3.7	4.3	5.6	5.4	4.7	4.2	3.7	6.7	21.8			
13-Jan	2.6	1.8	1.7	1.5	1.0	Z	0.6	0.4	0.3	0.3	0.3	0.5	0.4	0.5	0.4	1.2	1.4	0.9	0.6	0.7	0.8	0.7	0.5	0.5	0.8	2.6			
14-Jan	Z	0.7	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.7	0.9	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.7	0.7	0.6	0.7	0.9			
15-Jan	0.5	Z	0.6	0.7	0.6	0.7	0.6	0.5	0.6	0.9	0.5	0.4	0.5	0.5	0.4	0.7	0.4	0.4	0.4	2.4	1.2	1.1	0.5	2.3	0.8	2.4			
16-Jan	4.4	1.2	Z	1.1	0.8	0.9	0.7	0.6	1.2	1.5	0.9	1.0	1.1	1.1	1.7	1.3	1.0	0.9	0.8	0.8	1.0	0.9	0.8	0.7	1.2	4.4			
17-Jan	0.7	0.8	0.9	Z	3.9	8.5	11.6	9.8	8.3	6.4	6.9	7.0	5.4	5.6	7.2	8.1	8.5	8.7	8.3	7.1	10.1	10.1	11.3	12.0	7.3	12.0			
18-Jan	7.1	11.4	8.3	9.7	Z	7.6	7.0	6.3	7.3	4.9	2.8	2.5	3.3	4.3	5.1	6.5	6.7	6.9	5.9	4.8	5.5	5.3	5.8	4.7	6.1	11.4			
19-Jan	5.1	4.3	5.0	7.3	9.9	Z	12.0	11.0	10.2	9.5	8.2	3.2	1.5	0.8	5.9	8.0	7.8	9.6	10.0	9.1	6.1	2.1	1.2	1.0	6.5	12.0			
20-Jan	Z	1.0	0.8	0.8	0.8	2.0	2.0	1.1	1.0	0.7	0.4	0.0	0.0	0.0	0.0	0.1	0.4	1.1	0.8	0.8	0.7	1.0	0.8	1.1	0.8	2.0			
21-Jan	0.5	Z	2.4	2.5	2.3	3.7	6.0	8.0	5.7	3.7	3.7	3.7	2.9	3.1	2.9	3.4	3.1	2.7	2.1	2.0	2.5	2.4	1.9	2.9	3.2	8.0			
22-Jan	1.7	1.2	Z	1.0	0.9	0.7	0.5	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.5	1.0	2.4	0.6	2.4			
23-Jan	4.5	0.5	0.3	Z	0.4	0.3	0.4	0.3	0.5	0.2	0.2	0.5	0.7	0.6	0.5	0.8	1.0	1.3	0.9	0.8	0.6	0.4	0.4	0.6	0.7	4.5			
24-Jan	0.4	0.5	0.3	0.7	Z	0.6	0.5	0.7	1.7	1.8	1.4	2.2	0.6	0.4	0.5	0.5	0.6	0.3	0.2	0.4	0.6	0.4	1.5	1.8	0.8	2.2			
25-Jan	0.8	0.7	0.8	0.4	0.8	Z	0.6	0.2	1.1	0.1	0.1	0.2	0.4	0.4	0.1	0.0	0.1	0.0	0.2	0.5	0.8	1.9	2.2	3.7	0.7	3.7			
26-Jan	Z	2.5	1.4	1.0	1.2	0.3	0.2	0.2	1.0	0.7	0.5	1.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	2.5			
27-Jan	0.2	Z	0.3	0.2	0.2	0.3	0.6	0.4	0.6	3.0	0.7	0.4	0.3	0.8	0.9	0.4	0.8	0.3	0.5	0.3	0.3	0.4	0.3	0.3	0.5	3.0			
28-Jan	0.3	0.3	Z	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.0	0.2	0.4	0.5	0.5	0.6	0.7	0.6	0.8	0.3	0.1	0.0	0.4	0.8			
29-Jan	0.0	0.3	0.4	Z	0.4	0.3	0.4	0.4	0.3	0.4	0.1	0.6	2.7	4.6	3.8	5.4	8.0	7.0	1.7	0.6	0.6	0.3	0.3	0.4	1.7	8.0			
30-Jan	0.4	0.3	0.3	0.4	Z	0.6	0.8	0.7	1.0	1.5	0.1	0.0	0.0	0.0	0.0	0.1	0.2	1.0	1.3	1.0	0.9	0.8	0.9	0.6	0.6	1.5			
31-Jan	0.4	0.3	0.4	1.1	1.5	Z	0.7	0.6	0.5	0.6	0.4	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.8	0.8	0.5	0.4	0.4	0.4	0.5	1.5			
																								Diurnal Average			Diurnal Maximum		
2.3 2.4 2.2 2.2 2.3 2.3 2.8 2.9 2.8 3.2 2.6 2.8 2.5 2.4 2.6 2.6 2.6 2.5 2.3 2.2 2.2 1.9 2.2 2.7																								9.2 11.4 8.5 9.7 10.1 8.5 12.0 21.7 18.3 21.8 10.8 18.8 14.1 15.4 17.5 13.1 9.9 9.6 10.0 10.5 10.1 10.1 11.3 13.3					
Z - zerospan C - Calibration M - Maintenance																													



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.72	99.72
21 - 40	2	0.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	9	12	6	82	86	19	10	15	35	17	19	20	42	55	78	29	534
21 - 40	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	9	12	6	82	86	19	10	15	35	18	19	20	42	55	78	29	535

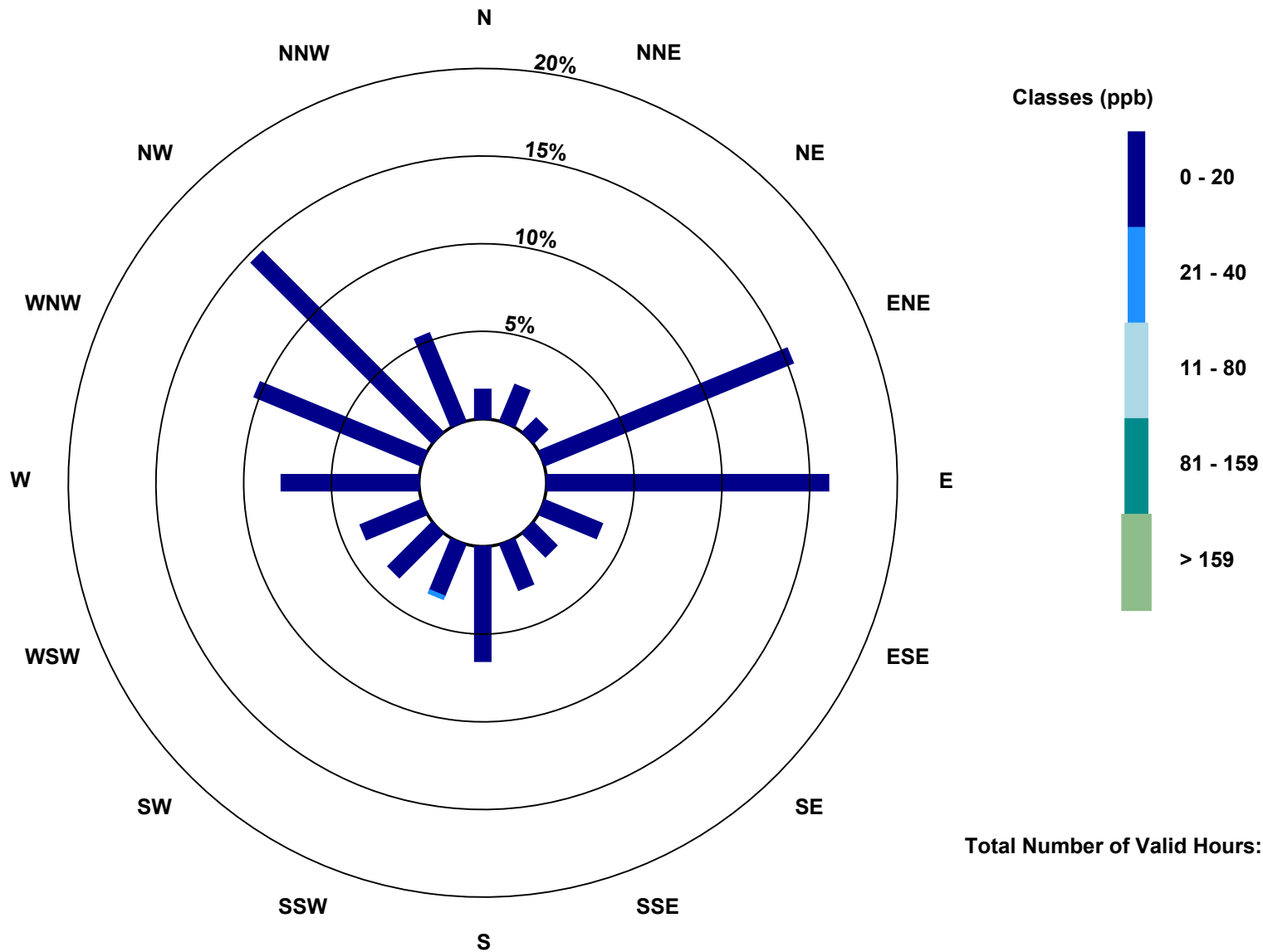
Total Number of Valid Hours: 535

Total Number of Hours: 744

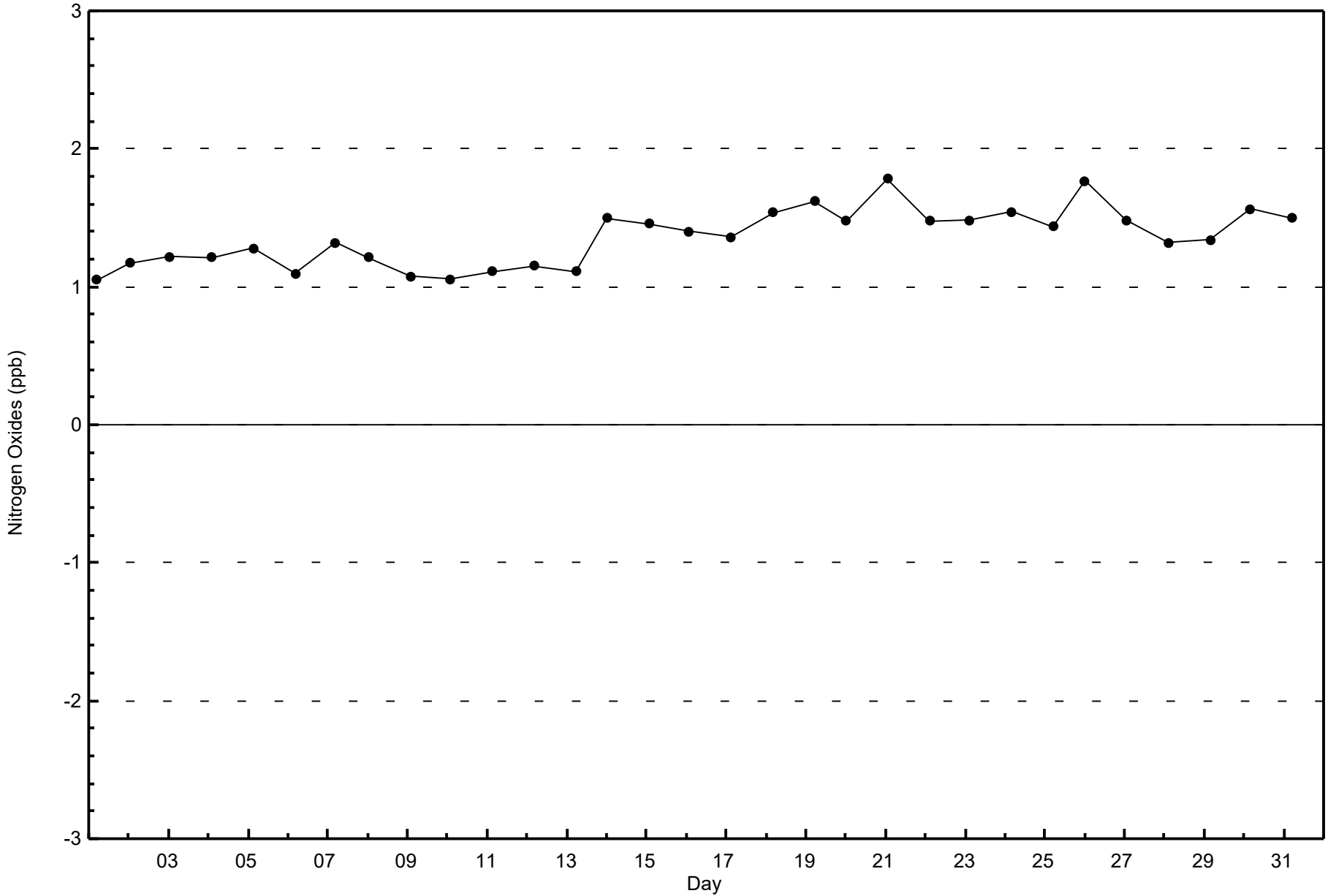


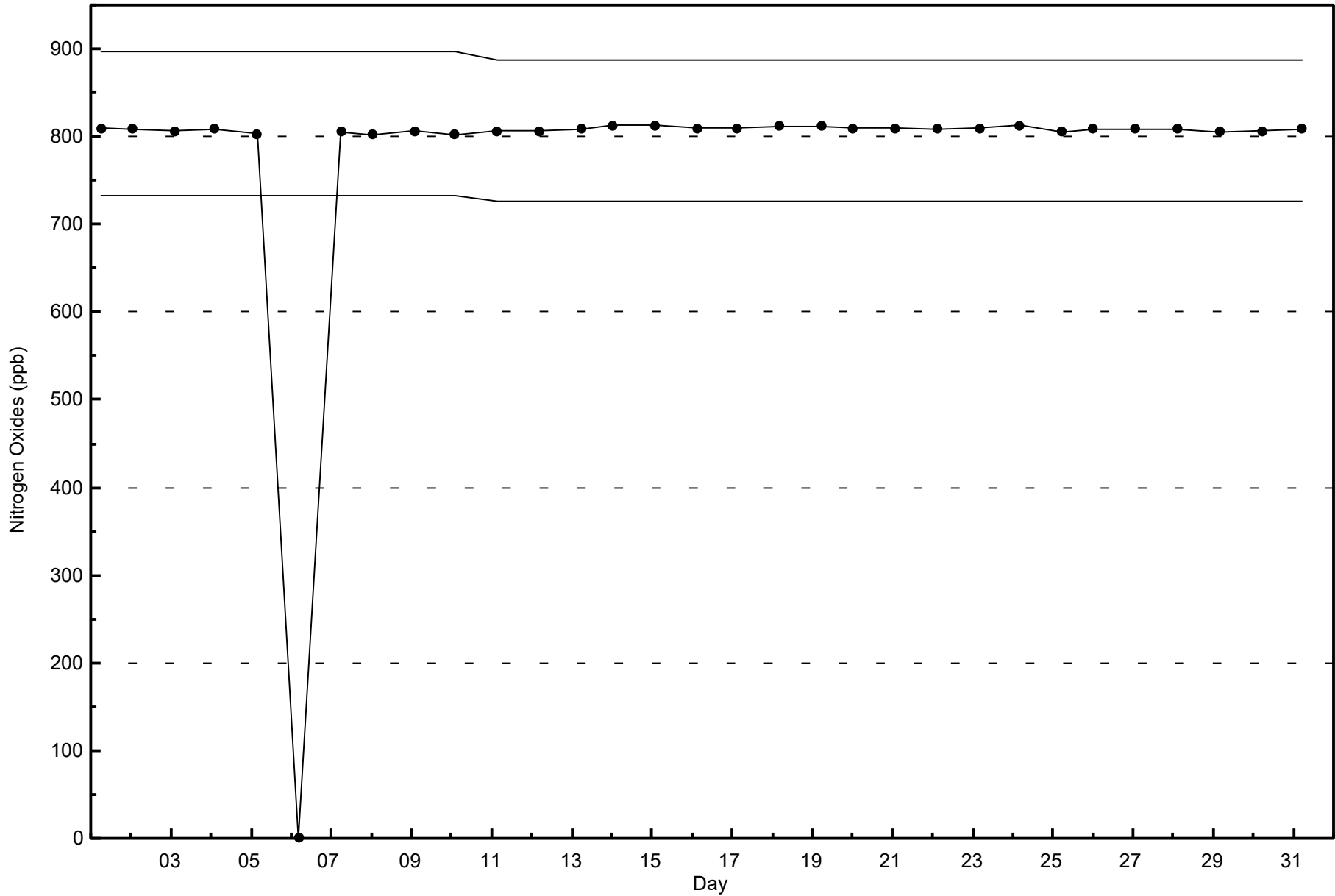
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan



Total Number of Valid Hours: 535







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort Chipewyan - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 41.4 ppb on Jan 28 16:00	Maximum Daily Average: 39.8 ppb on Jan 28		Hours of Data:	708
Minimum Value: 3.9 ppb on Jan 5 08:00	Minimum Daily Average: 17.1 ppb on Jan 17		Hours of Missing Data:	36
Maximum Diurnal Average: 29.4 ppb at hour 14	Minimum Diurnal Average: 26.5 ppb at hour 9		Hours of Calibration:	35
Monthly Average: 27.92 ppb	Percentiles: P ₁ = 11.6 P ₁₀ = 18.7 Q ₁ = 23.2 Median = 27.4 Q ₃ = 34.2 P ₉₀ = 37.5 P ₉₉ = 41.0		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	29.1	29.8	29.3	Z	28.2	27.1	25.3	24.5	24.3	22.4	17.1	10.2	17.4	21.5	20.5	19.3	17.8	17.1	18.0	17.8	18.2	20.3	19.8	17.7	21.4	29.8
2-Jan	16.6	15.3	16.5	18.4	Z	17.9	17.4	18.5	17.5	17.7	18.2	19.6	20.5	21.6	22.4	23.3	24.5	25.7	27.2	27.4	26.5	25.7	26.7	27.5	21.4	27.5
3-Jan	26.1	26.3	27.2	28.0	27.2	Z	27.1	27.1	27.4	26.8	26.8	28.1	28.4	27.9	27.4	25.9	24.7	24.8	27.5	28.4	29.1	29.6	30.2	29.0	27.4	30.2
4-Jan	Z	28.2	23.9	23.0	22.1	20.2	19.0	18.0	16.3	16.8	17.6	18.8	19.9	20.8	21.6	21.7	20.9	21.2	22.5	23.5	23.5	23.9	23.9	23.8	21.3	28.2
5-Jan	24.0	Z	19.7	17.0	15.3	15.3	11.2	3.9	6.1	13.3	16.6	18.1	18.5	18.4	18.8	20.1	21.1	21.9	22.2	22.7	23.4	25.2	24.9	16.8	18.0	25.2
6-Jan	25.8	29.2	Z	33.6	PF	34.3	34.7	30.3	21.3	18.8	22.6	23.6	23.1	22.1	19.6	21.6	25.3	27.3	23.2	21.1	22.7	23.4	23.8	23.5	25.0	34.7
7-Jan	19.5	18.7	16.8	Z	12.9	12.9	15.3	20.0	20.3	19.3	19.2	19.5	19.9	20.3	20.2	20.9	23.2	22.7	23.0	23.4	23.2	23.0	23.2	23.8	20.1	23.8
8-Jan	23.3	23.2	23.6	24.8	Z	22.8	23.7	24.5	24.4	25.5	26.1	26.2	27.0	27.9	28.5	27.2	26.7	26.7	26.2	27.4	28.4	29.5	29.3	28.0	26.1	29.5
9-Jan	29.5	27.5	28.0	27.8	25.7	Z	26.1	24.8	24.5	26.0	27.3	27.8	28.0	28.0	27.2	26.5	25.7	25.1	25.0	24.7	25.2	25.4	25.2	24.8	26.3	29.5
10-Jan	Z	24.8	24.8	24.9	25.1	24.6	24.1	C	C	C	C	26.1	25.9	25.5	26.0	25.9	25.3	24.7	24.8	24.5	23.6	24.6	25.0	24.8	25.0	26.1
11-Jan	24.6	Z	25.5	25.8	26.0	25.8	26.1	26.4	26.0	25.0	24.8	25.7	25.7	25.4	25.2	25.0	24.0	23.5	23.2	22.7	21.9	20.2	16.3	16.6	24.0	26.4
12-Jan	17.6	16.9	Z	19.5	19.7	20.7	19.9	19.1	18.0	17.6	20.2	22.1	21.7	22.7	23.1	21.9	22.3	22.1	21.8	20.1	19.6	19.9	20.2	20.1	20.3	23.1
13-Jan	19.0	18.9	19.1	Z	19.2	21.7	24.2	26.5	28.7	29.0	29.4	29.0	30.1	31.2	31.7	30.9	30.6	30.8	30.6	30.3	30.1	30.0	29.5	28.1	27.3	31.7
14-Jan	28.1	28.1	27.3	28.6	Z	29.1	29.0	28.9	28.5	28.6	28.7	29.3	29.6	30.0	30.3	30.6	30.6	30.8	30.8	30.4	29.8	29.1	27.5	27.5	29.2	30.8
15-Jan	27.8	27.7	27.6	27.4	27.5	Z	26.9	26.7	26.5	26.2	26.6	26.2	26.2	26.1	26.1	25.6	25.4	24.5	24.4	22.2	25.5	25.8	25.0	22.4	25.9	27.8
16-Jan	Z	23.6	24.9	24.6	24.9	25.0	25.6	26.2	26.1	25.9	26.6	26.8	27.0	27.3	27.2	27.5	27.8	27.1	26.7	26.1	24.9	24.5	24.8	25.5	25.9	27.8
17-Jan	25.9	Z	26.0	24.0	19.4	12.5	9.0	11.1	14.3	17.6	18.6	19.7	20.9	20.9	20.5	19.5	17.6	16.5	15.6	15.7	12.9	12.9	11.6	10.9	17.1	26.0
18-Jan	16.4	12.2	Z	14.1	15.5	19.1	21.3	22.7	21.7	25.7	28.5	29.0	28.5	27.5	26.3	24.1	22.8	22.3	23.0	23.9	22.9	23.4	22.7	24.0	22.5	29.0
19-Jan	23.7	24.7	23.6	Z	17.2	15.0	14.3	14.7	15.4	17.1	20.1	28.5	33.4	34.3	24.5	21.6	20.8	17.9	17.1	18.9	24.5	34.6	37.9	37.7	23.4	37.9
20-Jan	38.6	38.4	38.3	38.1	Z	36.4	34.5	35.7	35.6	35.8	35.4	36.2	36.5	36.6	36.1	35.5	35.0	34.2	34.2	34.6	35.0	34.2	33.6	32.1	35.7	38.6
21-Jan	33.1	30.3	31.0	29.8	28.0	Z	21.5	19.9	23.6	26.7	27.0	27.9	29.5	28.8	29.0	28.1	28.5	29.4	30.6	30.6	29.7	29.7	30.1	26.2	28.2	33.1
22-Jan	Z	26.6	28.1	30.7	31.7	32.2	34.0	32.0	31.6	32.2	33.5	34.2	34.7	34.0	31.7	30.8	30.0	30.2	30.8	32.2	33.2	33.3	31.8	30.4	31.7	34.7
23-Jan	27.8	Z	31.2	31.6	31.9	32.8	33.1	32.8	33.5	34.6	35.4	35.9	36.7	37.3	37.9	37.7	37.7	38.0	38.0	37.9	37.4	37.4	37.7	37.7	35.3	38.0
24-Jan	37.6	37.3	Z	35.8	36.1	35.7	34.9	34.4	32.5	31.8	32.4	32.6	34.4	34.6	33.8	33.4	33.6	33.8	34.0	33.9	33.3	33.1	31.9	30.2	34.0	37.6
25-Jan	31.3	30.8	31.2	Z	32.5	31.2	31.8	33.3	32.6	34.0	34.2	33.9	34.2	35.3	35.2	34.8	34.8	33.1	31.7	30.6	29.6	27.6	27.0	24.3	32.0	35.3
26-Jan	22.0	26.7	29.3	30.4	Z	33.7	33.6	33.5	32.6	31.0	30.4	30.3	33.5	34.1	34.6	36.1	36.4	36.6	37.0	37.9	38.1	38.3	38.2	38.4	33.6	38.4
27-Jan	37.7	37.5	37.9	37.4	36.9	Z	35.0	34.9	34.6	32.7	34.5	35.6	36.4	36.8	37.0	37.1	36.8	38.9	38.1	37.9	38.0	38.3	37.4	36.7	36.7	38.9
28-Jan	Z	36.5	36.4	36.3	36.5	37.6	38.6	39.7	40.2	40.2	41.0	41.3	41.2	41.0	41.4	41.4	41.1	41.1	41.0	40.8	40.3	40.4	40.2	40.3	39.8	41.4
29-Jan	39.8	Z	39.2	38.9	38.6	38.3	37.5	37.6	37.9	38.1	38.4	37.5	36.1	34.8	35.2	33.0	29.2	29.4	34.5	35.7	35.7	35.8	36.9	37.1	36.3	39.8
30-Jan	37.1	37.7	Z	36.1	37.2	37.0	35.8	36.1	36.7	35.5	34.8	34.8	37.0	37.5	36.5	35.0	34.9	34.3	34.2	34.4	36.2	36.0	37.2	37.8	36.1	37.8
31-Jan	37.3	36.6	37.2	Z	34.0	35.8	37.2	37.6	37.0	36.7	37.8	39.2	39.7	39.6	39.9	40.0	39.1	37.9	37.5	37.3	37.5	38.5	37.1	37.9	37.8	40.0

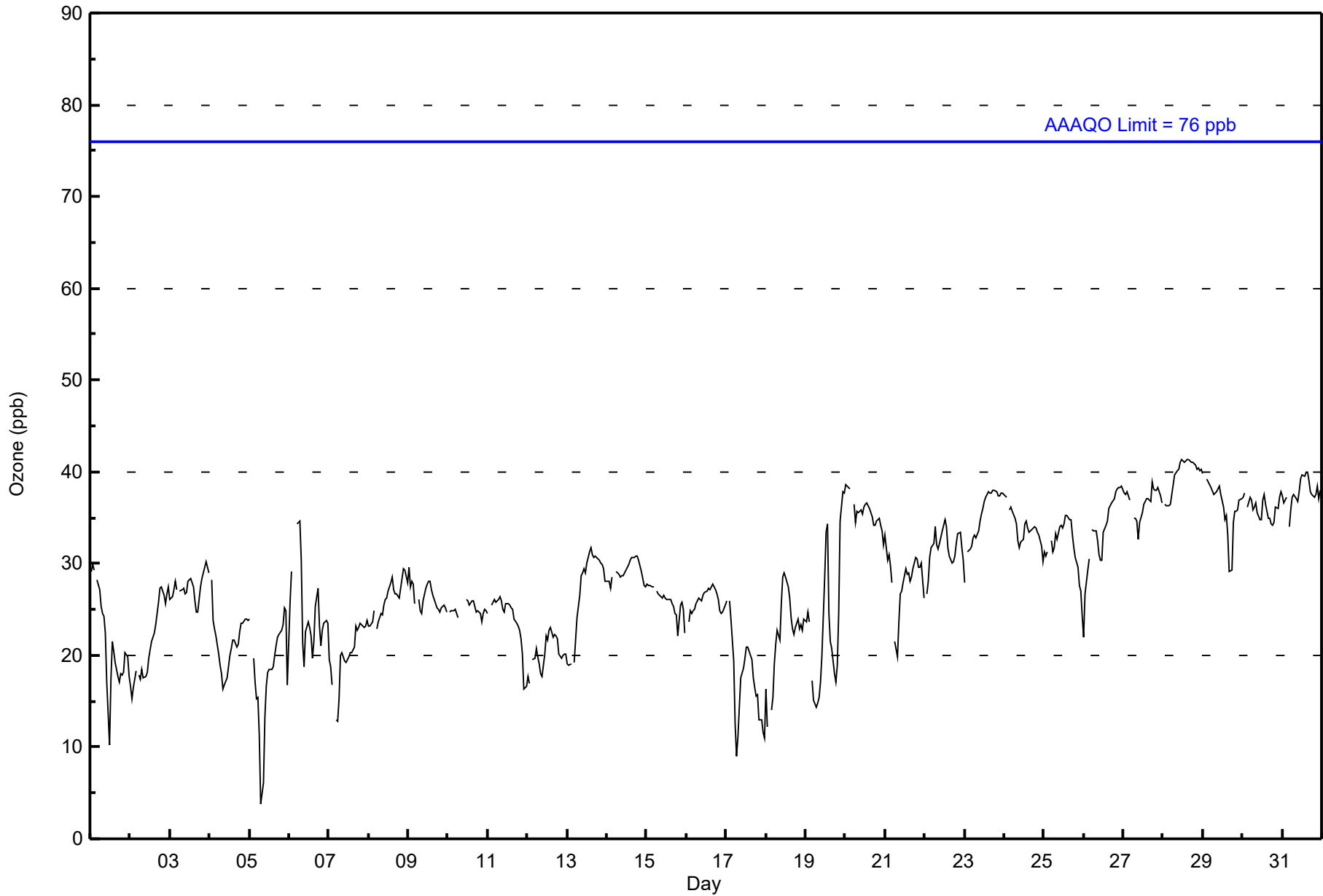
27.7	27.4	27.8	28.3	26.8	26.7	26.7	26.7	26.5	26.9	27.7	28.2	29.1	29.4	28.9	28.4	28.2	28.0	28.2	28.2	28.4	28.8	28.6	27.8	Diurnal Average	
39.8	38.4	39.2	38.9	38.6	38.3	38.6	39.7	40.2	40.2	41.0	41.3	41.2	41.0	41.4	41.4	41.1	41.1	41.0	40.8	40.3	40.4	40.2	40.3	Diurnal Maximum	

Z - zerospan C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Fort Chipewyan - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	118	16.67	16.67
21 - 50	590	83.33	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Fort Chipewyan - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	1	0	0	3	7	6	5	2	17	11	6	3	5	9	4	0	79
21 - 50	9	10	6	83	75	13	4	11	19	9	13	16	38	47	75	28	456
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	10	6	86	82	19	9	13	36	20	19	19	43	56	79	28	535

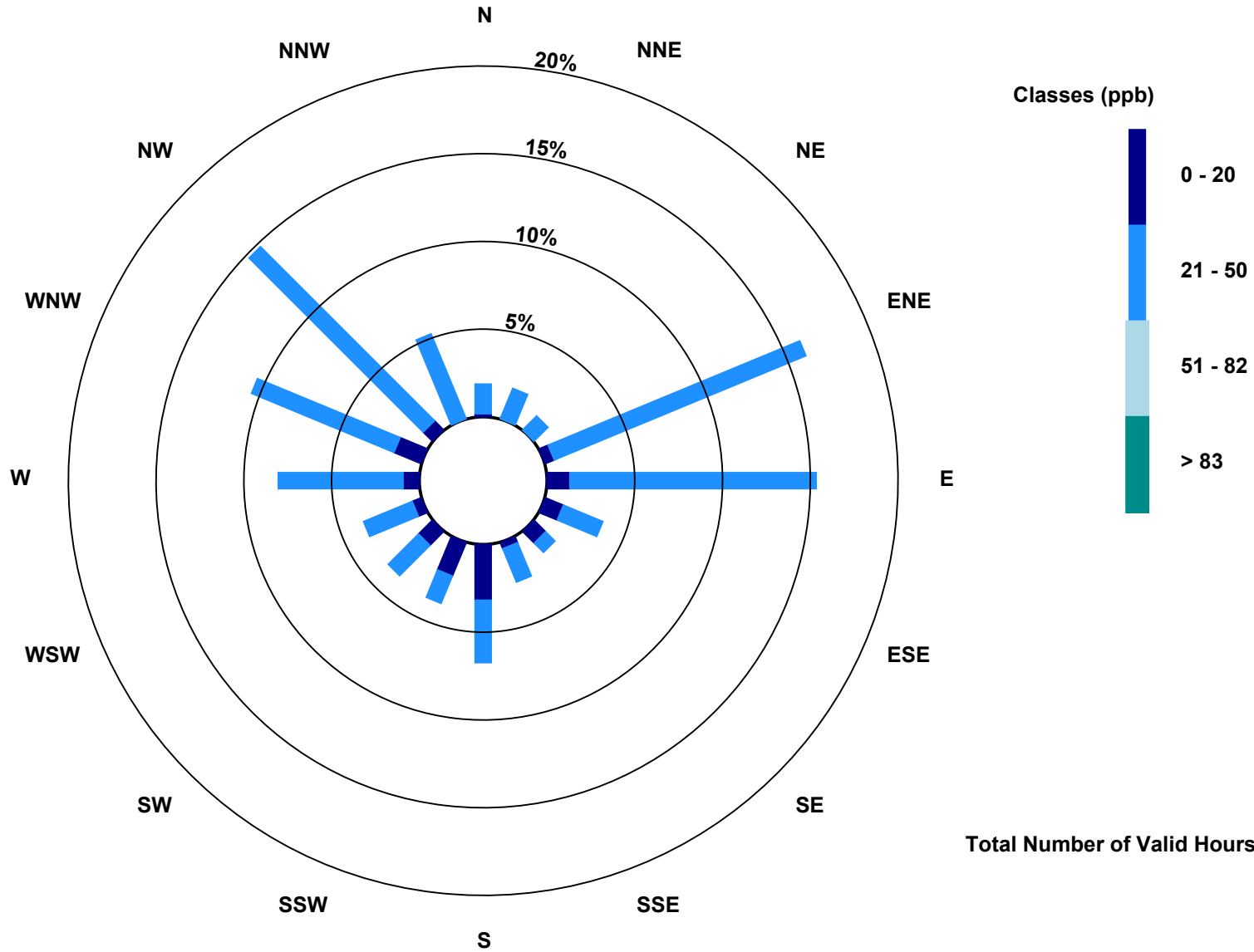
Total Number of Valid Hours: 535

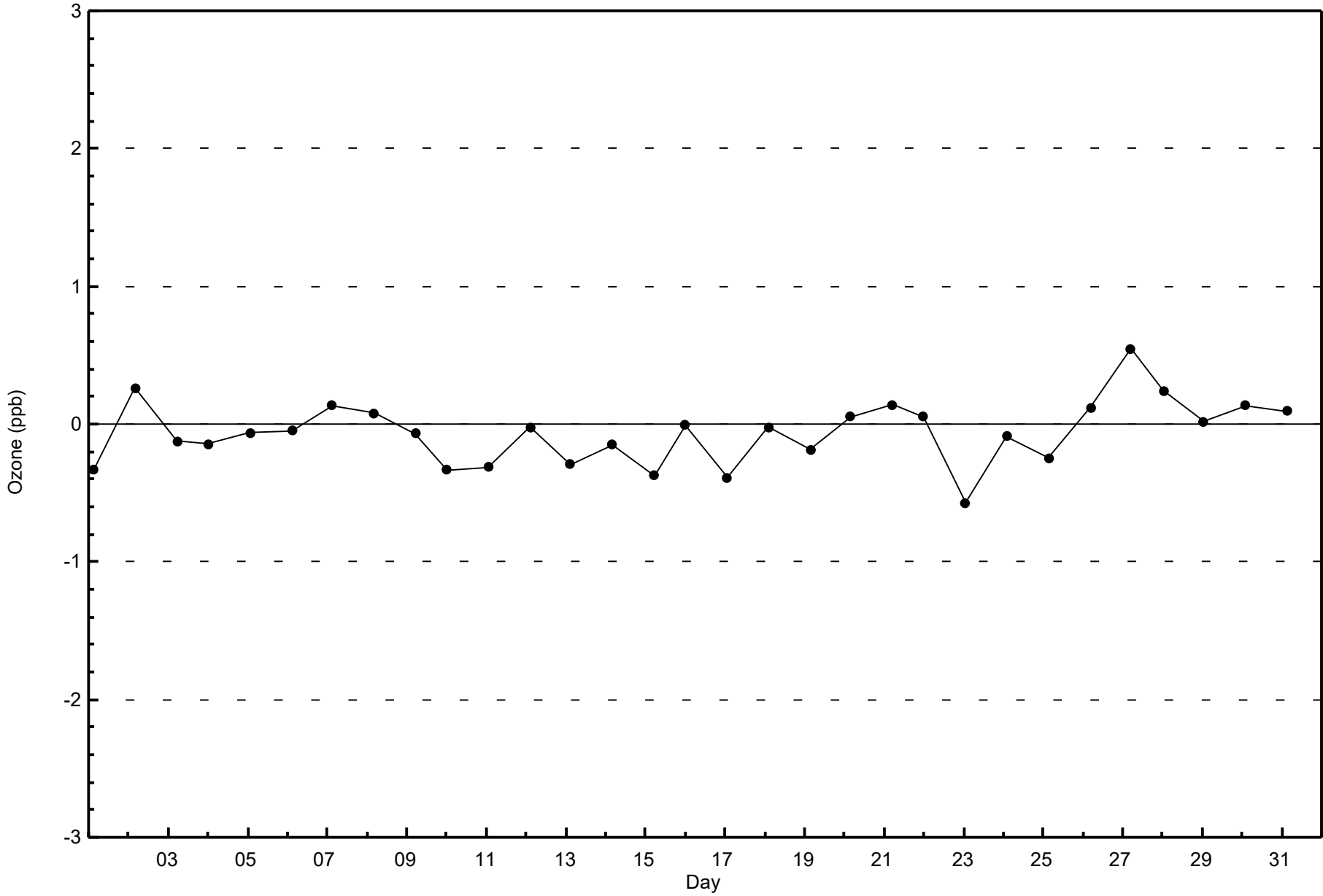
Total Number of Hours: 744

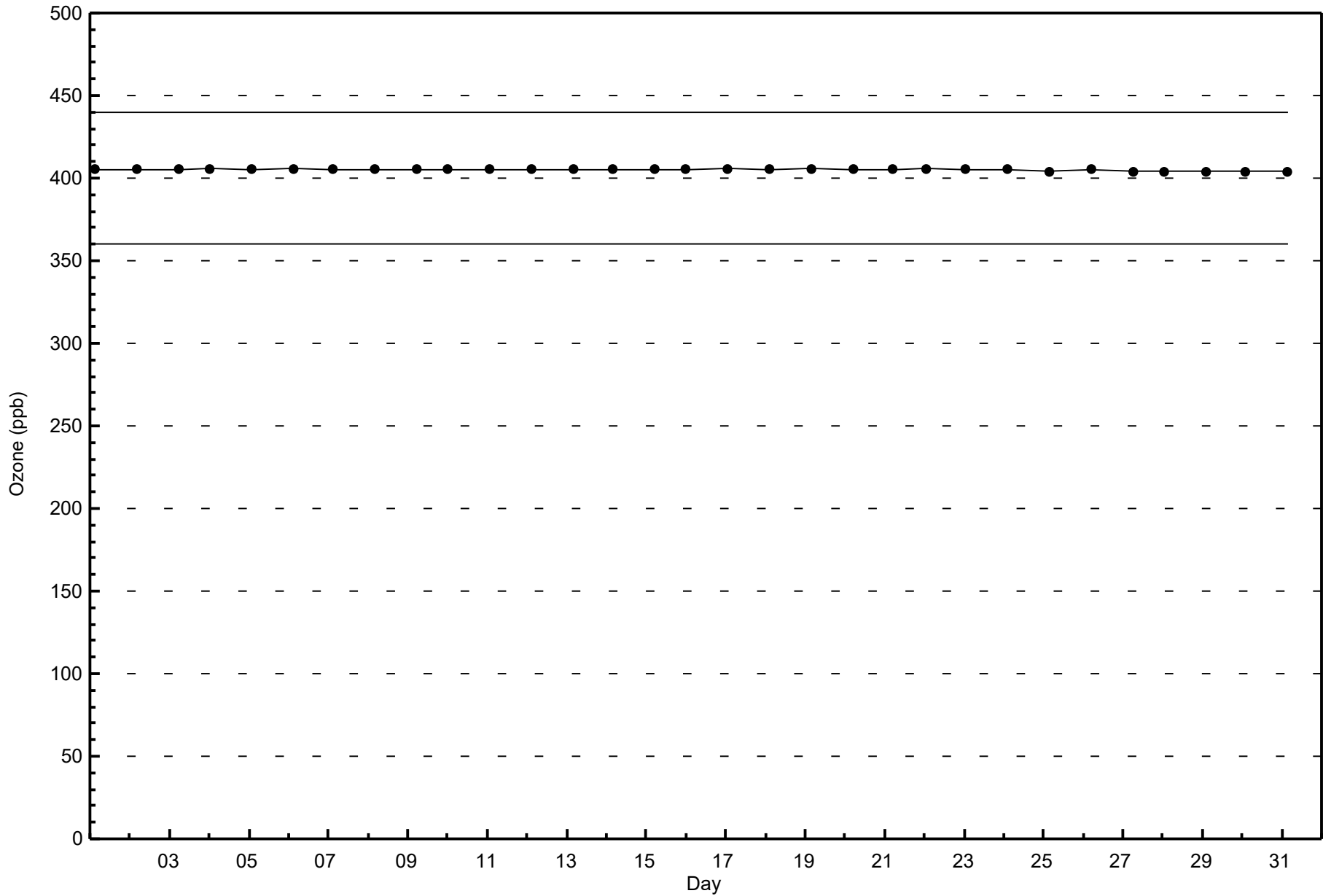


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Fort Chipewyan









Summary of Hour Averages

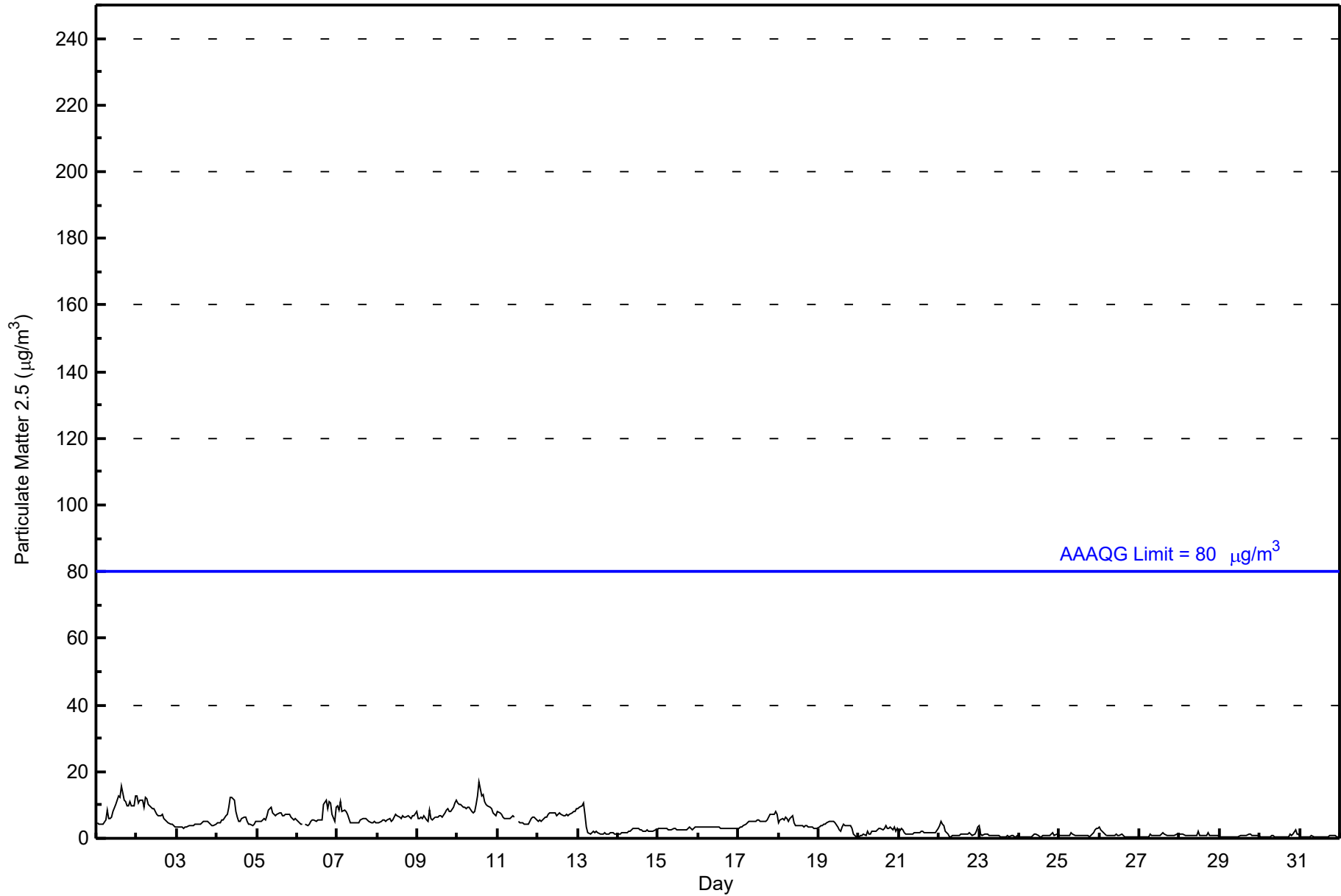
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 16.9 µg/m ³ on Jan 10 14:00	Maximum Daily Average: 9.9 µg/m ³ on Jan 10		Hours of Data:	742
Minimum Value: 0.3 µg/m ³ on Jan 22 08:00	Minimum Daily Average: 0.5 µg/m ³ on Jan 31		Hours of Missing Data:	2
Maximum Diurnal Average: 4.1 µg/m ³ at hour 18	Minimum Diurnal Average: 3.6 µg/m ³ at hour 23		Hours of Calibration:	1
Monthly Average: 3.88 µg/m ³	Percentiles: P ₁ = 0.4 P ₁₀ = 0.6 Q ₁ = 1.0 Median = 3.2 Q ₃ = 5.8 P ₉₀ = 8.2 P ₉₉ = 12.5		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	4.5	4.4	4.3	4.3	4.4	5.7	8.4	5.8	5.8	6.5	8.2	10.1	11.5	12.6	12.3	15.7	11.5	11.0	9.8	9.7	11.0	9.9	9.7	12.6	8.7	15.7
2-Jan	12.6	10.7	11.2	11.4	9.3	12.5	11.9	10.1	9.7	8.8	8.8	8.1	7.3	6.9	7.0	7.4	5.9	5.4	4.9	4.8	4.4	4.2	3.7	3.5	7.9	12.6
3-Jan	3.5	3.5	3.4	3.3	3.1	3.2	3.6	3.8	3.6	3.9	4.0	4.1	4.2	4.0	4.2	4.6	5.1	5.1	5.0	4.8	4.1	3.8	3.9	4.3	4.0	5.1
4-Jan	4.7	4.8	4.6	5.4	5.7	6.8	7.2	9.1	12.2	12.4	11.3	7.9	6.5	5.2	5.2	5.8	6.4	6.5	5.2	4.2	4.3	4.0	4.1	4.9	6.4	12.4
5-Jan	5.0	5.1	5.0	5.5	6.0	5.7	6.7	8.6	9.2	7.5	7.1	7.0	7.0	7.7	7.4	6.8	6.6	7.4	7.2	7.1	6.5	5.8	5.4	6.0	6.6	9.2
6-Jan	5.0	4.7	4.2	4.2	PF	4.2	3.9	4.1	4.9	5.3	5.3	5.1	5.5	5.3	5.5	5.7	10.2	11.4	9.0	10.9	10.7	7.2	5.0	9.2	6.4	11.4
7-Jan	9.8	8.5	10.9	8.0	8.4	7.9	7.4	5.9	4.7	4.8	4.8	4.8	4.9	4.6	5.4	6.0	6.0	6.1	5.5	4.9	4.6	4.8	4.9	4.8	6.2	10.9
8-Jan	4.8	4.8	5.0	5.6	5.5	5.1	5.4	5.8	5.1	5.4	6.4	7.0	6.9	6.2	5.8	6.6	6.3	6.4	6.9	6.4	6.0	6.7	6.7	7.9	6.0	7.9
9-Jan	5.9	6.1	6.4	5.8	6.8	5.5	5.1	8.3	6.1	5.6	6.3	6.4	6.4	7.0	6.9	6.5	7.6	8.7	8.9	8.0	8.3	9.4	10.6	11.6	7.2	11.6
10-Jan	10.5	10.3	10.1	9.5	9.2	9.0	9.3	9.5	8.2	7.6	8.1	10.0	12.6	16.9	12.7	13.3	11.2	10.3	9.7	9.3	9.1	7.7	7.0	6.9	9.9	16.9
11-Jan	7.9	7.7	7.1	6.4	6.0	5.9	6.0	6.1	6.2	6.9	6.6	C	5.0	4.9	4.7	4.7	4.1	4.2	4.4	5.0	6.1	6.5	6.3	5.4	5.8	7.9
12-Jan	5.3	5.5	4.9	5.5	6.4	6.4	7.1	7.7	7.6	7.4	7.6	6.7	7.0	7.4	7.1	6.6	6.7	7.1	6.7	7.2	7.5	8.2	8.2	8.7	6.9	8.7
13-Jan	8.8	9.2	9.9	10.6	7.3	3.2	1.6	1.4	1.7	2.1	1.8	1.9	1.7	1.4	1.1	1.3	1.7	1.4	1.5	1.6	1.6	1.5	1.2	1.3	3.2	10.6
14-Jan	1.5	1.4	1.6	1.7	1.8	1.8	1.9	2.3	2.7	2.9	3.1	3.1	3.0	2.6	2.4	2.2	2.1	2.6	2.2	2.0	2.1	2.0	2.6	2.7	2.3	3.1
15-Jan	2.8	2.8	3.0	2.9	3.0	3.1	2.7	2.4	2.7	2.9	2.8	2.7	2.6	2.6	2.7	2.7	2.4	2.6	2.9	3.2	2.7	3.2	3.3	3.3	2.8	3.3
16-Jan	3.4	3.5	3.3	3.3	3.2	3.3	3.2	3.2	3.4	3.5	3.5	3.4	3.3	3.0	3.0	3.0	2.9	3.0	2.8	2.9	3.0	3.1	3.1	2.9	3.2	3.5
17-Jan	2.8	3.3	3.4	3.7	4.1	4.7	5.1	5.3	5.3	5.3	5.2	5.3	5.3	5.2	5.2	5.1	5.1	5.4	6.4	7.4	7.4	7.3	8.0	7.2	5.4	8.0
18-Jan	4.7	5.6	5.8	5.7	6.4	5.9	5.3	5.8	6.9	4.8	3.9	3.8	3.8	3.8	3.7	3.6	3.6	3.7	3.6	3.3	3.3	3.2	3.0	3.2	4.4	6.9
19-Jan	3.6	3.8	4.0	4.1	4.2	4.6	5.1	5.3	5.1	4.9	4.5	3.4	2.6	2.2	3.3	4.1	3.8	3.9	3.9	3.7	2.9	1.3	0.6	0.6	3.6	5.3
20-Jan	0.6	0.7	0.8	1.1	1.0	2.2	1.1	1.3	2.2	2.1	2.3	2.6	2.8	2.9	2.6	2.9	4.0	3.0	3.0	3.2	2.4	3.6	2.1	2.9	2.2	4.0
21-Jan	1.7	2.9	2.7	1.7	1.4	1.3	1.3	1.3	1.5	1.8	1.7	1.7	1.8	2.0	2.0	1.9	1.7	1.8	1.8	1.8	1.7	1.8	1.6	3.0	1.8	3.0
22-Jan	3.8	5.2	4.2	4.0	2.0	1.1	0.6	0.3	0.7	0.7	0.7	1.0	1.0	1.2	1.2	1.3	1.2	1.4	1.6	1.1	1.0	1.2	2.1	3.2	1.7	5.2
23-Jan	3.8	1.1	1.0	1.2	1.2	1.1	0.9	0.8	0.8	0.7	0.6	0.7	0.7	0.5	0.5	0.6	0.5	0.7	0.6	0.8	0.8	0.6	0.6	0.7	0.9	3.8
24-Jan	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.9	1.3	1.1	1.0	0.6	0.6	0.7	0.8	0.8	0.9	0.8	1.1	1.7	1.0	1.1	1.3	0.8	1.7
25-Jan	0.8	0.8	0.9	1.0	0.9	0.9	1.0	1.6	1.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.7	0.8	0.6	0.8	1.6	2.5	2.9	2.8	1.2	2.9
26-Jan	3.3	2.6	1.5	1.2	0.8	0.7	0.7	0.8	0.7	1.0	1.1	0.9	1.0	1.3	0.8	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.5	0.5	0.9	3.3
27-Jan	0.5	0.6	0.6	0.6	0.6	0.6	1.3	0.7	0.7	0.7	0.7	0.9	1.0	1.1	1.6	1.4	0.9	0.9	0.7	0.7	0.8	1.0	1.1	1.1	0.9	1.6
28-Jan	1.3	1.4	1.2	1.0	0.9	0.9	0.8	0.7	0.7	0.8	0.7	2.1	1.1	0.7	0.9	0.7	0.8	1.6	0.7	0.7	1.0	0.8	0.9	0.7	1.0	2.1
29-Jan	0.5	0.6	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.8	1.0	1.2	1.2	0.7	0.9	0.9	1.0	0.7	0.7	1.2
30-Jan	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.7	0.9	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.6	1.3	0.9	1.2	2.6	1.2	1.2	0.7	2.6
31-Jan	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.9	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.6	0.8	0.9	1.0	0.7	0.6	0.5	0.5	1.0

4.0	4.0	4.0	3.9	3.7	3.7	3.8	3.9	4.0	3.9	3.9	3.8	3.9	3.9	3.8	4.0	3.9	4.1	3.9	3.9	3.9	3.8	3.6	4.1	Diurnal Average	
12.6	10.7	11.2	11.4	9.3	12.5	11.9	10.1	12.2	12.4	11.3	10.1	12.6	16.9	12.7	15.7	11.5	11.4	9.8	10.9	11.0	9.9	10.6	12.6	Diurnal Maximum	

C - Calibration PF - Power Failure
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	536	72.24	72.24
6 - 15	204	27.49	99.73
16 - 25	2	0.27	100.00
26 - 80	0	0.00	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Chipewyan - January 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	9	12	6	81	75	14	7	11	27	12	16	16	38	51	77	29	481
6 - 15	1	0	0	6	13	6	3	4	10	8	3	4	6	8	4	1	77
16 - 25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
26 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	12	6	87	88	20	10	15	37	20	19	20	44	60	81	30	559

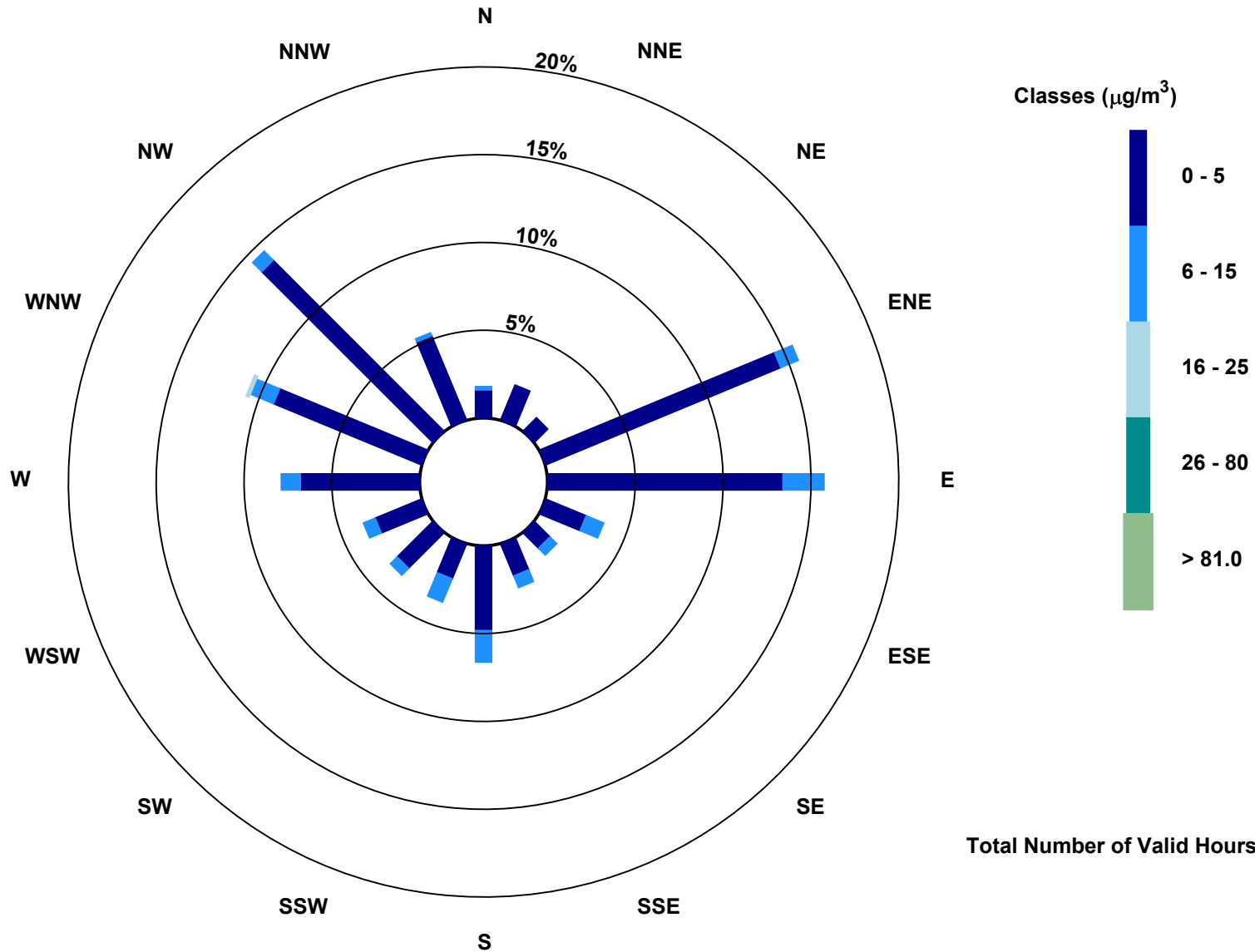
Total Number of Valid Hours: 559

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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

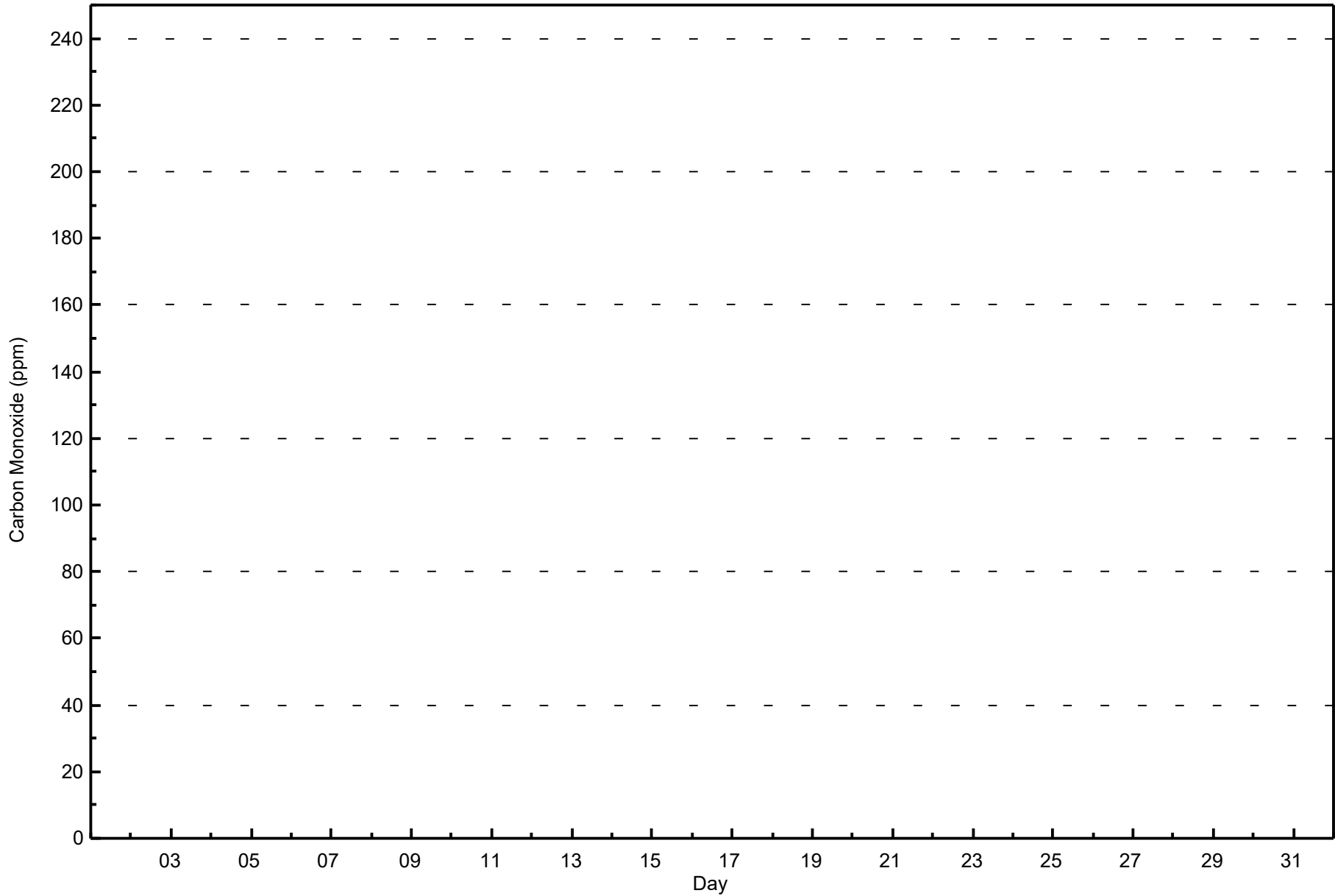


Total Number of Valid Hours: 559



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Fort Chipewyan - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort Chipewyan - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	709	100.00	100.00
0.4 - 0.5	0	0.00	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort Chipewyan - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	10	10	6	80	86	20	10	14	36	18	19	20	42	55	79	27	532
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	10	6	80	86	20	10	14	36	18	19	20	42	55	79	27	532

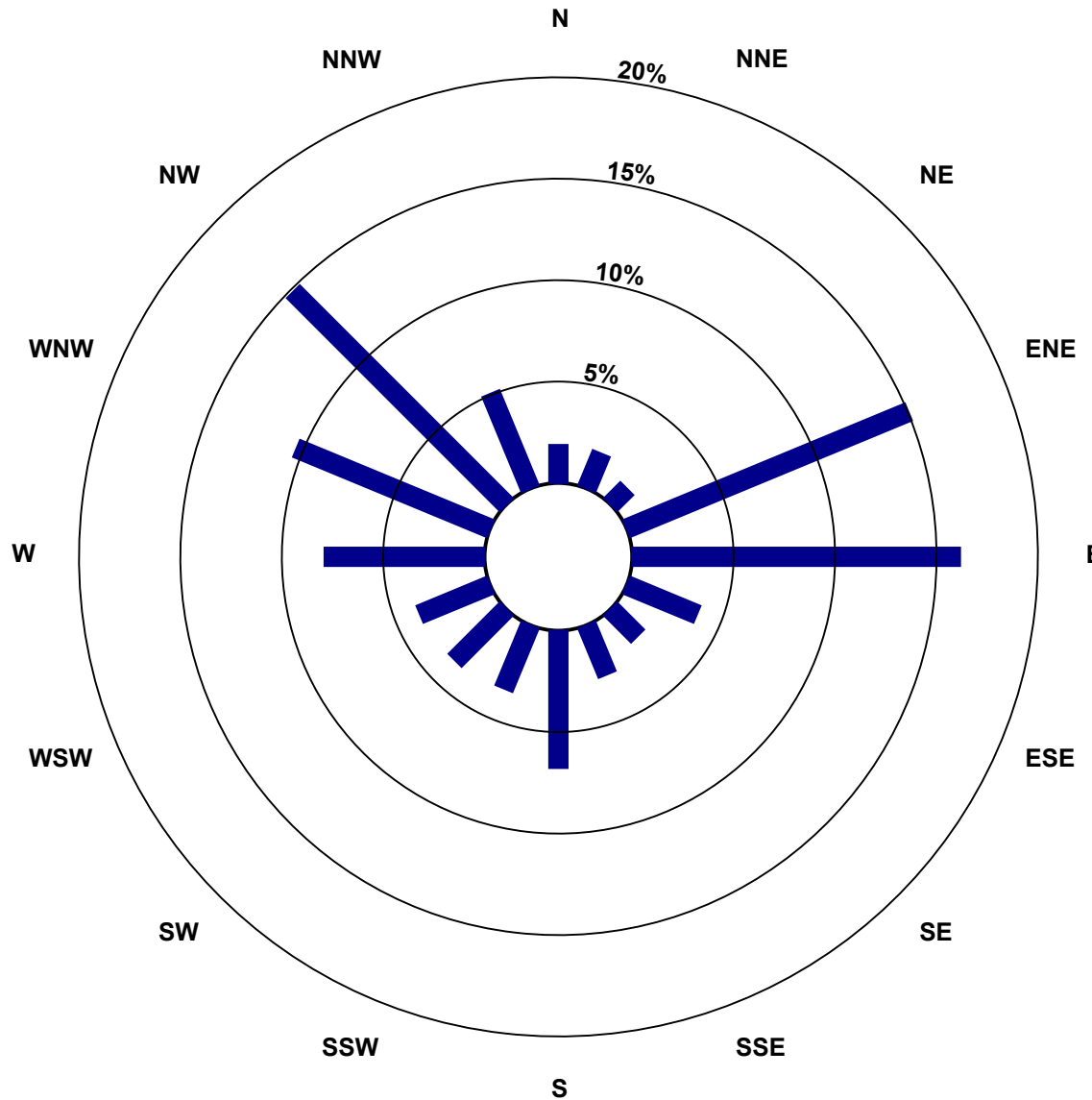
Total Number of Valid Hours: 532

Total Number of Hours: 744

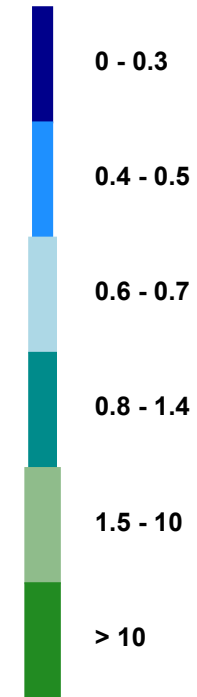


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Monoxide (CO) - ppm
Fort Chipewyan



Classes (ppm)



Total Number of Valid Hours: 532



Wood Buffalo Environmental Association
Summary of Hour Averages

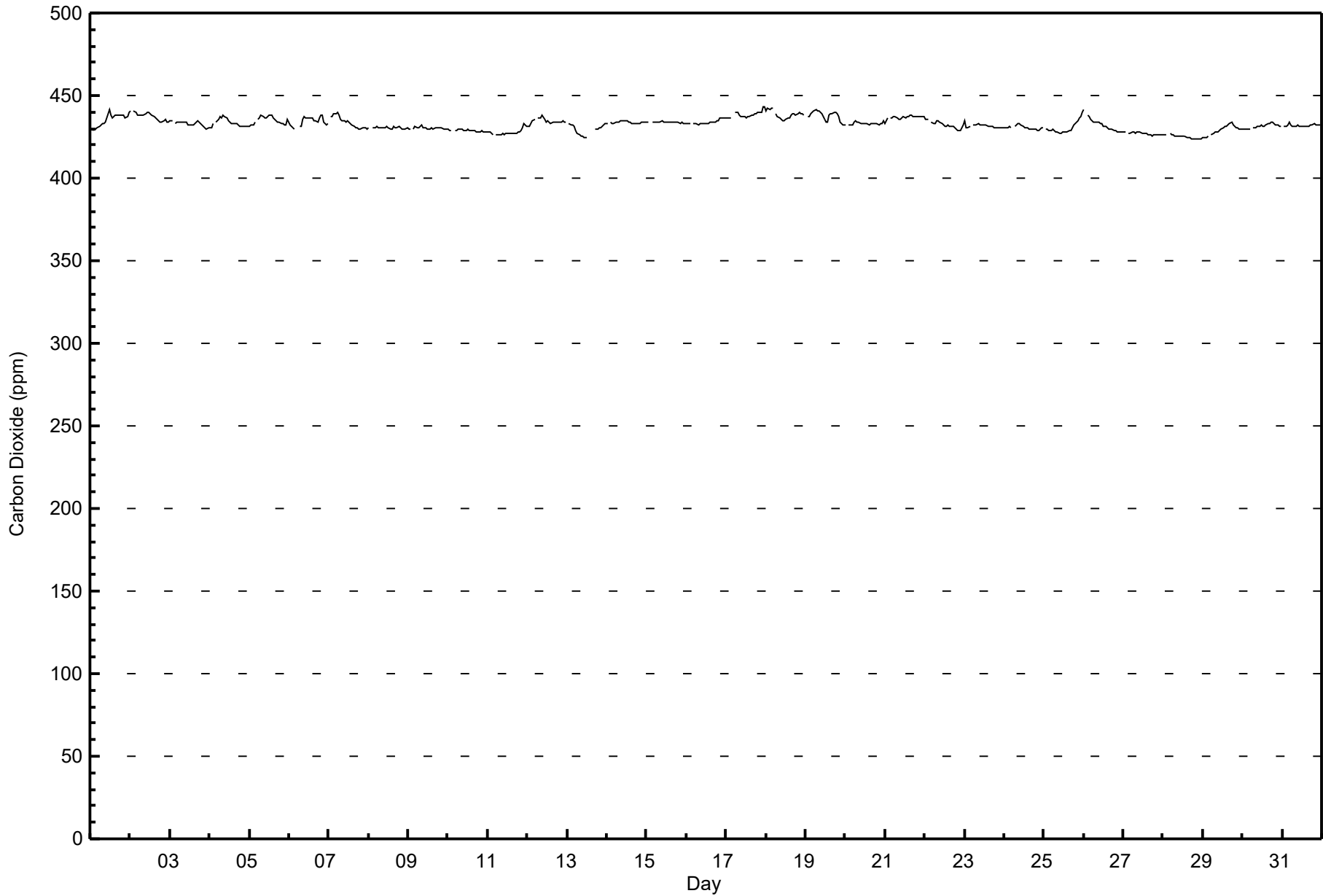
Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 443.4 ppm on Jan 18 00:00		Maximum Daily Average: 438.5 ppm on Jan 17																	Hours of Data:	708							
Minimum Value: 423.8 ppm on Jan 28 20:00		Minimum Daily Average: 425.1 ppm on Jan 28																	Hours of Missing Data:	36							
Maximum Diurnal Average: 433.2 ppm at hour 5		Minimum Diurnal Average: 432.0 ppm at hour 2																	Hours of Calibration:	35							
Monthly Average: 432.61 ppm		Percentiles: P ₁ = 424.4 P ₁₀ = 427.6 Q ₁ = 430.1 Median = 432.6 Q ₃ = 434.8 P ₉₀ = 438.0 P ₉₉ = 441.3																	Percent Operational Time:	99.9							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	Z	429.1	429.3	429.7	430.2	431.2	432.2	432.8	433.1	433.7	436.2	441.5	438.2	436.6	437.4	437.9	438.1	438.4	437.8	438.0	438.3	436.8	437.2	439.8	435.4	441.5	
2-Jan	441.1	Z	441.1	439.9	438.2	437.8	438.1	437.7	438.5	439.0	439.6	439.5	439.4	438.3	437.3	436.6	435.7	434.9	434.0	433.9	434.6	435.2	434.1	433.5	437.3	441.1	
3-Jan	434.5	434.4	Z	433.3	434.0	433.9	434.0	433.9	433.6	433.7	432.5	432.2	432.4	432.3	433.1	433.9	434.4	432.9	432.1	431.2	430.2	429.6	430.3	432.9	434.5	434.5	
4-Jan	430.2	430.5	433.3	Z	433.5	435.6	437.7	436.7	437.7	437.6	436.1	434.9	434.3	433.4	432.8	432.8	433.2	432.4	431.7	431.4	431.2	430.9	431.2	431.1	433.5	437.7	
5-Jan	431.4	432.1	432.5	434.1	Z	435.3	436.2	437.9	437.0	436.1	436.4	437.1	438.0	438.2	436.8	435.6	434.8	433.9	433.5	433.2	433.1	432.2	432.3	435.7	434.9	438.2	
6-Jan	432.5	431.5	430.6	429.4	PF	Z	431.0	431.6	435.2	437.2	436.3	436.6	436.6	436.8	436.0	434.6	434.7	433.5	436.5	438.5	437.8	433.5	432.2	433.1	434.3	438.5	
7-Jan	Z	437.0	437.5	439.1	438.8	439.6	438.1	435.3	434.7	434.6	434.2	434.6	433.6	432.7	432.1	431.5	430.4	430.5	430.0	430.0	430.6	430.7	430.6	430.0	433.8	439.6	
8-Jan	430.3	Z	430.7	430.4	430.9	431.1	430.9	430.8	430.8	430.5	430.6	430.9	430.7	429.8	429.7	431.0	430.8	430.8	431.5	430.6	430.0	429.5	429.8	430.2	430.5	431.5	
9-Jan	429.6	429.7	Z	429.6	431.4	430.2	430.3	431.5	432.0	430.7	430.1	429.7	429.9	430.0	430.1	429.9	430.2	430.4	430.5	430.4	430.4	430.0	429.9	429.8	430.3	432.0	
10-Jan	429.4	429.2	429.2	Z	428.9	429.2	429.7	429.5	429.7	429.0	428.9	429.0	429.2	429.2	428.8	429.2	428.8	428.2	428.1	428.2	428.5	428.1	427.8	427.8	428.8	429.7	
11-Jan	427.8	427.7	427.1	426.7	Z	426.3	426.3	425.9	426.5	426.9	426.6	426.7	427.0	427.0	427.1	427.1	426.8	427.0	427.6	428.0	428.8	430.5	433.5	431.4	427.7	433.5	
12-Jan	431.3	431.7	432.6	434.4	435.5	Z	436.2	436.3	436.6	438.5	435.8	434.3	434.4	434.0	433.3	433.6	433.6	433.9	433.5	434.0	434.2	434.3	433.9	433.8	434.3	438.5	
13-Jan	Z	433.2	432.6	432.3	431.3	429.1	427.4	426.0	425.3	425.5	424.9	425.0	424.7	C	C	C	C	429.8	430.0	430.2	430.7	431.3	431.9	432.8	429.2	433.2	
14-Jan	432.7	Z	433.8	433.2	433.3	433.7	433.7	434.3	434.7	434.6	435.0	434.7	434.4	433.9	433.5	433.1	433.1	432.9	432.7	432.9	433.3	433.6	434.0	433.9	433.7	435.0	
15-Jan	433.8	433.7	Z	433.8	433.6	433.7	433.8	433.9	434.1	434.4	434.0	434.1	434.3	434.2	434.1	434.2	434.2	433.9	433.9	433.5	433.5	433.2	433.3	433.9	433.9	434.4	
16-Jan	433.3	433.4	433.1	Z	433.1	433.1	432.7	432.5	433.0	433.0	432.7	432.7	433.0	433.3	433.7	433.7	433.7	434.3	434.7	435.0	436.1	436.3	436.6	436.4	433.9	436.6	
17-Jan	436.4	436.2	436.2	436.7	Z	439.5	440.2	439.5	438.5	437.2	437.1	437.0	436.7	436.9	437.6	438.0	438.4	438.6	439.1	439.6	439.8	439.9	443.4	443.4	438.5	443.4	
18-Jan	440.6	442.7	441.2	442.0	442.0	Z	438.9	437.1	436.0	435.6	434.5	434.7	435.3	436.2	436.7	438.2	438.7	438.8	438.1	438.7	439.6	439.0	439.0	438.0	438.3	442.7	
19-Jan	Z	437.1	437.5	438.7	439.9	440.9	441.3	440.8	440.8	440.2	439.2	435.8	433.8	433.6	437.8	438.6	438.6	439.9	440.2	439.4	437.4	433.6	432.3	432.3	437.8	441.3	
20-Jan	431.8	Z	431.9	431.9	432.0	433.7	434.6	433.5	433.5	433.3	433.3	432.7	432.7	432.7	432.6	432.8	432.9	432.9	432.7	432.7	432.3	432.7	433.4	434.8	432.9	434.8	
21-Jan	433.4	436.8	Z	436.3	436.2	437.1	437.2	436.8	435.9	435.9	436.8	436.9	436.4	437.2	437.4	438.0	438.0	437.6	437.1	436.9	437.2	437.1	436.9	437.7	436.8	438.0	
22-Jan	435.5	435.3	435.2	Z	433.8	433.2	432.9	434.7	434.6	433.7	432.7	432.0	431.4	431.3	431.8	431.7	431.3	431.0	430.5	429.7	429.0	429.1	430.5	432.1	432.3	435.5	
23-Jan	435.0	430.6	430.9	431.3	Z	431.8	432.0	432.6	432.7	432.2	432.0	432.3	432.5	432.2	431.4	431.2	431.1	431.1	430.7	430.7	430.5	430.3	430.2	430.3	431.5	435.0	
24-Jan	430.2	430.5	430.4	431.0	430.8	Z	431.4	431.8	433.3	433.3	432.1	431.3	430.8	430.3	430.2	430.1	429.8	429.5	429.3	429.3	429.2	429.2	430.1	430.9	430.6	433.3	
25-Jan	Z	429.8	429.4	428.5	429.0	429.7	429.1	428.1	428.2	427.5	427.5	428.0	428.0	427.8	428.1	428.6	429.0	430.1	431.8	433.0	434.5	436.2	437.6	439.4	430.4	439.4	
26-Jan	441.4	Z	438.4	437.5	435.9	434.6	434.0	433.5	433.5	433.7	433.5	432.7	431.6	431.1	430.6	429.8	429.6	429.3	429.0	428.5	428.4	428.1	427.9	427.7	432.2	441.4	
27-Jan	427.8	427.9	Z	427.4	427.4	428.0	428.0	427.4	427.7	428.3	427.6	427.1	426.9	426.8	426.7	426.5	426.4	425.8	426.2	426.2	426.2	426.0	426.2	426.3	427.0	428.3	
28-Jan	426.5	426.5	426.7	Z	426.8	426.5	426.1	425.7	425.5	425.4	425.1	425.1	425.1	425.1	425.0	424.6	424.5	424.1	423.9	423.8	423.8	423.8	424.0	424.1	425.1	426.8	
29-Jan	424.4	424.6	424.8	425.6	Z	426.3	427.0	427.6	427.9	428.2	428.5	429.4	430.2	431.0	431.2	432.0	433.3	433.6	431.9	431.1	430.9	430.5	430.0	429.6	429.1	433.6	
30-Jan	429.5	429.3	429.5	429.9	429.8	Z	430.7	430.8	430.9	431.1	431.7	432.0	431.4	431.3	432.0	432.8	432.7	433.5	433.8	433.4	432.4	432.4	431.5	431.3	431.5	433.8	
31-Jan	Z	431.5	431.1	432.0	433.6	432.2	431.3	431.2	431.5	431.9	431.3	431.1	431.0	431.1	431.0	431.0	431.6	432.2	432.6	432.8	432.5	431.8	432.5	431.9	431.8	433.6	
		432.4	432.0	432.6	432.9	433.2	432.8	433.0	432.8	433.0	433.0	432.7	432.6	432.4	432.5	432.5	432.6	432.6	432.5	432.4	432.5	432.4	432.1	432.4	432.7	Diurnal Average	
		441.4	442.7	441.2	442.0	442.0	440.9	441.3	440.8	440.8	440.2	439.6	441.5	439.4	438.3	437.8	438.6	438.7	439.9	440.2	439.6	439.8	439.9	443.4	443.4	Diurnal Maximum	
Z - zerospan		C - Calibration				PF - Power Failure																					



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	0	0.00	0.00
420 - 440	693	97.88	97.88
440 - 460	15	2.12	100.00
460 - 480	0	0.00	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420 - 440	10	12	6	78	84	16	9	12	33	16	18	20	41	55	79	27	516
440 - 460	0	0	0	0	1	4	1	2	3	2	1	0	1	0	0	0	15
460 - 480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480 - 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	12	6	78	85	20	10	14	36	18	19	20	42	55	79	27	531

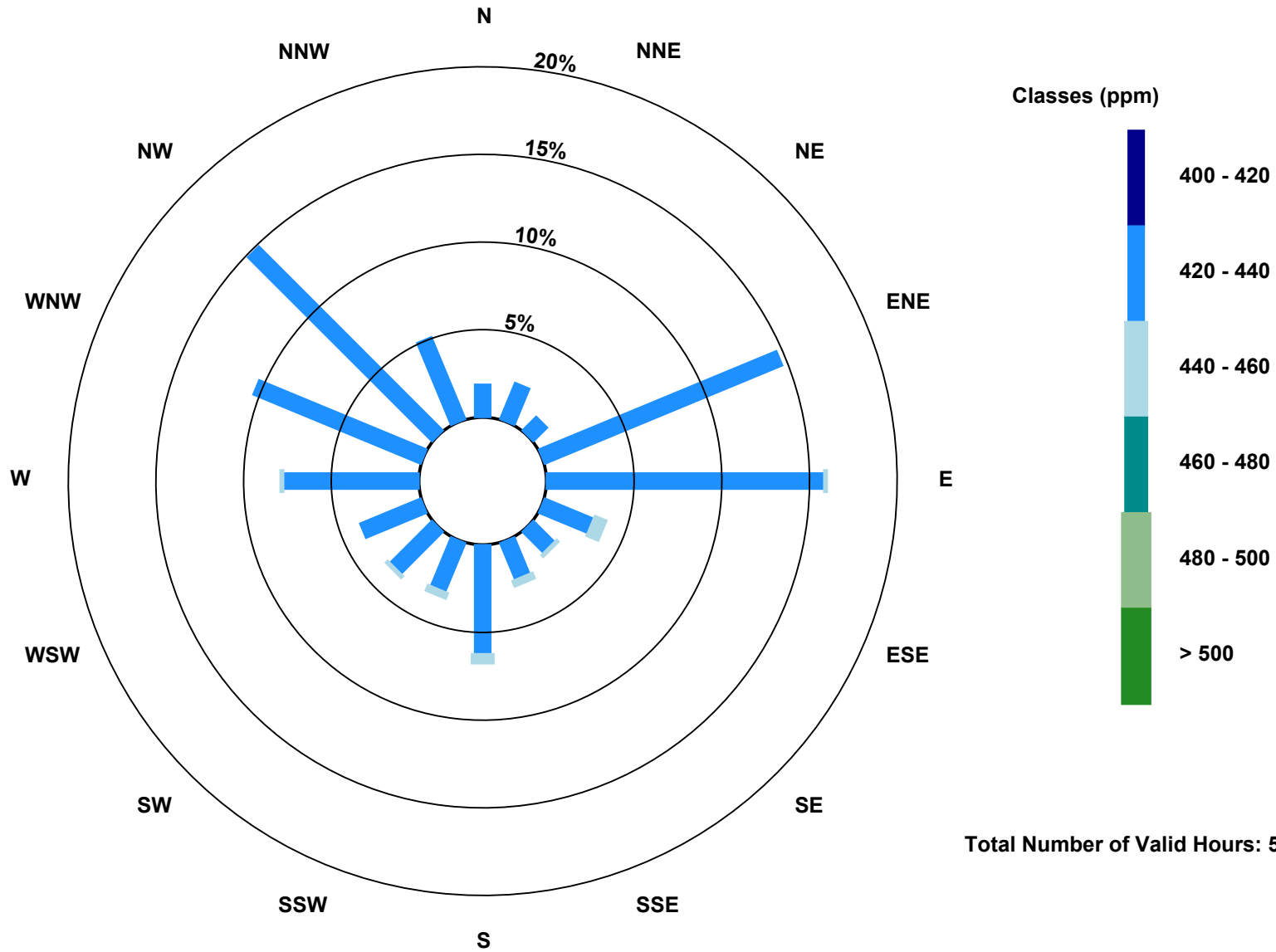
Total Number of Valid Hours: 531

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan



Total Number of Valid Hours: 531

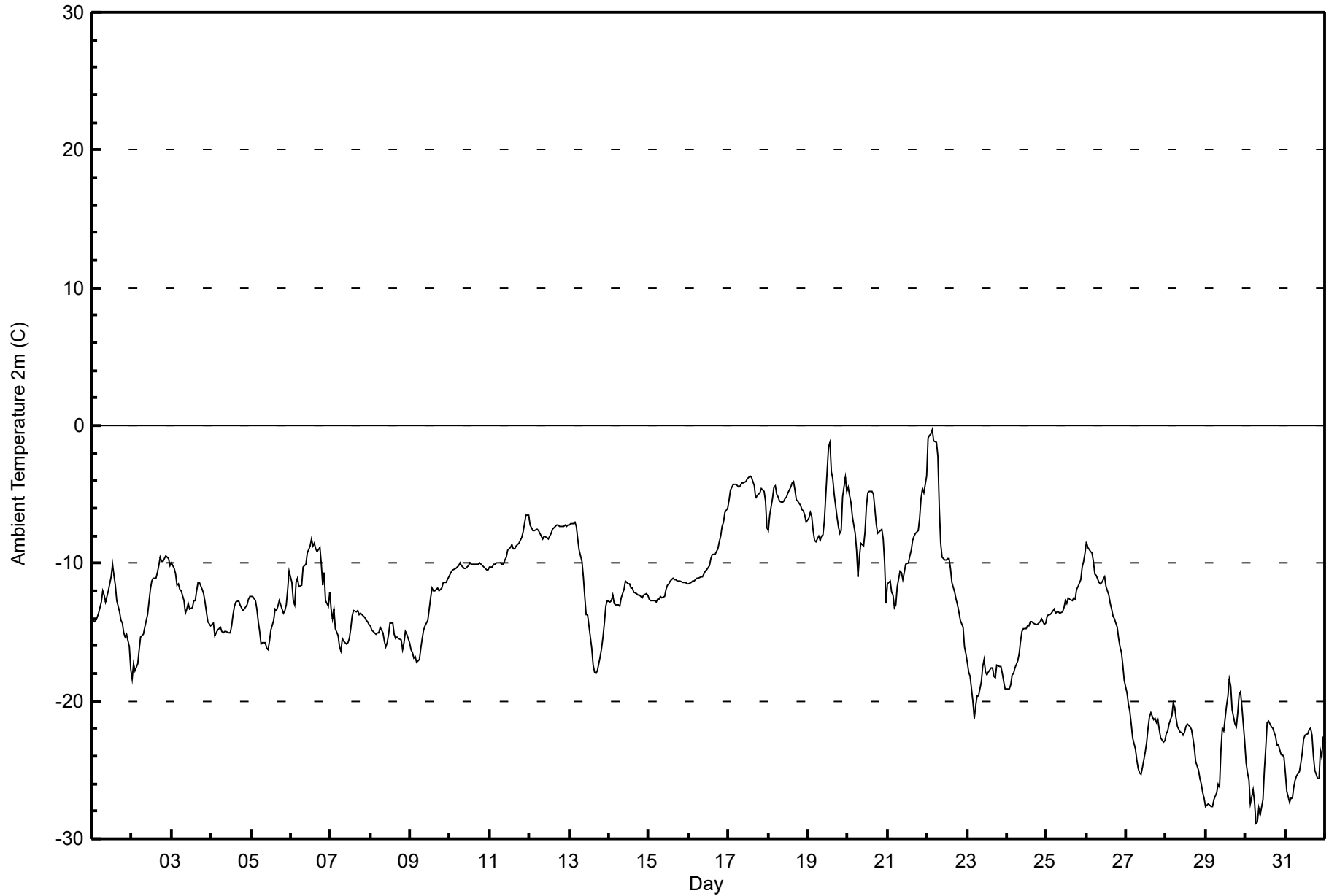


Maximum Value: -0.3 C on Jan 22 04:00 Maximum Daily Average: -4.6 C on Jan 17																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -28.9 C on Jan 30 07:00 Minimum Daily Average: -24.8 C on Jan 30 Maximum Diurnal Average: -12.4 C at hour 14 Minimum Diurnal Average: -14.0 C at hour 9 Monthly Average: -13.30 C Percentiles: P ₁ = -27.5 P ₁₀ = -22.3 Q ₁ = -15.8 Median = -12.6 Q ₃ = -9.7 P ₉₀ = -6.3 P ₉₉ = -1.8																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-14.1	-14.3	-14.1	-13.9	-13.6	-12.8	-12.0	-12.3	-12.8	-12.4	-12.0	-11.0	-10.1	-10.8	-11.6	-12.7	-13.5	-14.1	-14.3	-15.1	-15.4	-15.1	-16.1	-17.7	-13.4	-10.1
2-Jan	-18.4	-17.3	-17.8	-17.3	-16.3	-15.3	-15.3	-15.2	-14.6	-13.7	-12.8	-11.9	-11.3	-11.1	-11.1	-10.7	-10.2	-9.6	-9.8	-9.9	-9.5	-9.6	-9.7	-10.2	-12.9	-9.5
3-Jan	-10.0	-10.4	-10.7	-11.6	-11.5	-11.9	-12.0	-12.8	-13.6	-13.3	-13.0	-13.4	-13.3	-12.7	-12.7	-12.0	-11.4	-11.4	-11.9	-12.2	-12.8	-13.5	-14.2	-14.5	-12.4	-10.0
4-Jan	-14.4	-14.4	-15.3	-15.0	-14.9	-14.6	-15.0	-15.0	-14.9	-14.9	-15.1	-15.1	-14.5	-13.8	-13.1	-12.8	-12.8	-13.0	-13.2	-13.4	-13.3	-13.0	-12.7	-12.4	-14.0	-12.4
5-Jan	-12.4	-12.4	-12.7	-13.3	-14.2	-14.9	-15.8	-15.8	-15.8	-16.1	-16.3	-15.6	-14.8	-14.1	-13.3	-13.4	-13.2	-12.7	-13.1	-13.7	-13.4	-13.0	-11.9	-10.6	-13.9	-10.6
6-Jan	-11.4	-12.8	-13.0	-11.4	-11.1	-11.7	-11.6	-10.3	-10.2	-10.1	-9.3	-8.7	-8.2	-8.7	-8.6	-9.0	-9.1	-8.9	-10.1	-11.6	-10.6	-12.7	-13.1	-12.1	-10.6	-8.2
7-Jan	-13.3	-14.0	-13.4	-14.8	-15.2	-16.1	-16.4	-15.5	-15.7	-15.9	-15.8	-15.5	-14.7	-13.8	-13.4	-13.6	-13.4	-13.7	-13.6	-13.7	-13.9	-14.2	-14.3	-14.4	-14.5	-13.3
8-Jan	-14.5	-14.9	-15.0	-15.2	-15.0	-15.0	-14.6	-15.1	-15.6	-16.1	-15.8	-15.2	-14.3	-14.4	-15.2	-15.4	-15.4	-15.5	-15.5	-16.3	-15.7	-14.9	-15.2	-15.8	-15.2	-14.3
9-Jan	-16.3	-16.5	-16.9	-16.8	-17.2	-16.9	-16.1	-15.4	-14.8	-14.5	-14.2	-13.3	-12.5	-11.8	-12.0	-12.0	-11.8	-12.0	-11.9	-11.8	-11.4	-11.4	-11.2	-11.0	-13.7	-11.0
10-Jan	-10.8	-10.6	-10.4	-10.3	-10.3	-10.2	-10.0	-10.2	-10.4	-10.4	-10.3	-10.2	-10.0	-10.1	-10.1	-10.0	-10.1	-10.1	-10.0	-10.2	-10.3	-10.4	-10.5	-10.4	-10.3	-10.0
11-Jan	-10.3	-10.2	-10.1	-10.1	-10.0	-10.0	-10.0	-10.1	-10.0	-9.8	-9.5	-9.1	-8.8	-8.7	-9.0	-8.9	-8.8	-8.5	-8.4	-8.1	-7.7	-7.1	-6.5	-6.6	-9.0	-6.5
12-Jan	-7.2	-7.4	-7.6	-7.6	-7.5	-7.7	-7.9	-8.1	-8.2	-8.1	-8.1	-8.2	-8.1	-7.8	-7.6	-7.4	-7.2	-7.2	-7.3	-7.3	-7.3	-7.3	-7.3	-7.3	-7.6	-7.2
13-Jan	-7.3	-7.2	-7.1	-7.0	-7.3	-8.2	-9.0	-9.9	-10.9	-12.4	-13.7	-13.7	-14.5	-16.2	-17.4	-17.9	-18.0	-17.8	-16.8	-16.1	-15.4	-14.3	-13.1	-12.7	-12.7	-7.0
14-Jan	-12.8	-12.7	-12.3	-12.9	-13.1	-13.0	-13.1	-12.5	-12.2	-11.9	-11.3	-11.5	-11.8	-11.8	-11.8	-12.1	-12.2	-12.3	-12.3	-12.4	-12.5	-12.3	-12.3	-12.3	-12.3	-11.3
15-Jan	-12.6	-12.7	-12.7	-12.7	-12.8	-12.6	-12.6	-12.4	-12.5	-12.4	-11.9	-11.6	-11.4	-11.3	-11.1	-11.2	-11.2	-11.3	-11.3	-11.3	-11.4	-11.4	-11.4	-11.5	-11.9	-11.1
16-Jan	-11.5	-11.4	-11.3	-11.2	-11.2	-11.1	-11.0	-11.0	-10.9	-10.8	-10.6	-10.5	-10.1	-9.7	-9.3	-9.4	-9.3	-8.9	-8.4	-8.0	-7.3	-7.0	-6.3	-6.0	-9.7	-6.0
17-Jan	-5.4	-4.7	-4.4	-4.3	-4.2	-4.4	-4.5	-4.4	-4.2	-4.2	-4.0	-3.9	-3.7	-3.7	-3.7	-4.3	-5.3	-5.1	-5.0	-4.8	-4.6	-4.8	-5.5	-7.4	-4.6	
18-Jan	-7.6	-6.5	-5.3	-4.5	-4.4	-5.0	-5.2	-5.5	-5.6	-5.5	-5.3	-5.2	-4.9	-4.5	-4.2	-4.1	-4.7	-5.4	-5.5	-5.8	-6.1	-6.2	-6.5	-7.1	-5.4	-4.1
19-Jan	-6.7	-6.3	-6.6	-7.7	-8.3	-8.4	-8.0	-8.3	-8.0	-7.9	-6.9	-3.3	-1.5	-1.2	-3.3	-3.9	-4.9	-6.6	-7.3	-7.8	-7.7	-5.1	-3.7	-4.8	-6.0	-1.2
20-Jan	-4.5	-5.1	-5.6	-6.6	-7.9	-9.0	-10.9	-9.6	-8.5	-8.7	-7.8	-5.9	-4.9	-4.7	-4.7	-5.0	-6.0	-7.1	-7.8	-7.8	-7.5	-8.3	-9.9	-12.9	-7.4	-4.5
21-Jan	-11.5	-11.3	-12.1	-12.3	-13.2	-13.0	-11.7	-10.6	-10.7	-11.2	-10.7	-10.1	-9.9	-9.5	-9.0	-8.3	-8.1	-7.8	-7.6	-6.7	-5.3	-4.5	-4.9	-3.7	-9.3	-3.7
22-Jan	-0.9	-0.7	-0.6	-0.3	-1.1	-1.3	-2.2	-5.9	-8.6	-9.6	-9.7	-9.8	-9.7	-9.7	-10.4	-11.3	-12.1	-12.6	-13.0	-13.5	-14.1	-14.7	-16.1	-16.6	-8.5	-0.3
23-Jan	-17.2	-17.9	-18.2	-20.0	-21.3	-20.4	-19.7	-19.6	-18.7	-17.5	-17.0	-17.9	-18.1	-17.9	-17.6	-17.6	-18.2	-18.3	-17.4	-17.5	-17.5	-18.0	-18.6	-19.1	-18.4	-17.0
24-Jan	-19.2	-19.1	-18.8	-18.1	-18.0	-17.6	-17.0	-16.6	-15.7	-14.9	-14.7	-14.7	-14.5	-14.5	-14.2	-14.2	-14.4	-14.4	-14.4	-14.3	-14.3	-14.0	-14.4	-14.4	-15.7	-14.0
25-Jan	-13.9	-13.7	-13.7	-13.6	-13.4	-13.6	-13.5	-13.5	-13.6	-13.5	-13.2	-12.7	-12.9	-12.5	-12.6	-12.7	-12.5	-12.6	-11.9	-11.7	-11.2	-10.3	-9.9	-9.2	-12.6	-9.2
26-Jan	-8.4	-8.9	-9.2	-9.3	-9.8	-10.7	-10.9	-11.3	-11.5	-11.4	-11.2	-11.0	-11.6	-12.3	-13.0	-13.3	-13.8	-14.1	-14.6	-15.4	-16.0	-16.5	-17.4	-18.5	-12.5	-8.4
27-Jan	-19.4	-20.2	-20.8	-21.7	-22.7	-23.5	-24.4	-24.9	-25.3	-25.3	-24.8	-23.7	-23.0	-21.9	-21.2	-20.9	-21.3	-21.2	-21.5	-21.3	-22.0	-22.7	-23.0	-22.9	-22.5	-19.4
28-Jan	-22.4	-22.1	-21.7	-21.0	-20.1	-20.4	-21.2	-21.9	-22.2	-22.3	-22.4	-22.3	-21.8	-21.7	-21.8	-22.1	-22.7	-23.4	-24.4	-25.0	-25.7	-26.0	-26.7	-27.0	-22.9	-20.1
29-Jan	-27.6	-27.5	-27.6	-27.7	-27.7	-27.1	-26.7	-26.1	-26.2	-23.6	-22.0	-22.2	-20.4	-19.6	-18.4	-19.0	-20.7	-21.6	-21.9	-20.9	-19.6	-19.3	-20.5	-23.0	-23.2	-18.4
30-Jan	-24.5	-25.2	-25.7	-27.5	-26.5	-27.3	-28.9	-28.8	-27.8	-28.3	-27.2	-25.0	-23.4	-21.6	-21.4	-21.9	-21.9	-22.2	-22.6	-23.2	-23.2	-23.9	-23.9	-24.1	-24.8	-21.4
31-Jan	-25.2	-26.6	-27.3	-27.0	-27.0	-26.3	-25.8	-25.4	-25.1	-24.6	-23.8	-22.7	-22.4	-22.3	-22.1	-22.0	-22.4	-24.0	-25.0	-25.6	-25.6	-23.6	-24.1	-22.6	-24.5	-22.0
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature 2m (AT 2m) - C
Fort Chipewyan - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Fort Chipewyan - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	117	15.73	15.73
-20 - 0	627	84.27	100.00
0 - 10	0	0.00	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

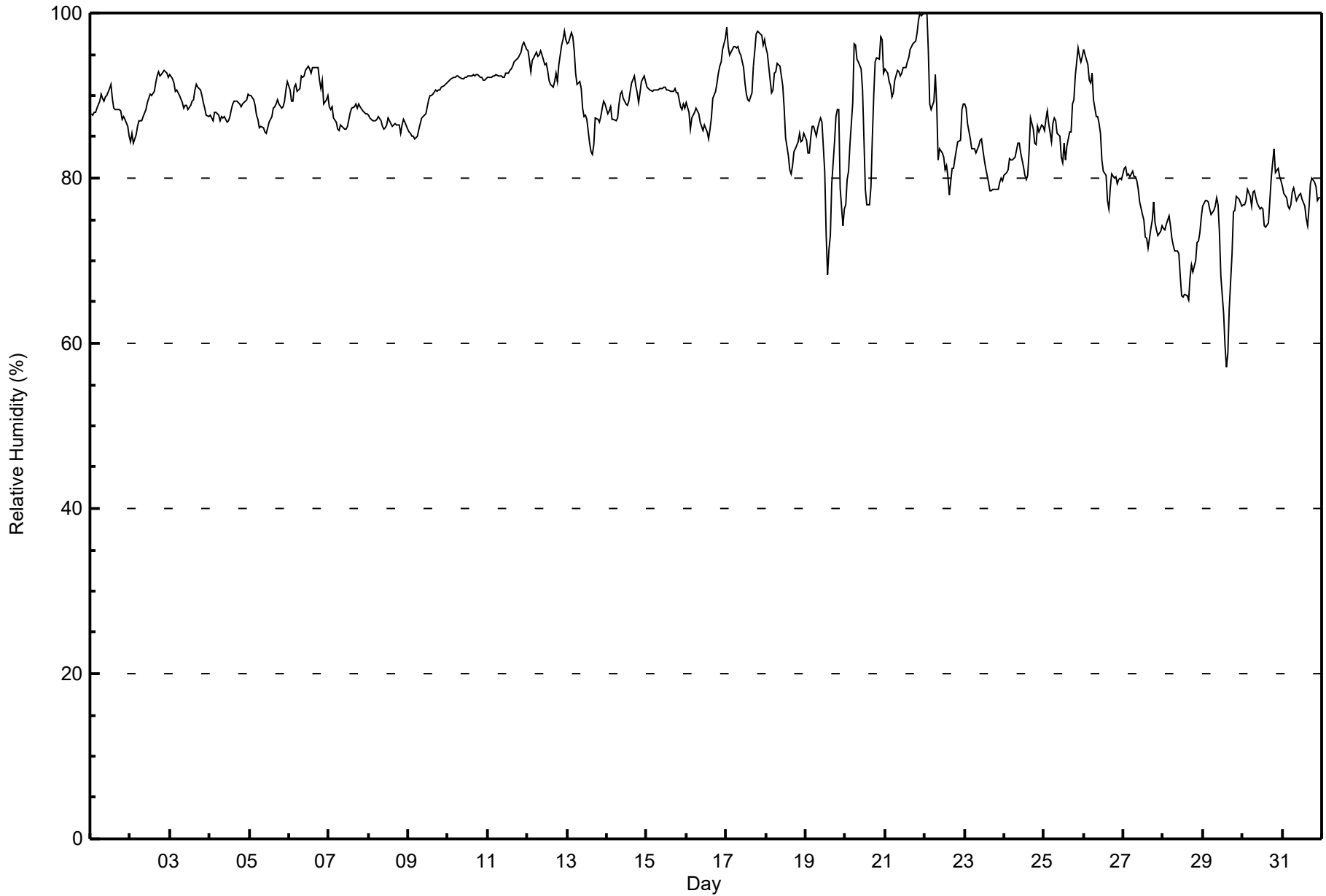
**Relative Humidity (RH) - %
Fort Chipewyan - January 2023**

Maximum Value: 100.0 % on Jan 21 22:00 Maximum Daily Average: 94.8 % on Jan 17																						Hours in Service: 744				
Minimum Value: 57.2 % on Jan 29 15:00 Minimum Daily Average: 70.6 % on Jan 28																						Hours of Data: 744				
Maximum Diurnal Average: 87.9 % at hour 1 Minimum Diurnal Average: 83.6 % at hour 15																						Hours of Missing Data: 0				
Monthly Average: 86.56 % Percentiles: P₁ = 65.7 P₁₀ = 76.8 Q₁ = 82.7 Median = 87.9 Q₃ = 91.5 P₉₀ = 94.0 P₉₉ = 97.8																						Hours of Calibration: 0				
																						Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	87.8	87.7	87.9	88.0	88.5	89.3	90.1	89.7	89.3	89.8	90.1	90.9	91.3	89.6	88.4	88.3	88.3	88.3	88.1	87.1	87.5	87.2	86.3	85.1	88.5	91.3
2-Jan	84.5	85.4	84.2	85.3	86.3	87.0	86.9	87.0	87.5	88.3	89.1	89.7	90.2	90.0	90.6	91.6	92.3	92.9	92.5	92.6	93.1	92.9	92.8	92.2	89.4	93.1
3-Jan	92.5	92.0	91.5	90.6	90.7	90.3	90.1	89.2	88.4	88.8	88.8	88.4	88.9	89.4	89.6	90.7	91.3	91.1	90.7	90.1	89.2	88.4	87.7	87.5	89.8	92.5
4-Jan	87.6	87.3	87.0	88.0	88.0	87.6	86.9	87.4	87.3	87.4	86.8	86.9	87.4	88.3	89.0	89.3	89.4	89.1	89.0	88.7	88.9	89.2	89.6	90.1	88.2	90.1
5-Jan	89.9	90.0	89.6	88.8	87.7	87.1	86.0	86.3	86.1	85.7	85.5	86.2	86.8	87.5	88.4	88.7	89.0	89.5	88.9	88.5	88.7	89.3	90.7	91.8	88.2	91.8
6-Jan	90.7	89.4	89.4	91.1	91.3	90.5	90.9	92.3	92.2	92.4	93.1	93.5	93.1	92.6	93.4	93.3	93.4	93.3	91.9	90.8	91.9	89.0	89.6	89.9	91.6	93.5
7-Jan	88.6	88.3	88.7	87.3	86.7	85.9	85.7	86.5	86.3	85.9	86.0	86.3	87.1	88.1	88.5	88.7	88.9	88.5	88.9	88.7	88.2	87.9	87.8	87.7	87.6	88.9
8-Jan	87.6	87.2	87.0	86.9	87.0	87.1	87.5	86.9	86.3	85.9	86.0	86.4	87.3	86.6	86.3	86.5	86.7	86.4	86.5	85.5	86.4	87.2	86.7	86.0	86.7	87.6
9-Jan	85.7	85.4	85.1	85.2	84.7	85.1	85.9	86.6	87.2	87.4	87.9	88.7	89.4	90.0	90.0	90.2	90.7	90.5	90.7	90.7	91.1	91.2	91.4	91.5	88.4	91.5
10-Jan	91.7	91.9	92.1	92.2	92.2	92.3	92.4	92.3	92.1	92.1	92.1	92.2	92.4	92.3	92.4	92.5	92.4	92.5	92.6	92.3	92.2	91.9	91.9	92.0	92.2	92.6
11-Jan	92.2	92.1	92.3	92.4	92.4	92.5	92.3	92.3	92.4	92.2	92.2	92.8	92.7	93.0	93.2	93.6	94.0	94.4	94.5	94.9	95.3	96.1	96.5	95.7	93.4	96.5
12-Jan	95.4	94.3	92.8	94.3	95.0	95.3	94.8	94.9	95.4	94.8	93.8	94.0	93.1	91.9	91.3	91.1	91.8	92.8	91.7	93.7	96.0	96.8	97.8	96.9	94.2	97.8
13-Jan	96.3	96.5	97.6	97.1	95.4	92.6	91.3	91.6	90.8	88.5	87.4	87.6	87.2	84.3	83.3	82.9	84.1	87.3	87.1	86.9	87.4	88.4	89.3	89.0	89.6	97.6
14-Jan	87.8	88.2	88.6	87.1	87.1	86.9	87.3	89.0	90.1	90.6	89.6	88.9	89.3	90.5	91.5	92.3	91.2	90.4	89.2	90.3	91.7	92.4	91.7	89.6	92.4	
15-Jan	91.1	90.9	90.6	90.5	90.7	90.7	90.7	90.7	90.9	90.9	91.1	91.0	90.8	90.7	90.6	90.5	90.6	90.8	90.4	90.3	88.6	88.4	88.9	88.5	90.4	91.1
16-Jan	89.1	88.0	85.9	87.3	87.6	87.9	88.6	87.9	86.8	86.2	85.7	86.5	85.6	84.7	86.0	87.3	89.7	90.6	91.5	92.7	93.5	94.1	95.6	97.0	89.0	97.0
17-Jan	98.4	96.0	94.9	95.3	96.0	95.9	95.7	96.0	95.3	94.8	93.4	91.6	90.2	89.5	89.3	90.3	93.6	95.5	97.5	97.9	97.6	97.3	96.1	96.8	94.8	98.4
18-Jan	95.8	95.1	91.8	90.4	90.7	92.8	93.0	93.9	93.6	92.3	91.2	88.5	85.0	82.7	81.0	80.5	81.6	83.3	83.6	84.4	85.5	84.4	84.5	85.3	88.0	95.8
19-Jan	84.6	83.1	83.0	84.9	86.2	86.2	85.1	86.1	86.7	87.2	86.8	80.8	73.3	68.4	71.4	73.0	79.3	84.5	87.4	88.4	88.3	78.8	74.2	76.3	81.8	88.4
20-Jan	76.8	79.8	80.9	84.1	89.2	96.2	96.0	94.5	94.1	93.2	90.8	84.8	78.7	76.8	76.7	78.9	85.0	90.1	94.0	94.6	94.4	97.1	96.8	92.7	88.2	97.1
21-Jan	93.2	92.7	91.7	91.2	89.9	90.3	91.8	93.1	92.8	92.4	92.8	93.4	93.3	94.1	94.5	95.6	95.9	96.2	96.6	97.7	99.2	100.0	99.7	100.0	94.5	100.0
22-Jan	100.0	100.0	95.4	88.9	88.4	89.3	92.5	88.9	82.3	83.5	83.1	82.5	81.1	81.5	80.1	78.0	81.1	81.1	82.4	83.4	84.4	84.5	88.4	89.1	86.2	100.0
23-Jan	89.1	88.4	86.6	84.8	83.5	83.6	83.0	83.9	84.6	84.8	83.4	82.2	81.1	79.5	78.5	78.4	78.7	78.6	78.7	78.7	79.5	80.1	79.6	82.2	89.1	89.1
24-Jan	80.3	80.8	81.0	82.3	82.1	82.2	82.5	83.3	84.2	84.3	83.1	81.4	80.3	79.9	80.3	83.2	87.3	85.9	84.2	84.1	86.3	85.6	86.4	86.3	83.2	87.3
25-Jan	85.7	87.1	88.1	86.6	84.4	86.6	87.3	87.0	85.4	85.0	82.5	81.9	84.3	82.2	83.9	85.6	85.7	89.0	89.5	92.3	95.8	94.7	94.1	94.7	87.5	95.8
26-Jan	95.5	94.9	93.7	91.9	91.5	92.7	89.4	87.5	87.4	86.7	85.4	82.2	80.8	80.3	77.3	76.2	78.7	80.6	79.9	80.2	79.3	79.9	80.0	79.8	84.7	95.5
27-Jan	81.1	81.3	80.3	80.5	80.2	80.9	80.2	80.1	79.6	78.6	77.1	75.6	74.9	73.0	72.7	71.5	73.9	74.9	77.1	74.6	73.8	73.1	73.6	74.3	76.8	81.3
28-Jan	73.9	73.7	74.4	75.3	74.2	72.6	71.9	71.1	71.2	70.8	68.2	65.8	65.6	65.9	65.7	65.2	67.9	69.4	68.7	70.1	72.3	72.4	73.4	75.2	70.6	75.3
29-Jan	76.7	77.2	77.2	77.1	76.3	75.7	76.1	76.6	77.6	76.7	73.4	68.2	63.5	59.7	57.2	58.9	64.2	70.8	76.0	76.1	77.7	77.7	77.4	76.6	72.7	77.7
30-Jan	76.8	76.9	77.3	78.7	77.7	76.6	78.3	78.5	77.7	76.9	76.3	76.4	76.2	74.2	74.0	74.6	77.4	80.0	81.8	83.5	80.8	81.2	80.2	79.7	78.0	83.5
31-Jan	78.9	78.1	77.6	76.6	76.2	76.8	78.3	78.9	77.3	77.7	78.0	78.1	77.4	76.6	75.1	74.3	76.4	79.4	80.1	79.5	79.0	77.3	77.6	77.7	77.6	80.1
																						Diurnal Average				
																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort Chipewyan - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Fort Chipewyan - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	3	0.40	0.40
60 - 80	136	18.28	18.68
80 - 100	601	80.78	99.46

Total Number of Valid Hours: 744

Total Number of Hours: 744

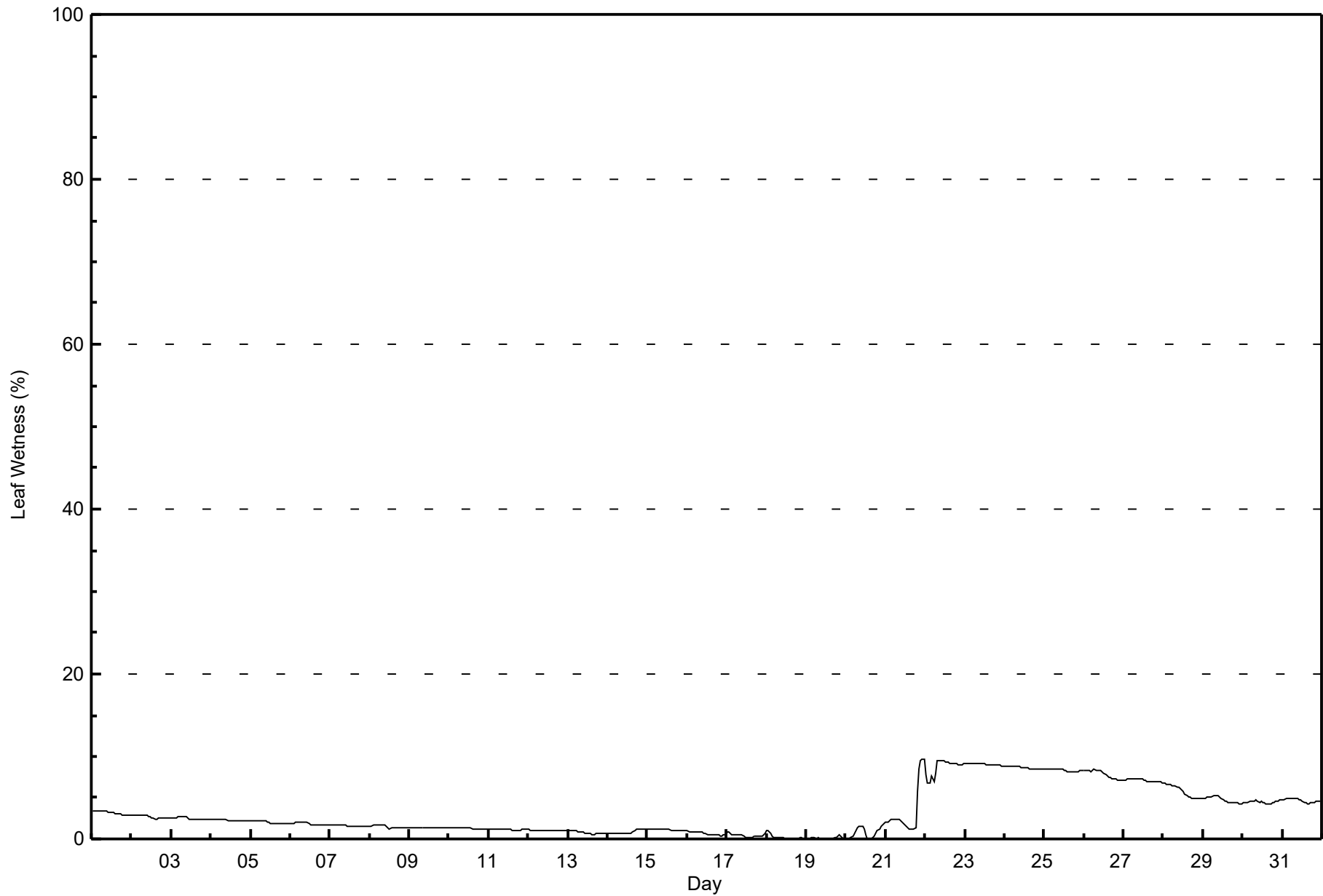


Maximum Value: 9.7 % on Jan 21 23:00																				Maximum Daily Average: 9.0 % on Jan 23					Hours in Service: 744																							
Minimum Value: 0.0 % on Jan 18 13:00																				Minimum Daily Average: 0.1 % on Jan 19					Hours of Data: 744																							
Maximum Diurnal Average: 3.4 % at hour 9																				Minimum Diurnal Average: 3.0 % at hour 16					Hours of Missing Data: 0																							
Monthly Average: 3.22 %																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.5 Q ₁ = 1.1 Median = 1.9 Q ₃ = 4.9 P ₉₀ = 8.5 P ₉₉ = 9.4					Hours of Calibration: 0																							
																									Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.1	3.2	3.1	3.1	3.0	3.0	3.0	2.9	2.9	2.9	2.8	2.8	3.2	3.4																						
2-Jan	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.8																						
3-Jan	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.7																						
4-Jan	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																						
5-Jan	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.2																						
6-Jan	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.8	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.8	2.0																						
7-Jan	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7																						
8-Jan	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.5	1.7																						
9-Jan	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.4																						
10-Jan	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.4																						
11-Jan	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.2	1.2																						
12-Jan	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1																						
13-Jan	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	1.0																						
14-Jan	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.8	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2																						
15-Jan	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	1.1	1.2																						
16-Jan	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.7	0.9																						
17-Jan	0.9	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.7	0.4	0.9																						
18-Jan	1.0	1.0	0.7	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0																						
19-Jan	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.4	0.0	0.0	0.1	0.5	0.5																						
20-Jan	0.0	0.0	0.1	0.2	0.3	0.7	1.1	1.3	1.5	1.6	1.5	1.2	0.5	0.0	0.0	0.2	0.4	0.7	1.0	1.2	1.4	1.6	1.8	0.8	1.8																							
21-Jan	2.0	2.1	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.2	2.0	1.8	1.5	1.3	1.2	1.2	1.2	1.2	1.4	5.7	8.5	9.5	9.7	9.6	3.3	9.7																						
22-Jan	7.9	6.7	6.7	6.7	7.7	6.9	7.9	9.4	9.5	9.5	9.5	9.4	9.4	9.3	9.3	9.2	9.2	9.1	9.1	9.1	9.1	9.1	9.1	9.1	8.7	9.5																						
23-Jan	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.2	9.2	9.2	9.1	9.1	9.1	9.0	9.0	9.0	9.0	9.0	8.9	8.9	8.9	8.9	8.9	9.0	9.2																						
24-Jan	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.6	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.7	8.8																						
25-Jan	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.4	8.4	8.3	8.2	8.1	8.1	8.1	8.1	8.1	8.1	8.2	8.3	8.3	8.3	8.5																						
26-Jan	8.3	8.3	8.3	8.2	8.2	8.3	8.4	8.4	8.3	8.3	8.2	8.1	8.0	7.8	7.7	7.5	7.4	7.3	7.3	7.2	7.2	7.1	7.1	7.1	7.8	8.4																						
27-Jan	7.2	7.2	7.2	7.2	7.2	7.3	7.3	7.3	7.4	7.3	7.3	7.3	7.2	7.1	7.0	7.0	7.0	6.9	6.9	6.9	6.9	6.9	6.9	6.8	7.1	7.4																						
28-Jan	6.8	6.7	6.7	6.6	6.6	6.5	6.4	6.4	6.3	6.2	6.1	5.9	5.7	5.5	5.3	5.1	5.0	5.0	4.9	4.9	4.9	4.9	4.9	4.9	5.8	6.8																						
29-Jan	5.0	5.0	5.0	5.1	5.1	5.1	5.2	5.2	5.2	5.2	5.0	4.8	4.7	4.6	4.5	4.4	4.3	4.3	4.3	4.4	4.4	4.3	4.3	4.3	4.7	5.2																						
30-Jan	4.3	4.4	4.4	4.5	4.5	4.6	4.6	4.6	4.7	4.6	4.5	4.5	4.5	4.3	4.3	4.2	4.2	4.3	4.4	4.5	4.5	4.6	4.7	4.7	4.5	4.7																						
31-Jan	4.8	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.3	4.3	4.4	4.4	4.5	4.5	4.5	4.5	4.6	4.9																						
																								3.3	3.3	3.3	3.2	3.3	3.3	3.3	3.4	3.4	3.4	3.3	3.2	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.2	3.3	3.3	3.3	3.4	Diurnal Average
																								9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.4	9.5	9.5	9.5	9.4	9.4	9.3	9.3	9.2	9.2	9.1	9.1	9.1	9.1	9.5	9.7	9.6	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Fort Chipewyan - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Fort Chipewyan - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	59	7.93	7.93
0.4 - 0.5	27	3.63	11.56
0.6 - 0.7	31	4.17	15.73
0.8 - 1.4	185	24.87	40.59
1.5 - 10	440	59.14	99.73
> 10	0	0.00	99.73

Total Number of Valid Hours: 744

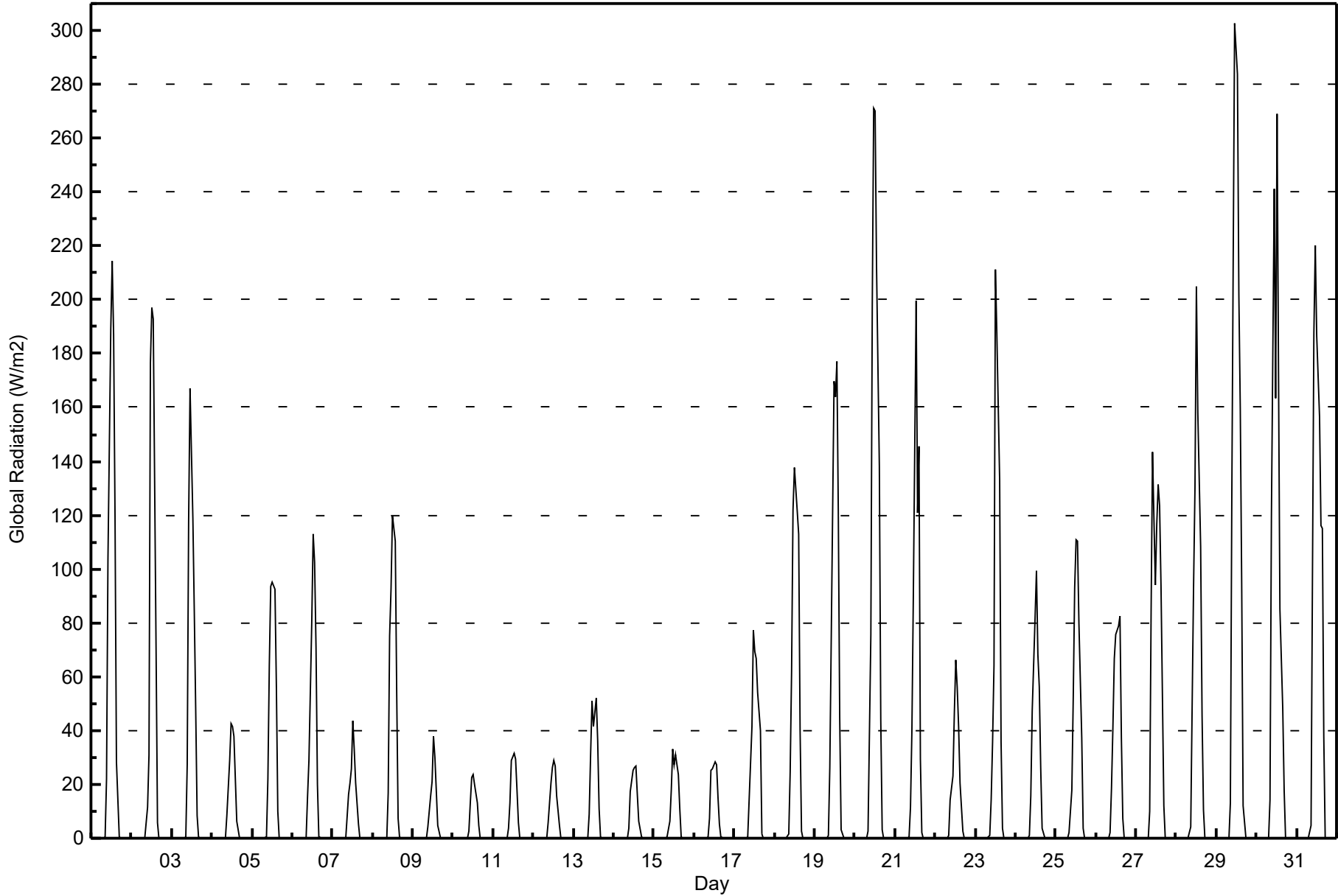
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Global Radiation (GR) - W/m2
Fort Chipewyan - January 2023

Maximum Value: 302.7 W/m2 on Jan 29 12:00 Maximum Daily Average: 58.6 W/m2 on Jan 29																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 0.0 W/m2 on Jan 1 01:00 Minimum Daily Average: 4.2 W/m2 on Jan 10 Maximum Diurnal Average: 117.9 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 4 Monthly Average: 21.68 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 15.3 P ₉₀ = 83.9 P ₉₉ = 214.7																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	21.9	103.7	189.4	214.6	187.3	119.5	28.5	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	36.1	214.6
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	11.4	31.2	176.3	196.9	193.0	69.8	5.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	196.9
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	27.3	118.0	166.8	118.8	83.9	47.9	8.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	166.8
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	8.4	28.8	42.8	41.4	37.8	21.9	6.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	42.8
5-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	21.8	64.0	93.7	95.2	92.4	56.1	10.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	95.2
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	15.0	28.8	80.2	113.2	102.3	70.7	19.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	113.2
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	16.0	20.6	25.6	43.6	33.0	20.6	5.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	43.6
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	16.9	75.0	92.4	120.0	110.1	54.4	7.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9	120.0
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	15.9	21.2	37.9	29.9	17.5	5.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	37.9
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	13.1	22.7	23.8	20.1	13.1	4.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	23.8
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.8	12.9	28.8	31.5	29.4	17.7	6.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	31.5
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.5	20.6	26.3	29.0	27.0	15.9	4.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	29.0
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	9.1	30.8	50.7	41.7	51.9	36.2	11.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	51.9
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.5	17.5	25.4	26.3	26.9	16.5	6.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	26.9
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	6.1	18.0	33.4	27.1	30.8	23.4	11.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	33.4
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	7.3	25.1	25.5	28.4	27.3	15.1	5.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	28.4
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	14.4	41.3	77.1	69.6	66.7	54.3	40.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	77.1
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	24.7	62.1	122.0	137.7	121.6	113.1	40.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.1	137.7
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	26.2	73.7	169.6	164.0	177.1	121.4	44.7	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.5	177.1
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	75.6	197.4	270.9	270.2	212.9	138.3	44.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.6	270.9
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	11.7	39.9	89.5	199.6	120.8	145.6	29.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.7	199.6
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	14.2	23.2	46.7	66.1	56.1	41.4	20.3	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	66.1
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	14.2	35.8	64.0	211.3	187.8	132.8	35.7	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	211.3
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	15.7	47.5	81.3	99.6	68.2	56.0	26.1	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	99.6
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	17.9	52.8	93.0	110.8	110.4	79.9	37.3	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	110.8
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	18.4	40.8	66.8	75.6	78.8	82.4	37.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1	82.4
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	83.9	143.3	93.9	116.9	131.2	123.5	93.6	12.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	33.7	143.3
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	49.2	93.4	130.1	205.1	158.4	108.2	45.9	10.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	33.5	205.1
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	124.7	214.7	302.7	283.9	201.6	159.8	94.7	12.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	58.6	302.7
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	119.4	240.9	163.2	269.0	174.5	85.1	48.3	18.0	0.2	0.0	0.0	0.1	0.1	0.0	0.0	47.2	269.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	97.3	187.8	220.0	186.8	156.4	116.2	114.8	37.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	46.8	220.0
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Fort Chipewyan - January 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	574	77.15	77.15
21 - 100	109	14.65	91.80
101 - 300	60	8.06	99.87
301 - 600	1	0.13	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 30 km/h on Jan 23 10:00	Maximum Daily Speed Average: 18.6 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 1 km/h on Jan 15 09:00	Minimum Daily Speed Average: 0.3 km/h on Jan 1	Hours of Data: 559
Maximum Diurnal Speed Average: 2.2 km/h at hour 24	Minimum Diurnal Speed Average: 0.2 km/h at hour 11	Hours of Missing Data: 185
Monthly Average Velocity: 1.3 km/h 37.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 7 Median = 12 Q ₃ = 16 P ₉₀ = 21 P ₉₉ = 27	Percent Operational Time: 75.1

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	E7	E8	E7	ESE6	E7	ESE5	ESE5	E5	E5	E5	SE3	SW5	WSW6	W8	W6	WNW7	WNW6	WNW5	NW5	WNW5	WNW6	NW4	WNW2	WSW2	N0.3	W8	
2-Jan	W1	NW1	ESE2	E3	E3	E5	ENE6	E7	E7	E7	ENE6	ENE5	E5	E5	ENE5	ENE6	ENE8	ENE7	ENE9	ENE9	ENE7	ENE7	ENE8	E8	E5.5	ENE9	
3-Jan	ENE6	ENE5	ENE6	E8	ENE6	E7	E7	E8	E8	E7	E7	E8	E7	E7	E8	E7	ENE7	E6	E7	E6	E5	E5	ESE5	E2	E6.4	E8	
4-Jan	E2	UO	NW2	NNW1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	NW2	
5-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
6-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
7-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
8-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
9-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
10-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	---	
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	E16	E18	E16	ESE14	SE19	---	SE19	
12-Jan	ESE20	SE16	SSE18	S14	SSW14	SSW16	SSW16	SSW16	SSW14	SSW9	S15	SSW14	S9	S12	S14	SSW13	SW8	SW10	WSW8	W4	WSW5	W5	W7	WNW6	SSW9.5	ESE20	
13-Jan	WNW6	WNW7	NW7	NNW6	N9	N10	NNW10	NNW13	N15	N13	NNE6	NNE6	E17	ENE19	E18	ENE14	ENE14	ENE20	ENE23	ENE19	ENE16	ENE19	ENE25	ENE28	NE10.7	ENE28	
14-Jan	ENE28	ENE25	ENE26	ENE27	ENE25	ENE24	ENE22	ENE24	ENE20	ENE21	ENE18	E18	E15	E13	E11	E10	E9	ESE6	SSE3	SW5	W4	WSW3	NW4	NNW5	ENE13.5	ENE28	
15-Jan	NW6	NW5	NW5	WNW5	NW5	NW4	NW2	W2	NNE1	UO	SW2	SW2	SSE1	NE1	SE1	ENE2	N2	NNE3	NNE4	NNE3	ENE6	NE5	NE4	NNE3	N1.9	ENE6	
16-Jan	NNE4	ENE6	ENE6	ENE7	ENE7	ENE9	ENE10	ENE14	ENE13	ENE16	ENE18	ENE17	ENE18	ENE18	ENE23	ENE24	ENE26	ENE29	ENE28	ENE26	ENE27	E23	E21	ENE16.7	ENE29		
17-Jan	E15	SE13	S16	S15	SSW13	SSW10	SSW9	SSW9	S15	S16	S19	S20	S16	S16	S18	S19	S16	S16	S20	S16	S15	SE11	ESE13	ESE15	S13.5	S20	
18-Jan	ESE15	SE13	SSE12	SSE14	S19	SSE19	S22	S25	SSE19	SSE16	SSE18	SSE19	SSE20	S21	S21	S19	S16	SSE17	SSE15	S18	S18	S19	S18	S18	SSE17.3	S25	
19-Jan	S27	S24	S16	S15	S14	S14	S12	SSW12	SSW14	SW13	SW14	WSW13	WSW14	SW11	S12	SW14	SW12	SW12	SW12	SW12	SW13	SW12	WSW14	WSW18	W17	SW12.7	S27
20-Jan	W18	W13	W12	W11	WSW6	ESE2	SE2	WSW7	WSW8	WSW8	WSW8	W10	W9	W10	W10	WNW10	WNW8	WNW8	WNW9	WNW11	NW10	WNW9	W4	E4	W7.6	W18	
21-Jan	SSW3	ENE6	ENE6	E6	E7	E9	E8	E10	E12	E14	E13	E15	E14	E14	E16	E15	E17	E16	E13	E12	E9	E6	E5	W7	E9.8	E17	
22-Jan	W12	W14	W16	W16	WNW15	WNW14	NW22	NNW23	NW25	NW22	NW22	NW25	NW22	NW19	NNW16	NW16	NW13	NW12	NNW9	NNW9	NNW7	WNW3	SE1	SE2	NW13.8	NW25	
23-Jan	E7	E10	E13	E16	E16	E18	E23	E26	E27	E30	E28	ENE25	ENE25	ENE25	ENE22	ENE18	ENE17	ENE14	ENE14	ENE11	ENE13	E12	ENE15	ENE12	ENE17.8	E30	
24-Jan	E15	ENE16	E17	ENE14	ENE17	ENE18	ENE20	ENE20	ENE13	NE12	NE7	N6	NNW6	NW8	NW8	NW8	NW8	NNW5	NNW5	NW5	NW4	WNW3	W4	WNW4	NE6.5	ENE20	
25-Jan	WNW3	WNW1	NW3	WNW2	W3	WNW2	NW3	NNE3	ENE5	ESE5	SE3	SSE4	E5	ESE4	E10	E11	E14	ESE17	ESE17	ESE18	ESE18	E18	E18	E22	E6.9	E22	
26-Jan	E23	ENE26	ENE25	NE22	NNE12	N14	NNW12	NNW10	NW13	NW16	NW16	NW16	NW18	NW18	NW16	NNW16	NNW14	NNW13	NNW12	N10	N11	N10	NNE7	NNE6	N11.0	ENE26	
27-Jan	NNW5	NNW8	NNW10	NNW12	NNW10	NNW9	NNW9	NNW8	NW8	NW10	NW12	NW13	NW12	WNW15	NW17	NW15	NW13	NNW15	NNW13	NW17	NW18	NW19	NW21	NW19	NW12.6	NW21	
28-Jan	NW21	NW20	WNW19	WNW14	NW17	NW20	NW22	NW21	NW20	NW21	NW23	NW22	NW21	NW23	NW24	NW21	NW16	NW14	NW13	NW14	NW13	WNW15	WNW20	WNW19	NW18.6	NW24	
29-Jan	WNW19	WNW18	WNW17	WNW16	WNW17	WNW16	W14	W15	WSW16	WSW17	SW15	SSW15	SSW14	SW12	WSW9	SW9	SW9	W8	WNW10	W7	NW7	NW8	NW15	NW15	W11.3	WNW19	
30-Jan	WNW13	WNW13	WNW12	WNW10	NW12	WNW9	W7	WNW10	WNW8	W7	WSW7	WSW6	W7	W9	W8	W6	W7	W7	W6	WNW8	NW6	NW9	NW7	NW8	WNW8.0	WNW13	
31-Jan	NNW6	NNW5	NNW4	WNW4	WNW4	WNW5	WNW7	WNW5	WSW5	W7	W9	WNW12	WNW11	W12	W12	W11	W9	W8	WNW8	WNW8	WNW10	WNW9	WNW10	WNW13	WNW7.7	WNW13	

ENE1.6	ENE1.9	ENE1.2	NE1.0	NNE1.1	NE1.6	NE1.7	NE2.0	NNE1.6	NNE1.3	ENE0.2	WNW0.8	N0.8	NNW0.9	NNE0.6	N1.3	NNE1.5	NNE1.7	NE1.7	NE1.8	NE2.2	NE2.1	NE1.9	NE2.2	Diurnal Average	
ENE28	ENE26	ENE26	ENE27	ENE25	ENE24	E23	E26	E27	E30	E28	ENE25	ENE25	ENE25	NW24	ENE23	ENE24	ENE26	ENE29	ENE28	ENE26	ENE27	ENE25	ENE28	Diurnal Maximum	

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

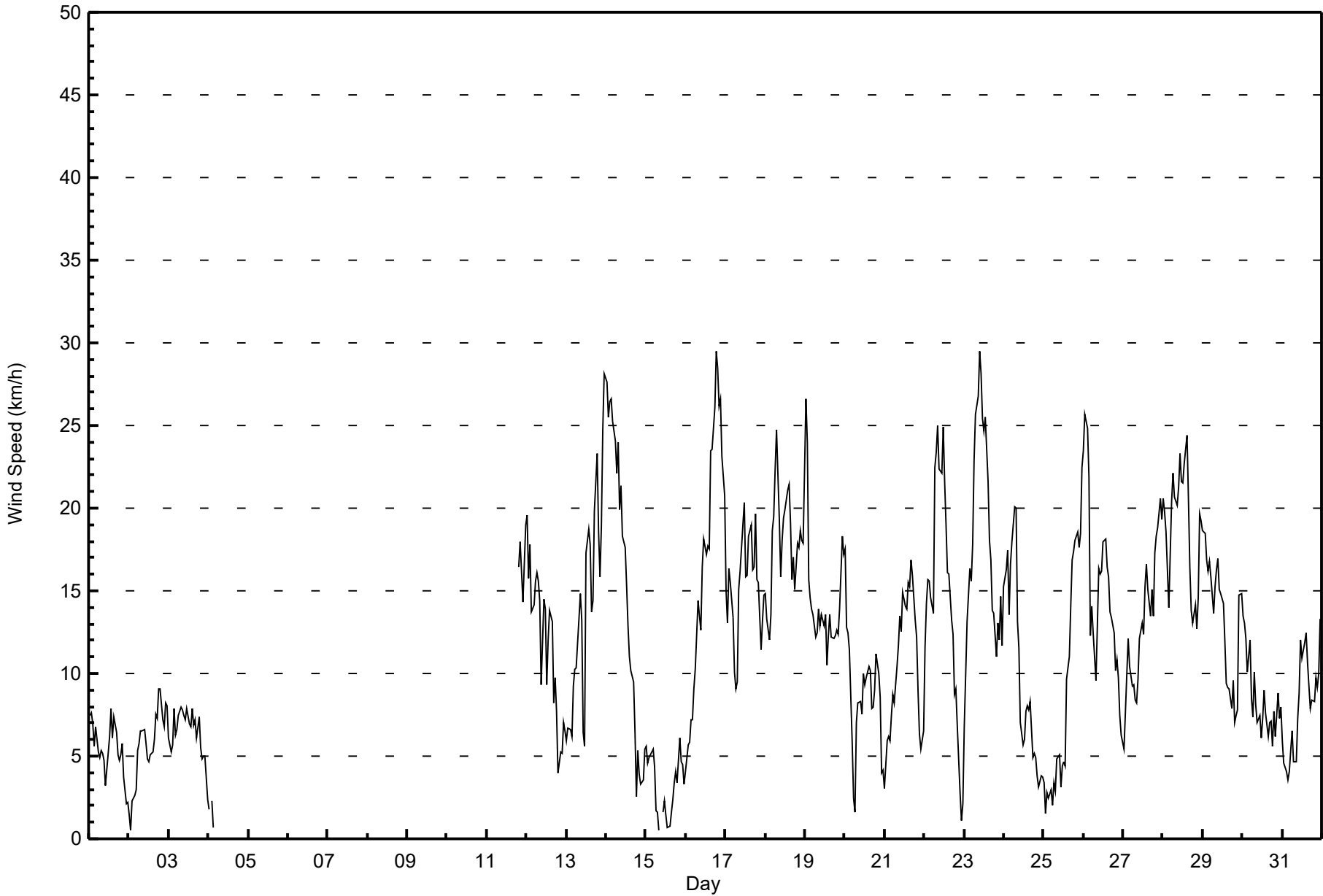
Wind Speed (WS) - km/h
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 9 km/h on Jan 22 08:00	Hours of Data: 559
Minimum Value: 0 km/h on Jan 2 04:00	Hours of Missing Data: 185
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 75.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	1	1	1	1	1	1	0	0	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2
2-Jan	2	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3-Jan	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	2
4-Jan	1	UO	1	1	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	1	
5-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
6-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
7-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
8-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
9-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
10-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4	1	2	1	3	4
12-Jan	2	2	3	3	3	2	2	2	3	2	3	3	1	1	2	2	2	2	2	2	1	1	2	3	
13-Jan	1	2	2	2	3	3	3	4	4	4	2	2	5	3	2	3	3	4	3	3	2	3	3	5	
14-Jan	3	3	3	3	4	3	3	3	3	4	3	2	1	2	1	1	1	1	1	1	1	1	1	4	
15-Jan	1	1	1	1	1	2	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
16-Jan	1	1	1	1	1	1	1	1	2	2	3	2	2	3	3	3	4	4	4	3	3	3	3	4	
17-Jan	2	2	2	2	2	1	1	3	2	2	2	3	2	2	2	2	2	2	3	3	3	2	2	3	
18-Jan	2	2	3	4	3	3	3	4	6	4	4	3	4	3	3	3	4	2	3	3	3	3	3	6	
19-Jan	4	4	2	2	2	2	2	2	2	2	2	2	3	2	3	3	1	2	2	3	3	3	4	4	
20-Jan	4	3	3	2	2	1	2	2	2	3	2	3	3	3	2	2	2	1	1	2	2	1	1	4	
21-Jan	2	2	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	2	1	2	2	2	3	
22-Jan	2	3	3	3	3	3	8	9	8	8	7	7	7	6	6	5	4	4	3	3	3	1	1	9	
23-Jan	4	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	2	4	
24-Jan	4	3	3	2	3	3	3	4	2	2	3	1	2	2	3	2	2	2	1	1	1	1	1	4	
25-Jan	2	1	1	1	1	1	1	1	1	2	1	2	1	1	2	2	2	1	2	2	2	1	2	2	
26-Jan	2	2	3	4	5	4	4	4	4	5	6	6	6	7	5	6	5	4	4	4	4	3	2	7	
27-Jan	2	2	3	3	2	2	2	2	3	2	3	4	3	4	4	4	4	4	3	4	5	5	5	5	
28-Jan	5	5	5	3	5	7	6	6	5	6	7	7	7	6	7	7	5	5	4	4	3	3	4	7	
29-Jan	3	3	3	3	3	3	3	4	3	3	3	2	2	3	2	2	1	2	2	2	2	2	4	4	
30-Jan	3	3	3	2	3	2	1	2	1	1	2	2	2	2	2	1	1	1	2	1	1	2	2	3	
31-Jan	2	1	1	1	1	2	2	2	1	2	2	4	3	3	3	3	2	1	1	2	2	3	3	4	
	5	5	5	4	5	7	8	9	8	8	7	7	7	7	7	7	5	5	4	4	5	5	5	5	

Diurnal Maximum

UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	100	17.89	17.89
6 - 11	174	31.13	49.02
12 - 19	214	38.28	87.30
20 - 28	69	12.34	99.64
29 - 38	2	0.36	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 559

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	1	7	3	5	15	7	5	4	0	1	4	4	8	15	14	7	100
6 - 11	6	4	1	24	37	2	1	0	1	4	5	10	25	24	16	14	174
12 - 19	3	1	1	28	28	10	4	10	28	15	10	6	11	20	31	8	214
20 - 28	0	0	1	29	7	1	0	1	8	0	0	0	0	1	20	1	69
29 - 38	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	12	6	87	88	20	10	15	37	20	19	20	44	60	81	30	559

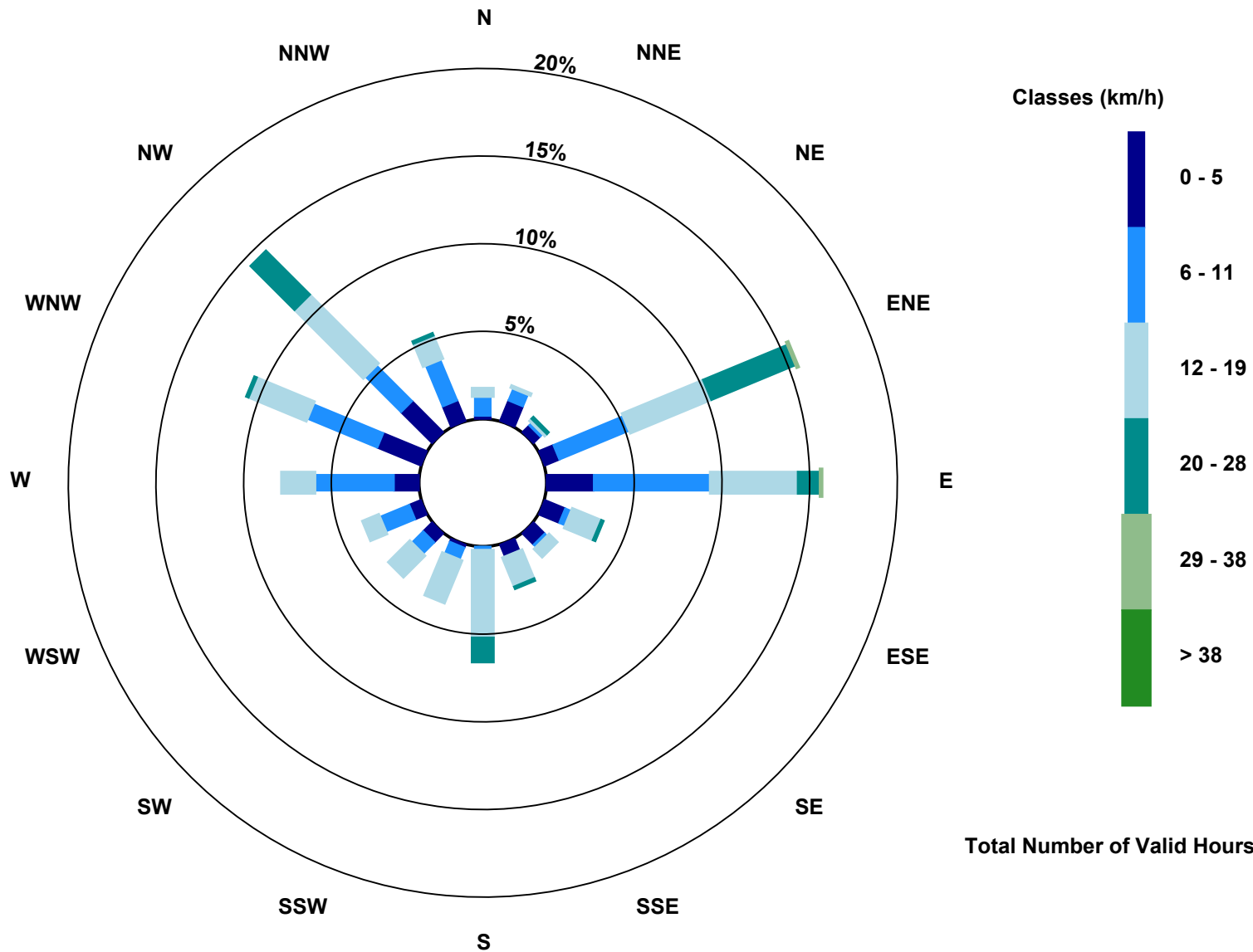
Total Number of Valid Hours: 559

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort Chipewyan - January 2023

Direction of Maximum Speed: 84 deg on Jan 23 10:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 311.3 deg on Jan 28	Hours of Data: 559
Direction of Minimum Speed: 31 deg on Jan 15 09:00	Hours of Missing Data: 185
Direction of Minimum Daily Speed Average: 0.3 deg on Jan 1	Percent Operational Time: 75.1
Monthly Average Direction: 37.4 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	86	90	93	103	99	107	104	92	89	99	132	224	256	278	269	293	300	297	306	292	301	316	293	256	9.7
2-Jan	278	323	104	99	94	92	78	82	83	83	75	76	82	81	77	77	76	77	76	77	72	71	77	85	79.3
3-Jan	75	70	72	79	74	80	80	82	84	82	86	94	92	90	87	84	78	88	92	91	94	98	103	81	84.7
4-Jan	94	UO	UO	312	333	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
5-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
7-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
8-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
9-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
10-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	93	86	96	118	124	--
12-Jan	123	133	163	185	195	193	192	193	199	197	190	213	185	176	187	209	228	223	247	278	258	265	268	285	193.9
13-Jan	284	293	313	331	358	352	347	348	353	355	14	13	79	73	82	61	64	63	68	75	74	70	74	71	48.4
14-Jan	69	67	69	66	63	66	66	70	68	78	75	80	84	86	92	95	92	108	154	233	261	249	307	334	72.6
15-Jan	323	322	316	301	317	311	320	269	31	UO	221	218	147	54	131	65	358	13	18	20	68	47	39	25	351.9
16-Jan	24	72	64	61	57	62	68	73	65	66	71	73	66	62	62	60	58	60	66	70	69	74	79	83	67.2
17-Jan	101	146	178	191	203	204	204	196	188	187	182	181	191	185	176	177	183	187	184	173	176	129	115	104	174.6
18-Jan	104	130	156	162	178	167	171	170	159	147	158	157	161	170	173	170	181	168	160	175	181	188	180	174	165.9
19-Jan	183	186	191	171	173	186	178	196	206	222	236	246	255	233	189	222	230	233	234	233	235	246	254	262	215.0
20-Jan	262	264	265	263	257	103	142	250	254	238	255	270	266	265	270	291	287	287	291	297	309	294	263	82	271.4
21-Jan	203	78	76	80	87	85	88	89	85	90	93	90	89	88	89	89	90	92	96	91	89	98	83	269	89.6
22-Jan	272	276	281	280	285	295	312	328	322	315	314	317	315	316	328	322	313	317	329	342	341	282	127	134	310.7
23-Jan	85	88	95	86	88	89	84	81	79	84	81	71	72	68	60	59	59	60	61	60	72	82	78	70	75.5
24-Jan	82	72	80	75	75	75	77	73	62	55	38	354	333	325	324	319	317	330	330	318	325	285	277	303	47.3
25-Jan	300	291	307	294	280	288	319	16	74	103	164	168	96	107	97	97	98	104	117	123	112	103	87	83	100.7
26-Jan	90	74	67	50	19	1	347	340	325	324	324	323	322	319	321	332	339	339	348	358	360	4	18	13	0.2
27-Jan	343	346	347	342	336	333	327	334	324	305	316	311	308	301	311	307	304	313	293	311	313	311	310	310	315.7
28-Jan	310	311	303	296	309	319	317	318	310	313	315	311	313	312	317	322	319	322	320	321	308	303	292	289	311.3
29-Jan	282	287	290	286	282	282	276	262	258	253	218	210	210	217	241	236	229	269	285	278	313	326	315	308	267.8
30-Jan	291	302	294	289	313	295	270	288	299	278	244	255	268	273	264	262	269	276	263	294	309	316	322	320	287.9
31-Jan	328	340	337	297	283	290	302	301	250	266	279	282	297	270	271	279	275	278	286	285	295	305	283	301	287.9
	75.9	65.7	60.0	50.2	17.5	40.7	37.5	46.4	30.4	32.7	72.2	286.8	354.6	331.2	17.7	359.0	11.3	31.0	47.3	49.2	43.6	44.1	44.5	37.7	
	Diurnal Average																								

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



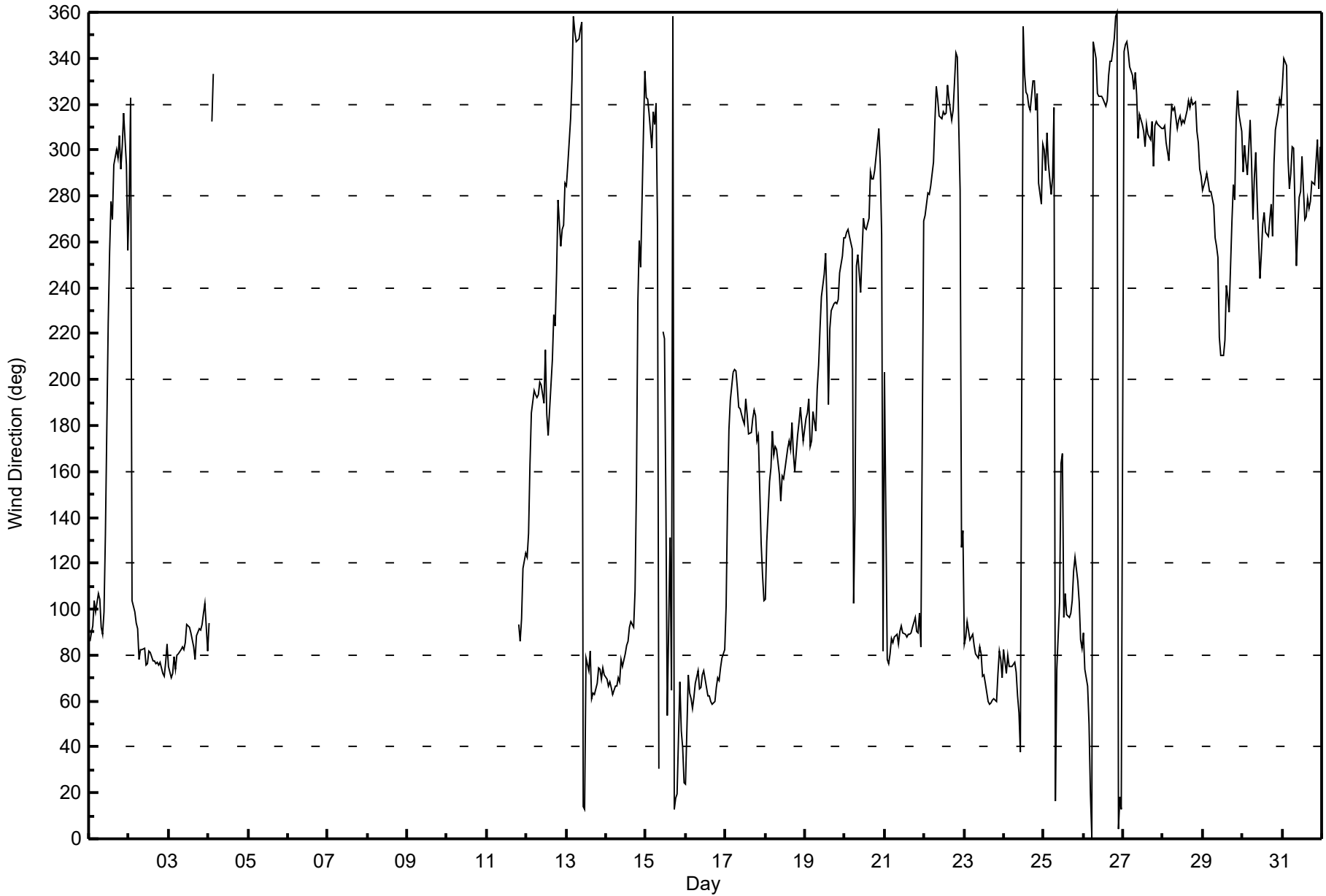
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort Chipewyan - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 81 deg on Jan 15 15:00	Hours of Data: 559
Minimum Value: 3 deg on Jan 21 05:00	Hours of Missing Data: 185
Percentiles: P ₁ = 4 P ₁₀ = 6 Q ₁ = 8 Median = 13 Q ₃ = 18 P ₉₀ = 24 P ₉₉ = 64	Hours of Calibration: 0
	Percent Operational Time: 75.1

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	6	4	7	8	7	15	12	9	9	10	24	16	20	14	14	16	10	11	12	10	8	15	48	33	48
2-Jan	68	63	18	6	7	9	7	5	6	7	7	7	6	5	5	6	5	6	5	5	7	6	5	6	68
3-Jan	12	11	11	7	8	6	5	4	6	5	6	6	5	4	6	7	5	11	6	5	5	9	5	11	12
4-Jan	46	UO	UO	23	22	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	46
5-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
6-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
7-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
8-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
9-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
10-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
11-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	6	4	12	4	15	15
12-Jan	9	11	13	13	9	9	9	10	12	15	14	14	15	8	8	10	12	8	21	31	19	20	15	15	31
13-Jan	15	19	24	28	22	21	19	18	18	29	26	21	21	8	5	10	9	8	8	7	7	7	6	6	29
14-Jan	7	7	7	7	7	7	7	7	8	7	7	5	5	4	4	4	11	50	12	20	18	48	23	50	
15-Jan	17	23	20	20	16	20	52	35	66	UO	35	24	21	73	81	46	20	22	20	27	14	21	16	21	81
16-Jan	16	14	13	9	13	9	8	6	8	9	8	7	8	8	8	8	8	8	7	6	7	6	6	4	16
17-Jan	15	15	9	7	8	8	7	9	7	7	7	8	7	9	7	6	6	8	8	13	13	18	8	7	18
18-Jan	8	17	23	18	9	9	9	9	16	17	16	12	10	9	8	9	17	8	11	12	9	8	12	14	23
19-Jan	8	9	12	8	12	9	10	11	9	10	12	13	14	20	17	14	10	12	13	13	15	14	14	15	20
20-Jan	13	15	12	12	25	55	73	17	13	18	19	20	21	16	17	12	10	11	13	11	7	15	48	30	73
21-Jan	44	11	8	4	3	4	5	4	6	5	6	8	7	7	5	7	6	6	5	6	5	10	53	23	53
22-Jan	13	13	12	14	13	16	18	24	19	17	18	17	17	19	24	20	17	19	26	21	29	51	72	36	72
23-Jan	26	5	7	4	5	5	5	5	4	5	8	7	8	9	9	9	9	8	9	10	9	7	7	16	26
24-Jan	8	7	6	8	7	6	7	7	9	10	32	20	25	22	22	22	18	28	25	25	26	26	18	11	32
25-Jan	26	44	22	26	22	33	23	37	31	15	39	26	15	25	9	6	7	6	9	5	6	6	7	6	44
26-Jan	7	7	8	11	21	20	21	26	21	20	23	24	22	20	21	22	22	24	21	22	21	23	24	24	26
27-Jan	23	16	16	15	15	15	14	15	17	16	14	15	16	16	15	17	14	18	14	15	16	15	15	15	23
28-Jan	15	14	14	14	17	18	17	17	17	17	17	17	17	17	17	20	19	20	19	16	13	13	12	13	20
29-Jan	12	11	12	12	12	13	15	15	13	13	21	11	10	11	13	11	8	20	11	20	21	21	15	15	21
30-Jan	14	15	14	12	12	20	11	16	17	12	17	17	21	19	15	14	8	8	9	18	21	19	18	20	21
31-Jan	21	19	24	20	16	20	18	23	18	15	16	16	24	17	17	14	16	10	9	9	17	24	16	14	24
68 63 24 28 25 55 73 37 66 29 39 26 25 73 81 46 22 28 50 31 29 51 72 36																									
Diurnal Maximum																									

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09 BARGE LANDING JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	13.4	0	3	0
TRS(ppb) Average	707	36	37	99.87	3.2	0	1.3	0
THC(ppm) Average	709	35	35	100	3.8	-	2.7	-
NMHC(ppm) Average	709	35	35	100	1.268	-	0.147	-
CH4(ppm) Average	709	35	35	100	3.4	-	2.6	-
NO2 (ppb) Average	707	36	37	99.87	45.3	0	26.2	-
NO (ppb) Average	707	36	37	99.87	97.4	-	45.9	-
NOX (ppb) Average	707	36	37	99.87	137.4	-	69.9	-
PM2.5(ug/m3) Average	742	1	2	99.87	94.9	1	29.5	1
Temperature (C) Average	744	0	0	100	2	-	-2.5	-
Relative Humidity (%) Average	744	0	0	100	97.6	-	89.4	-
Barometric Pressure (inHg) Average	744	0	0	100	29.6	-	29.5	-
Wind Speed 20 m (km/h) Average	740	0	4	99.46	30	-	16	-
Wind Direction 20 m (deg) Average	740	0	4	99.46	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)

JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.89	1.3	-	0	0	0.1	0.3	1.1	2.4	13.4
TRS(ppb) Average	707	0.66	0.4	-	0.2	0.3	0.4	0.5	0.9	1.2	3.2
THC(ppm) Average	709	2.2	0.2	-	1.9	2	2	2.1	2.3	2.5	3.8
NMHC(ppm) Average	709	0.022	0.077	-	0	0	0	0	0	0.1	1.268
CH4(ppm) Average	709	2.18	0.2	-	1.9	2	2	2.1	2.2	2.4	3.4
NO2 (ppb) Average	707	16.6	8.7	-	0.2	5.1	10.1	17.1	22.8	26.6	45.3
NO (ppb) Average	707	10	16	-	0	0	0.3	2.8	11.8	30.8	97.4
NOX (ppb) Average	707	26.6	22.5	-	0.2	5.2	10.8	20.4	34.7	56.8	137.4
PM2.5(ug/m3) Average	742	9.84	7.8	-	0.6	2.2	4.4	8.5	13.2	18.1	94.9
Temperature (C) Average	744	-10.38	5.8	-	-30.1	-18.7	-12.8	-9	-7	-4.6	2
Relative Humidity (%) Average	744	82.98	7	-	54.3	73.3	81.1	85.1	87.7	88.9	97.6
Barometric Pressure (inHg) Average	744	28.88	0.2	-	28.5	28.6	28.7	28.8	29	29.2	29.6
Wind Speed 20 m (km/h) Average	740	8.7	5	-	1	3	5	9	12	14	30
Wind Direction 20 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
 JANUARY 2023

OPERATIONAL NOTES

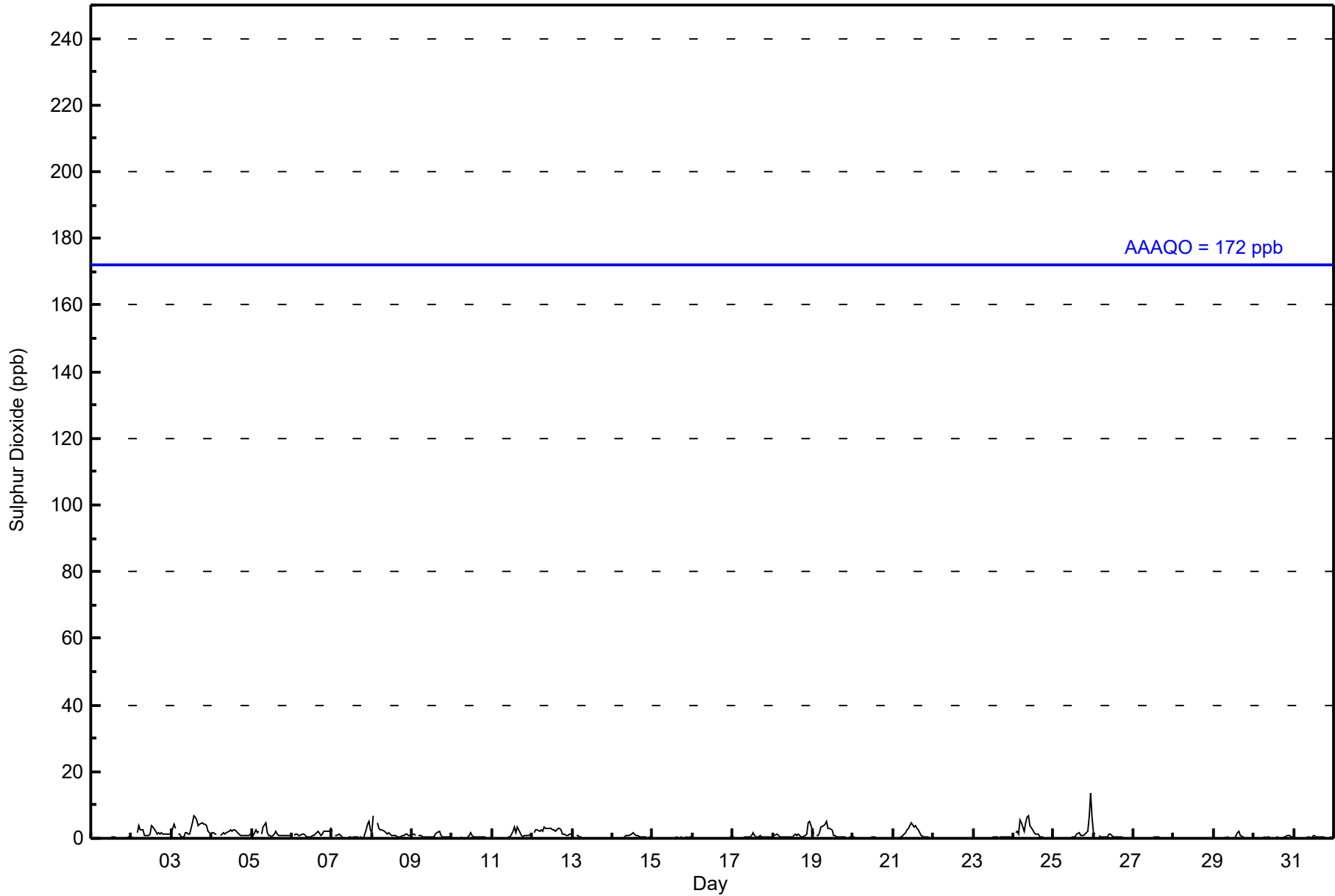
Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2 , TRS	13 Jan 2023 13:00	13 Jan 2023 13:00	1	Maintenance - sample manifold cleaned
PM2.5	23 Jan 2023 13:00	23 Jan 2023 13:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	09 Jan 2023 03:00	09 Jan 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	10 Jan 2023 03:00	10 Jan 2023 03:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Jan 2023 18:00	15 Jan 2023 18:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	31 Jan 2023 11:00	31 Jan 2023 11:00	1	Flat line in sensor output signal



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 13.4 ppb on Jan 25 23:00	Maximum Daily Average: 3.0 ppb on Jan 3		Hours of Data:	709
Minimum Value: 0.0 ppb on Jan 1 05:00	Minimum Daily Average: 0.1 ppb on Jan 28		Hours of Missing Data:	35
Maximum Diurnal Average: 1.2 ppb at hour 14	Minimum Diurnal Average: 0.6 ppb at hour 19		Hours of Calibration:	35
Monthly Average: 0.89 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.1 P ₉₀ = 2.4 P ₉₉ = 6.1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3																							
2-Jan	0.2	0.3	Z	1.6	4.0	2.5	2.5	2.3	1.0	0.7	0.8	1.3	4.0	3.5	2.2	1.4	1.9	1.2	1.6	1.3	1.2	1.1	1.3	1.1	1.7	4.0																							
3-Jan	1.6	4.2	3.0	Z	1.1	1.2	0.5	0.5	1.8	1.5	1.3	1.2	4.7	6.7	6.2	5.4	3.8	4.4	4.9	4.1	4.2	3.7	1.9	1.4	3.0	6.7																							
4-Jan	1.5	1.5	1.3	1.3	Z	1.0	1.3	1.9	1.4	1.8	2.3	2.7	2.3	2.7	2.2	1.5	1.0	0.8	0.8	1.1	1.0	0.8	1.3	1.6	2.7																								
5-Jan	1.2	0.7	2.5	1.7	2.2	Z	1.4	3.3	4.5	1.6	0.8	0.7	0.6	1.4	2.1	1.4	0.9	1.0	0.8	0.8	0.7	0.6	0.6	0.8	1.4	4.5																							
6-Jan	Z	1.0	1.1	1.1	0.8	1.0	1.4	1.3	0.9	0.4	0.4	0.4	1.0	1.0	1.4	1.7	2.0	1.0	1.4	2.0	2.2	2.2	2.1	2.8	1.3	2.8																							
7-Jan	2.0	Z	1.0	1.0	1.1	0.7	0.4	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	2.5	4.4	5.3	2.5	1.0	5.3																							
8-Jan	1.5	7.0	Z	4.6	2.9	2.4	2.4	2.0	1.6	1.4	1.5	1.1	1.0	0.9	0.9	0.6	0.5	0.5	0.7	1.0	1.1	1.2	1.1	1.0	1.7	7.0																							
9-Jan	1.4	1.2	1.0	Z	1.1	0.8	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.6	1.1	1.5	2.0	0.8	0.5	0.4	0.3	0.3	0.2	0.1	0.7	2.0																							
10-Jan	0.1	0.1	0.1	0.0	Z	0.3	0.1	0.1	0.1	0.4	0.9	1.5	0.9	0.5	0.4	0.3	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.4	1.5																							
11-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.3	0.6	2.3	3.4	1.9	3.3	2.4	0.9	0.6	0.6	1.0	0.7	0.8	1.3	0.9	3.4																							
12-Jan	Z	1.9	2.6	2.7	2.0	2.5	2.0	3.3	2.8	2.9	3.1	2.9	2.4	2.3	2.1	2.9	2.8	2.4	1.1	1.3	0.9	0.9	1.2	1.2	2.2	3.3																							
13-Jan	1.5	Z	1.0	0.7	0.5	0.4	0.1	0.1	0.1	0.0	C	C	C	C	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.3	1.5																							
14-Jan	0.1	0.1	Z	0.1	0.0	0.1	0.2	0.3	0.8	1.0	0.7	1.1	1.7	1.2	1.0	0.8	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.7																							
15-Jan	0.1	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.2	0.3																							
16-Jan	0.2	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.7	0.1	0.7																							
17-Jan	0.3	0.1	0.1	0.1	0.1	Z	0.1	0.3	0.3	0.3	0.5	0.8	1.6	0.8	0.5	0.6	0.8	0.6	0.3	0.4	0.4	0.4	0.5	0.6	0.4	1.6																							
18-Jan	Z	0.9	1.3	0.7	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.5	1.1	0.7	1.2	0.8	0.4	0.3	0.7	1.5	4.6	5.0	3.7	1.2	5.0																							
19-Jan	1.3	Z	0.7	0.7	1.7	3.3	3.9	4.3	5.2	2.9	2.8	2.4	1.0	0.9	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.4	1.5	5.2																							
20-Jan	0.3	0.3	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																							
21-Jan	0.0	0.0	0.0	Z	0.4	0.3	0.8	1.8	2.4	3.1	3.7	4.7	3.4	3.7	3.1	2.3	1.6	1.0	0.5	0.3	0.3	0.2	0.1	0.1	1.5	4.7																							
22-Jan	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1																							
23-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.4																							
24-Jan	Z	1.7	2.1	1.3	5.7	4.8	2.2	4.5	6.4	6.9	4.0	2.4	1.5	1.2	1.3	1.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	2.1	6.9																							
25-Jan	0.0	Z	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	1.4	1.5	1.0	0.7	0.7	1.1	2.1	6.2	13.4	6.2	1.6	13.4																							
26-Jan	1.7	1.5	Z	1.0	0.6	0.4	0.6	0.3	0.6	1.3	1.2	0.7	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.6	1.7																							
27-Jan	0.2	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.5																							
28-Jan	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2																							
29-Jan	0.1	0.2	0.1	0.1	0.1	Z	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.8	1.8	2.0	0.8	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.3	2.0																							
30-Jan	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.4	0.1	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.4	0.6	1.0	0.6	0.5	0.5	0.3	1.0																							
31-Jan	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.4	0.3	0.1	0.4	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.3	0.7																							
																								0.6	0.9	0.7	0.8	1.0	0.9	0.7	0.9	1.1	0.9	0.9	0.9	1.1	1.2	1.1	1.1	0.8	0.6	0.6	0.6	0.7	1.0	1.2	0.9	Diurnal Average	
																								2.0	7.0	3.0	4.6	5.7	4.8	3.9	4.5	6.4	6.9	4.0	4.7	4.7	6.7	6.2	5.4	3.8	4.4	4.9	4.1	4.2	6.2	13.4	6.2	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	42	54	25	10	8	10	16	192	131	37	34	18	19	16	17	75	704
11 - 20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	25	10	8	10	16	193	131	37	34	18	19	16	17	75	705

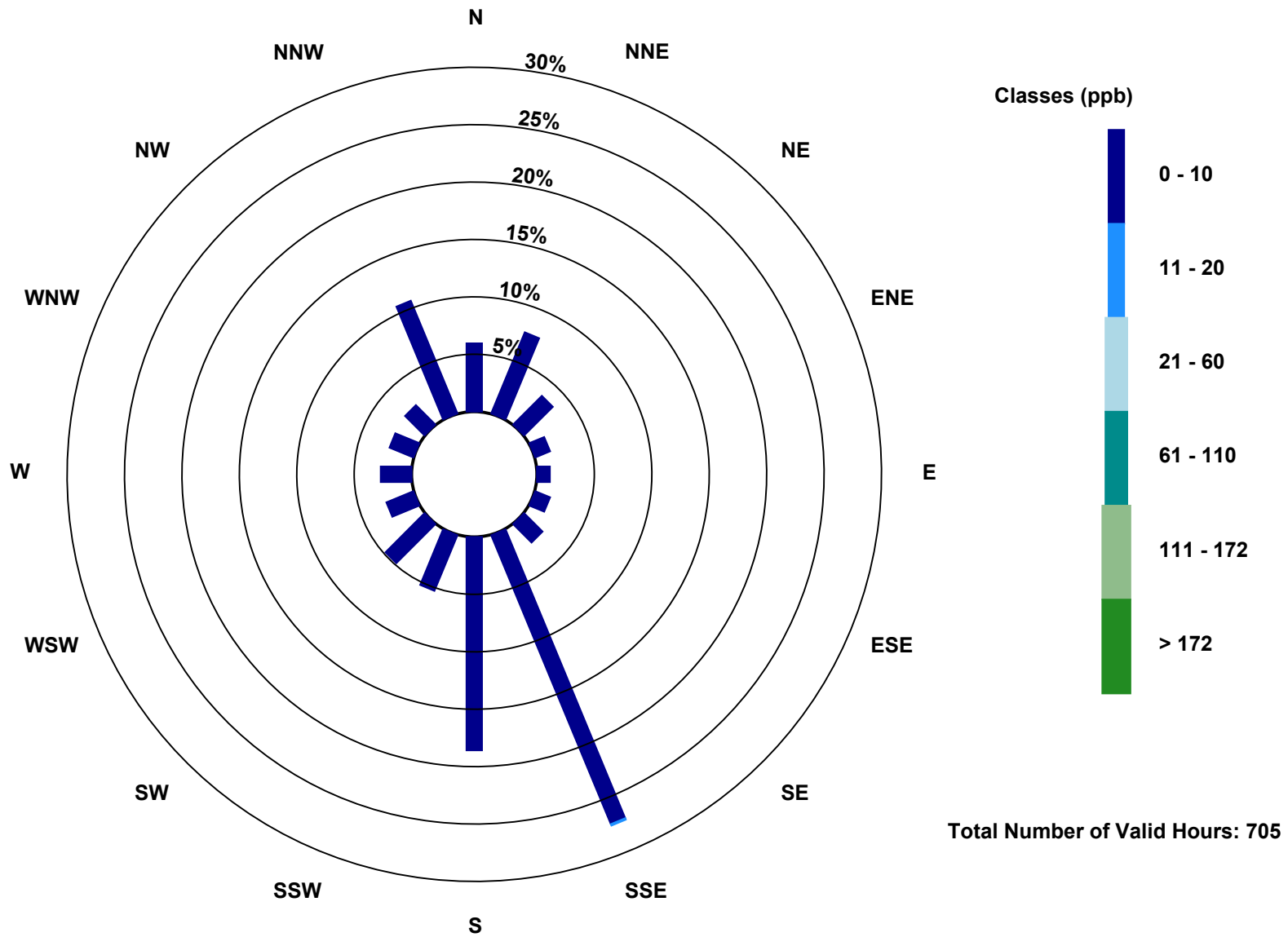
Total Number of Valid Hours: 705

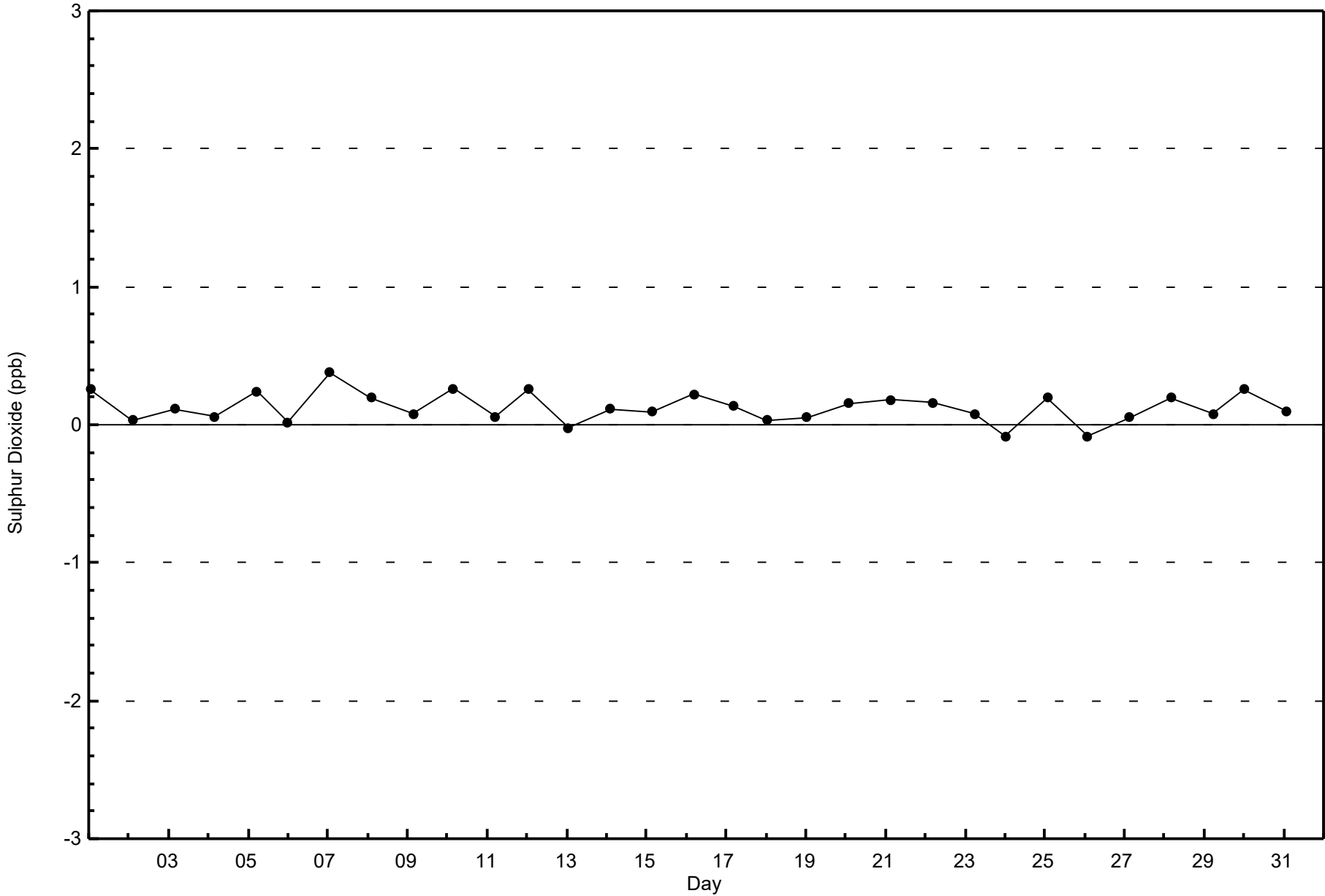
Total Number of Hours: 744

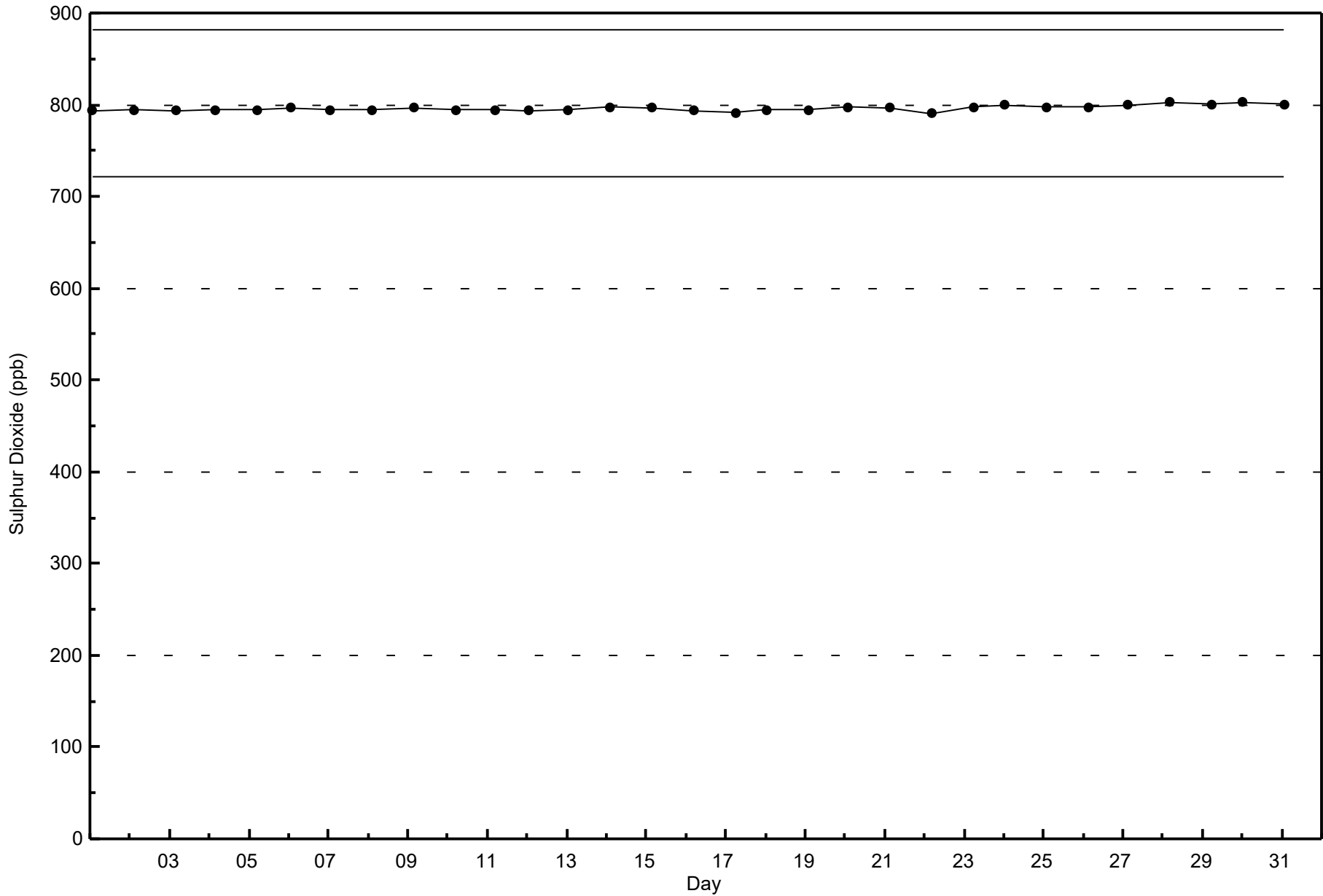


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Barge Landing









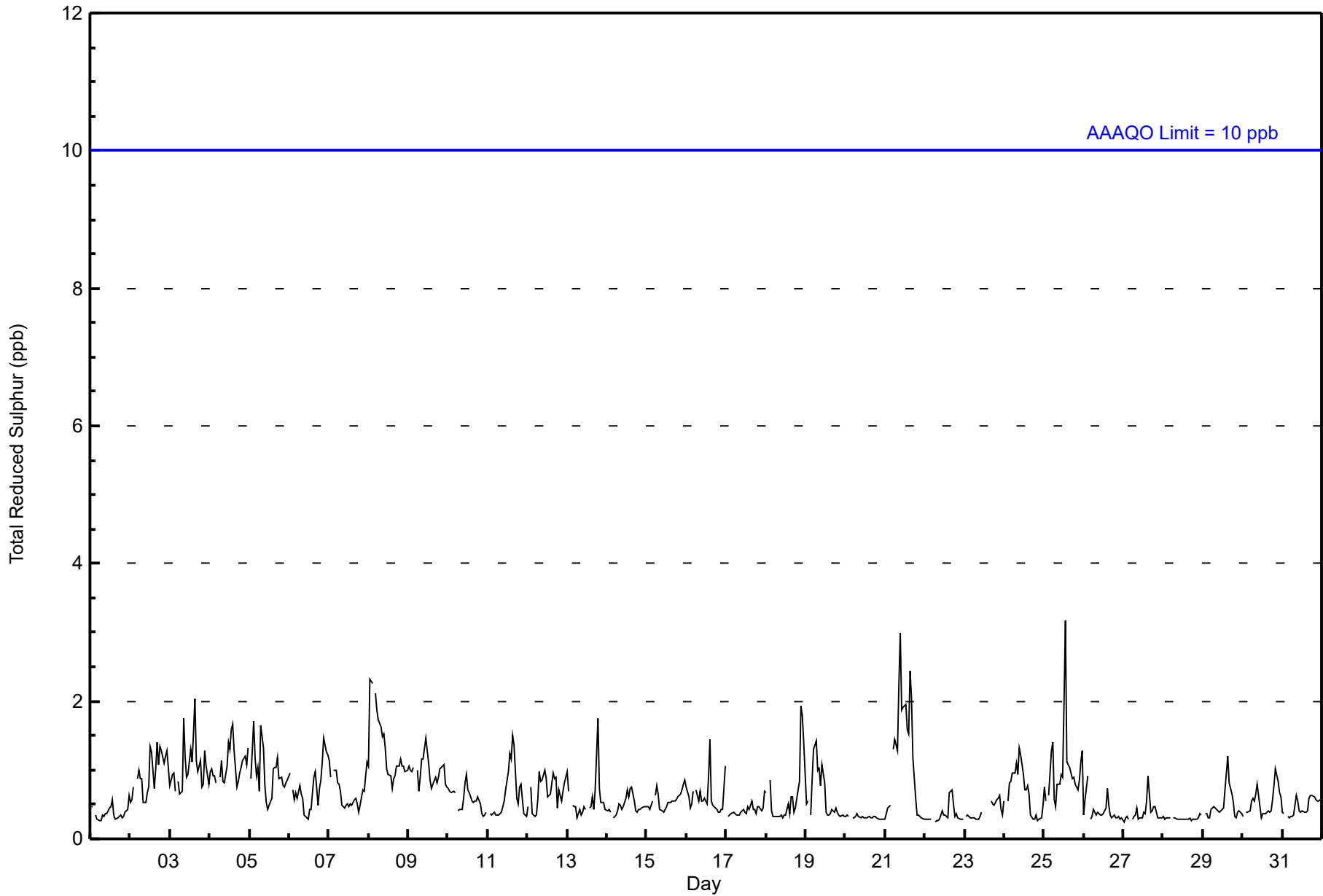
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Barge Landing - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																		Hours in Service: 744																															
Maximum Value: 3.2 ppb on Jan 25 14:00																		Maximum Daily Average: 1.3 ppb on Jan 8																															
Minimum Value: 0.2 ppb on Jan 22 07:00																		Hours of Data: 707																															
Maximum Diurnal Average: 0.8 ppb at hour 16																		Hours of Missing Data: 37																															
Monthly Average: 0.66 ppb																		Hours of Calibration: 36																															
Minimum Daily Average: 0.3 ppb on Jan 28																		Percent Operational Time: 99.9																															
Minimum Diurnal Average: 0.5 ppb at hour 4																		Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.9 P ₉₀ = 1.2 P ₉₉ = 2.1																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.5	0.5	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.4	0.6																							
2-Jan	0.5	0.6	0.8	Z	0.9	1.0	0.9	0.9	0.5	0.5	0.7	0.8	1.3	1.3	0.7	1.0	1.4	1.1	1.3	1.3	1.1	1.2	1.3	1.0	1.0	1.4																							
3-Jan	0.8	0.9	1.0	0.7	Z	0.8	0.6	0.7	1.7	1.2	0.9	0.9	1.3	1.1	1.5	2.0	1.1	1.0	1.1	0.7	0.8	1.3	1.0	0.8	1.1	2.0																							
4-Jan	1.0	1.0	0.9	0.9	0.8	Z	0.9	1.1	0.8	0.8	1.1	1.4	1.3	1.6	1.7	1.3	0.7	0.8	1.0	1.0	1.1	1.2	1.1	1.3	1.1	1.7																							
5-Jan	Z	0.9	1.7	1.2	0.9	1.0	0.7	1.7	1.3	0.8	0.5	0.4	0.5	0.6	1.0	1.0	1.0	1.2	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.7																							
6-Jan	0.9	Z	0.7	0.6	0.7	0.6	0.8	0.6	0.6	0.4	0.3	0.3	0.4	0.4	0.7	0.9	1.0	0.5	0.7	0.9	1.1	1.5	1.3	1.2	0.7	1.5																							
7-Jan	1.1	0.9	Z	1.0	1.0	0.8	0.8	0.7	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.5	0.7	0.7	0.9	1.1	0.7	1.1																							
8-Jan	1.1	2.3	2.2	Z	2.1	1.9	1.7	1.6	1.5	1.5	1.3	1.0	0.9	0.9	0.7	0.9	0.9	1.1	1.1	1.2	1.1	1.0	1.0	1.0	1.3	2.3																							
9-Jan	1.0	1.0	1.0	1.0	Z	1.0	0.7	0.9	1.2	1.2	1.5	1.3	1.1	0.9	0.7	0.8	0.9	0.8	0.9	1.0	1.0	1.1	0.8	0.7	1.0	1.5																							
10-Jan	0.7	0.7	0.7	0.7	0.7	Z	0.4	0.4	0.4	0.6	0.8	0.9	0.7	0.7	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.3	0.3	0.4	0.6	0.9																							
11-Jan	Z	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7	1.0	1.2	1.2	1.5	1.4	0.6	0.5	0.7	0.8	0.6	0.4	0.3	0.6	1.5																							
12-Jan	0.5	Z	0.8	0.4	0.3	0.3	0.6	1.0	0.8	0.9	1.0	0.9	0.6	0.6	0.6	1.0	0.9	0.9	0.4	0.7	0.5	0.7	0.8	0.9	0.7	1.0																							
13-Jan	1.0	0.7	Z	0.5	0.5	0.5	0.3	0.4	0.3	0.4	0.5	0.4	M	0.4	0.5	0.6	0.4	0.7	1.7	0.7	0.5	0.5	0.5	0.4	0.6	1.7																							
14-Jan	0.4	0.4	0.4	Z	0.3	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.7	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.7	1.3																						
15-Jan	0.5	0.5	0.4	0.5	Z	0.6	0.8	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	0.6	0.9																							
16-Jan	0.7	0.6	0.5	0.5	0.7	Z	0.7	0.6	0.7	0.5	0.5	0.6	0.5	0.9	1.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	1.1	0.6	1.4																							
17-Jan	Z	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.6	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.7	0.4	0.7																							
18-Jan	0.7	Z	0.8	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.5	0.4	0.6	0.6	0.4	0.5	0.7	0.8	1.9	1.8	1.4	0.6	1.9																							
19-Jan	0.5	0.6	Z	0.3	0.8	1.3	1.4	1.0	1.0	0.8	1.1	0.8	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.6	1.4																							
20-Jan	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4																							
21-Jan	0.3	0.4	0.5	0.5	Z	1.3	1.5	1.3	2.2	3.0	1.9	1.9	2.0	1.6	1.5	2.4	2.1	1.2	0.6	0.4	0.3	0.3	0.3	0.3	1.2	3.0																							
22-Jan	0.3	0.3	0.3	0.3	0.3	Z	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.7	0.7	0.5	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.7																							
23-Jan	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	C	C	C	C	C	0.6	0.5	0.5	0.6	0.6	0.6	0.4	0.4	0.4	0.6																							
24-Jan	0.5	Z	0.6	0.8	0.8	1.0	1.0	1.1	0.9	1.3	1.2	0.9	0.7	0.7	0.8	0.7	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.5	0.7	1.3																							
25-Jan	0.7	0.5	Z	0.6	1.3	1.4	0.6	0.5	0.8	0.8	0.9	0.9	2.0	3.2	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.9	1.1	1.3	3.2																							
26-Jan	0.3	0.6	0.9	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.9																							
27-Jan	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.9	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.9																							
28-Jan	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4																							
29-Jan	Z	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1.0	1.2	0.8	0.7	0.5	0.3	0.3	0.4	0.4	0.4	0.5	1.2																							
30-Jan	0.3	Z	0.4	0.4	0.4	0.5	0.6	0.5	0.7	0.8	0.5	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.8	1.0	0.8	0.7	0.6	1.0																							
31-Jan	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.6																							
																								0.6	0.6	0.7	0.5	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	Diurnal Average	
																								1.1	2.3	2.2	1.2	2.1	1.9	1.7	1.7	2.2	3.0	1.9	1.9	2.0	3.2	1.7	2.4	2.1	1.2	1.7	1.3	1.1	1.9	1.8	1.4	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	99.72	99.72
3 - 4	2	0.28	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	41	52	28	11	7	11	16	192	133	36	34	19	17	17	16	71	701
3 - 4	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	52	28	11	7	11	16	193	133	36	34	20	17	17	16	71	703

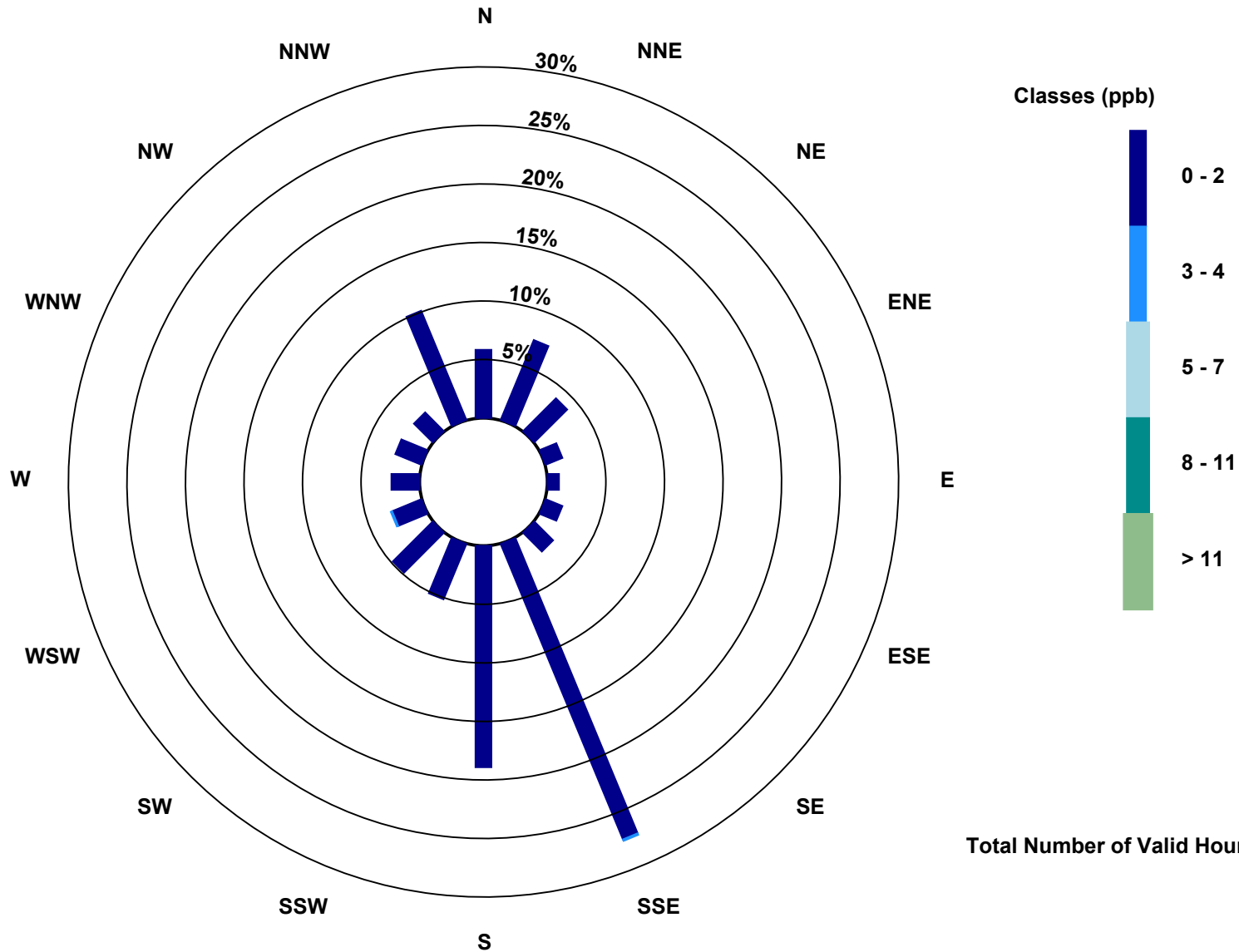
Total Number of Valid Hours: 703

Total Number of Hours: 744

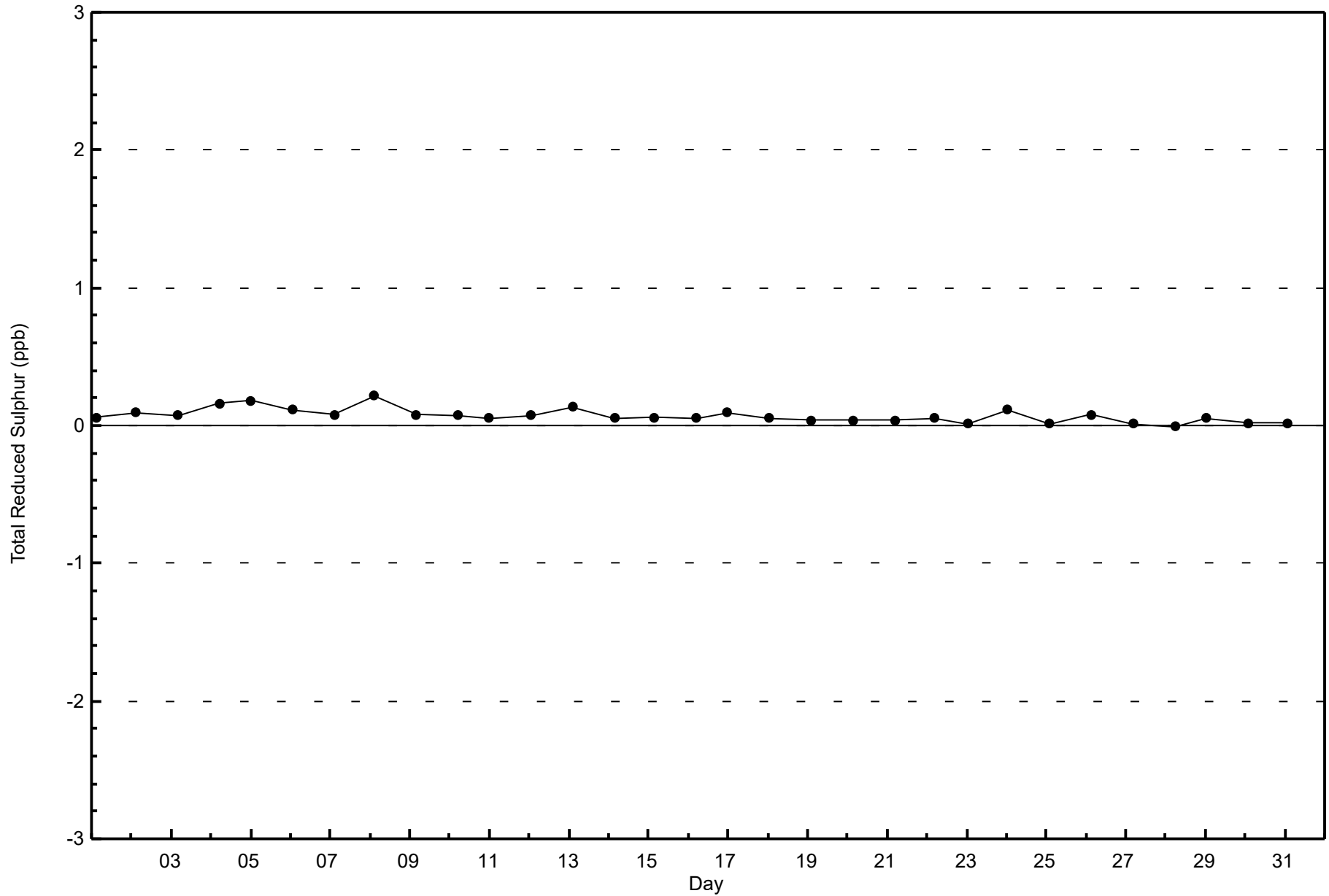


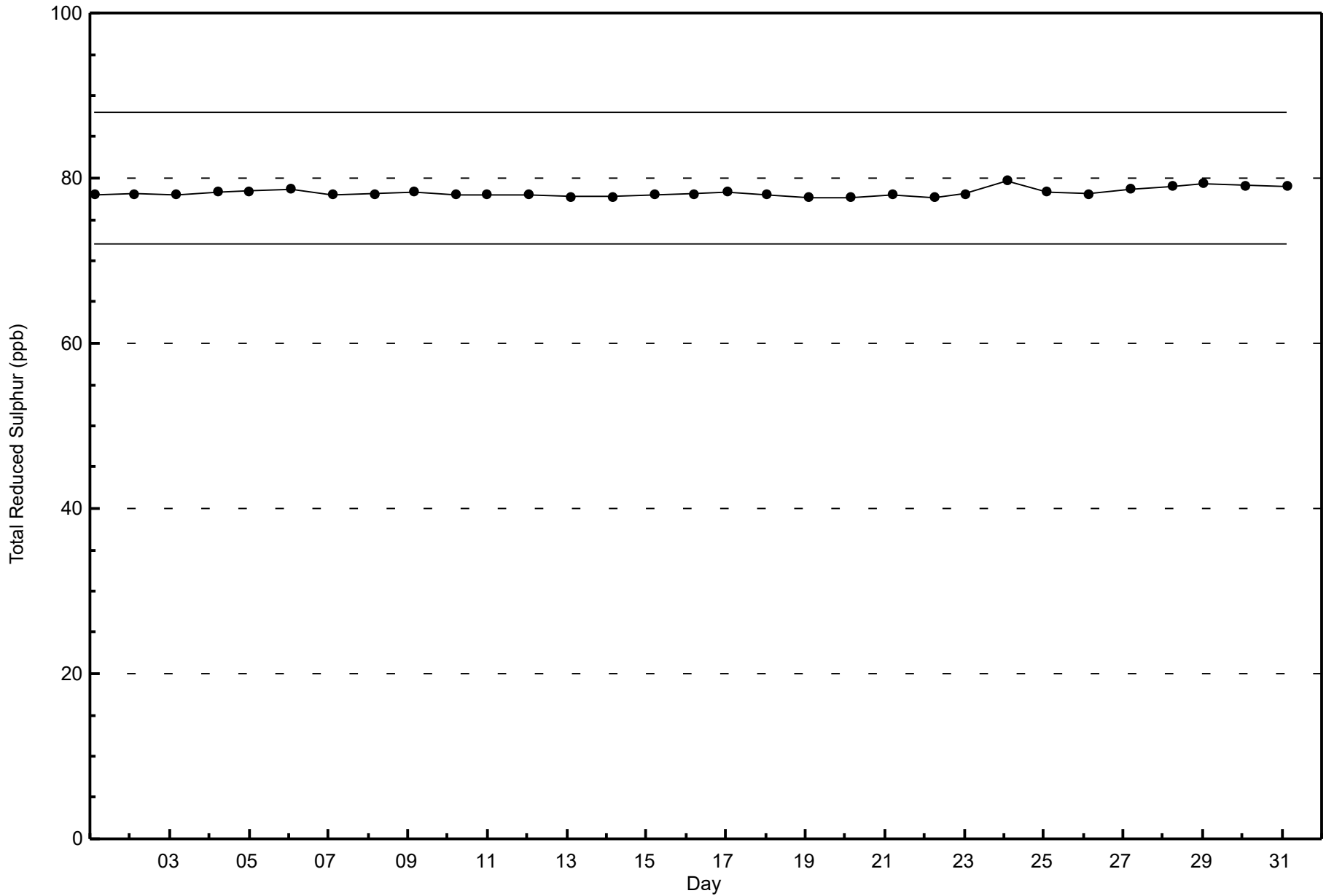
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Barge Landing



Total Number of Valid Hours: 703







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

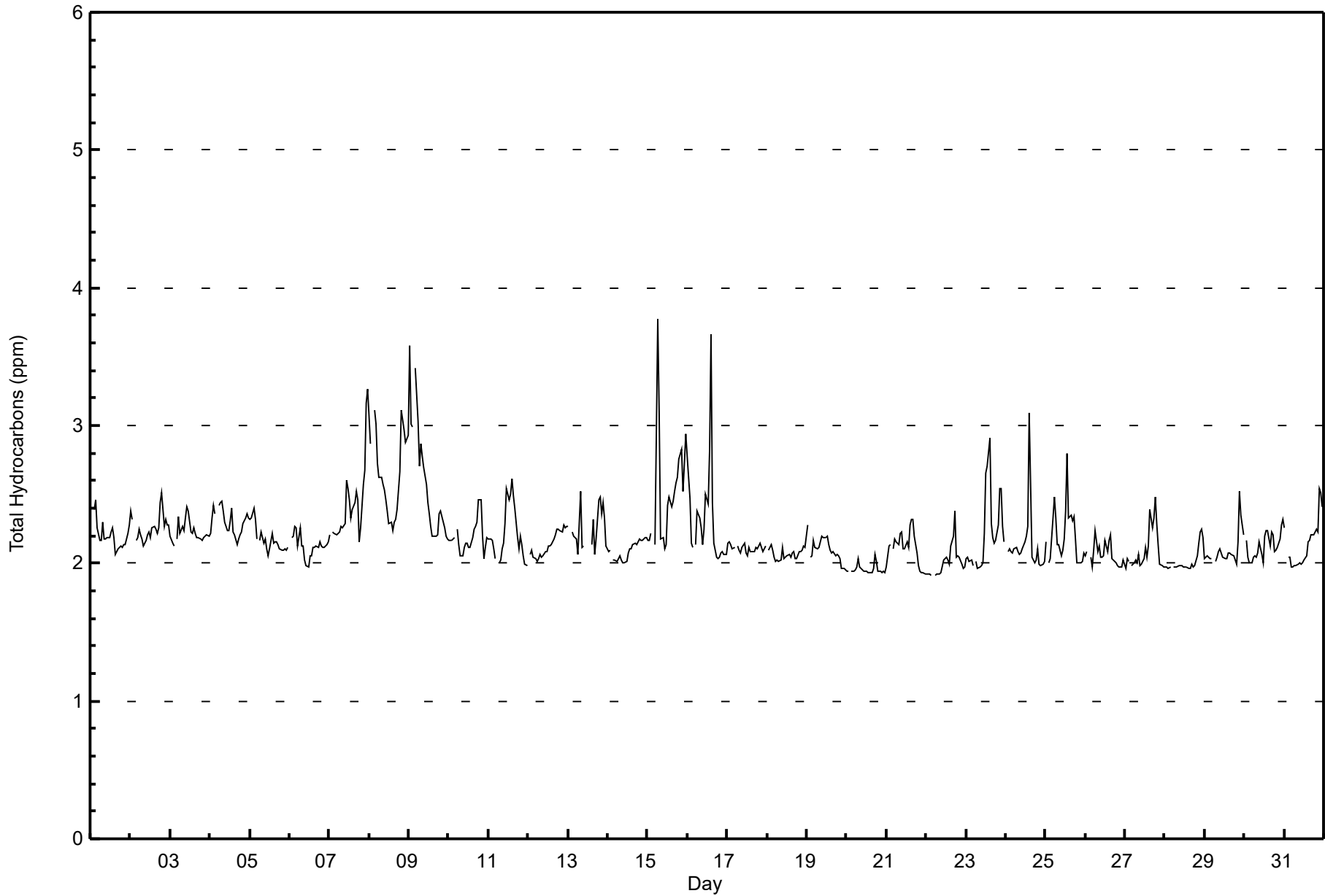
Barge Landing - January 2023

Maximum Value: 3.8 ppm on Jan 15 07:00		Maximum Daily Average: 2.7 ppm on Jan 8		Hours in Service: 744																							
Minimum Value: 1.9 ppm on Jan 22 06:00		Minimum Daily Average: 2.0 ppm on Jan 20		Hours of Data: 709																							
Maximum Diurnal Average: 2.3 ppm at hour 15		Minimum Diurnal Average: 2.1 ppm at hour 10		Hours of Missing Data: 35																							
Monthly Average: 2.20 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.5 P ₉₉ = 3.1		Hours of Calibration: 35																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	2.3	Z	2.4	2.5	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.5	
2-Jan	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.4	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.5
3-Jan	2.2	2.1	2.1	Z	2.2	2.3	2.2	2.3	2.2	2.3	2.4	2.4	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
4-Jan	2.2	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.3	2.4	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4	2.4
5-Jan	2.3	2.3	2.4	2.3	2.2	Z	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4
6-Jan	Z	2.2	2.2	2.3	2.3	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3
7-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.6	2.5	2.5	2.3	2.4	2.4	2.5	2.5	2.2	2.3	2.6	2.7	3.2	3.3	2.4	3.3	
8-Jan	3.1	2.9	Z	3.1	3.0	2.7	2.6	2.6	2.6	2.5	2.5	2.4	2.3	2.3	2.2	2.3	2.3	2.4	2.7	3.1	3.0	3.0	2.9	2.9	2.7	3.1	
9-Jan	3.6	3.0	3.0	Z	3.4	3.0	2.7	2.9	2.8	2.7	2.6	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.2	2.2	2.6	3.6	
10-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.5	2.5	2.2	2.0	2.1	2.2	2.2	2.5	
11-Jan	2.2	2.2	2.2	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.3	2.5	2.5	2.5	2.6	2.5	2.4	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.2	2.6	
12-Jan	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.3	
13-Jan	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.5	2.1	2.1	2.1	C	C	C	C	2.1	2.3	2.1	2.2	2.5	2.5	2.4	2.4	2.3	2.1	2.3	
14-Jan	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	
15-Jan	2.2	2.2	2.2	Z	2.1	2.9	3.8	3.1	2.2	2.2	2.1	2.1	2.4	2.5	2.4	2.5	2.5	2.6	2.6	2.8	2.8	2.5	2.7	2.9	2.5	3.8	
16-Jan	2.8	2.5	2.1	2.1	Z	2.1	2.4	2.3	2.3	2.1	2.2	2.5	2.4	2.8	3.7	2.4	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	3.7	
17-Jan	2.1	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
18-Jan	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	
19-Jan	2.3	Z	2.0	2.0	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3	
20-Jan	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	
21-Jan	2.0	2.1	2.1	Z	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.2	2.1	2.3	2.3	2.3	2.2	2.1	2.0	1.9	1.9	1.9	1.9	2.1	2.3	
22-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.4	
23-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.6	2.7	2.9	2.3	2.2	2.1	2.2	2.3	2.5	2.5	2.3	2.2	2.2	2.9	
24-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	3.1	2.6	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	3.1	
25-Jan	2.2	Z	2.0	2.0	2.3	2.5	2.3	2.1	2.1	2.1	2.1	2.2	2.4	2.8	2.3	2.3	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.2	2.8	
26-Jan	2.1	2.1	Z	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.4	2.3	2.3	2.5	2.3	2.1	2.0	2.0	2.0	2.1	2.5	
28-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	
29-Jan	2.0	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.5	2.3	2.2	2.1	2.5	
30-Jan	Z	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.0	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.1	2.3	
31-Jan	2.3	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.4	2.1	2.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Barge Landing - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Barge Landing - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	184	25.95	25.95
2.1 - 3.0	514	72.50	98.45
3.1 - 10.0	11	1.55	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Barge Landing - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	7	28	11	6	3	2	4	23	19	11	23	12	15	9	4	6	183
2.1 - 3.0	32	25	14	4	5	7	12	168	111	25	11	6	4	7	13	67	511
3.1 - 10.0	3	1	0	0	0	1	0	2	1	1	0	0	0	0	0	2	11
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	25	10	8	10	16	193	131	37	34	18	19	16	17	75	705

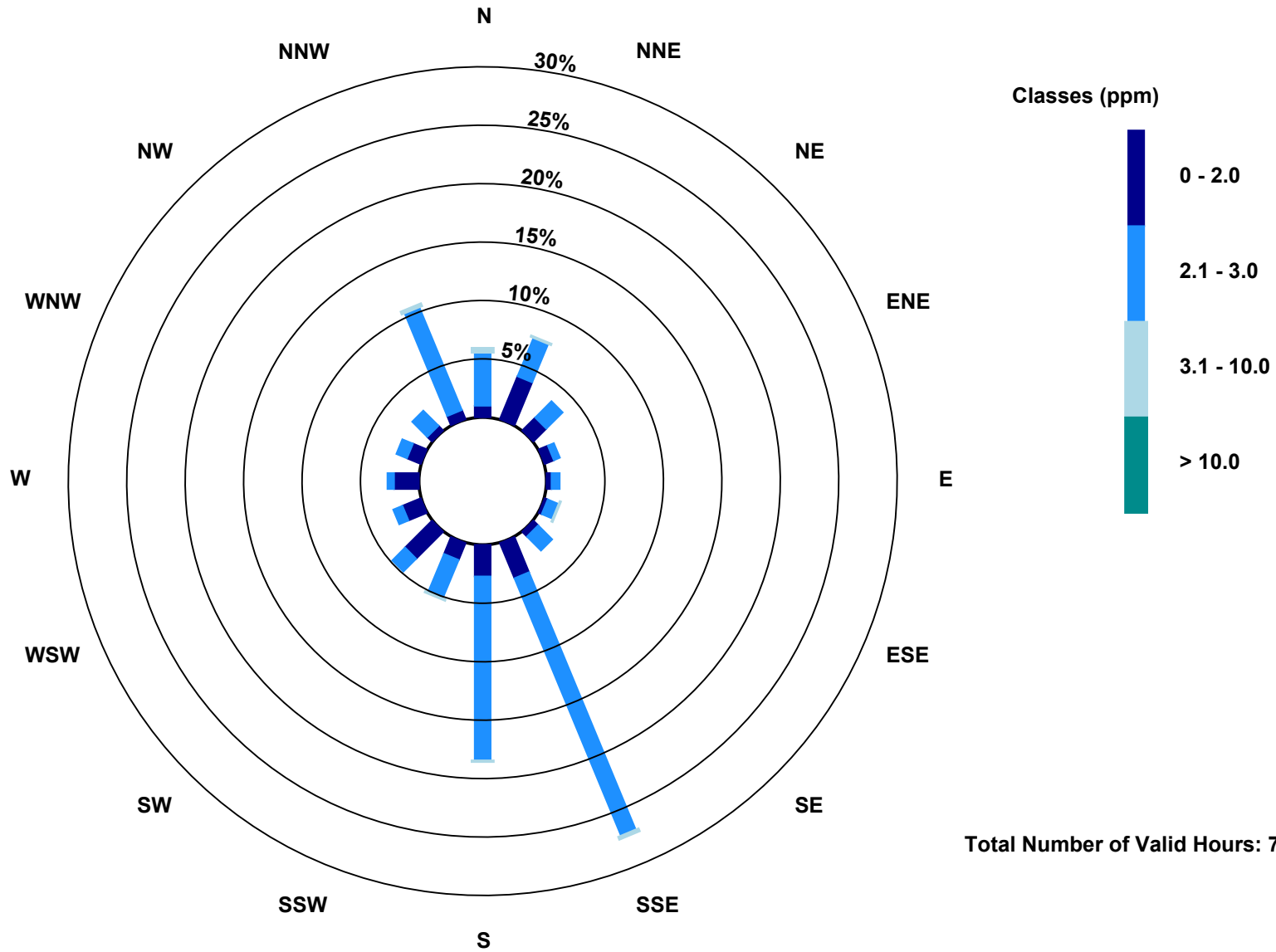
Total Number of Valid Hours: 705

Total Number of Hours: 744

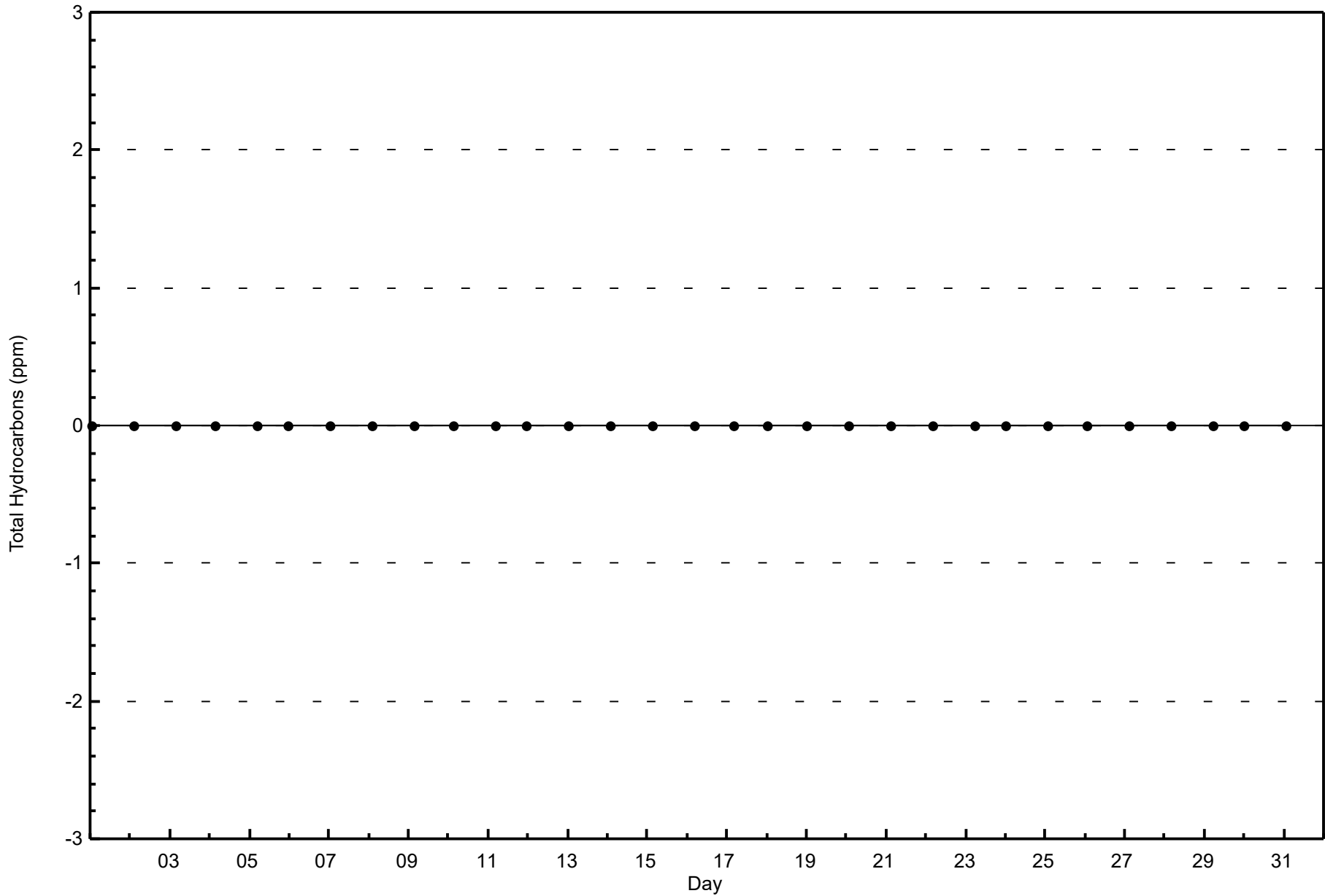


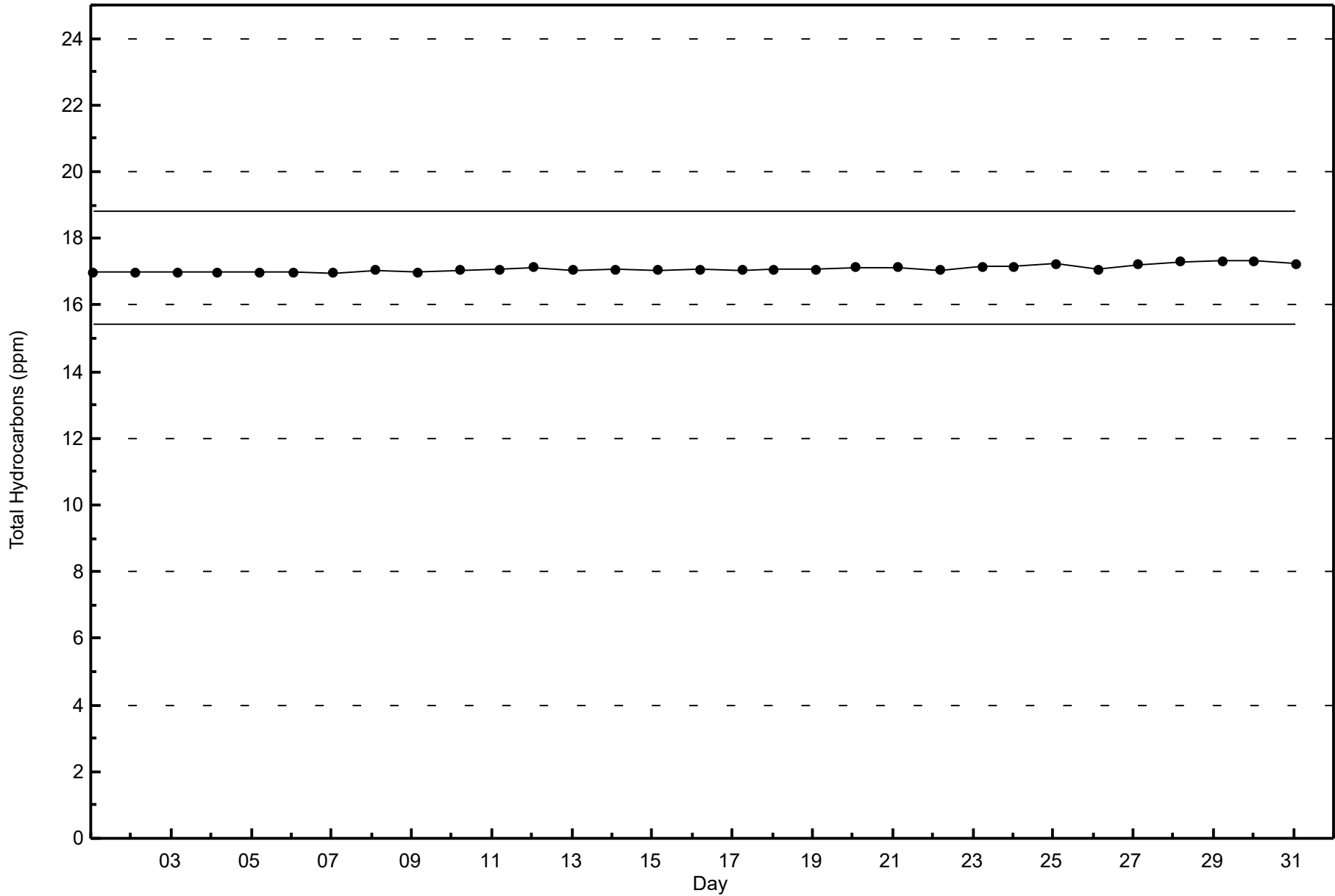
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Barge Landing



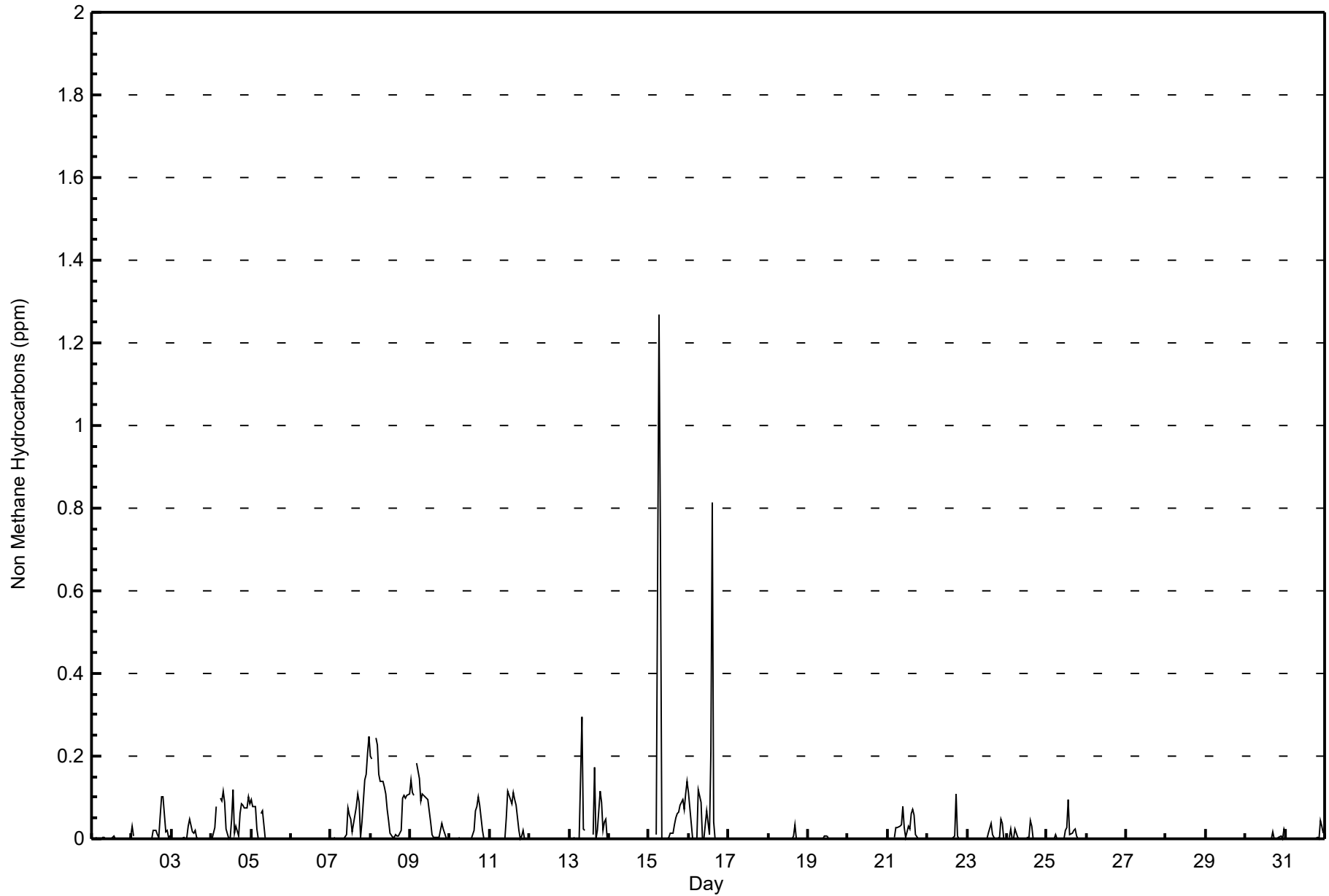
Total Number of Valid Hours: 705







Maximum Value: 1.268 ppm on Jan 15 07:00		Maximum Daily Average: 0.147 ppm on Jan 15		Hours in Service: 744																						
Minimum Value: 0.000 ppm on Jan 1 04:00		Minimum Daily Average: 0.000 ppm on Jan 12		Hours of Data: 709																						
Maximum Diurnal Average: 0.058 ppm at hour 7		Minimum Diurnal Average: 0.009 ppm at hour 3		Hours of Missing Data: 35																						
Monthly Average: 0.022 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.2		Hours of Calibration: 35																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.002	Z	0.002	0.000	0.000	0.000	0.004	0.003	0.000	0.000	0.001	0.000	0.004	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.001	0.008	
2-Jan	0.032	0.008	Z	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.020	0.009	0.003	0.053	0.101	0.100	0.018	0.019	0.005	0.005	0.017	0.101	
3-Jan	0.000	0.000	0.000	Z	0.001	0.001	0.001	0.002	0.000	0.002	0.030	0.047	0.016	0.012	0.019	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.047	
4-Jan	0.001	0.014	0.028	0.077	Z	0.099	0.093	0.117	0.088	0.022	0.000	0.003	0.046	0.118	0.014	0.032	0.008	0.062	0.085	0.083	0.074	0.076	0.102	0.085	0.058	0.118
5-Jan	0.097	0.077	0.078	0.025	0.001	Z	0.062	0.068	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.097	
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
7-Jan	0.001	Z	0.005	0.000	0.000	0.002	0.000	0.001	0.001	0.009	0.075	0.058	0.047	0.016	0.038	0.077	0.109	0.087	0.002	0.040	0.141	0.158	0.208	0.247	0.057	0.247
8-Jan	0.201	0.192	Z	0.245	0.227	0.156	0.138	0.139	0.126	0.109	0.072	0.044	0.015	0.004	0.002	0.010	0.008	0.008	0.021	0.098	0.106	0.098	0.104	0.108	0.097	0.245
9-Jan	0.142	0.112	0.105	Z	0.184	0.146	0.092	0.110	0.106	0.100	0.096	0.068	0.040	0.012	0.003	0.005	0.004	0.003	0.019	0.036	0.025	0.005	0.000	0.000	0.061	0.184
10-Jan	0.000	0.000	0.000	0.000	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.067	0.078	0.101	0.081	0.021	0.000	0.000	0.000	0.016	0.101	
11-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.052	0.117	0.095	0.086	0.111	0.094	0.082	0.020	0.000	0.008	0.019	0.000	0.000	0.030	0.117	
12-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Jan	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.294	0.025	0.022	C	C	C	C	0.009	0.174	0.000	0.020	0.114	0.087	0.020	0.042	0.046	0.000	0.045	0.294
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Jan	0.000	0.000	0.000	Z	0.010	0.635	1.268	0.722	0.000	0.000	0.000	0.000	0.005	0.013	0.013	0.036	0.051	0.060	0.064	0.082	0.095	0.071	0.108	0.138	0.147	1.268
16-Jan	0.113	0.037	0.000	0.000	Z	0.000	0.117	0.089	0.001	0.000	0.033	0.069	0.012	0.209	0.814	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.067	0.814	
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	
18-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.035	
19-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.008	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008	
20-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21-Jan	0.000	0.000	0.000	Z	0.003	0.027	0.027	0.030	0.032	0.080	0.028	0.005	0.031	0.023	0.061	0.072	0.057	0.010	0.000	0.000	0.000	0.000	0.000	0.021	0.080	
22-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.007	0.109	0.005	0.000	0.000	0.000	0.000	0.000	0.005	0.109	
23-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.001	0.013	0.039	0.010	0.002	0.000	0.001	0.005	0.048	0.037	0.000	0.000	0.007	0.048	
24-Jan	Z	0.003	0.024	0.001	0.002	0.024	0.003	0.000	0.001	0.000	0.000	0.000	0.005	0.002	0.043	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.043	
25-Jan	0.000	Z	0.000	0.001	0.001	0.009	0.000	0.000	0.000	0.000	0.001	0.019	0.028	0.097	0.009	0.014	0.021	0.024	0.006	0.000	0.000	0.000	0.000	0.010	0.097	
26-Jan	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
27-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
28-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.000	0.000	0.000	0.002	0.006	0.000	0.024	0.024	
31-Jan	0.012	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.045	0.031	0.012	0.005	0.045
		0.023	0.018	0.009	0.014	0.017	0.042	0.058	0.051	0.012	0.011	0.013	0.015	0.011	0.021	0.039	0.022	0.016	0.018	0.016	0.018	0.018	0.018	0.020	0.020	Diurnal Average
		0.201	0.192	0.105	0.245	0.227	0.635	1.268	0.722	0.126	0.109	0.096	0.117	0.095	0.209	0.814	0.174	0.109	0.109	0.114	0.100	0.141	0.158	0.208	0.247	Diurnal Maximum
Z - zerospan		C - Calibration																								





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	521	73.48	73.48
0.006 - 0.05	97	13.68	87.17
0.06 - 0.1	75	10.58	97.74
> 0.1	16	2.26	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	28	43	19	9	8	7	14	130	106	32	31	14	16	13	12	37	519
0.006 - 0.05	4	7	4	1	0	1	2	34	15	1	0	2	1	3	2	20	97
0.06 - 0.1	7	1	1	0	0	1	0	25	8	3	3	1	2	0	3	18	73
> 0.1	3	3	1	0	0	1	0	4	2	1	0	1	0	0	0	0	16
Totals	42	54	25	10	8	10	16	193	131	37	34	18	19	16	17	75	705

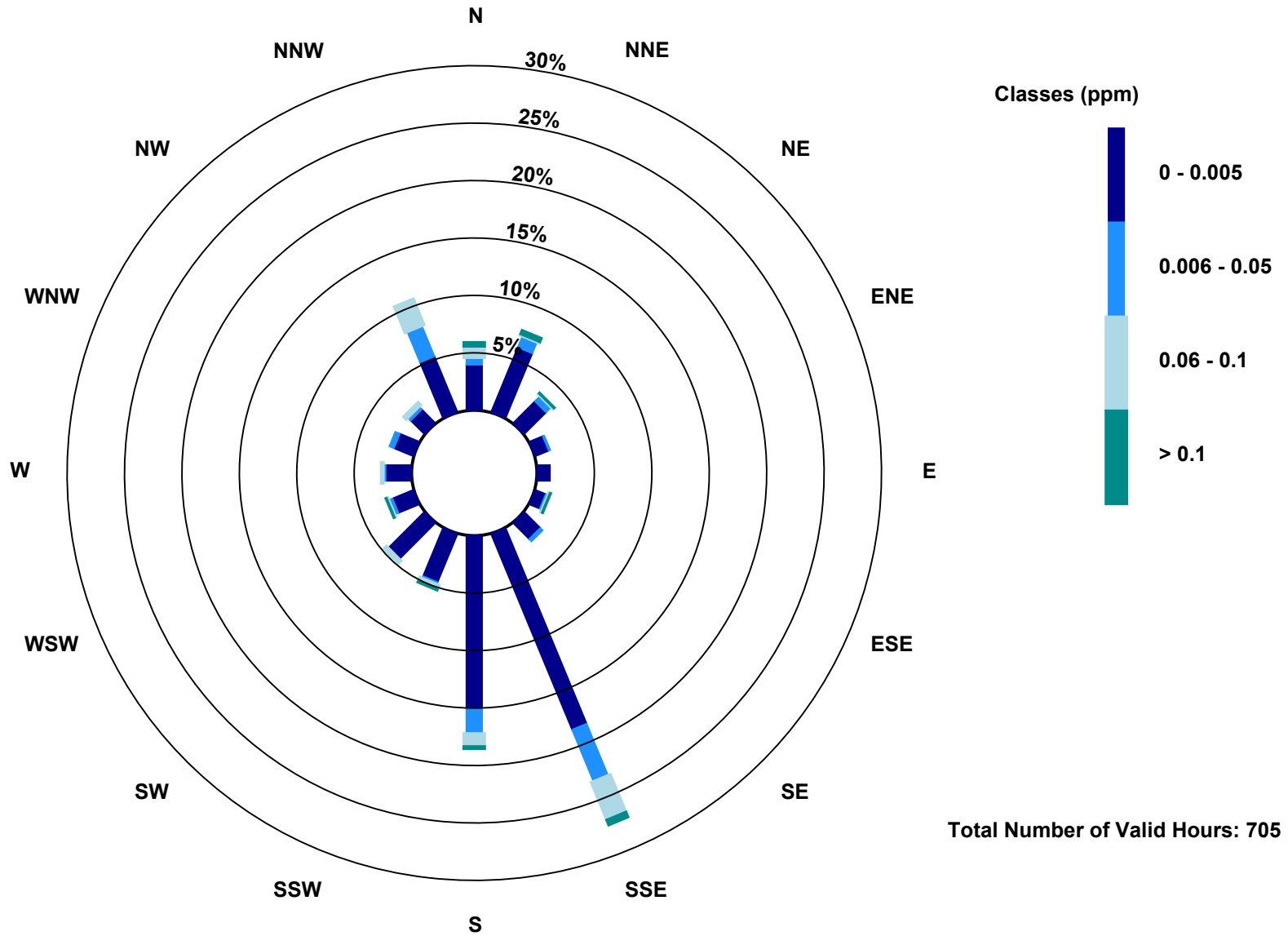
Total Number of Valid Hours: 705

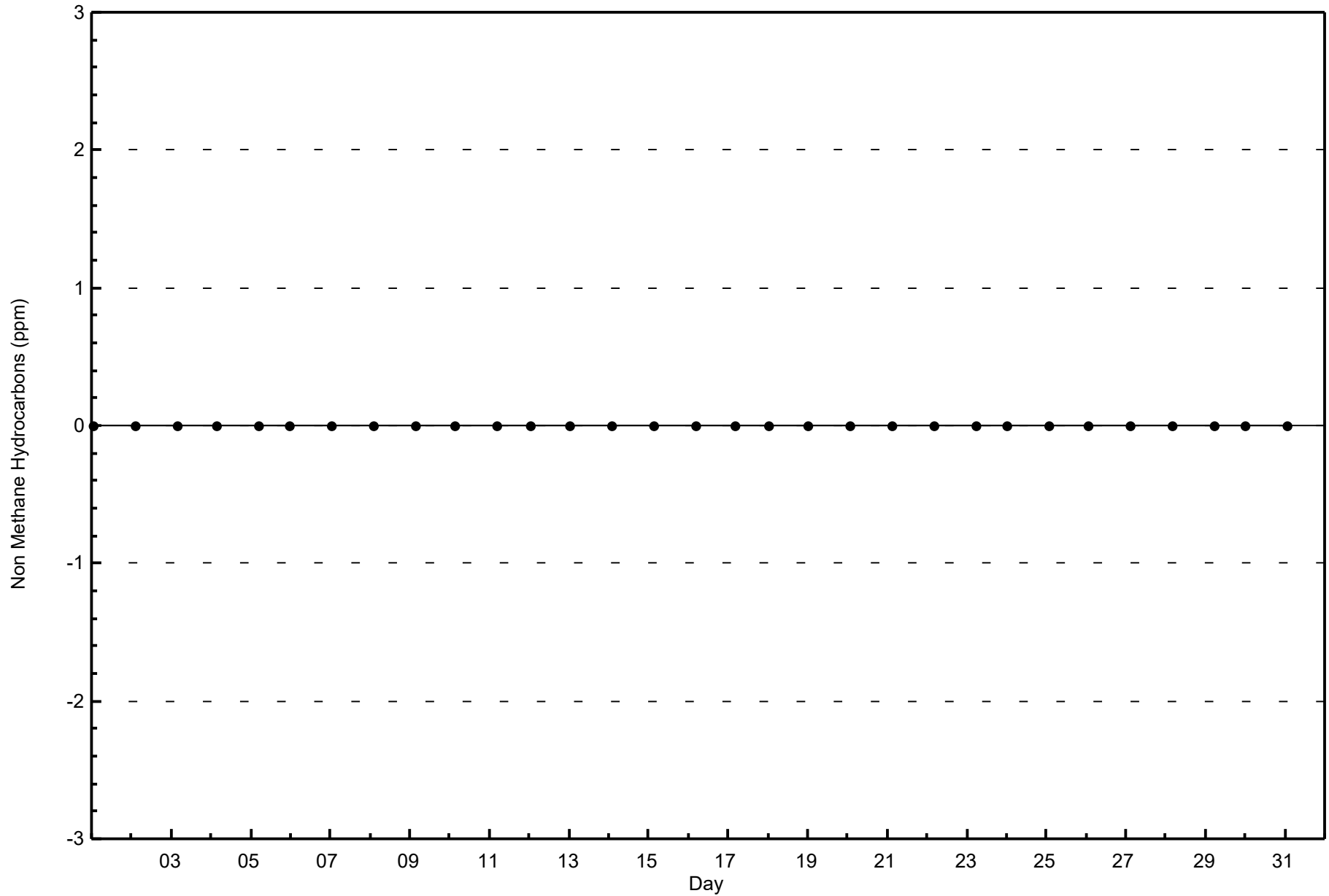
Total Number of Hours: 744

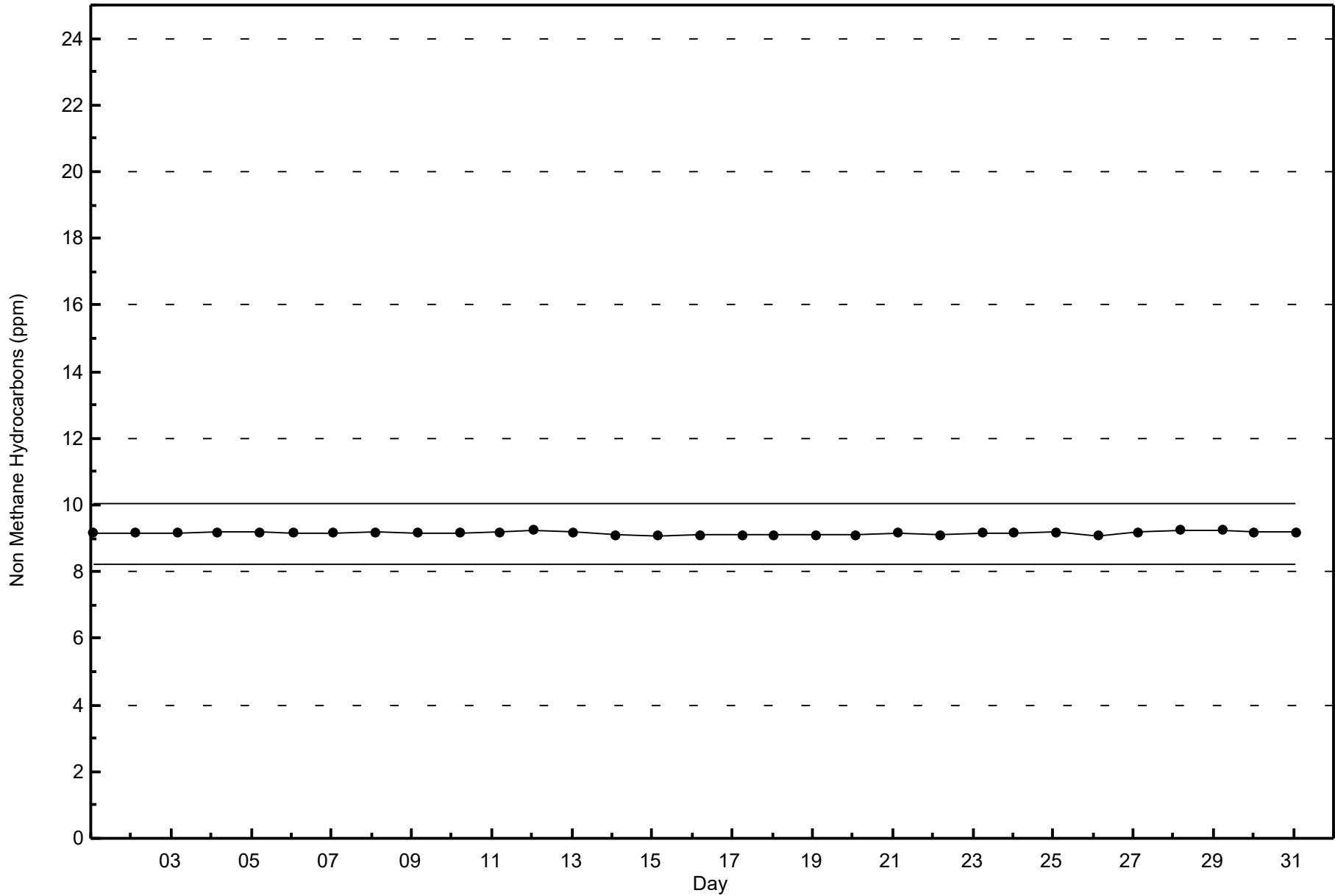


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing

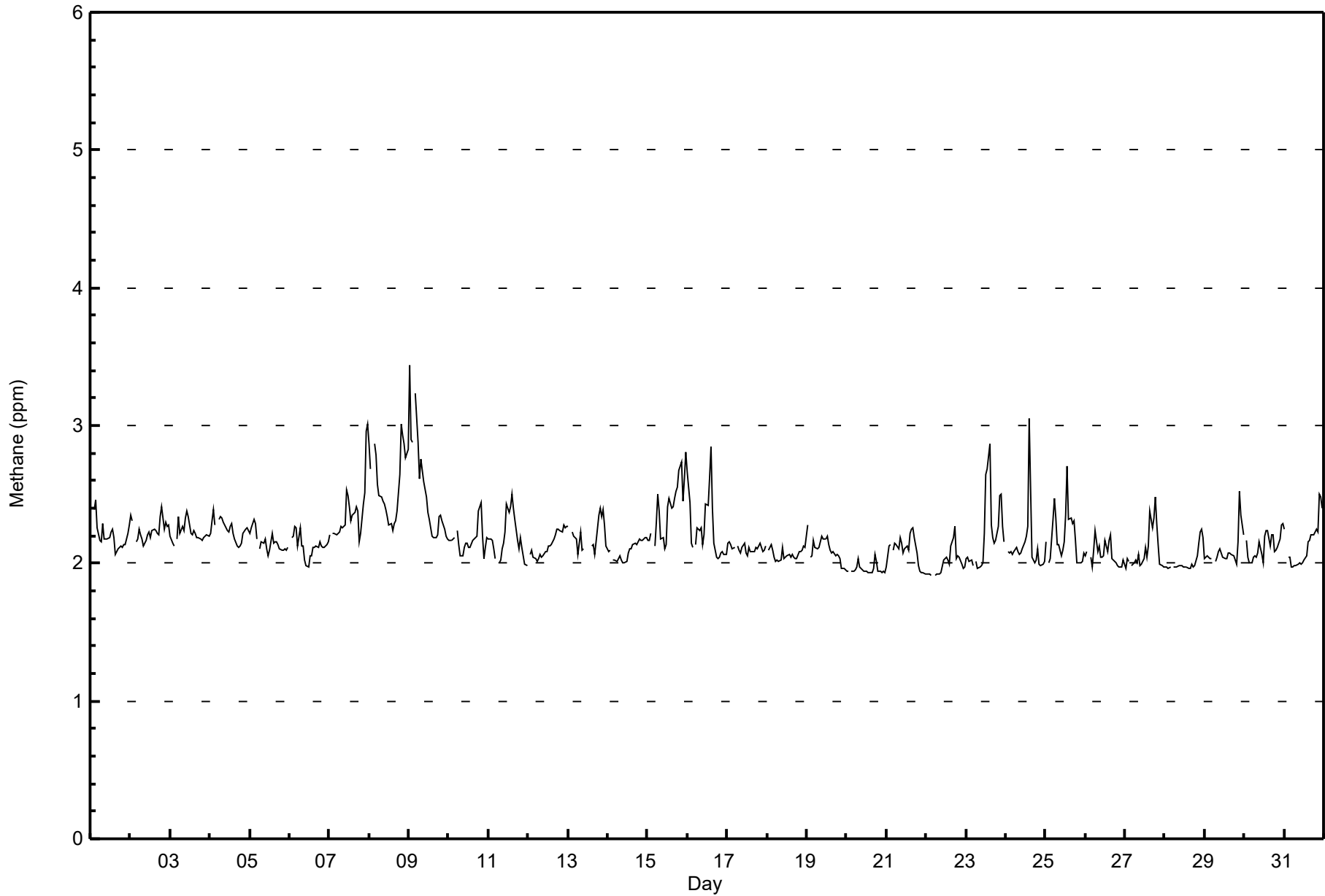








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																Daily Average		Daily Maximum			
Maximum Value: 3.4 ppm on Jan 9 01:00		Maximum Daily Average: 2.6 ppm on Jan 8		Hours of Data: 709																Hours of Missing Data: 35		Hours of Calibration: 35					
Minimum Value: 1.9 ppm on Jan 22 06:00		Minimum Daily Average: 2.0 ppm on Jan 20		Hours of Calibration: 35																Percent Operational Time: 100.0							
Maximum Diurnal Average: 2.2 ppm at hour 15		Minimum Diurnal Average: 2.1 ppm at hour 10		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.9																							
Monthly Average: 2.18 ppm																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	2.3	Z	2.4	2.5	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.5	
2-Jan	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.4	
3-Jan	2.2	2.1	2.1	Z	2.2	2.3	2.2	2.3	2.2	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
4-Jan	2.2	2.3	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.4	
5-Jan	2.2	2.3	2.3	2.3	2.2	Z	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	
6-Jan	Z	2.2	2.2	2.3	2.3	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.3	
7-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.3	2.3	2.4	2.4	2.4	2.2	2.2	2.4	2.5	3.0	3.0	2.4	3.0
8-Jan	2.9	2.7	Z	2.9	2.8	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.6	3.0	2.9	2.9	2.8	2.8	2.6	3.0	
9-Jan	3.4	2.9	2.9	Z	3.2	2.9	2.6	2.8	2.7	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.5	3.4	
10-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.4	2.4	2.2	2.0	2.1	2.2	2.2	2.4	
11-Jan	2.2	2.2	2.2	2.1	2.0	Z	2.0	2.0	2.1	2.1	2.2	2.4	2.4	2.4	2.5	2.4	2.3	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.2	2.5	
12-Jan	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.1	2.3	
13-Jan	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	C	C	C	C	2.1	2.1	2.1	2.2	2.3	2.4	2.3	2.4	2.3	2.1	2.2	2.4
14-Jan	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2
15-Jan	2.2	2.2	2.2	Z	2.1	2.3	2.5	2.4	2.2	2.2	2.1	2.1	2.4	2.5	2.4	2.4	2.5	2.5	2.6	2.7	2.7	2.5	2.6	2.8	2.4	2.8	
16-Jan	2.7	2.4	2.1	2.1	Z	2.1	2.3	2.2	2.3	2.1	2.2	2.4	2.4	2.6	2.8	2.4	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.3	2.8	
17-Jan	2.1	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
18-Jan	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
19-Jan	2.3	Z	2.0	2.0	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.3	
20-Jan	1.9	1.9	Z	1.9	1.9	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.1	
21-Jan	2.0	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.0	1.9	1.9	1.9	1.9	2.1	2.3	
22-Jan	1.9	1.9	1.9	1.9	Z	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.3	
23-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.2	2.6	2.7	2.9	2.3	2.2	2.1	2.2	2.3	2.5	2.5	2.3	2.2	2.2	2.9	
24-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	3.1	2.5	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	3.1	
25-Jan	2.2	Z	2.0	2.0	2.3	2.5	2.3	2.1	2.1	2.1	2.1	2.2	2.4	2.7	2.3	2.3	2.3	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.2	2.7	
26-Jan	2.1	2.1	Z	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.4	2.3	2.3	2.5	2.3	2.1	2.0	2.0	2.0	2.1	2.5	
28-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.0	2.2
29-Jan	2.0	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.2	2.5	2.3	2.2	2.1	2.5
30-Jan	Z	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.1	2.0	2.2	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.1	2.3	
31-Jan	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.4	2.1	2.5
																								Diurnal Average		Diurnal Maximum	
																								2.2		3.0	
																								3.4		3.0	
Z - zerospan C - Calibration																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Barge Landing - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	185	26.09	26.09
2.1 - 3.0	521	73.48	99.58
3.1 - 10.0	3	0.42	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Barge Landing - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	7	28	11	6	3	2	4	24	19	11	23	12	15	9	4	6	184
2.1 - 3.0	34	26	14	4	5	7	12	169	112	26	11	6	4	7	13	68	518
3.1 - 10.0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	25	10	8	10	16	193	131	37	34	18	19	16	17	75	705

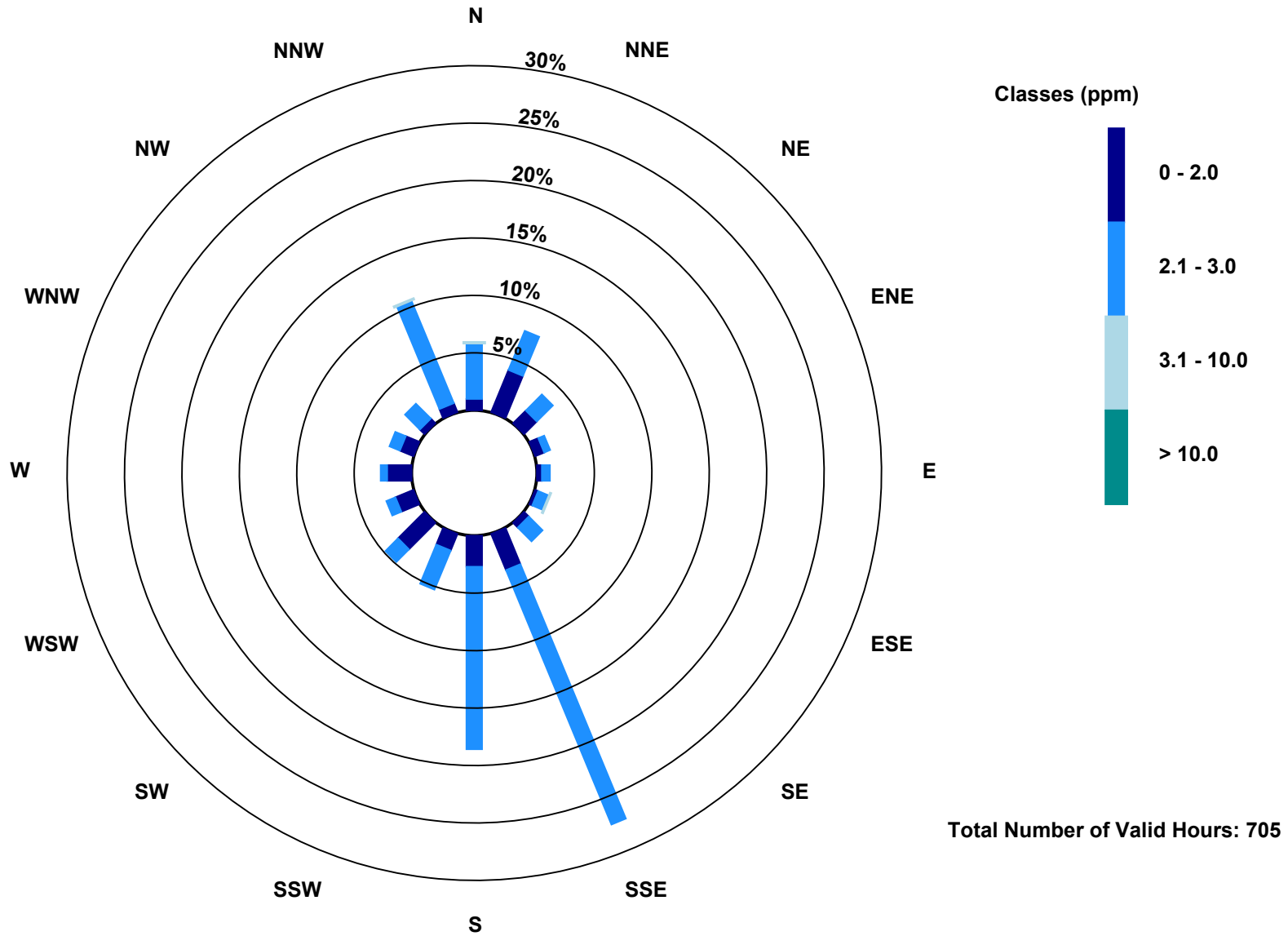
Total Number of Valid Hours: 705

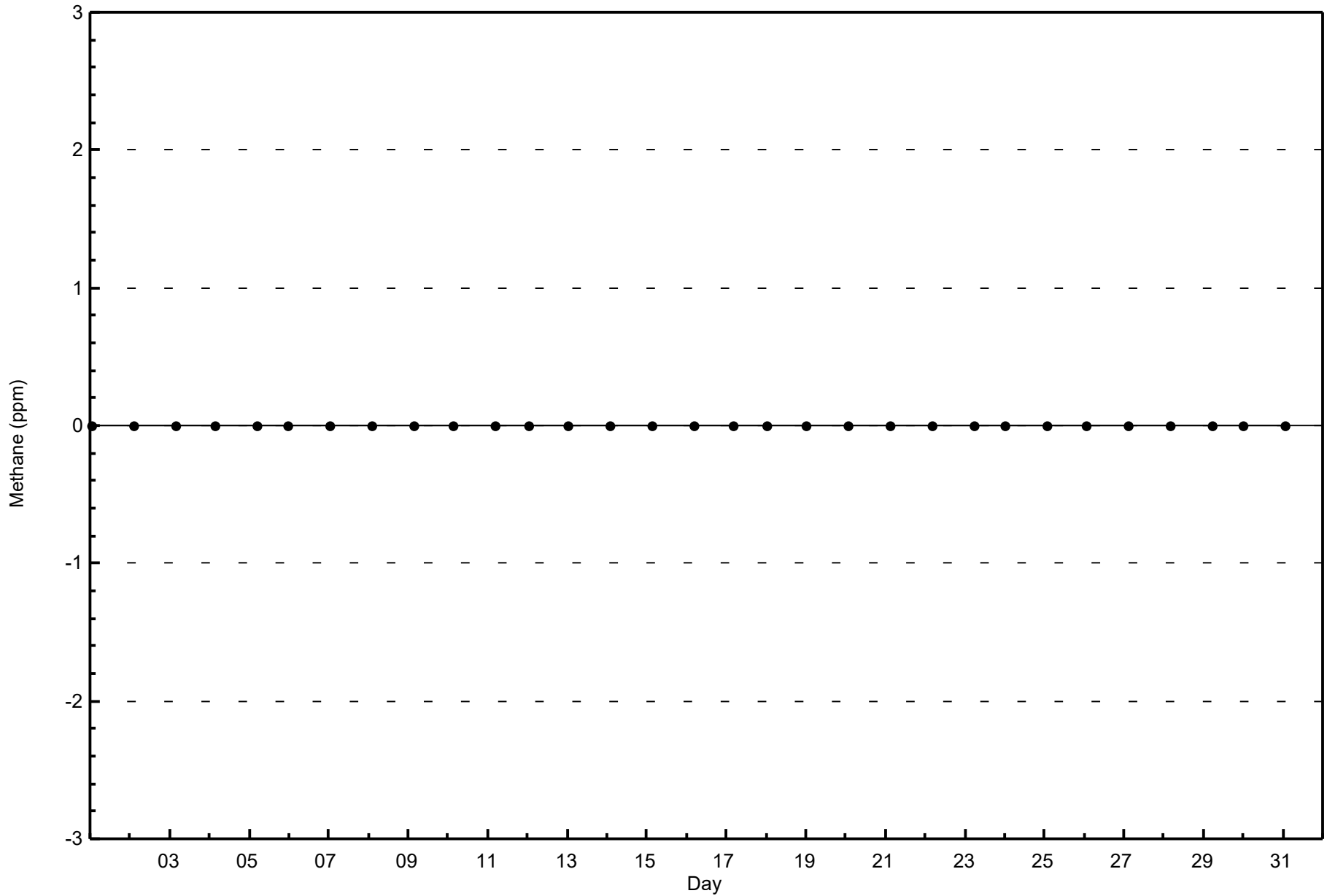
Total Number of Hours: 744

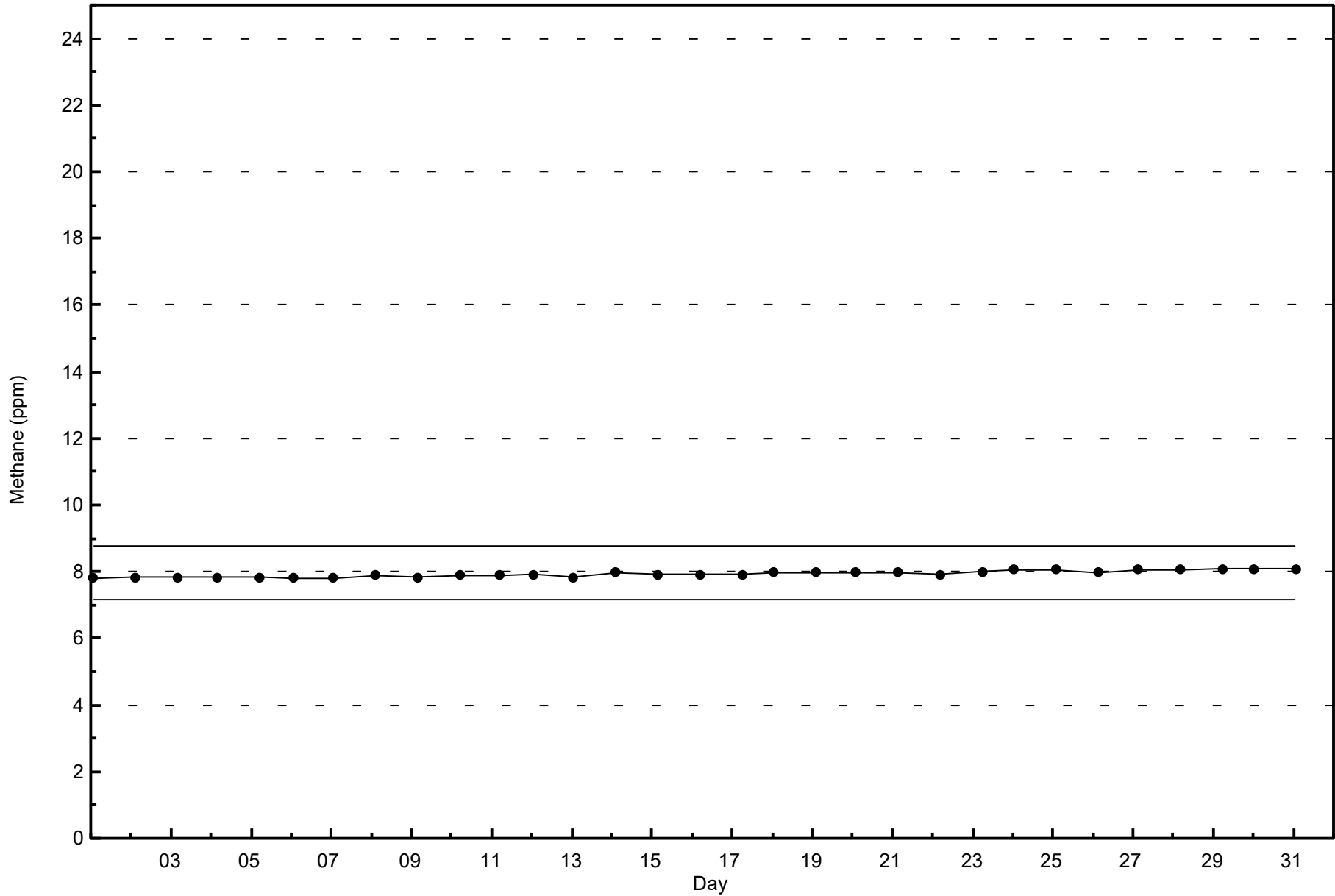


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

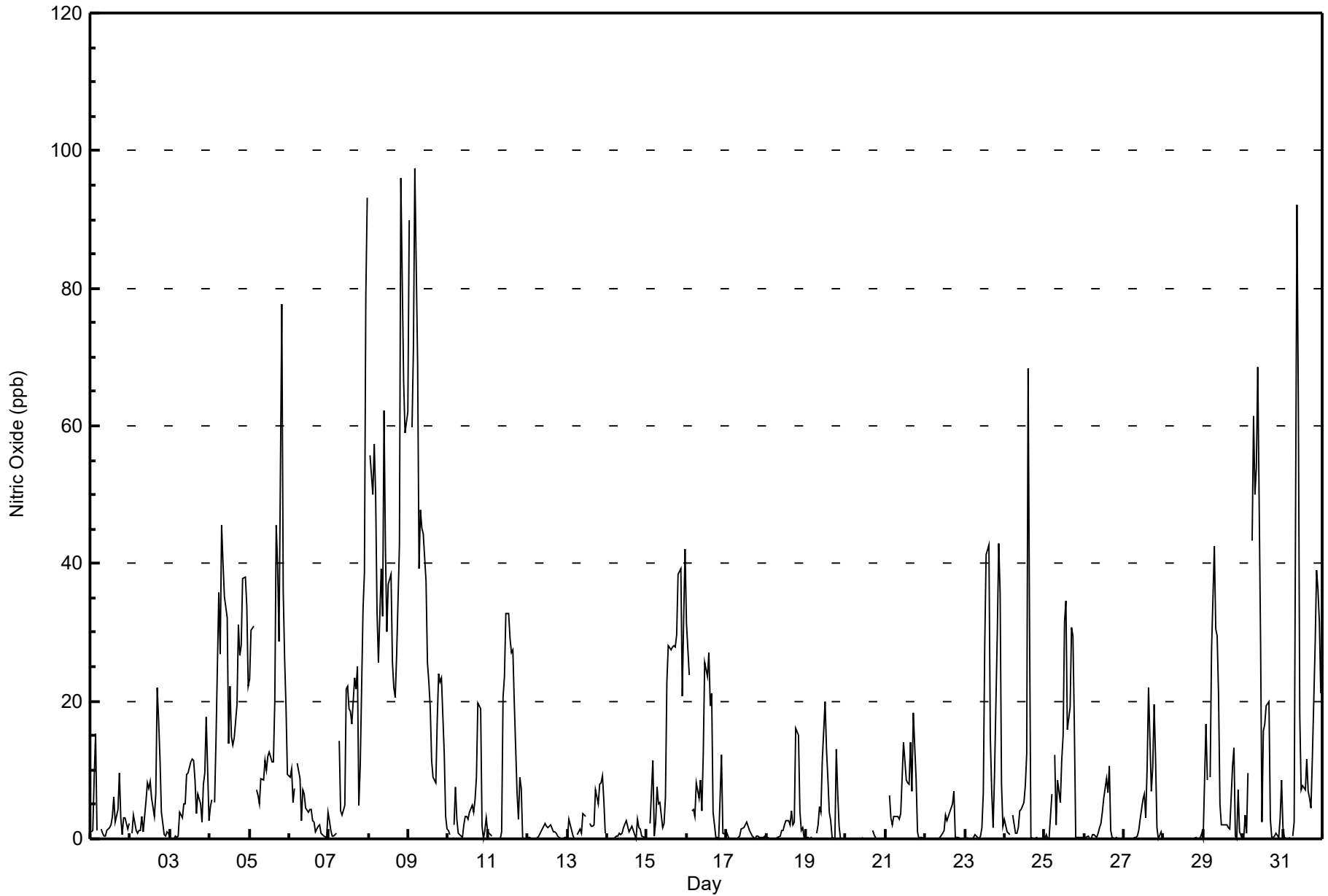
Barge Landing - January 2023

Maximum Value: 97.4 ppb on Jan 9 05:00		Maximum Daily Average: 45.9 ppb on Jan 8		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Jan 20 20:00		Minimum Daily Average: 0.1 ppb on Jan 28		Hours of Data: 707																																													
Maximum Diurnal Average: 13.3 ppb at hour 20		Minimum Diurnal Average: 6.0 ppb at hour 2		Hours of Missing Data: 37																																													
Monthly Average: 10.00 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.3 Median = 2.8 Q ₃ = 11.8 P ₉₀ = 30.8 P ₉₉ = 77.4		Hours of Calibration: 36																																													
				Percent Operational Time: 99.9																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	1.1	1.3	9.0	15.2	1.3	Z	1.3	0.8	0.4	0.5	1.2	1.6	2.0	3.3	6.1	2.5	4.3	9.5	3.0	0.6	3.0	3.1	1.4	2.2	3.2	15.2																							
2-Jan	Z	0.7	3.5	1.3	0.7	1.3	1.3	3.2	1.0	5.5	8.2	7.3	8.4	5.9	3.3	6.5	22.0	17.2	11.6	3.9	0.7	0.4	1.0	0.8	5.0	22.0																							
3-Jan	0.1	Z	0.1	0.4	0.2	0.4	3.8	3.0	5.0	5.1	9.4	9.6	11.2	11.7	11.4	8.5	3.7	6.6	5.0	2.5	7.8	9.6	17.8	2.6	5.9	17.8																							
4-Jan	4.8	5.7	Z	5.3	14.4	35.8	26.8	45.5	40.1	35.1	32.2	13.8	22.2	14.8	13.6	14.6	19.6	31.2	26.7	28.1	37.9	37.9	33.7	22.1	24.4	45.5																							
5-Jan	23.2	30.3	30.9	Z	7.1	6.3	5.1	8.8	8.6	11.4	9.9	11.9	12.6	11.2	11.1	20.2	45.6	39.7	28.8	77.8	36.0	26.3	19.1	9.3	21.4	77.8																							
6-Jan	9.0	10.2	5.3	7.3	Z	11.1	8.8	2.6	7.0	6.6	4.5	3.8	4.2	4.2	2.7	2.5	1.0	1.8	2.1	0.8	0.6	0.5	0.1	3.9	4.4	11.1																							
7-Jan	2.6	1.2	0.3	0.5	0.9	Z	14.3	4.1	3.4	4.8	21.8	22.3	18.9	18.5	16.7	23.4	21.7	24.9	4.8	10.5	33.4	38.6	78.9	93.1	20.0	93.1																							
8-Jan	Z	55.8	50.0	57.4	50.3	33.0	25.5	39.3	32.4	62.3	42.3	30.2	37.1	38.5	25.5	21.9	20.4	26.7	42.8	96.0	81.2	66.6	59.0	62.1	45.9	96.0																							
9-Jan	89.9	Z	59.8	71.3	97.4	68.8	39.2	47.7	45.2	44.3	37.3	25.6	22.8	19.1	11.3	8.9	8.1	17.4	24.0	22.8	23.3	12.3	3.3	1.4	34.9	97.4																							
10-Jan	1.1	0.6	Z	1.9	7.4	2.9	0.8	0.7	0.3	2.1	3.2	3.3	2.9	4.0	5.0	3.9	5.6	8.9	19.8	19.0	1.8	0.0	1.2	3.0	4.3	19.8																							
11-Jan	1.0	0.6	0.4	Z	0.0	0.0	0.0	0.0	1.1	20.5	23.6	32.7	32.8	29.0	27.0	27.5	19.8	6.6	2.8	9.0	7.3	0.2	0.1	0.1	10.5	32.8																							
12-Jan	0.2	0.1	0.1	0.1	Z	0.3	0.3	0.5	1.0	1.4	2.1	1.8	1.7	1.7	2.0	1.0	1.1	0.8	0.4	0.1	0.1	0.1	0.1	0.2	0.7	2.1																							
13-Jan	0.1	2.9	1.2	0.3	0.1	Z	0.6	1.4	0.8	3.7	3.4	3.3	M	2.1	1.8	1.7	2.0	7.1	5.2	7.9	8.2	9.1	5.4	0.7	3.1	9.1																							
14-Jan	Z	0.1	0.1	0.1	0.1	0.3	0.3	0.8	0.7	0.8	1.5	2.6	1.7	1.1	1.4	1.8	0.6	0.1	2.8	1.7	1.4	0.5	0.2	0.0	0.9	2.8																							
15-Jan	0.0	Z	2.1	11.3	0.3	2.5	7.4	5.0	5.3	1.7	2.3	6.1	22.8	28.0	27.5	27.9	28.0	27.8	29.7	38.4	39.3	20.6	31.8	42.1	17.7	42.1																							
16-Jan	31.3	23.8	Z	4.1	4.3	3.3	8.1	6.0	8.6	4.0	12.4	25.7	23.6	27.0	19.3	21.2	3.8	0.1	0.2	0.1	5.9	12.2	0.7	0.5	10.7	31.3																							
17-Jan	0.8	0.2	0.0	Z	0.0	0.0	0.0	0.2	0.4	1.5	1.6	2.1	2.3	1.7	1.2	0.3	0.2	0.0	0.5	0.3	0.2	0.3	0.2	0.3	0.6	2.3																							
18-Jan	0.1	0.3	0.1	0.0	Z	0.0	0.1	0.2	0.4	1.2	1.3	2.0	2.7	2.7	2.1	4.1	1.9	2.4	16.0	15.0	4.1	1.2	1.6	0.2	2.6	16.0																							
19-Jan	0.2	0.2	0.0	0.2	0.1	Z	0.7	2.1	4.6	3.8	11.5	19.9	13.0	8.8	3.9	2.7	0.3	0.1	13.0	6.7	1.7	0.1	0.0	0.0	4.1	19.9																							
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	C	C	C	C	C	1.2	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.1	1.2																							
21-Jan	0.4	Z	6.2	3.0	2.0	3.2	3.2	3.3	2.9	3.6	8.8	14.1	8.6	8.1	7.8	14.0	6.9	18.3	8.8	1.0	0.0	0.2	0.2	0.0	5.4	18.3																							
22-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.3	3.4	2.6	3.3	3.8	5.1	6.9	0.2	0.2	0.1	0.1	0.0	0.0	1.2	6.9																							
23-Jan	0.0	0.1	0.1	Z	0.1	0.1	0.5	0.3	0.0	0.5	1.5	6.7	27.8	41.3	42.7	14.9	6.8	1.7	9.4	30.0	42.9	35.8	7.9	1.8	11.9	42.9																							
24-Jan	2.8	1.0	0.9	0.5	Z	3.4	0.8	0.8	1.7	4.0	4.2	5.3	7.7	12.4	68.4	31.3	0.3	0.1	0.1	0.2	0.1	0.0	0.0	0.0	6.3	68.4																							
25-Jan	0.1	0.5	0.0	0.1	6.6	Z	12.2	2.0	8.6	5.4	11.4	15.2	31.5	34.5	15.8	19.1	30.8	29.5	16.7	0.1	0.3	0.3	0.2	0.1	10.5	34.5																							
26-Jan	Z	0.2	0.4	0.1	0.0	0.7	0.6	0.2	0.8	1.5	2.2	3.9	5.9	8.7	6.8	10.6	1.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	1.9	10.6																							
27-Jan	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.4	1.2	2.8	5.6	6.5	3.1	10.4	21.9	6.8	10.4	19.5	11.7	1.6	0.0	1.0	0.0	4.5	21.9																							
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	0.8	0.1	0.8																							
29-Jan	0.0	16.6	8.6	Z	8.9	27.4	42.6	30.4	29.4	20.9	5.2	2.0	2.0	2.1	2.1	1.5	1.3	10.6	13.2	0.3	0.0	7.1	1.0	0.0	10.1	42.6																							
30-Jan	0.0	3.5	0.8	9.7	Z	43.3	61.4	50.1	54.0	68.5	29.1	2.4	15.6	16.8	19.3	19.9	2.8	0.2	0.3	0.4	0.7	0.1	3.1	8.6	17.9	68.5																							
31-Jan	1.5	0.2	0.1	0.0	0.3	Z	0.4	2.4	92.1	62.7	18.0	7.1	7.8	7.1	11.6	6.9	5.9	4.4	11.8	28.3	39.0	36.3	31.5	21.1	17.2	92.1																							
																								6.6	6.0	6.9	7.3	7.8	9.8	8.6	8.4	11.5	12.4	10.1	9.6	12.4	12.3	12.7	11.5	9.0	10.1	10.3	13.3	12.2	10.3	9.7	8.9	Diurnal Average	
																								89.9	55.8	59.8	71.3	97.4	68.8	61.4	50.1	92.1	68.5	42.3	32.7	37.1	41.3	68.4	31.3	45.6	39.7	42.8	96.0	81.2	66.6	78.9	93.1	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Barge Landing - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Barge Landing - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	581	82.18	82.18
21 - 40	88	12.45	94.63
41 - 80	32	4.53	99.15
81 - 159	5	0.71	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	37	50	28	8	7	8	15	160	110	29	25	17	14	15	14	43	580
21 - 40	4	3	1	1	0	2	2	27	13	2	2	2	2	2	2	22	87
11 - 80	1	1	0	1	1	1	0	7	4	5	3	0	1	0	1	5	31
81 - 159	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	2	5
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	29	10	8	12	17	194	129	36	30	19	17	17	17	72	703

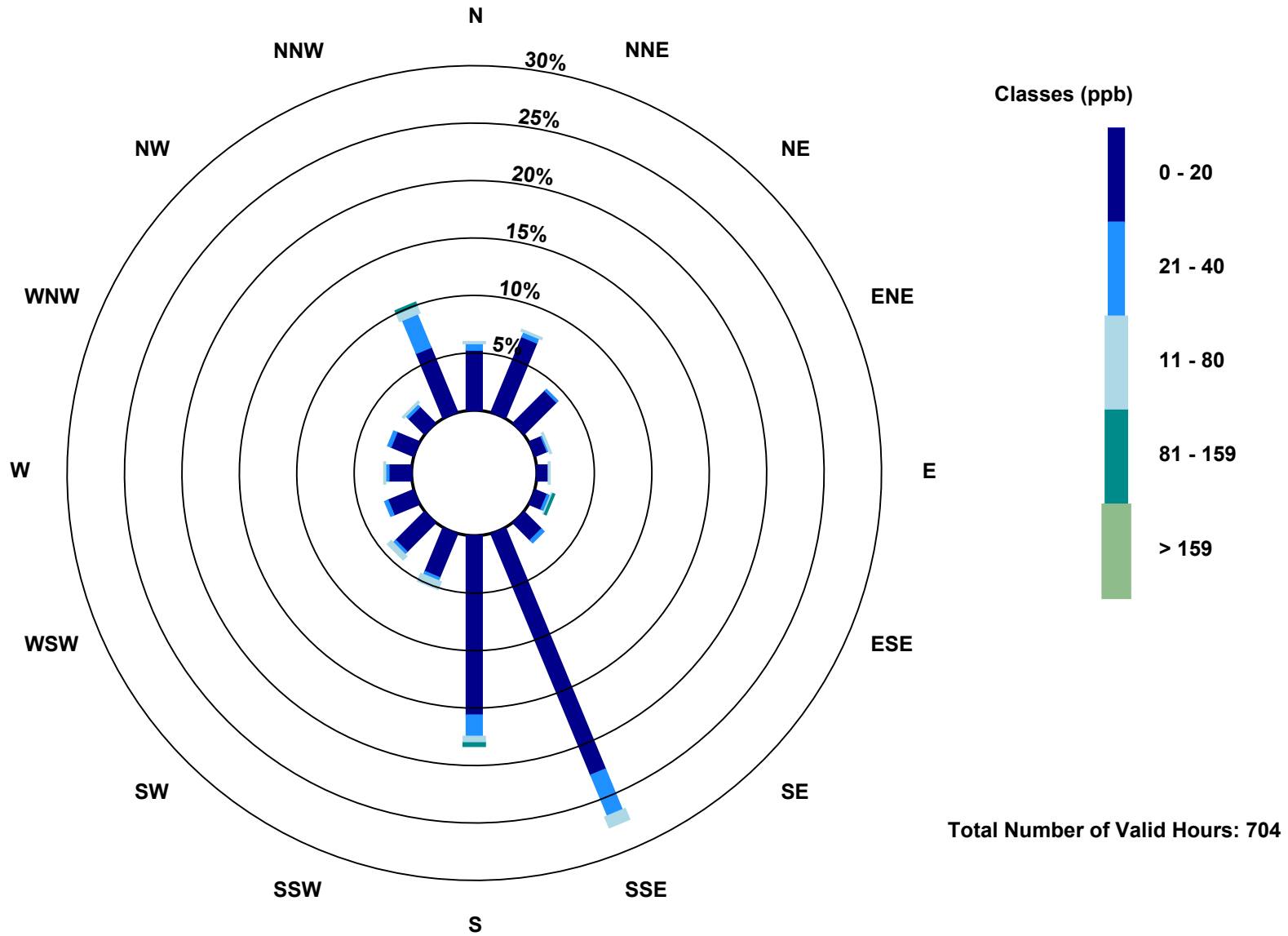
Total Number of Valid Hours: 704

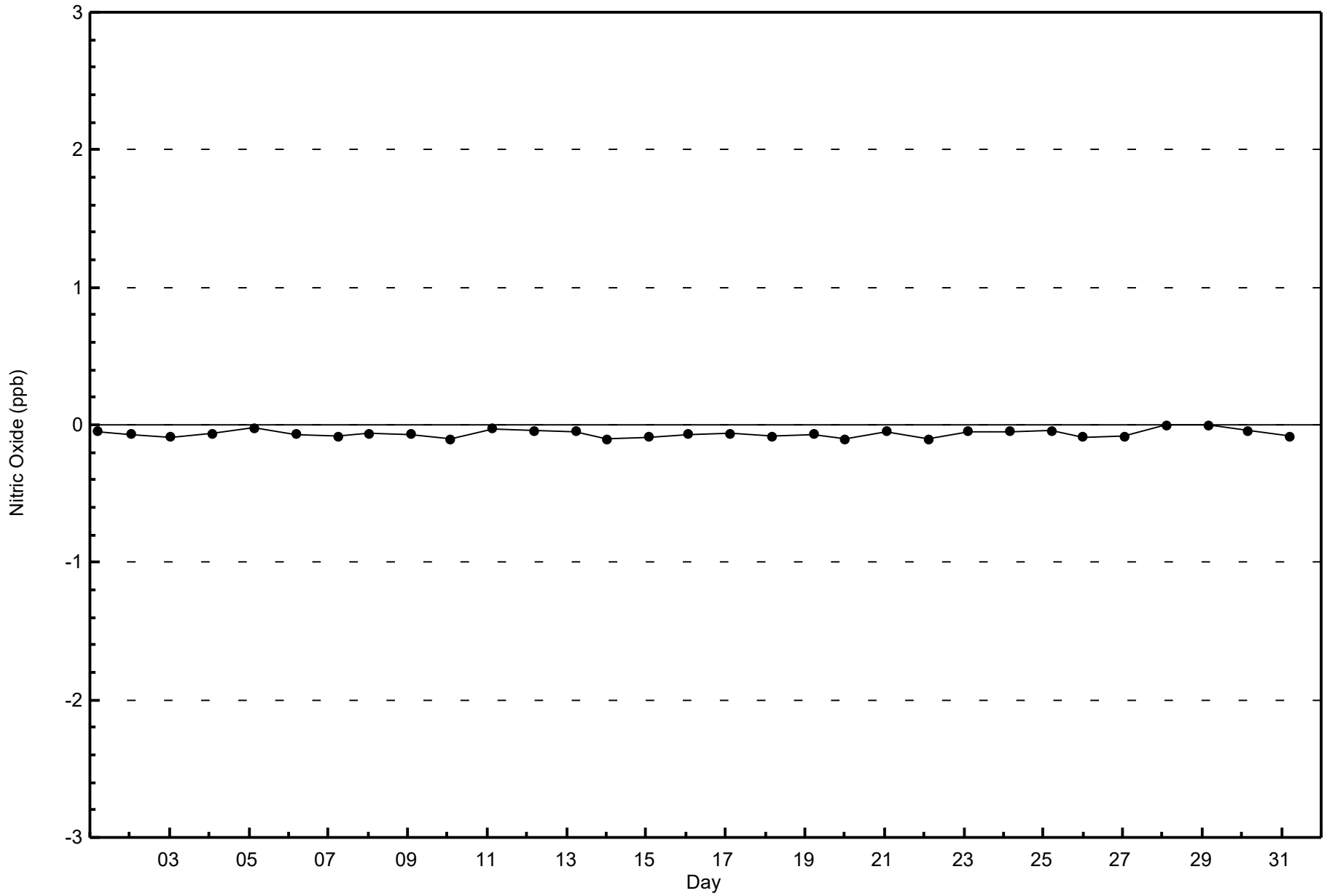
Total Number of Hours: 744

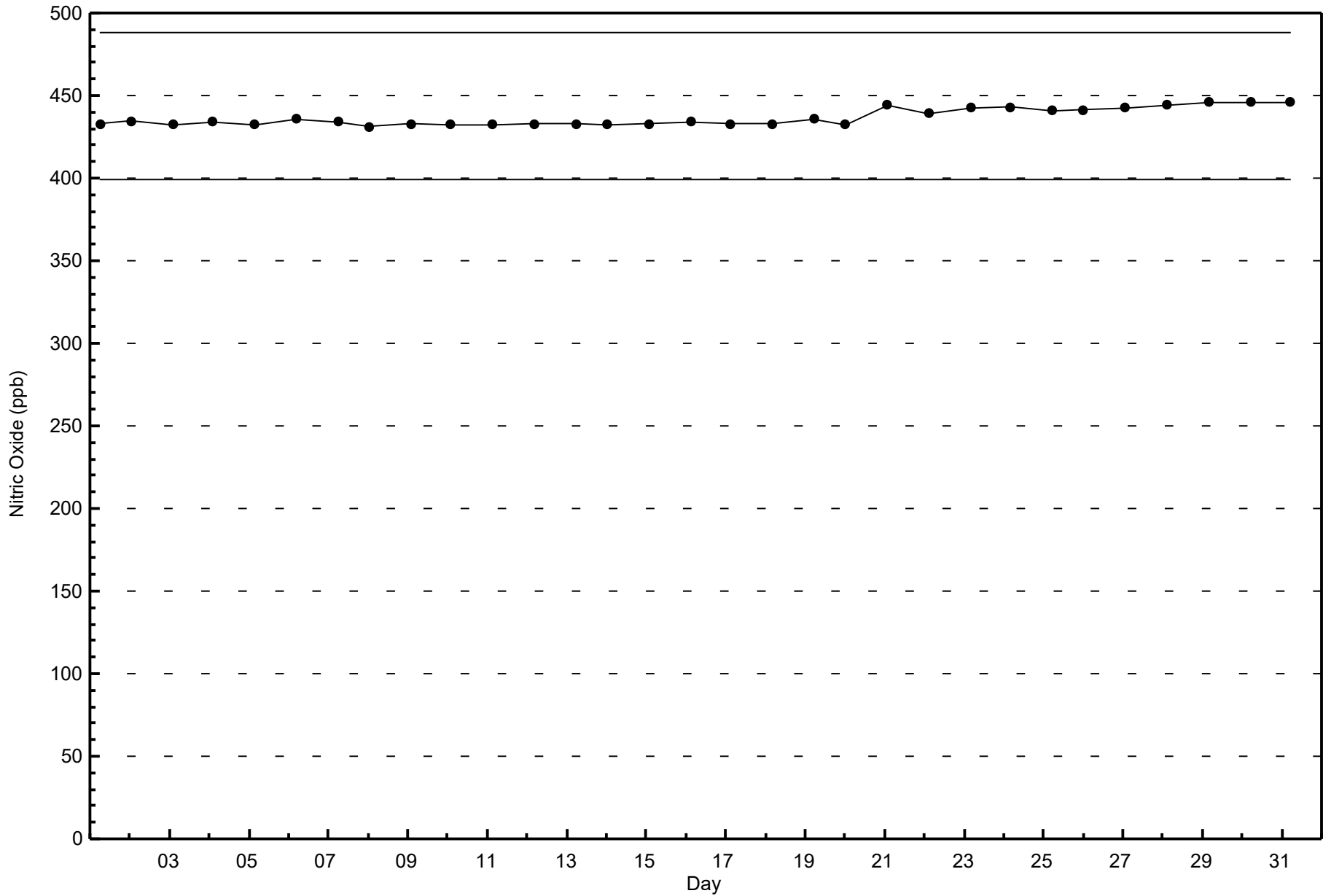


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

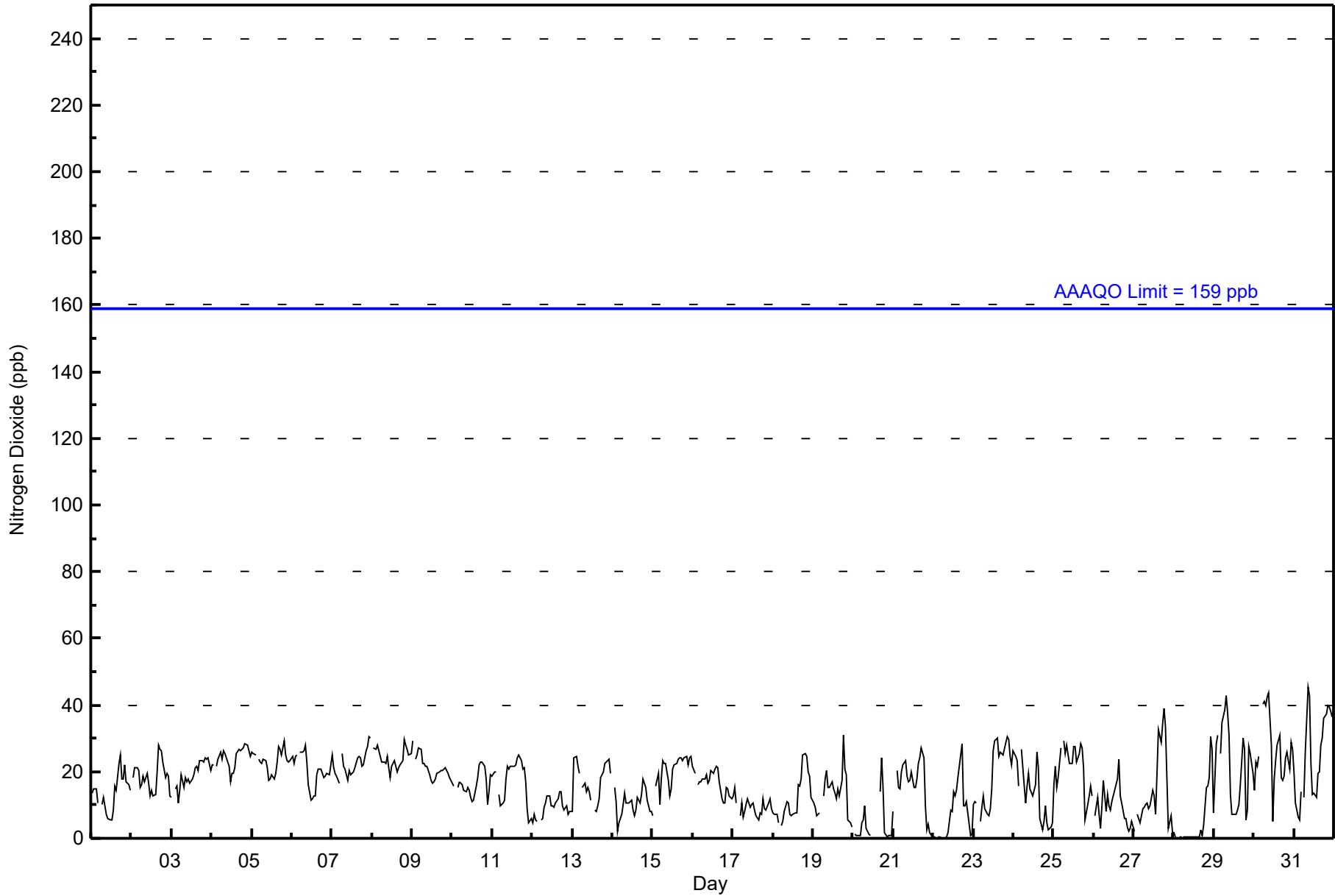
Nitrogen Dioxide (NO₂) - ppb Barge Landing - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum						
Maximum Value: 45.3 ppb on Jan 31 09:00		Maximum Daily Average: 26.2 ppb on Jan 30		Hours of Data: 707																	Hours of Missing Data: 37		Hours of Calibration: 36						
Minimum Value: 0.2 ppb on Jan 22 06:00		Minimum Daily Average: 4.9 ppb on Jan 20		Hours of Calibration: 36																	Percent Operational Time: 99.9								
Maximum Diurnal Average: 20.8 ppb at hour 18		Minimum Diurnal Average: 13.4 ppb at hour 12		Percentiles: P ₁ = 0.3 P ₁₀ = 5.1 Q ₁ = 10.1 Median = 17.1 Q ₃ = 22.8 P ₉₀ = 26.6 P ₉₉ = 39.9																									
Monthly Average: 16.60 ppb																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	13.5	14.7	14.8	15.0	10.8	Z	10.1	12.3	9.9	7.0	6.1	5.5	5.5	8.4	15.5	14.5	22.6	24.8	17.9	17.6	22.2	17.0	15.9	14.4	13.7	24.8			
2-Jan	Z	18.3	21.2	21.2	20.4	15.3	16.1	18.6	16.9	19.6	16.5	12.8	14.5	12.8	13.3	20.1	27.9	26.9	26.4	22.8	18.4	19.3	18.5	12.7	18.7	27.9			
3-Jan	12.2	Z	14.8	15.7	10.8	14.5	19.0	15.3	18.1	16.9	17.9	16.5	17.7	19.2	21.3	21.8	20.3	23.2	23.1	22.7	24.0	23.9	24.0	20.4	18.8	24.0			
4-Jan	22.1	21.9	Z	21.7	23.7	26.0	23.6	26.4	25.4	24.2	21.6	17.1	19.6	19.7	21.2	25.4	26.7	26.4	26.6	27.2	28.4	28.1	26.2	24.7	24.1	28.4			
5-Jan	25.8	25.5	25.2	Z	23.7	23.0	22.6	23.8	23.3	21.0	17.4	17.6	18.9	17.6	19.5	23.0	27.6	26.8	25.0	29.1	25.0	23.4	22.9	23.4	23.1	29.1			
6-Jan	24.5	22.4	24.6	24.9	Z	25.9	26.0	26.1	27.9	22.9	16.3	11.6	11.7	12.9	12.5	19.0	20.7	20.9	19.4	18.3	18.7	19.3	19.0	22.0	20.3	27.9			
7-Jan	25.0	21.2	19.3	18.8	16.5	Z	25.3	21.8	20.9	17.2	20.5	18.9	19.6	20.1	21.3	24.2	24.4	24.0	21.8	21.9	26.4	27.4	30.4	30.1	22.5	30.4			
8-Jan	Z	27.1	26.6	28.0	26.2	24.4	22.9	23.0	22.6	24.5	21.2	18.1	21.4	23.5	21.7	20.0	21.3	22.1	23.4	29.5	28.0	26.5	25.1	25.4	24.0	29.5			
9-Jan	29.3	Z	23.9	25.2	27.3	26.7	22.5	22.5	21.8	21.4	19.2	17.5	16.6	17.1	18.0	19.3	20.1	20.3	20.4	20.8	21.0	19.7	18.4	17.3	21.1	29.3			
10-Jan	16.7	15.5	Z	15.4	17.1	16.6	16.2	14.5	14.0	15.4	14.4	12.2	11.0	11.5	15.5	18.4	22.2	23.0	22.8	21.8	17.9	10.0	13.9	19.0	16.3	23.0			
11-Jan	18.8	19.9	20.1	Z	13.0	9.9	10.6	11.3	18.0	21.5	20.7	21.7	21.5	21.6	22.2	24.1	25.0	23.1	20.8	21.3	17.1	8.7	4.5	5.9	17.4	25.0			
12-Jan	4.5	7.4	5.4	5.0	Z	5.4	5.8	9.5	10.4	12.7	12.7	9.8	9.7	9.3	10.8	11.8	14.1	14.0	9.7	8.5	9.7	7.0	8.1	8.2	9.1	14.1			
13-Jan	8.2	24.0	24.6	21.6	19.6	Z	15.2	16.5	13.9	15.1	13.8	11.3	M	8.3	8.2	9.7	12.0	18.2	19.8	22.3	22.8	23.2	23.6	19.5	16.9	24.6			
14-Jan	Z	15.2	10.9	2.1	4.6	7.0	10.2	13.5	10.8	10.5	10.7	11.3	8.5	6.9	8.6	12.2	10.6	13.2	18.0	16.7	15.3	11.3	7.9	8.2	10.6	18.0			
15-Jan	6.7	Z	15.8	19.4	10.3	17.7	23.1	22.4	22.5	17.3	12.6	14.7	20.8	22.1	22.4	23.6	24.3	24.1	23.5	24.2	24.5	22.2	24.0	24.4	20.1	24.5			
16-Jan	21.6	19.7	Z	16.3	17.1	16.9	17.9	17.7	18.9	16.7	17.5	20.5	19.4	20.7	21.5	21.3	16.9	11.9	10.7	10.7	15.2	15.0	12.6	11.9	16.9	21.6			
17-Jan	12.5	15.3	10.8	Z	6.8	10.6	6.5	8.1	10.3	11.7	9.3	10.0	10.6	8.4	6.7	5.3	7.7	7.4	12.0	9.1	8.5	10.8	11.7	8.9	9.5	15.3			
18-Jan	7.7	7.3	7.0	4.6	Z	4.0	5.2	7.9	10.9	10.7	7.2	6.8	7.0	7.5	7.7	16.3	15.6	17.9	24.9	25.3	24.7	19.9	18.8	12.1	12.0	25.3			
19-Jan	10.4	9.4	6.6	7.2	7.6	Z	12.6	17.6	20.3	15.1	15.4	17.1	14.9	13.4	12.0	14.7	12.5	17.2	30.9	20.9	18.9	5.7	4.7	3.2	13.4	30.9			
20-Jan	Z	1.1	1.0	1.0	1.0	4.8	5.5	9.9	3.1	1.3	1.0	C	C	C	C	C	14.0	24.2	15.4	1.5	0.6	0.7	0.9	1.0	4.9	24.2			
21-Jan	8.1	Z	20.5	15.3	14.7	20.0	22.2	23.2	18.5	17.1	17.2	19.8	15.4	15.3	17.7	22.6	24.0	27.3	24.2	9.7	2.5	4.4	1.9	0.6	15.7	27.3			
22-Jan	0.6	0.5	Z	0.5	0.3	0.2	0.2	0.2	0.4	1.5	8.5	8.1	13.9	12.7	14.5	18.4	25.0	28.5	9.6	9.6	10.9	4.1	0.9	1.3	7.4	28.5			
23-Jan	10.2	11.1	10.8	Z	4.9	9.5	12.9	9.1	7.0	6.9	8.8	15.0	26.3	29.3	30.2	24.6	26.0	25.5	25.2	28.7	30.4	29.6	24.6	22.0	18.6	30.4			
24-Jan	26.1	24.7	23.2	15.5	Z	26.7	15.5	10.8	15.7	19.7	15.0	12.9	14.5	16.3	25.8	21.3	6.1	2.6	5.0	9.6	4.6	2.5	3.6	4.6	14.0	26.7			
25-Jan	16.2	21.5	15.1	18.1	27.0	Z	29.3	25.6	28.0	22.4	22.3	22.6	27.5	27.7	22.8	25.6	28.2	27.3	21.1	5.6	10.3	12.8	15.7	12.5	21.1	29.3			
26-Jan	Z	6.8	12.1	7.1	2.8	9.9	17.2	7.9	13.3	9.7	8.6	11.1	12.8	16.1	17.6	23.8	12.8	10.8	5.8	5.8	3.4	2.3	3.1	5.1	9.8	23.8			
27-Jan	2.3	Z	7.0	5.8	4.8	9.1	9.2	10.1	10.7	8.9	9.6	14.5	12.5	7.3	19.5	32.7	29.0	34.3	38.8	33.4	18.1	3.0	6.8	1.9	14.3	38.8			
28-Jan	1.5	0.5	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	2.7	0.8	3.8	15.3	15.6	18.2	30.3	26.9	5.2	30.3			
29-Jan	7.8	28.4	31.0	Z	25.3	34.7	38.7	43.0	37.6	30.8	13.0	7.1	7.1	7.1	8.3	10.1	16.3	30.0	26.5	5.5	8.4	27.5	25.6	19.3	21.3	43.0			
30-Jan	14.6	22.7	21.8	24.5	Z	40.2	41.2	39.9	42.2	43.6	27.9	5.1	17.6	23.2	27.8	31.0	18.1	17.2	18.7	24.3	25.7	20.6	28.9	26.6	26.2	43.6			
31-Jan	19.9	10.5	6.4	5.3	14.1	Z	12.2	25.9	45.3	42.6	22.6	13.1	13.4	12.4	19.5	20.1	27.9	30.2	36.1	37.4	39.8	39.5	38.3	36.6	24.7	45.3			
		14.1	15.9	16.2	13.7	13.5	16.0	16.6	17.2	18.0	17.0	14.4	13.4	14.8	15.0	16.8	19.2	19.4	20.8	20.2	18.6	18.0	16.2	16.5	15.2	Diurnal Average			
		29.3	28.4	31.0	28.0	27.3	40.2	41.2	43.0	45.3	43.6	27.9	22.6	27.5	29.3	30.2	32.7	29.0	34.3	38.8	37.4	39.8	39.5	38.3	36.6	Diurnal Maximum			
Z - zerospan		C - Calibration		M - Maintenance																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		159 ppb																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Barge Landing - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	454	64.21	64.22
21 - 40	247	34.94	99.15
41 - 80	6	0.85	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	23	42	24	6	4	6	11	117	88	24	22	16	15	13	11	32	454
21 - 40	19	12	5	4	3	6	6	77	38	10	8	3	2	4	6	41	244
11 - 80	0	0	0	0	1	0	0	0	3	2	0	0	0	0	0	0	6
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	29	10	8	12	17	194	129	36	30	19	17	17	17	73	704

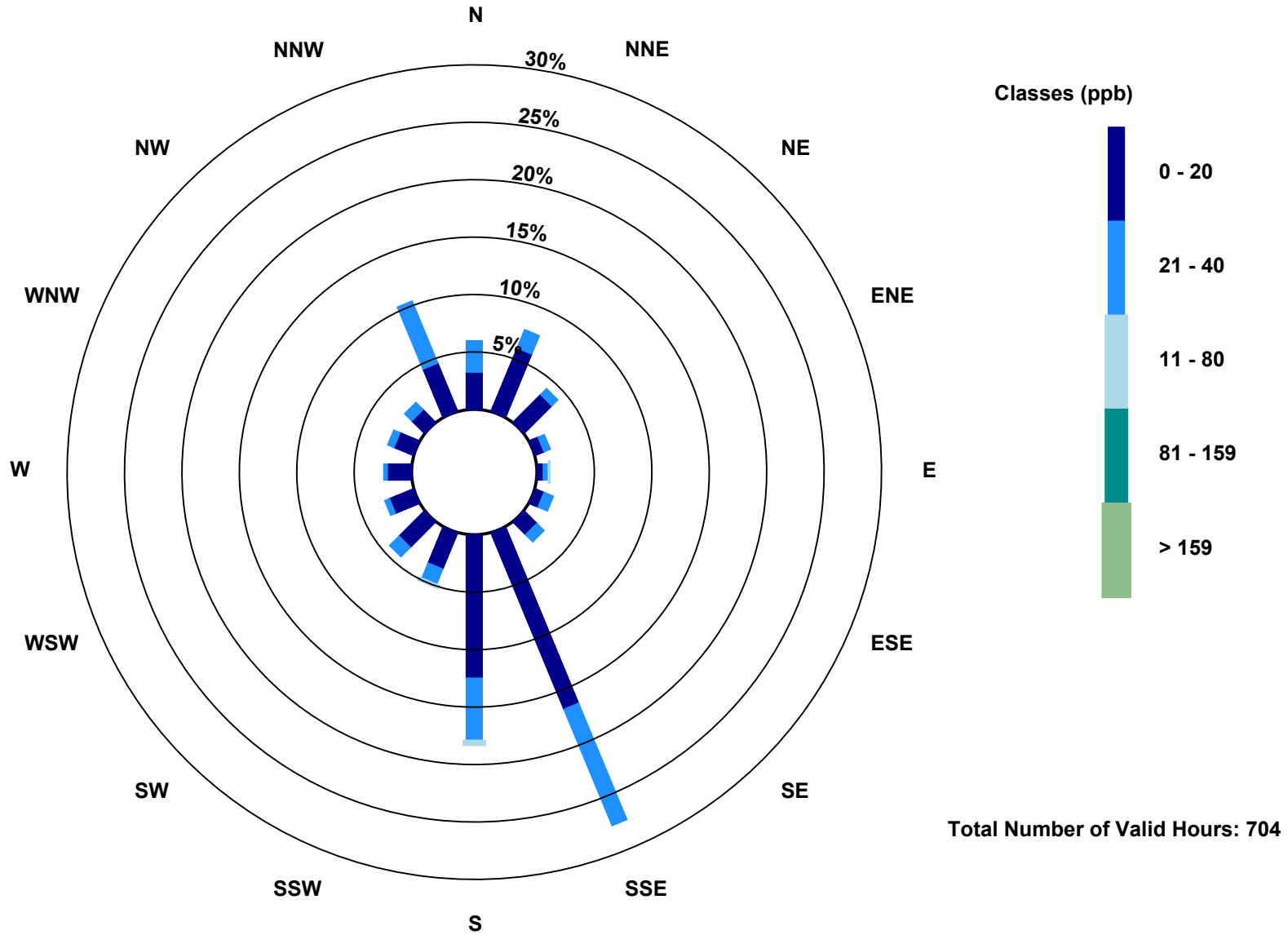
Total Number of Valid Hours: 704

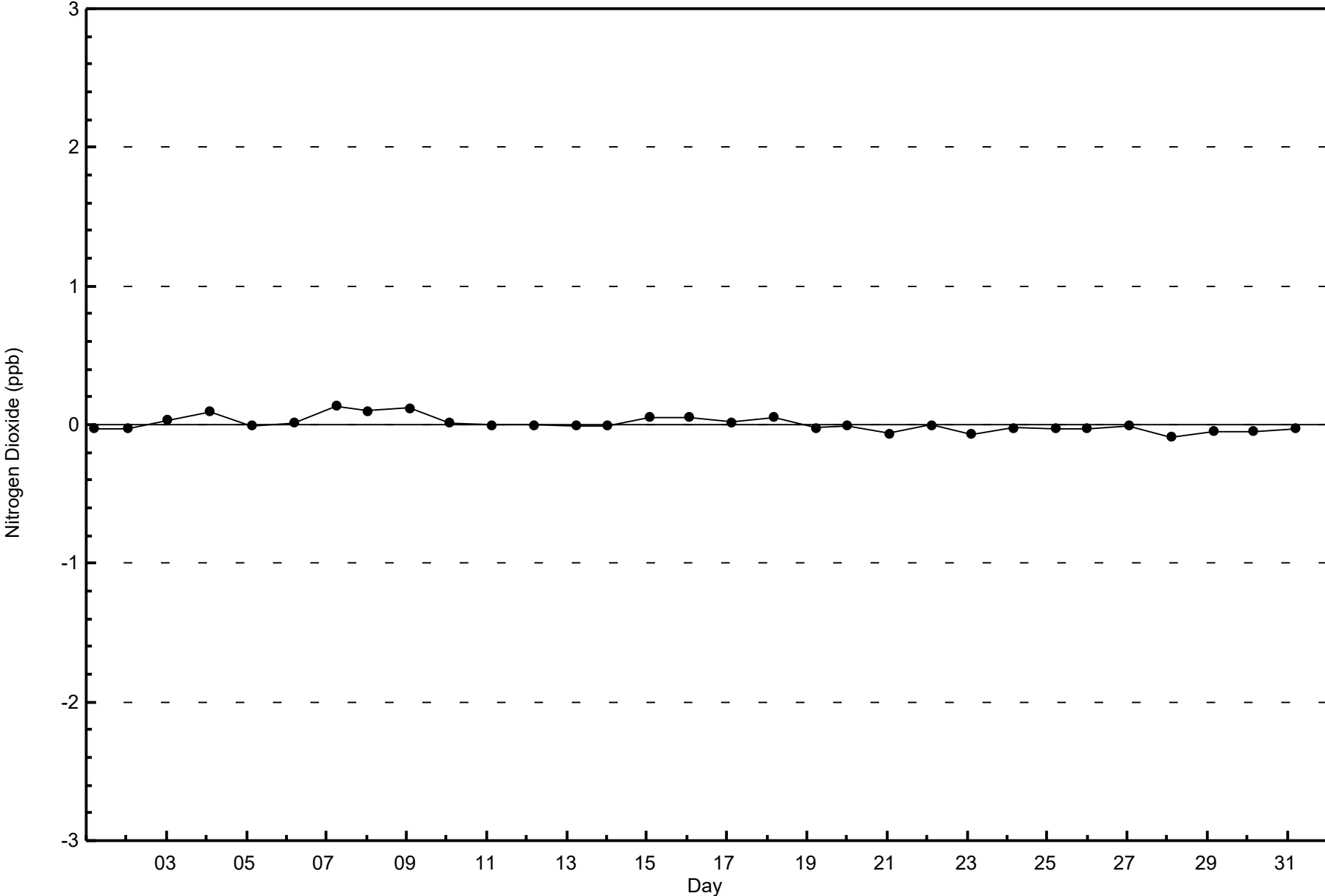
Total Number of Hours: 744

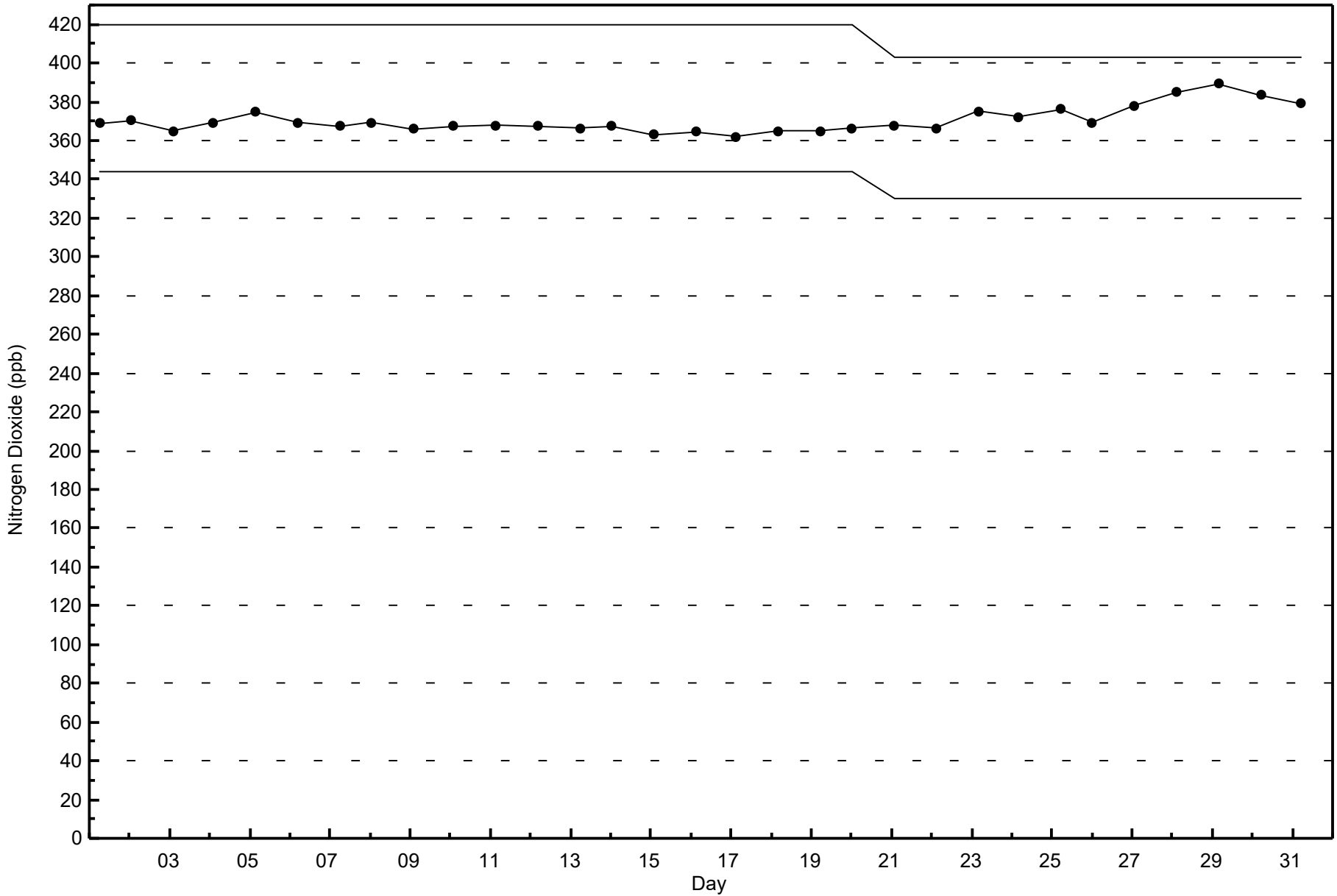


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Barge Landing





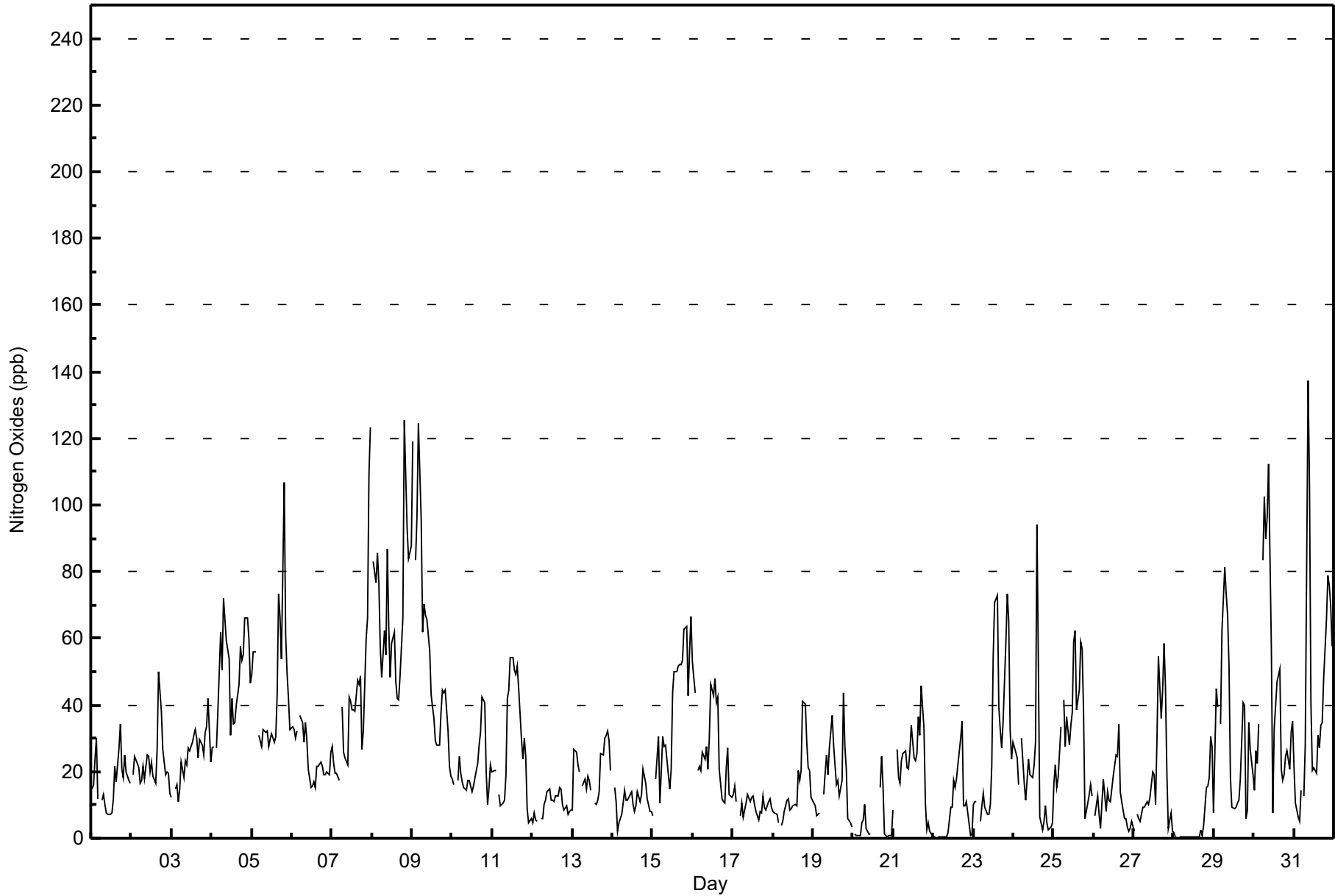




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Barge Landing - January 2023

Maximum Value: 137.4 ppb on Jan 31 09:00																						Maximum Daily Average: 69.9 ppb on Jan 8																						Hours in Service: 744	
Minimum Value: 0.2 ppb on Jan 22 08:00																						Minimum Daily Average: 5.0 ppb on Jan 20																						Hours of Data: 707	
Maximum Diurnal Average: 32.0 ppb at hour 20																						Minimum Diurnal Average: 20.7 ppb at hour 1																						Hours of Missing Data: 37	
Monthly Average: 26.60 ppb																						Percentiles: P ₁ = 0.3 P ₁₀ = 5.2 Q ₁ = 10.8 Median = 20.4 Q ₃ = 34.7 P ₉₀ = 56.8 P ₉₉ = 109.1																						Hours of Calibration: 36	
																																												Percent Operational Time: 99.9	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																					
1-Jan	14.6	16.0	23.8	30.2	12.1	Z	11.4	13.1	10.3	7.5	7.3	7.1	7.5	11.7	21.6	17.0	26.9	34.3	20.9	18.2	25.2	20.1	17.3	16.6	17.0	34.3																			
2-Jan	Z	19.0	24.7	22.5	21.1	16.6	17.4	21.8	17.9	25.1	24.7	20.1	22.9	18.7	16.6	26.6	49.9	44.1	38.0	26.7	19.1	19.7	19.5	13.5	23.8	49.9																			
3-Jan	12.3	Z	14.9	16.1	11.0	14.9	22.8	18.3	23.1	22.0	27.3	26.1	28.9	30.9	32.7	30.3	24.0	29.8	28.1	25.2	31.8	33.5	41.8	23.0	24.7	41.8																			
4-Jan	26.9	27.6	Z	27.0	38.1	61.8	50.4	71.9	65.5	59.3	53.8	30.9	41.8	34.5	34.8	40.0	46.3	57.6	53.3	55.3	66.3	66.0	59.9	46.8	48.5	71.9																			
5-Jan	49.0	55.8	56.1	Z	30.8	29.3	27.7	32.6	31.9	32.4	27.3	29.5	31.5	28.8	30.6	43.2	73.2	66.5	53.8	106.9	61.0	49.7	42.0	32.7	44.5	106.9																			
6-Jan	33.5	32.6	29.9	32.2	Z	37.0	34.8	28.7	34.9	29.5	20.8	15.4	15.9	17.1	15.2	21.5	21.7	22.7	21.5	19.1	19.3	19.8	19.1	25.9	24.7	37.0																			
7-Jan	27.6	22.4	19.6	19.3	17.4	Z	39.6	25.9	24.3	22.0	42.3	41.2	38.5	38.6	38.0	47.6	46.1	48.9	26.6	32.4	59.8	66.0	109.3	123.2	42.5	123.2																			
8-Jan	Z	82.9	76.6	85.4	76.5	57.4	48.4	62.3	55.0	86.8	63.5	48.3	58.5	62.0	47.2	41.9	41.7	48.8	66.2	125.5	109.2	93.1	84.1	87.5	69.9	125.5																			
9-Jan	119.2	Z	83.7	96.5	124.7	95.5	61.7	70.2	67.0	65.7	56.5	43.1	39.4	36.2	29.3	28.2	28.2	37.7	44.4	43.6	44.3	32.0	21.7	18.7	56.0	124.7																			
10-Jan	17.8	16.1	Z	17.3	24.5	19.5	17.0	15.2	14.3	17.5	17.6	15.5	13.9	15.5	20.5	22.3	27.8	31.9	42.6	40.8	19.7	10.0	15.1	22.0	20.6	42.6																			
11-Jan	19.8	20.5	20.5	Z	13.0	9.9	10.6	11.3	19.1	42.0	44.3	54.4	54.3	50.6	49.2	51.6	44.8	29.7	23.6	30.3	24.4	8.9	4.6	6.0	28.0	54.4																			
12-Jan	4.7	7.5	5.5	5.1	Z	5.7	6.1	10.0	11.4	14.1	14.8	11.6	11.4	11.0	12.8	12.8	15.2	14.8	10.1	8.6	9.8	7.1	8.2	8.4	9.9	15.2																			
13-Jan	8.3	26.9	25.8	21.9	19.7	Z	15.8	17.9	14.7	18.8	17.2	14.6	M	10.4	10.0	11.4	14.0	25.3	25.0	30.2	31.0	32.3	29.0	20.2	20.0	32.3																			
14-Jan	Z	15.3	11.0	2.2	4.7	7.3	10.5	14.3	11.5	11.3	12.2	13.9	10.2	8.0	10.0	14.0	11.2	13.3	20.8	18.4	16.7	11.8	8.1	8.2	11.5	20.8																			
15-Jan	6.7	Z	17.9	30.7	10.6	20.2	30.5	27.4	27.8	19.0	14.9	20.8	43.6	50.1	49.9	51.5	52.3	51.9	53.2	62.6	63.8	42.8	55.8	66.5	37.9	66.5																			
16-Jan	52.9	43.5	Z	20.4	21.4	20.2	26.0	23.7	27.5	20.7	29.9	46.2	43.0	47.7	40.8	42.5	20.7	12.0	10.9	10.8	21.1	27.2	13.3	12.4	27.6	52.9																			
17-Jan	13.3	15.5	10.8	Z	6.8	10.6	6.5	8.3	10.7	13.2	10.9	12.1	12.9	10.1	7.9	5.6	7.9	7.4	12.5	9.4	8.7	11.1	11.9	9.2	10.1	15.5																			
18-Jan	7.8	7.6	7.1	4.6	Z	4.0	5.3	8.1	11.3	11.9	8.5	8.8	9.7	10.2	9.8	20.4	17.5	20.3	40.9	40.3	28.8	21.1	20.4	12.3	14.6	40.9																			
19-Jan	10.6	9.6	6.6	7.4	7.7	Z	13.3	19.7	24.9	18.9	26.9	37.0	27.9	22.2	15.9	17.4	12.8	17.3	43.9	27.6	20.6	5.8	4.7	3.2	17.5	43.9																			
20-Jan	Z	1.1	1.0	1.0	1.0	4.8	5.5	10.0	3.1	1.4	1.1	C	C	C	C	C	15.2	24.7	15.7	1.5	0.6	0.7	0.9	1.0	5.0	24.7																			
21-Jan	8.5	Z	26.7	18.3	16.7	23.2	25.4	26.5	21.4	20.7	26.0	33.9	24.0	23.4	25.5	36.6	30.9	45.6	33.0	10.7	2.5	4.6	2.1	0.6	21.2	45.6																			
22-Jan	0.6	0.5	Z	0.5	0.3	0.2	0.2	0.2	0.4	1.6	9.3	9.4	17.3	15.3	17.8	22.2	30.1	35.4	9.8	9.8	11.0	4.2	0.9	1.3	8.6	35.4																			
23-Jan	10.2	11.2	10.9	Z	5.0	9.6	13.4	9.4	7.0	7.4	10.3	21.7	54.1	70.6	72.9	39.5	32.8	27.2	34.6	58.7	73.3	65.4	32.5	23.8	30.5	73.3																			
24-Jan	28.9	25.7	24.1	16.0	Z	30.1	16.3	11.6	17.4	23.7	19.2	18.2	22.2	28.7	94.2	52.6	6.4	2.7	5.1	9.8	4.7	2.5	3.6	4.6	20.4	94.2																			
25-Jan	16.3	22.0	15.1	18.2	33.6	Z	41.5	27.6	36.6	27.8	33.7	37.8	59.0	62.2	38.6	44.7	59.0	56.8	37.8	5.7	10.6	13.1	15.9	12.6	31.6	62.2																			
26-Jan	Z	7.0	12.5	7.2	2.8	10.6	17.8	8.1	14.1	11.2	10.8	15.0	18.7	24.8	24.4	34.4	14.0	10.9	5.9	5.9	3.4	2.3	3.1	5.2	11.7	34.4																			
27-Jan	2.3	Z	7.1	5.9	4.9	9.2	9.4	10.2	11.1	10.1	12.4	20.1	19.0	10.4	29.9	54.6	35.8	44.7	58.3	45.1	19.7	3.0	7.8	1.9	18.8	58.3																			
28-Jan	1.5	0.5	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	2.7	0.8	3.8	15.4	15.7	18.2	30.6	27.7	5.3	30.6																			
29-Jan	7.8	45.0	39.6	Z	34.2	62.1	81.3	73.4	67.0	51.7	18.2	9.1	9.1	9.2	10.4	11.6	17.6	40.6	39.7	5.8	8.4	34.6	26.6	19.3	31.4	81.3																			
30-Jan	14.6	26.2	22.6	34.2	Z	83.5	102.6	90.0	96.2	112.1	57.0	7.5	33.2	40.0	47.1	50.9	20.9	17.4	19.0	24.7	26.4	20.7	32.0	35.2	44.1	112.1																			
31-Jan	21.4	10.7	6.5	5.3	14.4	Z	12.6	28.3	137.4	105.3	40.6	20.2	21.2	19.5	31.1	27.0	33.8	34.6	47.9	65.7	78.8	75.8	69.8	57.7	42.0	137.4																			
20.7 21.9 23.1 21.0 21.3 25.7 25.2 25.7 29.5 29.4 24.5 23.0 27.2 27.3 29.5 30.7 28.4 30.8 30.5 32.0 30.2 26.6 26.2 24.1																								Diurnal Average																					
119.2 82.9 83.7 96.5 124.7 95.5 102.6 90.0 137.4 112.1 63.5 54.4 59.0 70.6 94.2 54.6 73.2 66.5 66.2 125.5 109.2 93.1 109.3 123.2																								Diurnal Maximum																					
Z - zerospan C - Calibration M - Maintenance																																													





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	356	50.35	50.35
21 - 40	202	28.57	78.93
41 - 80	124	17.54	96.46
81 - 159	24	3.39	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	16	37	21	6	4	6	8	85	71	19	19	13	14	11	8	18	356
21 - 40	18	12	7	2	3	2	6	72	31	9	5	4	0	5	5	21	202
11 - 80	7	5	1	1	0	3	3	34	21	4	5	2	3	1	3	29	122
81 - 159	1	0	0	1	1	1	0	3	6	4	0	0	0	0	1	5	23
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	54	29	10	8	12	17	194	129	36	29	19	17	17	17	73	703

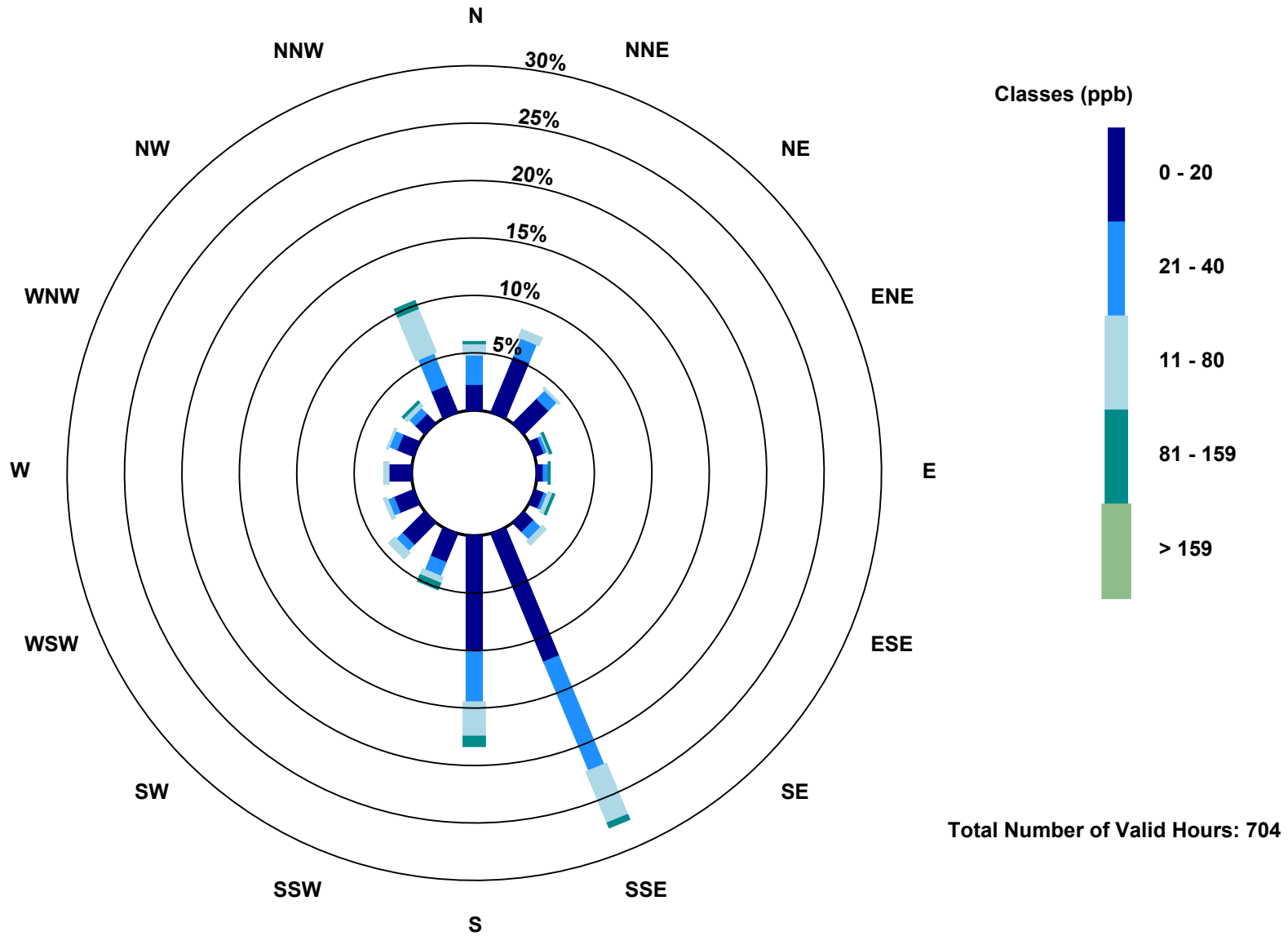
Total Number of Valid Hours: 704

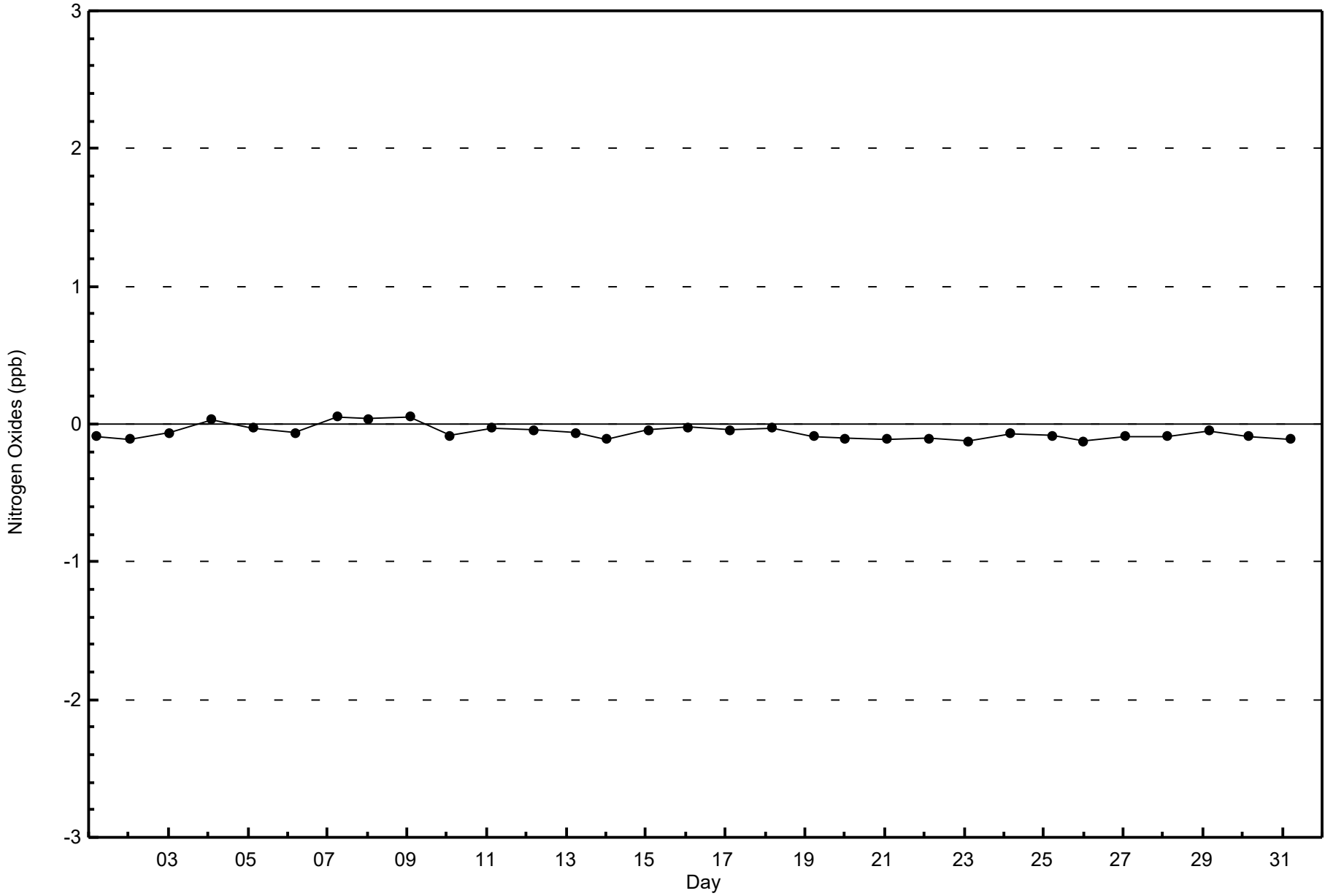
Total Number of Hours: 744

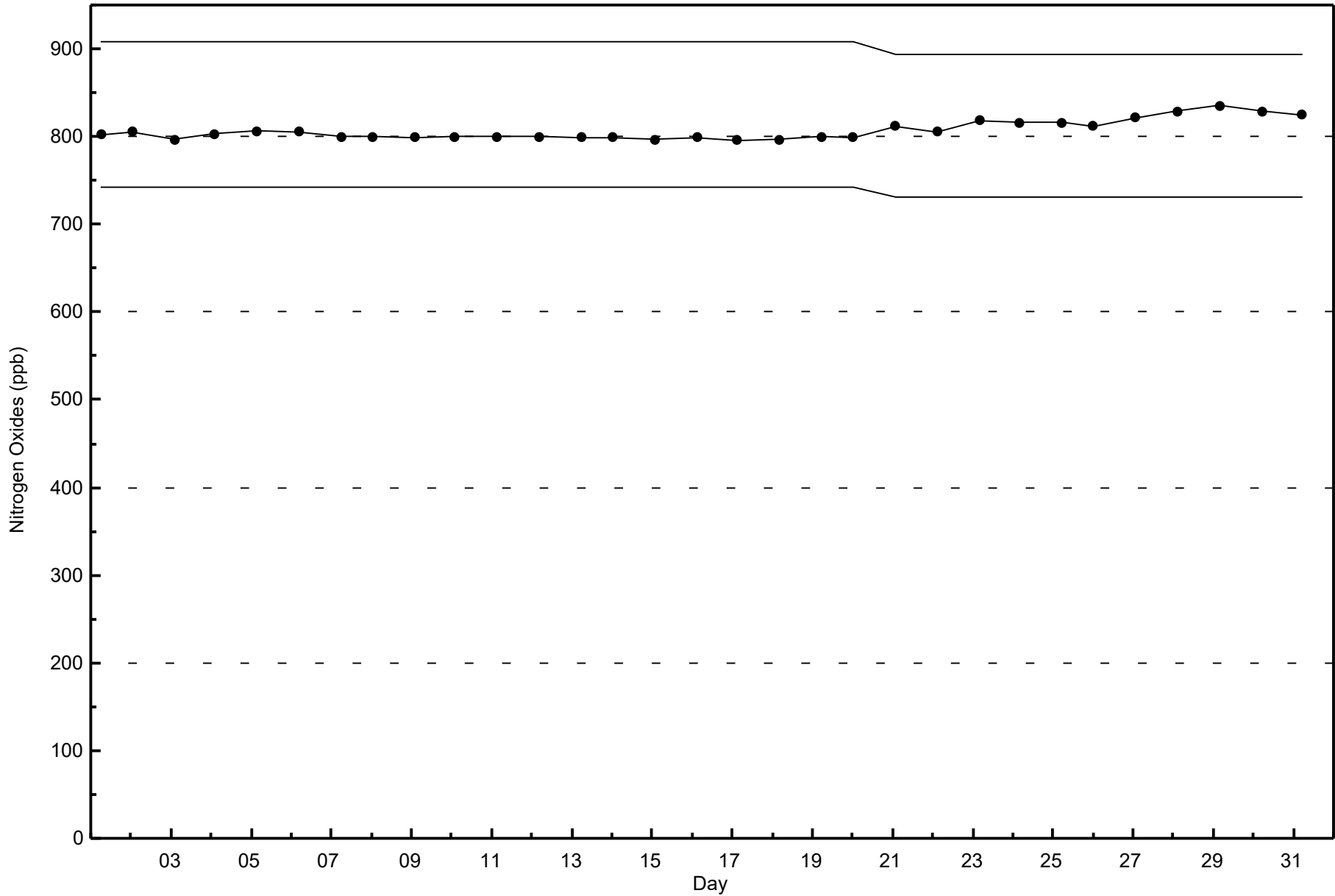


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Barge Landing

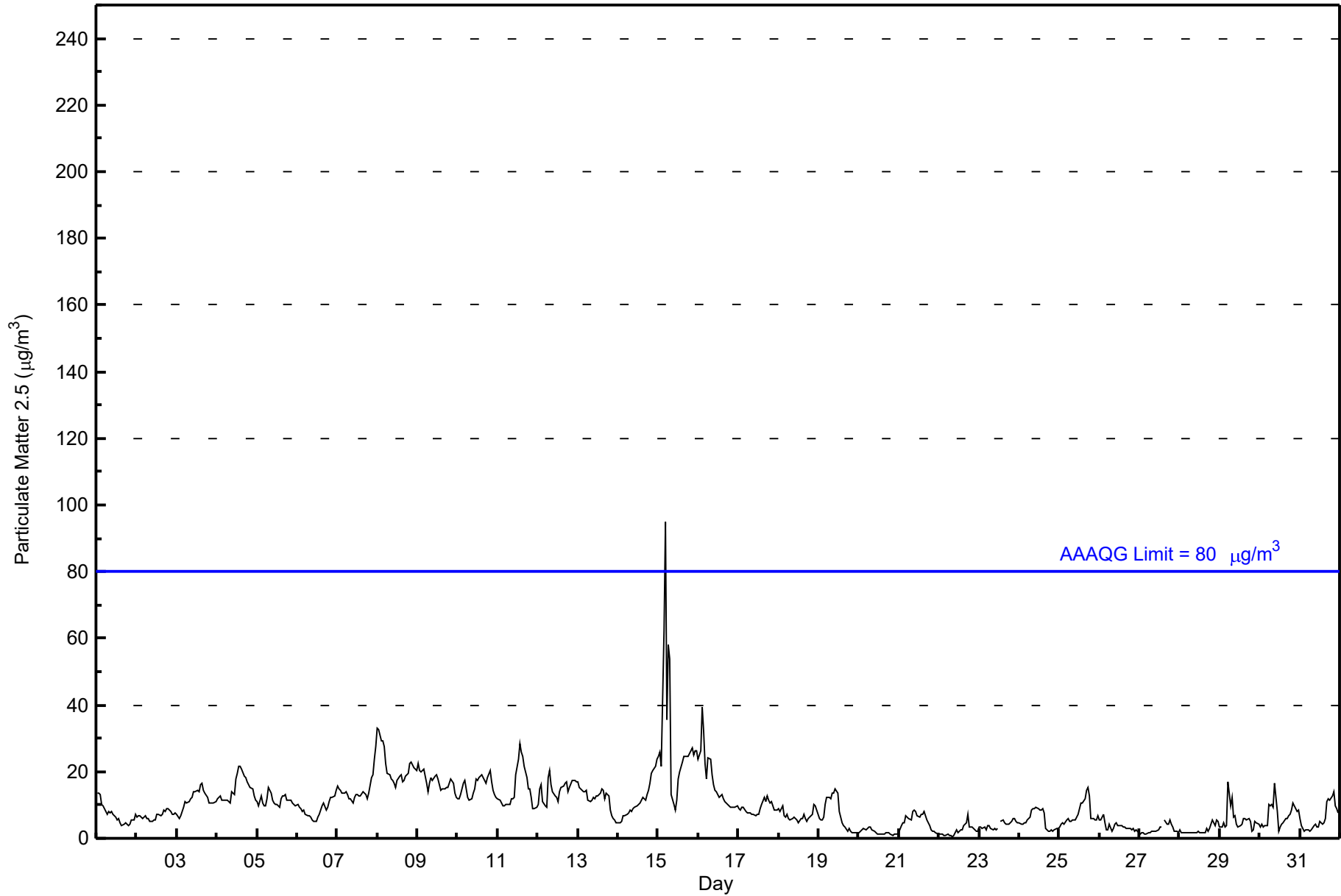








Number of Exceedences (AAAQO):		1-hr: 1	24-hr: 1	Hours in Service: 744																	744																												
Maximum Value: 94.9 µg/m ³ on Jan 15 05:00		Maximum Daily Average: 29.5 µg/m ³ on Jan 15																	Hours of Data: 742																														
Minimum Value: 0.6 µg/m ³ on Jan 22 09:00		Minimum Daily Average: 1.9 µg/m ³ on Jan 20																	Hours of Missing Data: 2																														
Maximum Diurnal Average: 11.5 µg/m ³ at hour 5		Minimum Diurnal Average: 8.7 µg/m ³ at hour 11																	Hours of Calibration: 1																														
Monthly Average: 9.84 µg/m ³		Percentiles: P ₁ = 1.1 P ₁₀ = 2.2 Q ₁ = 4.4 Median = 8.5 Q ₃ = 13.2 P ₉₀ = 18.1 P ₉₉ = 32.4																	Percent Operational Time: 99.9																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	13.7	13.7	13.2	10.0	9.9	8.1	7.0	8.1	7.5	7.9	7.3	6.4	5.7	5.9	4.5	3.8	4.4	4.6	4.4	3.9	4.2	5.6	5.7	7.1	7.2	13.7																							
2-Jan	6.4	6.6	6.9	6.1	6.5	6.9	5.8	6.1	5.2	5.3	5.4	5.7	7.4	7.1	6.6	7.4	8.6	7.9	9.1	9.0	8.2	7.3	7.1	7.6	6.9	9.1																							
3-Jan	7.1	6.1	6.8	8.0	9.4	11.2	10.5	10.9	11.7	12.3	13.9	14.2	14.6	14.0	15.9	16.6	14.2	13.5	12.3	10.6	10.5	10.8	10.7	10.9	11.5	16.6																							
4-Jan	11.7	12.2	12.6	11.5	11.5	11.6	11.3	11.2	10.6	13.9	13.0	17.8	19.3	21.8	21.5	20.8	18.8	18.1	17.1	16.3	15.4	14.8	12.9	11.6	14.9	21.8																							
5-Jan	11.0	9.5	12.9	10.6	9.7	9.9	11.7	15.1	13.5	11.3	10.5	10.0	10.0	9.2	11.7	12.8	12.8	13.3	11.5	11.5	11.4	10.6	10.1	9.9	11.3	15.1																							
6-Jan	10.0	9.3	8.8	8.2	8.4	7.1	6.9	6.9	6.4	5.4	5.3	5.2	6.5	7.1	8.6	9.6	10.7	8.6	9.2	11.0	12.3	12.1	12.6	14.4	8.8	14.4																							
7-Jan	15.5	14.7	14.4	13.7	13.5	13.9	13.1	12.1	12.0	10.6	12.2	13.1	13.2	12.9	13.9	13.6	13.2	12.1	13.4	18.1	19.1	23.6	27.6	14.7	27.6																								
8-Jan	33.2	32.5	29.1	29.2	27.7	22.3	19.4	18.9	17.9	17.5	16.7	15.3	17.2	18.8	19.2	17.0	17.2	18.5	19.3	22.6	22.7	21.9	21.1	20.5	21.5	33.2																							
9-Jan	22.3	20.5	19.7	20.4	20.7	16.6	13.9	16.4	18.0	17.6	18.6	19.2	17.8	16.3	14.5	14.8	14.7	15.3	15.4	16.7	17.7	16.3	13.5	12.4	17.1	22.3																							
10-Jan	12.0	11.9	13.2	16.6	17.2	14.7	12.4	11.3	11.7	13.5	14.9	18.0	17.5	18.3	18.9	18.1	17.5	16.5	18.1	20.5	17.0	14.6	13.1	12.4	15.4	20.5																							
11-Jan	11.9	11.4	10.8	9.9	9.8	10.2	10.0	10.4	11.7	11.7	12.4	19.0	23.6	28.4	26.0	24.7	21.7	18.0	14.8	15.0	12.4	8.7	9.1	9.5	14.6	28.4																							
12-Jan	10.2	15.0	16.2	11.1	9.7	9.2	18.1	20.5	16.1	14.1	12.8	12.4	11.0	14.0	15.1	15.5	16.6	17.0	14.0	15.2	17.2	17.2	17.4	17.1	14.7	20.5																							
13-Jan	17.0	15.1	14.5	14.1	14.0	14.3	11.5	11.1	11.6	12.3	11.9	12.6	12.7	13.8	14.9	14.3	11.8	13.5	12.5	8.5	6.6	5.9	5.4	4.8	11.9	17.0																							
14-Jan	4.7	4.7	5.2	6.9	6.8	7.2	7.7	8.3	8.1	9.0	9.5	9.8	10.4	10.6	11.5	12.2	11.5	13.0	14.4	16.3	19.6	20.2	21.4	23.8	11.4	23.8																							
15-Jan	24.5	26.0	21.6	62.4	94.9	35.4	57.9	53.9	13.3	10.0	8.3	11.4	18.0	19.9	22.9	24.7	24.7	24.4	24.6	25.2	27.2	25.0	26.2	26.3	29.5	94.9																							
16-Jan	23.8	26.5	39.4	32.4	22.3	17.7	24.2	23.5	19.2	16.2	14.6	14.1	12.4	12.6	13.0	11.8	10.9	10.0	9.6	9.2	9.2	9.4	9.2	9.8	16.7	39.4																							
17-Jan	9.1	8.7	9.4	9.4	7.9	7.6	7.6	7.5	7.0	7.1	6.9	7.0	7.2	9.1	10.0	12.1	10.9	12.5	11.2	10.7	10.9	8.5	8.3	8.6	9.0	12.5																							
18-Jan	8.7	8.1	9.7	6.8	6.2	7.0	6.1	5.7	6.0	6.3	5.8	5.3	4.7	6.0	6.0	7.0	5.7	5.0	5.9	6.9	7.4	10.2	9.9	8.4	6.9	10.2																							
19-Jan	5.7	5.5	5.3	6.3	10.1	12.2	12.4	11.9	13.4	13.6	14.7	13.6	8.1	6.4	4.7	3.9	3.2	2.3	2.9	2.2	1.9	1.6	1.6	1.7	6.9	14.7																							
20-Jan	1.8	2.2	2.4	2.8	2.6	2.9	3.2	3.4	2.6	1.9	1.7	1.4	1.3	1.3	1.4	1.3	1.6	1.9	1.6	1.1	1.0	1.1	1.2	1.2	1.9	3.4																							
21-Jan	1.6	4.0	4.5	4.7	6.6	6.5	6.0	5.7	7.9	8.3	7.9	6.6	6.5	7.1	7.3	8.0	6.8	5.3	3.8	2.4	2.3	2.2	1.8	1.3	5.2	8.3																							
22-Jan	1.2	1.2	1.1	1.0	1.0	1.1	0.9	0.8	0.6	0.9	2.7	1.5	2.0	2.3	2.7	3.7	4.7	7.1	3.5	3.4	3.5	2.4	1.9	1.9	2.2	7.1																							
23-Jan	3.4	3.4	3.1	3.3	2.6	3.7	3.9	2.9	2.6	2.9	2.8	3.2	M	5.0	5.6	4.5	4.3	4.1	4.2	5.2	6.1	5.9	4.9	4.8	4.0	6.1																							
24-Jan	4.8	4.3	4.4	4.8	4.8	5.3	6.2	8.3	9.0	9.1	9.4	8.8	8.6	8.6	8.9	7.4	3.1	2.2	2.2	2.5	2.3	2.6	3.0	3.0	5.6	9.4																							
25-Jan	3.6	4.4	4.6	4.4	5.4	6.0	5.2	5.1	5.7	5.5	6.4	7.4	8.9	10.5	10.8	11.7	14.3	15.4	12.7	6.1	5.7	5.7	5.6	6.6	7.4	15.4																							
26-Jan	5.3	5.7	7.3	4.8	2.7	2.7	4.3	2.1	3.0	4.3	4.7	4.0	3.8	3.6	3.3	3.6	3.1	2.9	3.0	2.7	3.1	2.2	2.5	2.1	3.6	7.3																							
27-Jan	1.3	1.7	1.5	1.4	1.4	1.7	1.9	2.3	2.2	2.0	2.0	2.5	3.3	3.4	C	5.5	4.1	4.2	5.4	4.3	3.5	2.2	2.1	1.9	2.7	5.5																							
28-Jan	2.4	1.7	1.7	1.9	1.8	1.9	1.8	1.7	1.6	1.7	1.8	2.0	1.8	1.9	1.7	1.7	3.1	2.1	2.8	5.5	4.6	3.9	5.5	5.0	2.6	5.5																							
29-Jan	3.2	3.3	4.7	3.6	3.7	17.2	9.8	12.2	6.3	6.9	4.2	3.2	3.8	4.1	5.8	5.8	5.3	6.1	5.2	2.0	2.6	5.1	4.7	4.0	5.5	17.2																							
30-Jan	3.3	4.0	3.5	3.8	4.0	10.0	9.9	10.0	9.4	16.5	7.9	2.2	3.6	4.2	4.8	6.0	6.1	6.6	7.1	8.5	10.6	8.8	8.2	8.4	7.0	16.5																							
31-Jan	6.1	3.8	2.1	2.6	2.6	2.6	1.9	2.6	3.9	4.2	3.6	3.5	5.2	4.1	4.6	6.0	10.9	12.0	11.4	12.6	13.9	9.6	8.7	7.5	6.1	13.9																							
																								9.6	9.6	10.0	10.7	11.5	9.8	10.4	10.5	8.9	9.0	8.7	8.9	9.5	9.9	10.5	10.5	10.2	10.2	9.7	9.7	10.0	9.4	9.3	9.4	Diurnal Average	
																								33.2	32.5	39.4	62.4	94.9	35.4	57.9	53.9	19.2	17.6	18.6	19.2	23.6	28.4	26.0	24.7	24.7	24.4	24.6	25.2	27.2	25.0	26.2	27.6	Diurnal Maximum	
C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Barge Landing - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	238	32.08	32.08
6 - 15	383	51.62	83.69
16 - 25	101	13.61	97.30
26 - 80	19	2.56	99.87
> 81.0	1	0.13	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Barge Landing - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	21	40	19	6	3	4	5	15	27	16	24	13	15	12	8	9	237
6 - 15	14	12	9	5	3	5	8	155	100	17	6	4	3	3	5	33	382
16 - 25	6	1	0	1	2	3	4	26	7	5	6	3	1	2	5	27	99
26 - 80	3	2	0	0	0	0	0	6	2	0	0	0	0	0	0	6	19
> 81.0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	44	56	28	12	8	12	17	202	136	38	36	20	19	17	18	75	738

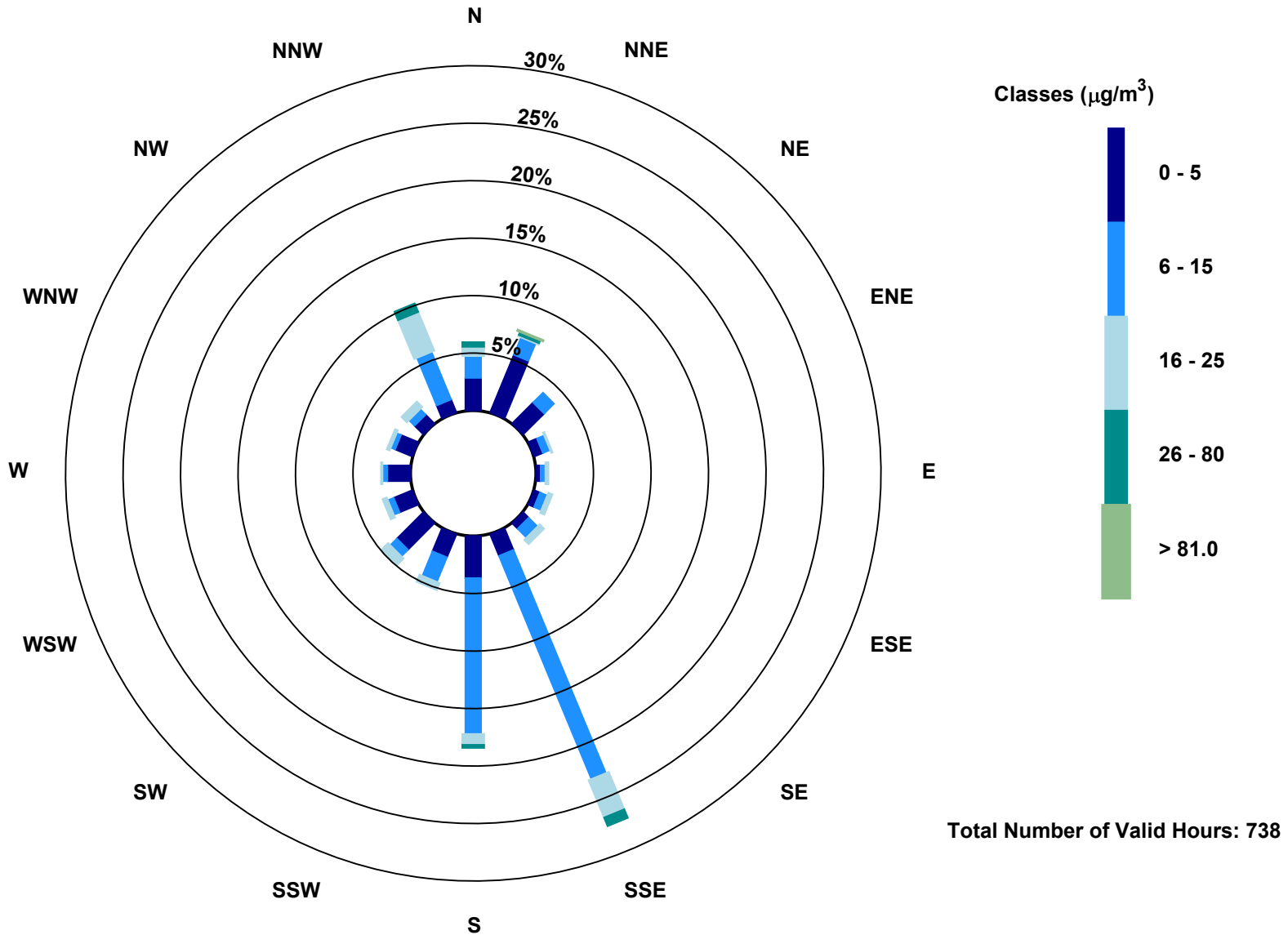
Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Barge Landing





Wood Buffalo Environmental Association
Summary of Hour Averages

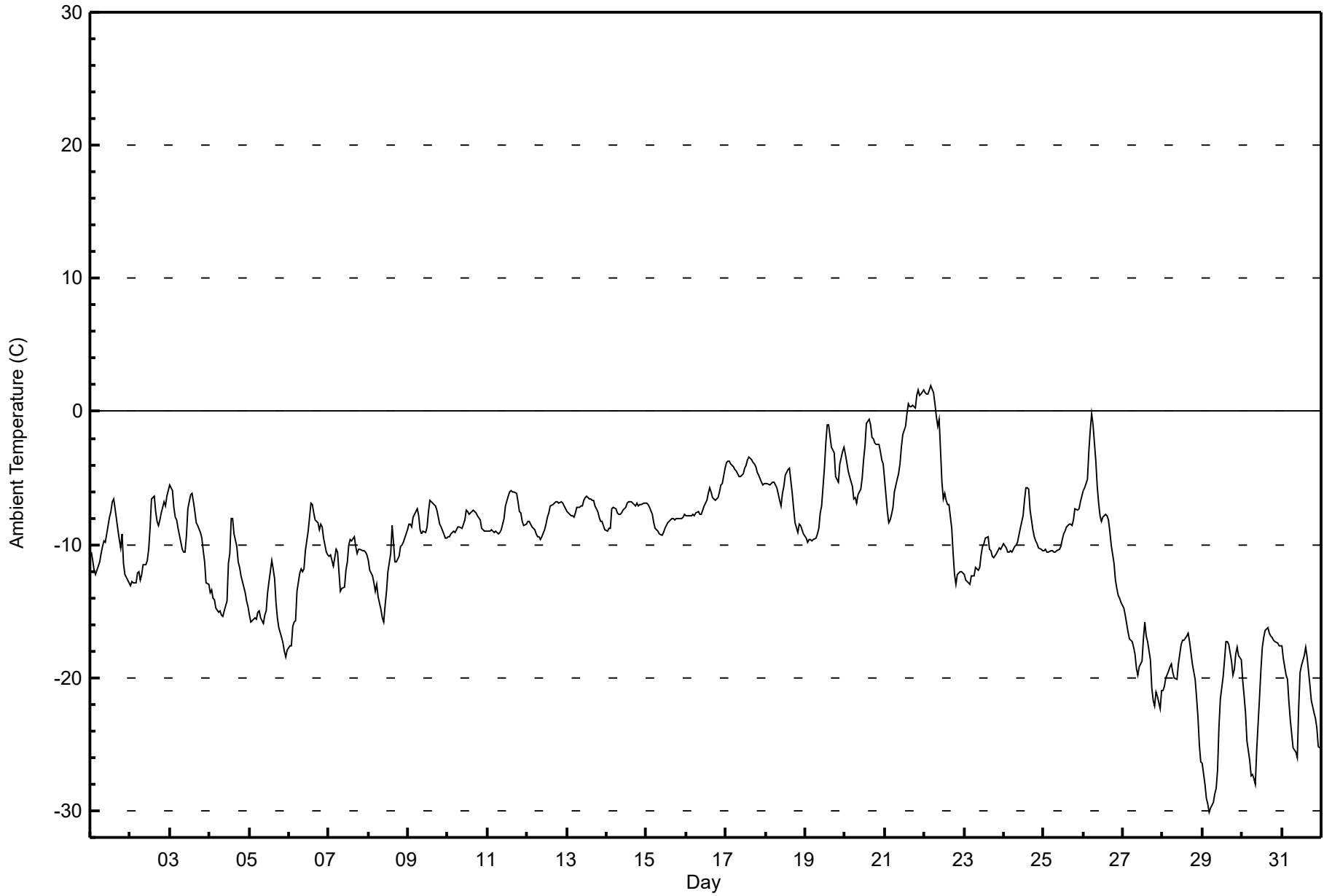
Ambient Temperature (AT) - C
Barge Landing - January 2023

Maximum Value: 2.0 C on Jan 22 05:00 Maximum Daily Average: -2.5 C on Jan 21																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -30.1 C on Jan 29 05:00 Minimum Daily Average: -23.0 C on Jan 29 Maximum Diurnal Average: -8.1 C at hour 15 Minimum Diurnal Average: -11.7 C at hour 9 Monthly Average: -10.38 C Percentiles: P ₁ = -28.0 P ₁₀ = -18.7 Q ₁ = -12.8 Median = -9.0 Q ₃ = -7.0 P ₉₀ = -4.6 P ₉₉ = 1.3																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.5	-11.2	-11.9	-12.3	-12.0	-11.3	-10.7	-10.1	-9.8	-9.8	-9.2	-7.9	-7.5	-6.8	-6.5	-7.3	-8.9	-9.6	-10.2	-9.2	-11.4	-12.3	-12.6	-12.9	-10.1	-6.5
2-Jan	-13.1	-12.8	-12.9	-12.8	-12.1	-12.0	-12.7	-12.3	-11.6	-11.6	-11.2	-10.4	-8.8	-6.6	-6.3	-7.5	-8.2	-8.6	-8.2	-7.6	-6.8	-7.1	-6.3	-5.9	-9.7	-5.9
3-Jan	-5.6	-5.9	-7.2	-8.0	-8.1	-8.8	-9.3	-10.3	-10.6	-10.6	-9.3	-7.3	-6.3	-6.1	-6.8	-7.5	-8.4	-8.6	-9.1	-9.5	-10.5	-11.3	-12.8	-13.0	-8.8	-5.6
4-Jan	-13.6	-13.4	-14.1	-14.1	-14.7	-15.0	-15.0	-15.2	-15.4	-15.0	-14.2	-11.4	-10.7	-8.0	-8.0	-9.2	-10.1	-11.3	-11.7	-12.3	-12.8	-13.6	-14.3	-14.6	-12.8	-8.0
5-Jan	-15.3	-15.8	-15.6	-15.5	-15.6	-15.1	-14.9	-15.5	-15.9	-15.3	-14.0	-13.6	-12.7	-11.2	-11.8	-12.5	-14.4	-15.5	-16.2	-17.0	-17.4	-18.0	-18.4	-17.9	-15.3	-11.2
6-Jan	-17.6	-17.6	-16.1	-15.8	-15.7	-13.5	-12.2	-11.8	-12.0	-11.8	-10.5	-9.0	-8.0	-6.9	-6.9	-7.6	-8.1	-8.4	-8.8	-8.5	-8.7	-9.5	-10.5	-10.7	-11.1	-6.9
7-Jan	-10.9	-10.7	-11.2	-11.7	-10.4	-10.6	-12.1	-13.5	-13.3	-13.2	-11.9	-11.3	-10.0	-9.6	-9.7	-9.4	-10.2	-10.7	-10.3	-10.4	-10.4	-10.5	-10.6	-10.8	-11.0	-9.4
8-Jan	-11.2	-11.9	-12.4	-12.9	-13.5	-13.0	-13.9	-14.9	-15.5	-15.8	-14.6	-13.5	-12.0	-10.7	-8.6	-9.8	-11.3	-11.2	-10.9	-10.2	-10.0	-9.9	-9.5	-8.9	-11.9	-8.6
9-Jan	-8.5	-8.5	-8.7	-8.0	-7.7	-7.3	-7.9	-8.9	-9.2	-9.0	-9.1	-8.7	-7.5	-6.7	-6.8	-6.9	-7.1	-7.4	-7.9	-8.4	-8.7	-9.2	-9.5	-9.5	-8.2	-6.7
10-Jan	-9.4	-9.4	-9.2	-9.0	-9.1	-8.9	-8.7	-8.7	-8.8	-8.5	-8.1	-7.4	-7.5	-7.7	-7.5	-7.4	-7.5	-7.6	-7.8	-8.2	-8.8	-8.9	-9.0	-9.0	-8.4	-7.4
11-Jan	-9.0	-9.0	-8.9	-9.0	-9.1	-9.0	-9.2	-9.1	-8.9	-8.5	-8.0	-7.1	-6.4	-6.0	-5.9	-6.0	-6.1	-6.2	-6.7	-7.5	-7.7	-8.2	-8.6	-8.4	-7.9	-5.9
12-Jan	-8.3	-8.3	-8.5	-8.7	-8.9	-9.2	-9.4	-9.4	-9.6	-9.4	-8.9	-8.5	-7.9	-7.6	-7.1	-7.0	-6.9	-6.8	-6.8	-6.8	-6.7	-6.9	-7.1	-7.3	-8.0	-6.7
13-Jan	-7.5	-7.6	-7.8	-7.9	-8.0	-7.7	-7.2	-7.2	-7.1	-7.1	-6.7	-6.4	-6.3	-6.6	-6.6	-6.7	-6.7	-7.1	-7.6	-7.9	-8.2	-8.3	-8.5	-8.9	-7.4	-6.3
14-Jan	-9.0	-8.8	-8.8	-7.3	-7.2	-7.3	-7.6	-7.7	-7.7	-7.6	-7.4	-7.2	-6.9	-6.8	-6.8	-6.7	-7.0	-7.1	-6.9	-7.1	-7.0	-7.0	-6.9	-6.9	-7.4	-6.7
15-Jan	-6.9	-7.0	-7.2	-7.7	-8.4	-8.8	-8.9	-9.0	-9.2	-9.3	-9.1	-8.8	-8.6	-8.3	-8.1	-8.1	-8.1	-8.2	-8.1	-8.0	-8.0	-8.0	-7.9	-7.8	-8.2	-6.9
16-Jan	-7.8	-7.8	-7.8	-7.8	-7.7	-7.8	-7.6	-7.6	-7.7	-7.8	-7.4	-7.0	-6.7	-6.2	-5.7	-6.0	-6.5	-6.7	-6.6	-6.5	-6.0	-5.5	-5.4	-4.3	-6.8	-4.3
17-Jan	-3.8	-3.7	-3.7	-4.0	-4.2	-4.4	-4.5	-4.7	-4.9	-4.8	-4.7	-4.3	-4.0	-3.6	-3.4	-3.6	-3.8	-4.0	-4.2	-4.6	-4.8	-5.3	-5.5	-5.4	-4.3	-3.4
18-Jan	-5.5	-5.4	-5.5	-5.4	-5.4	-5.3	-5.5	-5.8	-6.7	-7.1	-6.1	-5.6	-4.8	-4.4	-4.3	-5.2	-6.2	-7.3	-8.4	-9.1	-8.5	-8.6	-8.9	-9.2	-6.4	-4.3
19-Jan	-9.5	-9.8	-9.6	-9.6	-9.7	-9.6	-9.6	-9.2	-8.8	-7.6	-7.1	-4.3	-2.4	-1.0	-1.0	-1.8	-2.6	-3.1	-4.9	-5.1	-5.4	-3.9	-3.0	-2.7	-5.9	-1.0
20-Jan	-3.2	-3.8	-4.5	-4.9	-5.6	-6.6	-6.5	-6.8	-6.3	-5.9	-5.0	-3.7	-2.6	-0.9	-0.5	-0.9	-2.0	-2.0	-2.4	-2.5	-2.5	-3.0	-3.6	-3.9	-3.7	-0.5
21-Jan	-5.2	-7.5	-8.4	-8.2	-7.7	-7.2	-6.0	-5.1	-4.7	-3.9	-2.7	-1.7	-1.1	-0.1	0.6	0.4	0.4	0.5	0.3	1.3	1.7	1.2	1.3	1.6	-2.5	1.7
22-Jan	1.4	1.3	1.3	1.6	2.0	1.4	0.6	-0.4	-1.1	-0.6	-5.3	-6.6	-6.2	-6.7	-7.0	-6.9	-8.8	-10.7	-12.3	-13.0	-12.2	-12.0	-12.0	-12.1	-5.2	2.0
23-Jan	-12.2	-12.7	-12.8	-13.0	-12.4	-12.4	-12.3	-11.8	-11.9	-11.7	-10.8	-10.2	-9.9	-9.5	-9.4	-10.4	-10.4	-10.8	-11.0	-10.7	-10.5	-10.2	-10.3	-10.1	-11.1	-9.4
24-Jan	-10.0	-10.3	-10.5	-10.6	-10.4	-10.5	-10.2	-10.0	-9.8	-9.4	-8.8	-7.8	-6.6	-5.8	-5.7	-5.8	-7.4	-8.9	-9.4	-9.7	-10.0	-10.3	-10.3	-10.5	-9.1	-5.7
25-Jan	-10.5	-10.4	-10.6	-10.5	-10.5	-10.5	-10.5	-10.6	-10.5	-10.3	-10.1	-9.6	-9.2	-9.0	-8.7	-8.5	-8.5	-8.5	-8.1	-7.3	-7.4	-7.3	-6.8	-6.3	-9.2	-6.3
26-Jan	-5.9	-5.7	-5.1	-3.0	-1.5	-0.1	-1.0	-3.7	-5.7	-6.9	-7.8	-8.2	-8.0	-7.7	-7.8	-8.1	-9.0	-10.0	-11.4	-12.7	-13.3	-13.8	-14.1	-14.3	-7.7	-0.1
27-Jan	-14.8	-15.3	-15.9	-16.5	-17.0	-17.3	-17.7	-18.2	-19.3	-19.8	-19.2	-18.7	-17.1	-15.9	-16.8	-17.3	-18.7	-20.8	-21.7	-22.1	-21.0	-21.4	-22.3	-21.0	-18.6	-14.8
28-Jan	-21.0	-20.6	-20.0	-19.5	-19.2	-19.0	-19.6	-20.0	-20.1	-19.0	-18.2	-17.5	-17.2	-17.2	-16.9	-16.7	-17.3	-18.2	-18.9	-20.2	-21.5	-22.9	-25.1	-26.3	-19.7	-16.7
29-Jan	-26.5	-28.0	-29.1	-29.5	-30.1	-29.8	-29.4	-28.8	-28.3	-26.9	-23.7	-21.6	-19.9	-18.6	-17.3	-17.2	-17.5	-18.7	-19.8	-19.3	-18.2	-17.7	-18.3	-18.6	-23.0	-17.2
30-Jan	-20.3	-21.4	-22.6	-24.7	-26.2	-27.4	-27.3	-27.5	-28.0	-25.4	-21.5	-19.4	-17.7	-17.0	-16.4	-16.2	-16.7	-16.8	-16.9	-17.2	-17.3	-17.4	-17.6	-17.6	-20.7	-16.2
31-Jan	-17.6	-18.5	-19.8	-20.2	-21.8	-23.1	-24.2	-25.3	-25.6	-26.0	-22.2	-19.6	-19.1	-18.3	-17.7	-18.5	-19.5	-20.5	-21.7	-22.7	-23.1	-23.8	-25.2	-25.3	-21.6	-17.6
	-10.6	-10.9	-11.1	-11.2	-11.2	-11.2	-11.3	-11.6	-11.7	-11.5	-10.8	-9.8	-9.0	-8.3	-8.1	-8.5	-9.1	-9.7	-10.1	-10.3	-10.4	-10.7	-11.0	-10.9		Diurnal Average
	1.4	1.3	1.3	1.6	2.0	1.4	0.6	-0.4	-1.1	-0.6	-2.7	-1.7	-1.1	-0.1	0.6	0.4	0.4	0.5	0.3	1.3	1.7	1.2	1.3	1.6		Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Barge Landing - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Barge Landing - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	55	7.39	7.39
-20 - 0	672	90.32	97.72
0 - 10	17	2.28	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

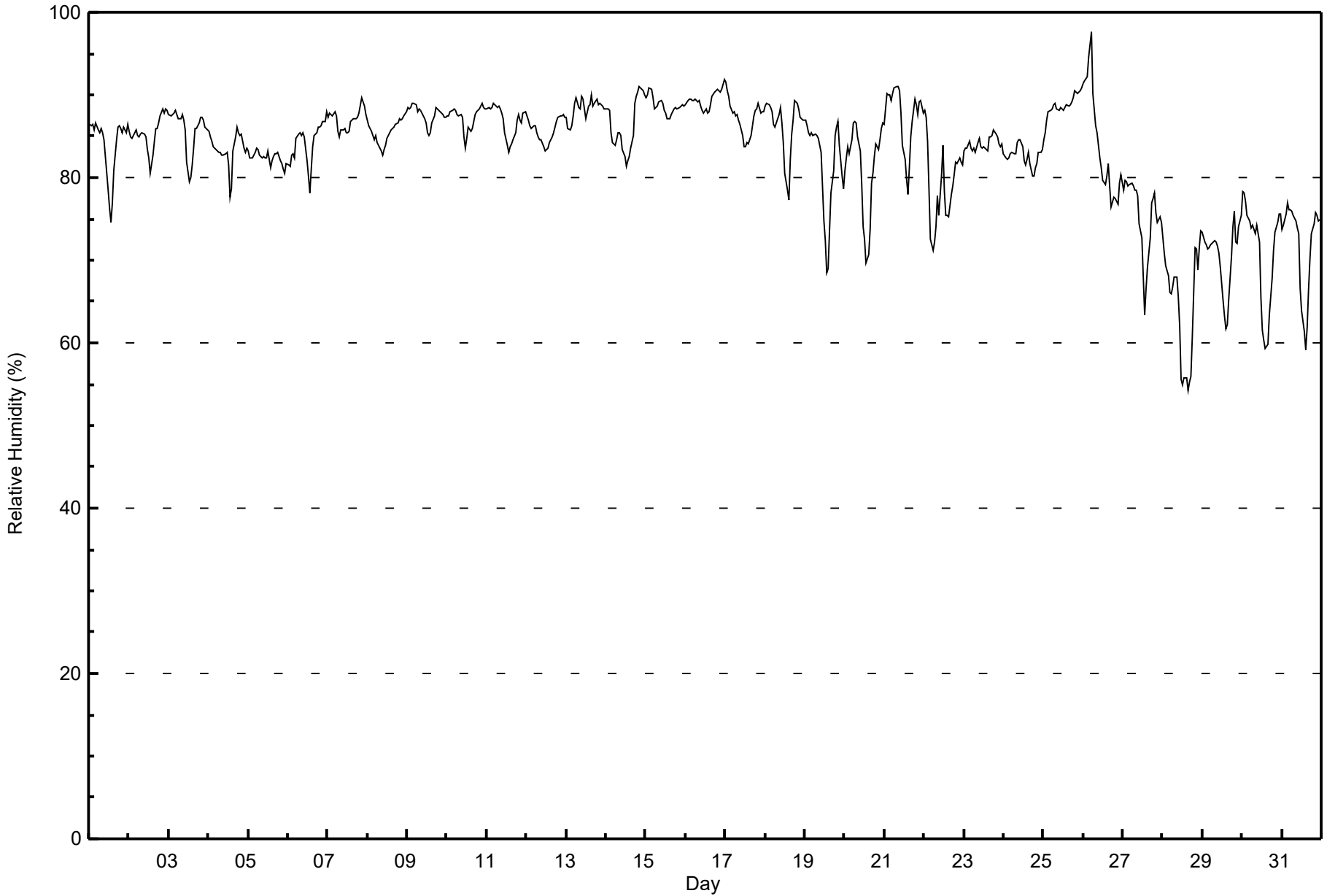
Relative Humidity (RH) - %
Barge Landing - January 2023

Maximum Value: 97.6 % on Jan 26 06:00 Maximum Daily Average: 89.4 % on Jan 16 Minimum Value: 54.3 % on Jan 28 16:00 Minimum Daily Average: 64.5 % on Jan 28 Maximum Diurnal Average: 84.9 % at hour 1 Minimum Diurnal Average: 78.0 % at hour 14 Monthly Average: 82.98 % Percentiles: P ₁ = 59.2 P ₁₀ = 73.3 Q ₁ = 81.1 Median = 85.1 Q ₃ = 87.7 P ₉₀ = 88.9 P ₉₉ = 91.2																						Hours in Service:	744																							
																						Hours of Data:	744																							
																						Hours of Missing Data:	0																							
																						Hours of Calibration:	0																							
																						Percent Operational Time:	100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jan	86.5	86.2	86.5	85.8	86.6	85.8	85.5	85.9	85.4	84.5	82.5	78.4	76.2	74.6	77.0	80.9	84.6	86.0	86.3	86.0	85.5	86.0	85.5	86.4	83.9	86.6																				
2-Jan	85.5	85.0	84.7	85.3	85.8	85.0	84.9	85.3	85.5	85.2	85.0	83.3	82.5	80.5	82.7	84.4	85.9	86.0	86.6	87.4	88.2	87.7	88.2	88.1	85.4	88.2																				
3-Jan	87.7	87.4	87.6	87.8	88.2	87.7	87.2	87.0	87.6	86.9	85.7	81.8	79.6	79.9	81.5	83.6	86.0	85.9	86.7	87.3	87.3	87.0	86.1	85.8	85.8	88.2																				
4-Jan	85.7	84.8	84.4	83.7	83.6	83.2	83.0	83.0	82.7	82.8	82.9	83.1	81.5	77.6	78.7	83.2	84.9	86.1	85.5	85.0	85.2	83.6	83.1	83.5	83.4	86.1																				
5-Jan	83.3	82.4	82.4	82.8	83.0	83.6	83.3	82.6	82.4	82.6	82.4	82.4	83.2	81.1	82.0	82.6	83.0	82.9	83.1	82.0	81.7	81.1	80.5	81.6	82.4	83.6																				
6-Jan	81.6	81.3	82.8	82.9	82.4	84.8	85.3	85.5	85.2	85.4	84.9	82.1	80.1	78.1	81.0	83.8	85.1	85.5	86.1	86.2	86.2	86.9	86.8	88.0	84.1	88.0																				
7-Jan	87.3	87.8	87.7	87.5	87.9	87.5	85.6	84.9	85.8	85.7	86.0	85.4	85.5	85.5	86.8	87.0	87.2	87.0	87.2	87.8	89.7	89.2	88.6	87.6	87.0	89.7																				
8-Jan	86.9	86.3	85.5	85.1	84.6	85.0	84.3	83.6	83.2	82.7	83.4	83.9	84.8	85.4	85.8	85.9	86.2	86.4	86.7	87.1	86.9	87.1	87.5	88.0	85.5	88.0																				
9-Jan	88.4	88.4	88.5	89.0	89.0	88.8	88.0	88.3	88.1	87.8	87.1	86.5	85.5	85.0	85.5	86.7	87.4	88.5	88.2	88.2	87.9	87.7	87.2	87.3	87.6	89.0																				
10-Jan	87.4	87.5	87.9	88.2	88.3	88.2	87.6	87.5	87.7	87.2	84.9	83.6	84.8	86.2	85.7	86.0	86.9	87.6	88.0	88.2	88.6	88.9	88.5	88.3	87.2	88.9																				
11-Jan	88.4	88.4	88.2	88.5	89.0	88.8	88.5	88.7	88.4	87.8	87.2	85.4	83.9	83.1	83.8	84.0	84.6	85.5	86.9	87.6	86.9	86.6	87.8	88.0	86.9	89.0																				
12-Jan	87.4	87.0	86.3	85.9	86.3	86.2	85.4	84.9	84.5	84.5	83.7	83.2	83.4	83.5	84.2	84.8	85.4	86.0	86.7	87.2	87.4	87.5	87.6	87.3	85.7	87.6																				
13-Jan	87.3	86.0	85.8	86.2	87.5	89.1	89.6	88.5	88.3	89.8	89.4	88.2	87.2	88.7	88.7	90.0	88.6	89.1	89.5	88.8	89.0	88.9	88.6	88.3	88.4	90.0																				
14-Jan	88.3	88.3	88.2	85.4	84.3	83.9	84.6	85.4	85.5	85.0	83.4	82.6	81.3	82.0	82.6	83.5	85.1	88.9	89.9	90.3	91.1	90.9	90.6	90.1	86.3	91.1																				
15-Jan	89.7	90.0	90.9	90.6	89.6	88.2	88.5	88.6	89.2	89.3	89.1	88.2	87.8	87.2	87.1	87.6	88.0	88.3	88.4	88.3	88.5	88.7	88.7	88.6	88.7	90.9																				
16-Jan	88.8	89.4	89.5	89.4	89.2	89.3	89.5	89.1	89.3	88.7	88.2	87.9	88.3	87.9	87.9	88.8	89.9	90.3	90.6	90.6	90.5	90.3	90.7	91.8	89.4	91.8																				
17-Jan	91.5	90.5	89.9	88.6	87.8	87.9	87.4	87.6	86.9	86.5	85.1	83.7	83.7	84.3	84.0	85.1	86.3	87.4	88.2	88.2	88.9	87.9	88.0	87.9	87.2	91.5																				
18-Jan	88.6	88.9	88.8	88.5	87.9	86.5	86.1	86.6	87.6	88.5	86.7	84.3	80.6	78.4	77.2	82.1	85.2	87.0	89.4	88.9	88.3	87.4	87.2	87.0	86.2	89.4																				
19-Jan	87.0	86.3	85.5	85.2	85.4	85.1	85.2	85.0	84.7	83.8	83.0	74.7	72.4	68.5	69.0	73.6	78.1	80.9	85.1	86.1	86.9	83.9	80.2	78.7	81.4	87.0																				
20-Jan	80.8	82.4	83.7	82.9	84.5	86.6	86.8	86.5	84.9	83.2	79.2	74.1	72.6	69.7	70.6	73.8	79.4	80.6	82.6	84.1	83.3	84.6	85.9	86.6	81.2	86.8																				
21-Jan	86.5	90.2	90.1	90.0	89.4	90.2	90.9	91.0	91.0	90.5	87.7	84.0	82.2	79.8	78.0	81.2	84.8	86.8	89.5	88.8	87.6	89.1	89.4	87.8	87.3	91.0																				
22-Jan	88.1	87.3	84.5	78.7	72.6	71.2	72.2	74.0	77.8	75.5	80.4	83.9	78.4	75.5	75.4	75.2	77.9	79.0	80.3	81.8	81.7	82.4	81.9	81.6	79.0	88.1																				
23-Jan	83.3	83.5	83.6	84.4	83.6	83.2	83.6	83.1	84.3	84.8	83.7	83.5	83.7	83.6	83.3	84.9	85.0	85.1	85.8	85.2	84.9	84.1	83.7	84.1	84.1	85.8																				
24-Jan	82.9	82.4	82.2	82.4	82.9	83.1	82.9	82.8	84.3	84.6	84.5	83.8	82.0	81.5	82.2	83.0	81.7	80.1	81.2	81.6	83.1	83.1	83.1	83.5	82.6	84.6																				
25-Jan	84.6	85.4	86.9	87.9	88.1	88.4	88.8	89.0	88.3	88.2	88.5	88.3	88.2	88.5	88.8	88.6	88.9	89.1	89.6	90.5	90.2	90.3	90.5	90.9	88.6	90.9																				
26-Jan	91.4	91.6	92.2	94.6	96.2	97.6	90.2	86.2	85.5	83.9	82.3	81.1	79.7	79.2	80.1	81.8	79.0	76.5	77.6	77.4	77.1	76.8	79.3	80.3	84.1	97.6																				
27-Jan	78.4	79.7	79.5	79.0	79.2	79.3	79.0	78.5	78.4	77.7	74.4	72.8	67.9	63.3	66.5	69.2	72.8	77.0	77.5	78.1	75.8	74.6	75.2	74.5	75.4	79.7																				
28-Jan	72.8	70.9	69.2	68.1	66.2	65.9	66.8	67.9	68.0	65.5	62.1	55.6	54.8	55.7	55.8	54.3	55.3	56.0	60.6	71.5	71.4	68.8	71.6	73.5	64.5	73.5																				
29-Jan	73.4	72.3	71.9	71.3	71.5	71.8	72.1	72.4	72.2	71.7	70.8	69.1	65.2	63.3	61.7	62.3	65.3	70.5	74.0	76.0	72.2	72.0	74.0	75.4	70.5	76.0																				
30-Jan	78.3	78.1	77.0	75.4	74.7	73.9	74.2	73.7	73.3	74.2	72.2	65.5	61.6	60.3	59.3	59.8	63.4	65.6	67.7	71.1	73.4	74.6	75.7	75.5	70.8	78.3																				
31-Jan	73.7	74.3	75.6	77.0	76.1	76.1	75.8	75.4	74.8	74.0	73.3	66.7	63.9	61.4	59.1	61.8	66.4	70.2	73.3	74.4	75.7	75.5	74.8	74.9	71.8	77.0																				
																						84.9	84.8	84.8	84.5	84.2	84.3	84.0	83.8	83.9	83.5	82.6	80.6	79.1	78.0	78.5	80.0	81.5	82.6	83.8	84.6	84.5	84.3	84.4	84.5	Diurnal Average
																						91.5	91.6	92.2	94.6	96.2	97.6	90.9	91.0	91.0	90.5	89.4	88.3	88.3	88.7	88.8	90.0	89.9	90.3	90.6	90.6	91.1	90.9	90.7	91.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Barge Landing - January 2023



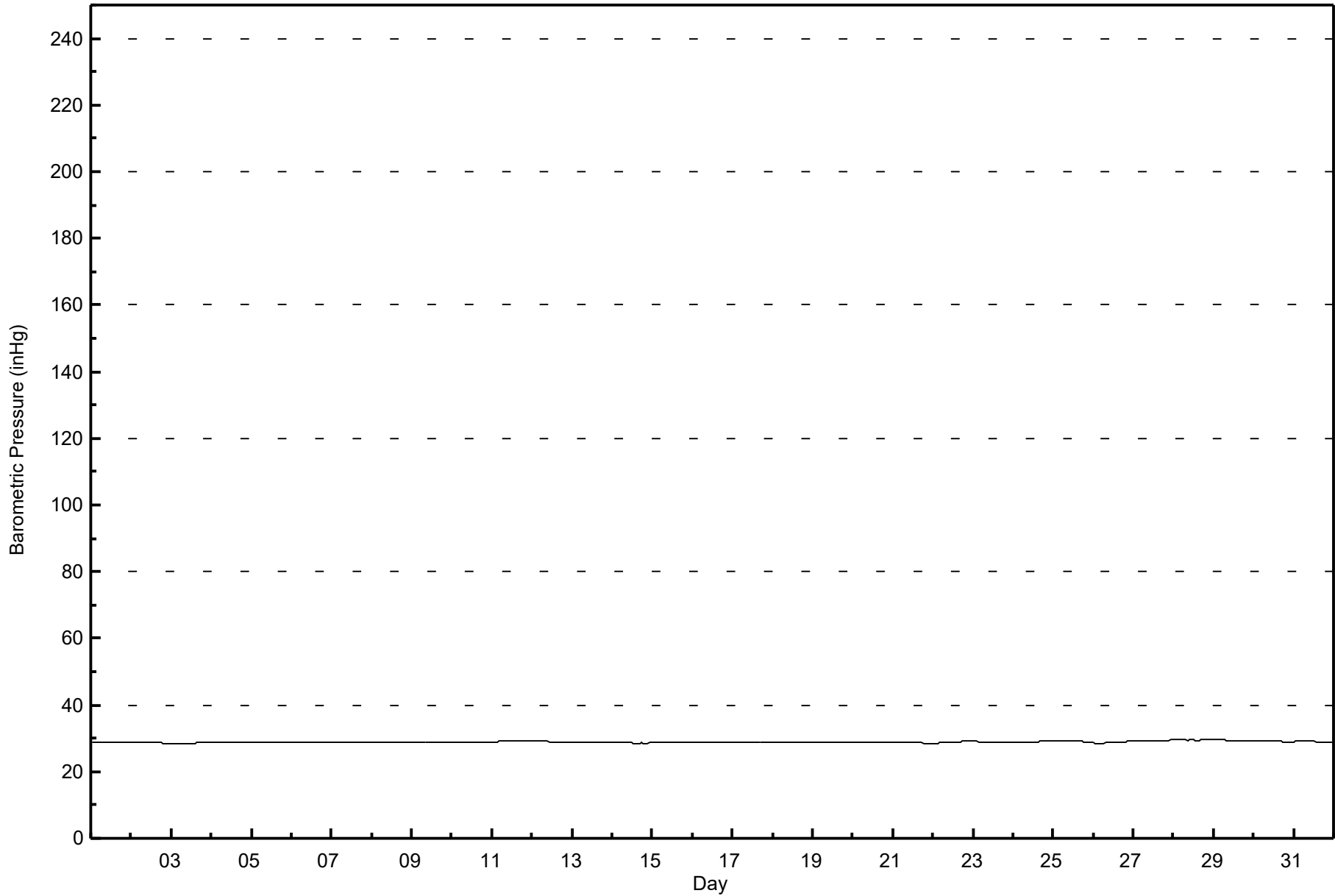


Maximum Value: 29.6 inHg on Jan 29 00:00 Maximum Daily Average: 29.5 inHg on Jan 28																						Hours in Service:	744				
Minimum Value: 28.5 inHg on Jan 26 04:00 Minimum Daily Average: 28.6 inHg on Jan 3																						Hours of Data:	744				
Maximum Diurnal Average: 28.9 inHg at hour 11 Minimum Diurnal Average: 28.9 inHg at hour 2																						Hours of Missing Data:	0				
Monthly Average: 28.88 inHg Percentiles: P ₁ = 28.6 P ₁₀ = 28.6 Q ₁ = 28.7 Median = 28.8 Q ₃ = 29.0 P ₉₀ = 29.2 P ₉₉ = 29.5																						Hours of Calibration:	0				
																						Percent Operational Time:	100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.8	
2-Jan	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.8
3-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.6	28.7
4-Jan	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9
5-Jan	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
6-Jan	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
7-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
8-Jan	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
9-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.7	28.8
10-Jan	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.9	29.0
11-Jan	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
12-Jan	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.1
13-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.9	28.9
14-Jan	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7
15-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
16-Jan	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
17-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8
18-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
19-Jan	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
20-Jan	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9
21-Jan	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.9
22-Jan	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.8	28.8	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	28.8	29.1
23-Jan	29.1	29.1	29.0	29.0	29.0	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	29.1
24-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
25-Jan	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.0	29.0	28.9	28.8	28.7	28.7	29.1	29.2	
26-Jan	28.6	28.5	28.5	28.5	28.5	28.5	28.6	28.7	28.7	28.8	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	28.8	29.1	
27-Jan	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.3	29.5
28-Jan	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.4	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.5	29.6
29-Jan	29.6	29.6	29.5	29.5	29.5	29.5	29.5	29.4	29.4	29.4	29.3	29.3	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3	29.6
30-Jan	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.2
31-Jan	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
28.9 28.9																						Diurnal Average					
29.6 29.6 29.5 29.5 29.5 29.5 29.5 29.5 29.4 29.5 29.5 29.5 29.5 29.4 29.4 29.4 29.5 29.5 29.5 29.5 29.5 29.5 29.5 29.5 29.6 29.6																						Diurnal Maximum					



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Barge Landing - January 2023





Maximum Speed: 30 km/h on Jan 26 08:00	Maximum Daily Speed Average: 14.2 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 1 km/h on Jan 9 07:00	Minimum Daily Speed Average: 0.9 km/h on Jan 9	Hours of Data: 740
Maximum Diurnal Speed Average: 4.7 km/h at hour 6	Minimum Diurnal Speed Average: 1.7 km/h at hour 21	Hours of Missing Data: 4
Monthly Average Velocity: 3.1 km/h 170.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 9 Q ₃ = 12 P ₉₀ = 14 P ₉₉ = 21	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S8	S7	SSW6	WSW5	SW4	SSW7	S8	S10	S12	S13	S14	S12	S13	S11	SSW10	S8	S10	S10	SSE9	SSW9	SSE6	S10	SSE9	SSE9	S8.8	S14
2-Jan	S10	SSE11	SSE12	SSE13	S10	SE10	S10	SSE11	S9	S6	S8	S8	S12	S11	S12	SSE8	SSE9	S10	S11	SSE14	SSE12	S11	SSE13	SSE14	SSE10.6	SSE14
3-Jan	SSE14	SSE14	S11	SSE14	SSE13	SSE13	S13	SSE12	SSE13	SSE13	SSE14	SSE15	SSE14	SSE13	SSE12	SSE10	SSE12	SSE14	SSE14	SSE10	SSE11	S7	SE8	S9	SSE12.2	SSE15
4-Jan	SSE8	SSE10	SSE9	SSE10	SSE9	SSE10	SSE10	SSE9	SSE12	SSE10	SSE9	SSE8	SSE6	SSE7	SSE7	SSE10	SSE9	SSE10	SSE11	SSE11	SSE10	SSE10	SSE12	SSE10	SSE9.4	SSE12
5-Jan	SSE9	SSE11	S11	SSE12	SSE11	SSE14	SSE11	SSE12	S10	SSE10	SSE10	SSE10	SSE9	SSE9	S7	S5	SSE5	S5	S4	S4	SSE7	S6	S6	S5	SSE8.4	SSE14
6-Jan	S4	NW4	NNW1	WNW3	S4	S10	SSE11	S11	S9	S10	S12	S12	S11	SSE12	SSE13	SSE14	S15	SSE14	SSE15	SSE16	SSE14	SSE12	S7	SSE9	S9.5	SSE16
7-Jan	SSE10	S11	S9	S9	S8	S7	SSW5	NNW9	NNW11	NW8	NNW7	NW6	NNW5	SSW1	WNW4	N5	W4	NNW6	NNW4	S3	SW4	WSW4	SSW4	S3	WSW1.8	NNW11
8-Jan	S4	S5	SSE6	SSE5	SSE7	SSE7	SSW6	S4	SSW4	SSE5	SSW4	S5	S3	SE1	SSE3	SSE5	N2	NNW6	NNE2	NNW3	NNW4	NNW3	NW2	NNW3	S1.9	SSE7
9-Jan	NNW4	NW2	UO	ENE2	ESE4	SSE5	ESE1	SW2	W2	SW1	N3	NNW3	WNW1	WSW2	WNW3	SW2	SW2	S2	W2	NNW2	WNW3	NNW4	NNW4	NNW3	NW0.9	SSE5
10-Jan	NNW3	NNW3	UO	SW2	WSW4	S4	SSE4	SSE3	SSE3	SSE3	WSW2	SW2	NW5	NNW7	NNW6	N3	N4	N3	NNW6	NNW4	NNW7	NNW7	NNW6	NNW3	NW2.1	NNW7
11-Jan	N2	NNW3	NW3	NNW4	NNW5	N2	SSW1	SW3	SSW2	SE4	SSE5	SSE6	S6	SSE7	SSE8	S8	S7	S9	SSE8	SSE7	S13	SSE15	SSE17	SSE16	S5.1	SSE17
12-Jan	SSE15	SSE15	SSE17	SSE18	SSE17	SSE17	SSE17	SSE17	SSE17	SSE16	SSE16	SSE15	SSE16	SSE16	SSE14	SSE15	SSE14	SSE14	SSE12	SSE10	S10	SSE9	SSE7	SSE7	SSE14.2	SSE18
13-Jan	SE8	ESE7	E4	E3	W2	N8	N11	NNE10	ENE5	NE8	NE7	NE8	ENE5	NNE7	NE12	NE12	NE13	NNE9	NNE10	NNW7	NNW5	NNW5	N5	N5	NNE5.9	NE13
14-Jan	NNE4	NE3	ESE5	SE9	SSE10	SSE14	SSE11	SSE10	SSE13	SSE11	SSE9	SSE11	SSE9	SSE6	SSE7	SSE7	SSE6	S5	SE4	ESE4	SE3	SE3	ESE3	E3	SSE6.3	SSE14
15-Jan	E3	N2	NW4	N7	NNE5	NNE7	NNE7	N4	NNW5	NNW4	NNW4	NW3	NNW4	NNW4	NNW5	NNW3	NW2	UO	NNW2	NNW3	NNW4	NNW4	NNW4	NNW4	N3.7	NNE7
16-Jan	NNW5	NNW6	NNW6	NNW5	NNW4	NNW6	N6	NNW6	NNW6	NNW5	N5	N5	NNW5	N5	N5	NNW5	NNW7	NNW6	NNW5	N4	SE5	SSE5	S7	S7	NNW3.4	NNW7
17-Jan	SSW7	SSW8	S8	SSW9	S10	SSW9	S11	S12	SSE13	SSE13	SSE14	S13	S10	SSW10	S12	S12	S9	SSW9	S8	S10	S9	SSE11	SSE11	SSE13	S10.3	SSE14
18-Jan	SSE11	SSE12	S12	S13	S14	S15	S16	S16	S14	S14	S13	S15	S15	S16	S13	SSE12	SSE11	SE9	SSE8	SSE12	SSE15	SSE14	SSE15	SSE14	SSE13.2	S16
19-Jan	S14	S13	S13	SSE14	SSE18	S17	SSE17	SSE16	S17	S14	SSE10	S7	SSW9	SW10	SSW11	S13	S14	SSW13	S9	SSW10	SSW8	SW9	SW10	SW11	S11.6	SSE18
20-Jan	SW11	SW12	SW10	SW17	SSW13	SSW10	SSW12	SSW12	SW12	SW11	SW10	SW12	SW12	SW10	WSW12	SW10	SSW11	SSW14	SW10	WSW11	WSW16	WSW13	WSW13	SW14	SW11.5	SW17
21-Jan	S6	SE10	SE9	SSE11	SSE10	SE11	SSE12	SSE11	SSE12	SSE11	SSE9	S10	SSE12	SSE12	S11	SSE10	S11	S9	SSW8	SSW8	SW7	SSW5	SW9	WSW12	S8.8	SSE12
22-Jan	WSW9	WSW9	W6	W8	WNW11	W14	W14	W10	WSW10	WNW10	NNE21	N17	NNE13	NNE13	NNE13	NNE10	NNE9	NE14	ENE12	NE12	NNE12	NE8	NE8	NNE6	N5.8	NNE21
23-Jan	N3	NE3	E4	SSE1	ESE7	SE4	SE5	ESE6	NNE3	NE4	NNE4	N5	NNW8	NNW7	NNW6	NNW8	NNW4	NW3	N3	ESE4	ESE3	SE4	SSE3	SSE5	NE1.6	NNW8
24-Jan	SSE9	SSE11	SSE10	SSE11	SSE10	SSE9	SSE10	SSE12	SSE11	SSE10	S9	S8	SSE5	NNE3	N10	NNE11	NE13	NE12	NE8	NE8	ENE7	NE7	ENE5	N5	ESE4.6	NE13
25-Jan	N6	NE4	NE5	NNE6	N5	NNW2	NNW4	N4	ENE4	ENE3	N1	NE3	NE3	WSW3	WSW2	S3	SSE4	S2	SSE8	SSE12	SSE11	SSE12	SSE9	SSW7	SE1.5	SSE12
26-Jan	S7	SSE10	S10	SW9	NW6	N10	N18	NNE30	N23	NNE22	NNE21	N14	NNE10	NE10	NE8	NNE12	NNE18	N19	NNE23	NNE22	NNE28	NNE23	NNE20	NNE20	NNE13.2	NNE30
27-Jan	NNE20	NNE18	NNE17	NNE13	NNE14	N12	NNE12	N13	NNE17	N12	NNE11	NNE6	NE2	WSW2	NE7	NNE4	N6	N10	NNW8	NW6	WNW7	W8	WNW3	W7	N8.4	NNE20
28-Jan	WSW8	W11	W10	WSW13	WSW15	W13	W12	W13	W11	W10	WNW14	WNW20	WNW18	WNW19	WNW17	WNW15	NW21	NW18	NNW14	NNE14	N14	N11	N8	NNW7	WNW11.1	NW21
29-Jan	NW7	SW3	SW9	SW7	SW6	SW8	SW8	S9	S10	SSE11	S14	S14	S15	S16	S16	S10	S8	SSW4	NW4	NNW9	NNW9	N10	NW6	WNW6	SSW5.1	S16
30-Jan	NW5	NNE9	NE8	SE3	S5	S9	SSW9	SSW7	S8	SSW6	S3	SSW5	S4	SSE5	S5	SSE6	SE7	ESE4	E5	ESE3	NNE3	N5	NNE4	NNE8	SSE2.0	NNE9
31-Jan	NNE13	NE13	NNE10	NE9	ENE10	ENE6	ENE8	E3	S3	E3	UO	W1	N2	SW3	S5	S6	SSE7	SE5	NNE4	ENE7	NNE5	NNW9	NNW9	NNW10	NE3.5	NE13

S2.8 SSE3.4 S3.8 S4.2 S4.3 S4.7 S4.5 SSE4.0 S4.4 S3.9 SSE3.3 S3.4 S3.6 S3.4 S3.0 SSE3.0 SSE2.8 SSE2.1 SE1.8 SE2.0 SSE1.7 S1.8 S2.3 S2.3	Diurnal Average
NNE20 NNE18 NNE17 SSE18 SSE18 SSE17 N18 NNE30 NNE23 NNE22 NNE21 WNW20 WNW18 WNW19 WNW17 WNW15 NW21 NNE19 NNE23 NNE22 NNE28 NNE23 NNE20 NNE20	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

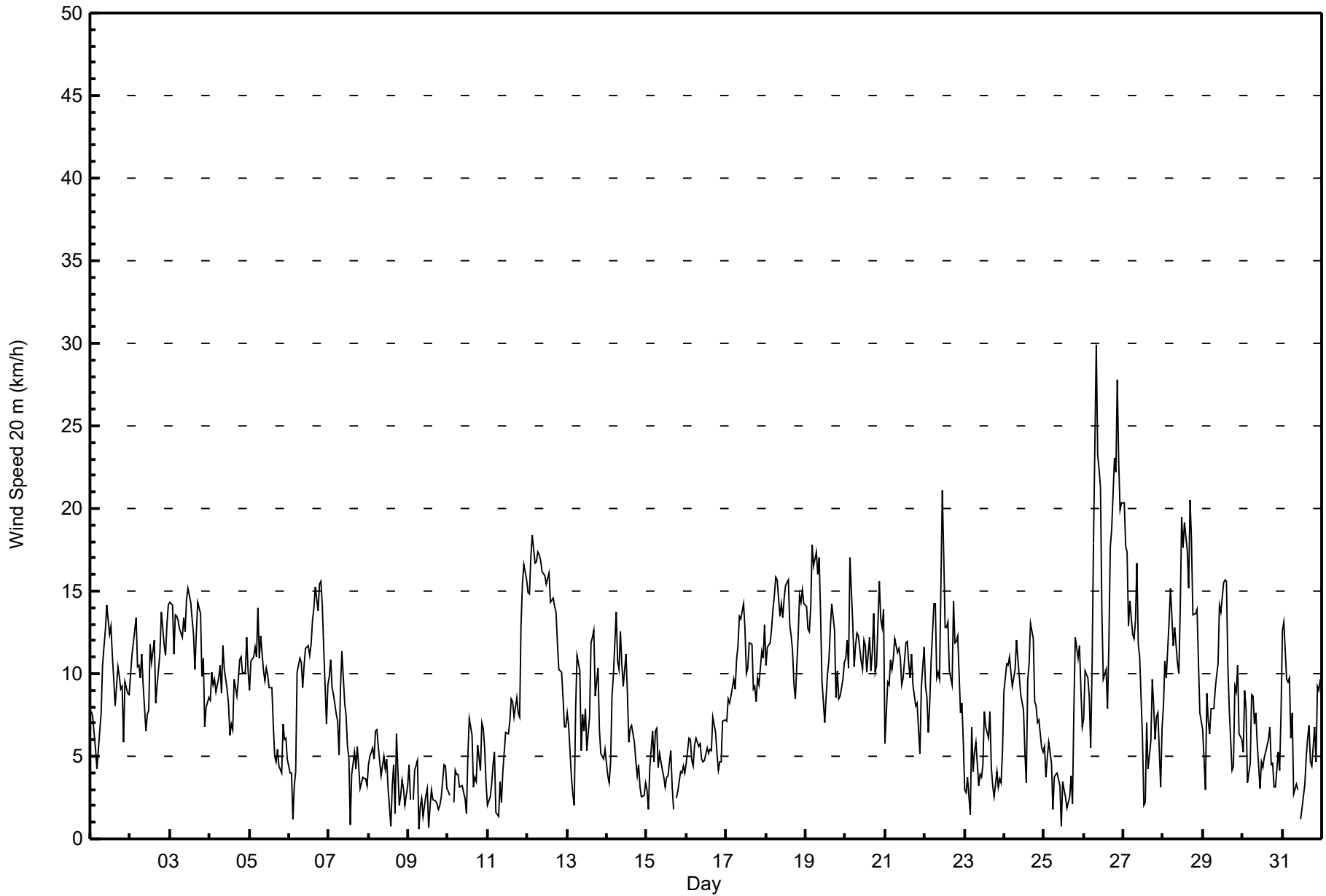
Wind Speed 20 m (WS20m) - km/h
Barge Landing - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 07:00 Minimum Value: 0 km/h on Jan 11 08:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 3 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	2	1	1	2	2	2	2	3	3	3	3	2	1	1	1	2	4	2	1	1	2	4	
2-Jan	1	1	2	2	3	2	2	3	2	2	2	3	2	3	3	1	2	2	2	1	2	2	2	2	3	
3-Jan	2	3	3	2	2	2	2	2	1	1	2	3	3	2	2	1	2	2	2	2	2	2	4	3	4	
4-Jan	2	2	2	2	2	1	1	1	1	2	1	2	2	2	1	1	1	2	1	1	2	1	2	1	2	
5-Jan	1	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	3	1	1	3	
6-Jan	1	2	1	1	2	2	1	2	1	2	2	3	3	2	2	2	2	2	2	2	2	3	3	2	3	
7-Jan	2	2	1	3	2	1	2	3	2	2	2	2	1	2	1	2	1	1	1	1	1	1	1	1	3	
8-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	2	1	1	2	1	1	2	
9-Jan	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	2	
10-Jan	1	1	UO	2	1	1	1	0	1	1	1	1	2	2	1	1	1	1	1	3	1	1	1	1	3	
11-Jan	1	1	1	1	1	1	1	0	1	1	1	2	2	2	2	2	1	2	1	2	4	4	4	3	4	
12-Jan	3	3	4	4	4	3	3	4	3	3	3	3	3	4	3	3	3	2	2	2	2	1	2	1	4	
13-Jan	1	1	1	2	1	4	3	2	1	2	2	2	1	2	3	3	3	2	2	2	1	1	1	1	4	
14-Jan	1	2	3	2	3	3	2	2	3	3	2	2	2	2	1	1	1	1	0	1	1	0	1	1	3	
15-Jan	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	UO	0	1	1	1	1	1	2	
16-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2	2	1	1	1	1	2	1	1	2	
17-Jan	1	1	2	2	2	2	2	2	3	3	3	3	2	2	3	4	2	2	2	2	2	3	2	2	4	
18-Jan	2	2	3	3	3	4	4	4	3	3	4	3	4	5	3	3	2	2	1	2	2	2	3	2	5	
19-Jan	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3	2	3	1	2	2	3	3	3	3	
20-Jan	3	3	3	4	3	2	3	2	2	3	3	3	3	3	2	2	2	3	2	2	3	4	3	2	4	
21-Jan	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	2	4	3	4	
22-Jan	2	2	2	3	4	4	4	4	3	5	6	5	3	3	3	3	3	2	2	3	3	2	2	2	6	
23-Jan	1	2	1	2	1	1	2	2	1	1	1	2	2	1	2	2	1	2	1	2	1	2	2	2	2	
24-Jan	2	2	3	2	2	2	2	3	3	2	2	2	1	3	2	4	3	3	2	2	2	2	1	1	4	
25-Jan	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	3	2	3	3	2	2	3	
26-Jan	3	3	2	2	3	4	8	7	6	5	7	4	2	3	2	4	5	5	6	6	6	6	5	5	8	
27-Jan	5	4	4	3	4	3	3	3	4	3	2	3	1	1	2	1	1	2	2	1	2	1	3	1	5	
28-Jan	2	3	2	3	3	3	2	2	3	3	5	6	5	5	5	4	5	5	5	3	4	3	4	2	6	
29-Jan	2	2	1	2	1	1	1	1	1	1	3	4	4	4	3	3	2	2	3	1	2	2	1	1	4	
30-Jan	2	2	2	1	1	2	1	2	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	3	3	
31-Jan	4	4	4	3	2	2	2	2	1	1	UO	1	1	2	2	2	1	1	1	2	3	1	1	1	4	
	5	4	4	4	4	4	8	7	6	5	7	6	5	5	5	4	5	5	6	6	6	6	5	5		
Diurnal Maximum																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Barge Landing - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Barge Landing - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	218	29.46	29.46
6 - 11	324	43.78	73.24
12 - 19	184	24.86	98.11
20 - 28	13	1.76	99.87
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Barge Landing - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	26	11	8	6	8	9	10	20	24	10	11	8	5	7	10	45	218
6 - 11	12	17	13	5	0	3	7	100	71	23	19	5	9	4	6	30	324
12 - 19	6	16	8	1	0	0	0	82	41	5	6	7	5	5	1	1	184
20 - 28	0	11	0	0	0	0	0	0	0	0	0	0	0	1	1	0	13
29 - 38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	56	29	12	8	12	17	202	136	38	36	20	19	17	18	76	740

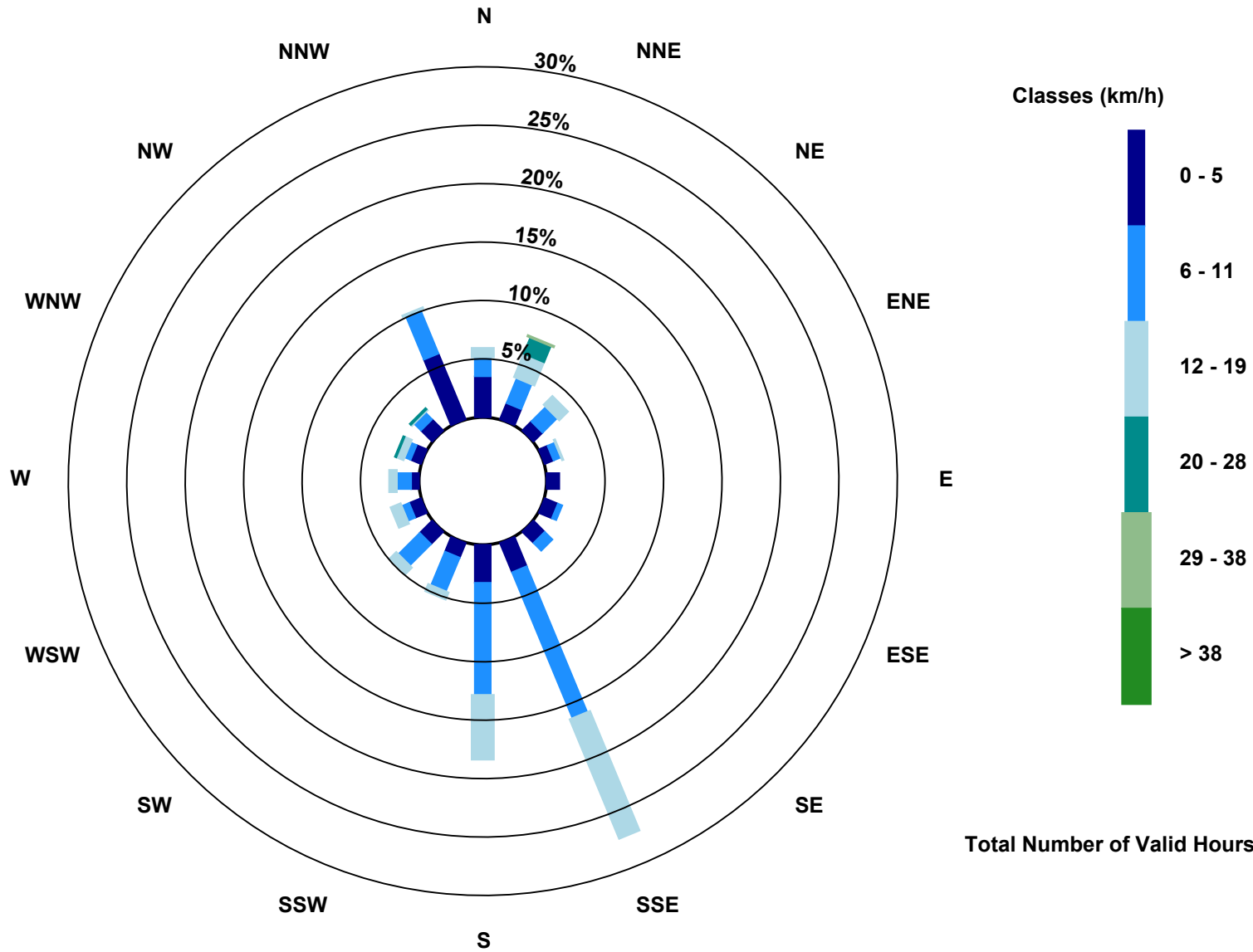
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 20 m (WS20m) - km/h
Barge Landing





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Barge Landing - January 2023

Direction of Maximum Speed: 12 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 161.8 deg on Jan 12	Hours of Data: 740
Direction of Minimum Speed: 106 deg on Jan 9 07:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 9	Percent Operational Time: 99.5
Monthly Average Direction: 170.9 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	176	172	210	238	228	192	170	170	178	182	174	184	178	186	200	189	174	176	168	200	159	171	153	162	180.5
2-Jan	172	161	155	155	173	145	172	164	176	174	179	178	177	181	177	163	159	173	171	161	168	170	158	158	166.8
3-Jan	164	163	180	167	164	168	175	153	156	157	167	165	166	161	161	158	150	155	156	164	155	177	142	178	162.4
4-Jan	163	160	156	164	164	161	156	159	156	161	152	156	160	163	160	165	155	152	160	160	161	165	158	151	159.0
5-Jan	163	168	169	157	161	154	167	164	169	162	163	163	164	177	186	163	181	186	176	167	177	190	188	167.3	
6-Jan	171	320	346	295	184	183	168	174	174	174	169	171	176	166	161	165	172	168	164	163	162	168	181	158	170.0
7-Jan	166	173	182	184	191	185	203	329	336	317	338	321	346	205	296	360	281	344	329	175	215	243	199	176	249.9
8-Jan	169	171	165	167	150	160	198	190	208	147	199	180	173	137	158	154	4	348	24	346	330	330	310	332	175.9
9-Jan	347	320	UO	64	104	147	106	217	259	215	350	342	291	242	301	229	229	178	274	327	285	336	340	341	308.8
10-Jan	346	338	UO	216	237	183	164	148	166	166	239	229	320	333	335	353	7	11	334	333	331	333	337	344	323.7
11-Jan	349	344	324	333	333	359	200	232	205	146	155	167	170	158	166	172	169	183	165	153	175	163	168	166	170.2
12-Jan	159	166	162	164	168	160	160	163	159	160	161	157	161	161	160	165	162	165	162	165	170	159	154	153	161.8
13-Jan	143	104	94	83	270	353	8	30	57	37	47	39	60	33	36	35	40	17	22	346	339	343	352	352	30.3
14-Jan	25	45	116	143	156	155	156	156	158	167	167	163	167	158	159	160	164	179	141	116	145	141	118	91	152.2
15-Jan	88	7	325	355	16	22	25	9	327	340	339	317	333	327	334	344	315	UO	327	342	340	338	346	336	348.8
16-Jan	342	337	332	327	334	340	354	340	339	330	352	349	342	7	3	340	328	332	332	350	142	160	173	172	340.3
17-Jan	194	196	190	196	189	195	187	169	168	164	164	172	179	192	188	191	191	195	187	174	185	166	165	163	180.1
18-Jan	165	163	169	172	170	177	175	177	173	174	181	175	169	173	175	164	156	146	159	160	163	161	165	167	168.6
19-Jan	170	174	179	167	162	170	165	161	171	178	156	181	201	216	203	187	188	198	178	200	193	216	221	225	182.6
20-Jan	223	220	224	224	204	192	200	197	215	229	228	223	228	228	237	221	200	206	214	254	255	248	240	223	222.6
21-Jan	176	146	146	164	151	139	156	157	155	157	165	170	164	165	173	167	173	187	193	210	216	198	222	247	171.7
22-Jan	248	248	262	266	288	275	267	262	245	295	22	11	13	17	18	30	26	38	58	36	17	52	55	27	351.2
23-Jan	355	48	92	163	115	144	131	104	17	42	16	355	336	340	337	333	329	316	1	113	104	134	154	157	42.2
24-Jan	149	152	163	151	156	168	168	154	165	167	171	173	154	20	11	24	49	54	39	51	63	55	63	2	118.4
25-Jan	3	52	41	25	351	330	332	4	59	59	4	44	36	250	253	171	165	184	164	163	163	164	168	194	135.3
26-Jan	189	157	189	230	308	357	1	12	11	20	13	358	20	34	41	26	17	11	17	17	23	18	14	24	15.5
27-Jan	16	22	29	12	19	1	12	11	22	4	15	24	51	252	43	30	357	7	332	324	296	270	297	273	6.3
28-Jan	253	263	265	258	256	271	266	265	260	275	292	300	296	301	291	302	323	308	344	14	7	353	0	339	298.1
29-Jan	318	219	227	229	235	221	218	180	178	168	171	183	175	176	171	178	171	210	304	332	336	1	320	290	202.4
30-Jan	316	21	41	141	186	176	195	195	184	208	186	211	180	162	181	156	146	115	98	117	17	5	19	33	152.0
31-Jan	19	37	28	35	58	57	68	89	178	100	UO	264	5	230	176	177	155	125	32	63	21	335	335	335	39.0

172.8 161.6 171.0 181.2 177.6 174.7 175.4 165.5 172.1 169.6 162.8 179.0 178.2 182.7 180.4 167.0 157.1 161.6 140.5 145.7 161.2 171.5 170.0 181.6

Diurnal Average

UO - Unstable Operation

All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

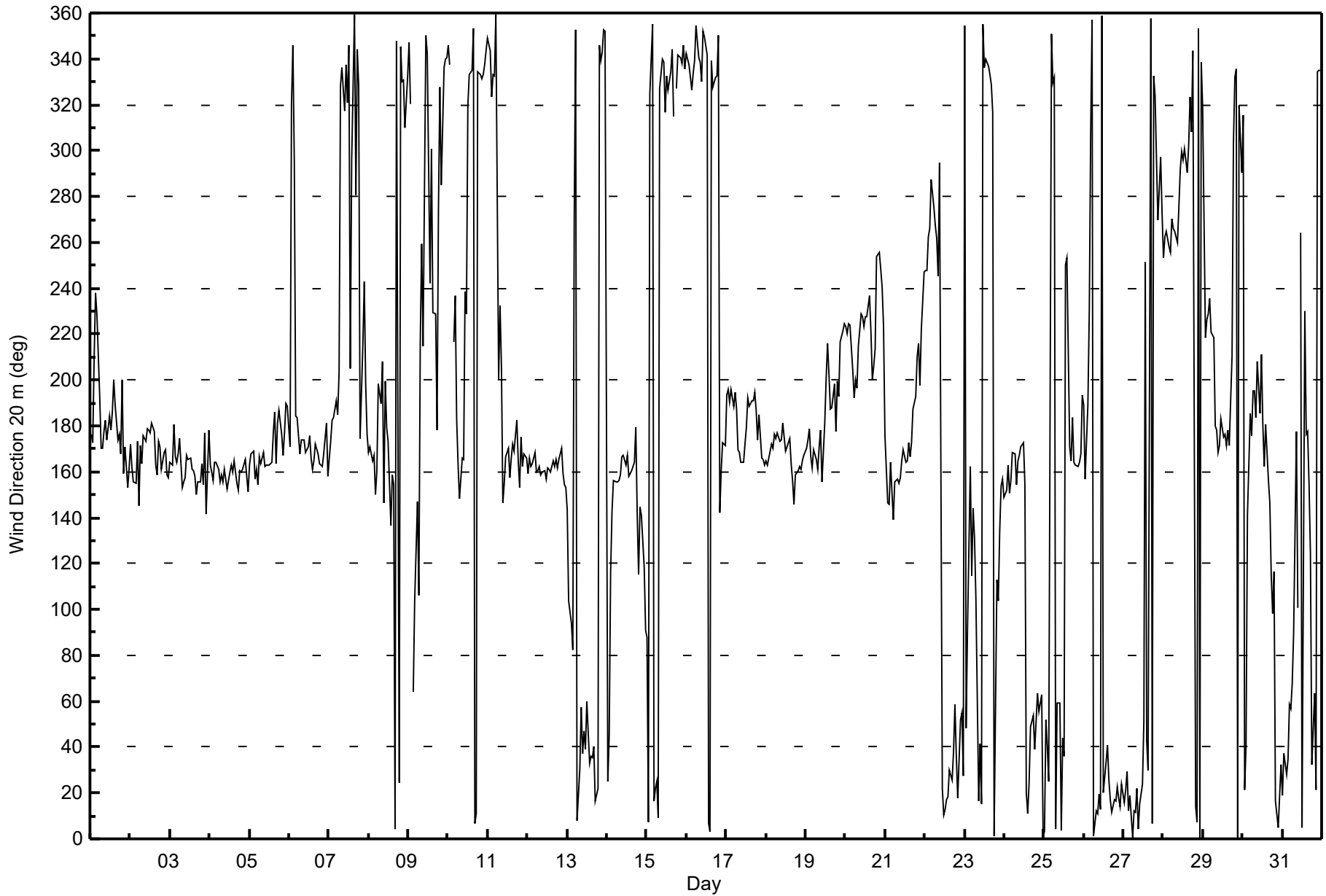
Wind Direction 20 m (WD20m) - deg
Barge Landing - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 100 deg on Jan 7 14:00	Hours of Data: 740
Minimum Value: 5 deg on Jan 18 19:00	Hours of Missing Data: 4
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 12 Median = 15 Q ₃ = 20 P ₉₀ = 32 P ₉₉ = 77	Hours of Calibration: 0
	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	15	11	15	15	18	22	21	12	13	14	14	15	15	16	15	17	11	13	18	35	29	14	12	14	35
2-Jan	13	6	10	9	17	14	14	15	14	25	14	18	14	17	13	16	12	16	13	5	11	9	12	9	25
3-Jan	8	10	12	9	8	9	10	6	7	8	11	11	12	9	9	8	7	8	7	11	7	17	12	20	20
4-Jan	12	7	7	7	7	9	8	15	7	7	8	11	12	15	13	9	10	8	6	7	7	6	7	6	15
5-Jan	11	8	12	6	9	9	11	9	10	10	10	13	13	12	15	11	21	9	12	16	14	30	17	31	31
6-Jan	38	66	88	32	23	9	9	10	10	11	11	13	15	14	10	9	10	12	8	9	8	15	28	13	88
7-Jan	6	10	12	7	21	20	26	17	8	11	19	22	25	100	25	25	25	30	21	40	19	28	24	20	100
8-Jan	13	14	15	18	9	14	14	19	22	8	11	14	28	69	18	9	75	8	77	55	17	37	38	16	77
9-Jan	17	45	UO	27	17	14	83	55	32	43	45	19	67	45	22	33	25	30	44	57	52	13	13	16	83
10-Jan	7	23	UO	30	15	16	8	11	10	29	27	75	24	12	14	19	13	14	15	14	12	11	14	26	75
11-Jan	28	32	23	23	14	50	74	10	43	14	12	17	19	16	18	14	17	15	9	15	16	13	14	11	74
12-Jan	12	12	12	12	14	11	12	11	10	11	11	12	12	12	11	12	11	11	11	13	14	13	14	13	14
13-Jan	14	13	23	54	50	25	16	13	18	14	17	16	20	16	13	14	13	22	12	19	18	16	19	20	54
14-Jan	43	51	58	12	14	12	13	12	12	14	15	11	14	15	14	12	12	12	23	9	16	24	40	9	58
15-Jan	15	31	15	24	28	13	12	27	15	17	19	21	18	18	13	18	20	UO	15	8	12	10	10	15	31
16-Jan	16	11	12	15	14	10	19	16	18	14	21	23	18	26	26	28	13	12	9	32	25	12	13	9	32
17-Jan	13	13	15	16	14	15	15	13	12	12	12	13	15	17	18	16	16	16	17	19	19	11	11	11	19
18-Jan	13	11	13	14	14	15	15	15	15	13	17	14	15	16	15	11	11	9	5	6	8	9	10	10	17
19-Jan	12	15	14	12	10	11	10	10	11	17	10	23	17	21	20	13	12	13	13	20	15	28	21	18	28
20-Jan	14	14	17	9	10	14	12	13	13	17	20	16	16	15	12	14	13	11	15	17	9	16	14	9	20
21-Jan	52	11	10	11	14	8	10	12	10	14	16	14	10	12	13	9	11	11	22	16	18	31	22	13	52
22-Jan	14	13	22	25	22	17	15	25	16	46	18	19	17	16	14	17	19	8	18	16	13	18	14	14	46
23-Jan	28	46	68	82	11	24	21	20	32	35	32	28	13	16	16	12	22	22	46	17	14	50	41	21	82
24-Jan	12	13	13	13	13	15	14	11	14	14	16	18	22	79	17	23	15	17	15	17	19	15	18	26	79
25-Jan	19	28	15	15	22	63	25	35	23	43	76	32	32	35	48	32	29	46	15	13	13	14	20	20	76
26-Jan	26	18	18	19	46	42	22	17	18	14	19	20	17	15	18	14	16	16	16	16	13	16	17	16	46
27-Jan	16	15	13	21	18	20	19	17	14	17	15	22	68	69	12	24	14	10	20	13	31	20	60	11	69
28-Jan	10	14	16	11	12	13	12	11	13	27	16	16	17	16	17	18	18	16	30	15	19	16	25	19	30
29-Jan	11	57	8	11	11	11	17	13	9	11	14	17	15	16	14	16	22	42	52	9	11	15	19	16	57
30-Jan	13	25	14	48	27	11	12	15	13	21	45	25	40	36	27	14	13	17	14	17	64	21	26	17	64
31-Jan	25	19	19	19	12	26	16	41	18	23	UO	84	77	87	42	27	11	15	32	15	42	7	7	9	87
	52	66	88	82	50	63	83	55	43	46	76	84	77	100	48	33	75	46	77	57	64	50	60	31	

Diurnal Maximum

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS11 LOWER CAMP JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	132	0	24.2	0
H2S (ppb) Average	709	35	35	100	15	3	2.7	0
THC (ppm) Average	709	35	35	100	3.7	-	2.7	-
CH4(ppm) Average	709	35	35	100	3.6	-	2.6	-
NMHC(ppm) Average	709	35	35	100	0.239	-	0.071	-
Temperature (C) Average	744	0	0	100	3.4	-	-3.8	-
Relative Humidity (%) Average	744	0	0	100	94	-	91.3	-
Barometric Pressure (inHg) Average	744	0	0	100	29.8	-	29.7	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	26	-	18	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	2.16	9	-	0	0.1	0.2	0.4	1.1	3.5	132
H2S (ppb) Average	709	0.64	1	-	0	0.1	0.3	0.4	0.8	1.1	15
THC (ppm) Average	709	2.31	0.3	-	2	2.1	2.2	2.2	2.4	2.6	3.7
CH4(ppm) Average	709	2.29	0.2	-	2	2.1	2.2	2.2	2.3	2.6	3.6
NMHC(ppm) Average	709	0.023	0.04	-	0	0	0	0	0	0.1	0.239
Temperature 2 m (C) Average	744	-10.64	6.1	-	-31.3	-18.7	-14.1	-9.2	-7	-4.9	3.4
Relative Humidity (%) Average	744	83.49	7	-	54.6	74.4	80.4	85.1	88.4	90.7	94
Barometric Pressure (inHg) Average	744	29.08	0.2	-	28.7	28.8	28.9	29	29.2	29.4	29.8
Wind Speed 10 m (km/h) Average	740	8.3	5	-	0	2	4	8	12	15	26
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	10 Jan 2023 01:00	10 Jan 2023 01:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	14 Jan 2023 23:00	15 Jan 2023 00:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 19:00	31 Jan 2023 19:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb
Lower Camp - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 132.0 ppb on Jan 17 04:00	Maximum Daily Average: 24.2 ppb on Jan 17		Hours of Data:	709
Minimum Value: 0.0 ppb on Jan 6 07:00	Minimum Daily Average: 0.1 ppb on Jan 6		Hours of Missing Data:	35
Maximum Diurnal Average: 7.2 ppb at hour 4	Minimum Diurnal Average: 0.6 ppb at hour 11		Hours of Calibration:	35
Monthly Average: 2.16 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.4 Q ₃ = 1.1 P ₉₀ = 3.5 P ₉₉ = 33.7		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.2	6.8	Z	28.8	1.3	4.6	11.9	0.8	0.4	0.4	0.9	0.8	0.9	1.0	0.7	2.0	0.8	1.2	0.8	0.7	0.4	0.2	0.4	7.1	3.2	28.8	
2-Jan	2.6	1.1	0.3	Z	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	2.1	0.4	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.4	2.6	
3-Jan	0.2	0.2	0.3	0.7	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	
4-Jan	0.2	0.3	0.2	0.2	0.2	Z	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.4	
5-Jan	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.1	0.1	0.1	0.3	
6-Jan	0.0	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.3	0.1	0.0	0.1	0.3	
7-Jan	0.0	0.0	Z	0.2	0.1	0.1	0.1	2.6	1.0	0.3	0.2	0.7	0.7	1.2	3.4	1.1	2.2	0.7	0.6	1.2	25.1	34.2	16.5	19.1	4.8	34.2	
8-Jan	8.6	10.2	9.8	Z	2.1	1.5	1.1	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.8	0.7	1.9	2.4	1.3	1.1	1.0	0.9	1.1	1.3	2.2	10.2	
9-Jan	1.3	1.4	1.8	2.1	Z	2.8	1.3	1.0	0.9	0.9	0.7	0.7	1.3	0.6	0.5	0.3	3.6	16.9	7.7	5.4	6.2	3.0	1.7	0.6	2.7	16.9	
10-Jan	0.5	0.4	1.6	2.6	19.3	Z	2.7	2.5	1.6	1.0	2.3	0.8	1.4	1.9	2.5	3.5	0.7	1.9	6.2	6.7	7.4	0.8	0.5	0.5	3.0	19.3	
11-Jan	Z	0.5	0.3	0.2	0.3	0.2	0.2	0.4	0.4	0.6	0.9	1.9	4.5	1.7	1.1	1.8	1.8	3.5	4.6	0.7	0.5	1.0	1.2	0.9	1.3	4.6	
12-Jan	1.5	Z	2.4	7.7	1.2	0.7	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.7	3.7	0.4	1.0	7.7	
13-Jan	0.5	0.2	Z	0.2	0.2	0.4	0.6	0.6	0.5	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.6	
14-Jan	0.2	0.2	0.4	Z	2.3	1.8	3.7	1.9	1.7	0.6	0.5	0.5	0.6	0.3	0.4	1.1	3.2	6.1	4.5	3.0	4.5	1.1	2.1	1.9	1.8	6.1	
15-Jan	1.1	1.1	0.9	0.7	Z	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.4	1.1	
16-Jan	0.4	0.4	0.5	0.4	0.4	Z	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.1	0.9	0.4	0.2	0.3	0.9	
17-Jan	Z	58.3	103.8	132.0	61.5	7.0	1.3	0.6	0.6	0.7	0.5	0.4	1.0	10.3	5.2	1.4	35.2	114.7	18.3	1.0	0.8	0.5	0.7	0.9	24.2	132.0	
18-Jan	1.0	Z	0.9	1.1	0.9	0.9	0.7	0.3	0.4	0.6	1.8	4.0	4.6	5.4	1.0	0.4	0.3	0.8	1.1	3.5	1.4	3.7	2.7	4.4	1.8	5.4	
19-Jan	1.2	0.9	Z	0.6	0.4	0.6	0.7	1.0	0.7	2.4	1.1	1.0	1.0	2.6	5.8	1.2	6.5	27.7	3.1	2.7	1.0	1.3	0.8	1.0	2.8	27.7	
20-Jan	2.7	2.1	8.0	Z	24.0	48.0	14.9	0.9	0.7	0.5	0.9	C	C	C	C	1.0	3.1	2.3	2.0	0.7	0.5	3.9	3.9	5.2	6.6	48.0	
21-Jan	1.1	0.7	0.4	0.4	Z	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.5	0.4	0.3	0.6	0.7	0.7	1.1	0.9	0.6	0.4	0.5	1.1	
22-Jan	1.9	3.4	2.7	6.5	12.0	Z	3.1	0.5	0.4	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	12.0	
23-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.3	
24-Jan	0.2	Z	0.1	1.3	1.3	6.1	7.4	2.6	5.2	1.2	2.2	0.7	0.4	0.3	0.9	1.4	1.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	1.5	7.4	
25-Jan	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	1.7	2.0	2.4	3.3	2.4	1.5	0.5	0.5	1.3	1.2	10.7	4.2	2.7	1.6	10.7	
26-Jan	1.2	0.5	0.2	Z	3.7	0.6	0.4	0.2	0.5	1.2	1.4	1.2	0.6	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.7	
27-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	6.1	7.0	0.6	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.7	7.0	
28-Jan	0.0	0.5	0.5	0.6	2.4	Z	1.4	0.4	4.1	4.5	0.6	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.7	4.5
29-Jan	Z	0.2	0.1	0.3	1.1	1.3	1.6	0.9	0.4	0.3	0.3	1.7	0.5	0.8	1.1	0.5	7.9	0.6	3.0	0.7	0.4	0.4	0.3	0.2	1.1	7.9	
30-Jan	0.8	Z	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.5	0.7	0.4	2.7	2.2	0.9	0.5	0.6	0.7	0.8	0.8	0.7	1.1	2.3	0.7	2.7	
31-Jan	1.6	0.4	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.8	3.7	3.4	6.5	3.5	1.3	0.8	0.8	0.5	0.9	0.6	0.6	0.4	1.2	6.5

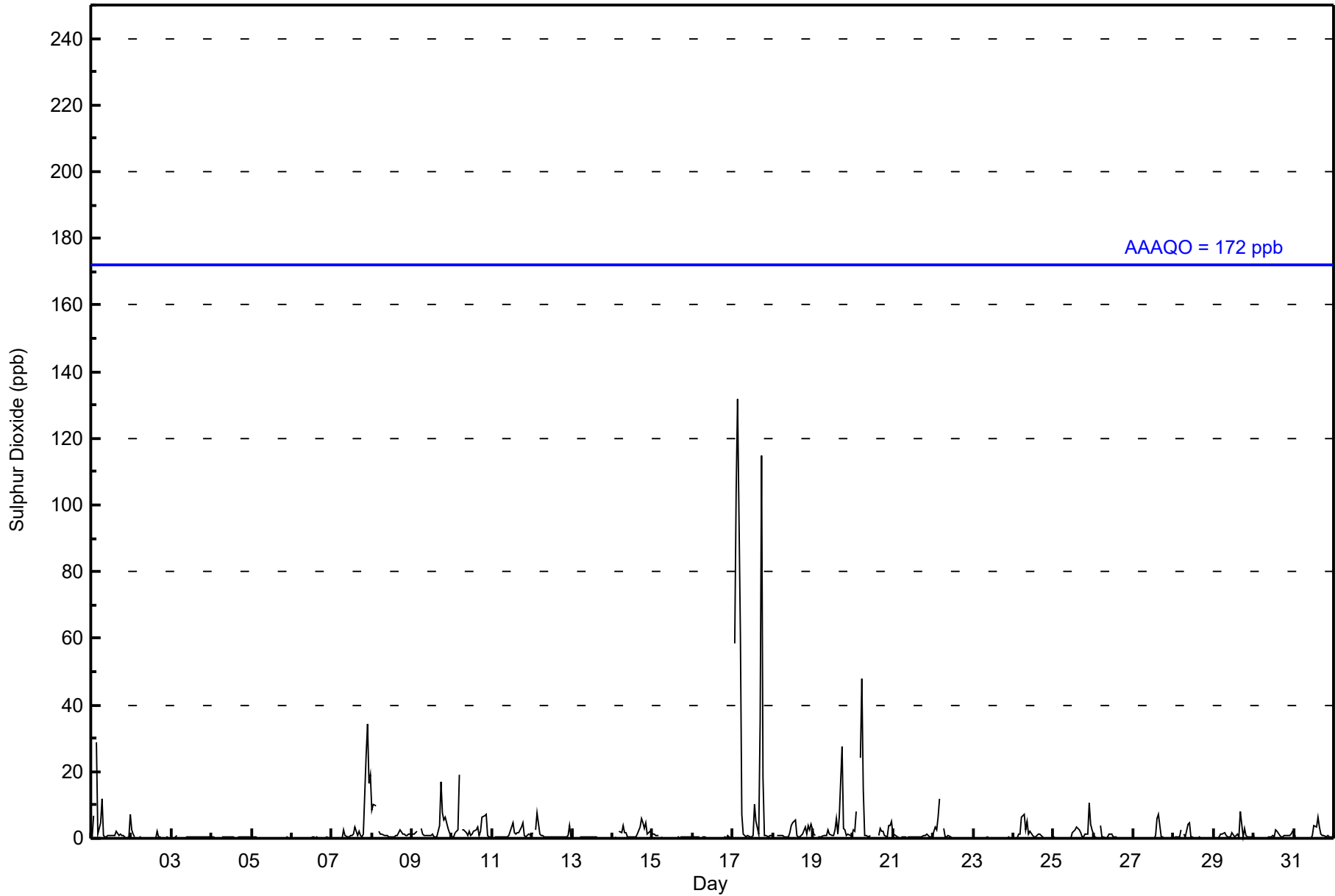
1.1	3.5	5.4	7.2	5.2	3.0	1.8	0.6	0.7	0.6	0.6	0.7	0.9	1.3	1.5	1.1	2.4	5.9	1.9	1.1	1.8	2.2	1.4	1.7	Diurnal Average	
8.6	58.3	103.8	132.0	61.5	48.0	14.9	2.6	5.2	4.5	2.3	4.0	4.6	10.3	6.5	7.0	35.2	114.7	18.3	6.7	25.1	34.2	16.5	19.1	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Lower Camp - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Lower Camp - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	688	97.04	97.04
11 - 20	9	1.27	98.31
21 - 60	8	1.13	99.44
61 - 110	2	0.28	99.72
111 - 172	2	0.28	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	49	25	5	11	14	21	225	126	11	4	1	12	26	44	72	38	684
11 - 20	0	0	0	0	0	0	4	2	0	2	0	0	0	1	0	0	9
21 - 60	0	0	0	0	0	0	0	0	2	4	0	1	1	0	0	0	8
61 - 110	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
111 - 172	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	25	5	11	14	21	229	128	14	13	1	13	27	45	72	38	705

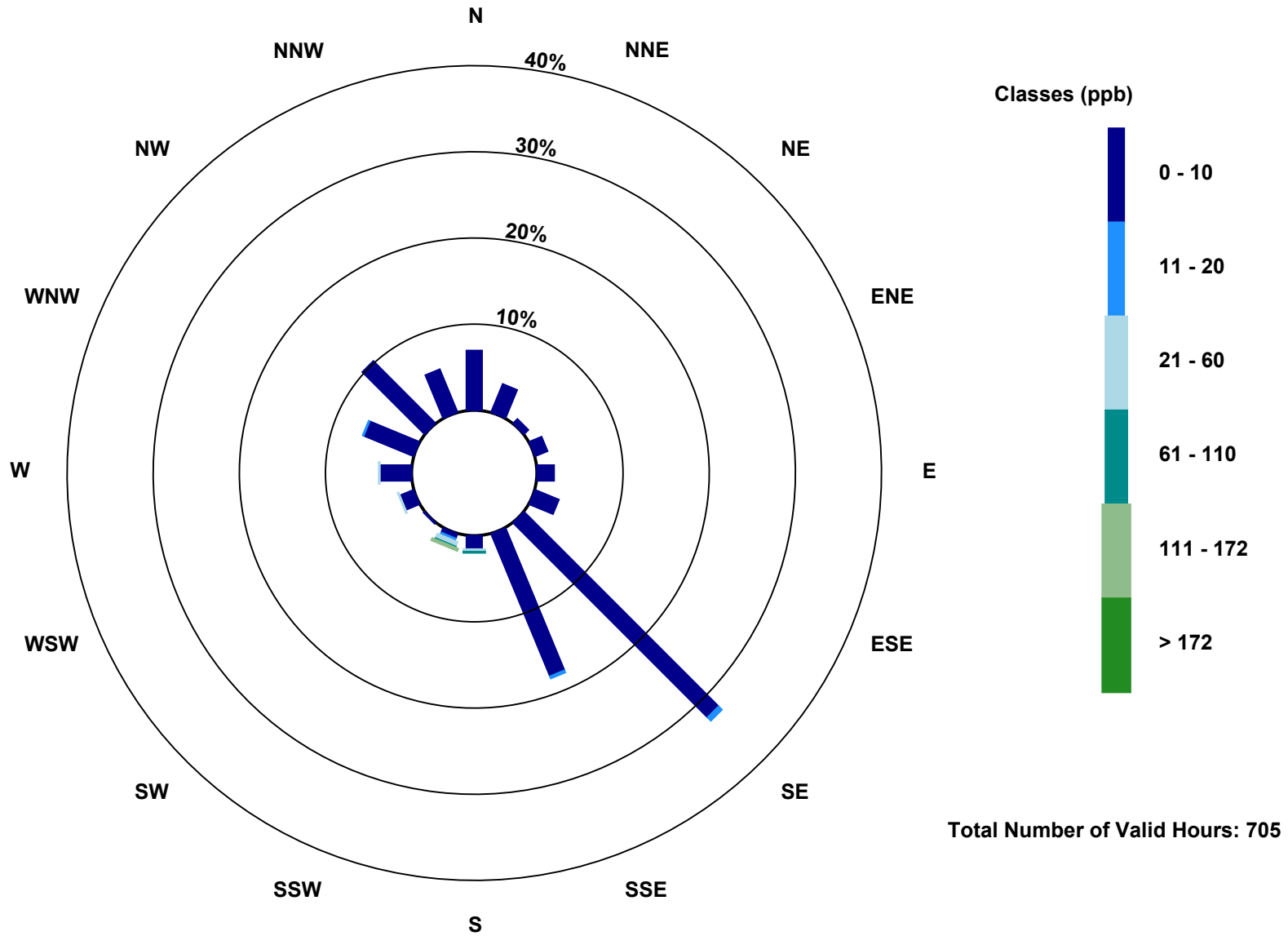
Total Number of Valid Hours: 705

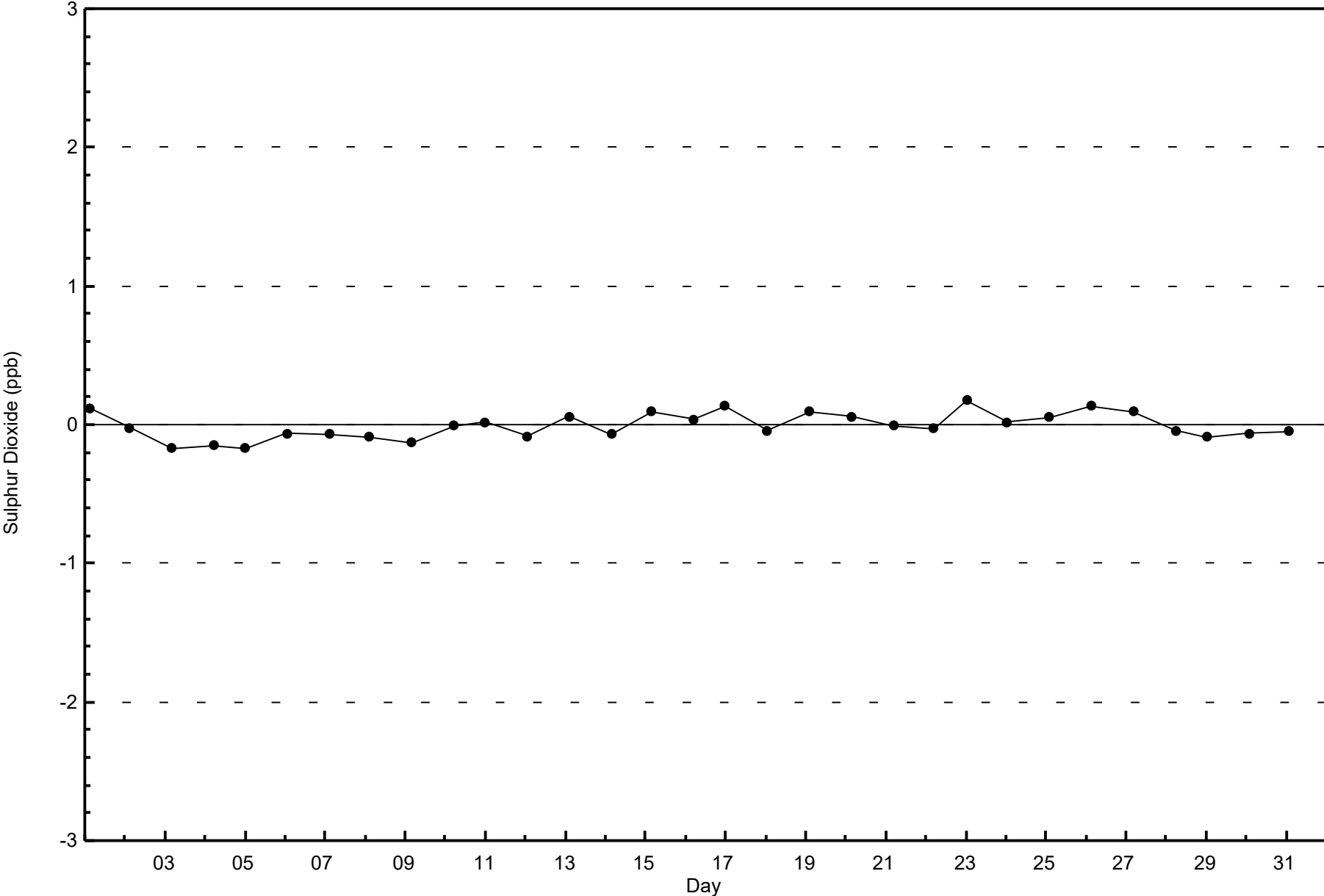
Total Number of Hours: 744

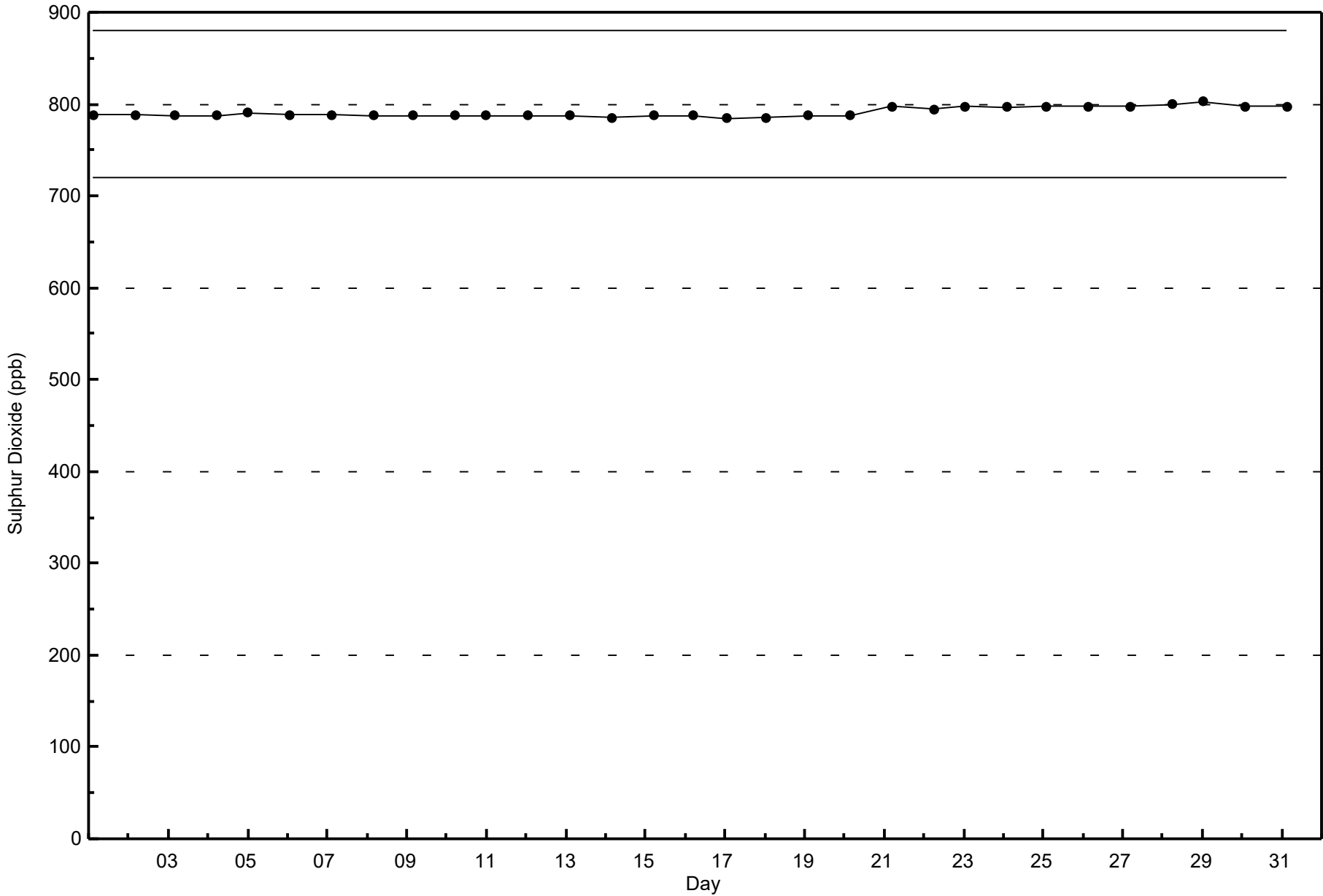


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Lower Camp

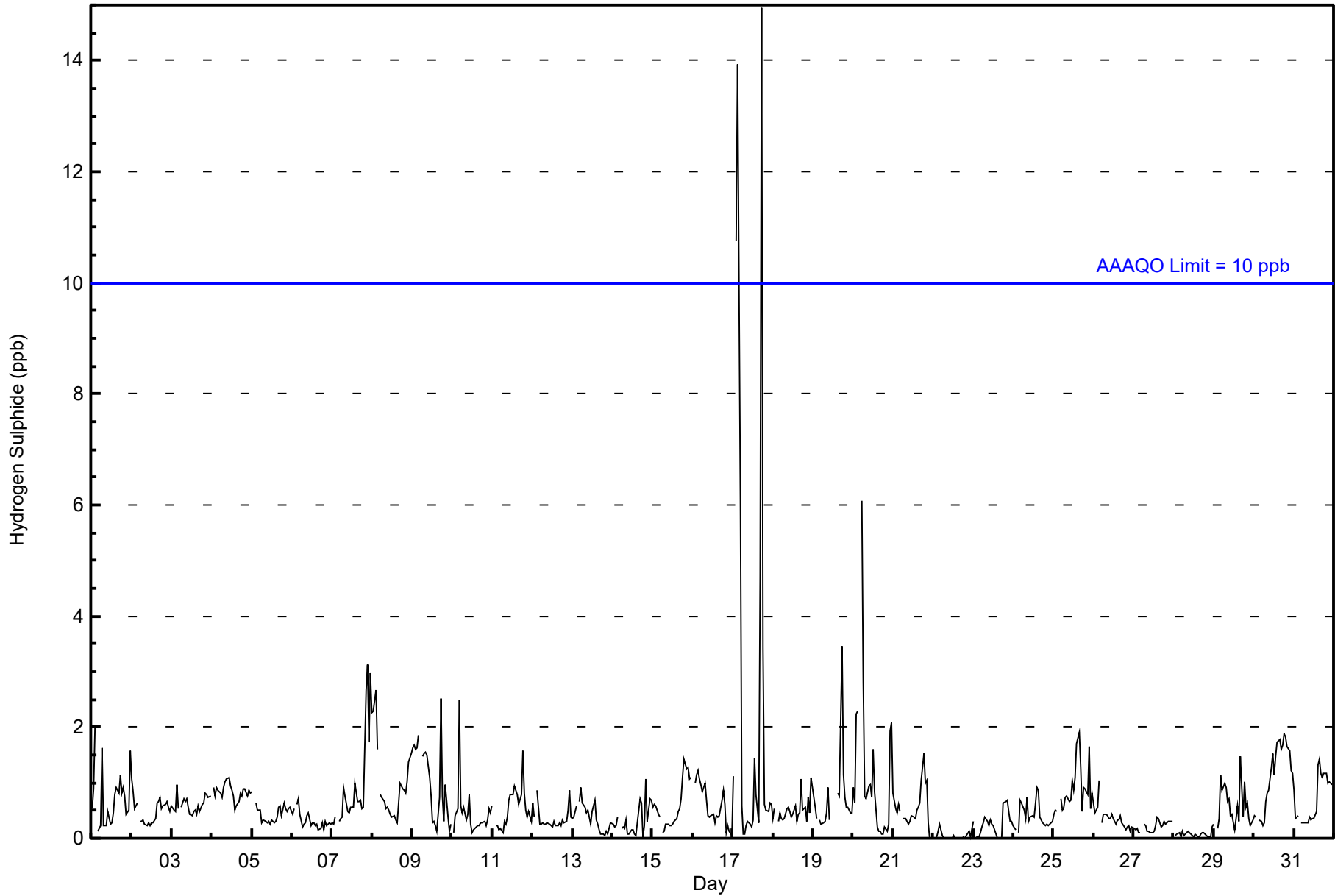








Number of Exceedences (AAAQO):		1-hr: 3	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 15.0 ppb on Jan 17 18:00		Maximum Daily Average: 2.7 ppb on Jan 17																			Hours of Data:	709																											
Minimum Value: 0.0 ppb on Jan 22 00:00		Minimum Daily Average: 0.0 ppb on Jan 22																			Hours of Missing Data:	35																											
Maximum Diurnal Average: 1.2 ppb at hour 4		Minimum Diurnal Average: 0.4 ppb at hour 13																			Hours of Calibration:	35																											
Monthly Average: 0.64 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.3 Median = 0.4 Q ₃ = 0.8 P ₉₀ = 1.1 P ₉₉ = 3.4																			Percent Operational Time:	100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.5	0.9	2.0	Z	0.1	0.2	1.6	0.2	0.2	0.2	0.5	0.2	0.3	0.5	0.8	0.9	0.8	1.2	0.8	0.9	0.8	0.4	0.5	1.6	0.7	2.0																							
2-Jan	1.1	0.8	0.5	0.6	Z	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.6	0.7	0.7	0.5	0.6	0.6	0.7	0.5	0.5	0.5	1.1																							
3-Jan	0.6	0.5	0.5	1.0	0.5	Z	0.6	0.7	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.6	0.5	0.6	0.6	0.8	0.8	0.7	0.8	0.6	1.0																							
4-Jan	Z	0.9	0.8	0.9	0.9	0.8	0.7	0.9	1.0	1.1	1.1	0.9	0.9	0.8	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.8	0.9	0.8	0.8	1.1																							
5-Jan	0.8	Z	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.4	0.6	0.5	0.5	0.5	0.6	0.5	0.8																							
6-Jan	0.4	0.5	Z	0.6	0.7	0.4	0.2	0.2	0.3	0.4	0.5	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.2	0.3	0.7																							
7-Jan	0.3	0.3	0.4	Z	0.3	0.4	0.4	0.9	0.8	0.5	0.4	0.6	0.6	0.6	1.0	0.7	0.7	0.7	0.5	0.5	2.7	3.1	1.7	3.0	0.9	3.1																							
8-Jan	2.3	2.3	2.7	1.6	Z	0.8	0.7	0.7	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.6	1.0	0.9	0.9	0.8	1.0	1.4	1.5	1.0	2.7																							
9-Jan	1.6	1.7	1.6	1.6	1.8	Z	1.5	1.5	1.6	1.5	1.1	0.8	0.3	0.3	0.2	0.1	0.7	2.5	0.8	0.3	1.0	0.4	0.1	0.2	1.0	2.5																							
10-Jan	Z	0.1	0.4	0.5	2.5	0.6	0.4	0.6	0.3	0.4	0.8	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.5	0.4	2.5																							
11-Jan	0.6	Z	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.4	0.7	0.8	0.8	0.9	0.9	0.8	0.6	0.8	1.6	0.8	0.5	0.4	0.5	0.3	0.6	1.6																							
12-Jan	0.6	0.4	Z	0.9	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.5	0.9	0.4	0.4	0.9																							
13-Jan	0.4	0.4	0.6	Z	0.7	0.9	0.6	0.6	0.4	0.5	0.4	0.3	0.5	0.7	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.9																							
14-Jan	0.3	0.2	0.2	0.4	Z	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.0	0.3	0.7	0.6	0.0	0.2	1.1	0.3	0.7	0.7	0.3	1.1																							
15-Jan	0.6	0.6	0.6	0.4	0.4	Z	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.7	1.1	1.4	1.3	1.3	1.1	1.1	0.6	1.4																							
16-Jan	Z	1.0	1.1	1.2	1.1	1.0	0.8	1.0	0.7	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.7	0.9	0.6	0.1	0.2	0.1	0.0	0.6	1.2																							
17-Jan	1.1	Z	10.8	13.9	6.1	0.6	0.1	0.1	0.2	0.3	0.3	0.2	0.3	1.4	0.8	0.3	4.7	15.0	3.4	0.6	0.5	0.5	0.6	0.6	2.7	15.0																							
18-Jan	0.4	0.5	Z	0.3	0.4	0.4	0.3	0.4	0.5	0.6	0.5	0.4	0.4	0.6	0.3	0.4	0.5	1.1	0.5	0.6	0.3	0.7	0.5	1.1	0.5	1.1																							
19-Jan	0.7	0.6	0.3	Z	0.3	0.2	0.3	0.3	0.5	0.9	0.3	C	C	C	C	0.8	0.8	3.5	1.1	0.7	0.6	0.5	0.5	0.5	0.7	3.5																							
20-Jan	0.9	0.6	2.2	2.3	Z	6.1	2.8	0.8	0.7	0.9	1.0	0.7	1.6	0.8	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	1.9	2.1	1.2	6.1																							
21-Jan	0.8	0.5	0.5	0.6	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	1.1	1.5	1.0	1.0	0.3	0.0	0.0	0.5	1.5																							
22-Jan	Z	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.3																							
23-Jan	0.3	Z	0.0	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.6	0.6	0.7	0.5	0.3	0.3	0.3	0.7																							
24-Jan	0.2	0.2	Z	0.1	0.7	0.6	0.5	0.4	0.7	0.3	0.4	0.4	0.4	0.6	0.9	0.9	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.9																							
25-Jan	0.4	0.5	0.5	Z	0.7	0.5	0.6	0.7	0.8	0.7	0.7	1.0	0.9	1.1	1.7	1.9	1.3	0.5	0.9	0.9	0.8	1.7	0.5	0.8	0.9	1.9																							
26-Jan	0.6	0.4	0.6	1.0	Z	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.4	1.0																							
27-Jan	0.2	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.4																							
28-Jan	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.2																							
29-Jan	0.3	Z	0.2	0.4	1.1	0.9	1.0	0.9	0.7	0.7	0.4	0.4	0.2	0.4	0.6	0.3	1.5	0.4	1.0	0.6	0.6	0.3	0.2	0.3	0.6	1.5																							
30-Jan	0.4	0.4	Z	0.3	0.3	0.2	0.3	0.7	0.8	0.9	1.3	1.5	1.2	1.5	1.7	1.8	1.6	1.7	1.9	1.8	1.6	1.6	1.2	1.2	1.1	1.9																							
31-Jan	0.9	0.4	0.4	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.5	1.3	1.4	1.2	1.1	1.2	1.2	1.0	1.0	1.0	1.0	0.7	1.4																							
																								0.7	0.6	1.1	1.2	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.7	1.2	0.7	0.6	0.6	0.6	0.7	Diurnal Average		
																								2.3	2.3	10.8	13.9	6.1	6.1	2.8	1.5	1.6	1.5	1.3	1.5	1.6	1.5	1.7	1.9	4.7	15.0	3.4	1.8	2.7	3.1	1.9	3.0	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	695	98.03	98.03
3 - 4	8	1.13	99.15
5 - 7	3	0.42	99.58
8 - 11	0	0.00	99.58
> 11	3	0.42	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	48	26	5	11	15	19	225	126	13	7	3	13	26	47	69	39	692
3 - 4	0	0	0	0	0	0	2	2	1	2	0	0	1	0	0	0	8
5 - 7	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
Totals	48	26	5	11	15	19	227	128	16	13	3	13	27	47	69	39	706

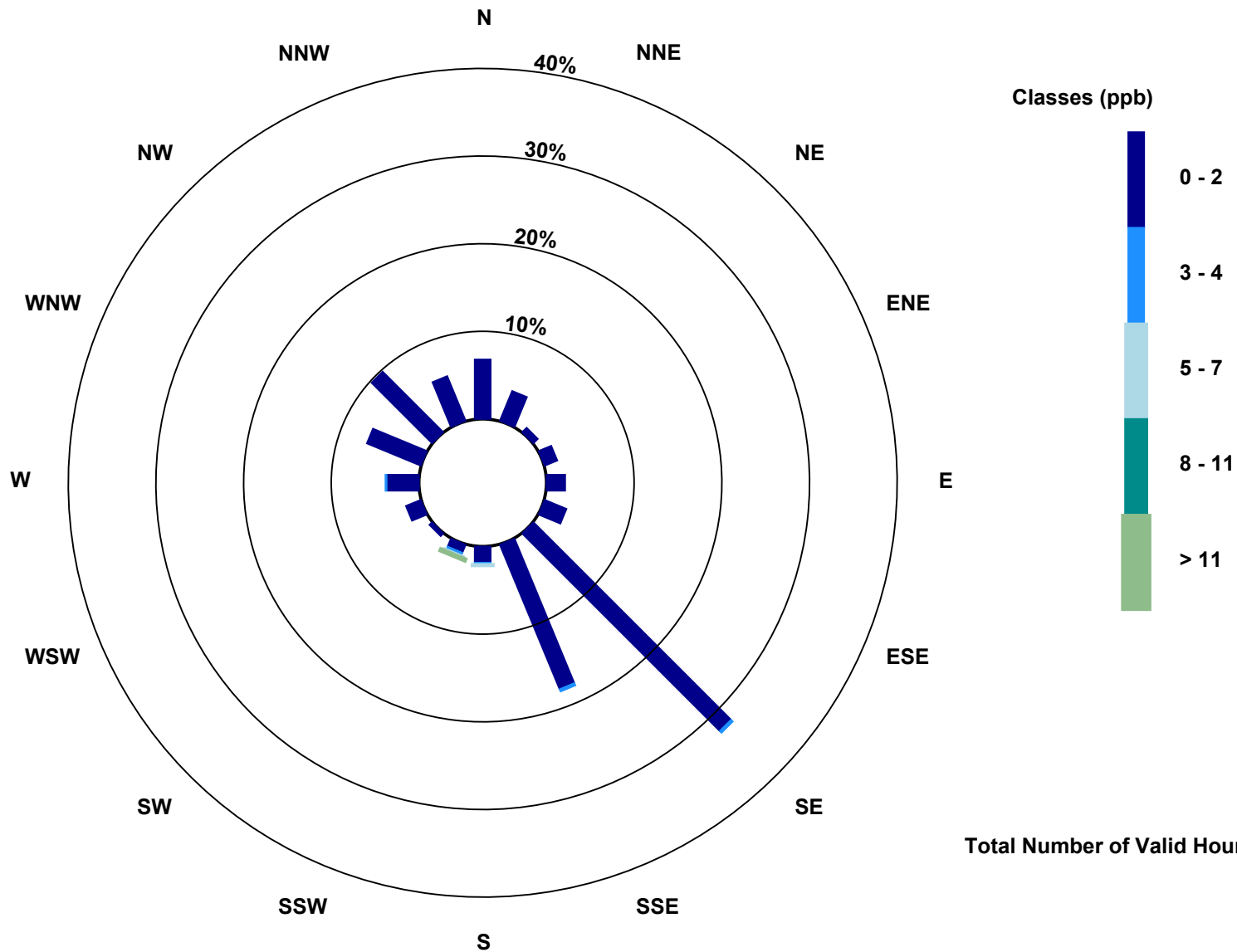
Total Number of Valid Hours: 706

Total Number of Hours: 744

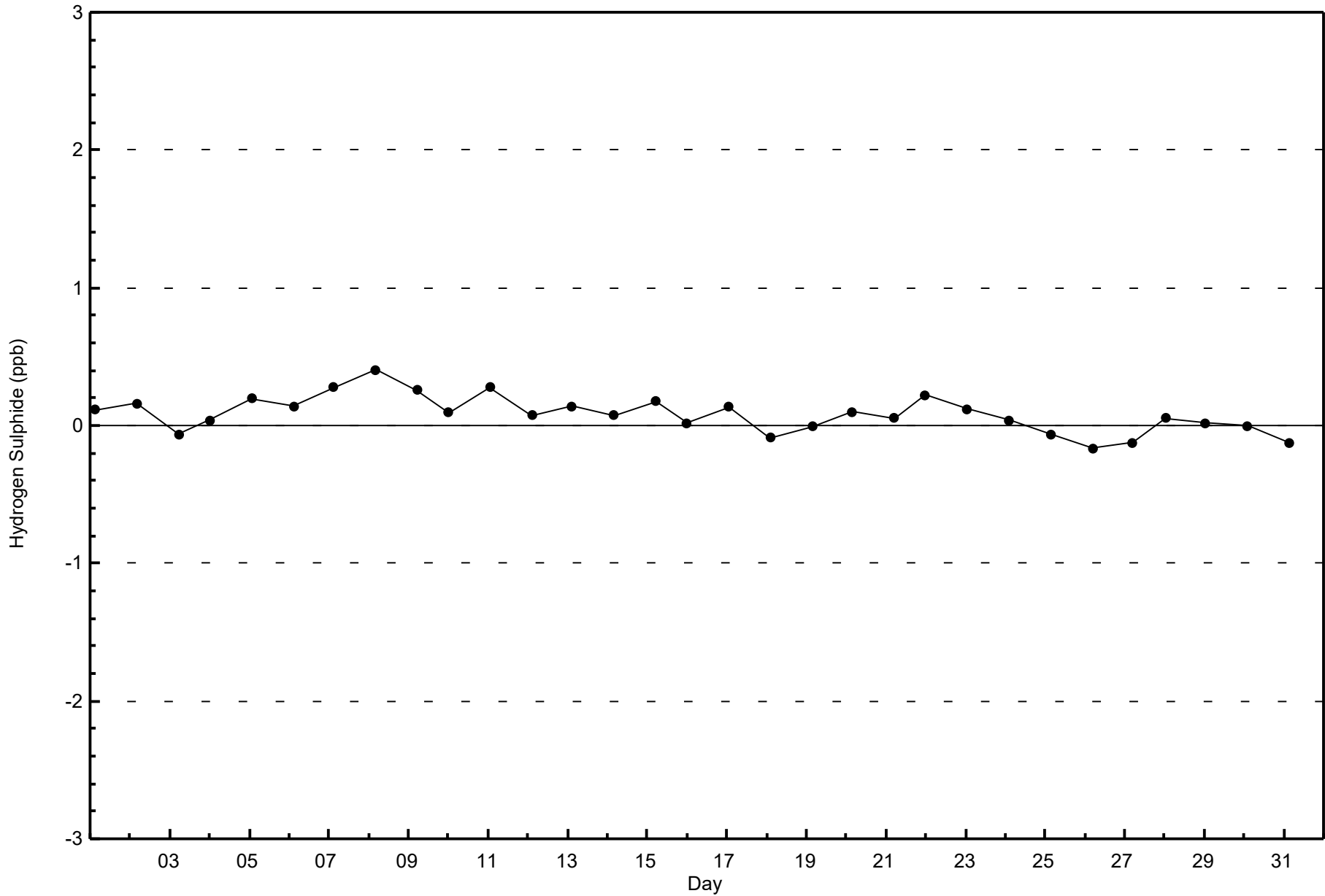


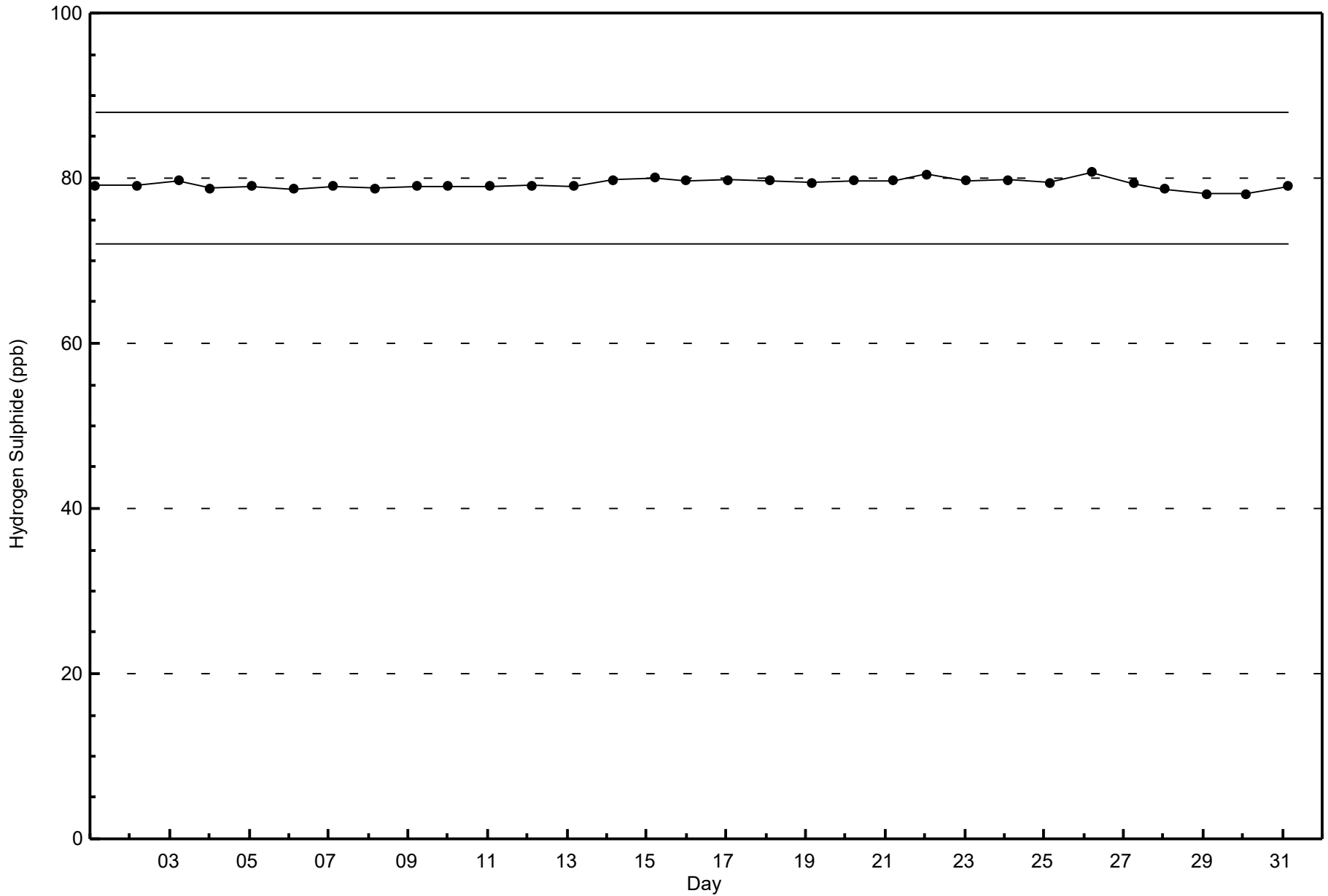
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Lower Camp



Total Number of Valid Hours: 706





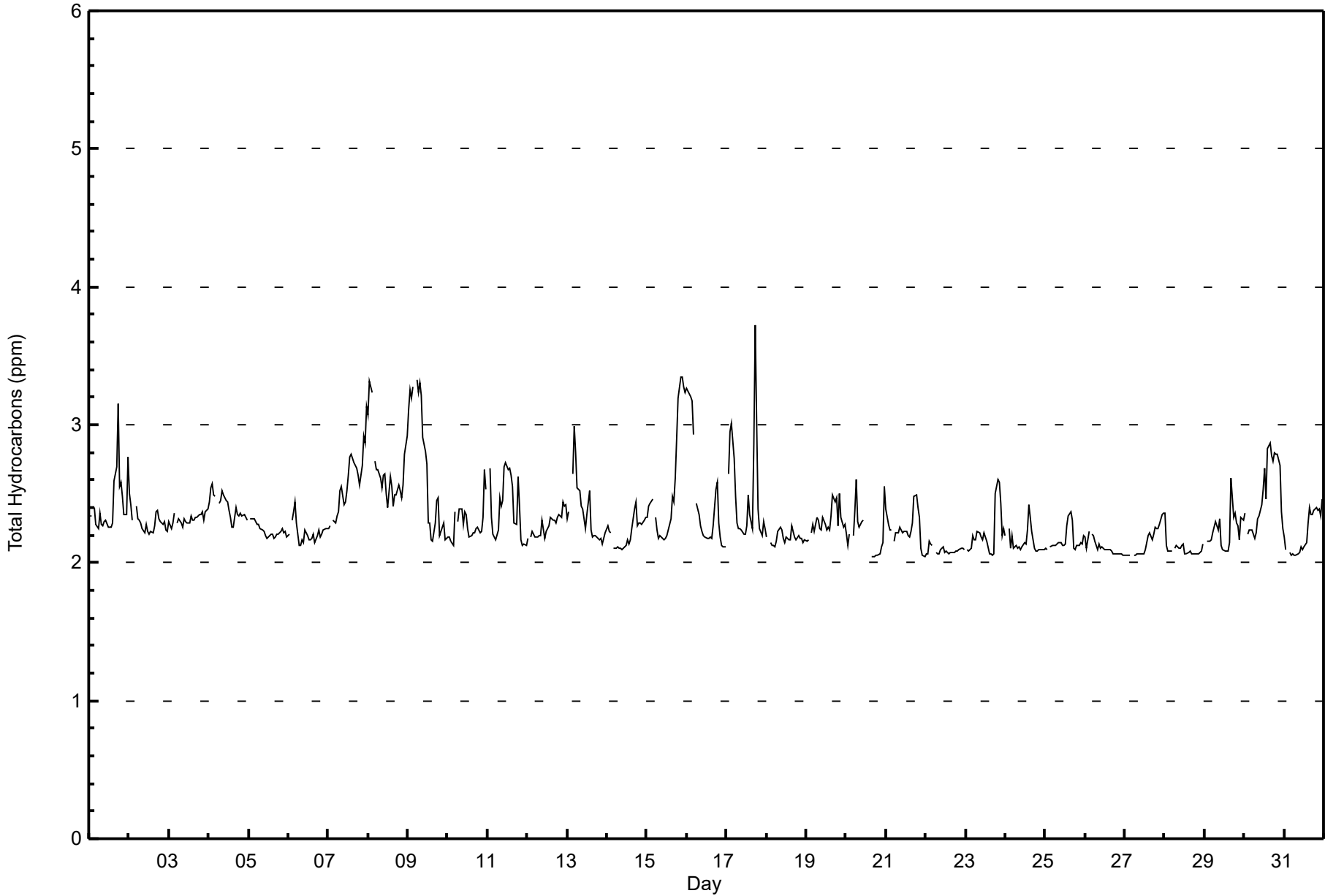


Maximum Value: 3.7 ppm on Jan 17 18:00		Maximum Daily Average: 2.7 ppm on Jan 9		Hours in Service: 744																																												
Minimum Value: 2.0 ppm on Jan 20 18:00		Minimum Daily Average: 2.1 ppm on Jan 22		Hours of Data: 709																																												
Maximum Diurnal Average: 2.4 ppm at hour 18		Minimum Diurnal Average: 2.2 ppm at hour 13		Hours of Missing Data: 35																																												
Monthly Average: 2.31 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 3.3		Hours of Calibration: 35																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	2.3	2.3	Z	2.4	2.3	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6	2.7	3.2	2.6	2.6	2.5	2.3	2.4	2.8	2.4	3.2																							
2-Jan	2.5	2.4	2.3	Z	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.5																						
3-Jan	2.3	2.2	2.3	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.3	2.4																						
4-Jan	2.4	2.5	2.6	2.5	2.5	Z	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.6																						
5-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																						
6-Jan	2.2	Z	2.3	2.4	2.4	2.3	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4																						
7-Jan	2.2	2.3	Z	2.3	2.3	2.3	2.4	2.5	2.6	2.4	2.4	2.5	2.6	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.7	2.9	2.9	3.1	2.6	3.1																						
8-Jan	3.1	3.3	3.2	Z	2.7	2.7	2.7	2.6	2.5	2.6	2.6	2.5	2.4	2.6	2.6	2.4	2.5	2.5	2.6	2.5	2.5	2.6	2.8	2.9	2.7	3.3																						
9-Jan	3.1	3.2	3.2	3.3	Z	3.3	3.2	3.3	3.2	2.9	2.8	2.7	2.3	2.3	2.2	2.2	2.3	2.5	2.5	2.2	2.2	2.3	2.2	2.2	2.7	3.3																						
10-Jan	2.2	2.2	2.2	2.1	2.4	Z	2.3	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.7	2.5	2.3	2.7																						
11-Jan	Z	2.7	2.3	2.2	2.2	2.2	2.2	2.5	2.4	2.5	2.7	2.7	2.7	2.7	2.6	2.6	2.3	2.3	2.6	2.4	2.2	2.1	2.1	2.1	2.4	2.7																						
12-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4																						
13-Jan	2.3	2.4	Z	2.6	3.0	2.8	2.5	2.5	2.4	2.4	2.3	2.2	2.3	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.4	3.0																						
14-Jan	2.3	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4																						
15-Jan	2.3	2.4	2.4	2.5	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.6	2.9	3.2	3.3	3.3	3.3	3.2	2.6	3.3																						
16-Jan	3.3	3.2	3.2	3.2	2.9	Z	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.6	2.3	2.2	2.1	2.1	2.1	2.5	3.3																						
17-Jan	Z	2.6	3.0	3.0	2.8	2.5	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.5	2.3	2.3	2.9	3.7	3.0	2.4	2.2	2.2	2.3	2.2	2.5	3.7																						
18-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3																						
19-Jan	2.2	2.2	Z	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.3	2.5	2.4	2.5	2.3	2.5	2.3	2.3	2.3	2.3	2.5																						
20-Jan	2.2	2.1	2.2	Z	2.2	2.4	2.6	2.3	2.3	2.3	2.3	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.6	2.2	2.6																						
21-Jan	2.4	2.3	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.5	2.4	2.3	2.1	2.1	2.0	2.2	2.5																						
22-Jan	2.1	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
23-Jan	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.5	2.6	2.6	2.4	2.2	2.2	2.2	2.6																						
24-Jan	2.2	Z	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4																						
25-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4																						
26-Jan	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
27-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.1	2.4																						
28-Jan	2.4	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																					
29-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.2	2.6																						
30-Jan	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.7	2.5	2.8	2.9	2.8	2.7	2.8	2.8	2.8	2.8	2.7	2.4	2.3	2.5	2.9																					
31-Jan	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.5	2.2	2.5																						
																								2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	Diurnal Average
																								3.3	3.3	3.2	3.3	3.0	3.3	3.2	3.3	3.2	2.9	2.8	2.7	2.7	2.8	2.8	2.9	2.9	3.7	3.0	3.2	3.3	3.3	3.3	3.2	Diurnal Maximum
Z - zerospan C - Calibration																																																



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Lower Camp - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	4	0.56	0.56
2.1 - 3.0	682	96.19	96.76
3.1 - 10.0	23	3.24	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Lower Camp - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4
2.1 - 3.0	49	25	5	11	14	21	227	125	14	12	1	13	22	40	61	38	678
3.1 - 10.0	0	0	0	0	0	0	2	3	0	1	0	0	1	5	11	0	23
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	25	5	11	14	21	229	128	14	13	1	13	27	45	72	38	705

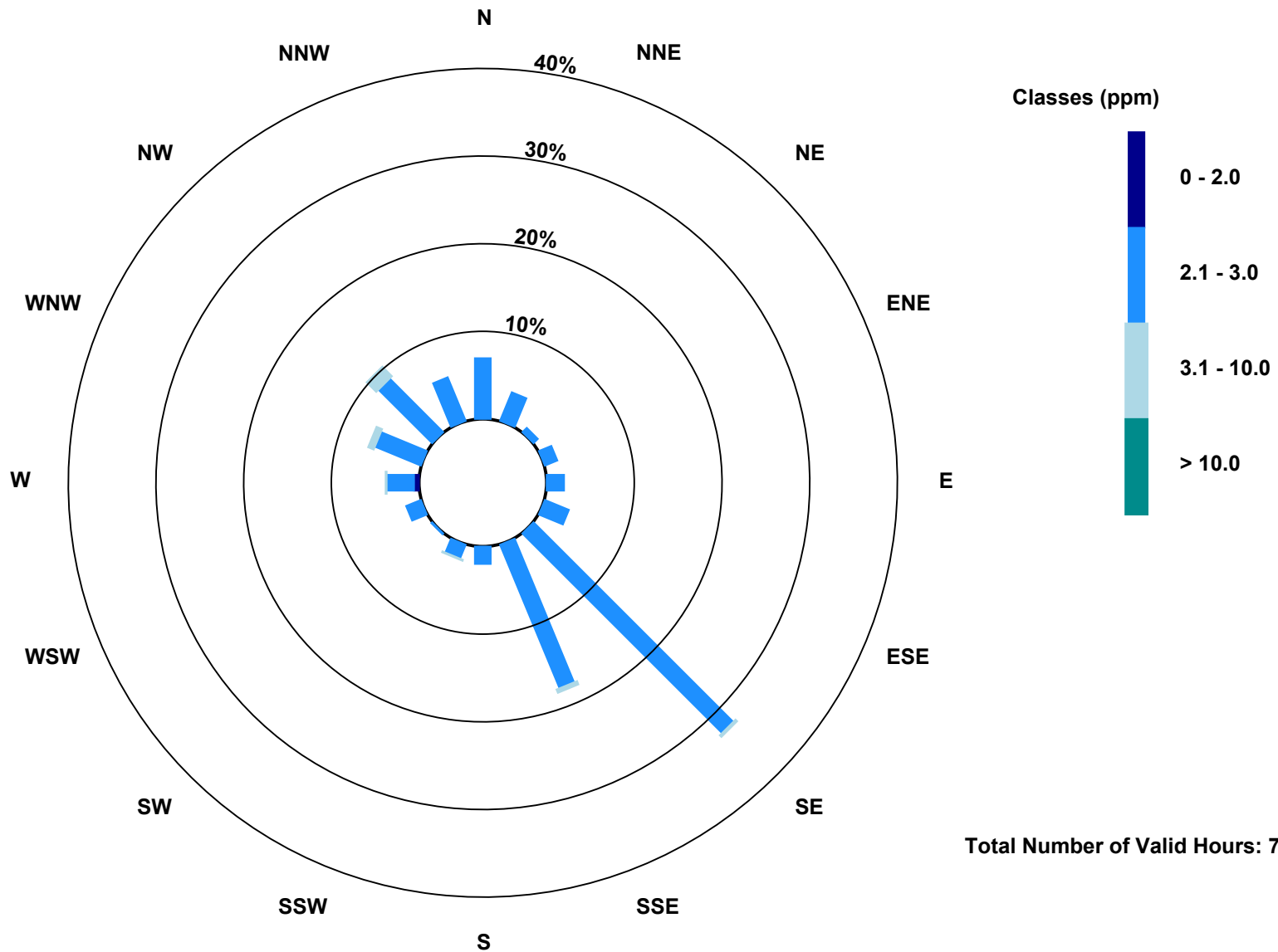
Total Number of Valid Hours: 705

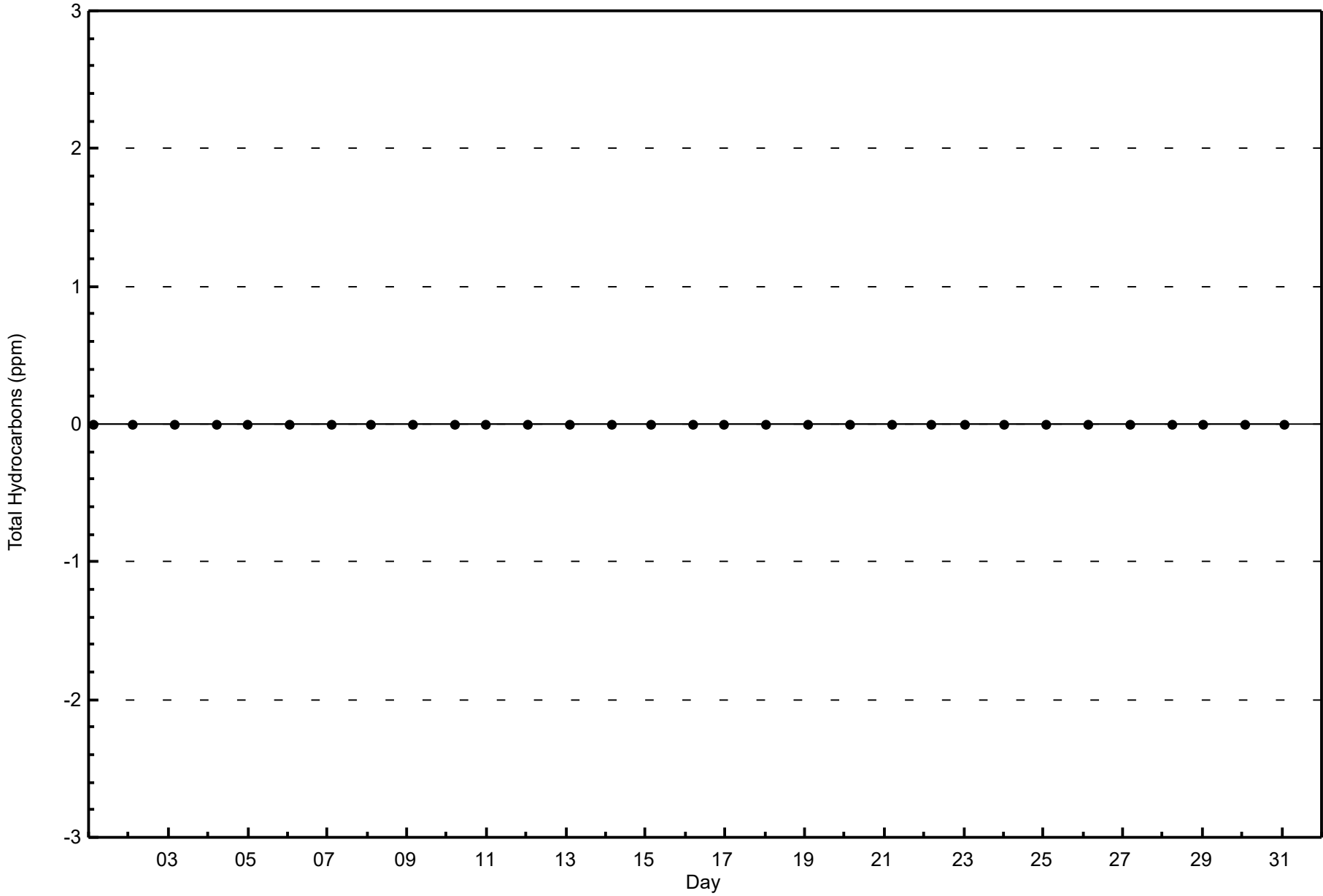
Total Number of Hours: 744

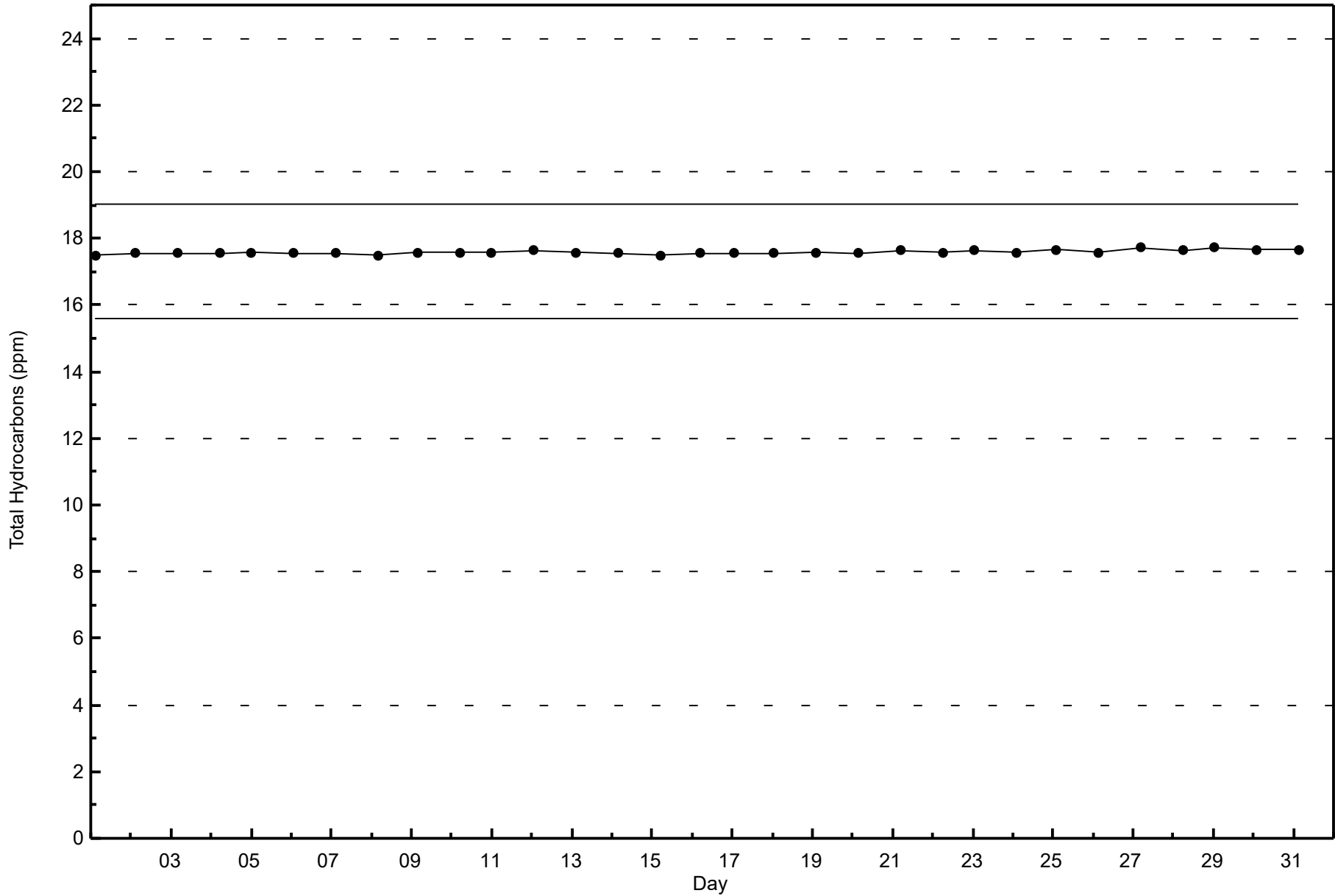


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

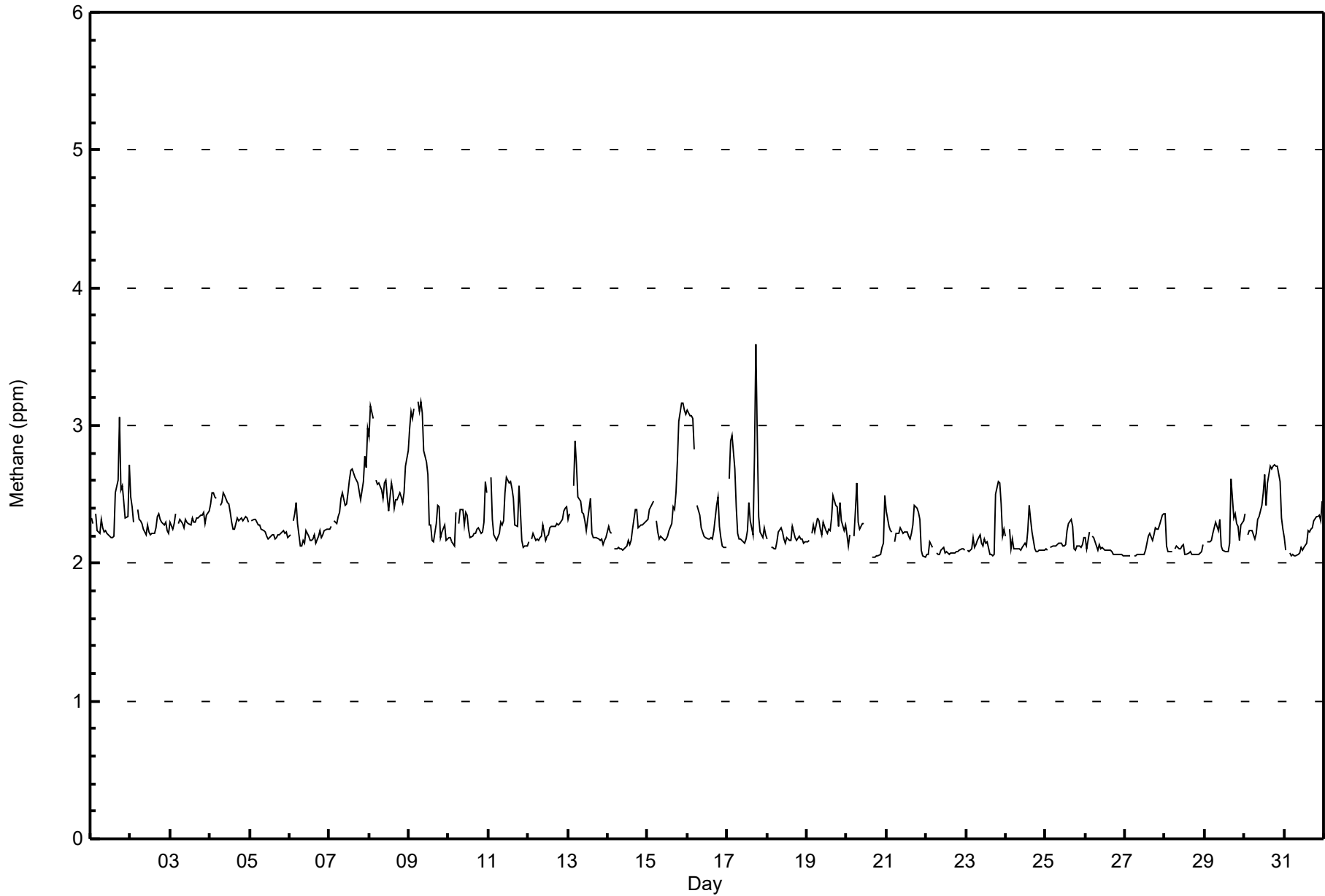
Lower Camp - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 3.6 ppm on Jan 17 18:00		Maximum Daily Average: 2.6 ppm on Jan 9		Hours of Data: 709														709																															
Minimum Value: 2.0 ppm on Jan 20 18:00		Minimum Daily Average: 2.1 ppm on Jan 22		Hours of Missing Data: 35														35																															
Maximum Diurnal Average: 2.4 ppm at hour 3		Minimum Diurnal Average: 2.2 ppm at hour 13		Hours of Calibration: 35														35																															
Monthly Average: 2.29 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.1 Q ₁ = 2.2 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.1		Percent Operational Time: 100.0														100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.3	2.3	Z	2.4	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.6	3.1	2.5	2.6	2.4	2.3	2.3	2.7	2.4	3.1																							
2-Jan	2.5	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.5																							
3-Jan	2.3	2.2	Z	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.3	2.4																							
4-Jan	2.4	2.5	2.5	2.5	Z	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5																							
5-Jan	Z	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																							
6-Jan	2.2	Z	2.3	2.4	2.4	2.3	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4																							
7-Jan	2.2	Z	Z	2.3	2.3	2.3	2.4	2.5	2.5	2.4	2.4	2.5	2.6	2.7	2.7	2.6	2.6	2.6	2.5	2.5	2.6	2.8	2.7	3.0	2.5	3.0																							
8-Jan	2.9	3.1	3.0	Z	2.6	2.6	2.6	2.5	2.5	2.6	2.6	2.5	2.4	2.6	2.5	2.4	2.5	2.5	2.5	2.5	2.4	2.5	2.7	2.8	2.6	3.1																							
9-Jan	3.0	3.1	3.0	3.1	Z	3.2	3.1	3.2	3.1	2.8	2.7	2.6	2.3	2.3	2.2	2.2	2.3	2.4	2.4	2.2	2.2	2.3	2.2	2.2	2.6	3.2																							
10-Jan	2.2	2.2	2.2	2.1	2.4	Z	2.3	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.6	2.5	2.3	2.6																							
11-Jan	Z	2.6	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.5	2.6	2.6	2.6	2.5	2.5	2.3	2.3	2.6	2.4	2.2	2.1	2.1	2.1	2.3	2.6																							
12-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.2	2.4																							
13-Jan	2.3	2.4	Z	2.6	2.9	2.7	2.5	2.5	2.4	2.4	2.3	2.2	2.3	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.9																							
14-Jan	2.3	2.2	Z	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.4																							
15-Jan	2.3	2.4	2.4	2.5	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.5	2.7	3.0	3.2	3.2	3.1	3.1	2.5	3.2																							
16-Jan	3.1	3.1	3.1	3.0	2.8	Z	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.3	2.2	2.1	2.1	2.1	2.4	3.1																							
17-Jan	Z	2.6	2.9	2.9	2.7	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.3	2.2	2.8	3.6	2.9	2.3	2.2	2.2	2.3	2.2	2.4	3.6																							
18-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3																							
19-Jan	2.2	2.2	Z	2.2	2.3	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.4	2.3	2.4	2.3	2.2	2.3	2.3	2.5																							
20-Jan	2.2	2.1	2.2	Z	2.2	2.4	2.6	2.3	2.2	2.3	2.3	C	C	C	C	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.5	2.2	2.6																							
21-Jan	2.4	2.3	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.3	2.1	2.1	2.0	2.2	2.4																							
22-Jan	2.1	2.1	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
23-Jan	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.5	2.6	2.6	2.4	2.2	2.2	2.2	2.6																							
24-Jan	2.2	Z	2.3	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4																							
25-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3																							
26-Jan	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
27-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.4	2.1	2.4																							
28-Jan	2.4	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																						
29-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.6	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.2	2.6																							
30-Jan	2.4	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.6	2.4	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.3	2.2	2.7																							
31-Jan	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.2	2.5																							
																								2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	Diurnal Average
																								3.1	3.1	3.1	3.1	2.9	3.2	3.1	3.2	3.1	2.8	2.7	2.6	2.6	2.7	2.7	2.7	2.8	3.6	2.9	3.0	3.2	3.2	3.1	3.1	3.1	Diurnal Maximum
Z - zerspan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Lower Camp - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Lower Camp - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	4	0.56	0.56
2.1 - 3.0	689	97.18	97.74
3.1 - 10.0	16	2.26	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Lower Camp - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4
2.1 - 3.0	49	25	5	11	14	21	229	126	14	12	1	13	23	41	63	38	685
3.1 - 10.0	0	0	0	0	0	0	0	2	0	1	0	0	0	4	9	0	16
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	25	5	11	14	21	229	128	14	13	1	13	27	45	72	38	705

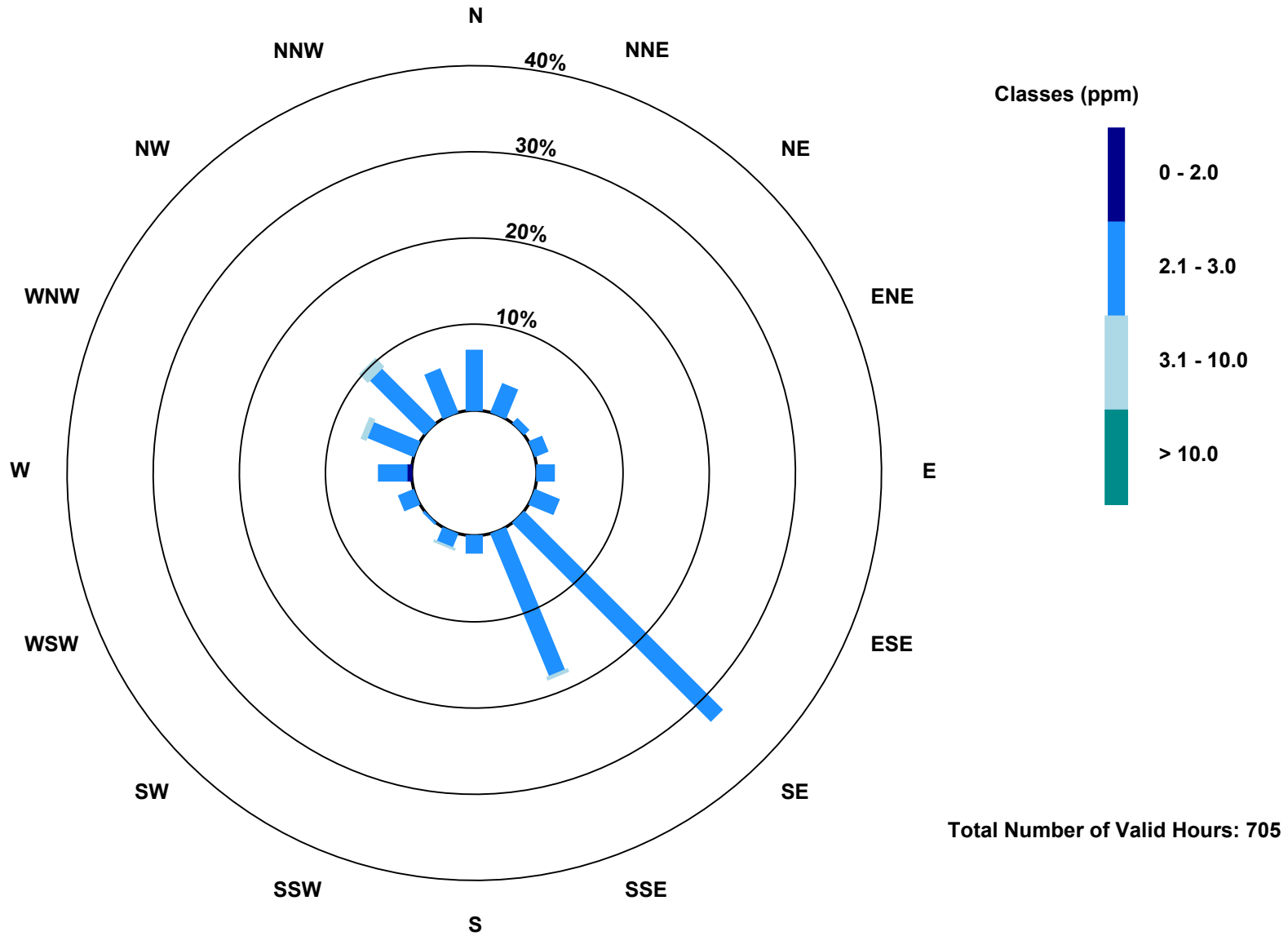
Total Number of Valid Hours: 705

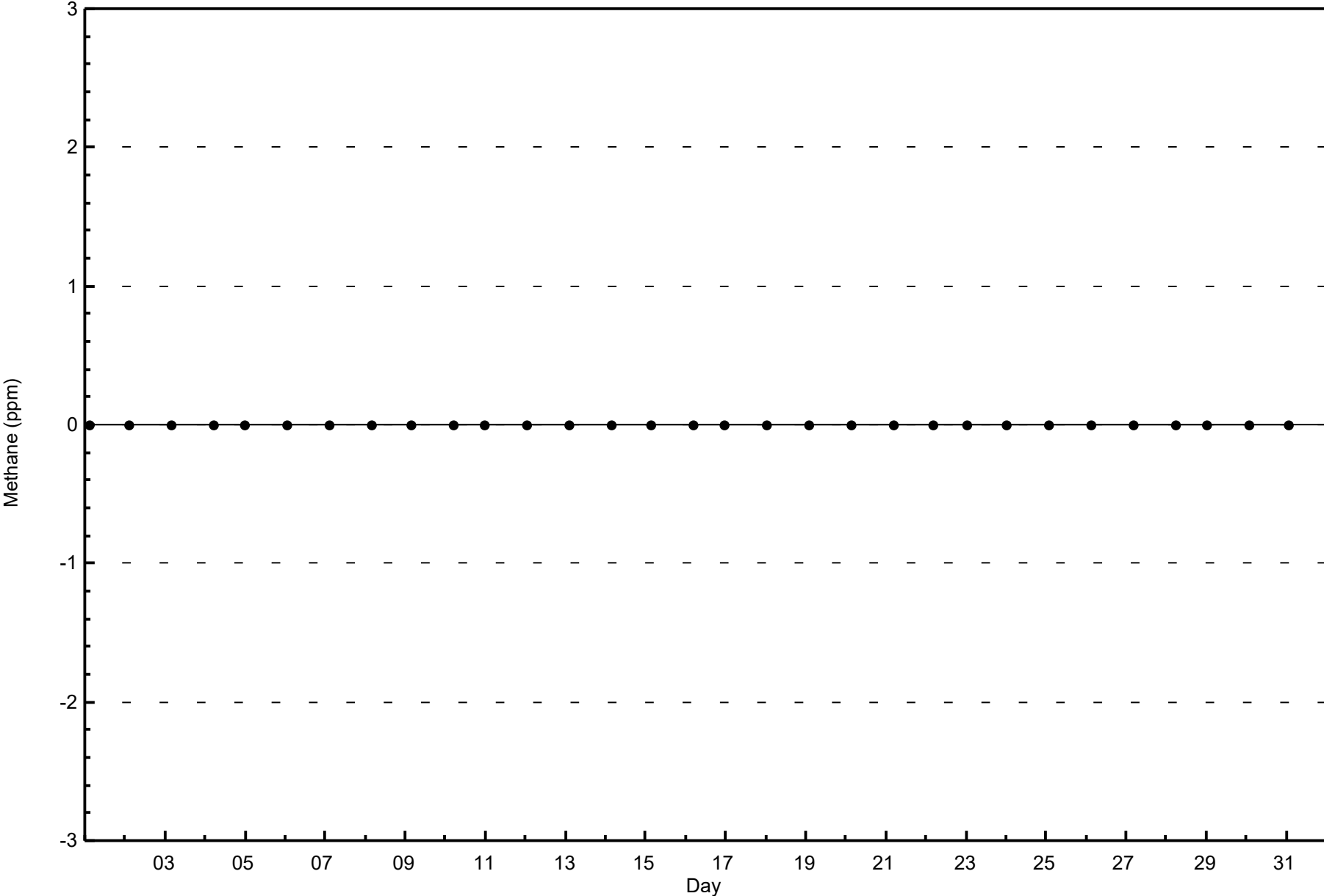
Total Number of Hours: 744

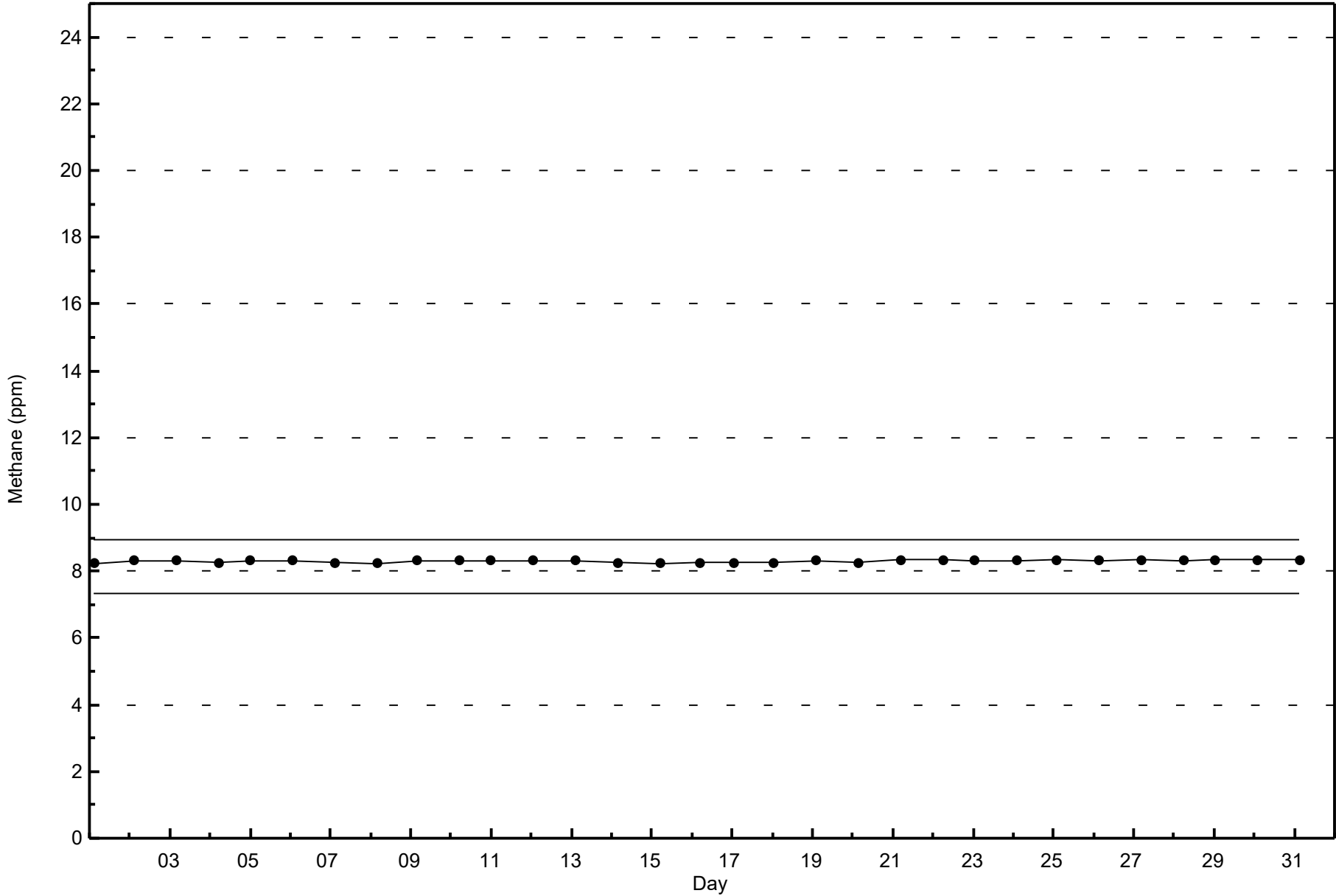


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Lower Camp





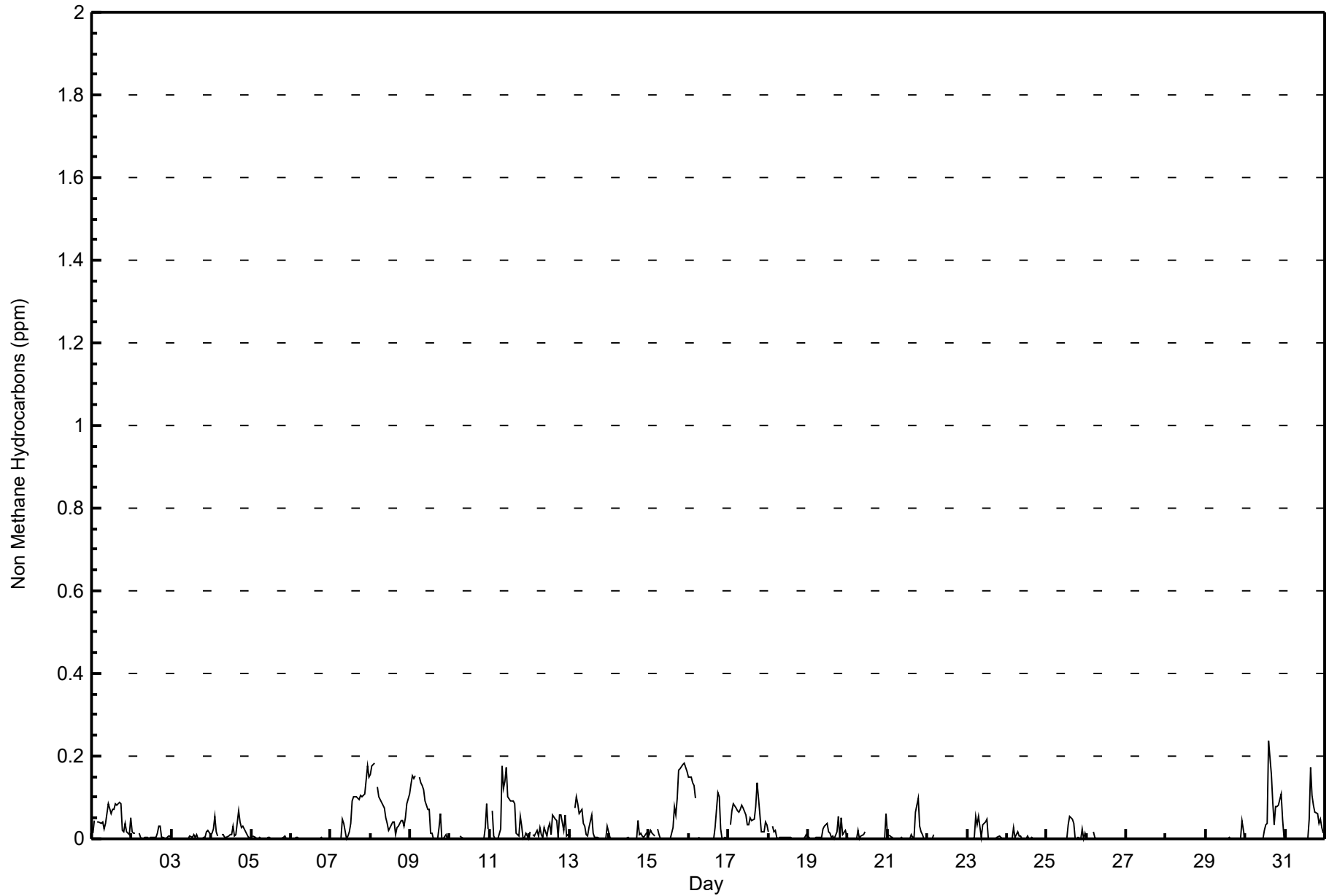




Summary of Hour Averages

Lower Camp - January 2023

Maximum Value: 0.239 ppm on Jan 30 15:00		Maximum Daily Average: 0.071 ppm on Jan 8		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Jan 2 08:00		Minimum Daily Average: 0.000 ppm on Jan 27		Hours of Data:	709																						
Maximum Diurnal Average: 0.034 ppm at hour 19		Minimum Diurnal Average: 0.015 ppm at hour 12		Hours of Missing Data:	35																						
Monthly Average: 0.023 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.2		Hours of Calibration:	35																						
				Percent Operational Time:	100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.014	0.043	Z	0.039	0.042	0.037	0.041	0.022	0.039	0.062	0.086	0.061	0.071	0.070	0.083	0.083	0.090	0.085	0.019	0.018	0.037	0.016	0.011	0.050	0.049	0.090	
2-Jan	0.017	0.014	0.013	Z	0.013	0.003	0.001	0.000	0.003	0.004	0.002	0.003	0.002	0.003	0.003	0.012	0.029	0.029	0.004	0.002	0.001	0.005	0.005	0.006	0.008	0.029	
3-Jan	0.002	0.000	0.000	0.001	Z	0.001	0.001	0.000	0.001	0.000	0.001	0.006	0.003	0.012	0.004	0.009	0.000	0.001	0.002	0.002	0.002	0.016	0.021	0.009	0.004	0.021	
4-Jan	0.015	0.024	0.055	0.016	0.008	Z	0.011	0.011	0.004	0.003	0.007	0.010	0.011	0.030	0.008	0.010	0.068	0.040	0.027	0.032	0.024	0.009	0.004	0.002	0.018	0.068	
5-Jan	Z	0.006	0.002	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.003	0.008	0.000	0.001	0.000	0.001	0.008	
6-Jan	0.000	Z	0.001	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.000	0.001	0.000	0.000	0.002	
7-Jan	0.001	0.001	Z	0.000	0.000	0.001	0.001	0.046	0.036	0.000	0.006	0.016	0.037	0.092	0.101	0.102	0.100	0.096	0.104	0.101	0.109	0.144	0.175	0.149	0.062	0.175	
8-Jan	0.155	0.177	0.183	Z	0.125	0.103	0.095	0.082	0.073	0.051	0.036	0.021	0.027	0.041	0.040	0.012	0.029	0.030	0.042	0.043	0.030	0.050	0.086	0.107	0.071	0.183	
9-Jan	0.131	0.152	0.146	0.153	Z	0.149	0.135	0.129	0.120	0.093	0.071	0.070	0.014	0.015	0.000	0.001	0.000	0.026	0.062	0.001	0.000	0.010	0.001	0.000	0.064	0.153	
10-Jan	0.000	0.001	0.001	0.000	0.000	Z	0.007	0.002	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.085	0.025	0.007	0.085	
11-Jan	Z	0.067	0.008	0.000	0.000	0.001	0.024	0.175	0.123	0.139	0.174	0.101	0.093	0.093	0.093	0.086	0.014	0.008	0.055	0.030	0.001	0.003	0.014	0.000	0.057	0.175	
12-Jan	0.017	Z	0.011	0.006	0.020	0.006	0.028	0.009	0.002	0.026	0.008	0.028	0.037	0.010	0.059	0.046	0.044	0.003	0.058	0.057	0.020	0.056	0.008	0.009	0.025	0.059	
13-Jan	0.007	0.011	Z	0.076	0.102	0.084	0.063	0.072	0.039	0.031	0.009	0.006	0.027	0.057	0.013	0.002	0.004	0.003	0.000	0.001	0.000	0.000	0.001	0.032	0.028	0.102	
14-Jan	0.004	0.000	0.001	Z	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.046	0.011	0.013	0.007	0.004	0.013	0.016	0.005	0.046		
15-Jan	0.010	0.021	0.013	0.007	Z	0.023	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.077	0.057	0.097	0.165	0.170	0.179	0.184	0.172	0.161	0.060	0.184	
16-Jan	0.149	0.149	0.137	0.129	0.098	Z	0.003	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.027	0.113	0.101	0.023	0.000	0.000	0.002	0.000	0.041	0.149		
17-Jan	Z	0.033	0.067	0.085	0.075	0.066	0.066	0.072	0.080	0.073	0.057	0.034	0.033	0.052	0.043	0.047	0.077	0.135	0.099	0.057	0.015	0.018	0.041	0.034	0.059	0.135	
18-Jan	0.016	Z	0.029	0.016	0.020	0.005	0.001	0.003	0.005	0.002	0.003	0.002	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.009	0.005	0.029	
19-Jan	0.005	0.000	Z	0.002	0.001	0.003	0.004	0.003	0.004	0.022	0.032	0.037	0.017	0.012	0.002	0.007	0.001	0.017	0.054	0.001	0.052	0.011	0.022	0.006	0.014	0.054	
20-Jan	0.000	0.000	0.000	Z	0.000	0.001	0.021	0.000	0.007	0.009	0.017	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.006	0.060	
21-Jan	0.011	0.008	0.004	0.003	Z	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.010	0.004	0.004	0.064	0.098	0.029	0.016	0.010	0.000	0.000	0.012	0.098		
22-Jan	0.000	0.000	0.000	0.002	0.011	Z	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011		
23-Jan	Z	0.000	0.000	0.001	0.002	0.055	0.035	0.055	0.005	0.035	0.038	0.040	0.046	0.002	0.000	0.000	0.000	0.000	0.003	0.006	0.003	0.000	0.000	0.000	0.014	0.055	
24-Jan	0.000	Z	0.000	0.000	0.027	0.004	0.017	0.008	0.006	0.000	0.000	0.000	0.008	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.027	
25-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035	0.053	0.049	0.037	0.001	0.000	0.005	0.000	0.025	0.001	0.013	0.010	0.053	
26-Jan	0.000	0.000	0.000	Z	0.018	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.018	
27-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045	0.000	0.002	0.045	
30-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.035	0.036	0.239	0.155	0.087	0.034	0.078	0.079	0.082	0.108	0.046	0.002	0.043	0.239	
31-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.174	0.105	0.083	0.066	0.062	0.038	0.048	0.027	0.012	0.029	0.174	
		0.021	0.027	0.027	0.021	0.022	0.021	0.018	0.022	0.018	0.018	0.018	0.015	0.016	0.019	0.028	0.028	0.025	0.029	0.034	0.024	0.020	0.024	0.025	0.023	Diurnal Average	
		0.155	0.177	0.183	0.153	0.125	0.149	0.135	0.175	0.123	0.139	0.174	0.101	0.093	0.093	0.239	0.174	0.105	0.135	0.165	0.170	0.179	0.184	0.175	0.161	Diurnal Maximum	
Z - zerospan		C - Calibration																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	411	57.97	57.97
0.006 - 0.05	189	26.66	84.63
0.06 - 0.1	92	12.98	97.60
> 0.1	17	2.40	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	38	23	4	9	9	10	124	69	4	6	0	7	20	24	43	20	410
0.006 - 0.05	9	1	1	1	3	9	77	41	6	3	1	5	4	9	10	7	187
0.06 - 0.1	2	1	0	1	2	2	22	16	4	4	0	1	2	10	13	11	91
> 0.1	0	0	0	0	0	0	6	2	0	0	0	0	1	2	6	0	17
Totals	49	25	5	11	14	21	229	128	14	13	1	13	27	45	72	38	705

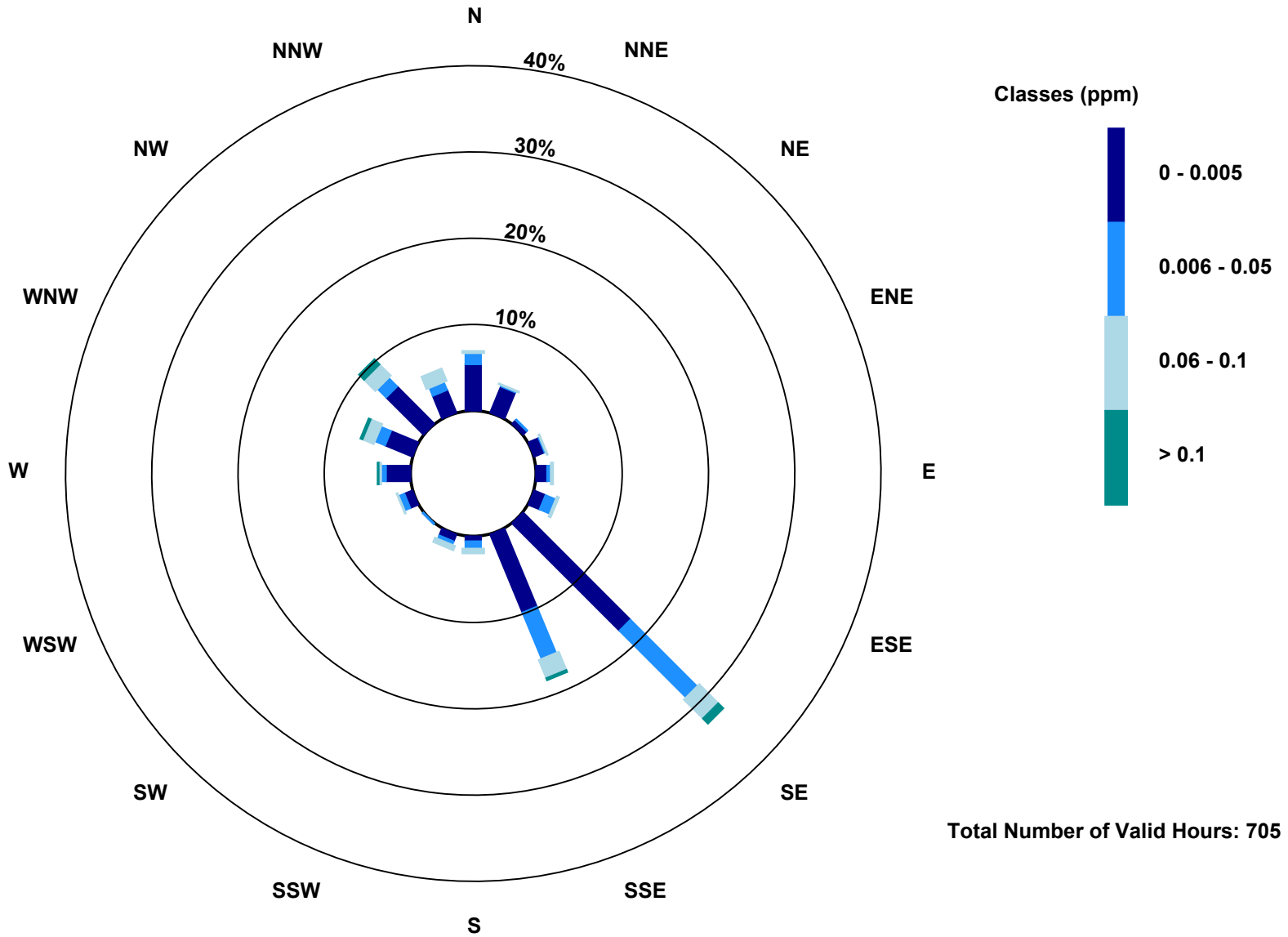
Total Number of Valid Hours: 705

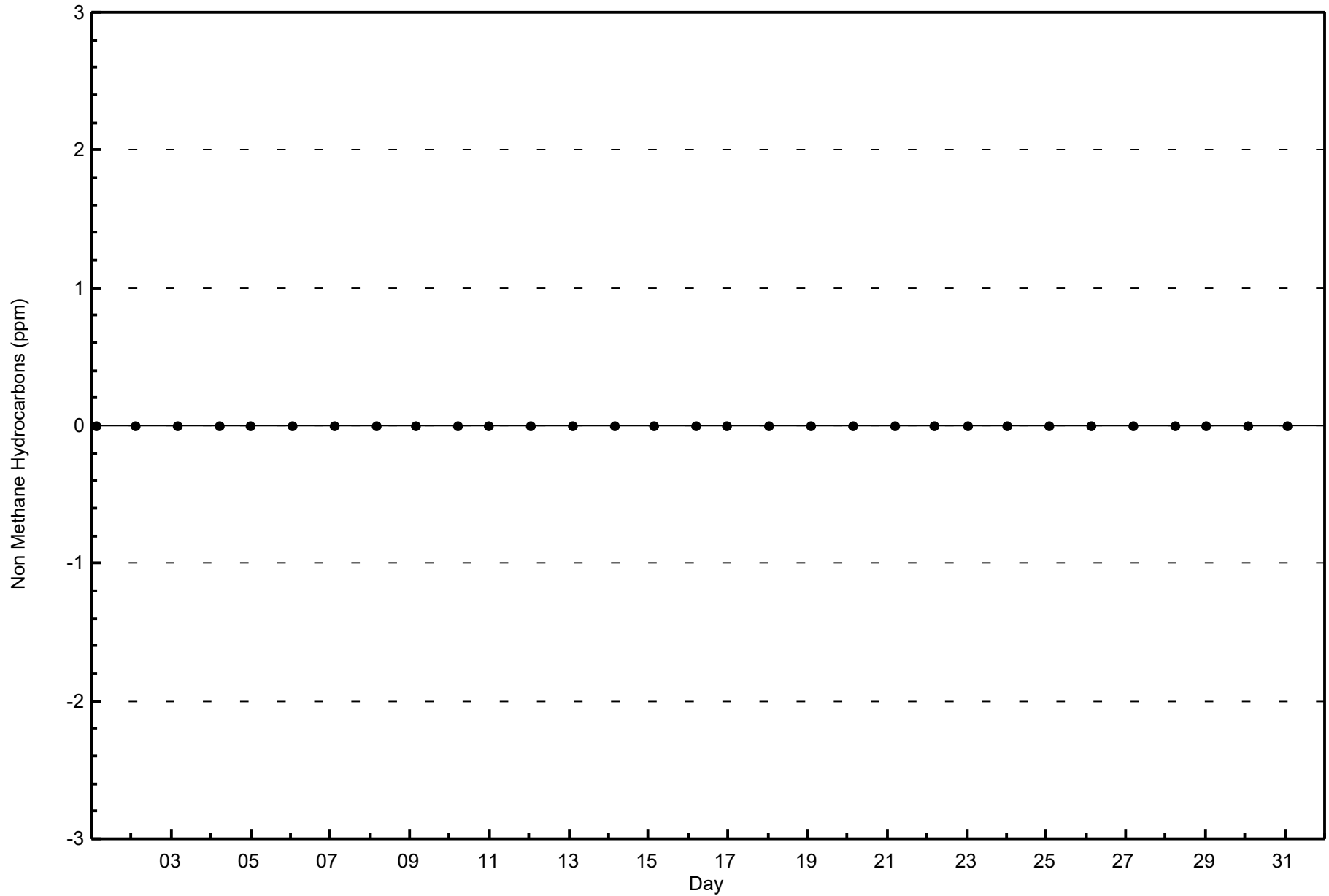
Total Number of Hours: 744

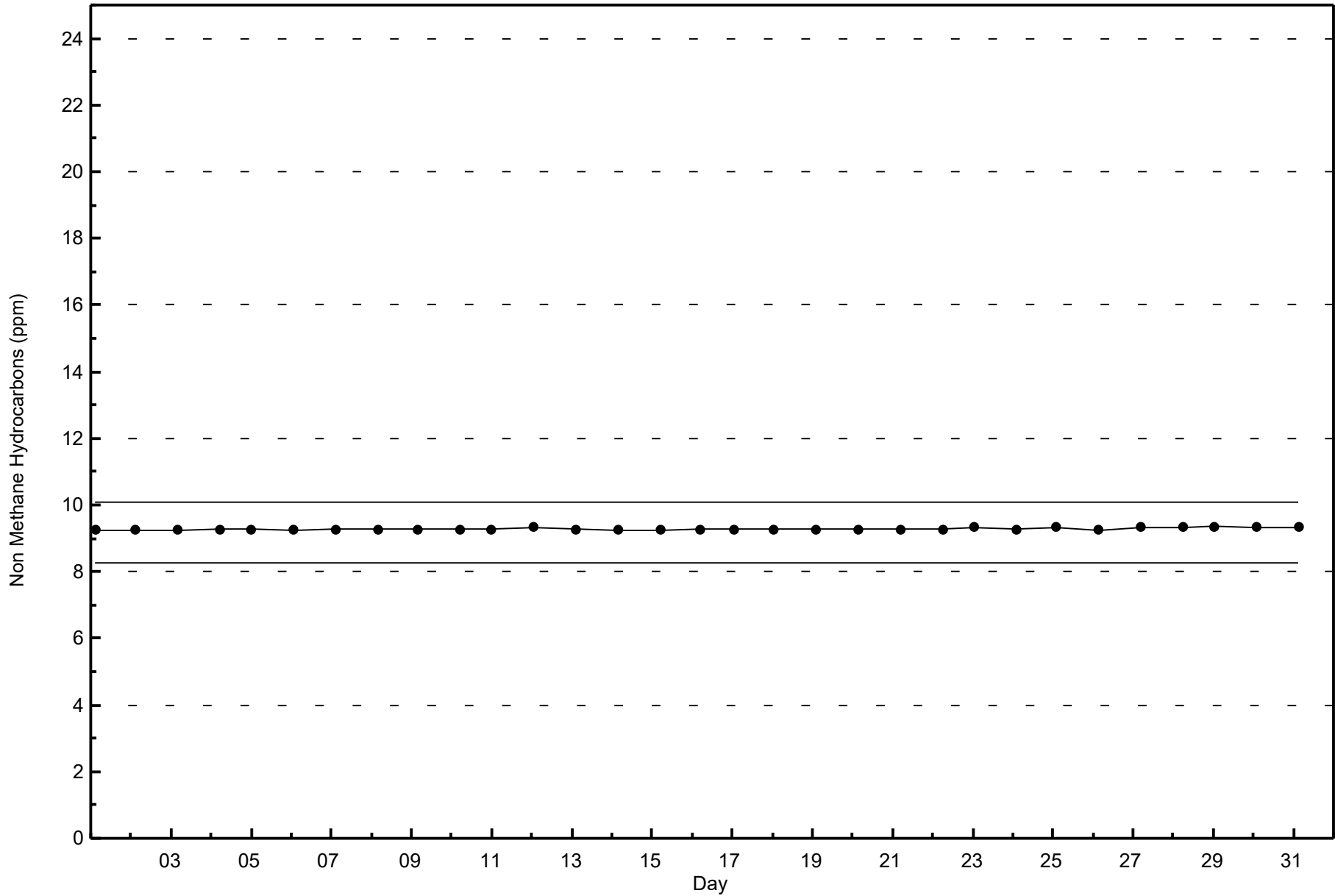


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp









Wood Buffalo Environmental Association
Summary of Hour Averages

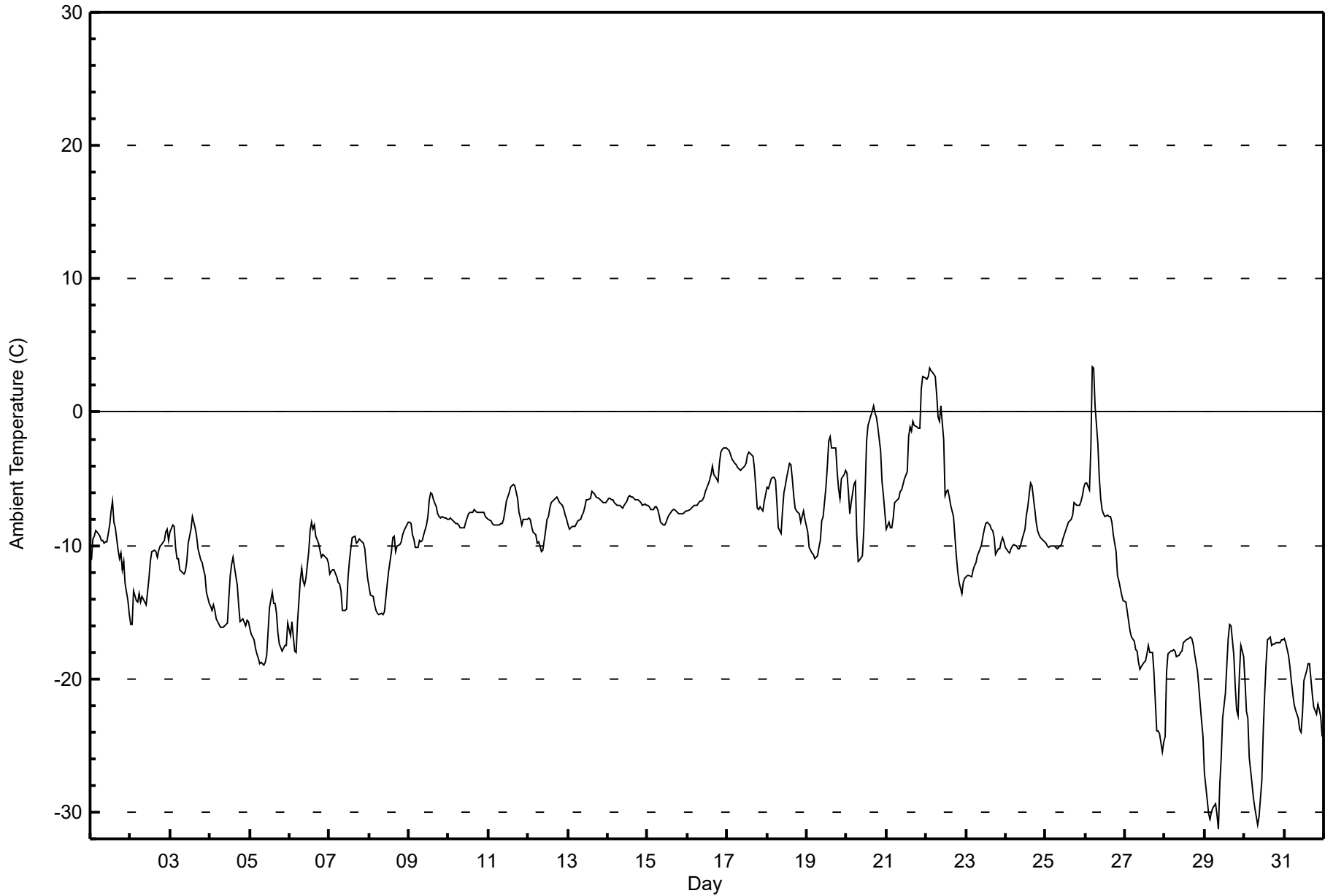
Ambient Temperature (AT) - C
Lower Camp - January 2023

Maximum Value: 3.4 C on Jan 26 05:00		Maximum Daily Average: -3.8 C on Jan 21		Hours in Service: 744																						
Minimum Value: -31.3 C on Jan 29 09:00		Minimum Daily Average: -23.9 C on Jan 29		Hours of Data: 744																						
Maximum Diurnal Average: -8.5 C at hour 15		Minimum Diurnal Average: -12.2 C at hour 9		Hours of Missing Data: 0																						
Monthly Average: -10.64 C		Percentiles: P ₁ = -29.9 P ₁₀ = -18.7 Q ₁ = -14.1 Median = -9.2 Q ₃ = -7.0 P ₉₀ = -4.9 P ₉₉ = 2.6		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-11.1	-9.5	-9.3	-8.9	-9.0	-9.3	-9.6	-9.6	-9.9	-9.7	-9.8	-8.4	-7.4	-6.7	-8.2	-8.6	-10.3	-11.0	-10.5	-11.9	-11.2	-12.9	-14.2	-15.2	-10.1	-6.7
2-Jan	-15.9	-16.0	-13.4	-14.1	-14.2	-13.6	-14.2	-13.8	-14.0	-14.5	-13.5	-12.5	-11.2	-10.5	-10.3	-10.5	-10.9	-10.4	-10.0	-9.9	-9.6	-9.0	-8.8	-9.6	-12.1	-8.8
3-Jan	-9.0	-8.4	-8.6	-10.1	-11.0	-11.0	-11.8	-12.1	-12.1	-11.9	-11.2	-9.8	-8.8	-7.8	-8.3	-8.6	-9.3	-10.3	-11.1	-11.3	-11.8	-12.3	-13.5	-14.4	-10.6	-7.8
4-Jan	-14.5	-14.9	-14.5	-14.9	-15.5	-15.9	-16.1	-16.2	-16.2	-16.0	-15.8	-13.9	-12.3	-11.4	-10.9	-11.6	-13.0	-14.4	-15.7	-15.7	-15.5	-16.1	-15.6	-15.8	-14.7	-10.9
5-Jan	-16.2	-16.7	-17.1	-17.7	-18.2	-18.5	-18.9	-18.8	-19.0	-18.8	-18.2	-16.5	-14.7	-13.5	-14.3	-14.4	-15.1	-16.5	-17.4	-17.9	-17.7	-17.4	-17.5	-15.8	-16.9	-13.5
6-Jan	-16.8	-15.8	-16.9	-18.0	-18.0	-15.7	-12.5	-11.8	-12.6	-13.0	-12.4	-10.5	-8.9	-8.2	-8.8	-8.5	-9.3	-9.8	-10.4	-10.9	-10.7	-10.8	-11.0	-11.3	-12.2	-8.2
7-Jan	-12.2	-12.0	-11.8	-11.8	-12.3	-12.8	-12.9	-13.4	-14.8	-14.9	-14.8	-12.5	-11.2	-10.3	-9.4	-9.3	-9.8	-9.7	-9.5	-9.6	-9.8	-10.3	-11.4	-12.4	-11.6	-9.3
8-Jan	-13.1	-13.7	-13.8	-14.4	-14.8	-15.0	-15.1	-15.1	-15.2	-15.0	-13.9	-12.9	-11.9	-10.4	-9.4	-9.3	-10.5	-10.0	-10.0	-9.7	-9.2	-8.9	-8.6	-8.3	-12.0	-8.3
9-Jan	-8.2	-8.4	-9.2	-9.5	-10.1	-10.1	-9.7	-9.8	-9.6	-9.2	-8.5	-7.8	-6.6	-6.0	-6.2	-6.6	-7.1	-7.6	-7.8	-7.9	-7.9	-7.9	-7.9	-8.0	-8.2	-6.0
10-Jan	-8.0	-7.9	-8.0	-8.2	-8.4	-8.4	-8.5	-8.6	-8.7	-8.6	-8.3	-7.9	-7.6	-7.6	-7.5	-7.3	-7.4	-7.5	-7.5	-7.6	-7.5	-7.5	-7.8	-7.9	-7.9	-7.3
11-Jan	-8.1	-8.2	-8.3	-8.4	-8.5	-8.5	-8.5	-8.4	-8.3	-8.0	-7.5	-6.7	-6.0	-5.7	-5.5	-5.4	-5.5	-6.5	-7.5	-8.0	-8.4	-8.1	-8.0	-8.0	-7.5	-5.4
12-Jan	-8.0	-8.1	-8.5	-8.9	-9.2	-9.8	-9.8	-10.0	-10.5	-10.4	-8.9	-8.1	-7.8	-7.2	-6.8	-6.6	-6.5	-6.4	-6.6	-6.8	-7.0	-7.3	-7.8	-8.1	-8.1	-6.4
13-Jan	-8.4	-8.8	-8.6	-8.5	-8.6	-8.4	-8.1	-8.0	-7.7	-7.5	-7.1	-6.6	-6.5	-6.5	-5.9	-6.0	-6.2	-6.3	-6.4	-6.6	-6.7	-6.8	-6.8	-6.7	-7.2	-5.9
14-Jan	-6.4	-6.5	-6.6	-6.5	-6.7	-7.0	-7.0	-7.1	-7.2	-7.0	-6.7	-6.3	-6.3	-6.4	-6.4	-6.5	-6.6	-6.6	-6.7	-6.8	-6.9	-6.9	-7.0	-7.0	-6.7	-6.3
15-Jan	-7.0	-7.1	-7.3	-7.3	-7.1	-7.1	-7.3	-7.7	-8.2	-8.5	-8.4	-8.2	-8.0	-7.7	-7.4	-7.3	-7.4	-7.4	-7.5	-7.6	-7.6	-7.6	-7.6	-7.4	-7.6	-7.0
16-Jan	-7.4	-7.3	-7.2	-7.1	-7.0	-7.0	-7.0	-6.7	-6.6	-6.6	-6.3	-6.0	-5.4	-5.1	-4.7	-4.1	-4.6	-5.0	-5.2	-3.8	-3.0	-2.8	-2.7	-2.7	-5.5	-2.7
17-Jan	-2.7	-2.9	-3.2	-3.5	-3.8	-4.0	-4.1	-4.3	-4.3	-4.2	-4.0	-3.8	-3.2	-3.0	-3.1	-3.3	-4.3	-5.8	-7.2	-7.3	-7.1	-7.4	-6.7	-6.1	-4.6	-2.7
18-Jan	-5.6	-5.7	-5.0	-4.9	-4.9	-5.1	-6.7	-8.6	-9.1	-7.4	-6.1	-5.5	-4.9	-3.9	-4.0	-5.0	-6.2	-7.2	-7.4	-7.7	-8.3	-7.8	-7.5	-8.0	-6.4	-3.9
19-Jan	-9.0	-10.1	-10.3	-10.5	-10.7	-11.0	-10.8	-10.1	-9.6	-8.2	-7.8	-5.7	-4.1	-2.1	-1.8	-2.7	-2.7	-2.6	-4.5	-5.8	-6.4	-5.0	-4.7	-4.3	-6.7	-1.8
20-Jan	-4.6	-5.9	-7.6	-6.8	-5.4	-5.2	-9.2	-11.1	-11.1	-10.8	-8.8	-5.7	-2.2	-1.0	-0.2	0.0	0.4	0.0	-0.4	-1.1	-2.9	-5.2	-6.3	-7.5	-4.9	0.4
21-Jan	-8.8	-8.3	-8.6	-8.6	-8.0	-6.8	-6.6	-6.4	-6.0	-5.8	-5.4	-4.9	-4.5	-1.9	-1.1	-1.5	-0.7	-1.0	-1.1	-1.3	-1.2	1.7	2.6	2.6	-3.8	2.6
22-Jan	2.4	2.7	3.3	3.1	3.0	2.7	1.3	-0.4	-0.7	0.5	-2.0	-6.3	-6.0	-5.8	-6.4	-6.9	-7.9	-9.3	-10.8	-11.9	-12.8	-13.6	-12.8	-12.5	-4.5	3.3
23-Jan	-12.4	-12.3	-12.3	-12.3	-11.8	-11.6	-11.3	-10.8	-10.3	-9.9	-9.3	-8.8	-8.4	-8.3	-8.4	-8.8	-8.8	-9.5	-10.6	-10.3	-10.2	-9.8	-9.5	-9.8	-10.2	-8.3
24-Jan	-10.1	-10.4	-10.5	-10.2	-10.0	-10.0	-10.1	-10.3	-10.2	-10.0	-9.5	-8.8	-7.7	-7.1	-6.1	-5.3	-5.5	-7.3	-8.2	-8.9	-9.2	-9.4	-9.6	-9.7	-8.9	-5.3
25-Jan	-9.8	-10.1	-10.2	-10.1	-10.0	-10.0	-10.1	-10.2	-10.2	-9.9	-9.5	-9.2	-8.9	-8.5	-8.2	-8.0	-7.7	-6.8	-6.9	-7.0	-7.0	-6.6	-6.2	-5.6	-8.6	-5.6
26-Jan	-5.3	-5.3	-5.8	-2.7	3.4	3.3	0.5	-2.3	-4.9	-6.5	-7.3	-7.6	-7.8	-7.8	-7.8	-7.8	-8.2	-9.2	-10.4	-12.2	-12.7	-13.2	-13.7	-14.1	-6.9	3.4
27-Jan	-14.2	-14.9	-15.8	-16.4	-16.8	-17.2	-17.8	-17.9	-18.7	-19.2	-19.1	-18.8	-18.7	-18.1	-17.5	-18.0	-18.0	-19.5	-21.7	-23.9	-24.0	-24.2	-25.5	-24.7	-19.2	-14.2
28-Jan	-24.3	-19.5	-18.1	-18.0	-17.9	-17.9	-17.9	-18.3	-18.3	-18.0	-17.9	-17.3	-17.2	-17.1	-17.0	-16.8	-16.9	-17.4	-18.1	-19.4	-20.6	-21.9	-23.2	-24.3	-18.9	-16.8
29-Jan	-27.0	-29.1	-30.1	-30.5	-30.0	-29.7	-29.4	-30.2	-31.3	-27.9	-25.9	-23.0	-21.1	-18.9	-17.0	-15.9	-16.0	-18.3	-20.6	-22.4	-22.8	-19.6	-17.5	-18.4	-23.9	-15.9
30-Jan	-20.3	-22.4	-22.9	-25.9	-27.9	-29.0	-29.7	-30.3	-31.0	-30.3	-27.6	-23.9	-21.2	-18.9	-17.0	-16.9	-17.5	-17.4	-17.4	-17.3	-17.3	-17.3	-17.1	-17.1	-22.2	-16.9
31-Jan	-17.0	-17.3	-18.2	-19.1	-20.1	-21.1	-22.0	-22.3	-22.9	-23.8	-24.0	-22.6	-20.1	-19.4	-18.9	-18.9	-20.0	-21.2	-22.1	-22.6	-21.9	-22.3	-22.8	-24.3	-21.0	-17.0
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Lower Camp - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Lower Camp - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	57	7.66	7.66
-20 - 0	671	90.19	97.85
0 - 10	16	2.15	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

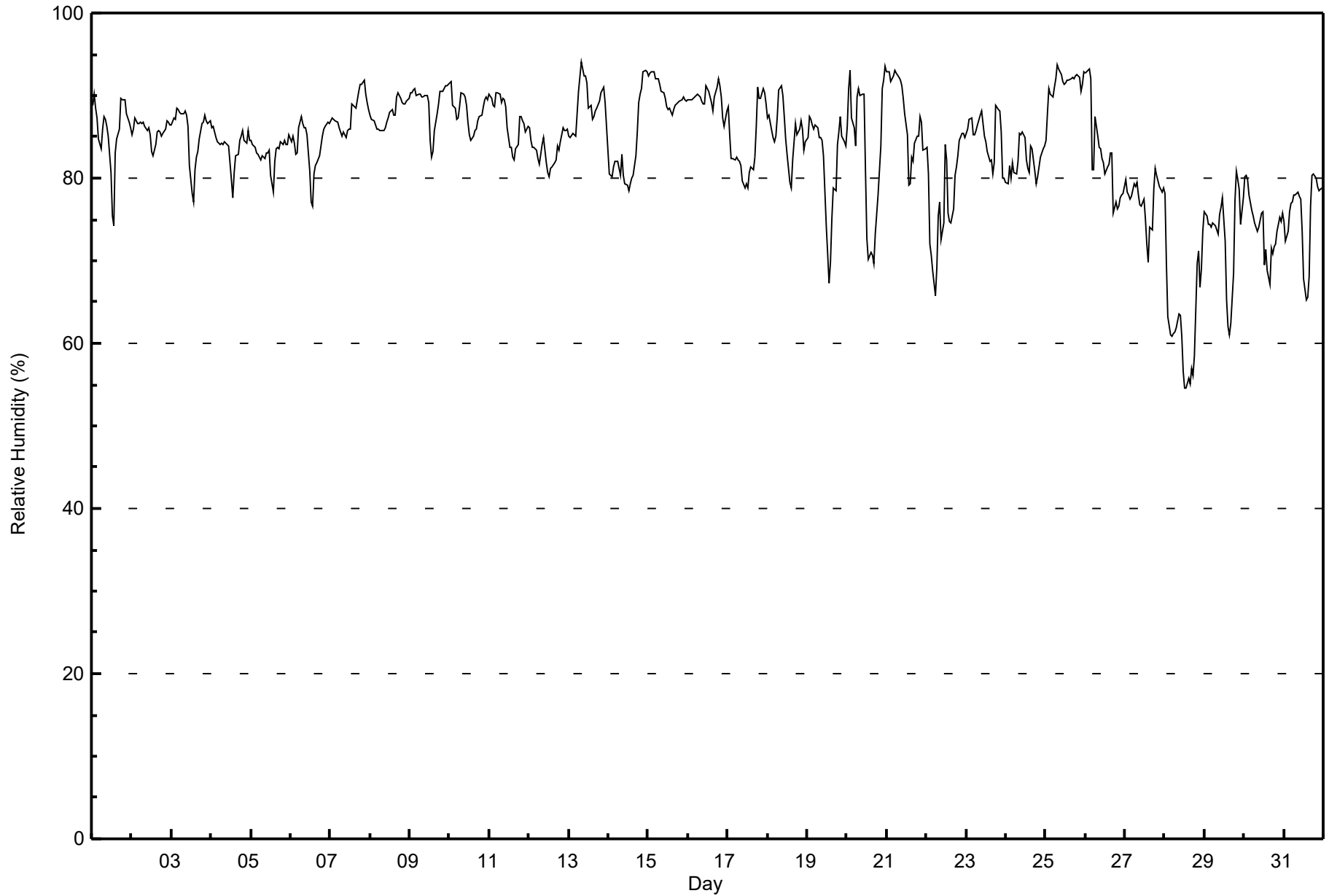
Relative Humidity (RH) - %
Lower Camp - January 2023

Maximum Value: 94.0 % on Jan 13 08:00 Maximum Daily Average: 91.3 % on Jan 25 Minimum Value: 54.6 % on Jan 28 13:00 Minimum Daily Average: 62.6 % on Jan 28 Maximum Diurnal Average: 85.6 % at hour 21 Minimum Diurnal Average: 78.7 % at hour 14 Monthly Average: 83.49 % Percentiles: P ₁ = 59.5 P ₁₀ = 74.4 Q ₁ = 80.4 Median = 85.1 Q ₃ = 88.4 P ₉₀ = 90.7 P ₉₉ = 93.1																						Hours in Service:	744			
																						Hours of Data:	744			
																						Hours of Missing Data:	0			
																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	88.9	90.2	88.5	87.3	84.8	83.6	86.0	87.5	87.2	86.2	85.0	80.7	75.5	74.2	83.0	84.8	86.0	89.6	89.5	89.5	89.5	87.8	86.7	86.0	85.7	90.2
2-Jan	85.3	85.9	87.2	86.6	86.6	86.8	86.6	86.8	86.3	85.7	86.1	85.3	83.2	82.6	84.1	85.5	85.8	85.7	85.1	85.5	86.0	86.9	86.8	86.4	85.8	87.2
3-Jan	86.5	87.2	87.1	88.5	88.4	88.0	87.9	87.8	88.2	87.7	86.3	81.6	78.1	77.1	81.0	82.6	83.3	84.7	86.6	86.7	87.6	86.9	86.7	86.9	85.5	88.5
4-Jan	86.0	86.3	85.6	85.0	84.3	84.1	84.2	84.1	84.4	84.3	83.9	81.8	79.9	77.6	80.7	82.7	82.9	84.5	85.1	85.8	84.7	84.3	85.8	84.5	83.8	86.3
5-Jan	84.6	84.0	83.7	83.1	82.9	82.5	82.2	82.7	82.3	83.0	83.0	83.4	80.4	78.3	82.0	83.6	83.8	83.5	84.4	84.0	84.6	84.0	84.1	85.3	83.2	85.3
6-Jan	84.5	85.1	84.3	82.8	83.0	86.1	87.5	86.6	86.1	86.1	85.3	80.9	77.1	76.6	80.5	81.5	81.9	82.7	83.9	85.1	86.0	86.3	86.7	86.7	83.9	87.5
7-Jan	86.9	87.2	87.1	87.0	86.8	86.1	85.7	85.1	85.5	84.9	85.7	86.0	85.9	89.0	88.8	88.4	89.4	90.5	91.3	91.4	91.8	90.2	89.1	88.3	87.8	91.8
8-Jan	87.7	87.2	87.0	86.4	86.0	86.0	85.8	85.7	85.7	86.1	86.8	87.3	88.0	88.4	87.6	87.7	89.9	90.4	89.6	89.1	89.0	88.9	89.3	89.6	87.7	90.4
9-Jan	90.3	90.4	90.7	90.9	90.0	90.1	90.1	89.8	89.9	89.9	90.0	89.2	84.5	82.5	83.3	85.7	87.9	89.0	90.6	90.4	90.6	91.3	91.1	91.3	89.1	91.3
10-Jan	91.5	91.6	88.9	88.5	87.2	87.3	88.6	90.3	90.1	89.8	88.9	86.7	85.3	84.6	85.1	85.7	85.9	87.0	87.4	87.6	88.7	89.5	89.9	89.5	88.1	91.6
11-Jan	90.2	89.7	88.8	88.6	90.4	90.4	90.1	89.2	89.6	89.5	88.7	86.1	83.7	83.7	82.6	82.2	83.6	84.0	87.5	87.5	86.9	86.6	85.5	86.2	87.1	90.4
12-Jan	86.0	84.6	83.7	83.7	83.4	82.4	81.7	82.8	84.1	84.9	81.9	80.7	80.1	81.3	81.3	81.8	82.2	83.9	83.5	84.5	86.1	85.7	85.7	85.9	83.4	86.1
13-Jan	85.1	84.9	85.5	85.3	85.0	87.8	90.5	94.0	93.1	92.3	92.3	91.5	88.5	88.7	87.1	87.4	88.2	88.5	89.4	90.3	90.7	91.0	89.2	86.3	88.9	94.0
14-Jan	80.6	80.4	80.2	81.3	82.0	82.0	81.2	80.4	83.0	80.3	79.3	79.1	78.5	79.3	80.1	80.3	82.6	85.6	89.2	90.1	90.9	92.8	93.1	92.9	83.6	93.1
15-Jan	92.5	92.7	93.0	92.8	92.0	92.1	92.1	91.4	90.5	90.3	89.6	88.6	88.3	88.4	87.7	88.3	88.8	88.9	89.2	89.3	89.5	89.8	89.5	89.3	90.2	93.0
16-Jan	89.6	89.6	89.5	89.6	89.8	90.0	90.2	89.8	89.3	89.0	89.1	91.2	90.6	89.8	89.2	88.2	89.9	91.1	92.0	91.2	89.9	87.3	86.3	88.2	89.6	92.0
17-Jan	88.7	85.3	82.4	82.4	82.2	82.5	82.1	82.1	81.6	79.7	78.8	79.4	78.9	80.6	81.3	81.0	82.6	86.3	91.0	89.6	89.7	90.8	90.3	89.0	84.1	91.0
18-Jan	87.3	87.6	85.7	84.9	84.4	85.2	87.5	90.6	91.2	90.0	87.5	84.7	82.8	79.5	78.8	82.3	84.4	86.6	85.3	85.9	86.9	86.0	83.4	84.4	85.5	91.2
19-Jan	85.0	87.4	87.1	86.5	86.0	86.4	86.1	85.0	84.9	84.7	82.7	74.3	70.8	67.4	69.8	75.1	78.8	78.4	84.1	85.6	87.5	85.0	84.3	83.9	81.9	87.5
20-Jan	86.3	90.9	93.1	87.3	86.2	83.9	89.9	90.9	90.0	90.2	90.3	81.1	72.7	70.2	71.0	70.7	69.7	73.2	75.6	78.0	83.8	90.8	91.8	93.5	83.4	93.5
21-Jan	92.9	92.8	91.6	92.1	92.4	93.0	92.7	92.3	91.9	91.2	89.7	87.9	85.2	79.2	79.3	82.5	82.0	84.3	85.0	85.1	87.4	86.8	83.4	83.6	87.7	93.0
22-Jan	83.7	80.6	72.0	70.7	68.7	65.8	69.1	75.5	77.1	72.5	74.7	84.1	82.1	75.8	74.8	74.7	76.2	80.3	81.4	82.7	84.6	85.5	85.4	84.9	77.6	85.5
23-Jan	85.5	86.0	87.1	87.3	85.3	85.3	85.7	86.5	87.6	88.1	86.6	85.1	84.3	83.3	82.0	82.2	80.6	81.9	88.8	88.4	88.1	85.6	80.0	80.1	85.0	88.8
24-Jan	79.5	79.4	81.5	79.9	81.9	80.6	80.5	82.1	85.4	85.2	85.6	85.0	82.2	81.1	80.8	83.9	83.5	80.9	79.4	80.2	81.3	82.6	83.5	83.9	82.1	85.6
25-Jan	84.7	87.9	90.8	90.2	89.8	91.0	92.0	93.7	93.3	92.5	91.7	91.3	91.5	91.8	91.9	92.0	92.3	92.1	92.4	92.5	92.3	90.5	91.3	92.9	91.3	93.7
26-Jan	92.7	92.8	93.2	92.1	81.0	81.1	87.5	85.1	83.7	83.5	82.4	81.8	80.5	81.4	81.6	83.0	83.1	75.8	77.1	76.3	76.5	77.7	78.0	78.1	82.7	93.2
27-Jan	79.9	78.3	78.0	77.5	77.7	79.2	79.0	79.5	78.0	76.7	76.6	77.5	75.1	72.0	69.8	74.1	73.7	78.7	81.1	80.4	79.6	78.9	78.3	78.8	77.4	81.1
28-Jan	78.1	69.6	63.2	61.0	60.8	61.1	61.3	61.8	63.6	63.5	60.8	56.6	54.6	54.7	55.8	55.0	57.0	56.2	58.5	69.6	71.1	66.7	68.9	73.5	62.6	78.1
29-Jan	75.9	75.4	74.4	74.5	74.1	74.5	74.2	73.7	73.1	75.6	76.4	77.6	72.4	65.3	62.1	61.1	62.3	68.5	77.2	80.8	79.9	78.7	74.3	77.6	73.3	80.8
30-Jan	80.1	80.4	79.9	77.9	76.1	75.4	74.6	74.1	73.6	74.1	75.7	76.0	69.5	71.4	68.7	67.1	71.6	70.9	71.7	72.1	73.5	75.2	74.7	75.8	74.2	80.4
31-Jan	74.7	72.3	73.6	75.9	76.9	77.1	77.9	77.9	78.4	77.8	77.5	73.5	67.7	65.2	65.5	68.1	76.5	80.3	80.5	79.9	78.9	78.5	78.6	78.8	75.5	80.5
																						Diurnal Average				
																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - January 2023



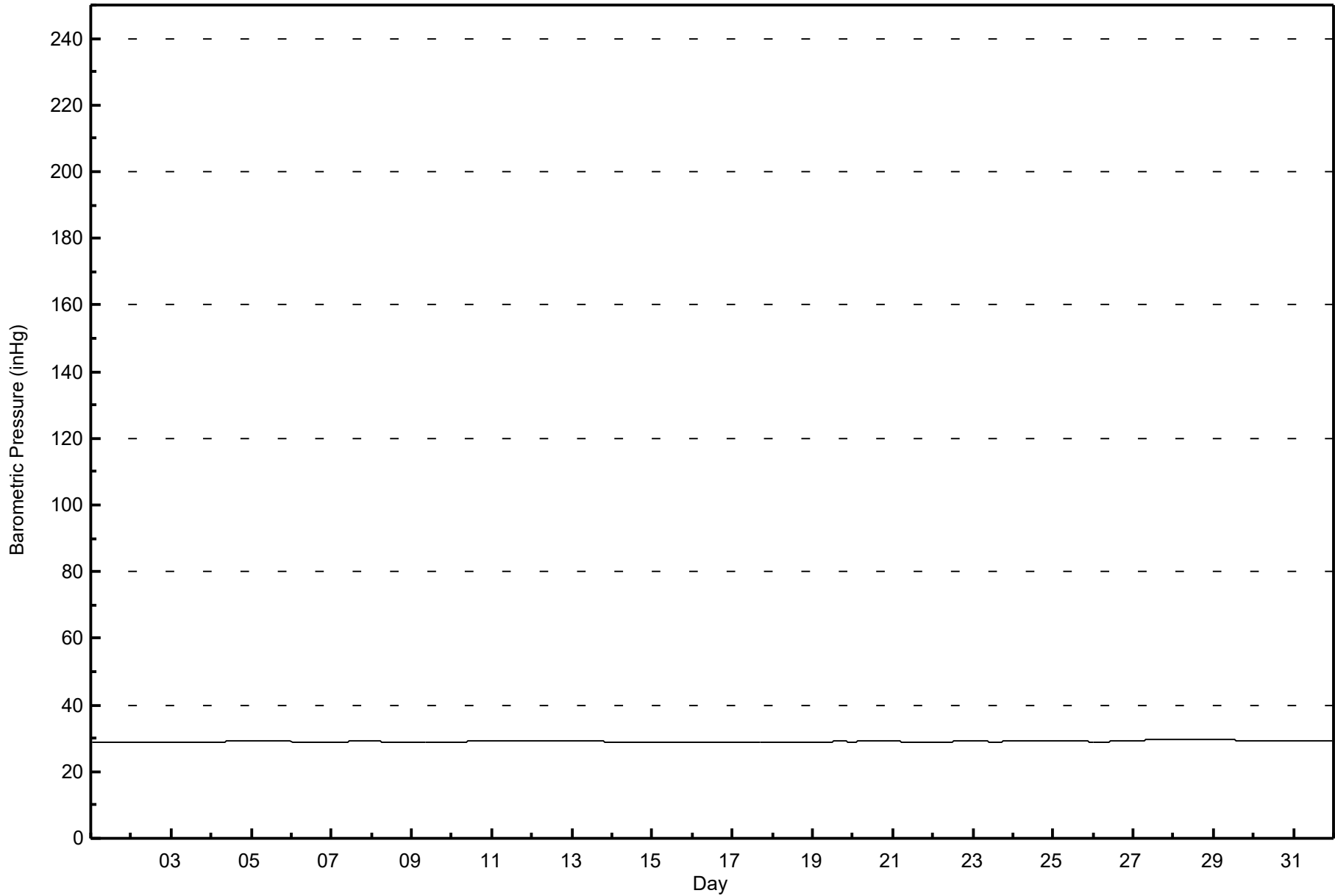


Maximum Value: 29.8 inHg on Jan 29 01:00 Maximum Daily Average: 29.7 inHg on Jan 28																						Hours in Service: 744					
Minimum Value: 28.7 inHg on Jan 26 05:00 Minimum Daily Average: 28.8 inHg on Jan 3																						Hours of Data: 744					
Maximum Diurnal Average: 29.1 inHg at hour 11 Minimum Diurnal Average: 29.1 inHg at hour 2																						Hours of Missing Data: 0					
Monthly Average: 29.08 inHg Percentiles: P ₁ = 28.8 P ₁₀ = 28.8 Q ₁ = 28.9 Median = 29.0 Q ₃ = 29.2 P ₉₀ = 29.4 P ₉₉ = 29.7																						Hours of Calibration: 0					
																						Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.0	
2-Jan	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	29.0
3-Jan	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9
4-Jan	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.0
5-Jan	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2
6-Jan	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
7-Jan	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
8-Jan	29.1	29.1	29.0	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
9-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	28.9	29.0
10-Jan	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.1	29.2
11-Jan	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
12-Jan	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.1	29.2
13-Jan	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	29.1
14-Jan	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
15-Jan	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.9
16-Jan	28.9	28.9	28.9	28.9	29.0	29.0	29.0	28.9	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
17-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
18-Jan	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
19-Jan	28.9	28.9	28.9	29.0	29.0	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0
20-Jan	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.0	29.1	29.1	29.1	29.1	29.1	29.0	29.1
21-Jan	29.1	29.1	29.1	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.8	28.9	29.1	29.1
22-Jan	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9	28.9	28.9	29.0	29.1	29.1	29.1	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.0	29.3
23-Jan	29.3	29.3	29.2	29.2	29.2	29.1	29.1	29.1	29.0	29.0	29.0	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.3
24-Jan	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.3
25-Jan	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.2	29.2	29.1	29.0	28.9	28.9	29.3	29.4	29.4
26-Jan	28.8	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.9	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.3	29.0	29.3	29.3
27-Jan	29.3	29.3	29.4	29.4	29.4	29.4	29.4	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.5	29.7	29.7
28-Jan	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.6	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.7	29.8
29-Jan	29.8	29.8	29.8	29.8	29.7	29.7	29.7	29.7	29.7	29.6	29.6	29.6	29.5	29.5	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.5
30-Jan	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3
31-Jan	29.2	29.2	29.2	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3
29.1																								Diurnal Average			
29.8																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Lower Camp - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Lower Camp - January 2023

Maximum Speed: 26 km/h on Jan 26 10:00	Maximum Daily Speed Average: 17.4 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 10 07:00	Minimum Daily Speed Average: 0.5 km/h on Jan 25	Hours of Data: 740
Maximum Diurnal Speed Average: 4.1 km/h at hour 12	Minimum Diurnal Speed Average: 1.5 km/h at hour 19	Hours of Missing Data: 4
Monthly Average Velocity: 3.1 km/h 144.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 8 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 22	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SE8	SW6	SSW7	WSW4	WNW9	WSW6	SE6	SE10	SE12	SSE11	SE10	SE12	SE11	SE9	SSE6	SE6	SE5	SSE8	SE6	SE5	SSE10	SE4	SE3	N1	SSE5.7	SE12	
2-Jan	ESE1	SE8	SE11	SE15	SE13	SE10	SE9	SE11	SE14	SE16	SE12	SE12	SE16	SE15	SE15	SSE8	SE9	SSE7	SSE9	SE14	SE15	SE11	SSE13	SE16	SE11.6	SE16	
3-Jan	SSE12	SE14	SE10	SE6	SE16	SE15	SE9	SE9	SE10	SE11	SE11	SE16	SE14	SE15	SE14	SE12	SE13	SE13	SE11	SE15	SE7	SE8	SE7	SE10	SE11.6	SE16	
4-Jan	SE7	SE8	SE10	SSE11	SSE13	SE12	SSE12	SE12	SSE11	SE11	SE11	SE11	SE11	SE11	SE11	SSE10	SE10	SE7	SE9	SE10	SE10	SE9	SE8	SE11	SE10	SE10.4	SSE13
5-Jan	SE12	SE10	SSE10	SE14	SE13	SE14	SE14	SE10	SSE8	SSE8	SE11	SE11	SSE8	SE10	SE9	SSE8	SSE7	SE5	SE5	SE5	SE8	SE5	SE7	SE8	SE9.1	SE14	
6-Jan	E2	E1	NW3	NW4	SSW1	SE7	SSE13	SSE11	SSE14	SE7	SSE7	SE8	SE10	SE11	SE14	SSE12	SE15	SE15	SE19	SE19	SSE17	SE17	SE12	SSE11	SE9.8	SE19	
7-Jan	SE16	SSE12	SSE14	SSE12	SSE9	SE15	SSE12	SSE6	WNW0	ESE1	N1	ENE0	NNW2	WNW1	N3	NNW6	WNW4	NNW5	NW5	E1	W3	SSW3	SE7	SE4	SSE3.5	SE16	
8-Jan	SE7	SSE4	SSE5	SE7	SSE8	SSE7	SE8	SSE9	SE7	SSE5	SE5	SSE6	SE5	SE3	E1	SSW1	NNW1	WNW3	WNW4	WNW4	NW4	NW3	NNW4	NNW3	SSE2.6	SSE9	
9-Jan	WNW4	WNW4	W3	WNW3	WNW2	NW2	WNW3	WNW1	NW1	N2	WNW2	WNW2	SSE1	SE6	SE4	SE6	SSE4	SSW4	WSW3	WSW4	SE2	WSW2	NW3	ENE1	WSW1.1	SE6	
10-Jan	UO	SE1	SSE8	SSE6	SSW4	SSE4	ESE0	N1	W0	N2	NNW4	NNW3	W3	W4	WSW5	WSW3	W4	W3	WSW4	WSW5	W4	N5	NNW6	NW5	W1.6	SSE8	
11-Jan	NW5	NNW4	NNW4	NNW6	NW5	NW4	WNW4	W1	NNE2	SE3	SE5	SE6	SE6	SE8	SSE9	SSE5	SSE7	SSE4	SSE6	SSE9	SSE9	SSE11	SSE10	SSE9	SSE3.0	SSE11	
12-Jan	SSE11	SSE12	SSE12	SSE10	SSE9	SSE11	SSE11	SSE12	SE13	SE13	SSE12	SSE11	SSE13	SSE13	SSE11	SSE11	SSE10	SSE8	SSE8	SSE7	SSE6	S6	SE7	SE8	SSE10.1	SE13	
13-Jan	SE11	SE9	SE3	SE4	ENE1	NW3	WNW3	WNW1	W3	NW2	NNW2	N3	SE2	ESE1	NNE8	NE7	NE5	ENE5	ENE4	ENE6	ENE6	E5	E7	ESE9	E2.5	SE11	
14-Jan	SE18	SE19	SE20	SE22	SE20	SE17	SSE15	SSE12	SSE12	SSE13	SSE10	SE7	SE7	SE7	SSE6	SSE5	SSE3	WSW3	WSW4	SE2	ESE1	ENE1	UO	UO	SSE9.5	SE22	
15-Jan	NE1	WNW3	NW1	NW3	NNW5	N7	N7	NNW5	NNW6	NNW5	NW5	NW4	NW4	NNW4	N5	NNW4	NW3	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NNW4.0	N7	
16-Jan	NW3	NW3	NW4	NW3	NNW4	NNW4	NW5	NNW6	NNW5	N5	N6	N9	NNW5	NW4	WNW4	NNE4	N8	NNW6	NNW5	SE8	SE14	SSE10	S9	SSE7	NNW1.6	SE14	
17-Jan	S5	SSW8	SSW8	SSW8	S7	S7	SSE8	SSE9	SSE10	SSE12	SSE12	SSE8	SSE7	S7	S6	S7	S5	SSW5	SE6	SE9	SSE8	SE10	SE9	SSE9	SSE7.4	SSE12	
18-Jan	SSE9	SSE9	SSE9	S10	S11	S10	SSE9	SE10	SE10	SSE8	SSE10	SSE11	SE12	SSE12	SE15	SSE11	SE12	SE12	SE9	SE12	SE12	SE12	SSE12	SSE11	SSE10.5	SE15	
19-Jan	SSE11	SSE10	SE6	SE9	SE15	SSE16	SE16	SE18	SSE18	SE16	SE13	SE12	SE10	SE6	SSE6	SSE10	SSE8	S5	SE8	SSW3	SE8	SE8	SE8	SE7	SE10.0	SSE18	
20-Jan	ESE2	SE1	SSE2	SSW3	SSW5	SSW6	SSE6	SE9	SE10	SE10	SE10	SSE6	S4	SW4	W6	W16	W14	W13	W15	W11	WNW3	SSE1	S3	SE6	SW3.8	W16	
21-Jan	SE8	SE8	SE9	SE8	SE9	SE12	SE15	SE13	SE14	SE17	SE19	SE18	SE15	SE15	SE15	SE12	SE12	SE10	SE11	SE12	SE10	W12	W17	W13	SSE9.9	SE19	
22-Jan	W17	W15	WNW10	WNW11	WNW12	WNW15	W16	WNW10	W14	WNW20	N18	NNE19	N8	N14	N15	NNE12	NNE10	N6	NNW5	NW5	NW5	NW0	NW3	NNW3	NW8.1	WNW20	
23-Jan	NW2	ESE1	SE1	E2	SE7	SE3	E5	ESE13	ESE5	E8	ESE3	ESE8	ESE1	ENE3	E6	E4	ENE4	SE3	NW3	W3	NNE1	SE7	SSE9	SE11	ESE3.7	ESE13	
24-Jan	SE13	SE15	SE15	SSE13	SE13	SE9	SE12	SE14	SE15	SE15	SE10	SE12	SE11	SE7	NW2	NW6	NNE12	NNE11	N9	N10	NNE8	N6	NNW5	NW7	ESE5.6	SE15	
25-Jan	NNW6	N6	N6	NW6	NW6	N5	NNW4	N5	NW3	NW4	WNW4	N2	NNW5	NW4	N3	NNW3	SE2	SSE9	S10	SE12	SE11	SSE16	SE14	SE8	ESE0.5	SSE16	
26-Jan	SE10	SE17	SE16	WSW5	WNW18	NW16	N14	N25	NNE23	NNE26	N21	NNW12	N12	NNE11	NNE8	NNE9	NNE10	N13	NNE17	N13	NNE14	NNE18	N17	NNE14	N10.7	NNE26	
27-Jan	N14	N17	N16	NNE13	NNE11	N8	NNE6	N7	N9	NNW9	N12	N11	N6	W6	WSW6	W6	NW7	WNW4	NW3	N1	ENE1	NW2	NW2	NW3	N6.3	N17	
28-Jan	NW0	WNW17	WNW21	WNW22	WNW21	WNW20	WNW20	WNW21	WNW21	WNW21	WNW22	NW22	NW25	NW23	NW23	NW23	NW21	NW22	NW21	NW19	N14	N12	NNW11	NW10	WNW7	NW17.4	NW25
29-Jan	SW1	ESE2	ESE2	E3	ESE3	SSE6	SSE7	SE8	SE8	SSE12	SE17	SE17	SE20	SE16	SE15	SSE11	SSE5	SE4	SSW0	WNW4	NW5	WNW7	NW8	NW5	SSE5.3	SE20	
30-Jan	WNW4	WNW4	NW5	NNW2	N1	ESE1	ESE2	ESE4	E2	SE5	SE8	SE8	SE7	SE8	SE9	SE8	SE6	ESE3	NW2	NW2	WNW3	NNW5	NNW5	NW5	SE1.3	SE9	
31-Jan	N7	NNE16	NNE11	NNE11	NE7	NE5	N4	WNW4	NW4	NW3	WNW3	W2	WSW3	E2	ESE5	SE5	SE4	E1	UO	NW2	W4	NNW4	NW3	NW4	N2.8	NNE16	

SE3.7 SSE3.2 SSE3.2 SSE2.7 SSE3.0 SSE3.1 SSE3.7 SE4.0 SE3.9 SE3.8 SE3.6 SE4.1 SE4.1 SE3.9 SE3.5 SSE2.7 SE2.0 SSE1.6 SSE1.5 SE2.6 SE3.1 SE2.4 SSE2.2 SE2.6	Diurnal Average
SE18 SE19WNW21WNW22WNW21WNW20WNW20 N25 NNE23 NNE26WNW22 NW22 NW25 NW23 NW23 NW21 NW22 NW21 NW19 SE19 SSE17 NNE18 W17 SE16	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

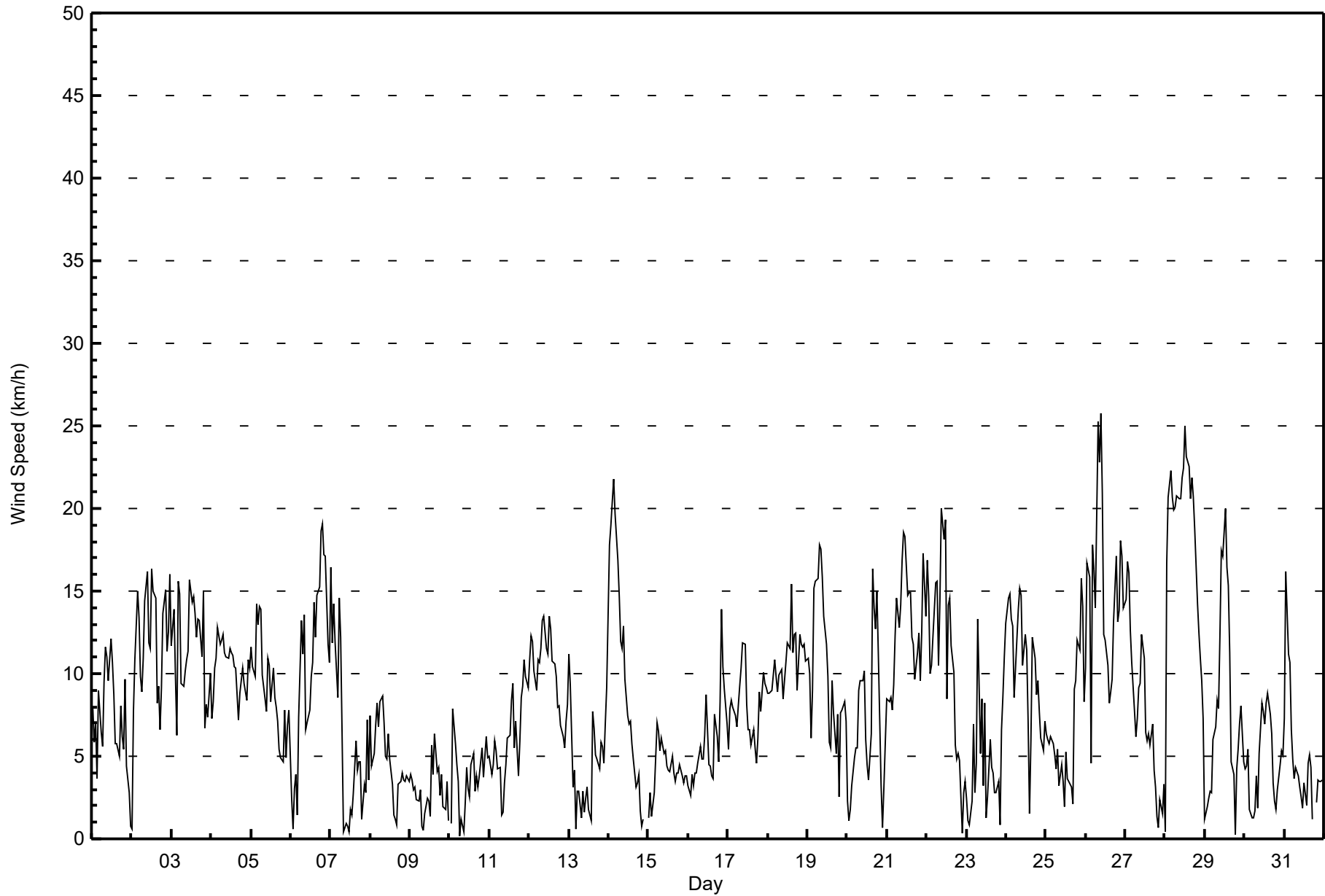
Wind Speed (WS) - km/h
Lower Camp - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 08:00 Minimum Value: 0 km/h on Jan 10 18:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	2	2	2	2	3	2	2	2	2	2	2	2	3	3	2	3	2	3	2	3	1	1	3	3
2-Jan	1	3	2	3	3	3	2	4	2	3	3	2	2	3	3	5	2	2	2	3	3	3	3	3	5
3-Jan	2	2	2	2	5	4	2	2	2	2	2	3	2	2	2	2	2	2	2	3	2	2	1	2	5
4-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	3	2	2	2	3
5-Jan	2	2	2	2	2	2	2	2	3	2	2	2	2	1	1	1	1	1	1	1	2	2	2	4	4
6-Jan	1	1	1	2	2	2	2	2	2	3	2	1	1	2	2	2	2	2	2	2	3	2	2	3	3
7-Jan	4	3	2	3	2	3	3	4	1	1	2	2	2	2	2	2	2	1	2	1	1	2	2	1	4
8-Jan	2	2	2	1	2	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2
9-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3	1	1	1	1	1	2	1	1	3
10-Jan	UO	1	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	2	1	1	3
11-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	3	1	2	2	3	4	4	3	4
12-Jan	3	3	3	3	3	2	3	2	3	2	3	3	4	4	3	3	3	2	2	2	2	2	3	2	4
13-Jan	2	2	2	2	1	1	1	1	1	1	1	1	2	1	2	2	1	2	1	1	1	1	1	2	2
14-Jan	4	3	3	4	5	4	4	4	3	4	3	2	2	2	2	1	1	1	1	1	1	1	1	2	5
15-Jan	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	2
16-Jan	1	1	1	1	1	2	1	2	2	2	2	2	2	2	1	3	3	2	1	6	3	3	3	2	6
17-Jan	2	3	3	2	3	2	3	2	3	3	3	3	2	2	2	2	1	2	2	2	2	1	2	2	3
18-Jan	2	2	2	3	4	4	3	1	1	2	2	3	3	4	2	3	3	4	3	3	2	2	4	3	4
19-Jan	3	2	2	3	2	2	2	2	3	2	2	1	2	2	2	2	2	2	1	3	3	2	2	1	3
20-Jan	2	1	2	3	2	2	2	2	2	2	2	3	2	2	4	3	4	4	4	3	4	2	1	2	4
21-Jan	2	2	2	2	2	2	2	3	2	3	2	2	2	2	2	3	2	2	2	2	2	6	3	3	6
22-Jan	4	4	3	2	3	3	3	3	5	4	5	5	2	3	3	3	2	1	1	1	1	1	2	1	5
23-Jan	1	1	1	3	2	2	4	4	4	3	3	2	1	2	3	2	2	1	1	1	1	3	2	2	4
24-Jan	2	2	3	3	2	2	3	2	3	2	4	2	2	2	2	3	3	3	2	3	2	2	1	1	4
25-Jan	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	3	3	3	3	4	6	4	3	6
26-Jan	5	3	2	6	3	5	4	7	6	7	5	3	3	2	2	2	4	4	5	5	4	4	4	4	7
27-Jan	4	4	4	5	3	2	2	5	4	2	3	2	2	2	1	1	1	1	2	1	1	2	2	1	5
28-Jan	1	6	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	5	4	5	3	3	2	2	6
29-Jan	2	1	1	1	2	2	3	2	2	3	2	2	2	3	3	3	2	2	1	2	1	2	1	1	3
30-Jan	1	2	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	3	2	1	3
31-Jan	3	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	UO	1	1	2	1	1	3
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Lower Camp - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Lower Camp - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	264	35.68	35.68
6 - 11	289	39.05	74.73
12 - 19	162	21.89	96.62
20 - 28	25	3.38	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	17	3	3	9	12	18	30	13	5	10	2	12	13	29	58	30	264
6 - 11	17	13	2	2	3	2	120	85	11	5	1	2	4	6	7	9	289
12 - 19	14	9	0	0	0	1	85	35	0	0	0	0	11	4	2	1	162
20 - 28	2	2	0	0	0	0	4	0	0	0	0	0	0	10	7	0	25
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	50	27	5	11	15	21	239	133	16	15	3	14	28	49	74	40	740

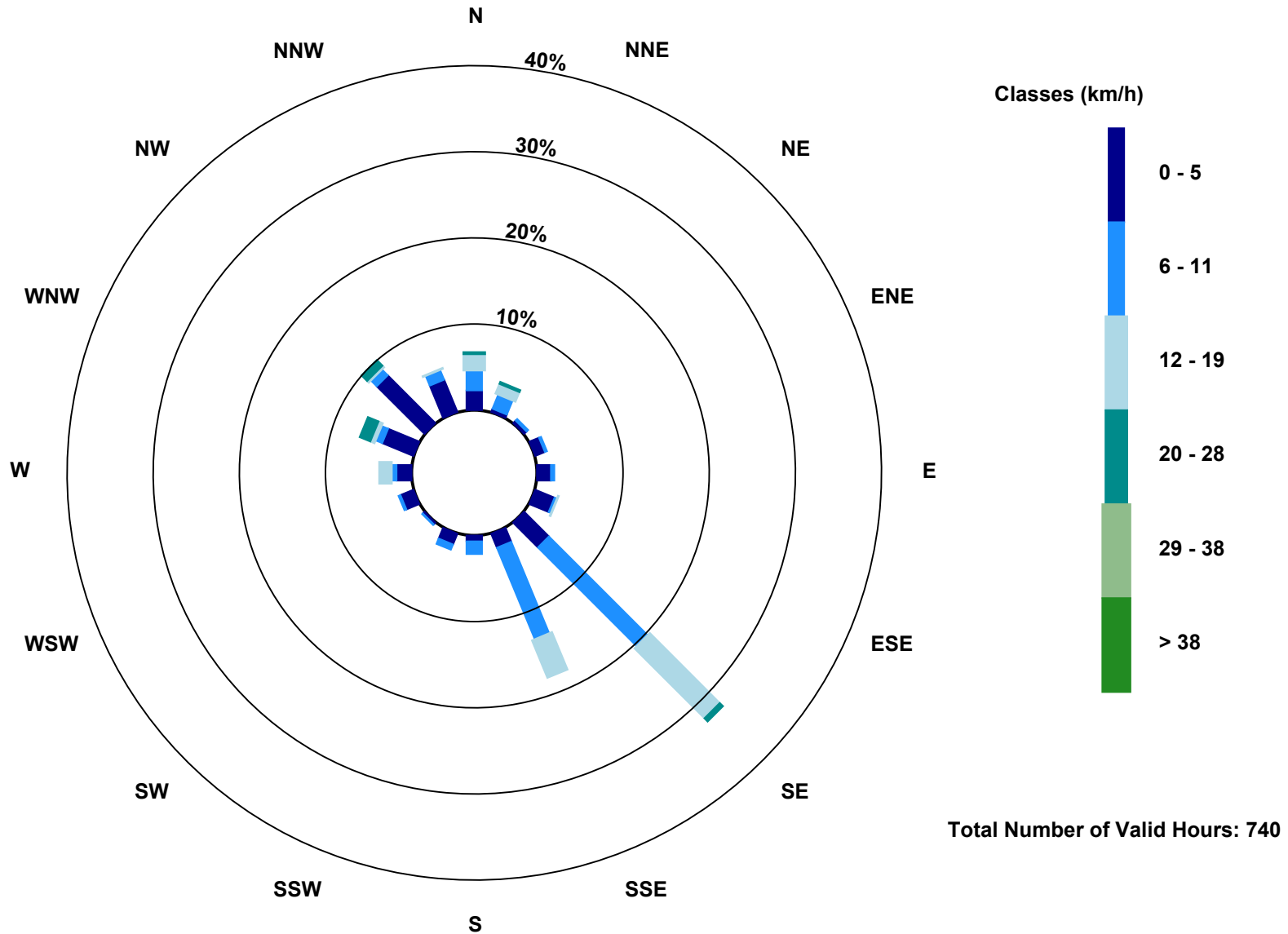
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Lower Camp





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Lower Camp - January 2023

Direction of Maximum Speed: 20 deg on Jan 26 10:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 309.2 deg on Jan 28	Hours of Data: 740
Direction of Minimum Speed: 123 deg on Jan 10 07:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 0.5 deg on Jan 25	Percent Operational Time: 99.5
Monthly Average Direction: 144.6 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	146	220	203	237	284	254	141	143	143	147	143	146	145	146	147	144	143	148	142	138	147	133	131	9	155.2
2-Jan	103	140	142	143	143	142	144	145	141	145	143	142	143	146	146	155	143	153	148	145	145	146	148	145	144.5
3-Jan	147	143	143	146	142	145	141	144	143	143	144	145	141	143	142	144	142	142	145	144	144	143	143		143.4
4-Jan	142	143	146	147	147	146	147	146	147	146	146	144	142	146	148	144	140	141	143	142	142	145	145		144.6
5-Jan	145	146	147	145	145	142	141	146	152	148	144	144	147	140	144	149	149	144	140	134	127	138	130	140	143.2
6-Jan	96	92	304	313	199	144	150	150	147	145	147	136	134	141	144	147	146	146	145	146	148	143	145	147	145.3
7-Jan	145	147	147	151	151	145	149	151	293	104	9	66	339	289	357	343	286	338	323	93	271	200	139	145	148.8
8-Jan	145	159	153	146	147	149	145	147	146	147	142	148	145	129	80	206	327	300	299	296	320	325	335	332	150.4
9-Jan	295	298	274	296	288	324	295	300	321	353	294	282	163	146	141	146	157	210	255	250	128	255	307	66	246.2
10-Jan	UO	132	150	148	194	168	123	353	280	349	346	337	273	268	244	253	276	266	237	240	265	352	329	322	264.0
11-Jan	313	332	334	329	323	325	299	263	32	132	135	132	132	140	147	150	150	150	148	147	160	162	155	153	150.6
12-Jan	153	154	151	159	158	150	162	148	146	145	155	159	158	164	163	167	164	159	159	162	155	174	141	139	155.8
13-Jan	140	143	145	143	74	319	291	299	268	323	346	356	136	111	29	36	37	74	75	69	70	81	90	105	82.2
14-Jan	131	131	131	136	139	144	149	163	153	162	156	155	151	152	164	165	161	240	251	138	113	69	UO	UO	146.5
15-Jan	39	291	312	325	348	360	1	333	330	340	317	325	319	328	350	347	309	318	317	319	323	315	316	317	331.0
16-Jan	318	314	323	323	328	333	321	340	330	350	2	9	342	313	303	25	3	331	333	140	139	159	169	167	347.5
17-Jan	179	212	195	202	189	175	161	159	155	157	153	149	160	179	181	178	187	197	145	146	148	145	144	150	165.9
18-Jan	150	152	167	174	175	178	150	146	145	147	148	149	146	150	144	151	141	137	145	140	143	146	160	151	151.0
19-Jan	152	148	132	135	146	147	145	146	148	144	142	144	144	145	155	151	155	169	146	207	137	142	133	137	145.9
20-Jan	118	140	164	210	202	198	147	143	144	144	144	166	169	221	265	265	262	274	263	281	299	167	188	146	214.6
21-Jan	140	143	139	139	143	144	144	143	142	144	143	142	141	143	139	140	146	141	144	146	145	263	270	275	150.7
22-Jan	265	262	298	288	293	300	273	298	278	295	357	24	350	9	10	29	16	8	345	308	306	307	318	327	319.5
23-Jan	314	102	131	90	128	130	88	116	117	94	110	115	110	65	93	92	62	124	321	267	13	144	148	140	114.2
24-Jan	143	144	138	147	141	135	125	130	144	138	127	137	138	146	306	317	19	28	10	11	20	2	342	321	117.0
25-Jan	340	350	350	311	325	351	339	2	323	324	299	359	336	323	360	331	146	167	170	145	146	151	143	145	120.6
26-Jan	143	141	143	255	296	315	350	11	12	20	10	348	359	15	23	28	23	5	23	9	14	13	7	21	11.1
27-Jan	4	3	7	22	25	357	13	8	5	341	4	353	353	266	248	266	313	294	315	1	67	317	320	319	351.9
28-Jan	318	300	295	299	295	294	298	300	296	296	300	312	321	312	313	312	316	315	312	353	356	343	325	302	309.2
29-Jan	224	119	114	91	111	150	155	144	132	147	144	142	142	143	142	151	156	138	213	298	306	297	305	316	146.6
30-Jan	301	292	309	334	0	108	118	123	89	135	140	145	143	143	140	143	139	120	316	311	298	335	331	311	139.5
31-Jan	358	15	13	14	40	49	11	303	309	313	302	281	243	98	112	134	140	94	UO	305	276	330	315	318	3.4

146.2 149.7 148.5 157.0 163.3 158.7 149.3 137.9 143.9 139.4 130.6 130.4 140.5 145.4 140.5 148.5 139.3 150.1 156.1 143.7 134.8 143.0 149.0 144.7
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Lower Camp - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 105 deg on Jan 29 19:00	Hours of Data: 740
Minimum Value: 5 deg on Jan 30 13:00	Hours of Missing Data: 4
Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 11 Median = 17 Q ₃ = 28 P ₉₀ = 53 P ₉₉ = 92	Hours of Calibration: 0
	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	13	29	31	55	18	42	25	10	8	10	10	11	9	11	41	38	20	31	17	25	11	36	47	58	58
2-Jan	80	16	8	7	10	10	11	12	6	7	10	8	6	9	9	32	13	19	14	10	8	15	13	7	80
3-Jan	11	7	13	16	9	8	9	12	8	8	8	7	9	6	6	7	8	8	8	8	17	11	11	9	17
4-Jan	15	9	9	10	9	9	10	9	10	9	10	8	7	9	11	11	26	19	7	11	21	12	11	10	26
5-Jan	9	11	12	9	8	6	6	15	18	11	7	9	10	7	7	9	10	12	17	15	15	30	18	43	43
6-Jan	60	93	26	24	70	15	10	12	7	20	15	10	8	8	7	9	8	8	6	6	9	7	9	15	93
7-Jan	13	11	10	14	16	7	12	42	96	76	97	86	78	83	57	32	36	24	30	66	36	51	14	15	97
8-Jan	10	29	24	11	13	16	12	13	11	11	12	11	15	19	43	70	59	19	29	12	31	13	23	22	70
9-Jan	15	17	53	34	51	44	40	76	88	65	33	47	55	16	22	16	25	35	49	21	39	68	38	55	88
10-Jan	UO	68	26	31	34	40	94	33	78	35	26	25	37	20	15	19	15	15	27	17	31	19	12	16	94
11-Jan	8	32	21	12	19	11	11	44	53	17	12	12	14	13	17	27	26	28	20	21	26	26	24	22	53
12-Jan	18	18	16	22	24	17	21	15	13	12	18	18	19	20	19	22	21	19	17	19	19	25	28	9	28
13-Jan	9	8	42	19	90	45	28	68	59	82	34	27	87	78	15	27	18	16	16	8	11	15	12	15	90
14-Jan	9	7	7	8	12	14	15	23	20	24	22	24	19	16	21	22	28	38	19	26	57	39	UO	UO	57
15-Jan	45	21	51	23	17	15	17	21	13	19	11	14	15	14	22	21	17	9	14	18	15	20	23	22	51
16-Jan	23	29	15	15	17	33	33	34	34	28	18	10	37	33	45	68	37	36	26	81	9	25	22	20	81
17-Jan	27	28	29	29	31	25	20	20	19	19	17	21	29	27	31	26	26	36	31	10	10	7	9	17	36
18-Jan	19	19	25	27	27	32	24	8	8	13	19	22	15	19	9	16	17	16	17	13	12	13	24	18	32
19-Jan	20	14	33	17	9	8	6	8	8	7	6	6	7	13	28	11	19	38	11	97	19	17	12	19	97
20-Jan	51	68	78	68	45	29	16	8	12	8	14	48	46	68	65	12	19	21	16	23	93	75	50	21	93
21-Jan	10	12	9	20	10	8	7	9	9	6	6	6	7	6	6	6	9	10	9	8	13	19	12	15	20
22-Jan	13	14	15	13	12	15	13	15	16	12	43	15	22	18	15	13	9	25	33	27	20	86	48	35	86
23-Jan	52	49	89	81	16	67	35	12	54	24	74	28	85	63	19	27	29	60	49	23	82	14	17	11	89
24-Jan	9	9	10	14	10	21	9	11	9	8	14	7	8	10	86	31	14	17	24	15	20	19	27	14	86
25-Jan	17	24	28	11	16	26	27	19	34	24	72	51	27	30	27	25	71	23	27	16	23	23	14	32	72
26-Jan	38	6	6	80	17	24	21	21	15	15	17	19	17	16	17	19	19	18	18	20	17	16	15	17	80
27-Jan	16	17	16	18	17	24	27	37	21	17	15	18	25	27	19	9	13	27	65	55	82	51	69	35	82
28-Jan	96	28	11	11	11	11	11	11	12	11	11	14	11	12	12	11	10	11	10	20	20	17	15	17	96
29-Jan	52	22	21	57	83	44	45	10	10	11	6	6	6	9	9	14	32	80	105	43	13	16	13	16	105
30-Jan	20	16	21	53	62	37	69	24	46	19	7	6	5	6	6	9	10	36	67	43	36	32	17	15	69
31-Jan	27	10	12	17	22	37	39	19	26	17	36	69	55	72	26	12	13	62	UO	63	18	38	38	33	72
	96	93	89	81	90	67	94	76	96	82	97	86	87	83	86	70	71	80	105	97	93	86	69	58	

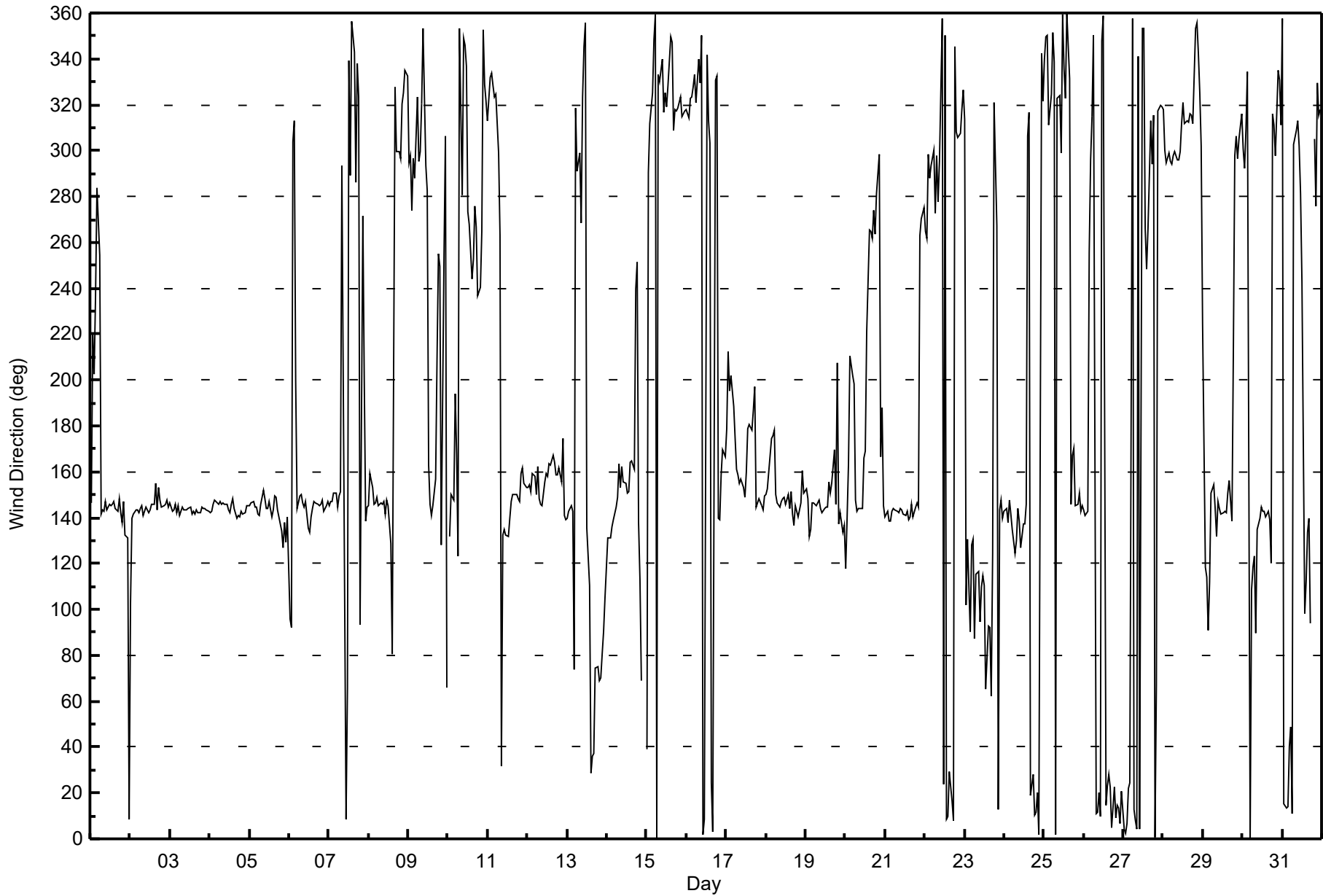
Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Lower Camp - January 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13 FORT MCKAY SOUTH JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	15.9	0	2.9	0
TRS(ppb) Average	707	37	37	100	4.6	0	1.5	0
THC(ppm) Average	709	35	35	100	3.6	-	2.8	-
NMHC(ppm) Average	709	35	35	100	0.273	-	0.04	-
CH4(ppm) Average	709	35	35	100	3.6	-	2.7	-
O3(ppb) Average	709	35	35	100	37.6	0	32.6	-
NO2(ppb) Average	708	36	36	100	37.9	0	23.6	-
NO(ppb) Average	708	36	36	100	110.4	-	45.6	-
NOX(ppb) Average	708	36	36	100	141.4	-	66.5	-
PM2.5(ug/m3) Average	743	1	1	100	80.7	1	30.2	1
ET(C) Average	744	0	0	100	2.2	-	-3.9	-
RH(%) Average	744	0	0	100	97.1	-	92.5	-
WS(km/h) Average	739	0	5	99.33	24	-	13	-
WD(deg) Average	739	0	5	99.33	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	709	1.05	1.5	-	0	0.2	0.4	0.6	1.2	1.9	15.9
TRS(ppb) Average	707	0.76	0.4	-	0.4	0.4	0.5	0.6	0.9	1.2	4.6
THC(ppm) Average	709	2.32	0.2	-	2	2.1	2.1	2.3	2.4	2.7	3.6
NMHC(ppm) Average	709	0.002	0.017	-	0	0	0	0	0	0	0.273
CH4(ppm) Average	709	2.31	0.2	-	2	2.1	2.1	2.3	2.4	2.6	3.6
O3(ppb) Average	709	10.99	9.7	-	0.6	1.1	1.9	8.2	18.2	25.4	37.6
NO2(ppb) Average	708	14.38	7.5	-	0.2	4.2	8.4	14.7	19.8	24.1	37.9
NO(ppb) Average	708	10.43	16.9	-	0	0	0.1	2.7	11.9	35.8	110.4
NOX(ppb) Average	708	24.81	21.7	-	0.2	4.2	9.1	19	32.2	56.4	141.4
PM2.5(ug/m3) Average	743	9.53	8	-	0.5	1.8	3.6	7.9	13	19.4	80.7
Temperature 2 m (C) Average	744	-11.07	6.2	-	-32.5	-19.7	-15	-9.4	-7.2	-4.7	2.2
Relative Humidity (%) Average	744	85.18	6.9	-	59	75.6	82.4	86.9	90.3	92	97.1
Wind Speed 10 m (km/h) Average	739	6	4	-	0	2	3	5	8	11	24
Wind Direction 10 m (deg) Average	739	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	09 Jan 2023 02:00	09 Jan 2023 03:00	2	Sensor Failure - inconsistent response
Wind Speed, Wind Direction	15 Jan 2023 18:00	15 Jan 2023 18:00	1	Maintenance - sensor replaced
Wind Speed, Wind Direction	15 Jan 2023 20:00	15 Jan 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Jan 2023 22:00	22 Jan 2023 22:00	1	Flat line in sensor output signal



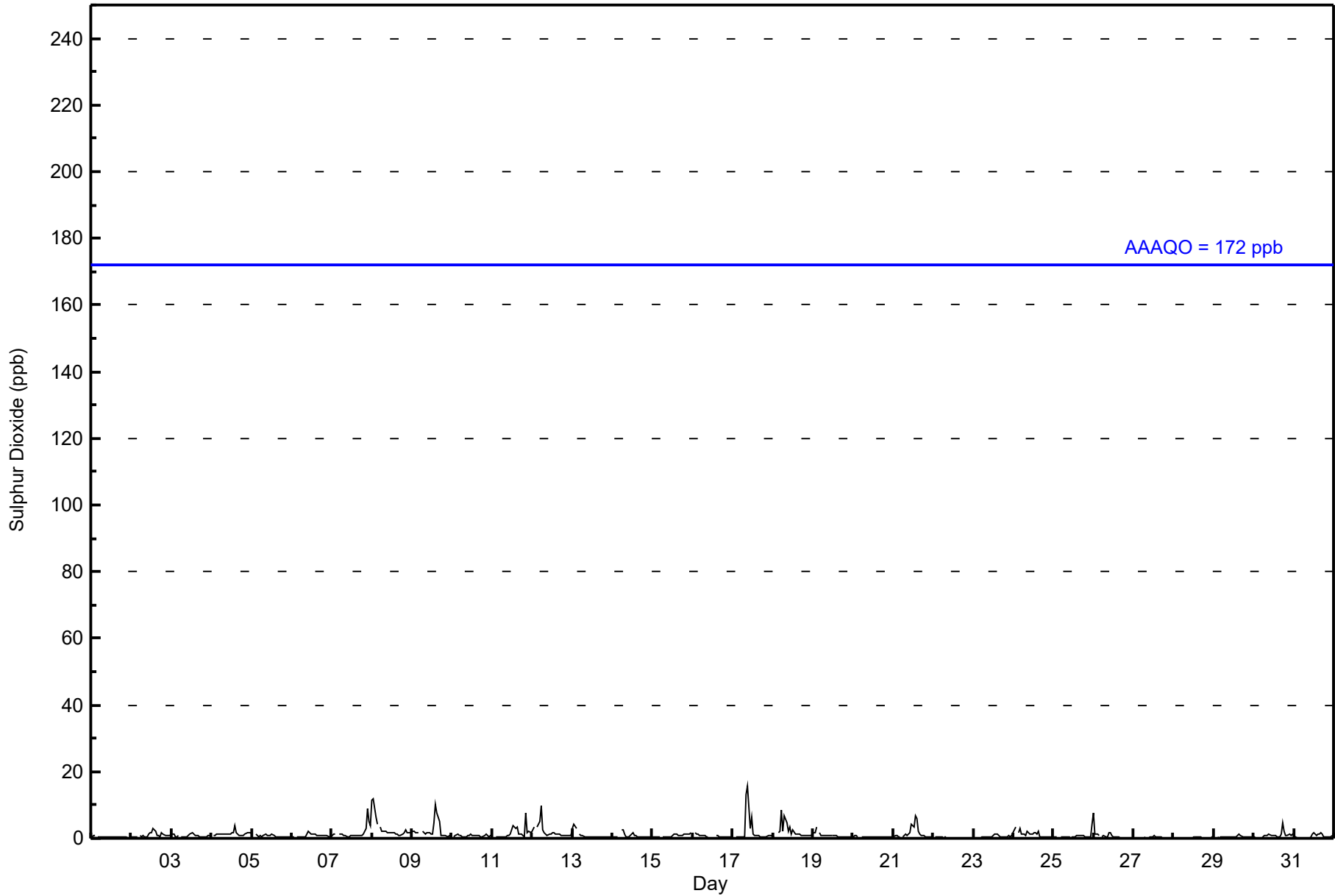
Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Fort McKay South - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 15.9 ppb on Jan 17 10:00		Maximum Daily Average: 2.9 ppb on Jan 8		Hours of Data:														709																															
Minimum Value: 0.0 ppb on Jan 22 18:00		Minimum Daily Average: 0.1 ppb on Jan 22		Hours of Missing Data:														35																															
Maximum Diurnal Average: 1.5 ppb at hour 2		Minimum Diurnal Average: 0.6 ppb at hour 20		Hours of Calibration:														35																															
Monthly Average: 1.05 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.4 Median = 0.6 Q ₃ = 1.2 P ₉₀ = 1.9 P ₉₉ = 8.3		Percent Operational Time:														100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.5	0.7	0.9	Z	0.5	0.3	0.4	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.5	0.4	0.4	0.5	0.6	0.4	0.3	0.3	0.2	0.2	0.5	0.9																							
2-Jan	0.3	0.4	0.6	0.4	Z	0.7	0.3	0.6	0.4	0.5	1.3	1.5	1.9	2.9	2.2	1.0	0.7	0.5	1.6	1.2	0.9	1.0	0.7	0.7	1.0	2.9																							
3-Jan	1.1	1.4	0.6	0.6	0.7	Z	0.5	0.6	0.5	0.6	0.8	1.1	1.9	1.4	1.0	0.8	0.7	0.5	0.6	0.6	0.5	0.6	0.7	0.7	0.8	1.9																							
4-Jan	Z	0.9	0.9	1.1	1.1	1.3	1.4	1.3	1.4	1.2	1.2	1.5	1.8	1.7	3.6	1.7	0.8	0.7	0.7	0.9	1.1	1.8	1.9	1.5	1.4	3.6																							
5-Jan	1.4	Z	1.3	0.9	0.6	0.6	0.5	0.7	1.2	0.6	0.8	0.9	1.1	0.8	0.6	0.6	0.5	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.7	1.4																							
6-Jan	0.3	0.5	Z	0.5	0.4	0.3	0.3	0.4	0.6	1.4	2.0	1.1	1.4	1.2	1.3	0.9	0.7	1.1	0.9	0.8	0.9	0.7	0.6	0.6	0.8	2.0																							
7-Jan	0.8	1.1	1.3	Z	1.3	1.3	1.1	1.0	0.8	0.6	0.6	0.7	0.8	0.7	0.9	1.0	0.8	1.0	0.9	1.1	2.8	8.9	5.1	3.9	1.7	8.9																							
8-Jan	11.4	11.8	6.5	4.2	Z	3.3	2.2	2.2	2.0	1.7	1.6	1.5	1.5	1.3	1.1	0.8	1.0	1.2	1.7	2.6	1.7	1.8	1.8	2.9	11.8																								
9-Jan	2.1	2.0	1.6	1.6	1.7	Z	1.9	1.7	1.2	1.5	1.6	1.3	1.1	4.5	10.2	7.8	5.2	0.9	0.7	0.7	0.6	0.6	0.7	0.7	2.3	10.2																							
10-Jan	Z	0.6	0.8	1.1	1.0	0.7	0.6	0.5	0.5	0.7	0.9	1.4	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.9	1.1	0.7	0.6	0.7	0.8	1.4																							
11-Jan	0.7	Z	0.6	0.3	0.4	0.4	0.3	0.3	0.4	0.7	0.8	1.3	4.0	3.2	2.8	3.4	1.3	1.3	0.9	0.6	7.7	1.5	2.1	1.6	1.6	7.7																							
12-Jan	2.3	3.5	Z	3.5	5.3	9.7	2.5	1.8	1.4	1.0	1.1	1.4	1.7	1.9	1.2	1.3	1.4	0.8	0.7	0.7	0.7	0.7	0.7	0.9	2.0	9.7																							
13-Jan	2.8	4.2	2.8	Z	1.4	1.0	0.8	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.9	4.2																							
14-Jan	0.3	0.4	0.3	0.3	Z	2.4	2.5	1.2	0.5	0.5	0.5	1.2	1.8	1.0	0.7	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.8	2.5																							
15-Jan	0.3	0.3	0.4	0.5	0.3	Z	0.4	0.3	0.5	0.5	0.5	0.6	0.9	1.1	1.2	1.0	0.9	1.0	1.0	1.1	1.2	1.4	1.3	1.5	0.8	1.5																							
16-Jan	Z	1.5	1.5	1.2	0.7	0.8	0.7	0.8	0.5	0.4	C	C	C	C	0.7	0.8	0.6	0.3	0.2	0.3	0.3	0.4	0.4	0.5	0.6	1.5																							
17-Jan	0.4	Z	0.4	0.3	0.3	0.3	0.6	13.3	15.9	3.0	6.5	1.4	0.9	0.8	0.7	0.5	0.5	0.4	0.5	0.4	0.9	0.8	0.9	2.2	15.9																								
18-Jan	0.6	0.6	Z	1.6	2.2	8.3	2.2	6.7	4.7	2.3	3.2	1.4	2.4	1.3	1.3	1.1	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.9	2.0	8.3																							
19-Jan	1.8	1.5	3.3	Z	1.9	0.8	0.8	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.7	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.9	3.3																							
20-Jan	0.6	0.7	0.7	0.5	Z	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.3	0.3	0.2	0.3	0.4	0.7																							
21-Jan	0.3	0.9	0.6	0.5	0.4	Z	0.6	1.2	0.9	1.4	1.8	4.3	3.3	6.9	5.8	2.1	1.3	0.9	0.7	0.6	0.5	0.4	0.4	0.3	1.6	6.9																							
22-Jan	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3																							
23-Jan	0.1	Z	0.1	0.1	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.7	1.2	1.2	1.0	0.6	0.4	0.4	0.5	0.6	0.7	0.5	0.7	0.5	1.2																							
24-Jan	1.5	3.5	Z	1.6	3.0	1.2	1.1	1.0	2.2	1.6	1.3	1.3	1.7	1.9	1.4	1.9	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	1.3	3.5																							
25-Jan	0.4	0.3	0.3	Z	0.3	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.6	0.7	0.9	1.0	0.9	0.7	0.5	0.3	0.3	0.5	4.2	0.6	4.2																							
26-Jan	7.5	1.4	1.5	0.9	Z	0.4	0.7	0.3	0.4	1.5	1.7	0.8	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.8	7.5																							
27-Jan	0.1	0.1	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.5	0.4	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.7																							
28-Jan	Z	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.4	0.2	0.4																							
29-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.4	0.5	0.6	1.0	1.2	0.7	0.5	0.5	0.4	0.5	0.5	0.3	0.3	0.4	1.2																							
30-Jan	0.3	0.2	Z	0.2	0.1	0.4	1.0	1.0	1.0	1.3	0.9	1.0	1.0	0.7	0.4	0.5	1.4	4.5	1.9	0.9	1.0	1.3	0.9	1.2	1.0	4.5																							
31-Jan	0.8	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.3	1.4	1.6	1.0	1.2	1.4	1.7	1.3	0.6	0.4	0.3	0.4	0.4	0.8	0.6	1.7																							
																								1.5	1.5	1.1	0.9	0.9	1.4	0.8	0.9	1.2	1.3	1.0	1.2	1.3	1.4	1.5	1.2	0.9	0.7	0.6	0.6	0.9	0.9	0.8	0.9	Diurnal Average	
																								11.4	11.8	6.5	4.2	5.3	9.7	2.5	6.7	13.3	15.9	3.2	6.5	4.0	6.9	10.2	7.8	5.2	4.5	1.9	1.7	7.7	8.9	5.1	4.2	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.44	99.44
11 - 20	4	0.56	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	115	46	6	6	2	4	21	131	168	50	23	25	21	12	27	43	700
11 - 20	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	4
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	46	6	6	2	4	21	134	169	50	23	25	21	12	27	43	704

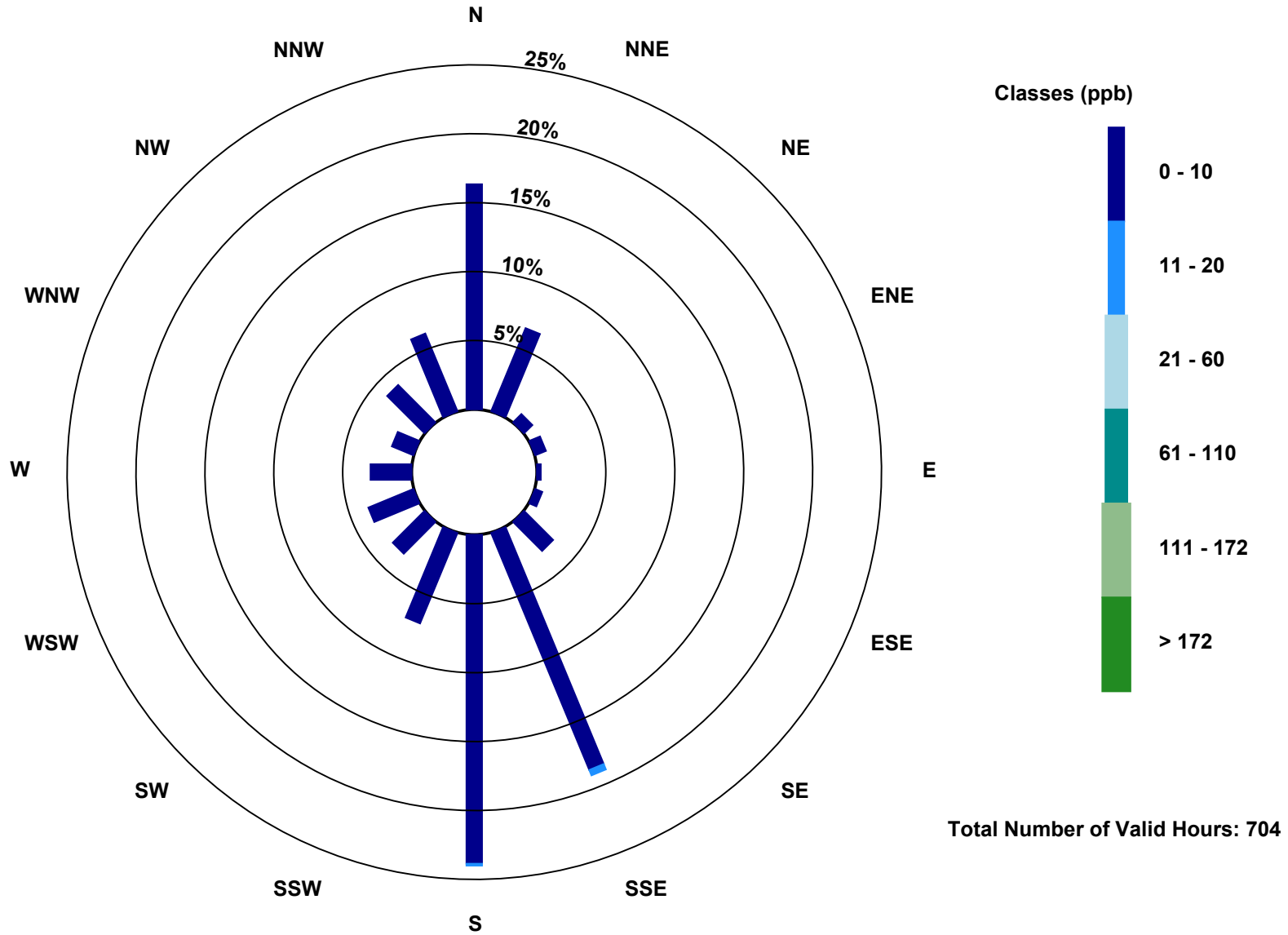
Total Number of Valid Hours: 704

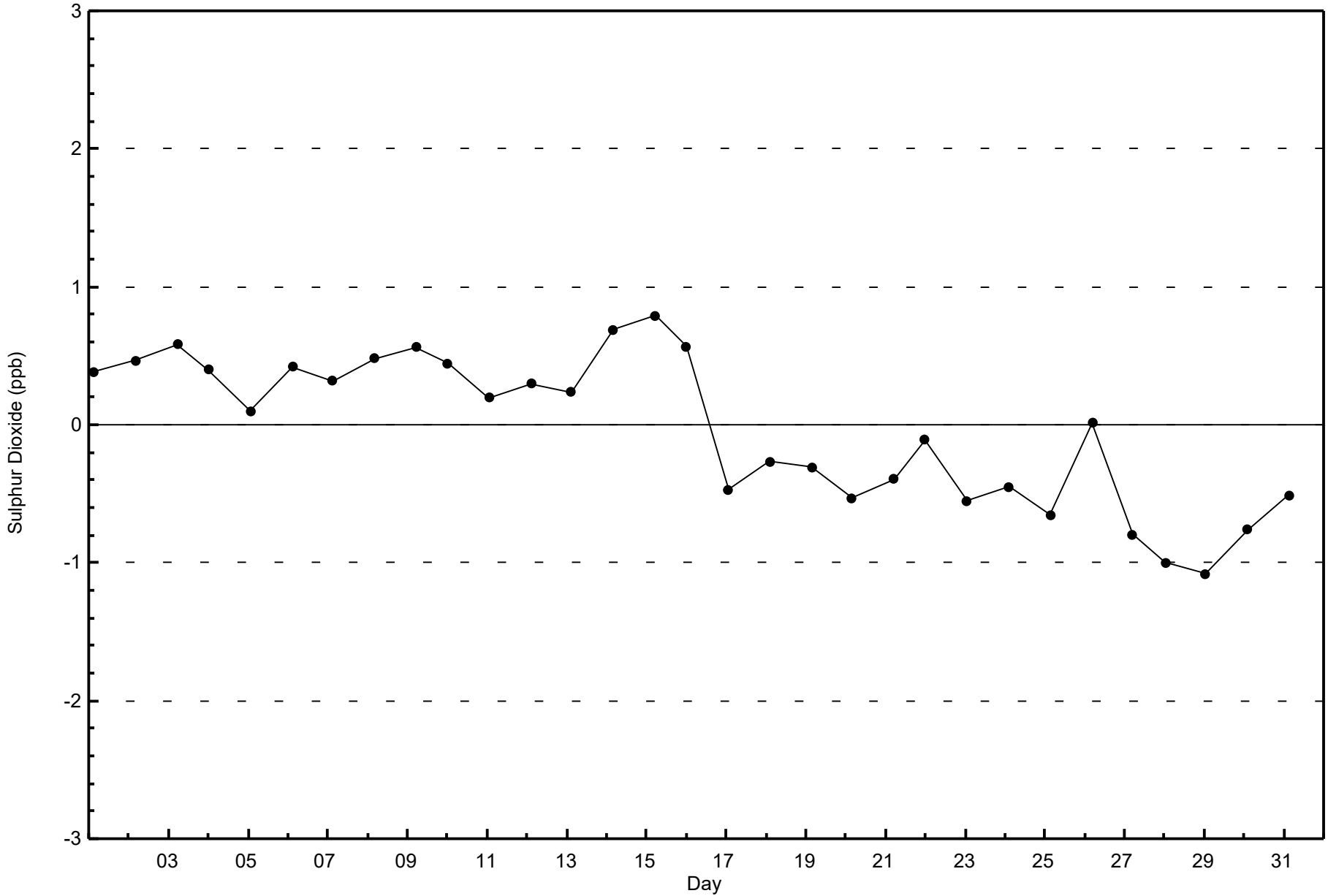
Total Number of Hours: 744

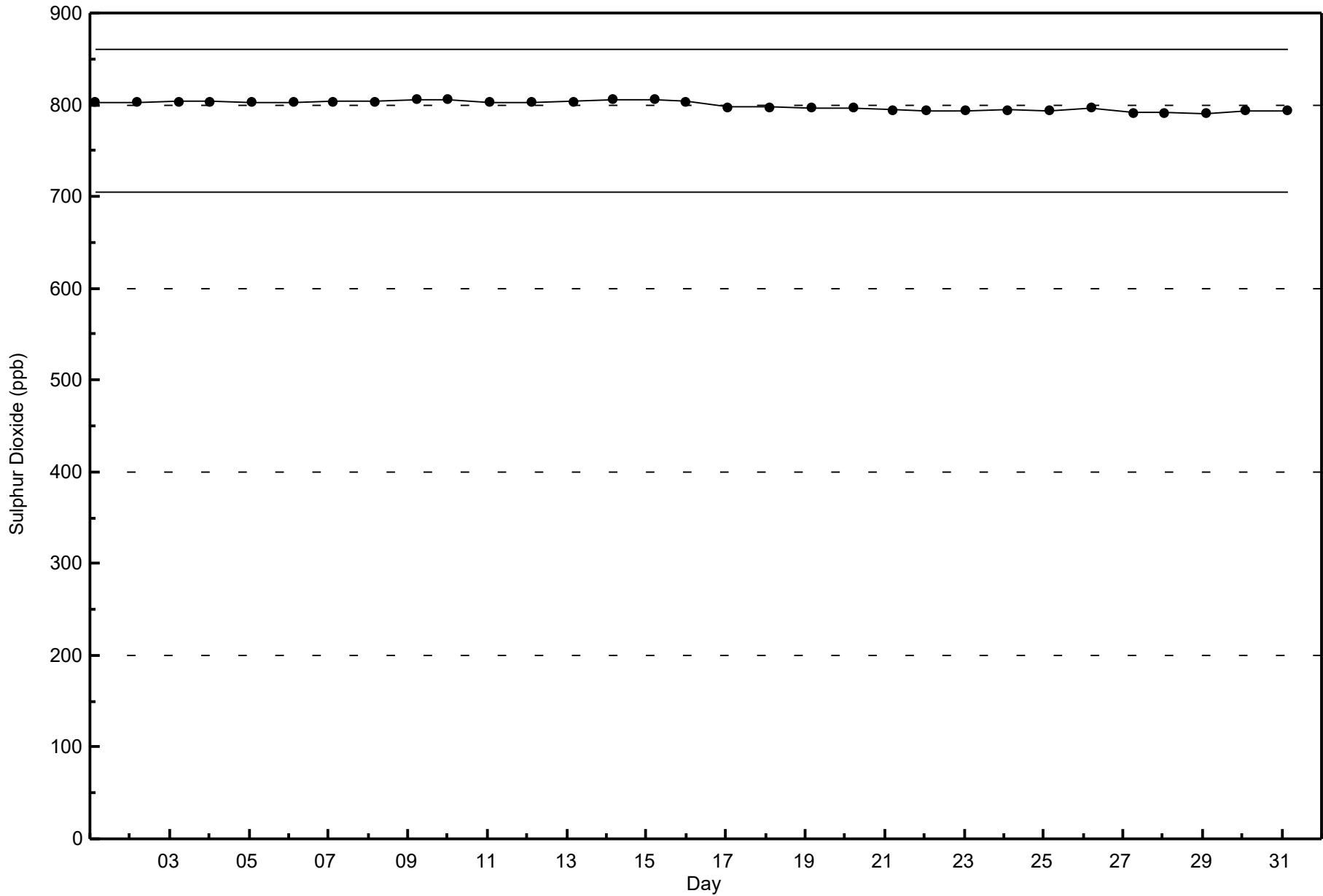


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

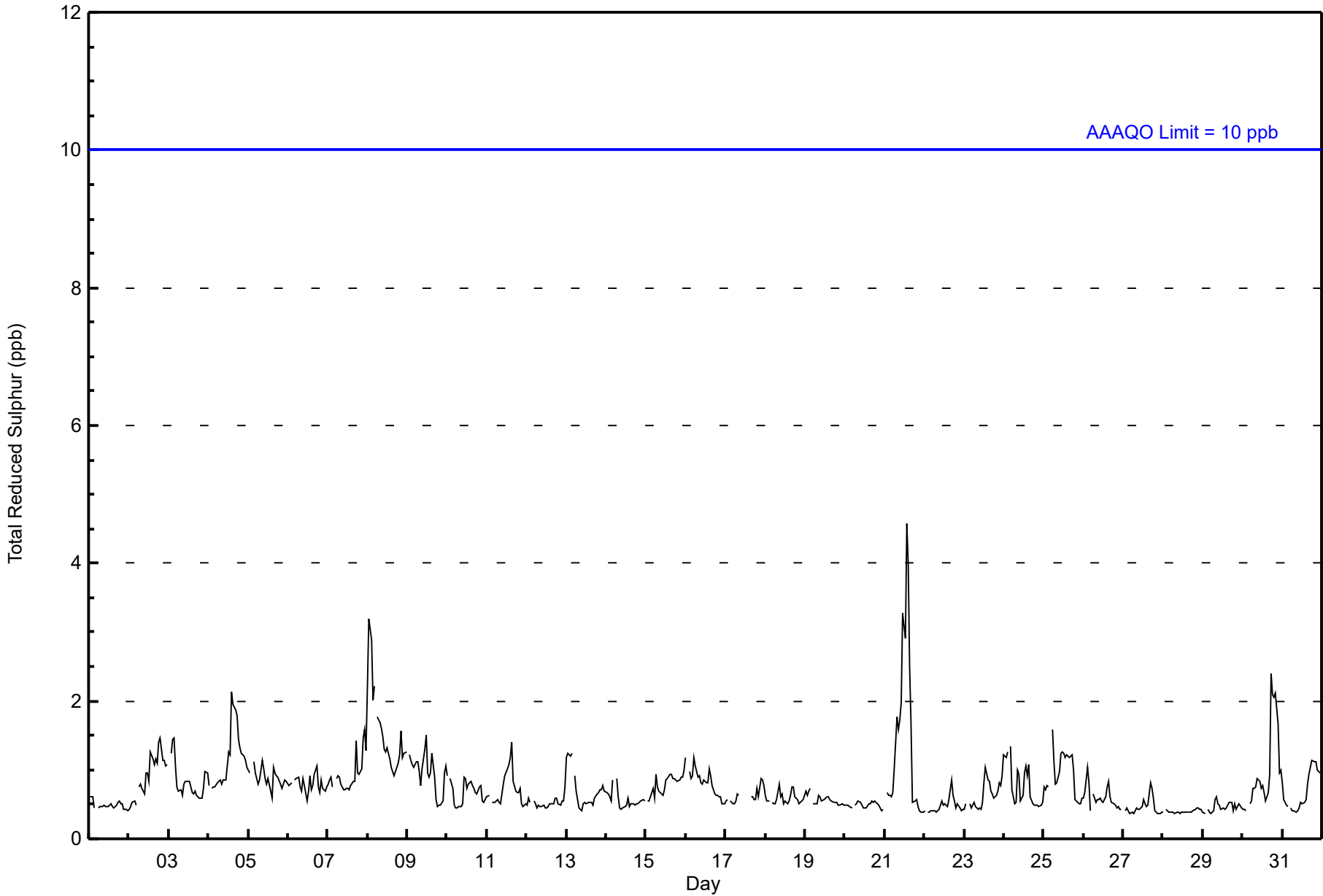
Total Reduced Sulphur (TRS) - ppb

Fort McKay South - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 4.6 ppb on Jan 21 14:00	Maximum Daily Average: 1.5 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.4 ppb on Jan 27 22:00	Minimum Daily Average: 0.4 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 0.9 ppb at hour 14	Minimum Diurnal Average: 0.7 ppb at hour 6		Hours of Calibration:	37
Monthly Average: 0.76 ppb	Percentiles: P ₁ = 0.4 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.6 Q ₃ = 0.9 P ₉₀ = 1.2 P ₉₉ = 2.4		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	0.6	0.6	0.6	0.5	Z	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6																						
2-Jan	0.4	0.5	0.5	0.5	0.5	Z	0.7	0.8	0.7	0.6	0.9	1.0	0.8	1.3	1.2	1.1	1.2	1.1	1.4	1.5	1.1	1.1	1.0	1.1	0.9	1.5																						
3-Jan	Z	1.2	1.4	1.5	1.1	0.8	0.7	0.7	0.6	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	1.0	1.0	0.8	1.5																						
4-Jan	0.8	Z	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.1	1.3	1.2	2.1	1.9	1.9	1.8	1.4	1.3	1.2	1.2	1.1	1.0	1.2	2.1																						
5-Jan	1.0	1.0	Z	1.1	0.9	0.9	0.8	0.8	1.1	1.0	0.9	0.8	0.9	0.7	0.6	1.0	1.0	0.9	0.9	0.8	0.7	0.8	0.9	0.8	0.9	1.1																						
6-Jan	0.8	0.8	0.8	Z	0.9	0.9	0.9	0.8	0.7	0.9	0.8	0.6	0.7	0.9	0.7	0.8	0.9	1.1	0.7	0.7	0.9	0.7	0.7	0.7	0.8	1.1																						
7-Jan	0.8	0.9	0.9	0.7	Z	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	1.4	1.0	0.9	1.0	1.5	1.6	1.3	0.9	1.6																						
8-Jan	2.2	3.2	2.9	2.0	2.2	Z	1.8	1.7	1.6	1.5	1.3	1.3	1.3	1.2	1.0	1.0	0.9	1.0	1.1	1.2	1.6	1.2	1.2	1.3	1.5	3.2																						
9-Jan	Z	1.2	1.1	1.1	1.0	1.1	1.1	1.0	0.8	1.0	1.3	1.5	1.0	0.9	1.0	1.2	0.9	0.6	0.5	0.5	0.5	0.6	1.0	1.1	0.9	1.5																						
10-Jan	0.9	Z	0.9	0.7	0.5	0.5	0.4	0.5	0.5	0.5	0.9	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.6	0.5	0.6	0.7	0.9																						
11-Jan	0.6	0.6	Z	0.5	0.5	0.5	0.6	0.5	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.4	0.8	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.7	1.4																						
12-Jan	0.5	0.6	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.5	0.7																						
13-Jan	1.2	1.2	1.2	1.2	Z	0.9	0.7	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	1.2																						
14-Jan	0.7	0.7	0.6	0.6	0.8	Z	0.9	0.6	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.9																						
15-Jan	Z	0.5	0.6	0.7	0.7	0.6	0.9	0.7	0.7	0.7	0.6	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	1.0	0.8	1.0																						
16-Jan	1.2	Z	1.0	0.9	0.9	1.2	1.1	0.9	0.9	0.8	0.8	0.9	0.8	0.8	1.0	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.8	1.2																						
17-Jan	0.6	0.6	Z	0.6	0.5	0.5	0.5	0.6	0.6	C	C	C	C	C	C	0.6	0.6	0.6	0.6	0.7	0.6	0.9	0.9	0.8	--	0.9																						
18-Jan	0.6	0.6	0.6	Z	0.5	0.5	0.5	0.6	0.8	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.8																						
19-Jan	0.7	0.6	0.7	0.7	Z	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7																						
20-Jan	0.5	0.5	0.5	0.5	0.4	Z	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.6																						
21-Jan	Z	0.7	0.6	0.6	0.6	0.7	1.0	1.8	1.6	1.7	2.0	3.3	2.9	4.6	4.0	2.5	1.7	0.5	0.6	0.6	0.5	0.4	0.4	0.4	1.5	4.6																						
22-Jan	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.6	0.9	0.6	0.6	0.4	0.5	0.4	0.4	0.4	0.5	0.9																						
23-Jan	0.4	0.5	Z	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.8	1.0	0.8	0.8	0.7	0.7	0.6	0.6	0.7	0.8	0.8	0.9	0.6	1.0																						
24-Jan	1.2	1.2	1.3	Z	1.3	0.7	0.5	0.5	1.0	0.9	0.5	0.6	0.9	1.1	0.9	1.1	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	1.3																						
25-Jan	0.8	0.7	0.8	0.7	Z	1.6	1.1	0.8	0.8	1.0	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.0	0.6	0.5	0.5	0.5	0.6	0.9	1.6																						
26-Jan	0.6	0.7	1.0	0.8	0.4	Z	0.7	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.8	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.6	1.0																						
27-Jan	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.8	0.7	0.6	0.4	0.4	0.4	0.4	0.5	0.8																						
28-Jan	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5																						
29-Jan	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.6																						
30-Jan	0.4	0.4	0.4	Z	0.5	0.5	0.7	0.7	0.8	0.9	0.8	0.7	0.8	0.7	0.6	0.7	0.9	2.4	2.1	2.1	2.1	1.7	1.0	1.0	1.0	2.4																						
31-Jan	0.8	0.6	0.5	0.5	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.8	0.9	1.0	1.1	1.1	1.1	1.0	1.0	0.9	0.7	1.1																						
																								0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	Diurnal Average
																								2.2	3.2	2.9	2.0	2.2	1.6	1.8	1.8	1.6	1.7	2.0	3.3	2.9	4.6	4.0	2.5	1.9	2.4	2.1	2.1	2.1	1.7	1.6	1.3	Diurnal Maximum

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	701	99.15	99.15
3 - 4	5	0.71	99.86
5 - 7	1	0.14	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	115	47	6	6	2	4	20	124	168	50	22	26	21	13	28	44	696
3 - 4	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	5
5 - 7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	47	6	6	2	4	21	129	168	50	22	26	21	13	28	44	702

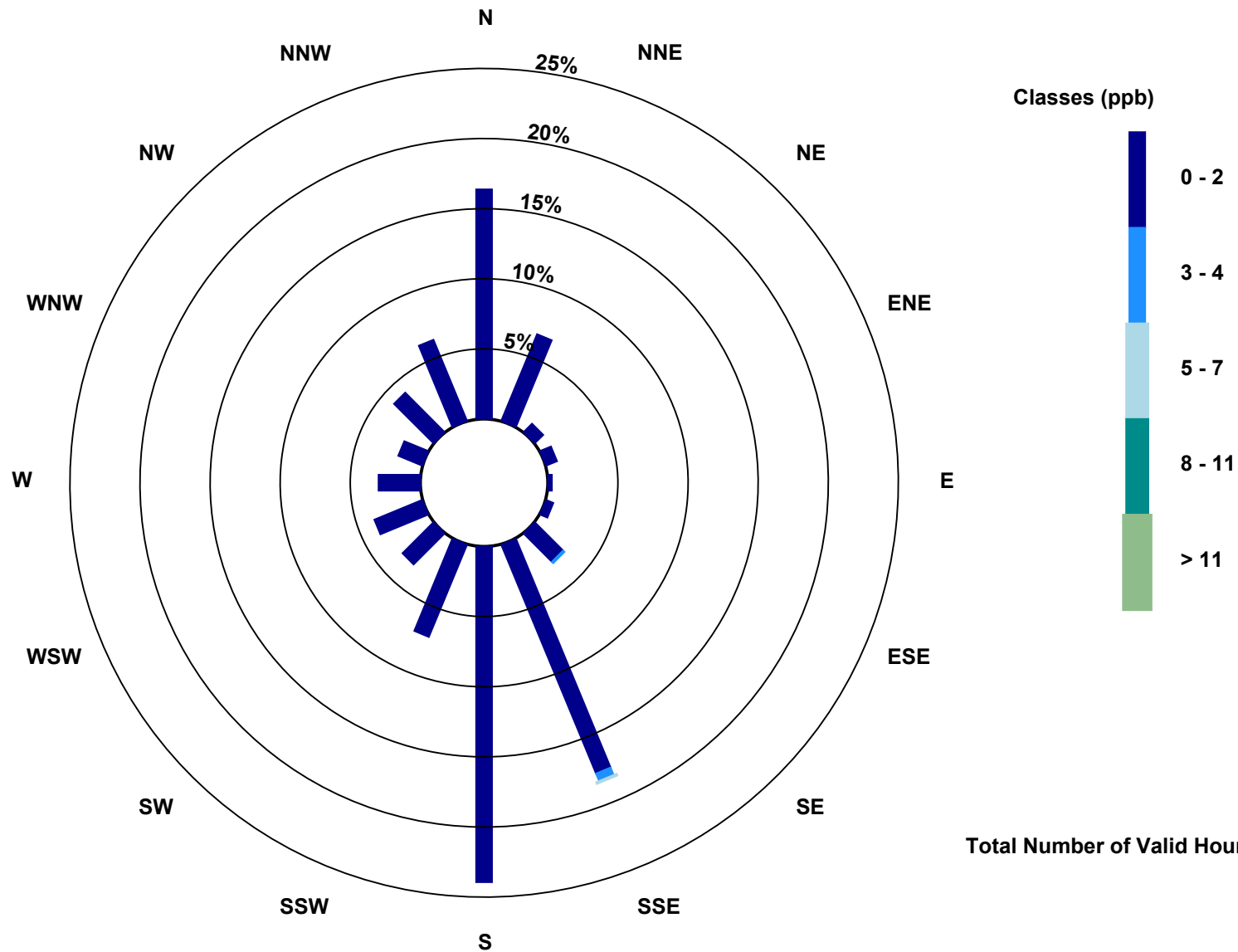
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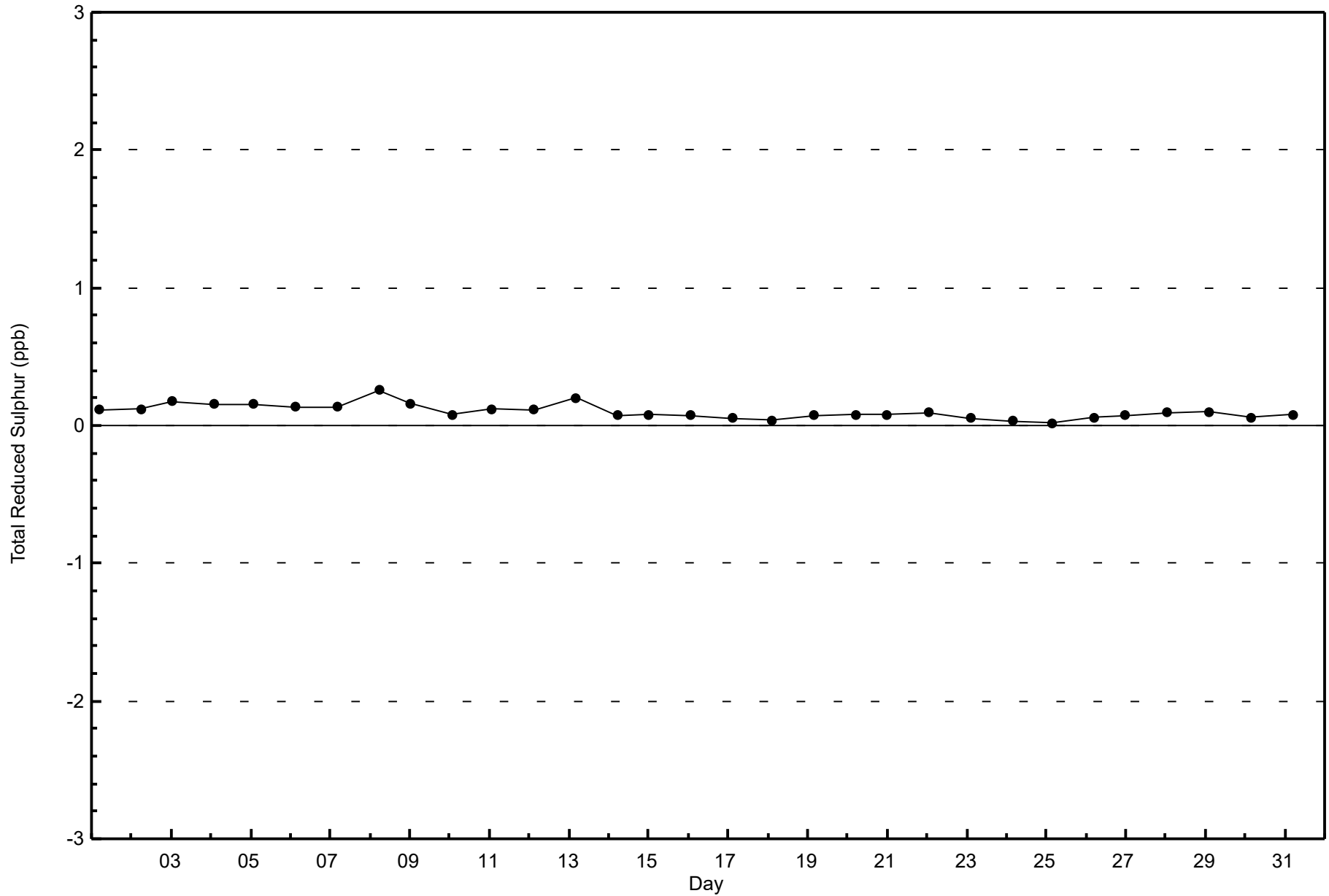
Total Number of Hours: 744

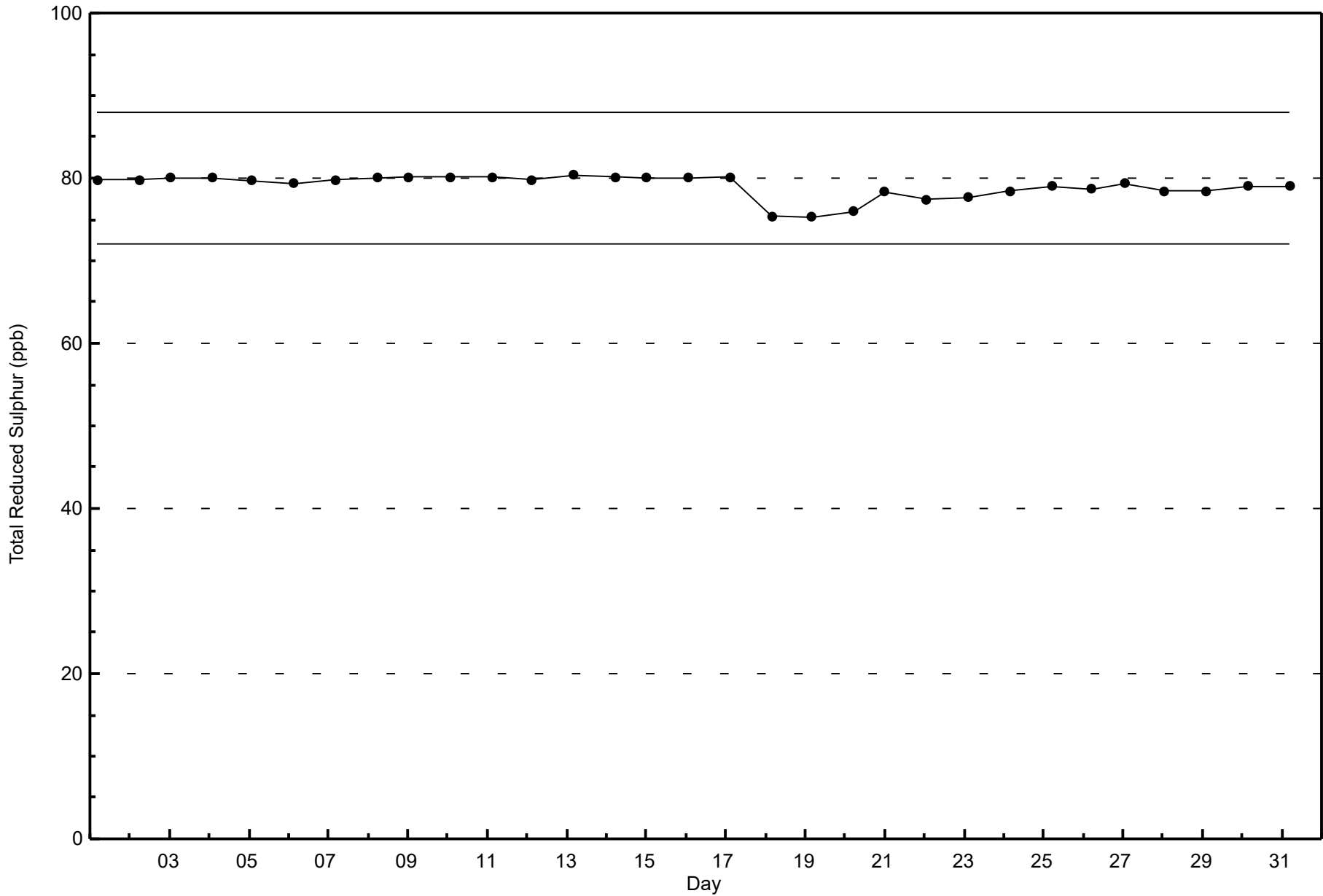


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Fort McKay South



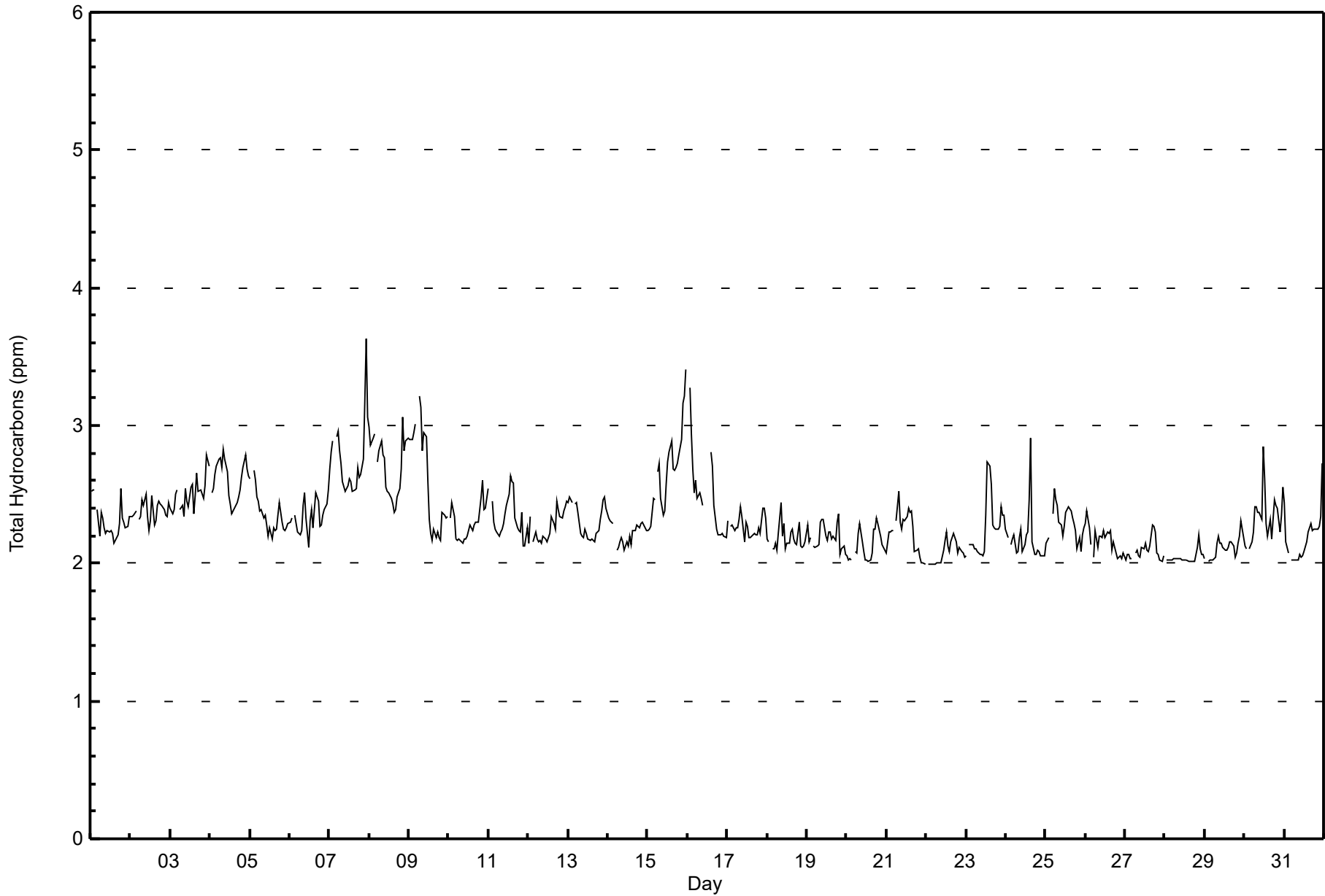






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	62	8.74	8.74
2.1 - 3.0	637	89.84	98.59
3.1 - 10.0	10	1.41	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort McKay South - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	8	2	0	1	0	0	0	0	1	1	4	15	13	6	10	1	62
2.1 - 3.0	105	44	6	5	2	4	21	134	168	47	18	9	8	6	16	39	632
3.1 - 10.0	2	0	0	0	0	0	0	0	0	2	1	1	0	0	1	3	10
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	46	6	6	2	4	21	134	169	50	23	25	21	12	27	43	704

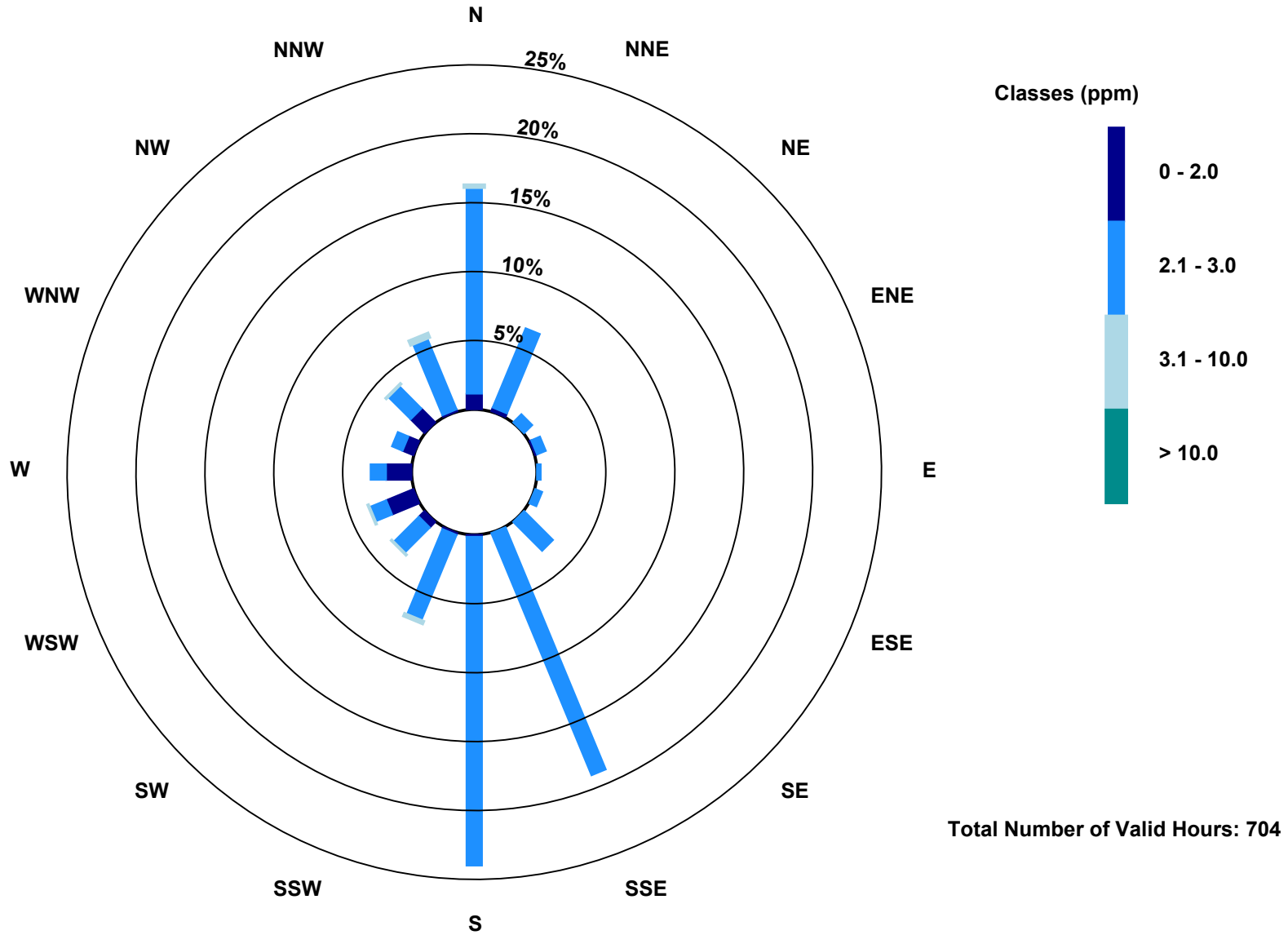
Total Number of Valid Hours: 704

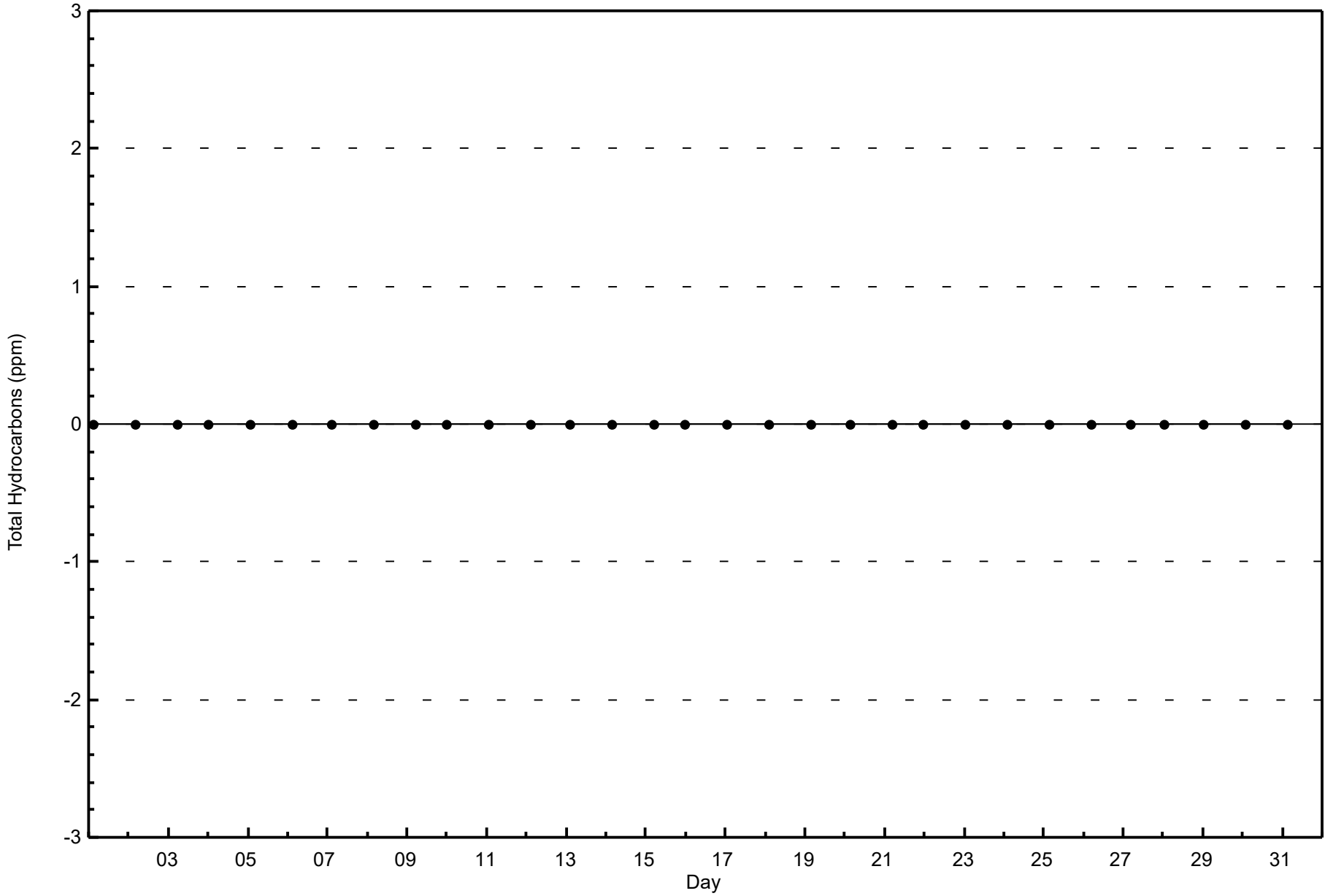
Total Number of Hours: 744

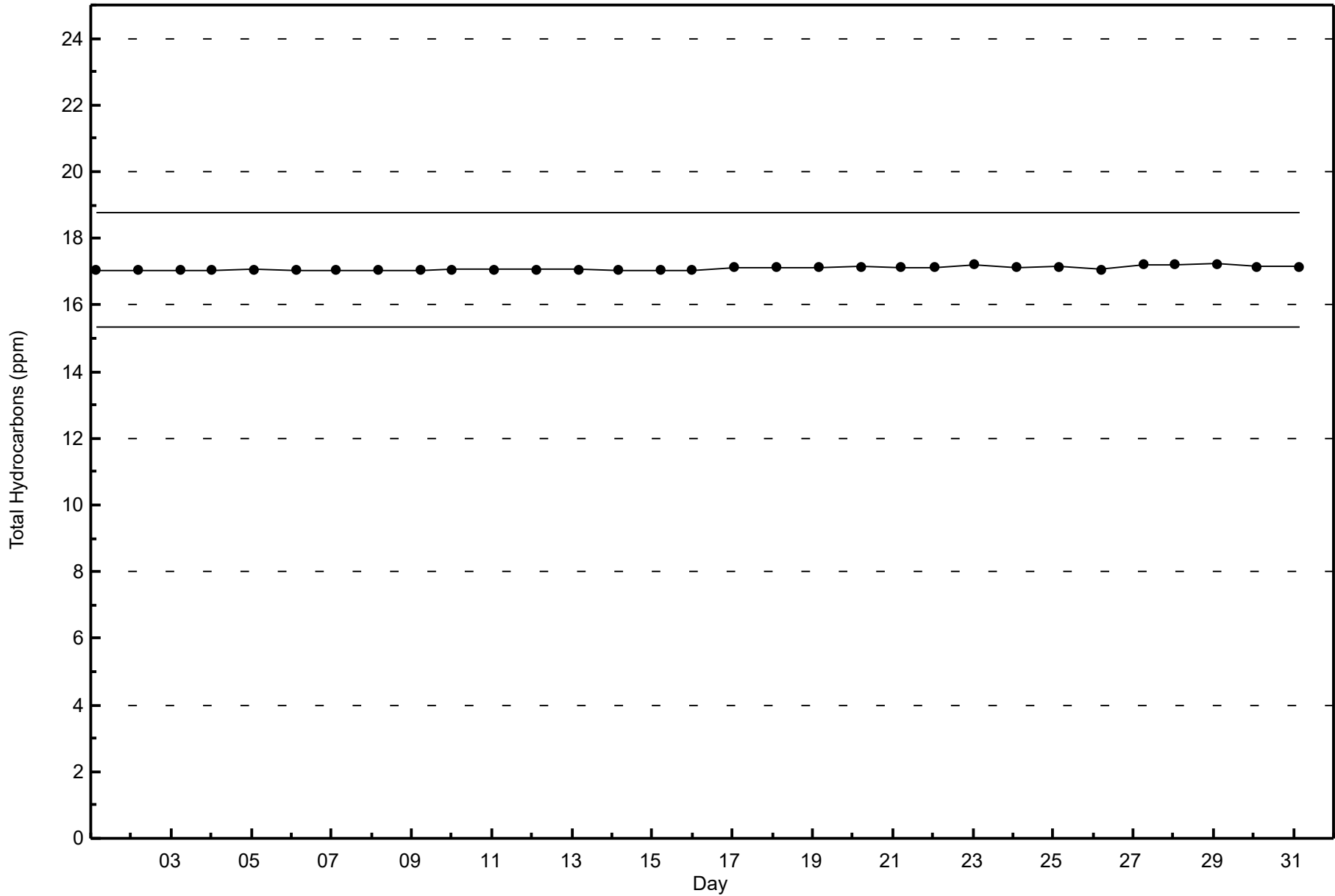


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Fort McKay South







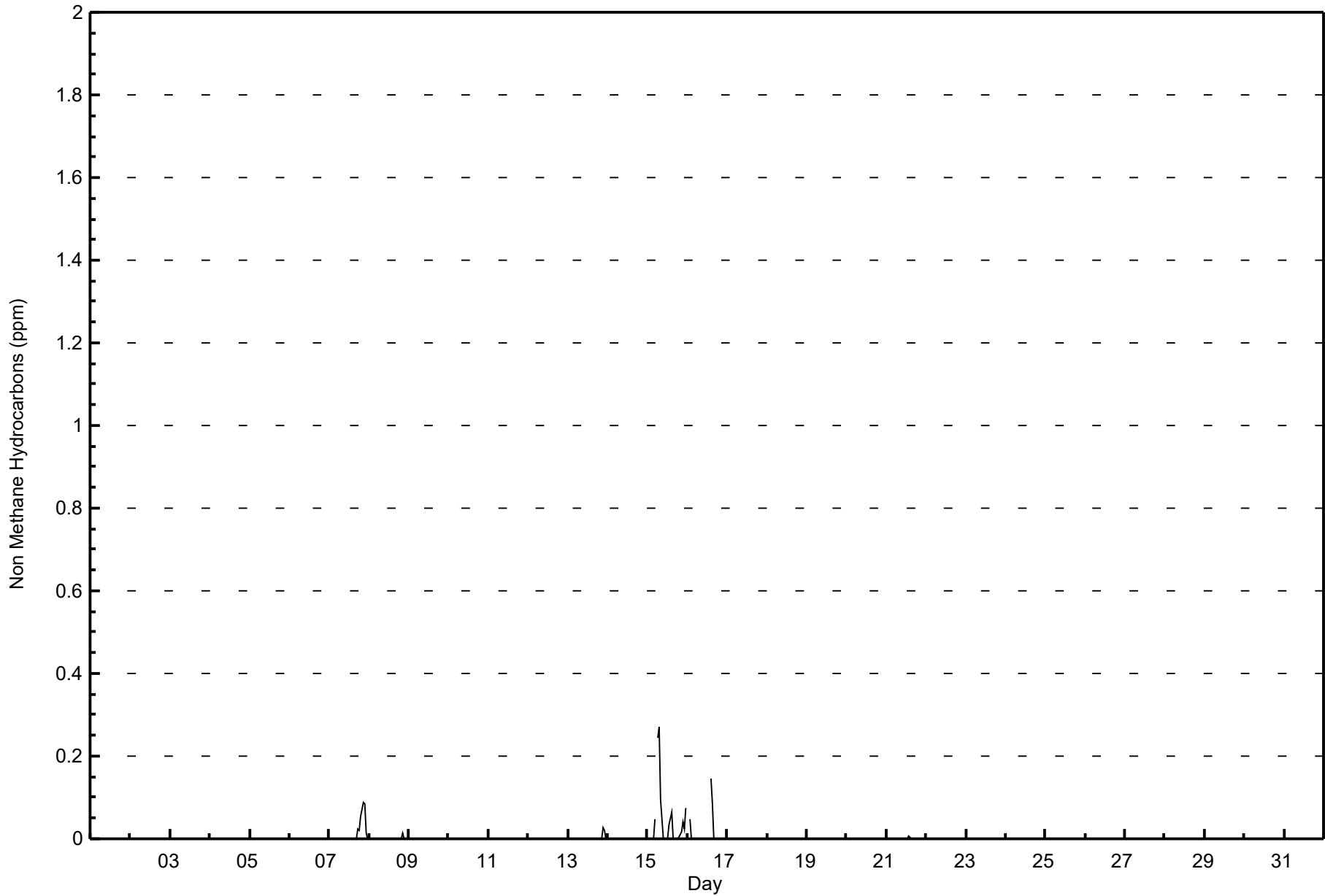


Maximum Value: 0.273 ppm on Jan 15 08:00		Maximum Daily Average: 0.040 ppm on Jan 15		Hours in Service: 744																														
Minimum Value: 0.000 ppm on Jan 1 01:00		Minimum Daily Average: 0.000 ppm on Jan 1		Hours of Data: 709																														
Maximum Diurnal Average: 0.009 ppm at hour 8		Minimum Diurnal Average: 0.000 ppm at hour 1		Hours of Missing Data: 35																														
Monthly Average: 0.002 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.1		Hours of Calibration: 35																														
				Percent Operational Time: 100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
2-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
3-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
4-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
5-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
6-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
7-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.019	0.055	0.087	0.084	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
8-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
12-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
13-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
14-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
15-Jan	0.000	0.000	0.000	0.000	0.048	Z	0.244	0.273	0.096	0.000	0.000	0.000	0.000	0.035	0.064	0.001	0.000	0.001	0.002	0.004	0.018	0.040	0.023	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.273
16-Jan	Z	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.145	0.086	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.145	
17-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
18-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
19-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
20-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
22-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
23-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
24-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
26-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
27-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
28-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
30-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
31-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		0.000	0.002	0.000	0.000	0.002	0.000	0.008	0.009	0.003	0.000	0.000	0.000	0.001	0.007	0.003	0.000	0.001	0.001	0.002	0.004	0.005	0.002	0.002							Diurnal Average			
		0.000	0.046	0.000	0.000	0.048	0.000	0.244	0.273	0.096	0.000	0.000	0.002	0.000	0.035	0.145	0.086	0.000	0.023	0.019	0.055	0.087	0.084	0.023	0.076					Diurnal Maximum				
Z - zerospan		C - Calibration																																



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	686	96.76	96.76
0.006 - 0.05	13	1.83	98.59
0.06 - 0.1	8	1.13	99.72
> 0.1	2	0.28	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	105	43	6	6	2	4	21	132	169	49	22	24	21	12	27	38	681
0.006 - 0.05	6	1	0	0	0	0	0	1	0	0	0	1	0	0	0	4	13
0.06 - 0.1	3	1	0	0	0	0	0	1	0	1	1	0	0	0	0	1	8
> 0.1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	115	46	6	6	2	4	21	134	169	50	23	25	21	12	27	43	704

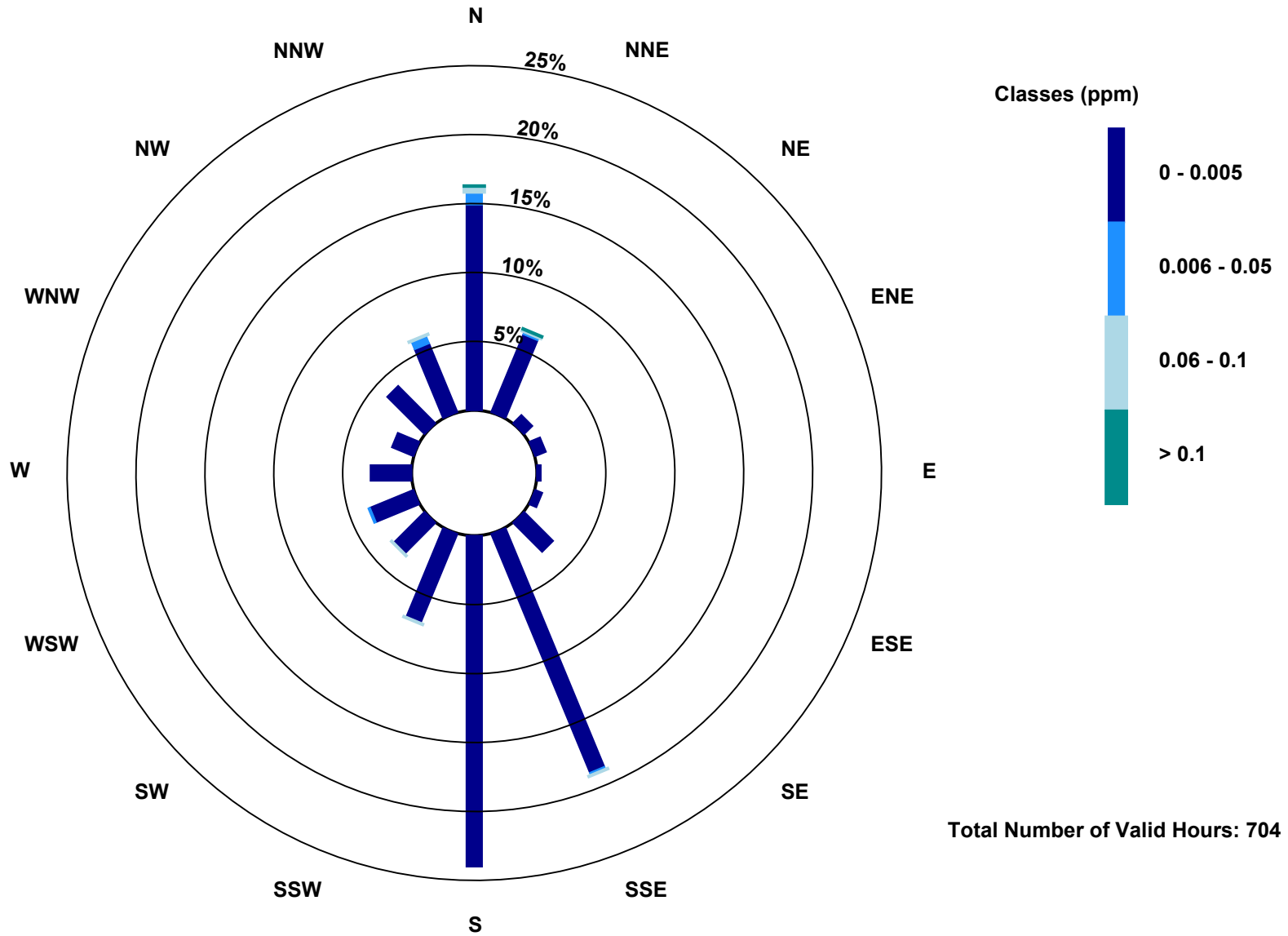
Total Number of Valid Hours: 704

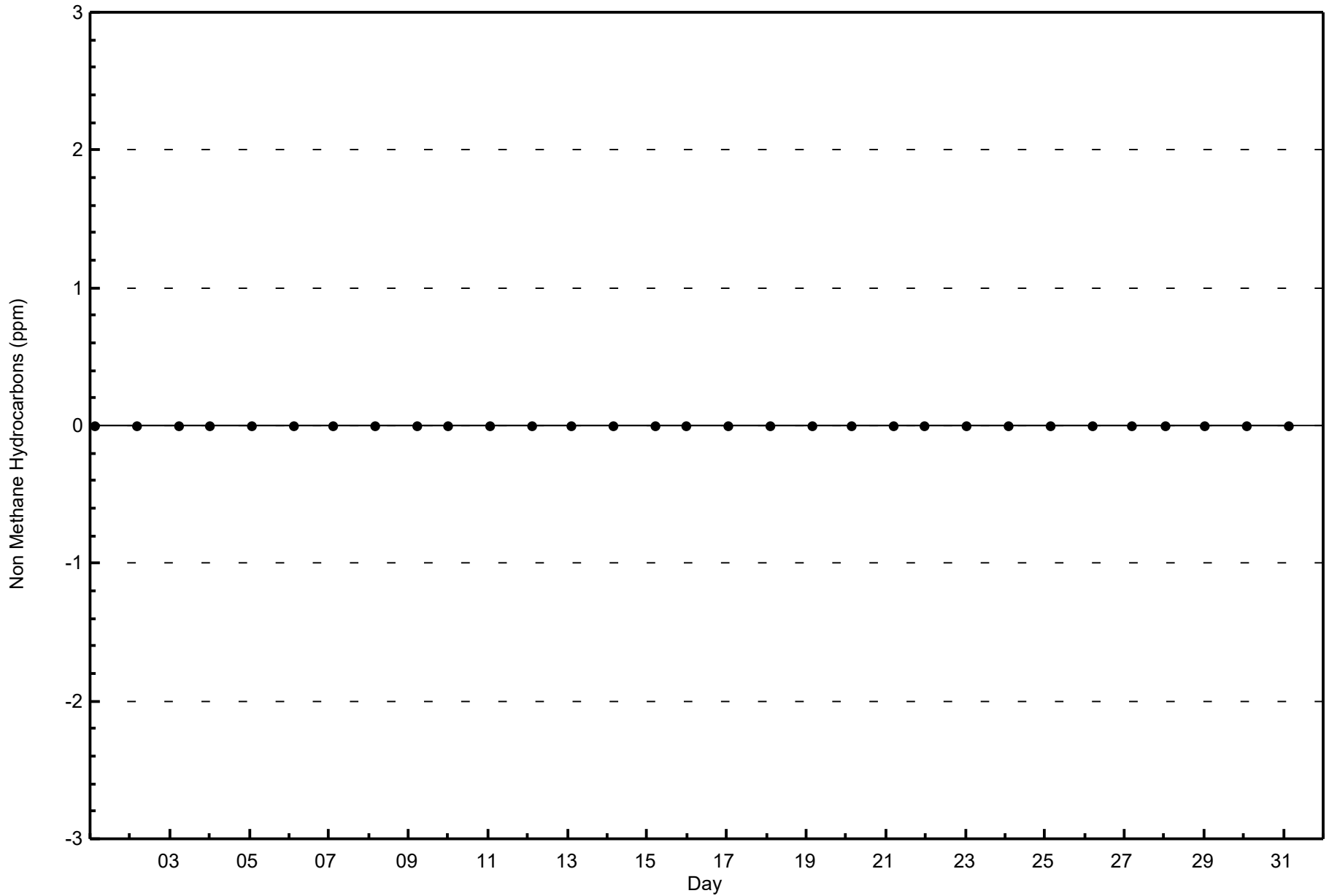
Total Number of Hours: 744

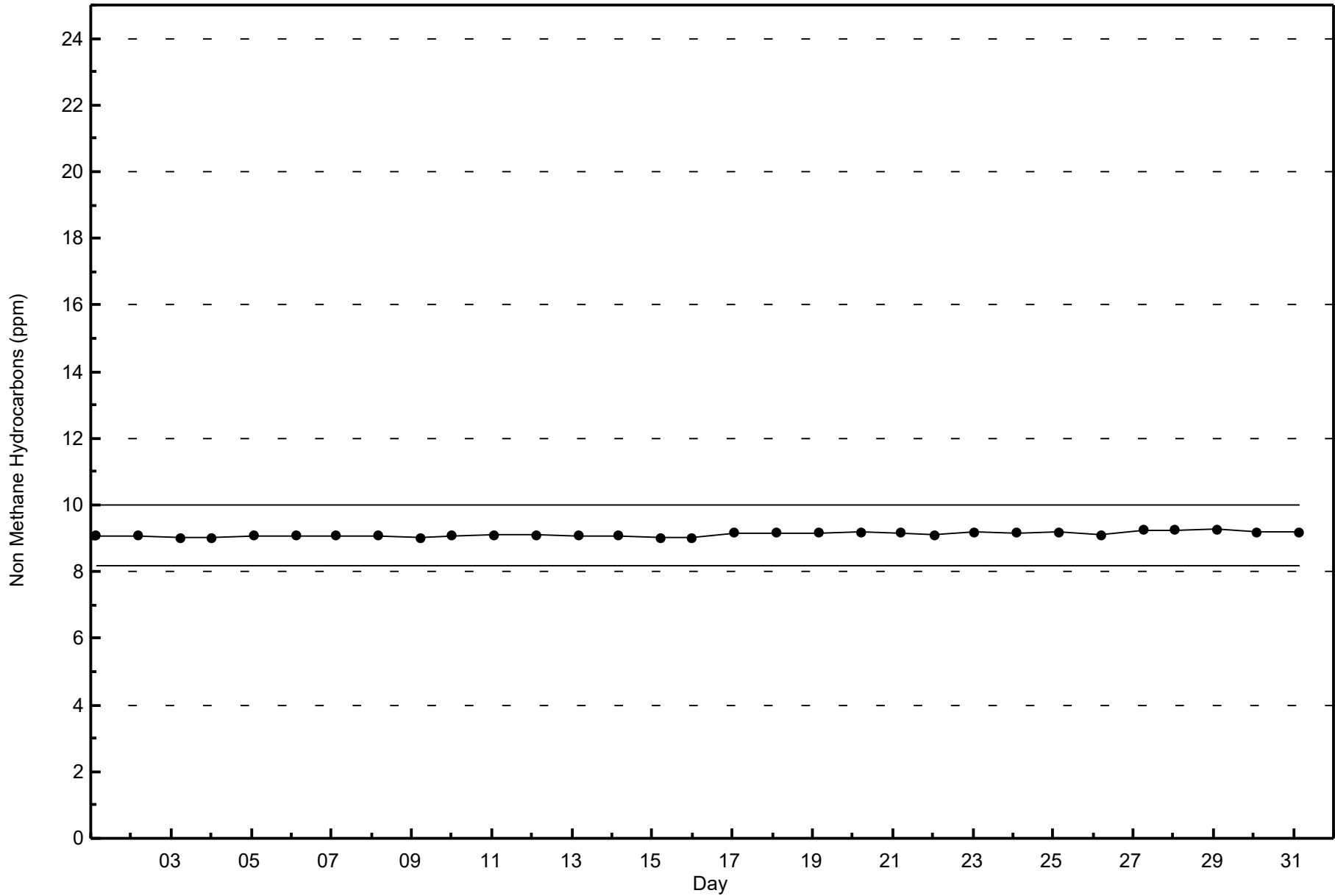


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South



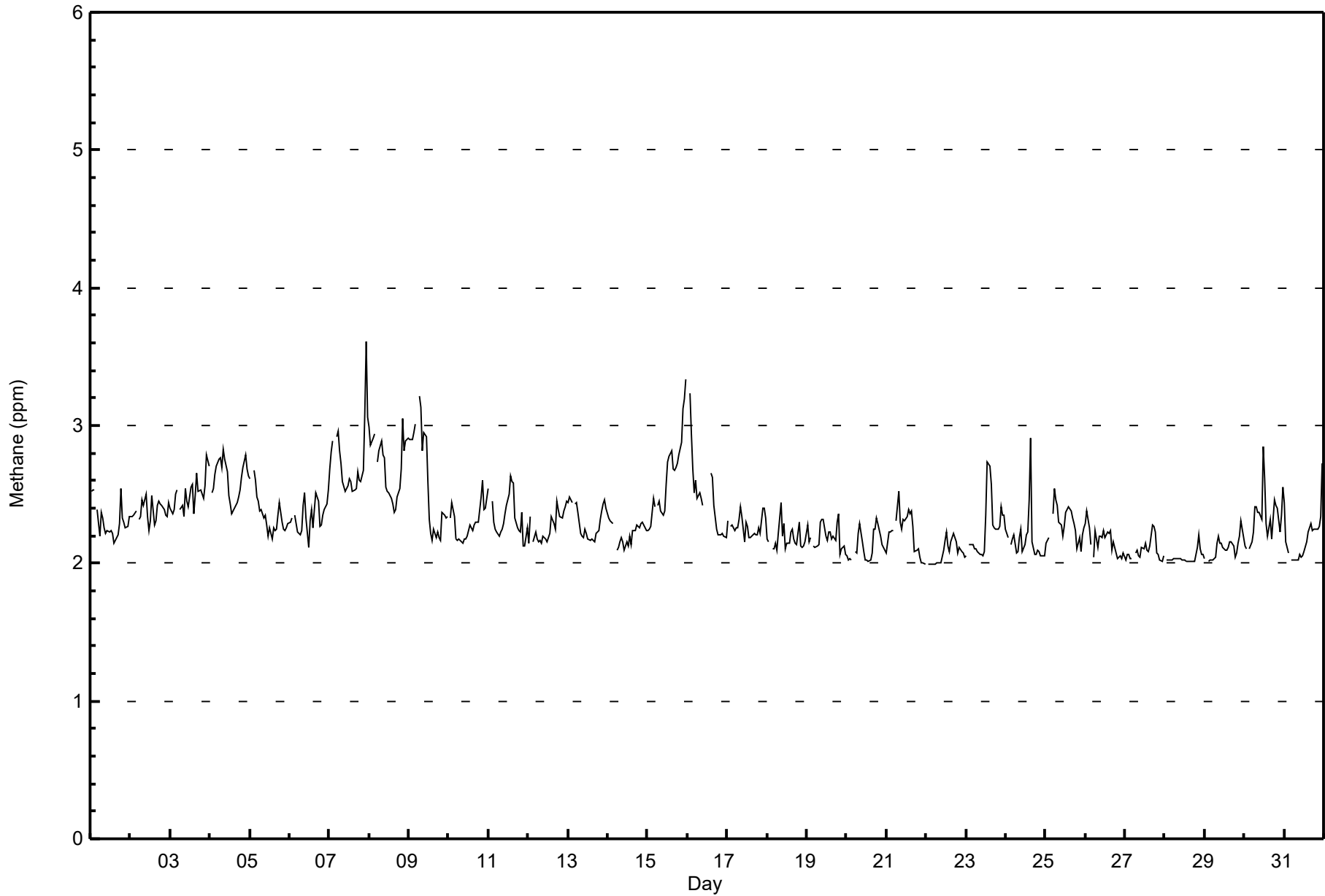






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort McKay South - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	62	8.74	8.74
2.1 - 3.0	638	89.99	98.73
3.1 - 10.0	9	1.27	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Fort McKay South - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	8	2	0	1	0	0	0	0	1	1	4	15	13	6	10	1	62
2.1 - 3.0	105	44	6	5	2	4	21	134	168	47	18	9	8	6	16	40	633
3.1 - 10.0	2	0	0	0	0	0	0	0	0	2	1	1	0	0	1	2	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	46	6	6	2	4	21	134	169	50	23	25	21	12	27	43	704

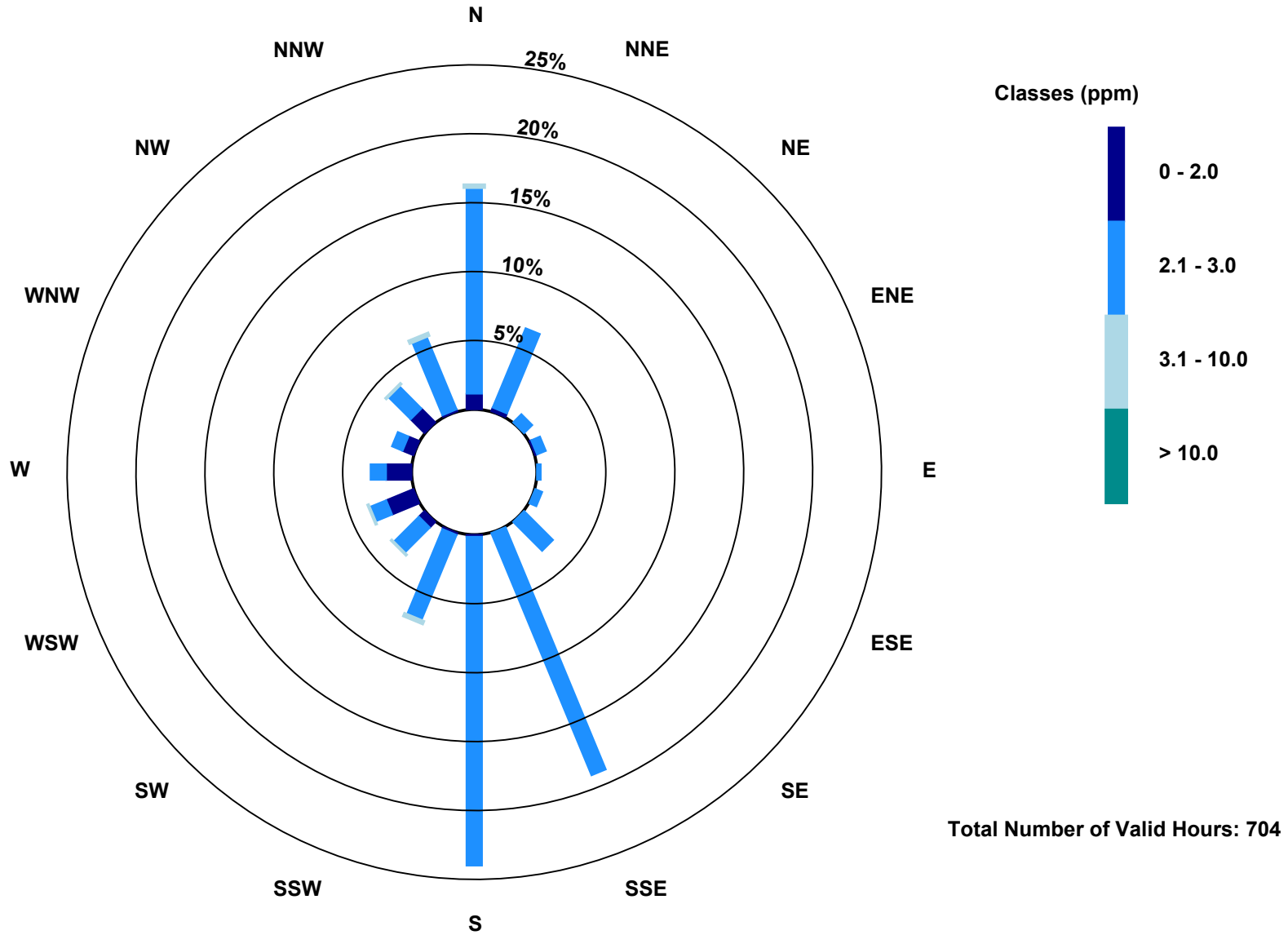
Total Number of Valid Hours: 704

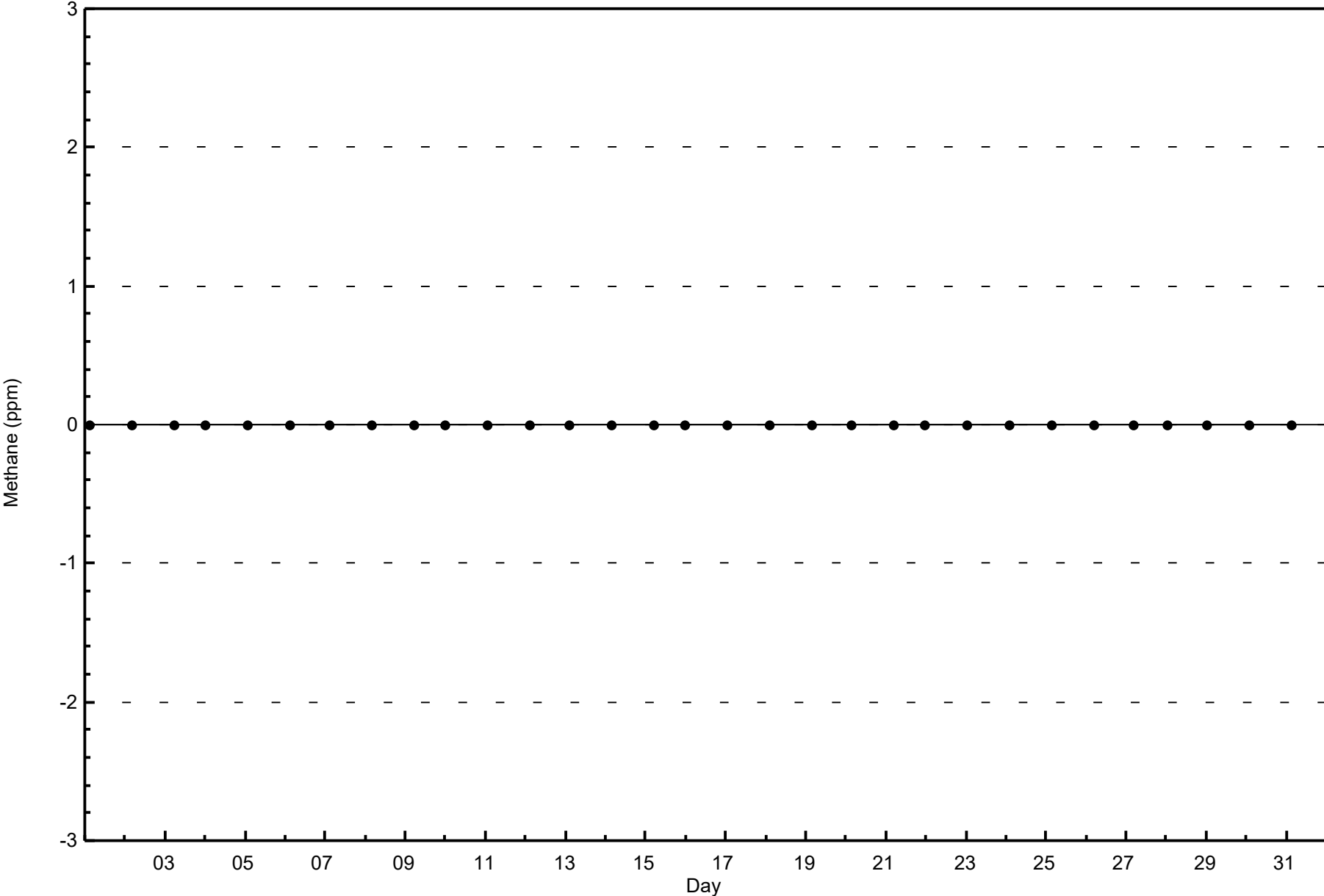
Total Number of Hours: 744

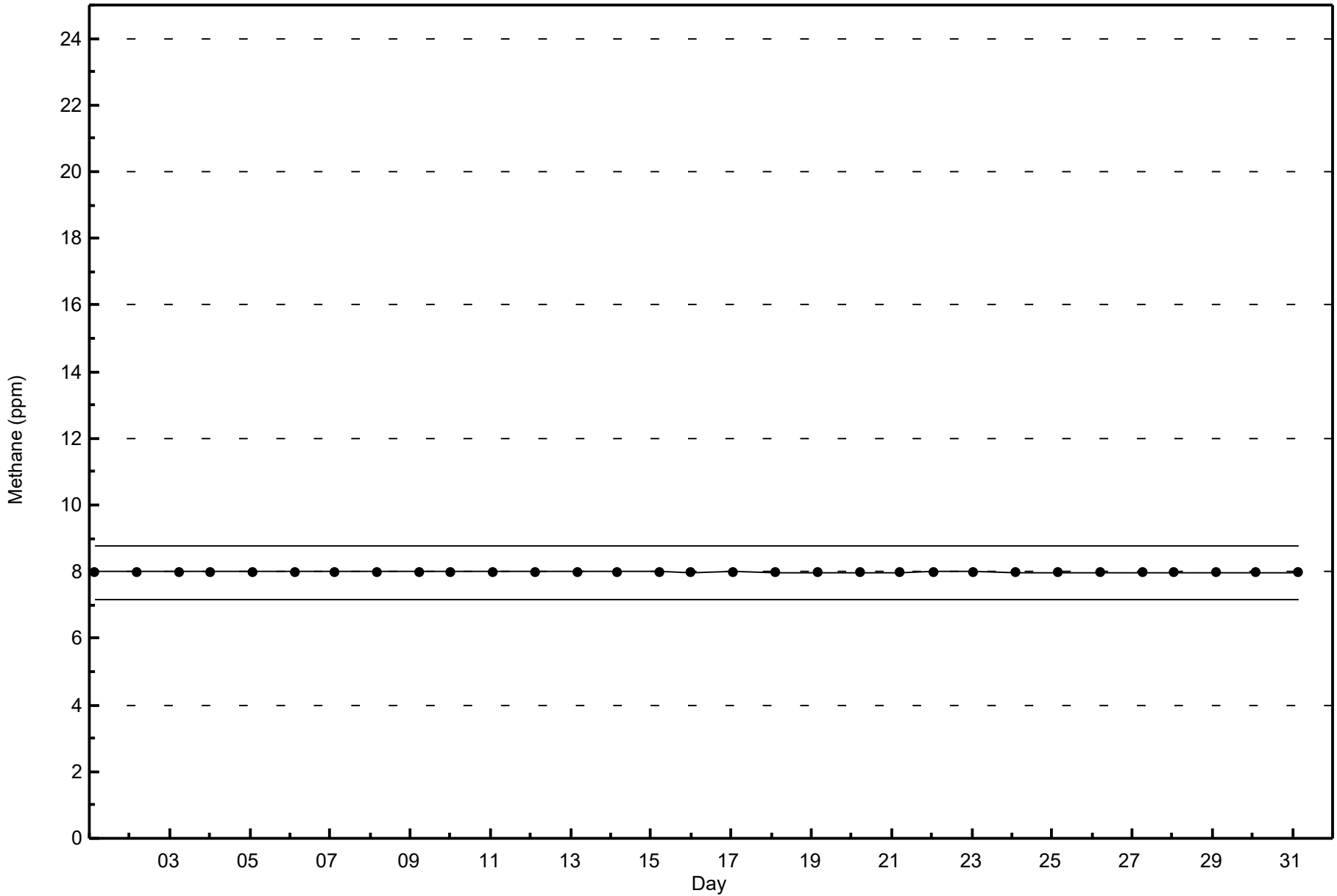


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

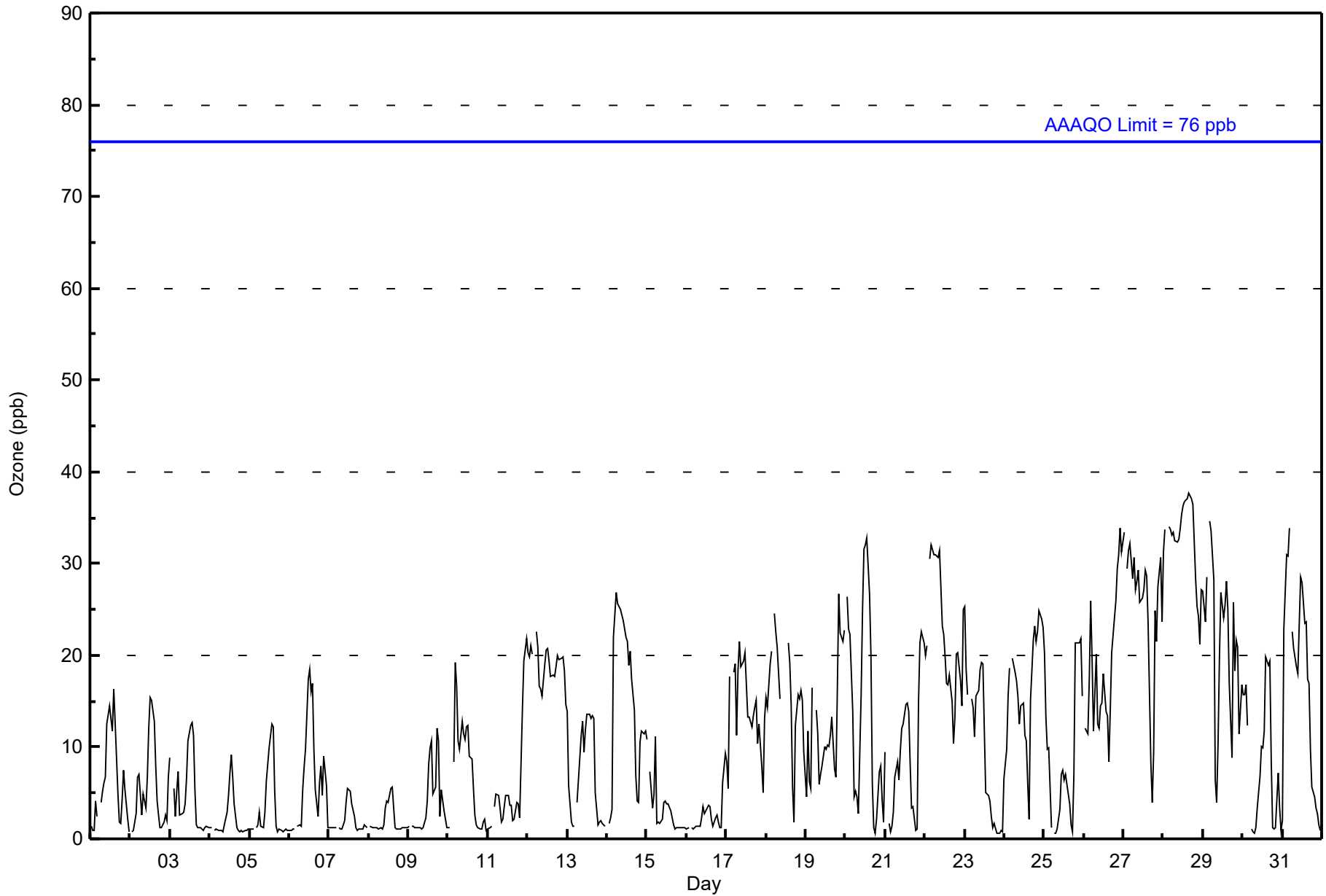
Ozone (O₃) - ppb

Fort McKay South - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 37.6 ppb on Jan 28 16:00	Maximum Daily Average: 32.6 ppb on Jan 28		Hours of Data:	709
Minimum Value: 0.6 ppb on Jan 23 21:00	Minimum Daily Average: 2.0 ppb on Jan 8		Hours of Missing Data:	35
Maximum Diurnal Average: 14.7 ppb at hour 13	Minimum Diurnal Average: 6.9 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 10.99 ppb	Percentiles: P ₁ = 0.7 P ₁₀ = 1.1 Q ₁ = 1.9 Median = 8.2 Q ₃ = 18.2 P ₉₀ = 25.4 P ₉₉ = 35.3		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	1.4	0.9	0.9	4.1	2.5	Z	4.0	5.2	6.2	6.7	12.5	14.5	13.1	11.8	16.4	12.6	4.8	1.8	1.6	4.3	7.5	5.4	2.2	0.8	6.1	16.4																							
2-Jan	Z	0.8	0.8	2.8	6.7	7.0	4.9	2.6	4.9	3.4	6.8	12.1	15.5	15.1	12.9	8.0	4.1	2.5	1.2	1.1	1.8	2.6	2.0	6.7	5.5	15.5																							
3-Jan	8.9	Z	5.6	2.5	5.1	7.3	2.5	2.7	2.9	3.8	6.5	10.6	12.4	12.7	11.2	5.3	1.6	1.2	1.2	1.1	1.0	1.2	1.4	1.3	4.8	12.7																							
4-Jan	1.2	1.2	Z	0.9	1.0	0.9	0.9	0.9	0.8	1.5	2.8	4.7	7.2	9.2	6.7	3.8	1.2	0.8	0.8	0.9	0.8	0.9	1.0	1.0	2.2	9.2																							
5-Jan	1.1	1.0	1.0	Z	1.2	1.5	2.9	1.3	1.2	2.9	6.3	8.2	9.9	12.6	12.1	5.3	1.4	0.8	1.0	0.9	0.8	0.9	1.0	0.9	3.3	12.6																							
6-Jan	0.9	1.0	1.0	1.0	Z	1.3	1.6	1.3	5.4	7.8	9.7	17.4	18.4	16.0	16.9	9.8	5.3	2.5	6.1	8.0	4.7	9.0	5.7	1.2	6.6	18.4																							
7-Jan	1.3	1.3	1.2	1.3	1.3	Z	1.2	1.1	1.1	2.1	3.9	5.5	5.3	5.2	3.9	2.4	1.2	1.0	1.1	1.0	1.1	1.5	1.4	1.2	2.1	5.5																							
8-Jan	Z	1.4	1.3	1.3	1.3	1.2	1.1	1.2	1.1	1.6	3.4	4.2	4.0	5.4	5.7	3.4	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	2.0	5.7																							
9-Jan	1.4	Z	1.3	1.3	1.1	1.2	1.2	1.2	1.1	1.2	2.2	4.2	8.1	10.0	10.8	4.8	5.7	12.0	10.7	2.5	5.3	3.0	2.1	1.2	4.1	12.0																							
10-Jan	1.2	1.2	Z	8.4	19.2	16.6	10.6	9.8	12.8	11.4	10.9	12.2	12.3	9.0	8.6	5.5	2.6	1.5	1.2	1.1	1.0	1.8	2.1	1.0	7.0	19.2																							
11-Jan	1.1	1.2	1.3	Z	3.4	4.8	4.8	3.4	1.8	2.1	3.6	4.7	4.7	3.7	3.7	2.0	2.2	3.9	3.9	2.3	8.2	14.2	19.4	21.8	5.3	21.8																							
12-Jan	20.2	19.8	21.0	20.2	Z	22.6	20.9	16.7	16.4	15.5	19.1	20.5	20.8	19.4	17.7	17.8	17.7	18.8	20.0	19.5	19.6	19.8	18.3	14.6	19.0	22.6																							
13-Jan	13.8	5.8	1.8	1.4	1.4	Z	3.9	8.9	11.2	12.8	9.5	11.8	13.6	13.5	13.1	13.5	13.1	5.1	1.6	1.8	2.1	1.7	1.5	1.4	7.1	13.8																							
14-Jan	Z	1.7	2.2	3.2	22.0	26.8	25.7	25.4	25.0	24.4	23.8	21.9	21.6	19.0	20.5	17.5	14.0	6.9	4.2	3.9	10.5	11.8	11.5	11.7	15.4	26.8																							
15-Jan	10.8	Z	7.4	3.3	4.9	11.1	1.7	1.8	1.7	2.1	3.9	4.1	3.8	3.0	2.3	1.5	1.1	1.3	1.2	1.2	1.2	1.2	1.2	1.2	3.3	11.1																							
16-Jan	1.1	1.2	Z	1.3	1.1	1.3	1.4	1.4	1.3	2.2	3.4	2.8	3.3	3.6	3.6	2.1	1.4	2.3	2.5	1.8	1.2	1.2	6.1	9.3	2.5	9.3																							
17-Jan	8.4	5.5	17.7	Z	18.2	19.1	11.3	18.2	21.4	18.8	19.4	20.3	16.8	13.3	13.3	12.2	13.4	14.3	15.1	10.3	12.5	8.0	5.0	13.1	14.2	21.4																							
18-Jan	15.4	14.3	19.0	20.4	Z	24.6	22.6	21.0	15.2	C	C	C	C	21.3	19.3	14.7	5.6	1.8	12.3	15.8	15.3	16.2	15.1	9.4	15.7	24.6																							
19-Jan	4.6	11.7	6.2	5.4	16.4	Z	14.0	11.4	5.9	7.0	7.9	10.0	9.8	10.2	10.1	11.3	13.2	7.6	6.6	16.3	26.6	22.4	21.5	22.8	12.1	26.6																							
20-Jan	Z	26.3	22.9	22.2	14.0	4.6	5.1	4.5	2.7	15.8	25.0	31.6	32.0	32.8	26.6	20.0	5.9	1.3	0.7	2.1	7.3	7.9	4.3	1.9	13.8	32.8																							
21-Jan	9.5	Z	1.6	0.8	1.4	2.9	6.8	8.5	6.4	9.6	12.1	12.5	14.7	14.7	13.8	8.2	3.4	3.5	0.9	1.1	14.9	21.3	22.6	21.3	9.2	22.6																							
22-Jan	20.0	21.0	Z	30.5	32.1	31.0	31.0	30.8	30.7	31.5	23.2	22.3	19.8	16.9	16.8	17.8	15.0	10.4	13.3	20.1	20.3	17.3	14.4	25.0	22.2	32.1																							
23-Jan	25.3	18.5	15.8	Z	15.3	14.3	11.1	15.5	16.2	18.4	19.3	19.0	11.9	5.0	4.8	4.0	2.5	1.3	1.7	0.7	0.6	0.6	0.9	0.8	9.7	25.3																							
24-Jan	6.6	9.8	15.6	18.6	Z	19.6	18.2	17.2	15.6	12.6	14.5	14.7	11.3	10.6	6.1	2.1	15.1	21.6	23.2	21.5	22.5	24.8	23.9	23.1	16.0	24.8																							
25-Jan	20.3	13.3	9.8	10.0	1.3	Z	0.6	0.6	1.1	3.1	7.1	7.5	6.4	7.0	6.0	3.9	1.5	0.7	7.0	21.4	21.3	21.4	21.8	15.6	9.1	21.8																							
26-Jan	Z	12.0	11.5	17.5	25.9	19.5	11.7	20.1	12.5	12.1	14.5	14.7	18.0	14.0	13.4	8.3	14.0	20.2	24.1	26.0	29.4	30.9	33.8	31.3	18.9	33.8																							
27-Jan	33.4	Z	29.4	31.4	32.2	28.4	30.7	27.1	28.0	29.3	25.7	26.3	27.1	29.3	28.7	23.7	8.3	3.9	9.4	24.8	21.5	27.5	30.7	23.6	25.2	33.4																							
28-Jan	31.2	33.7	Z	34.1	33.6	33.1	33.4	32.6	32.3	32.7	33.9	35.3	36.2	36.7	37.0	37.6	37.4	37.1	36.5	28.3	25.4	24.3	21.2	27.1	32.6	37.6																							
29-Jan	27.0	23.6	28.5	Z	34.6	33.5	28.3	6.5	4.0	10.3	19.9	26.8	24.1	25.5	28.1	25.0	16.9	8.9	25.7	18.3	21.7	20.8	11.5	16.8	21.1	34.6																							
30-Jan	15.7	15.8	16.8	12.3	Z	1.1	0.7	0.6	1.2	3.3	6.9	10.0	9.9	11.8	19.8	18.9	19.3	8.5	1.2	1.1	1.3	7.2	3.3	0.9	8.2	19.8																							
31-Jan	2.1	22.9	30.9	30.8	33.8	Z	22.5	20.8	18.8	18.1	23.4	28.5	28.0	23.5	23.7	17.5	17.0	9.7	5.6	4.6	3.3	2.7	1.6	0.9	17.0	33.8																							
																								10.9	10.3	10.5	11.0	12.7	13.4	10.9	10.3	9.9	10.8	12.7	14.6	14.7	14.3	14.0	11.0	8.6	6.9	7.8	8.5	10.1	10.7	10.0	10.0	Diurnal Average	
																								33.4	33.7	30.9	34.1	34.6	33.5	33.4	32.6	32.3	32.7	33.9	35.3	36.2	36.7	37.0	37.6	37.4	37.1	36.5	28.3	29.4	30.9	33.8	31.3	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	576	81.24	81.24
21 - 50	133	18.76	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	95	35	4	4	1	4	21	113	152	44	17	9	10	6	18	39	572
21 - 50	22	13	1	2	1	0	0	23	11	4	5	17	11	8	12	3	133
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	117	48	5	6	2	4	21	136	163	48	22	26	21	14	30	42	705

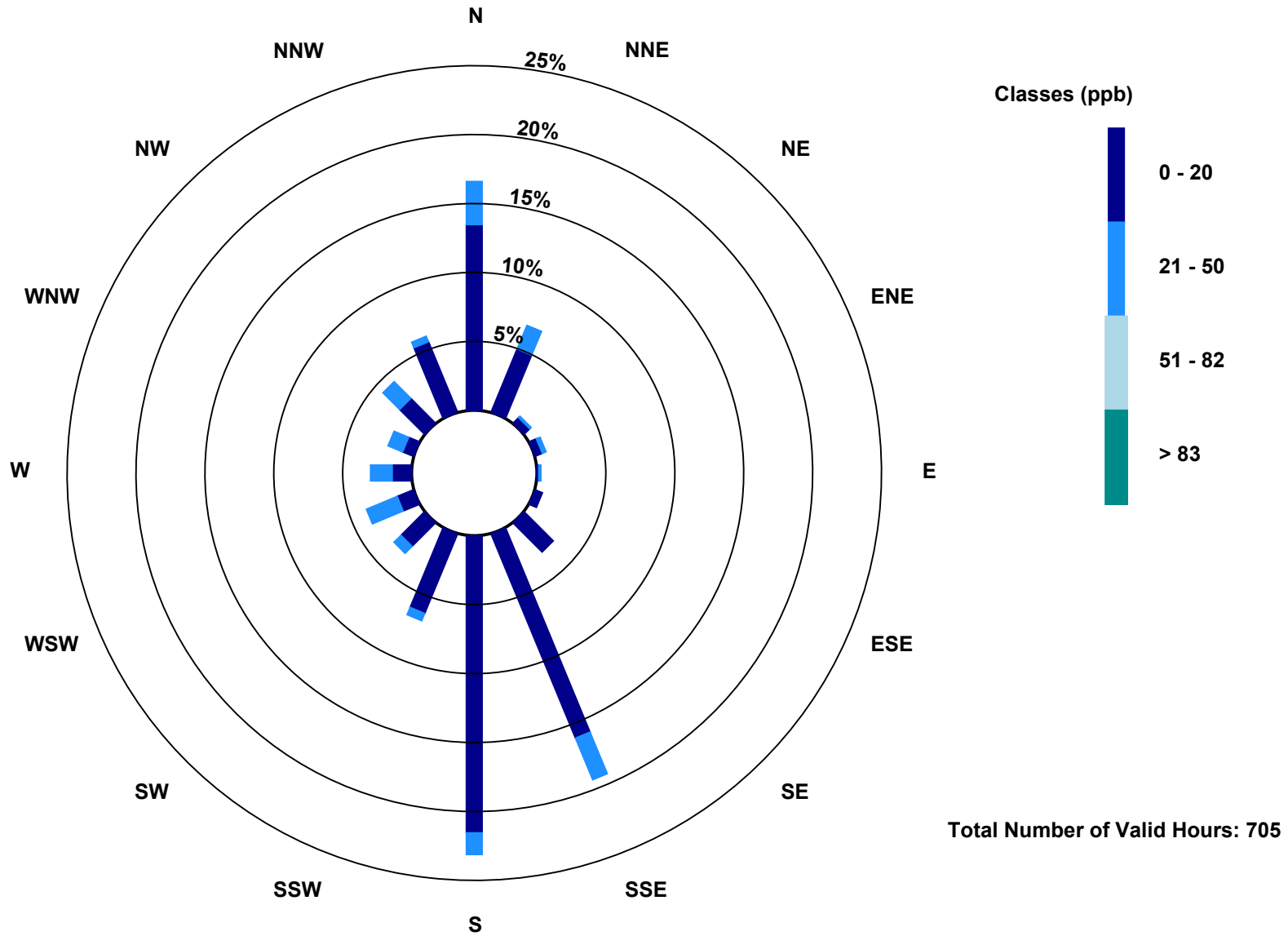
Total Number of Valid Hours: 705

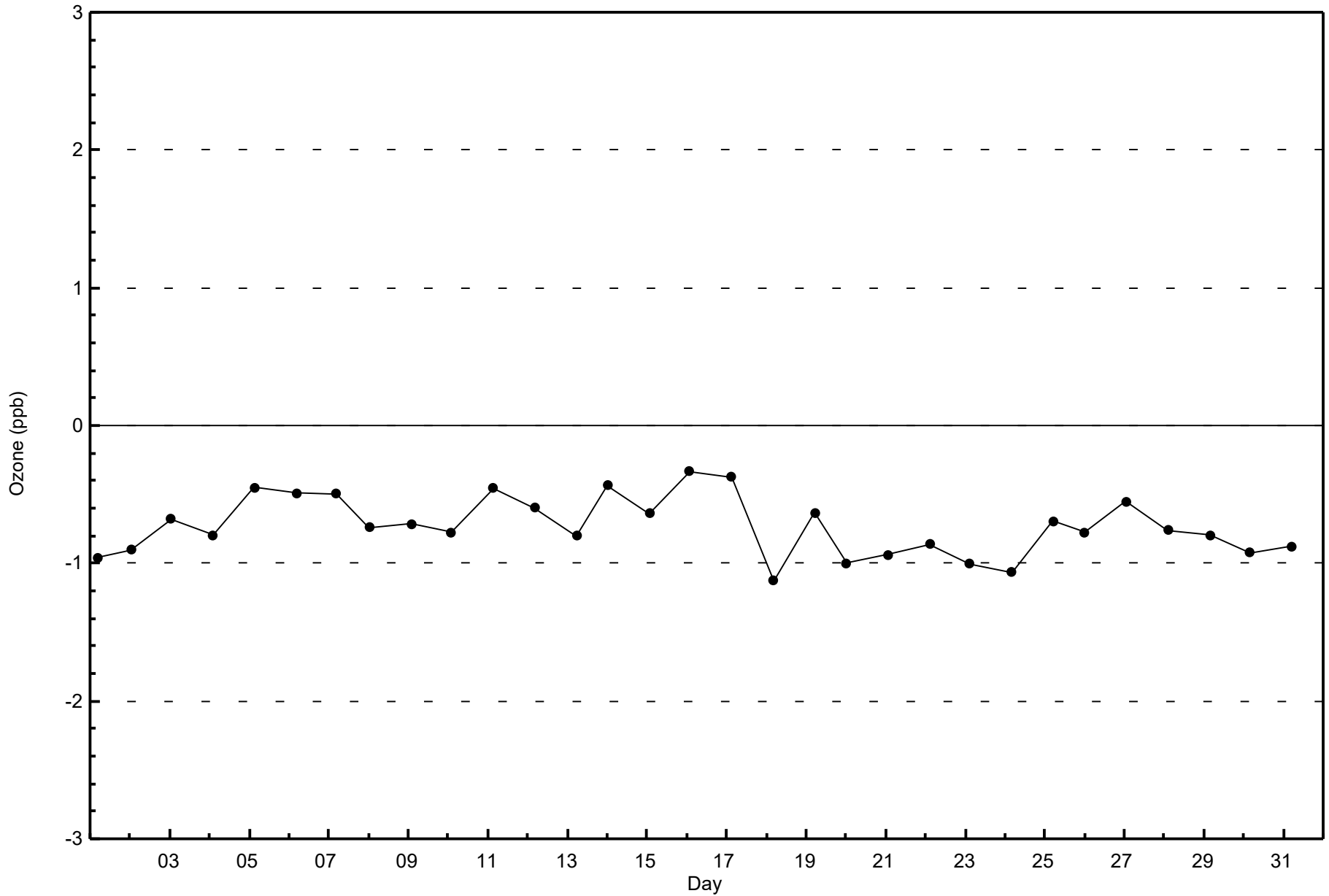
Total Number of Hours: 744

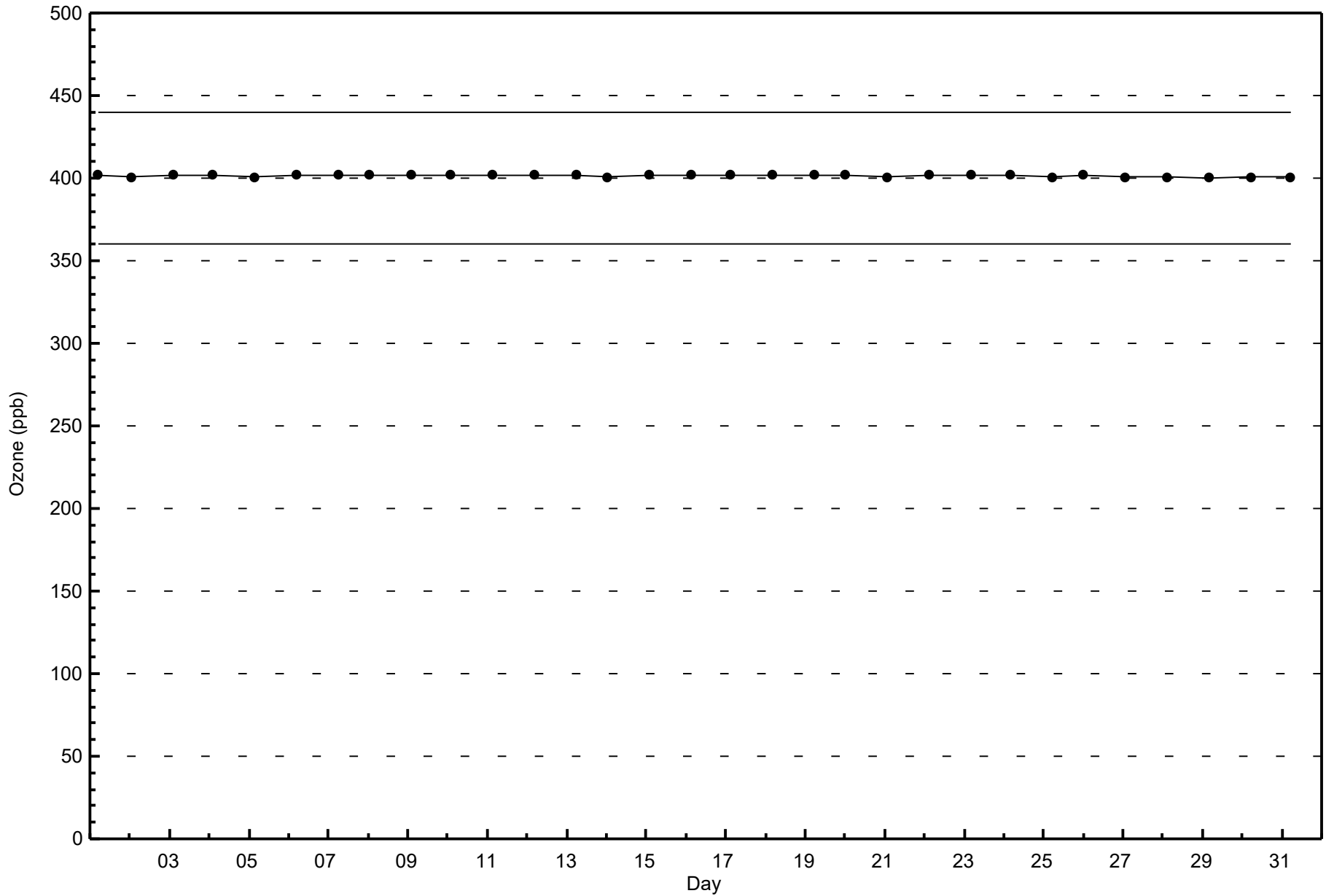


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O_3) - ppb
Fort McKay South

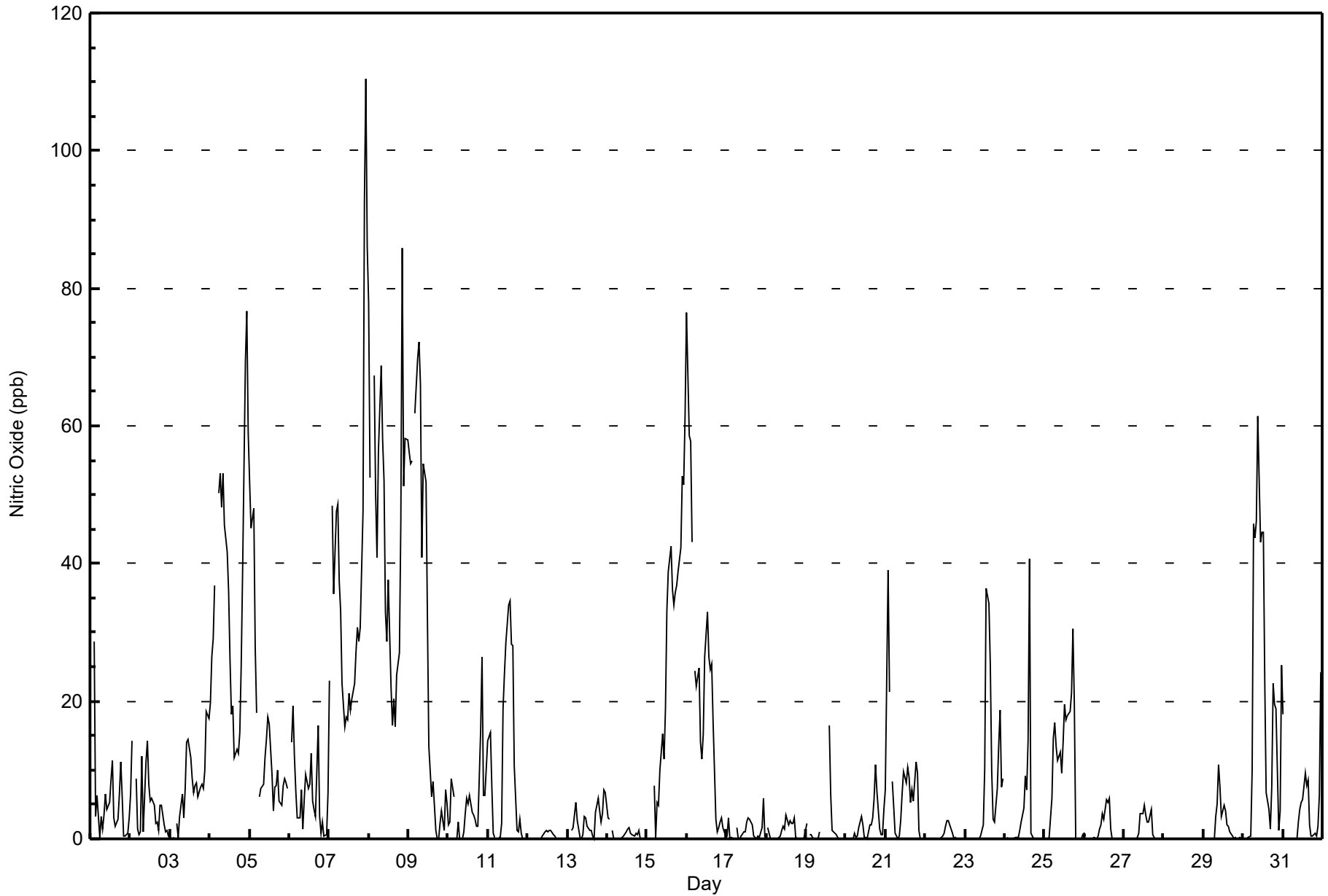








Maximum Value: 110.4 ppb on Jan 7 23:00																				Maximum Daily Average: 45.6 ppb on Jan 8					Hours in Service:	744
Minimum Value: 0.0 ppb on Jan 11 23:00																				Minimum Daily Average: 0.0 ppb on Jan 28					Hours of Data:	708
Maximum Diurnal Average: 14.1 ppb at hour 1																				Minimum Diurnal Average: 6.6 ppb at hour 17					Hours of Missing Data:	36
Monthly Average: 10.43 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 2.7 Q ₃ = 11.9 P ₉₀ = 35.8 P ₉₉ = 71.9					Hours of Calibration:	36
																									Percent Operational Time:	100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.2	Z	28.6	3.2	6.3	0.2	3.3	1.4	3.5	6.6	4.3	5.2	8.6	11.5	3.0	1.8	2.9	6.5	11.2	6.1	0.3	0.4	0.9	3.1	5.4	28.6
2-Jan	6.6	14.2	Z	8.7	1.5	0.6	1.0	12.1	0.9	11.1	14.2	7.9	5.5	5.8	4.9	2.3	2.5	1.3	4.9	4.8	2.1	1.1	1.2	0.4	5.0	14.2
3-Jan	0.1	0.1	0.1	Z	2.3	0.2	3.3	6.4	3.0	7.4	14.0	14.4	11.7	8.7	6.7	7.7	8.1	6.1	7.5	7.9	7.3	10.0	18.5	17.4	7.4	18.5
4-Jan	19.8	26.5	29.1	36.9	Z	50.2	53.1	48.2	53.0	45.5	41.7	35.9	26.1	18.2	19.4	11.7	13.0	12.5	15.5	25.2	38.9	69.3	76.8	58.9	35.9	76.8
5-Jan	51.8	45.2	48.1	27.8	18.2	Z	6.2	7.3	7.9	11.9	14.5	17.6	16.8	9.4	4.1	7.6	7.7	10.1	5.5	4.9	7.8	8.7	8.2	7.3	15.4	51.8
6-Jan	Z	14.1	19.3	12.1	7.0	3.0	3.1	7.1	1.4	5.7	9.4	7.4	7.9	12.3	5.6	4.2	3.2	16.5	3.2	0.8	2.4	0.5	0.6	6.6	6.7	19.3
7-Jan	23.0	Z	48.3	35.7	47.6	48.5	37.4	33.3	22.5	16.2	17.6	17.3	21.1	18.8	20.2	22.6	27.3	30.7	28.7	30.7	47.5	92.6	110.4	86.1	38.4	110.4
8-Jan	77.8	52.4	Z	67.4	50.1	40.9	56.4	68.7	58.1	52.1	32.9	28.7	37.6	22.2	16.5	20.4	16.4	23.8	27.0	46.2	85.8	51.3	58.2	57.9	45.6	85.8
9-Jan	56.1	54.4	55.0	Z	61.8	69.7	72.1	66.1	40.8	54.6	51.9	31.9	13.5	9.7	6.0	8.4	1.2	0.0	0.1	2.3	4.0	1.3	7.2	5.1	29.3	72.1
10-Jan	2.0	2.5	8.7	6.2	Z	0.0	2.5	0.1	0.1	1.1	3.6	5.9	5.2	6.3	3.8	3.5	2.8	1.9	1.8	15.7	26.4	6.3	6.4	10.3	5.3	26.4
11-Jan	14.2	15.4	7.6	0.8	0.2	Z	0.2	0.1	2.2	18.8	24.1	28.5	33.9	34.5	28.3	28.0	10.5	1.2	1.0	2.9	0.7	0.0	0.0	0.0	11.0	34.5
12-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.2	1.1	1.3	1.3	0.6	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3	1.3
13-Jan	0.0	Z	1.2	1.7	3.4	5.3	2.6	0.2	0.1	0.6	3.2	3.1	1.9	1.2	1.1	0.4	0.1	3.9	5.8	4.1	2.5	3.6	7.2	6.8	2.6	7.2
14-Jan	3.1	2.8	Z	1.2	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.1	1.4	1.5	0.8	0.6	0.3	0.8	0.7	1.2	0.1	0.0	0.0	0.0	0.7	3.1
15-Jan	0.0	0.0	0.1	Z	7.7	0.1	5.3	4.9	10.0	15.3	11.6	19.0	33.2	38.9	42.6	36.2	33.9	35.7	36.8	38.9	42.4	52.6	51.4	61.5	25.1	61.5
16-Jan	76.5	58.6	57.8	43.1	Z	24.4	22.1	24.8	14.0	11.6	15.2	26.4	32.9	26.5	24.6	25.4	17.2	2.8	1.1	1.7	2.4	3.0	1.6	0.4	22.4	76.5
17-Jan	0.4	3.0	0.1	0.2	0.0	Z	1.5	0.0	0.0	0.4	1.1	1.0	2.4	3.0	2.8	2.0	0.5	0.2	0.0	0.4	0.2	1.5	5.8	0.1	1.2	5.8
18-Jan	Z	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.3	1.2	1.9	1.5	3.5	2.1	2.7	2.2	2.2	3.0	0.2	0.0	0.0	0.0	0.0	0.2	1.0	3.5
19-Jan	2.2	Z	0.6	0.7	0.1	0.0	0.0	0.1	1.0	C	C	C	C	C	16.4	6.5	1.3	0.9	0.5	0.1	0.0	0.0	0.0	0.0	1.7	16.4
20-Jan	0.0	0.0	Z	0.0	0.0	0.7	0.2	0.4	1.7	3.2	2.1	0.1	0.1	0.1	2.0	2.1	3.1	5.9	10.8	6.9	1.4	0.6	0.6	4.2	2.0	10.8
21-Jan	7.2	39.0	21.3	Z	8.3	4.6	0.9	0.1	0.4	2.6	6.6	9.8	8.1	10.3	8.9	5.2	7.0	5.6	11.1	9.6	1.1	0.0	0.0	0.0	7.3	39.0
22-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.8	1.8	2.6	2.6	2.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.6
23-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	1.2	2.1	10.1	36.4	34.3	25.2	9.8	2.9	2.5	7.3	13.6	18.7	7.6	8.8	7.9	36.4
24-Jan	Z	0.2	0.0	0.0	0.0	0.0	0.2	0.2	0.2	1.2	2.4	4.5	9.1	7.1	14.5	40.7	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.5	40.7
25-Jan	0.0	Z	0.0	0.1	6.0	14.7	17.0	13.4	11.3	12.6	9.6	14.1	19.4	17.3	18.0	18.5	21.2	30.5	19.7	0.0	0.0	0.0	0.0	0.7	10.6	30.5
26-Jan	0.8	0.5	Z	0.0	0.0	0.0	0.1	0.0	0.4	1.3	2.1	3.6	2.9	5.8	5.3	5.9	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.9
27-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.9	3.6	3.7	4.8	3.5	2.5	2.5	4.2	0.6	0.2	0.0	0.0	0.0	0.0	0.0	1.2	4.8
28-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
29-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	3.3	5.0	10.9	7.6	3.3	4.9	4.1	2.0	1.8	0.9	0.3	0.0	0.1	0.0	0.0	0.2	0.0	1.9	10.9
30-Jan	Z	0.0	0.0	0.1	0.4	10.1	45.8	43.8	46.1	61.4	43.1	44.5	44.5	23.1	6.7	4.4	1.4	7.5	22.6	19.6	19.0	1.2	4.1	25.2	20.6	61.4
31-Jan	18.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.5	4.3	5.3	5.7	9.5	7.7	8.6	2.1	0.4	0.4	0.9	0.4	1.7	6.3	24.3	4.3	24.3
																								Diurnal Average		
																								Diurnal Maximum		
14.1 13.2 12.5 9.5 8.5 10.5 10.8 11.0 9.2 11.9 11.5 11.5 12.5 11.7 10.2 10.0 6.6 6.8 7.1 7.7 9.9 10.5 12.0 12.4																										
77.8 58.6 57.8 67.4 61.8 69.7 72.1 68.7 58.1 61.4 51.9 44.5 44.5 38.9 42.6 40.7 33.9 35.7 36.8 46.2 85.8 92.6 110.4 86.1																										
Z - zerospan C - Calibration																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	588	83.05	83.05
21 - 40	60	8.47	91.53
41 - 80	56	7.91	99.44
81 - 159	4	0.56	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	90	38	6	6	2	4	16	121	143	33	17	25	17	10	28	31	587
21 - 40	19	4	0	0	0	0	3	10	6	4	2	0	2	2	0	6	58
11 - 80	10	3	0	0	0	0	0	6	13	8	4	1	2	0	2	5	54
81 - 159	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	45	6	6	2	4	19	137	162	46	24	27	21	12	30	43	703

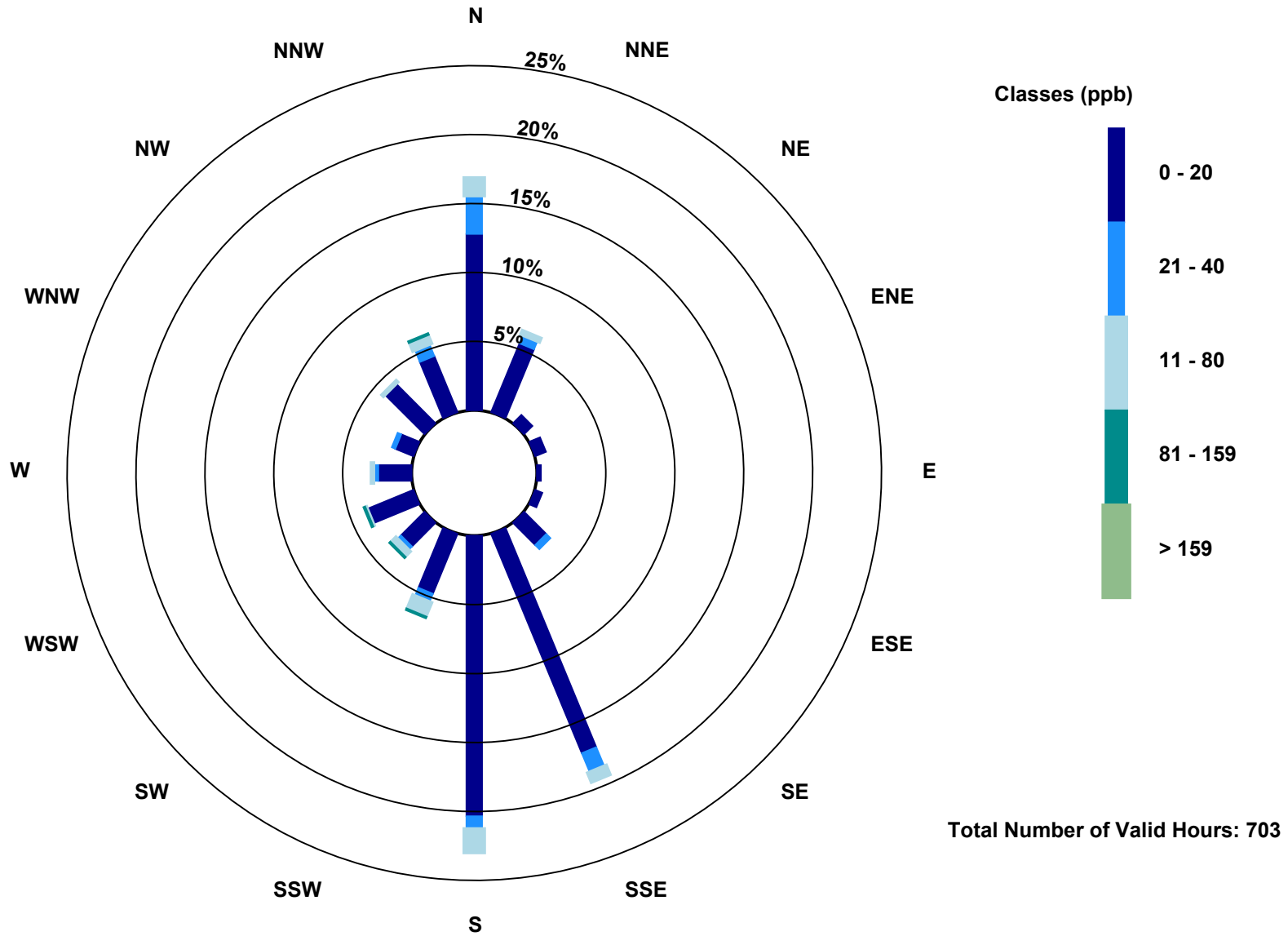
Total Number of Valid Hours: 703

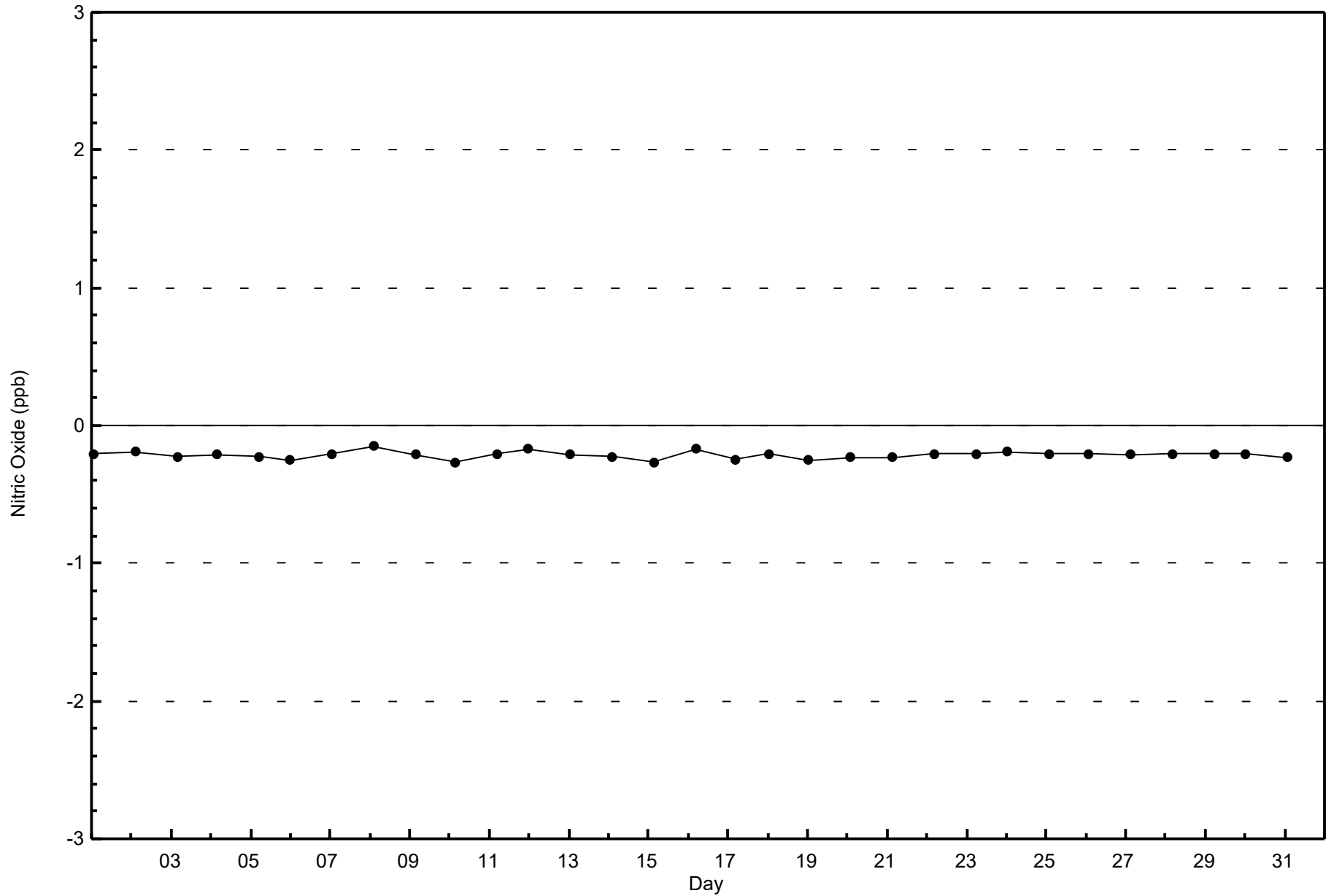
Total Number of Hours: 744

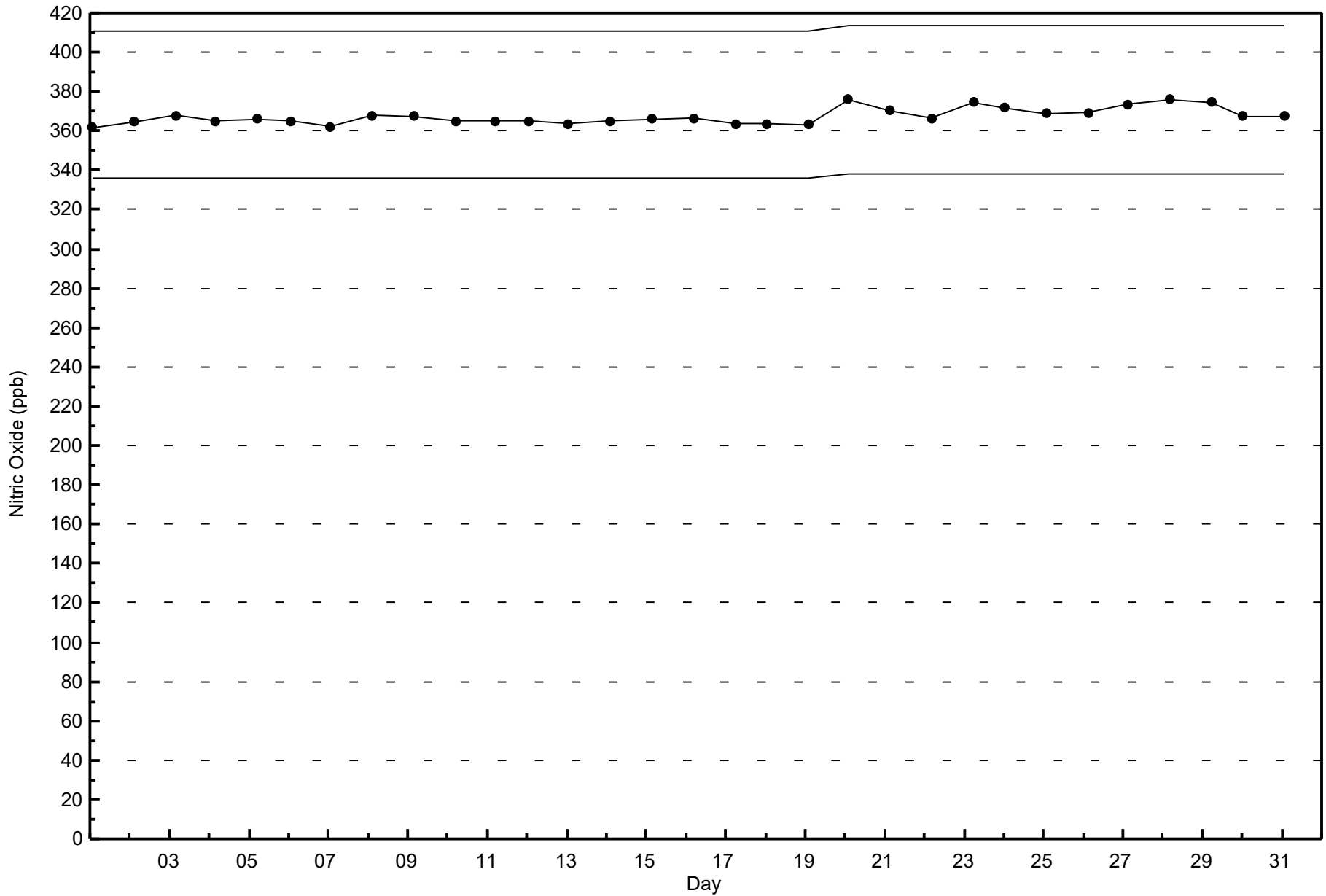


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Fort McKay South









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

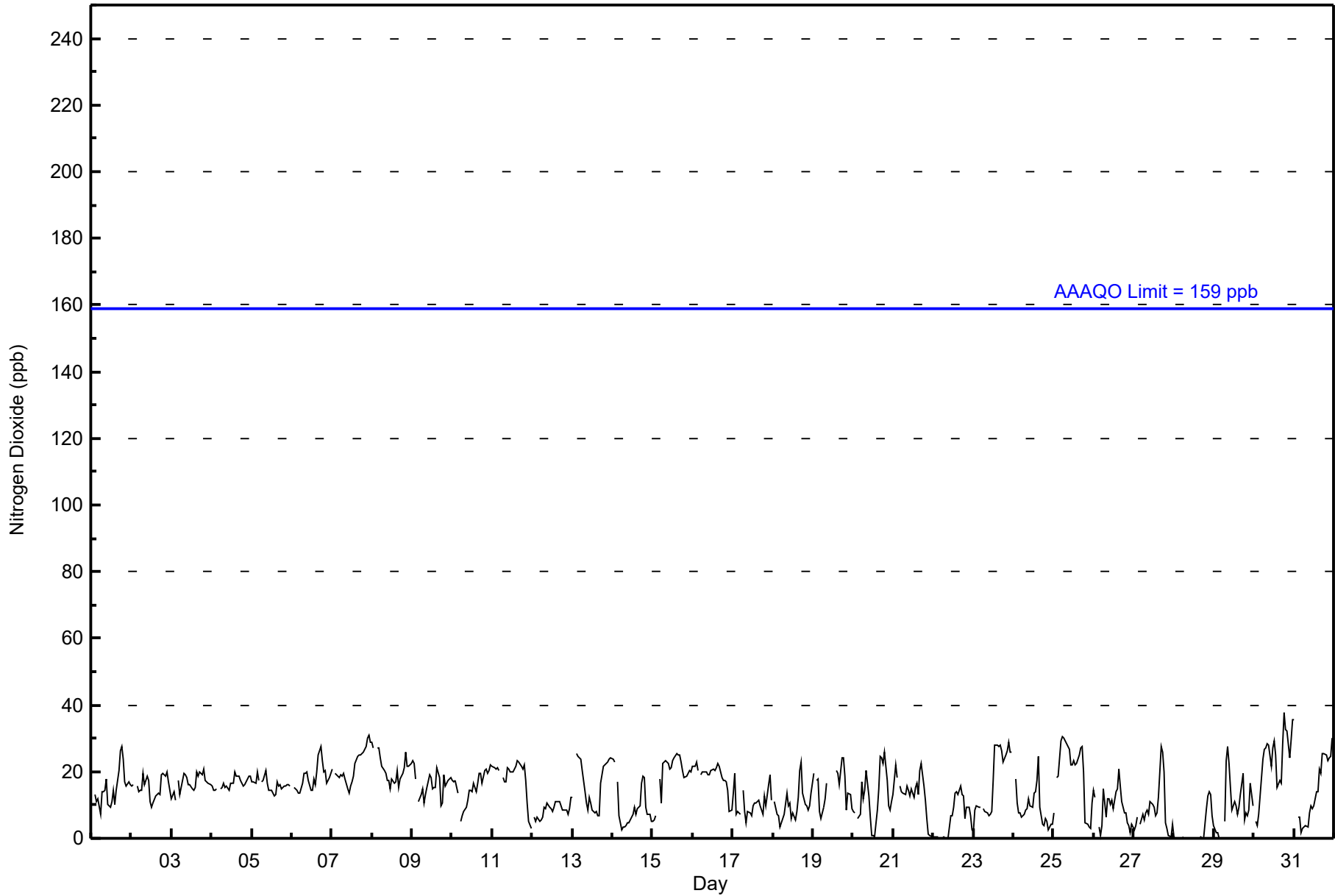
Fort McKay South - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 37.9 ppb on Jan 30 19:00		Maximum Daily Average: 23.6 ppb on Jan 30																			Hours of Data:	708					
Minimum Value: 0.2 ppb on Jan 22 06:00		Minimum Daily Average: 2.6 ppb on Jan 28																			Hours of Missing Data:	36					
Maximum Diurnal Average: 18.8 ppb at hour 18		Minimum Diurnal Average: 11.7 ppb at hour 6																			Hours of Calibration:	36					
Monthly Average: 14.38 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 4.2 Q ₁ = 8.4 Median = 14.7 Q ₃ = 19.8 P ₉₀ = 24.1 P ₉₉ = 30.0																			Percent Operational Time:	100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	13.6	Z	13.0	11.1	12.0	7.0	13.8	14.1	14.4	17.6	10.0	9.2	11.2	14.5	10.2	14.3	20.5	26.2	27.4	23.8	16.8	15.8	17.0	16.3	15.2	27.4	
2-Jan	15.5	16.2	Z	15.8	14.1	14.4	14.5	19.4	16.1	18.6	17.2	11.1	9.2	10.8	12.7	13.0	13.5	13.1	18.9	19.6	18.8	19.9	17.1	14.6	15.4	19.9	
3-Jan	12.0	14.1	11.4	Z	17.5	13.2	15.3	19.7	19.0	18.2	16.1	16.2	14.9	14.4	15.4	19.8	18.7	20.1	19.0	20.7	17.5	16.8	16.7	15.9	16.6	20.7	
4-Jan	15.8	14.5	14.5	15.0	Z	14.8	15.4	16.4	15.3	15.6	14.2	16.7	16.4	16.5	20.1	18.8	18.5	17.2	16.7	15.6	16.3	17.8	18.8	18.6	16.5	20.1	
5-Jan	16.9	16.8	16.6	19.9	17.2	Z	16.9	17.5	20.5	16.7	14.5	14.5	14.4	12.5	13.1	16.9	15.7	16.0	15.0	15.5	15.8	16.3	16.2	15.7	16.1	20.5	
6-Jan	Z	15.2	14.8	14.6	13.4	13.6	16.4	19.5	19.4	19.9	17.2	14.3	14.3	17.7	16.0	20.1	25.1	27.7	23.5	19.8	20.5	16.4	18.1	19.5	18.1	27.7	
7-Jan	20.7	Z	19.4	19.0	18.3	19.1	18.5	19.5	17.7	15.0	13.6	15.7	17.0	18.6	22.4	24.5	24.8	25.2	25.4	25.8	27.6	29.9	31.0	28.9	21.6	31.0	
8-Jan	28.9	27.2	Z	27.0	27.0	24.3	21.6	20.2	19.4	17.3	17.3	15.0	17.6	16.4	16.9	20.2	15.4	17.7	19.7	21.3	25.7	21.4	21.6	22.4	20.9	28.9	
9-Jan	23.4	22.6	17.8	Z	11.0	13.2	14.7	10.6	13.1	15.1	18.9	18.3	15.0	15.2	15.1	21.2	18.4	9.9	10.5	19.1	15.5	17.2	17.6	18.3	16.2	23.4	
10-Jan	17.3	16.9	17.4	13.4	Z	5.0	6.8	7.9	9.4	11.4	14.2	14.5	13.9	16.4	13.8	16.6	19.4	19.3	16.6	20.5	20.8	19.5	20.3	22.1	15.4	22.1	
11-Jan	21.7	21.3	20.9	21.0	20.2	Z	18.2	16.9	16.8	21.3	20.9	20.0	20.0	20.9	21.7	23.5	22.9	21.8	20.6	22.0	17.3	10.7	5.1	3.1	18.6	23.5	
12-Jan	Z	6.3	5.2	6.4	5.0	5.5	6.3	9.2	8.9	10.7	9.3	8.9	8.0	9.2	10.9	10.9	10.9	9.6	8.6	8.6	8.4	7.4	8.8	12.1	8.5	12.1	
13-Jan	12.2	Z	25.3	24.4	24.1	23.6	20.3	13.8	10.7	8.3	12.4	10.4	8.4	7.7	8.1	6.7	6.8	16.5	21.6	22.0	22.3	22.9	23.8	24.1	16.4	25.3	
14-Jan	23.7	22.7	Z	17.1	6.7	2.5	3.2	3.5	4.0	4.6	4.8	6.5	7.2	9.2	7.0	8.9	9.7	16.5	18.6	18.2	9.3	7.1	7.0	5.0	9.7	23.7	
15-Jan	4.9	5.6	6.8	Z	17.6	10.5	22.6	23.0	23.3	22.5	20.7	21.1	23.1	24.1	25.4	25.0	24.8	22.8	20.3	18.3	18.7	19.3	20.3	20.0	19.2	25.4	
16-Jan	21.4	21.6	22.7	20.2	Z	19.1	20.0	20.0	20.1	19.2	18.9	20.4	20.6	20.5	21.1	22.4	21.5	18.4	17.4	17.5	17.0	14.6	8.0	8.6	18.7	22.7	
17-Jan	13.4	19.7	7.0	8.1	7.0	Z	14.5	7.9	4.7	8.1	7.7	6.9	9.7	10.7	10.7	11.4	9.8	8.5	7.0	12.5	9.9	15.9	19.2	11.3	10.5	19.7	
18-Jan	Z	11.1	7.2	6.7	3.6	4.5	5.9	7.2	13.6	9.9	10.4	5.9	7.6	5.6	7.9	12.1	20.2	23.0	13.4	10.0	9.7	8.6	9.9	13.7	9.9	23.0	
19-Jan	19.5	Z	17.5	17.9	8.1	6.0	9.2	11.9	16.7	C	C	C	C	C	20.2	19.6	16.3	24.2	24.0	18.7	8.3	13.5	13.3	8.8	15.2	24.2	
20-Jan	8.1	7.8	Z	5.8	7.2	17.1	11.9	14.2	20.4	12.6	6.2	1.0	0.9	0.6	8.3	14.9	24.4	24.1	22.5	25.7	17.2	9.9	8.4	11.2	12.2	25.7	
21-Jan	13.0	22.1	18.2	Z	15.6	14.1	13.4	13.1	15.8	14.3	12.5	14.7	12.3	15.3	16.6	13.3	20.4	22.5	15.6	11.4	5.8	1.3	0.7	0.6	13.2	22.5	
22-Jan	0.6	0.5	0.4	0.3	Z	0.2	0.3	0.2	0.2	0.2	6.9	6.6	9.3	13.4	14.1	13.3	15.5	13.3	12.8	5.9	9.3	9.3	6.7	2.6	6.2	15.5	
23-Jan	2.1	8.3	9.8	9.3	9.2	Z	9.0	8.0	7.7	6.7	7.1	8.0	17.4	28.1	28.1	27.6	27.8	26.2	22.7	24.9	26.3	28.7	25.9	26.0	17.2	28.7	
24-Jan	Z	18.0	10.8	7.5	7.6	6.2	7.2	8.4	8.8	11.9	9.9	9.3	13.7	14.0	17.2	24.7	9.2	4.1	3.7	5.8	4.9	2.7	4.2	4.2	9.3	24.7	
25-Jan	7.8	Z	18.4	18.5	29.3	30.6	29.9	29.2	28.5	26.7	22.2	22.0	23.2	22.1	22.6	24.8	27.3	27.6	19.9	4.8	4.2	3.6	3.1	10.4	19.9	30.6	
26-Jan	14.6	12.2	Z	3.6	0.7	3.9	14.7	6.3	11.9	11.7	10.1	11.6	8.9	13.8	14.9	20.8	15.6	10.9	7.8	7.6	4.8	3.9	1.9	4.3	9.4	20.8	
27-Jan	2.4	4.0	6.4	Z	4.1	7.4	5.6	7.8	8.5	7.2	11.1	10.3	9.3	6.9	7.5	12.3	27.6	25.7	19.8	4.8	2.9	0.7	0.4	4.2	8.6	27.6	
28-Jan	0.5	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	9.1	12.6	13.8	13.3	6.8	2.6	13.8	
29-Jan	3.7	1.9	1.6	0.2	0.2	Z	4.9	23.2	27.5	22.6	15.3	8.3	11.2	9.8	7.0	9.4	13.1	19.6	5.5	7.7	6.6	8.3	16.7	9.7	10.2	27.5	
30-Jan	Z	5.1	4.0	7.2	18.2	23.8	26.7	27.3	28.6	28.1	21.8	27.2	29.1	25.2	15.4	17.2	16.5	28.5	37.9	32.5	32.3	24.3	29.5	35.5	23.6	37.9	
31-Jan	35.4	Z	6.3	6.2	1.8	3.1	3.5	3.8	3.6	7.7	9.7	9.0	9.7	14.1	13.9	20.6	19.3	25.5	25.3	25.1	23.5	24.0	24.4	30.0	15.0	35.4	
		14.2	13.3	12.1	12.2	12.2	11.7	12.9	13.5	14.3	14.0	13.0	12.5	13.1	14.1	14.7	16.9	17.7	18.8	17.4	16.6	15.1	14.2	14.4	14.3	Diurnal Average	
		35.4	27.2	25.3	27.0	29.3	30.6	29.9	29.2	28.6	28.1	22.2	27.2	29.1	28.1	28.1	27.6	27.8	28.5	37.9	32.5	32.3	29.9	31.0	35.5	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 159 ppb																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	559	78.95	78.95
21 - 40	149	21.05	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	81	34	5	5	2	4	14	116	139	39	19	26	18	11	20	23	556
21 - 40	38	11	1	1	0	0	5	21	23	7	5	1	3	1	10	20	147
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	45	6	6	2	4	19	137	162	46	24	27	21	12	30	43	703

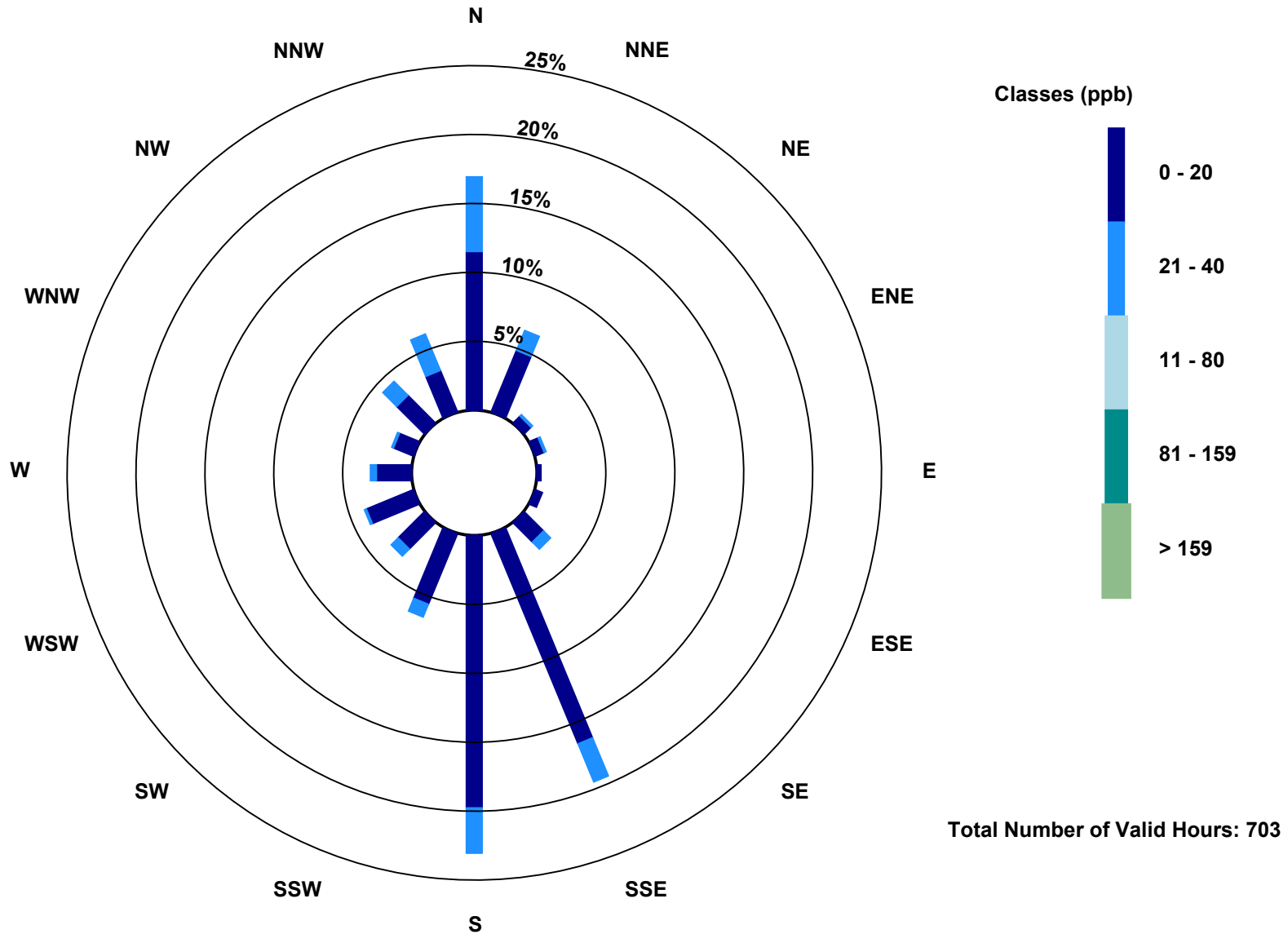
Total Number of Valid Hours: 703

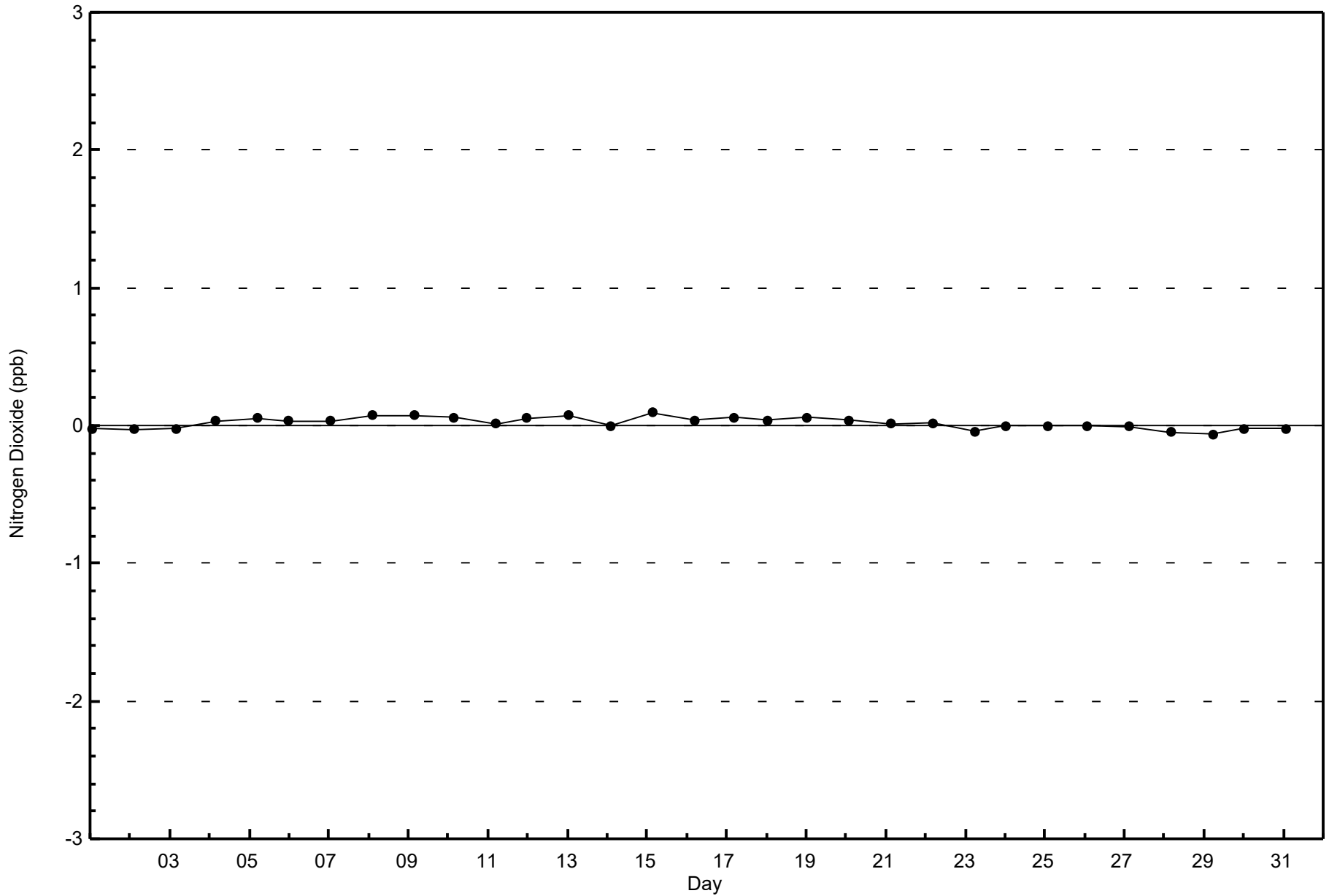
Total Number of Hours: 744

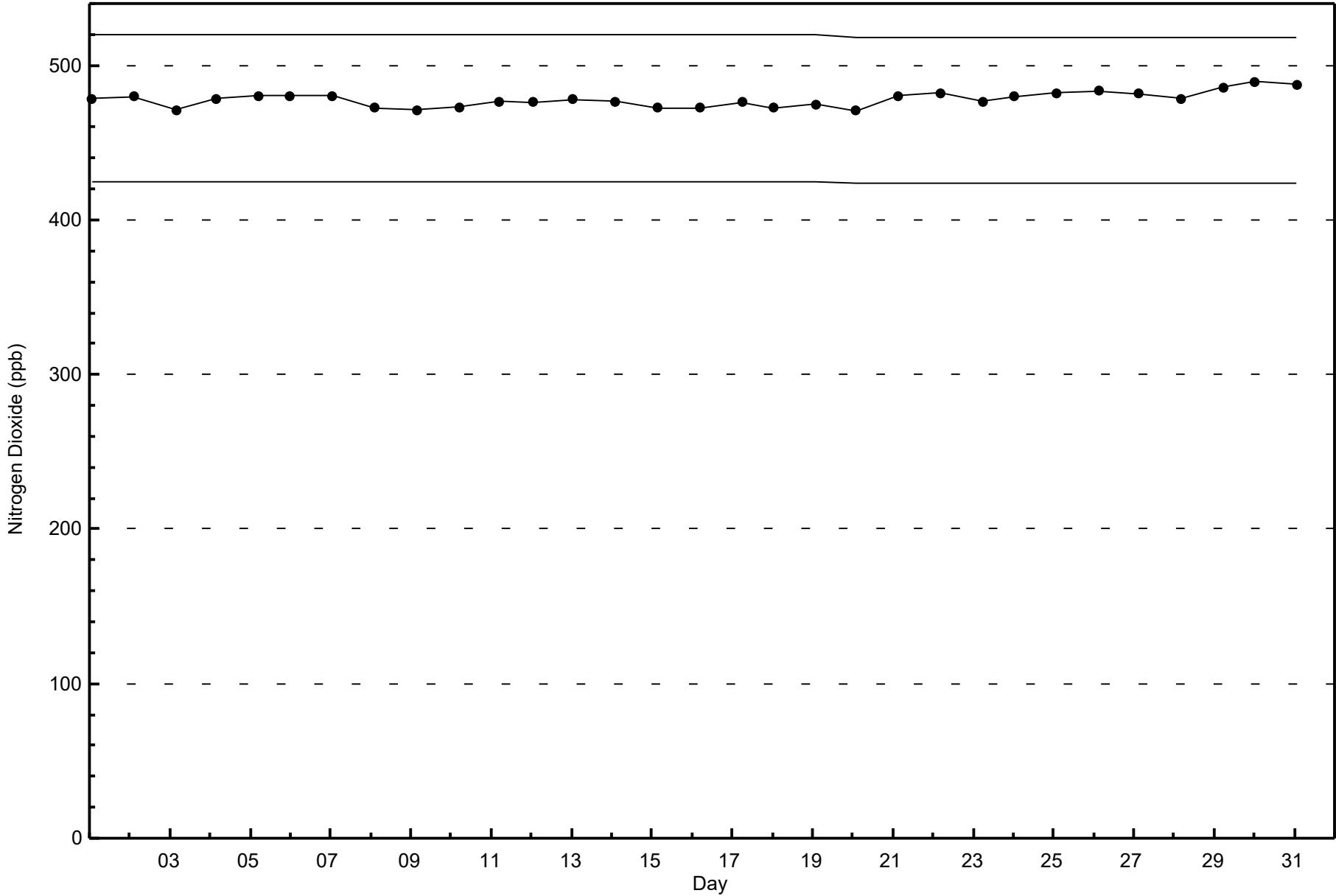


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

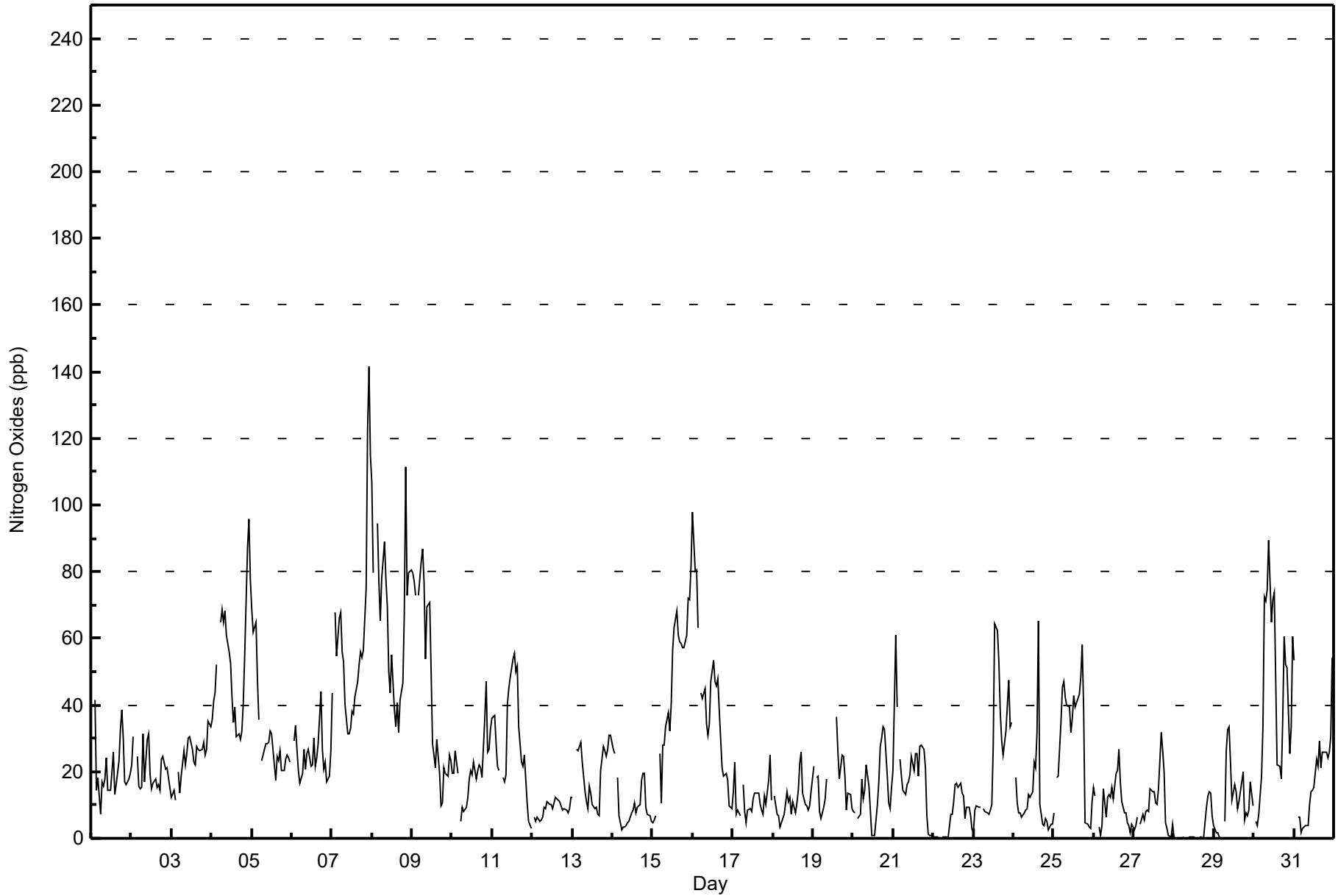
Nitrogen Oxides (NO_x) - ppb
Fort McKay South - January 2023

Maximum Value: 141.4 ppb on Jan 7 23:00 Maximum Daily Average: 66.5 ppb on Jan 8																						Hours in Service: 744 Hours of Data: 708				
Minimum Value: 0.2 ppb on Jan 22 10:00 Minimum Daily Average: 2.6 ppb on Jan 28 Maximum Diurnal Average: 28.3 ppb at hour 1 Minimum Diurnal Average: 20.7 ppb at hour 5 Monthly Average: 24.81 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 4.2 Q ₁ = 9.1 Median = 19.0 Q ₃ = 32.2 P ₉₀ = 56.4 P ₉₉ = 94.1																						Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	19.8	Z	41.6	14.3	18.3	7.2	17.1	15.5	17.9	24.2	14.3	14.4	19.8	26.0	13.2	16.1	23.4	32.7	38.6	29.9	17.1	16.2	17.9	19.4	20.6	41.6
2-Jan	22.1	30.4	Z	24.5	15.6	15.0	15.5	31.5	17.0	29.7	31.4	19.0	14.7	16.6	17.6	15.3	16.0	14.4	23.8	24.4	20.9	21.0	18.3	15.0	20.4	31.5
3-Jan	12.1	14.2	11.5	Z	19.8	13.4	18.6	26.1	22.0	25.6	30.1	30.6	26.6	23.1	22.1	27.5	26.8	26.2	26.5	28.6	24.8	26.8	35.2	33.3	24.0	35.2
4-Jan	35.6	41.0	43.6	51.9	Z	65.0	68.5	64.6	68.3	61.1	55.9	52.6	42.5	34.7	39.5	30.5	31.5	29.7	32.2	40.8	55.2	87.1	95.6	77.5	52.4	95.6
5-Jan	68.7	62.0	64.7	47.7	35.4	Z	23.1	24.8	28.4	28.6	29.0	32.1	31.2	21.9	17.2	24.5	23.4	26.1	20.5	20.4	23.6	25.0	24.4	23.0	31.5	68.7
6-Jan	Z	29.3	34.1	26.7	20.4	16.6	19.5	26.6	20.8	25.6	26.6	21.7	22.2	30.0	21.6	24.3	28.3	44.2	26.7	20.6	22.9	16.9	18.7	26.1	24.8	44.2
7-Jan	43.7	Z	67.7	54.7	65.9	67.6	55.9	52.8	40.2	31.2	31.2	33.0	38.1	37.4	42.6	47.1	52.1	55.9	54.1	56.5	75.1	122.5	141.4	115.0	60.1	141.4
8-Jan	106.7	79.6	Z	94.4	77.1	65.2	78.0	88.9	77.5	69.4	50.2	43.7	55.2	38.6	33.4	40.6	31.8	41.5	46.7	67.5	111.5	72.7	79.8	80.3	66.5	111.5
9-Jan	79.5	77.0	72.8	Z	72.8	82.9	86.8	76.7	53.9	69.7	70.8	50.2	28.5	24.9	21.1	29.6	19.6	9.9	10.6	21.4	19.5	18.5	24.8	23.4	45.4	86.8
10-Jan	19.3	19.4	26.1	19.6	Z	5.0	9.3	8.0	9.5	12.5	17.8	20.4	19.1	22.7	17.6	20.1	22.2	21.2	18.4	36.2	47.2	25.8	26.7	32.4	20.7	47.2
11-Jan	35.9	36.7	28.5	21.8	20.4	Z	18.4	17.0	19.0	40.1	45.0	48.5	53.9	55.4	50.0	51.5	33.4	23.0	21.6	24.9	18.0	10.7	5.1	3.1	29.6	55.4
12-Jan	Z	6.3	5.2	6.4	5.0	5.5	6.3	9.2	8.9	11.2	10.3	10.1	9.1	10.5	12.2	11.5	11.2	9.6	8.6	8.7	8.5	7.4	8.8	12.2	8.8	12.2
13-Jan	12.2	Z	26.5	26.1	27.5	28.9	22.9	14.0	10.8	8.9	15.6	13.5	10.3	8.9	9.2	7.1	6.9	20.4	27.4	26.1	24.8	26.5	31.0	30.9	19.0	31.0
14-Jan	26.8	25.5	Z	18.3	6.7	2.5	3.2	3.5	4.0	4.8	5.3	7.6	8.6	10.7	7.8	9.5	10.0	17.3	19.3	19.4	9.4	7.1	7.0	5.0	10.4	26.8
15-Jan	4.9	5.6	6.9	Z	25.3	10.6	27.9	27.9	33.3	37.8	32.3	40.1	56.3	63.0	68.0	61.2	58.7	58.5	57.1	57.2	61.1	71.9	71.7	81.5	44.3	81.5
16-Jan	97.9	80.2	80.5	63.3	Z	43.5	42.1	44.8	34.1	30.8	34.1	46.8	53.5	47.0	45.7	47.8	38.7	21.2	18.5	19.2	19.4	17.6	9.6	9.0	41.1	97.9
17-Jan	13.8	22.7	7.1	8.3	7.0	Z	16.0	7.9	4.7	8.5	8.8	7.9	12.1	13.7	13.5	13.4	10.3	8.7	7.0	12.9	10.1	17.4	25.0	11.4	11.6	25.0
18-Jan	Z	12.8	7.3	6.7	3.6	4.5	5.9	7.2	13.9	11.1	12.3	7.4	11.1	7.7	10.6	14.3	22.4	26.0	13.6	10.0	9.7	8.6	9.9	13.9	10.9	26.0
19-Jan	21.7	Z	18.1	18.6	8.2	6.0	9.2	12.0	17.7	C	C	C	C	C	36.6	26.1	17.6	25.1	24.5	18.8	8.3	13.5	13.3	8.8	16.9	36.6
20-Jan	8.1	7.8	Z	5.8	7.2	17.8	12.1	14.6	22.1	15.8	8.3	1.1	1.0	0.7	10.3	17.0	27.5	30.0	33.3	32.6	18.6	10.5	9.0	15.4	14.2	33.3
21-Jan	20.2	61.1	39.5	Z	23.9	18.7	14.3	13.2	16.2	16.9	19.1	24.5	20.4	25.6	25.5	18.5	27.4	28.1	26.7	21.0	6.9	1.3	0.7	0.6	20.5	61.1
22-Jan	0.6	0.5	0.4	0.3	Z	0.2	0.3	0.2	0.2	0.2	7.3	7.4	11.1	16.0	16.7	15.3	16.3	13.4	12.9	5.9	9.3	9.3	6.7	2.6	6.6	16.7
23-Jan	2.1	8.3	9.8	9.3	9.2	Z	9.0	8.0	7.8	7.1	8.3	10.1	27.5	64.5	62.4	52.8	37.6	29.1	25.2	32.2	39.9	47.4	33.5	34.8	25.0	64.5
24-Jan	Z	18.2	10.8	7.5	7.6	6.2	7.4	8.6	9.0	13.1	12.3	13.8	22.8	21.1	31.7	65.4	10.0	4.2	3.7	5.8	4.9	2.7	4.2	4.2	12.8	65.4
25-Jan	7.8	Z	18.4	18.6	35.3	45.3	46.9	42.6	39.8	39.3	31.8	36.1	42.6	39.4	40.6	43.3	48.5	58.1	39.6	4.8	4.2	3.6	3.1	11.1	30.5	58.1
26-Jan	15.4	12.7	Z	3.6	0.7	3.9	14.8	6.3	12.3	13.0	12.2	15.2	11.8	19.6	20.2	26.7	17.0	11.0	7.8	7.6	4.8	3.9	1.9	4.3	10.7	26.7
27-Jan	2.4	4.0	6.4	Z	4.1	7.4	5.6	7.8	8.7	8.1	14.7	14.0	14.1	10.4	10.0	14.8	31.8	26.3	20.0	4.8	2.9	0.7	0.4	4.2	9.7	31.8
28-Jan	0.5	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	9.1	12.7	13.9	13.4	6.8	2.6	13.9
29-Jan	3.7	1.9	1.6	0.2	0.2	Z	4.9	26.5	32.5	33.5	22.9	11.6	16.1	13.9	9.0	11.2	14.0	19.9	5.5	7.8	6.6	8.3	16.9	9.7	12.1	33.5
30-Jan	Z	5.1	4.0	7.3	18.6	33.9	72.5	71.1	74.7	89.5	64.9	71.7	73.6	48.3	22.1	21.6	17.9	36.0	60.5	52.1	51.3	25.5	33.6	60.7	44.2	89.5
31-Jan	53.5	Z	6.3	6.2	1.8	3.1	3.5	3.8	3.7	10.2	14.0	14.3	15.4	23.6	21.6	29.2	21.4	25.9	25.7	26.0	23.9	25.7	30.7	54.3	19.3	54.3
28.3 26.5 24.6 21.6 20.7 22.2 23.7 24.6 23.5 25.9 24.6 24.0 25.6 25.9 24.8 26.9 24.3 25.6 24.4 24.3 24.9 24.7 26.4 26.8																								Diurnal Average		
106.7 80.2 80.5 94.4 77.1 82.9 86.8 88.9 77.5 89.5 70.8 71.7 73.6 64.5 68.0 65.4 58.7 58.5 60.5 67.5 111.5 122.5 141.4 115.0																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	383	54.10	54.10
21 - 40	196	27.68	81.78
41 - 80	114	16.10	97.88
81 - 159	13	1.84	99.72
> 159	0	0.00	99.72

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort McKay South - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	54	30	4	5	2	1	6	87	86	20	11	23	16	10	16	11	382
21 - 40	35	8	1	1	0	3	8	34	57	12	6	2	1	0	10	18	196
11 - 80	28	7	1	0	0	0	5	14	18	11	6	1	3	2	3	11	110
81 - 159	1	0	0	0	0	0	0	2	1	3	1	1	1	0	1	2	13
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	45	6	6	2	4	19	137	162	46	24	27	21	12	30	42	701

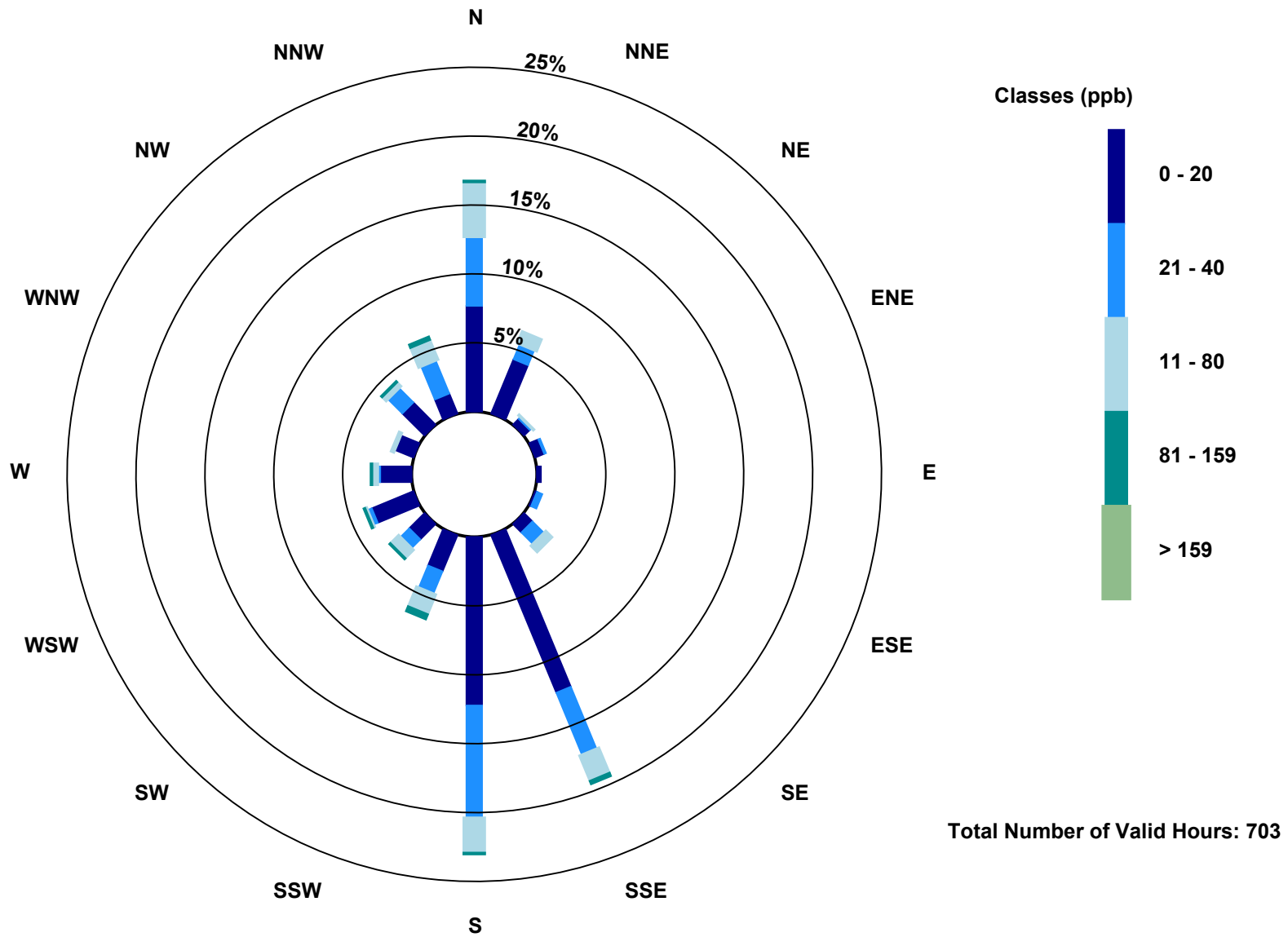
Total Number of Valid Hours: 703

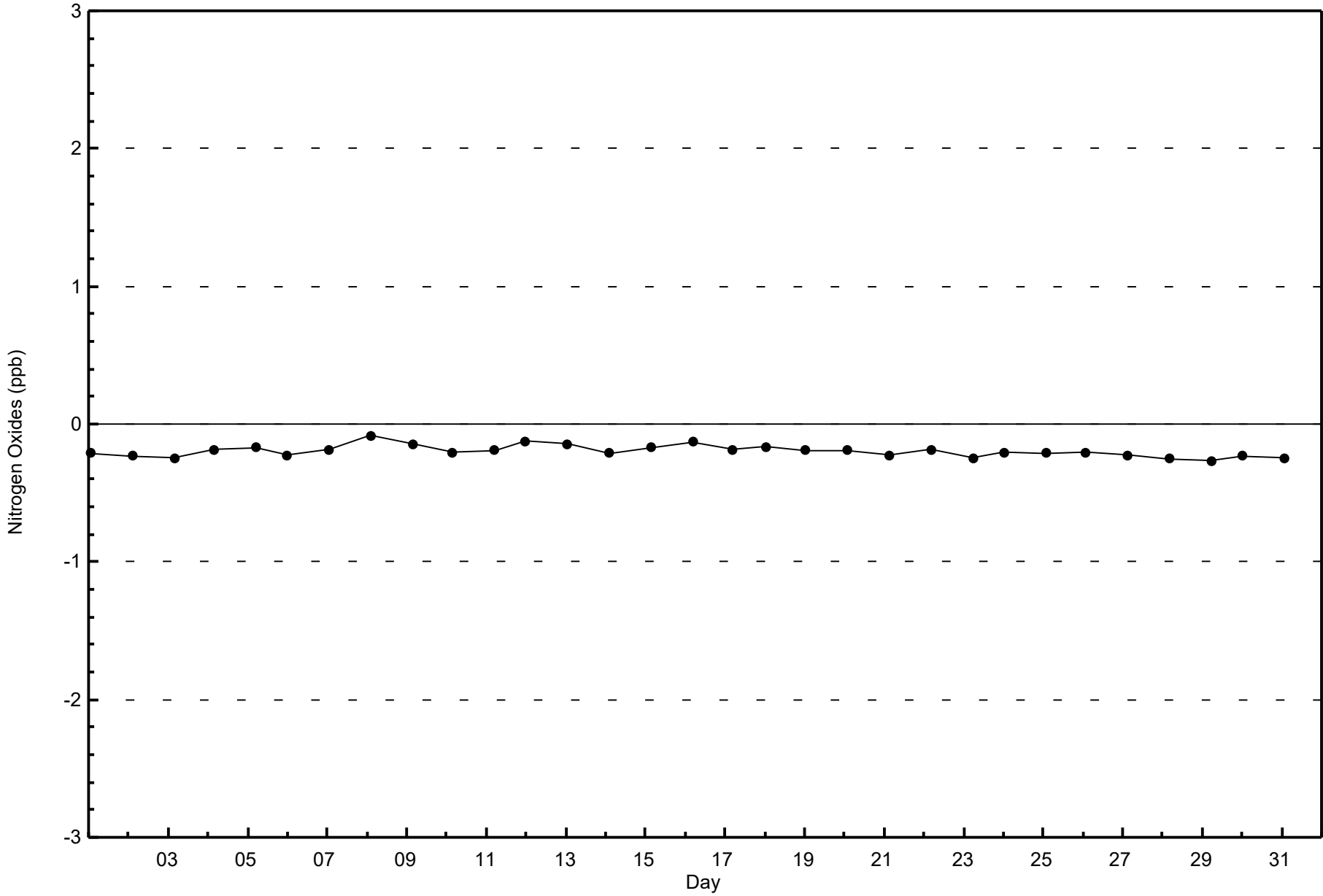
Total Number of Hours: 744

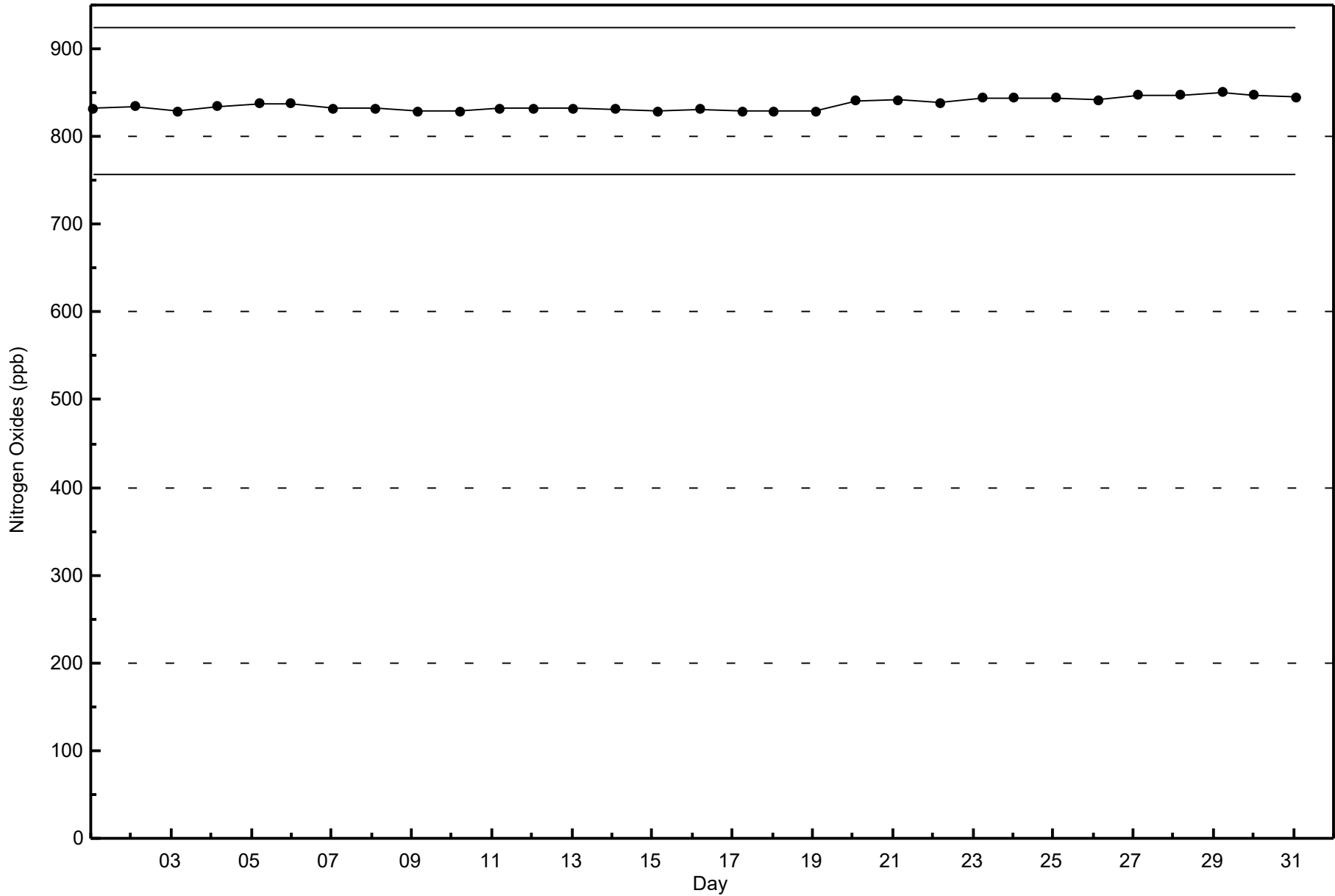


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay South









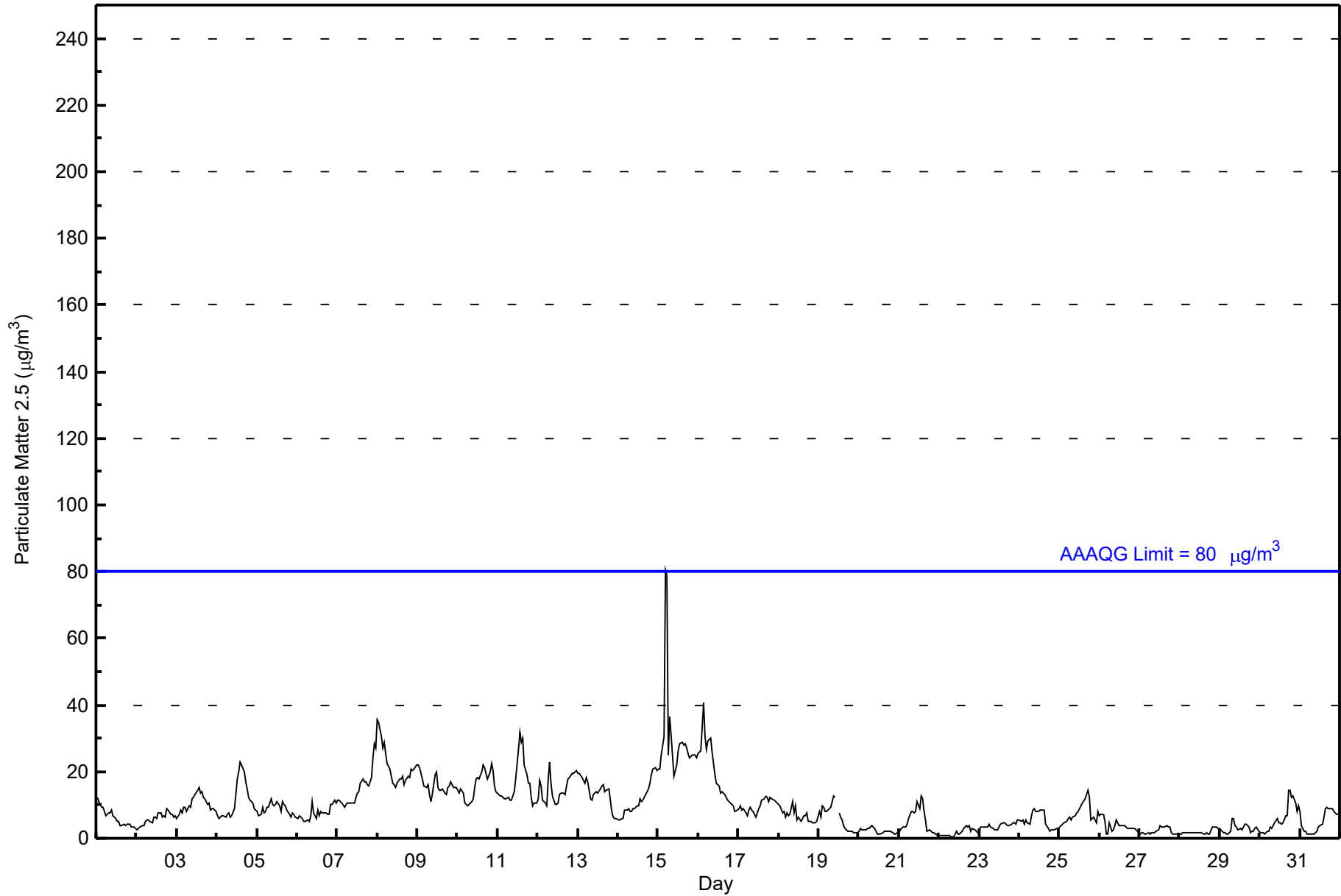
Wood Buffalo Environmental Association

Summary of Hour Averages

Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Fort McKay South - January 2023

Number of Exceedences (AAAQO):		1-hr: 1	24-hr: 1	Hours in Service: 744																	744																												
Maximum Value: 80.7 µg/m ³ on Jan 15 05:00		Maximum Daily Average: 30.2 µg/m ³ on Jan 15																	743																														
Minimum Value: 0.5 µg/m ³ on Jan 22 09:00		Minimum Daily Average: 1.8 µg/m ³ on Jan 22																	1																														
Maximum Diurnal Average: 11.0 µg/m ³ at hour 16		Minimum Diurnal Average: 8.7 µg/m ³ at hour 10																	1																														
Monthly Average: 9.53 µg/m ³		Percentiles: P ₁ = 0.9 P ₁₀ = 1.8 Q ₁ = 3.6 Median = 7.9 Q ₃ = 13.0 P ₉₀ = 19.4 P ₉₉ = 31.5																	100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	12.2	11.0	10.3	9.3	9.4	6.9	7.1	7.7	7.7	8.3	7.0	5.8	5.2	5.0	3.9	4.0	4.0	4.0	4.2	4.2	4.1	3.6	3.3	3.0	6.3	12.2																							
2-Jan	2.7	2.9	3.2	3.9	3.9	5.0	5.5	5.7	5.2	4.7	6.2	6.4	6.1	7.8	7.4	6.5	6.7	6.2	8.8	8.6	7.1	7.0	6.2	6.6	5.9	8.8																							
3-Jan	5.9	7.3	8.4	7.6	9.4	9.2	8.3	9.8	9.4	11.7	12.2	13.3	14.4	15.3	13.5	14.1	12.2	11.9	10.1	10.4	8.6	8.9	8.8	7.9	10.4	15.3																							
4-Jan	6.9	5.9	6.2	6.7	6.6	6.3	7.2	7.5	6.6	7.0	8.9	13.0	17.8	19.9	22.9	21.9	19.9	17.0	14.9	12.3	11.5	10.4	8.8	8.5	11.4	22.9																							
5-Jan	7.9	7.0	7.4	9.2	7.8	8.1	9.1	9.2	12.0	10.0	9.7	10.0	11.1	9.6	8.1	11.0	10.4	9.6	8.6	7.1	6.4	7.5	7.0	6.5	8.8	12.0																							
6-Jan	5.9	6.8	6.5	5.7	5.1	5.2	5.3	5.1	6.8	11.0	7.8	6.1	8.5	6.8	8.0	7.4	7.7	7.5	7.1	7.3	10.2	10.4	11.5	10.6	7.5	11.5																							
7-Jan	11.3	11.6	11.0	10.6	9.5	10.4	10.4	10.6	10.8	10.7	10.6	12.1	13.6	14.2	16.4	17.9	17.1	17.0	15.9	15.6	18.1	24.0	28.4	27.2	14.8	28.4																							
8-Jan	35.7	34.9	30.7	27.0	28.7	25.6	22.5	20.9	18.8	16.6	15.9	15.1	16.6	17.9	17.8	18.9	16.2	17.2	18.7	18.4	20.8	20.5	21.0	22.2	21.6	35.7																							
9-Jan	22.1	21.2	19.4	17.9	15.7	15.3	16.0	13.2	11.2	13.1	19.0	20.0	15.2	14.5	14.2	14.9	13.7	13.1	15.2	15.6	17.1	15.1	15.2	15.3	16.0	22.1																							
10-Jan	14.4	13.5	14.6	13.7	10.8	10.1	9.7	10.2	10.9	11.8	15.2	17.8	18.2	17.8	19.9	22.0	21.3	19.6	17.8	20.1	22.3	20.3	15.6	14.0	15.9	22.3																							
11-Jan	13.4	12.9	12.6	12.2	11.9	11.7	12.2	11.5	11.3	12.9	14.0	17.9	26.7	32.0	28.6	29.9	22.1	19.1	16.7	16.6	12.1	9.9	10.4	10.6	16.2	32.0																							
12-Jan	11.8	17.4	15.8	11.6	10.5	9.9	17.4	23.1	16.4	12.7	10.2	10.2	10.7	13.3	13.6	13.7	13.1	15.9	17.9	18.4	19.4	19.5	19.8	20.3	15.1	23.1																							
13-Jan	19.4	19.3	18.2	17.5	16.3	18.3	16.9	11.7	11.4	13.0	13.6	13.9	13.8	14.9	15.6	15.9	14.0	14.2	15.0	11.3	8.1	6.5	6.1	5.7	13.8	19.4																							
14-Jan	5.6	5.6	5.7	5.8	8.5	8.4	8.7	8.0	8.1	8.9	8.9	9.5	9.9	11.7	11.0	11.5	13.3	14.0	15.0	16.5	19.2	20.8	21.3	20.2	11.5	21.3																							
15-Jan	20.8	20.8	25.0	30.4	80.7	78.8	25.2	36.5	30.8	18.7	20.5	22.2	26.2	28.3	28.8	28.1	28.2	27.1	25.4	24.1	24.8	25.0	25.0	24.3	30.2	80.7																							
16-Jan	25.2	26.1	33.5	40.5	30.6	26.5	29.3	30.1	25.6	22.6	18.9	16.6	15.6	13.7	13.8	13.7	13.2	11.5	10.8	10.4	10.4	9.6	7.9	8.3	19.4	40.5																							
17-Jan	8.9	9.7	8.6	8.9	7.5	6.9	8.3	9.2	8.7	8.0	6.5	7.6	8.8	9.7	11.2	11.8	12.7	12.1	11.1	12.1	11.7	11.6	11.1	10.6	9.7	12.7																							
18-Jan	10.2	9.8	7.8	7.9	6.4	7.7	6.9	7.1	11.0	7.8	9.7	5.5	6.2	5.1	6.1	6.7	7.0	7.5	5.1	5.1	4.8	4.7	4.8	4.9	6.9	11.0																							
19-Jan	7.9	6.2	9.8	9.5	7.9	8.2	9.1	9.3	11.1	12.8	12.4	C	7.7	6.4	5.5	3.9	2.8	2.3	2.1	1.9	1.9	1.9	1.9	1.9	6.3	12.8																							
20-Jan	2.2	2.8	2.4	2.5	2.4	2.8	2.9	3.3	3.6	2.8	2.3	1.4	1.3	1.4	1.7	1.9	2.2	2.2	2.1	2.1	1.7	1.3	1.2	1.5	2.2	3.6																							
21-Jan	1.7	3.1	3.2	3.2	3.3	4.0	5.9	8.2	8.1	7.4	8.0	11.2	9.0	12.9	12.0	8.2	5.7	2.2	2.3	2.2	1.7	1.6	1.1	1.0	5.3	12.9																							
22-Jan	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.6	0.5	0.6	2.2	1.2	1.3	1.8	2.3	2.9	3.7	3.5	3.7	2.1	2.9	2.7	2.3	1.8	1.8	3.7																							
23-Jan	1.9	3.3	3.4	3.2	3.2	3.5	4.1	3.4	3.0	2.7	2.5	2.8	3.3	4.3	4.8	4.6	4.2	3.9	3.7	4.1	4.5	4.8	4.4	5.7	3.7	5.7																							
24-Jan	5.7	4.9	5.5	4.3	5.7	4.5	4.3	6.8	8.4	9.1	7.9	8.1	8.5	8.5	8.6	8.5	4.3	2.8	2.3	2.4	2.7	2.6	2.8	2.9	5.5	9.1																							
25-Jan	3.3	3.6	4.1	4.6	5.3	5.9	6.3	5.6	6.3	6.9	7.7	8.1	9.0	9.8	10.7	12.0	13.2	14.5	12.2	5.7	6.3	5.5	4.8	7.9	7.5	14.5																							
26-Jan	7.0	7.2	7.1	5.1	1.4	1.3	4.5	2.1	2.6	4.0	5.4	4.5	4.0	3.9	3.8	3.8	3.3	2.9	3.1	3.2	3.2	3.1	2.5	2.0	3.8	7.2																							
27-Jan	1.3	1.7	1.5	1.4	1.1	1.7	1.4	1.7	1.7	1.7	2.1	2.4	3.8	3.4	3.2	3.4	4.0	3.6	3.5	1.8	1.4	1.3	1.3	1.5	2.2	4.0																							
28-Jan	1.3	1.4	1.6	1.7	1.6	1.7	1.6	1.5	1.6	1.6	1.5	1.6	1.5	1.5	1.3	1.5	1.3	1.4	3.3	3.6	3.5	3.5	3.0	1.9	3.6	3.6																							
29-Jan	3.0	1.9	1.9	1.5	1.4	1.4	2.0	5.7	5.8	3.7	3.2	2.7	2.9	2.5	3.4	4.4	4.1	3.4	1.5	2.3	2.1	2.9	3.2	2.2	2.9	5.8																							
30-Jan	1.6	1.6	1.5	1.4	1.9	2.3	3.2	2.9	3.8	4.7	6.1	4.5	4.5	4.4	4.8	6.6	6.7	14.3	14.5	12.2	12.5	10.6	7.9	9.9	6.0	14.5																							
31-Jan	8.0	4.0	2.0	2.1	1.4	1.4	1.2	1.4	1.3	1.6	2.1	3.3	4.0	4.3	6.3	8.9	9.4	8.8	9.1	8.7	8.2	7.8	7.2	7.2	5.0	9.4																							
																								9.2	9.2	9.4	9.3	10.2	10.0	8.8	9.3	9.0	8.7	9.0	9.2	9.8	10.4	10.6	11.0	10.3	10.0	9.7	9.2	9.3	9.2	8.9	8.9	Diurnal Average	
																								35.7	34.9	33.5	40.5	80.7	78.8	29.3	36.5	30.8	22.6	20.5	22.2	26.7	32.0	28.8	29.9	28.2	27.1	25.4	24.1	24.8	25.0	28.4	27.2	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	263	35.40	35.40
6 - 15	347	46.70	82.10
16 - 25	102	13.73	95.83
26 - 80	30	4.04	99.87
> 81.0	1	0.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort McKay South - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	50	24	2	6	1	0	4	17	48	19	13	23	16	10	18	11	262
6 - 15	36	14	2	0	0	2	12	97	113	28	7	3	5	3	9	16	347
16 - 25	24	6	2	0	1	2	4	16	14	3	3	1	2	1	3	17	99
26 - 80	11	4	0	0	0	0	1	9	0	0	1	1	0	0	0	2	29
> 81.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	122	48	6	6	2	4	21	139	175	50	24	28	23	14	30	46	738

Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

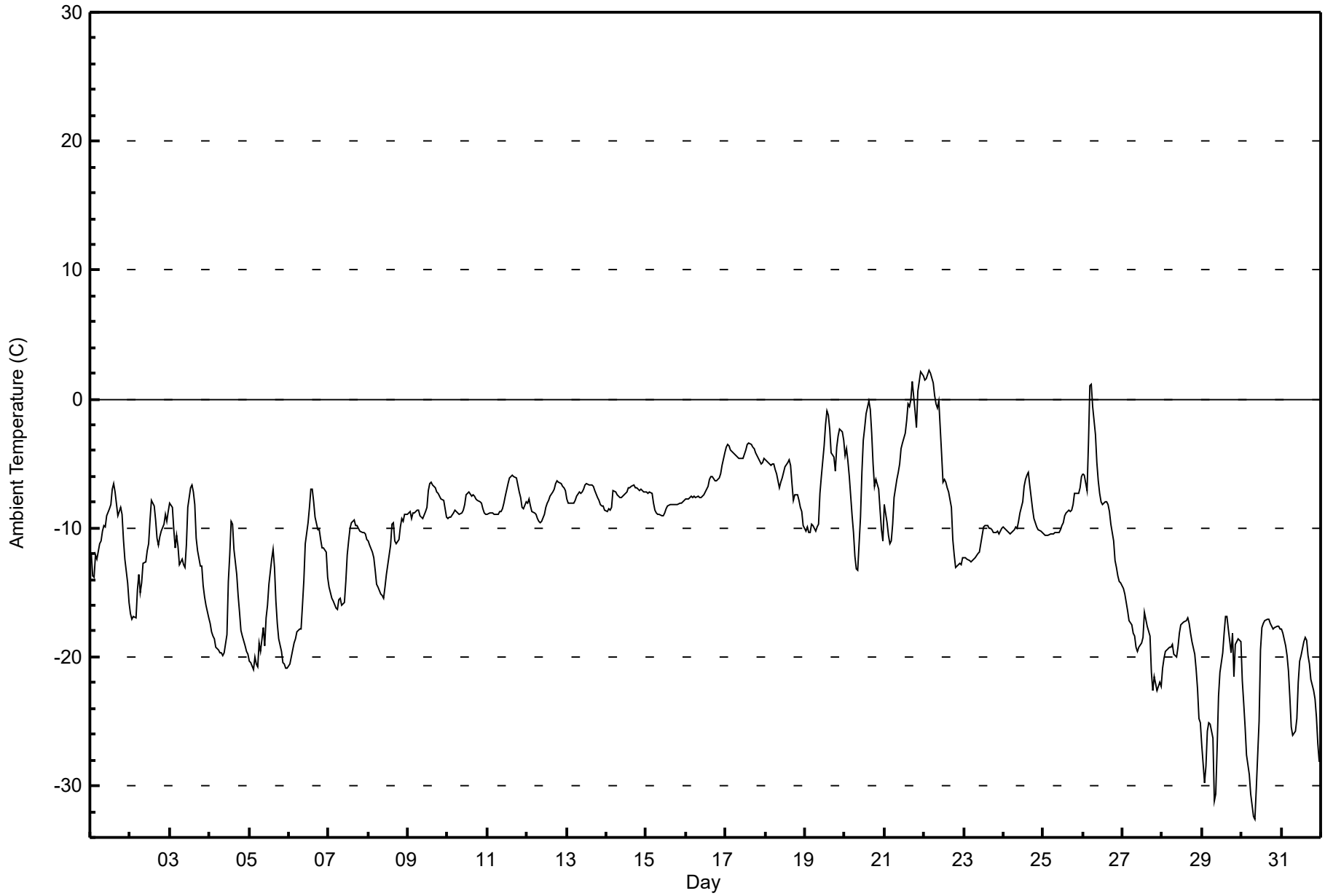
Ambient Temperature (AT) - C
Fort McKay South - January 2023

Maximum Value: 2.2 C on Jan 22 04:00		Maximum Daily Average: -3.9 C on Jan 21		Hours in Service: 744																																												
Minimum Value: -32.5 C on Jan 30 09:00		Minimum Daily Average: -22.7 C on Jan 29		Hours of Data: 744																																												
Maximum Diurnal Average: -8.4 C at hour 15		Minimum Diurnal Average: -12.7 C at hour 8		Hours of Missing Data: 0																																												
Monthly Average: -11.07 C		Percentiles: P ₁ = -29.5 P ₁₀ = -19.7 Q ₁ = -15.0 Median = -9.4 Q ₃ = -7.2 P ₉₀ = -4.7 P ₉₉ = 1.4		Hours of Calibration: 0																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-12.0	-13.7	-13.8	-12.1	-12.4	-11.2	-11.0	-10.2	-9.8	-9.9	-9.1	-8.5	-8.2	-6.9	-6.5	-7.2	-9.1	-8.7	-8.4	-9.0	-10.9	-12.4	-14.3	-15.8	-10.5	-6.5																						
2-Jan	-16.6	-17.1	-16.9	-16.9	-14.8	-13.6	-15.1	-14.3	-12.8	-12.6	-11.8	-11.2	-9.4	-7.8	-8.3	-9.4	-10.8	-11.3	-10.7	-10.3	-9.7	-9.0	-9.5	-8.7	-12.0	-7.8																						
3-Jan	-8.1	-8.4	-10.1	-11.5	-10.6	-11.4	-12.9	-12.5	-12.8	-13.1	-11.3	-8.4	-6.9	-6.6	-7.3	-8.2	-10.8	-11.7	-12.9	-13.0	-14.4	-15.3	-16.0	-16.9	-11.3	-6.6																						
4-Jan	-17.4	-18.1	-18.3	-18.6	-19.2	-19.5	-19.7	-19.7	-19.9	-19.7	-18.3	-14.1	-12.1	-9.5	-7.7	-11.7	-13.6	-15.3	-16.6	-17.9	-18.4	-19.2	-19.6	-19.8	-16.9	-9.5																						
5-Jan	-20.3	-20.5	-21.0	-20.0	-20.5	-20.8	-18.9	-19.6	-17.7	-19.1	-16.9	-16.0	-14.3	-12.4	-11.7	-13.1	-15.6	-17.4	-18.6	-19.5	-20.4	-20.6	-20.9	-20.9	-18.2	-11.7																						
6-Jan	-20.6	-20.0	-19.4	-18.9	-18.6	-18.0	-17.9	-17.8	-16.0	-14.1	-11.2	-9.6	-8.4	-7.0	-7.0	-8.0	-9.1	-10.1	-10.2	-10.9	-11.6	-11.6	-11.9	-13.9	-13.4	-7.0																						
7-Jan	-14.6	-15.0	-15.5	-15.7	-16.2	-16.3	-15.6	-15.5	-16.0	-15.8	-14.2	-12.1	-11.0	-10.1	-9.6	-9.4	-9.8	-9.8	-10.1	-10.2	-10.3	-10.4	-10.4	-10.9	-12.7	-9.4																						
8-Jan	-11.0	-11.3	-11.9	-12.3	-13.3	-14.3	-14.6	-15.1	-15.2	-15.5	-14.6	-13.7	-12.8	-11.3	-9.7	-9.6	-11.1	-11.2	-10.9	-9.9	-9.3	-9.5	-9.0	-8.9	-11.9	-8.9																						
9-Jan	-8.8	-8.7	-9.2	-8.9	-8.9	-8.6	-8.6	-9.0	-9.1	-9.2	-8.8	-8.4	-7.1	-6.6	-6.4	-6.6	-6.9	-7.2	-7.4	-7.5	-7.7	-7.9	-8.5	-9.2	-8.1	-6.4																						
10-Jan	-9.2	-9.2	-9.2	-8.9	-8.6	-8.7	-8.8	-8.9	-8.8	-8.6	-8.2	-7.4	-7.3	-7.2	-7.5	-7.5	-7.6	-7.7	-7.9	-8.0	-8.1	-8.5	-8.8	-8.9	-8.3	-7.2																						
11-Jan	-8.9	-8.8	-8.8	-8.9	-8.9	-8.9	-8.9	-8.8	-8.7	-8.5	-8.1	-7.5	-6.5	-6.1	-6.1	-6.0	-6.0	-6.1	-6.7	-7.2	-7.6	-8.4	-8.5	-7.9	-7.8	-6.0																						
12-Jan	-8.1	-7.7	-8.3	-8.8	-8.9	-8.9	-9.2	-9.5	-9.6	-9.5	-8.9	-8.5	-8.1	-7.8	-7.5	-7.2	-7.0	-6.6	-6.3	-6.4	-6.6	-6.8	-6.9	-7.1	-7.9	-6.3																						
13-Jan	-7.8	-8.1	-8.1	-8.0	-8.1	-7.8	-7.6	-7.3	-7.3	-7.2	-7.0	-6.7	-6.6	-6.7	-6.6	-6.7	-6.7	-7.1	-7.7	-7.9	-8.2	-8.3	-8.3	-8.6	-7.5	-6.6																						
14-Jan	-8.7	-8.5	-8.6	-8.4	-7.1	-7.2	-7.4	-7.5	-7.6	-7.7	-7.5	-7.3	-7.2	-6.9	-6.8	-6.8	-6.7	-6.8	-6.9	-7.0	-7.1	-7.0	-7.2	-7.2	-7.4	-6.7																						
15-Jan	-7.2	-7.3	-7.2	-7.3	-8.1	-8.7	-8.8	-9.0	-9.0	-9.0	-9.0	-8.8	-8.5	-8.3	-8.2	-8.2	-8.2	-8.2	-8.2	-8.2	-8.1	-8.1	-8.0	-7.9	-8.2	-7.2																						
16-Jan	-7.7	-7.7	-7.6	-7.5	-7.6	-7.5	-7.6	-7.5	-7.6	-7.6	-7.6	-7.4	-7.0	-6.8	-6.2	-6.0	-6.1	-6.3	-6.3	-6.2	-6.1	-5.8	-5.2	-4.2	-6.8	-4.2																						
17-Jan	-3.7	-3.5	-3.6	-3.9	-4.1	-4.3	-4.4	-4.5	-4.6	-4.6	-4.6	-4.3	-4.0	-3.5	-3.4	-3.5	-3.7	-3.8	-4.1	-4.4	-4.6	-5.0	-4.9	-4.6	-4.2	-3.4																						
18-Jan	-4.7	-4.8	-5.0	-5.2	-5.1	-5.0	-5.5	-5.8	-6.8	-6.5	-6.1	-5.7	-5.3	-4.9	-4.7	-5.1	-6.5	-7.8	-7.4	-7.5	-7.9	-8.3	-8.7	-9.8	-6.3	-4.7																						
19-Jan	-10.2	-9.9	-10.3	-10.3	-9.7	-9.8	-10.2	-9.9	-9.7	-7.3	-6.0	-3.7	-2.0	-0.9	-1.2	-2.3	-4.2	-4.5	-5.6	-3.7	-2.9	-2.3	-2.5	-3.2	-5.9	-0.9																						
20-Jan	-4.3	-3.8	-4.8	-6.0	-9.0	-10.4	-12.2	-13.1	-13.2	-9.2	-5.7	-3.2	-2.3	-1.1	-0.1	-0.8	-2.6	-5.0	-6.7	-6.2	-7.0	-8.6	-10.2	-11.0	-6.5	-0.1																						
21-Jan	-8.2	-9.6	-10.6	-11.2	-11.0	-9.7	-7.7	-6.2	-5.7	-5.1	-3.9	-3.4	-2.6	-1.7	-0.4	-0.6	-0.1	1.3	-0.9	-2.2	0.6	1.4	2.1	1.8	-3.9	2.1																						
22-Jan	1.5	1.6	2.0	2.2	2.0	1.2	0.3	-0.3	-0.7	-0.1	-4.2	-6.5	-6.2	-6.5	-6.9	-7.2	-8.4	-10.9	-12.1	-13.1	-12.9	-12.8	-12.3	-5.1	2.2																							
23-Jan	-12.3	-12.4	-12.4	-12.5	-12.6	-12.5	-12.4	-12.3	-12.0	-11.9	-11.2	-10.6	-9.9	-9.9	-9.8	-10.0	-10.0	-10.2	-10.4	-10.3	-10.3	-10.4	-10.2	-10.0	-11.1	-9.8																						
24-Jan	-9.9	-10.2	-10.3	-10.3	-10.4	-10.4	-10.1	-10.0	-10.0	-9.5	-8.9	-8.0	-6.8	-6.2	-5.9	-5.7	-6.7	-8.5	-9.2	-9.6	-9.9	-10.2	-10.3	-10.3	-9.1	-5.7																						
25-Jan	-10.4	-10.5	-10.5	-10.5	-10.5	-10.5	-10.4	-10.4	-10.4	-10.3	-10.1	-9.8	-9.6	-9.1	-8.8	-8.6	-8.7	-8.6	-8.2	-7.3	-7.3	-7.4	-6.9	-6.0	-9.2	-6.0																						
26-Jan	-5.8	-5.9	-7.1	-3.4	1.1	1.1	-0.6	-2.8	-4.9	-6.4	-7.3	-8.0	-8.2	-7.9	-7.9	-8.1	-8.7	-9.7	-11.0	-12.6	-13.1	-13.7	-14.1	-14.2	-7.5	1.1																						
27-Jan	-14.7	-15.1	-15.8	-16.5	-17.1	-17.5	-18.1	-18.4	-19.3	-19.6	-19.2	-18.9	-18.4	-16.6	-17.1	-17.6	-18.4	-21.1	-22.6	-21.6	-22.1	-22.6	-21.9	-22.3	-18.9	-14.7																						
28-Jan	-20.9	-20.1	-19.6	-19.3	-19.2	-19.2	-19.1	-19.8	-20.0	-19.2	-18.2	-17.5	-17.5	-17.3	-17.1	-17.0	-17.4	-18.1	-18.9	-19.8	-21.0	-22.5	-24.8	-25.1	-19.5	-17.0																						
29-Jan	-26.9	-29.8	-28.5	-25.8	-25.1	-25.2	-26.3	-31.1	-30.7	-27.1	-23.0	-21.2	-19.7	-18.1	-16.9	-16.9	-17.8	-19.7	-18.2	-21.5	-19.0	-18.8	-18.6	-18.8	-22.7	-16.9																						
30-Jan	-21.9	-23.6	-25.4	-27.6	-29.1	-30.6	-31.5	-32.3	-32.5	-30.2	-25.0	-19.5	-17.7	-17.4	-17.2	-17.1	-17.1	-17.4	-17.6	-17.8	-17.7	-17.6	-17.7	-17.8	-22.5	-17.1																						
31-Jan	-17.8	-18.2	-19.2	-19.9	-21.1	-23.2	-25.4	-26.1	-25.8	-24.8	-22.0	-20.3	-19.9	-18.8	-18.5	-18.7	-19.9	-20.6	-21.8	-22.6	-23.3	-24.6	-26.7	-28.2	-22.0	-17.8																						
																								-11.5	-11.8	-12.1	-12.0	-12.0	-12.2	-12.5	-12.7	-12.7	-12.2	-11.2	-10.2	-9.4	-8.6	-8.4	-8.7	-9.5	-10.2	-10.7	-10.9	-11.1	-11.4	-11.7	-11.9	Diurnal Average
																								1.5	1.6	2.0	2.2	2.0	1.2	0.3	-0.3	-0.7	-0.1	-3.9	-3.2	-2.0	-0.9	-0.1	-0.6	-0.1	1.3	-0.9	-2.2	0.6	1.4	2.1	1.8	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort McKay South - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	63	8.47	8.47
-20 - 0	667	89.65	98.12
0 - 10	14	1.88	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

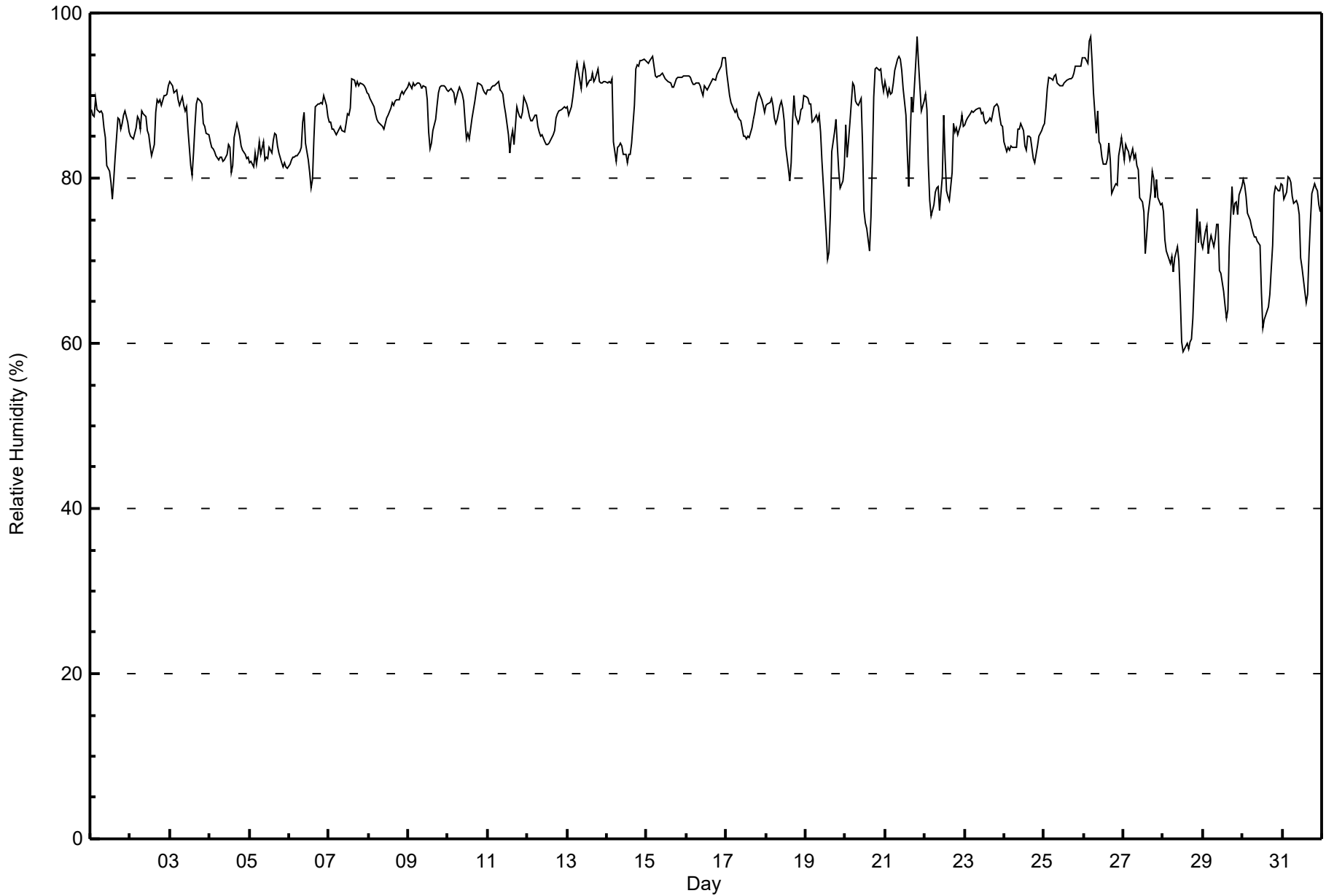
Relative Humidity (RH) - %
Fort McKay South - January 2023

Maximum Value: 97.1 % on Jan 26 05:00 Maximum Daily Average: 92.5 % on Jan 15																						Hours in Service: 744 Hours of Data: 744																										
Minimum Value: 59.0 % on Jan 28 13:00 Minimum Daily Average: 67.7 % on Jan 28 Maximum Diurnal Average: 87.0 % at hour 1 Minimum Diurnal Average: 80.4 % at hour 14 Monthly Average: 85.18 % Percentiles: P ₁ = 62.3 P ₁₀ = 75.6 Q ₁ = 82.4 Median = 86.9 Q ₃ = 90.3 P ₉₀ = 92.0 P ₉₉ = 94.5																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	88.4	87.7	87.5	89.6	88.4	87.9	88.2	87.8	86.1	84.9	81.5	80.8	79.6	77.5	79.8	82.5	87.3	87.0	85.9	86.7	87.6	88.2	86.8	85.5	85.5	89.6																						
2-Jan	85.0	84.9	84.7	86.1	87.5	87.2	86.0	88.1	87.8	87.5	85.7	85.3	83.9	82.7	84.1	87.9	89.4	89.2	89.5	88.9	90.0	90.1	90.3	91.2	87.2	91.2																						
3-Jan	91.6	91.2	90.3	90.6	90.7	89.5	88.8	89.8	88.9	88.2	88.7	86.0	81.6	80.4	83.0	86.3	89.0	89.6	89.3	89.0	86.7	86.3	85.5	85.2	87.8	91.6																						
4-Jan	84.3	83.7	83.6	83.3	82.8	82.2	82.6	82.6	82.1	82.3	82.8	84.0	83.8	80.7	81.5	84.9	86.6	86.0	85.1	83.9	83.4	82.8	82.4	82.5	83.3	86.6																						
5-Jan	81.9	82.0	81.4	83.0	81.6	82.9	84.4	82.8	84.4	82.3	82.6	82.4	83.8	83.0	84.5	85.4	85.2	83.9	83.0	81.8	81.4	81.8	81.4	81.2	82.8	85.4																						
6-Jan	81.7	82.2	82.6	82.6	82.6	82.8	83.3	83.7	86.8	87.9	84.2	82.2	80.7	78.7	79.8	84.8	88.7	89.0	89.0	89.2	89.0	90.0	88.9	87.5	84.9	90.0																						
7-Jan	86.8	86.7	86.0	85.9	85.2	85.6	85.9	86.3	85.8	85.6	86.7	87.8	87.7	88.4	92.0	91.9	91.1	91.7	91.2	91.5	91.4	91.1	90.8	90.3	88.5	92.0																						
8-Jan	90.2	89.6	89.0	88.7	87.8	87.1	86.8	86.4	86.3	86.0	86.6	87.3	87.6	88.5	89.2	88.8	89.4	89.4	89.5	90.1	90.4	90.2	90.6	91.0	88.6	91.0																						
9-Jan	91.5	91.2	90.8	91.5	91.1	91.4	91.6	91.3	90.8	91.2	91.0	89.5	85.5	83.6	84.3	85.8	87.1	88.9	90.3	91.0	91.2	91.1	91.0	90.7	89.7	91.6																						
10-Jan	90.6	90.7	90.8	90.4	89.1	89.8	90.5	91.0	90.1	89.3	87.0	84.8	85.4	84.7	87.3	88.4	89.4	90.5	91.5	91.3	91.2	90.8	90.4	90.2	89.4	91.5																						
11-Jan	90.7	90.8	91.0	91.2	91.1	91.3	91.8	90.7	90.5	90.1	88.9	87.7	85.3	83.1	85.0	85.8	84.0	88.6	87.9	87.4	87.3	88.0	89.9	89.0	88.6	91.8																						
12-Jan	88.3	87.5	86.9	87.0	87.6	87.6	86.3	85.5	85.0	85.2	84.4	84.1	84.1	84.3	84.6	85.2	85.7	87.2	87.7	88.1	88.3	88.6	88.7	88.5	86.5	88.7																						
13-Jan	88.6	87.6	88.7	89.8	91.4	92.8	93.8	91.9	90.9	92.7	93.9	93.1	91.1	91.9	91.9	92.6	91.6	92.1	93.3	91.7	91.5	91.6	91.7	91.8	91.6	93.9																						
14-Jan	91.5	91.7	91.6	92.0	84.4	82.0	83.7	83.9	84.2	83.9	82.9	82.8	81.9	82.9	82.9	84.3	88.8	93.2	93.8	93.6	94.3	94.3	94.4	94.2	88.0	94.4																						
15-Jan	94.1	93.9	94.2	94.8	93.6	92.4	92.2	92.4	92.4	92.6	92.3	92.1	91.9	91.8	91.5	91.1	91.1	91.6	92.0	92.2	92.3	92.2	92.4	92.4	92.5	94.8																						
16-Jan	92.3	92.3	92.1	91.6	91.3	91.4	91.5	91.5	91.2	90.6	90.0	91.2	90.6	91.1	91.3	91.6	92.1	91.9	92.6	92.9	93.2	93.6	94.5	94.6	92.0	94.6																						
17-Jan	92.7	91.4	90.0	89.1	88.3	88.1	88.3	87.5	87.1	87.0	85.1	85.1	84.7	85.0	84.9	86.1	87.1	88.0	89.1	89.8	90.4	89.4	88.8	88.0	88.0	92.7																						
18-Jan	88.7	89.0	89.2	89.7	88.8	87.3	86.7	87.0	88.8	89.4	88.4	87.0	83.9	81.3	79.7	81.8	87.0	90.1	87.6	86.6	87.1	88.3	88.5	90.1	87.2	90.1																						
19-Jan	89.9	89.7	89.0	89.0	86.7	86.9	87.6	87.0	87.7	85.6	82.0	76.2	73.5	70.1	71.0	75.6	83.2	85.6	87.1	83.9	80.8	78.8	79.7	81.4	82.8	89.9																						
20-Jan	86.4	82.6	84.5	86.8	91.6	91.2	89.4	89.0	88.8	89.7	84.1	76.1	74.6	73.9	71.3	75.3	82.0	89.9	93.3	93.5	93.1	93.2	91.6	90.5	85.9	93.5																						
21-Jan	91.7	90.0	90.9	90.2	90.3	91.6	93.1	94.3	94.8	94.4	93.1	90.8	87.7	83.1	79.0	84.6	89.9	88.0	93.9	97.1	93.9	91.1	88.2	89.3	90.5	97.1																						
22-Jan	90.2	88.3	81.6	77.2	75.5	76.8	78.4	78.8	79.0	76.1	80.2	87.7	82.3	78.5	77.7	77.4	80.7	86.7	85.6	86.1	85.3	86.5	87.6	86.2	82.1	90.2																						
23-Jan	86.4	87.0	87.2	87.9	88.1	88.1	88.1	88.4	88.4	88.5	87.8	87.9	86.9	86.7	86.9	87.3	86.9	87.8	88.7	89.0	88.7	87.5	86.4	86.3	87.6	89.0																						
24-Jan	84.5	83.2	83.7	83.4	83.8	83.8	83.8	83.7	85.9	85.9	86.7	85.8	83.9	83.3	85.1	85.0	84.9	82.4	81.8	82.8	83.9	85.1	85.8	86.3	84.4	86.7																						
25-Jan	86.7	88.5	90.8	92.3	92.0	91.9	92.3	92.6	91.5	91.2	91.2	91.2	91.5	91.6	91.8	92.0	92.1	92.2	92.7	93.5	93.6	93.6	94.5	91.9	94.5																							
26-Jan	94.6	94.6	93.9	96.6	97.1	94.1	90.3	85.4	88.1	84.5	84.1	82.5	81.7	81.7	82.4	84.2	82.3	78.1	79.0	79.3	79.1	82.8	83.7	84.8	86.0	97.1																						
27-Jan	82.2	84.0	83.6	83.2	82.3	83.5	82.4	82.8	81.5	81.0	77.6	77.2	75.8	70.9	73.1	75.6	78.4	80.9	80.0	77.6	79.9	77.7	76.8	76.9	79.4	84.0																						
28-Jan	76.0	72.6	71.2	70.2	69.6	70.5	68.7	70.3	71.6	70.0	65.5	60.2	59.0	59.4	60.0	59.4	60.2	60.4	63.0	72.2	76.3	72.2	74.7	72.2	67.7	76.3																						
29-Jan	71.6	73.6	74.2	70.8	72.2	73.1	71.7	72.7	74.4	74.3	68.9	68.5	66.3	64.6	63.0	64.1	71.8	78.9	75.6	77.0	77.0	75.5	78.0	79.0	72.4	79.0																						
30-Jan	79.8	79.1	77.8	75.8	74.8	74.1	73.4	72.9	72.8	72.4	71.9	66.1	61.8	62.9	63.4	64.3	65.9	69.0	71.9	77.9	79.0	78.5	78.5	79.3	72.6	79.8																						
31-Jan	79.1	77.5	78.4	80.1	80.0	79.4	77.7	77.0	77.3	76.8	75.6	70.4	69.1	66.3	64.8	65.9	70.8	74.7	78.1	79.4	78.8	78.4	76.9	76.0	75.4	80.1																						
																								87.0	86.6	86.4	86.5	86.0	85.9	85.8	85.7	85.8	85.4	84.2	83.0	81.5	80.4	80.9	82.4	84.5	85.9	86.4	86.9	87.0	86.7	86.7	86.7	Diurnal Average
																								94.6	94.6	94.2	96.6	97.1	94.1	93.8	94.3	94.8	94.4	93.9	93.1	91.9	91.9	92.0	92.6	92.1	93.2	93.9	97.1	94.3	94.3	94.5	94.6	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort McKay South - January 2023





Maximum Speed: 24 km/h on Jan 26 08:00	Maximum Daily Speed Average: 12.4 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 16 22:00	Minimum Daily Speed Average: 0.4 km/h on Jan 8	Hours of Data: 739
Maximum Diurnal Speed Average: 2.8 km/h at hour 14	Minimum Diurnal Speed Average: 0.7 km/h at hour 21	Hours of Missing Data: 5
Monthly Average Velocity: 1.5 km/h 181.3 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 3 Median = 5 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 17	Percent Operational Time: 99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	S4	SSW4	SW4	W2	WNW2	SSW4	SSE5	S8	S11	S10	S11	S12	S11	S6	SSW7	S6	SSE6	S7	S8	SSE5	ENE1	S4	SSW1	SW3	S5.5	S12	
2-Jan	SSW2	S3	S3	S5	S5	SSE4	S5	S5	S5	SSE3	SSE3	SSE6	SSE8	SSE9	SSE9	SSW1	SSW3	S3	S7	S4	S5	S4	SSE2	S5	S4.5	SSE9	
3-Jan	SSE5	SSE2	SSW3	S7	SSE5	SSE5	SSE6	SSE6	S5	S4	SSE6	SE9	SSE11	SSE11	SSE9	S6	S5	S3	S6	S4	S4	SSW2	SW1	SSW3	S5.2	SSE11	
4-Jan	SW2	S4	S3	SSW2	SSW2	S3	S4	SSW3	S3	SSW3	S4	S4	SSE5	SSE5	SSE6	S4	S3	SSW2	SW2	SSW3	SSW2	SSW3	S3	S3	S3.1	SSE6	
5-Jan	S4	S3	S3	S4	S4	S6	S5	S5	S3	S5	S6	SSE5	SSE6	SSE8	SSE6	NNW0	S1	WSW2	WSW1	WSW1	WSW1	SW2	S1	NNW2	W0	S3.2	SSE8
6-Jan	NNW2	NNW3	NW2	N2	WSW1	SW2	SSW1	S4	SSW4	S4	SE3	SE6	SSE8	SSE11	SSE9	S8	S9	S9	S9	S7	SSE4	S6	S5	NW3	S3.9	SSE11	
7-Jan	W1	SSW3	NW2	WNW2	SW2	S4	SSW3	N3	N2	NNW1	N3	SE1	NNE3	SE0	NW2	N4	W2	NNW4	N2	SSE3	SW3	SSW2	WSW2	SW3	WNW0.8	NNW4	
8-Jan	SSE4	SSE3	SE3	SSE2	SSE5	SSE4	W1	N2	SSE2	SW2	S3	SSE3	NNE1	NNW2	ESE0	SSW1	NNW2	N4	N2	NNW3	NNW1	N1	NNE2	NNE2	SE0.4	SSE5	
9-Jan	N3	UO	UO	NNW1	WSW1	W1	NW1	SSW2	SW1	N2	N3	N4	ESE1	SE5	SSE3	S6	SSW5	SSW4	SSW2	S2	SSE5	SE2	NNE3	NNE3	S0.9	S6	
10-Jan	N2	N2	N2	S3	S4	SSE2	SE1	ESE1	SSE3	S2	NNE1	SSE3	S3	ESE1	N4	NE3	N2	NNW2	WNW2	NNW4	NNW4	N5	N7	N5	NNE0.9	N7	
11-Jan	NW2	NW3	NNW3	NNW3	NNW4	NNE3	W1	SSW2	SSE1	SSE2	SSE3	SE5	SSE7	SSE7	SSE8	SSE6	S9	S6	S6	SSE8	S10	SSE14	SSE15	SSE13	SSE4.4	SSE15	
12-Jan	SSE11	S12	SSE15	SSE15	S16	SSE15	SSE14	SSE14	SSE14	SSE14	SSE15	SSE14	SSE15	SSE14	SSE13	SSE13	SSE12	SSE10	S11	S10	S10	SSE9	S6	SSE6	SSE12.4	S16	
13-Jan	SE6	SE6	SW1	N1	NW2	NNW3	N6	NNE7	NNE4	NNE6	N4	NNE6	NNE6	N7	NNE7	NNE9	NNE9	N9	N10	N8	N7	N7	N7	N7	NNE4.9	N10	
14-Jan	N6	N3	N3	S1	SSE12	SSE15	SSE10	SSE11	SSE10	SSE7	SSE8	SSE8	SSE5	SSE6	SSE5	SSW3	S3	SE3	SE2	S3	SSE2	E1	NE0	SSE4.7	SSE15		
15-Jan	N2	NNW2	N3	N6	N9	NNE6	N6	N5	N5	N4	N4	N4	N4	NNE4	NNE5	NNE5	NNW2	UO	NNW2	UO	NNW3	NNW2	N3	NNW2	N3.9	N9	
16-Jan	NNW3	N4	N5	N6	N6	N6	N8	N8	N8	N6	N8	N9	N9	N9	N8	N8	NNW6	NNW6	NNW4	N4	NW0	S0	S4	S5	N5.0	N9	
17-Jan	SSW6	SSW8	SSW9	S9	S9	S10	S9	S11	S10	S9	SSE11	S10	S10	S9	S11	S9	S9	S9	S8	S8	S9	SSE8	SSE8	S12	S9.0	S12	
18-Jan	S11	S11	S11	SSE11	S14	S14	SSE14	S13	S13	S12	S13	S17	S14	SSE14	SSE12	S9	S7	S6	S11	S12	SSE10	S11	S13	S7	S11.6	S17	
19-Jan	SSW5	S5	SSE5	S6	SSE14	S12	S10	S9	S10	S10	S7	SSW5	SSW6	S7	S8	S9	S7	S6	S4	SW9	SW10	SSW7	SSW6	SSE2	S7.2	SSE14	
20-Jan	SSW3	SSW5	S6	SW4	S3	S5	S4	S3	SSW2	S2	SW4	SW8	WSW10	WSW11	WSW8	SW8	S3	SSW5	SW2	NNW1	SE1	S4	S5	S4	SSW4.0	WSW11	
21-Jan	SW7	SW0	S4	S4	S5	S4	S4	S5	SSE5	SSE5	SSE6	SSE7	SSE7	SSE9	SSE8	SSE5	S7	S7	SSE2	SSW1	SW3	WSW7	WSW8	WSW6	S4.4	SSE9	
22-Jan	WSW5	W6	W5	W10	WNW9	WNW6	WSW10	W10	WSW7	WNW9	N17	N15	N13	N12	NNE9	NNE6	NNE6	N5	NNE5	N6	N6	UO	NNW2	N4	NNW5.3	N17	
23-Jan	N4	NNW2	NW0	NE1	ENE0	W0	ENE2	N2	N4	N5	N5	N6	N7	N8	N7	NNW7	NNW5	NW2	NNE1	SSE2	ENE1	SE2	SSE2	SSE4	N2.3	N8	
24-Jan	SSE7	SSE9	SSE7	SSE9	SSE10	SSE9	SSE6	SSE9	SSE8	SSE9	SSE8	SSE7	SE4	NE3	N9	N9	NNE10	NNE10	NNE7	NNE6	NE5	NNE5	NNE4	NNW5	ESE2.7	NNE10	
25-Jan	N6	NNE4	N5	N7	N5	NNW3	NNW3	NNE3	N3	N4	N3	NNE4	N5	NNE2	NE2	SE3	SSE3	SE1	SSE5	SSE12	SSE11	SSE13	S12	S9	ESE0.9	SSE13	
26-Jan	S8	SSE7	S5	WSW7	WNW9	NNW9	N15	N24	N18	N19	N15	N12	N9	NNE8	NNE6	NNE8	NNE12	N16	N19	N18	NNE16	N17	N17	N14	N10.3	N24	
27-Jan	N17	N14	NNE11	N10	N9	N8	N9	N6	N7	N11	N10	NNE6	NNE3	S3	ENE4	N6	NW4	NW2	NW3	WNW4	W4	W6	W8	WSW2	N5.6	N17	
28-Jan	WSW7	W10	W9	W9	W8	WSW6	WNW8	WSW6	W6	WNW6	NW11	NW14	NW16	NW15	NW13	NW12	NW13	NW12	NW11	N11	N13	N11	NNW5	NW8	NW8.6	NW16	
29-Jan	NW4	WSW5	WSW8	WSW9	WSW8	WSW8	SW5	S4	SSE4	S7	S13	S14	S15	S16	S13	SSE9	S2	WSW3	W7	NNW4	NW7	NNW4	WNW4	W4	SSW4.7	S16	
30-Jan	WNW4	NNW4	NW3	WSW4	SW3	SSW3	SSW3	S3	S3	SSW2	S2	SSW5	SSW5	SE6	SE6	SSE6	SSE5	SE4	SE2	NW1	NNW3	N4	N5	N5	S1.1	SSE6	
31-Jan	N8	NNE10	NNE8	NNE6	NNE5	N4	NW3	WSW3	W1	N2	ENE0	SSE3	E5	SSW6	S4	S6	S6	S4	NNW3	N3	NW1	NNW3	NW2	WNW1	N1.1	NNE10	

SSW1.1	SSW1.3	SW1.4	SW1.7	SSW2.2	S2.5	S1.8	S1.9	S2.2	S1.6	SSE1.4	SSE2.4	SSE2.5	SSE2.8	SSE2.4	SSE1.6	S1.2	SSW0.9	SSW0.8	S0.8	S0.7	S1.2	SSW1.0	SW0.9	Diurnal Average	
N17	N14	SSE15	SSE15	S16	SSE15	N15	N24	N18	N19	N17	S17	NW16	S16	WNW13	SSE13	NW13	N16	N19	N18	NNE16	N17	N17	N14	Diurnal Maximum	

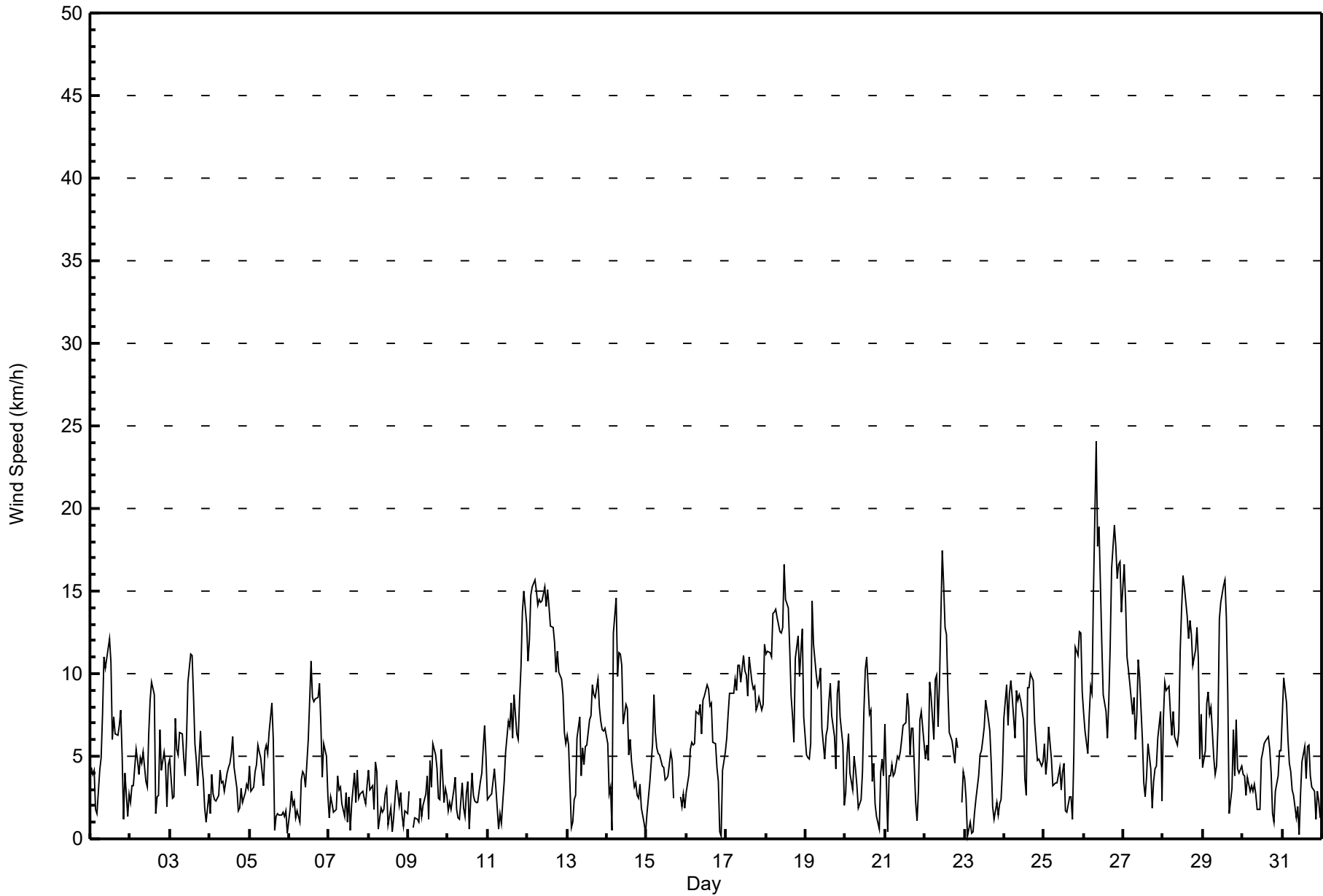
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort McKay South - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Jan 26 09:00 Minimum Value: 0 km/h on Jan 15 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 1 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	1	2	3
2-Jan	1	1	1	1	2	1	2	2	1	2	1	2	2	2	3	1	1	1	1	1	1	1	1	1	1	3
3-Jan	2	1	2	1	1	1	1	1	1	1	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	3
4-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5-Jan	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
6-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	2	2	2	3	1	3	3
7-Jan	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
8-Jan	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2
9-Jan	1	UO	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10-Jan	1	1	1	2	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2
11-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	1	1	2	3	3	2	3	3
12-Jan	2	2	3	2	3	3	2	2	3	2	2	2	3	2	2	2	2	2	2	2	2	1	1	2	3	3
13-Jan	2	2	1	1	1	2	2	2	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	2	2
14-Jan	1	1	1	1	5	4	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	1	1	5	5
15-Jan	1	0	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	UO	1	UO	1	1	1	1	2	2
16-Jan	0	1	1	1	1	1	2	2	2	2	1	1	2	2	1	2	1	1	1	1	1	1	2	1	2	2
17-Jan	1	2	2	2	2	2	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	1	2	3	3
18-Jan	2	2	2	2	3	3	2	2	2	3	4	3	3	2	2	1	1	3	2	1	2	2	3	3	4	4
19-Jan	2	1	2	2	2	2	2	1	1	2	2	2	2	2	1	1	2	1	2	3	3	2	2	1	3	3
20-Jan	2	2	2	2	2	1	1	2	1	3	3	3	4	4	2	2	2	1	1	2	1	1	1	2	4	4
21-Jan	3	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	1	2	1	2	3	3	4	4	4
22-Jan	2	2	2	3	4	3	3	3	3	4	5	4	3	3	2	2	2	1	1	1	1	UO	1	1	5	5
23-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2	2
24-Jan	1	2	1	2	2	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	2	2
25-Jan	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	0	1	1	5	2	2	2	3	4	5	5
26-Jan	2	2	2	3	4	4	5	5	5	5	4	3	2	2	1	2	3	4	5	4	5	4	4	3	5	5
27-Jan	3	3	3	2	2	1	2	2	2	3	2	2	1	1	1	1	1	1	2	2	1	1	2	2	3	3
28-Jan	2	3	3	3	3	2	2	2	2	3	3	5	4	5	4	4	4	3	3	3	3	3	1	2	5	5
29-Jan	3	2	2	2	2	2	3	1	1	2	3	2	3	3	3	2	1	2	2	2	2	2	1	1	3	3
30-Jan	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	1	1	1	2	1	2	1	1	1	2	2
31-Jan	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	2	1	1	2
Diurnal Maximum																										
UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay South - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	396	53.59	53.59
6 - 11	269	36.40	89.99
12 - 19	73	9.88	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay South - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	55	22	6	6	2	4	16	49	83	41	20	12	12	7	20	41	396
6 - 11	48	24	0	0	0	0	5	64	72	10	4	16	11	6	4	5	269
12 - 19	18	2	0	0	0	0	0	26	20	0	0	0	0	1	6	0	73
20 - 28	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	122	48	6	6	2	4	21	139	175	51	24	28	23	14	30	46	739

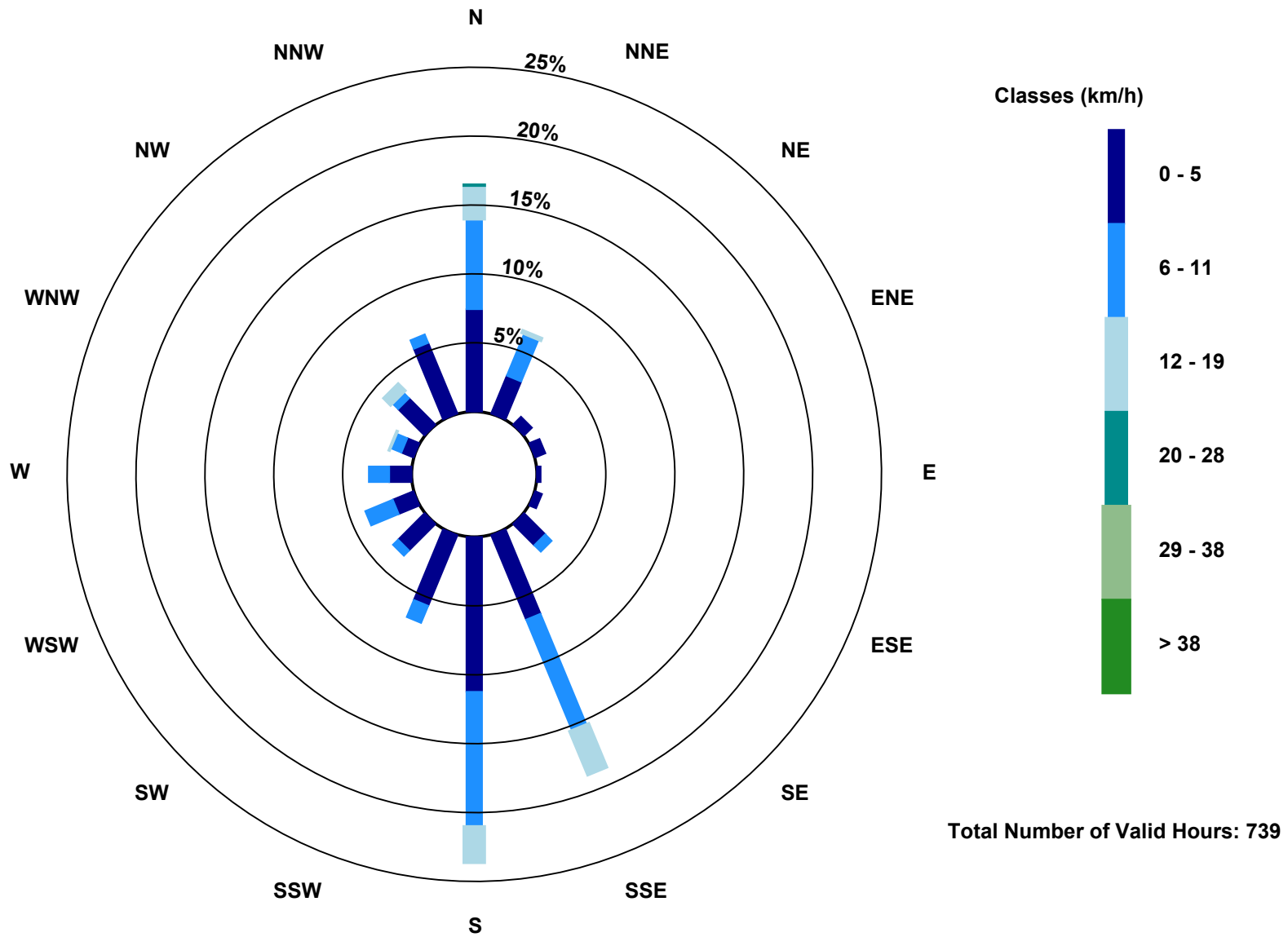
Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Fort McKay South





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - January 2023

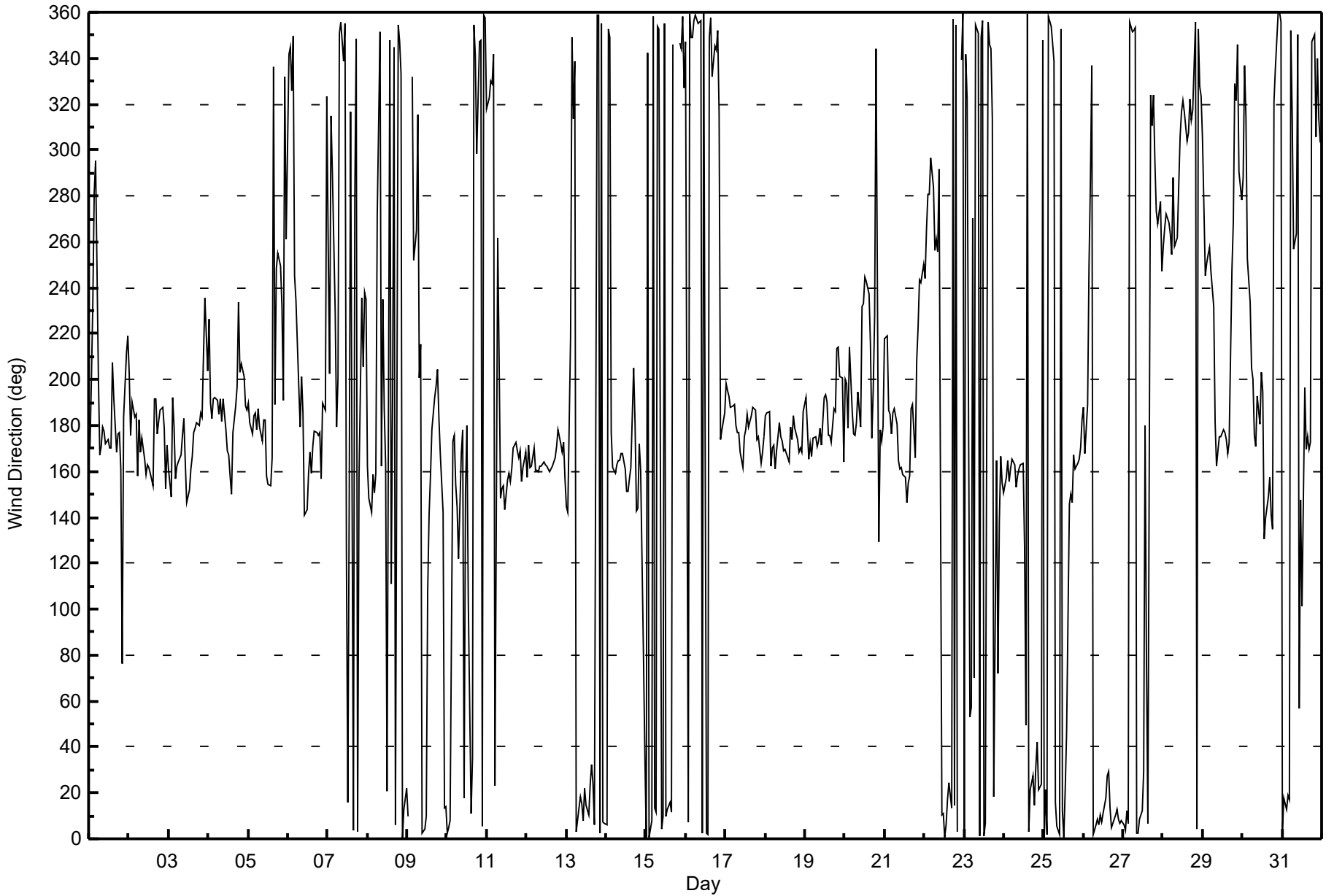
Direction of Maximum Speed: 6 deg on Jan 26 08:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 164.2 deg on Jan 12																						Hours of Data: 739			
Direction of Minimum Speed: 174 deg on Jan 16 22:00											Direction of Minimum Daily Speed Average: 0.4 deg on Jan 8											Hours of Missing Data: 5			
Monthly Average Direction: 181.3 deg																						Percent Operational Time: 99.3			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	171	200	232	281	295	201	167	171	179	178	172	174	170	170	208	191	168	176	177	161	76	184	211	219	181.1
2-Jan	202	176	191	184	185	158	182	169	174	165	159	163	162	159	154	192	192	176	182	187	188	179	152	171	172.5
3-Jan	161	149	192	180	157	162	164	167	176	183	164	146	152	161	167	177	179	181	180	186	184	210	235	204	169.0
4-Jan	226	190	183	192	192	191	185	192	182	192	178	169	167	158	150	177	189	197	233	203	207	201	189	187	183.3
5-Jan	190	181	177	184	186	178	187	179	174	183	182	158	154	154	166	336	189	248	255	250	232	191	332	261	179.5
6-Jan	342	345	326	349	245	234	197	179	201	185	141	143	159	168	159	171	177	177	176	177	157	190	186	323	175.1
7-Jan	259	203	315	290	229	179	201	351	356	339	355	126	16	146	317	4	280	348	3	157	236	206	238	235	286.9
8-Jan	162	148	142	159	151	159	272	351	162	235	187	163	21	348	111	195	345	6	355	347	333	0	13	22	138.2
9-Jan	10	UO	UO	332	252	265	316	201	215	3	4	10	107	141	158	178	192	197	204	183	168	142	13	14	173.4
10-Jan	2	5	8	173	176	155	145	122	168	178	18	151	180	103	11	35	354	341	298	347	348	5	359	357	12.3
11-Jan	318	323	330	329	342	23	262	207	148	153	154	143	156	159	155	161	170	173	169	166	169	156	162	168	163.5
12-Jan	158	172	162	162	170	160	160	160	162	162	164	163	162	161	160	162	164	166	171	178	172	168	172	157	164.2
13-Jan	145	142	219	349	314	339	3	13	19	16	8	22	14	10	24	33	24	6	359	359	2	355	7	7	13.4
14-Jan	6	353	349	177	162	159	163	165	165	168	168	161	151	151	157	162	205	181	143	144	172	161	80	37	160.5
15-Jan	0	342	0	8	358	13	11	354	353	4	10	355	10	13	16	12	346	UO	337	UO	346	344	358	327	1.5
16-Jan	347	7	359	349	349	356	359	355	356	356	3	360	3	2	349	357	332	346	343	352	315	174	178	186	354.3
17-Jan	198	195	193	188	189	189	180	177	177	169	162	175	178	185	179	184	188	187	187	174	175	163	168	175	180.1
18-Jan	184	185	186	162	170	171	161	169	181	175	174	169	169	166	164	179	174	184	179	174	168	170	169	186	173.0
19-Jan	192	179	165	172	167	175	175	171	173	179	171	192	193	191	176	176	172	187	186	214	214	201	201	164	182.3
20-Jan	200	198	179	214	186	177	176	181	195	180	232	233	244	243	237	215	175	196	227	344	129	178	173	179	208.3
21-Jan	218	219	187	185	176	186	187	180	165	161	162	158	158	147	155	158	188	189	166	208	222	243	242	250	184.6
22-Jan	244	265	281	281	297	284	256	261	255	292	10	11	0	6	17	24	13	357	15	354	3	UO	339	360	331.7
23-Jan	1	342	322	53	57	270	70	354	351	1	349	356	2	7	356	346	344	314	18	165	72	138	166	155	1.7
24-Jan	151	157	165	156	161	165	163	153	158	161	163	163	127	49	359	3	21	27	15	31	42	21	24	348	115.6
25-Jan	0	21	2	358	354	347	339	16	5	2	353	12	1	21	46	146	150	146	167	161	164	166	171	182	113.2
26-Jan	188	168	189	250	287	337	2	6	8	6	11	7	11	18	27	29	14	5	9	10	13	8	6	8	5.4
27-Jan	6	4	13	7	356	351	352	353	3	3	8	12	29	180	77	7	324	310	324	295	274	268	278	247	352.4
28-Jan	258	266	272	268	264	254	288	258	262	284	306	317	322	317	304	308	322	313	318	356	4	352	327	324	306.8
29-Jan	305	245	251	254	257	247	232	181	162	169	175	175	178	177	174	168	172	248	269	329	322	346	290	278	211.4
30-Jan	288	337	314	253	234	205	200	176	171	193	181	203	195	130	140	149	157	141	135	321	336	360	360	356	187.6
31-Jan	3	18	13	19	17	352	316	257	264	350	57	148	101	196	170	175	169	173	347	350	306	340	314	303	6.7
211.6 202.0 213.9 217.4 201.7 187.8 189.3 177.0 176.6 176.4 152.6 156.9 159.2 161.0 156.7 161.0 179.2 205.3 212.2 180.4 187.4 182.0 200.3 215.1																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay South - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 98 deg on Jan 16 22:00											Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 0 Percent Operational Time: 99.3														
Minimum Value: 6 deg on Jan 5 14:00																									
Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 13 Median = 18 Q ₃ = 31 P ₉₀ = 58 P ₉₉ = 92																									
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	12	23	20	76	69	29	14	8	10	10	9	10	11	21	23	27	16	25	19	51	90	21	59	21	90
2-Jan	28	21	18	11	35	32	24	16	16	60	47	12	13	12	13	48	59	43	10	16	14	17	64	19	64
3-Jan	24	43	36	11	31	26	11	12	9	16	20	7	9	7	7	11	8	12	8	13	21	54	69	46	69
4-Jan	49	13	34	17	49	24	13	20	12	17	9	14	15	13	7	22	21	76	73	17	23	11	11	14	76
5-Jan	8	12	14	9	11	7	10	12	24	13	11	8	11	6	14	83	55	30	25	54	49	94	44	93	94
6-Jan	50	27	39	55	59	54	84	20	14	20	33	9	16	11	13	6	7	6	8	10	17	18	58	27	84
7-Jan	61	51	48	54	58	29	26	58	47	79	46	84	60	96	52	38	48	19	36	30	33	45	40	18	96
8-Jan	22	25	30	57	13	13	64	38	66	44	19	18	74	18	89	64	10	8	21	14	51	93	51	36	93
9-Jan	16	UO	UO	47	41	64	55	21	24	48	17	11	64	20	18	16	15	16	24	16	14	52	42	16	64
10-Jan	15	17	10	76	17	23	42	36	10	25	57	41	38	70	12	17	25	26	17	21	18	14	12	14	76
11-Jan	33	29	25	19	14	21	68	52	87	60	11	13	24	23	15	13	11	15	12	14	18	8	9	10	87
12-Jan	10	14	9	10	12	10	9	8	9	9	9	9	9	9	9	9	8	10	9	10	10	9	13	17	17
13-Jan	18	21	95	76	28	51	20	14	18	16	21	19	17	16	21	19	15	15	14	11	11	12	12	11	95
14-Jan	13	37	45	90	14	10	12	12	12	11	12	11	11	14	10	12	23	21	18	28	10	24	55	79	90
15-Jan	32	11	14	12	13	15	17	14	14	16	11	14	18	14	12	13	20	UO	14	UO	15	22	11	19	32
16-Jan	14	14	12	13	10	12	12	13	14	19	14	12	14	13	14	23	14	10	13	12	63	98	59	12	98
17-Jan	13	16	13	13	12	13	10	10	10	11	9	11	10	16	13	14	15	17	14	19	15	12	14	13	19
18-Jan	14	12	13	9	13	12	9	10	10	12	13	11	11	10	11	9	6	17	8	8	10	11	11	20	20
19-Jan	29	23	18	18	10	10	9	10	10	11	18	33	27	20	13	7	9	22	35	23	23	28	24	80	80
20-Jan	80	32	26	31	58	19	13	49	68	78	82	36	25	22	29	17	43	21	62	82	94	24	17	34	94
21-Jan	40	79	27	22	15	19	17	15	31	22	13	10	9	7	9	25	21	22	83	86	80	21	22	49	86
22-Jan	36	31	33	27	34	46	28	28	37	33	23	16	14	15	15	22	17	15	27	14	13	UO	21	12	46
23-Jan	16	30	82	80	78	93	63	39	28	19	13	14	16	13	13	11	19	39	62	58	60	24	50	26	93
24-Jan	11	10	13	11	9	11	12	11	11	10	10	11	39	62	15	18	16	22	15	22	27	23	17	19	62
25-Jan	14	16	17	13	19	24	19	34	27	29	37	23	26	46	40	25	40	65	61	10	10	11	14	18	65
26-Jan	25	17	28	32	30	31	17	16	17	17	15	15	19	22	20	18	16	16	18	16	18	16	15	16	32
27-Jan	15	15	16	16	15	17	14	20	19	14	14	26	56	58	33	10	27	61	42	20	16	13	17	74	74
28-Jan	17	22	24	23	24	27	24	24	24	26	21	23	20	21	23	24	19	19	17	16	15	15	18	16	27
29-Jan	28	12	12	17	24	19	44	32	28	15	11	11	12	10	14	11	56	35	23	33	16	32	33	17	56
30-Jan	13	30	61	11	27	27	30	20	44	68	68	35	40	26	15	13	15	35	80	59	59	16	14	15	80
31-Jan	14	16	16	17	22	16	13	20	60	43	92	58	34	34	44	18	14	13	37	29	29	46	19	54	92
											80 79 95 90 78 93 84 58 87 79 92 84 74 96 89 83 59 76 83 86 94 98 69 93														
Diurnal Maximum																									
UO - Unstable Operation																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS14
ANZAC
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 JANUARY 2023

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	17.2	0	1.9	0
TRS(ppb) Average	708	36	36	100	1.2	0	0.4	0
THC(ppm) Average	677	33	67	95.43	2.8	-	2.2	-
NMHC(ppm) Average	677	33	67	95.43	0.661	-	0.04	-
CH4(ppm) Average	677	33	67	95.43	2.4	-	2.2	-
NO2(ppb) Average	707	37	37	100	22.6	0	7.1	-
NO(ppb) Average	707	37	37	100	36.1	-	2.5	-
NOX(ppb) Average	707	37	37	100	51.1	-	9	-
O3(ppb) Average	710	34	34	100	38.2	0	35.9	-
PM2.5(ug/m3) Average	741	3	3	100	35	0	12.4	0
AT 2m(C) Average	744	0	0	100	4.3	-	-0.9	-
RH(%) Average	744	0	0	100	99.8	-	95	-
WS(km/h) Average	725	0	19	97.45	37	-	21	-
WD(deg) Average	725	0	19	97.45	-	-	-	-
Leaf Wetness (% of range) Average	744	0	0	100	23.6	-	2.2	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2(ppb) Average	709	0.7	1.2	-	0	0.1	0.2	0.3	0.7	1.6	17.2
TRS(ppb) Average	708	0.26	0.1	-	0.1	0.2	0.2	0.2	0.3	0.4	1.2
THC(ppm) Average	677	2.14	0.1	-	2	2.1	2.1	2.1	2.2	2.2	2.8
NMHC (ppm) Average	677	0.007	0.039	-	0	0	0	0	0	0	0.661
CH4(ppm) Average	677	2.13	0.1	-	2	2.1	2.1	2.1	2.2	2.2	2.4
NO2(ppb) Average	707	3.61	3	-	0.2	1	1.6	2.8	4.5	7.3	22.6
NO(ppb) Average	707	0.65	1.9	-	0	0	0	0.2	0.6	1.5	36.1
NOX(ppb) Average	707	4.26	4.2	-	0.2	1.1	1.8	3.1	5.2	8.5	51.1
O3(ppb) Average	710	23.77	6.9	-	0	15.3	18.7	23.4	28.9	33.6	38.2
PM2.5(ug/m3) Average	741	5.64	4.1	-	0.4	1.3	2.4	4.7	8.2	10.7	35
Temperature 2 m (C) Average	744	-9.83	5.9	-	-26.8	-18.9	-12.6	-9.2	-6.6	-2.2	4.3
Relative Humidity (%) Average	744	86.4	8.9	-	49.5	72.9	81.3	89.8	93	94.4	99.8
Wind Speed 20 m (km/h) Average	725	9.6	6	-	0	3	5	8	13	17	37
Wind Direction 20 m (deg) Average	725	195.8	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	0.41	1.1	-	0	0	0	0.1	0.3	1.4	23.6

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
JANUARY 2023

OPERATIONAL NOTES				
Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	22 Jan 2023 06:00	23 Jan 2023 12:00	31	Unstable Operation - support gas depleted
THC/NMHC/CH4	23 Jan 2023 13:00	23 Jan 2023 13:00	1	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	31 Jan 2023 08:00	31 Jan 2023 09:00	2	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	10 Jan 2023 19:00	11 Jan 2023 01:00	7	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 07:00	11 Jan 2023 12:00	6	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	13 Jan 2023 00:00	13 Jan 2023 00:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 04:00	15 Jan 2023 04:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 06:00	15 Jan 2023 06:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 09:00	15 Jan 2023 10:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	25 Jan 2023 05:00	25 Jan 2023 05:00	1	Flat line in sensor output signal - Sensor frozen



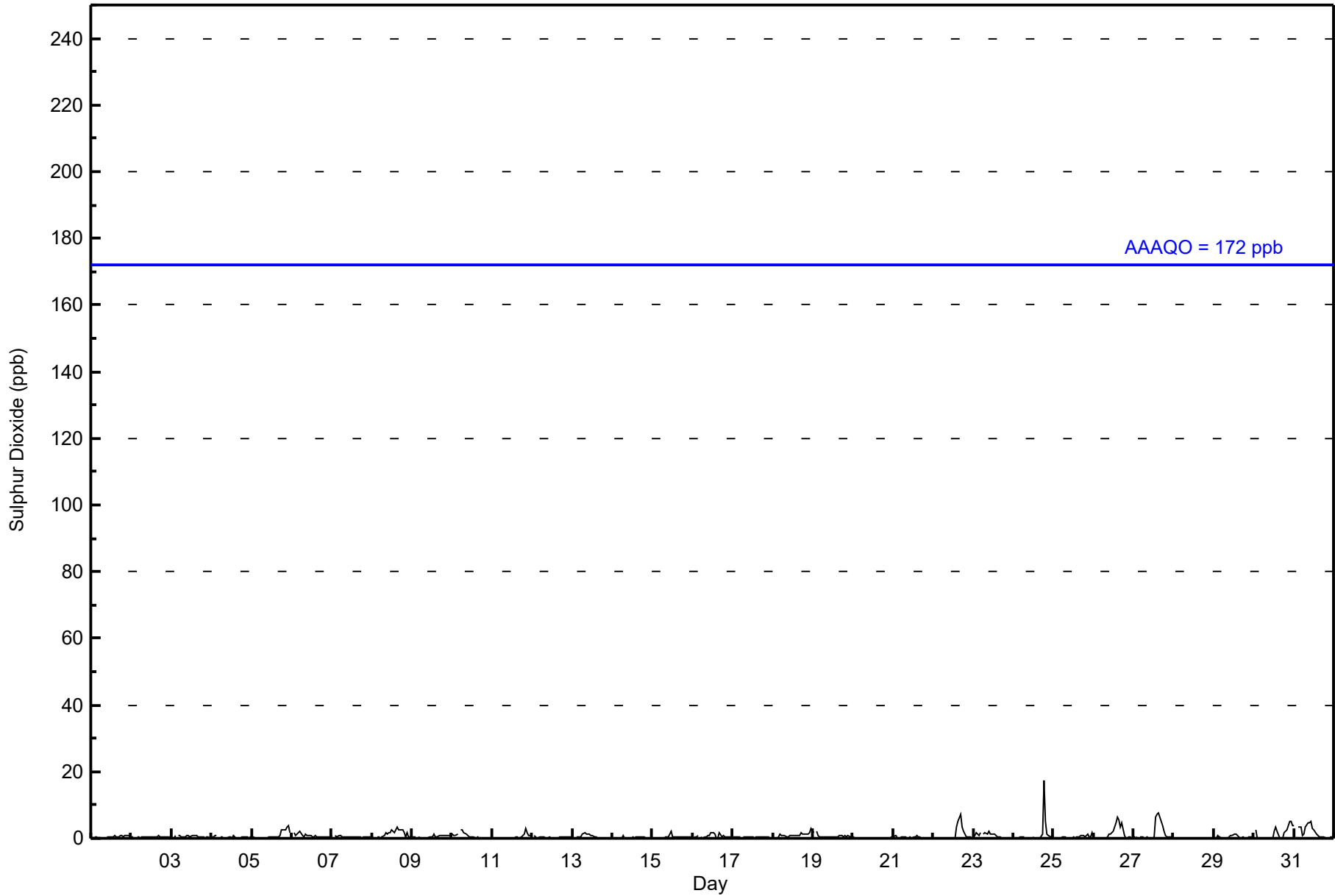
Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Anzac - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 17.2 ppb on Jan 24 19:00		Maximum Daily Average: 1.9 ppb on Jan 31																			Hours of Data:	709																											
Minimum Value: 0.0 ppb on Jan 13 17:00		Minimum Daily Average: 0.0 ppb on Jan 28																			Hours of Missing Data:	35																											
Maximum Diurnal Average: 1.2 ppb at hour 19		Minimum Diurnal Average: 0.4 ppb at hour 2																			Hours of Calibration:	35																											
Monthly Average: 0.70 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.7 P ₉₀ = 1.6 P ₉₉ = 5.2																			Percent Operational Time:	100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.4	0.6	0.4	0.3	0.7	0.5	0.5	0.8	0.7	0.5	0.8	0.7	0.7	0.5	0.4	0.8	0.4	0.8																					
2-Jan	0.6	0.4	Z	0.2	0.3	0.2	0.2	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.6	1.0	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	1.0																					
3-Jan	0.3	0.2	0.8	Z	0.8	0.9	0.6	0.5	0.5	0.7	0.8	0.5	0.7	0.9	0.8	0.7	0.4	0.4	0.2	0.2	0.2	0.3	0.3	0.1	0.5	0.9	0.9																						
4-Jan	0.3	0.5	0.9	1.0	Z	0.5	0.5	0.2	0.1	0.1	0.3	0.2	0.2	0.7	0.4	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.1	0.2	0.3	1.0	1.0																						
5-Jan	0.4	0.2	0.2	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.5	0.6	0.6	0.9	2.4	2.7	2.7	3.2	3.6	1.7	0.9	3.6	3.6																						
6-Jan	Z	1.8	1.0	1.1	1.7	2.2	0.9	0.5	1.2	0.8	0.6	0.7	0.6	0.6	1.0	0.6	0.4	0.3	0.3	0.3	0.5	0.4	0.5	0.6	0.8	2.2	2.2																						
7-Jan	0.7	Z	0.8	0.6	0.9	0.9	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.9	0.9																						
8-Jan	0.3	0.3	Z	0.3	0.3	0.1	0.4	0.9	1.6	1.2	1.8	1.6	2.7	1.8	2.5	3.2	2.6	2.4	2.6	1.6	0.5	1.8	0.3	0.2	1.4	3.2	3.2																						
9-Jan	0.2	0.5	0.5	Z	0.4	0.2	0.1	0.1	0.1	0.1	0.4	0.6	0.3	1.1	0.4	0.4	0.6	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.5	1.1	1.1																						
10-Jan	1.1	0.8	1.0	1.2	Z	2.4	2.6	1.5	1.3	0.7	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.7	2.6	2.6																						
11-Jan	0.1	0.1	0.2	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.3	0.3	0.1	0.3	1.0	1.4	2.8	1.6	0.9	0.7	0.5	2.8	2.8																						
12-Jan	Z	0.9	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.0	0.1	0.1	0.3	0.4	0.3	0.4	0.4	0.4	0.2	0.2	0.3	0.9	0.9																						
13-Jan	0.3	Z	0.2	0.4	0.4	0.4	1.2	1.6	1.1	1.1	1.1	1.0	0.8	0.5	0.2	0.2	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.5	1.6	1.6																						
14-Jan	0.2	0.0	Z	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.2	0.7	0.7																						
15-Jan	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.3	0.4	1.1	1.9	0.5	0.3	0.6	0.5	0.3	0.3	0.3	0.4	0.6	0.3	0.4	0.3	0.4	1.9	1.9																						
16-Jan	0.1	0.2	0.4	0.6	Z	0.3	0.1	0.4	0.3	0.7	0.7	1.6	1.7	1.2	0.1	0.1	1.8	0.6	0.9	0.5	0.5	0.6	0.6	0.4	0.6	1.8	1.8																						
17-Jan	0.3	0.2	0.3	0.3	0.3	Z	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.1	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.2	0.1	0.3	0.5	0.5																						
18-Jan	Z	0.1	0.2	0.3	1.1	1.0	0.9	0.7	0.6	0.6	0.7	0.7	0.7	0.8	0.7	0.8	1.0	1.7	1.3	1.3	1.1	1.3	1.7	2.8	1.0	2.8	2.8																						
19-Jan	1.8	Z	2.3	0.7	0.6	0.6	0.6	0.4	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.7	0.9	0.6	0.8	0.5	0.7	0.5	0.4	0.6	2.3	2.3																						
20-Jan	0.3	0.2	Z	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.3	0.3																						
21-Jan	0.4	0.6	0.5	Z	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.1	0.4	0.5	0.7	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.7	0.7																						
22-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	3.5	5.0	7.1	3.6	2.3	1.4	0.4	0.3	0.2	0.2	1.1	7.1	7.1																						
23-Jan	0.3	0.8	1.7	0.9	1.6	Z	1.4	1.6	1.4	2.2	1.4	1.1	1.2	1.1	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.8	2.2	2.2																						
24-Jan	Z	0.0	0.1	0.2	0.2	0.4	0.4	Z	C	C	C	C	0.2	0.2	0.0	0.0	0.0	1.1	17.2	5.2	1.4	0.8	0.4	0.3	1.5	17.2																							
25-Jan	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.3	0.1	0.3	0.3	0.7	0.9	1.0	0.3	1.2	0.3	0.3	1.7	0.4	1.7	1.7																						
26-Jan	0.2	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.4	1.2	1.2	1.5	2.0	4.5	6.4	5.5	3.3	4.6	0.7	0.2	0.2	0.2	0.3	0.2	1.4	6.4	6.4																						
27-Jan	0.3	0.2	0.3	Z	0.5	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.3	6.5	7.4	7.8	5.2	3.9	2.0	0.7	0.4	0.6	0.5	0.1	1.6	7.8	7.8																						
28-Jan	0.2	0.1	0.1	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.2																						
29-Jan	0.0	0.0	0.9	0.6	0.3	Z	0.1	0.2	0.1	0.2	0.7	0.9	1.4	1.4	0.8	0.5	0.2	0.4	0.0	0.0	0.0	0.5	0.6	0.3	0.4	1.4	1.4																						
30-Jan	Z	2.6	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	2.0	3.5	2.2	0.1	0.1	0.2	1.7	2.3	2.5	5.0	4.9	4.0	1.4	5.0	5.0																						
31-Jan	3.7	Z	3.4	3.4	3.3	1.0	1.4	3.3	4.7	4.5	5.2	2.8	2.5	1.5	0.8	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.4	0.4	1.9	5.2	5.2																						
																								0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.7	1.0	1.1	1.0	1.0	0.9	1.2	0.8	0.6	0.7	0.6	0.6	Diurnal Average		
																								3.7	2.6	3.4	3.4	3.3	2.4	2.6	3.3	4.7	4.5	5.2	2.8	2.7	6.5	7.4	7.8	7.1	4.6	17.2	5.2	2.8	5.0	4.9	4.0	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	13	6	8	9	34	112	126	61	20	17	13	44	111	51	40	25	690
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	6	8	9	34	112	126	61	20	17	13	44	111	51	41	25	691

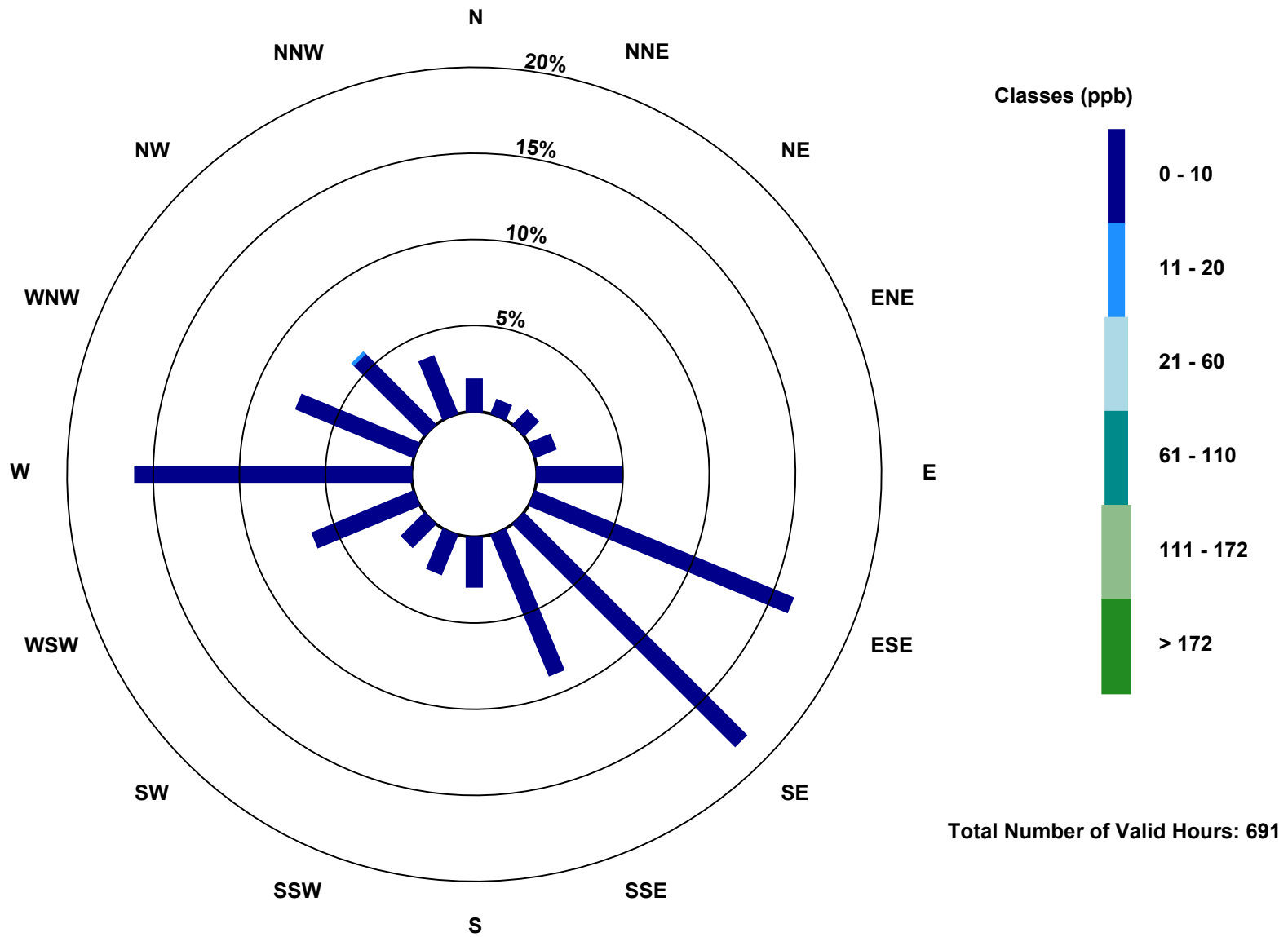
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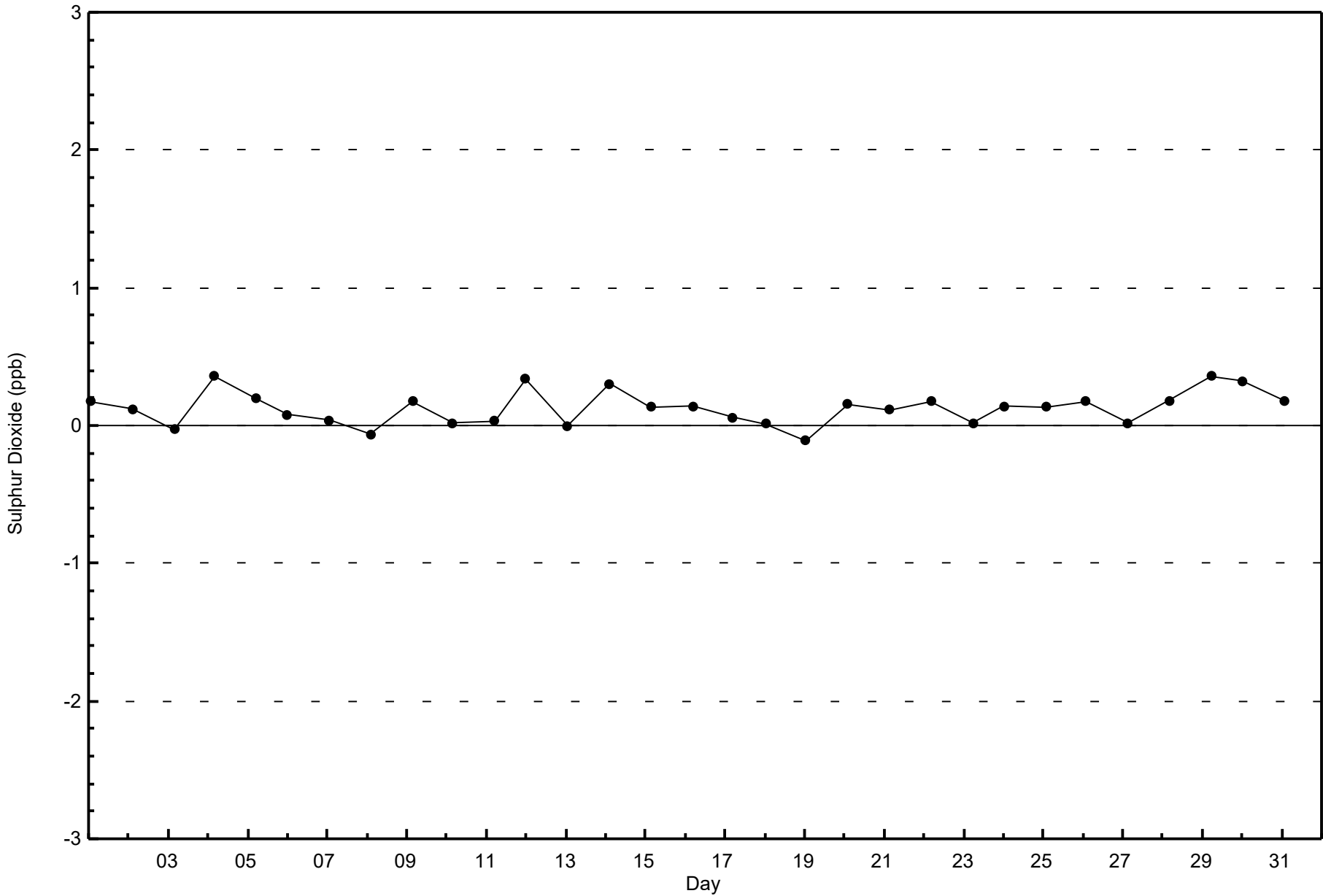
Total Number of Hours: 744

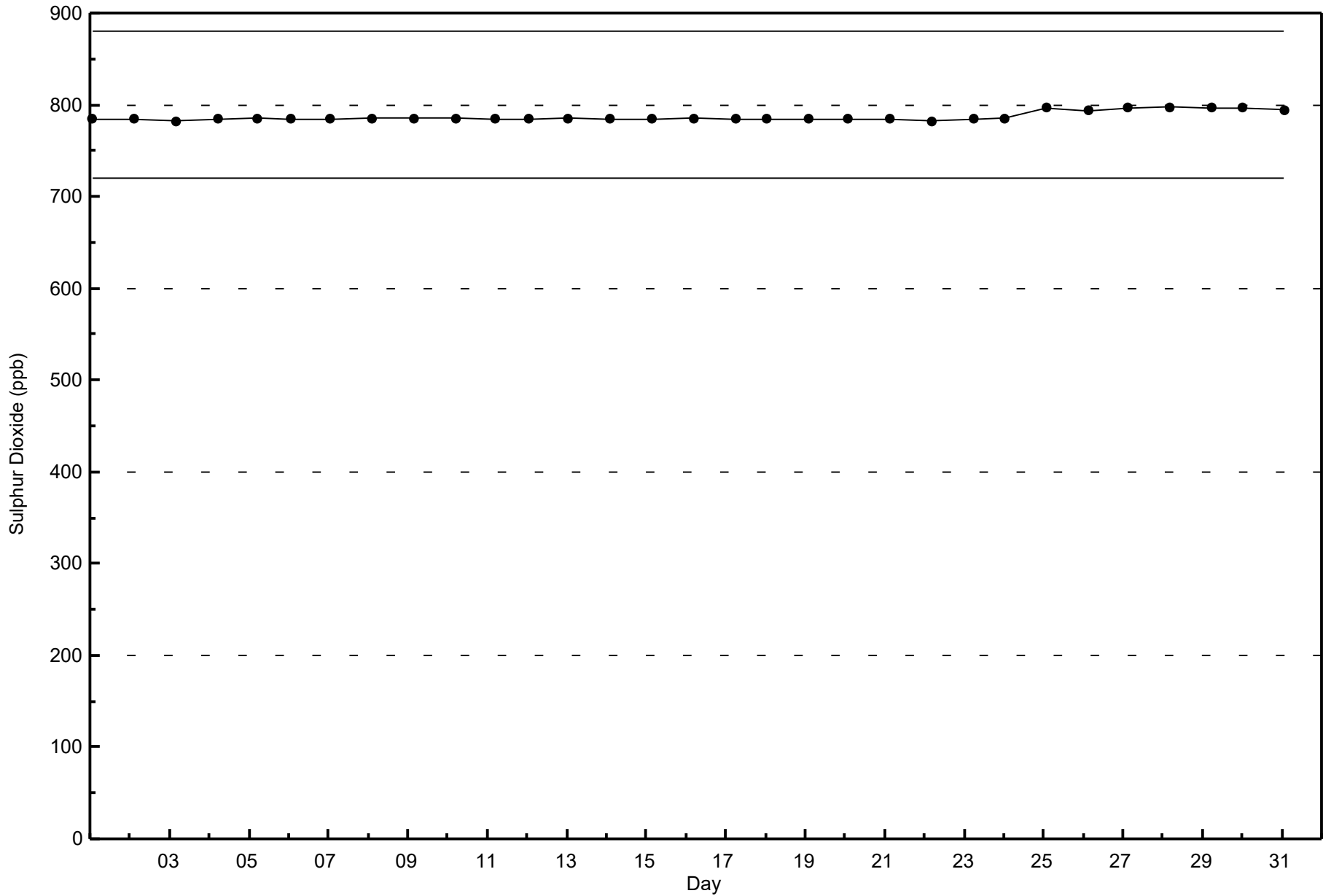


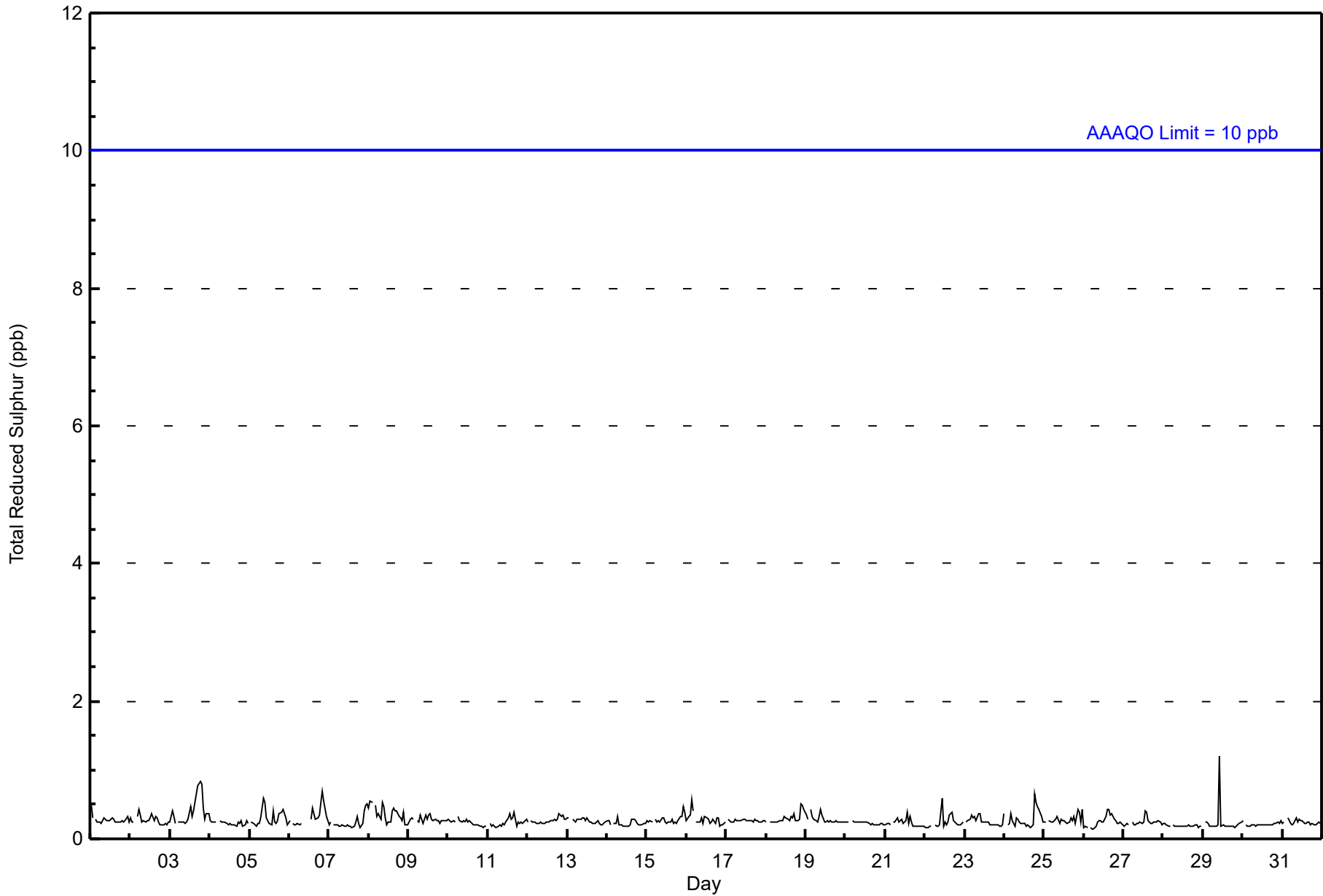
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Anzac











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	13	6	8	9	33	118	121	61	19	19	12	43	110	53	40	25	690
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	6	8	9	33	118	121	61	19	19	12	43	110	53	40	25	690

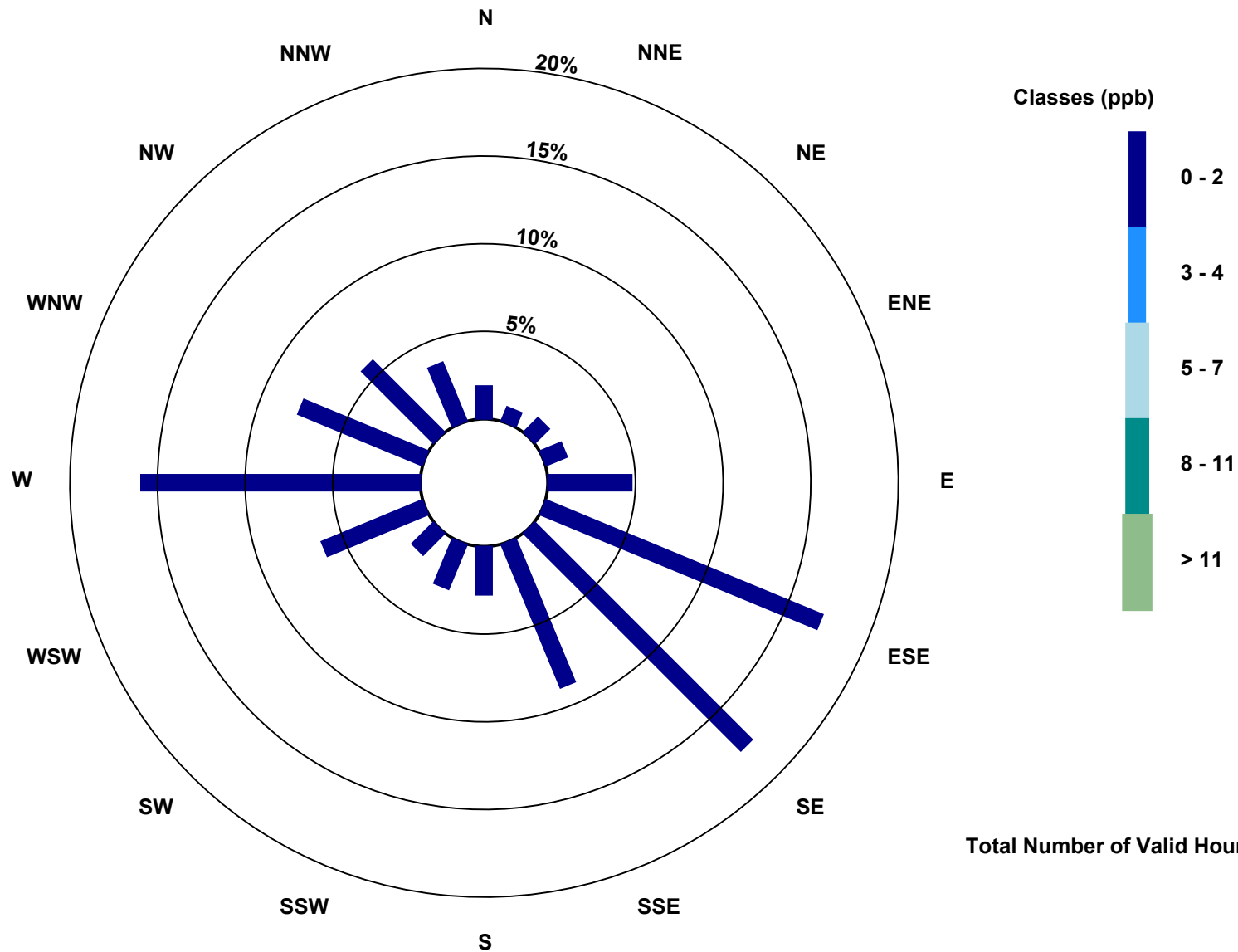
Total Number of Valid Hours: 690

Total Number of Hours: 744

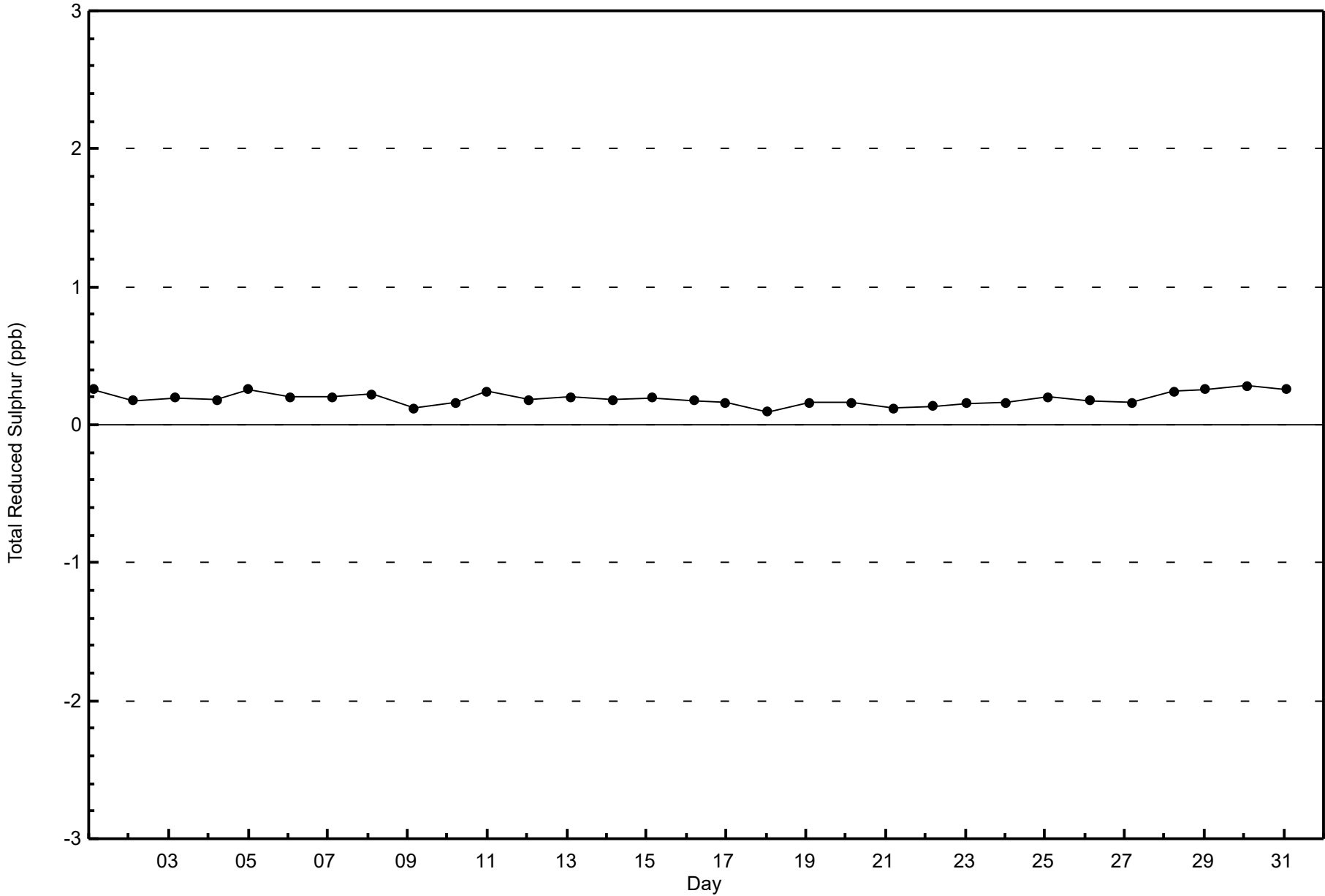


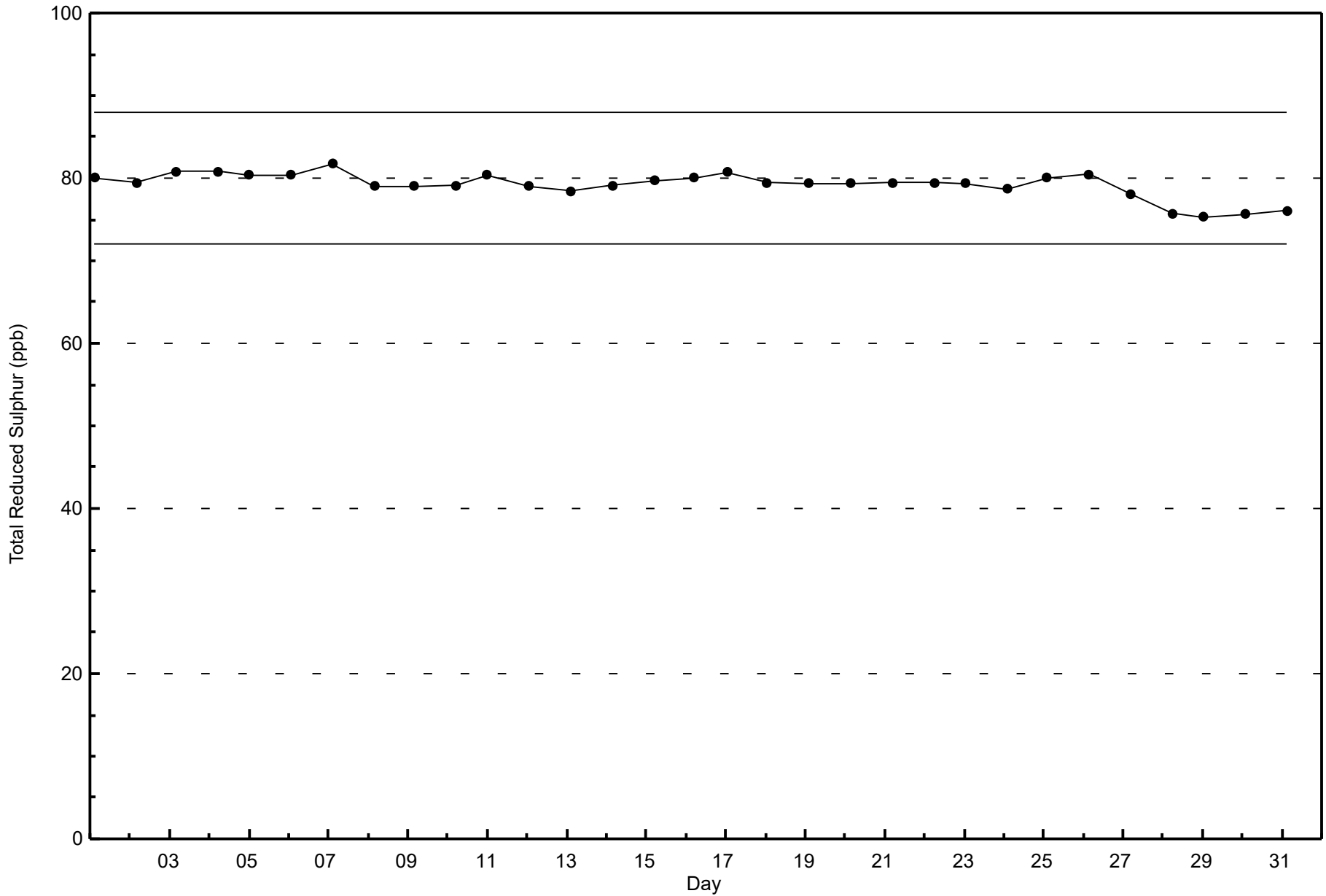
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Anzac



Total Number of Valid Hours: 690



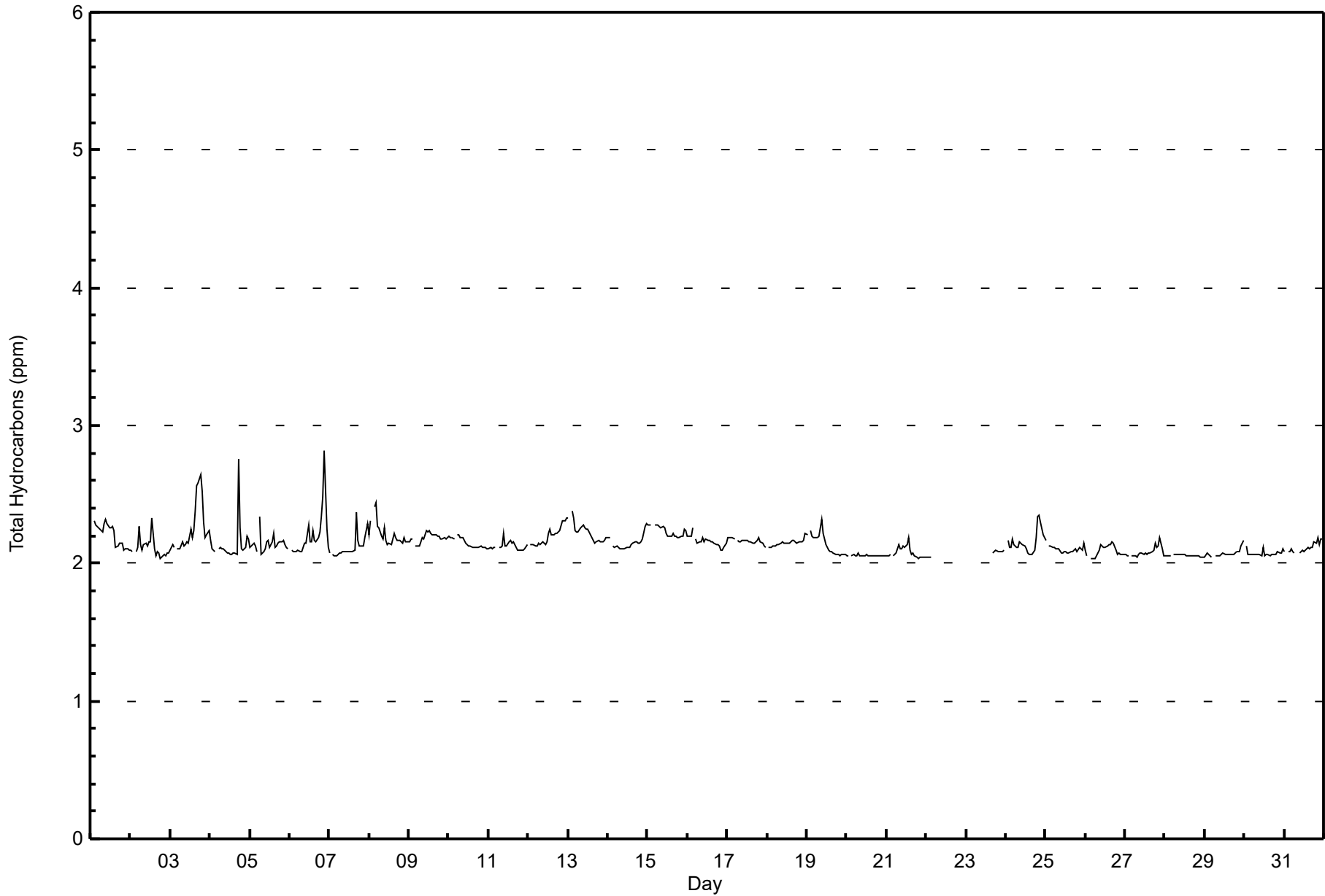




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Anzac - January 2023

Maximum Value: 2.8 ppm on Jan 6 22:00		Maximum Daily Average: 2.2 ppm on Jan 3		Hours in Service: 744																						
Minimum Value: 2.0 ppm on Jan 26 04:00		Minimum Daily Average: 2.1 ppm on Jan 28		Hours of Data: 677																						
Maximum Diurnal Average: 2.2 ppm at hour 18		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Missing Data: 67																						
Monthly Average: 2.14 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.5		Hours of Calibration: 33																						
				Percent Operational Time: 95.4																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.5	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5
2-Jan	2.1	2.1	Z	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.3
3-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.4	2.6	2.6	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.6
4-Jan	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.8	2.3	2.1	2.1	2.2	2.2	2.2	2.2	2.8
5-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.3	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.3
6-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.8	2.2	2.1	2.2	2.8
7-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.4
8-Jan	2.2	2.3	Z	2.4	2.4	2.3	2.3	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.4
9-Jan	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
10-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
11-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
12-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.3
13-Jan	2.3	Z	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
14-Jan	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.3
15-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3
16-Jan	2.2	2.2	2.2	2.3	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
17-Jan	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2
18-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
19-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3
20-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
21-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2
22-Jan	2.0	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.0
23-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	C	C	C	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
24-Jan	Z	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.2	2.2	2.3
25-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
26-Jan	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
27-Jan	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.2
28-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1
29-Jan	2.0	2.1	2.1	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
30-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
31-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.2	2.1	2.2
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										
M - Maintenance																										
UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	23	3.40	3.40
2.1 - 3.0	654	96.60	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Anzac - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	1	0	0	0	1	3	10	2	4	2	23
2.1 - 3.0	12	6	8	8	32	105	124	62	18	17	12	41	96	47	29	19	636
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	6	8	8	32	105	125	62	18	17	13	44	106	49	33	21	659

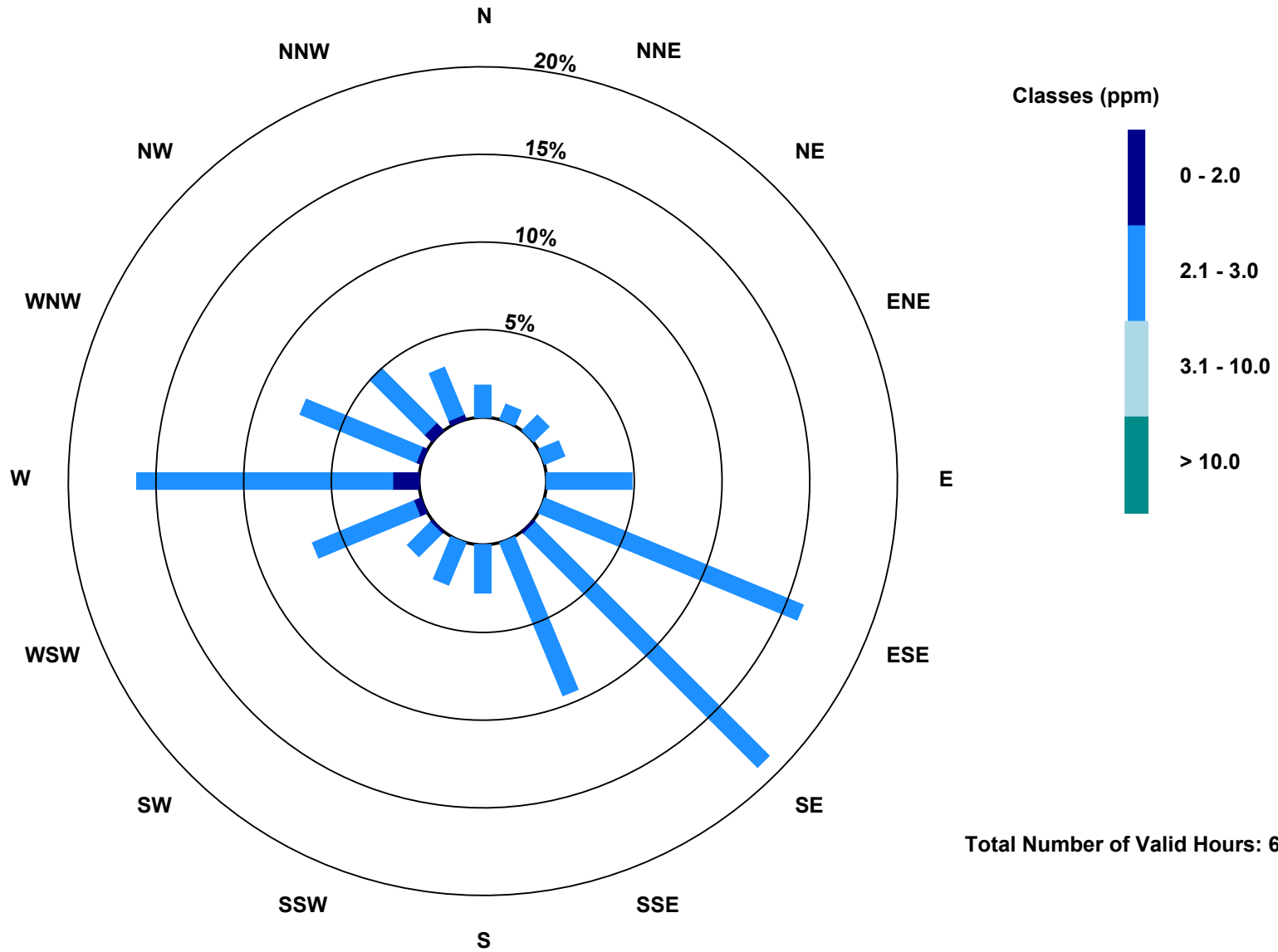
Total Number of Valid Hours: 659

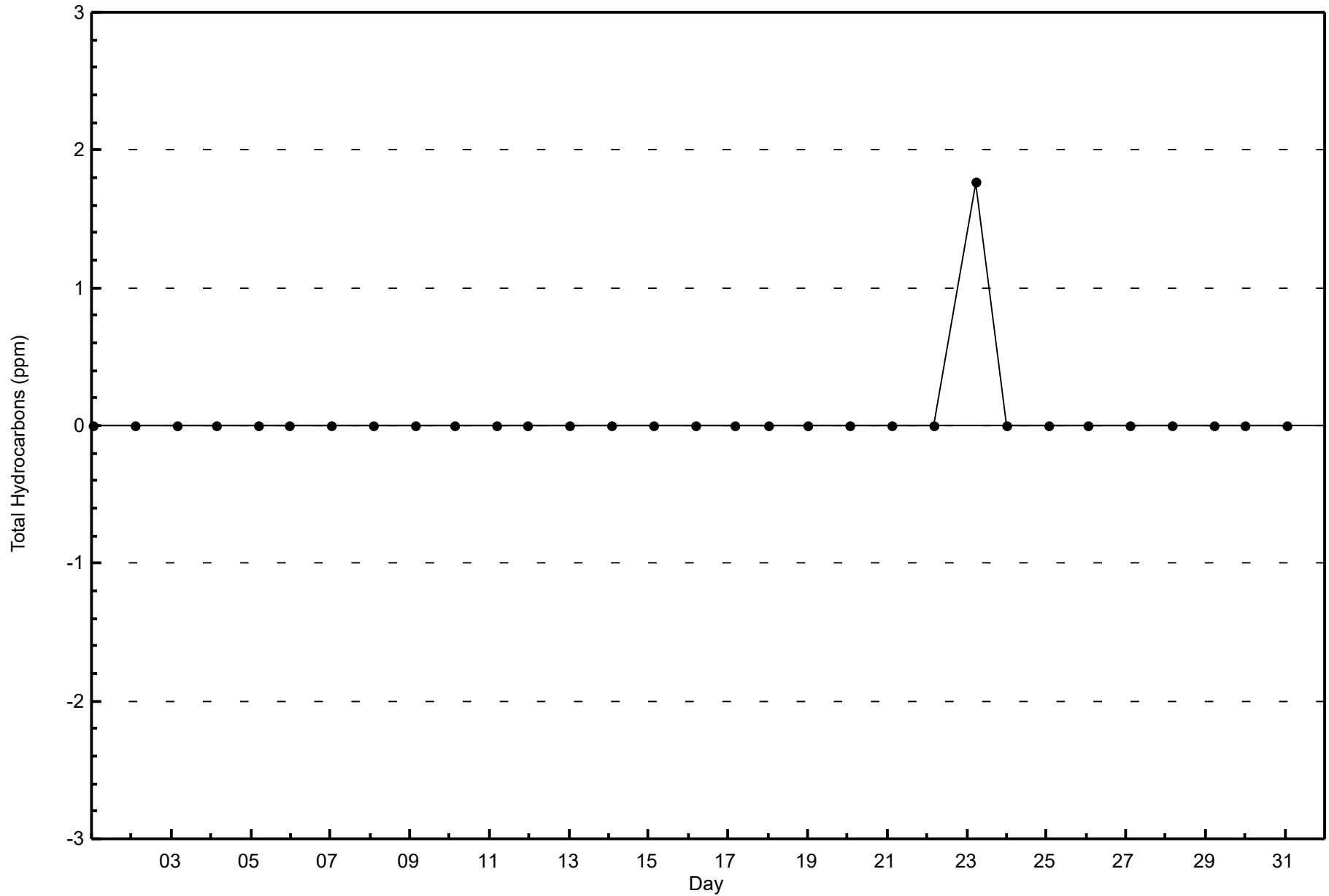
Total Number of Hours: 744

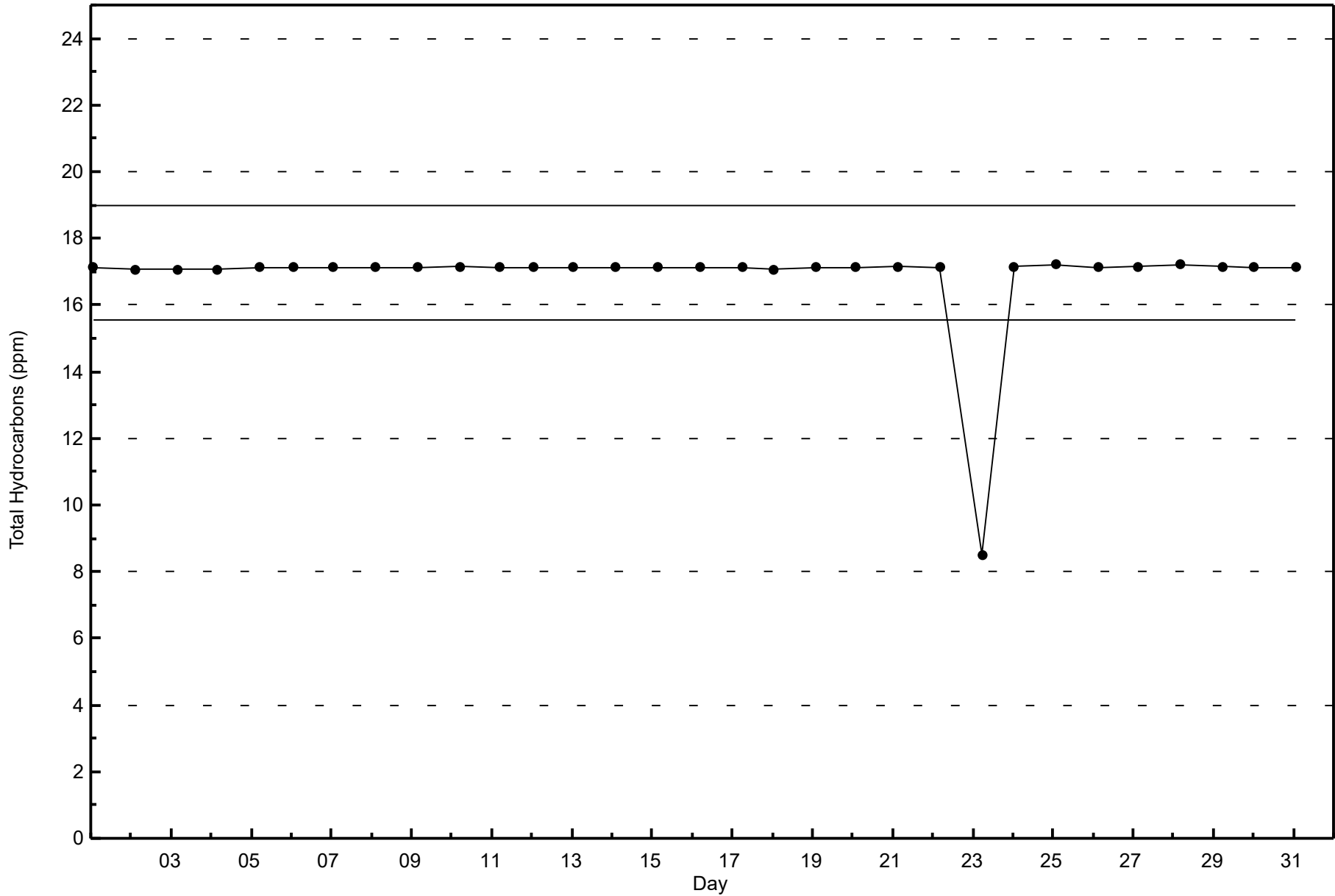


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Anzac





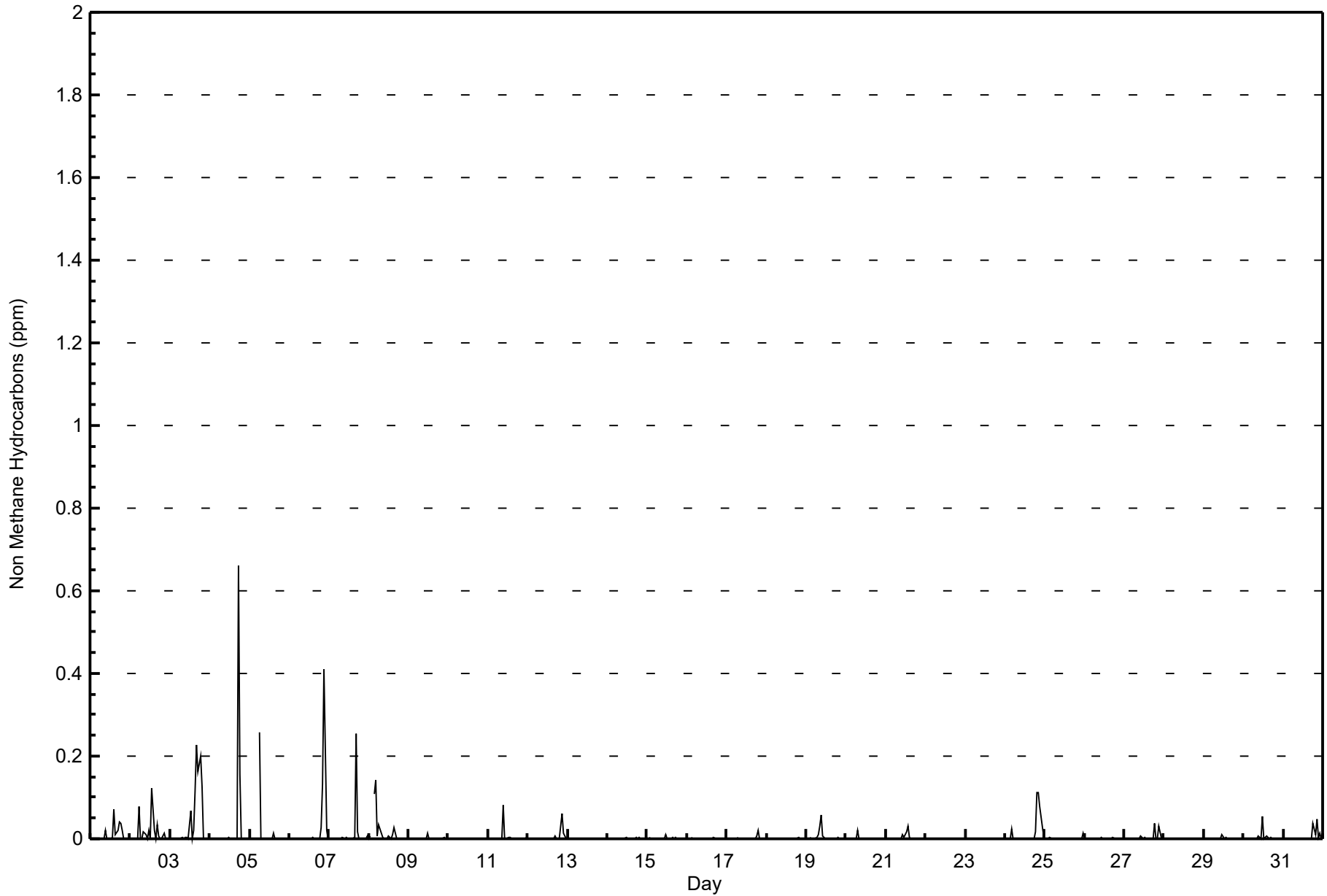




Summary of Hour Averages

Anzac - January 2023

Maximum Value: 0.661 ppm on Jan 4 18:00		Maximum Daily Average: 0.040 ppm on Jan 3		Hours in Service: 744																							
Minimum Value: 0.000 ppm on Jan 1 03:00		Minimum Daily Average: 0.000 ppm on Jan 10		Hours of Data: 677																							
Maximum Diurnal Average: 0.030 ppm at hour 18		Minimum Diurnal Average: 0.000 ppm at hour 2		Hours of Missing Data: 67																							
Monthly Average: 0.007 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.2		Hours of Calibration: 33																							
				Percent Operational Time: 95.4																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.023	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.003	0.072	0.011	0.022	0.039	0.039	0.022	0.000	0.000	0.000	0.000	0.011	0.072	
2-Jan	0.000	0.000	Z	0.000	0.000	0.078	0.000	0.000	0.017	0.009	0.000	0.021	0.000	0.122	0.019	0.000	0.034	0.005	0.000	0.000	0.015	0.000	0.000	0.000	0.014	0.122	
3-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.003	0.000	0.005	0.002	0.000	0.068	0.000	0.022	0.116	0.226	0.164	0.199	0.127	0.000	0.000	0.000	0.000	0.040	0.226	
4-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.001	0.000	0.661	0.156	0.000	0.000	0.000	0.000	0.036	0.661	
5-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.257	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.257	
6-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.029	0.132	0.409	0.019	0.000	0.026	0.409	
7-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.004	0.000	0.000	0.000	0.000	0.004	0.255	0.016	0.000	0.000	0.000	0.000	0.000	0.008	0.013	0.255	
8-Jan	0.000	0.006	Z	0.110	0.143	0.007	0.034	0.015	0.003	0.000	0.000	0.000	0.007	0.000	0.009	0.026	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.143	
9-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.001	0.013	
10-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.081	0.000	0.000	0.003	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.004	0.081	
12-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.061	0.014	0.006	0.000	0.004	0.061	
13-Jan	0.001	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	
14-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.004	0.000	0.004	0.000	0.001	0.001	0.004	0.004	
15-Jan	0.001	0.001	0.003	Z	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.009	0.000	0.000	0.000	0.003	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.009	
16-Jan	0.000	0.000	0.000	0.003	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	
17-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.021	0.000	0.000	0.000	0.000	0.001	0.021		
18-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.003	
19-Jan	0.000	Z	0.005	0.000	0.000	0.000	0.002	0.010	0.031	0.057	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.005	0.057	
20-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.021	
21-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.002	0.017	0.031	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.031	
22-Jan	0.000	0.000	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.000
23-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--	0.000	
24-Jan	Z	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.111	0.113	0.078	0.026	0.004	0.016	0.113	
25-Jan	0.000	Z	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.001	0.012	
26-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.004
27-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.003	0.000	0.000	0.002	0.000	0.001	0.037	0.000	0.001	0.032	0.001	0.000	0.004	0.037	
28-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
29-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.012	
30-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.055	0.000	0.003	0.007	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.055	
31-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.011	0.047	0.004	0.013	0.000	0.005	0.047		
		0.001	0.000	0.000	0.005	0.007	0.003	0.010	0.002	0.002	0.006	0.001	0.004	0.003	0.006	0.005	0.006	0.019	0.030	0.016	0.011	0.012	0.018	0.002	0.001	Diurnal Average	
		0.023	0.006	0.005	0.110	0.143	0.078	0.257	0.021	0.031	0.081	0.010	0.055	0.068	0.122	0.072	0.116	0.255	0.661	0.199	0.127	0.132	0.409	0.026	0.012	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				UO - Unstable Operation																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Anzac - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	599	88.48	88.48
0.006 - 0.05	55	8.12	96.60
0.06 - 0.1	15	2.22	98.82
> 0.1	8	1.18	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Anzac - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	11	6	8	8	29	96	109	50	12	14	11	37	97	47	27	20	582
0.006 - 0.05	0	0	0	0	3	9	11	8	2	1	2	6	7	2	4	0	55
0.06 - 0.1	1	0	0	0	0	0	3	3	2	1	0	1	0	0	2	1	14
> 0.1	0	0	0	0	0	0	2	1	2	1	0	0	2	0	0	0	8
Totals	12	6	8	8	32	105	125	62	18	17	13	44	106	49	33	21	659

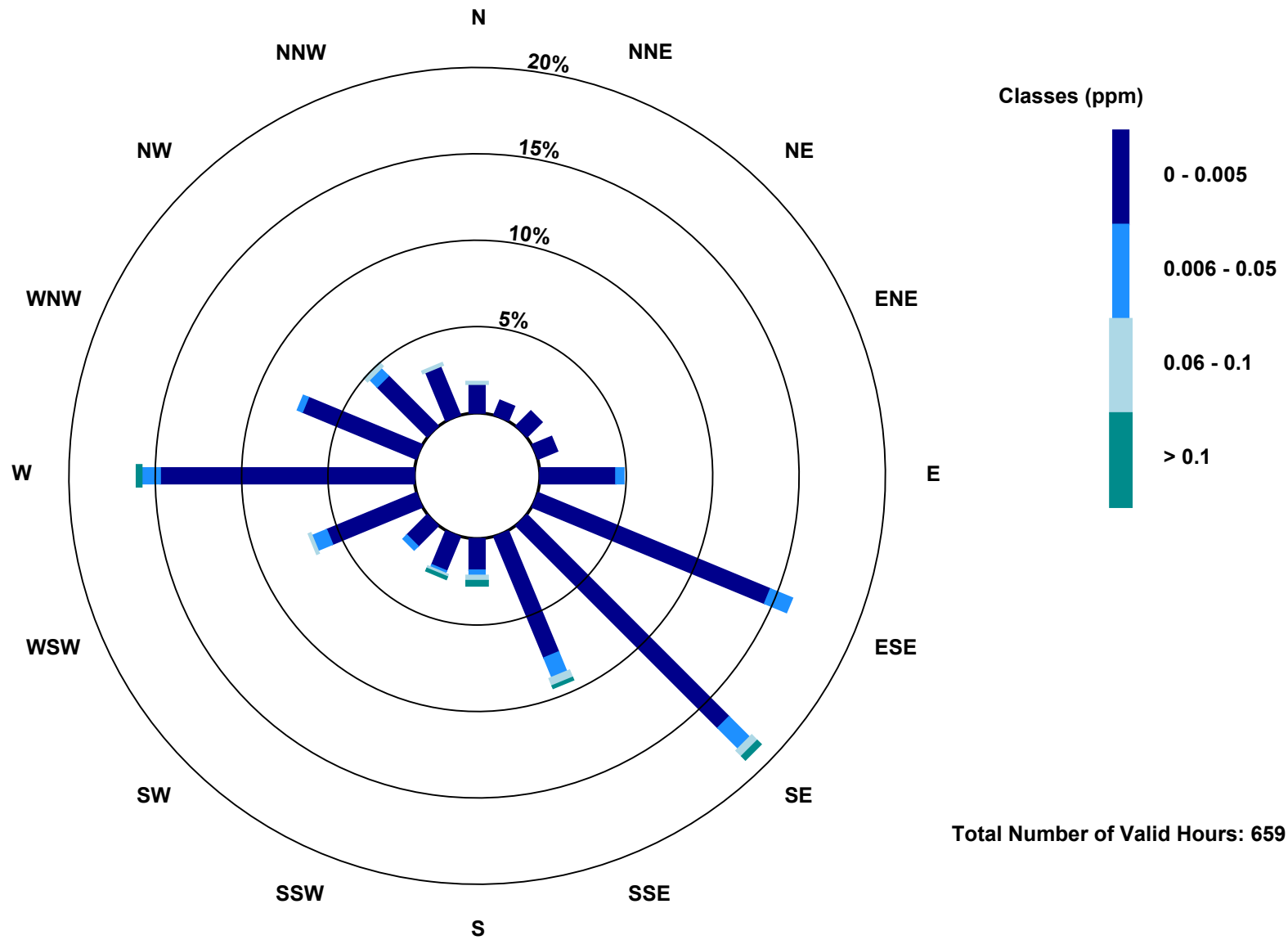
Total Number of Valid Hours: 659

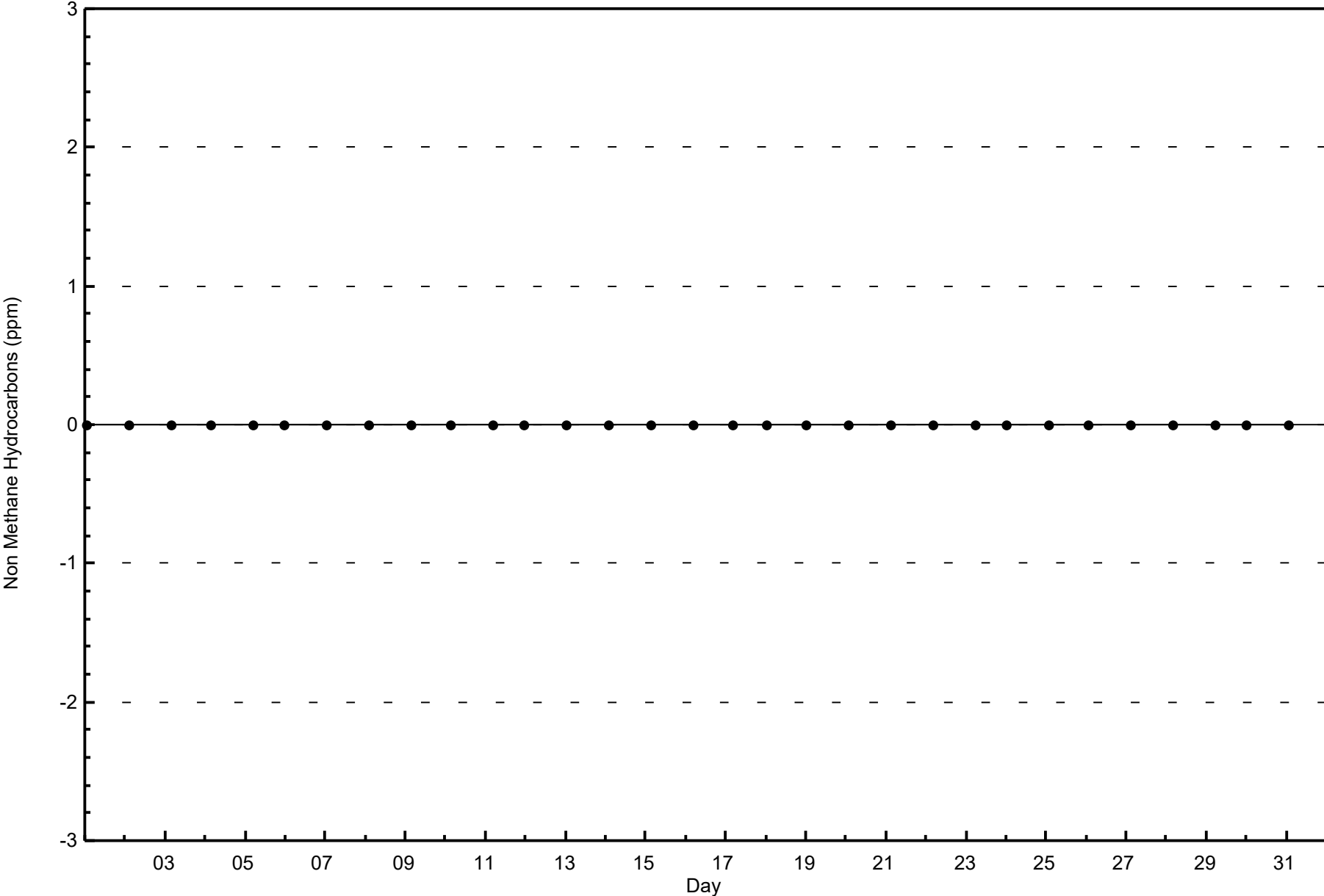
Total Number of Hours: 744

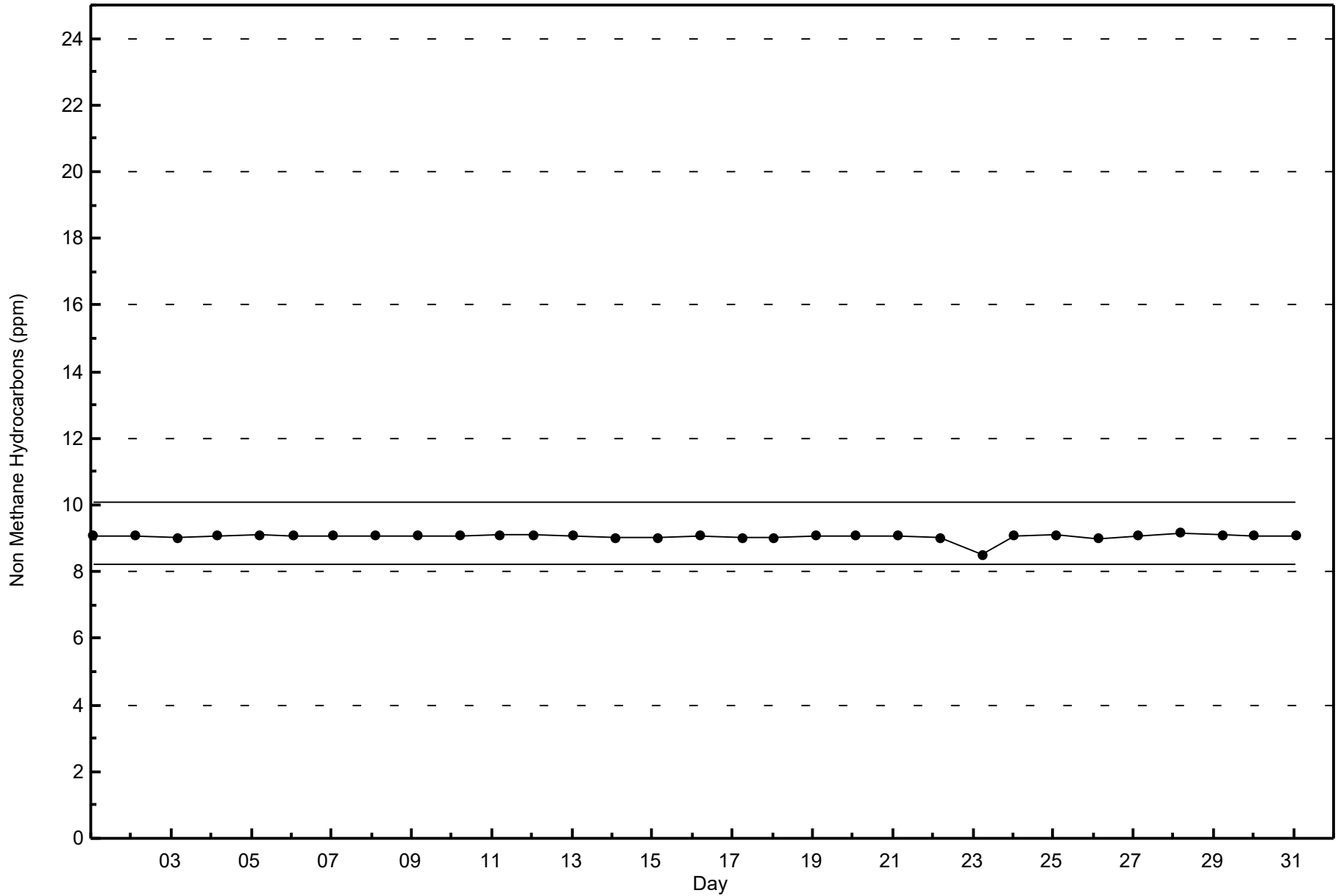


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

Methane (CH₄) - ppm
Anzac - January 2023

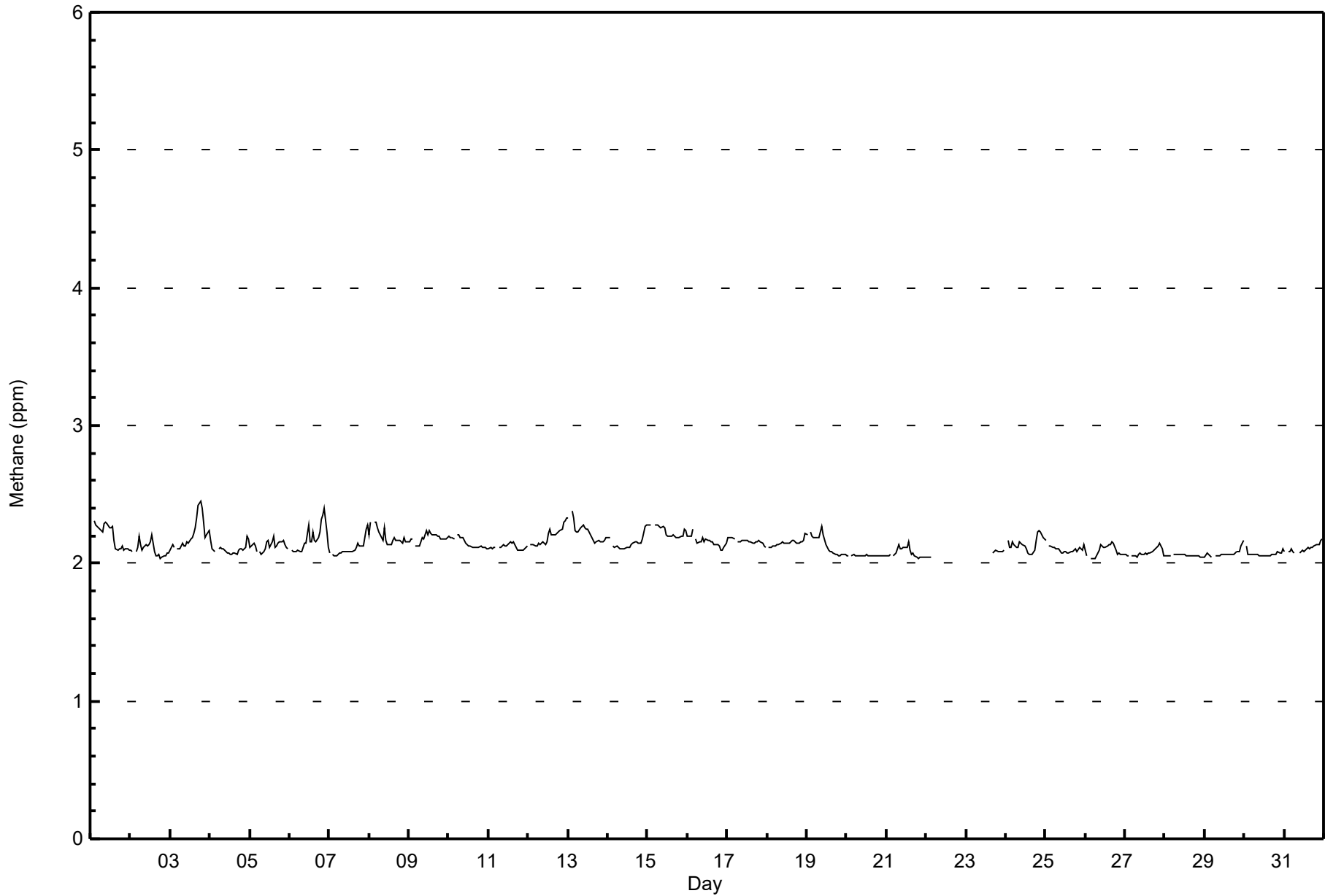
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 744	
Maximum Value: 2.4 ppm on Jan 3 19:00		Maximum Daily Average: 2.2 ppm on Jan 15	
Minimum Value: 2.0 ppm on Jan 26 04:00		Hours of Data: 677	
Maximum Diurnal Average: 2.1 ppm at hour 1		Hours of Missing Data: 67	
Monthly Average: 2.13 ppm		Hours of Calibration: 33	
Minimum Daily Average: 2.1 ppm on Jan 28		Percent Operational Time: 95.4	
Minimum Diurnal Average: 2.1 ppm at hour 16		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.3	

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24								
1-Jan	2.4	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4						
2-Jan	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2					
3-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.4						
4-Jan	2.2	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2					
5-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2					
6-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.1	2.2	2.4	2.4					
7-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.3					
8-Jan	2.2	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3				
9-Jan	2.2	2.2	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2				
10-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2				
11-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2				
12-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.3				
13-Jan	2.3	Z	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4				
14-Jan	2.2	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.1	2.3	2.3				
15-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3			
16-Jan	2.2	2.2	2.2	2.3	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3			
17-Jan	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2			
18-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2			
19-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3		
20-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
21-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
22-Jan	2.0	2.0	2.0	2.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	
23-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	
24-Jan	Z	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2
25-Jan	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
26-Jan	2.1	2.1	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Jan	2.1	2.1	2.1	Z	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
29-Jan	2.0	2.1	2.1	2.1	2.0	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
31-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	M	M	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.1 2.1																								Diurnal Average								
2.4 2.3 2.4 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.2 2.3 2.3 2.4 2.4 2.4 2.3 2.4 2.3 2.3																								Diurnal Maximum								
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																																



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Anzac - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Anzac - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	24	3.55	3.55
2.1 - 3.0	653	96.45	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Anzac - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	1	0	1	0	1	3	10	2	4	2	24
2.1 - 3.0	12	6	8	8	32	105	124	62	17	17	12	41	96	47	29	19	635
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	6	8	8	32	105	125	62	18	17	13	44	106	49	33	21	659

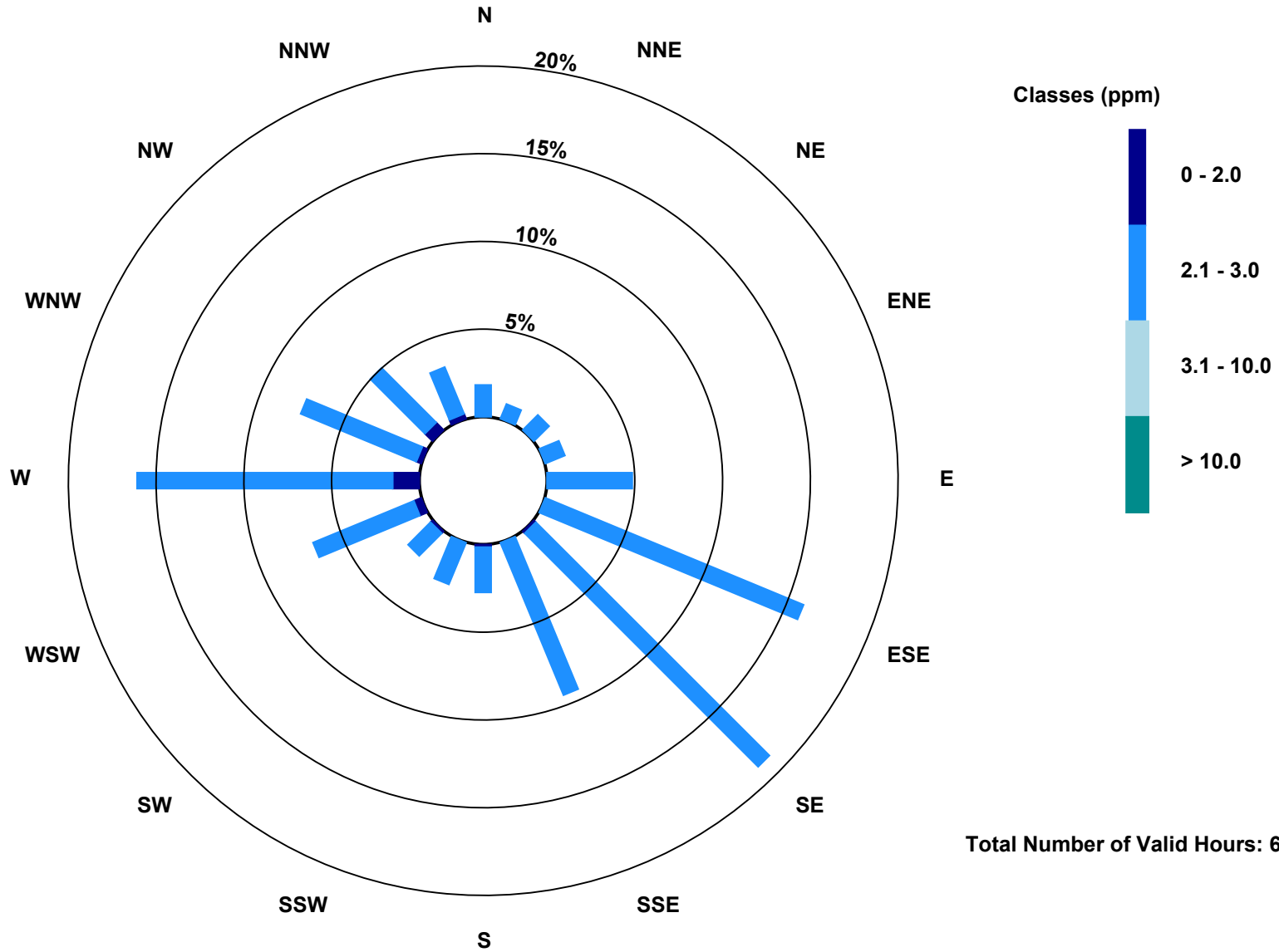
Total Number of Valid Hours: 659

Total Number of Hours: 744

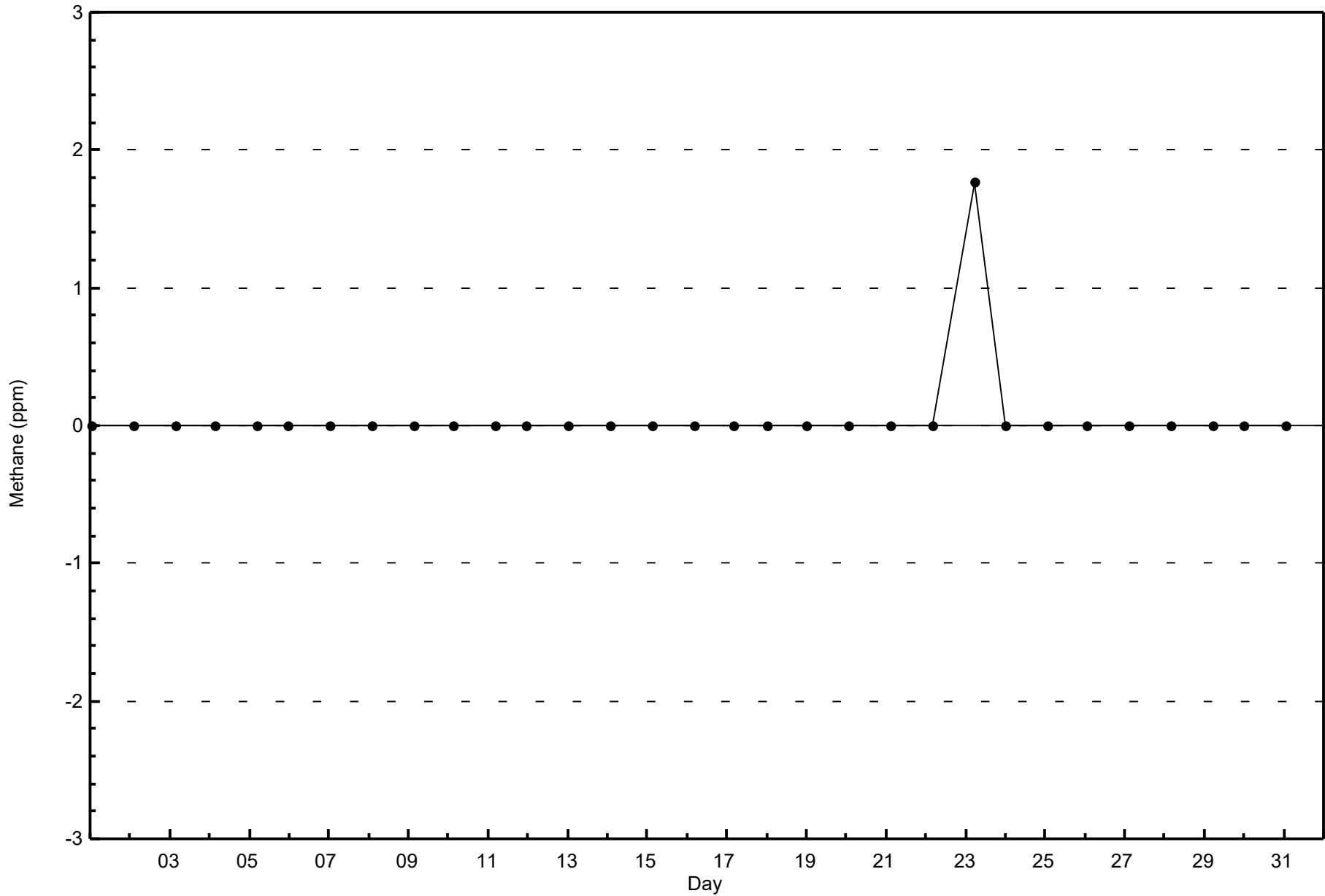


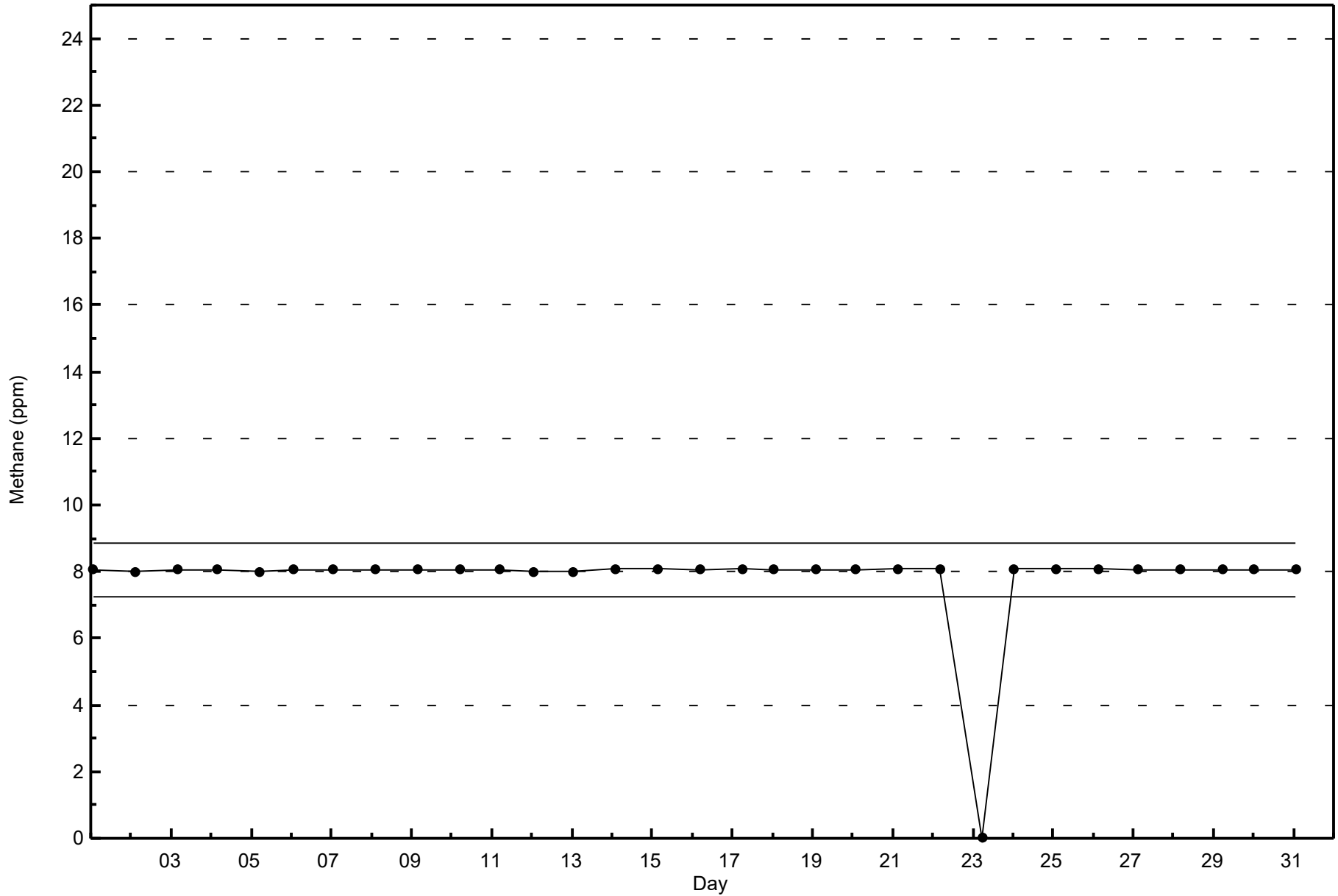
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Anzac



Total Number of Valid Hours: 659







Wood Buffalo Environmental Association
Summary of Hour Averages

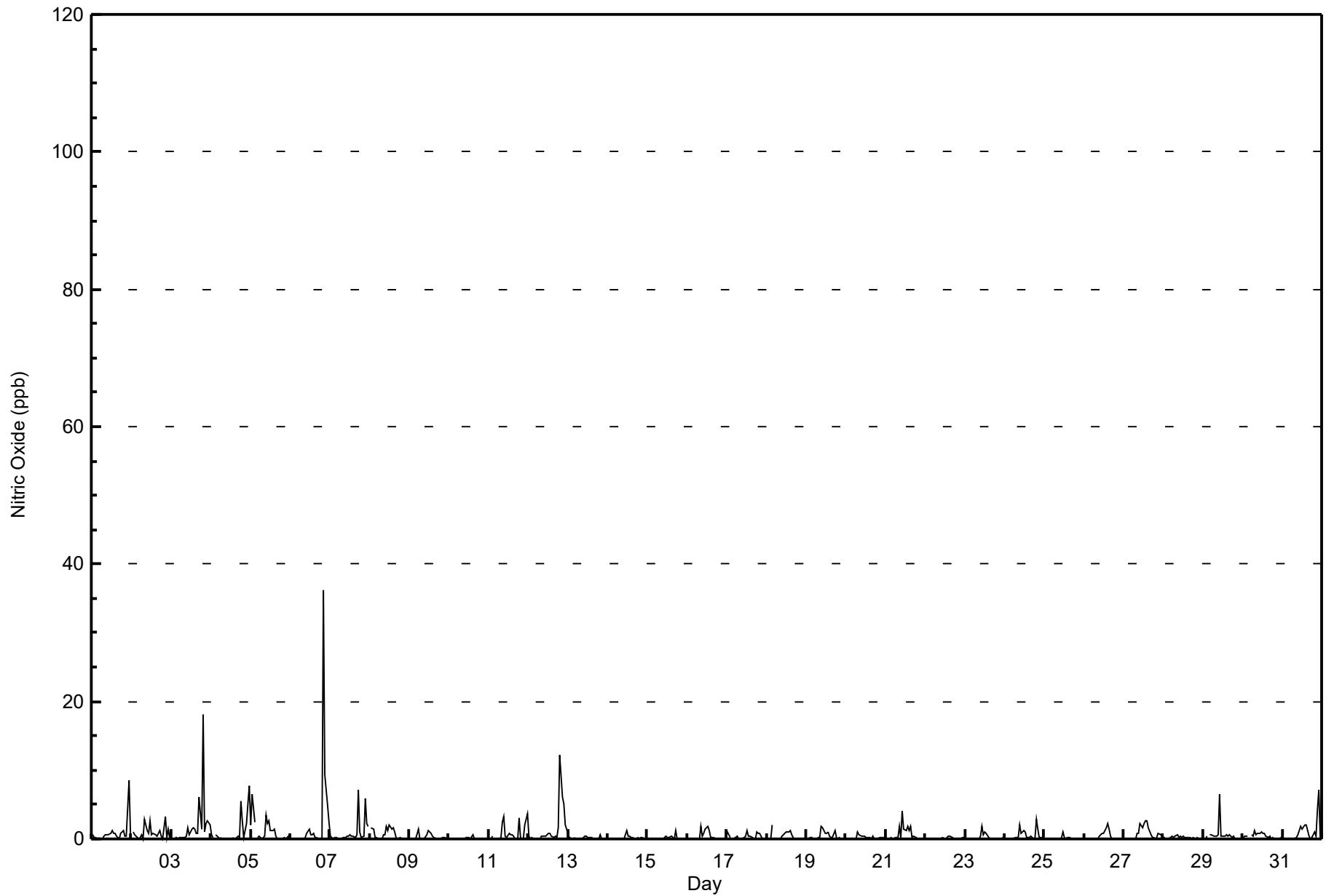
Nitric Oxide (NO) - ppb
Anzac - January 2023

Maximum Value: 36.1 ppb on Jan 6 21:00		Maximum Daily Average: 2.5 ppb on Jan 6		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Jan 2 05:00		Minimum Daily Average: 0.1 ppb on Jan 10		Hours of Data: 707																																													
Maximum Diurnal Average: 1.7 ppb at hour 21		Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Missing Data: 37																																													
Monthly Average: 0.65 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 1.5 P ₉₉ = 7.1		Hours of Calibration: 37																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.6	0.3	0.3	0.1	0.1	Z	0.1	0.4	0.5	0.6	0.7	0.9	1.2	0.9	0.8	0.3	0.1	0.8	1.0	1.2	0.4	0.4	8.5	0.8	0.9	8.5																							
2-Jan	Z	1.0	0.6	0.3	0.0	0.2	0.5	0.0	2.9	1.2	0.8	2.6	0.5	0.8	0.7	0.4	0.9	1.2	0.5	0.0	3.3	0.1	1.5	0.2	0.9	3.3																							
3-Jan	0.9	Z	0.2	0.1	0.0	0.1	0.2	0.2	0.3	0.3	1.6	0.7	1.4	1.6	1.4	0.8	0.8	6.1	1.4	18.1	1.0	2.2	2.6	2.0	1.9	18.1																							
4-Jan	0.7	0.1	Z	0.5	0.4	0.1	0.2	0.2	C	C	C	C	C	0.2	0.1	0.1	0.4	0.1	5.6	2.7	0.3	2.2	5.2	7.8	--	7.8																							
5-Jan	2.1	6.4	2.5	Z	0.2	0.4	0.1	0.0	0.4	3.4	2.2	2.7	1.3	1.1	1.4	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.4	1.1	6.4																							
6-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.2	0.8	1.4	0.6	0.5	0.8	0.2	0.1	0.0	0.0	0.2	36.1	9.3	4.9	2.4	2.5	36.1																							
7-Jan	0.5	0.3	0.1	0.2	0.2	Z	0.1	0.0	0.3	0.2	0.3	0.5	0.5	0.4	0.3	0.3	0.7	7.2	1.1	0.2	0.3	5.8	2.3	1.8	1.0	7.2																							
8-Jan	Z	1.5	1.4	0.1	0.3	0.1	0.1	0.0	0.6	0.6	1.8	1.3	2.1	1.4	1.6	1.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.6	2.1																							
9-Jan	0.0	Z	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.1	0.7	1.3	0.9	0.9	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.3	1.4																							
10-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																							
11-Jan	0.1	0.1	0.5	Z	0.0	0.0	0.0	0.1	2.3	3.3	0.4	0.3	0.7	0.5	0.6	0.3	0.0	0.0	3.1	0.3	0.0	0.0	2.0	3.6	0.8	3.6																							
12-Jan	0.4	0.0	0.3	0.0	Z	0.0	0.0	0.1	0.5	0.4	0.4	0.6	0.8	0.8	0.4	0.1	0.3	0.1	1.5	12.1	6.1	5.2	2.0	1.3	1.5	12.1																							
13-Jan	0.5	0.3	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.1	0.6																							
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.4	0.3	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	1.1																							
15-Jan	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.1	0.3	0.3	0.2	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2																							
16-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	1.7	0.3	0.7	1.5	1.9	1.3	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.9																							
17-Jan	1.0	0.6	0.2	Z	0.2	0.2	0.3	0.0	0.0	0.1	0.3	0.4	1.3	0.4	0.4	0.2	0.1	0.0	1.1	0.7	0.8	0.0	0.0	0.0	0.4	1.3																							
18-Jan	0.0	0.0	0.0	2.0	Z	0.0	0.0	0.0	0.0	0.3	0.7	0.9	1.0	1.1	1.2	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	2.0																							
19-Jan	0.0	0.0	0.2	0.2	0.1	Z	0.1	0.2	0.2	1.8	1.7	0.7	0.8	1.0	0.3	0.2	0.2	1.3	0.1	0.1	0.1	0.1	0.1	0.0	0.4	1.8																							
20-Jan	Z	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.5	0.5	0.3	0.5	0.2	0.2	0.1	0.1	0.3	0.0	0.0	0.1	0.1	0.2	0.3	0.1	0.2	1.0																							
21-Jan	0.1	Z	0.0	0.2	0.0	0.1	0.2	0.3	1.9	0.3	4.1	1.5	1.2	1.9	1.3	1.8	0.2	0.3	0.3	0.0	0.0	0.1	0.0	0.1	0.7	4.1																							
22-Jan	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.5	0.4	0.2	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.5																							
23-Jan	0.1	0.1	0.0	Z	0.0	0.0	0.1	0.0	0.1	0.4	1.9	0.5	0.9	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.9																							
24-Jan	0.1	0.0	0.0	0.0	Z	0.0	0.2	0.3	0.3	2.0	0.8	1.2	1.0	0.2	0.1	0.1	0.4	0.1	0.2	2.9	1.4	0.3	0.1	0.1	0.5	2.9																							
25-Jan	0.1	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.9	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9																							
26-Jan	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.4	0.5	0.8	0.8	1.6	2.2	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2																							
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	2.2	1.6	2.2	2.6	2.6	1.7	0.7	0.1	0.3	0.1	0.2	0.8	0.5	0.4	0.8	2.6																							
28-Jan	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.7	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.7																							
29-Jan	0.0	0.1	0.4	Z	0.6	0.6	0.4	0.4	0.4	0.5	6.4	0.5	0.4	0.4	0.6	0.5	0.5	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.6	6.4																							
30-Jan	0.1	0.4	0.4	0.3	Z	0.5	0.5	1.3	0.5	0.9	0.8	1.0	0.9	0.8	0.4	0.2	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.4	1.3																							
31-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.5	1.2	1.9	1.4	2.0	2.1	1.3	0.4	0.0	0.1	1.1	0.4	4.3	7.2	0.0	1.1	7.2																							
																								0.3	0.5	0.3	0.2	0.1	0.2	0.1	0.2	0.5	0.7	1.1	0.9	0.9	0.8	0.7	0.4	0.3	0.6	0.6	1.3	1.7	1.0	1.2	0.7	Diurnal Average	
																								2.1	6.4	2.5	2.0	0.6	1.4	0.5	1.3	2.9	3.4	6.4	2.7	2.2	2.6	2.6	1.8	0.9	7.2	5.6	18.1	36.1	9.3	8.5	7.8	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Anzac - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	706	99.86	99.86
21 - 40	1	0.14	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	6	8	9	33	115	127	61	19	18	12	43	105	51	41	24	687
21 - 40	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	6	8	9	33	115	127	62	19	18	12	43	105	51	41	24	688

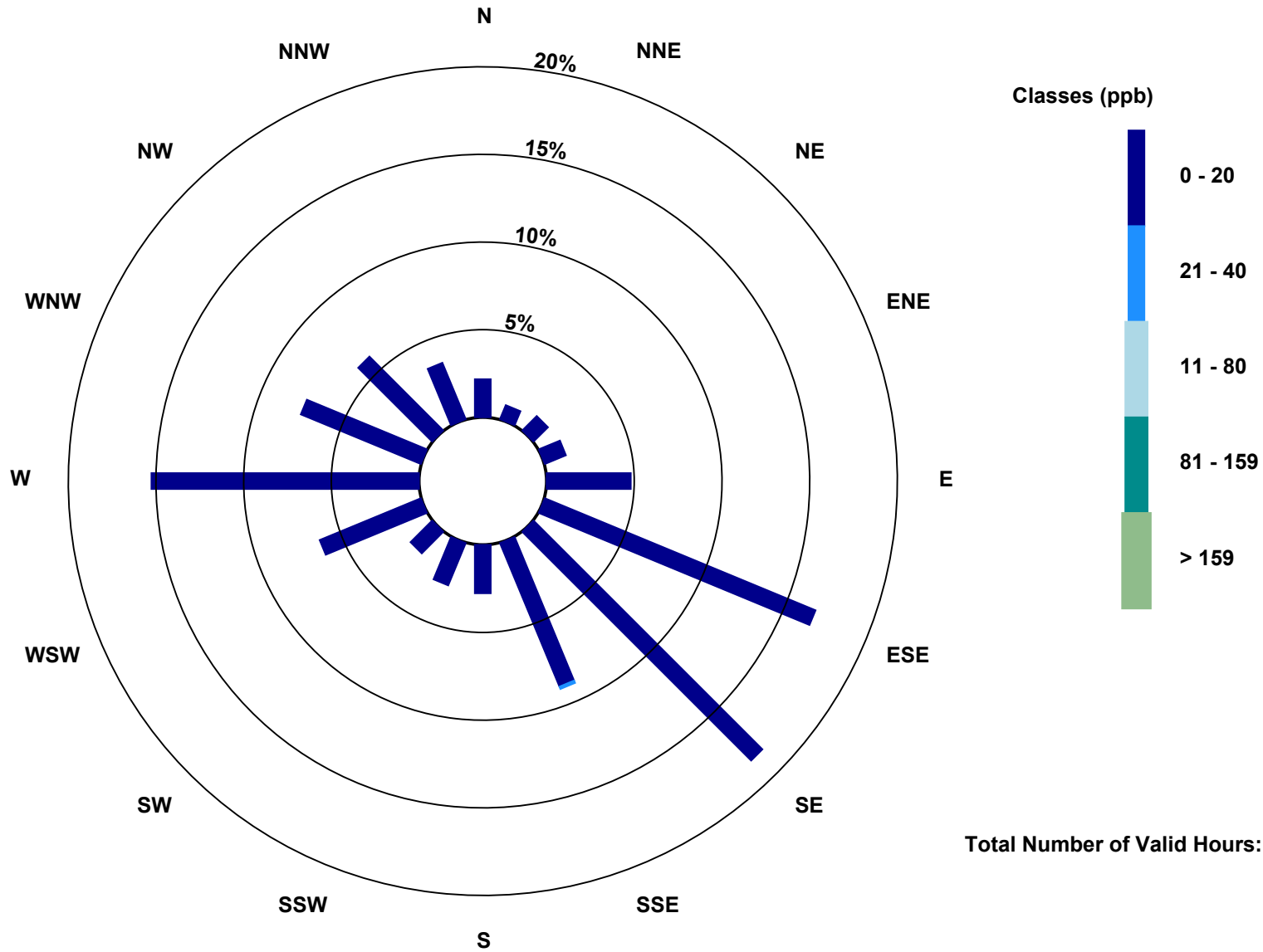
Total Number of Valid Hours: 688

Total Number of Hours: 744

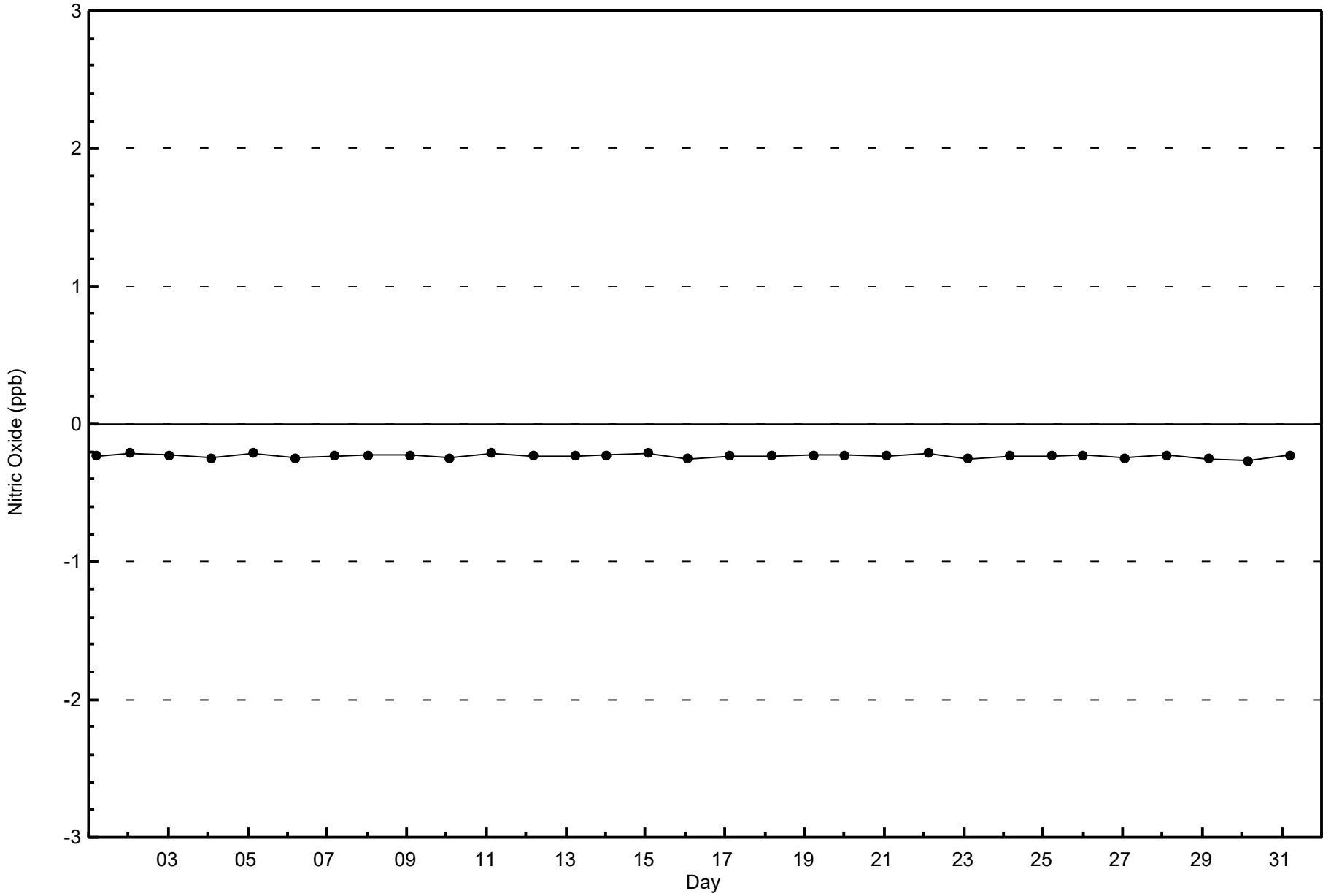


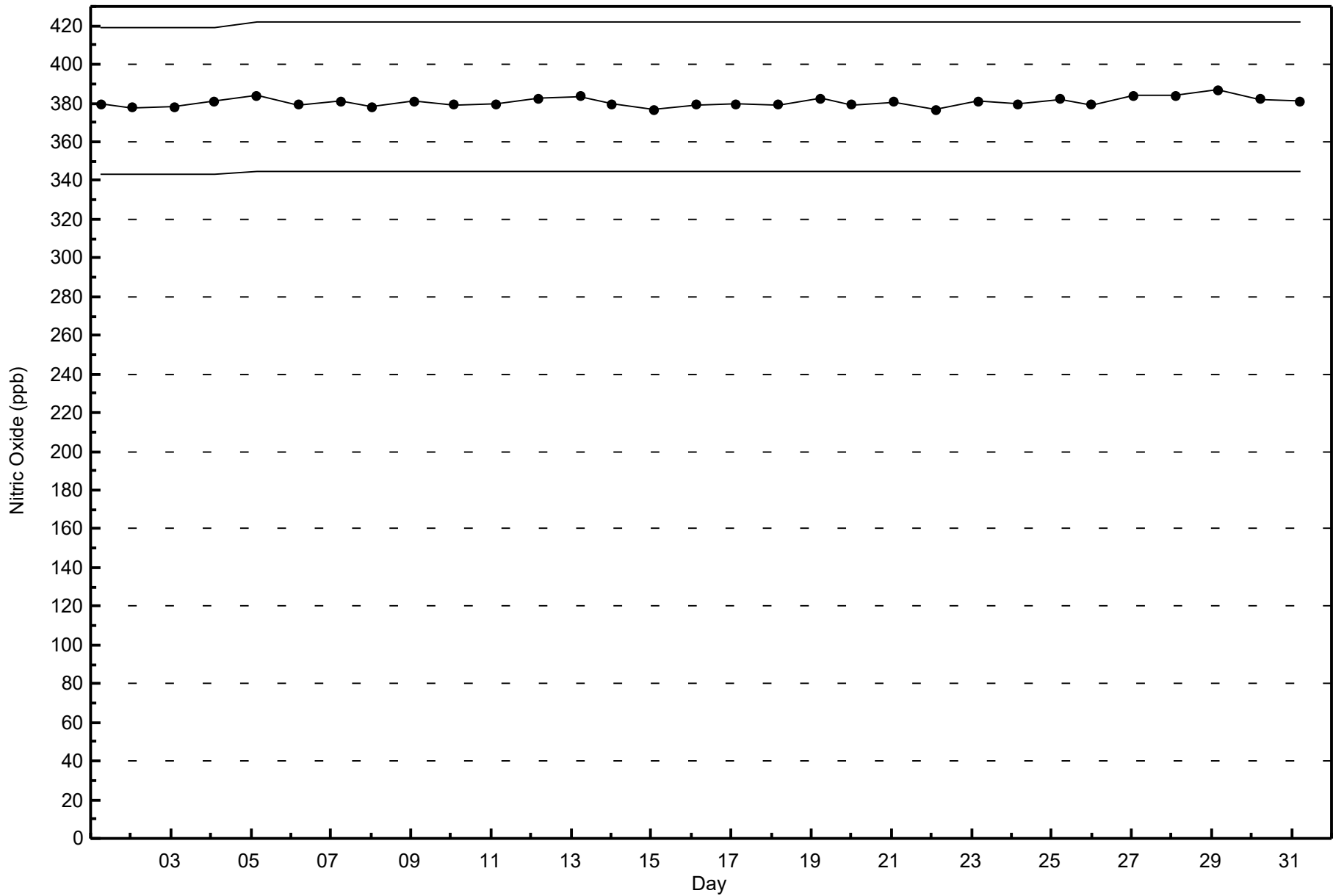
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Anzac



Total Number of Valid Hours: 688



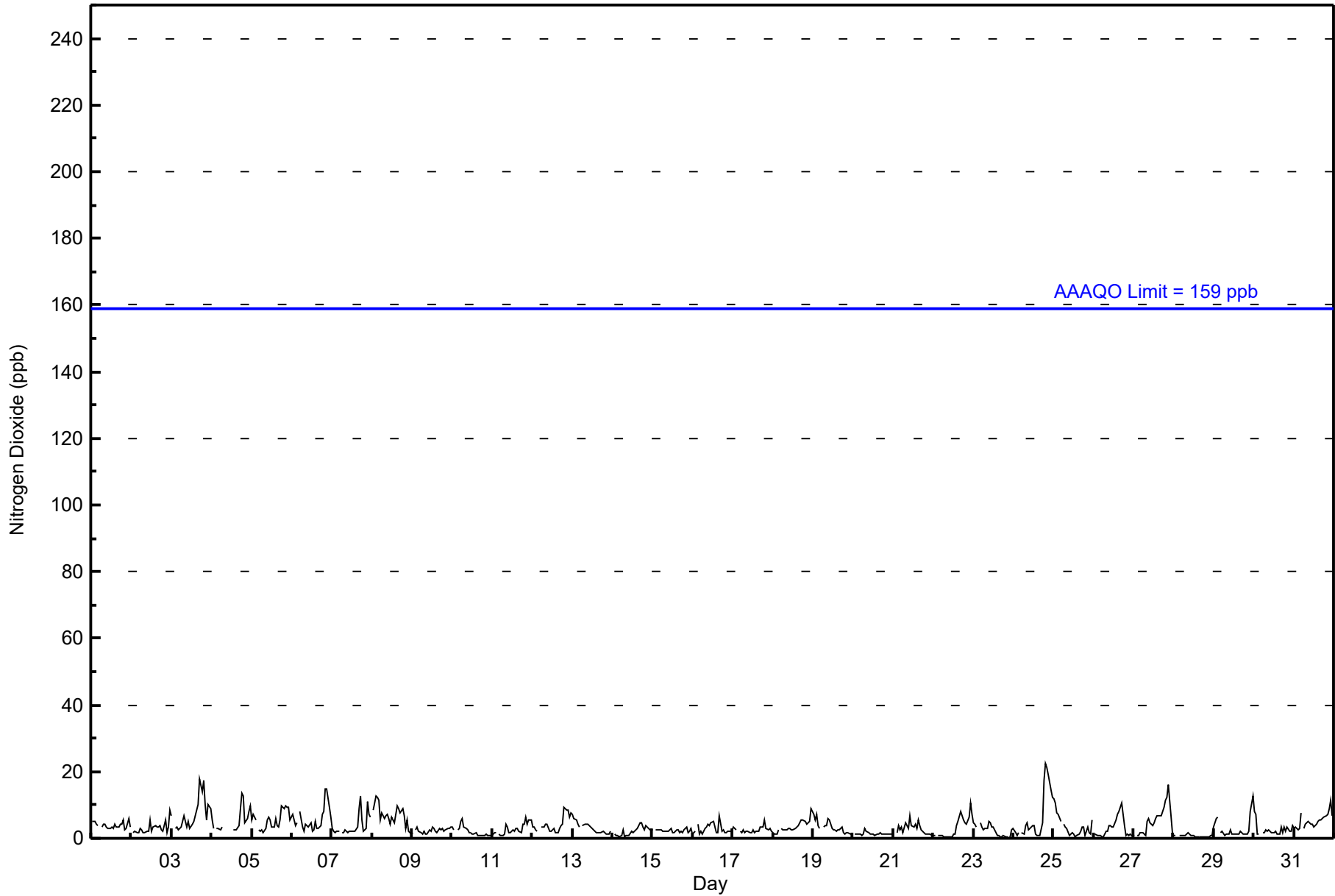




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Anzac - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 22.6 ppb on Jan 24 20:00		Maximum Daily Average: 7.1 ppb on Jan 3																			Hours of Data:	707																											
Minimum Value: 0.2 ppb on Jan 23 22:00		Minimum Daily Average: 0.7 ppb on Jan 28																			Hours of Missing Data:	37																											
Maximum Diurnal Average: 5.0 ppb at hour 20		Minimum Diurnal Average: 2.5 ppb at hour 6																			Hours of Calibration:	37																											
Monthly Average: 3.61 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 1.0 Q ₁ = 1.6 Median = 2.8 Q ₃ = 4.5 P ₉₀ = 7.3 P ₉₉ = 15.0																			Percent Operational Time:	100.0																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	5.2	5.1	5.1	4.2	3.9	Z	3.5	4.3	4.1	3.5	3.1	2.8	3.2	3.0	4.1	3.3	3.4	4.3	4.3	5.3	2.7	3.1	6.1	3.2	3.9	6.1																							
2-Jan	Z	1.6	2.0	1.9	1.6	2.8	2.4	1.6	1.8	2.0	2.0	5.6	2.3	3.4	3.7	3.5	3.6	4.0	2.5	2.0	5.7	1.9	3.4	8.6	3.0	8.6																							
3-Jan	6.9	Z	3.0	3.4	2.7	2.9	3.3	6.9	4.9	3.3	4.9	2.9	4.4	5.2	6.8	8.4	10.2	17.7	13.8	17.2	10.3	5.6	10.3	8.8	7.1	17.7																							
4-Jan	5.6	2.9	Z	3.0	2.9	2.4	3.2	C	C	C	C	C	C	2.4	2.4	2.5	4.0	9.0	13.7	12.7	4.8	6.0	8.2	9.7	--	13.7																							
5-Jan	5.7	7.2	5.3	Z	2.5	2.2	2.4	1.6	2.8	5.7	6.3	5.4	3.2	3.2	5.8	3.8	3.4	5.6	9.6	9.1	9.7	9.5	9.3	5.7	5.4	9.7																							
6-Jan	7.1	5.4	3.9	4.7	Z	8.1	3.4	2.0	4.3	3.7	3.2	4.7	2.2	2.4	5.0	2.8	2.9	4.0	7.4	7.9	15.0	15.0	9.2	6.3	5.7	15.0																							
7-Jan	3.1	2.3	1.9	2.2	2.0	Z	1.8	1.9	2.5	1.9	2.0	2.0	2.1	2.0	2.1	3.6	9.1	12.7	5.3	2.3	3.1	10.9	7.3	6.4	3.9	12.7																							
8-Jan	Z	8.6	12.7	12.2	11.6	5.5	7.8	5.8	6.6	7.3	5.8	4.4	6.2	4.8	7.4	9.9	8.7	7.7	8.7	6.6	3.1	5.7	2.0	1.4	7.0	12.7																							
9-Jan	1.7	Z	2.7	3.4	2.0	1.7	1.4	2.2	1.4	1.1	2.5	2.2	3.2	3.1	2.3	1.8	2.8	2.6	3.0	2.3	2.5	2.9	2.9	3.2	2.4	3.4																							
10-Jan	3.2	2.6	Z	2.6	3.0	5.1	5.8	3.4	3.1	2.4	1.7	1.5	1.4	1.2	1.5	0.9	0.9	0.9	0.9	0.9	1.1	0.9	0.8	0.8	2.0	5.8																							
11-Jan	0.9	1.5	1.6	Z	1.3	0.8	0.7	1.2	4.1	3.3	1.6	1.7	2.4	2.3	2.9	3.0	2.3	1.8	4.4	4.2	6.4	4.2	5.6	5.5	2.8	6.4																							
12-Jan	3.3	3.3	2.4	2.2	Z	3.6	3.5	3.6	4.2	4.2	2.3	2.1	2.5	3.0	1.9	1.8	2.9	4.0	4.1	9.2	8.3	8.6	6.5	7.6	4.1	9.2																							
13-Jan	7.3	5.8	5.3	4.3	3.4	Z	3.9	4.3	4.3	4.2	3.7	3.2	3.0	2.3	1.9	1.8	1.5	1.7	2.2	1.9	1.2	1.2	1.2	2.0	3.1	7.3																							
14-Jan	Z	1.1	0.8	0.7	0.6	0.7	2.5	0.6	0.7	0.8	1.0	2.3	1.8	2.0	2.4	2.9	4.5	4.8	3.2	2.7	3.8	3.5	2.5	2.6	2.1	4.8																							
15-Jan	2.4	Z	2.6	2.4	2.4	2.4	2.3	2.2	2.3	2.3	2.7	2.8	1.8	1.9	2.6	2.5	1.7	2.1	1.9	2.6	3.2	1.7	2.1	2.9	2.3	3.2																							
16-Jan	1.4	2.2	Z	4.2	1.3	2.1	1.3	3.1	3.6	4.1	3.8	4.5	4.9	3.4	1.6	1.6	6.7	2.3	2.5	1.6	1.6	2.0	2.0	2.1	2.8	6.7																							
17-Jan	3.3	3.0	2.7	Z	2.3	1.9	2.5	1.9	2.0	2.0	1.9	1.9	2.6	1.9	2.3	2.2	3.4	3.5	3.6	5.5	2.9	2.4	2.8	2.0	2.6	5.5																							
18-Jan	1.5	1.4	1.4	2.7	Z	2.9	2.6	2.4	2.6	2.8	2.8	2.7	2.7	2.9	3.3	3.7	4.7	5.5	5.3	5.0	4.4	4.5	5.2	9.1	3.6	9.1																							
19-Jan	7.2	5.3	7.1	3.8	3.1	Z	3.6	3.9	3.8	5.9	5.4	3.1	2.7	2.7	2.0	2.4	2.6	3.2	1.9	1.4	1.5	1.5	1.4	1.3	3.3	7.2																							
20-Jan	Z	1.2	1.2	1.2	1.1	1.0	1.1	2.9	2.2	1.7	1.4	1.1	1.1	1.0	1.1	1.1	1.7	1.2	1.1	1.3	1.2	1.4	1.3	1.2	1.3	2.9																							
21-Jan	1.4	Z	1.5	3.9	2.7	3.2	1.8	4.5	4.0	2.8	6.6	3.7	3.5	4.3	3.0	5.4	3.9	2.5	1.7	1.4	1.3	1.1	1.1	1.0	2.9	6.6																							
22-Jan	1.0	1.0	Z	1.0	0.7	0.7	0.6	0.6	0.5	0.4	0.5	0.4	1.1	1.3	3.9	5.2	8.0	6.7	5.3	4.8	4.3	6.2	10.7	7.0	3.1	10.7																							
23-Jan	4.7	4.4	3.4	Z	4.6	3.3	2.7	2.9	2.8	4.9	4.5	3.5	3.2	2.7	0.9	0.7	0.5	0.4	0.7	0.6	0.3	0.2	0.3	2.5	2.4	4.9																							
24-Jan	3.0	1.5	0.7	1.6	Z	1.8	1.3	4.0	4.5	2.7	3.0	4.0	3.7	1.2	0.8	0.7	1.0	4.6	17.4	22.6	21.1	19.0	14.3	12.3	6.4	22.6																							
25-Jan	11.9	10.5	7.5	7.0	5.1	Z	4.1	3.5	3.1	0.8	1.2	1.9	1.1	0.6	1.0	1.2	2.3	3.6	3.5	1.0	3.4	1.8	1.2	5.4	3.6	11.9																							
26-Jan	Z	1.4	1.0	0.9	0.8	0.6	0.5	2.0	2.3	4.0	3.9	3.5	3.2	5.5	7.4	8.2	9.2	10.5	3.7	0.7	1.3	0.9	1.3	0.8	3.2	10.5																							
27-Jan	0.8	Z	0.7	1.0	1.8	1.7	1.3	0.9	5.0	6.1	4.5	3.7	4.6	5.9	6.7	6.9	6.6	8.1	9.5	11.3	12.1	16.0	6.4	1.2	5.3	16.0																							
28-Jan	0.8	0.7	Z	0.7	0.7	0.7	0.7	1.0	1.6	1.1	0.8	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.5	0.3	0.8	0.7	0.7	1.6																							
29-Jan	3.4	5.9	6.3	Z	1.9	2.1	1.0	1.1	1.2	1.2	2.6	1.3	1.2	1.2	1.3	1.1	2.3	1.4	1.2	1.3	1.3	2.0	8.1	12.7	2.7	12.7																							
30-Jan	8.1	7.1	1.1	1.2	Z	1.5	1.5	2.7	2.1	2.5	1.9	1.6	1.7	2.0	1.3	1.1	3.2	1.9	3.5	2.2	3.2	2.2	2.0	3.9	2.6	8.1																							
31-Jan	2.8	3.4	2.4	3.1	7.7	Z	2.8	4.1	5.1	4.6	4.2	4.4	3.5	4.3	5.2	5.6	5.7	6.1	6.4	6.9	7.0	8.8	11.5	6.8	5.3	11.5																							
																								4.0	3.7	3.3	3.1	2.8	2.5	2.5	2.8	3.1	3.1	3.1	2.9	2.7	2.7	3.1	3.2	4.0	4.7	4.9	5.0	4.8	4.9	4.8	4.7	Diurnal Average	
																								11.9	10.5	12.7	12.2	11.6	8.1	7.8	6.9	6.6	7.3	6.6	5.6	6.2	5.9	7.4	9.9	10.2	17.7	17.4	22.6	21.1	19.0	14.3	12.7	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	99.72	99.72
21 - 40	2	0.28	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	6	8	9	33	115	127	62	19	18	12	43	105	51	40	23	686
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	6	8	9	33	115	127	62	19	18	12	43	105	51	41	24	688

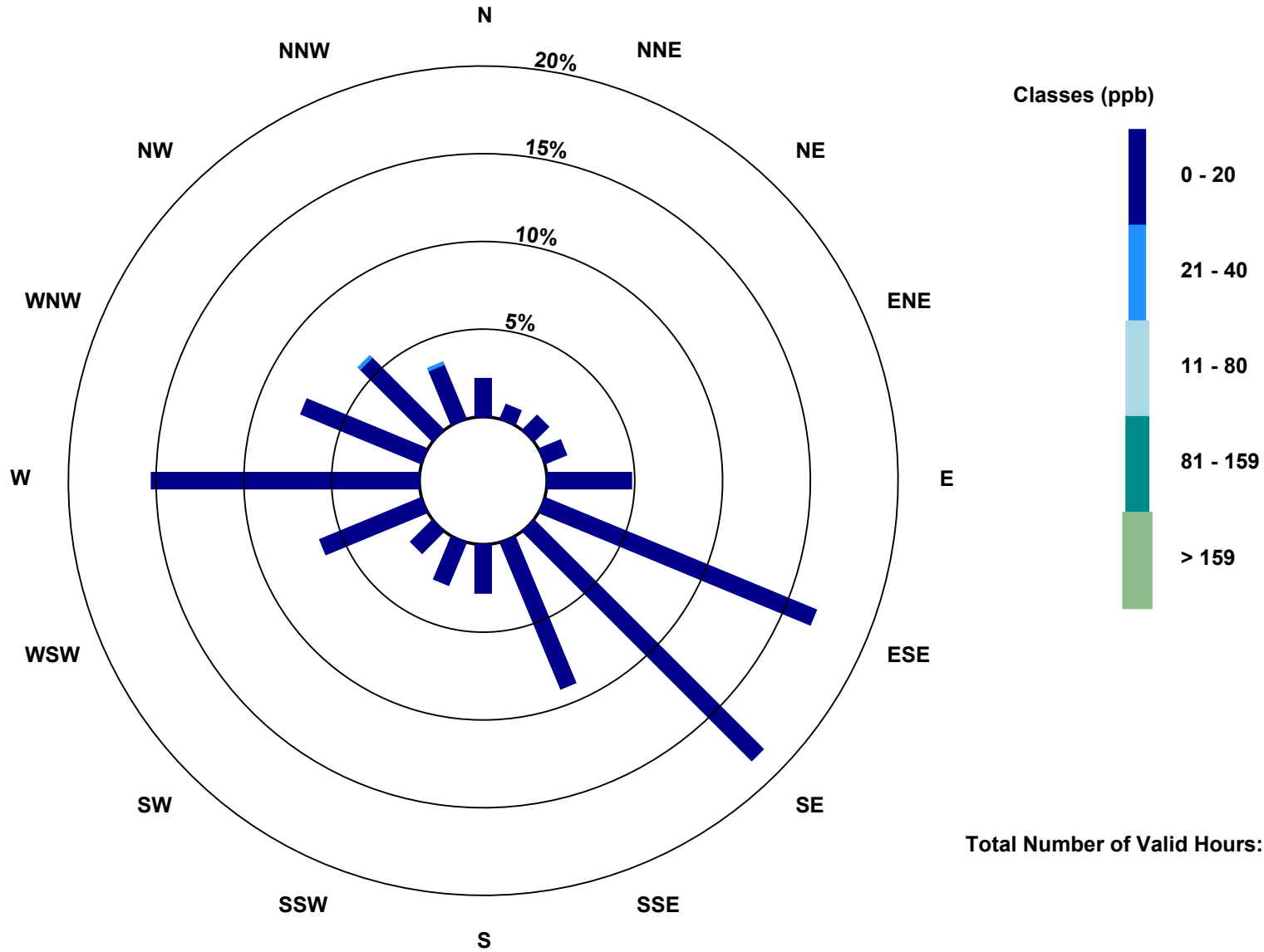
Total Number of Valid Hours: 688

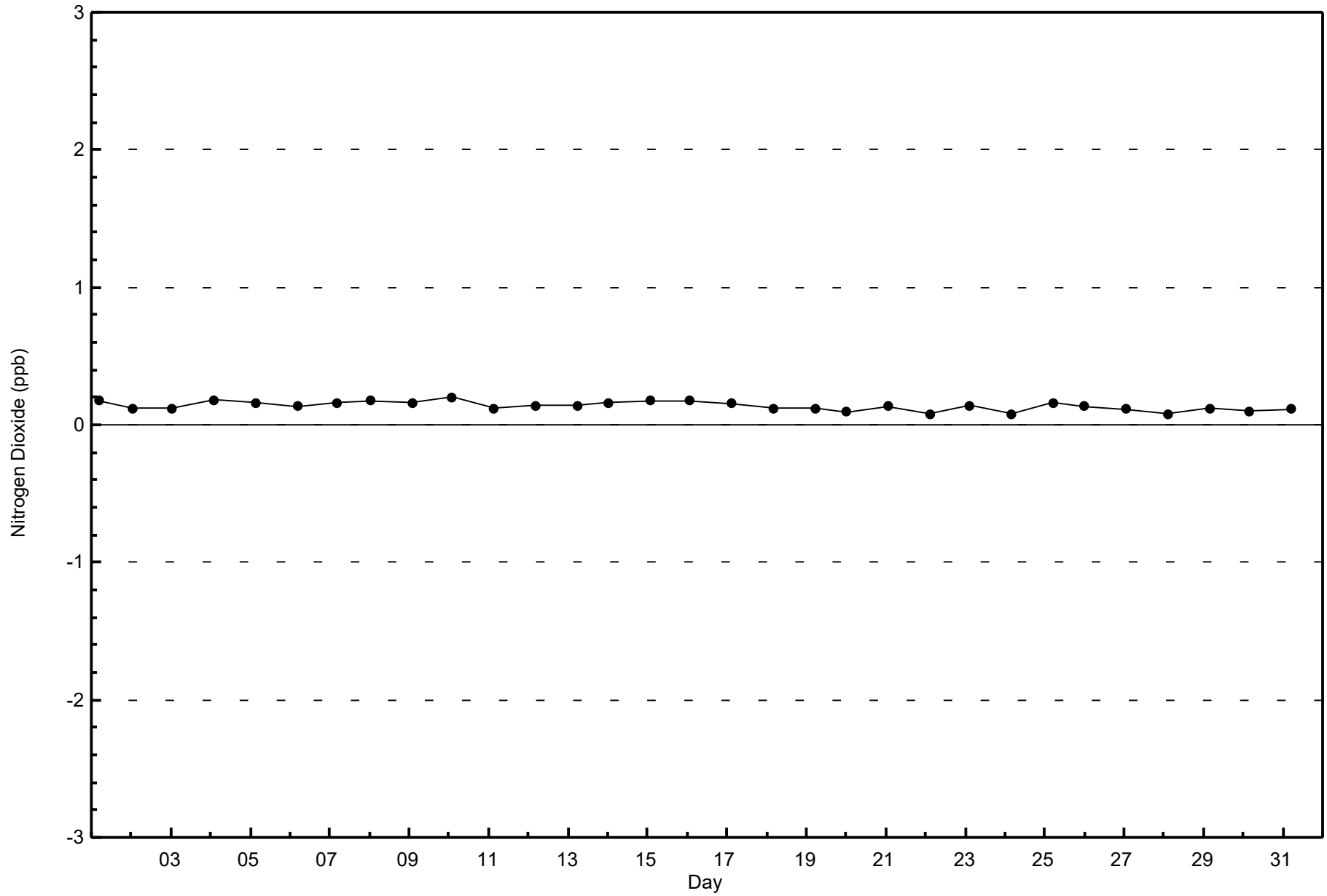
Total Number of Hours: 744

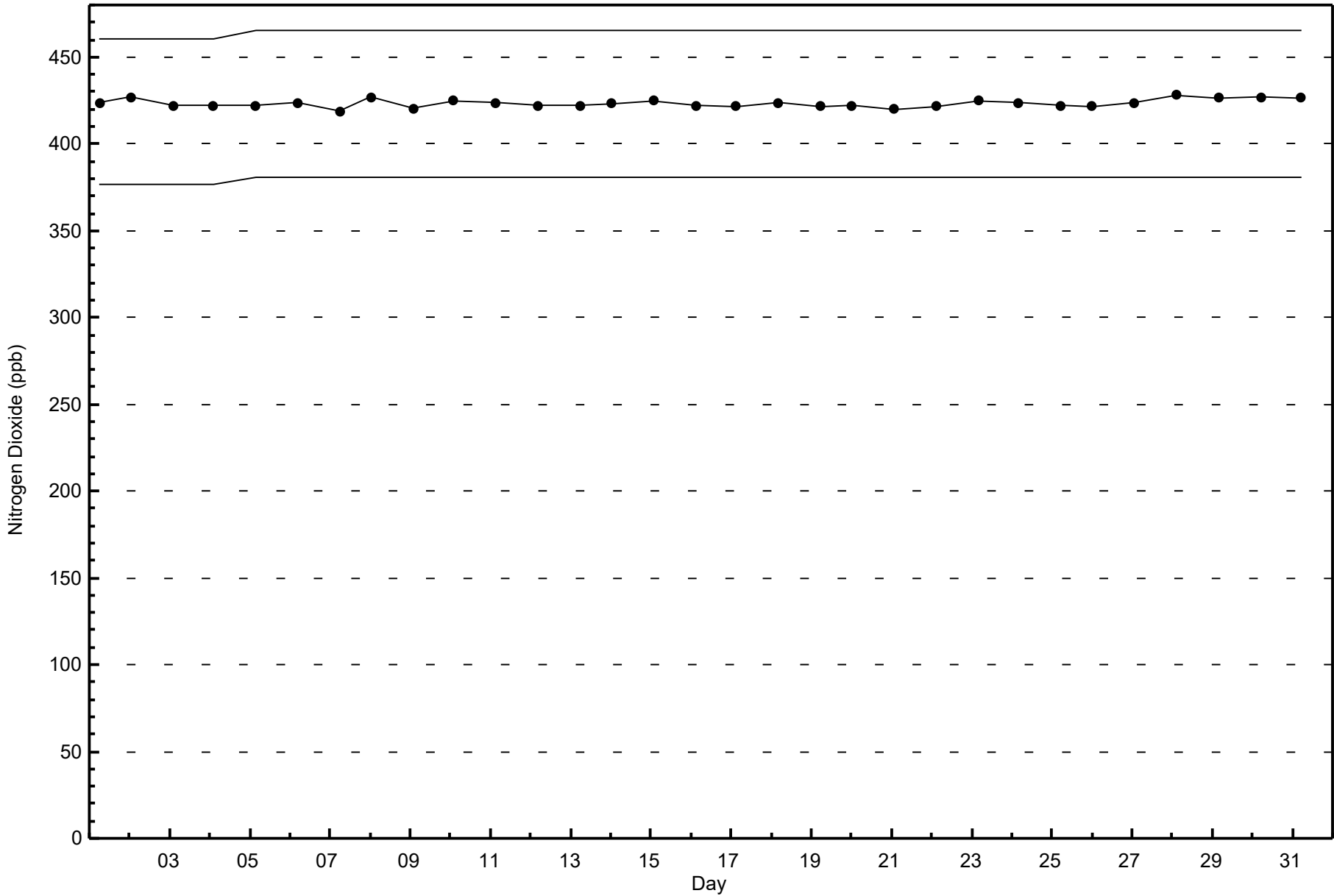


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

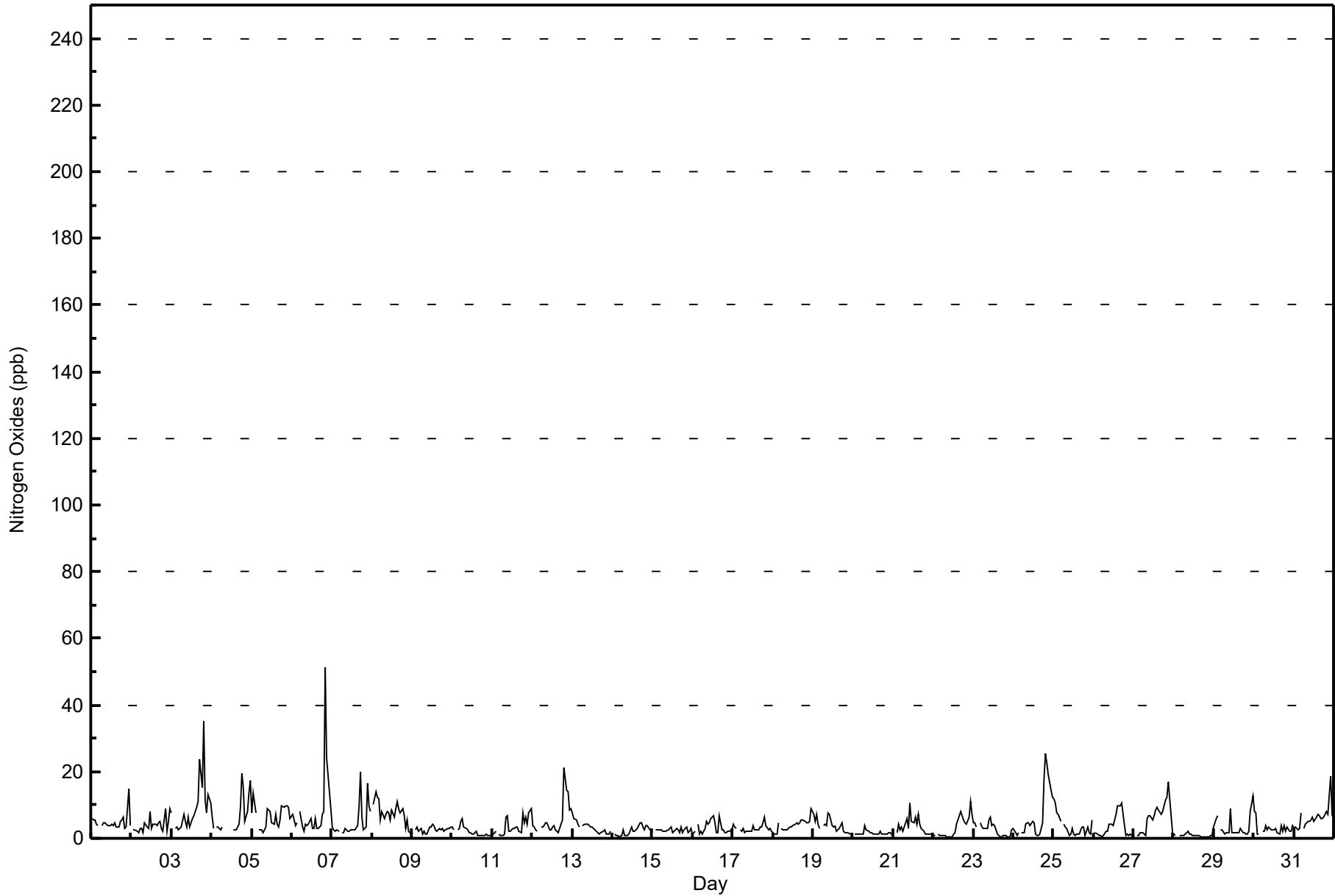
Nitrogen Oxides (NO_x) - ppb
Anzac - January 2023

Maximum Value: 51.1 ppb on Jan 6 21:00		Maximum Daily Average: 9.0 ppb on Jan 3		Hours in Service: 744																																													
Minimum Value: 0.2 ppb on Jan 23 22:00		Minimum Daily Average: 0.9 ppb on Jan 28		Hours of Data: 707																																													
Maximum Diurnal Average: 6.4 ppb at hour 21		Minimum Diurnal Average: 2.6 ppb at hour 7		Hours of Missing Data: 37																																													
Monthly Average: 4.26 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 1.1 Q ₁ = 1.8 Median = 3.1 Q ₃ = 5.2 P ₉₀ = 8.5 P ₉₉ = 19.9		Hours of Calibration: 37																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	5.8	5.4	5.4	4.3	4.0	Z	3.6	4.7	4.6	4.1	3.8	3.7	4.4	3.9	4.9	3.6	3.5	5.1	5.3	6.5	3.1	3.5	14.6	4.0	4.9	14.6																							
2-Jan	Z	2.6	2.6	2.2	1.6	3.0	2.9	1.6	4.7	3.2	2.8	8.2	2.8	4.2	4.4	3.9	4.5	5.2	3.0	2.0	9.0	2.0	4.9	8.8	3.9	9.0																							
3-Jan	7.8	Z	3.2	3.5	2.7	3.0	3.5	7.1	5.2	3.6	6.5	3.6	5.8	6.8	8.2	9.2	11.0	23.8	15.2	35.3	11.3	7.8	12.9	10.8	9.0	35.3																							
4-Jan	6.3	3.0	Z	3.5	3.3	2.5	3.4	C	C	C	C	C	C	2.6	2.5	2.6	4.4	9.1	19.3	15.4	5.1	8.2	13.4	17.5	--	19.3																							
5-Jan	7.8	13.6	7.8	Z	2.7	2.6	2.5	1.6	3.2	9.1	8.5	8.1	4.5	4.3	7.2	4.1	3.4	5.6	9.7	9.2	9.8	9.6	9.5	6.1	6.5	13.6																							
6-Jan	7.2	5.5	4.0	4.8	Z	8.2	3.4	2.0	4.3	3.9	4.0	6.1	2.8	2.9	5.8	3.0	3.0	4.0	7.4	8.1	51.1	24.3	14.1	8.7	8.2	51.1																							
7-Jan	3.6	2.6	2.0	2.4	2.2	Z	1.9	1.9	2.8	2.1	2.3	2.5	2.6	2.4	2.4	3.9	9.8	19.9	6.4	2.5	3.4	16.7	9.6	8.2	5.0	19.9																							
8-Jan	Z	10.1	14.1	12.3	11.9	5.6	7.9	5.8	7.2	7.9	7.6	5.7	8.3	6.2	9.0	11.0	8.8	7.7	8.8	6.7	3.1	5.7	2.0	1.4	7.6	14.1																							
9-Jan	1.7	Z	2.7	3.4	2.0	3.1	1.4	2.2	1.4	1.2	3.2	3.5	4.1	4.0	2.7	2.0	2.8	2.6	3.0	2.3	2.6	3.1	2.9	3.2	2.6	4.1																							
10-Jan	3.2	2.6	Z	2.6	3.0	5.1	5.8	3.4	3.1	2.5	1.8	1.7	1.5	1.3	2.2	0.9	0.9	0.9	0.9	0.9	1.1	0.9	0.8	0.8	2.1	5.8																							
11-Jan	1.0	1.6	2.1	Z	1.3	0.8	0.7	1.3	6.4	6.6	2.0	2.0	3.1	2.8	3.5	3.3	2.3	1.8	7.5	4.5	6.4	4.2	7.6	9.1	3.6	9.1																							
12-Jan	3.7	3.3	2.7	2.2	Z	3.6	3.5	3.7	4.7	4.6	2.7	2.7	3.3	3.8	2.3	1.9	3.2	4.1	5.6	21.3	14.4	13.8	8.5	8.9	5.6	21.3																							
13-Jan	7.8	6.1	5.4	4.4	3.5	Z	3.9	4.3	4.3	4.4	4.0	3.5	3.3	2.5	2.0	1.8	1.5	1.7	2.2	2.5	1.2	1.2	1.2	2.0	3.2	7.8																							
14-Jan	Z	1.1	0.8	0.7	0.6	0.7	2.5	0.6	0.7	0.8	1.1	3.4	2.2	2.3	2.6	3.1	4.5	4.9	3.3	2.7	3.9	3.6	2.5	2.7	2.2	4.9																							
15-Jan	2.4	Z	2.7	2.4	2.4	2.4	2.3	2.2	2.3	2.4	2.9	3.2	1.9	2.2	2.9	2.7	1.8	3.3	1.9	2.6	3.2	1.7	2.1	2.9	2.5	3.3																							
16-Jan	1.4	2.2	Z	4.2	1.3	2.1	1.3	3.1	5.3	4.4	4.5	6.0	6.8	4.7	1.8	1.7	6.9	2.3	2.5	1.6	1.6	2.0	2.0	2.3	3.1	6.9																							
17-Jan	4.3	3.6	2.9	Z	2.5	2.1	2.8	1.9	2.0	2.1	2.2	2.3	3.9	2.3	2.7	2.4	3.5	3.5	4.7	6.2	3.7	2.4	2.8	2.0	3.0	6.2																							
18-Jan	1.5	1.4	1.4	4.7	Z	2.9	2.6	2.4	2.6	3.1	3.5	3.6	3.7	4.0	4.5	4.2	4.8	5.5	5.3	5.0	4.5	4.5	5.2	9.1	3.9	9.1																							
19-Jan	7.2	5.3	7.3	4.0	3.2	Z	3.7	4.1	4.0	7.7	7.1	3.8	3.5	3.7	2.3	2.6	2.8	4.5	2.0	1.5	1.6	1.6	1.5	1.3	3.7	7.7																							
20-Jan	Z	1.2	1.2	1.2	1.1	1.1	1.1	3.9	2.7	2.2	1.7	1.6	1.3	1.2	1.2	1.2	2.0	1.2	1.1	1.4	1.3	1.6	1.6	1.3	1.5	3.9																							
21-Jan	1.5	Z	1.5	4.1	2.7	3.3	2.0	4.8	5.9	3.1	10.7	5.2	4.7	6.2	4.3	7.2	4.1	2.8	2.0	1.4	1.3	1.2	1.1	1.1	3.6	10.7																							
22-Jan	1.1	1.0	Z	1.1	0.7	0.7	0.6	0.7	0.6	0.4	0.6	0.4	1.2	1.5	4.4	5.6	8.2	6.7	5.3	4.8	4.4	6.3	11.0	7.2	3.2	11.0																							
23-Jan	4.8	4.5	3.4	Z	4.6	3.3	2.8	2.9	2.9	5.3	6.4	4.0	4.1	3.6	1.1	0.8	0.5	0.4	0.7	0.6	0.3	0.2	0.3	2.6	2.6	6.4																							
24-Jan	3.1	1.5	0.7	1.6	Z	1.8	1.5	4.3	4.8	4.7	3.8	5.2	4.7	1.4	0.9	0.8	1.4	4.7	17.6	25.5	22.5	19.3	14.4	12.4	6.9	25.5																							
25-Jan	12.0	10.6	7.5	7.0	5.1	Z	4.1	3.5	3.1	0.8	1.4	2.8	1.4	0.7	1.2	1.3	2.4	3.6	3.5	1.0	3.4	1.8	1.2	5.4	3.7	12.0																							
26-Jan	Z	1.5	1.1	1.0	0.8	0.6	0.6	2.0	2.3	4.4	4.4	4.3	4.0	7.1	9.6	9.6	9.7	10.6	3.7	0.7	1.3	0.9	1.3	0.8	3.6	10.6																							
27-Jan	0.8	Z	0.7	1.0	1.8	1.7	1.3	0.9	5.8	7.0	6.7	5.3	6.8	8.5	9.3	8.6	7.3	8.2	9.8	11.4	12.3	16.8	6.9	1.6	6.1	16.8																							
28-Jan	1.1	1.0	Z	1.0	1.0	1.0	1.0	1.4	2.3	1.3	1.2	1.0	1.0	0.8	0.7	0.8	0.6	0.6	0.6	0.5	0.6	0.3	0.8	0.7	0.9	2.3																							
29-Jan	3.4	6.0	6.7	Z	2.5	2.7	1.4	1.5	1.6	1.7	9.0	1.8	1.6	1.6	1.9	1.6	2.8	1.5	1.6	1.4	1.4	2.1	8.2	12.8	3.3	12.8																							
30-Jan	8.2	7.5	1.5	1.5	Z	2.0	2.0	4.0	2.6	3.4	2.7	2.6	2.6	2.8	1.7	1.3	3.6	2.0	3.7	2.2	3.2	2.2	2.0	4.0	3.0	8.2																							
31-Jan	2.9	3.4	2.4	3.1	7.7	Z	2.8	4.1	5.2	5.1	5.4	6.3	4.9	6.3	7.3	6.9	6.1	6.1	6.5	8.0	7.4	13.1	18.7	6.8	6.4	18.7																							
																								4.3	4.2	3.6	3.2	2.9	2.6	2.6	2.9	3.6	3.8	4.2	3.8	3.6	3.5	3.8	3.7	4.3	5.3	5.5	6.3	6.4	5.9	6.0	5.4	Diurnal Average	
																								12.0	13.6	14.1	12.3	11.9	8.2	7.9	7.1	7.2	9.1	10.7	8.2	8.3	8.5	9.6	11.0	11.0	23.8	19.3	35.3	51.1	24.3	18.7	17.5	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Anzac - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	99.01	99.01
21 - 40	6	0.85	99.86
41 - 80	1	0.14	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	15	6	8	9	33	115	126	60	18	17	12	43	105	51	40	23	681
21 - 40	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	1	6
11 - 80	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	6	8	9	33	115	127	62	19	18	12	43	105	51	41	24	688

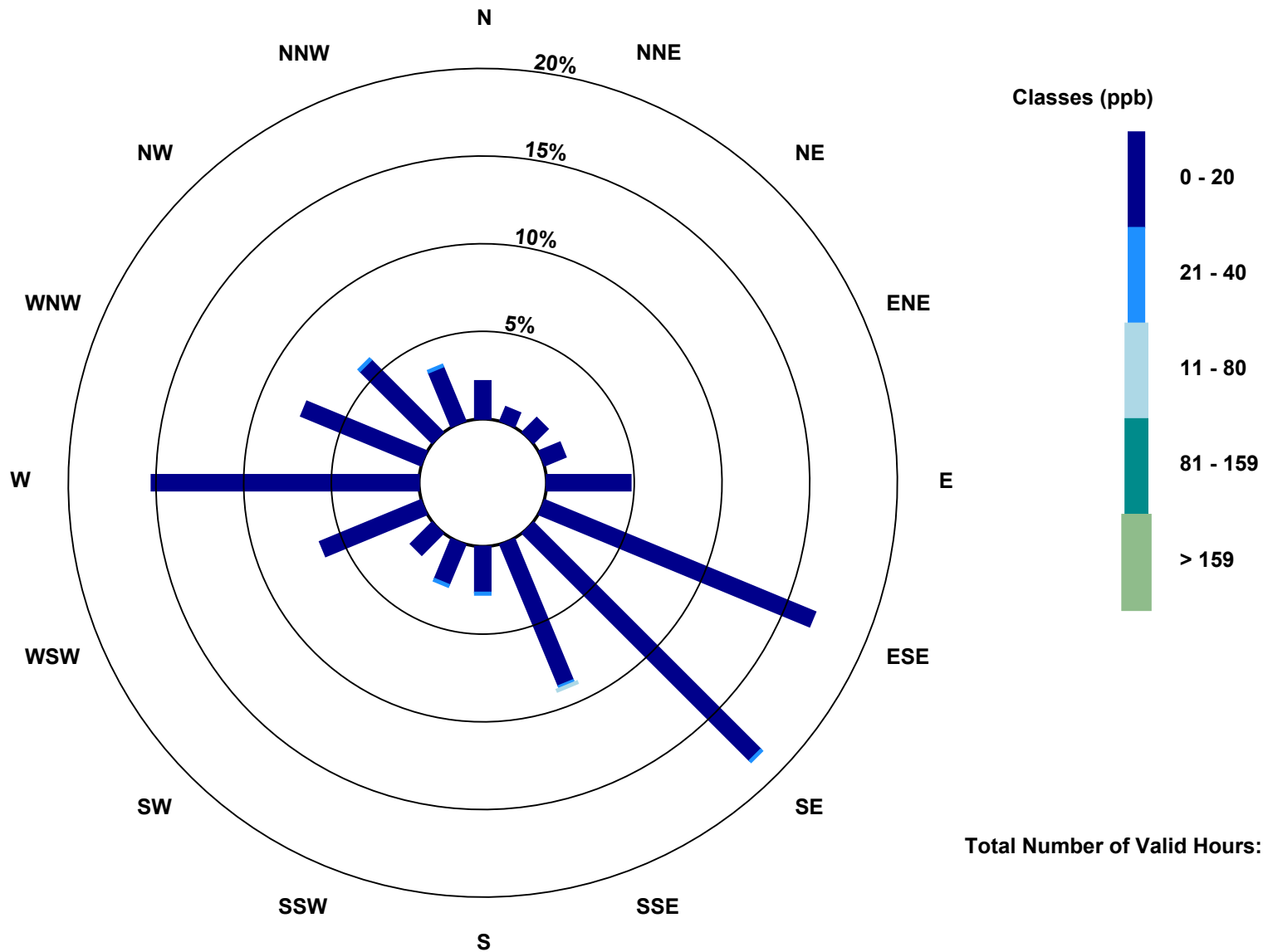
Total Number of Valid Hours: 688

Total Number of Hours: 744

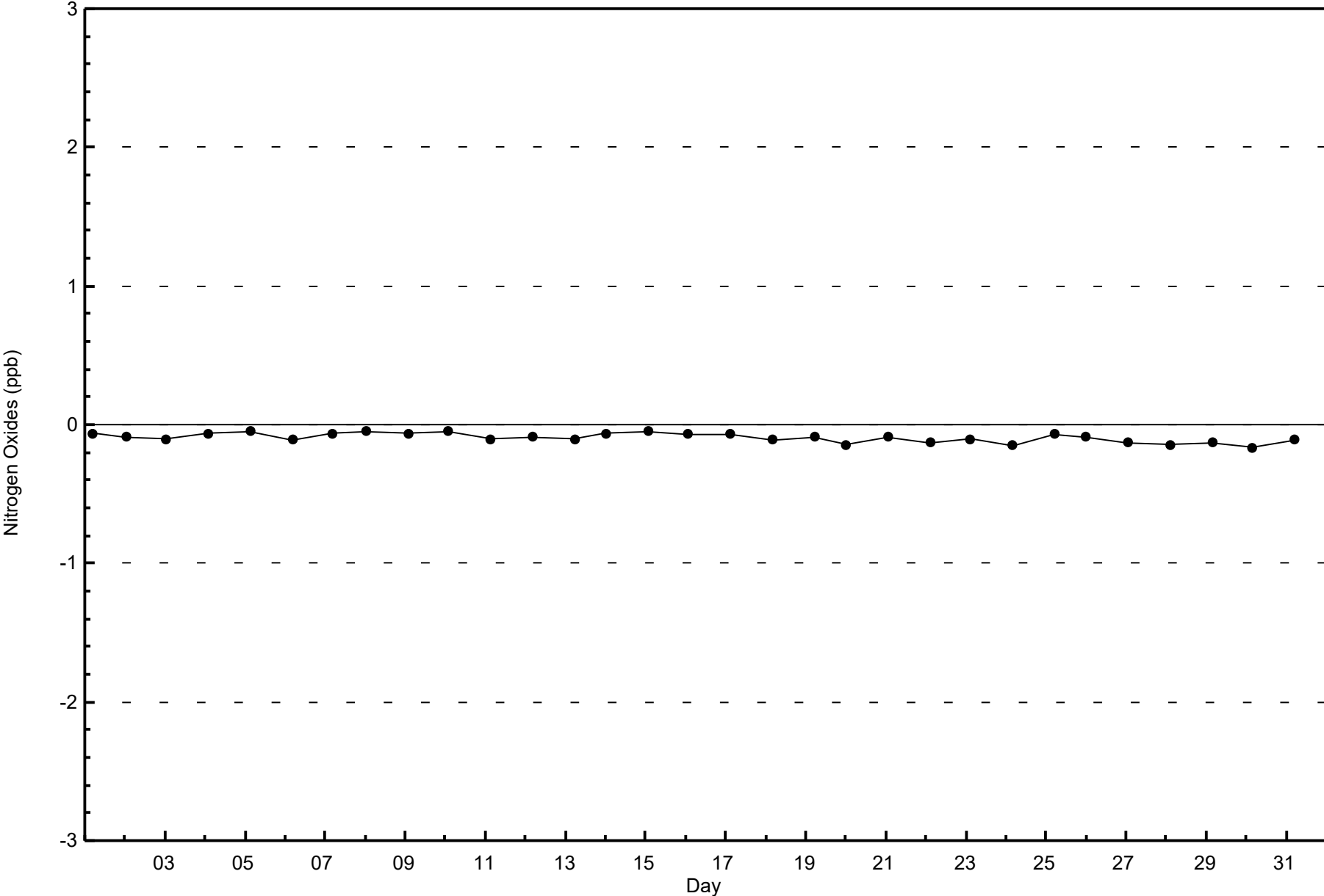


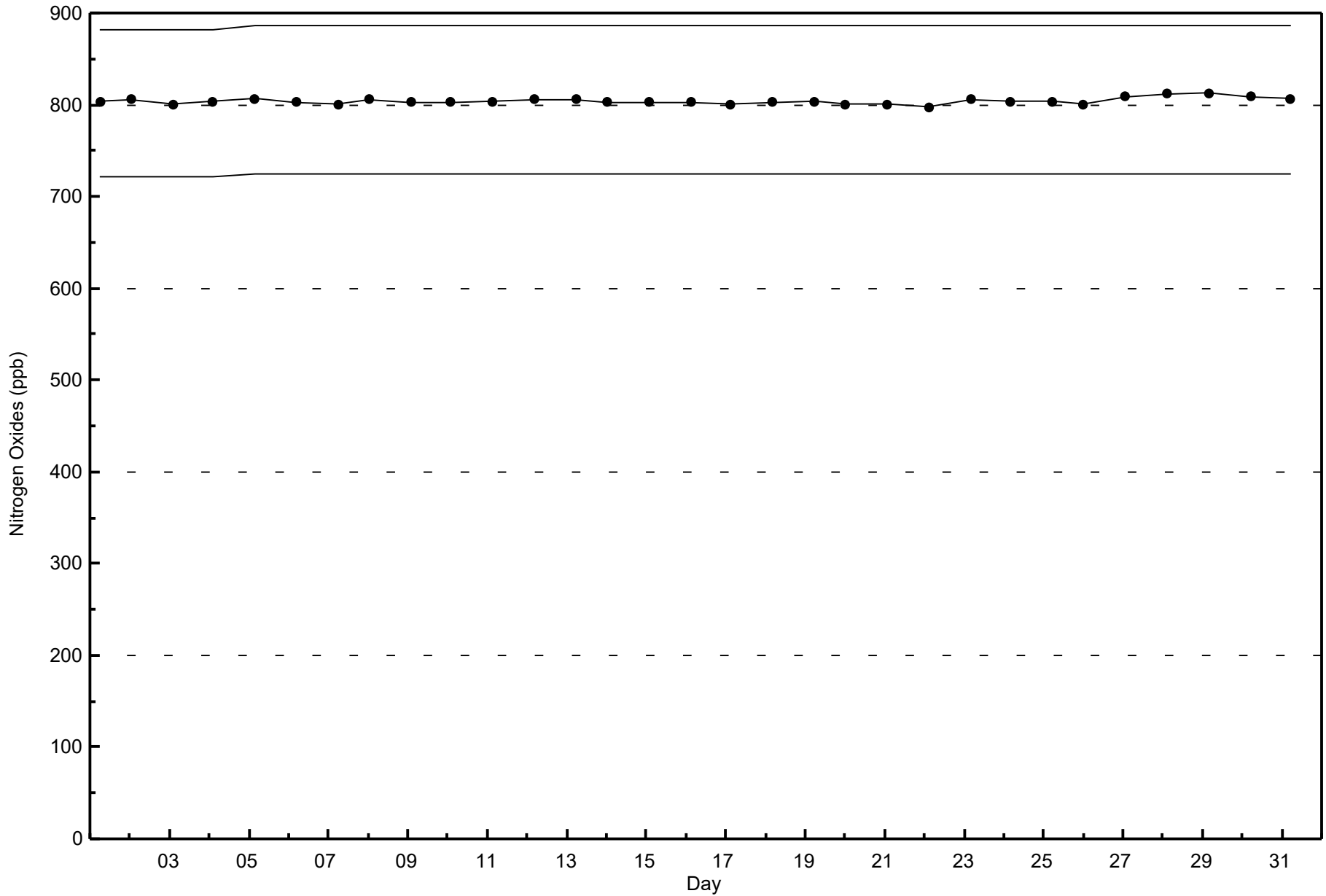
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Anzac



Total Number of Valid Hours: 688







Wood Buffalo Environmental Association
Summary of Hour Averages

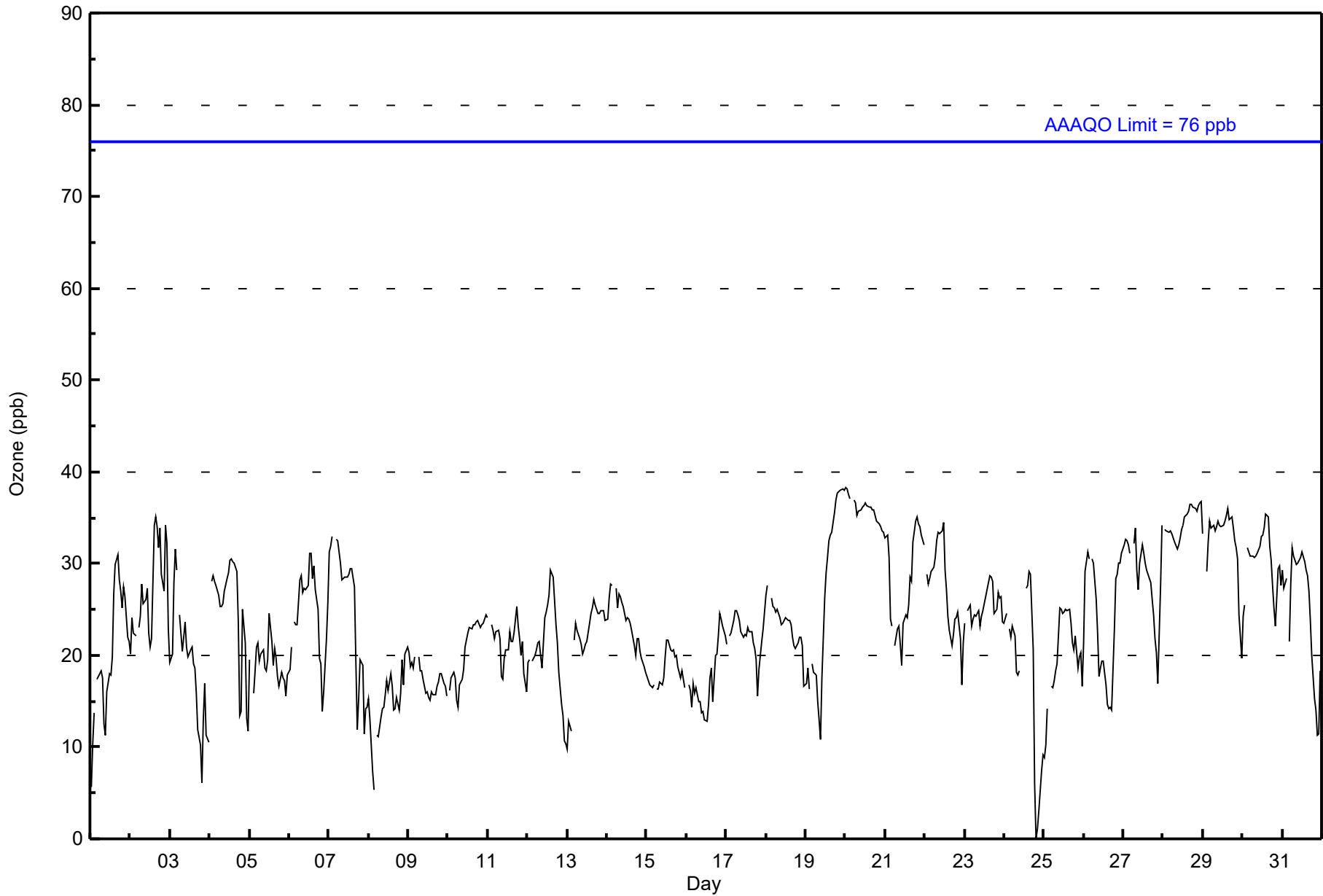
Ozone (O₃) - ppb
Anzac - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																			
Maximum Value: 38.2 ppb on Jan 20 01:00		Maximum Daily Average: 35.9 ppb on Jan 20				Hours of Data:		710																			
Minimum Value: 0.0 ppb on Jan 24 20:00		Minimum Daily Average: 14.8 ppb on Jan 8				Hours of Missing Data:		34																			
Maximum Diurnal Average: 26.1 ppb at hour 16		Minimum Diurnal Average: 21.8 ppb at hour 24				Hours of Calibration:		34																			
Monthly Average: 23.77 ppb		Percentiles: P ₁ = 7.3 P ₁₀ = 15.3 Q ₁ = 18.7 Median = 23.4 Q ₃ = 28.9 P ₉₀ = 33.6 P ₉₉ = 37.5				Percent Operational Time:		100.0																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	5.7	10.4	13.7	Z	17.4	18.0	18.2	17.6	12.5	11.2	16.0	18.0	17.9	19.8	26.7	29.9	30.9	28.2	27.0	25.2	27.4	26.3	22.0	21.5	20.1	30.9	
2-Jan	20.1	24.0	22.4	22.1	Z	23.0	24.3	27.8	25.7	26.2	27.2	22.5	20.9	21.8	34.2	35.1	34.0	31.8	33.9	28.9	27.0	34.1	32.2	23.0	27.0	35.1	
3-Jan	19.2	20.1	27.9	31.5	29.3	Z	24.5	20.5	22.0	23.7	21.0	19.8	20.6	21.0	19.0	18.6	15.9	11.9	10.2	6.1	13.0	16.9	11.3	10.5	18.9	31.5	
4-Jan	Z	28.1	28.7	28.1	27.6	26.6	25.4	25.3	25.7	27.0	28.3	29.1	30.3	30.6	30.3	30.1	29.1	23.6	13.4	13.9	25.0	21.4	13.1	11.7	24.9	30.6	
5-Jan	19.5	Z	15.8	18.3	20.8	21.4	19.3	20.1	20.7	18.6	18.3	19.5	24.5	21.6	19.0	20.8	19.7	17.7	16.7	18.2	17.5	17.2	15.6	17.9	19.1	24.5	
6-Jan	18.5	20.9	Z	23.6	23.3	23.4	28.3	28.7	26.9	27.4	27.1	27.6	31.1	31.1	28.3	29.7	27.1	25.0	19.7	19.0	13.9	15.9	21.8	25.8	24.5	31.1	
7-Jan	31.3	31.9	33.0	Z	32.7	32.5	31.2	30.0	28.3	28.6	28.6	28.5	28.9	29.5	29.5	27.4	19.3	11.8	15.3	19.5	18.9	11.4	14.2	14.4	25.1	33.0	
8-Jan	15.3	13.1	7.3	5.4	Z	11.2	11.2	13.2	14.2	14.3	15.7	17.2	16.1	18.0	16.6	14.1	14.2	15.5	14.1	15.8	19.5	16.8	20.1	20.8	14.8	20.8	
9-Jan	20.3	18.7	19.2	18.7	19.8	Z	19.8	18.4	18.3	17.5	15.8	16.0	15.3	15.1	16.0	15.7	15.7	16.6	17.1	18.0	18.1	16.9	16.6	15.5	17.4	20.3	
10-Jan	Z	16.2	17.5	18.2	17.5	15.1	14.3	16.8	17.4	18.5	20.9	21.7	22.5	23.0	22.9	23.4	23.4	23.7	23.8	23.0	23.3	23.4	24.0	24.4	20.7	24.4	
11-Jan	24.1	Z	23.3	22.8	21.9	22.5	22.7	21.8	17.7	17.3	19.7	20.6	20.7	22.5	21.5	21.5	22.4	25.2	23.1	21.8	19.9	21.5	18.1	16.0	21.2	25.2	
12-Jan	19.2	19.5	Z	19.3	19.9	20.6	21.4	21.5	19.9	18.5	24.1	24.7	25.5	26.6	29.3	28.5	25.9	23.3	21.4	18.2	14.6	13.4	10.7	10.3	20.7	29.3	
13-Jan	9.8	12.8	11.7	Z	21.7	23.5	22.7	21.8	21.2	20.1	20.5	21.2	21.5	23.6	24.5	25.2	26.1	25.5	24.6	24.5	24.9	24.8	24.8	23.8	21.8	26.1	
14-Jan	24.0	26.3	27.7	27.6	Z	27.3	25.2	26.7	26.3	25.8	25.3	23.8	24.1	24.0	23.5	22.8	21.0	20.0	21.9	21.9	20.4	19.7	18.8	18.2	23.6	27.7	
15-Jan	17.7	17.2	16.8	16.5	16.8	Z	16.3	16.4	17.1	16.8	17.5	19.8	21.7	21.6	20.5	20.4	20.5	19.8	19.9	18.8	17.5	18.3	17.4	16.4	18.3	21.7	
16-Jan	Z	16.7	16.1	14.3	17.0	15.8	16.5	14.9	14.9	13.8	13.9	13.0	12.9	14.6	17.5	18.7	14.9	20.0	20.1	22.1	24.6	23.9	23.2	22.1	17.5	24.6	
17-Jan	21.2	Z	22.1	22.4	23.8	24.9	24.8	24.5	23.8	22.6	22.0	22.3	22.1	23.1	22.6	22.6	21.3	20.8	19.5	15.6	18.4	21.5	22.8	24.7	22.1	24.9	
18-Jan	26.5	27.6	Z	26.3	25.3	25.2	24.6	25.0	24.1	23.3	23.5	23.9	24.1	23.9	23.7	23.4	22.0	21.1	20.8	21.3	21.9	22.0	21.0	16.6	23.3	27.6	
19-Jan	16.9	18.6	16.3	Z	19.1	18.2	17.9	15.0	13.0	10.8	17.5	26.2	28.9	30.6	32.5	33.1	33.3	35.6	36.9	37.7	37.9	38.0	38.1	38.0	26.5	38.1	
20-Jan	38.2	38.1	37.5	37.0	Z	36.9	36.6	35.2	35.7	35.9	36.2	36.3	36.6	36.3	36.2	36.2	35.8	35.9	35.3	34.7	34.4	34.0	33.6	33.5	35.9	38.2	
21-Jan	32.9	33.1	30.7	23.9	23.3	Z	21.1	22.9	23.2	21.2	18.9	23.5	24.5	24.1	25.4	28.5	28.0	32.4	34.6	35.1	34.3	34.0	33.2	32.0	27.8	35.1	
22-Jan	Z	28.9	27.7	28.3	29.2	29.6	30.6	32.4	33.4	33.3	33.6	34.4	29.3	27.1	24.2	22.7	21.0	22.3	24.0	24.1	24.7	21.8	16.8	21.3	27.0	34.4	
23-Jan	23.5	Z	24.8	25.5	23.3	23.9	24.4	24.3	24.9	23.2	24.3	24.9	25.6	26.3	28.0	28.7	28.6	28.0	24.6	25.0	26.8	26.3	26.3	23.6	25.4	28.7	
24-Jan	23.4	24.6	Z	22.9	21.9	23.2	22.2	18.2	17.9	18.3	C	C	C	27.3	27.6	29.1	28.9	20.6	5.9	0.0	1.0	3.0	7.5	9.1	17.6	29.1	
25-Jan	8.9	10.3	14.2	Z	16.7	16.5	17.3	18.3	19.1	25.2	25.0	24.5	24.7	25.1	24.8	24.9	23.5	21.3	20.6	22.1	18.6	19.9	20.3	16.6	19.9	25.2	
26-Jan	21.3	29.1	31.2	30.5	Z	30.5	30.0	26.0	22.5	17.7	18.7	19.4	19.3	16.7	14.7	14.2	14.3	14.0	22.9	28.4	28.8	30.0	30.0	31.2	23.5	31.2	
27-Jan	32.1	32.7	32.6	32.0	31.2	Z	32.2	33.8	29.2	27.1	30.1	32.0	31.1	30.0	29.3	28.8	27.8	26.1	24.5	21.8	20.3	16.9	27.6	34.1	28.8	34.1	
28-Jan	Z	33.8	33.6	33.4	33.5	33.2	32.9	32.3	31.6	32.0	32.8	33.7	34.2	35.0	35.4	35.7	36.5	36.4	36.2	36.1	35.6	36.3	36.6	36.7	34.5	36.7	
29-Jan	33.3	Z	29.2	32.3	34.6	33.9	34.1	33.6	34.0	34.6	34.1	34.0	34.2	34.6	35.2	36.0	34.8	35.0	33.8	32.4	31.7	30.6	24.5	19.6	32.6	36.0	
30-Jan	24.2	25.5	Z	31.7	30.8	30.8	30.8	30.6	30.8	31.1	31.9	32.9	33.1	33.8	35.4	35.0	31.9	30.4	27.6	25.1	23.2	29.4	29.7	27.6	30.2	35.4	
31-Jan	29.3	27.3	28.3	Z	21.5	27.8	31.8	30.9	29.8	30.1	30.4	30.6	31.3	30.2	29.2	28.6	27.0	23.7	19.9	15.2	14.1	11.4	11.5	18.2	25.1	31.8	
		22.2	23.3	23.4	24.5	23.8	24.4	24.3	24.0	23.3	22.9	24.0	24.7	25.1	25.4	25.9	26.1	25.0	24.0	22.9	22.2	22.5	22.5	22.0	21.8	Diurnal Average	
		38.2	38.1	37.5	37.0	34.6	36.9	36.6	35.2	35.7	35.9	36.2	36.3	36.6	36.3	36.2	36.2	36.5	36.4	36.9	37.7	37.9	38.0	38.1	38.0	Diurnal Maximum	
Z - zerospan										C - Calibration																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr										76 ppb																	



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Anzac - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Anzac - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	234	32.96	32.96
21 - 50	476	67.04	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Anzac - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	3	3	0	3	10	67	51	26	6	5	4	4	11	13	15	5	226
21 - 50	11	4	7	6	22	53	70	36	14	14	9	37	100	38	26	19	466
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	7	7	9	32	120	121	62	20	19	13	41	111	51	41	24	692

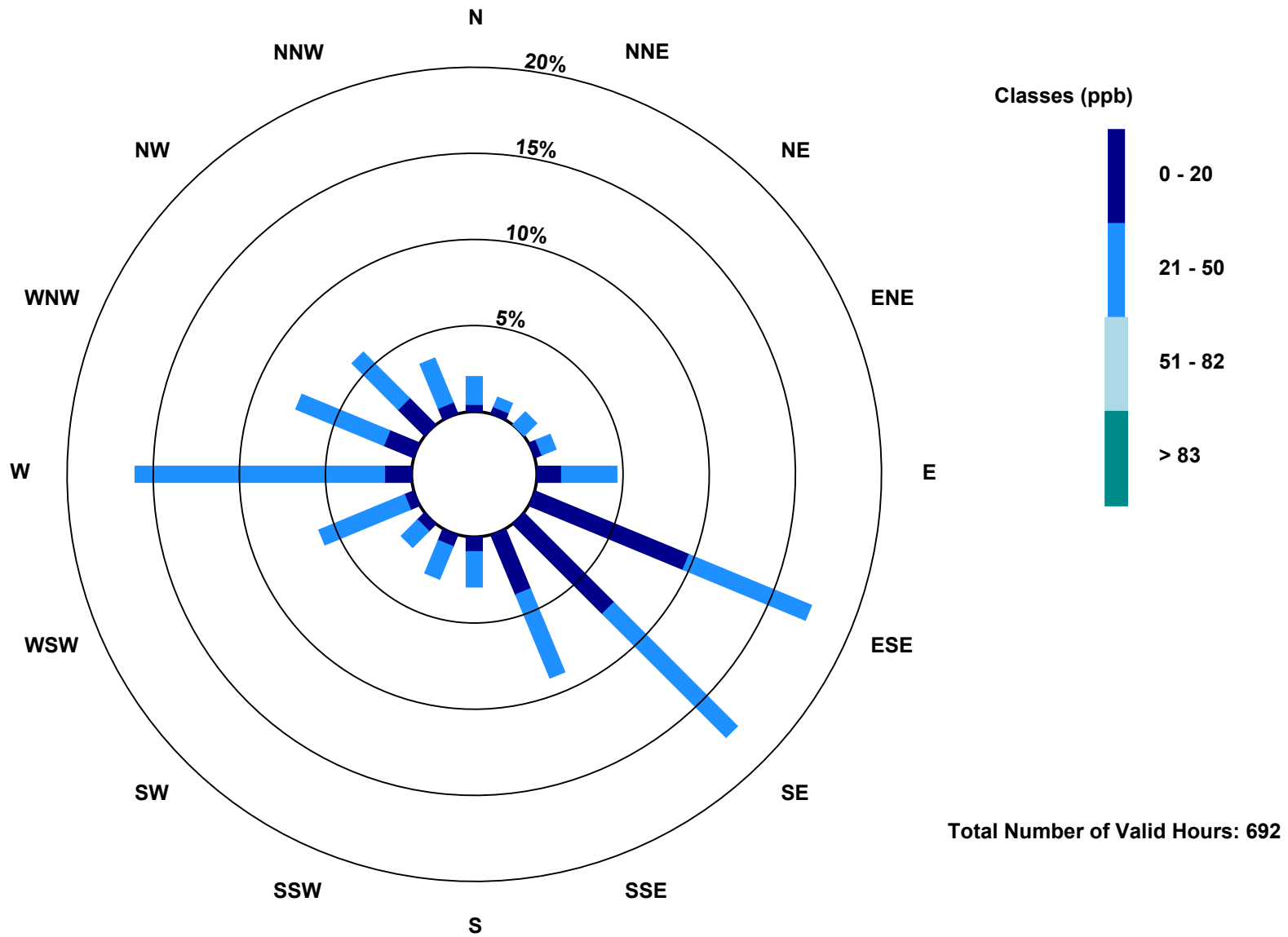
Total Number of Valid Hours: 692

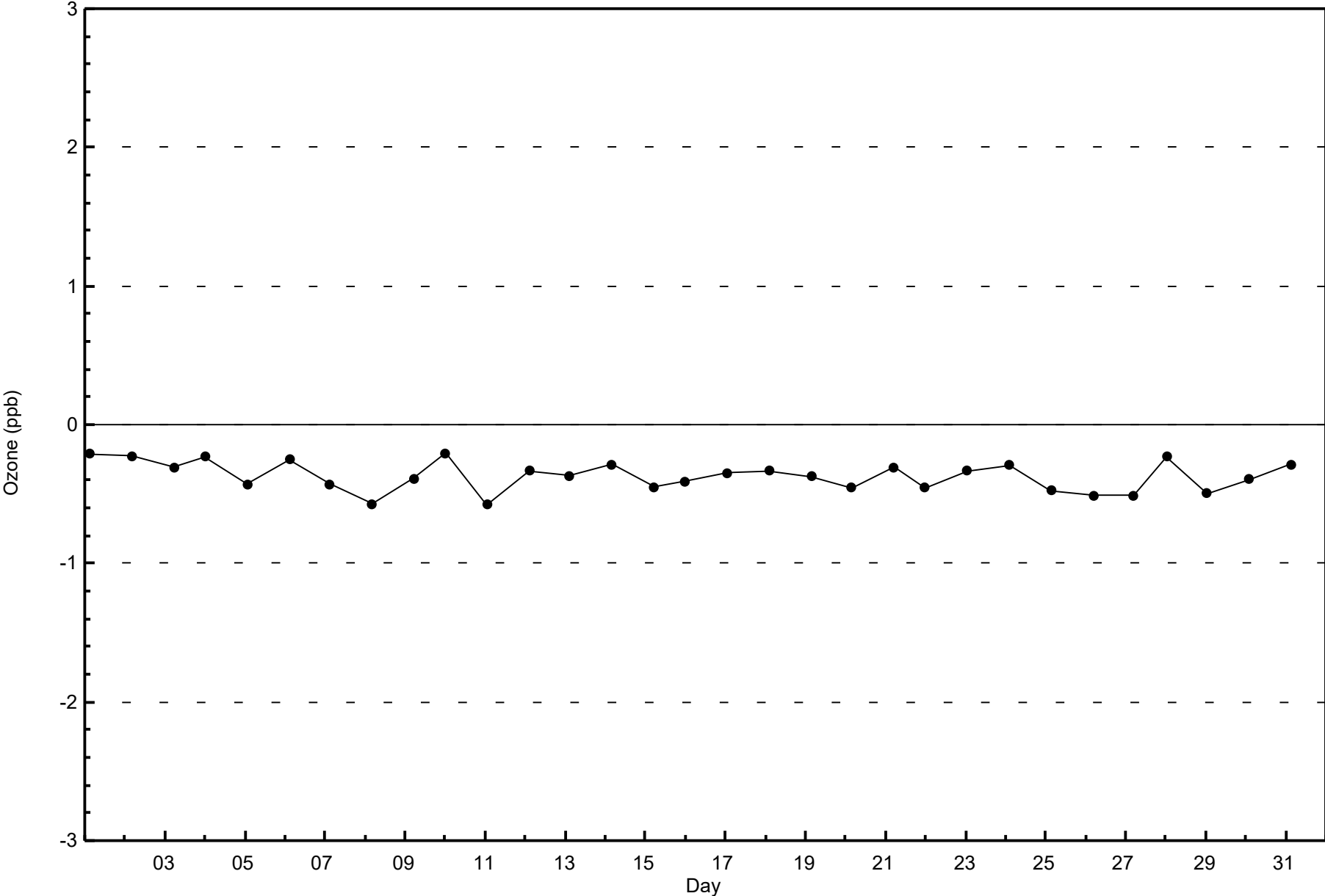
Total Number of Hours: 744

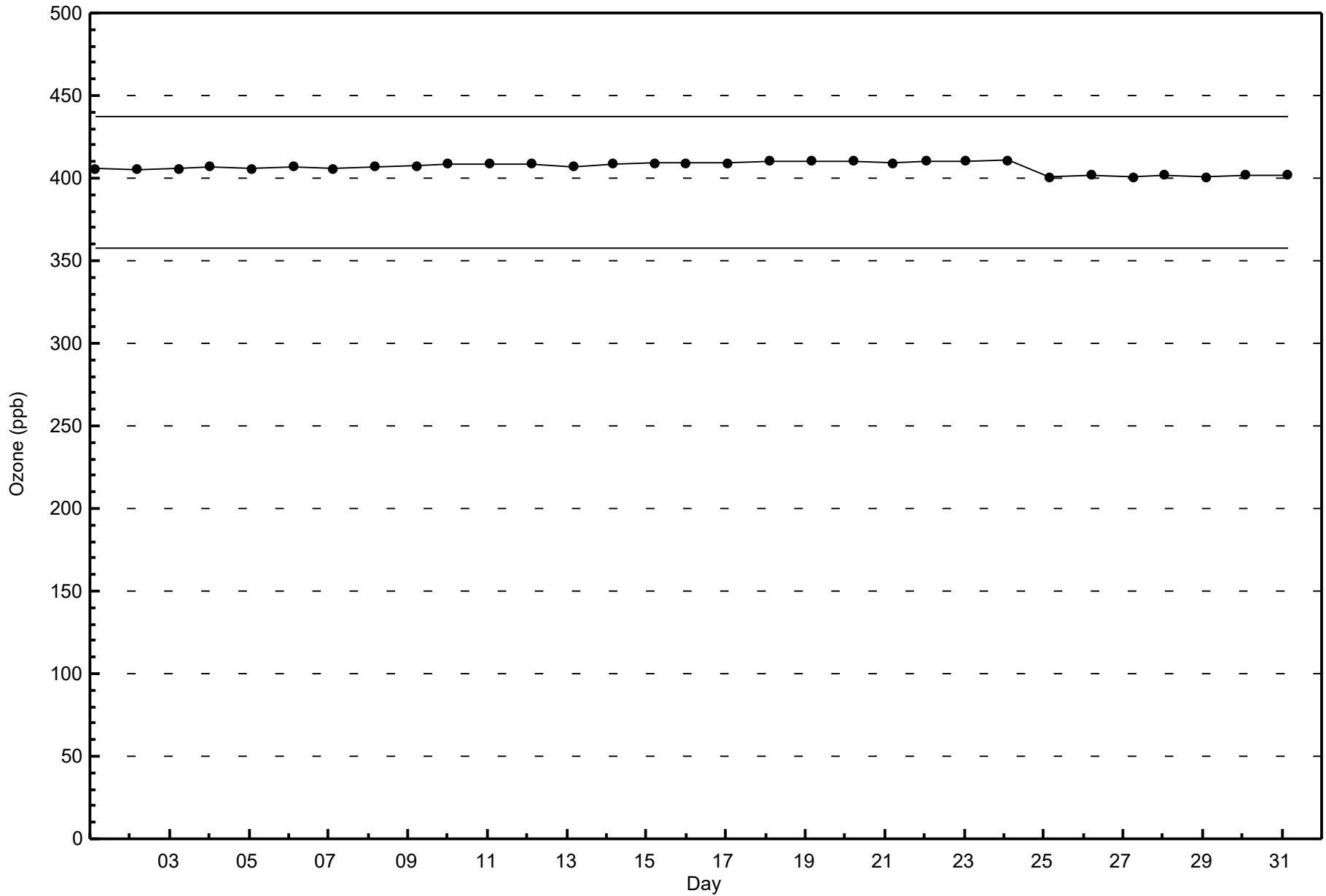


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Anzac

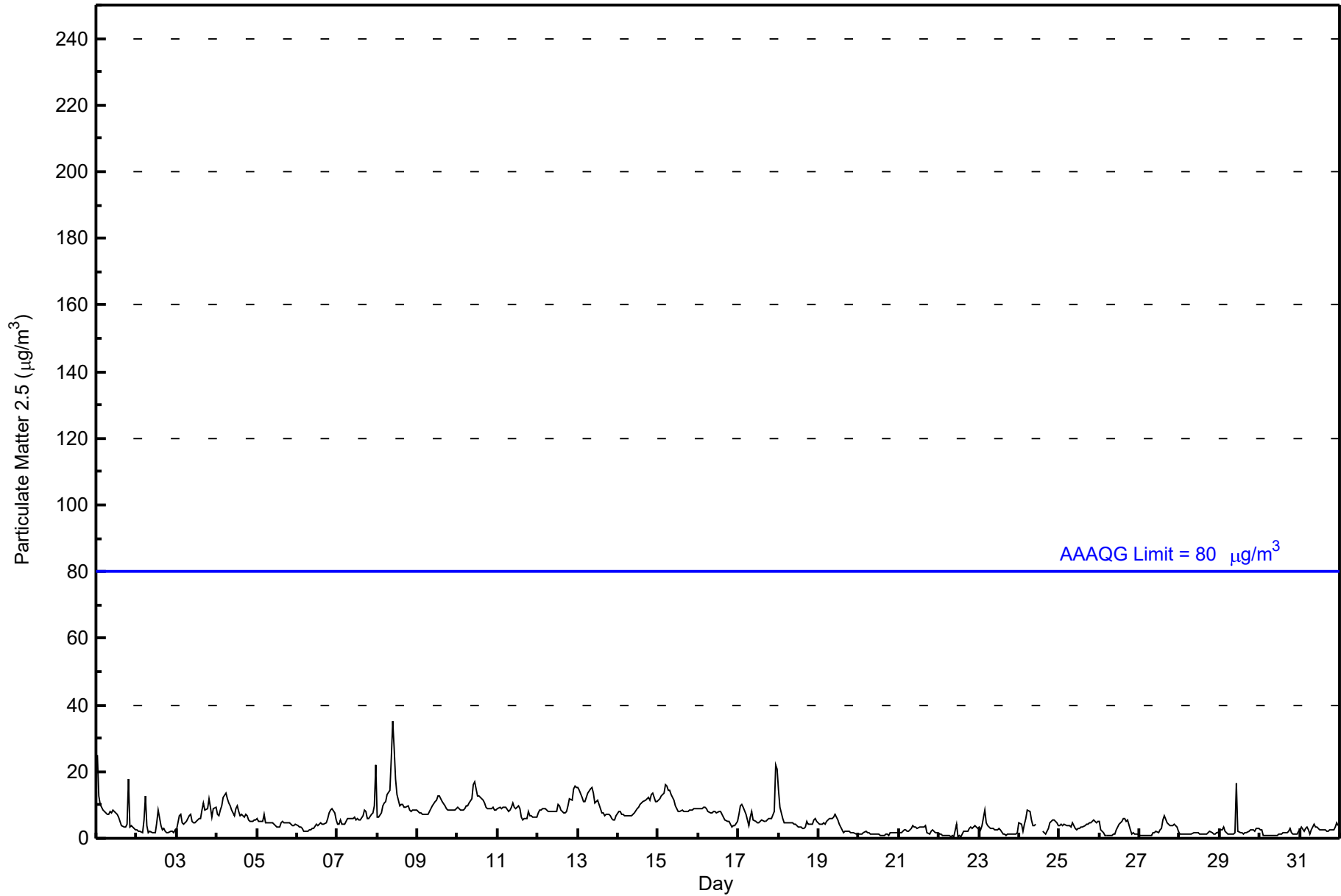








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																Daily Average		Daily Maximum																									
Maximum Value: 35.0 µg/m ³ on Jan 8 10:00		Maximum Daily Average: 12.4 µg/m ³ on Jan 8		Hours of Data: 741																Hours of Missing Data: 3		Hours of Calibration: 3																											
Minimum Value: 0.4 µg/m ³ on Jan 22 14:00		Minimum Daily Average: 1.3 µg/m ³ on Jan 20		Hours of Calibration: 3																Percent Operational Time: 100.0																													
Maximum Diurnal Average: 6.6 µg/m ³ at hour 11		Minimum Diurnal Average: 5.0 µg/m ³ at hour 17		Percentiles: P ₁ = 0.7 P ₁₀ = 1.3 Q ₁ = 2.4 Median = 4.7 Q ₃ = 8.2 P ₉₀ = 10.7 P ₉₉ = 17.7																																													
Monthly Average: 5.64 µg/m ³																																																	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	25.0	12.8	10.2	9.4	8.6	7.5	7.2	7.2	7.9	7.8	8.4	7.4	7.3	6.3	5.3	3.8	3.5	3.2	4.1	17.7	3.3	3.7	3.0	2.8	7.6	25.0																							
2-Jan	2.5	1.9	2.1	1.8	5.4	12.9	3.8	1.9	2.0	1.9	1.7	1.6	4.5	8.4	3.9	2.6	2.8	1.9	1.8	1.6	2.1	2.0	1.8	2.4	3.1	12.9																							
3-Jan	2.4	6.9	7.2	4.7	4.2	4.6	4.9	6.6	7.2	5.1	4.8	4.7	5.5	6.0	6.0	8.6	10.7	8.6	8.9	11.8	9.1	6.3	9.0	9.4	6.8	11.8																							
4-Jan	7.3	6.9	8.4	9.9	12.4	13.6	11.7	10.8	9.9	8.5	6.9	8.7	9.6	8.0	6.9	7.2	6.2	7.2	6.6	5.6	4.9	5.1	5.6	5.6	8.1	13.6																							
5-Jan	6.0	5.2	5.3	5.2	7.2	4.7	4.7	4.5	4.7	4.7	4.3	4.0	3.2	3.2	4.5	5.0	4.8	4.9	4.6	4.5	4.3	4.0	3.7	4.1	4.6	7.2																							
6-Jan	3.8	3.5	3.3	2.9	2.3	2.2	2.1	2.4	2.5	3.0	3.1	4.2	4.0	4.1	4.8	4.4	4.2	4.8	5.7	7.7	8.6	8.8	7.5	5.7	4.4	8.8																							
7-Jan	4.1	4.3	5.7	4.3	4.0	5.0	5.8	5.8	5.7	5.9	6.2	5.7	5.9	5.6	5.5	6.7	8.6	8.2	6.1	5.8	7.0	7.7	9.6	22.1	6.7	22.1																							
8-Jan	6.5	6.4	7.7	9.9	10.8	11.2	13.1	14.3	24.3	35.0	27.2	17.8	13.0	9.6	10.3	10.1	9.2	9.4	9.6	8.5	7.9	8.5	8.6	8.3	12.4	35.0																							
9-Jan	7.9	7.5	7.6	7.3	7.2	7.3	7.4	8.1	9.1	9.6	11.0	11.6	12.5	12.9	12.0	11.2	9.6	9.0	8.6	8.3	8.6	8.5	8.5	8.8	9.2	12.9																							
10-Jan	9.5	8.8	8.5	8.4	8.7	9.6	9.8	10.4	11.9	16.0	16.9	14.7	12.7	12.7	11.9	11.6	10.8	9.3	8.8	8.8	8.8	9.2	8.7	8.5	10.6	16.9																							
11-Jan	9.0	9.2	8.9	9.3	9.5	9.1	8.1	8.3	9.3	10.4	9.4	9.1	9.7	8.8	6.6	5.5	5.8	6.1	7.9	6.9	6.6	6.6	6.3	6.3	8.0	10.4																							
12-Jan	7.5	8.4	8.5	9.0	9.1	8.3	8.2	8.2	8.2	8.3	8.1	8.0	10.2	9.8	8.5	7.8	7.7	8.0	9.6	12.0	11.6	14.8	15.6	15.2	9.6	15.6																							
13-Jan	15.3	14.3	12.4	11.1	10.9	12.3	13.7	14.8	15.2	13.5	10.7	11.0	11.4	8.8	7.8	7.6	6.6	7.4	7.4	6.9	5.9	5.5	5.6	6.6	10.1	15.3																							
14-Jan	7.9	8.1	7.2	7.0	6.8	6.6	6.7	6.7	6.8	7.4	7.8	8.8	9.4	10.0	10.5	11.0	11.6	12.0	12.2	11.6	13.1	13.5	10.8	10.9	9.4	13.5																							
15-Jan	11.4	12.0	12.6	13.5	16.0	15.7	14.5	14.5	13.0	11.5	9.8	8.8	8.2	8.1	8.3	8.1	7.9	7.9	8.0	8.4	8.4	8.7	9.0	8.8	10.5	16.0																							
16-Jan	8.8	8.8	8.9	9.4	9.3	8.9	8.0	7.6	7.7	8.2	7.9	7.7	8.1	8.1	7.2	6.2	5.3	5.1	5.0	4.3	3.6	3.7	3.7	5.0	6.9	9.4																							
17-Jan	7.3	9.6	10.2	9.4	7.2	5.4	3.8	6.2	7.8	5.6	5.0	4.6	4.6	5.1	5.5	5.0	5.1	5.4	5.8	5.9	5.7	8.1	21.9	20.9	7.6	21.9																							
18-Jan	14.5	9.3	5.8	4.6	4.7	4.8	4.6	4.7	4.6	4.1	4.1	4.0	3.4	3.2	3.1	3.1	3.6	4.9	4.2	4.1	4.3	5.6	5.8	5.0	5.0	14.5																							
19-Jan	4.2	4.2	4.4	4.5	4.3	5.0	5.9	6.0	5.8	6.4	7.0	5.4	4.2	3.5	2.4	1.7	2.0	2.3	2.1	1.8	1.7	1.8	1.4	1.4	3.7	7.0																							
20-Jan	1.2	1.2	1.2	1.5	1.9	1.6	1.5	1.5	1.3	1.3	1.2	1.2	1.1	1.0	0.9	0.9	1.1	1.1	0.8	1.5	1.6	1.7	1.9	1.7	1.3	1.9																							
21-Jan	1.6	1.7	2.2	2.7	2.5	2.1	2.1	2.9	3.6	3.6	3.5	3.0	3.4	3.6	3.2	3.2	3.7	1.6	1.2	1.9	2.7	2.2	1.7	1.6	2.6	3.7																							
22-Jan	1.1	1.1	0.9	0.8	0.8	0.7	0.7	0.6	1.0	0.6	4.2	0.5	0.8	0.4	1.5	2.2	2.0	1.9	2.9	3.4	2.8	3.6	3.5	2.9	1.7	4.2																							
23-Jan	3.4	2.5	3.9	8.4	4.5	3.8	3.2	3.1	3.1	2.6	2.5	2.5	3.1	2.6	1.3	1.1	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	2.6	8.4																							
24-Jan	4.7	4.3	2.2	4.2	6.1	8.3	8.1	5.6	3.9	4.0	4.1	C	C	C	2.0	1.6	1.2	2.9	4.8	5.2	5.5	5.6	4.6	3.8	4.4	8.3																							
25-Jan	3.8	4.2	4.0	4.3	3.7	3.9	3.8	3.4	4.6	2.8	2.7	2.9	3.1	3.2	3.4	3.7	4.1	4.4	4.6	4.8	5.4	5.3	4.7	5.2	4.0	5.4																							
26-Jan	5.0	2.6	1.6	0.9	0.9	0.8	0.8	1.0	1.2	1.4	2.5	3.3	4.1	5.1	5.9	5.8	5.0	5.4	2.6	1.3	1.5	1.4	1.2	1.1	2.6	5.9																							
27-Jan	0.8	0.7	0.7	0.7	0.7	0.7	0.6	1.0	1.5	1.9	2.0	1.7	2.4	3.1	5.5	6.8	4.7	4.4	3.8	3.8	3.7	4.3	3.2	2.1	2.5	6.8																							
28-Jan	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.6	1.7	1.7	1.4	1.3	1.2	1.3	1.3	1.6	2.0	1.7	1.5	1.3	1.6	1.6	1.4	2.0																							
29-Jan	2.4	2.7	3.4	2.2	1.7	1.4	1.2	1.3	1.4	1.8	16.6	2.2	1.8	1.9	1.5	1.5	1.8	2.2	2.4	2.6	2.4	2.2	2.8	3.0	2.7	16.6																							
30-Jan	2.6	2.5	1.0	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.1	1.3	1.7	1.6	1.7	2.1	2.8	1.9	1.3	1.5	1.4	2.0	1.5	2.8																							
31-Jan	2.3	3.2	2.3	2.8	3.4	2.6	1.4	2.7	4.3	3.6	3.4	3.1	2.7	2.6	2.4	2.4	2.3	2.3	2.5	2.4	2.6	3.3	4.8	3.8	2.9	4.8																							
																								6.2	5.7	5.5	5.6	5.7	5.9	5.5	5.6	6.2	6.4	6.6	5.7	5.7	5.6	5.2	5.1	5.0	5.1	5.1	5.6	5.1	5.3	5.8	6.1	Diurnal Average	
																								25.0	14.3	12.6	13.5	16.0	15.7	14.5	14.8	24.3	35.0	27.2	17.8	13.0	12.9	12.0	11.6	11.6	12.0	12.2	17.7	13.1	14.8	21.9	22.1	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Anzac - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	417	56.28	56.28
6 - 15	309	41.70	97.98
16 - 25	13	1.75	99.73
26 - 80	2	0.27	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Anzac - January 2023

Concentration Ranges (µg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	12	2	5	4	18	48	60	22	13	13	6	35	76	40	37	25	416
6 - 15	2	5	3	5	13	70	70	39	7	7	6	8	37	15	4	1	292
16 - 25	1	0	0	0	3	1	1	2	0	0	1	1	2	0	0	0	12
26 - 80	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	7	8	9	34	121	131	63	20	20	13	44	115	55	41	26	722

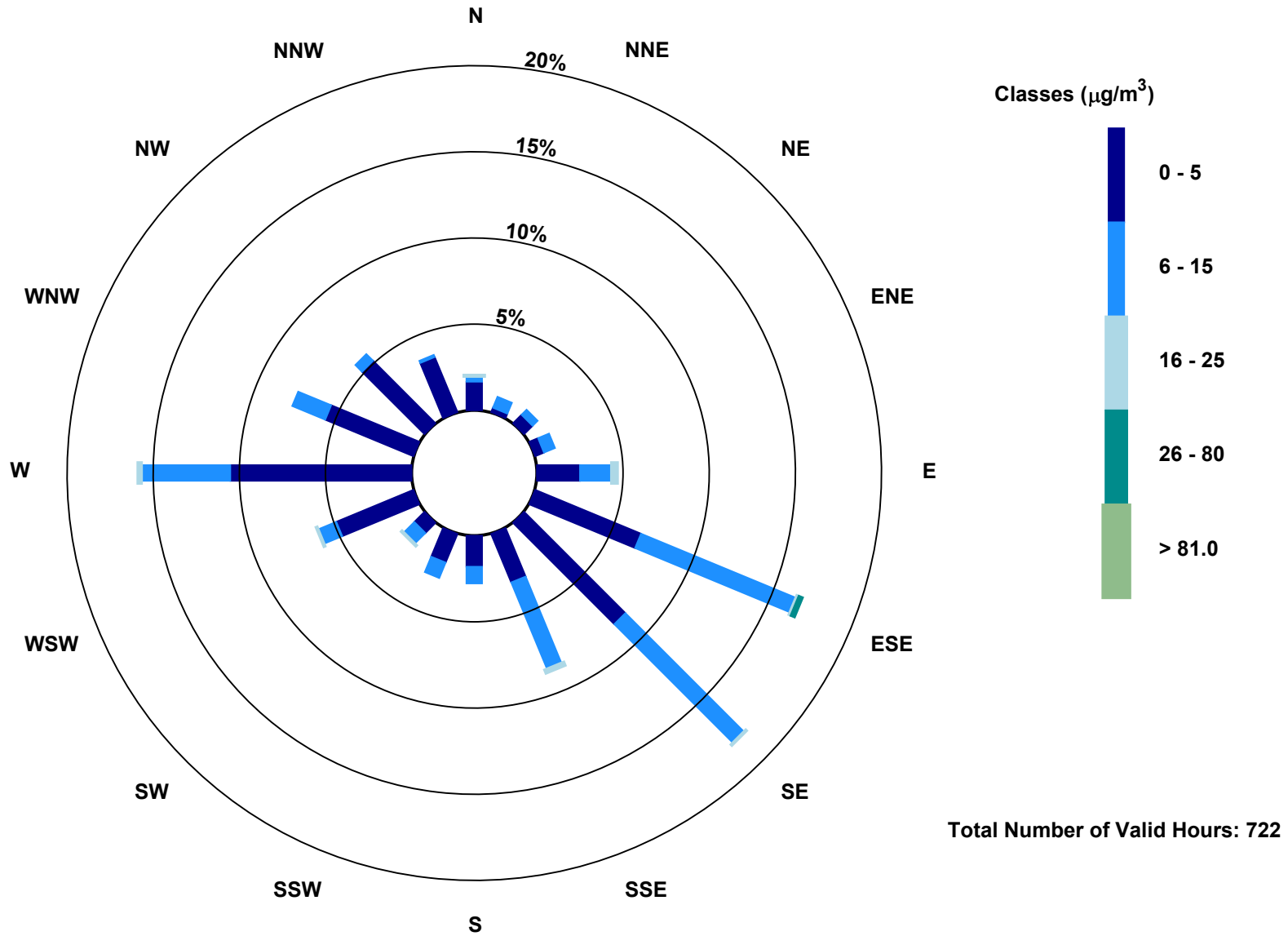
Total Number of Valid Hours: 722

Total Number of Hours: 744



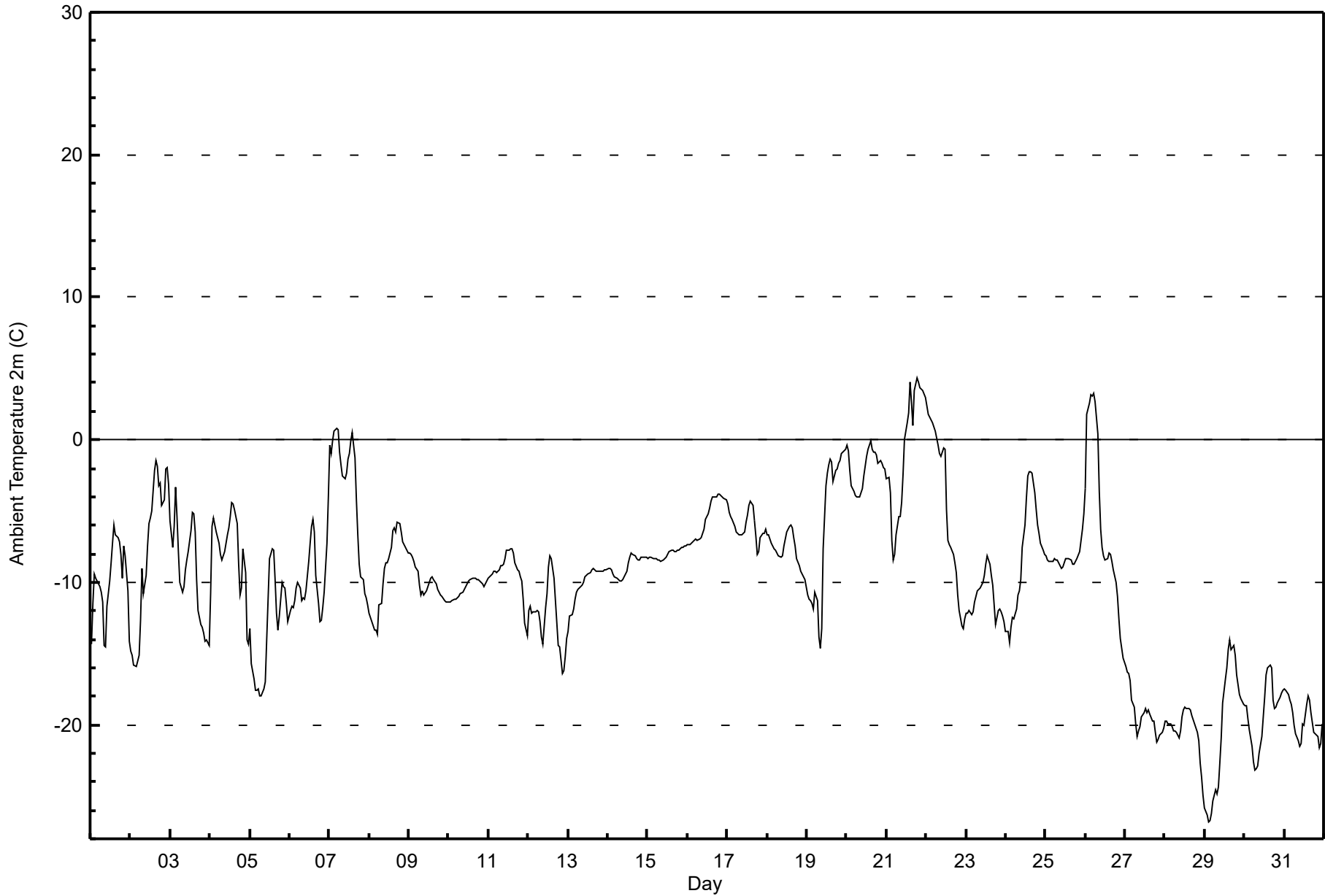
Wood Buffalo Environmental Association
Wind Rose Jan 2023

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





Maximum Value: 4.3 C on Jan 21 19:00 Maximum Daily Average: -0.9 C on Jan 21																								Hours in Service:	744	
Minimum Value: -26.8 C on Jan 29 03:00 Minimum Daily Average: -20.3 C on Jan 28																								Hours of Data:	744	
Maximum Diurnal Average: -7.4 C at hour 15 Minimum Diurnal Average: -11.2 C at hour 9																								Hours of Missing Data:	0	
Monthly Average: -9.83 C Percentiles: P ₁ = -24.7 P ₁₀ = -18.9 Q ₁ = -12.6 Median = -9.2 Q ₃ = -6.6 P ₉₀ = -2.2 P ₉₉ = 3.2																								Hours of Calibration:	0	
																								Percent Operational Time:	100.0	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-14.4	-11.5	-9.4	-9.7	-9.9	-10.3	-10.7	-11.4	-14.5	-14.5	-11.7	-9.9	-8.6	-7.2	-6.0	-6.6	-6.8	-7.1	-8.0	-9.7	-7.5	-8.1	-10.6	-14.2	-9.9	-6.0
2-Jan	-14.8	-15.1	-15.8	-15.9	-15.5	-15.2	-12.6	-9.1	-10.8	-9.6	-7.4	-5.9	-5.5	-5.0	-2.2	-1.4	-1.8	-3.2	-3.0	-4.6	-4.2	-2.0	-2.0	-3.1	-7.7	-1.4
3-Jan	-5.7	-7.5	-6.1	-3.3	-5.4	-7.8	-10.0	-10.7	-10.3	-9.1	-8.4	-7.8	-6.4	-5.1	-5.2	-6.5	-9.8	-12.0	-13.0	-13.2	-13.5	-14.2	-14.0	-14.4	-9.1	-3.3
4-Jan	-10.8	-6.1	-5.5	-5.9	-6.5	-7.2	-8.0	-8.4	-8.1	-7.8	-6.7	-6.2	-5.3	-4.4	-4.5	-4.9	-5.8	-8.7	-10.9	-10.4	-7.6	-9.3	-14.1	-14.3	-7.8	-4.4
5-Jan	-13.2	-15.7	-16.8	-17.6	-17.6	-17.4	-18.0	-17.9	-17.5	-17.0	-14.0	-11.2	-8.4	-7.6	-7.8	-9.8	-12.2	-13.4	-12.4	-10.0	-10.3	-10.4	-11.5	-12.8	-13.4	-7.6
6-Jan	-12.0	-11.7	-11.8	-11.3	-10.4	-10.0	-10.4	-11.3	-11.1	-11.2	-10.6	-8.5	-7.3	-6.1	-5.6	-6.5	-9.5	-11.5	-12.8	-12.7	-11.8	-10.7	-7.2	-4.0	-9.8	-4.0
7-Jan	-0.4	-0.9	0.0	0.6	0.8	0.7	-0.8	-1.7	-2.5	-2.7	-2.3	-1.4	-0.9	-0.1	0.5	-1.3	-4.2	-6.7	-8.8	-9.6	-9.8	-10.8	-11.1	-11.5	-3.6	0.8
8-Jan	-12.1	-12.5	-13.1	-13.4	-13.3	-13.7	-11.6	-11.5	-10.1	-9.0	-8.6	-8.6	-8.3	-7.5	-6.4	-6.1	-6.4	-5.8	-5.9	-6.5	-7.1	-7.4	-7.6	-7.9	-9.2	-5.8
9-Jan	-7.9	-8.0	-8.3	-8.6	-8.9	-9.3	-10.2	-10.9	-10.6	-10.9	-10.6	-10.3	-10.0	-9.7	-9.6	-9.8	-10.1	-10.5	-10.7	-10.9	-11.0	-11.3	-11.4	-11.4	-10.0	-7.9
10-Jan	-11.3	-11.4	-11.3	-11.2	-11.2	-11.0	-11.0	-10.8	-10.7	-10.5	-10.3	-10.1	-9.9	-9.8	-9.7	-9.7	-9.7	-9.8	-9.8	-10.0	-10.1	-10.3	-10.1	-9.9	-10.4	-9.7
11-Jan	-9.7	-9.5	-9.4	-9.2	-9.3	-9.3	-9.1	-8.9	-8.8	-8.7	-8.3	-7.8	-7.7	-7.6	-7.6	-8.0	-8.7	-9.2	-9.3	-9.6	-9.9	-11.2	-12.8	-13.8	-9.3	-7.6
12-Jan	-11.9	-11.7	-12.2	-12.1	-12.1	-12.0	-12.1	-12.7	-13.8	-14.4	-11.8	-10.8	-8.9	-8.2	-8.3	-9.7	-11.3	-12.8	-14.5	-14.5	-16.4	-16.2	-15.2	-13.9	-12.4	-8.2
13-Jan	-13.5	-12.4	-12.3	-11.9	-11.2	-10.7	-10.5	-10.3	-10.2	-10.0	-9.6	-9.5	-9.5	-9.3	-9.1	-9.1	-9.1	-9.2	-9.2	-9.2	-9.2	-9.2	-9.1	-9.1	-10.1	-9.1
14-Jan	-9.0	-9.0	-9.1	-9.4	-9.6	-9.8	-9.8	-9.9	-9.9	-9.8	-9.7	-9.2	-8.7	-8.2	-8.0	-8.1	-8.2	-8.3	-8.4	-8.4	-8.2	-8.2	-8.2	-8.3	-8.9	-8.0
15-Jan	-8.3	-8.3	-8.2	-8.3	-8.3	-8.3	-8.4	-8.5	-8.5	-8.5	-8.3	-8.2	-8.1	-7.8	-7.7	-7.7	-7.8	-7.8	-7.7	-7.7	-7.6	-7.5	-7.5	-7.4	-8.0	-7.4
16-Jan	-7.3	-7.3	-7.3	-7.1	-7.1	-7.0	-7.0	-7.0	-6.8	-6.6	-6.2	-5.6	-5.2	-4.8	-4.3	-4.1	-4.1	-4.0	-3.9	-3.8	-3.9	-4.0	-4.1	-4.2	-5.5	-3.8
17-Jan	-4.5	-5.1	-5.4	-5.6	-6.1	-6.5	-6.6	-6.6	-6.6	-6.6	-6.5	-5.8	-5.3	-4.6	-4.3	-4.6	-5.7	-6.8	-8.0	-7.9	-6.9	-6.6	-6.6	-6.2	-6.1	-4.3
18-Jan	-6.7	-6.7	-7.2	-7.5	-7.7	-7.7	-7.9	-8.1	-8.2	-8.1	-7.4	-7.0	-6.5	-6.1	-6.0	-6.2	-6.9	-7.5	-8.3	-8.8	-9.3	-9.5	-9.6	-9.8	-7.7	-6.0
19-Jan	-10.9	-11.1	-11.3	-11.5	-11.9	-10.7	-11.3	-13.8	-14.7	-13.3	-7.7	-3.2	-2.3	-1.7	-1.3	-1.6	-2.9	-2.2	-2.0	-1.7	-1.4	-0.9	-0.8	-0.7	-6.3	-0.7
20-Jan	-0.4	-0.7	-2.2	-3.2	-3.7	-3.9	-4.0	-4.1	-4.0	-3.4	-2.5	-1.8	-1.1	-0.7	-0.1	-0.7	-0.8	-0.8	-1.1	-1.6	-1.4	-1.7	-2.0	-2.1	-2.0	-0.1
21-Jan	-2.7	-2.6	-3.7	-7.0	-8.4	-8.1	-6.7	-5.4	-5.4	-4.4	-2.5	0.0	1.2	1.9	4.0	2.7	1.0	3.5	4.3	4.1	3.7	3.6	3.4	3.0	-0.9	4.3
22-Jan	2.3	1.8	1.6	1.4	1.2	0.6	0.1	-0.3	-1.0	-1.2	-0.6	-0.7	-4.9	-7.1	-7.4	-7.5	-8.1	-8.6	-9.3	-10.8	-12.0	-13.0	-13.3	-12.6	-4.6	2.3
23-Jan	-12.2	-12.2	-12.0	-12.3	-12.1	-11.4	-11.0	-10.6	-10.4	-10.2	-10.0	-9.5	-8.7	-8.1	-8.8	-9.5	-10.2	-11.5	-12.9	-12.0	-11.9	-12.1	-12.4	-12.8	-11.0	-8.1
24-Jan	-13.4	-13.5	-14.2	-13.2	-12.4	-12.6	-11.9	-10.9	-10.6	-9.8	-7.6	-6.0	-4.1	-2.5	-2.3	-2.2	-2.4	-3.7	-4.9	-6.0	-6.6	-7.3	-7.8	-8.0	-8.1	-2.2
25-Jan	-8.2	-8.4	-8.6	-8.5	-8.5	-8.4	-8.5	-8.4	-8.6	-9.0	-8.9	-8.6	-8.3	-8.4	-8.3	-8.4	-8.7	-8.7	-8.5	-8.3	-7.8	-7.1	-6.3	-5.2	-8.2	-5.2
26-Jan	-3.4	1.8	2.6	3.2	3.1	3.2	2.7	0.4	-3.6	-6.3	-7.6	-8.2	-8.4	-8.3	-8.0	-8.1	-8.6	-9.1	-10.0	-11.0	-12.6	-13.9	-14.6	-15.3	-5.8	3.2
27-Jan	-15.9	-16.3	-16.4	-16.9	-18.3	-18.8	-20.0	-20.8	-20.4	-20.1	-19.4	-19.1	-18.9	-19.2	-19.0	-19.2	-19.7	-19.7	-20.5	-21.2	-21.0	-20.7	-20.5	-20.3	-19.3	-15.9
28-Jan	-19.8	-19.8	-19.9	-20.0	-20.1	-20.4	-20.4	-20.5	-20.9	-20.5	-19.5	-18.9	-18.7	-18.9	-18.9	-18.9	-19.3	-19.6	-19.9	-20.5	-21.1	-22.7	-23.7	-25.0	-20.3	-18.7
29-Jan	-25.8	-26.4	-26.8	-26.7	-26.3	-25.4	-24.6	-24.8	-24.4	-22.7	-20.9	-18.4	-16.8	-16.0	-14.7	-14.0	-14.7	-14.4	-15.2	-16.5	-17.2	-17.8	-18.2	-18.5	-20.3	-14.0
30-Jan	-18.6	-18.6	-19.5	-20.4	-21.5	-22.6	-23.1	-23.1	-22.9	-22.0	-20.8	-19.4	-18.0	-16.5	-16.0	-15.8	-16.0	-18.3	-18.8	-18.8	-18.5	-18.1	-17.8	-17.6	-19.3	-15.8
31-Jan	-17.4	-17.6	-17.8	-18.2	-18.6	-19.1	-20.0	-20.6	-21.1	-21.5	-21.3	-19.9	-20.1	-18.6	-18.0	-18.3	-19.2	-19.9	-20.6	-20.8	-20.8	-21.6	-21.3	-20.0	-19.7	-17.4
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	50	6.72	6.72
-20 - 0	664	89.25	95.97
0 - 10	30	4.03	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

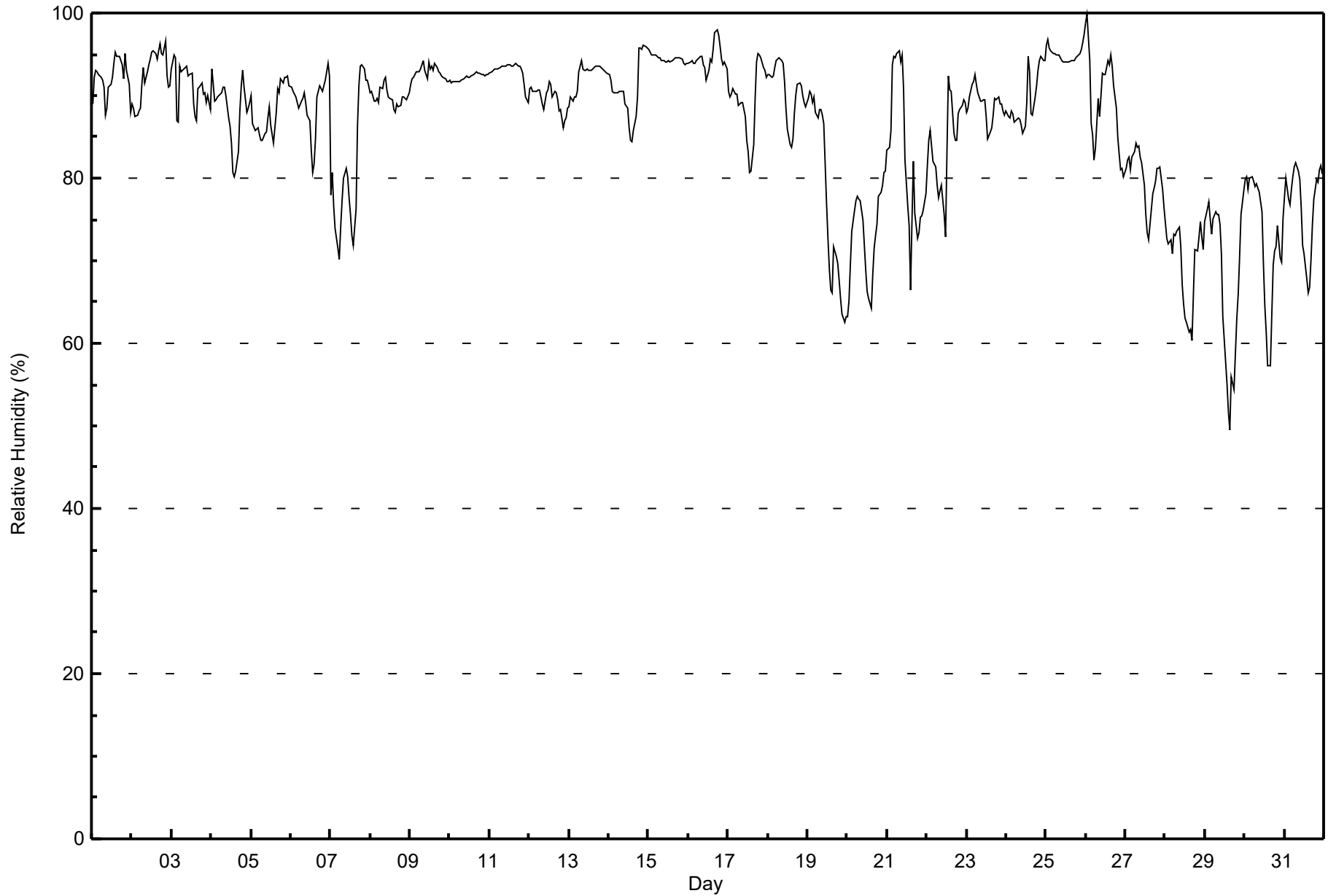
Relative Humidity (RH) - %
Anzac - January 2023

Maximum Value: 99.8 % on Jan 26 02:00 Maximum Daily Average: 95.0 % on Jan 25 Minimum Value: 49.5 % on Jan 29 16:00 Minimum Daily Average: 67.7 % on Jan 29 Maximum Diurnal Average: 88.2 % at hour 8 Minimum Diurnal Average: 82.2 % at hour 15 Monthly Average: 86.40 % Percentiles: P ₁ = 58.3 P ₁₀ = 72.9 Q ₁ = 81.3 Median = 89.8 Q ₃ = 93.0 P ₉₀ = 94.4 P ₉₉ = 96.5																						Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	88.9	92.3	93.0	92.9	92.6	92.2	91.8	91.0	87.7	88.5	91.0	91.4	92.3	93.8	95.3	94.8	94.8	94.3	93.8	92.1	95.1	93.1	91.4	88.0	92.2	95.3	
2-Jan	88.9	88.5	87.4	87.6	88.1	88.5	91.4	93.4	91.5	92.9	93.8	94.4	95.3	95.4	95.0	94.4	95.4	96.2	95.1	94.9	96.5	92.5	91.0	91.2	92.5	96.5	
3-Jan	93.1	94.9	94.6	87.0	86.8	93.6	92.9	93.3	93.3	93.6	92.4	92.6	92.7	89.0	87.5	87.0	90.8	90.9	91.5	90.2	90.3	89.1	90.0	88.2	91.1	94.9	
4-Jan	93.2	91.4	89.3	89.5	89.8	90.1	90.3	91.1	91.0	89.9	87.3	86.2	84.2	80.7	80.2	80.9	83.1	88.1	91.2	93.1	91.0	87.9	88.5	89.2	88.2	93.2	
5-Jan	90.0	86.6	85.8	85.9	86.1	85.2	84.5	84.5	85.5	85.6	87.3	88.7	86.5	84.3	86.1	88.0	90.8	90.3	92.0	91.5	92.1	92.2	92.3	91.2	88.0	92.3	
6-Jan	91.1	90.5	90.2	89.8	89.1	88.5	89.3	89.7	90.4	89.2	87.7	87.0	83.4	80.8	81.7	84.8	89.8	91.2	90.9	90.6	91.3	91.9	93.9	92.4	88.9	93.9	
7-Jan	77.9	80.7	76.7	74.0	71.5	70.1	74.0	77.3	80.0	81.2	80.1	77.6	75.6	73.1	71.9	76.4	86.2	91.3	93.6	93.7	93.3	91.9	91.9	91.2	81.3	93.7	
8-Jan	90.3	90.5	89.3	89.3	89.6	89.1	91.1	90.9	91.8	92.3	90.7	89.8	89.6	89.4	88.3	88.0	89.0	88.6	88.7	89.8	89.8	89.6	89.6	90.4	89.8	92.3	
9-Jan	91.4	92.0	92.3	92.5	92.8	92.9	93.2	93.7	94.3	93.1	92.1	94.1	93.3	93.6	93.0	93.9	93.3	92.8	92.7	92.3	92.3	92.0	91.8	91.6	92.8	94.3	
10-Jan	91.8	91.6	91.6	91.7	91.6	91.7	91.7	91.8	92.1	92.2	92.3	92.3	92.2	92.4	92.6	92.7	92.8	92.7	92.7	92.6	92.5	92.4	92.6	92.6	92.2	92.8	
11-Jan	92.8	92.9	93.1	93.2	93.2	93.2	93.4	93.6	93.6	93.6	93.6	93.7	93.7	93.6	93.6	93.7	93.8	93.6	93.6	93.3	92.7	91.4	89.9	89.2	93.0	93.8	
12-Jan	90.9	91.1	90.5	90.6	90.4	90.6	90.6	89.9	88.9	88.3	90.3	90.7	91.7	91.3	89.8	90.4	90.4	89.5	88.1	88.3	86.2	86.9	87.3	88.5	89.6	91.7	
13-Jan	88.6	89.8	89.4	89.8	89.9	90.4	92.9	94.2	93.2	93.1	93.0	93.2	93.1	93.1	93.3	93.5	93.6	93.6	93.6	93.4	93.2	93.1	92.9	92.8	92.4	94.2	
14-Jan	92.5	91.9	90.4	90.3	90.3	90.3	90.5	90.5	90.5	90.5	89.0	88.4	86.1	84.5	84.4	85.8	87.4	89.8	95.7	95.8	95.5	96.1	95.9	95.8	90.7	96.1	
15-Jan	95.5	95.2	94.9	94.8	94.8	94.8	94.6	94.6	94.3	94.2	94.1	94.0	94.2	94.1	94.2	94.4	94.6	94.6	94.6	94.6	94.4	94.0	93.8	93.8	94.5	95.5	
16-Jan	93.8	94.1	94.2	94.0	93.9	94.3	94.5	94.7	94.8	93.8	93.3	91.9	93.1	94.4	94.1	95.6	97.7	98.0	97.2	96.0	94.4	93.8	94.1	93.2	94.5	98.0	
17-Jan	90.5	89.9	90.2	90.8	90.1	90.2	88.9	89.1	89.2	89.2	87.5	84.5	83.2	80.7	80.9	84.0	89.7	94.0	95.1	95.0	94.6	93.4	93.1	92.3	89.4	95.1	
18-Jan	92.6	92.5	92.2	92.3	93.4	94.3	94.5	94.5	94.3	93.9	91.6	88.4	85.9	84.1	83.7	84.7	87.8	90.0	91.3	91.6	91.2	90.1	89.2	88.7	90.5	94.5	
19-Jan	89.7	90.6	90.2	89.2	89.9	88.0	87.2	88.3	88.3	87.7	86.6	77.0	72.7	69.0	66.5	66.2	71.7	70.6	69.7	67.6	65.5	63.6	62.5	63.3	77.6	90.6	
20-Jan	63.3	65.1	69.6	73.6	76.0	77.3	77.8	77.4	77.2	75.0	71.9	68.8	66.2	65.5	64.3	68.3	71.5	73.1	74.4	77.8	78.3	79.1	80.6	80.8	73.0	80.8	
21-Jan	83.3	83.8	85.7	93.8	94.8	94.5	95.1	95.4	94.0	94.9	90.8	82.1	76.6	74.2	66.5	74.7	82.0	75.8	72.7	73.4	75.3	75.4	76.2	78.2	82.9	95.4	
22-Jan	81.6	84.6	85.7	84.0	82.0	81.4	79.2	77.6	78.5	79.2	75.7	72.9	83.2	92.4	90.6	90.6	85.4	84.6	84.6	87.7	88.3	88.9	89.5	89.1	84.0	92.4	
23-Jan	87.9	88.5	89.9	91.3	91.8	92.5	91.3	90.4	89.4	89.3	89.5	89.5	87.5	84.7	85.6	86.0	87.6	89.7	89.5	89.8	89.0	88.9	88.1	87.7	89.0	92.5	
24-Jan	88.1	87.5	87.2	88.2	87.8	86.8	87.2	87.3	87.2	86.5	85.4	86.2	89.1	94.8	92.8	87.8	87.7	89.9	91.1	93.1	94.3	94.7	94.2	94.2	89.5	94.8	
25-Jan	96.1	96.8	95.8	95.4	95.2	95.1	95.0	95.0	95.0	94.3	94.0	94.1	94.1	94.1	94.0	94.2	94.2	94.2	94.3	94.6	94.8	95.0	95.7	96.4	97.5	95.0	97.5
26-Jan	98.9	99.8	94.3	86.7	85.3	82.2	83.5	89.7	87.5	90.0	92.8	92.5	92.5	94.3	93.7	94.9	93.5	91.3	88.4	85.0	82.8	81.0	81.1	80.2	89.2	99.8	
27-Jan	81.1	82.2	82.5	81.0	82.5	83.2	84.3	83.7	83.9	82.5	81.8	79.2	75.7	73.3	72.6	74.4	78.1	78.8	79.6	81.1	81.1	81.4	78.7	76.4	80.0	84.3	
28-Jan	74.5	72.8	72.1	72.5	70.9	73.2	73.0	73.6	74.1	71.7	67.2	64.7	63.1	62.6	61.4	61.7	60.3	65.9	71.3	71.3	72.9	74.7	72.8	71.4	69.6	74.7	
29-Jan	74.8	76.2	77.2	75.1	73.2	75.1	75.9	75.5	75.6	74.5	70.8	63.2	57.8	55.1	51.8	49.5	56.0	54.4	58.9	63.0	65.9	70.5	75.6	78.4	67.7	78.4	
30-Jan	79.9	80.2	78.6	80.1	80.2	79.7	79.0	79.3	78.8	78.3	76.0	69.7	64.6	61.4	57.2	57.3	63.5	69.6	71.2	71.7	74.2	70.3	69.8	75.1	72.7	80.2	
31-Jan	77.6	79.9	77.4	76.7	78.6	80.1	81.4	81.9	80.9	79.9	76.5	71.8	70.9	67.8	66.2	66.7	70.2	74.3	77.5	79.8	79.5	80.9	81.6	80.5	76.6	81.9	
87.4 87.9 87.5 87.2 87.2 87.4 87.7 88.2 88.0 87.7 86.6 84.9 83.9 83.1 82.2 83.1 85.3 86.2 86.9 87.3 87.4 87.0 87.0 86.9																								Diurnal Average			
98.9 99.8 95.8 95.4 95.2 95.1 95.1 95.4 95.0 94.9 94.1 94.4 95.3 95.4 95.3 95.6 97.7 98.0 97.2 96.0 96.5 96.1 96.4 97.5																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Anzac - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Anzac - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	9	1.21	1.21
60 - 80	151	20.30	21.51
80 - 100	584	78.49	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

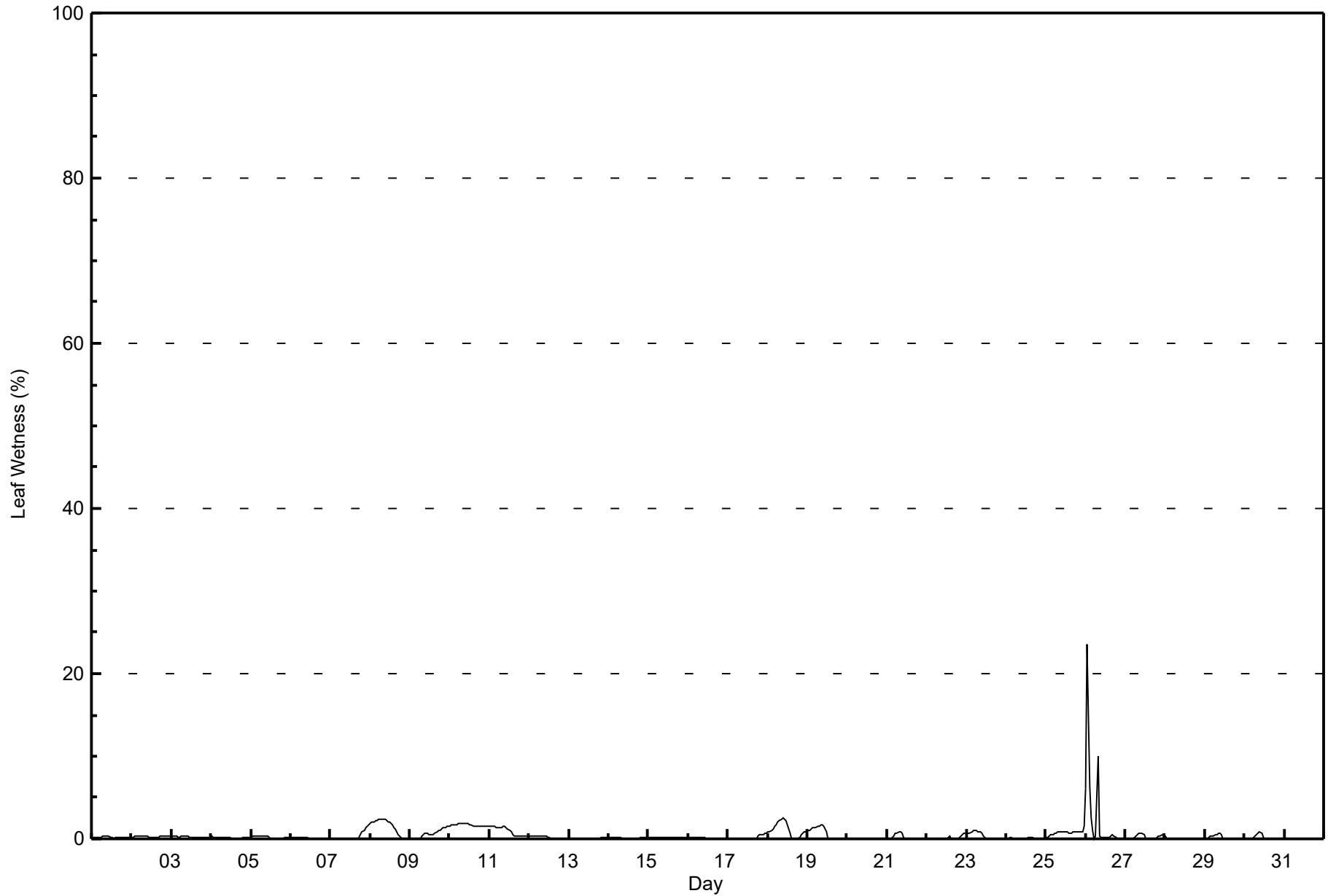
Leaf Wetness (LW) - %
Anzac - January 2023

Maximum Value: 23.6 % on Jan 26 02:00		Maximum Daily Average: 2.2 % on Jan 26		Hours in Service: 744																																														
Minimum Value: 0.0 % on Jan 4 14:00		Minimum Daily Average: 0.0 % on Jan 20		Hours of Data: 744																																														
Maximum Diurnal Average: 1.1 % at hour 2		Minimum Diurnal Average: 0.2 % at hour 16		Hours of Missing Data: 0																																														
Monthly Average: 0.41 %		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 1.4 P ₉₉ = 2.4		Hours of Calibration: 0																																														
				Percent Operational Time: 100.0																																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																										
1-Jan	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
2-Jan	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																						
3-Jan	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
4-Jan	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3																						
5-Jan	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
6-Jan	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2																						
7-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.8	1.1	1.3	1.6	1.8	0.3	0.3	1.8																							
8-Jan	1.9	2.0	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.2	2.1	2.0	1.7	1.4	1.1	0.9	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4																						
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.5	0.6	0.6	1.5																							
10-Jan	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.7	1.8																							
11-Jan	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.5	1.5	1.4	1.2	1.1	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5																							
12-Jan	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3																							
13-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2																							
14-Jan	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2																							
15-Jan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																							
16-Jan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																							
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.5	0.6	0.7	0.7	0.2	0.7																								
18-Jan	0.8	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.3	2.5	2.4	2.2	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.8	0.9	1.1	1.1	2.5																							
19-Jan	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7																							
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
21-Jan	0.0	0.0	0.0	0.1	0.4	0.6	0.7	0.8	0.8	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8																							
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.6	0.6	0.1	0.6																								
23-Jan	0.6	0.6	0.6	0.8	0.9	1.0	1.1	0.9	0.8	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1																							
24-Jan	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2																							
25-Jan	0.2	0.2	0.3	0.4	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.6	0.7	1.6																							
26-Jan	6.1	23.6	6.2	2.6	1.0	0.0	0.3	10.0	0.4	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	2.2	23.6																								
27-Jan	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.7	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.2	0.7																								
28-Jan	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3																							
29-Jan	0.0	0.0	0.1	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7																								
30-Jan	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.7	0.8	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8																								
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																							
																								0.5	1.1	0.6	0.5	0.4	0.5	0.5	0.8	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	Diurnal Average		
																								6.1	23.6	6.2	2.6	2.2	2.3	2.3	10.0	2.4	2.5	2.4	2.2	2.0	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Leaf Wetness (LW) - %
Anzac - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %
Anzac - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	559	75.13	75.13
0.4 - 0.5	28	3.76	78.90
0.6 - 0.7	30	4.03	82.93
0.8 - 1.4	59	7.93	90.86
1.5 - 10	61	8.20	99.06
> 10	1	0.13	99.19

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Anzac - January 2023

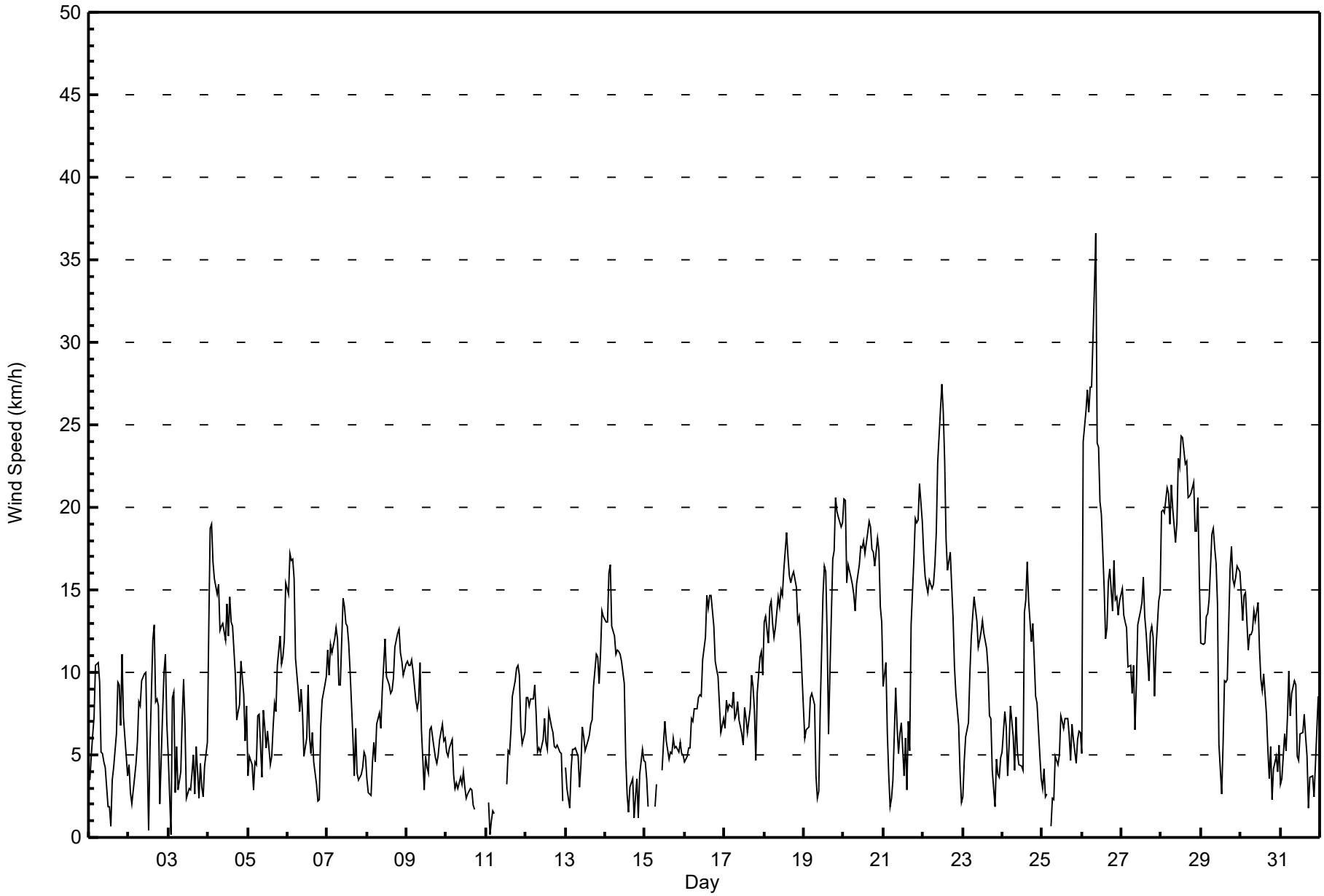
Maximum Speed: 37 km/h on Jan 26 09:00 Maximum Daily Speed Average: 20.0 km/h on Jan 28 Minimum Speed Value: 0 km/h on Jan 3 02:00 Minimum Daily Speed Average: 2.3 km/h on Jan 24 Maximum Diurnal Speed Average: 2.8 km/h at hour 2 Minimum Diurnal Speed Average: 1.2 km/h at hour 17 Monthly Average Velocity: 2.1 km/h 237.7 deg Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 8 Q ₃ = 13 P ₉₀ = 17 P ₉₉ = 26		Hours in Service: 744 Hours of Data: 725 Hours of Missing Data: 19 Percent Operational Time: 97.5																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	WSW4	WNW5	W6	WNW7	WNW10	WNW11	WNW9	W5	SSE5	SSE5	SE4	SE2	SE2	SW1	WSW3	WSW4	W6	W9	W9	W7	W11	WSW7	SW5	SSW4	W4.6	W11
2-Jan	SSW4	SSE3	ESE2	SE4	SE4	SSE6	S8	SSE8	SE10	SE10	SSE10	SE5	SSE0	S5	WSW12	WSW13	SW8	SSW8	SW8	SE2	S8	S10	S11	SSE7	S5.6	WSW13
3-Jan	S5	NNE0	SSW9	SSW9	SW3	N6	WNW3	SW4	S7	SSE10	S7	NW2	N3	ENE3	SE4	SE5	SE3	SE6	SSW2	SSW5	SW3	N2	W4	WSW6	S2.4	SSE10
4-Jan	W13	W19	W17	W16	W15	W15	W13	W13	W13	W12	W14	W12	W15	W13	W13	W10	W7	W8	W8	W11	W9	W6	W8	W12.3	W19	
5-Jan	W4	SSE5	SSE4	SSE3	SSE5	SE4	SSE7	SSE7	SE4	SE8	SE7	S5	SSE6	SE4	E5	E7	ESE8	ESE8	ESE10	ESE12	ESE10	ESE11	ESE12	E15	SE6.4	E15
6-Jan	ESE15	ESE17	E17	ESE17	ESE16	ESE11	E9	E8	ESE9	SE8	SE5	SE6	SE9	ESE6	E5	E6	ESE5	SE3	SE2	SE2	SSE7	S8	SW9	WSW10	ESE7.0	ESE17
7-Jan	W11	WSW10	WSW12	WSW11	WSW12	WSW13	W12	WSW9	WSW9	W14	W14	W13	W13	W12	W10	W6	S4	SSE7	SE4	E3	ESE4	SE4	SE5	SE5	WSW6.8	W14
8-Jan	SE4	SE3	ESE3	SE5	SE6	ESE5	ESE7	E8	ESE7	ESE9	ESE10	E12	ESE10	ESE9	ESE9	ESE9	ESE10	ESE12	ESE12	ESE13	ESE11	ESE11	E10	ESE11	ESE8.3	ESE13
9-Jan	ESE11	ESE10	ESE10	ESE11	ESE10	E8	ESE8	ESE8	SE11	SE7	SE3	ESE5	SSE4	SE4	SE7	SE7	SE5	ESE5	ESE5	SSE5	SSE6	SSE7	SE6	SE6	SE6.7	ESE11
10-Jan	SE5	SE5	SE5	SE6	ESE4	SE3	ESE3	ESE3	SE4	E3	E4	E3	ENE2	NNE3	NNE3	NE3	NE2	ESE2	UO	UO	UO	UO	UO	UO	ESE2.9	SE6
11-Jan	UO	WSW2	SW0	SW1	W2	NNE1	UO	UO	UO	UO	UO	UO	SE3	SE5	ESE5	ESE7	ESE9	SE9	SE10	SE10	SE10	SSE7	SSE6	SSE6	----	SE10
12-Jan	SE8	SE8	SE8	SE8	SE8	SE9	SE7	SE5	SSE5	SSE5	SE6	SE7	SSE6	SSE5	SSE8	SSE7	SSE6	SSE6	SSE5	SSE6	SSE5	SSE5	SW2	UO	SE6.3	SE9
13-Jan	WNW4	WNW3	WSW2	W4	WNW5	W5	NW5	NNW5	NE3	ENE4	E7	E6	E5	ENE6	E6	E7	E7	ESE9	ESE11	ESE11	ESE9	ESE11	ESE14	ESE13	E4.0	ESE14
14-Jan	ESE13	ESE13	SE16	SE16	SE13	SE12	SE11	SE11	SE11	SE11	SSE9	SE5	SE3	SE2	ESE3	SE4	SSE1	SSE2	SSE4	SSW1	W4	WNW5	WNW5	SE6.5	SE16	
15-Jan	WNW5	WNW4	WNW2	UO	N1	UO	NNE2	ENE3	UO	UO	ESE4	ESE6	SE7	SE6	ESE5	ESE5	ESE5	ESE6	ESE5	ESE5	ESE5	ESE6	ESE5	SE5	ESE3.3	SE7
16-Jan	ESE5	ESE5	ESE5	ESE5	ESE7	E7	E8	ESE8	ESE8	ESE9	ESE9	ESE11	ESE12	ESE15	SE14	SE15	ESE15	SE13	ESE11	SE10	SE10	SE8	SE6	SSE7	ESE9.0	ESE15
17-Jan	SSW7	SSW8	S8	S8	SSW8	SSW9	S7	SSE7	SE8	SE7	SE6	SE6	SE8	SE7	SE6	SE8	ESE10	SE9	SSE8	SSE5	SSE9	SSE11	SSE11	SSE10	SSE7.1	SSE11
18-Jan	SSE13	SSE13	SE12	SE14	SE14	SE13	ESE12	SE13	SE15	ESE14	SE15	ESE15	ESE16	ESE18	SE17	SE16	SE15	ESE16	SE16	SE15	ESE13	ESE13	ESE12	ESE10	SE14.1	ESE18
19-Jan	ESE6	ESE7	SE7	SE7	SE9	SE9	SSE8	SE4	ESE2	S3	WSW8	W15	W16	W16	W12	WSW6	SW10	WSW17	WSW17	WSW21	WSW20	WSW19	WSW19	WSW19	SW8.1	WSW21
20-Jan	WSW20	WSW20	W15	W17	W16	W15	W15	WSW14	WSW15	WSW17	WSW18	WSW18	WSW18	WSW17	W19	W19	W19	W17	W17	W16	W18	W17	W14	W13	W16.8	WSW20
21-Jan	W9	WNW11	W6	SSW4	SSE2	WSW2	SE3	SSE9	SE7	SE5	SE6	SSE7	SE4	SSE6	S3	WSW7	SSW5	WSW13	WSW17	W19	W19	WSW19	W21	W19	WSW6.5	WSW21
22-Jan	W17	W16	W15	W15	W16	W15	W15	W16	W18	W23	WNW26	WNW27	NNW26	NNW23	NW18	NW16	NW17	NW15	NW13	NW10	NW9	NW7	NNW4	S2	WNW14.1	WNW27
23-Jan	S2	SE5	SE6	ESE7	ESE10	ESE12	SE13	SE15	ESE13	ESE11	ESE12	ESE12	ESE13	E12	E11	ENE10	ENE7	NE7	ENE4	E2	NNE5	N4	E4	ESE5	ESE7.4	SE15
24-Jan	ESE5	SE8	SE7	ESE4	E6	SSE8	SSE6	SE4	SSE7	SE5	SE4	SE4	WSW4	W14	W14	WNW17	WNW14	NW12	NW13	NNW11	NW9	NW8	NW5	NW4	W2.3	WNW17
25-Jan	NNW3	N4	NNE2	NE3	UO	ESE1	ENE2	E2	E5	E4	E5	SE7	E7	E7	ESE7	SE7	ESE6	ESE5	ESE7	SE6	SE4	SE6	SE6	SE6	ESE4.0	SE7
26-Jan	SSW5	W24	W26	W27	W26	WNW27	WNW27	NW33	NNW37	NW24	NW24	NW20	NW20	NW15	WNW12	NW13	NW16	NNW16	NNW14	NNW17	N14	NNW15	NNW14	N14	NW17.3	NNW37
27-Jan	NNW15	NNW13	NNW13	N13	NNW10	NNW10	NW9	NW10	WNW7	WNW9	NW13	WNW14	NW14	NW16	WNW13	WNW12	NW9	NW12	NW13	NW12	NNW9	NNW11	W14	WNW15	NW11.1	NW16
28-Jan	WNW20	WNW20	WNW20	WNW21	WNW21	WNW19	W21	W20	W18	WNW19	WNW23	WNW22	WNW24	WNW24	WNW23	WNW23	WNW21	WNW21	WNW21	WNW22	NW19	NNW19	NW21	NW16	WNW20.0	WNW24
29-Jan	NW12	WNW12	W12	W13	W14	W14	W18	W19	W18	W17	W14	WSW6	SSW3	WSW6	SSW9	SSW9	SW10	WSW16	W18	W16	WNW15	NW16	NW16	NW16	W11.8	W19
30-Jan	WNW15	WNW13	WNW15	WNW15	W11	W12	W12	W13	W14	W13	W14	W11	W10	W9	WNW10	W7	W5	NE4	SSE5	ESE2	NE4	NE5	SSE4	SSE6	W7.4	WNW15
31-Jan	S3	NNW4	N6	NNW5	NNW7	NNW10	N7	NNW9	N10	N9	N5	W5	N6	W6	WNW7	NNW6	NNW5	SSW2	SSE4	S4	SSW2	W4	W7	NNW9	NW4.2	NNW10
WSW2.5WSW2.8WSW2.8 SW2.8 SW2.8WSW2.7WSW2.7WSW2.0SSW2.1 SW2.3 SW2.0WSW2.2 W1.2 W1.8 W2.0WSW1.5 SW1.2 SW1.6 SW2.1WSW1.7WSW2.0WSW1.9 SW2.0 SW1.8																								Diurnal Average		
WSW20 W24 W26 W27 W26WNW27WNW27 NW33NNW37 NW24WNW26WNW27NNW26WNW24WNW23WNW23WNW21WNW21WNW21WNW22WSW20WSW19WSW21 W19																								Diurnal Maximum		
UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Anzac - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 08:00 Minimum Value: 0 km/h on Jan 31 19:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7																	Hours in Service: 744 Hours of Data: 725 Hours of Missing Data: 19 Hours of Calibration: 0 Percent Operational Time: 97.5									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	2	2	3	2	2	1	2	2	1	1	1	2	2	2	1	1	2	2	2	1	1	3	3
2-Jan	1	1	1	1	1	1	1	1	1	2	1	2	2	2	3	2	3	2	2	2	2	2	1	3	3	3
3-Jan	2	1	3	2	3	2	1	1	2	3	3	3	2	1	1	2	1	1	1	1	2	3	1	2	3	4
4-Jan	4	4	3	4	3	3	3	2	3	3	3	3	3	3	2	2	2	2	1	2	2	2	1	2	4	4
5-Jan	3	1	1	1	1	1	1	2	1	1	1	2	1	3	2	1	1	1	3	2	2	2	3	4	4	4
6-Jan	3	3	3	3	4	4	3	3	2	2	2	1	2	2	1	1	1	1	1	1	2	1	2	2	4	4
7-Jan	3	2	2	2	3	3	3	4	3	3	3	3	3	3	3	2	2	1	2	1	1	1	1	1	4	4
8-Jan	1	2	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	3	3	3
9-Jan	2	3	3	2	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3
10-Jan	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	UO	UO	UO	UO	UO	UO	2	2
11-Jan	UO	1	1	1	1	1	UO	UO	UO	UO	UO	UO	1	1	1	2	2	2	2	2	2	1	1	2	2	2
12-Jan	2	2	1	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	2	2
13-Jan	1	1	2	1	1	1	1	2	1	1	2	2	2	2	2	2	2	2	3	3	2	3	4	4	4	4
14-Jan	3	3	4	3	4	3	3	2	2	3	3	3	2	1	1	1	1	1	2	1	1	2	1	1	4	4
15-Jan	1	1	1	UO	1	UO	1	1	UO	UO	2	1	1	2	1	1	1	2	1	1	1	2	1	1	2	2
16-Jan	1	1	1	2	1	2	2	2	2	2	2	3	3	3	3	3	4	3	2	2	2	2	1	1	4	4
17-Jan	3	3	2	2	2	2	2	1	2	2	1	2	2	2	1	2	2	2	1	1	2	2	3	3	3	3
18-Jan	2	3	2	3	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3	3	3	3	3	2	4	4
19-Jan	2	2	3	2	2	1	1	2	1	2	4	4	4	4	3	2	3	5	4	6	5	5	5	5	6	6
20-Jan	5	6	4	4	4	4	4	4	3	4	5	5	5	5	5	4	4	4	4	4	4	4	4	3	6	6
21-Jan	2	2	3	2	2	2	2	2	1	1	2	2	1	1	2	2	2	4	4	5	5	5	6	5	6	6
22-Jan	4	4	4	3	3	3	3	4	5	6	8	8	6	5	5	4	4	3	3	2	2	2	2	2	8	8
23-Jan	1	1	1	1	2	2	3	3	3	3	2	3	3	3	3	3	2	1	2	1	1	1	1	1	3	3
24-Jan	1	1	1	2	2	1	2	1	1	1	2	1	4	3	4	5	3	3	3	2	2	1	2	2	5	5
25-Jan	1	1	2	1	UO	1	1	2	1	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	2	2
26-Jan	4	6	7	8	7	8	7	8	8	6	7	5	5	4	3	3	3	3	3	4	4	3	3	3	8	8
27-Jan	4	3	3	3	3	3	2	2	2	2	3	3	3	3	3	3	2	3	3	3	2	3	4	4	4	4
28-Jan	5	5	5	5	5	5	5	5	4	5	6	6	6	7	6	6	5	5	5	5	4	4	5	4	7	7
29-Jan	2	2	2	3	3	4	4	4	4	3	3	4	3	4	3	3	3	5	5	3	3	3	3	3	5	5
30-Jan	3	3	3	3	2	3	3	2	3	3	3	3	2	2	2	2	1	1	1	1	2	2	2	1	3	3
31-Jan	1	2	1	1	2	2	2	2	2	2	3	2	2	2	2	2	1	1	0	1	1	1	1	1	3	3
Diurnal Maximum																										
UO - Unstable Operation																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	212	29.24	29.24
6 - 11	272	37.52	66.76
12 - 19	201	27.72	94.48
20 - 28	38	5.24	99.72
29 - 38	2	0.28	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 725

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	6	7	7	6	13	33	50	24	10	11	8	7	10	10	4	6	212
6 - 11	6	0	1	3	17	55	64	37	10	9	5	12	26	10	9	8	272
12 - 19	3	0	0	0	4	33	18	2	0	0	0	21	73	16	22	9	201
20 - 28	0	0	0	0	0	0	0	0	0	0	0	5	7	19	5	2	38
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	15	7	8	9	34	121	132	63	20	20	13	45	116	55	41	26	725

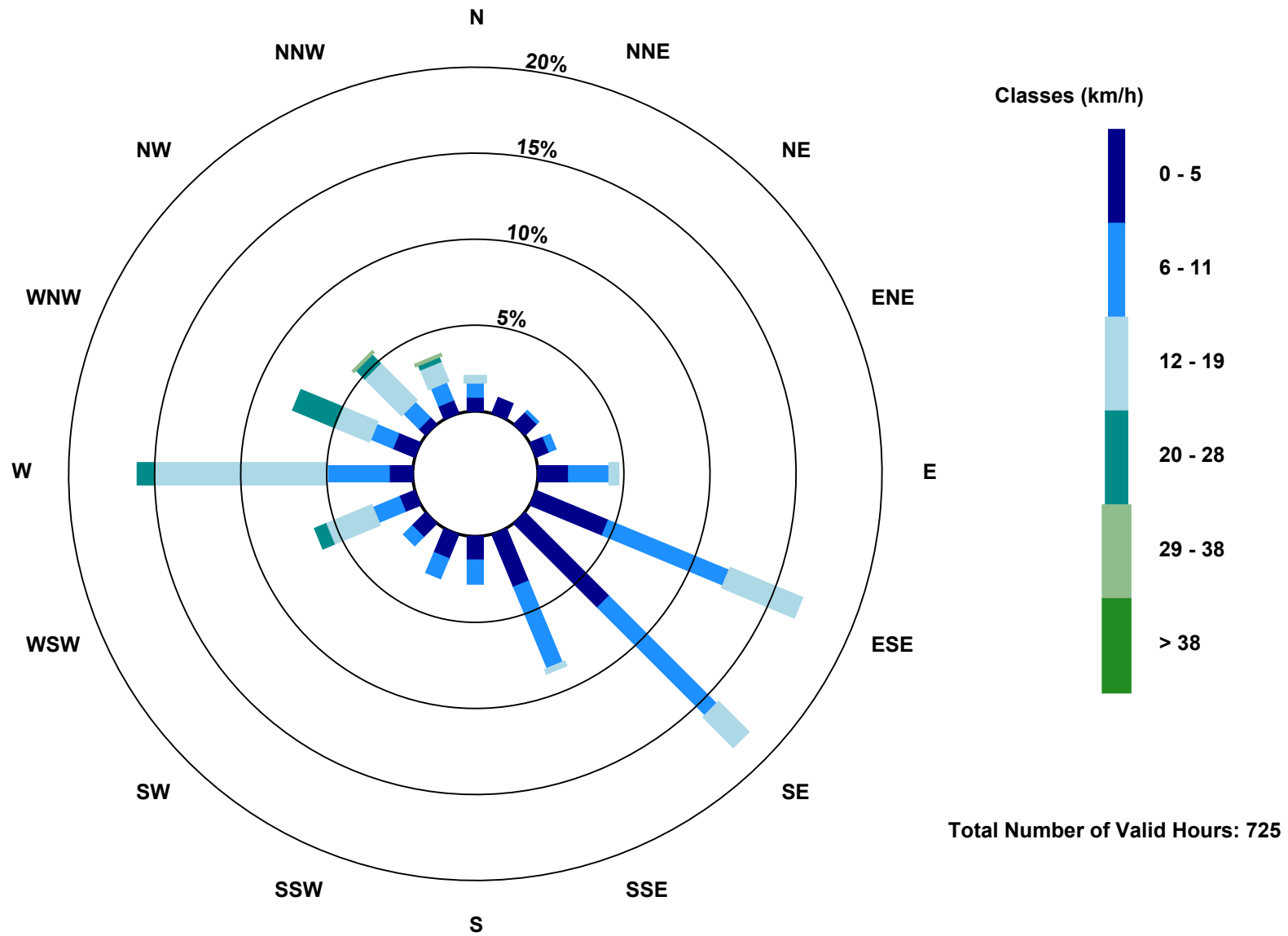
Total Number of Valid Hours: 725

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Anzac





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Anzac - January 2023

Direction of Maximum Speed: 334 deg on Jan 26 09:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 295.9 deg on Jan 28																						Hours of Data: 725			
Direction of Minimum Speed: 29 deg on Jan 3 02:00											Direction of Minimum Daily Speed Average: 2.3 deg on Jan 24											Hours of Missing Data: 19			
Monthly Average Direction: 237.7 deg																						Percent Operational Time: 97.5			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	256	283	280	289	287	282	285	272	163	150	144	133	144	235	249	246	259	262	265	262	273	254	214	203	259.5
2-Jan	213	164	109	135	137	165	184	162	145	145	156	146	151	187	255	240	235	199	215	140	187	185	171	160	182.7
3-Jan	177	29	192	199	216	353	283	229	174	166	169	310	0	76	131	131	129	146	200	202	215	349	274	255	189.5
4-Jan	271	278	274	273	275	276	271	268	267	272	273	276	277	279	278	275	272	269	268	270	274	260	274	276	273.1
5-Jan	279	149	161	157	157	141	147	149	134	146	144	170	147	140	89	91	106	114	118	115	116	112	105	100	125.5
6-Jan	110	107	100	103	108	103	98	97	109	126	126	128	136	116	79	97	121	131	134	124	154	188	225	258	118.2
7-Jan	260	245	254	252	246	256	262	256	257	266	274	278	273	277	274	272	186	163	142	83	122	140	138	135	253.2
8-Jan	130	134	103	126	140	109	106	93	119	117	103	99	110	109	116	118	115	112	108	109	114	111	101	103	110.8
9-Jan	109	119	113	109	106	100	108	122	132	135	137	113	152	137	145	135	128	120	119	151	155	154	146	131	125.0
10-Jan	131	128	129	127	121	133	106	113	129	79	84	84	66	23	31	44	47	118	UO	UO	UO	UO	UO	UO	103.0
11-Jan	UO	238	224	225	278	15	UO	UO	UO	UO	UO	UO	127	130	107	114	123	131	127	133	145	151	153	150	--
12-Jan	145	138	140	135	133	140	138	136	147	149	136	140	153	148	151	156	152	148	151	162	150	159	220	UO	145.6
13-Jan	286	287	239	274	283	276	314	340	50	73	91	88	82	77	82	85	98	111	111	103	104	104	108	108	93.3
14-Jan	118	123	125	129	131	126	125	134	135	137	135	147	138	137	125	117	143	162	157	159	210	276	296	292	133.6
15-Jan	299	298	284	UO	6	UO	27	66	UO	UO	106	113	138	130	116	108	103	105	103	107	114	120	119	126	110.8
16-Jan	119	102	116	119	120	98	101	107	121	111	109	115	118	122	124	124	119	131	122	125	136	131	138	160	120.9
17-Jan	196	197	187	184	205	209	184	149	142	136	129	129	130	144	139	129	122	135	151	155	147	155	155	156	156.5
18-Jan	148	147	134	134	135	130	122	125	128	123	124	121	120	121	124	124	126	122	129	128	120	116	116	114	126.2
19-Jan	107	107	127	135	146	146	147	140	119	188	258	261	262	263	265	251	229	244	240	245	251	247	246	243	234.5
20-Jan	248	257	262	262	266	265	260	257	248	255	252	257	256	257	260	261	262	269	272	261	261	261	260	262	259.5
21-Jan	263	290	263	192	160	238	142	151	144	145	144	156	129	147	179	245	208	255	255	264	260	258	259	263	240.1
22-Jan	267	273	271	270	266	267	265	260	264	269	282	295	336	327	312	317	320	318	312	322	312	316	344	176	292.4
23-Jan	178	143	140	112	117	122	124	127	123	114	109	108	112	91	83	78	58	41	59	91	29	2	93	117	104.6
24-Jan	117	144	146	123	100	152	148	134	149	130	128	145	252	267	280	286	292	325	325	328	312	323	315	317	281.2
25-Jan	335	353	24	42	UO	122	66	90	87	91	91	141	97	91	103	128	109	111	122	130	130	135	129	133	107.2
26-Jan	206	262	262	260	272	287	290	324	334	325	317	310	310	313	301	325	324	329	333	339	349	344	345	349	308.9
27-Jan	348	347	347	350	345	342	312	317	283	283	306	300	306	306	297	293	306	309	311	318	309	285	281	288	312.4
28-Jan	295	293	288	288	287	282	281	277	275	284	289	291	294	301	301	299	301	294	296	303	314	334	321	325	295.9
29-Jan	305	300	276	275	275	269	276	276	273	271	266	246	211	248	202	198	217	252	266	275	285	304	322	306	273.7
30-Jan	302	292	284	285	277	274	271	264	265	269	270	267	265	275	297	268	266	35	156	111	52	53	150	164	275.6
31-Jan	176	331	356	346	328	340	349	340	350	353	352	277	357	275	303	337	340	204	167	187	212	259	275	331	325.9
240.5 249.1 236.3 230.3 235.4 247.0 242.8 239.3 209.0 218.3 234.7 239.5 259.0 261.6 259.4 242.6 224.1 229.1 228.4 237.1 236.6 236.3 234.2 232.7																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

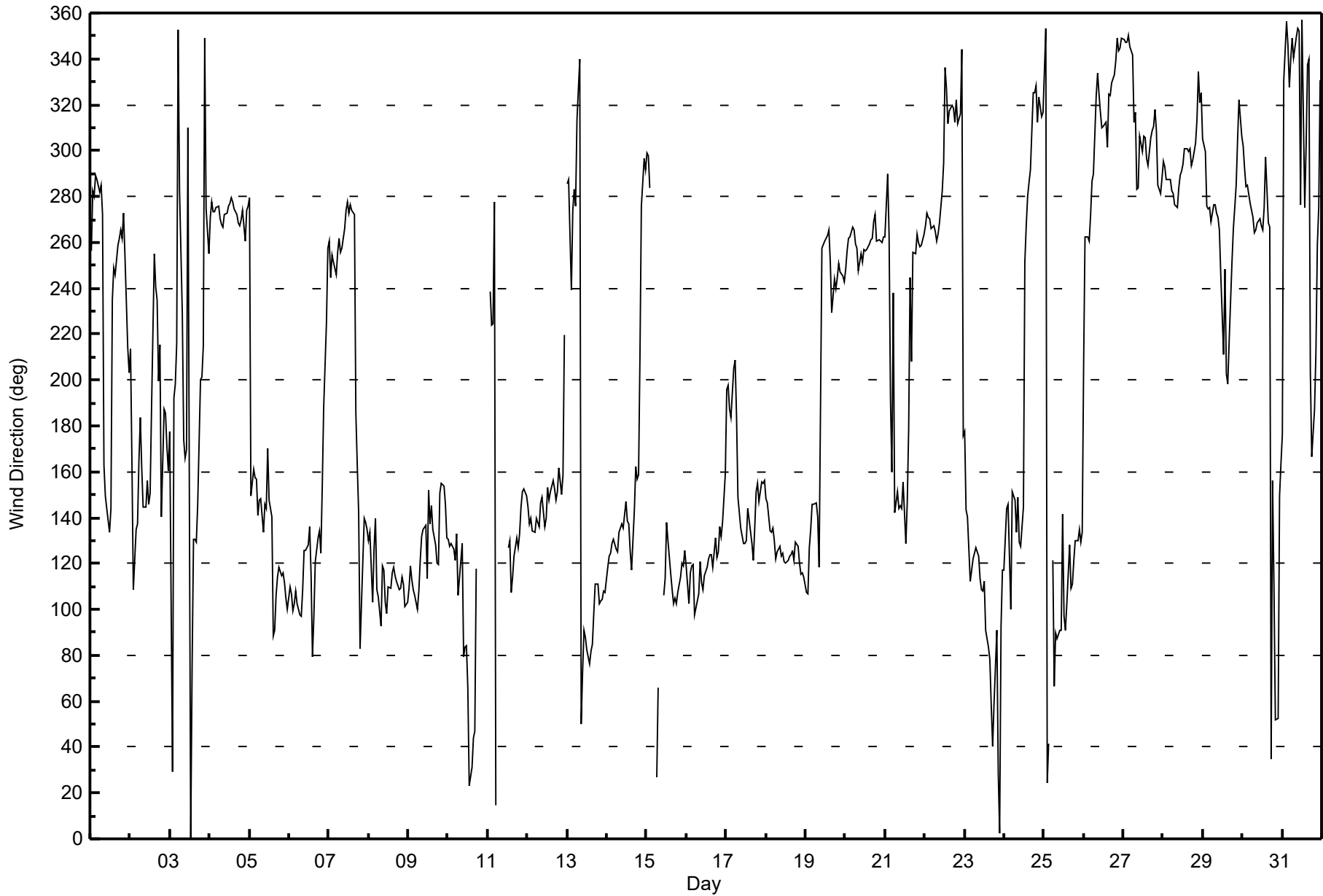
Wind Direction (WD) - deg
Anzac - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Jan 3 02:00 Minimum Value: 5 deg on Jan 2 11:00 Percentiles: P ₁ = 8 P ₁₀ = 12 Q ₁ = 13 Median = 15 Q ₃ = 18 P ₉₀ = 27 P ₉₉ = 75																	Hours in Service: 744 Hours of Data: 725 Hours of Missing Data: 19 Hours of Calibration: 0 Percent Operational Time: 97.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	30	19	15	16	16	15	15	22	14	16	21	23	48	89	27	29	17	9	11	14	12	23	14	23	89
2-Jan	13	19	25	12	9	18	16	13	8	8	5	58	89	31	11	8	23	16	17	82	32	15	8	28	89
3-Jan	45	97	17	13	72	11	39	12	18	6	15	75	35	29	22	12	16	8	38	7	30	60	48	39	97
4-Jan	11	11	12	13	14	13	12	11	11	13	14	13	14	12	11	11	14	14	13	13	10	13	18	15	18
5-Jan	83	9	20	16	15	10	12	12	15	8	10	29	11	42	26	10	11	10	12	11	14	14	13	14	83
6-Jan	15	12	13	13	15	22	17	21	13	11	17	17	12	17	18	16	12	14	43	42	10	17	20	17	43
7-Jan	15	13	13	12	14	16	17	25	18	12	14	17	17	17	17	19	59	8	42	21	17	22	11	9	59
8-Jan	17	28	31	20	19	15	16	25	20	18	11	11	14	13	14	13	11	14	14	12	13	13	14	15	31
9-Jan	13	15	15	13	14	15	14	14	14	17	30	20	14	17	13	14	19	16	22	12	11	13	15	13	30
10-Jan	15	16	14	14	16	17	17	21	22	20	18	19	25	22	18	18	20	27	UO	UO	UO	UO	UO	UO	27
11-Jan	UO	18	74	20	27	27	UO	UO	UO	UO	UO	UO	18	16	14	14	15	13	13	13	16	11	8	11	74
12-Jan	11	11	12	12	13	12	13	17	14	14	15	13	14	15	12	10	9	12	12	11	11	9	46	UO	46
13-Jan	16	31	59	17	22	22	18	17	32	22	16	17	18	20	19	17	17	16	15	15	15	15	15	16	59
14-Jan	16	16	15	13	14	15	15	12	13	13	13	12	16	21	28	24	14	79	59	17	21	22	16	17	79
15-Jan	17	20	20	UO	24	UO	38	14	UO	UO	19	18	14	19	19	16	14	12	14	14	20	17	15	15	38
16-Jan	17	14	16	18	14	14	18	14	16	16	15	16	16	15	15	14	17	14	15	15	14	13	15	14	18
17-Jan	19	18	17	17	18	15	18	13	12	12	13	16	15	18	24	15	12	12	11	17	12	9	16	16	24
18-Jan	11	13	11	12	11	11	13	13	13	14	14	14	14	13	13	13	12	13	13	13	14	13	15	13	15
19-Jan	42	18	25	13	9	10	9	52	21	39	26	17	16	15	16	21	17	15	13	17	17	16	16	16	52
20-Jan	17	18	16	14	16	17	16	15	15	16	15	15	16	15	16	14	14	16	15	14	14	14	16	15	18
21-Jan	14	22	44	21	63	53	47	9	11	9	14	17	18	11	52	18	21	19	16	16	16	16	16	16	63
22-Jan	16	16	16	15	15	14	15	16	16	16	16	18	16	20	15	14	13	12	14	13	10	11	21	27	29
23-Jan	17	14	14	16	15	14	13	13	15	16	15	14	14	16	15	15	16	11	18	43	21	25	33	24	43
24-Jan	22	13	14	19	25	16	17	22	11	16	20	27	56	17	16	16	16	15	12	16	17	15	18	25	56
25-Jan	22	18	31	21	UO	92	30	41	20	19	22	21	21	17	15	16	19	17	18	16	22	17	17	16	92
26-Jan	48	16	17	17	17	16	15	21	13	13	16	13	15	13	19	14	12	12	12	14	14	14	13	15	48
27-Jan	15	14	15	15	14	13	14	13	20	14	15	19	17	14	16	16	10	11	11	15	13	15	15	15	20
28-Jan	15	15	15	15	14	15	16	15	15	16	15	17	16	16	16	15	14	15	15	13	19	13	12	12	19
29-Jan	12	14	13	14	15	15	14	14	13	13	14	56	65	51	19	19	19	19	17	15	15	17	13	12	65
30-Jan	12	15	14	14	14	14	13	12	13	13	14	15	16	19	18	20	16	36	16	31	14	13	22	9	36
31-Jan	25	44	17	21	13	14	16	14	13	12	37	39	17	29	27	19	8	49	7	9	12	15	13	12	49
83 97 74 21 72 92 47 52 32 39 37 75 89 89 52 29 59 79 59 82 32 60 48 39																									
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Anzac - January 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS17
WAPASU
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	46.4	0	10.8	0
H2S (ppb) Average	708	36	36	100	2.9	0	0.9	0
THC (ppm) Average	708	34	36	99.73	3.3	-	2.8	-
O3 (ppb) Average	710	34	34	100	40.1	0	36.3	-
NO2 (ppb) Average	708	36	36	100	31.4	0	19.3	-
NO (ppb) Average	708	36	36	100	104.6	-	21.4	-
NOX (ppb) Average	708	36	36	100	136	-	40.6	-
PM2.5 (ug/m3) Average	743	1	1	100	40.5	0	20.4	0
Temperature 2 m (C) Average	744	0	0	100	1.2	-	-2.4	-
Relative Humidity (%) Average	744	0	0	100	96.9	-	94	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	25	-	15	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-
Precipitation (mm) Total	744	0	0	100	1.3	-	2.3	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.76	3.9	-	0	0	0.1	0.3	1.3	5.7	46.4
H2S (ppb) Average	708	0.17	0.3	-	0	0	0	0.1	0.2	0.4	2.9
THC (ppm) Average	708	2.38	0.1	-	2.2	2.3	2.3	2.3	2.4	2.5	3.3
O3 (ppb) Average	710	24.58	9	-	2.1	10.6	20.2	26.5	30.4	34.6	40.1
NO2 (ppb) Average	708	5.77	6	-	0	0.9	1.6	3.5	7.7	14.2	31.4
NO (ppb) Average	708	1.8	7.4	-	0	0	0	0.1	0.4	2.6	104.6
NOX (ppb) Average	708	7.56	12	-	0	1	1.7	3.7	8.2	16.2	136
PM2.5 (ug/m3) Average	743	6.79	6	-	0.6	1.6	2.5	4.8	9.3	13.7	40.5
Temperature 2 m (C) Average	744	-10.18	6.2	-	-33.8	-20.9	-11.1	-8.7	-6.4	-4.5	1.2
Relative Humidity (%) Average	744	88.51	6	-	65.5	79.3	84.8	91.2	93	94.1	96.9
Wind Speed 10 m (km/h) Average	740	7.7	4	-	0	2	4	8	10	13	25
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	11.05	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC	27 Jan 2023 12:00	27 Jan 2023 13:00	2	Maintenance - replaced support gas cylinder
Wind Speed, Wind Direction	11 Jan 2023 07:00	11 Jan 2023 07:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Jan 2023 01:00	15 Jan 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	15 Jan 2023 21:00	15 Jan 2023 22:00	2	Flat line in sensor output signal

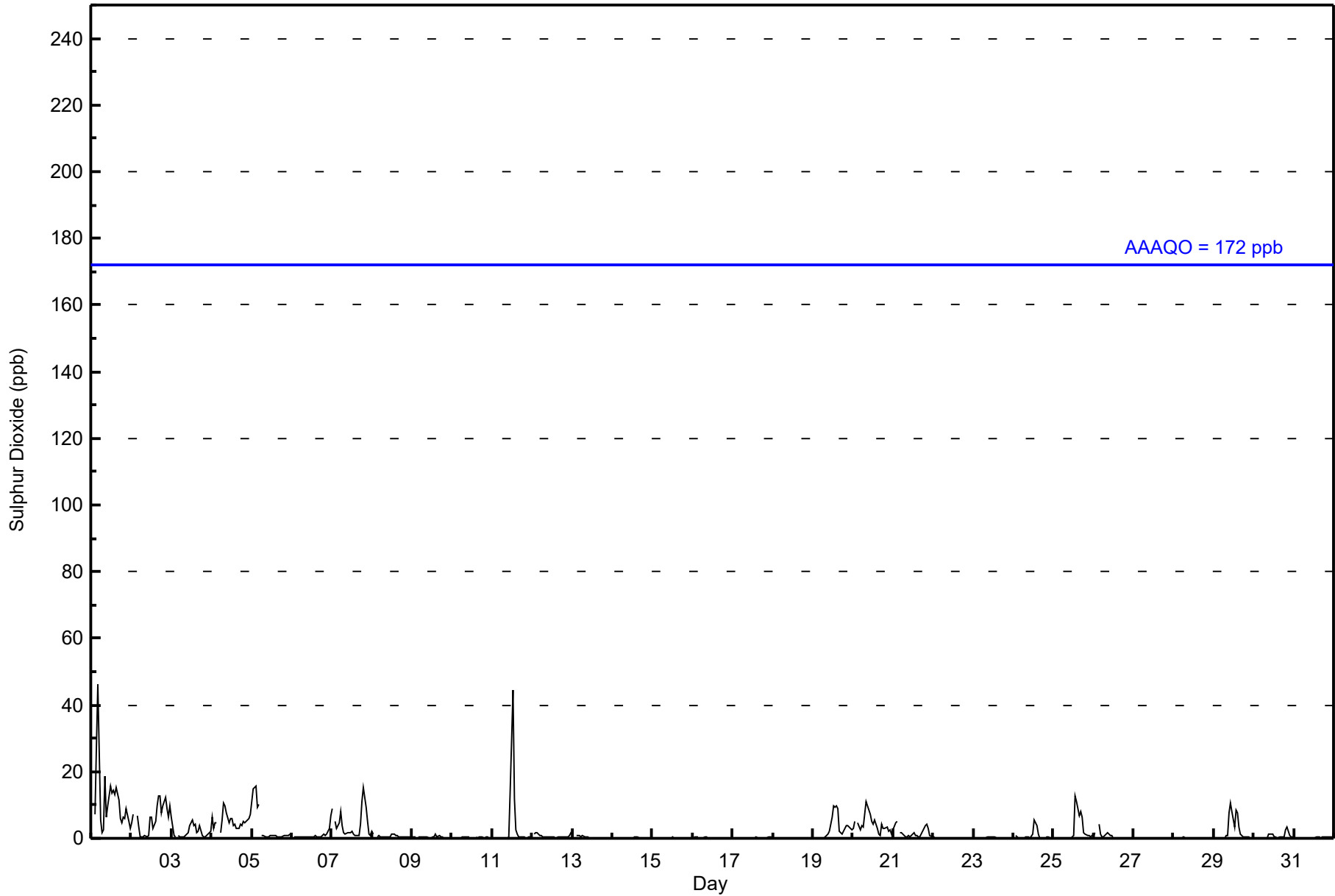


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 46.4 ppb on Jan 1 05:00				Maximum Daily Average: 10.8 ppb on Jan 1		Hours of Data: 710														710						
Minimum Value: 0.0 ppb on Jan 10 00:00				Minimum Daily Average: 0.0 ppb on Jan 22		Hours of Missing Data: 34														34						
Maximum Diurnal Average: 3.6 ppb at hour 13				Minimum Diurnal Average: 0.7 ppb at hour 7		Hours of Calibration: 34														34						
Monthly Average: 1.76 ppb				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.3 P ₉₀ = 5.7 P ₉₉ = 15.2		Percent Operational Time: 100.0														100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.2	Z	7.2	27.4	46.4	5.4	1.8	2.6	18.8	6.3	9.9	15.6	13.7	14.6	13.1	15.4	11.6	6.1	4.5	6.2	6.0	8.7	4.9	3.1	10.8	46.4
2-Jan	4.8	7.1	Z	6.9	3.2	0.6	0.4	0.4	0.6	0.4	0.7	6.4	6.4	3.0	5.2	9.6	12.9	12.7	7.8	9.6	12.4	9.0	6.3	9.9	5.9	12.9
3-Jan	6.4	1.0	0.5	Z	0.6	0.3	0.3	0.3	0.7	1.1	1.9	4.0	5.6	3.8	4.1	1.8	2.2	3.8	0.7	0.5	0.4	0.7	1.3	2.3	1.9	6.4
4-Jan	6.2	2.8	4.6	4.7	Z	1.7	5.7	10.4	9.9	7.7	4.9	5.8	5.9	4.0	4.2	3.1	2.8	4.3	4.0	4.9	4.5	5.5	5.8	7.3	5.3	10.4
5-Jan	10.9	14.7	15.5	9.3	10.3	Z	1.0	0.7	0.4	0.2	0.5	0.9	0.9	1.0	0.7	0.5	0.3	0.3	0.5	0.7	1.0	1.1	0.9	1.2	3.2	15.5
6-Jan	Z	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.5	0.8	0.4	0.4	0.3	0.8	1.4	1.0	1.2	2.8	6.7	0.9	6.7
7-Jan	8.8	Z	4.9	3.2	4.5	8.2	3.8	1.7	1.2	1.6	1.8	1.8	2.0	1.3	0.8	0.7	0.9	4.1	11.0	15.2	9.2	5.0	1.2	0.8	4.1	15.2
8-Jan	2.0	1.4	Z	0.5	0.7	0.5	0.4	0.4	0.3	0.5	0.3	0.4	1.1	1.2	0.7	0.6	0.5	0.3	0.5	0.4	0.4	0.4	0.4	0.2	0.6	2.0
9-Jan	0.3	0.3	0.3	Z	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	1.2	0.4	0.7	0.6	0.3	0.1	0.2	0.1	0.0	0.0	0.3	1.2
10-Jan	0.0	0.0	0.0	0.1	Z	0.2	0.4	0.4	0.3	0.4	0.4	C	C	C	0.3	0.1	0.2	0.3	0.4	0.2	0.3	0.3	0.0	0.1	0.2	0.4
11-Jan	0.2	0.1	0.1	0.1	0.1	Z	0.0	0.2	0.2	0.2	0.2	14.3	44.5	11.8	2.7	1.2	0.5	0.4	0.3	0.3	0.2	0.2	0.3	0.3	3.4	44.5
12-Jan	Z	1.3	1.6	1.5	1.0	0.7	0.5	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.5	0.4	0.3	0.3	0.8	1.8	0.6	1.8
13-Jan	1.2	Z	1.0	0.7	0.7	0.6	0.6	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2
14-Jan	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3
15-Jan	0.1	0.1	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.3
16-Jan	0.0	0.2	0.3	0.3	Z	0.2	0.1	0.5	0.2	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
17-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.1	0.4
18-Jan	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2
19-Jan	0.0	Z	0.2	0.1	0.2	0.2	0.2	0.3	0.9	1.1	2.1	6.5	9.9	9.4	9.6	8.8	2.1	1.2	2.0	3.2	3.7	3.9	2.9	2.3	3.1	9.9
20-Jan	2.9	5.2	Z	4.5	2.6	4.0	3.4	7.3	11.1	8.5	7.3	5.2	4.3	5.3	2.8	1.3	0.8	4.4	3.0	3.0	3.2	2.1	2.7	1.1	4.2	11.1
21-Jan	2.4	4.6	5.1	Z	1.7	1.9	1.3	0.5	0.5	0.7	0.4	0.8	1.5	0.8	0.7	0.6	0.3	1.4	3.2	4.0	4.4	2.8	0.9	0.4	1.8	5.1
22-Jan	0.3	0.2	0.1	0.2	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
23-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4
24-Jan	Z	0.8	0.3	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.1	1.2	5.4	4.8	3.8	1.4	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.9	5.4
25-Jan	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.9	12.9	11.2	6.6	7.9	6.2	1.6	1.1	0.9	0.7	0.6	0.7	2.3	12.9
26-Jan	0.5	1.5	Z	4.1	1.4	0.5	0.4	1.3	1.5	1.1	1.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.1
27-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.2
28-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3
29-Jan	0.1	0.2	0.1	0.1	0.2	Z	0.2	0.8	1.0	7.4	10.5	8.1	3.3	8.4	7.8	3.4	1.1	0.5	0.6	0.6	0.5	0.3	0.2	0.1	2.4	10.5
30-Jan	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	1.2	1.1	1.1	0.3	0.3	0.2	0.2	0.2	0.2	0.4	2.5	3.3	1.0	0.4	0.3	0.6	3.3
31-Jan	0.2	Z	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.4
																								Diurnal Average		
																								Diurnal Maximum		
1.8 1.7 1.7 2.5 2.9 1.0 0.7 1.0 1.6 1.3 1.5 2.5 3.6 2.8 2.3 1.9 1.5 1.6 1.4 1.8 1.7 1.4 1.1 1.3																								Diurnal Average		
10.9 14.7 15.5 27.4 46.4 8.2 5.7 10.4 18.8 8.5 10.5 15.6 44.5 14.6 13.1 15.4 12.9 12.7 11.0 15.2 12.4 9.0 6.3 9.9																								Diurnal Maximum		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Wapasu - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	687	96.76	96.76
11 - 20	20	2.82	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	48	19	20	11	13	16	43	181	153	53	23	5	10	10	11	67	683
11 - 20	0	0	0	0	0	0	1	4	8	6	1	0	0	0	0	0	20
21 - 60	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	19	20	11	13	16	44	185	162	60	25	5	10	10	11	67	706

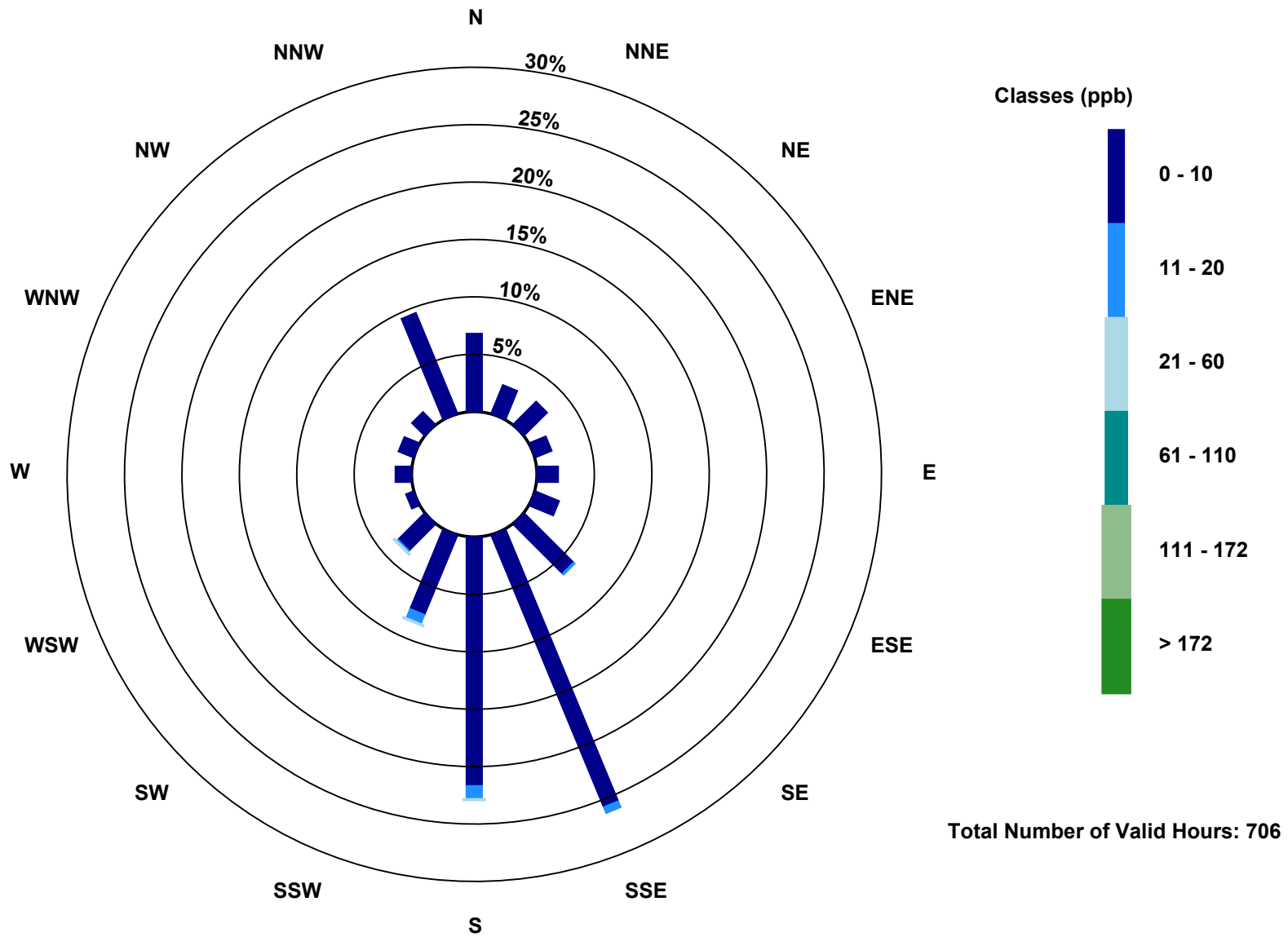
Total Number of Valid Hours: 706

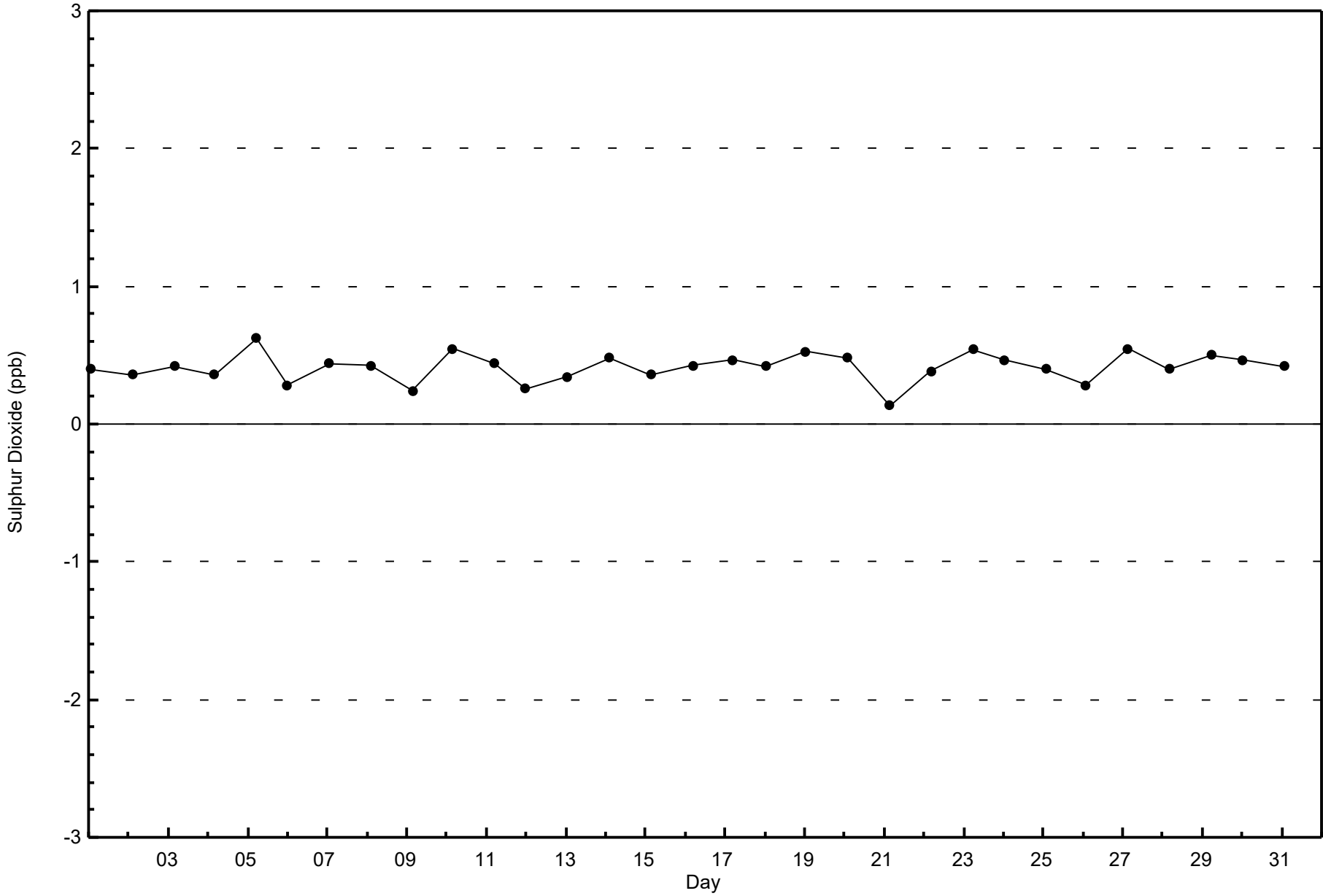
Total Number of Hours: 744

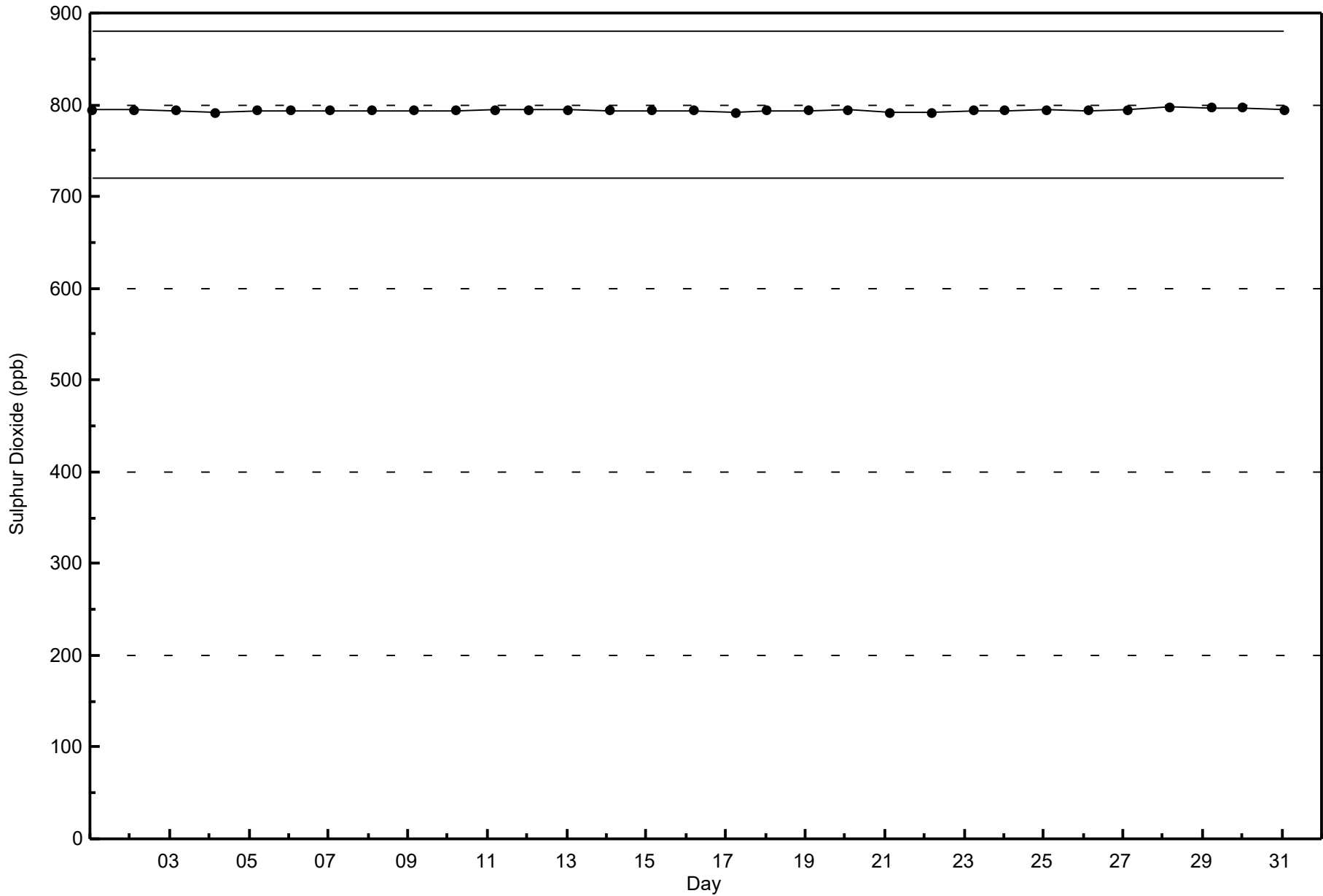


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Wapasu







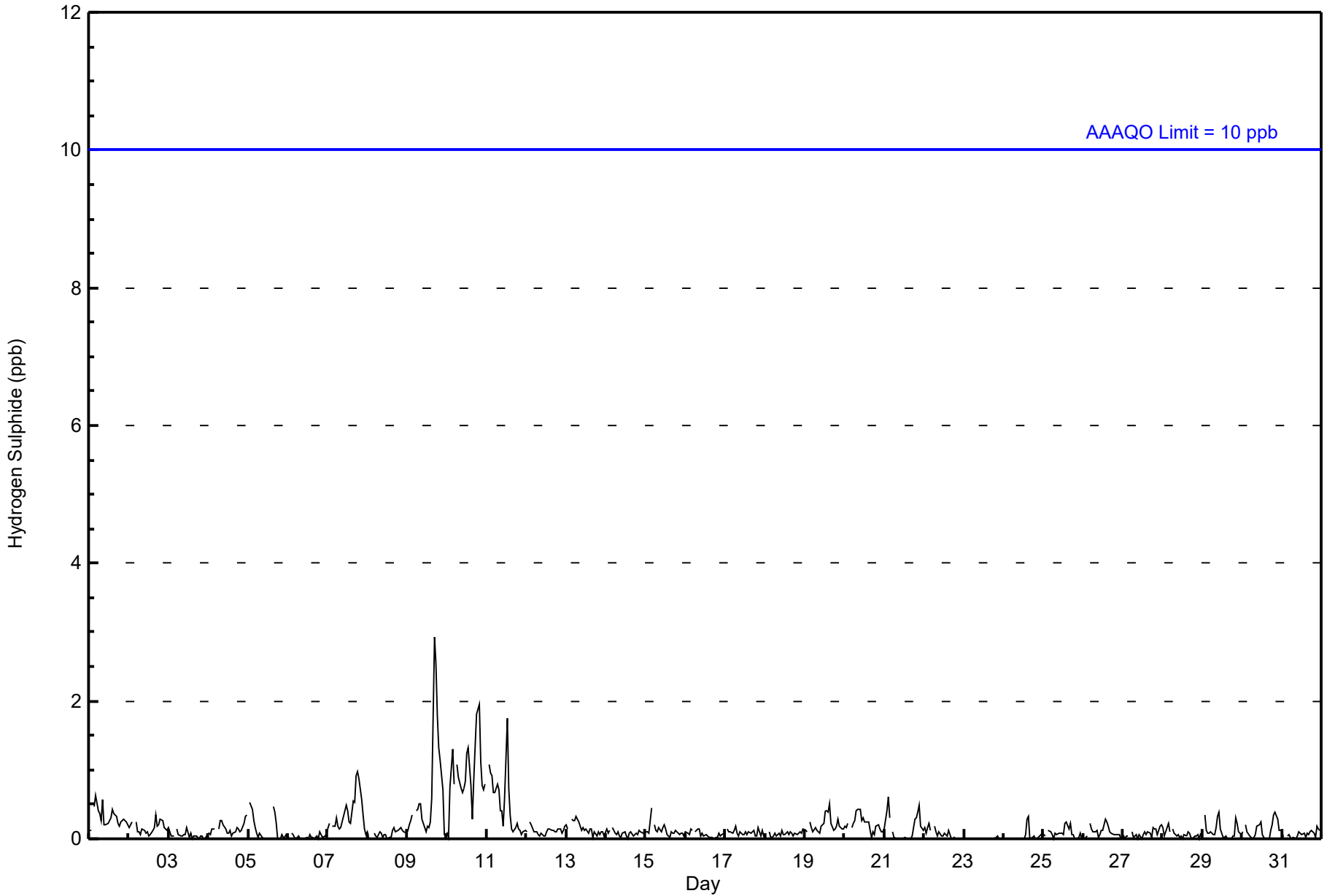


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 2.9 ppb on Jan 9 17:00		Maximum Daily Average: 0.9 ppb on Jan 10														Hours of Data:		708									
Minimum Value: 0.0 ppb on Jan 3 19:00		Minimum Daily Average: 0.0 ppb on Jan 23														Hours of Missing Data:		36									
Maximum Diurnal Average: 0.2 ppb at hour 4		Minimum Diurnal Average: 0.1 ppb at hour 1														Hours of Calibration:		36									
Monthly Average: 0.17 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.3														Percent Operational Time:		100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.1	0.1	Z	0.5	0.6	0.4	0.4	0.3	0.6	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.6	
2-Jan	0.2	0.2	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.4	
3-Jan	0.2	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	
4-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	
5-Jan	Z	0.5	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.0	C	C	C	C	C	0.5	0.4	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.5	
6-Jan	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	
7-Jan	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.2	0.2	0.6	0.5	0.9	1.0	0.9	0.6	0.3	0.1	0.1	0.4	1.0	
8-Jan	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	
9-Jan	0.1	0.2	0.3	0.3	Z	0.4	0.4	0.5	0.5	0.3	0.2	0.1	0.2	0.2	0.2	0.6	2.9	2.5	1.8	1.3	1.1	0.7	0.1	0.0	0.7	2.9	
10-Jan	0.1	0.0	0.8	1.3	0.8	Z	1.1	0.9	0.7	0.7	0.7	0.8	1.2	1.3	0.8	0.3	0.9	1.4	1.8	2.0	1.1	0.8	0.7	0.8	0.9	2.0	
11-Jan	Z	1.1	1.0	0.9	0.7	0.7	0.8	0.7	0.4	0.4	0.2	0.6	1.7	0.7	0.3	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.5	1.7	
12-Jan	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	
13-Jan	0.2	0.1	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.3	
14-Jan	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
15-Jan	0.1	0.1	0.1	0.4	Z	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.4	
16-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	
17-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.2	
18-Jan	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
19-Jan	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.4	0.4	0.5	0.2	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.5	
20-Jan	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.4	
21-Jan	0.1	0.4	0.6	0.3	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.4	0.5	0.2	0.1	0.1	0.6	
22-Jan	0.2	0.1	0.2	0.2	0.1	Z	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
23-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3	
25-Jan	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	
26-Jan	0.0	0.0	0.0	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.3	
27-Jan	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	
28-Jan	0.2	0.0	0.1	0.2	0.1	Z	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	
29-Jan	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.1	0.4	
30-Jan	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.3	0.1	0.1	0.1	0.4	
31-Jan	0.1	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	
																								Diurnal Average		0.17	
																								Diurnal Maximum		0.9	
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Wapasu - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	99.72	99.72
3 - 4	2	0.28	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	47	19	18	11	12	16	48	182	159	62	24	5	10	10	10	69	702
3 - 4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	19	18	11	12	16	48	182	159	62	24	5	10	10	11	69	704

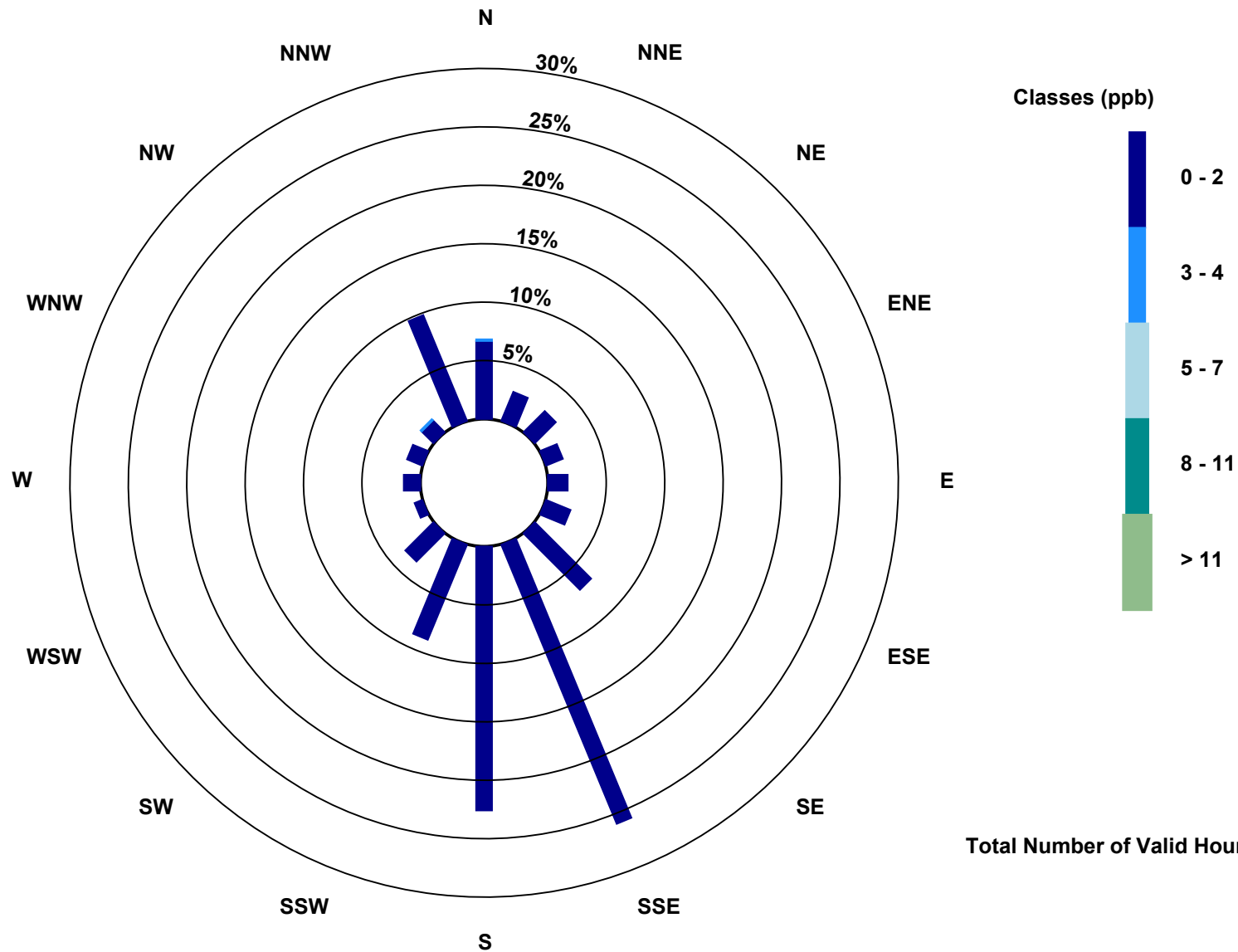
Total Number of Valid Hours: 704

Total Number of Hours: 744

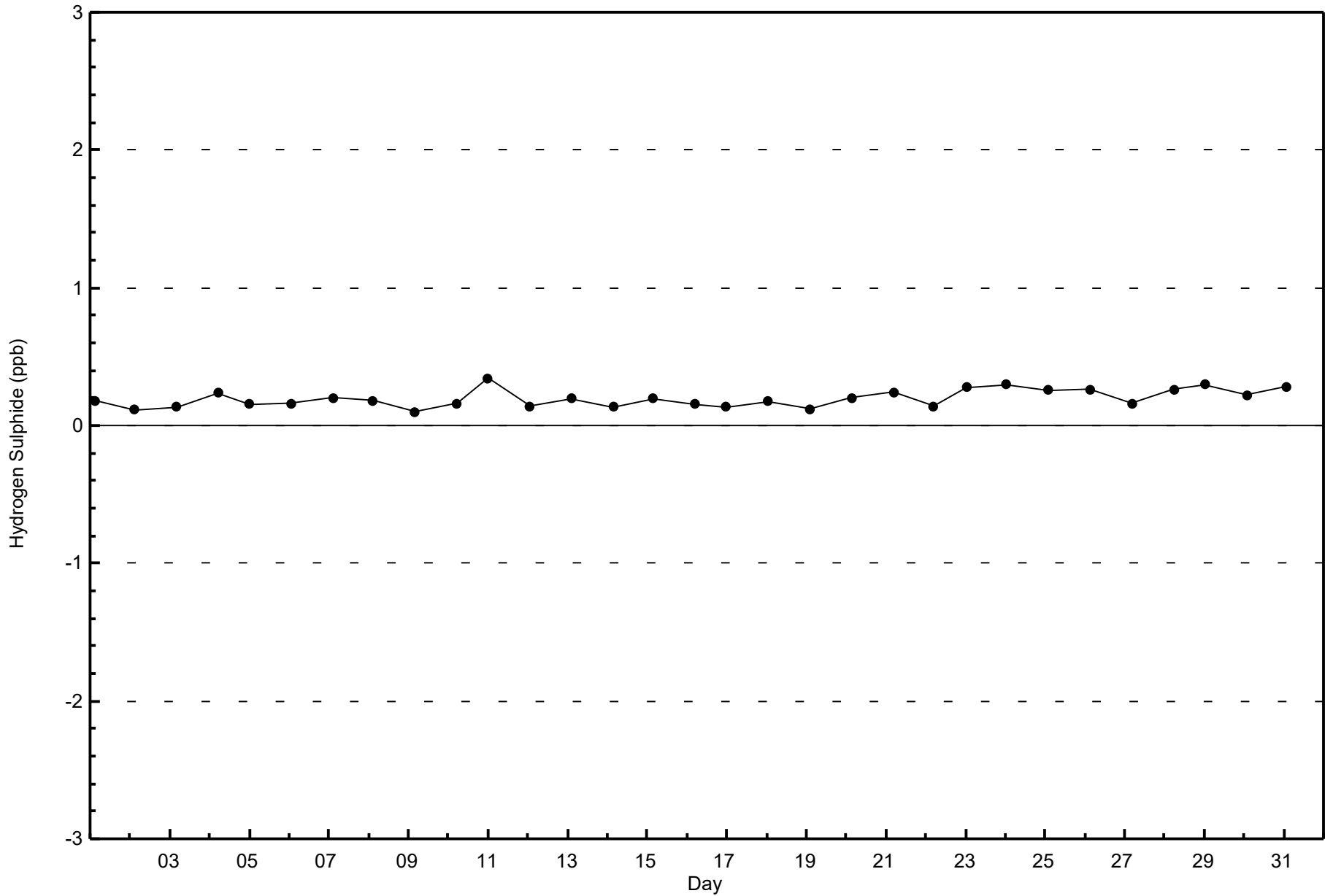


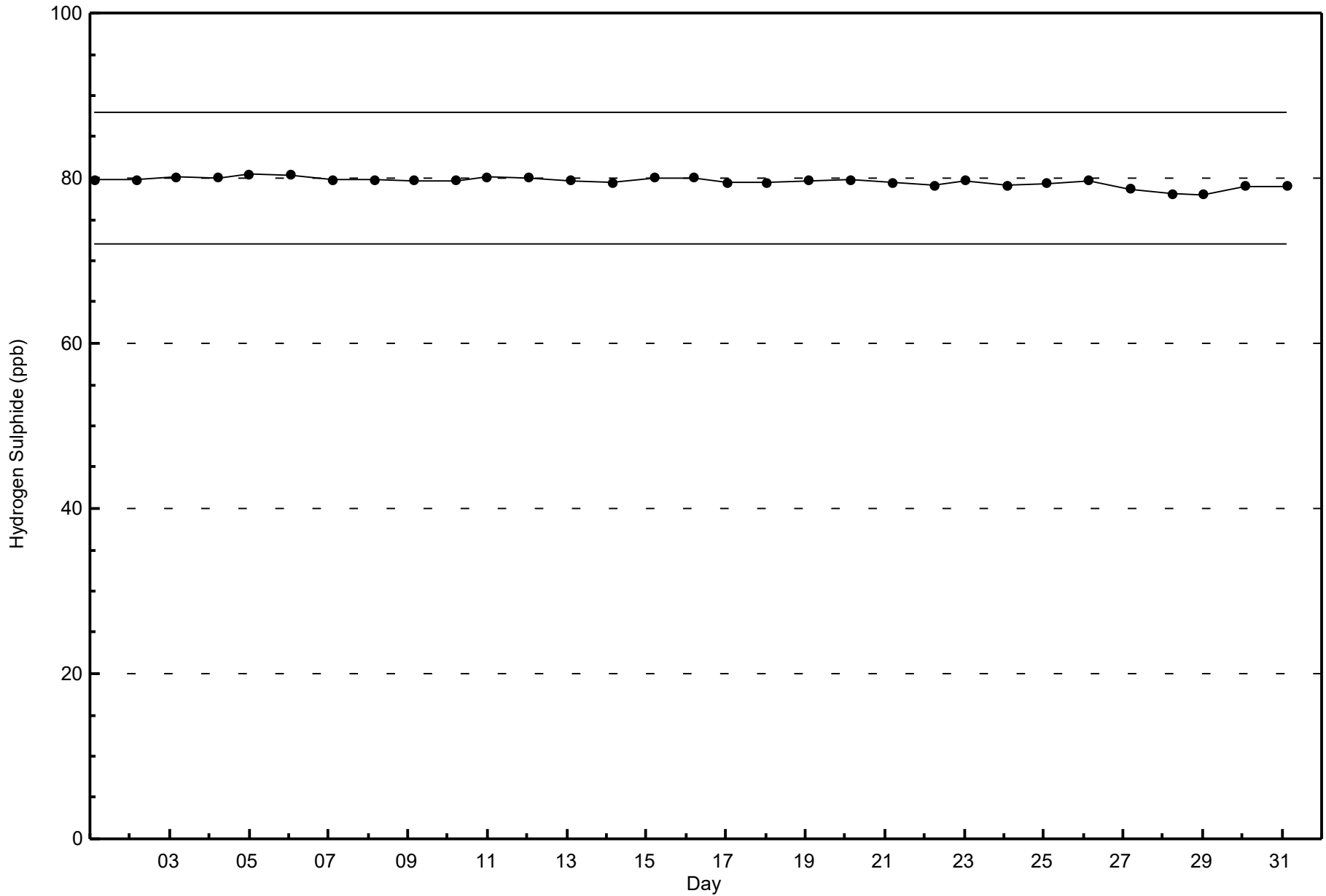
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Wapasu



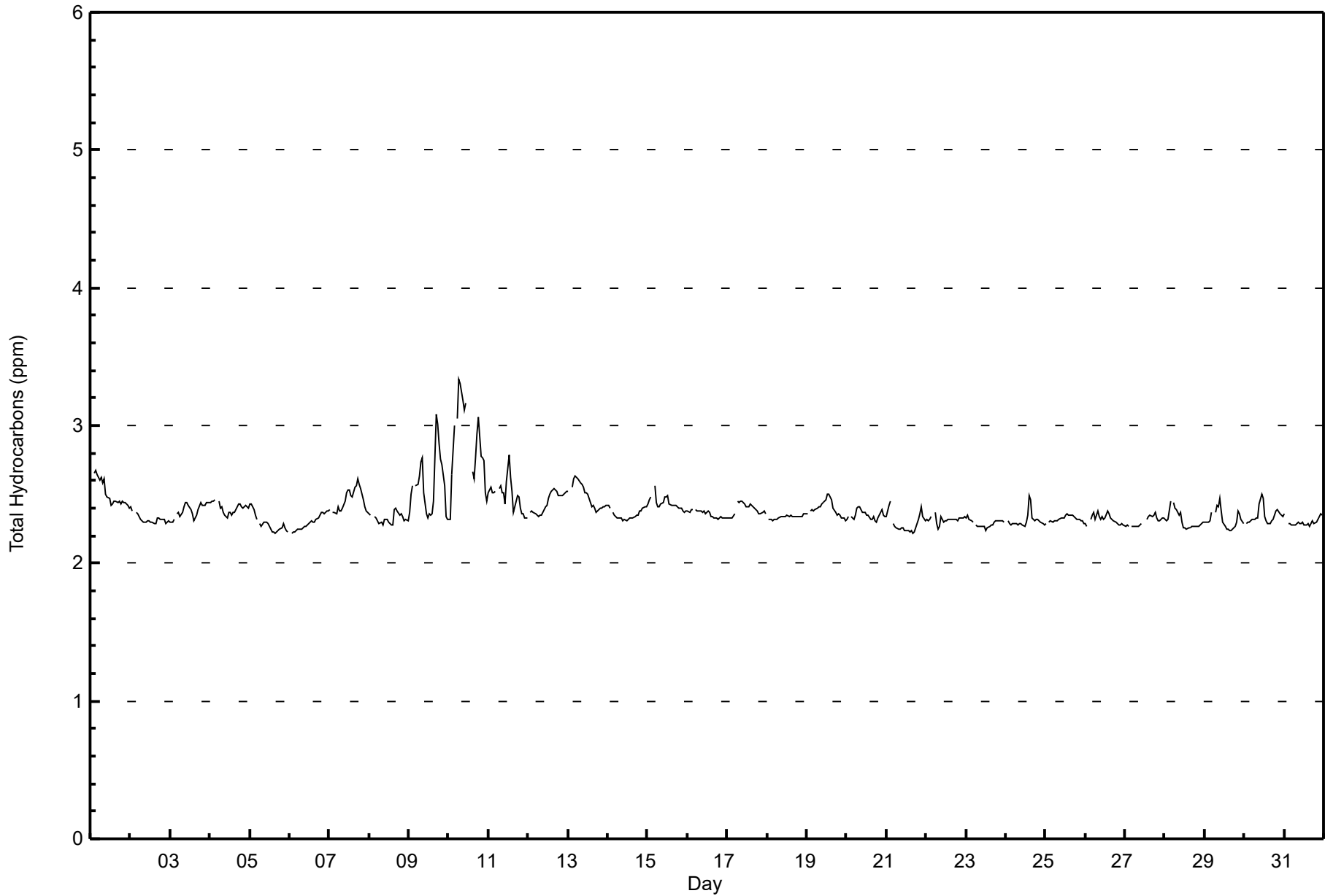
Total Number of Valid Hours: 704







Maximum Value: 3.3 ppm on Jan 10 07:00		Maximum Daily Average: 2.8 ppm on Jan 10		Hours in Service: 744																																													
Minimum Value: 2.2 ppm on Jan 5 16:00		Minimum Daily Average: 2.3 ppm on Jan 5		Hours of Data: 708																																													
Maximum Diurnal Average: 2.4 ppm at hour 8		Minimum Diurnal Average: 2.3 ppm at hour 24		Hours of Missing Data: 36																																													
Monthly Average: 2.38 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.3 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.5 P ₉₉ = 3.0		Hours of Calibration: 34																																													
				Percent Operational Time: 99.7																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.5	Z	2.7	2.7	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.7																							
2-Jan	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
3-Jan	2.3	2.3	2.3	Z	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4																							
4-Jan	2.4	2.4	2.5	2.5	Z	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5																							
5-Jan	2.4	2.4	2.4	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.4																							
6-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.4																							
7-Jan	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.5	2.6																							
8-Jan	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
9-Jan	2.4	2.5	2.6	Z	2.6	2.6	2.6	2.7	2.8	2.5	2.4	2.3	2.4	2.4	2.4	2.5	3.1	3.0	2.9	2.8	2.7	2.6	2.3	2.3	2.6	3.1																							
10-Jan	2.3	2.3	2.6	3.0	Z	3.1	3.3	3.3	3.2	3.1	3.2	C	C	C	2.7	2.6	2.8	2.9	3.1	2.8	2.8	2.8	2.5	2.5	2.8	3.3																							
11-Jan	2.5	2.6	2.5	2.5	2.5	Z	2.5	2.6	2.5	2.5	2.4	2.6	2.8	2.6	2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.5	2.8																							
12-Jan	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.5																							
13-Jan	2.5	Z	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6																							
14-Jan	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4																							
15-Jan	2.4	2.5	2.5	Z	2.6	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6																							
16-Jan	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4																							
17-Jan	2.3	2.3	2.3	2.3	2.4	Z	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5																							
18-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3																							
19-Jan	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.4	2.5																							
20-Jan	2.3	2.3	Z	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.4	2.4																							
21-Jan	2.3	2.4	2.5	Z	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.5																							
22-Jan	2.3	2.3	2.3	2.3	Z	2.4	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
23-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3																							
24-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5																							
25-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
26-Jan	2.3	2.3	Z	2.3	2.3	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
27-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	M	M	2.3	2.3	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
28-Jan	2.3	2.3	2.3	2.5	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5																							
29-Jan	2.3	2.3	2.3	2.3	2.4	Z	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.5																							
30-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.5																							
31-Jan	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.4																							
																								2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	Diurnal Average		
																								2.5	2.6	2.7	3.0	2.6	3.1	3.3	3.3	3.2	3.1	3.2	2.6	2.8	2.6	2.7	2.6	3.1	3.0	3.1	2.8	2.8	2.8	2.5	2.5	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	700	98.87	98.87
3.1 - 10.0	8	1.13	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	45	18	20	11	13	16	44	185	162	60	25	5	10	10	9	63	696
3.1 - 10.0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	4	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	19	20	11	13	16	44	185	162	60	25	5	10	10	11	67	704

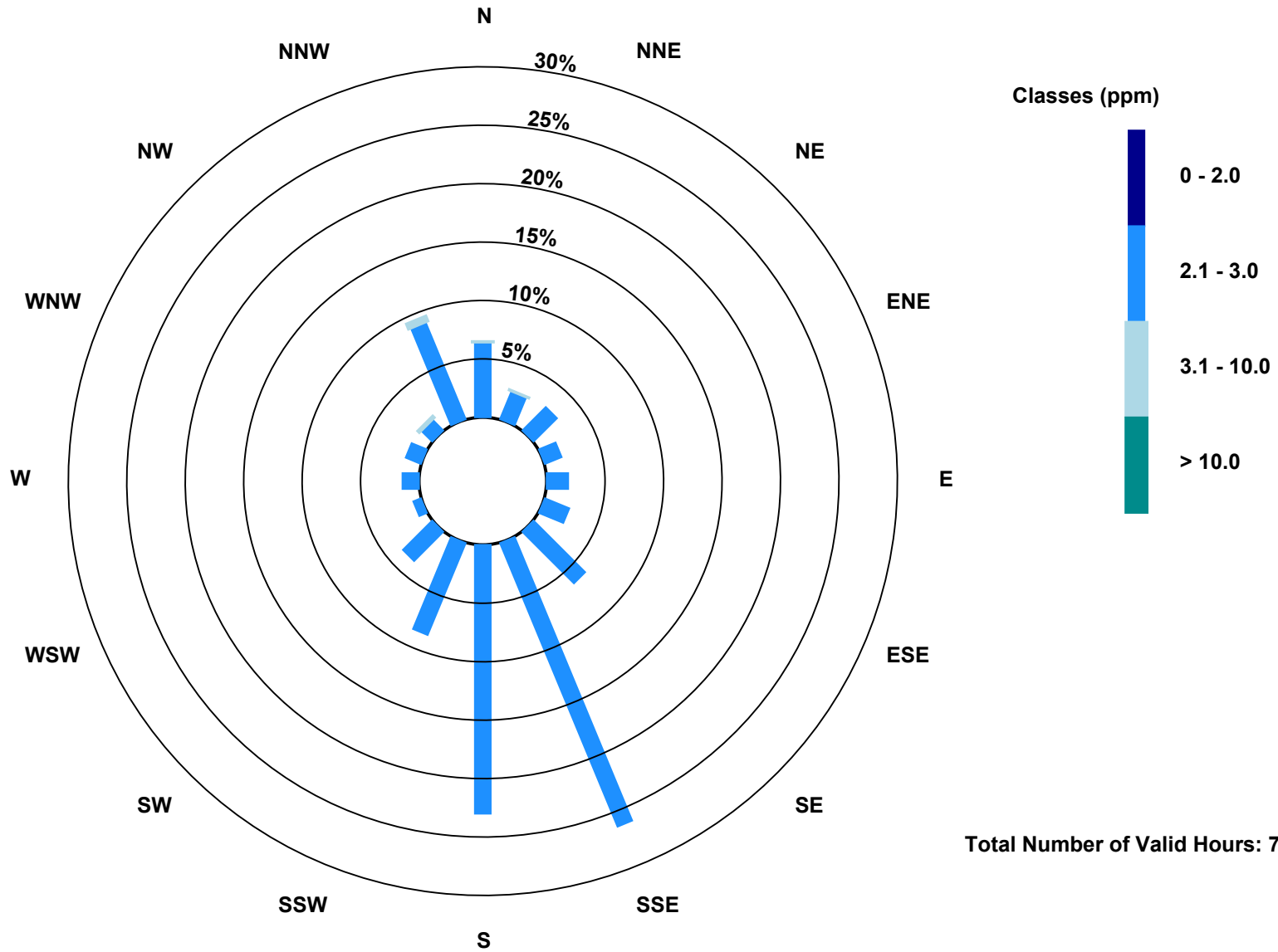
Total Number of Valid Hours: 704

Total Number of Hours: 744

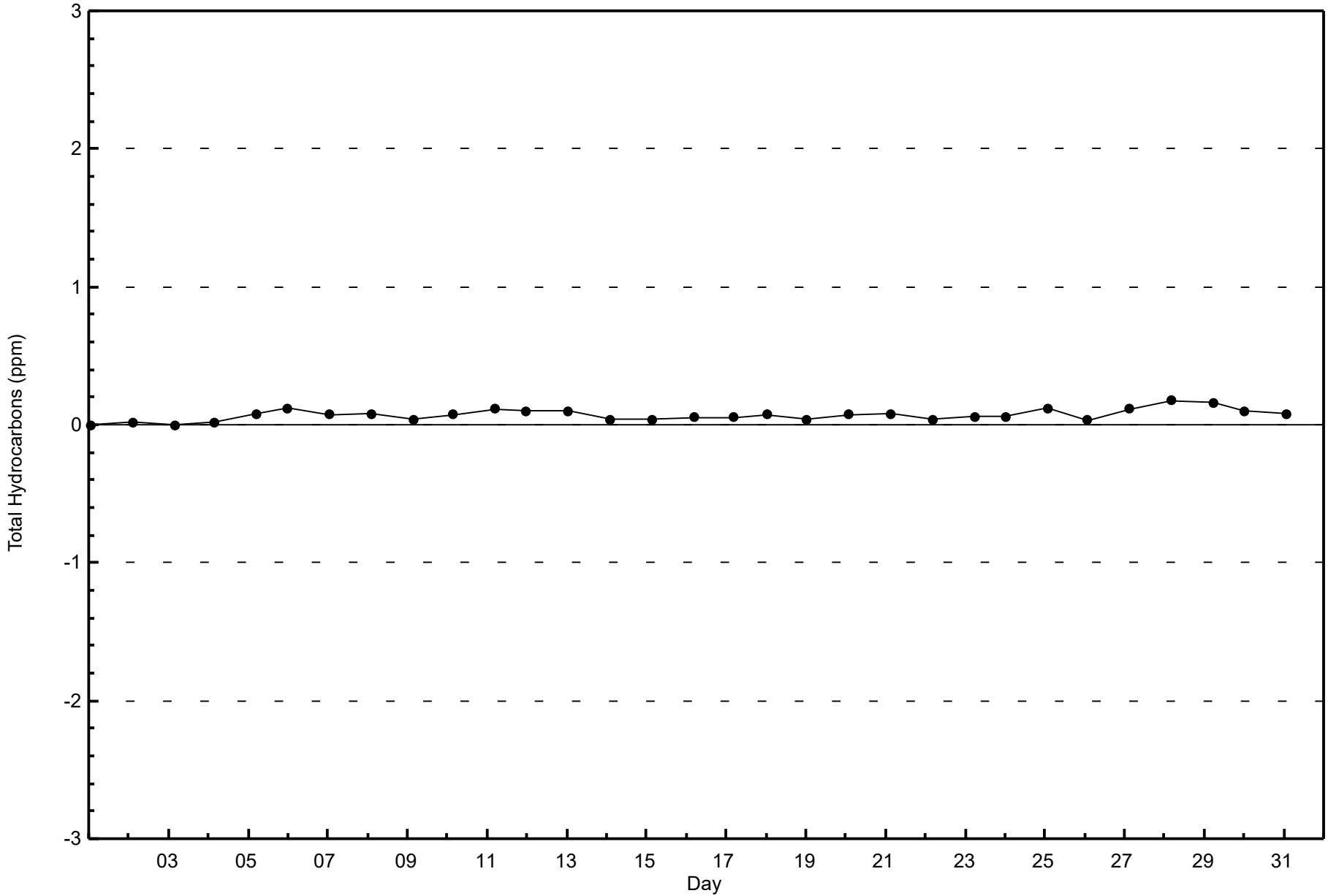


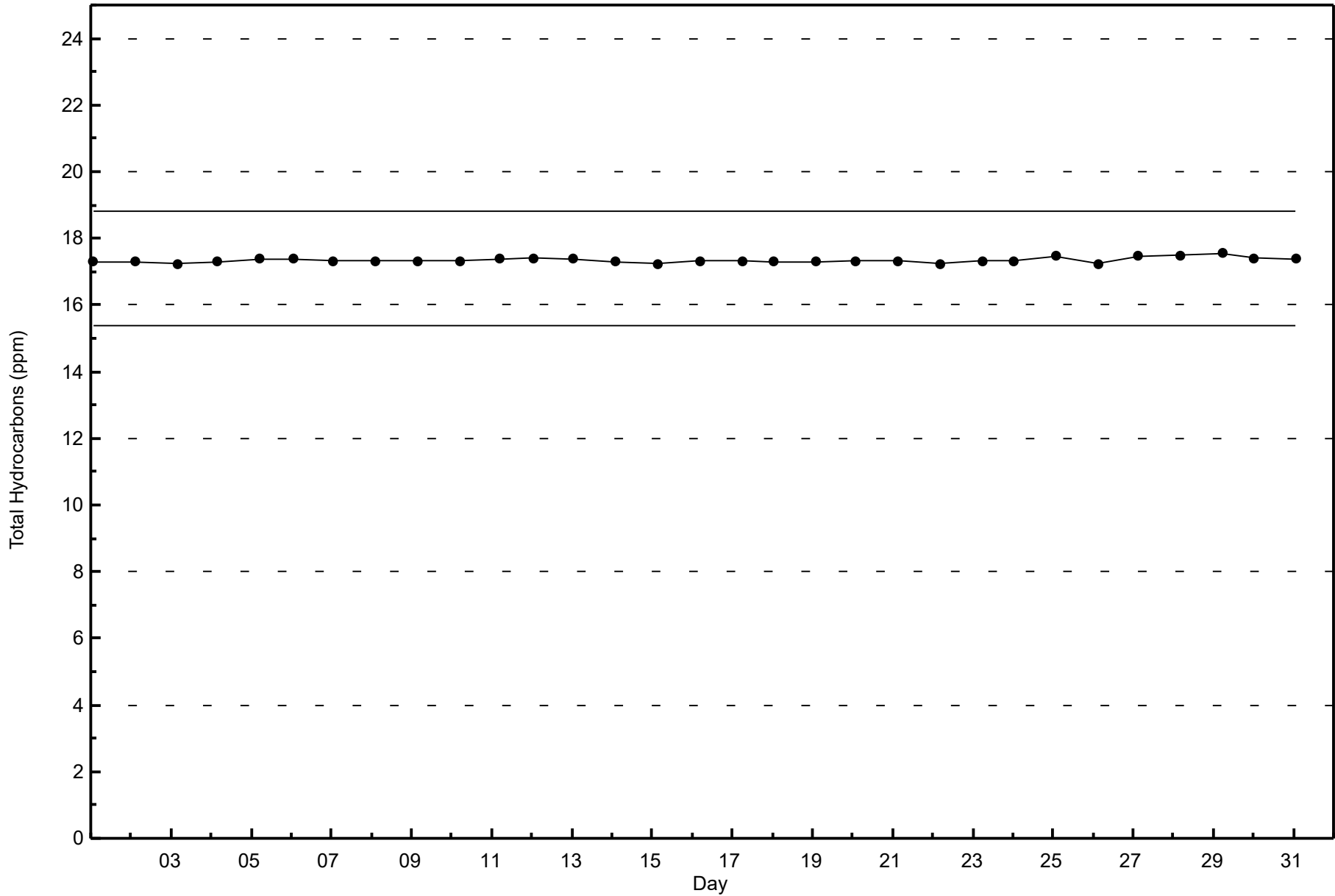
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Wapasu



Total Number of Valid Hours: 704







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

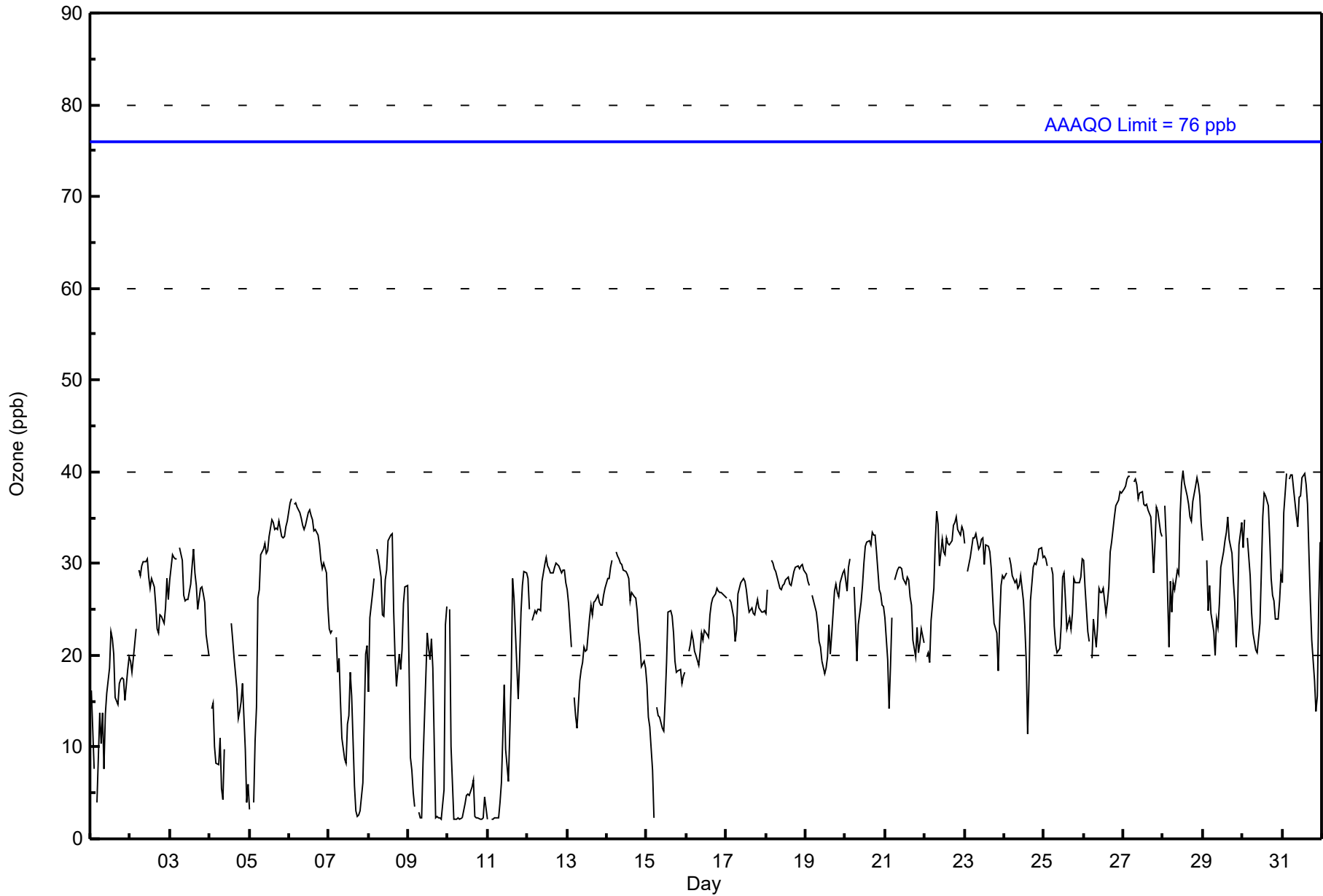
Wapasu - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 40.1 ppb on Jan 28 13:00		Maximum Daily Average: 36.3 ppb on Jan 27																	710							
Minimum Value: 2.1 ppb on Jan 9 21:00		Minimum Daily Average: 4.5 ppb on Jan 10																	34							
Maximum Diurnal Average: 27.2 ppb at hour 14		Minimum Diurnal Average: 21.9 ppb at hour 5																	34							
Monthly Average: 24.58 ppb		Percentiles: P ₁ = 2.1 P ₁₀ = 10.6 Q ₁ = 20.2 Median = 26.5 Q ₃ = 30.4 P ₉₀ = 34.6 P ₉₉ = 39.4																	100.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	16.2	11.9	7.6	Z	3.9	13.7	10.3	13.7	7.7	13.6	15.9	18.7	22.5	21.7	20.2	15.4	14.6	16.9	17.4	17.5	17.5	15.1	18.5	19.9	15.2	22.5
2-Jan	19.4	18.2	19.7	22.9	Z	29.3	28.7	29.8	30.1	30.2	30.5	28.5	27.4	28.3	27.5	25.5	22.9	22.4	24.4	24.3	23.4	25.2	28.4	26.1	25.8	30.5
3-Jan	28.2	31.0	30.7	30.5	30.5	Z	31.7	30.4	26.5	25.9	26.0	26.1	27.8	29.7	31.5	29.0	27.6	25.1	27.3	27.4	26.7	25.8	22.3	20.0	27.7	31.7
4-Jan	Z	14.2	14.8	10.1	8.3	8.1	11.0	5.5	4.2	9.8	C	C	C	23.5	21.7	19.6	16.3	13.1	13.9	14.9	16.9	9.8	3.9	6.0	12.3	23.5
5-Jan	3.2	Z	3.9	10.6	14.4	26.2	27.2	31.0	31.5	32.2	31.1	31.5	33.0	34.7	34.4	33.8	33.8	33.8	34.6	33.0	32.9	33.0	34.0	34.6	28.2	34.7
6-Jan	36.6	37.1	Z	36.4	36.6	36.2	35.6	34.9	34.1	33.7	34.2	35.6	35.8	35.2	34.7	33.6	33.7	33.2	32.0	30.4	29.5	30.1	29.0	25.3	33.6	37.1
7-Jan	22.8	22.4	22.8	Z	22.0	18.2	19.6	14.9	10.9	8.7	8.2	12.5	13.5	18.1	15.6	5.7	3.1	2.4	2.6	3.0	6.1	13.0	20.2	21.1	13.4	22.8
8-Jan	16.0	24.2	26.9	28.4	Z	31.6	30.8	28.5	24.4	24.2	28.3	29.3	32.5	33.0	33.3	24.9	19.8	16.7	20.1	18.4	20.5	25.6	27.5	27.7	25.8	33.3
9-Jan	18.9	8.8	7.5	5.1	3.5	Z	2.8	2.4	2.4	8.3	17.8	22.4	20.8	19.6	21.9	18.6	2.3	2.4	2.2	2.3	2.1	5.4	23.3	25.3	10.7	25.3
10-Jan	Z	25.0	10.1	2.1	2.1	2.1	2.2	2.1	2.3	3.0	3.8	4.7	4.9	4.8	5.6	6.4	2.5	2.3	2.3	2.1	2.1	2.2	4.6	3.3	4.5	25.0
11-Jan	2.1	Z	2.2	2.2	2.3	2.3	2.3	3.9	6.2	11.2	16.8	9.7	6.3	11.6	17.5	28.4	26.2	18.9	15.3	19.5	24.8	27.6	29.2	29.0	13.7	29.2
12-Jan	28.4	25.1	Z	23.8	24.8	24.6	25.0	25.1	24.9	28.1	29.9	30.7	29.8	29.4	29.0	29.0	29.6	30.1	30.0	29.7	29.0	29.3	29.2	27.9	27.9	30.7
13-Jan	27.2	25.6	20.9	Z	15.4	13.5	12.0	17.3	18.5	19.2	20.8	20.5	20.7	24.1	25.5	24.4	25.8	26.0	26.5	25.7	25.5	25.5	26.5	27.2	22.4	27.2
14-Jan	28.3	28.3	29.5	30.3	Z	31.2	30.9	30.5	30.1	29.8	29.4	29.2	28.8	28.3	26.0	26.8	26.4	26.3	24.9	22.5	21.2	18.7	19.4	18.6	26.8	31.2
15-Jan	16.8	13.3	12.1	7.5	2.3	Z	14.4	13.4	13.2	12.0	11.8	15.1	19.3	24.7	24.9	24.2	22.4	19.4	18.2	18.3	18.4	16.9	17.6	18.2	16.3	24.9
16-Jan	Z	20.4	21.2	22.4	21.6	20.5	20.0	18.9	20.4	22.4	21.7	22.7	22.2	22.0	24.5	25.6	26.3	26.6	27.4	27.0	26.9	26.9	26.7	26.4	23.5	27.4
17-Jan	26.2	Z	26.1	25.8	24.1	21.5	22.7	26.7	27.3	27.9	28.4	28.1	27.1	25.8	24.6	25.2	24.6	24.4	25.4	26.0	25.1	24.8	24.7	24.9	25.5	28.4
18-Jan	24.5	27.2	Z	30.4	30.1	29.4	29.1	28.5	27.2	27.2	27.7	27.8	28.2	28.5	27.7	27.6	28.3	29.1	29.6	29.7	29.4	29.7	29.9	29.4	28.5	30.4
19-Jan	28.8	28.1	27.7	Z	26.6	25.9	24.7	23.3	21.6	20.8	19.3	17.9	18.6	19.9	23.3	20.1	22.2	27.1	27.8	26.8	26.4	28.0	29.0	29.3	24.5	29.3
20-Jan	28.2	26.9	29.5	30.5	Z	27.5	23.7	19.4	23.3	25.7	27.6	30.0	31.9	32.4	32.4	32.0	33.5	33.2	33.1	31.3	27.2	26.7	25.4	25.4	28.6	33.5
21-Jan	24.1	19.5	14.3	18.8	24.2	Z	28.3	29.3	29.6	29.6	29.4	28.4	27.8	28.6	28.2	26.3	25.5	21.7	19.9	23.0	20.3	21.3	22.9	21.3	24.5	29.6
22-Jan	Z	19.9	20.3	19.2	23.8	27.3	32.3	35.7	34.4	29.7	32.6	31.3	30.9	32.8	32.2	32.0	32.5	34.2	34.4	35.2	33.8	33.0	33.9	33.5	30.6	35.7
23-Jan	32.1	Z	29.1	30.7	31.8	32.8	32.7	33.3	31.6	31.9	32.7	32.8	29.9	32.0	31.9	31.2	29.4	26.3	23.5	22.4	18.2	23.6	27.6	28.6	29.4	33.3
24-Jan	28.3	29.0	Z	30.6	29.9	28.7	27.9	28.2	27.4	27.6	28.7	26.0	23.1	19.4	11.4	17.4	26.0	29.6	30.1	29.9	30.5	31.5	31.8	30.6	27.1	31.8
25-Jan	30.9	30.5	29.7	Z	29.6	28.8	23.1	21.2	20.2	20.7	23.4	28.5	29.0	26.1	22.9	24.2	22.9	24.6	28.4	28.0	28.0	28.0	28.6	30.5	26.4	30.9
26-Jan	30.3	27.5	22.6	21.6	Z	19.7	23.9	20.9	23.2	27.4	26.9	26.8	27.2	24.6	25.8	27.5	31.2	32.4	35.0	36.2	36.5	37.0	37.9	37.7	28.7	37.9
27-Jan	38.1	38.4	39.2	39.5	39.5	Z	38.9	39.1	38.5	37.1	37.7	37.8	36.5	36.3	36.5	35.9	35.0	32.4	29.0	32.1	36.1	35.7	33.4	32.9	36.3	39.5
28-Jan	Z	36.3	32.7	21.0	28.1	24.7	27.9	27.2	29.3	28.9	35.5	38.8	40.1	38.8	37.3	36.4	35.1	34.6	36.8	38.4	39.3	38.6	37.3	34.4	33.8	40.1
29-Jan	32.6	Z	30.4	24.9	27.6	24.6	22.6	20.0	24.0	23.0	25.6	29.6	31.3	32.5	33.4	35.2	32.6	31.2	28.1	25.7	20.9	24.8	32.0	34.4	28.1	35.2
30-Jan	31.7	34.7	Z	32.8	28.7	24.7	22.4	21.6	20.6	20.3	23.5	29.1	35.0	37.6	37.3	36.3	32.6	28.3	26.6	25.9	23.9	24.0	26.0	28.8	28.4	37.6
31-Jan	27.9	35.6	39.8	Z	39.2	39.7	39.7	38.2	35.2	34.0	37.2	37.4	39.4	39.8	38.5	36.5	31.2	25.9	21.7	17.3	14.0	15.6	25.8	32.4	32.3	39.8
24.9 25.4 22.0 22.3 21.9 23.6 23.4 23.1 22.6 23.4 25.4 26.2 26.7 27.2 27.0 26.3 25.0 24.2 24.1 24.0 23.6 24.3 26.0 26.2																								Diurnal Average		
38.1 38.4 39.8 39.5 39.5 39.7 39.7 39.1 38.5 37.1 37.7 38.8 40.1 39.8 38.5 36.5 35.1 34.6 36.8 38.4 39.3 38.6 37.9 37.7																								Diurnal Maximum		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Wapasu - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Wapasu - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	186	26.20	26.20
21 - 50	524	73.80	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	4	8	6	9	8	5	44	29	15	8	1	2	2	7	20	182
21 - 50	34	14	12	6	4	7	43	133	135	47	16	5	8	8	3	49	524
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	18	20	12	13	15	48	177	164	62	24	6	10	10	10	69	706

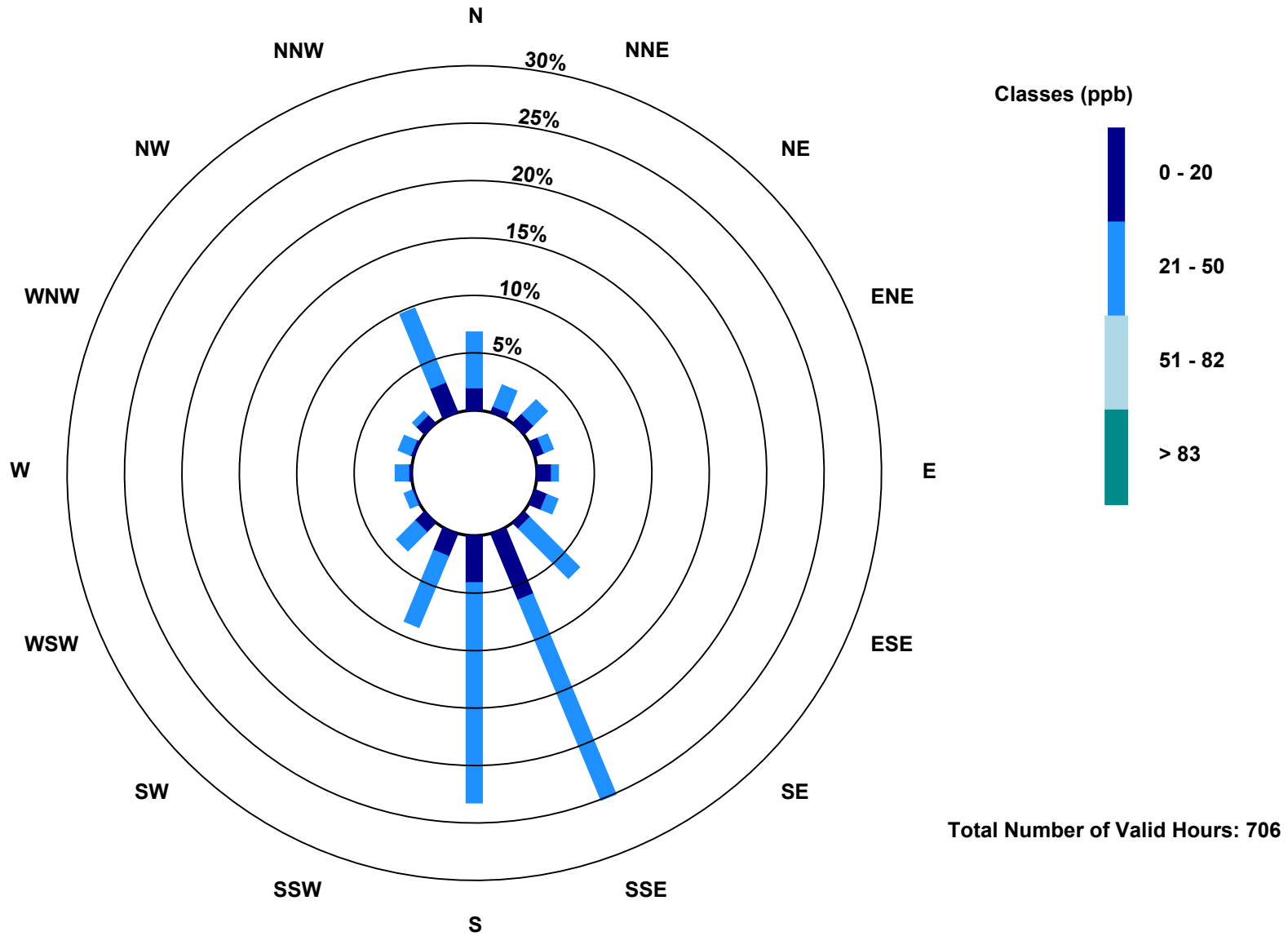
Total Number of Valid Hours: 706

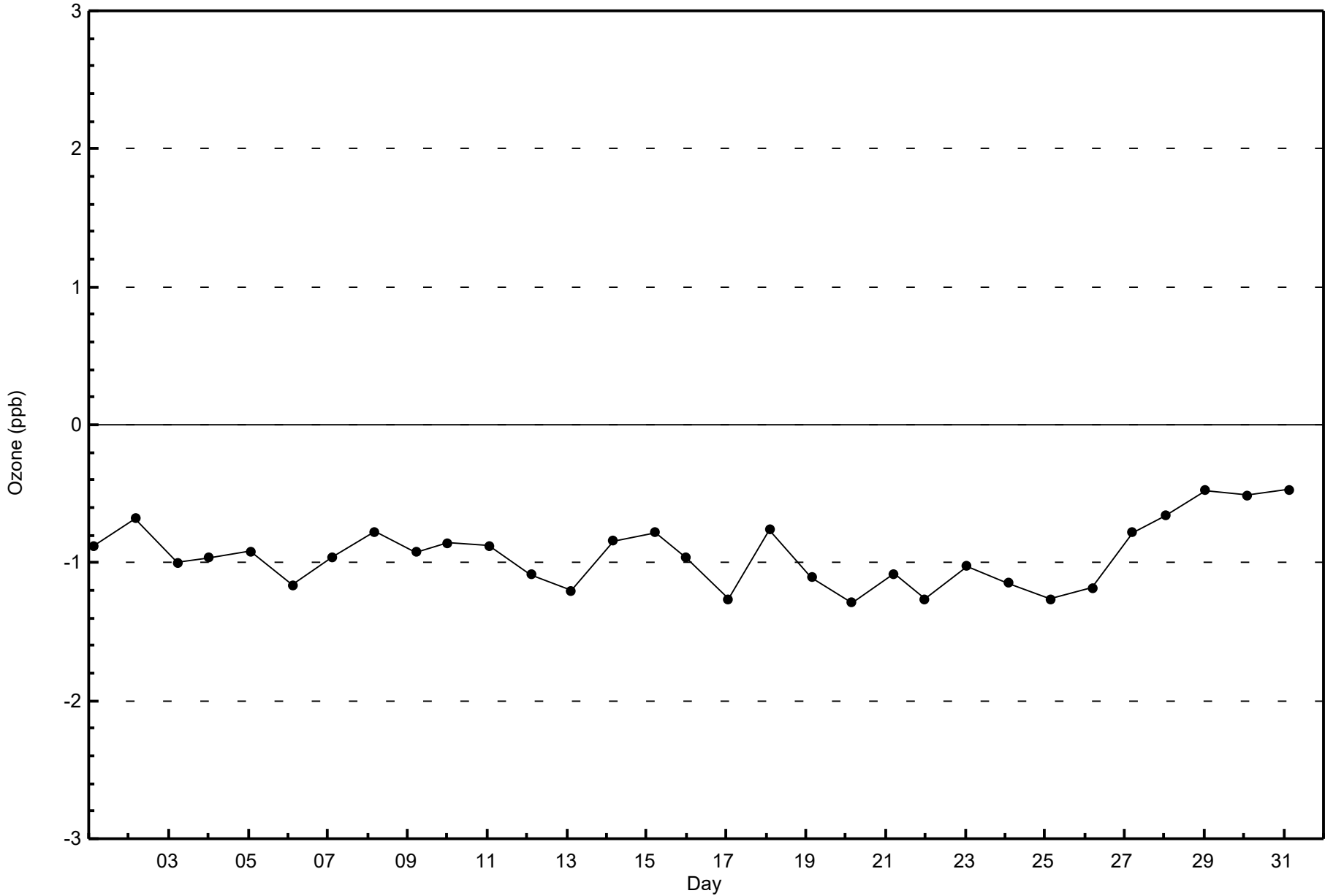
Total Number of Hours: 744

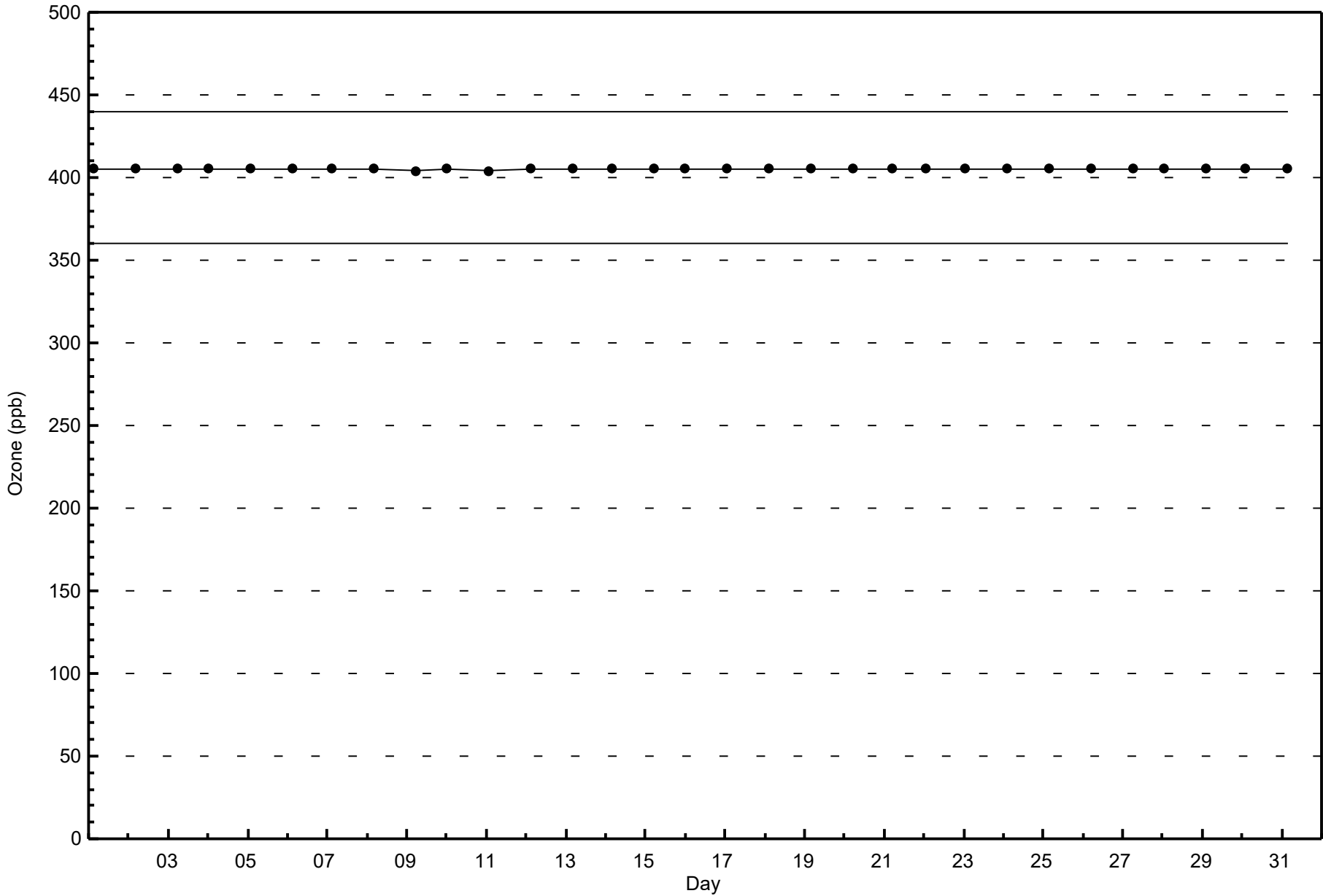


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Wapasu









Wood Buffalo Environmental Association
Summary of Hour Averages

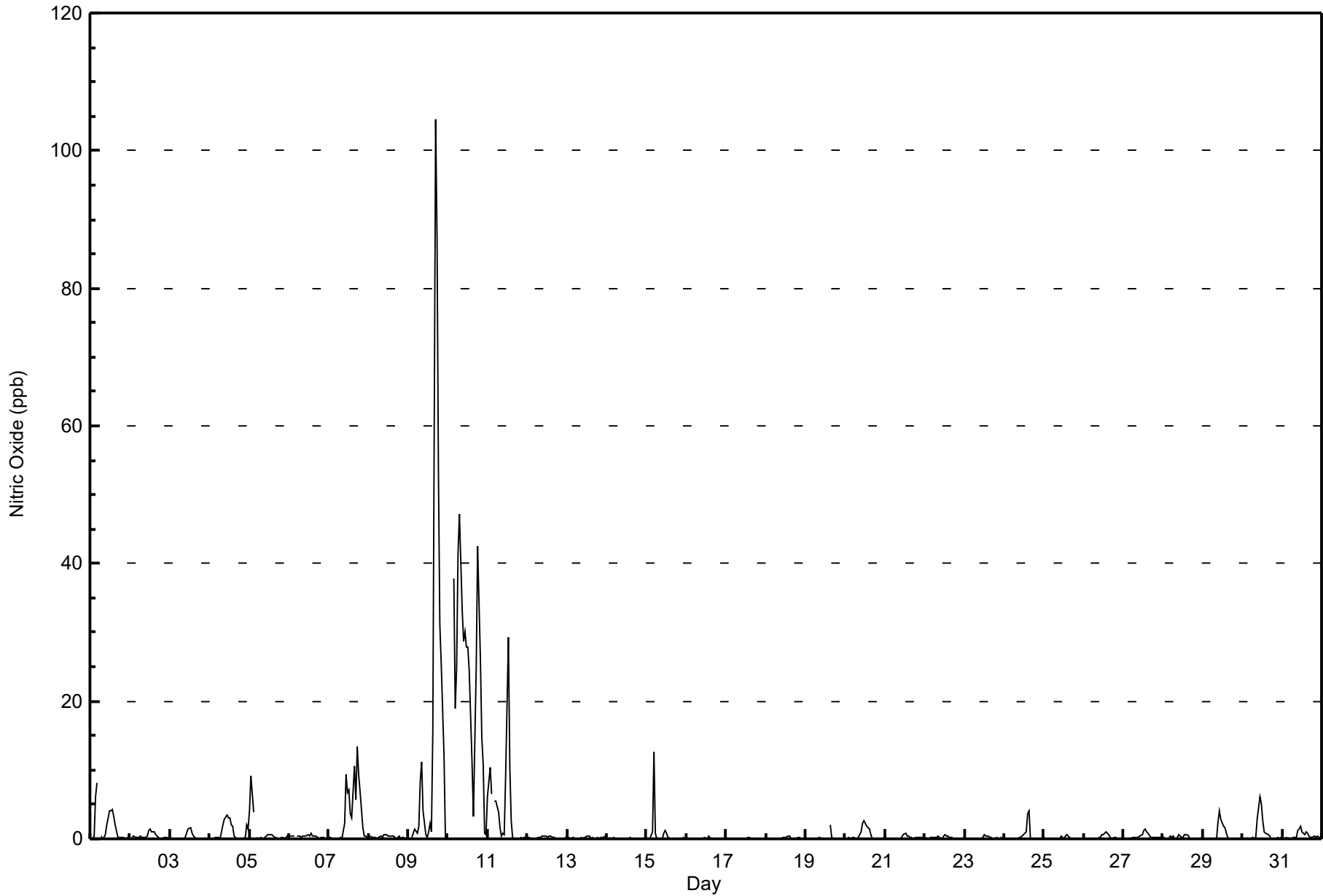
Nitric Oxide (NO) - ppb
Wapasu - January 2023

Maximum Value: 104.6 ppb on Jan 9 17:00 Maximum Daily Average: 21.4 ppb on Jan 10																				Hours in Service: 744 Hours of Data: 708 Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0						
Minimum Value: 0.0 ppb on Jan 1 01:00 Minimum Daily Average: 0.0 ppb on Jan 17 Maximum Diurnal Average: 4.1 ppb at hour 17 Minimum Diurnal Average: 0.2 ppb at hour 24 Monthly Average: 1.80 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 2.6 P ₉₉ = 33.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.4	6.0	8.1	Z	0.5	0.0	0.3	0.5	2.0	4.2	4.0	4.3	3.2	2.0	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.2	1.6	8.1
2-Jan	Z	0.3	0.3	0.2	0.1	0.1	0.3	0.1	0.2	0.3	0.3	1.1	1.3	1.0	0.9	0.6	0.3	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.4	1.3
3-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.4	1.5	0.8	0.4	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.2	1.5
4-Jan	0.0	0.0	Z	0.2	0.2	0.2	0.0	1.0	2.1	2.8	3.5	3.1	3.1	2.0	1.9	0.5	0.0	0.0	0.0	0.0	0.0	0.1	2.0	1.4	1.1	3.5
5-Jan	4.1	9.1	3.9	Z	0.2	0.1	0.0	0.1	0.0	0.1	0.3	0.5	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.9	9.1
6-Jan	0.3	0.3	0.3	0.4	Z	0.4	0.3	0.1	0.4	0.3	0.5	0.6	0.4	0.8	0.4	0.3	0.3	0.1	0.0	0.2	0.3	0.2	0.1	0.1	0.3	0.8
7-Jan	0.1	0.1	0.0	0.0	0.1	Z	0.1	0.1	0.1	2.3	9.4	6.8	7.2	3.7	3.0	10.6	5.8	13.5	9.3	7.0	1.7	0.5	0.3	0.3	3.6	13.5
8-Jan	Z	0.4	0.2	0.2	0.3	0.1	0.2	0.3	0.2	0.6	0.6	0.7	0.4	0.5	0.4	0.4	0.3	0.1	0.3	0.1	0.1	0.3	0.0	0.2	0.3	0.7
9-Jan	0.1	Z	0.1	0.8	1.4	0.9	1.7	8.2	11.2	4.2	0.5	0.2	1.1	2.3	0.9	15.8	104.6	87.6	53.2	31.1	25.5	12.0	0.0	0.1	15.8	104.6
10-Jan	0.0	0.0	Z	37.9	18.9	24.9	41.4	47.3	33.1	28.7	30.1	27.9	27.8	24.5	11.3	3.2	14.3	24.8	42.5	26.0	14.6	10.7	0.7	0.6	21.4	47.3
11-Jan	6.1	10.4	6.5	Z	5.4	5.5	3.9	1.6	0.5	0.9	0.5	9.0	29.4	10.5	2.6	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	4.1	29.4
12-Jan	0.1	0.1	0.0	0.1	Z	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3
13-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.2	0.0	0.2	0.2	0.3	0.3	0.0	0.2	0.1	0.0	0.2	0.0	0.2	0.1	0.2	0.3	0.1	0.3
14-Jan	Z	0.2	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2
15-Jan	0.0	Z	0.0	1.0	12.7	0.8	0.0	0.0	0.0	0.0	0.0	0.9	1.2	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.8	12.7
16-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
17-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
18-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.3
19-Jan	0.0	0.1	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.3	C	C	C	C	C	2.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.1
20-Jan	Z	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.2	1.1	2.3	2.7	2.3	1.8	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.7
21-Jan	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.6	0.9	0.4	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.2	0.9
22-Jan	0.0	0.2	Z	0.3	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.4	0.5	0.4	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.5
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.3	0.3	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.7
24-Jan	0.0	0.1	0.0	0.1	Z	0.0	0.0	0.1	0.0	0.1	0.1	0.6	0.9	1.0	3.7	4.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.1
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
26-Jan	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.5	1.1	0.8	0.5	0.2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.2	1.1
27-Jan	0.0	Z	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.3	0.3	0.6	1.3	1.4	1.0	0.7	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.4	1.4
28-Jan	0.3	0.2	Z	0.2	0.4	0.3	0.3	0.1	0.1	0.7	0.5	0.2	0.1	0.6	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
29-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	2.5	4.0	2.8	1.8	1.6	0.9	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.6	4.0
30-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.3	2.9	6.0	5.1	2.7	0.9	0.7	0.5	0.3	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.9	6.0
31-Jan	0.1	0.0	0.3	0.0	0.1	Z	0.2	0.2	0.2	1.2	1.3	1.9	1.0	0.6	0.9	0.9	0.4	0.3	0.2	0.3	0.2	0.3	0.1	0.3	0.5	1.9
																								Diurnal Average		
																								Diurnal Maximum		
0.4 0.8 0.5 1.8 1.9 1.4 1.6 1.9 1.6 1.6 2.2 2.4 3.1 2.1 1.3 1.5 4.1 4.1 3.5 2.1 1.4 0.8 0.2 0.2 6.1 10.4 6.5 37.9 18.9 24.9 41.4 47.3 33.1 28.7 30.1 27.9 29.4 24.5 11.3 15.8 104.6 87.6 53.2 31.1 25.5 12.0 2.0 1.4																										
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	689	97.32	97.32
21 - 40	13	1.84	99.15
41 - 80	4	0.56	99.72
81 - 159	2	0.28	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	43	18	19	12	13	16	46	185	157	59	23	5	9	8	9	63	685
21 - 40	3	1	0	0	0	0	0	0	1	0	1	0	0	1	1	5	13
11 - 80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	19	19	12	13	16	46	185	158	59	24	5	9	9	11	70	704

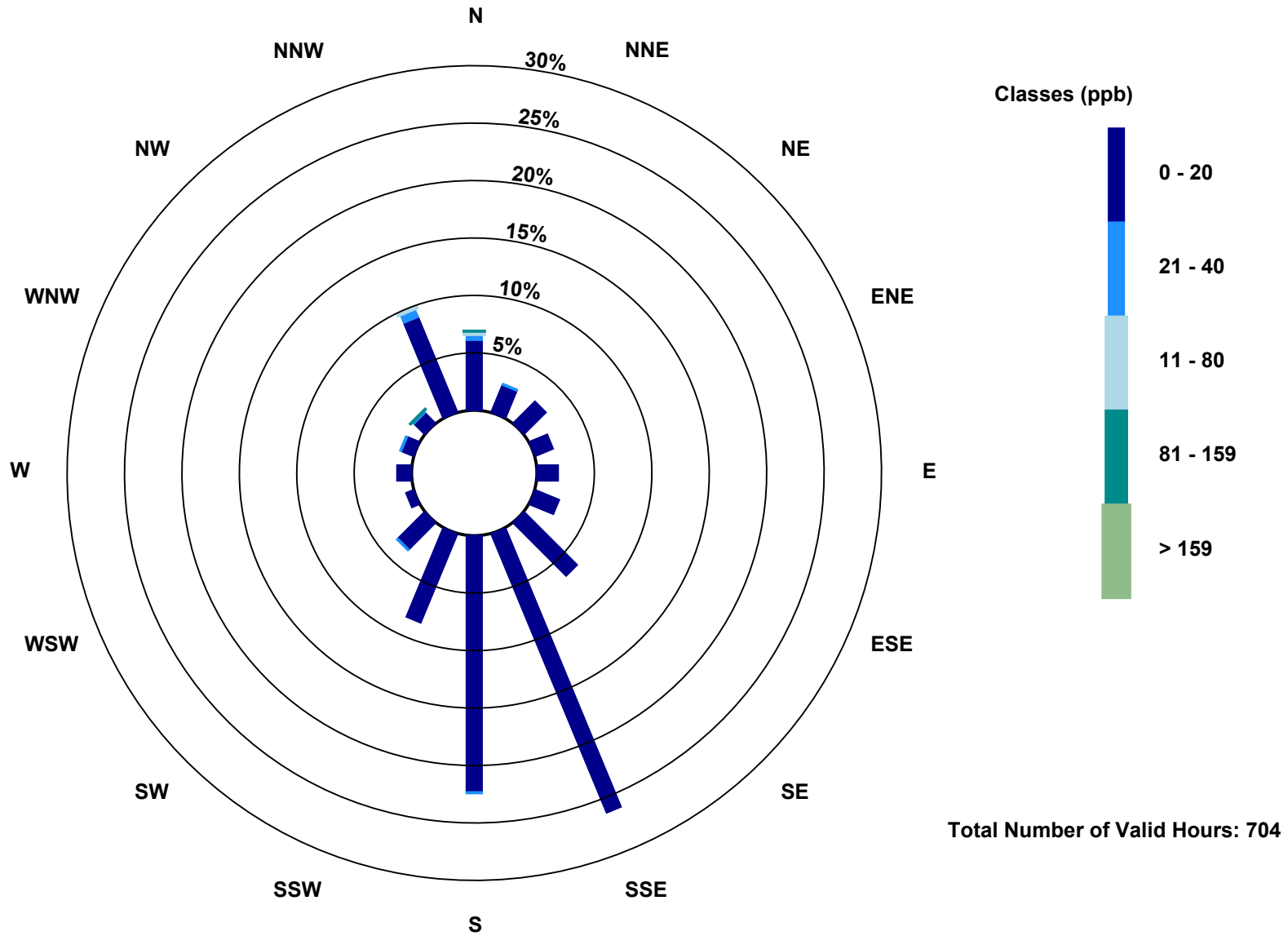
Total Number of Valid Hours: 704

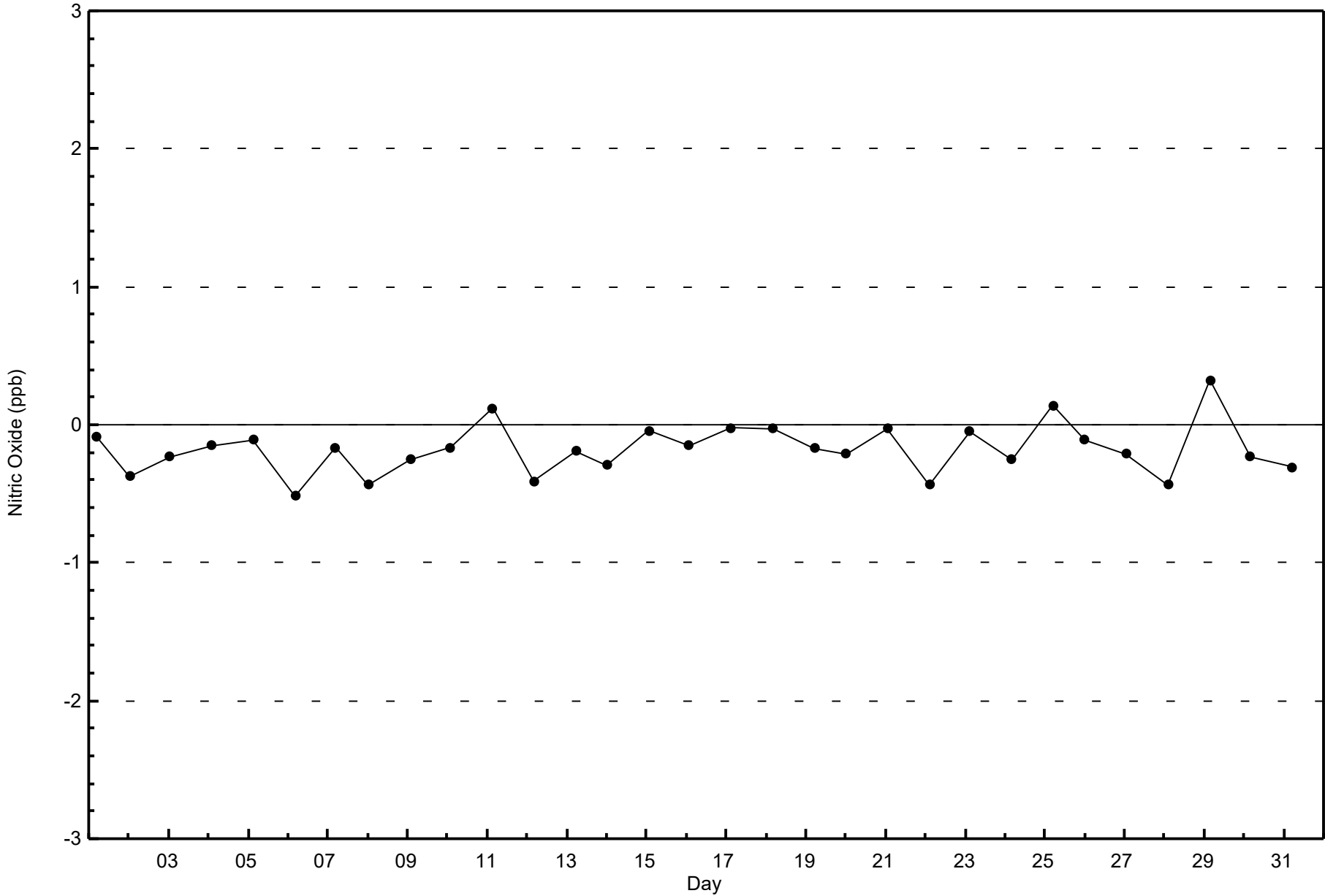
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Wapasu

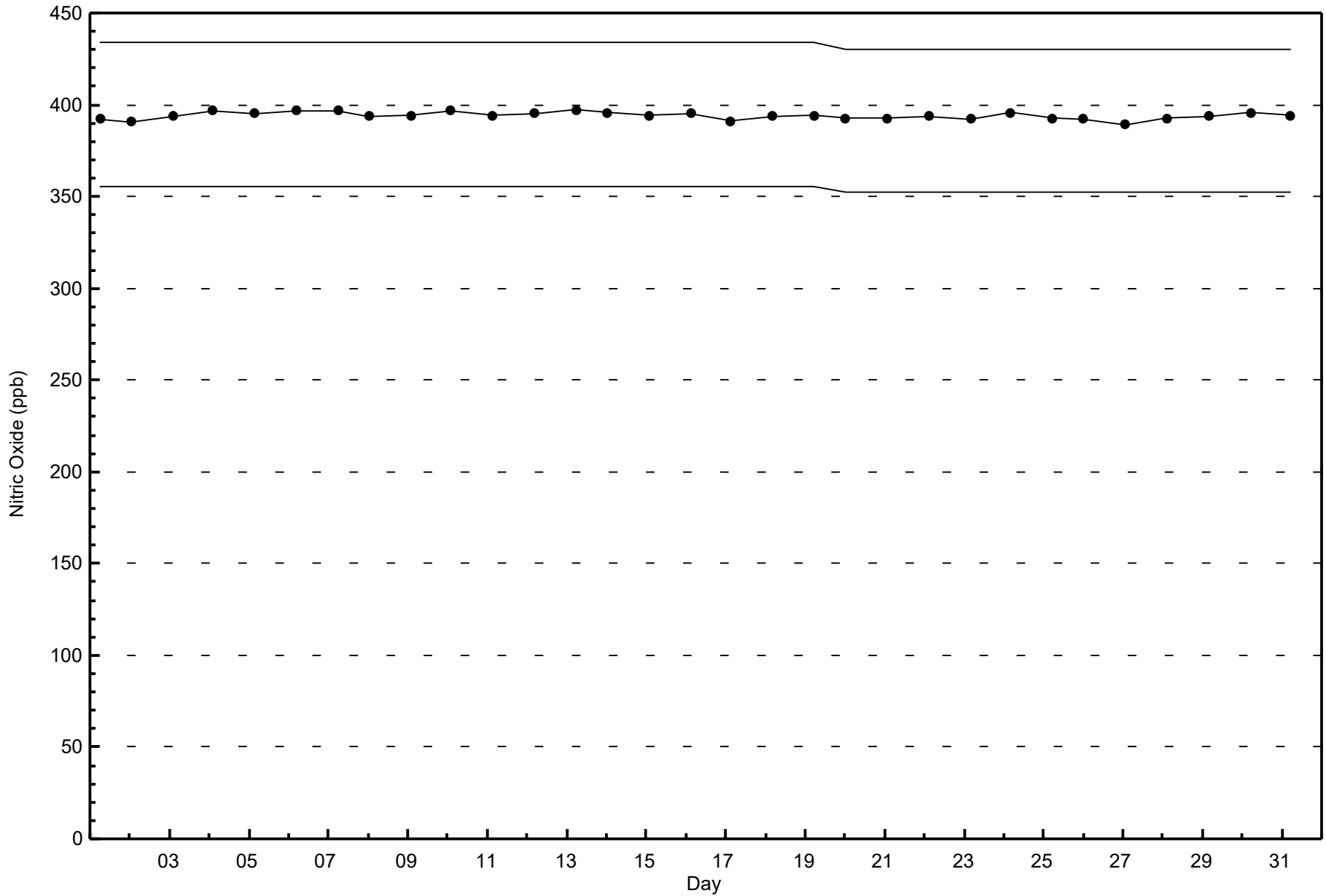






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Wapasu - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

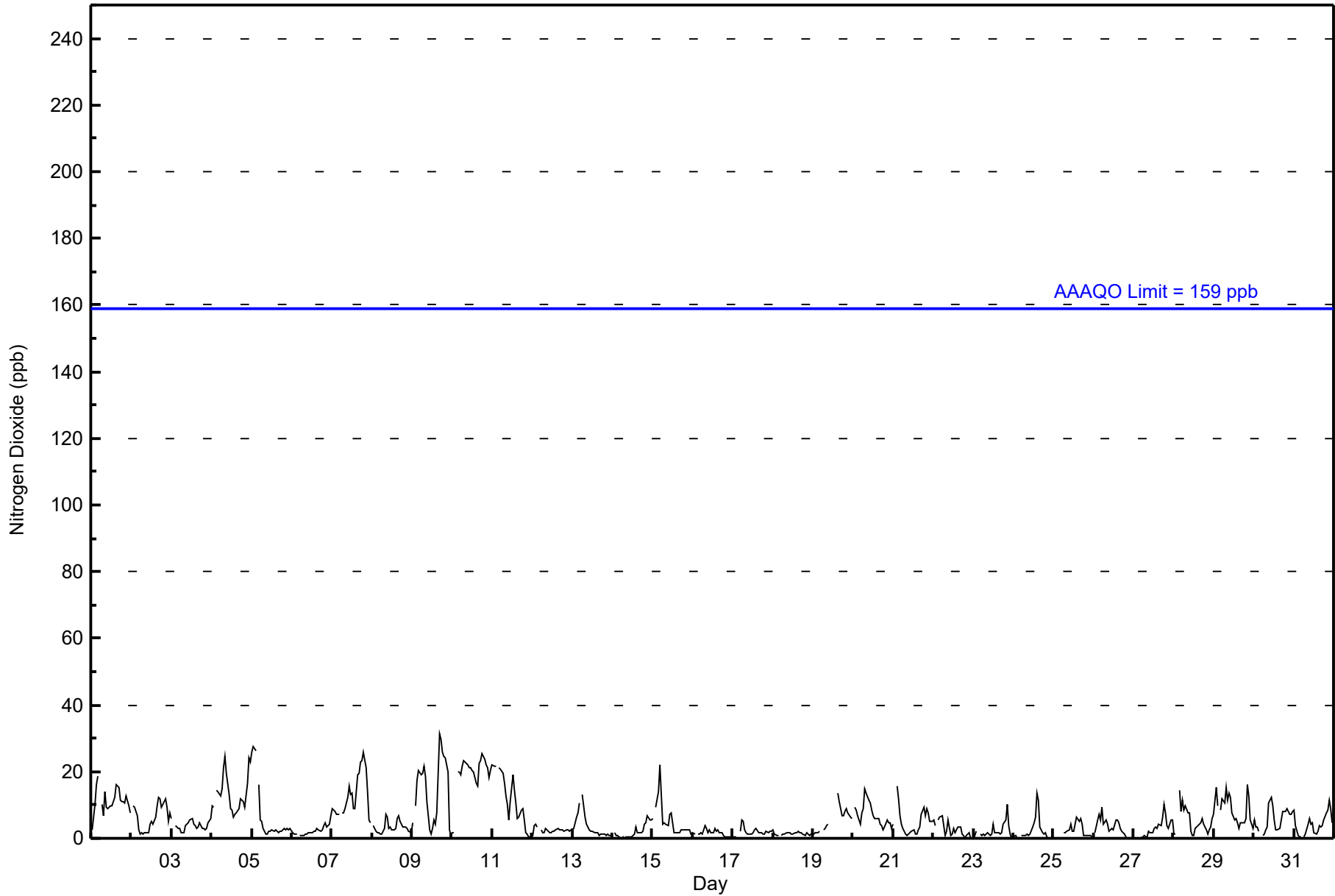
Wapasu - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 31.4 ppb on Jan 9 17:00				Maximum Daily Average: 19.3 ppb on Jan 10		Hours of Data:														708																													
Minimum Value: 0.0 ppb on Jan 22 20:00				Minimum Daily Average: 1.4 ppb on Jan 18		Hours of Missing Data:														36																													
Maximum Diurnal Average: 7.9 ppb at hour 5				Minimum Diurnal Average: 4.5 ppb at hour 24		Hours of Calibration:														36																													
Monthly Average: 5.77 ppb				Percentiles: P ₁ = 0.0 P ₁₀ = 0.9 Q ₁ = 1.6 Median = 3.5 Q ₃ = 7.7 P ₉₀ = 14.2 P ₉₉ = 25.4		Percent Operational Time:														100.0																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.5	6.3	10.3	16.2	18.8	Z	10.0	6.9	14.1	9.4	9.0	9.8	9.9	11.2	12.1	15.9	15.3	11.4	10.9	11.0	10.6	12.6	9.8	7.7	10.9	18.8																							
2-Jan	Z	9.9	9.3	6.8	2.7	1.1	1.8	1.4	1.6	1.8	1.7	4.2	5.0	4.3	6.2	9.9	12.4	11.8	9.5	10.3	11.9	9.2	5.2	7.6	6.3	12.4																							
3-Jan	6.1	Z	3.7	3.3	3.1	2.8	1.5	1.8	3.7	4.4	4.5	5.7	5.8	4.3	4.0	3.0	3.5	4.7	2.9	3.0	2.6	2.8	4.6	5.9	3.8	6.1																							
4-Jan	9.6	9.3	Z	14.2	13.9	12.5	14.7	21.3	24.7	19.6	13.1	9.0	8.3	6.2	7.4	7.5	9.1	11.7	11.3	11.1	9.4	16.6	24.1	22.7	13.4	24.7																							
5-Jan	26.0	27.4	26.4	Z	16.3	5.3	5.1	2.9	1.3	1.4	2.3	2.2	2.6	2.3	2.4	2.3	1.5	2.1	2.2	2.8	2.6	2.8	2.6	2.8	6.3	27.4																							
6-Jan	1.6	1.1	1.2	1.3	Z	1.0	1.0	0.9	1.2	1.4	1.5	1.5	1.6	2.1	2.3	3.1	2.4	2.1	2.7	4.0	4.5	3.6	4.1	6.8	2.3	6.8																							
7-Jan	9.1	8.4	7.9	7.3	7.4	Z	7.8	7.6	8.8	12.3	15.8	13.1	13.7	8.9	9.1	19.1	19.5	22.8	23.4	25.7	21.2	14.1	5.3	4.5	12.7	25.7																							
8-Jan	Z	3.7	2.2	1.9	1.5	1.1	1.2	3.0	7.1	6.2	2.8	3.5	2.6	2.7	2.8	5.8	6.7	5.1	3.6	3.2	3.5	2.8	2.2	1.8	3.3	7.1																							
9-Jan	4.5	Z	9.8	17.4	20.2	19.2	19.6	21.4	18.5	11.0	2.7	1.1	2.8	5.5	4.3	7.6	31.4	29.7	25.9	24.7	24.0	20.1	2.7	0.9	14.1	31.4																							
10-Jan	1.5	1.6	Z	19.8	19.8	19.0	21.5	23.4	22.3	22.2	21.3	21.0	20.5	20.0	16.4	15.7	22.3	23.5	25.4	23.9	22.0	21.1	18.2	20.5	19.3	25.4																							
11-Jan	21.9	21.7	21.4	Z	21.3	20.9	19.5	16.4	12.6	10.2	5.3	10.9	19.1	14.2	10.6	6.0	6.3	8.5	9.1	5.7	1.8	1.2	0.5	0.4	11.5	21.9																							
12-Jan	1.0	3.8	4.1	3.5	Z	2.4	1.7	1.7	3.0	2.6	1.7	1.8	2.2	2.3	2.7	2.8	2.6	2.6	2.4	2.2	2.7	2.4	2.1	2.7	2.5	4.1																							
13-Jan	2.5	3.1	6.5	7.6	10.4	Z	13.2	6.2	4.3	3.6	2.6	2.1	2.0	1.8	1.5	1.5	1.0	1.3	1.3	1.1	1.0	1.2	0.9	0.8	3.4	13.2																							
14-Jan	Z	1.6	1.0	0.7	0.3	0.2	0.4	0.2	0.4	0.4	0.5	0.6	0.8	1.2	3.3	1.9	1.8	1.6	2.3	4.1	4.8	6.8	5.3	5.5	2.0	6.8																							
15-Jan	5.8	Z	9.2	13.9	21.9	13.3	4.1	4.6	4.2	3.8	7.3	7.6	4.6	1.9	1.7	1.6	1.7	2.4	2.5	2.5	2.5	2.4	2.4	1.4	5.4	21.9																							
16-Jan	1.5	1.3	Z	1.2	1.3	1.9	1.4	4.0	3.0	1.8	2.7	1.7	1.9	2.9	2.3	2.4	1.8	1.5	1.0	0.6	0.4	0.3	0.6	0.4	1.6	4.0																							
17-Jan	0.5	0.5	0.6	Z	2.1	5.4	4.9	2.5	1.9	1.4	1.2	1.1	1.6	2.5	3.1	1.9	1.7	1.7	1.4	1.3	2.1	1.7	2.1	2.0	2.0	5.4																							
18-Jan	2.7	1.3	0.7	0.8	Z	1.0	1.2	1.1	1.6	1.8	1.5	1.3	1.4	1.5	1.8	2.0	1.7	1.5	1.1	1.0	1.5	1.2	1.0	1.1	1.4	2.7																							
19-Jan	1.4	1.5	1.7	1.8	2.0	Z	2.4	3.1	3.9	4.3	Z	Z	Z	Z	Z	13.5	11.1	6.7	6.9	8.2	8.8	7.6	6.3	6.1	5.4	13.5																							
20-Jan	Z	9.5	8.5	6.8	4.4	7.6	8.9	14.7	13.5	11.6	10.7	8.3	6.9	6.1	5.9	5.8	4.1	3.7	2.6	3.5	5.7	4.6	4.6	3.1	7.0	14.7																							
21-Jan	4.2	Z	15.8	12.0	6.7	4.1	2.8	1.4	1.0	1.4	1.6	2.3	2.6	1.3	1.2	2.5	3.6	7.0	9.2	6.7	9.0	7.6	5.0	5.2	5.0	15.8																							
22-Jan	5.7	3.9	Z	5.6	6.5	6.7	3.7	0.8	2.1	5.7	0.9	1.2	3.0	1.9	2.5	3.2	3.3	1.4	0.7	0.0	0.9	1.5	0.0	0.0	2.7	6.7																							
23-Jan	0.0	0.7	2.1	Z	1.1	1.0	1.4	0.8	1.9	1.4	1.0	1.2	4.2	1.9	1.7	1.6	1.4	1.7	4.2	5.4	10.2	3.9	1.2	0.2	2.2	10.2																							
24-Jan	0.6	0.7	0.2	0.2	Z	0.7	0.9	0.9	1.2	1.0	1.2	3.2	4.8	6.3	13.7	11.4	3.6	1.8	1.1	1.8	0.5	0.0	0.2	0.3	2.4	13.7																							
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	1.7	1.7	2.1	2.6	4.4	2.2	2.1	4.4	6.5	5.0	5.8	4.1	0.9	1.0	0.7	0.8	0.8	0.6	2.1	6.5																							
26-Jan	Z	1.9	5.6	7.1	5.6	9.2	4.2	5.6	4.1	2.3	2.5	2.8	2.7	5.6	5.4	4.7	2.9	2.0	1.1	0.4	0.1	0.2	0.0	0.0	3.3	9.2																							
27-Jan	0.0	Z	0.0	0.1	0.2	0.3	0.7	0.5	0.5	2.1	1.7	1.8	2.8	3.3	2.8	4.2	4.0	6.3	10.2	7.5	3.7	3.1	5.7	5.6	2.9	10.2																							
28-Jan	1.3	1.1	Z	14.6	7.9	11.3	8.4	9.8	7.5	7.8	2.3	0.7	0.8	2.8	3.9	4.2	4.7	5.9	4.1	2.5	1.4	2.4	3.2	6.1	5.0	14.6																							
29-Jan	7.4	15.1	9.8	Z	8.6	12.0	10.5	15.3	11.6	13.6	12.2	7.8	5.4	6.0	4.8	3.0	4.5	4.7	4.6	5.9	16.0	12.7	5.3	2.9	8.7	16.0																							
30-Jan	5.7	3.6	3.4	2.1	Z	1.0	1.4	2.5	3.6	10.5	12.2	9.6	5.4	2.4	2.4	3.1	5.5	8.1	8.0	8.0	8.7	7.3	7.3	8.0	5.6	12.2																							
31-Jan	8.3	3.8	0.9	0.6	0.5	Z	0.5	1.4	4.2	6.0	4.3	4.5	1.7	1.2	2.2	3.9	3.6	4.0	5.4	7.6	8.6	11.4	8.7	4.5	4.3	11.4																							
																								5.1	5.5	6.2	6.4	7.9	6.4	5.7	6.0	6.2	6.0	5.1	4.8	5.0	4.6	4.9	5.7	6.5	6.6	6.4	6.3	6.6	6.0	4.6	4.5	Diurnal Average	
																								26.0	27.4	26.4	19.8	21.9	20.9	21.5	23.4	24.7	22.2	21.3	21.0	20.5	20.0	16.4	19.1	31.4	29.7	25.9	25.7	24.0	21.1	24.1	22.7	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Wapasu - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	672	94.92	94.92
21 - 40	36	5.08	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	41	17	18	11	13	16	44	176	157	59	23	5	9	9	8	62	668
21 - 40	8	2	1	1	0	0	2	9	1	0	1	0	0	0	3	8	36
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	19	19	12	13	16	46	185	158	59	24	5	9	9	11	70	704

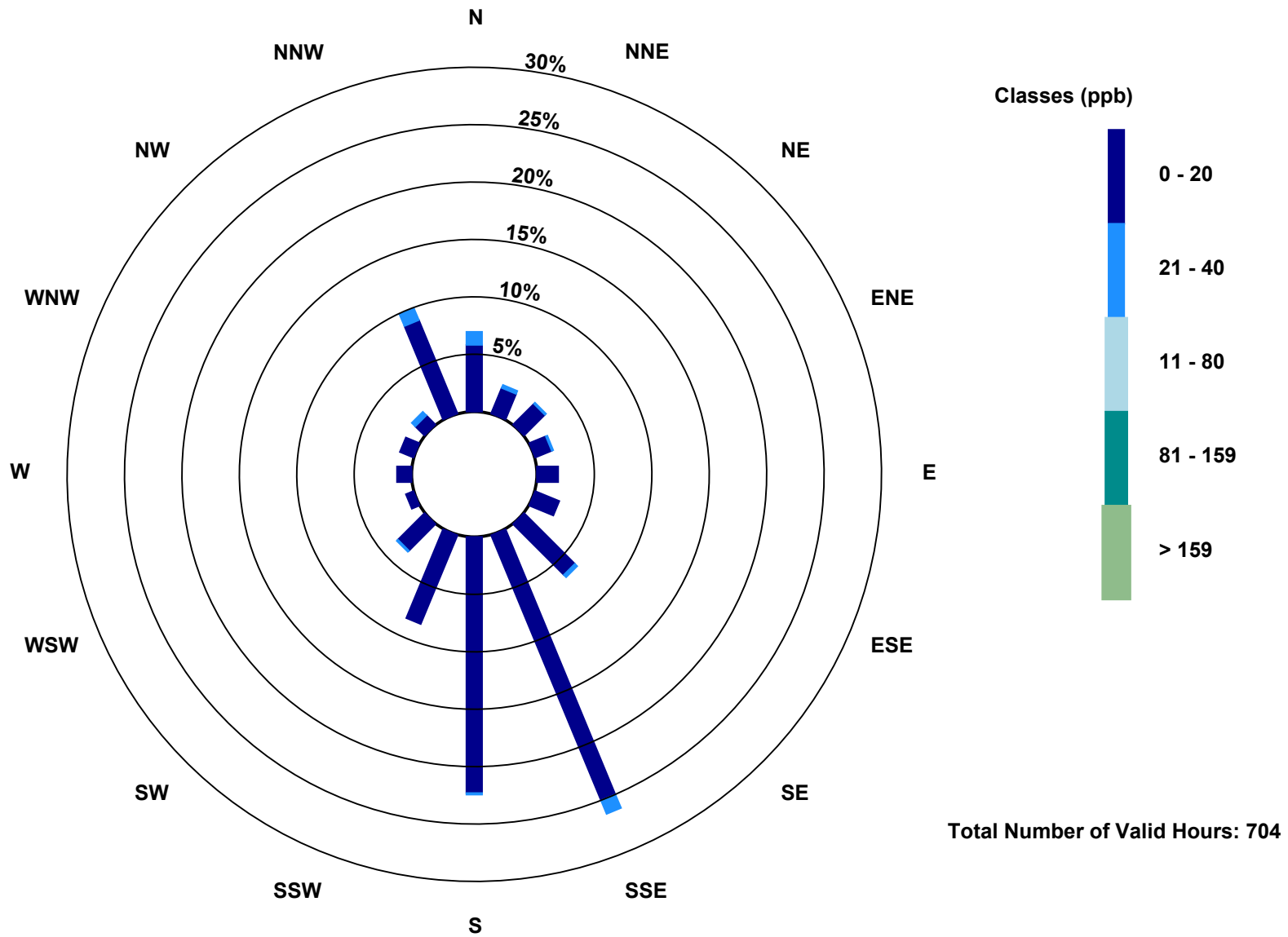
Total Number of Valid Hours: 704

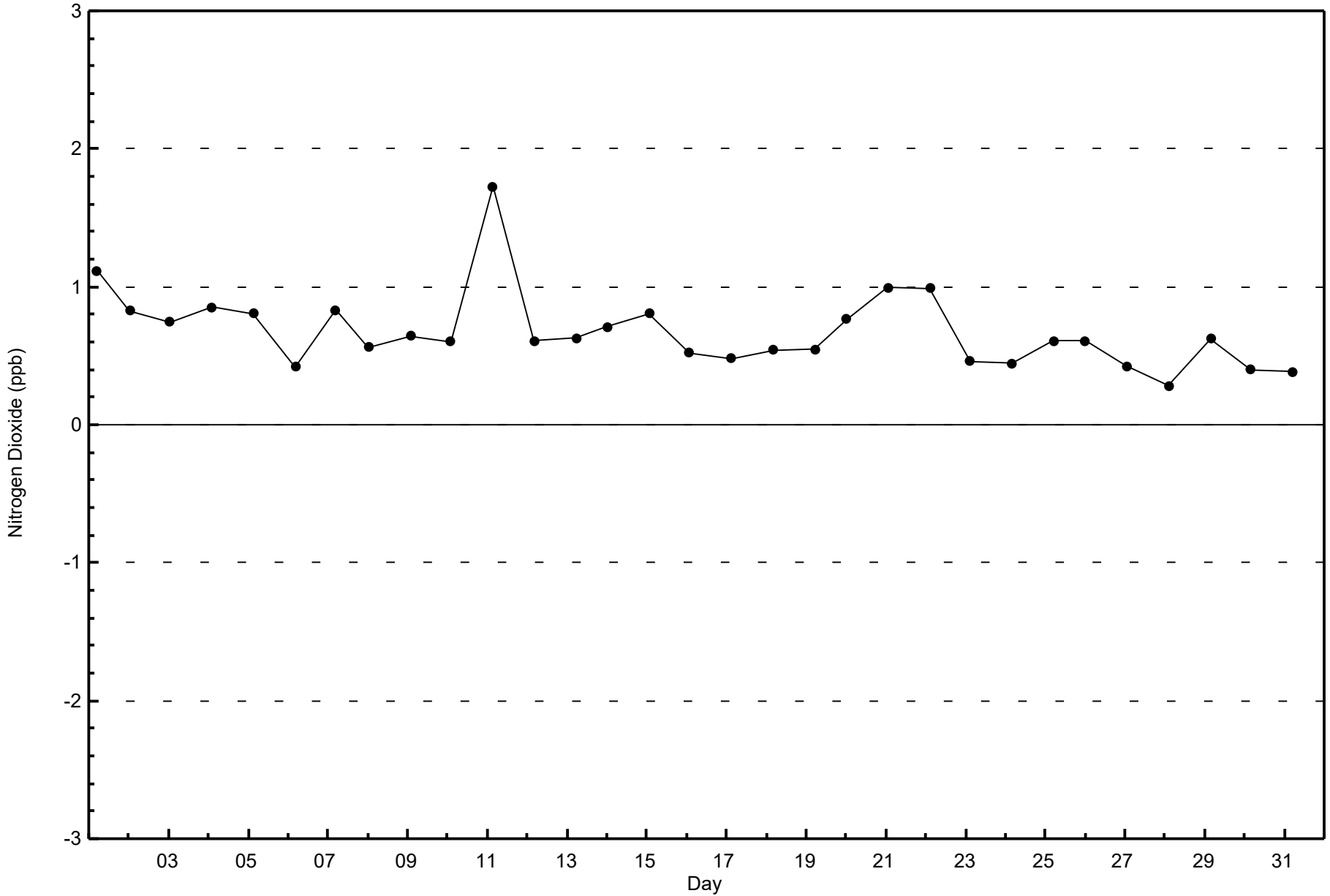
Total Number of Hours: 744

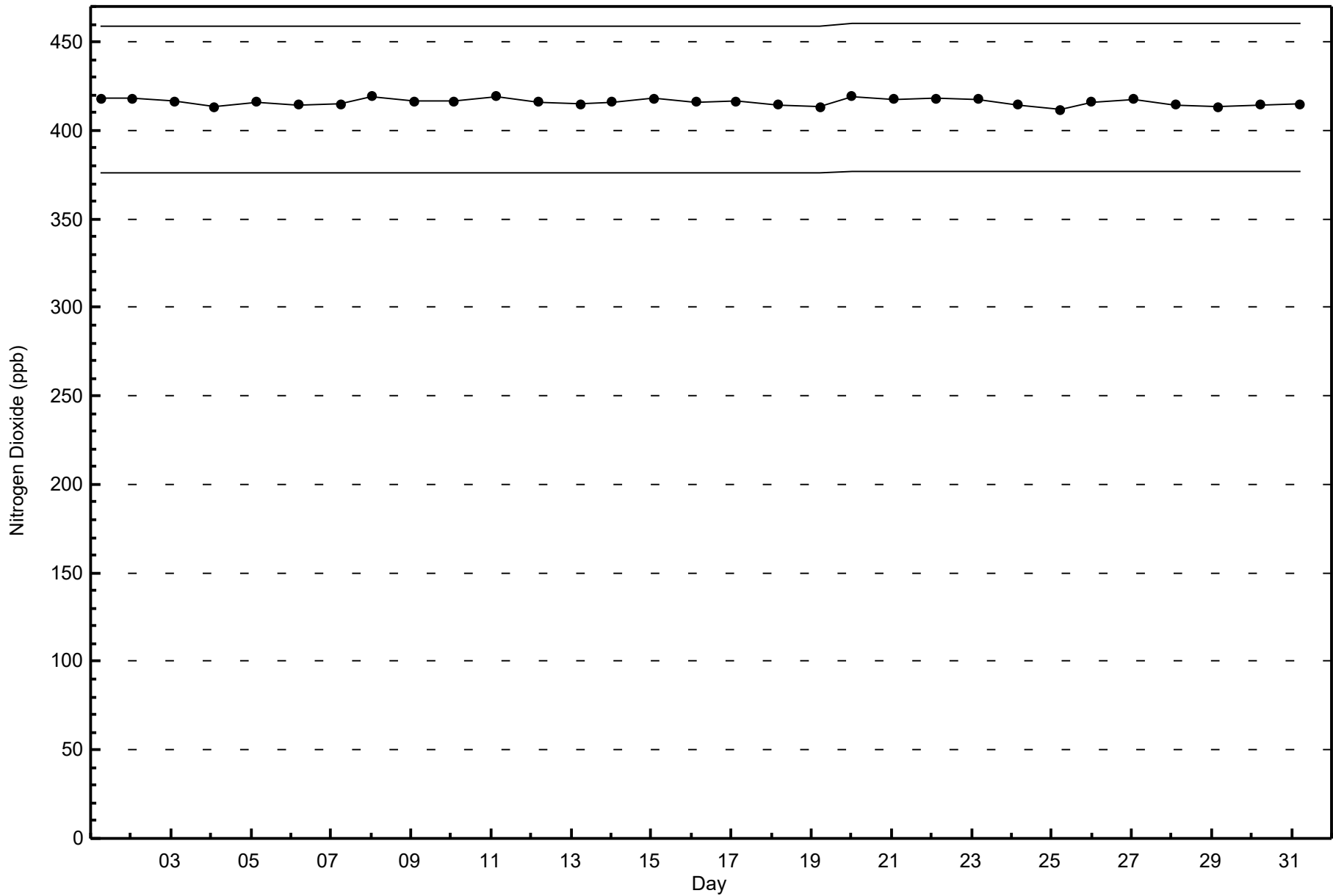


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Wapasu









Wood Buffalo Environmental Association
Summary of Hour Averages

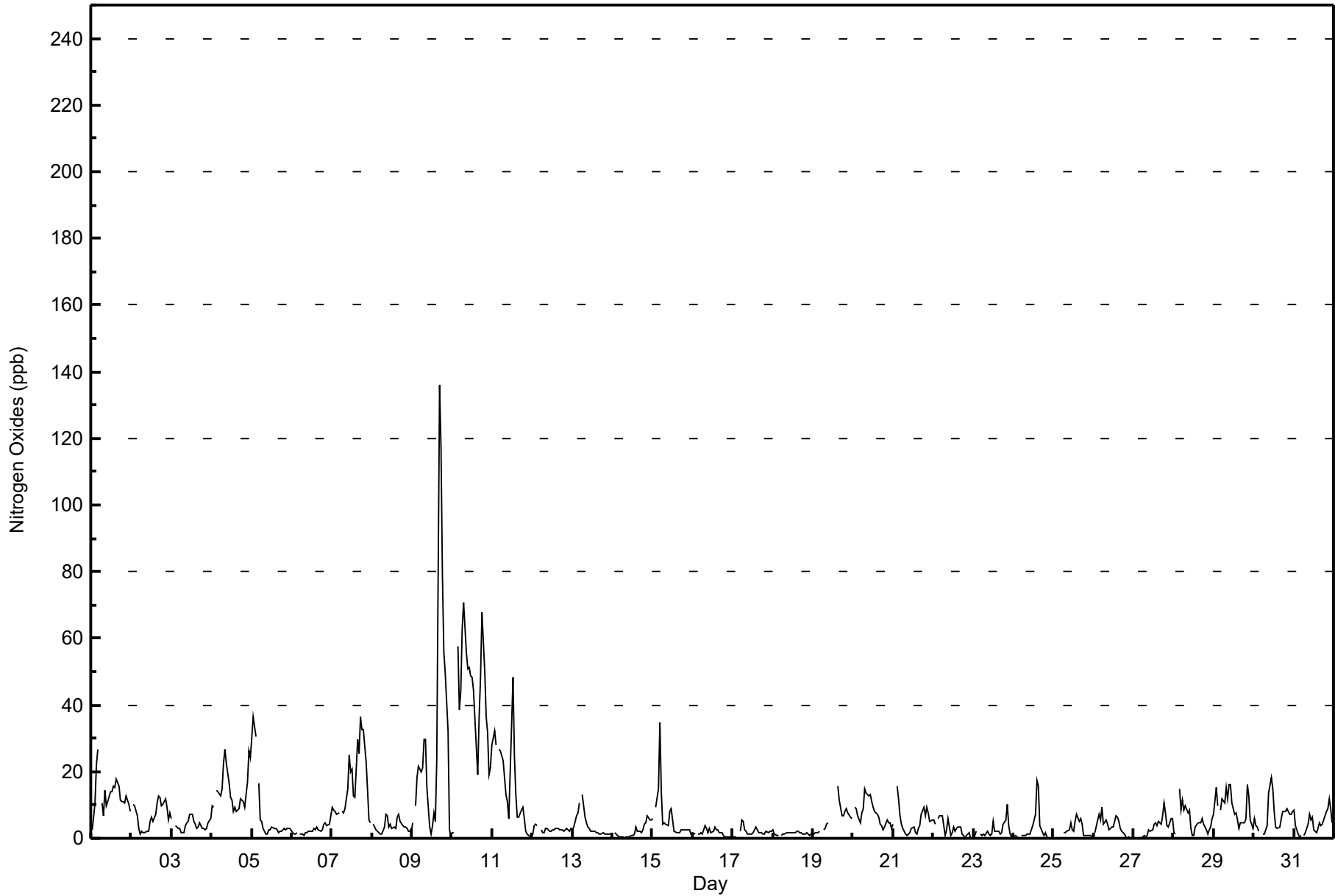
Nitrogen Oxides (NO_x) - ppb
Wapasu - January 2023

Maximum Value: 136.0 ppb on Jan 9 17:00 Maximum Daily Average: 40.6 ppb on Jan 10																					Hours in Service: 744 Hours of Data: 708					
Minimum Value: 0.0 ppb on Jan 22 23:00 Minimum Daily Average: 1.5 ppb on Jan 18 Maximum Diurnal Average: 10.7 ppb at hour 18 Minimum Diurnal Average: 4.6 ppb at hour 24 Monthly Average: 7.56 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 1.0 Q ₁ = 1.7 Median = 3.7 Q ₃ = 8.2 P ₉₀ = 16.2 P ₉₉ = 55.8																					Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.5	6.3	10.7	22.2	26.9	Z	10.5	6.9	14.4	9.9	11.0	14.0	13.9	15.5	15.3	17.9	15.5	11.6	11.1	11.2	10.7	12.7	10.1	7.9	12.5	26.9
2-Jan	Z	10.2	9.6	7.0	2.8	1.2	2.1	1.5	1.8	2.1	2.0	5.3	6.3	5.3	7.1	10.5	12.7	12.1	9.6	10.3	12.0	9.3	5.3	7.7	6.7	12.7
3-Jan	6.1	Z	3.7	3.3	3.1	2.8	1.5	1.8	3.7	4.6	5.2	7.1	7.3	5.1	4.4	3.1	3.5	4.7	3.0	1.1	2.6	2.8	4.7	5.9	4.0	7.3
4-Jan	9.6	9.3	Z	14.4	14.1	12.7	14.7	22.3	26.8	22.4	16.6	12.1	11.4	8.2	9.3	8.0	9.1	11.7	11.3	11.1	9.4	16.7	26.1	24.1	14.4	26.8
5-Jan	30.1	36.5	30.3	Z	16.5	5.4	5.1	3.0	1.3	1.5	2.6	2.7	3.2	2.8	2.8	2.5	1.7	2.2	2.3	2.9	2.7	2.9	2.9	3.1	7.3	36.5
6-Jan	1.9	1.4	1.5	1.7	Z	1.4	1.3	1.0	1.6	1.7	2.0	2.1	2.0	2.9	2.7	3.4	2.7	2.2	2.7	4.2	4.8	3.8	4.2	6.9	2.6	6.9
7-Jan	9.2	8.5	7.9	7.3	7.5	Z	7.9	7.7	8.9	14.6	25.2	19.9	20.9	12.6	12.1	29.7	25.3	36.3	32.7	32.7	22.9	14.6	5.6	4.8	16.3	36.3
8-Jan	Z	4.1	2.4	2.1	1.8	1.2	1.4	3.3	7.3	6.8	3.4	4.2	3.0	3.2	3.2	6.2	7.0	5.2	3.9	3.3	3.6	3.1	2.2	2.0	3.6	7.3
9-Jan	4.6	Z	9.9	18.2	21.6	20.1	21.3	29.6	29.7	15.2	3.2	1.3	3.9	7.8	5.2	23.4	136.0	117.3	79.1	55.8	49.5	32.1	2.7	1.0	29.9	136.0
10-Jan	1.5	1.6	Z	57.7	38.7	43.9	62.9	70.7	55.4	50.9	51.4	48.9	48.3	44.5	27.7	18.9	36.6	48.3	67.9	49.9	36.6	31.8	18.9	21.1	40.6	70.7
11-Jan	28.0	32.1	27.9	Z	26.7	26.4	23.4	18.0	13.1	11.1	5.8	19.9	48.5	24.7	13.2	6.2	6.3	8.5	9.2	5.8	1.9	1.2	0.6	0.6	15.6	48.5
12-Jan	1.1	3.9	4.1	3.6	Z	2.4	1.9	1.9	3.2	2.9	2.0	2.1	2.4	2.6	3.0	3.1	2.8	2.6	2.5	2.3	2.8	2.4	2.2	2.8	2.6	4.1
13-Jan	2.6	3.2	6.6	7.7	10.5	Z	13.3	6.2	4.5	3.6	2.8	2.3	2.3	2.1	1.5	1.7	1.1	1.3	1.5	1.1	1.2	1.3	1.1	1.1	3.5	13.3
14-Jan	Z	1.8	1.1	0.7	0.5	0.2	0.4	0.2	0.4	0.5	0.6	0.7	0.9	1.2	3.5	1.9	1.9	1.6	2.3	4.2	4.8	6.8	5.3	5.5	2.0	6.8
15-Jan	5.8	Z	9.2	14.9	34.6	14.1	4.1	4.6	4.2	3.8	8.2	8.8	5.4	2.1	1.7	1.6	1.7	2.4	2.5	2.5	2.5	2.5	2.5	1.4	6.1	34.6
16-Jan	1.5	1.3	Z	1.2	1.3	1.9	1.4	4.0	3.0	1.8	2.8	1.8	2.0	3.3	2.5	2.4	1.8	1.5	1.0	0.6	0.4	0.3	0.6	0.4	1.7	4.0
17-Jan	0.5	0.5	0.6	Z	2.1	5.4	4.9	2.5	2.0	1.4	1.2	1.1	1.7	2.7	3.4	1.9	1.7	1.7	1.4	1.3	2.1	1.7	2.1	2.0	2.0	5.4
18-Jan	2.7	1.3	0.7	0.8	Z	1.0	1.2	1.1	1.6	1.8	1.6	1.6	1.7	1.8	2.1	2.0	1.7	1.5	1.1	1.2	1.6	1.2	1.0	1.1	1.5	2.7
19-Jan	1.4	1.6	1.7	1.9	2.0	Z	2.4	3.1	4.0	4.6	C	C	C	C	C	15.6	11.3	6.7	6.9	8.2	8.8	7.6	6.3	6.1	5.6	15.6
20-Jan	Z	9.5	8.7	6.9	4.5	7.7	8.9	14.7	13.7	12.7	13.0	11.0	9.2	7.9	7.3	6.4	4.1	3.7	2.6	3.5	5.7	4.6	4.6	3.1	7.6	14.7
21-Jan	4.2	Z	15.8	12.0	6.7	4.2	2.8	1.4	1.0	1.4	1.9	2.9	3.5	1.7	1.5	2.8	3.8	7.1	9.4	6.8	9.2	7.7	5.2	5.5	5.2	15.8
22-Jan	5.7	4.1	Z	5.9	6.6	6.8	3.9	1.0	2.4	5.9	1.0	1.6	3.5	2.3	2.9	3.4	3.4	1.4	0.7	0.0	1.0	1.5	0.0	0.0	2.8	6.8
23-Jan	0.0	0.7	2.1	Z	1.1	1.0	1.4	0.8	1.9	1.4	1.0	1.3	4.9	2.2	2.0	1.9	1.5	1.7	4.2	5.5	10.2	3.9	1.3	0.2	2.3	10.2
24-Jan	0.6	0.8	0.2	0.3	Z	0.7	0.9	1.0	1.2	1.1	1.3	3.8	5.7	7.3	17.4	15.5	3.7	1.8	1.1	1.8	0.5	0.0	0.2	0.3	2.9	17.4
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	1.7	1.7	2.1	2.6	4.8	2.3	2.1	4.9	7.0	5.1	5.8	4.1	0.9	1.0	0.7	0.8	0.8	0.6	2.1	7.0
26-Jan	Z	1.9	5.7	7.1	5.6	9.2	4.2	5.6	4.2	2.5	2.8	3.3	3.2	6.7	6.2	5.2	3.1	2.0	1.2	0.5	0.1	0.3	0.0	0.0	3.5	9.2
27-Jan	0.0	Z	0.0	0.1	0.2	0.5	0.9	0.6	0.7	2.4	2.0	2.4	4.1	4.7	3.8	4.9	4.3	6.6	10.5	7.7	4.0	3.3	6.0	5.9	3.3	10.5
28-Jan	1.6	1.3	Z	14.8	8.3	11.6	8.7	9.9	7.6	8.5	2.8	0.9	0.9	3.4	4.6	4.5	4.7	5.9	4.1	2.5	1.4	2.4	3.2	6.1	5.2	14.8
29-Jan	7.4	15.1	9.8	Z	8.6	12.0	10.5	15.3	11.7	16.1	16.2	10.6	7.2	7.6	5.7	3.2	4.5	4.7	4.6	6.0	16.0	12.7	5.3	2.9	9.3	16.2
30-Jan	5.8	3.7	3.5	2.2	Z	1.2	1.5	2.6	3.9	13.4	18.2	14.7	8.1	3.3	3.1	3.6	5.8	8.2	8.0	8.0	8.8	7.4	7.3	8.1	6.5	18.2
31-Jan	8.4	3.8	1.2	0.6	0.6	Z	0.7	1.6	4.4	7.2	5.6	6.4	2.7	1.8	3.1	4.8	4.0	4.3	5.6	7.9	8.8	11.7	8.8	4.8	4.7	11.7
5.5 6.3 6.7 8.2 9.7 7.8 7.3 7.9 7.8 7.6 7.3 7.2 8.0 6.7 6.2 7.1 10.6 10.7 9.8 8.5 8.0 6.8 4.7 4.6																								Diurnal Average		
30.1 36.5 30.3 57.7 38.7 43.9 62.9 70.7 55.4 50.9 51.4 48.9 48.5 44.5 27.7 29.7 136.0 117.3 79.1 55.8 49.5 32.1 26.1 24.1																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Wapasu - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	651	91.95	91.95
21 - 40	38	5.37	97.32
41 - 80	17	2.40	99.72
81 - 159	2	0.28	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	38	17	18	11	11	16	44	175	153	57	21	4	9	8	6	60	648
21 - 40	5	1	1	1	2	0	2	10	4	2	2	1	0	0	3	3	37
11 - 80	5	1	0	0	0	0	0	0	1	0	1	0	0	1	1	7	17
81 - 159	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	19	19	12	13	16	46	185	158	59	24	5	9	9	11	70	704

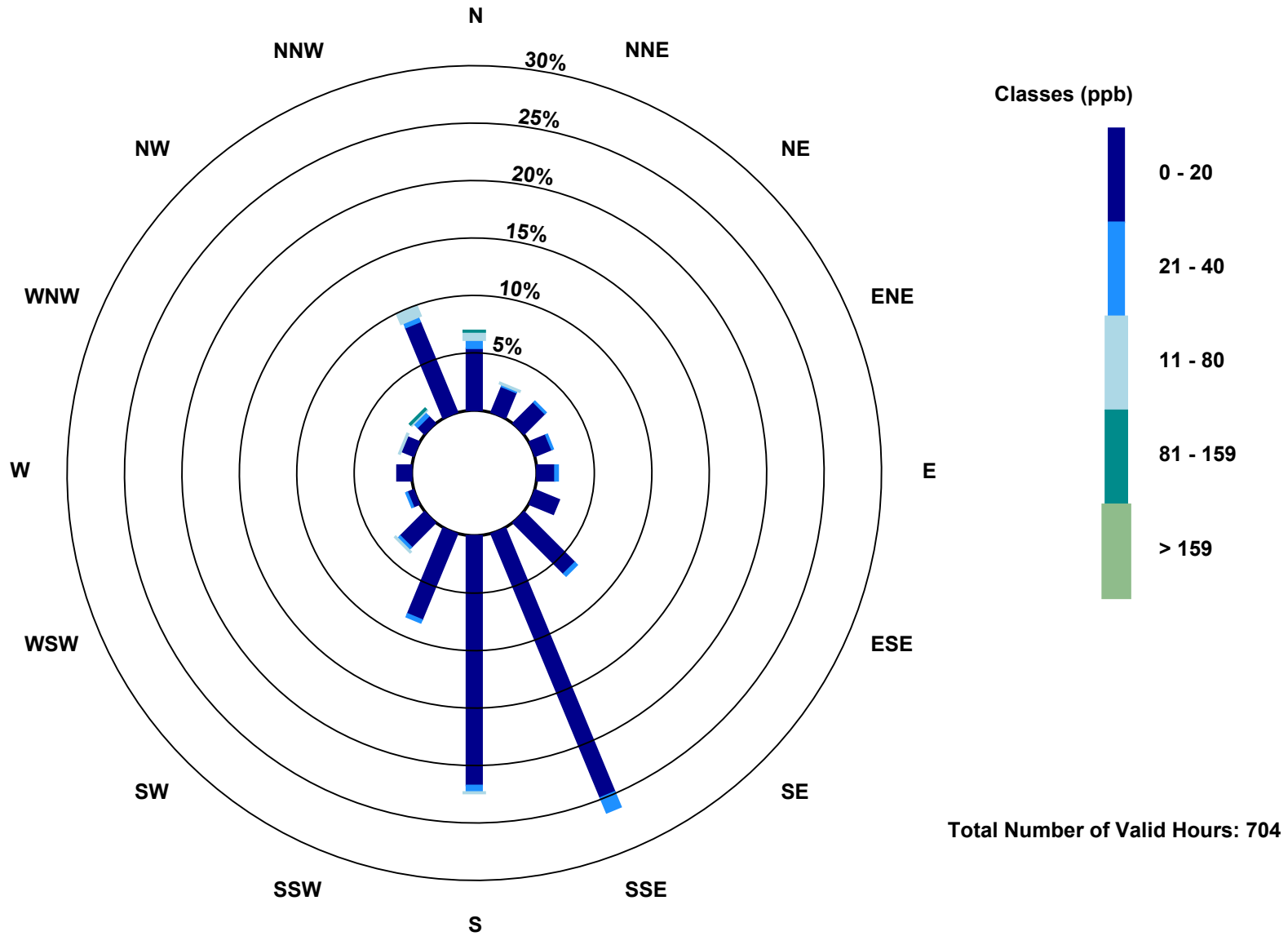
Total Number of Valid Hours: 704

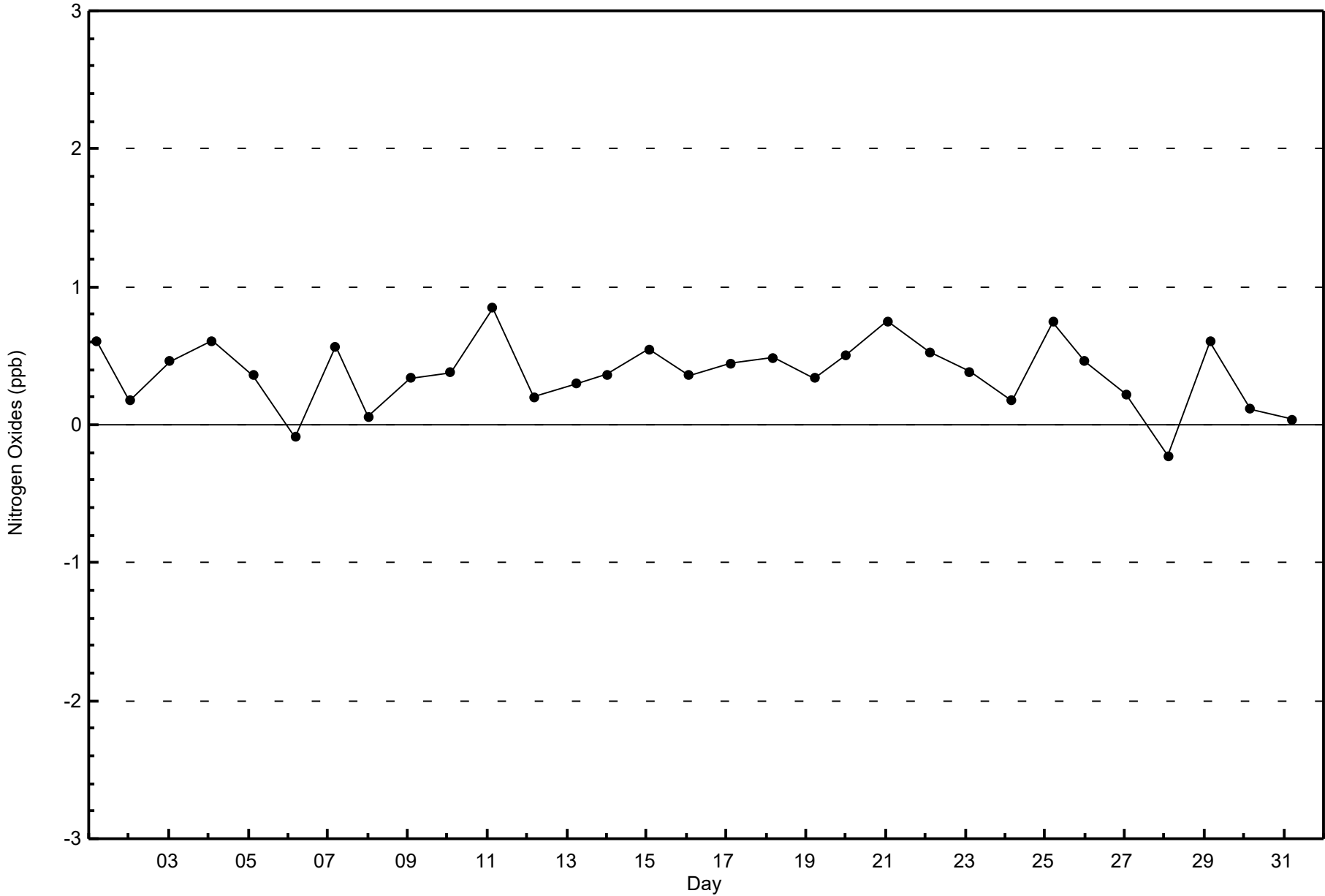
Total Number of Hours: 744

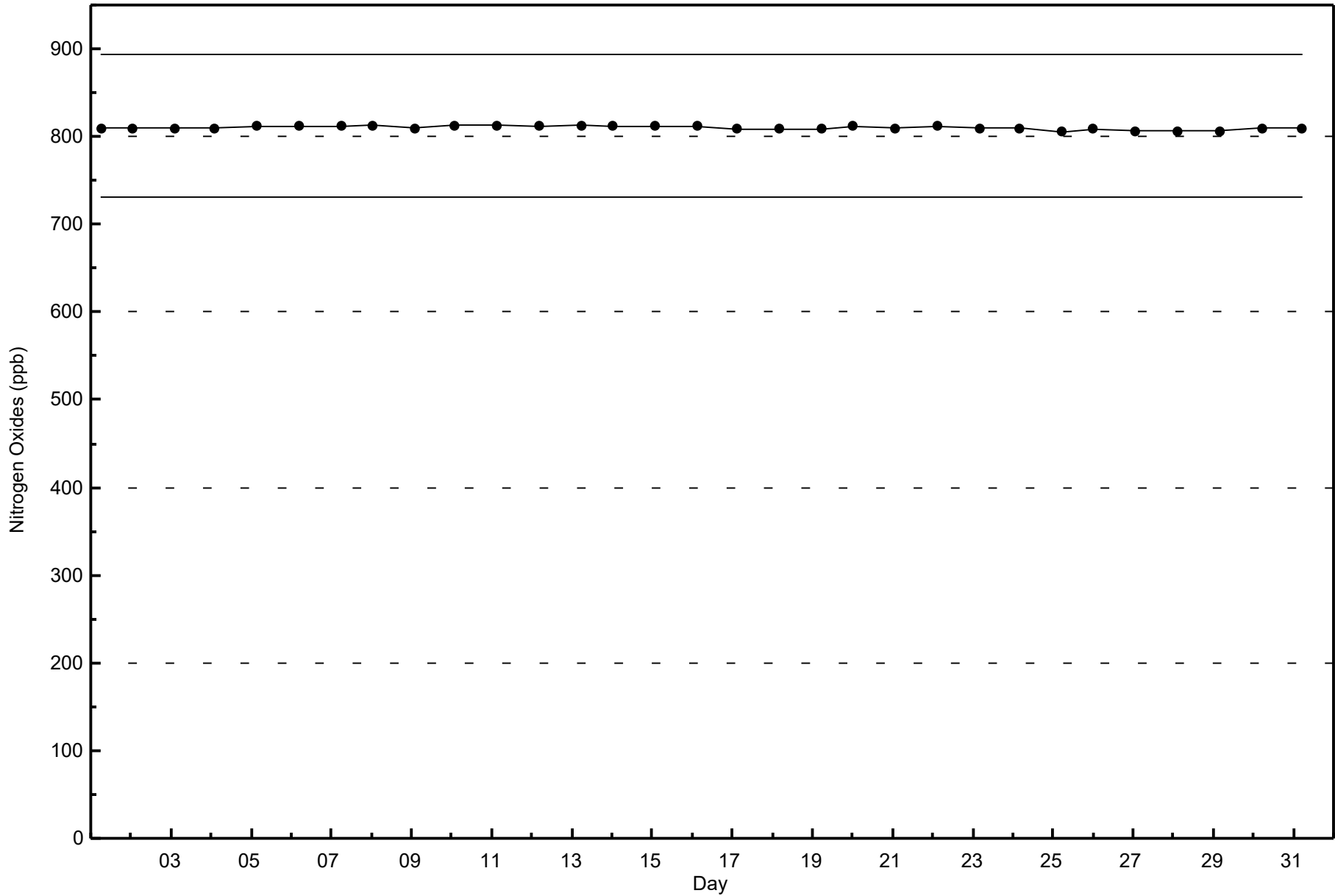


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Wapasu

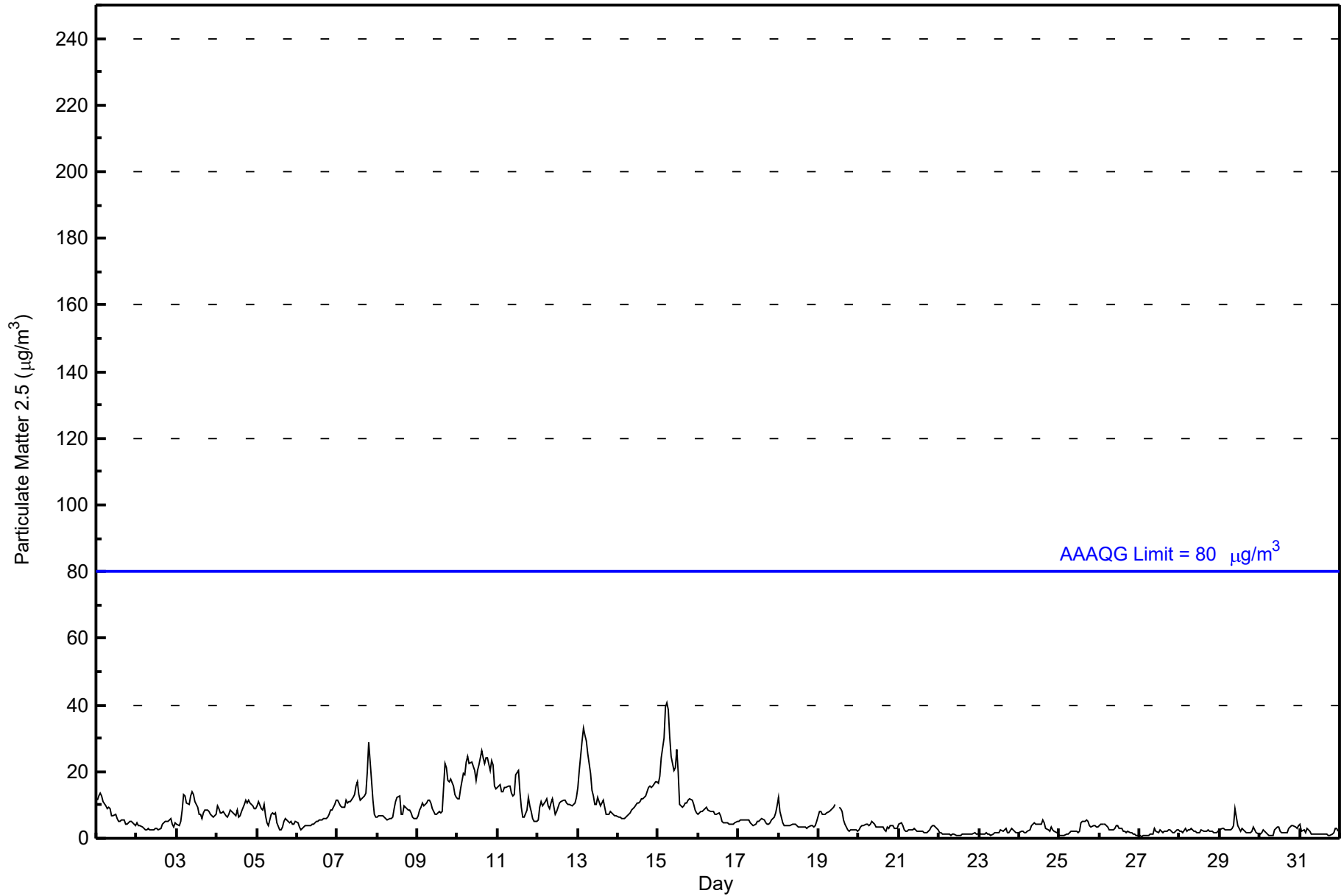








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 40.5 µg/m ³ on Jan 15 06:00		Maximum Daily Average: 20.4 µg/m ³ on Jan 10				Hours of Data:		743																																									
Minimum Value: 0.6 µg/m ³ on Jan 27 02:00		Minimum Daily Average: 1.3 µg/m ³ on Jan 22				Hours of Missing Data:		1																																									
Maximum Diurnal Average: 8.0 µg/m ³ at hour 6		Minimum Diurnal Average: 5.6 µg/m ³ at hour 23				Hours of Calibration:		1																																									
Monthly Average: 6.79 µg/m ³		Percentiles: P ₁ = 0.8 P ₁₀ = 1.6 Q ₁ = 2.5 Median = 4.8 Q ₃ = 9.3 P ₉₀ = 13.7 P ₉₉ = 29.4				Percent Operational Time:		100.0																																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	11.5	12.5	13.6	12.9	10.8	9.8	8.8	9.3	8.8	6.8	6.7	7.3	5.8	5.2	4.9	5.4	5.5	4.4	4.0	4.7	5.1	5.3	4.3	4.0	7.4	13.6																							
2-Jan	4.6	3.7	3.8	3.5	2.8	2.5	2.7	2.9	2.7	2.5	2.4	3.1	2.8	2.6	2.8	4.0	4.8	5.2	5.1	5.2	5.9	4.0	3.6	4.6	3.7	5.9																							
3-Jan	4.0	3.8	5.2	8.4	12.9	12.6	10.6	10.2	12.6	13.8	13.0	11.1	9.4	7.4	7.0	5.8	7.7	8.5	8.7	8.2	7.2	6.7	6.4	7.0	8.7	13.8																							
4-Jan	9.8	8.7	7.4	7.6	7.9	6.7	6.3	7.1	8.6	8.0	7.3	6.7	8.3	6.4	6.7	7.9	10.3	11.3	10.5	11.4	10.4	9.8	9.0	8.7	8.4	11.4																							
5-Jan	9.6	11.0	9.0	8.5	10.1	6.9	4.6	3.9	7.1	7.6	7.2	7.4	4.5	2.7	2.5	3.2	4.9	6.1	5.6	4.8	5.1	4.3	4.4	4.9	6.1	11.0																							
6-Jan	4.6	3.3	2.6	3.1	3.5	3.6	3.7	3.8	4.0	4.2	4.4	4.9	5.3	5.6	5.7	5.7	5.8	6.3	7.3	8.4	8.7	10.0	11.3	5.5	11.3																								
7-Jan	11.5	10.7	9.7	9.4	9.2	11.3	10.7	11.1	11.0	12.1	13.2	15.5	17.1	13.0	11.6	12.5	12.6	13.7	19.8	28.8	17.4	11.5	7.3	6.5	12.8	28.8																							
8-Jan	6.4	6.7	6.8	6.8	6.3	6.0	5.7	6.0	5.9	6.4	9.1	11.0	12.5	12.8	7.4	7.0	9.6	9.2	8.6	8.4	7.8	6.5	6.0	6.1	7.7	12.8																							
9-Jan	6.6	8.5	9.3	10.5	9.9	10.5	11.4	11.6	10.7	8.7	7.3	7.0	7.7	8.0	7.5	8.3	22.3	21.1	17.3	16.8	17.7	15.7	13.2	12.3	11.7	22.3																							
10-Jan	11.9	11.9	15.0	19.6	19.1	22.8	24.6	22.4	22.8	21.5	20.2	17.4	20.3	22.1	26.1	24.0	22.5	24.3	24.0	20.3	23.1	22.2	15.8	14.6	20.4	26.1																							
11-Jan	15.4	15.9	14.1	14.1	15.2	15.2	15.7	15.6	13.7	12.8	13.1	19.2	20.2	13.9	9.3	6.3	6.2	8.3	12.2	9.9	7.9	6.0	5.1	5.0	12.1	20.2																							
12-Jan	5.5	9.1	10.8	9.6	11.1	11.9	10.0	8.9	10.5	11.8	7.3	8.0	9.5	10.5	11.2	11.4	11.3	10.7	10.1	10.2	9.8	10.4	10.6	12.3	10.1	12.3																							
13-Jan	15.2	20.5	29.4	33.2	30.9	29.3	25.6	19.3	14.2	12.8	10.2	10.3	12.2	9.9	10.4	11.6	9.5	7.4	7.2	8.0	7.4	7.4	6.9	6.7	14.8	33.2																							
14-Jan	6.6	6.3	6.1	6.0	6.0	6.6	7.1	7.5	8.5	8.8	9.4	10.5	10.8	11.1	11.7	11.9	12.9	14.1	15.2	15.9	15.1	15.6	16.9	16.9	10.7	16.9																							
15-Jan	16.4	18.6	24.1	30.2	39.5	40.5	38.6	30.7	24.5	20.2	21.3	26.5	20.1	10.3	9.3	9.7	10.5	10.7	11.5	11.9	11.5	10.2	8.6	7.6	19.3	40.5																							
16-Jan	7.1	7.9	8.2	8.7	9.1	9.2	8.5	8.0	8.1	7.9	7.3	7.4	7.8	6.7	5.3	4.7	4.5	4.7	4.4	4.1	4.2	4.3	4.7	5.1	6.6	9.2																							
17-Jan	5.3	5.4	5.5	5.5	5.6	5.6	5.3	4.8	4.4	3.9	4.1	4.9	5.0	5.3	5.8	5.3	4.5	4.3	4.4	4.8	5.4	6.3	7.7	9.8	5.4	9.8																							
18-Jan	12.4	8.2	4.7	3.8	3.7	3.8	3.8	3.8	4.2	4.3	4.1	3.6	3.3	3.2	3.5	3.6	3.5	3.1	3.3	3.7	3.7	3.6	3.7	5.2	4.3	12.4																							
19-Jan	8.0	8.2	7.3	7.3	7.4	7.7	8.1	8.5	8.9	9.3	10.0	C	9.3	9.0	8.0	5.5	4.0	2.7	2.2	2.5	2.4	2.5	2.5	2.0	6.2	10.0																							
20-Jan	2.6	3.6	3.8	3.8	4.1	4.3	3.7	4.2	4.9	4.1	3.5	3.2	3.3	3.5	3.5	2.4	2.3	3.5	3.1	3.7	3.8	3.0	2.8	3.0	3.5	4.9																							
21-Jan	4.1	4.6	4.0	2.7	2.0	2.2	2.4	2.4	2.7	3.1	2.7	2.2	2.1	2.0	2.0	1.9	1.6	1.8	2.4	3.5	3.8	4.0	3.4	2.5	2.8	4.6																							
22-Jan	1.8	1.7	1.4	1.4	1.3	1.4	1.4	0.9	1.1	1.2	0.9	0.8	0.9	0.9	1.1	1.2	1.2	1.3	1.4	1.2	1.4	1.5	1.4	1.4	1.3	1.8																							
23-Jan	1.5	1.4	1.5	1.5	1.6	1.3	1.1	1.0	1.5	1.6	1.8	1.9	1.8	2.4	2.2	2.6	3.0	1.8	1.7	2.8	2.5	2.2	1.7	1.7	1.8	3.0																							
24-Jan	1.8	2.2	1.9	1.8	1.8	2.0	2.7	3.7	4.0	4.6	4.4	4.1	4.1	4.3	5.5	4.8	3.0	2.6	2.1	3.3	2.7	1.9	1.8	1.4	3.0	5.5																							
25-Jan	1.0	1.0	0.9	1.0	1.1	1.1	1.6	2.0	2.2	2.1	2.1	1.8	2.2	4.6	5.1	5.0	5.4	4.9	3.9	3.6	3.7	3.6	3.5	3.4	2.8	5.4																							
26-Jan	3.7	4.0	4.2	4.4	3.6	3.5	2.7	2.4	2.6	3.2	3.8	3.9	3.2	2.8	2.1	1.9	1.8	2.3	1.8	1.8	1.4	1.1	0.8	0.8	2.7	4.4																							
27-Jan	0.8	0.6	0.7	0.7	0.8	1.1	1.3	1.3	1.3	2.8	2.0	1.8	2.7	1.9	1.6	2.2	2.1	2.4	2.4	2.1	1.7	1.7	2.6	2.6	1.7	2.8																							
28-Jan	2.3	1.9	1.9	2.9	2.2	2.7	2.6	2.8	2.0	2.0	1.7	1.9	1.7	2.4	2.2	2.0	1.9	2.6	2.0	2.2	1.8	1.8	1.8	2.3	2.2	2.9																							
29-Jan	2.5	3.1	2.8	2.6	2.5	2.5	2.4	2.8	3.9	8.7	6.3	3.7	1.9	3.1	2.6	1.9	1.6	1.5	1.6	2.2	3.2	2.7	1.5	1.2	2.9	8.7																							
30-Jan	1.3	1.6	2.5	1.9	1.3	1.0	0.8	0.7	0.8	2.7	3.5	3.4	2.2	1.7	1.6	1.6	1.8	2.9	3.5	3.7	3.8	3.2	3.1	3.7	2.3	3.8																							
31-Jan	4.3	2.1	2.5	1.9	2.8	2.6	2.1	1.5	1.3	1.4	1.3	1.3	1.2	1.1	1.2	1.4	1.2	1.0	1.0	1.4	1.7	2.8	2.8	2.1	1.8	4.3																							
																								6.5	6.7	7.1	7.6	8.0	8.0	7.6	7.1	7.1	7.1	6.8	7.1	7.1	6.3	6.0	5.9	6.5	6.6	6.7	7.0	6.7	6.1	5.6	5.7	Diurnal Average	
																								16.4	20.5	29.4	33.2	39.5	40.5	38.6	30.7	24.5	21.5	21.3	26.5	20.3	22.1	26.1	24.0	22.5	24.3	24.0	28.8	23.1	22.2	16.9	16.9	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Wapasu - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	407	54.78	54.78
6 - 15	276	37.15	91.92
16 - 25	47	6.33	98.25
26 - 80	13	1.75	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Wapasu - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	37	15	9	4	5	2	25	93	80	38	21	5	8	8	5	52	407
6 - 15	2	2	7	5	8	12	21	95	82	24	2	1	3	1	2	7	274
16 - 25	7	1	3	1	0	3	1	4	5	1	2	0	0	1	5	11	45
26 - 80	5	2	1	2	0	0	1	1	0	0	0	0	0	0	0	1	13
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	51	20	20	12	13	17	48	193	167	63	25	6	11	10	12	71	739

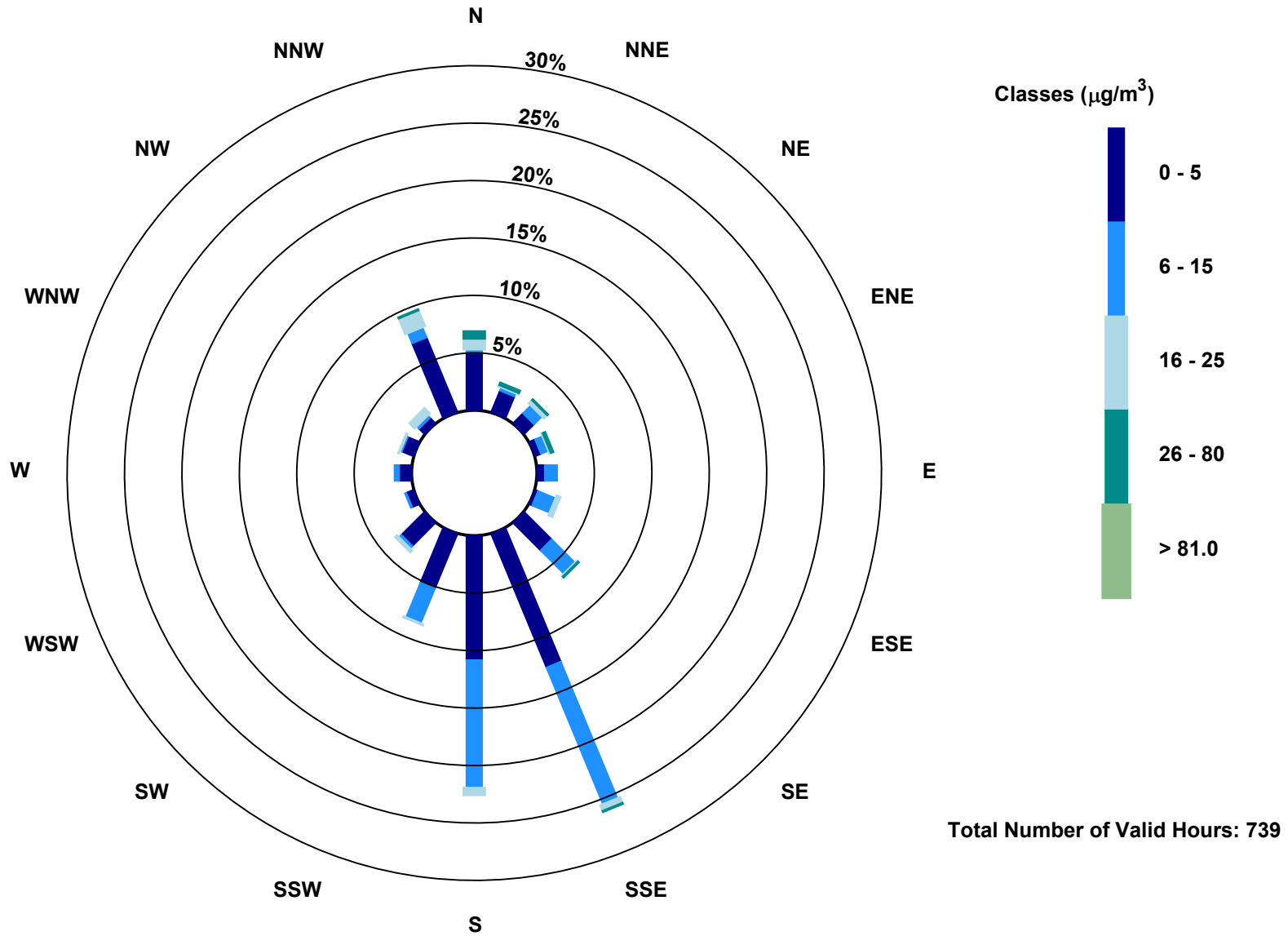
Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

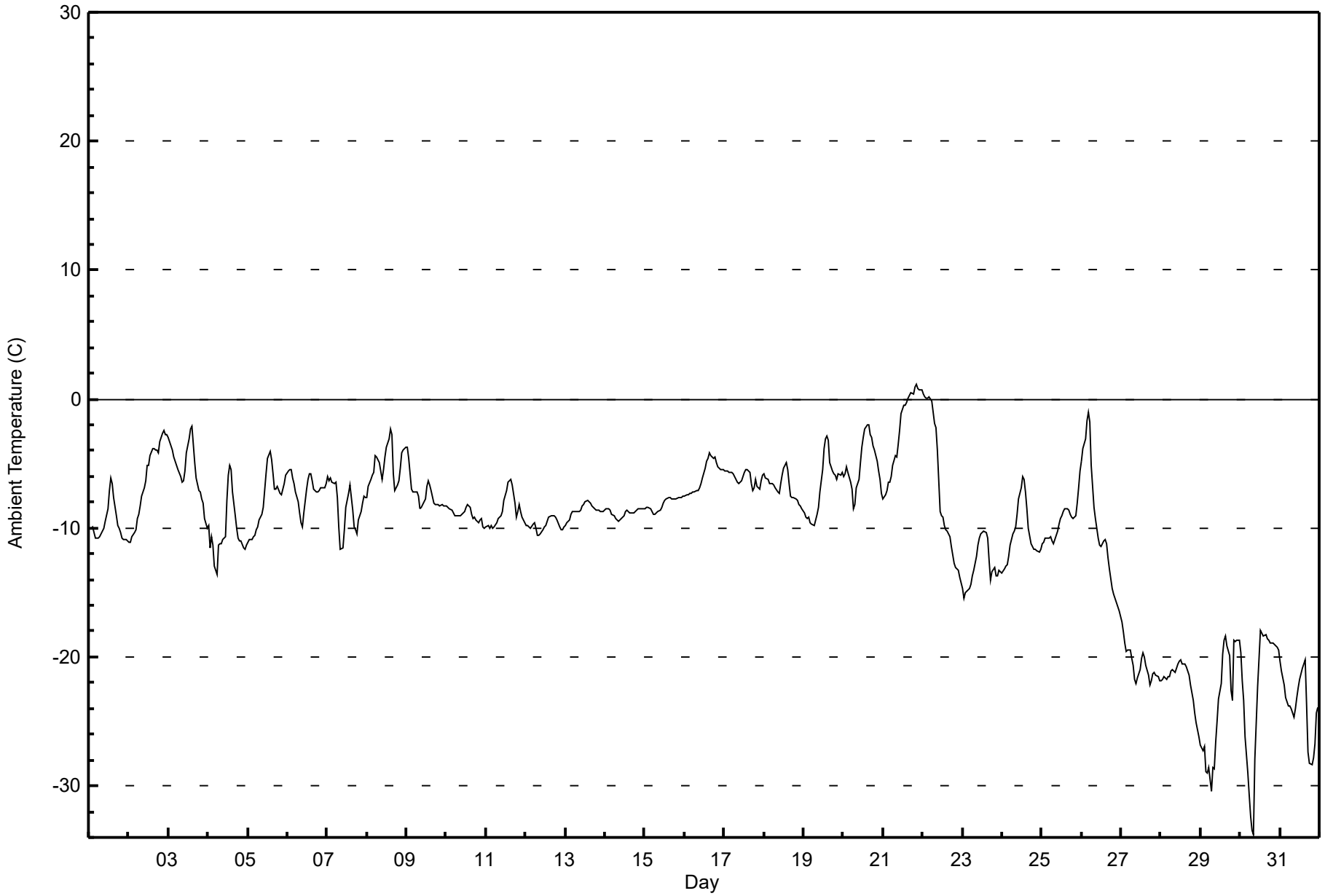
Ambient Temperature (AT) - C
Wapasu - January 2023

Maximum Value: 1.2 C on Jan 21 21:00 Maximum Daily Average: -2.4 C on Jan 21																						Hours in Service:	744			
Minimum Value: -33.8 C on Jan 30 09:00 Minimum Daily Average: -23.7 C on Jan 31																						Hours of Data:	744			
Maximum Diurnal Average: -8.3 C at hour 15 Minimum Diurnal Average: -11.3 C at hour 9																						Hours of Missing Data:	0			
Monthly Average: -10.18 C Percentiles: P ₁ = -28.8 P ₁₀ = -20.9 Q ₁ = -11.1 Median = -8.7 Q ₃ = -6.4 P ₉₀ = -4.5 P ₉₉ = 0.3																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.0	-10.1	-10.0	-10.4	-10.8	-10.8	-10.7	-10.4	-10.3	-10.0	-9.5	-8.5	-7.1	-6.2	-6.6	-7.6	-9.0	-9.8	-10.0	-10.4	-10.8	-10.9	-10.9	-11.0	-9.7	-6.2
2-Jan	-11.1	-11.1	-10.6	-10.4	-10.1	-9.3	-8.9	-8.3	-7.5	-6.9	-6.3	-5.1	-5.1	-4.4	-3.9	-3.8	-4.0	-3.9	-4.2	-3.3	-2.7	-2.5	-2.8	-2.8	-6.2	-2.5
3-Jan	-3.0	-3.7	-4.0	-4.5	-4.8	-5.1	-5.5	-6.0	-6.4	-6.4	-5.6	-4.2	-3.1	-2.3	-2.1	-3.5	-4.9	-6.1	-7.0	-7.2	-7.8	-8.1	-9.3	-10.0	-5.4	-2.1
4-Jan	-9.9	-11.6	-10.7	-11.3	-12.9	-13.6	-11.3	-11.2	-10.9	-10.6	-7.8	-5.9	-5.1	-5.5	-7.2	-9.0	-10.1	-10.8	-11.0	-11.1	-11.5	-11.7	-11.3	-10.1	-10.1	-5.1
5-Jan	-11.1	-10.9	-10.8	-10.7	-10.6	-10.1	-9.9	-9.4	-9.0	-8.4	-7.2	-5.8	-4.6	-4.0	-4.7	-5.8	-7.0	-7.0	-6.7	-7.4	-7.4	-7.0	-6.5	-5.9	-7.8	-4.0
6-Jan	-5.6	-5.4	-5.5	-6.1	-6.5	-7.2	-8.0	-8.8	-9.5	-9.9	-8.8	-7.0	-6.2	-5.8	-5.7	-6.3	-7.0	-7.2	-7.2	-7.1	-6.9	-6.9	-6.9	-6.6	-7.0	-5.4
7-Jan	-6.1	-6.3	-6.1	-6.4	-6.5	-6.5	-7.7	-9.9	-11.7	-11.6	-10.1	-8.4	-7.9	-7.3	-6.7	-8.6	-9.9	-10.1	-10.4	-9.3	-8.7	-8.1	-7.6	-7.6	-8.3	-6.1
8-Jan	-7.7	-6.8	-6.2	-5.9	-5.7	-4.4	-4.5	-4.9	-5.6	-6.2	-5.5	-4.5	-3.7	-3.1	-2.3	-2.8	-5.8	-7.1	-6.7	-6.3	-5.4	-4.2	-4.0	-3.8	-5.1	-2.3
9-Jan	-3.8	-4.6	-5.8	-7.0	-7.2	-7.2	-7.3	-7.5	-8.5	-8.4	-8.0	-7.7	-6.8	-6.3	-6.7	-7.1	-8.1	-8.1	-8.2	-8.2	-8.3	-8.2	-8.2	-8.3	-7.3	-3.8
10-Jan	-8.3	-8.4	-8.5	-8.6	-8.8	-9.0	-9.1	-9.1	-9.1	-9.0	-8.9	-8.7	-8.4	-8.2	-8.4	-8.9	-9.2	-9.2	-9.4	-9.6	-9.4	-9.3	-9.9	-10.1	-9.0	-8.2
11-Jan	-9.9	-9.9	-10.0	-9.8	-10.0	-9.9	-9.6	-9.3	-9.1	-9.1	-8.7	-7.8	-7.1	-6.5	-6.3	-6.2	-6.7	-8.1	-9.2	-8.7	-8.2	-8.7	-9.1	-9.6	-8.7	-6.2
12-Jan	-9.8	-9.8	-10.0	-10.1	-9.7	-9.6	-10.1	-10.6	-10.6	-10.5	-10.2	-9.9	-9.8	-9.5	-9.2	-9.0	-9.0	-9.0	-9.1	-9.4	-9.9	-10.2	-10.1	-10.0	-9.8	-9.0
13-Jan	-9.8	-9.6	-9.4	-9.0	-8.8	-8.8	-8.7	-8.7	-8.7	-8.6	-8.3	-8.1	-7.9	-7.8	-8.0	-8.1	-8.3	-8.5	-8.6	-8.6	-8.6	-8.7	-8.7	-8.7	-8.6	-7.8
14-Jan	-8.6	-8.5	-8.5	-8.7	-9.0	-9.1	-9.3	-9.3	-9.4	-9.4	-9.2	-9.0	-8.7	-8.6	-8.7	-8.8	-8.8	-8.8	-8.7	-8.6	-8.5	-8.5	-8.5	-8.5	-8.8	-8.5
15-Jan	-8.5	-8.4	-8.4	-8.5	-8.7	-8.9	-8.9	-8.8	-8.8	-8.6	-8.4	-8.0	-7.8	-7.7	-7.7	-7.7	-7.7	-7.8	-7.8	-7.8	-7.7	-7.6	-7.6	-7.6	-8.1	-7.6
16-Jan	-7.5	-7.4	-7.4	-7.4	-7.3	-7.3	-7.2	-7.1	-7.1	-6.9	-6.5	-6.1	-5.4	-4.9	-4.6	-4.2	-4.4	-4.6	-4.5	-4.9	-5.2	-5.4	-5.5	-5.5	-6.0	-4.2
17-Jan	-5.5	-5.6	-5.6	-5.7	-5.7	-5.8	-6.0	-6.2	-6.5	-6.6	-6.3	-6.0	-5.7	-5.5	-5.5	-5.7	-6.6	-7.0	-6.9	-6.2	-6.8	-6.9	-6.4	-5.9	-6.1	-5.5
18-Jan	-5.8	-6.2	-6.2	-6.5	-6.5	-6.5	-6.7	-6.9	-7.2	-7.3	-6.6	-5.9	-5.4	-5.0	-5.5	-6.5	-7.6	-7.7	-7.6	-7.7	-7.9	-8.2	-8.3	-8.6	-6.8	-5.0
19-Jan	-8.8	-9.2	-9.2	-9.1	-9.6	-9.7	-9.8	-9.4	-9.0	-8.4	-7.2	-5.4	-3.9	-3.0	-2.8	-3.2	-4.9	-5.6	-5.8	-5.9	-6.3	-5.8	-5.9	-5.6	-6.8	-2.8
20-Jan	-6.0	-5.8	-5.2	-5.7	-6.4	-7.0	-8.5	-8.2	-6.9	-6.2	-4.9	-3.8	-3.0	-2.4	-2.0	-2.0	-2.8	-3.0	-3.7	-4.0	-4.9	-5.6	-6.2	-7.3	-5.1	-2.0
21-Jan	-7.8	-7.4	-7.1	-6.5	-6.4	-6.0	-5.2	-4.4	-4.5	-3.5	-2.4	-1.1	-0.5	-0.5	-0.3	0.0	0.3	0.5	0.4	0.9	1.2	0.9	0.7	0.7	-2.4	1.2
22-Jan	0.4	0.2	0.1	0.1	0.2	-0.1	-1.0	-1.9	-2.3	-3.9	-8.7	-9.1	-9.2	-9.8	-10.1	-10.3	-10.6	-11.4	-12.1	-12.8	-13.1	-13.3	-13.8	-14.2	-7.0	0.4
23-Jan	-14.7	-15.4	-15.0	-14.7	-14.7	-14.4	-13.7	-13.2	-12.2	-11.4	-10.8	-10.4	-10.3	-10.2	-10.3	-10.8	-12.6	-14.1	-13.4	-13.1	-13.7	-13.7	-13.3	-13.4	-12.9	-10.2
24-Jan	-13.5	-13.1	-12.9	-12.8	-12.2	-11.3	-10.5	-10.2	-9.9	-8.9	-7.7	-6.9	-6.0	-6.2	-7.3	-8.5	-10.0	-11.3	-11.4	-11.6	-11.6	-11.8	-11.9	-11.6	-10.4	-6.0
25-Jan	-11.3	-11.1	-10.8	-10.8	-10.7	-10.7	-11.0	-11.3	-10.9	-10.3	-9.7	-9.2	-9.0	-8.7	-8.5	-8.5	-8.7	-8.9	-9.1	-9.3	-9.1	-8.1	-6.9	-5.6	-9.5	-5.6
26-Jan	-4.8	-3.8	-3.1	-1.6	-1.0	-1.8	-5.1	-8.4	-9.3	-10.0	-10.8	-11.4	-11.4	-11.1	-10.9	-11.3	-12.3	-13.1	-14.7	-15.1	-15.4	-15.8	-16.2	-16.4	-9.8	-1.0
27-Jan	-17.3	-18.1	-18.9	-19.5	-19.5	-19.4	-20.1	-20.7	-21.7	-22.0	-21.7	-20.9	-20.1	-19.7	-20.0	-20.6	-21.4	-22.2	-21.8	-21.3	-21.2	-21.4	-21.6	-21.8	-20.5	-17.3
28-Jan	-21.8	-21.7	-21.6	-21.8	-21.5	-21.5	-21.1	-21.0	-21.2	-20.9	-20.5	-20.3	-20.3	-20.6	-20.6	-20.7	-21.1	-21.4	-22.2	-23.4	-24.4	-25.1	-25.6	-26.2	-21.9	-20.3
29-Jan	-26.9	-27.3	-27.0	-28.9	-29.0	-28.6	-30.4	-28.6	-28.7	-26.6	-25.0	-23.3	-22.1	-19.8	-18.7	-18.4	-19.2	-19.9	-22.6	-23.4	-18.7	-18.8	-18.7	-18.7	-23.7	-18.4
30-Jan	-19.6	-21.9	-23.4	-26.2	-29.1	-30.7	-32.4	-33.5	-33.8	-27.9	-22.2	-20.1	-17.9	-18.2	-18.4	-18.2	-18.6	-18.8	-18.9	-18.9	-18.9	-19.1	-19.2	-19.5	-22.7	-17.9
31-Jan	-20.3	-21.1	-22.2	-23.1	-23.5	-23.8	-23.8	-24.1	-24.7	-24.0	-23.1	-22.4	-21.7	-20.9	-20.5	-20.3	-23.6	-27.3	-28.3	-28.4	-27.8	-26.8	-24.4	-23.9	-23.7	-20.3
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Wapasu - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	91	12.23	12.23
-20 - 0	639	85.89	98.12
0 - 10	14	1.88	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

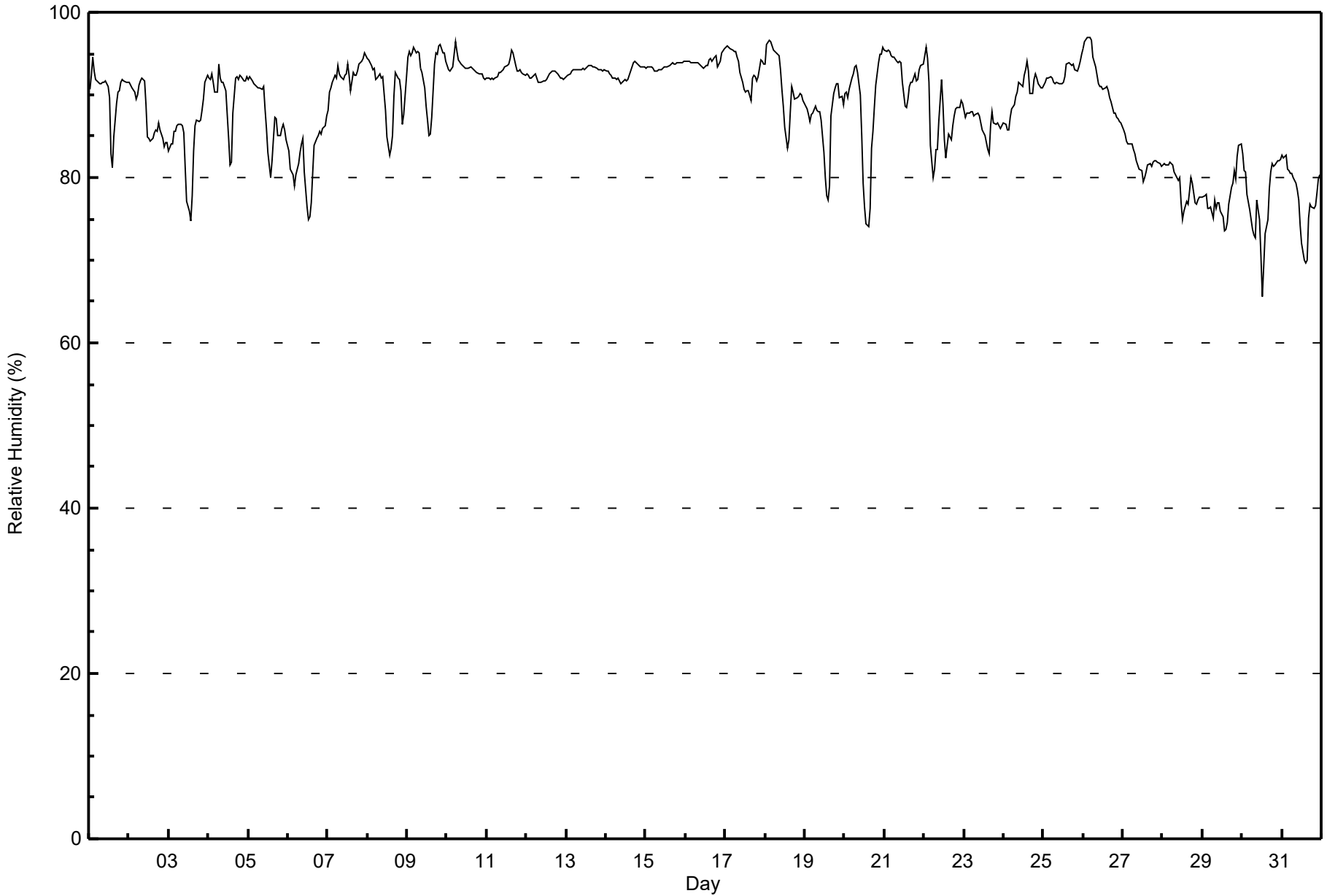
Relative Humidity (RH) - %
Wapasu - January 2023

Maximum Value: 96.9 % on Jan 26 03:00 Maximum Daily Average: 94.0 % on Jan 16																						Hours in Service: 744 Hours of Data: 744					
Minimum Value: 65.5 % on Jan 30 13:00 Minimum Daily Average: 77.0 % on Jan 30 Maximum Diurnal Average: 90.1 % at hour 2 Minimum Diurnal Average: 84.4 % at hour 14 Monthly Average: 88.51 % Percentiles: P ₁ = 72.9 P ₁₀ = 79.3 Q ₁ = 84.8 Median = 91.2 Q ₃ = 93.0 P ₉₀ = 94.1 P ₉₉ = 96.3																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	90.6	92.3	94.5	92.9	91.9	91.5	91.4	91.4	91.5	91.6	91.7	91.0	89.7	82.9	81.1	85.0	89.0	90.4	90.6	91.5	91.9	91.7	91.6	91.5	90.4	94.5	
2-Jan	91.5	91.2	90.9	90.3	89.4	90.0	91.2	91.7	92.0	91.7	88.8	84.9	84.8	84.4	84.8	85.4	85.8	85.6	86.6	85.7	84.8	83.8	84.2	84.3	87.6	92.0	
3-Jan	83.2	84.0	84.1	85.6	85.5	86.2	86.5	86.5	86.3	85.4	81.2	77.1	76.0	74.8	77.8	83.2	86.3	86.9	86.8	86.9	88.1	89.4	91.5	92.4	84.6	92.4	
4-Jan	92.1	91.9	92.5	91.6	90.3	90.3	93.7	92.0	91.6	91.5	90.4	87.7	84.7	81.5	81.9	87.7	92.0	92.2	91.9	92.3	92.1	91.6	91.8	92.3	90.3	93.7	
5-Jan	91.9	92.1	91.7	91.4	91.3	91.1	90.8	90.8	90.7	91.0	88.4	85.9	83.1	80.1	82.0	84.7	87.3	87.1	85.1	85.1	86.0	86.4	85.8	84.7	87.7	92.1	
6-Jan	83.2	81.0	80.7	80.4	79.0	80.4	81.8	83.0	84.2	84.7	80.7	76.4	75.0	75.3	76.9	80.6	83.9	84.8	85.2	85.5	85.3	85.9	86.3	87.4	82.0	87.4	
7-Jan	88.2	90.3	90.8	91.6	92.4	92.0	93.5	92.5	92.2	91.9	92.5	92.6	93.8	92.4	90.5	92.6	92.3	92.4	92.8	93.7	94.0	94.5	95.0	94.8	92.5	95.0	
8-Jan	94.3	94.3	93.5	93.0	93.2	91.9	92.0	92.5	92.0	92.3	90.2	88.1	84.9	82.7	83.6	85.1	89.9	92.8	92.0	91.9	90.4	86.4	87.7	92.1	90.3	94.3	
9-Jan	94.5	95.2	94.8	95.1	95.7	95.2	95.2	95.2	93.3	92.6	90.8	88.7	87.0	85.1	85.2	87.3	93.8	95.1	94.9	96.0	96.0	95.0	95.0	94.1	93.0	96.0	
10-Jan	93.5	93.1	92.9	93.3	95.0	96.5	95.2	94.2	93.8	93.5	93.4	93.2	93.2	93.2	93.3	93.3	93.1	92.9	92.7	92.5	92.6	92.6	92.1	91.9	93.4	96.5	
11-Jan	92.0	92.0	91.9	92.0	91.8	92.0	92.2	92.6	92.8	92.9	93.1	93.4	93.6	93.7	94.4	95.3	95.1	93.6	92.8	92.9	93.1	92.7	92.5	92.3	92.9	95.3	
12-Jan	92.5	92.4	92.1	92.0	92.4	92.5	92.0	91.5	91.6	91.5	91.6	91.6	91.8	92.2	92.5	92.8	92.9	92.8	92.7	92.5	92.0	92.0	91.9	92.0	92.2	92.9	
13-Jan	92.2	92.4	92.6	92.9	93.0	93.0	93.1	93.1	93.1	93.1	93.2	93.1	93.3	93.5	93.5	93.5	93.4	93.3	93.2	93.1	93.1	93.0	92.9	93.0	93.1	93.5	
14-Jan	93.0	92.8	92.6	92.4	92.0	92.0	91.9	92.0	91.8	91.3	91.6	91.9	91.7	91.8	92.4	92.8	93.9	94.2	93.9	93.7	93.6	93.5	93.4	93.4	92.6	94.2	
15-Jan	93.2	93.3	93.5	93.4	93.2	93.0	92.9	92.9	93.0	93.1	93.2	93.5	93.3	93.3	93.5	93.7	93.9	93.8	93.8	93.8	93.9	93.9	93.9	94.0	93.5	94.0	
16-Jan	94.0	94.1	94.0	94.0	94.0	93.9	93.9	93.9	93.7	93.5	93.4	93.3	93.5	93.6	94.2	94.3	94.1	94.6	94.8	93.5	93.8	94.1	95.1	95.6	94.0	95.6	
17-Jan	95.8	96.0	95.8	95.6	95.5	95.3	95.2	94.6	94.0	92.7	91.6	90.7	90.4	90.6	90.5	89.2	92.1	92.5	92.2	91.7	92.3	94.2	94.0	93.7	93.2	96.0	
18-Jan	93.8	96.2	96.7	96.4	95.9	95.4	95.3	95.1	94.7	93.1	90.7	88.6	86.1	83.5	84.6	87.9	91.0	90.3	89.5	89.6	89.9	90.2	90.0	89.4	91.4	96.7	
19-Jan	88.7	88.2	87.7	86.8	87.6	87.9	88.6	88.2	87.9	88.0	86.9	83.0	79.9	77.8	77.4	79.0	87.5	90.1	90.8	91.3	91.4	89.7	89.8	88.8	86.8	91.4	
20-Jan	90.1	90.3	89.7	90.7	92.0	92.6	93.4	93.6	92.6	90.0	85.1	79.3	76.4	74.4	74.0	76.3	83.6	85.6	88.5	91.3	94.0	95.0	94.9	95.7	87.9	95.7	
21-Jan	95.5	95.2	95.4	95.2	94.7	94.6	94.5	94.1	93.9	94.0	93.8	91.6	88.6	88.6	89.4	91.0	91.5	91.5	92.6	91.8	91.8	93.0	93.6	93.8	92.9	95.5	
22-Jan	94.7	95.8	94.5	91.4	83.9	80.0	81.1	83.3	83.4	86.7	91.9	88.9	84.5	82.4	84.0	85.2	84.5	86.2	87.5	88.3	88.4	88.4	89.3	89.0	87.2	95.8	
23-Jan	88.2	87.3	87.8	87.9	88.0	88.0	87.5	87.7	87.8	87.5	86.7	85.8	85.5	85.1	83.4	82.8	86.3	87.9	86.5	86.4	86.6	86.2	85.9	86.3	86.6	88.2	
24-Jan	86.7	86.4	85.7	85.8	87.2	88.3	88.8	89.8	90.4	91.6	91.4	91.0	92.4	93.0	94.2	92.8	90.2	90.2	91.9	92.6	92.0	91.3	90.9	90.9	90.2	94.2	
25-Jan	91.2	91.5	92.0	92.1	92.2	92.0	91.5	91.3	91.6	91.3	91.4	91.4	91.4	92.4	92.2	93.7	94.0	93.7	93.6	93.8	93.0	92.9	93.4	94.1	94.9	92.5	94.9
26-Jan	95.5	96.4	96.9	96.9	96.9	96.6	94.6	93.3	92.5	91.4	91.1	91.0	90.6	90.8	91.0	90.6	89.7	89.1	87.8	87.8	87.3	87.1	86.8	86.6	91.6	96.9	
27-Jan	85.7	85.3	84.5	84.0	84.1	84.0	83.5	82.9	82.0	81.6	81.0	80.9	79.4	80.0	80.7	81.5	81.7	81.4	81.8	82.1	82.1	81.9	81.7	81.4	82.3	85.7	
28-Jan	81.5	81.7	81.5	81.5	81.8	81.7	81.5	80.7	79.9	79.7	79.9	76.9	74.9	76.0	77.2	76.8	78.4	79.9	79.3	76.9	76.8	77.4	77.6	77.6	79.0	81.8	
29-Jan	77.6	77.8	77.9	76.3	76.4	76.4	75.1	77.3	76.3	76.9	76.9	75.9	75.3	73.5	73.7	74.5	76.8	78.8	79.2	80.9	79.8	82.5	83.9	84.1	77.7	84.1	
30-Jan	82.9	80.9	80.7	77.9	76.1	74.9	73.8	73.1	72.8	77.2	75.0	70.5	65.5	69.4	73.2	75.0	78.6	80.7	81.7	81.4	81.6	82.0	82.0	82.2	77.0	82.9	
31-Jan	82.7	82.4	82.7	81.0	80.9	80.6	80.6	80.0	79.2	78.5	77.2	74.2	72.0	69.9	69.6	70.0	75.0	76.8	76.5	76.2	76.6	78.1	79.9	80.4	77.6	82.7	
90.0 90.1 90.1 89.7 89.5 89.3 89.4 89.4 89.1 89.1 88.2 86.5 85.2 84.4 85.0 86.3 88.3 88.9 89.0 89.1 89.2 89.2 89.5 89.7																								Diurnal Average			
95.8 96.4 96.9 96.9 96.9 96.6 95.3 95.2 94.7 94.0 93.8 93.5 93.8 93.7 94.4 95.3 95.1 95.1 94.9 96.0 96.0 95.0 95.1 95.7																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Wapasu - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Wapasu - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	85	11.42	11.42
80 - 100	659	88.58	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

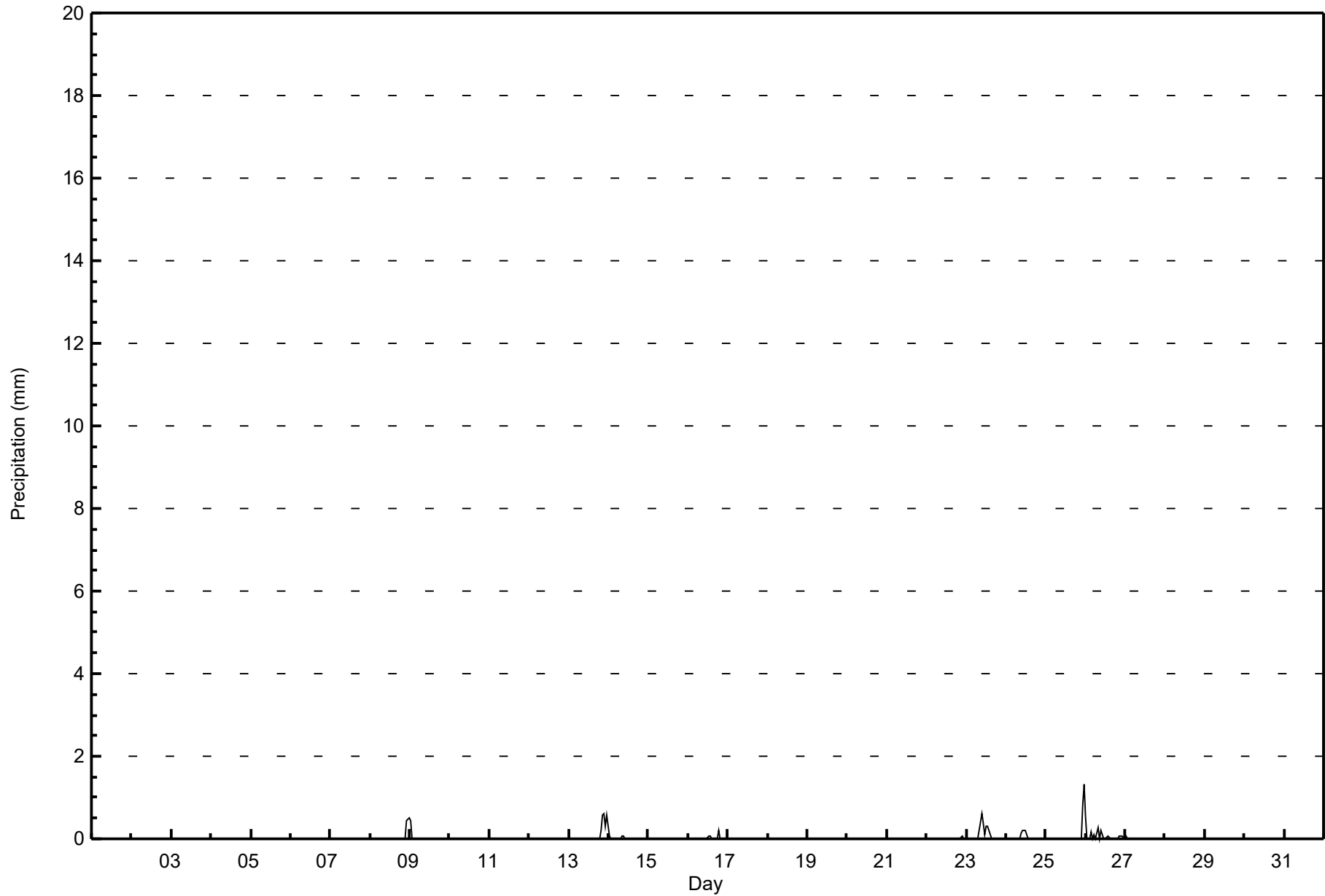
Wapasu - January 2023

Maximum Value: 1.3 mm on Jan 26 00:00 Maximum Daily Total: 2.3 mm on Jan 13																				Hours in Service: 744 Hours of Data: 744														
Minimum Value: 0.0 mm on Jan 1 01:00 Minimum Daily Total: 0.0 mm on Jan 1 Maximum Diurnal Total: 2.4 mm at hour 24 Minimum Diurnal Total: 0.0 mm at hour 2 Monthly Total: 11.05 mm Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.5																				Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	1.0	0.5	1.0	0.5		
9-Jan	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.4	0.1	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.3	2.1
26-Jan	0.5	0.0	0.0	0.2	0.0	0.1	0.0	0.3	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8
27-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
																								Diurnal Average										
																								Diurnal Maximum										



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - January 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Wapasu - January 2023

Maximum Speed: 25 km/h on Jan 26 08:00	Maximum Daily Speed Average: 13.1 km/h on Jan 6	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 9 09:00	Minimum Daily Speed Average: 0.2 km/h on Jan 9	Hours of Data: 740
Maximum Diurnal Speed Average: 4.5 km/h at hour 4	Minimum Diurnal Speed Average: 1.9 km/h at hour 17	Hours of Missing Data: 4
Monthly Average Velocity: 3.1 km/h 172.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 8 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 20	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S6	S6	SSW6	SSW9	SW10	SSW8	SSW8	S7	S7	S8	S8	S9	SSW9	SSW9	SSW8	SSW7	S7	S7	S7	S6	S7	SSE6	S6	SSE7	S7.2	SW10
2-Jan	S7	SSE7	SSE7	SSE9	SSE10	SSE9	SSE8	S10	SSE9	S9	S9	S10	S9	SSW11	SSW10	SSW11	S7	SSW8	S7	SSW8	S8	S9	S9	S9	S8.5	SSW11
3-Jan	S9	SSE10	S8	S9	SSE12	SSE10	S10	S9	SSE10	SSE9	SSE10	S9	S9	SSE7	SSE8	SSE7	SSE7	SSE9	SSE10	SSE11	SSE8	SSE8	SSE5	SSE8	SSE8.9	SSE12
4-Jan	SSE6	SSE5	SSE7	SSE7	SSE6	SSE6	SSE6	SSE7	SSE6	SSE7	SSE7	SSE5	SSE4	S5	S5	SSE5	SSE5	SSE6	SSE6	SSE6	SSE7	SSE7	SSE6	SSE7	SSE6.0	SSE7
5-Jan	SSE7	SSE7	SSE7	SSE7	SSE8	SSE7	SE7	SSE7	SSE8	SSE7	S7	S7	S8	S5	SSE7	SSE7	SE8	SE10	SSE11	SSE12	SSE14	SSE15	SSE16	SSE18	SSE9.0	SSE18
6-Jan	SSE19	SSE19	SSE21	SSE21	SSE20	SSE18	SSE18	SSE17	SSE13	SSE12	S12	S12	S11	SSW11	S10	S10	S10	S11	S10	S11	SSE11	S10	S9	S9	SSE13.1	SSE21
7-Jan	S8	S8	S8	SSE8	S7	S6	SSE5	E2	ENE5	E5	E3	ESE2	SW3	SE4	E2	WSW3	E3	S4	SSE6	SE6	SSE6	SSE6	SSE6	SSE6	SSE4.1	S8
8-Jan	SSE6	SSE8	SSE8	SSE7	SSE7	SSE9	SSE8	SE6	SE5	SSE5	SSE5	SSE6	SSE8	SSE11	SE8	W2	NNW3	NNE2	NNW2	ENE1	SE4	S4	SSE7	SE6	SSE4.9	SSE11
9-Jan	NNW2	W1	NNW3	NNW3	NNW2	NW1	N2	NNE1	S0	SSW3	SSW3	S1	ESE4	SSE4	SSE4	S2	NW3	N1	N3	NNW3	SW1	SSW3	S3	SSE2	SW0.2	SSE4
10-Jan	SSE2	SSE2	W1	NNW2	NW3	NW3	NNW3	N2	NNE2	NNW2	NNW4	N3	N3	NNW4	N4	NNW4	N4	N3	NNW4	NNW2	ENE1	NW3	NNW3	N2	NNW2.3	NNW4
11-Jan	NE2	NNW2	NNW1	NNW1	NW2	SE0	UO	S2	SW3	SSW3	SSW2	S3	S4	S4	S5	SSE5	S5	S5	SSE7	SSE8	SSE9	S8	SSE9	S8	S3.4	SSE9
12-Jan	S9	S9	S9	S8	S9	S8	S9	S8	SSW10	SSW10	S9	SSW9	SSW9	SSW10	SSW8	S8	S7	S8	S8	SSW7	SSW7	S6	S5	SSE4	S8.1	SSW10
13-Jan	SSE3	SE2	NE1	N2	N2	N4	NNE4	NE4	NE3	NE4	NE3	NE4	NE2	NE3	ENE4	ENE5	E4	ESE4	ESE5	SE4	SE4	SE5	SE6	SE7	E2.5	SE7
14-Jan	SE7	SSE7	SE8	SSE10	SSE12	SSE13	SSE13	SSE13	SSE12	SSE11	SSE9	SSE8	SSE7	S6	SSW6	S5	SSE4	S4	SSW3	S2	S2	S2	SSE1	NE1	SSE6.7	SSE13
15-Jan	UO	NW1	NNW2	NNW3	N2	NNE2	ENE2	ENE2	NE1	ESE1	ESE3	SSE3	SSE3	SSE4	S3	S3	S2	SSE2	SE1	SE2	UO	UO	E1	ESE2	SE0.9	SSE4
16-Jan	ESE2	ESE2	ESE2	ESE3	ESE3	ESE2	ENE3	E3	ESE4	SE5	SE4	ESE6	SE7	SE8	SE8	SE10	SE12	SSE8	SSE8	SSE13	SSE14	SSE12	SSE12	SSE11	SE6.4	SSE14
17-Jan	SSE11	SSE9	SSE10	S8	S8	SSW7	SSW9	SSW10	S10	S9	S10	S10	S10	SSW9	S9	S9	S9	S9	SSE11	SSE12	S9	SSE12	S10	S12	S9.4	SSE12
18-Jan	S11	S12	S12	S12	S11	S10	S9	S9	SSE10	SSE11	SSE10	SSE10	SSE12	SSE11	SSE11	SSE11	SSE12	SSE15	SSE13	SSE15	SSE16	SSE15	SSE14	SSE14	SSE11.8	SSE16
19-Jan	SSE14	SSE13	S13	S13	S13	S12	S12	S12	S11	S10	S9	SSW10	SSW10	SSW9	SSW10	S9	S8	S7	S7	S8	S8	S8	S8	S8	S9.9	SSE14
20-Jan	S7	SSW9	SSW10	SSW10	SSW8	S7	S7	S8	SSW10	SSW10	SW12	SSW11	SW12	SW11	SW10	SW8	SW11	SW11	SW8	SW8	SSW7	SSW6	S6	SSE6	SSW8.6	SW12
21-Jan	SSE7	SSE7	SSE7	SSE7	SSE7	SSE8	SSE8	SSE8	SSE9	SSE9	S9	S10	S9	S9	S9	S9	S9	SSW9	SSW8	SW9	SW9	SSW7	SW9	SW9	S7.7	S10
22-Jan	SW6	SW7	SW7	SW7	WSW6	WSW7	WSW10	WSW8	W7	NNW17	N21	N20	NNW22	NNW21	NNW17	NNW17	NNW15	N12	NNE9	N11	N11	N8	NE7	NE3	NNW8.0	NNW22
23-Jan	E2	SSE3	S5	SSE6	SSE8	SE9	SSE8	SE10	SE13	SE14	SE15	SE13	SE11	SE7	SE9	SE4	SE5	SE4	SE4	SE4	SSE4	SSE5	SSE6	S5	SE7.0	SE15
24-Jan	SSE6	SSE8	SSE8	SSE9	SSE10	SSE8	S8	S9	S9	S8	S8	SSW8	SW9	NW7	NNW9	N12	N9	N9	N8	NNE7	NNE6	NE6	ENE6	NE7	SE1.5	N12
25-Jan	NE5	ENE4	ENE3	ESE2	E2	SE3	NNW2	WNN1	E3	E1	SSE3	NNE0	SSE2	S7	SW6	SSW5	S6	S8	SSE9	S9	SSE11	SSE13	SSE12	SSE13	SSE4.2	SSE13
26-Jan	S11	S9	SSW9	SW11	W8	NNW17	N25	NNW25	N23	N20	NNW19	NNW20	NNW15	NNW11	NNW15	NNW18	NNW17	N14	N15	N15	N11	NNE10	NNE11	N11	NNW11.5	NNW25
27-Jan	N10	N11	NNE10	NNE9	N9	N10	N10	N7	N6	N10	N11	N13	N8	NNW10	NNW11	NNW12	N10	NNW9	NNW12	NNW12	NNW11	NNW11	NNW13	NNW10	N10.0	NNW13
28-Jan	NW7	WNN5	WNN6	W5	W6	W6	W7	WNN7	NW9	NW9	NW14	NNW18	NNW18	NNW16	NNW15	NNW14	NNW15	NNW17	NNW17	NNW19	NNW20	NNW18	NNW16	NNW14	NNW11.6	NNW20
29-Jan	NNW10	NNW9	NNW7	WSW4	SSW5	SSW6	SSW5	SSW6	SSE7	S7	S9	S10	S11	S10	S10	S10	SSW9	S5	SE3	NNW6	NNW13	NNW11	NNW12	NNW13	SW2.3	NNW13
30-Jan	NNW14	N10	N5	NNE4	NE2	SSE3	SE4	SE5	SSE5	S4	S4	SSW4	WNN3	WNN4	W4	W1	SSW2	SSW2	SE3	SSE3	ENE2	NE3	NNE4	N5	NNE0.6	NNW14
31-Jan	N8	N10	NNE8	NNE5	N5	NNE5	NNE5	N4	NNW5	NNW5	NNW8	WNN6	WNN5	SW1	SSW2	SSW3	SSE1	SE4	SE3	ESE2	E2	NE4	NE5	NNE6	N3.0	N10

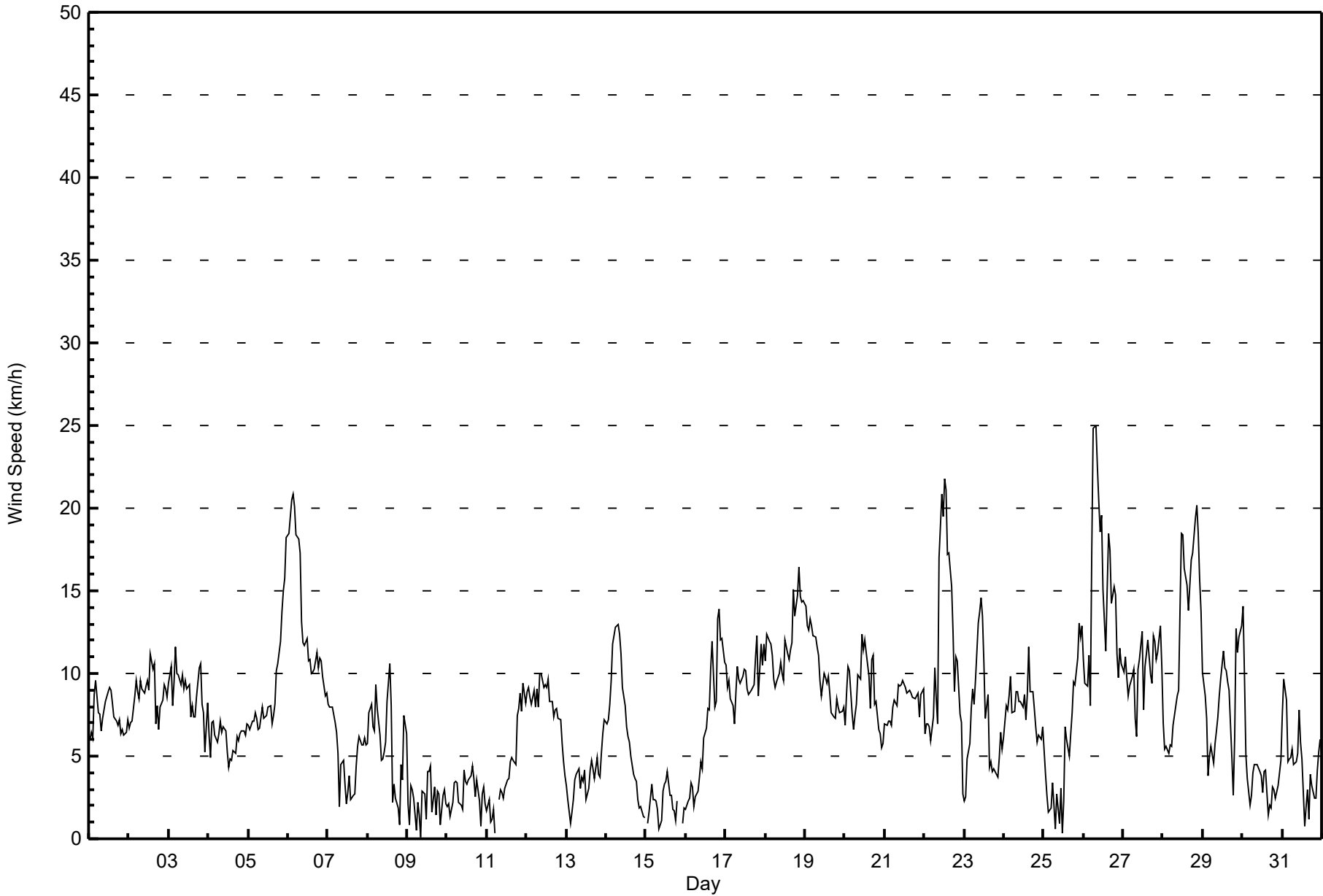
SSE3.5 SSE3.7 S3.9 S4.5 S4.4 S3.8 SSE3.5 S3.5 SSE3.7 S3.2 S2.9 S2.8 SSW3.2 SSW3.1 SSW2.7 SSW2.1 S1.9 S2.5 SSE2.6 SSE2.6 SSE2.8 SSE3.0 SSE3.2 SSE3.2	Diurnal Average
SSE19 SSE19 SSE21 SSE21 SSE20 SSE18 N25 NNW25 N23 N20 N21 NNW20 NNW22 NNW21 NNW17 NNW18 NNW17 NNW17 NNW17 NNW19 NNW20 NNW18 SSE16 SSE18	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Wapasu - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	233	31.49	31.49
6 - 11	400	54.05	85.54
12 - 19	94	12.70	98.24
20 - 28	13	1.76	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	18	11	17	11	13	16	23	33	29	14	4	2	6	7	7	22	233
6 - 11	22	9	3	1	0	1	20	119	126	50	19	4	5	3	4	14	400
12 - 19	6	0	0	0	0	0	5	38	12	0	2	0	0	0	1	30	94
20 - 28	5	0	0	0	0	0	0	3	0	0	0	0	0	0	0	5	13
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	51	20	20	12	13	17	48	193	167	64	25	6	11	10	12	71	740

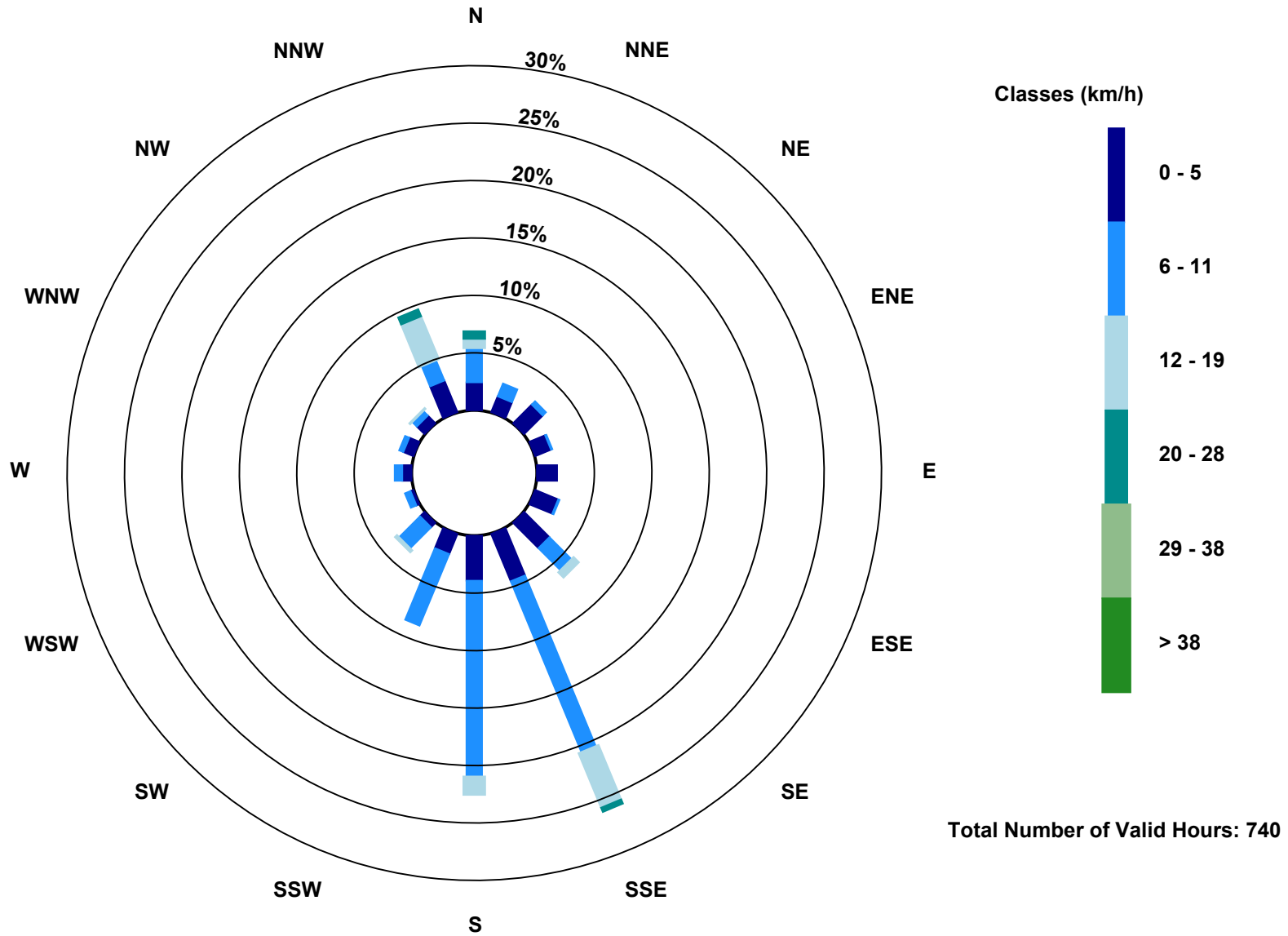
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 22 10:00 Minimum Value: 0 km/h on Jan 10 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	2	2	3	3	2	2	2	2	2	2	3	3	3	2	2	2	2	2	1	2	1	1	2	3	
2-Jan	2	2	2	2	2	3	2	3	3	3	3	3	3	3	4	4	3	2	2	3	2	3	3	2	4	
3-Jan	3	3	2	3	3	2	3	3	2	2	2	3	3	2	2	1	2	2	3	3	2	2	1	1	3	
4-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	
5-Jan	1	1	1	1	1	2	1	1	2	2	2	2	3	2	2	2	2	2	3	3	4	4	4	5	5	
6-Jan	5	5	6	6	5	5	5	5	4	3	4	4	4	4	3	3	3	4	3	3	3	3	3	3	6	
7-Jan	3	2	2	2	2	2	2	2	1	1	1	1	2	1	2	3	2	1	1	1	1	1	1	1	3	
8-Jan	1	2	2	1	1	2	2	1	1	2	1	2	2	3	2	2	1	1	2	1	2	1	2	2	3	
9-Jan	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	
10-Jan	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
11-Jan	1	1	1	1	1	1	UO	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	
12-Jan	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	1	3	
13-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	2	2	2	2	
14-Jan	2	2	2	3	4	4	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	4	
15-Jan	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	UO	1	1	1	
16-Jan	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	4	4	4	3	3	3	4	
17-Jan	3	3	3	3	3	2	3	3	3	3	3	3	4	3	3	3	3	3	3	4	3	4	3	4	4	
18-Jan	4	4	4	4	4	3	3	3	4	3	3	3	4	4	3	3	4	4	4	5	4	4	4	4	5	
19-Jan	5	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	5	
20-Jan	2	3	3	3	2	2	2	2	3	3	3	4	4	3	3	3	3	3	2	2	1	1	1	1	4	
21-Jan	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	3	
22-Jan	2	2	2	2	2	2	3	3	2	8	7	6	6	5	5	5	5	4	3	4	3	3	3	1	8	
23-Jan	1	2	1	2	2	2	2	3	3	4	4	3	3	3	2	1	1	1	1	1	1	1	1	1	4	
24-Jan	1	2	2	3	3	2	2	3	3	3	2	3	3	2	2	4	3	3	3	2	2	2	2	2	4	
25-Jan	2	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2	3	3	3	3	4	4	4	4	
26-Jan	4	3	3	3	3	7	7	7	7	6	5	5	5	3	4	5	5	4	5	5	4	4	4	4	7	
27-Jan	4	4	4	3	3	3	3	2	2	3	4	4	3	3	3	3	3	2	3	3	3	3	3	3	4	
28-Jan	2	2	2	2	2	2	2	3	3	2	5	5	5	4	4	3	4	5	5	5	5	5	4	4	5	
29-Jan	3	2	2	2	1	1	1	1	1	2	3	3	4	3	3	3	3	2	1	3	3	3	3	3	4	
30-Jan	4	3	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	4	
31-Jan	3	3	3	2	2	2	2	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	3	
																	Diurnal Maximum									
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Wapasu - January 2023

Direction of Maximum Speed: 347 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 166.8 deg on Jan 6	Hours of Data: 740
Direction of Minimum Speed: 185 deg on Jan 9 09:00	Direction of Minimum Daily Speed Average: 0.2 deg on Jan 9
Direction of Minimum Daily Speed Average: 0.2 deg on Jan 9	Hours of Missing Data: 4
Monthly Average Direction: 172.2 deg	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	180	190	207	213	221	211	203	189	181	180	186	189	199	205	195	197	176	172	176	172	173	161	170	167	189.4
2-Jan	170	166	167	156	157	161	164	176	168	178	178	191	182	197	192	200	191	197	176	194	182	186	184	179	179.4
3-Jan	176	166	171	173	167	162	169	172	164	162	164	172	170	167	157	160	164	161	158	154	164	153	153	148	164.0
4-Jan	147	166	151	147	150	153	158	152	153	155	153	162	167	180	176	163	166	156	161	156	154	149	152	150	156.3
5-Jan	149	156	153	151	151	152	143	147	154	160	174	176	173	176	167	153	143	146	147	148	150	148	148	150	153.7
6-Jan	151	152	150	152	154	153	159	159	168	164	173	187	188	193	188	183	183	187	182	177	168	173	171	176	166.8
7-Jan	182	169	179	168	185	185	167	82	70	89	92	123	228	126	96	253	95	182	155	145	150	158	161	155	157.2
8-Jan	155	158	149	152	153	158	149	139	124	153	158	151	158	149	144	278	335	25	337	68	127	185	151	141	149.6
9-Jan	337	262	302	341	342	314	359	20	185	195	193	179	104	154	152	179	325	359	353	345	221	200	183	147	231.9
10-Jan	155	165	264	292	319	320	338	1	18	337	337	3	350	348	353	343	354	3	345	330	69	321	347	5	342.7
11-Jan	48	329	335	332	313	145	UO	175	235	207	192	170	190	178	170	160	174	173	154	157	162	174	165	185	173.5
12-Jan	184	188	191	182	184	189	176	189	194	195	190	192	193	192	195	190	188	190	190	192	194	185	172	165	188.6
13-Jan	157	132	52	5	359	2	20	37	45	46	40	47	40	54	60	62	83	106	120	125	129	126	145	142	83.2
14-Jan	143	155	146	152	153	152	153	153	153	155	162	161	167	180	194	187	165	188	192	176	180	178	159	44	159.5
15-Jan	UO	320	347	347	7	20	58	61	46	118	119	148	165	165	176	173	190	166	141	138	UO	UO	85	102	124.2
16-Jan	105	119	113	122	122	107	73	83	113	127	134	123	132	131	138	134	134	154	155	152	153	153	154	160	139.6
17-Jan	161	165	165	177	190	198	201	194	191	185	182	181	191	201	190	175	172	172	164	160	186	168	170	171	178.6
18-Jan	182	182	181	171	175	176	171	169	165	160	161	165	160	162	167	159	157	155	159	159	158	157	160	162	164.9
19-Jan	166	168	180	189	184	181	180	177	182	182	187	199	203	202	197	185	177	182	173	191	187	186	177	183	183.5
20-Jan	185	205	210	205	192	189	179	189	200	201	217	213	217	220	221	229	227	224	221	218	208	205	185	164	207.8
21-Jan	152	156	158	160	167	156	152	159	166	166	174	183	187	176	184	188	189	196	204	217	215	211	220	232	182.7
22-Jan	218	219	219	219	255	255	251	254	275	333	360	352	342	344	345	342	346	2	13	2	357	6	35	37	334.3
23-Jan	99	161	169	166	160	143	149	146	136	136	136	136	131	139	130	131	144	145	142	137	162	166	149	174	143.4
24-Jan	158	150	163	168	164	161	175	176	175	176	185	197	231	307	345	357	3	10	9	13	28	41	63	56	140.9
25-Jan	51	57	69	107	81	134	345	295	91	91	163	31	153	187	219	198	169	176	165	173	166	157	164	161	159.6
26-Jan	177	183	197	227	260	344	351	347	350	351	346	340	340	347	343	341	347	354	356	357	9	17	13	10	345.7
27-Jan	9	4	16	16	8	9	4	7	6	355	349	352	358	345	333	343	349	347	343	341	330	334	338	335	351.6
28-Jan	311	299	287	270	277	262	272	283	304	316	326	333	332	338	336	336	339	342	348	345	345	344	348	343	330.0
29-Jan	333	340	336	240	200	204	198	196	163	178	181	180	187	186	187	190	198	183	141	332	344	345	342	343	231.3
30-Jan	340	356	4	25	35	151	140	139	152	180	177	202	286	290	271	272	200	199	146	147	67	47	32	11	13.6
31-Jan	3	358	13	13	8	21	22	349	344	336	336	302	301	226	196	207	166	139	129	106	100	43	41	16	5.4

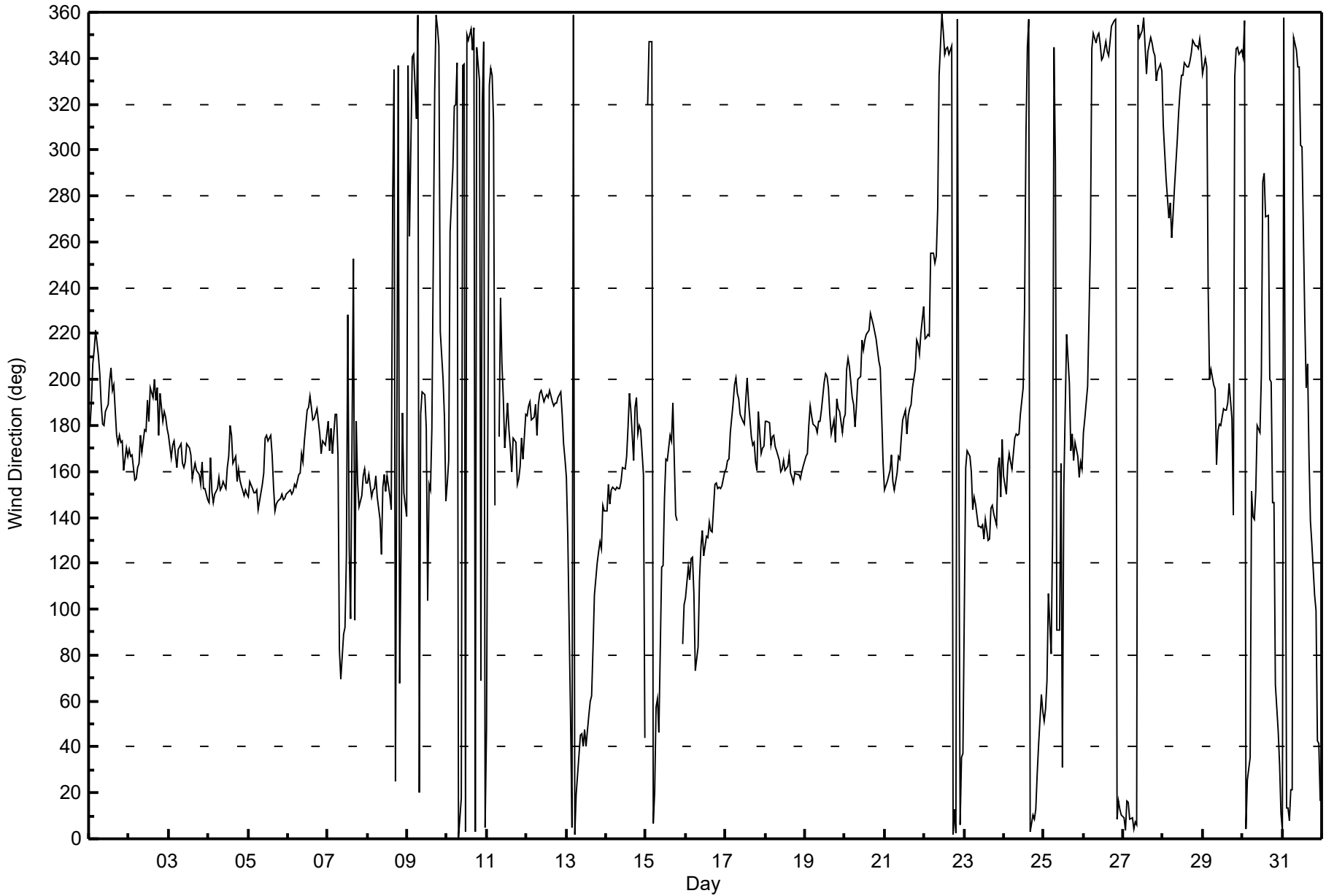
163.6 168.5 171.8 175.1 176.1 170.1 168.5 169.7 166.7 169.9 175.6 187.7 196.1 194.4 193.9 198.0 178.1 172.4 160.1 163.5 162.5 158.2 151.3 154.7
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Wapasu - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 93 deg on Jan 9 09:00 Minimum Value: 5 deg on Jan 4 05:00 Percentiles: P ₁ = 8 P ₁₀ = 16 Q ₁ = 20 Median = 25 Q ₃ = 28 P ₉₀ = 34 P ₉₉ = 73											Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5														
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	29	28	23	22	17	24	23	28	29	29	27	27	25	22	25	25	22	19	24	18	19	19	18	19	29
2-Jan	21	22	20	18	19	24	25	29	27	26	28	28	28	27	27	24	28	23	23	26	25	25	26	26	29
3-Jan	28	22	27	24	23	20	22	25	21	20	21	28	26	24	14	18	19	18	20	17	19	15	11	9	28
4-Jan	8	35	9	6	5	7	11	11	11	11	11	20	21	26	25	16	12	9	10	10	10	7	7	8	35
5-Jan	7	9	10	8	11	19	13	12	19	22	23	26	25	26	22	16	15	16	17	17	19	17	18	19	26
6-Jan	19	19	19	21	20	20	22	23	26	25	27	29	30	26	29	28	29	27	27	26	23	26	30	25	30
7-Jan	28	20	24	17	23	27	19	69	16	35	32	61	66	41	62	77	59	28	13	9	12	11	12	12	77
8-Jan	10	15	14	17	17	21	16	10	14	38	25	22	20	19	20	66	20	36	74	63	26	29	18	27	74
9-Jan	49	91	44	31	23	76	30	68	93	27	29	58	27	29	22	69	19	31	21	24	70	29	32	29	93
10-Jan	33	33	46	31	21	19	21	34	36	32	20	29	35	28	24	17	22	31	25	24	47	28	20	28	47
11-Jan	37	23	47	54	57	64	UO	32	25	28	28	26	30	29	27	22	30	27	18	22	26	27	24	29	64
12-Jan	29	30	28	29	30	31	28	29	29	28	29	28	27	26	31	29	29	29	30	28	27	29	27	23	31
13-Jan	24	20	59	56	43	30	33	29	31	26	30	29	36	26	26	26	26	32	22	22	20	21	23	20	59
14-Jan	25	25	22	23	22	20	20	19	20	21	25	25	28	29	28	28	29	31	27	30	25	24	44	39	44
15-Jan	UO	36	17	18	27	26	32	38	49	18	16	25	26	25	27	25	19	18	41	17	UO	UO	44	33	49
16-Jan	19	21	21	20	15	33	24	42	26	27	25	24	22	21	23	20	18	23	22	19	21	21	20	24	42
17-Jan	23	24	23	30	27	27	26	28	27	30	28	29	28	27	30	26	25	26	23	24	30	24	26	28	30
18-Jan	30	29	30	28	29	28	27	28	26	23	26	25	25	26	25	23	22	19	22	21	21	21	21	24	30
19-Jan	26	25	28	27	29	28	28	27	28	29	29	25	22	23	26	26	22	24	21	24	24	26	25	26	29
20-Jan	23	21	21	18	25	24	23	24	23	24	18	20	20	20	19	35	21	15	17	15	15	17	24	14	35
21-Jan	10	11	13	18	23	21	16	21	26	26	28	29	29	28	30	29	26	27	26	18	19	21	18	18	30
22-Jan	24	16	14	16	26	24	24	25	36	32	28	25	18	19	19	19	23	28	31	28	26	32	29	51	51
23-Jan	39	27	24	24	22	20	27	22	17	17	18	18	21	24	20	28	13	25	29	19	16	23	16	22	39
24-Jan	20	18	27	26	22	25	27	25	25	28	28	26	18	28	21	25	29	29	30	30	27	23	21	21	30
25-Jan	22	27	34	61	43	20	72	90	34	73	34	92	39	30	23	32	27	28	27	28	26	22	25	24	92
26-Jan	29	27	27	20	32	21	24	20	22	22	18	15	18	20	18	18	20	25	25	25	29	30	30	29	32
27-Jan	31	29	31	32	29	28	28	28	28	25	22	24	26	21	18	19	21	18	17	17	16	16	16	18	32
28-Jan	25	25	31	29	28	28	28	29	24	21	18	17	17	18	16	15	17	17	19	19	19	19	20	17	31
29-Jan	14	14	12	33	18	16	17	17	12	25	29	30	28	28	27	27	25	38	60	34	17	18	16	18	60
30-Jan	16	24	28	16	55	35	11	18	24	18	28	32	69	28	34	72	35	48	23	28	34	18	24	27	72
31-Jan	27	25	31	29	28	28	27	27	22	16	22	33	43	91	66	46	56	7	14	33	37	12	12	26	91
49 91 59 61 57 76 72 90 93 73 34 92 69 91 66 77 59 48 74 63 70 32 44 51																									
Diurnal Maximum																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18 STONY MOUNTAIN JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
JANUARY 2023

MONTHLY SUMMARY for
AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	707	35	37	99.73	7.2	0	1.5	0
TRS(ppb) Average	706	36	38	99.73	0.5	0	0.3	0
THC(ppm) Average	706	35	38	99.6	2.4	-	2.3	-
NMHC(ppm) Average	706	35	38	99.6	0.023	-	0.001	-
CH4(ppm) Average	706	35	38	99.6	2.4	-	2.3	-
O3 (ppb) Average	707	35	37	99.73	37.6	0	35.6	-
NO2 (ppb) Average	702	37	42	99.33	16.1	0	6.7	-
NO (ppb) Average	702	37	42	99.33	20.2	-	3	-
NOX (ppb) Average	702	37	42	99.33	28.2	-	7.2	-
PM2.5 (ug/m3) Average	742	1	2	99.87	107.6	3	24.7	0
CO(ppm) Average	708	34	36	99.73	0.5	0	0.2	0
CO2(ppm) Average	708	34	36	99.73	482.9	0	464.6	0
Temperature 2 m (C) Average	744	0	0	100	3.3	-	0.5	-
Relative Humidity (%) Average	744	0	0	100	96.3	-	93.5	-
Wind Speed 20 m (km/h) Average	735	0	9	98.79	29	-	19	-
Wind Direction 20 m (deg) Average	735	0	9	98.79	-	-	-	-
Precipitation (mm) Total	744	0	0	100	0.9	-	5.1	-
Leaf Wetness (% of range) Average	744	0	0	100	31.6	-	6.3	-
Global Solar Radiation (W/m2) Average	744	0	0	100	307.2	-	52.2	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	707	0.42	0.6	-	0	0	0.1	0.2	0.4	1	7.2
TRS (ppb) Average	706	0.19	0.1	-	0.1	0.1	0.2	0.2	0.2	0.3	0.5
THC (ppm) Average	706	2.12	0.1	-	2	2.1	2.1	2.1	2.2	2.2	2.4
NMHC(ppm) Average	706	0	0.001	-	0	0	0	0	0	0	0.023
CH4(ppm) Average	706	2.12	0.1	-	2	2.1	2.1	2.1	2.2	2.2	2.4
O3 (ppb) Average	707	27.8	6.2	-	6	19.4	24.1	28.9	32.6	34.8	37.6
NO2 (ppb) Average	702	2.51	2	-	0	0.4	1.2	2.2	3.3	4.9	16.1
NO (ppb) Average	702	0.52	2.1	-	0	0	0	0	0.2	0.7	20.2
NOX (ppb) Average	702	3.03	3.2	-	0.1	0.4	1.3	2.3	3.6	5.9	28.2
PM2.5 (ug/m3) Average	742	7.28	8.6	-	0.3	1.1	2.2	4.6	10.2	15.5	107.6
CO(ppm) Average	708	0.16	0	-	0.1	0.1	0.1	0.2	0.2	0.2	0.5
CO2(ppm) Average	708	446.78	6.2	-	438	441.2	442.6	445.5	449.2	454.6	482.9
Temperature 2 m (C) Average	744	-8.99	5.7	-	-26.8	-18.1	-11.3	-8.3	-5.3	-2.4	3.3
Relative Humidity (%) Average	744	84.19	8.1	-	56.4	72.4	79.3	87.3	90	92	96.3
Wind Speed 10 m (km/h) Average	735	10.4	6	-	0	2	5	10	16	19	29
Wind Direction 10 m (deg) Average	735	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	8.28	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	744	2.96	1.7	-	1.4	1.9	2.1	2.6	3.7	3.9	31.6
Global Solar Radiation (W/m2) Average	744	26.39	55.3	-	0	0	0	0.1	25.3	99.9	307.2

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	19 Jan 2023 15:00	19 Jan 2023 16:00	2	Maintenance - WBEA internal audit
TRS	19 Jan 2023 14:00	19 Jan 2023 15:00	2	Maintenance - WBEA internal audit
THC/NMHC/CH4	19 Jan 2023 17:00	19 Jan 2023 19:00	3	Maintenance - WBEA internal audit
NO2	19 Jan 2023 14:00	19 Jan 2023 18:00	5	Maintenance - WBEA internal audit
PM2.5	19 Jan 2023 16:00	19 Jan 2023 16:00	1	Maintenance - WBEA internal audit
CO, O3	20 Jan 2023 09:00	20 Jan 2023 10:00	2	Maintenance - WBEA internal audit
CO2	20 Jan 2023 08:00	20 Jan 2023 09:00	2	Maintenance - WBEA internal audit
Wind Speed, Wind Direction	11 Jan 2023 01:00	11 Jan 2023 05:00	5	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 11:00	11 Jan 2023 11:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 09:00	15 Jan 2023 09:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 11:00	15 Jan 2023 11:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 23:00	15 Jan 2023 23:00	1	Flat line in sensor output signal - Sensor frozen



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 7.2 ppb on Jan 10 00:00	Maximum Daily Average: 1.5 ppb on Jan 10		Hours of Data:	707
Minimum Value: 0.0 ppb on Jan 12 03:00	Minimum Daily Average: 0.0 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 0.7 ppb at hour 14	Minimum Diurnal Average: 0.3 ppb at hour 6		Hours of Calibration:	35
Monthly Average: 0.42 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 1.0 P ₉₉ = 3.2		Percent Operational Time:	99.7

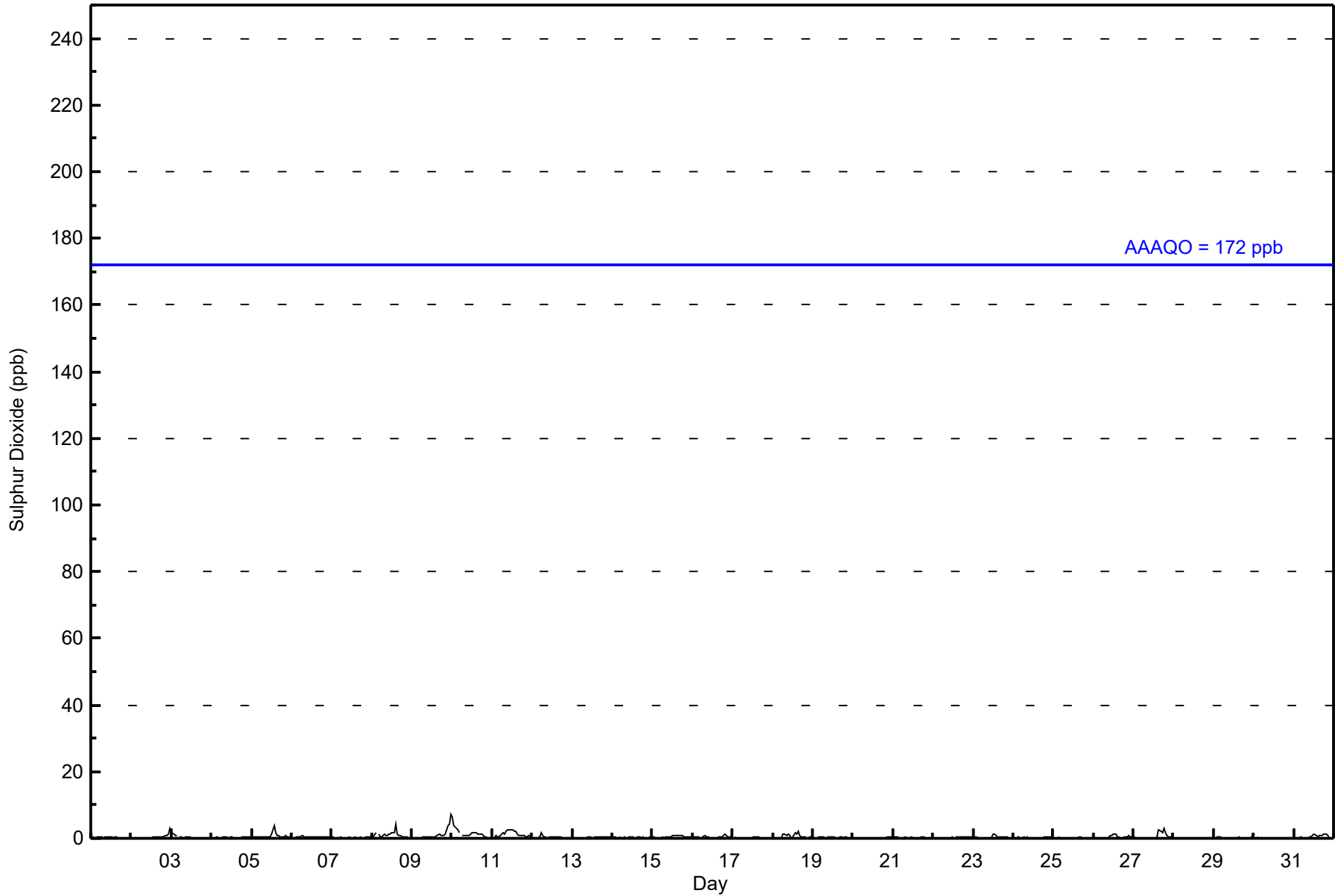
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.3	0.5	Z	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.5
2-Jan	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.7	1.1	1.2	2.9	0.4	2.9
3-Jan	1.6	1.2	0.9	1.0	Z	0.6	0.3	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4	1.6
4-Jan	0.1	0.1	0.2	0.2	0.3	Z	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.3	0.6
5-Jan	Z	0.5	0.5	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.6	1.3	3.7	1.6	0.9	0.7	0.5	0.3	0.6	0.6	0.5	0.4	0.5	0.7	3.7
6-Jan	0.5	Z	0.3	0.3	0.4	0.4	0.8	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.3	0.5	0.5	0.3	0.3	0.3	0.2	0.4	0.8
7-Jan	0.2	0.3	Z	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3
8-Jan	0.3	0.3	1.9	Z	1.1	0.6	0.5	1.2	0.7	1.0	1.2	1.3	1.5	1.9	4.4	1.3	1.0	1.0	0.6	0.2	0.3	0.2	0.2	0.2	1.0	4.4
9-Jan	0.2	0.2	0.1	0.1	Z	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.8	1.2	0.9	0.8	0.9	1.2	3.8	4.2	7.2	1.1	7.2
10-Jan	6.2	3.8	3.2	2.5	1.6	Z	1.0	0.9	0.9	0.8	1.0	1.1	1.6	1.7	1.6	1.2	1.2	1.3	1.2	0.5	0.3	0.1	0.1	0.0	1.5	6.2
11-Jan	Z	0.6	0.8	0.6	0.2	0.8	1.6	1.5	2.1	2.6	2.6	2.5	2.4	1.9	2.3	1.3	0.8	0.7	0.8	0.7	0.4	0.4	0.8	0.5	1.3	2.6
12-Jan	0.1	Z	0.0	0.0	0.5	1.5	1.0	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.3	1.5
13-Jan	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.5	0.2	0.5
14-Jan	0.4	0.3	0.4	Z	0.3	0.1	0.1	0.3	0.1	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.4
15-Jan	0.3	0.3	0.1	0.2	Z	0.1	0.3	0.2	0.3	0.3	0.3	0.5	0.7	0.7	0.8	0.8	0.7	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.5	0.9
16-Jan	0.4	0.3	0.3	0.2	0.4	Z	0.6	0.7	0.5	0.3	0.2	C	C	C	C	0.2	0.4	0.6	1.0	1.5	0.7	0.5	0.6	0.3	0.5	1.5
17-Jan	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.4	0.6	0.4	0.3	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6
18-Jan	0.0	Z	0.1	0.0	0.1	0.0	1.1	1.3	0.7	1.3	0.7	0.1	0.4	1.9	1.2	2.0	1.0	0.3	0.3	0.2	0.1	0.2	0.4	0.3	0.6	2.0
19-Jan	0.1	0.1	Z	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	M	M	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.2	0.4
20-Jan	0.1	0.1	0.0	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.1	0.3
21-Jan	0.3	0.4	0.4	0.3	Z	0.2	0.1	0.3	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4
22-Jan	0.1	0.0	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.2	0.5
23-Jan	Z	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.2	1.4	0.6	0.4	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.3	1.4
24-Jan	0.2	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.4	0.4	0.3	0.5	0.2	0.2	0.5
25-Jan	0.1	0.1	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.2	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.3
26-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.3	1.1	0.9	1.2	1.2	0.6	0.4	0.1	0.2	0.4	0.3	0.2	1.0	0.5	0.3	0.4	1.2
27-Jan	0.2	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2	2.5	2.1	1.9	2.8	1.9	0.9	0.5	0.4	0.3	0.6	2.8
28-Jan	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.2	0.0	0.2
29-Jan	Z	0.4	0.5	0.4	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.6	0.2	0.6
30-Jan	1.5	Z	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	1.5
31-Jan	0.1	0.1	Z	0.2	0.3	0.1	0.1	0.1	0.2	0.3	0.4	0.7	1.2	0.9	0.6	0.9	0.8	0.8	1.1	1.2	0.7	0.2	0.2	0.1	0.5	1.2

0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.6	Diurnal Average		
6.2	3.8	3.2	2.5	1.6	1.5	1.6	1.5	2.1	2.6	2.6	2.5	2.4	3.7	4.4	2.5	2.1	1.9	2.8	1.9	1.2	3.8	4.2	7.2	Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	22	22	18	20	18	14	19	19	66	86	98	45	56	76	52	68	699
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	18	20	18	14	19	19	66	86	98	45	56	76	52	68	699

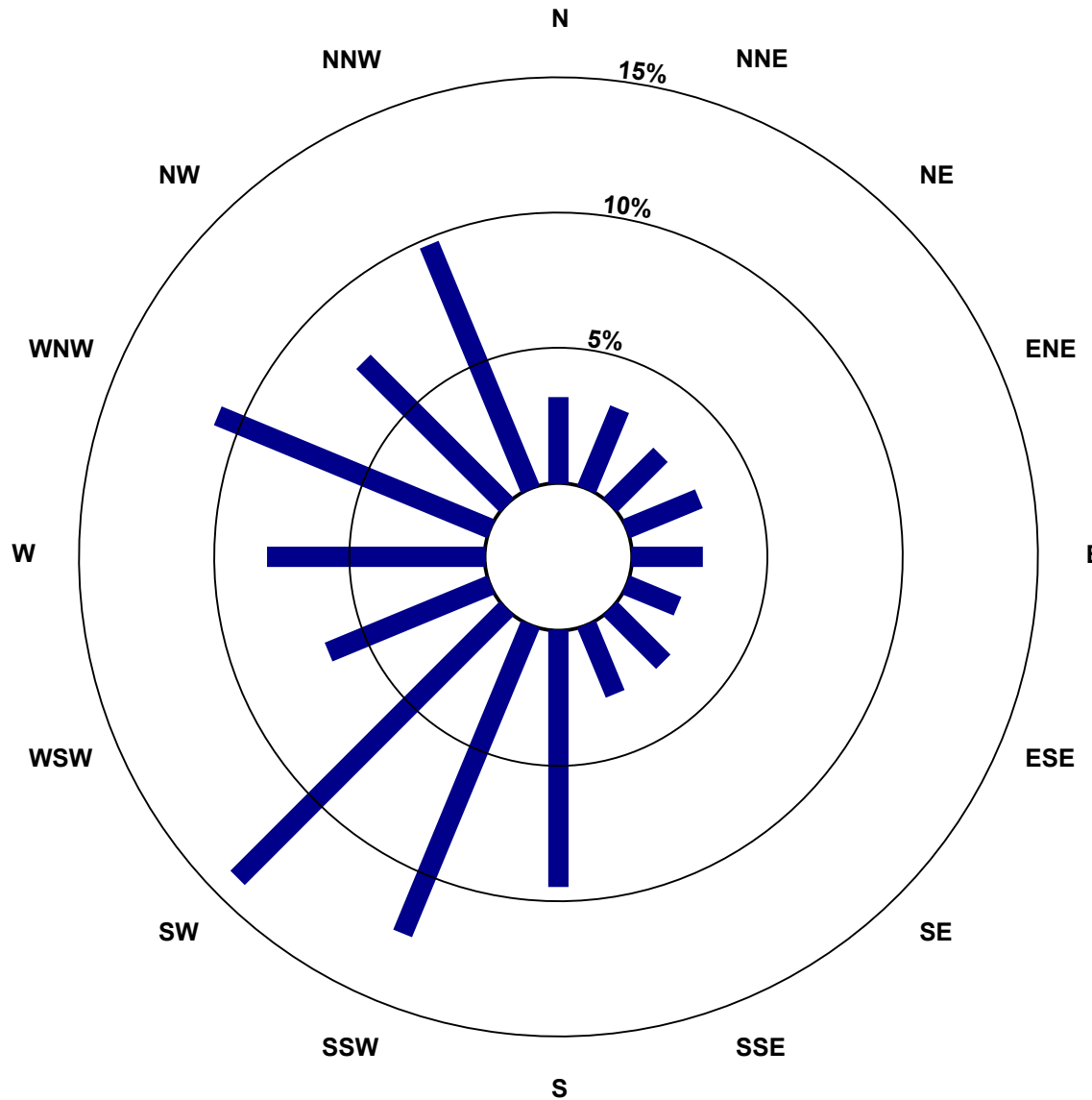
Total Number of Valid Hours: 699

Total Number of Hours: 744

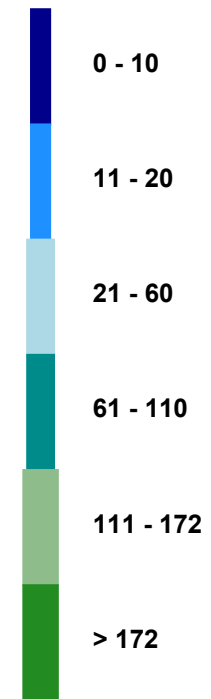


Wood Buffalo Environmental Association
Wind Rose Jan 2023

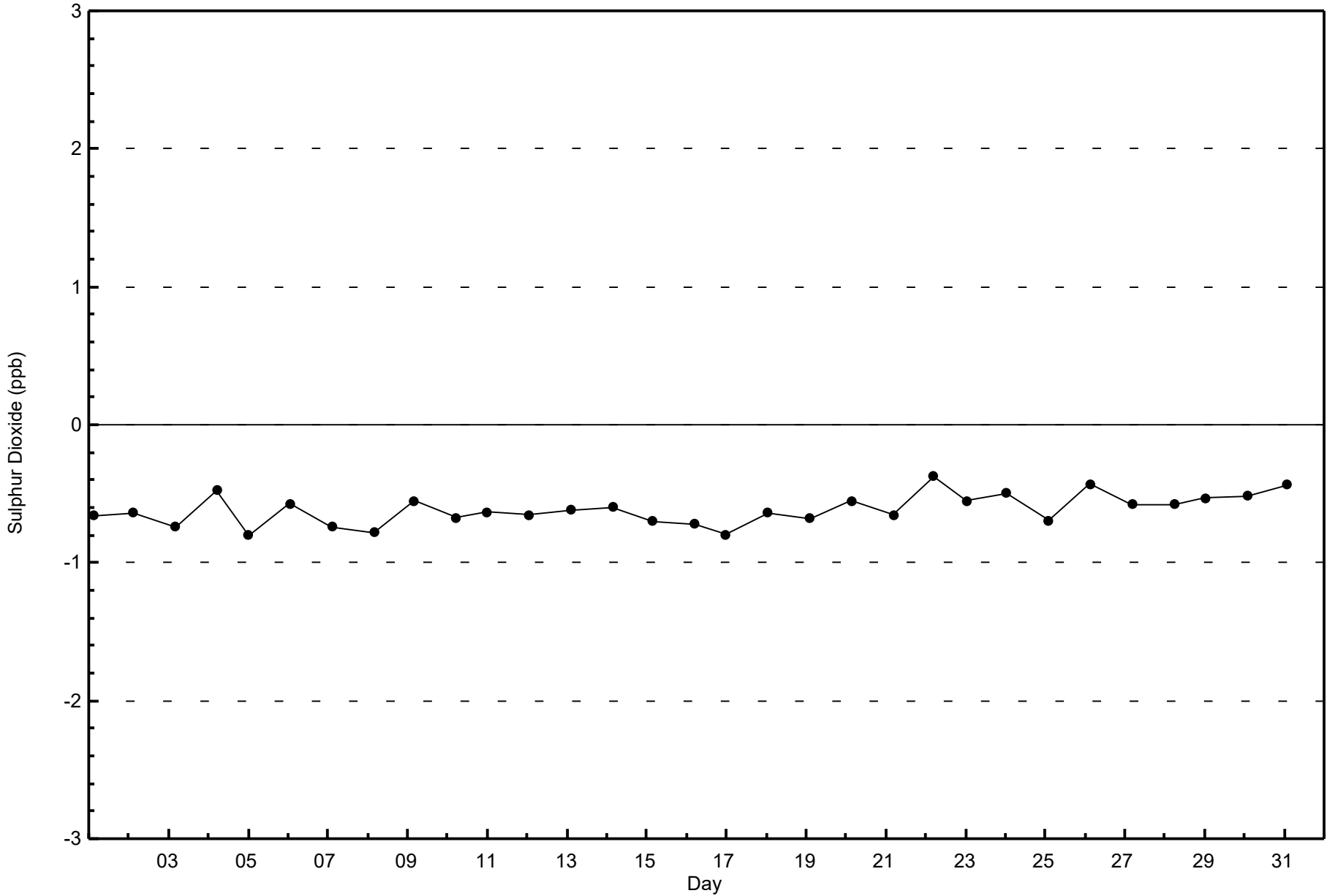
Sulphur Dioxide (SO₂) - ppb
Stony Mountain



Classes (ppb)



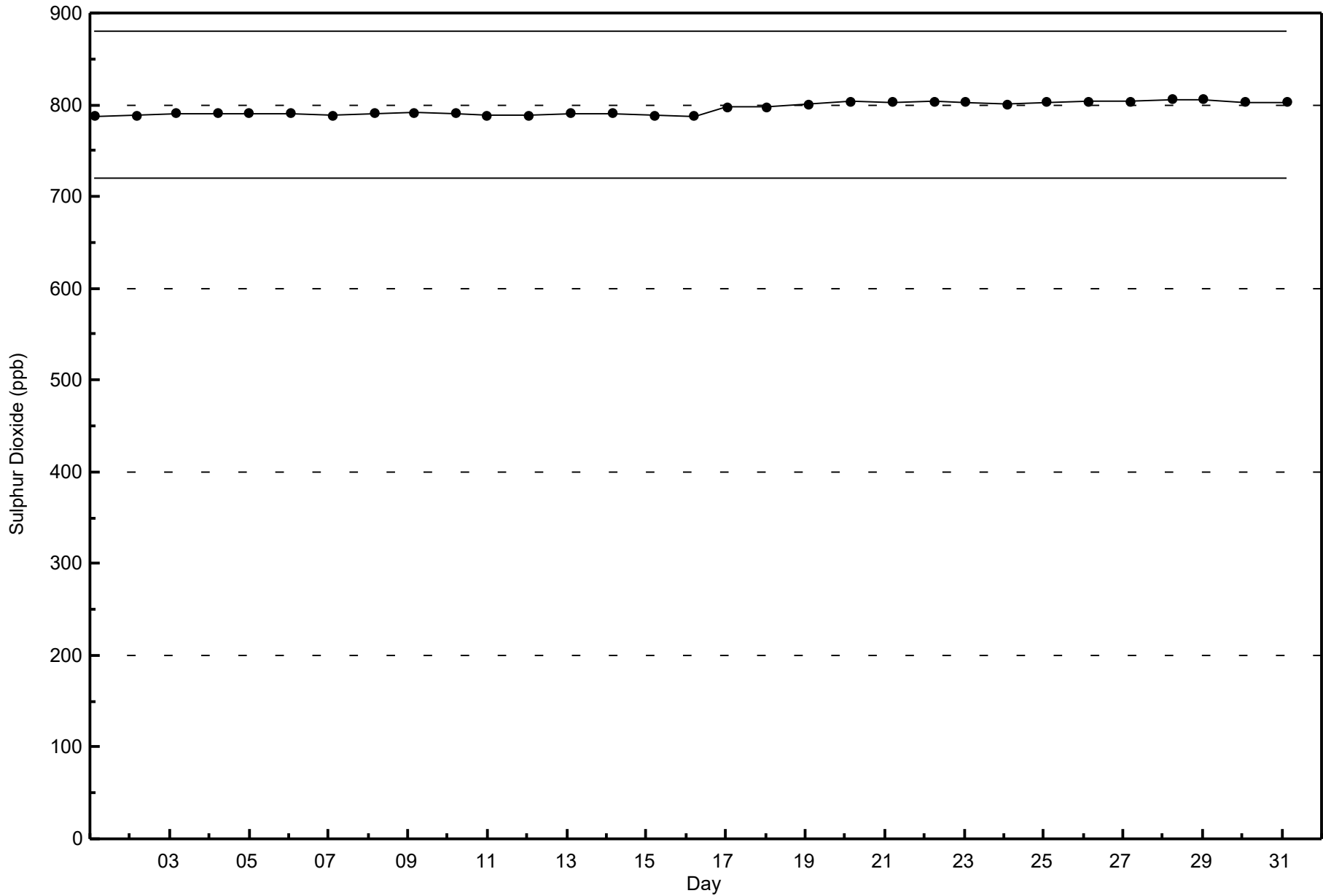
Total Number of Valid Hours: 699

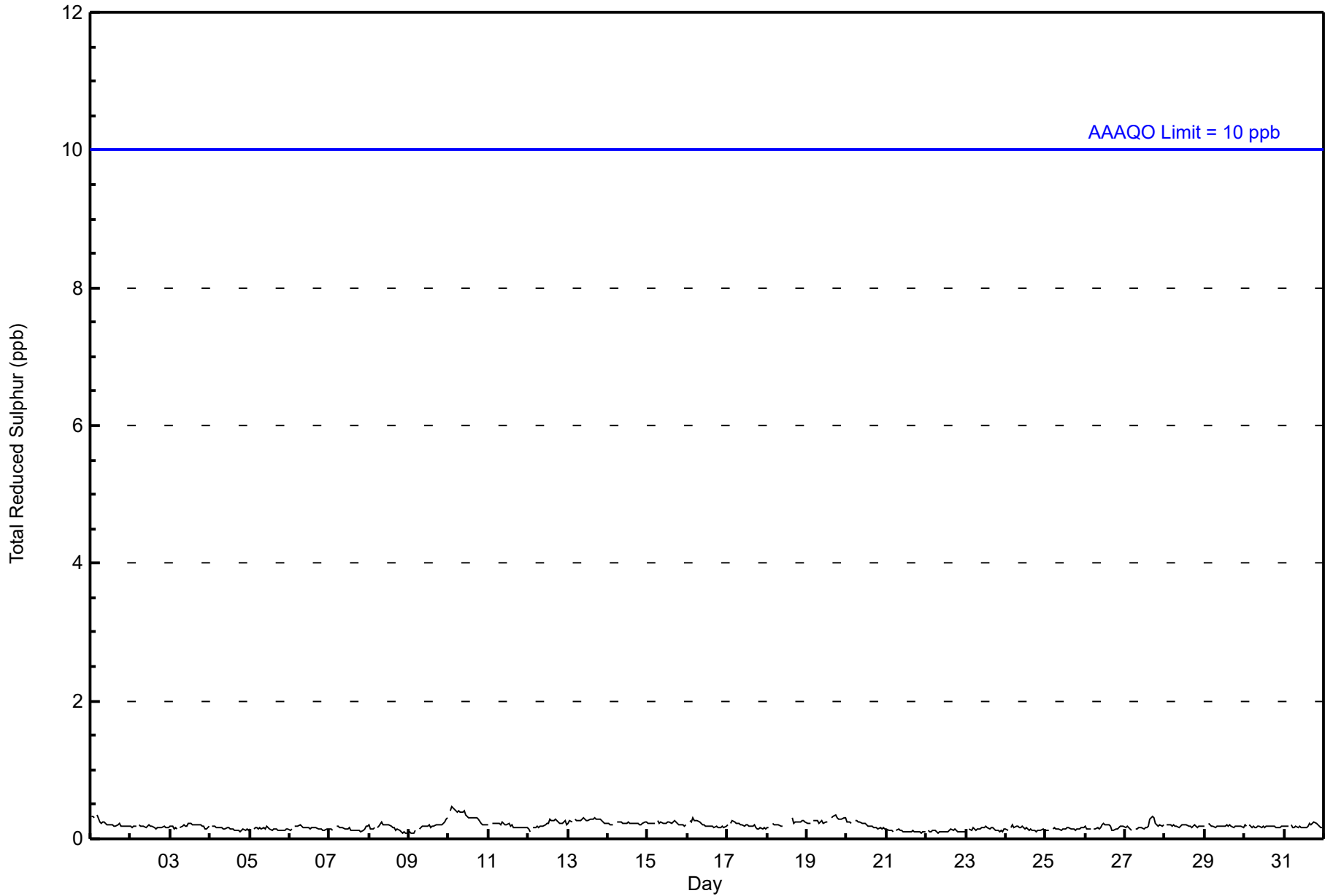




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - January 2023







**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	22	22	18	20	18	13	22	22	61	85	97	46	56	75	53	68	698
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	18	20	18	13	22	22	61	85	97	46	56	75	53	68	698

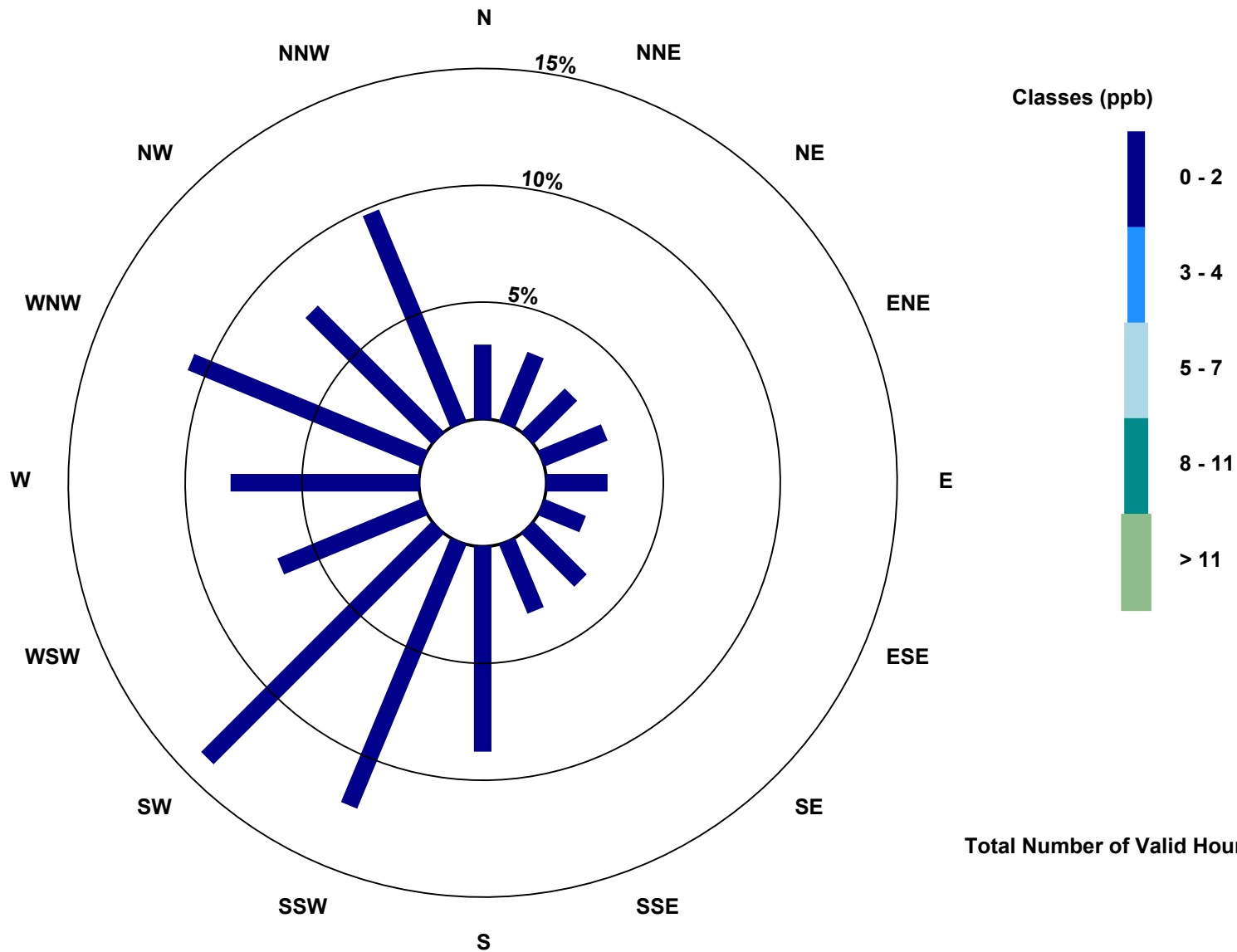
Total Number of Valid Hours: 698

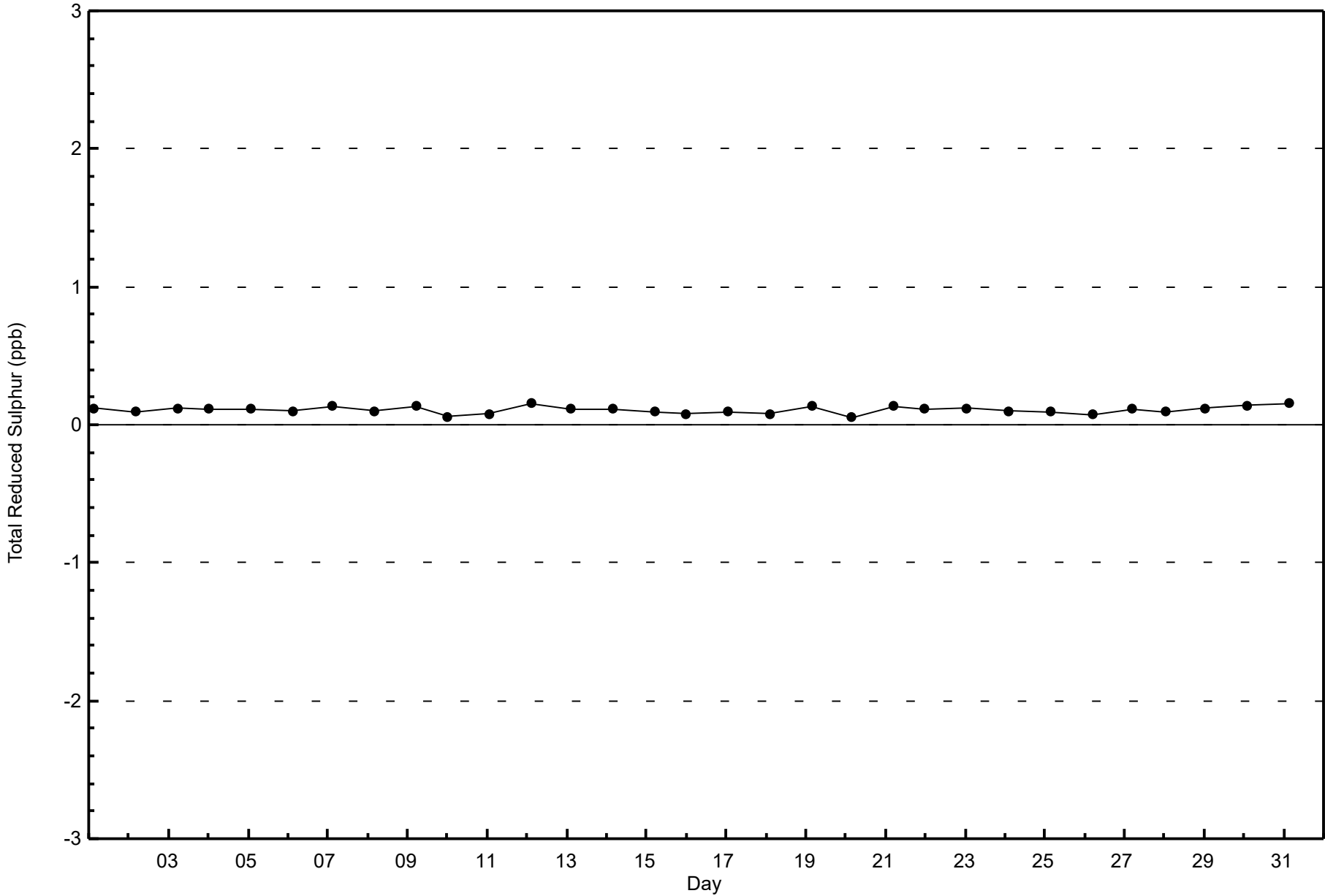
Total Number of Hours: 744

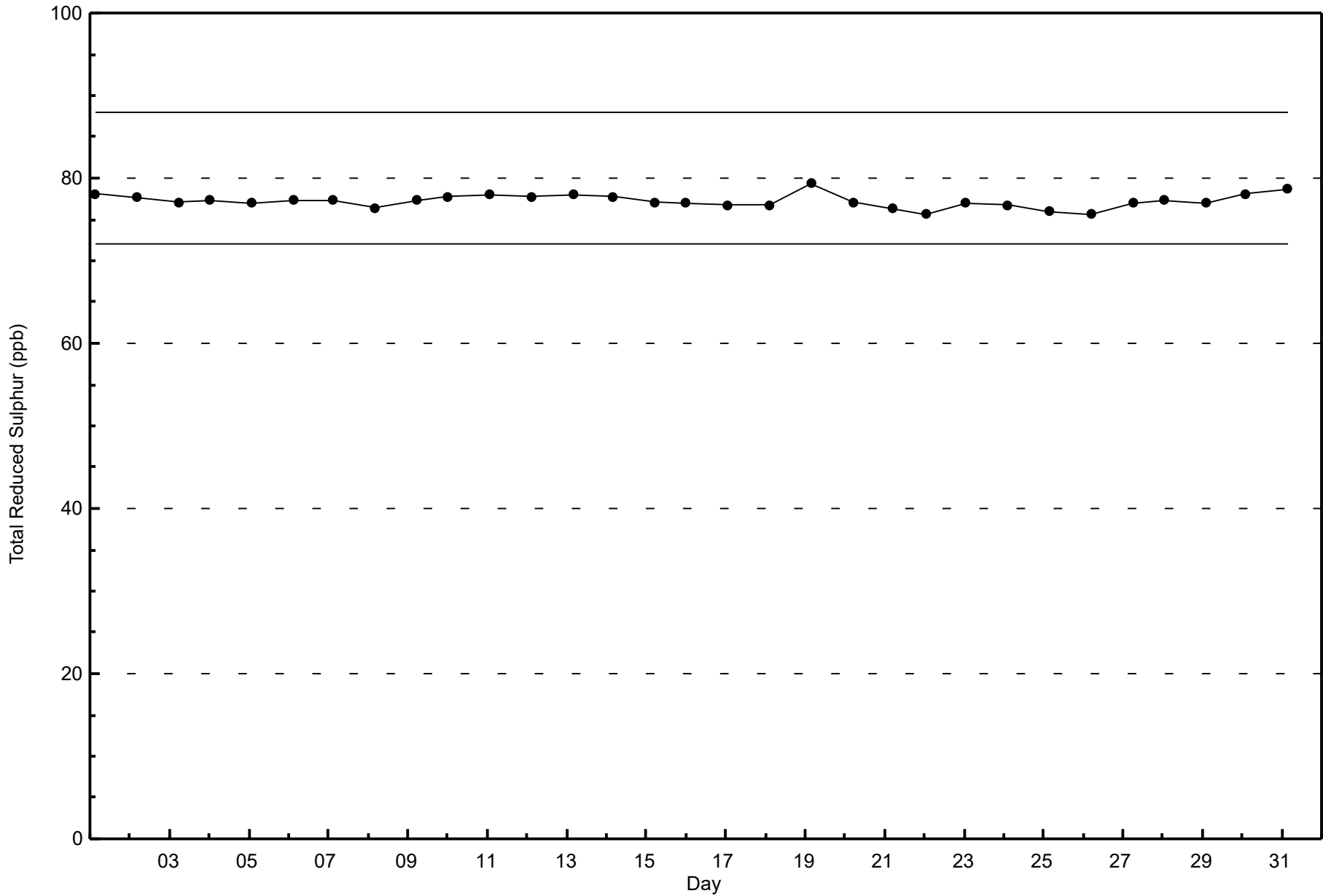


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Stony Mountain







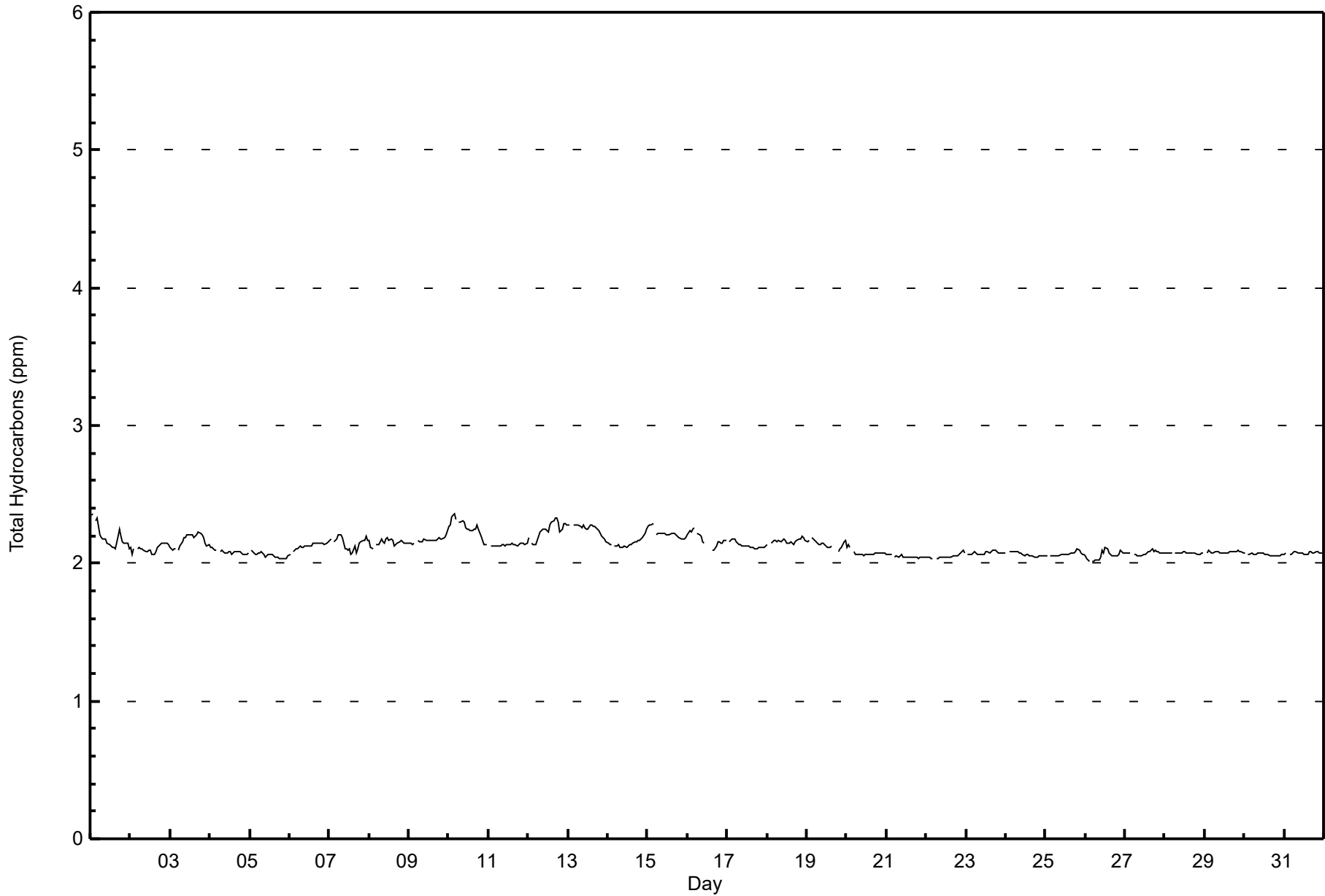


Maximum Value: 2.4 ppm on Jan 1 02:00		Maximum Daily Average: 2.3 ppm on Jan 10		Hours in Service: 744																																			
Minimum Value: 2.0 ppm on Jan 26 05:00		Minimum Daily Average: 2.0 ppm on Jan 21		Hours of Data: 706																																			
Maximum Diurnal Average: 2.1 ppm at hour 4		Minimum Diurnal Average: 2.1 ppm at hour 15		Hours of Missing Data: 38																																			
Monthly Average: 2.12 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.2 P ₉₉ = 2.3		Hours of Calibration: 35																																			
				Percent Operational Time: 99.6																																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24															
1-Jan	2.3	2.4	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4					
2-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2				
3-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2				
4-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1			
5-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1			
6-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2			
7-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
8-Jan	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2			
9-Jan	2.1	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
10-Jan	2.3	2.3	2.3	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.4		
11-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1		
12-Jan	2.2	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.3	
13-Jan	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
14-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	
15-Jan	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	
16-Jan	2.2	2.2	2.2	2.2	2.3	Z	2.2	2.2	2.2	2.2	2.1	C	C	C	C	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	
17-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2
18-Jan	2.1	Z	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
19-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	M	M	M	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
20-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
21-Jan	2.1	2.1	2.1	2.1	Z	2.0	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1
22-Jan	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
23-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
24-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
25-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
26-Jan	2.1	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
29-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
31-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
																								Diurnal Average															
																								Diurnal Maximum															
Z - zerospan C - Calibration M - Maintenance																																							



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	52	7.37	7.37
2.1 - 3.0	654	92.63	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	0	0	0	0	0	0	2	6	0	5	4	8	7	14	5	52
2.1 - 3.0	21	22	18	20	18	14	19	17	60	86	92	40	49	69	38	63	646
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	18	20	18	14	19	19	66	86	97	44	57	76	52	68	698

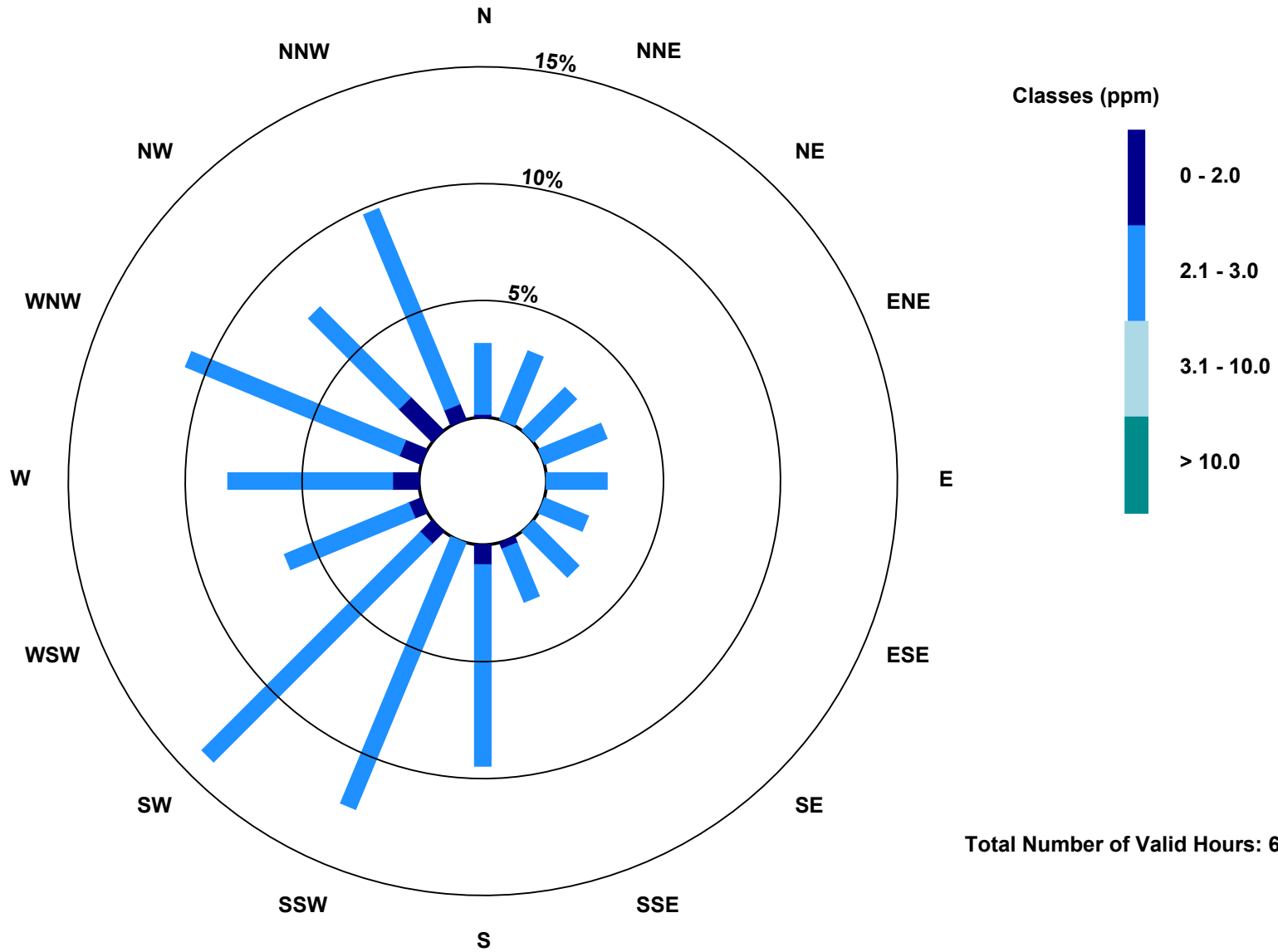
Total Number of Valid Hours: 698

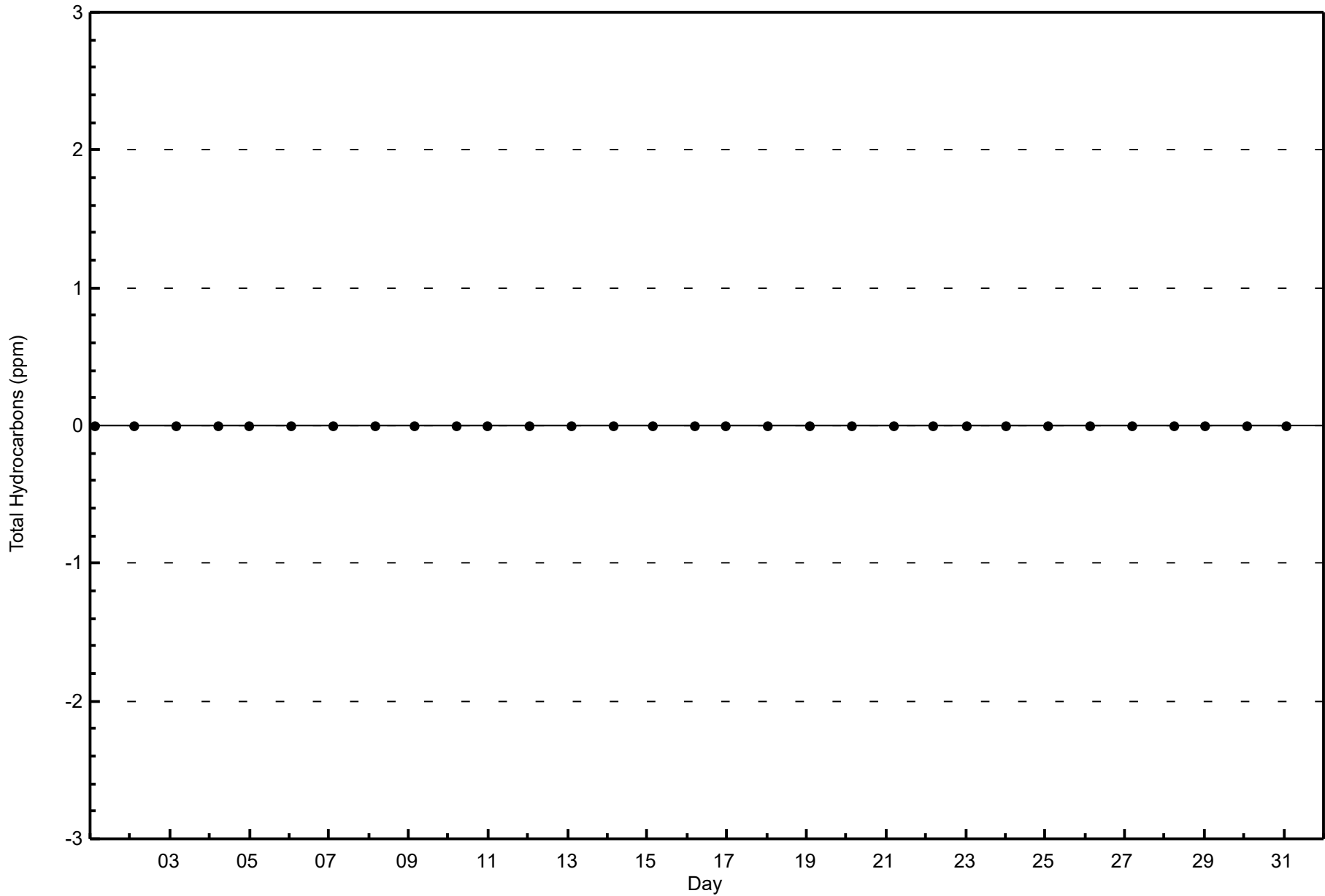
Total Number of Hours: 744

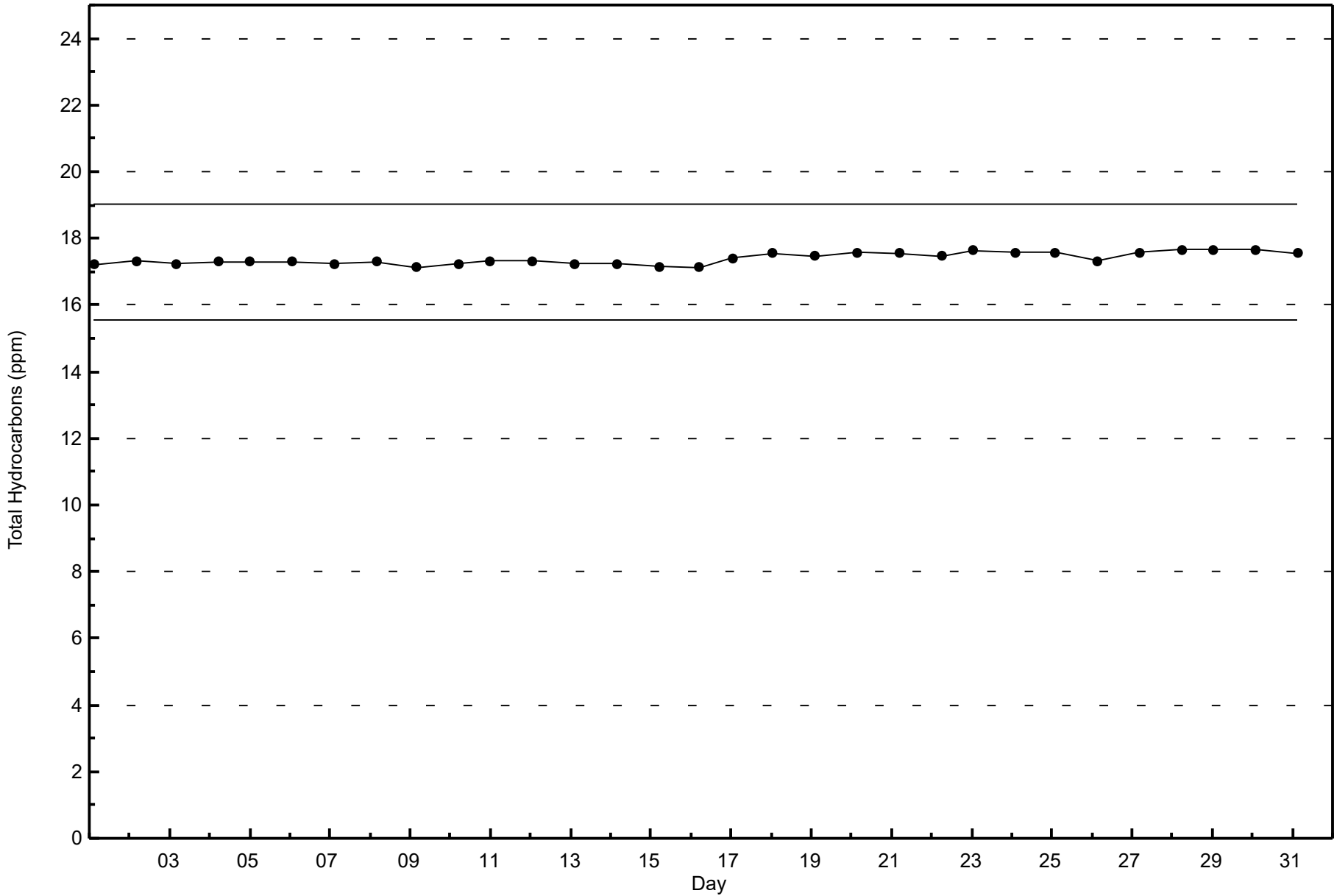


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Stony Mountain





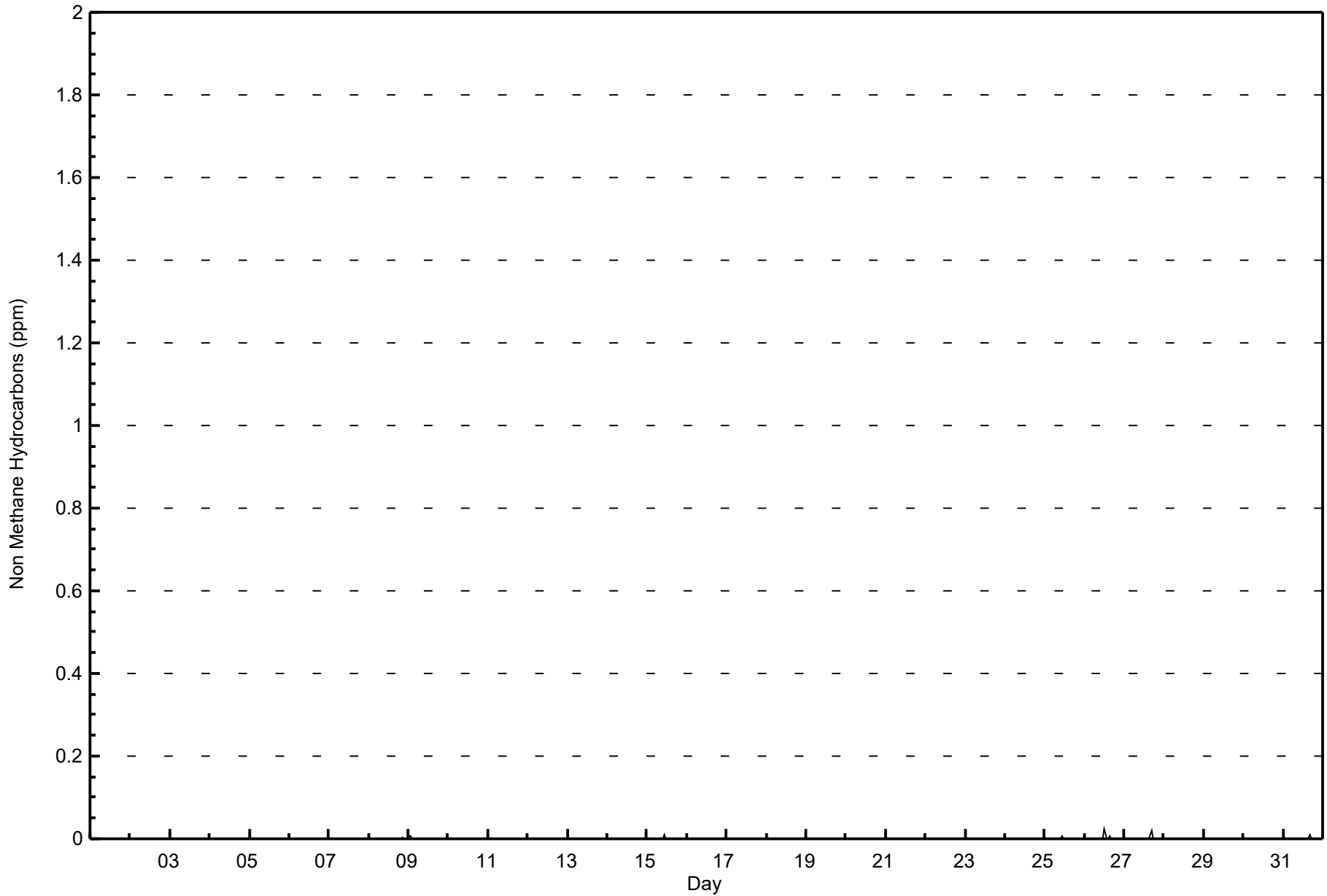




Summary of Hour Averages

Stony Mountain - January 2023

Maximum Value: 0.023 ppm on Jan 26 13:00		Maximum Daily Average: 0.001 ppm on Jan 26		Hours in Service:	744																							
Minimum Value: 0.000 ppm on Jan 1 01:00		Minimum Daily Average: 0.000 ppm on Jan 1		Hours of Data:	706																							
Maximum Diurnal Average: 0.001 ppm at hour 17		Minimum Diurnal Average: 0.000 ppm at hour 3		Hours of Missing Data:	38																							
Monthly Average: 0.000 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.0		Hours of Calibration:	35																							
				Percent Operational Time:	99.6																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.004
9-Jan	0.006	0.005	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006
10-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
16-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	C	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	M	M	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
26-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.023
27-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.021	0.000
28-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
29-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
30-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31-Jan	0.007	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011	0.000
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan		C - Calibration				M - Maintenance																						





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	699	99.01	99.01
0.006 - 0.05	7	0.99	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	22	21	17	20	18	14	19	19	66	86	97	44	57	74	52	66	692
0.006 - 0.05	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	2	6
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	18	20	18	14	19	19	66	86	97	44	57	76	52	68	698

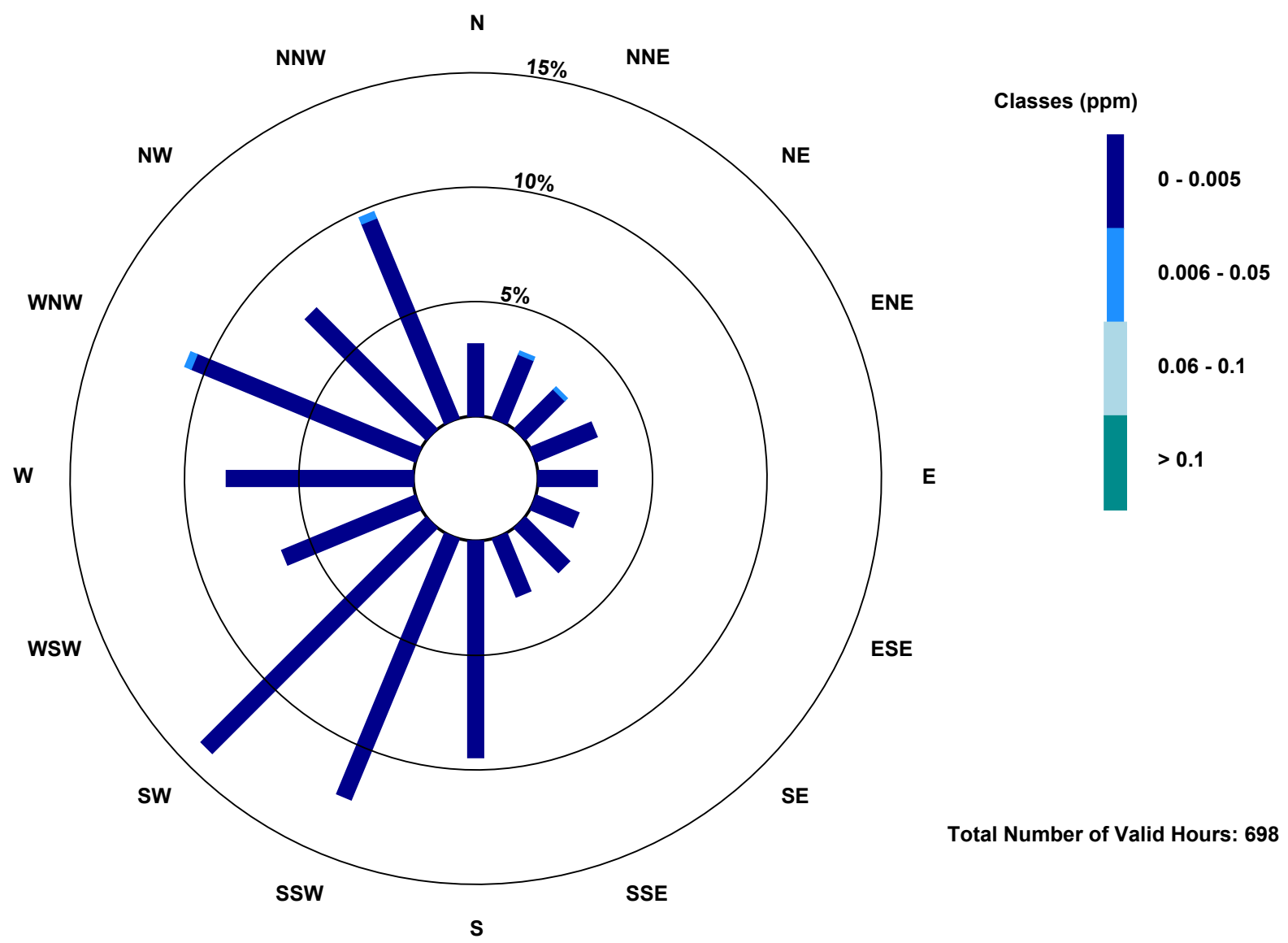
Total Number of Valid Hours: 698

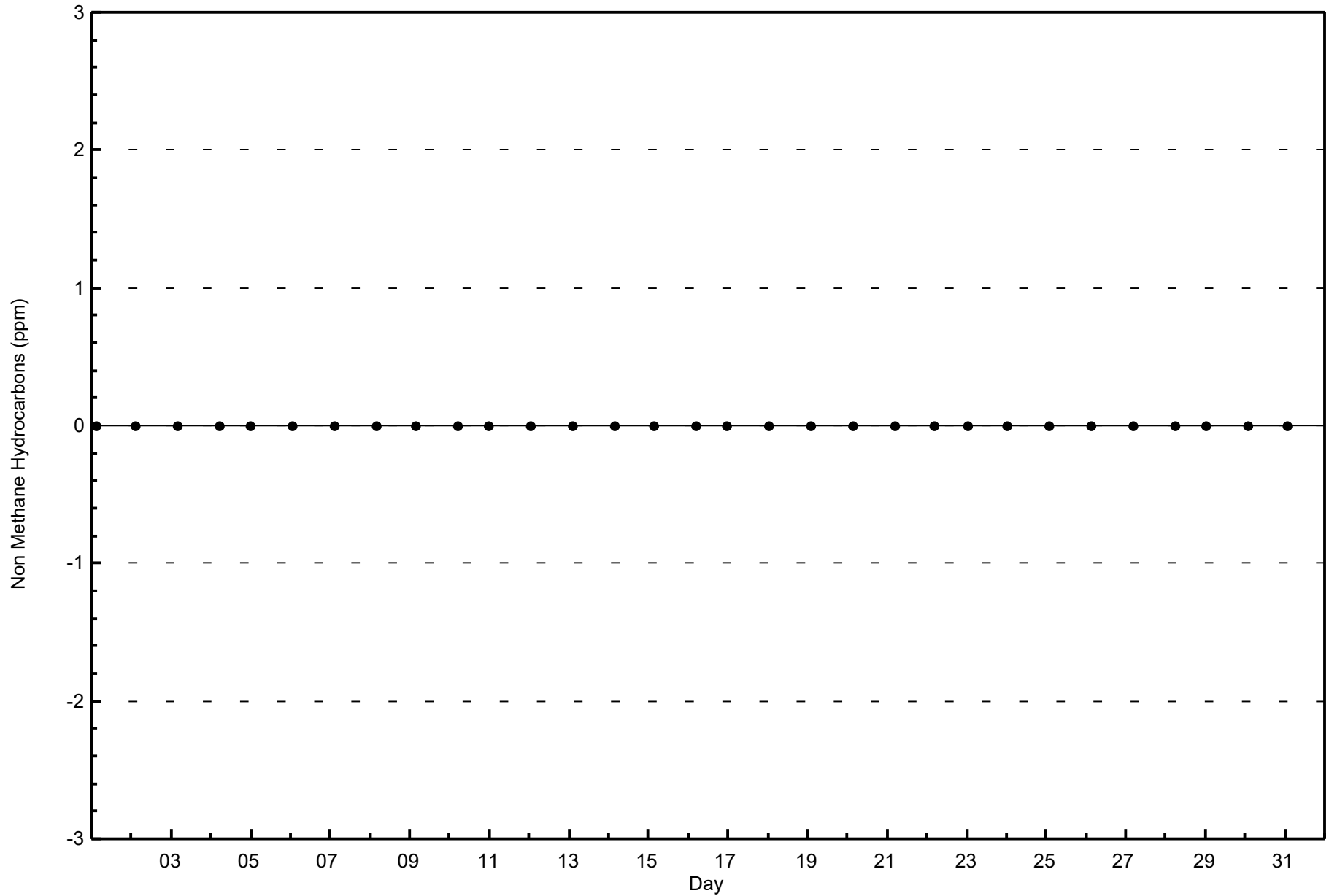
Total Number of Hours: 744

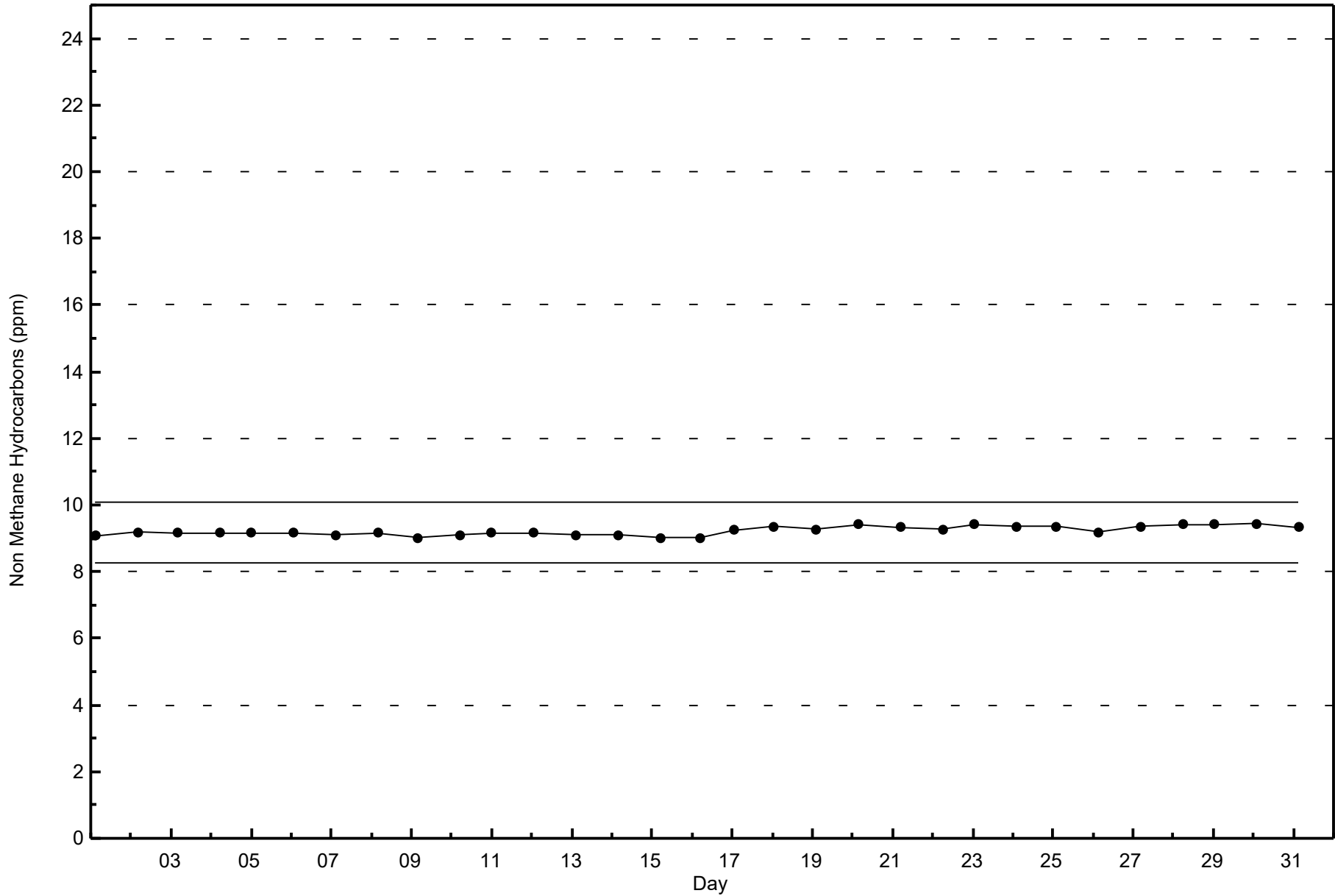


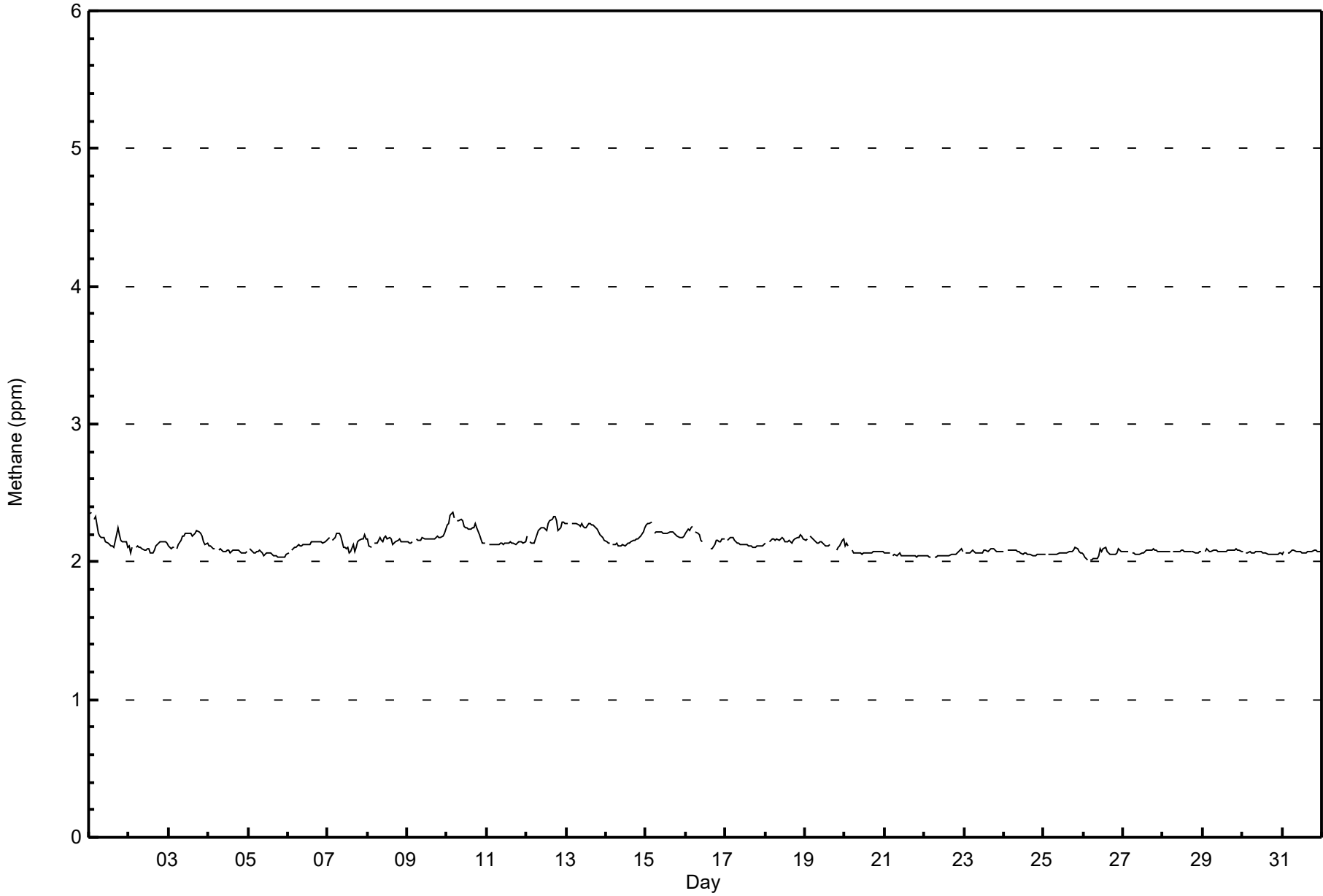
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	52	7.37	7.37
2.1 - 3.0	654	92.63	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Stony Mountain - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	0	0	0	0	0	0	2	6	0	5	4	8	7	14	5	52
2.1 - 3.0	21	22	18	20	18	14	19	17	60	86	92	40	49	69	38	63	646
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	18	20	18	14	19	19	66	86	97	44	57	76	52	68	698

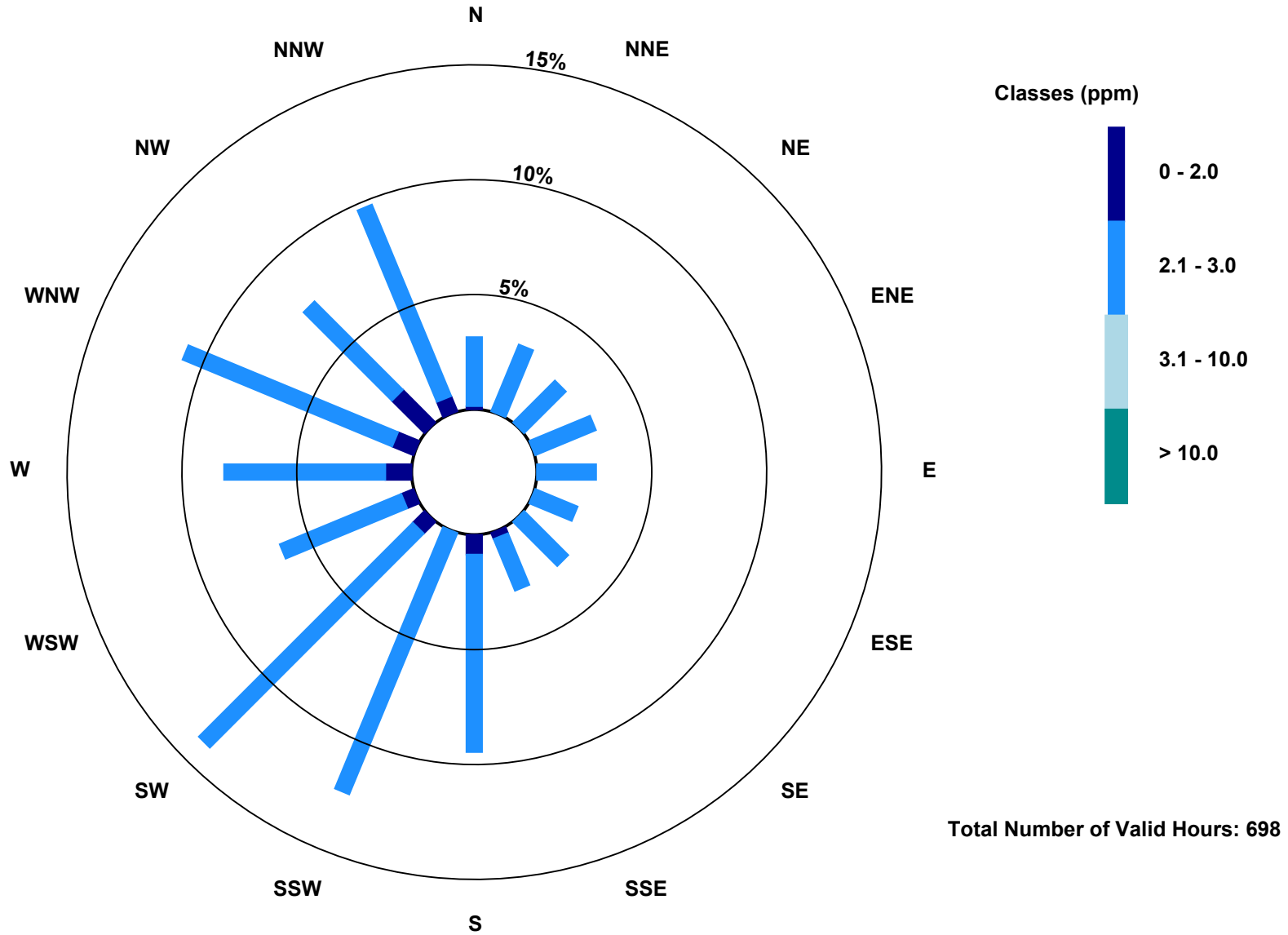
Total Number of Valid Hours: 698

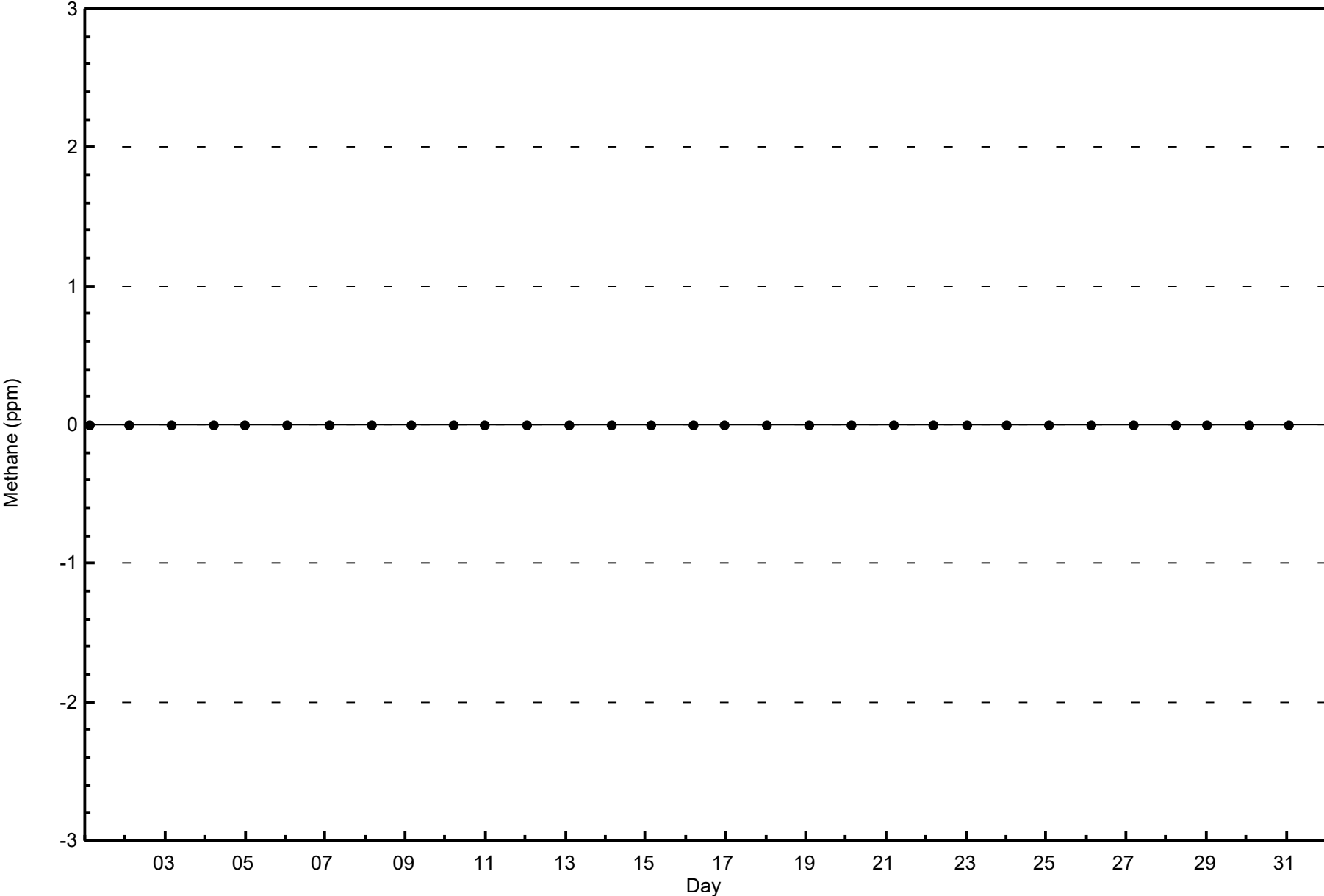
Total Number of Hours: 744

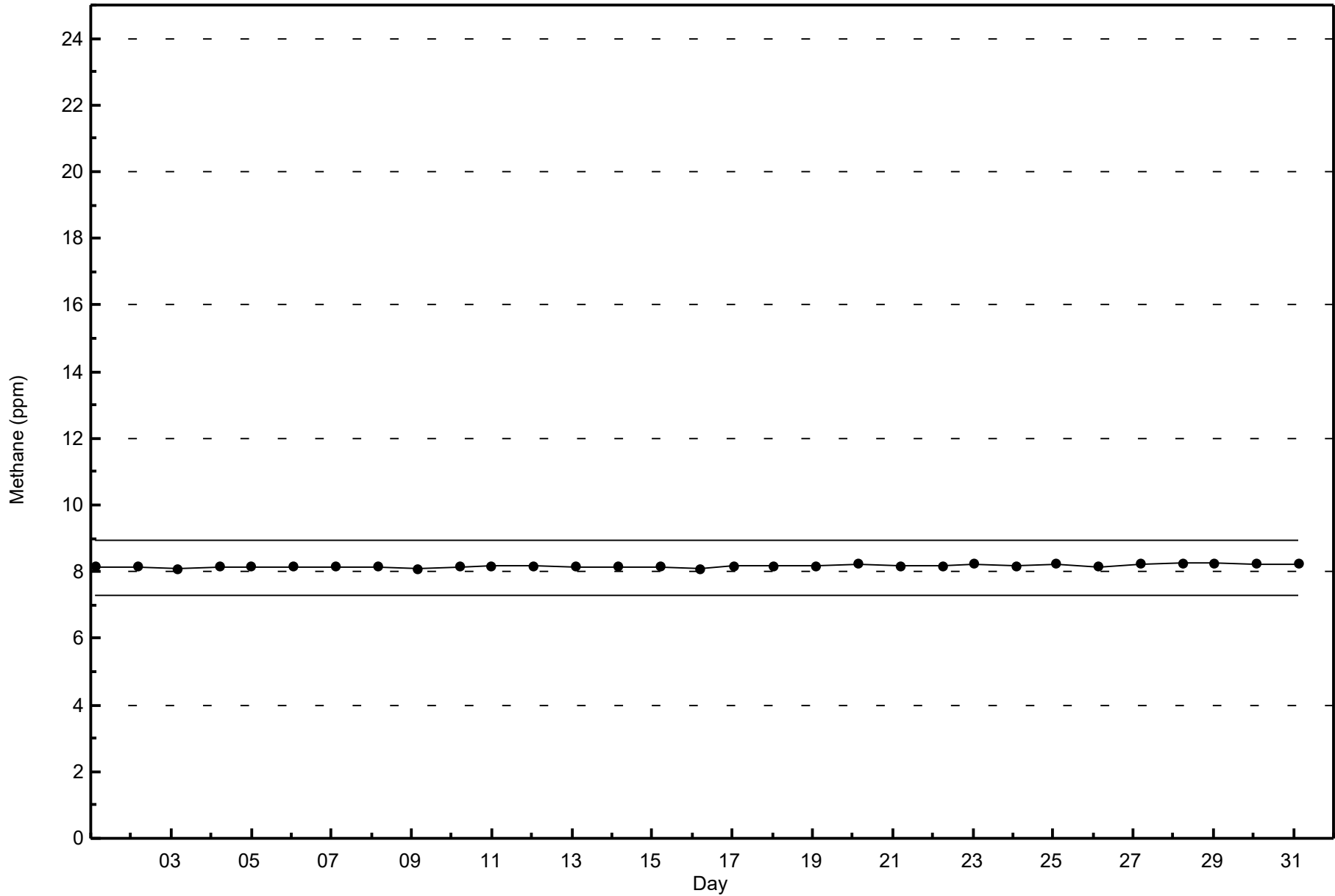


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Stony Mountain









Wood Buffalo Environmental Association
Summary of Hour Averages

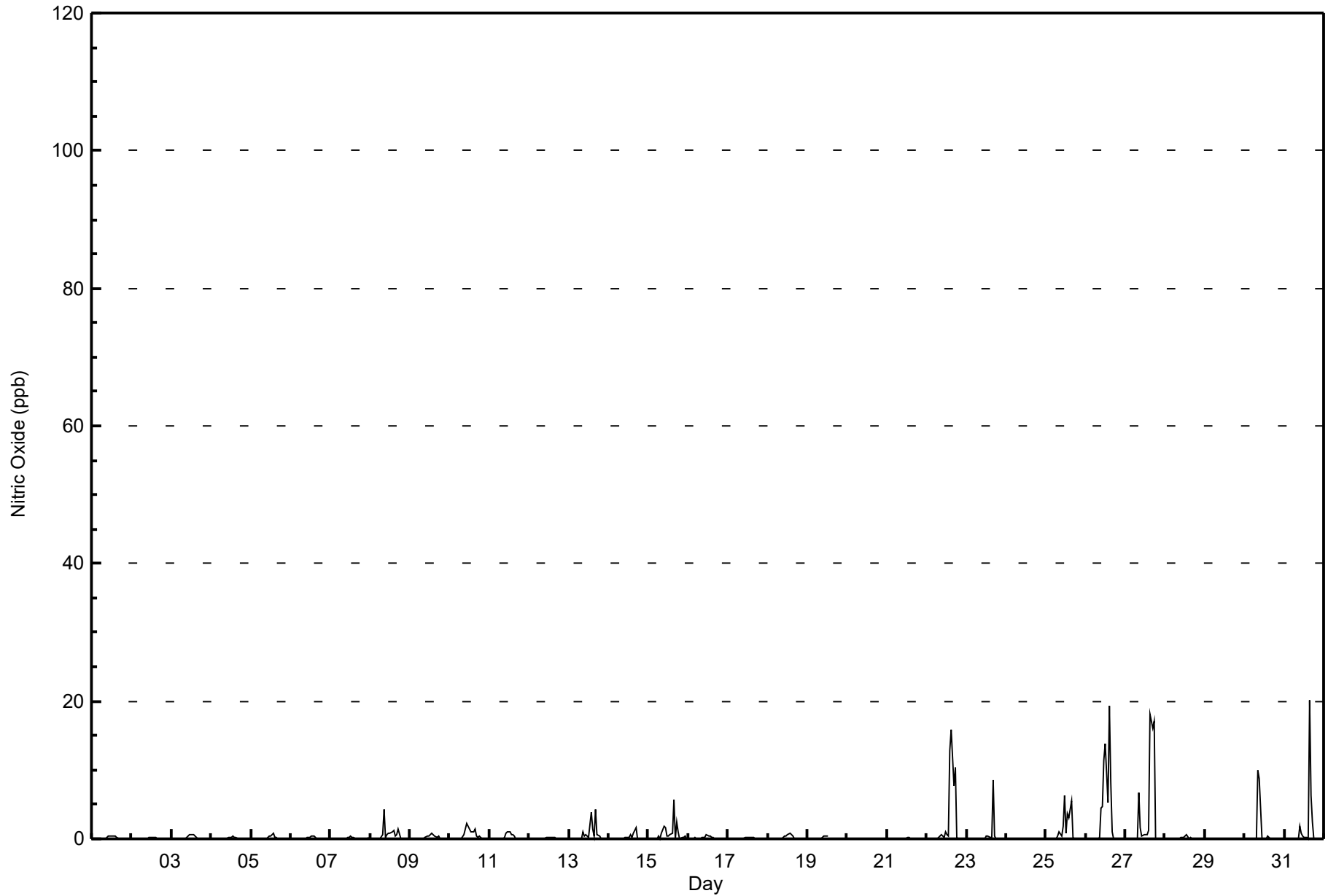
Nitric Oxide (NO) - ppb
Stony Mountain - January 2023

Maximum Value: 20.2 ppb on Jan 31 16:00		Maximum Daily Average: 3.0 ppb on Jan 26		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Jan 2 08:00		Minimum Daily Average: 0.0 ppb on Jan 29		Hours of Data: 702																							
Maximum Diurnal Average: 2.7 ppb at hour 16		Minimum Diurnal Average: 0.0 ppb at hour 20		Hours of Missing Data: 42																							
Monthly Average: 0.52 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.2 P ₉₀ = 0.7 P ₉₉ = 12.7		Hours of Calibration: 37																							
				Percent Operational Time: 99.3																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
2-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
3-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.6	0.7	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
4-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
5-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.4	0.7	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7
6-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.4
8-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.7	4.3	0.2	0.5	0.7	0.8	1.0	1.3	0.4	0.6	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.3
9-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.5	0.8	0.6	0.3	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
10-Jan	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.6	1.4	2.2	1.8	1.4	1.0	1.1	1.4	0.3	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.2
11-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.9	0.9	0.6	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
12-Jan	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	1.1	0.4	0.6	0.4	0.3	3.9	1.4	0.4	4.3	0.6	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.6	4.3
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.3	0.3	0.3	0.5	0.2	0.9	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.6
15-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.1	0.8	1.8	1.6	0.3	0.4	0.5	0.7	5.7	0.1	2.4	1.1	0.0	0.3	0.2	0.3	0.0	0.0	0.7	5.7
16-Jan	0.0	0.1	Z	0.1	0.3	0.1	0.1	0.1	0.3	0.2	0.3	0.6	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
17-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
18-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.5	0.8	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
19-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.4	0.5	0.5	M	M	M	M	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
21-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
22-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.2	1.1	0.5	0.4	12.7	15.9	7.8	10.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	15.9
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.4	0.3	0.2	8.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	8.6
24-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.4	0.9	0.4	1.8	6.3	0.9	3.7	3.0	5.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.3
26-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.4	4.6	11.4	13.7	5.2	19.4	8.2	1.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.0	19.4
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	6.7	1.7	0.5	0.7	0.6	0.7	1.2	18.1	16.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	18.1
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.2	0.4	0.5	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
29-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
30-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	9.9	8.8	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	9.9
31-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	1.8	0.9	0.4	0.2	0.2	0.1	20.2	6.3	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	20.2
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	21	17	20	19	14	22	20	64	88	94	47	53	74	50	70	694
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	21	17	20	19	14	22	20	64	88	94	47	53	74	50	70	694

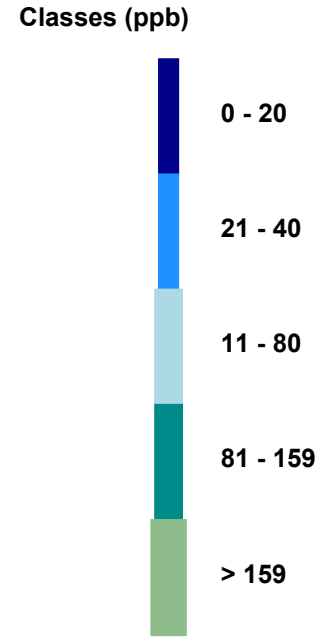
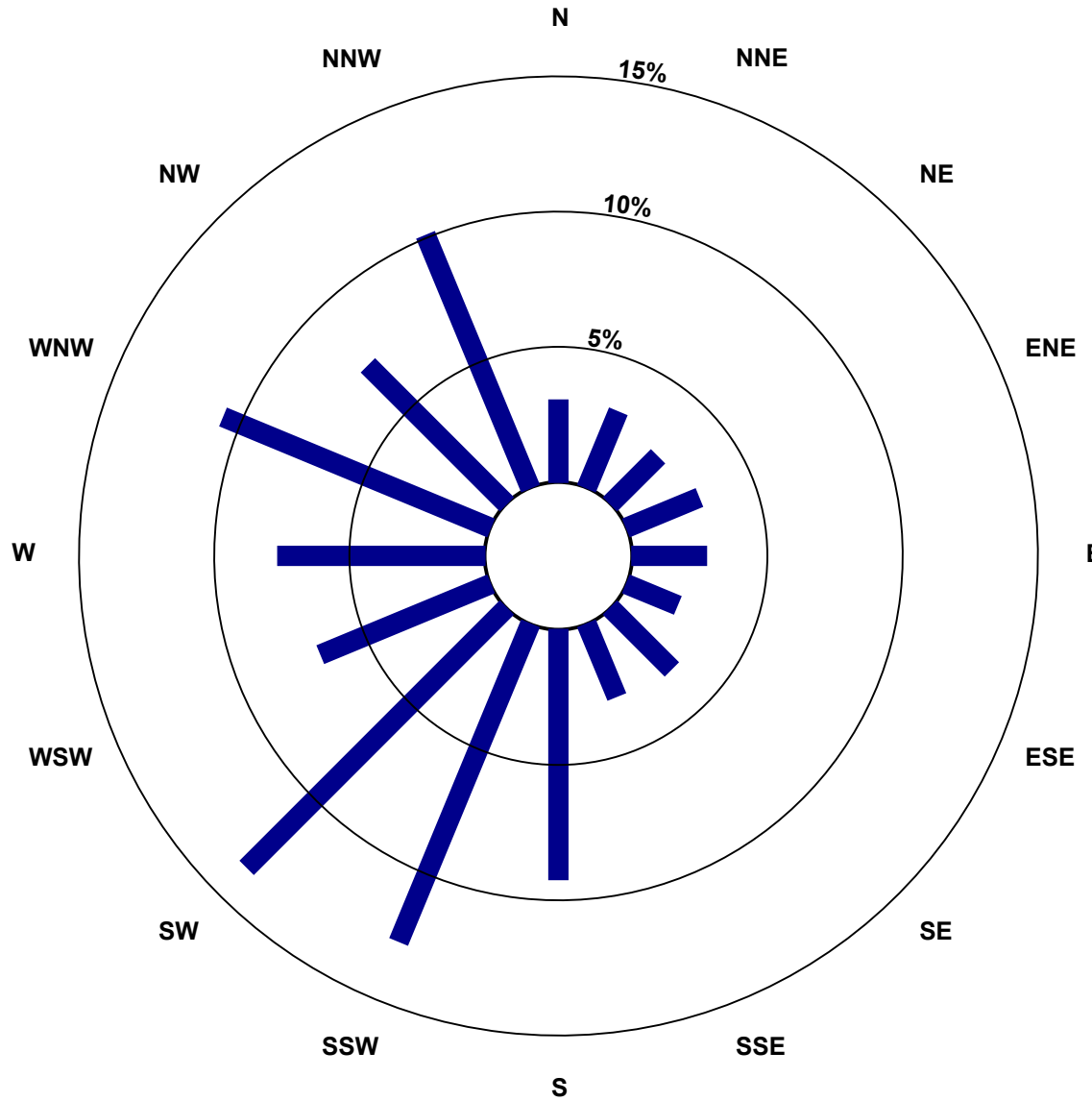
Total Number of Valid Hours: 694

Total Number of Hours: 744

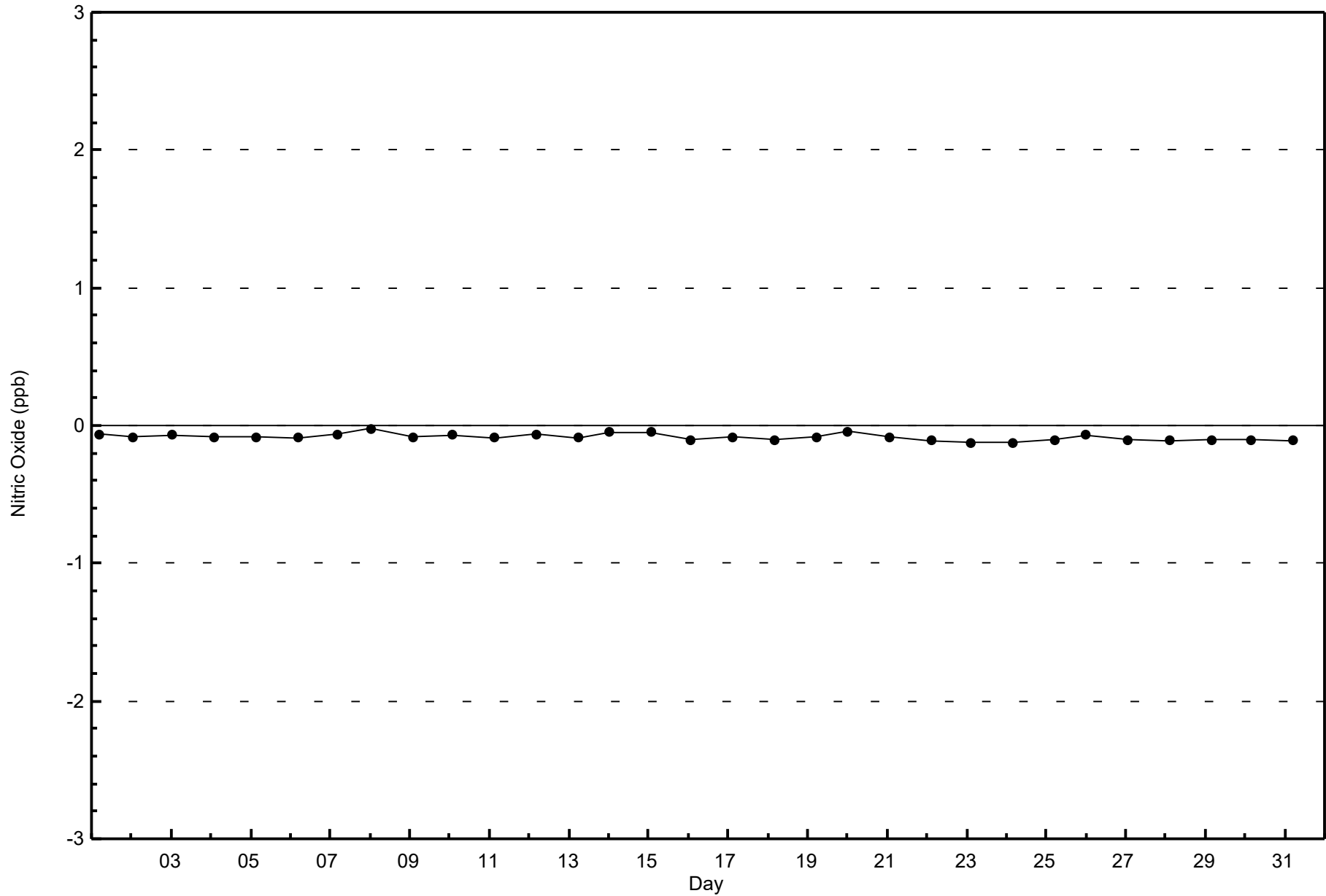


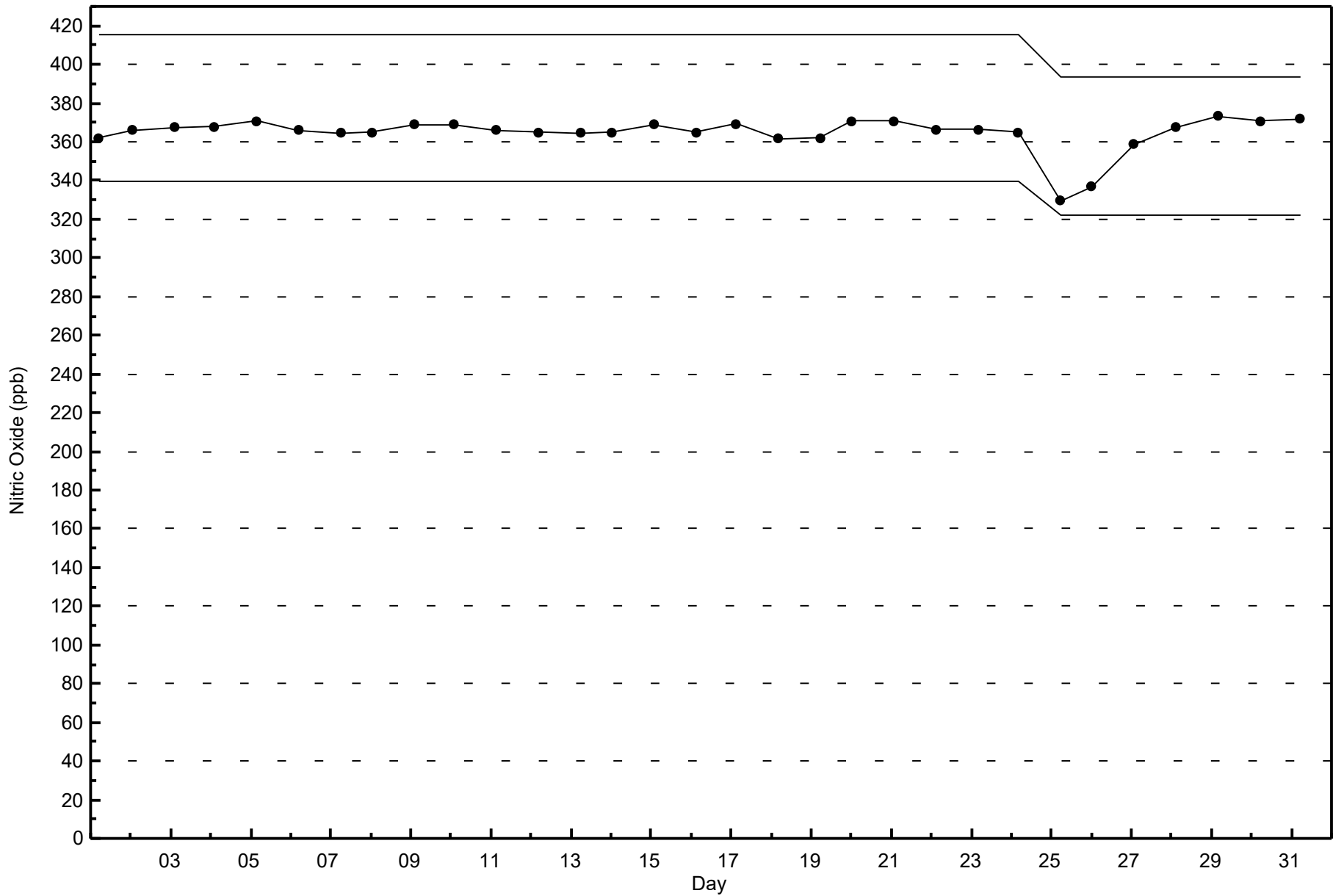
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Stony Mountain



Total Number of Valid Hours: 694







Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 16.1 ppb on Jan 10 01:00	Maximum Daily Average: 6.7 ppb on Jan 10		Hours of Data:	702
Minimum Value: 0.0 ppb on Jan 28 14:00	Minimum Daily Average: 0.2 ppb on Jan 28		Hours of Missing Data:	42
Maximum Diurnal Average: 3.2 ppb at hour 16	Minimum Diurnal Average: 1.9 ppb at hour 6		Hours of Calibration:	37
Monthly Average: 2.51 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 1.2 Median = 2.2 Q ₃ = 3.3 P ₉₀ = 4.9 P ₉₉ = 8.6		Percent Operational Time:	99.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.7	7.6	7.1	7.1	8.6	Z	4.9	4.2	4.0	3.6	2.9	2.7	2.5	2.6	2.7	2.7	4.2	5.0	4.0	3.1	3.0	2.7	2.7	2.0	4.2	8.6
2-Jan	Z	1.4	1.7	1.6	1.5	1.7	1.5	1.6	1.6	1.5	1.5	1.7	1.9	1.7	1.7	2.2	2.9	3.2	3.7	4.7	5.6	6.4	6.6	6.7	2.8	6.7
3-Jan	4.5	Z	3.1	3.1	2.7	2.5	2.9	3.5	4.3	4.4	4.8	4.8	4.8	4.8	4.7	4.7	5.1	5.2	4.9	4.9	5.2	3.8	3.3	3.6	4.2	5.2
4-Jan	3.4	3.0	Z	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.5	1.6	1.5	1.8	2.1	2.3	2.2	2.2	2.0	2.0	1.8	1.9	2.1	2.0	3.4
5-Jan	1.9	2.0	1.9	Z	1.6	1.4	1.3	1.4	1.1	1.0	2.0	2.2	2.0	3.3	2.2	3.6	2.6	2.4	2.4	2.7	2.9	2.5	2.2	2.7	2.1	3.6
6-Jan	2.7	2.0	1.8	1.9	Z	1.9	2.3	1.9	1.6	1.7	1.8	1.7	2.1	2.6	3.5	3.9	3.9	3.7	3.8	3.9	3.3	3.1	3.0	2.8	2.6	3.9
7-Jan	3.1	3.5	3.1	3.6	4.2	Z	4.9	4.8	4.5	3.2	2.8	2.5	2.6	2.0	2.2	2.7	1.8	2.1	2.7	3.2	3.5	4.0	6.6	5.6	3.4	6.6
8-Jan	Z	3.7	4.2	5.3	4.4	3.6	5.0	6.3	8.9	5.0	4.8	5.0	5.7	5.7	7.6	6.2	6.5	6.7	5.5	4.5	3.4	2.4	2.5	2.5	5.0	8.9
9-Jan	2.1	Z	2.0	1.8	1.7	1.8	2.1	2.6	2.7	2.9	2.9	2.2	2.1	2.4	3.0	3.4	3.7	6.1	5.9	3.5	3.7	7.5	9.9	15.2	4.0	15.2
10-Jan	16.1	15.3	Z	10.5	8.4	8.0	7.8	8.5	9.3	7.8	5.8	5.2	5.1	5.0	5.6	7.0	7.5	5.9	5.8	3.2	2.3	1.4	1.6	1.5	6.7	16.1
11-Jan	2.5	2.2	1.9	Z	1.2	2.1	3.5	3.9	4.3	4.1	4.0	3.8	3.4	2.5	3.5	4.0	3.1	2.4	2.6	2.5	2.7	3.1	4.2	5.7	3.2	5.7
12-Jan	7.0	4.5	3.5	3.0	Z	3.9	4.1	3.1	3.0	3.0	2.9	2.6	2.4	2.7	3.0	3.2	3.5	3.5	3.4	2.6	2.7	3.0	2.9	2.7	3.3	7.0
13-Jan	2.7	2.8	2.9	3.0	2.8	Z	2.7	2.6	3.6	4.0	3.4	3.1	2.7	4.2	2.9	2.9	5.0	3.8	2.6	2.3	2.0	2.0	1.9	1.9	2.9	5.0
14-Jan	Z	1.4	1.7	1.5	1.4	1.5	2.0	2.1	2.5	2.2	2.3	2.5	2.3	2.4	2.3	2.9	3.9	5.1	2.8	2.6	2.5	2.6	3.3	3.7	2.5	5.1
15-Jan	3.8	Z	3.7	3.8	2.8	2.4	2.9	2.4	3.2	3.3	3.0	2.9	3.0	3.2	3.8	4.8	5.2	6.6	5.8	4.5	4.3	4.3	4.1	3.5	3.8	6.6
16-Jan	3.5	3.6	Z	4.2	4.8	5.2	7.0	8.2	8.5	3.7	2.8	2.3	3.0	2.7	2.4	2.2	2.4	3.6	2.8	2.5	2.3	2.2	2.5	2.3	3.7	8.5
17-Jan	2.2	2.1	2.1	Z	2.1	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.7	1.9	1.7	1.8	1.6	1.7	1.9	1.8	1.8	1.7	1.7	1.7	1.8	2.2
18-Jan	1.8	1.7	1.8	2.0	Z	2.0	2.5	2.5	3.2	3.7	2.6	2.1	2.1	2.9	2.8	3.7	3.4	2.5	2.6	2.7	2.4	2.3	2.2	1.7	2.5	3.7
19-Jan	1.6	1.9	2.3	2.6	2.9	Z	2.6	2.4	2.4	2.5	2.6	2.5	2.2	M	M	M	M	M	3.0	2.2	2.6	2.8	3.9	3.9	2.6	3.9
20-Jan	Z	2.6	2.1	1.7	1.3	1.1	1.0	0.9	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.5	1.8	2.0	1.8	1.7	1.6	1.5	1.4	2.6
21-Jan	1.4	Z	1.4	1.3	1.3	1.2	1.1	1.1	1.1	1.0	0.9	1.0	1.0	1.2	1.2	1.2	1.4	1.6	1.7	1.5	1.4	1.4	1.2	1.0	1.2	1.7
22-Jan	0.9	0.9	Z	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	1.0	3.5	1.9	3.6	5.2	0.4	0.3	0.2	0.4	0.6	0.4	1.1	5.2
23-Jan	0.4	0.3	0.3	Z	1.3	1.6	0.5	0.3	0.5	0.5	0.8	0.9	2.2	2.5	2.1	2.5	3.1	3.3	2.5	1.4	1.1	1.1	1.1	1.1	1.4	3.3
24-Jan	1.5	1.9	1.3	1.3	Z	1.0	1.5	0.7	0.6	0.7	C	C	C	C	C	C	0.5	0.3	0.4	0.4	0.5	0.4	0.5	0.3	--	1.9
25-Jan	0.1	0.2	0.3	0.3	0.3	Z	0.3	0.5	1.4	0.6	1.2	0.5	1.0	1.4	2.0	2.6	1.5	1.3	1.5	1.6	1.5	1.5	1.5	1.6	1.1	2.6
26-Jan	Z	1.0	0.6	0.4	0.4	0.3	0.2	0.2	0.3	1.2	4.2	5.2	4.7	4.7	2.6	4.1	0.2	0.2	0.4	0.2	0.3	2.5	1.9	1.2	1.6	5.2
27-Jan	1.2	Z	0.2	0.4	0.3	0.2	0.2	0.4	4.4	2.8	0.9	1.0	0.9	1.5	1.9	6.5	5.4	6.3	3.8	3.0	1.7	1.0	0.5	0.3	1.9	6.5
28-Jan	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.3	0.3	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.4
29-Jan	0.2	0.4	0.4	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.7	0.9	0.8	1.0	1.0	0.9	0.8	0.5	1.0
30-Jan	1.2	0.5	0.4	0.3	Z	0.3	0.3	0.2	3.1	3.1	0.3	0.3	0.3	0.3	1.1	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.8	0.6	0.7	3.1
31-Jan	0.5	1.6	0.9	1.2	1.3	Z	2.7	1.9	1.5	4.8	2.6	1.2	0.7	0.6	0.6	8.0	4.8	2.8	2.6	2.8	2.4	1.3	1.3	0.8	2.1	8.0

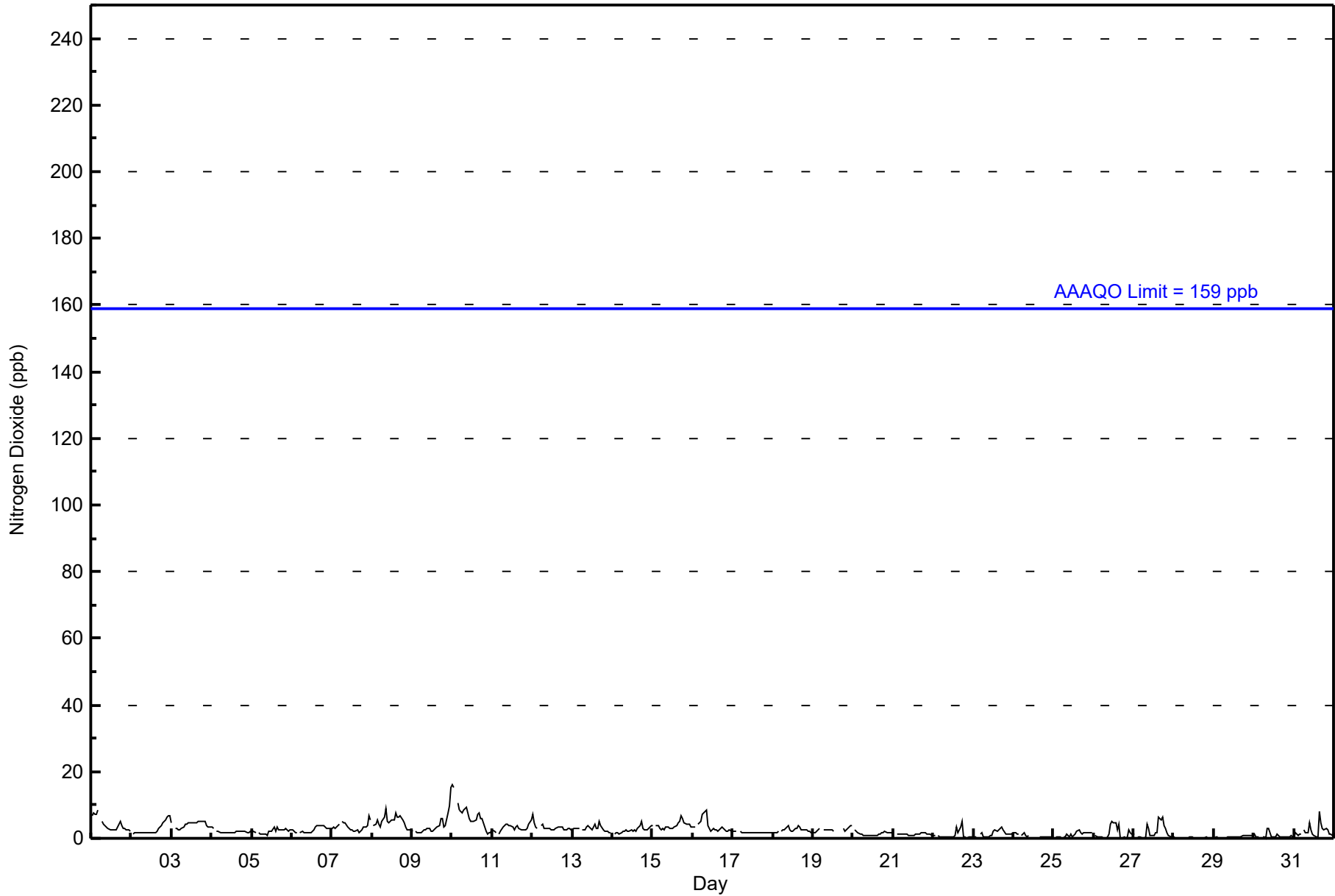
2.8	2.6	2.0	2.5	2.3	1.9	2.3	2.3	2.8	2.5	2.3	2.2	2.2	2.4	2.6	3.2	3.1	3.2	2.7	2.4	2.3	2.3	2.6	2.6	Diurnal Average	
16.1	15.3	7.1	10.5	8.6	8.0	7.8	8.5	9.3	7.8	5.8	5.2	5.7	5.7	7.6	8.0	7.5	6.7	5.9	4.9	5.6	7.5	9.9	15.2	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	21	17	20	19	14	22	20	64	88	94	47	53	74	50	70	694
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	21	17	20	19	14	22	20	64	88	94	47	53	74	50	70	694

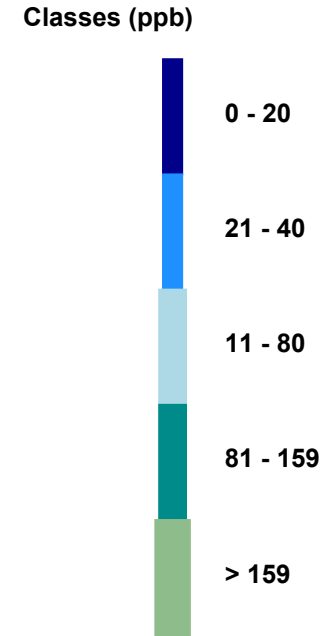
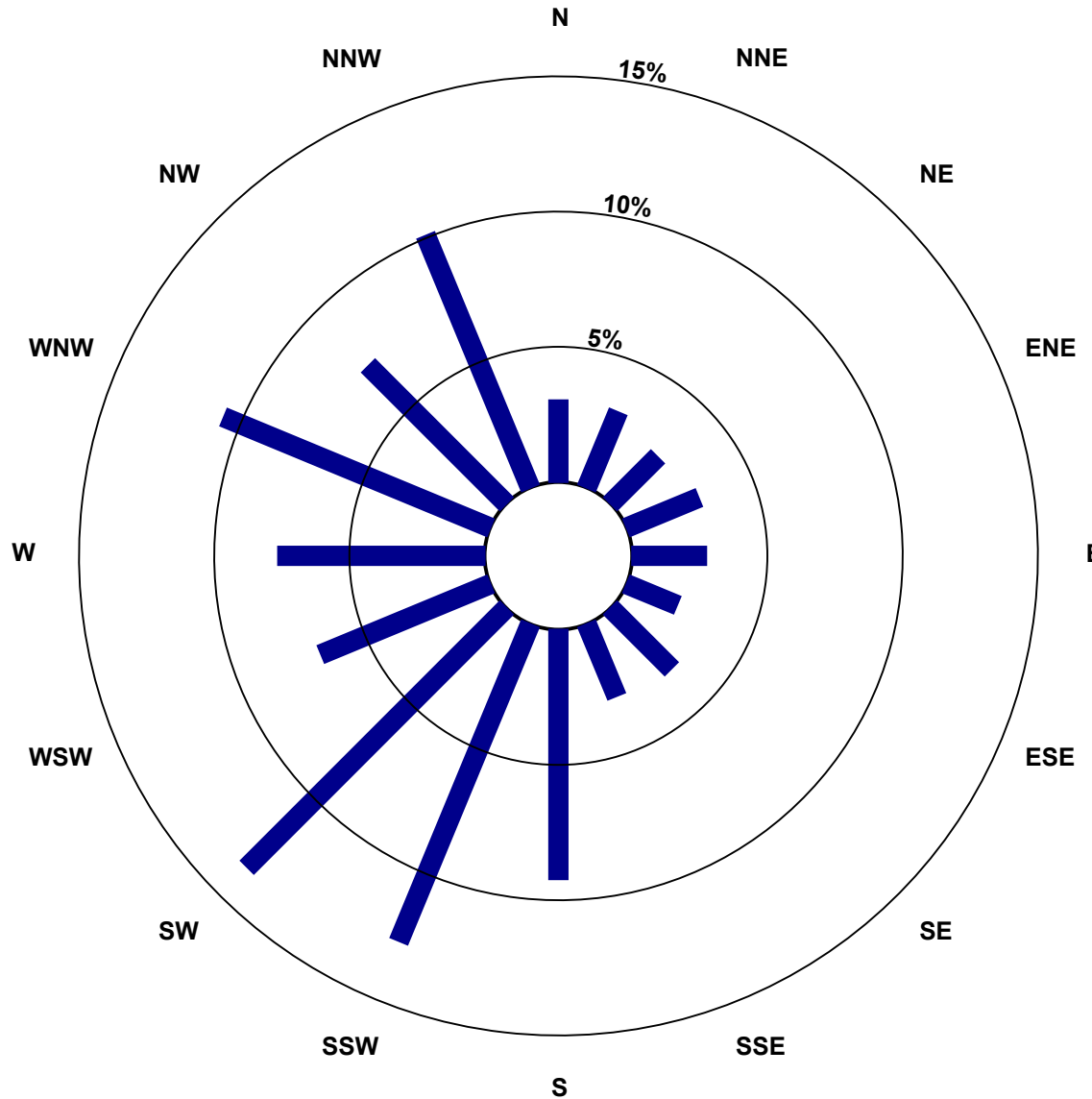
Total Number of Valid Hours: 694

Total Number of Hours: 744

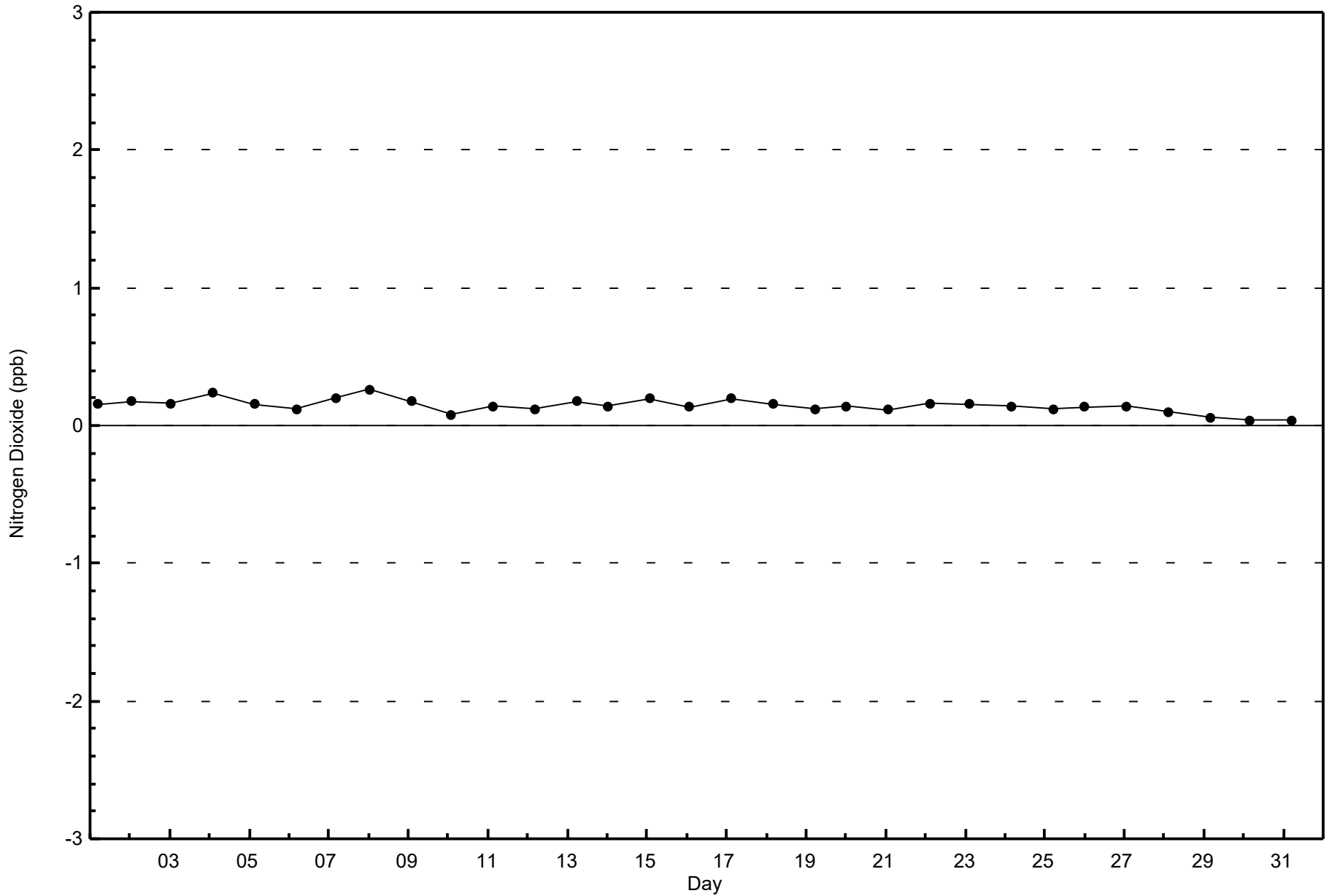


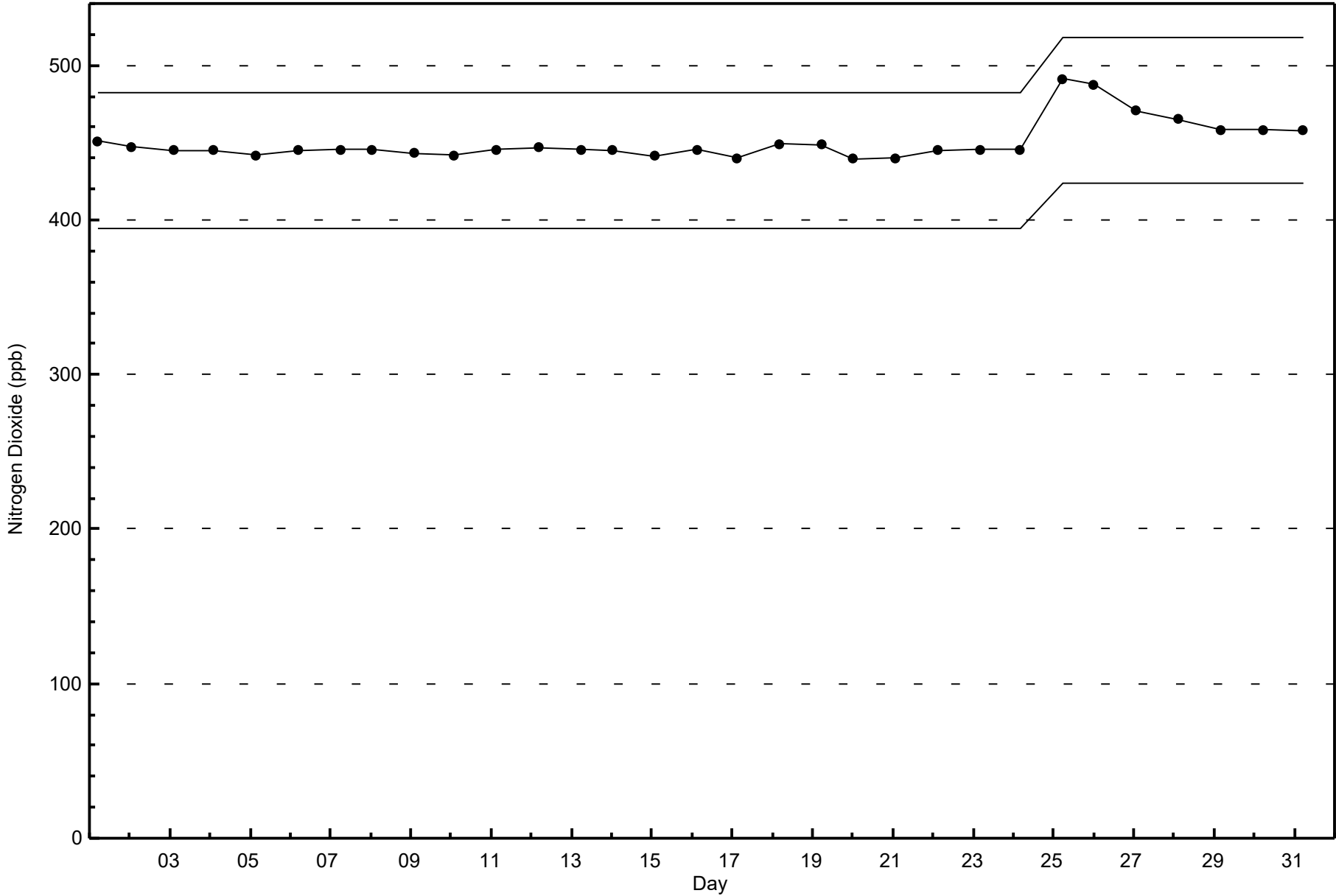
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain



Total Number of Valid Hours: 694







Wood Buffalo Environmental Association
Summary of Hour Averages

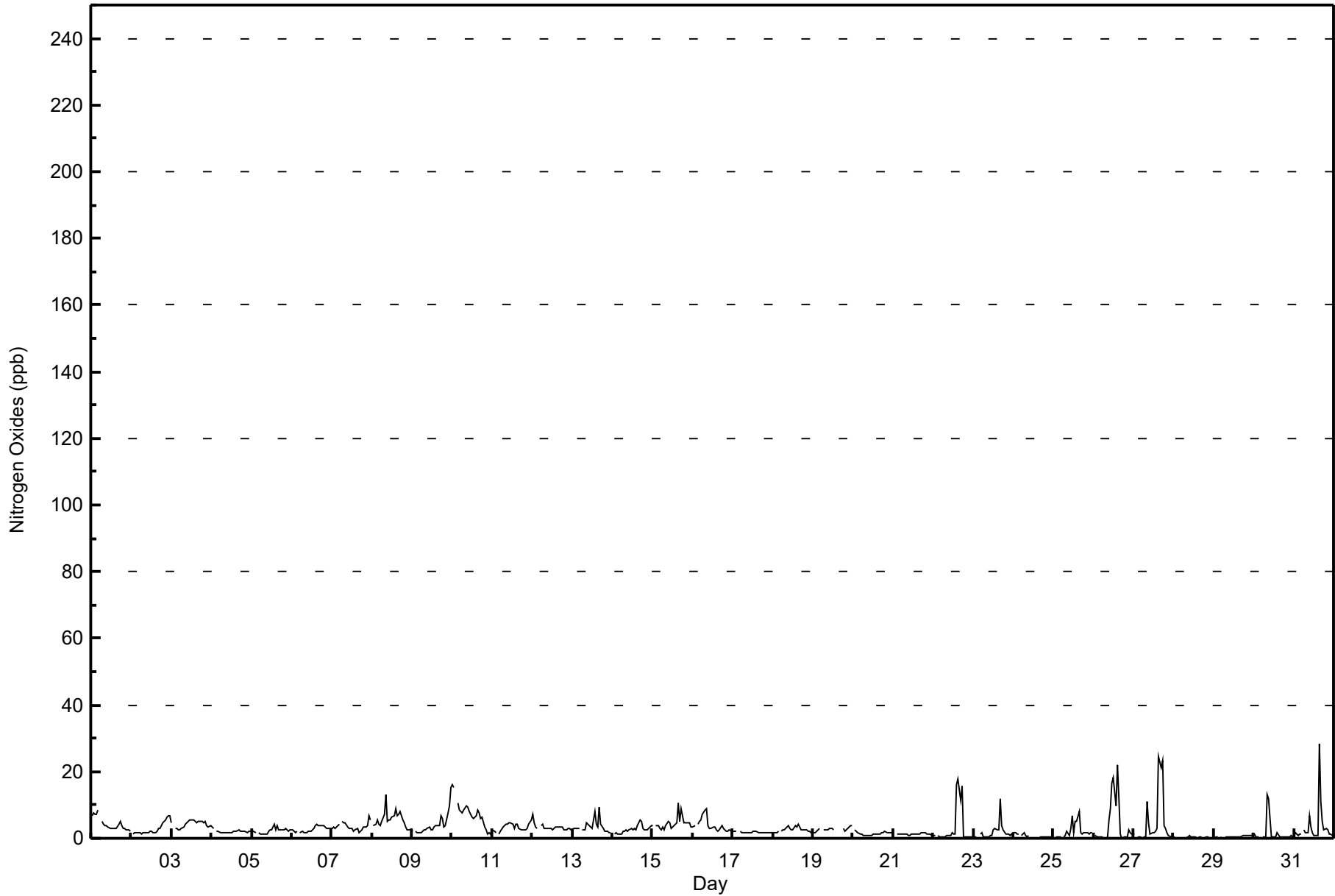
Nitrogen Oxides (NO_x) - ppb
Stony Mountain - January 2023

Maximum Value: 28.2 ppb on Jan 31 16:00		Maximum Daily Average: 7.2 ppb on Jan 10		Hours in Service: 744																						
Minimum Value: 0.1 ppb on Jan 28 04:00		Minimum Daily Average: 0.3 ppb on Jan 28		Hours of Data: 702																						
Maximum Diurnal Average: 5.9 ppb at hour 16		Minimum Diurnal Average: 1.9 ppb at hour 6		Hours of Missing Data: 42																						
Monthly Average: 3.03 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 1.3 Median = 2.3 Q ₃ = 3.6 P ₉₀ = 5.9 P ₉₉ = 16.6		Hours of Calibration: 37																						
				Percent Operational Time: 99.3																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.7	7.6	7.1	7.1	8.6	Z	4.9	4.2	4.0	3.8	3.3	3.1	2.9	3.0	3.0	2.8	4.2	5.0	4.0	3.1	3.0	2.7	2.7	2.0	4.3	8.6
2-Jan	Z	1.4	1.7	1.6	1.5	1.7	1.5	1.6	1.6	1.6	1.7	2.0	2.2	1.9	1.8	2.3	2.9	3.2	3.7	4.7	5.6	6.4	6.6	6.7	2.9	6.7
3-Jan	4.5	Z	3.1	3.1	2.7	2.5	2.9	3.5	4.3	4.6	5.3	5.4	5.5	5.5	5.1	4.9	5.1	5.2	4.9	4.9	5.2	3.8	3.3	3.6	4.3	5.5
4-Jan	3.4	3.0	Z	2.1	2.0	1.9	1.8	1.7	1.6	1.6	1.7	1.8	1.9	1.9	2.0	2.2	2.3	2.2	2.2	2.0	2.0	1.8	1.9	2.1	2.0	3.4
5-Jan	1.9	2.0	1.9	Z	1.6	1.4	1.3	1.4	1.1	1.1	2.3	2.7	2.4	4.0	2.5	3.8	2.6	2.4	2.4	2.7	2.9	2.5	2.2	2.7	2.3	4.0
6-Jan	2.7	2.0	1.8	1.9	Z	1.9	2.3	1.9	1.6	1.8	2.0	2.0	2.5	3.0	3.9	4.1	3.9	3.7	3.8	3.9	3.3	3.1	3.0	2.8	2.7	4.1
7-Jan	3.1	3.5	3.1	3.6	4.2	Z	4.9	4.8	4.5	3.3	3.0	2.8	3.0	2.2	2.4	2.8	1.8	2.1	2.7	3.2	3.5	4.0	6.7	5.7	3.5	6.7
8-Jan	Z	3.7	4.2	5.3	4.4	3.6	5.0	7.0	13.2	5.2	5.3	5.7	6.5	6.7	8.9	6.6	7.1	8.2	5.6	4.5	3.4	2.4	2.5	2.5	5.6	13.2
9-Jan	2.1	Z	2.0	1.8	1.7	1.8	2.1	2.6	2.7	3.1	3.4	2.7	2.6	3.2	3.6	3.7	3.8	6.6	6.0	3.5	3.7	7.5	9.9	15.2	4.1	15.2
10-Jan	16.2	15.4	Z	10.5	8.4	8.0	7.8	8.5	9.9	9.2	8.0	7.0	6.5	6.0	6.7	8.4	7.8	6.1	6.2	3.2	2.3	1.4	1.6	1.5	7.2	16.2
11-Jan	2.5	2.2	1.9	Z	1.2	2.1	3.5	3.9	4.3	4.4	4.7	4.7	4.3	3.1	4.1	4.3	3.1	2.4	2.6	2.5	2.7	3.1	4.2	5.7	3.4	5.7
12-Jan	7.1	4.5	3.5	3.0	Z	3.9	4.1	3.1	3.0	3.1	3.1	2.8	2.7	3.0	3.2	3.3	3.5	3.5	3.4	2.6	2.7	3.0	2.9	2.7	3.4	7.1
13-Jan	2.7	2.8	2.9	3.0	2.8	Z	2.7	2.6	4.7	4.4	4.0	3.5	3.0	8.1	4.3	3.3	9.3	4.4	2.9	2.3	2.1	2.1	1.9	1.9	3.5	9.3
14-Jan	Z	1.4	1.7	1.5	1.4	1.5	2.0	2.1	2.6	2.2	2.5	2.8	2.6	2.9	2.5	3.8	5.5	5.1	2.8	2.6	2.5	2.6	3.3	3.7	2.7	5.5
15-Jan	3.8	Z	3.7	3.8	2.8	2.4	3.2	2.5	4.0	5.1	4.6	3.2	3.4	3.7	4.5	10.5	5.3	9.0	6.9	4.5	4.6	4.5	4.5	3.5	4.5	10.5
16-Jan	3.5	3.7	Z	4.3	5.1	5.3	7.1	8.3	8.8	3.9	3.1	2.9	3.5	3.2	2.6	2.3	2.5	3.6	2.8	2.5	2.3	2.2	2.5	2.3	3.8	8.8
17-Jan	2.2	2.1	2.1	Z	2.1	1.8	1.8	1.8	1.8	1.9	1.9	1.8	2.0	2.2	1.9	1.9	1.6	1.7	1.9	1.8	1.8	1.7	1.7	1.7	1.9	2.2
18-Jan	1.8	1.7	1.8	2.0	Z	2.0	2.5	2.5	3.3	4.0	3.1	2.6	2.6	3.7	3.5	4.2	3.5	2.5	2.6	2.7	2.4	2.3	2.2	1.7	2.7	4.2
19-Jan	1.6	1.9	2.3	2.6	2.9	Z	2.6	2.4	2.4	2.7	3.0	3.0	2.7	M	M	M	M	M	3.0	2.2	2.6	2.8	3.9	3.9	2.7	3.9
20-Jan	Z	2.6	2.1	1.7	1.3	1.1	1.0	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.5	1.8	2.0	1.8	1.7	1.6	1.5	1.4	2.6
21-Jan	1.4	Z	1.4	1.3	1.3	1.2	1.1	1.1	1.1	1.0	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.6	1.7	1.5	1.4	1.4	1.2	1.0	1.3	1.7
22-Jan	0.9	0.9	Z	0.7	0.6	0.5	0.4	0.6	0.7	1.0	0.7	1.6	1.1	1.4	16.2	17.8	11.4	15.6	0.6	0.3	0.2	0.4	0.6	0.4	3.2	17.8
23-Jan	0.4	0.3	0.3	Z	1.3	1.6	0.5	0.3	0.5	0.5	0.9	1.0	2.5	2.9	2.4	2.7	11.7	3.6	2.5	1.4	1.1	1.1	1.1	1.1	1.8	11.7
24-Jan	1.5	1.9	1.3	1.3	Z	1.0	1.5	0.7	0.6	0.7	C	C	C	C	C	C	0.5	0.3	0.4	0.4	0.5	0.4	0.5	0.3	--	1.9
25-Jan	0.1	0.2	0.3	0.3	0.3	Z	0.3	0.9	2.3	1.0	3.0	6.8	1.9	5.1	5.0	8.0	1.6	1.3	1.5	1.6	1.5	1.5	1.5	1.6	2.1	8.0
26-Jan	Z	1.0	0.6	0.4	0.4	0.3	0.2	0.2	0.4	5.6	8.8	16.6	18.4	9.9	22.0	12.3	1.2	0.2	0.5	0.2	0.3	2.5	1.9	1.2	4.6	22.0
27-Jan	1.2	Z	0.2	0.4	0.3	0.2	0.2	0.4	11.1	4.5	1.4	1.7	1.5	2.2	3.1	24.6	21.4	23.4	3.8	3.0	1.7	1.0	0.5	0.3	4.7	24.6
28-Jan	0.3	0.2	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.7	0.4	0.5	0.5	0.5	0.2	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.7
29-Jan	0.2	0.4	0.4	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.7	0.9	0.8	1.0	1.0	0.9	0.8	0.5	1.0
30-Jan	1.2	0.5	0.4	0.3	Z	0.3	0.3	0.2	13.0	11.9	0.3	0.4	0.3	0.3	1.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.8	0.6	1.6	13.0
31-Jan	0.5	1.6	0.9	1.2	1.3	Z	2.7	1.9	1.5	6.6	3.5	1.6	0.9	0.8	0.7	28.2	11.1	5.2	2.6	2.8	2.4	1.3	1.3	0.8	3.5	28.2
																								Diurnal Average		
																								Diurnal Maximum		
																								2.8 2.6 2.0 2.5 2.3 1.9 2.3 2.4 3.6 3.3 2.9 3.2 3.1 3.2 4.2 5.9 4.6 4.4 2.8 2.4 2.3 2.3 2.6 2.6		
																								16.2 15.4 7.1 10.5 8.6 8.0 7.8 8.5 13.2 11.9 8.8 16.6 18.4 9.9 22.0 28.2 21.4 23.4 6.9 4.9 5.6 7.5 9.9 15.2		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	99.29	99.29
21 - 40	5	0.71	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	21	21	17	20	19	14	22	20	64	88	94	47	53	73	50	66	689
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	21	17	20	19	14	22	20	64	88	94	47	53	74	50	70	694

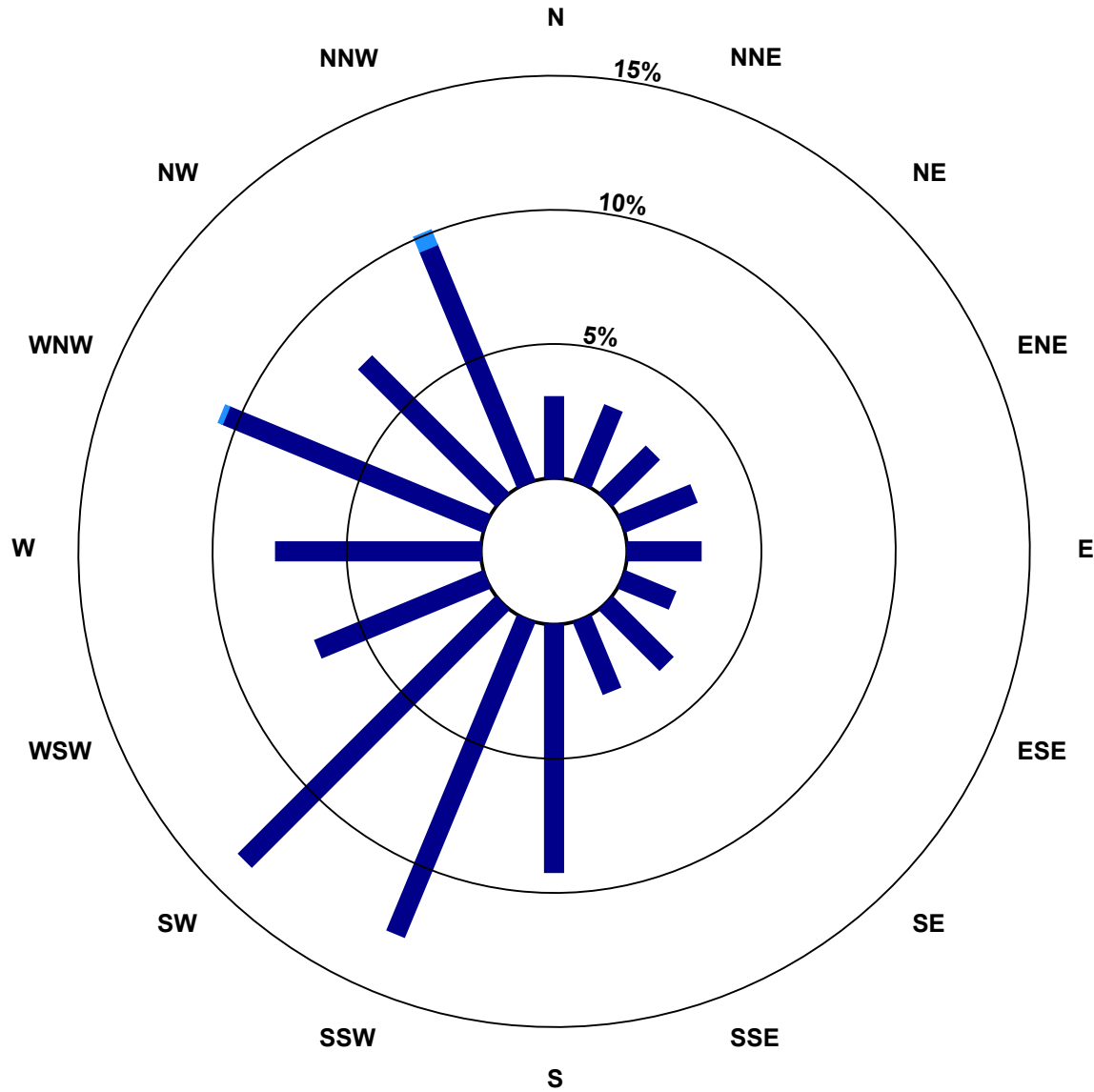
Total Number of Valid Hours: 694

Total Number of Hours: 744

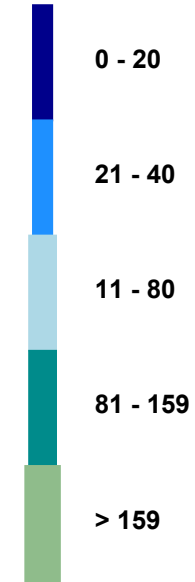


Wood Buffalo Environmental Association
Wind Rose Jan 2023

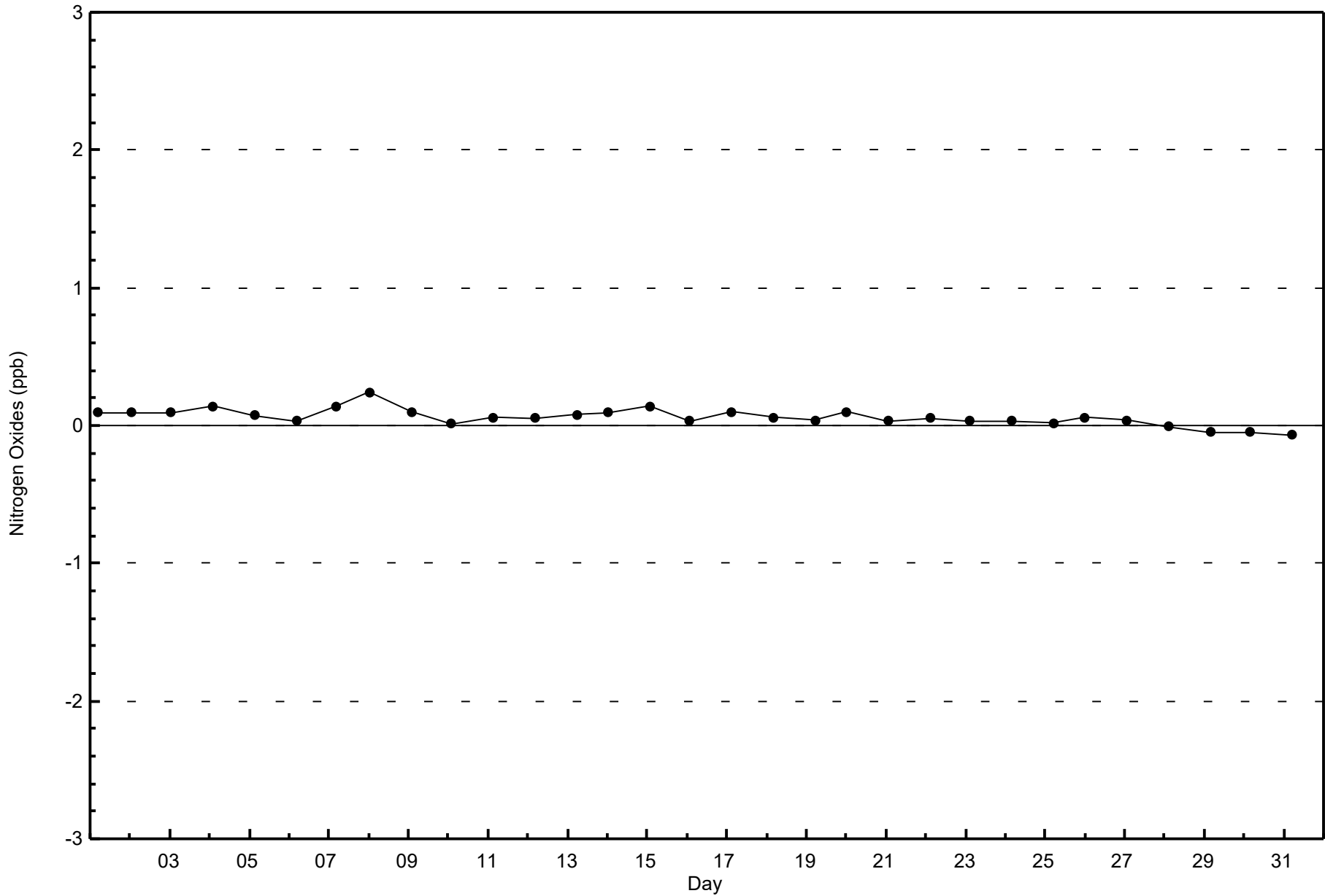
Nitrogen Oxides (NO_x) - ppb
Stony Mountain

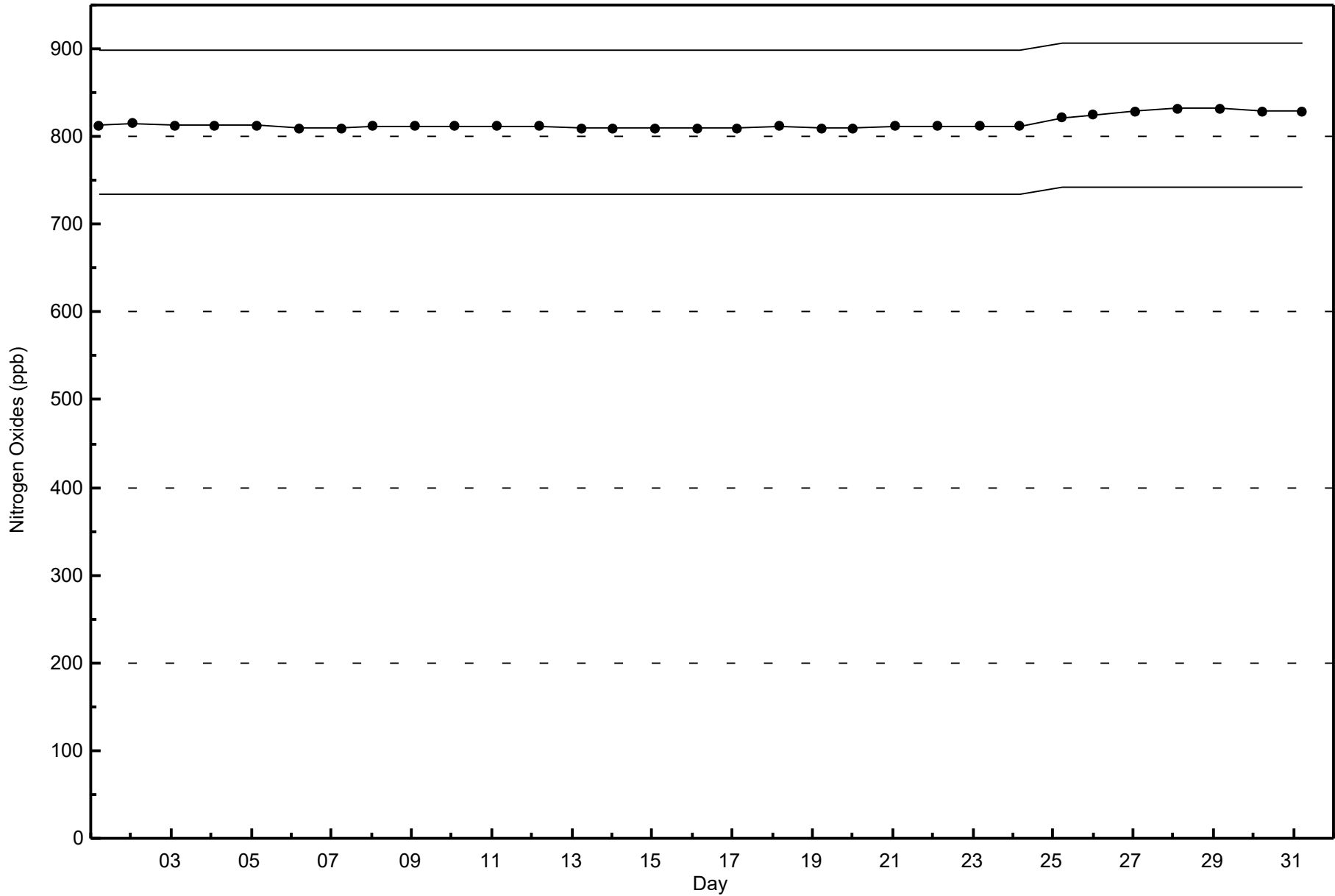


Classes (ppb)



Total Number of Valid Hours: 694







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Stony Mountain - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																											
Maximum Value: 37.6 ppb on Jan 30 17:00		Maximum Daily Average: 35.6 ppb on Jan 28																	707																													
Minimum Value: 6.0 ppb on Jan 10 01:00		Minimum Daily Average: 14.4 ppb on Jan 10																	37																													
Maximum Diurnal Average: 29.4 ppb at hour 15		Minimum Diurnal Average: 26.7 ppb at hour 9																	35																													
Monthly Average: 27.80 ppb		Percentiles: P ₁ = 9.9 P ₁₀ = 19.4 Q ₁ = 24.1 Median = 28.9 Q ₃ = 32.6 P ₉₀ = 34.8 P ₉₉ = 36.9																	99.7																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	13.8	13.1	15.4	15.2	Z	22.5	23.0	24.0	23.6	23.9	26.7	28.1	29.8	29.8	29.9	29.6	22.8	18.7	22.1	24.7	24.2	24.4	24.1	28.0	23.4	29.9																						
2-Jan	26.0	32.1	27.3	27.0	26.9	Z	26.5	26.5	28.1	30.3	30.8	30.2	30.9	34.6	34.5	32.3	30.4	29.9	29.3	28.3	26.0	25.3	25.6	25.7	28.9	34.6																						
3-Jan	Z	32.9	32.8	32.1	33.3	33.4	30.0	28.2	26.6	27.0	26.5	27.2	26.7	26.4	26.7	25.6	23.8	23.0	22.8	23.8	25.6	28.1	30.1	29.1	27.9	33.4																						
4-Jan	30.6	Z	30.3	31.3	31.0	30.7	30.6	30.3	30.5	30.6	31.0	30.9	30.8	32.1	31.5	31.0	30.9	30.6	30.5	30.8	30.9	31.2	30.9	30.5	30.8	32.1																						
5-Jan	31.2	28.3	Z	31.7	31.4	29.5	30.1	29.6	32.0	33.1	32.2	32.0	32.7	31.8	32.2	31.4	33.4	33.8	32.9	32.7	32.1	31.9	31.3	31.3	31.7	33.8																						
6-Jan	32.4	34.0	34.5	Z	35.6	35.7	34.1	34.4	34.9	34.3	34.6	34.9	34.7	34.0	32.5	31.5	31.7	32.0	31.5	31.3	32.3	31.6	30.6	30.2	33.2	35.7																						
7-Jan	29.6	28.6	28.9	27.8	Z	23.7	23.8	23.5	24.0	29.2	30.0	31.3	30.4	35.0	34.7	29.4	34.3	29.3	27.1	26.4	26.0	26.3	26.5	29.5	28.5	35.0																						
8-Jan	29.2	31.3	30.2	27.1	28.6	Z	28.2	23.8	21.6	23.4	24.3	24.4	23.0	23.6	22.5	25.2	24.3	20.7	19.2	16.7	18.0	18.4	17.8	17.3	23.4	31.3																						
9-Jan	Z	17.1	16.6	18.0	18.9	19.0	20.2	22.0	22.2	21.6	21.2	C	C	C	C	18.1	18.6	16.6	16.6	18.7	18.4	15.0	12.3	7.4	17.8	22.2																						
10-Jan	6.0	Z	6.5	10.6	12.1	11.8	11.5	10.4	9.6	10.2	13.1	14.3	16.6	18.9	17.5	14.2	13.7	14.3	13.7	17.5	19.5	22.8	23.1	23.3	14.4	23.3																						
11-Jan	22.8	23.0	Z	23.3	23.6	22.1	20.2	19.1	19.8	20.4	20.0	19.9	21.4	22.1	21.1	20.9	22.0	22.0	21.0	20.5	20.0	19.6	19.4	19.2	21.0	23.6																						
12-Jan	18.4	22.0	23.7	Z	25.5	24.2	24.6	26.4	27.5	27.5	28.0	29.1	29.2	28.1	27.5	26.8	26.4	26.2	27.4	30.1	29.9	29.0	28.8	29.2	26.8	30.1																						
13-Jan	29.0	28.3	27.9	27.7	Z	26.0	27.1	28.5	26.7	24.0	24.3	24.7	25.1	23.5	23.2	22.8	20.8	21.6	22.6	23.7	24.5	24.8	25.5	26.8	25.2	29.0																						
14-Jan	27.7	27.6	26.9	27.0	27.1	Z	25.5	24.9	24.6	24.5	24.0	24.1	24.4	24.1	24.1	23.5	21.9	20.7	22.5	22.0	22.0	22.8	22.0	21.2	24.1	27.7																						
15-Jan	Z	19.3	18.6	18.2	21.1	21.4	20.2	20.6	20.0	20.0	20.1	20.0	19.6	18.9	18.2	16.6	16.4	15.4	15.6	16.4	16.4	15.7	15.6	15.4	18.3	21.4																						
16-Jan	14.5	Z	11.2	10.1	10.0	9.7	9.2	9.8	9.8	18.2	20.1	23.1	24.9	25.8	27.8	28.3	26.9	24.2	24.4	25.8	25.5	25.1	24.7	25.2	19.8	28.3																						
17-Jan	25.7	25.8	Z	24.5	24.6	25.1	25.2	25.3	25.7	26.5	27.0	27.2	27.1	26.9	27.1	27.4	28.2	28.4	29.4	29.7	29.7	29.6	29.0	29.0	27.1	29.7																						
18-Jan	28.4	28.0	27.4	Z	25.7	25.8	25.3	25.3	24.4	23.8	25.0	26.0	26.7	26.7	26.8	26.1	26.3	26.5	26.3	25.8	26.2	25.9	26.5	27.1	26.2	28.4																						
19-Jan	26.9	26.0	25.4	24.7	Z	23.8	23.5	23.4	23.5	24.1	23.5	27.0	29.8	29.5	30.2	27.7	24.9	25.4	28.3	33.4	32.2	31.7	26.9	26.1	26.9	33.4																						
20-Jan	31.0	29.5	30.6	31.3	34.1	Z	36.9	37.1	M	M	36.2	36.5	36.7	36.8	36.4	35.2	34.2	33.9	34.2	34.3	34.6	34.7	34.5	34.1	34.4	37.1																						
21-Jan	Z	34.4	34.5	34.4	34.5	34.1	30.1	33.4	29.0	26.3	32.9	32.1	29.1	30.2	30.7	32.1	31.7	30.5	29.8	31.9	27.8	31.5	33.3	34.1	31.7	34.5																						
22-Jan	34.6	Z	33.3	32.1	31.8	31.7	32.2	33.4	33.6	34.1	33.5	33.9	34.6	34.8	32.7	31.6	33.6	32.8	35.2	35.5	34.8	33.4	32.6	32.4	33.4	35.5																						
23-Jan	32.2	32.0	Z	28.0	29.4	29.1	29.9	29.8	29.6	29.0	28.9	28.9	28.2	27.9	28.2	26.2	18.4	20.1	20.9	23.3	24.0	23.5	22.4	22.3	26.6	32.2																						
24-Jan	22.0	22.2	22.1	Z	19.4	20.1	24.6	25.9	25.5	26.2	28.5	30.7	30.4	30.5	31.5	32.4	31.6	32.4	32.7	31.2	31.1	32.0	31.6	28.1	32.7	32.7																						
25-Jan	32.2	31.6	31.7	30.9	Z	30.8	30.1	29.6	30.2	29.4	29.2	28.5	28.8	28.2	31.9	31.6	31.6	28.3	26.5	26.1	27.7	28.0	28.6	29.8	29.6	32.2																						
26-Jan	30.1	31.3	32.5	32.7	33.7	Z	35.7	35.9	35.0	29.1	24.8	28.2	24.4	23.6	27.0	31.3	32.7	33.2	32.9	32.8	30.9	25.9	26.8	29.6	30.4	35.9																						
27-Jan	Z	32.1	32.6	33.1	33.7	34.1	34.8	34.9	32.5	32.7	34.4	35.2	35.0	34.3	33.9	30.1	30.7	29.1	30.9	31.2	32.9	34.2	35.5	36.1	33.2	36.1																						
28-Jan	36.0	Z	35.8	35.2	35.2	35.2	34.9	34.6	34.3	33.9	34.0	34.3	34.7	34.9	35.7	35.9	36.2	36.7	37.0	36.8	36.8	36.9	36.5	36.5	35.6	37.0																						
29-Jan	36.1	35.5	Z	35.3	35.2	35.2	35.3	35.5	35.4	35.2	34.8	34.7	34.8	34.7	34.5	34.2	33.3	33.1	33.6	34.2	33.8	33.5	33.3	33.6	34.6	36.1																						
30-Jan	33.5	34.7	35.0	Z	34.3	34.3	34.5	34.1	32.7	33.4	35.5	36.0	36.5	36.9	37.1	37.4	37.6	36.9	36.4	36.3	35.8	34.9	36.1	36.8	35.5	37.6																						
31-Jan	37.3	34.9	34.1	33.0	Z	29.5	26.4	28.1	29.1	26.8	28.8	31.3	35.5	35.5	35.3	31.1	32.7	33.4	33.2	32.1	31.7	33.3	34.4	35.1	32.3	37.3																						
																								27.6	28.3	27.1	27.0	27.9	26.9	27.2	27.4	26.7	27.0	27.9	28.8	29.1	29.3	29.4	28.3	27.8	27.1	27.3	27.9	27.8	27.7	27.6	27.9	Diurnal Average
																								37.3	35.5	35.8	35.3	35.6	35.7	36.9	37.1	35.4	35.2	36.2	36.5	36.7	36.9	37.1	37.4	37.6	36.9	37.0	36.8	36.8	36.9	36.5	36.8	Diurnal Maximum
Z - zerospan C - Calibration M - Maintenance																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	91	12.87	12.87
21 - 50	616	87.13	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Stony Mountain - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	2	5	8	9	9	8	10	6	5	6	6	4	0	0	3	6	87
21 - 50	18	17	9	10	10	7	9	15	58	82	92	44	54	76	49	62	612
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	20	22	17	19	19	15	19	21	63	88	98	48	54	76	52	68	699

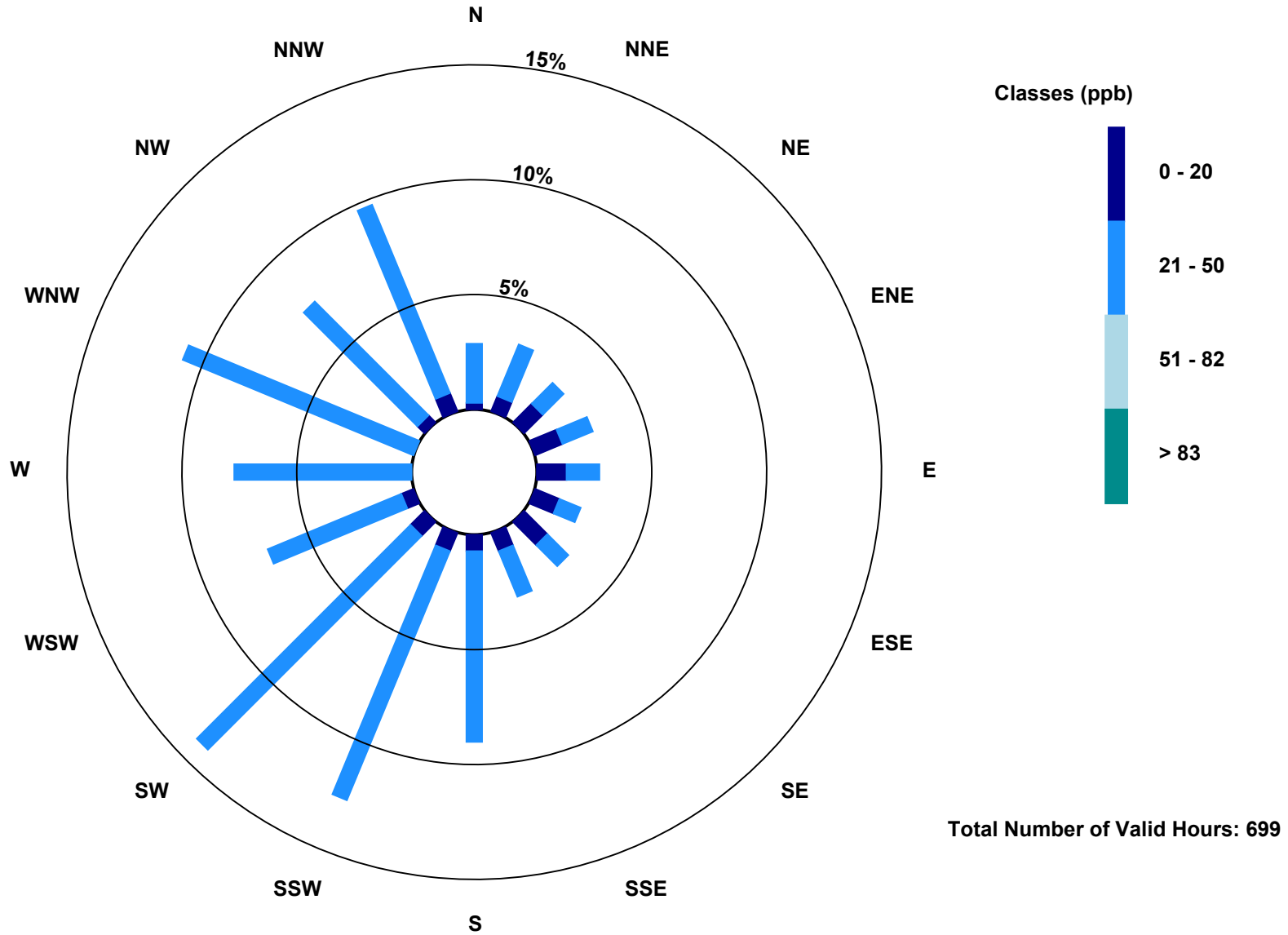
Total Number of Valid Hours: 699

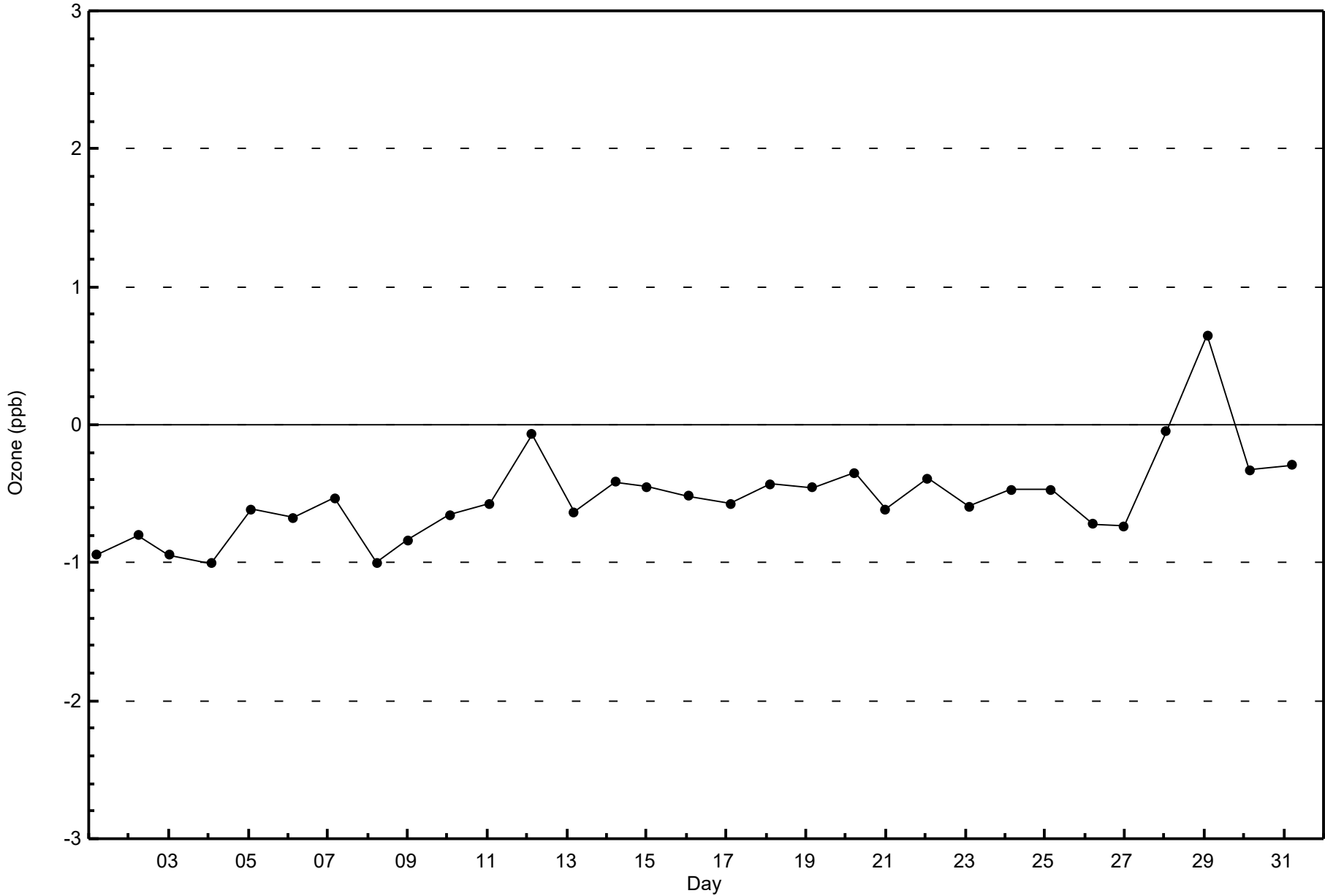
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Stony Mountain

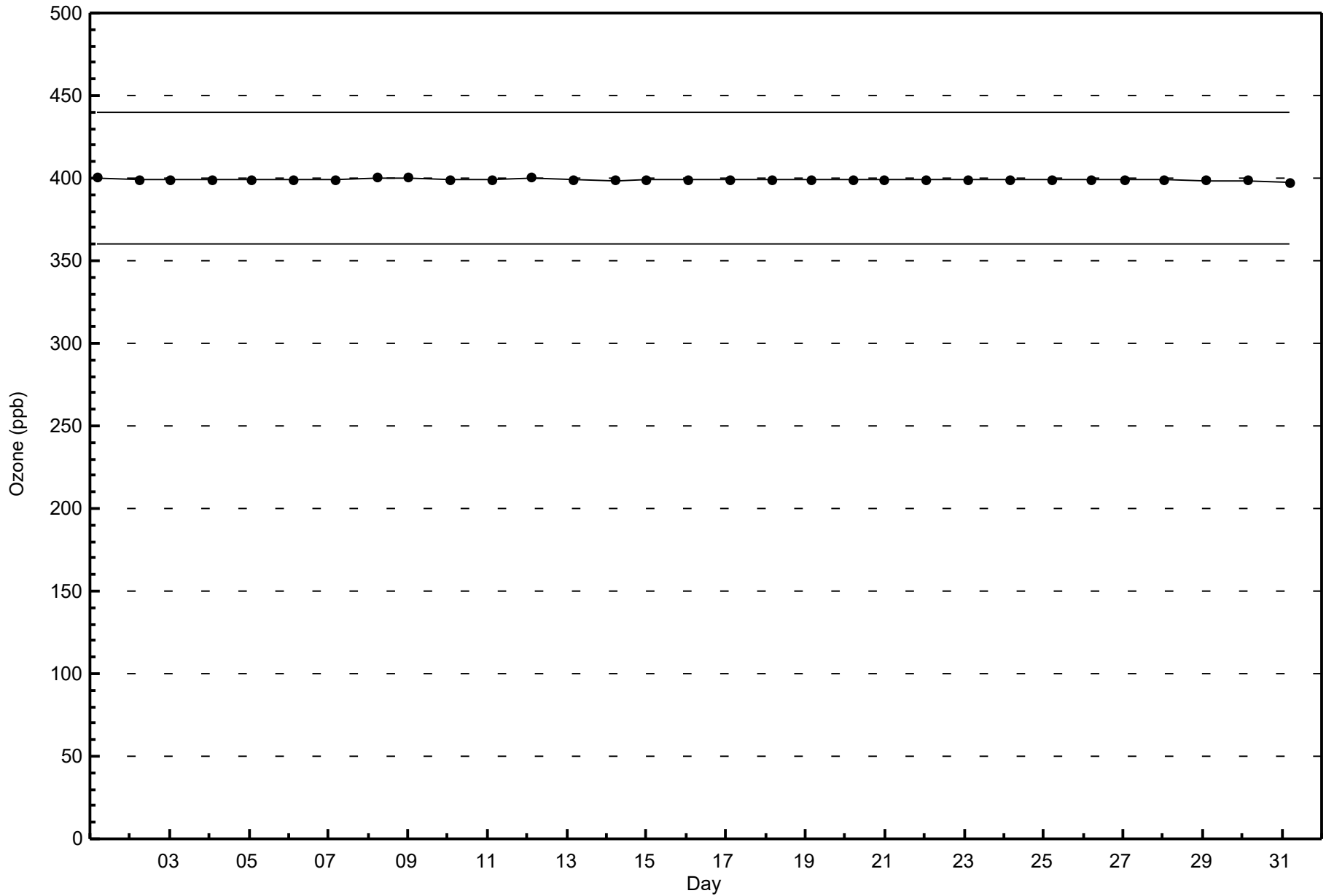






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Stony Mountain - January 2023





Summary of Hour Averages

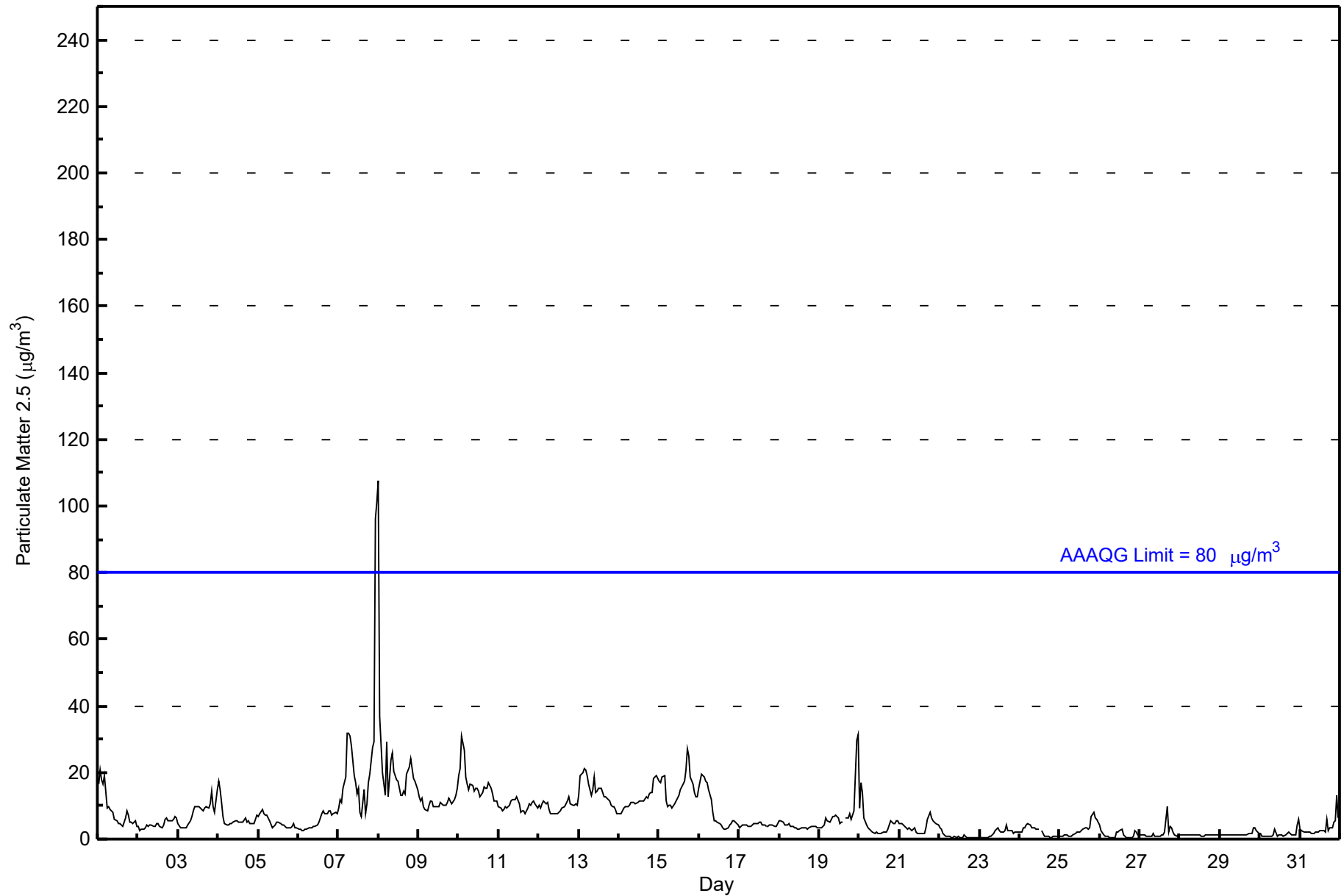
Stony Mountain - January 2023

Number of Exceedences (AAAQO):	1-hr: 3	24-hr: 0	Hours in Service:	744
Maximum Value: 107.6 µg/m ³ on Jan 8 01:00	Maximum Daily Average: 24.7 µg/m ³ on Jan 7		Hours of Data:	742
Minimum Value: 0.3 µg/m ³ on Jan 22 19:00	Minimum Daily Average: 0.8 µg/m ³ on Jan 22		Hours of Missing Data:	2
Maximum Diurnal Average: 10.5 µg/m ³ at hour 23	Minimum Diurnal Average: 5.6 µg/m ³ at hour 15		Hours of Calibration:	1
Monthly Average: 7.28 µg/m ³	Percentiles: P ₁ = 0.4 P ₁₀ = 1.1 Q ₁ = 2.2 Median = 4.6 Q ₃ = 10.2 P ₉₀ = 15.5 P ₉₉ = 30.9		Percent Operational Time:	99.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	16.7	20.8	18.0	16.6	19.0	9.5	9.7	9.0	8.6	8.0	6.1	5.5	4.6	4.8	4.1	3.7	6.2	8.5	7.0	5.2	5.1	4.7	5.3	3.7	8.8	20.8	
2-Jan	3.9	2.4	3.0	3.1	3.4	4.2	3.9	4.2	4.2	3.8	3.8	4.5	4.6	3.7	3.2	4.3	6.0	6.5	5.4	5.6	5.5	5.7	6.7	6.6	4.5	6.7	
3-Jan	4.6	3.4	3.3	3.5	3.4	3.2	4.1	5.4	6.9	8.5	9.8	9.9	9.9	9.4	8.7	8.6	9.3	9.9	9.5	10.4	14.2	9.7	8.1	14.6	7.8	14.6	
4-Jan	17.5	15.0	11.1	6.7	4.9	4.3	4.1	4.5	4.8	5.0	5.7	5.3	4.9	5.3	4.9	5.1	6.2	5.2	5.4	4.7	4.6	4.8	6.1	7.0	6.4	17.5	
5-Jan	6.6	7.4	8.9	7.7	7.2	7.1	6.4	5.3	3.6	3.6	4.1	5.0	4.9	4.5	4.2	4.1	3.8	3.5	3.5	3.4	3.8	4.5	3.5	3.4	5.0	8.9	
6-Jan	3.2	3.0	2.7	2.7	3.0	3.1	3.4	3.4	3.5	3.8	4.0	4.4	5.3	6.5	7.8	8.3	7.8	7.4	8.3	8.6	7.3	7.5	7.9	7.8	5.4	8.6	
7-Jan	9.2	12.0	11.1	15.4	18.8	32.0	31.6	30.8	28.1	18.9	17.2	13.7	15.2	8.0	6.8	14.8	7.5	10.4	17.1	19.6	27.6	29.0	96.1	101.2	24.7	101.2	
8-Jan	107.6	36.7	20.0	16.5	13.3	29.0	12.8	23.6	25.7	20.4	19.1	17.7	17.6	13.2	13.2	14.5	13.5	19.5	21.7	24.4	21.3	18.3	17.3	15.0	23.0	107.6	
9-Jan	12.9	11.5	12.2	9.8	8.8	8.6	10.0	11.2	11.4	9.8	9.7	9.6	9.7	11.1	10.4	10.3	10.0	11.0	12.1	11.3	10.7	11.7	13.1	15.4	10.9	15.4	
10-Jan	18.9	21.2	31.0	26.8	18.9	16.4	14.8	16.7	15.9	14.4	15.4	15.3	14.3	12.7	13.8	15.5	15.1	15.2	16.8	15.3	13.4	11.6	11.3	11.4	16.3	31.0	
11-Jan	9.8	9.5	8.5	8.9	9.7	9.3	10.2	11.3	11.8	11.7	12.0	12.7	10.4	8.2	8.5	8.3	7.7	9.2	10.6	10.0	11.0	11.3	10.4	9.5	10.0	12.7	
12-Jan	10.1	9.5	10.5	11.4	10.6	11.0	8.8	7.8	7.5	7.5	7.5	7.6	7.8	8.7	9.3	10.0	10.6	11.3	12.6	10.8	10.2	10.2	10.7	10.3	9.7	12.6	
13-Jan	13.3	19.3	20.1	21.3	20.6	19.2	16.7	13.1	15.0	18.6	13.8	14.2	15.2	15.2	14.0	12.7	12.8	12.5	11.4	10.0	9.7	9.6	9.0	7.8	14.4	21.3	
14-Jan	7.5	7.7	8.4	9.2	9.7	9.6	10.3	10.9	11.1	11.0	10.7	10.8	11.2	11.3	11.4	11.3	12.5	12.3	13.4	14.1	14.2	18.1	19.3	18.1	11.8	19.3	
15-Jan	17.2	17.1	18.5	19.0	11.5	9.7	10.1	10.3	9.4	10.6	11.4	12.1	13.2	14.9	16.4	17.5	20.9	26.9	25.2	18.8	16.4	14.2	12.8	12.9	15.3	26.9	
16-Jan	15.2	19.3	18.9	18.4	17.3	16.8	14.7	12.0	7.9	5.7	5.5	5.1	4.5	4.2	3.4	3.1	3.1	3.5	4.3	4.6	5.4	5.4	5.1	4.2	8.7	19.3	
17-Jan	3.4	3.7	4.1	4.4	4.1	3.7	3.7	4.0	4.3	4.5	4.8	4.6	4.9	5.1	4.4	4.3	4.0	3.9	4.1	4.2	4.3	3.9	4.0	4.6	4.2	5.1	
18-Jan	5.3	5.6	5.2	4.2	4.2	4.4	4.5	3.8	3.6	3.4	3.3	3.0	3.0	3.3	3.6	3.6	3.3	3.2	3.5	3.9	3.9	3.9	3.9	3.6	3.9	5.6	
19-Jan	3.4	3.4	3.7	4.3	6.2	5.6	5.2	6.0	6.8	7.0	7.4	6.3	4.8	5.1	5.2	M	6.5	6.2	7.8	5.9	7.2	8.6	29.7	31.3	8.0	31.3	
20-Jan	9.3	16.9	13.8	6.5	4.4	3.4	3.1	2.6	2.3	1.8	1.9	1.7	1.6	1.7	2.0	2.2	2.2	3.0	4.1	5.5	4.5	4.7	5.5	5.4	4.6	16.9	
21-Jan	4.8	4.8	4.4	3.7	3.3	2.9	3.4	2.4	3.0	3.2	1.9	1.6	1.7	1.6	1.8	1.9	3.4	6.0	8.0	6.2	5.5	5.1	4.7	4.1	3.7	8.0	
22-Jan	3.6	3.1	1.5	1.2	1.0	0.8	0.7	0.6	0.5	0.6	0.5	0.6	0.5	0.4	0.3	1.1	0.6	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.8	3.6	
23-Jan	0.5	0.5	0.5	0.4	0.6	0.6	0.7	1.0	1.6	2.5	3.1	3.3	2.7	2.1	2.0	2.4	4.3	2.4	2.7	2.4	1.8	2.0	2.2	2.2	1.8	4.3	
24-Jan	2.0	2.0	3.4	3.3	4.2	4.5	4.1	3.5	3.4	3.4	3.1	2.9	C	2.5	1.5	1.0	1.0	0.8	0.6	0.5	0.8	0.8	0.8	0.9	2.2	4.5	
25-Jan	0.9	1.0	0.9	1.2	1.1	0.9	1.1	1.0	1.1	1.5	1.9	2.2	2.2	2.5	3.0	3.3	3.2	3.1	3.4	6.7	8.0	6.5	6.0	5.0	2.8	8.0	
26-Jan	4.3	2.4	1.1	1.0	0.9	0.7	0.5	0.4	0.3	0.5	2.2	1.9	2.6	2.8	1.4	0.7	0.6	0.5	0.5	0.4	0.7	2.5	2.3	1.4	1.4	4.3	
27-Jan	1.4	1.3	1.3	1.1	0.9	0.8	0.7	0.7	1.5	1.0	0.7	0.8	1.1	1.2	1.3	2.0	9.6	2.3	3.9	3.4	1.9	1.3	1.0	1.2	1.8	9.6	
28-Jan	1.2	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.0	1.0	1.1	1.2	1.1	1.1	1.2	1.1	1.2	1.2	1.1	1.1	1.2	1.2
29-Jan	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.5	1.7	1.9	3.2	3.2	2.7	1.7	1.6	3.2	
30-Jan	1.7	1.0	0.8	0.8	0.8	0.8	0.9	0.9	1.3	2.8	1.0	1.1	1.2	1.1	1.0	1.4	1.9	1.9	1.5	1.1	1.2	1.1	4.3	6.0	1.6	6.0	
31-Jan	3.1	2.6	2.0	2.3	2.2	2.1	2.1	1.9	1.7	1.9	2.0	2.1	2.6	2.7	2.5	2.3	5.9	2.5	3.2	3.5	5.0	5.3	13.0	6.2	3.4	13.0	

10.3	8.6	8.1	7.5	7.0	7.3	6.6	6.8	6.8	6.4	6.2	6.1	6.1	5.7	5.6	6.0	6.5	6.8	7.4	7.2	7.4	7.3	10.5	10.4	Diurnal Average	
107.6	36.7	31.0	26.8	20.6	32.0	31.6	30.8	28.1	20.4	19.1	17.7	17.6	15.2	16.4	17.5	20.9	26.9	25.2	24.4	27.6	29.0	96.1	101.2	Diurnal Maximum	

C - Calibration M - Maintenance
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	417	56.20	56.20
6 - 15	250	33.69	89.89
16 - 25	58	7.82	97.71
26 - 80	14	1.89	99.60
> 81.0	3	0.40	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	18	14	4	2	2	0	2	11	48	55	34	25	36	56	47	63	417
6 - 15	2	8	9	11	12	10	12	10	18	33	45	20	19	21	3	8	241
16 - 25	2	1	5	6	4	5	7	1	1	1	12	2	3	2	4	2	58
26 - 80	0	0	0	1	1	0	2	0	1	0	8	1	0	0	0	0	14
> 81.0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Totals	22	23	18	20	19	15	23	22	68	89	102	48	58	79	54	73	733

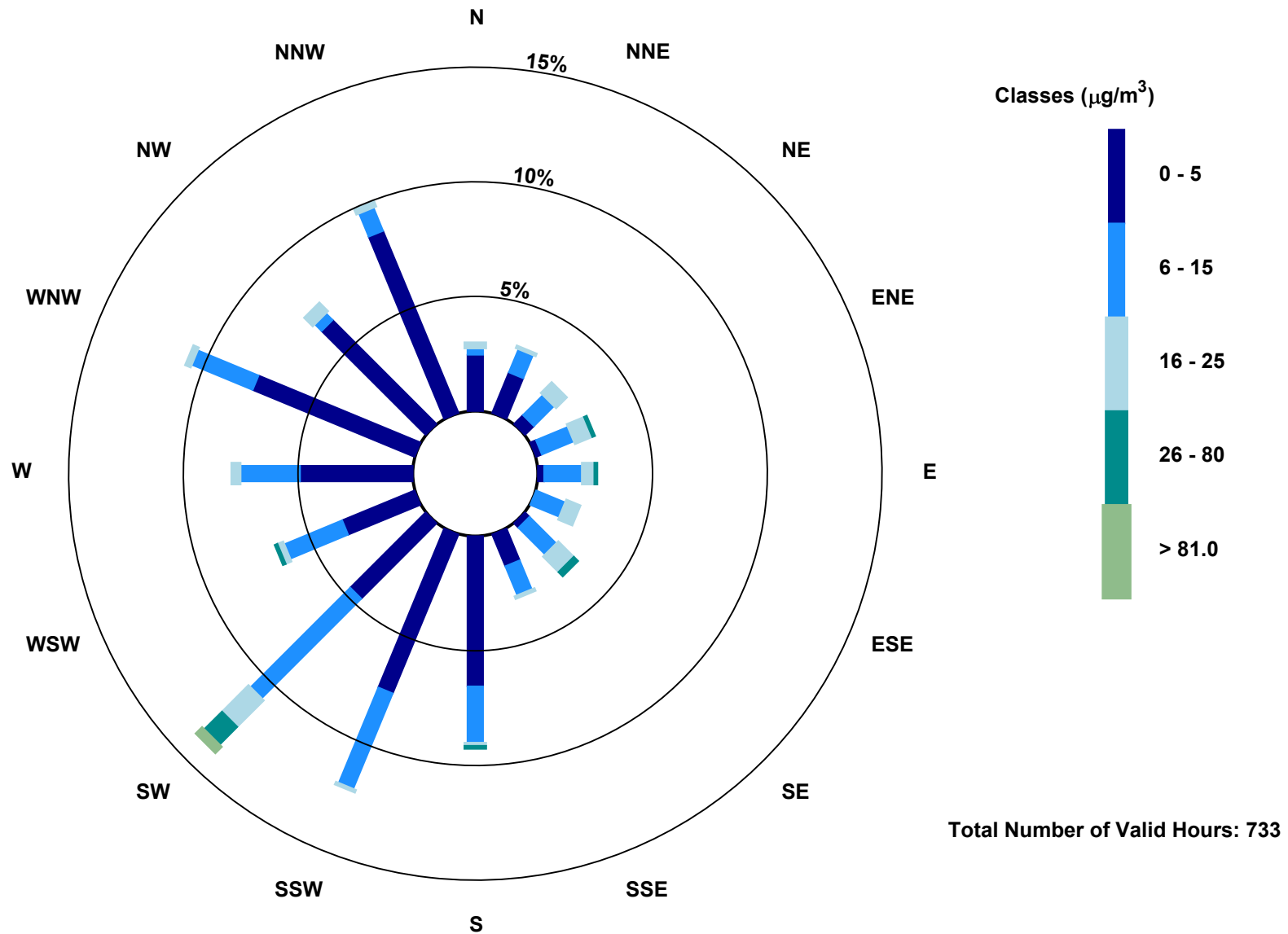
Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

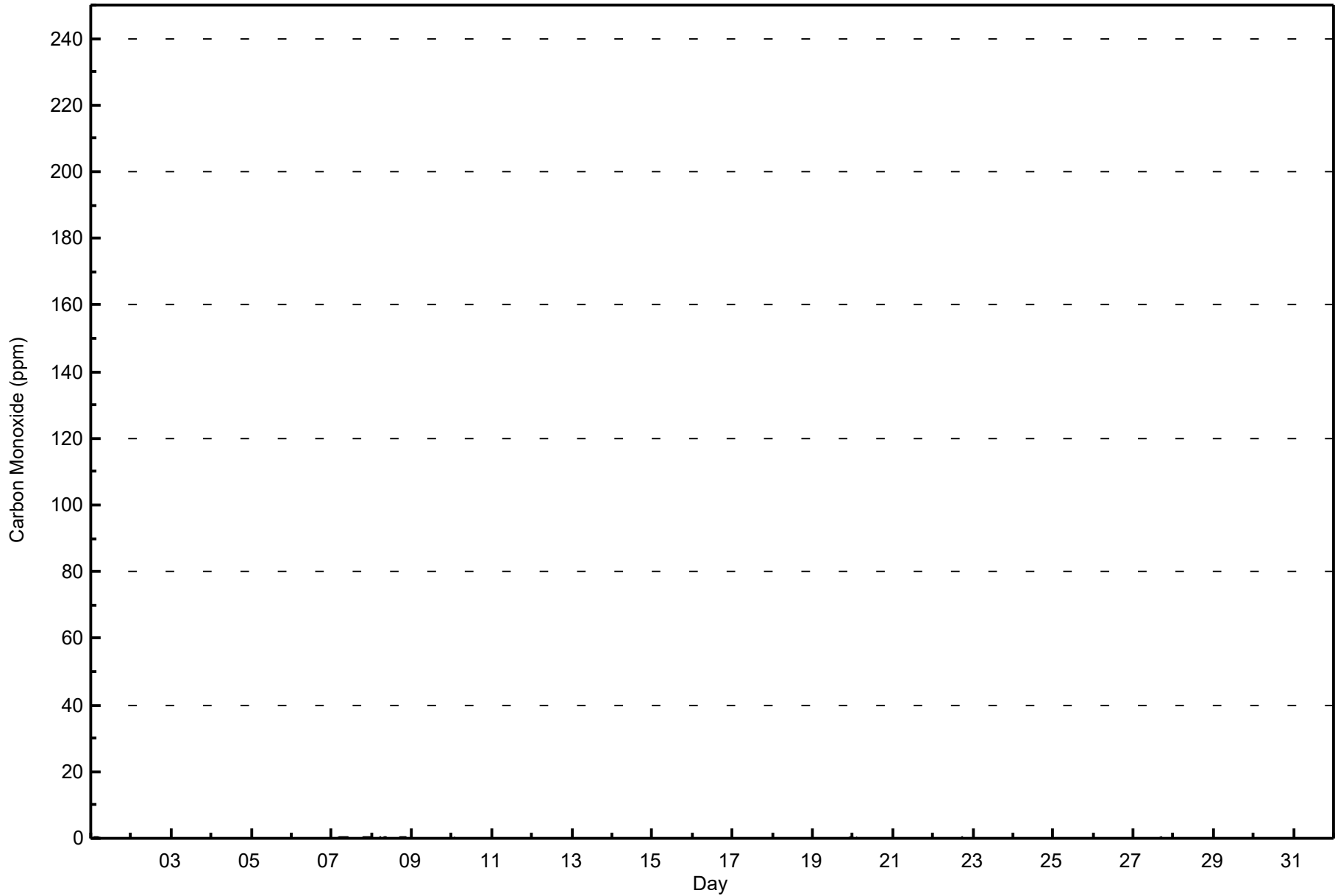
Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Stony Mountain





Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Stony Mountain - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Monoxide (CO) - ppm
Stony Mountain - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	704	99.44	99.44
0.4 - 0.5	4	0.56	100.00
0.6 - 0.7	0	0.00	100.00
0.8 - 1.4	0	0.00	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Stony Mountain - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.3	22	22	17	20	19	14	21	22	64	82	94	48	57	75	49	70	696
0.4 - 0.5	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4
0.6 - 0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.8 - 1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	22	17	20	19	14	21	22	64	82	98	48	57	75	49	70	700

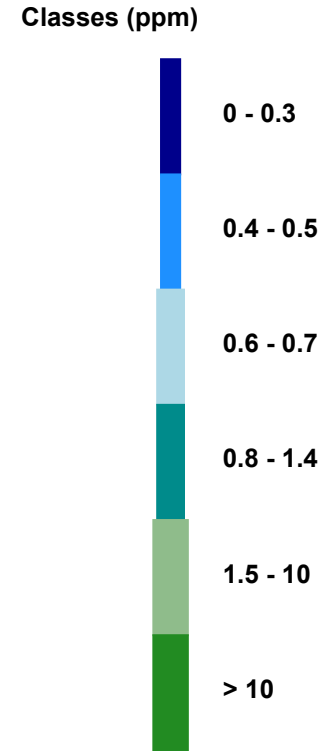
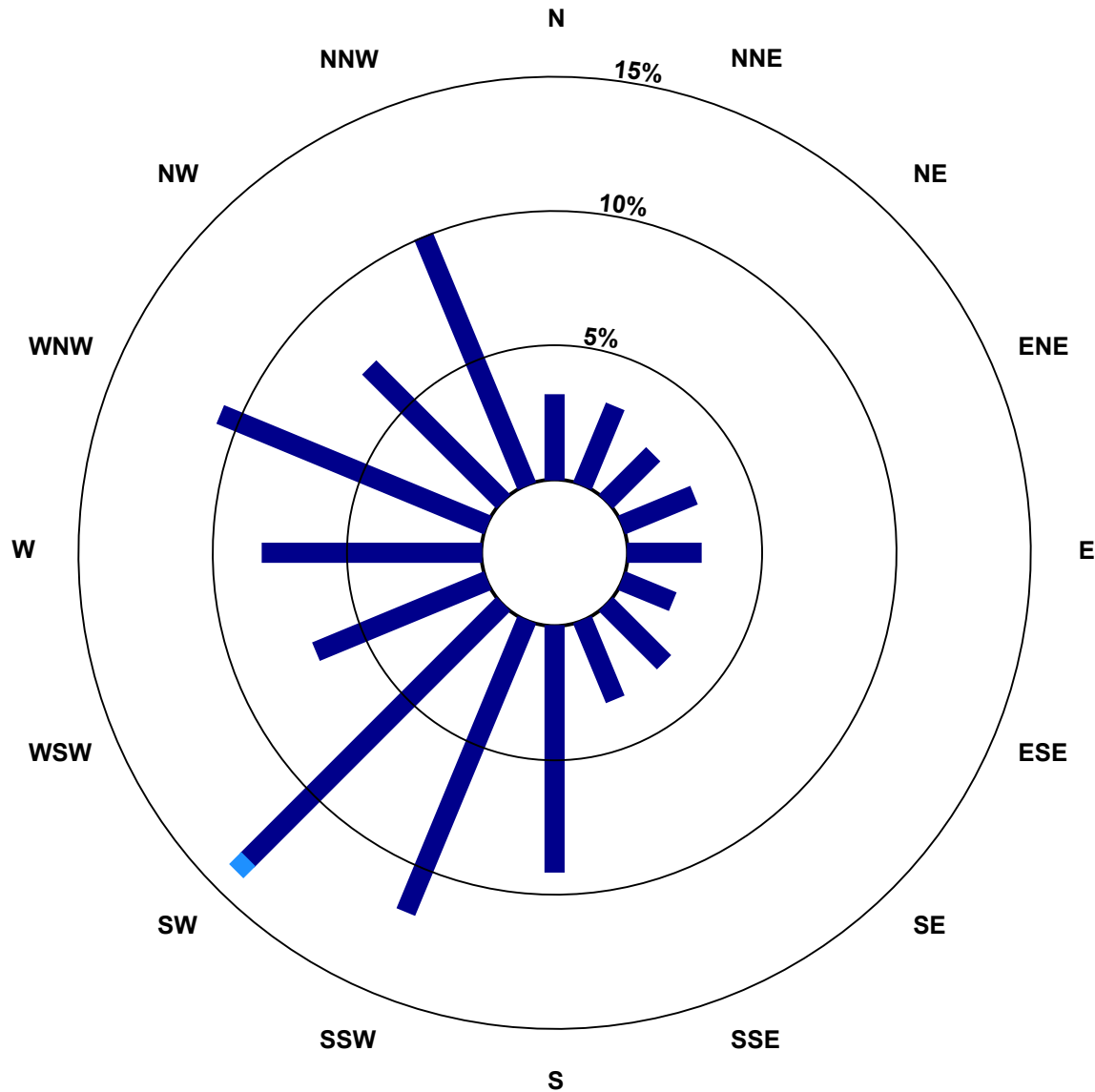
Total Number of Valid Hours: 700

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Monoxide (CO) - ppm
Stony Mountain



Total Number of Valid Hours: 700

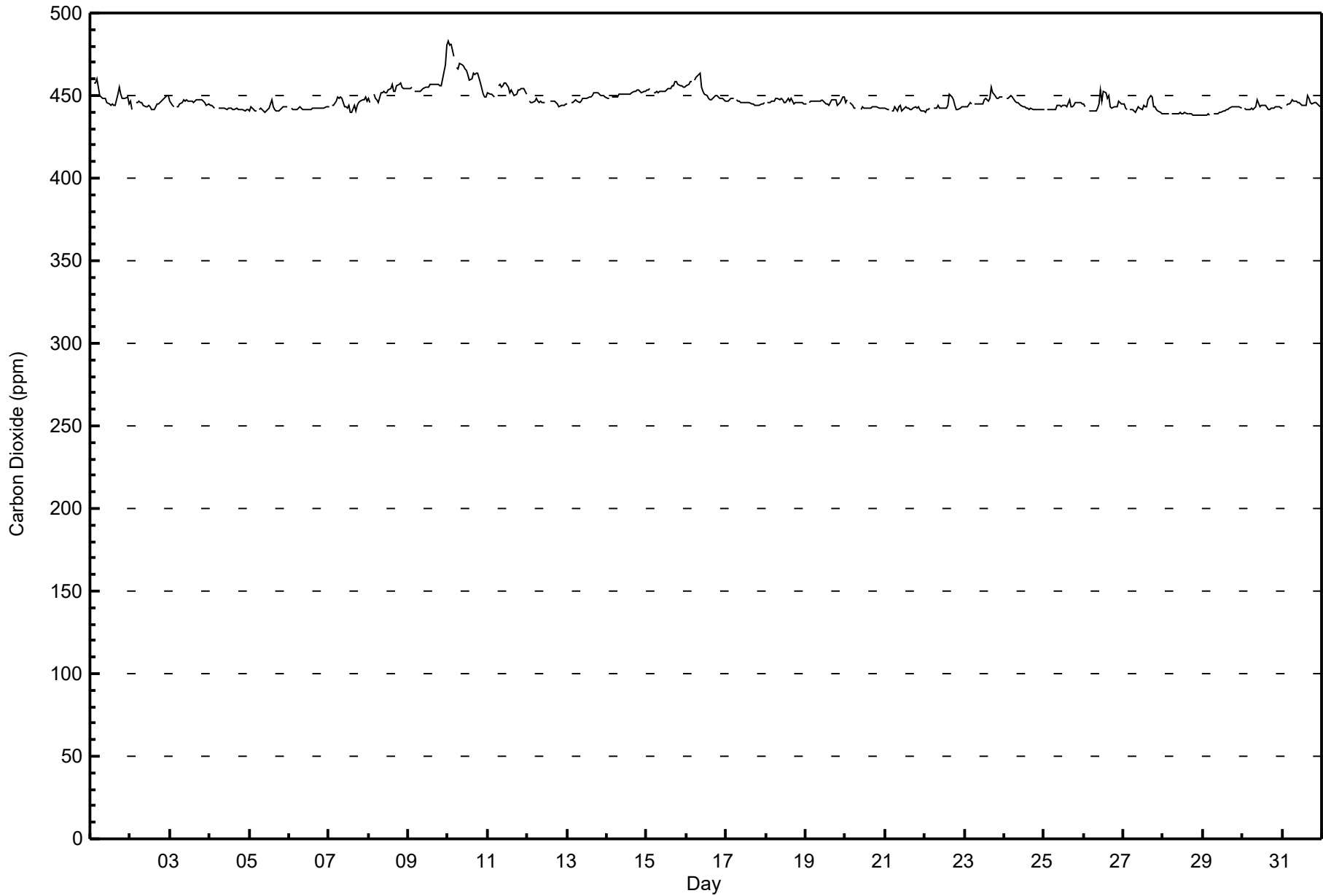


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744					
Maximum Value: 482.9 ppm on Jan 10 01:00		Maximum Daily Average: 464.6 ppm on Jan 10																	Hours of Data:		708					
Minimum Value: 438.0 ppm on Jan 29 00:00		Minimum Daily Average: 438.9 ppm on Jan 28																	Hours of Missing Data:		36					
Maximum Diurnal Average: 447.5 ppm at hour 1		Minimum Diurnal Average: 445.8 ppm at hour 5																	Hours of Calibration:		34					
Monthly Average: 446.78 ppm		Percentiles: P ₁ = 438.5 P ₁₀ = 441.2 Q ₁ = 442.6 Median = 445.5 Q ₃ = 449.2 P ₉₀ = 454.6 P ₉₉ = 468.4																	Percent Operational Time:		99.7					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	458.9	Z	457.6	457.6	459.8	450.0	449.0	448.4	448.3	448.2	446.0	445.3	444.3	444.5	444.3	444.1	450.8	454.7	450.7	447.9	448.4	448.4	448.9	445.0	449.6	459.8
2-Jan	447.0	441.4	Z	446.1	446.1	446.8	445.8	445.5	444.3	442.9	442.8	443.7	443.5	441.3	441.2	443.2	444.5	445.1	445.4	446.3	448.1	449.4	449.9	450.1	445.2	450.1
3-Jan	446.6	443.7	443.6	Z	443.3	443.4	445.3	446.1	447.4	446.9	447.4	446.8	446.7	446.5	446.1	446.8	447.7	447.7	447.7	447.1	446.5	445.4	444.5	444.8	446.0	447.7
4-Jan	444.0	443.8	443.6	442.6	Z	442.7	442.5	442.7	442.4	442.2	441.9	442.4	442.7	442.3	441.9	441.9	442.0	441.8	441.8	441.4	441.1	440.9	441.2	441.2	442.2	444.0
5-Jan	440.9	443.2	441.3	440.5	440.6	Z	441.3	442.3	440.5	439.5	440.5	441.6	442.4	442.2	443.6	441.5	440.8	440.6	441.0	442.2	443.3	443.2	443.5	443.6	442.0	447.2
6-Jan	Z	442.3	441.8	441.6	441.8	441.7	443.0	442.0	441.4	441.7	441.5	441.3	441.5	441.1	442.4	442.8	442.3	442.1	442.5	442.8	442.4	442.6	442.8	443.0	442.1	443.0
7-Jan	443.5	Z	443.7	444.4	446.2	448.8	448.7	448.8	448.1	443.5	443.2	442.6	444.0	440.2	439.9	444.1	440.6	443.8	446.0	446.7	447.2	447.1	449.1	446.7	445.1	449.1
8-Jan	448.2	445.5	Z	450.9	448.2	447.7	446.0	451.9	451.4	452.3	452.0	451.8	453.5	453.8	456.9	452.8	452.3	455.5	456.7	457.3	455.3	454.2	454.2	454.3	452.3	457.3
9-Jan	454.4	454.2	455.1	Z	452.8	452.8	452.9	452.7	453.0	453.9	454.9	455.3	454.8	457.1	456.4	457.1	457.0	456.9	456.9	455.7	456.3	464.6	468.5	480.9	457.1	480.9
10-Jan	482.9	480.8	481.2	473.3	Z	467.0	466.5	469.3	468.8	467.6	466.3	465.3	462.5	459.3	460.4	463.2	463.1	463.4	463.5	457.7	454.6	450.6	449.5	449.1	464.6	482.9
11-Jan	451.6	450.7	450.4	450.3	448.8	Z	456.3	457.2	455.5	456.3	457.4	457.3	455.0	451.7	453.3	451.3	449.6	450.5	453.1	453.7	454.1	454.2	454.5	451.1	453.2	457.4
12-Jan	Z	446.3	445.9	446.1	446.5	448.5	447.0	446.2	446.2	446.0	445.8	C	C	C	446.4	446.6	446.3	445.9	445.0	443.4	443.8	444.3	444.4	444.5	445.8	448.5
13-Jan	444.8	Z	445.7	445.8	446.7	447.2	446.5	445.7	446.6	448.3	448.2	447.9	447.9	448.9	449.3	450.0	451.3	451.7	451.3	451.0	449.9	449.9	449.9	449.2	448.4	451.7
14-Jan	448.3	448.2	Z	449.2	449.2	448.8	449.5	451.0	450.9	450.6	451.1	451.1	450.9	451.1	451.0	451.3	452.6	452.8	453.0	453.0	452.8	451.8	452.1	452.6	451.0	453.0
15-Jan	453.4	453.8	454.2	Z	452.0	451.6	452.3	452.0	452.5	452.3	452.4	452.8	453.4	454.0	454.6	455.7	456.1	458.3	458.7	456.8	455.8	455.7	455.4	455.4	454.3	458.7
16-Jan	456.0	456.9	458.5	458.3	Z	459.3	460.9	462.8	463.3	455.3	452.8	450.7	450.4	448.7	447.5	447.6	448.6	450.2	450.0	449.1	448.2	448.2	448.4	446.9	453.0	463.3
17-Jan	446.5	446.9	447.4	448.0	448.2	Z	447.1	446.9	446.8	446.0	445.7	445.6	446.0	446.1	445.5	445.0	444.6	444.5	444.0	443.9	444.4	444.9	445.0	445.4	445.8	448.2
18-Jan	Z	445.9	446.2	446.5	446.7	446.5	448.4	448.6	447.4	448.5	447.7	446.1	446.1	448.5	446.4	448.7	446.8	445.3	445.5	445.7	445.5	445.9	445.9	445.3	446.7	448.7
19-Jan	445.0	Z	445.7	446.3	446.3	446.2	446.4	446.6	446.8	446.8	447.1	446.0	444.9	444.8	444.1	445.5	447.4	447.6	447.2	444.3	445.2	445.8	449.0	449.2	446.3	449.2
20-Jan	446.1	447.2	Z	445.7	444.0	442.7	442.1	M	M	441.7	443.1	442.3	442.1	442.4	442.2	442.8	443.1	443.2	443.1	442.8	442.6	442.5	442.4	442.3	443.2	447.2
21-Jan	442.2	441.9	441.6	Z	440.6	440.5	443.1	440.7	443.1	444.5	441.1	441.7	443.1	442.4	442.1	441.6	441.8	442.6	442.9	442.1	442.8	441.5	440.7	440.7	442.0	444.5
22-Jan	440.2	441.6	441.9	442.0	Z	442.3	442.3	442.8	444.4	442.5	442.7	442.6	442.5	442.7	444.2	451.1	449.0	447.4	444.3	441.8	441.8	442.4	443.2	442.9	443.4	451.1
23-Jan	442.8	442.8	443.4	445.4	444.6	Z	444.9	444.7	444.7	445.0	445.1	445.3	447.8	448.5	446.5	448.0	455.4	451.9	450.4	448.6	448.0	448.9	449.3	449.3	447.0	455.4
24-Jan	Z	448.2	448.3	449.4	450.0	449.3	446.9	446.0	445.6	445.1	444.0	443.1	443.4	442.8	442.2	441.8	442.3	441.2	441.3	441.6	441.9	441.9	441.9	441.6	444.3	450.0
25-Jan	441.2	Z	441.4	441.5	441.8	441.3	441.6	441.6	444.0	444.1	443.2	444.0	444.1	444.0	443.0	447.3	443.3	443.2	444.1	445.9	445.9	445.8	445.7	444.9	443.6	447.3
26-Jan	444.7	442.8	Z	440.7	440.4	440.3	440.5	441.1	442.6	445.0	453.2	446.6	452.9	451.4	448.7	450.0	443.2	442.7	443.3	443.1	443.5	446.3	445.8	444.6	444.9	453.2
27-Jan	444.9	442.8	441.9	Z	441.5	441.2	440.5	440.2	441.7	442.9	442.3	441.6	444.1	442.9	443.2	447.8	450.0	448.9	443.6	443.3	441.8	440.6	439.6	439.2	442.9	450.0
28-Jan	439.0	438.8	438.7	438.7	Z	438.7	438.9	439.2	439.3	439.4	439.5	439.4	439.3	439.5	439.1	439.3	438.8	438.7	438.5	438.5	438.5	438.2	438.1	438.0	438.9	439.5
29-Jan	438.0	438.5	438.5	438.6	438.3	Z	438.7	438.9	439.2	439.4	439.7	440.0	440.5	440.8	441.3	441.7	442.4	442.8	443.0	443.0	443.5	443.2	443.0	442.8	440.7	443.5
30-Jan	Z	442.1	441.8	441.7	441.9	442.0	441.9	442.0	443.3	447.3	442.8	443.7	444.2	444.1	443.8	441.7	441.9	442.4	442.7	442.5	443.1	443.5	442.9	442.4	442.9	447.3
31-Jan	442.6	Z	443.8	444.6	444.5	445.7	447.6	446.7	446.4	446.1	445.4	444.8	443.6	444.0	443.8	449.6	448.2	445.7	445.1	445.8	445.8	444.7	444.3	443.5	445.3	449.6
447.5 446.8 447.0 446.8 445.8 446.7 446.6 447.0 447.2 446.8 446.7 446.3 446.6 446.4 446.2 447.2 447.2 447.4 447.2 446.6 446.5 446.7 446.9 446.8																								Diurnal Average		
482.9 480.8 481.2 473.3 459.8 467.0 466.5 469.3 468.8 467.6 466.3 465.3 462.5 459.3 460.4 463.2 463.1 463.4 463.5 457.7 456.3 464.6 468.5 480.9																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Stony Mountain - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	0	0.00	0.00
420 - 440	45	6.36	6.36
440 - 460	641	90.54	96.89
460 - 480	18	2.54	99.44
480 - 500	4	0.56	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Stony Mountain - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
400 - 420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
420 - 440	1	1	0	0	0	0	0	0	0	0	0	1	0	5	7	14	16	45
440 - 460	20	19	15	17	16	11	18	16	68	81	95	47	52	67	37	53	632	
460 - 480	1	2	2	2	1	2	3	4	0	0	0	0	0	0	1	0	18	
480 - 500	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	4	
> 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	22	22	17	19	18	14	23	20	68	81	96	47	57	74	52	69	699	

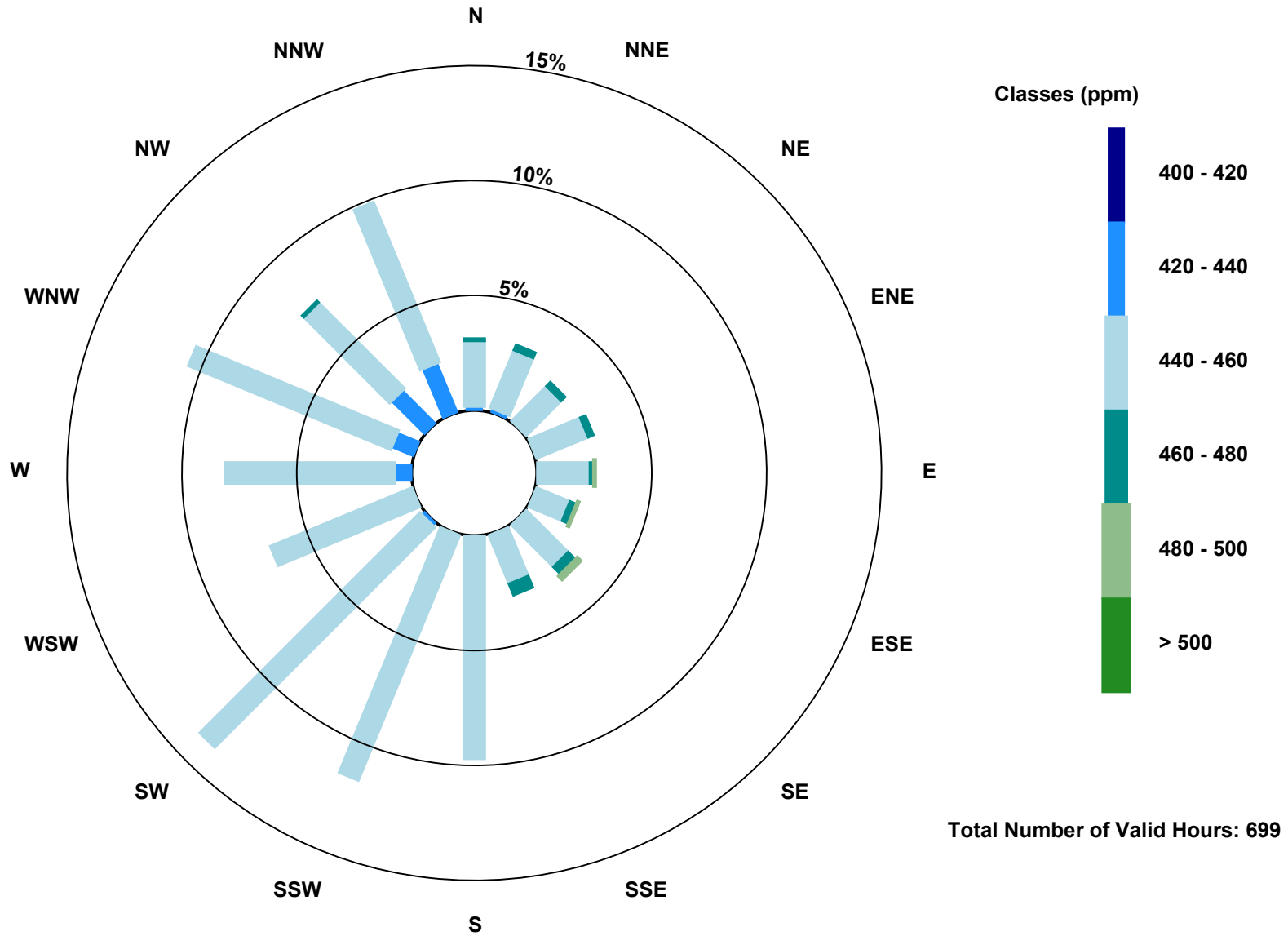
Total Number of Valid Hours: 699

Total Number of Hours: 744



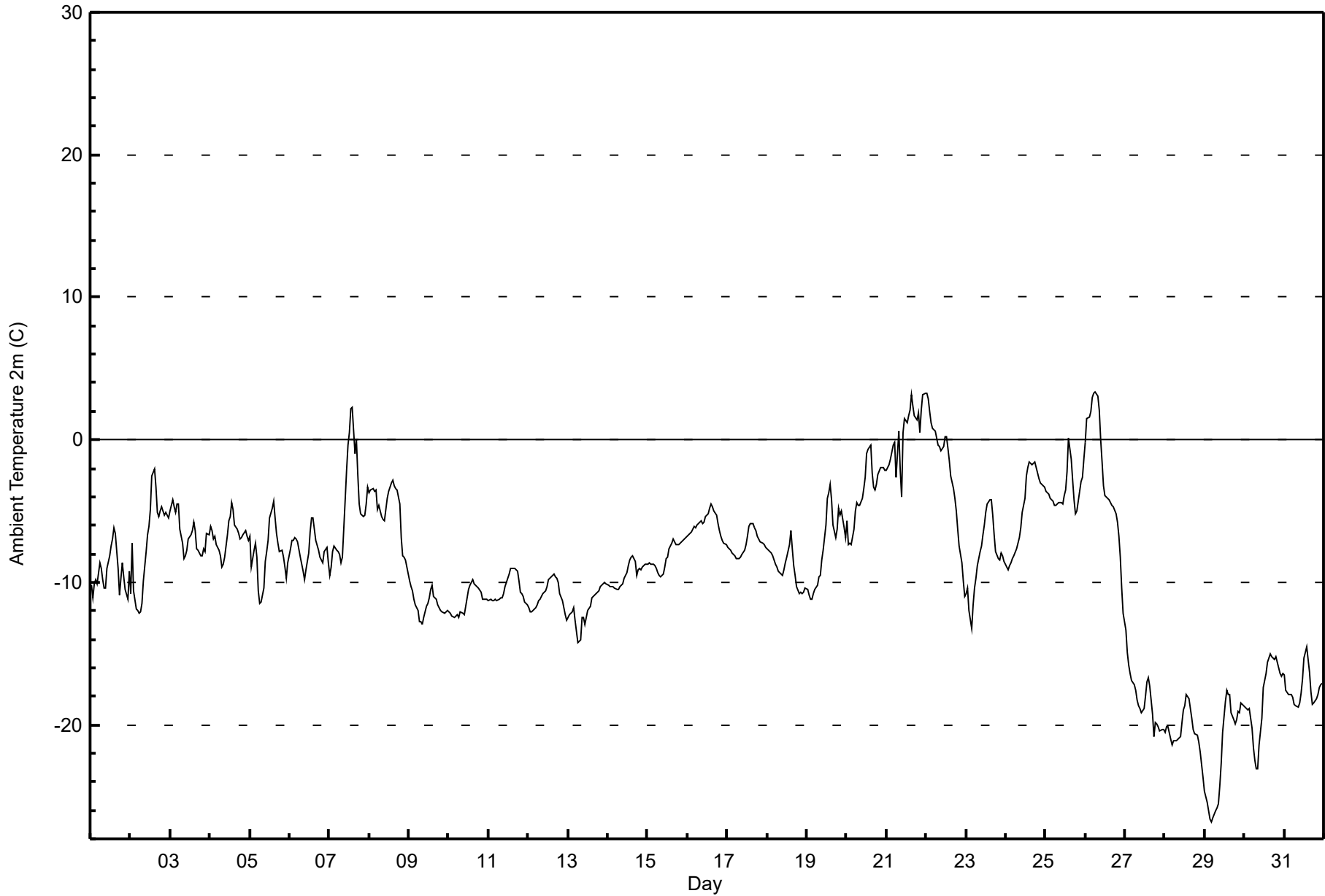
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Carbon Dioxide (CO₂) - ppm
Stony Mountain





Maximum Value: 3.3 C on Jan 26 07:00 Maximum Daily Average: 0.5 C on Jan 21																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -26.8 C on Jan 29 05:00 Minimum Daily Average: -21.9 C on Jan 29 Maximum Diurnal Average: -6.7 C at hour 15 Minimum Diurnal Average: -10.1 C at hour 8 Monthly Average: -8.99 C Percentiles: P ₁ = -25.1 P ₁₀ = -18.1 Q ₁ = -11.3 Median = -8.3 Q ₃ = -5.3 P ₉₀ = -2.4 P ₉₉ = 2.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.2	-11.0	-10.1	-9.8	-10.1	-8.7	-9.0	-9.8	-10.4	-10.4	-9.0	-8.1	-7.4	-7.0	-6.2	-6.6	-9.0	-10.9	-9.7	-8.7	-9.6	-10.5	-11.2	-9.2	-9.3	-6.2
2-Jan	-10.8	-7.3	-10.6	-11.8	-11.9	-12.2	-12.1	-11.5	-9.9	-7.8	-6.7	-6.1	-4.9	-2.5	-2.0	-3.3	-5.1	-5.4	-5.0	-4.7	-5.3	-5.1	-5.3	-5.5	-7.2	-2.0
3-Jan	-5.0	-4.2	-4.8	-5.1	-4.5	-4.5	-6.3	-7.3	-8.3	-8.1	-7.8	-6.9	-6.7	-6.4	-5.8	-6.4	-7.6	-7.7	-8.2	-8.1	-7.6	-7.9	-6.6	-6.6	-6.6	-4.2
4-Jan	-6.0	-6.4	-7.0	-6.8	-7.3	-7.7	-8.2	-9.0	-8.7	-8.2	-6.7	-5.7	-5.4	-4.4	-4.9	-6.0	-6.3	-6.6	-6.9	-6.9	-6.6	-6.4	-6.7	-7.0	-6.7	-4.4
5-Jan	-6.7	-8.9	-7.7	-7.3	-8.2	-10.6	-11.5	-11.4	-10.4	-8.6	-7.9	-7.0	-5.5	-4.8	-4.3	-5.5	-6.6	-7.2	-7.8	-7.8	-8.2	-8.9	-9.7	-8.6	-8.0	-4.3
6-Jan	-7.7	-7.0	-7.1	-6.8	-7.0	-7.1	-8.3	-8.8	-9.2	-9.8	-9.2	-7.9	-6.5	-5.5	-5.4	-6.2	-7.1	-7.8	-8.2	-8.5	-8.6	-7.9	-7.6	-8.7	-7.7	-5.4
7-Jan	-9.5	-8.9	-7.9	-7.4	-7.8	-7.8	-8.0	-8.6	-8.2	-4.2	-2.2	-0.3	0.5	2.2	2.3	-0.9	0.0	-2.4	-4.6	-5.2	-5.4	-5.3	-4.5	-3.4	-4.5	2.3
8-Jan	-3.7	-3.5	-3.4	-3.6	-3.6	-4.9	-4.6	-5.4	-5.6	-5.7	-4.9	-4.1	-3.6	-3.0	-2.8	-3.2	-3.4	-3.6	-4.5	-6.9	-8.1	-8.3	-8.5	-9.4	-4.9	-2.8
9-Jan	-9.9	-10.3	-10.6	-11.2	-11.6	-12.0	-12.7	-12.8	-13.0	-12.4	-11.7	-11.5	-11.1	-10.5	-10.2	-11.0	-11.2	-11.6	-11.7	-12.0	-12.1	-12.1	-12.1	-12.0	-11.6	-9.9
10-Jan	-12.1	-12.2	-12.4	-12.5	-12.4	-12.3	-12.4	-12.1	-12.1	-12.2	-11.7	-11.1	-10.5	-10.2	-9.8	-10.1	-10.2	-10.3	-10.4	-10.7	-11.2	-11.2	-11.2	-11.2	-11.3	-9.8
11-Jan	-11.3	-11.2	-11.3	-11.3	-11.2	-11.2	-11.2	-11.1	-11.1	-10.8	-10.3	-10.0	-9.4	-9.0	-9.0	-9.1	-9.1	-9.2	-9.9	-10.7	-10.8	-11.0	-11.4	-11.5	-10.5	-9.0
12-Jan	-11.8	-12.1	-12.1	-12.0	-11.7	-11.5	-11.3	-11.2	-11.0	-10.8	-10.6	-10.3	-9.8	-9.7	-9.6	-9.4	-9.6	-9.8	-10.0	-10.8	-11.3	-11.7	-12.3	-12.6	-11.0	-9.4
13-Jan	-12.5	-12.3	-12.1	-11.8	-12.7	-13.5	-14.2	-14.0	-12.4	-12.5	-12.9	-12.5	-12.0	-11.6	-11.1	-11.0	-10.9	-10.8	-10.6	-10.3	-10.2	-10.1	-10.0	-10.1	-11.8	-10.0
14-Jan	-10.2	-10.3	-10.3	-10.3	-10.4	-10.5	-10.5	-10.3	-10.2	-10.1	-9.7	-9.3	-8.8	-8.4	-8.2	-8.2	-8.5	-9.5	-9.1	-9.1	-9.1	-8.9	-8.7	-8.7	-9.5	-8.2
15-Jan	-8.7	-8.7	-8.7	-8.7	-8.8	-9.0	-9.3	-9.6	-9.6	-9.5	-8.9	-8.4	-8.3	-7.6	-7.3	-7.0	-7.2	-7.4	-7.3	-7.3	-7.1	-7.1	-7.0	-6.9	-8.1	-6.9
16-Jan	-6.8	-6.6	-6.4	-6.2	-6.0	-6.1	-5.9	-5.8	-5.7	-5.8	-5.8	-5.4	-5.2	-4.8	-4.5	-4.7	-5.0	-5.3	-5.9	-6.3	-6.8	-7.1	-7.2	-7.3	-5.9	-4.5
17-Jan	-7.5	-7.7	-7.8	-8.0	-8.2	-8.3	-8.4	-8.3	-8.2	-8.0	-7.8	-7.4	-6.7	-6.0	-5.9	-5.9	-6.1	-6.4	-6.8	-7.0	-7.1	-7.2	-7.3	-7.5	-7.3	-5.9
18-Jan	-7.7	-7.8	-7.9	-8.2	-8.5	-8.7	-8.9	-9.2	-9.4	-9.5	-9.1	-8.7	-8.3	-7.4	-6.4	-7.7	-8.8	-9.5	-10.3	-10.8	-10.7	-10.8	-10.7	-10.4	-9.0	-6.4
19-Jan	-10.5	-10.9	-11.2	-11.2	-10.8	-10.5	-10.2	-9.6	-9.5	-8.5	-7.8	-6.0	-4.1	-3.7	-3.2	-4.2	-6.0	-6.8	-6.3	-4.8	-5.3	-5.0	-6.2	-6.8	-7.5	-3.2
20-Jan	-5.7	-7.3	-7.3	-7.4	-6.3	-4.9	-4.4	-4.6	-4.6	-4.1	-3.4	-2.6	-1.0	-0.7	-0.4	-2.3	-3.3	-3.5	-3.1	-2.5	-1.9	-1.9	-1.9	-2.2	-3.6	-0.4
21-Jan	-2.1	-1.8	-1.3	-0.8	-0.4	-0.2	-2.7	0.6	-2.1	-4.0	0.5	1.5	1.2	1.7	2.1	3.1	2.4	1.7	1.4	1.9	0.5	2.1	3.1	3.3	0.5	3.3
22-Jan	3.2	2.8	2.0	1.2	0.8	0.6	0.1	-0.4	-0.5	-0.8	-0.5	0.2	0.2	-0.5	-1.5	-2.5	-3.4	-4.1	-5.0	-6.2	-7.5	-8.6	-9.9	-11.0	-2.1	3.2
23-Jan	-10.8	-10.4	-11.9	-13.2	-11.6	-10.4	-9.7	-8.8	-7.9	-7.4	-6.7	-6.0	-5.1	-4.5	-4.2	-4.2	-5.3	-6.7	-7.9	-8.4	-8.4	-8.0	-8.2	-8.5	-8.1	-4.2
24-Jan	-8.8	-9.1	-8.9	-8.7	-8.3	-8.2	-7.6	-7.3	-6.9	-6.1	-5.1	-4.1	-2.6	-1.9	-1.6	-1.6	-1.8	-1.6	-1.9	-2.3	-2.7	-3.0	-3.2	-3.3	-4.9	-1.6
25-Jan	-3.6	-3.7	-3.8	-4.1	-4.3	-4.6	-4.6	-4.5	-4.4	-4.4	-4.5	-3.9	-3.5	-2.2	0.1	-1.3	-2.8	-4.2	-5.2	-5.0	-3.6	-2.9	-2.6	-1.3	-3.5	0.1
26-Jan	-0.2	1.5	1.6	2.0	3.0	3.3	3.3	3.1	2.1	0.0	-1.6	-3.2	-4.0	-4.1	-4.2	-4.4	-4.6	-4.7	-5.2	-5.8	-6.7	-8.3	-10.4	-12.1	-2.5	3.3
27-Jan	-13.4	-14.9	-15.8	-16.4	-16.9	-17.2	-17.6	-18.3	-18.7	-18.9	-19.1	-18.8	-18.0	-17.0	-16.7	-17.3	-19.2	-20.8	-19.9	-20.0	-20.1	-20.5	-20.4	-20.4	-18.2	-13.4
28-Jan	-20.5	-20.1	-20.1	-21.1	-21.4	-21.1	-21.1	-21.1	-20.9	-20.8	-19.8	-19.0	-18.7	-17.9	-18.2	-18.8	-19.5	-20.4	-20.6	-20.7	-21.2	-21.9	-22.8	-23.7	-20.5	-17.9
29-Jan	-24.6	-25.5	-26.0	-26.7	-26.8	-26.5	-26.0	-25.8	-25.6	-24.2	-22.7	-20.5	-18.3	-17.6	-17.8	-17.9	-19.1	-19.7	-19.9	-19.6	-19.1	-19.1	-18.4	-18.6	-21.9	-17.6
30-Jan	-18.7	-18.9	-18.9	-18.9	-20.2	-21.6	-22.5	-23.1	-23.1	-21.4	-19.6	-17.3	-16.9	-16.4	-15.6	-15.0	-15.2	-15.3	-15.4	-15.2	-15.6	-16.4	-16.6	-16.4	-18.1	-15.0
31-Jan	-16.5	-17.6	-17.9	-17.9	-17.9	-18.1	-18.6	-18.7	-18.7	-18.5	-17.8	-16.8	-15.3	-14.5	-15.4	-16.3	-17.7	-18.5	-18.5	-18.2	-17.9	-17.4	-17.2	-17.1	-17.5	-14.5
	-9.4	-9.4	-9.6	-9.7	-9.8	-9.9	-10.1	-10.1	-10.1	-9.8	-9.1	-8.3	-7.6	-7.0	-6.7	-7.3	-8.0	-8.6	-8.8	-9.0	-9.2	-9.3	-9.4	-9.5		Diurnal Average
	3.2	2.8	2.0	2.0	3.0	3.3	3.3	3.1	2.1	0.0	0.5	1.5	1.2	2.2	2.3	3.1	2.4	1.7	1.4	1.9	0.5	2.1	3.1	3.3		Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	40	5.38	5.38
-20 - 0	667	89.65	95.03
0 - 10	37	4.97	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

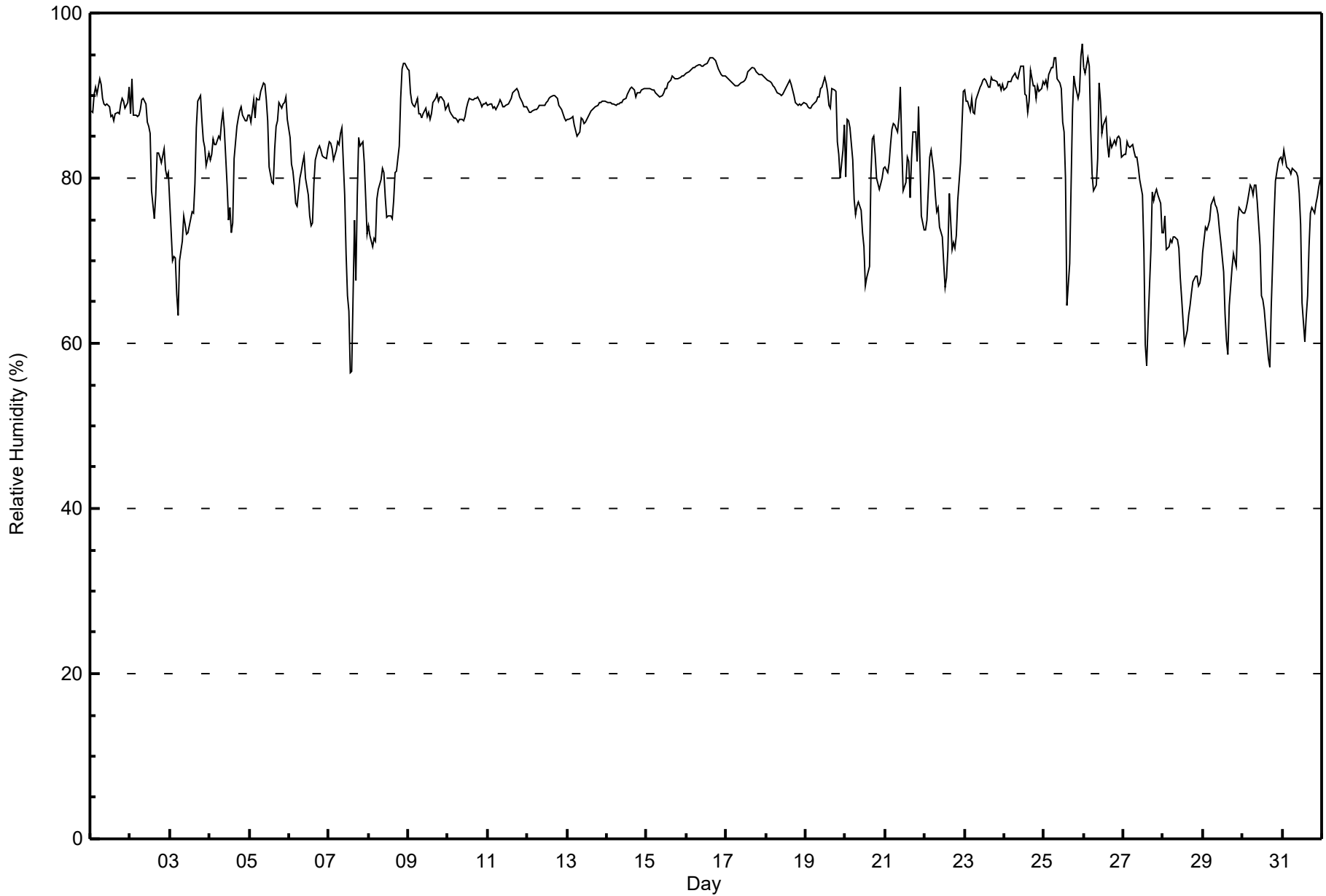


Maximum Value: 96.3 % on Jan 26 00:00 Maximum Daily Average: 93.5 % on Jan 16																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 56.4 % on Jan 7 14:00 Minimum Daily Average: 68.5 % on Jan 28 Maximum Diurnal Average: 85.7 % at hour 9 Minimum Diurnal Average: 79.0 % at hour 15 Monthly Average: 84.19 % Percentiles: P ₁ = 60.1 P ₁₀ = 72.4 Q ₁ = 79.3 Median = 87.3 Q ₃ = 90.0 P ₉₀ = 92.0 P ₉₉ = 94.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	88.1	88.0	90.2	91.1	90.2	92.0	91.4	89.7	89.1	88.7	88.9	88.6	87.5	87.7	87.0	87.8	88.0	87.8	89.0	89.7	89.2	88.4	89.2	91.0	89.1	92.0
2-Jan	87.8	92.1	87.6	87.6	87.4	87.6	88.3	89.5	89.6	88.9	86.8	86.2	85.5	78.5	75.2	78.0	83.0	83.1	82.5	81.9	83.6	81.1	80.1	80.6	84.7	92.1
3-Jan	77.2	70.0	70.5	70.4	65.9	63.4	70.1	72.4	75.5	74.4	73.2	73.4	75.0	75.9	75.7	79.3	86.1	89.3	90.0	86.9	84.6	83.8	81.4	83.0	77.0	90.0
4-Jan	82.2	82.8	84.8	84.1	84.0	85.2	84.8	86.8	88.0	85.9	79.2	75.0	76.4	73.4	74.5	82.4	86.3	87.3	88.2	88.6	87.7	86.9	87.0	87.6	83.7	88.6
5-Jan	87.6	86.8	89.6	87.3	89.7	89.5	89.4	90.4	91.5	91.4	89.5	86.9	81.3	79.4	79.4	83.6	86.2	87.0	88.2	88.4	89.0	89.1	89.8	87.1	87.5	91.5
6-Jan	84.9	81.6	80.8	79.1	76.9	76.6	80.0	80.9	81.8	82.7	80.1	78.0	75.5	74.2	74.5	79.4	82.2	83.5	83.9	83.3	82.7	82.6	82.3	83.5	80.5	84.9
7-Jan	84.4	84.3	83.6	82.3	83.4	84.4	84.0	85.4	86.1	78.0	70.9	65.8	63.8	56.4	56.7	75.0	67.6	77.9	85.0	83.9	84.5	81.9	77.7	73.2	77.3	86.1
8-Jan	74.2	73.1	71.6	72.7	72.4	77.5	78.7	79.8	81.2	80.7	77.6	75.3	75.5	75.4	75.1	77.3	80.6	80.8	83.8	89.7	93.3	93.8	94.0	93.3	80.3	94.0
9-Jan	93.0	90.3	89.2	88.8	88.6	89.7	87.7	87.8	87.4	87.8	88.4	87.5	88.0	87.1	87.8	89.1	89.7	90.1	89.3	89.8	89.8	89.4	88.3	88.6	88.9	93.0
10-Jan	89.0	88.2	87.8	87.4	87.2	87.1	86.8	87.2	87.1	87.0	87.5	88.5	89.2	89.7	89.5	89.6	89.6	89.6	89.8	89.1	88.7	88.9	89.0	89.2	88.4	89.8
11-Jan	88.9	89.0	89.0	88.6	88.6	88.4	89.0	89.6	89.1	88.6	88.6	88.8	89.1	89.3	89.6	90.3	90.6	90.8	90.5	89.8	89.5	89.1	88.7	88.7	89.2	90.8
12-Jan	88.3	87.9	88.0	88.1	88.2	88.3	88.5	88.7	88.8	88.8	88.9	89.1	89.4	89.7	89.8	89.9	90.0	89.9	89.6	88.8	88.4	87.9	87.3	86.9	88.7	90.0
13-Jan	87.1	87.1	87.3	87.5	86.5	85.8	85.2	85.6	87.2	87.2	86.7	86.7	87.2	87.7	88.1	88.3	88.5	88.6	88.8	89.1	89.2	89.3	89.4	89.3	87.6	89.4
14-Jan	89.1	89.1	89.1	89.1	88.9	88.9	89.0	89.1	89.2	89.2	89.5	89.7	90.2	90.6	90.9	91.0	90.7	89.8	90.3	90.3	90.4	90.6	90.8	90.9	89.8	91.0
15-Jan	90.9	90.8	90.8	90.7	90.6	90.4	90.2	90.1	89.9	90.0	90.4	90.8	90.9	91.4	91.9	92.3	92.2	92.1	92.1	92.1	92.3	92.3	92.4	92.5	91.3	92.5
16-Jan	92.7	92.9	93.0	93.2	93.4	93.4	93.6	93.8	93.8	93.6	93.6	93.8	93.9	94.2	94.6	94.6	94.5	94.3	93.8	93.3	92.8	92.6	92.4	92.3	93.5	94.6
17-Jan	92.1	92.0	91.8	91.7	91.4	91.2	91.2	91.3	91.4	91.6	91.6	91.9	92.3	92.9	93.1	93.4	93.4	93.3	92.9	92.7	92.6	92.5	92.4	92.2	92.2	93.4
18-Jan	92.0	91.9	91.7	91.5	91.2	91.0	90.7	90.4	90.2	90.0	90.2	90.5	90.8	91.5	91.9	91.3	90.7	90.0	89.2	88.8	88.9	88.8	89.0	89.2	90.5	92.0
19-Jan	89.0	88.6	88.4	88.5	88.9	89.0	89.3	89.8	89.9	90.8	91.0	92.3	91.6	90.5	88.8	88.5	90.9	90.7	90.5	84.4	82.9	80.0	83.3	86.4	88.5	92.3
20-Jan	80.2	87.2	87.0	86.2	82.2	77.4	75.6	76.6	77.2	76.0	73.3	71.7	67.0	67.9	69.4	80.5	84.8	85.1	82.9	80.0	78.7	79.3	80.1	81.2	78.6	87.2
21-Jan	81.3	80.8	81.8	84.1	85.9	86.6	86.5	85.5	87.2	91.1	84.1	78.4	79.5	82.6	82.0	77.7	82.3	85.6	85.6	82.0	88.7	82.3	75.5	73.8	82.9	91.1
22-Jan	73.8	74.9	78.6	82.6	83.3	80.6	77.9	75.9	76.4	74.0	72.8	69.7	66.8	67.9	71.3	78.1	71.4	72.3	71.6	73.1	77.2	81.9	86.3	90.5	76.2	90.5
23-Jan	90.7	89.3	89.4	88.1	89.7	88.0	87.8	89.5	90.6	91.0	91.4	91.9	92.0	91.9	91.1	91.0	92.2	91.9	91.9	91.8	91.1	91.3	90.7	91.4	90.7	92.2
24-Jan	90.7	91.0	91.7	91.6	91.6	92.2	92.8	92.1	92.1	92.9	93.5	93.6	90.2	90.0	88.0	89.3	93.0	91.2	91.2	89.7	91.2	90.5	90.8	91.8	91.4	93.6
25-Jan	91.3	91.9	91.0	92.5	93.3	93.5	94.6	94.6	92.0	91.5	90.9	86.8	85.7	80.0	64.6	69.6	79.2	88.2	92.4	91.3	89.6	90.6	94.8	96.3	88.6	96.3
26-Jan	93.4	92.7	94.6	93.5	86.0	80.4	78.4	79.2	82.3	91.6	89.3	85.5	86.5	87.3	84.1	82.5	84.6	83.8	84.6	84.1	85.0	85.2	84.7	82.5	85.9	94.6
27-Jan	82.9	82.8	84.4	83.9	83.7	84.0	83.2	82.5	82.5	81.3	79.8	77.9	71.4	59.8	57.3	62.3	71.1	78.4	77.3	78.1	78.6	78.0	76.9	73.5	77.1	84.4
28-Jan	73.4	75.4	71.4	71.6	72.5	72.1	72.8	72.9	72.5	71.5	68.0	65.4	62.8	60.0	61.5	63.5	64.5	66.1	67.5	68.1	68.2	67.0	67.3	68.2	68.5	75.4
29-Jan	71.1	74.0	73.6	74.3	74.9	76.8	77.6	76.7	76.4	75.6	73.7	72.2	68.6	63.5	60.4	58.6	64.6	69.2	70.9	70.0	69.3	74.8	76.5	75.9	71.6	77.6
30-Jan	75.8	75.7	76.2	77.1	79.2	78.9	77.9	79.1	79.1	77.1	71.9	65.8	65.3	64.1	62.0	58.2	57.1	64.4	69.8	75.3	79.6	81.9	82.4	82.5	73.2	82.5
31-Jan	81.8	83.4	81.3	81.2	81.0	80.6	81.2	81.0	80.6	80.2	78.2	74.5	64.9	60.2	63.3	65.8	71.8	75.7	76.5	75.8	76.9	77.9	79.0	79.8	76.4	83.4
																								Diurnal Average		
																								Diurnal Maximum		



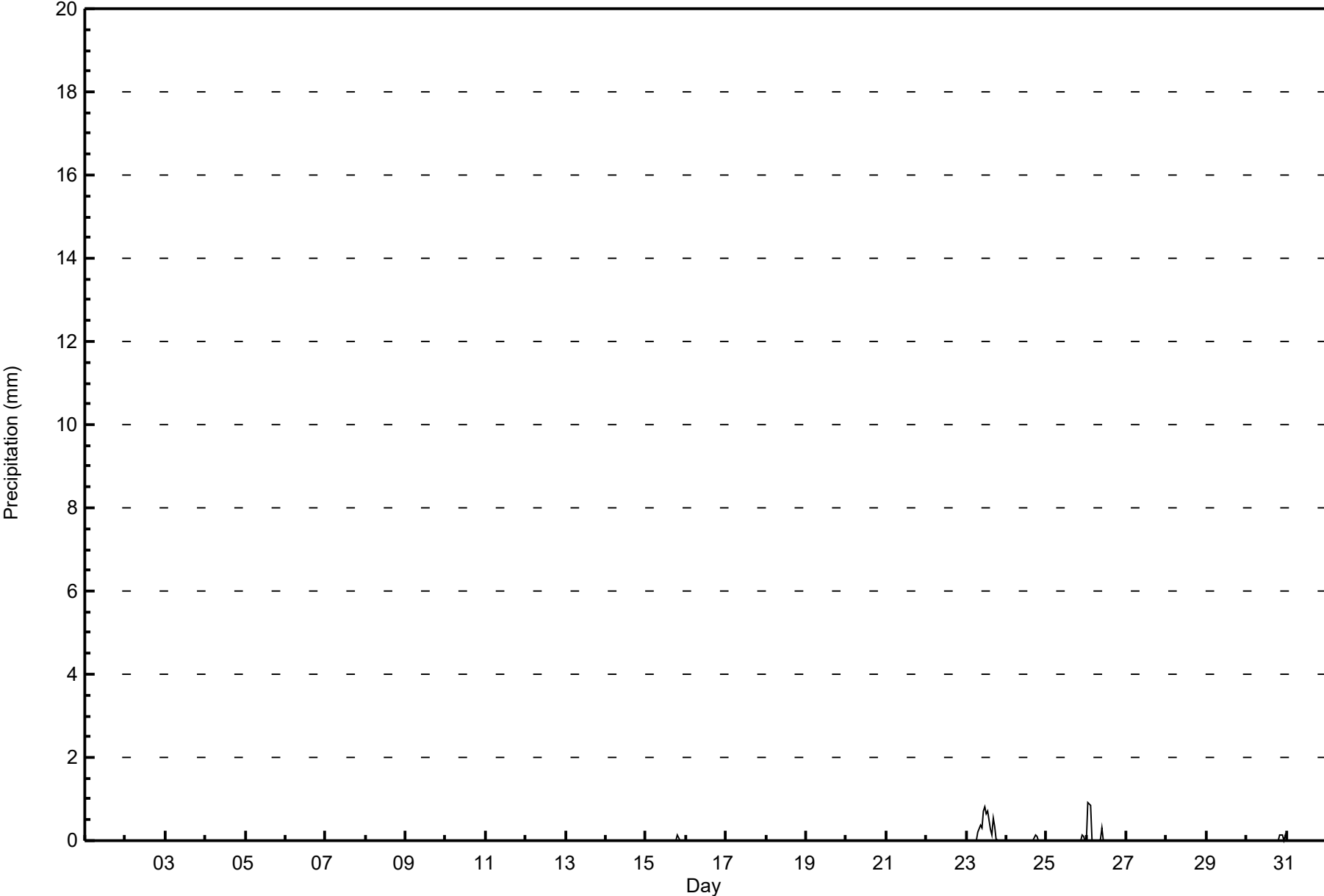
Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Stony Mountain - January 2023





Maximum Value: 0.9 mm on Jan 26 02:00		Maximum Daily Total: 5.1 mm on Jan 23		Hours in Service: 744																															
Minimum Value: 0.0 mm on Jan 1 01:00		Minimum Daily Total: 0.0 mm on Jan 1		Hours of Data: 744																															
Maximum Diurnal Total: 0.9 mm at hour 2		Minimum Diurnal Total: 0.0 mm at hour 4		Hours of Missing Data: 0																															
Monthly Total: 8.28 mm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.4		Hours of Calibration: 0																															
				Percent Operational Time: 100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24											
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
5-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.7	0.8	0.6	0.7	0.3	0.2	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.8
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2		
26-Jan	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.9		
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.1
31-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
		0.1	0.9	0.9	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.6	0.7	0.3	0.2	0.6	0.5	0.1	0.2	0.1	0.3	0.1	0.1							Diurnal Average			
		0.1	0.9	0.9	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.7	0.8	0.6	0.7	0.3	0.2	0.6	0.3	0.1	0.2	0.1	0.2	0.1	0.1							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Stony Mountain - January 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	736	98.92	98.92
0.4 - 0.5	1	0.13	99.06
0.6 - 0.7	4	0.54	99.60
0.8 - 1.4	3	0.40	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



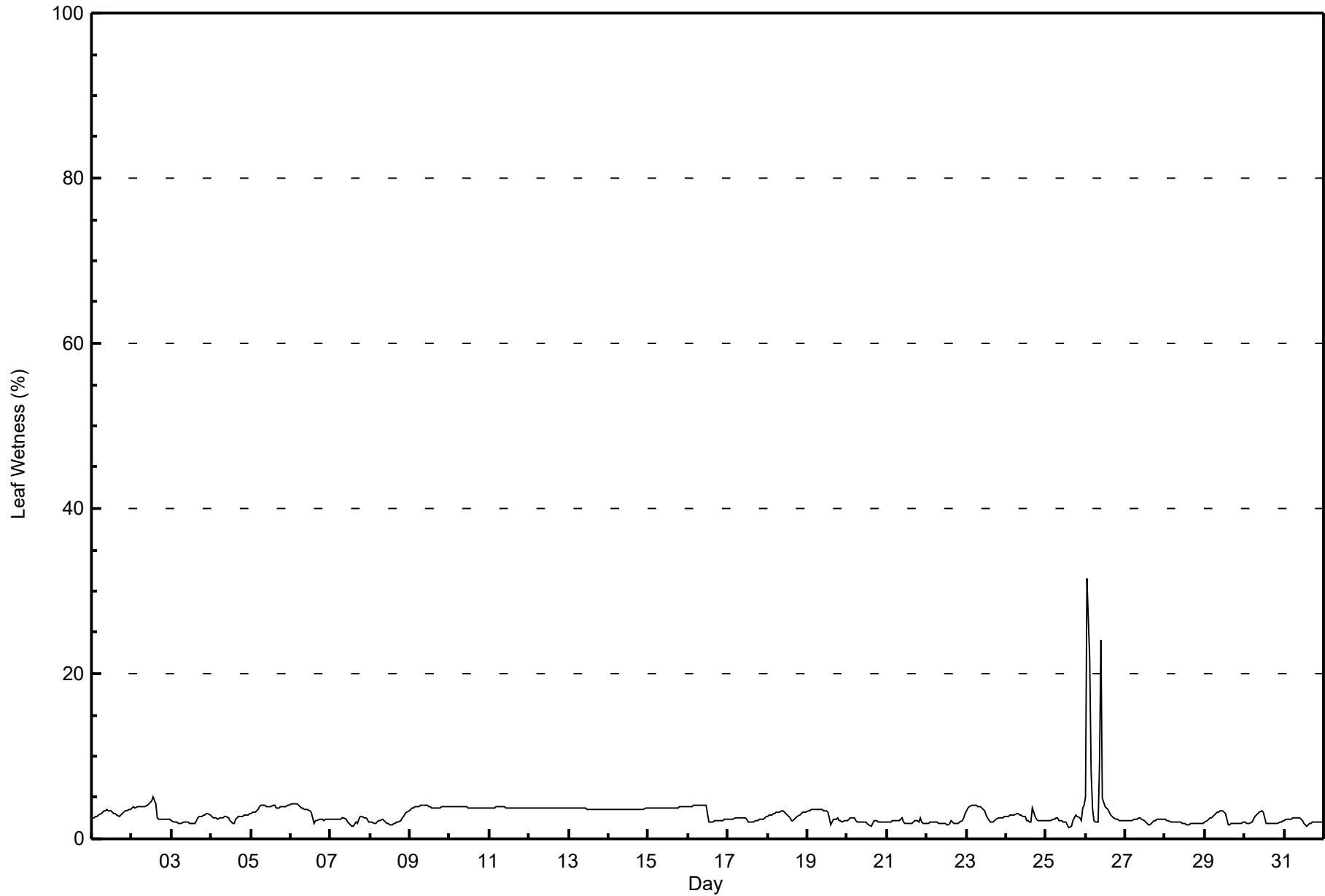
Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Stony Mountain - January 2023

Maximum Value: 31.6 % on Jan 26 02:00		Maximum Daily Average: 6.3 % on Jan 26		Hours in Service: 744																						
Minimum Value: 1.4 % on Jan 25 15:00		Minimum Daily Average: 2.0 % on Jan 28		Hours of Data: 744																						
Maximum Diurnal Average: 3.8 % at hour 2		Minimum Diurnal Average: 2.5 % at hour 15		Hours of Missing Data: 0																						
Monthly Average: 2.96 %		Percentiles: P ₁ = 1.7 P ₁₀ = 1.9 Q ₁ = 2.1 Median = 2.6 Q ₃ = 3.7 P ₉₀ = 3.9 P ₉₉ = 4.8		Hours of Calibration: 0																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.5	2.6	2.7	2.8	2.8	3.0	3.1	3.3	3.4	3.5	3.5	3.3	3.2	3.0	3.0	2.8	2.8	3.0	3.2	3.3	3.5	3.6	3.6	3.1	3.6	
2-Jan	3.7	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	4.1	4.2	4.4	4.6	5.0	4.3	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	3.4	5.0
3-Jan	2.2	2.0	2.0	2.0	1.9	1.9	1.9	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	2.1	2.5	2.6	2.8	2.9	3.0	3.0	3.0	2.9	2.3	3.0
4-Jan	2.8	2.6	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.8	2.6	2.3	2.1	1.9	1.9	2.3	2.7	2.7	2.7	2.7	2.8	2.9	2.9	3.0	2.5	3.0
5-Jan	3.1	3.3	3.3	3.3	3.5	3.9	4.0	4.1	4.1	4.0	3.9	3.9	4.0	4.1	4.1	3.7	3.7	3.8	3.8	3.9	3.9	4.0	4.0	4.0	3.8	4.1
6-Jan	4.2	4.3	4.3	4.3	4.2	4.0	3.8	3.7	3.6	3.5	3.5	3.4	3.2	2.5	1.9	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	3.1	4.3
7-Jan	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.5	2.6	2.4	2.0	1.9	1.7	1.5	1.5	2.1	1.9	2.4	2.8	2.6	2.6	2.5	2.3	2.0	2.3	2.8
8-Jan	2.0	2.0	1.9	1.9	2.0	2.2	2.2	2.4	2.2	2.0	1.9	1.8	1.8	1.8	1.9	2.0	2.1	2.3	2.5	2.8	3.1	3.3	3.4	2.2	3.4	
9-Jan	3.6	3.7	3.7	3.8	3.9	4.0	4.0	4.0	4.0	4.0	4.0	3.9	3.8	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	3.8	4.0
10-Jan	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.9
11-Jan	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8	3.8
12-Jan	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8
13-Jan	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7
14-Jan	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7
15-Jan	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.9	3.9	3.9	3.9	3.7	3.9
16-Jan	3.9	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	2.1	2.0	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.2	2.3	2.3	3.1	4.1
17-Jan	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.6	2.6	2.5	2.4	2.1	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.4	2.5	2.5	2.7	2.4	2.7
18-Jan	2.8	2.9	2.9	3.0	3.1	3.2	3.2	3.3	3.3	3.3	3.2	3.1	2.9	2.6	2.2	2.2	2.4	2.6	2.8	2.9	3.0	3.2	3.2	3.3	2.9	3.3
19-Jan	3.4	3.4	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.4	3.4	3.3	2.5	1.7	2.0	2.3	2.4	2.5	2.2	2.1	2.1	2.1	2.9	3.6
20-Jan	2.2	2.3	2.5	2.5	2.5	2.2	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.7	1.6	1.9	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.5
21-Jan	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.3	2.5	2.1	1.9	1.9	1.9	1.9	1.8	2.0	2.2	2.2	2.1	2.6	2.1	1.9	1.9	2.1	2.6
22-Jan	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	2.3	1.8	1.9	1.9	1.9	2.0	2.1	2.5	3.0	2.0	3.0
23-Jan	3.4	3.7	3.9	4.0	4.1	4.1	4.0	4.0	3.9	3.8	3.6	3.4	3.0	2.5	2.1	2.0	2.1	2.2	2.4	2.6	2.6	2.6	2.6	2.7	3.1	4.1
24-Jan	2.8	2.8	2.8	2.8	2.9	2.9	3.0	3.0	2.9	2.8	2.7	2.6	2.1	2.2	2.1	2.1	3.8	2.7	2.3	2.2	2.2	2.2	2.2	2.2	2.6	3.8
25-Jan	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.6	2.2	2.2	2.1	2.0	2.0	1.8	1.4	1.6	2.1	2.5	2.9	2.8	2.5	2.3	3.7	4.0	2.4	4.0
26-Jan	5.1	31.6	21.7	8.2	3.7	2.2	2.0	2.1	9.0	24.1	4.9	4.3	3.9	3.5	3.2	2.9	2.7	2.5	2.4	2.3	2.3	2.2	2.2	2.2	6.3	31.6
27-Jan	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.3	2.1	1.9	1.7	1.8	2.0	2.2	2.2	2.3	2.4	2.5	2.5	2.4	2.2	2.5
28-Jan	2.3	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.3
29-Jan	2.0	2.1	2.3	2.5	2.6	2.8	3.0	3.1	3.3	3.4	3.4	3.4	3.3	3.1	2.4	1.8	1.7	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.4	3.4
30-Jan	2.0	1.9	1.9	1.9	2.1	2.4	2.7	2.9	3.1	3.3	3.3	3.2	2.6	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.1	2.1	2.3	3.3
31-Jan	2.2	2.3	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.2	1.8	1.6	1.7	1.8	1.9	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.2	2.5
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	0	0.00	0.00
0.6 - 0.7	0	0.00	0.00
0.8 - 1.4	1	0.13	0.13
1.5 - 10	739	99.33	99.46
> 10	3	0.40	99.87

Total Number of Valid Hours: 744

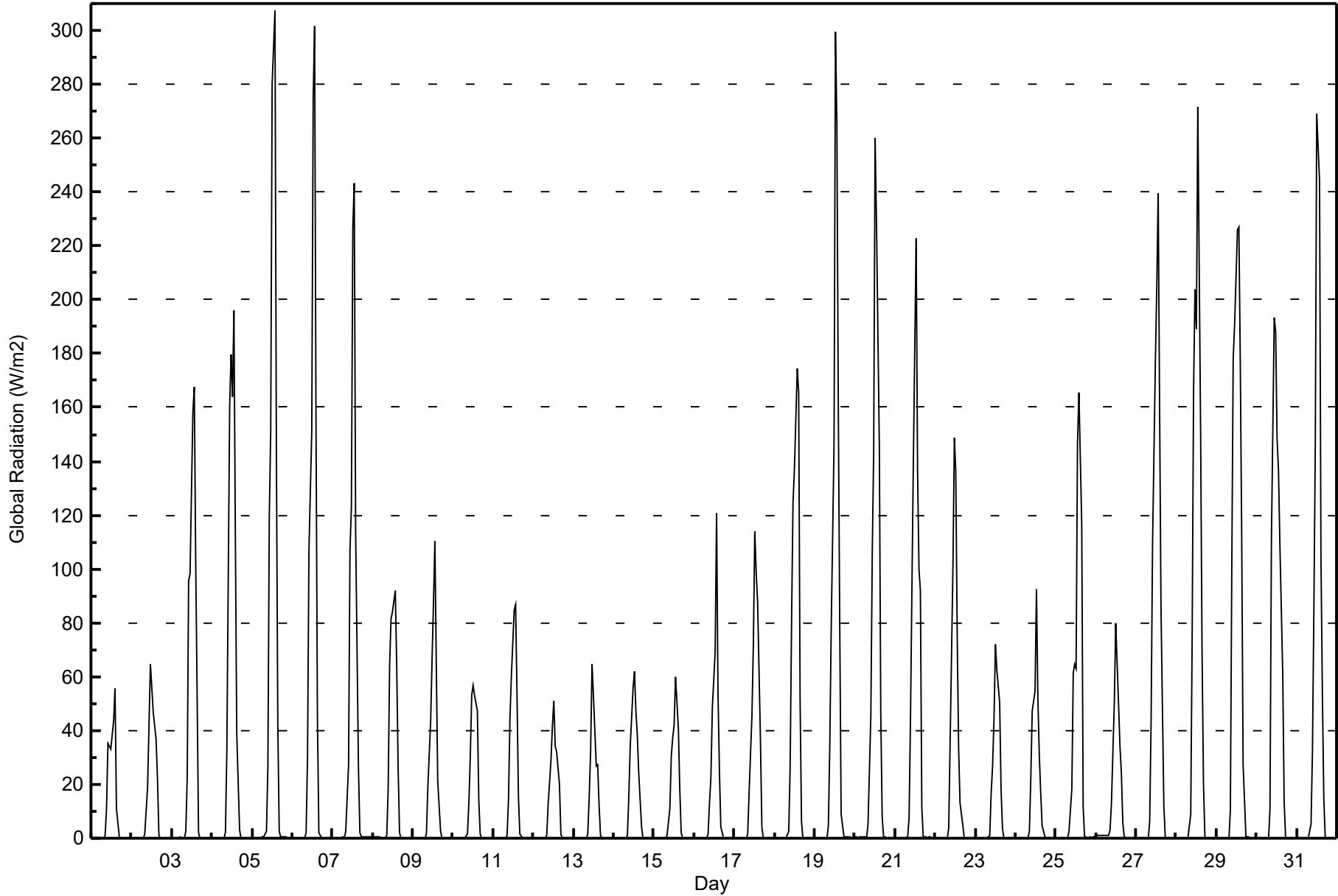
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Global Radiation (GR) - W/m2
Stony Mountain - January 2023

Maximum Value: 307.2 W/m2 on Jan 5 14:00		Maximum Daily Average: 52.2 W/m2 on Jan 29		Hours in Service:	744																					
Minimum Value: 0.0 W/m2 on Jan 1 04:00		Minimum Daily Average: 9.3 W/m2 on Jan 12		Hours of Data:	744																					
Maximum Diurnal Average: 140.2 W/m2 at hour 14		Minimum Diurnal Average: 0.1 W/m2 at hour 23		Hours of Missing Data:	0																					
Monthly Average: 26.39 W/m2		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 25.3 P ₉₀ = 99.9 P ₉₉ = 262.9		Hours of Calibration:	0																					
				Percent Operational Time:	100.0																					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.2	35.1	33.2	38.4	43.6	55.8	11.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	55.8
2-Jan	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.5	19.0	42.3	64.5	55.5	46.7	37.0	21.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	64.5
3-Jan	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.1	2.5	22.5	95.9	98.0	158.3	167.7	102.6	53.6	2.2	0.0	0.0	0.1	0.1	0.1	0.1	0.0	29.4	167.7
4-Jan	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2.2	32.7	160.9	179.5	163.8	196.2	113.6	39.0	3.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	37.2	196.2
5-Jan	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.3	2.7	26.8	119.7	151.4	280.1	307.2	143.6	42.4	2.4	0.4	0.4	0.3	0.4	0.1	0.2	0.1	45.0	307.2
6-Jan	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	2.1	29.8	106.5	151.4	275.0	301.5	153.7	45.0	2.3	0.1	0.1	0.1	0.0	0.1	0.1	0.0	44.5	301.5
7-Jan	0.0	0.1	0.1	0.2	0.1	0.2	0.3	0.2	2.6	27.1	107.2	123.2	226.7	243.4	113.5	25.6	2.3	0.5	0.4	0.4	0.4	0.6	0.5	0.7	36.5	243.4
8-Jan	0.5	0.6	0.5	0.4	0.3	0.1	0.1	0.0	1.1	18.8	64.1	81.6	83.9	91.8	64.8	26.6	2.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	18.2	91.8
9-Jan	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	1.4	19.0	43.6	66.8	87.7	110.2	63.1	21.2	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	110.2
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	13.1	30.7	53.1	56.6	53.0	47.4	14.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	56.6
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	14.9	44.0	59.8	84.4	86.8	53.4	15.8	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	86.8
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	12.7	29.1	41.6	50.9	34.1	31.9	20.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	50.9
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.5	15.3	31.9	64.8	52.9	26.9	27.4	12.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.8	64.8
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	15.6	34.3	55.6	62.1	47.3	38.5	24.4	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	62.1
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.2	30.6	37.5	42.2	59.7	40.9	18.5	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.2	59.7
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	13.1	22.7	48.2	69.2	121.0	54.1	25.2	4.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	15.0	121.0
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	17.5	45.6	72.6	114.0	98.2	87.6	36.1	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9	114.0
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	27.1	81.2	124.6	136.9	174.7	165.4	51.9	6.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	32.1	174.7
19-Jan	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.8	35.2	78.2	146.4	299.6	265.1	160.7	80.9	9.0	0.6	0.4	0.5	0.4	0.4	0.0	0.2	45.1	299.6
20-Jan	0.5	0.4	0.2	0.3	0.4	0.4	0.3	0.2	5.1	45.5	106.0	143.5	260.0	227.9	145.7	46.8	7.7	0.4	0.3	0.2	0.1	0.0	0.1	0.0	41.3	260.0
21-Jan	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.5	7.4	44.4	92.1	138.5	222.7	137.2	99.7	92.0	11.5	0.7	0.5	0.2	0.5	0.3	0.0	0.0	35.4	222.7
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	35.2	100.9	148.6	136.2	75.9	33.5	13.4	5.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	23.0	148.6
23-Jan	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.0	16.7	26.9	44.3	72.0	62.6	50.6	17.8	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	72.0
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	22.1	47.2	54.5	92.4	52.2	30.9	16.6	4.9	0.4	0.2	0.2	0.2	0.1	0.1	0.0	13.5	92.4
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	18.2	61.4	64.6	63.0	146.4	165.5	115.9	11.7	0.7	0.3	0.1	0.3	0.2	0.4	0.6	27.2	165.5
26-Jan	0.9	1.2	0.9	0.9	1.0	1.1	1.0	0.9	3.3	13.2	32.2	49.8	79.9	49.7	34.4	24.0	5.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	12.5	79.9
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	43.4	108.4	176.6	204.3	239.6	159.8	84.9	11.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	43.1	239.6
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	74.7	166.2	203.7	188.9	271.9	149.7	68.6	20.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	48.1	271.9
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	10.6	100.1	177.9	190.7	226.0	226.8	177.6	112.7	27.5	0.8	0.3	0.3	0.1	0.0	0.0	0.0	52.2	226.8
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.0	110.6	193.1	188.1	148.3	136.5	108.9	60.8	13.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	40.5	193.1
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	32.7	84.6	145.9	268.8	244.5	104.8	54.3	15.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	39.9	268.8
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - January 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	550	73.92	73.92
21 - 100	120	16.13	90.05
101 - 300	72	9.68	99.73
301 - 600	2	0.27	100.00
601 - 900	0	0.00	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 29 km/h on Jan 26 06:00	Maximum Daily Speed Average: 19.0 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 15 16:00	Minimum Daily Speed Average: 0.9 km/h on Jan 15	Hours of Data: 735
Maximum Diurnal Speed Average: 6.1 km/h at hour 20	Minimum Diurnal Speed Average: 4.7 km/h at hour 16	Hours of Missing Data: 9
Monthly Average Velocity: 5.4 km/h 263.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 5 Median = 10 Q ₃ = 16 P ₉₀ = 19 P ₉₉ = 25	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SW5	SW5	WSW5	SW4	SW3	W5	W5	W4	W4	WSW5	W5	W6	W5	WSW5	W6	WSW10	SW11	SW13	WSW13	WSW11	WSW11	WSW10	WSW11	W12	WSW7.0	WSW13
2-Jan	W9	WNW12	WSW11	WSW12	SW14	SW15	SW15	SW17	SW16	SW16	SW17	SW17	SW18	WSW20	WSW19	SW18	SW19	SW22	SW21	SW21	SW19	SW20	SW16	SW20	SW16.4	SW22
3-Jan	SW22	SW23	SW22	SW19	SW18	SW15	SSW16	SSW18	SSW19	SSW19	SSW16	SSW16	SSW17	SSW14	SW9	SSW9	SSW13	SW14	SW15	WSW13	W11	WNW13	WNW14	WNW16	SW14.4	SW23
4-Jan	WNW18	WNW18	WNW17	WNW17	WNW19	WNW18	WNW18	WNW16	NW15	NW16	NW12	NW11	NW10	WNW10	W9	W10	W12	WNW14	WNW17	WNW17	WNW18	WNW16	WNW15	WNW15	WNW14.8	WNW19
5-Jan	WNW14	WNW11	W16	WNW14	NW12	WNW7	W4	SSW13	SSW13	SSW12	SSW11	SSW13	SSW13	S12	W9	S11	S14	S15	S16	S16	S14	SSE13	SSE14	SSE16	SSW8.8	SSE16
6-Jan	SSE21	S23	S20	S21	S24	S23	S18	S21	S15	S15	SSW16	SSW15	SSW16	SSW14	SSW15	SW15	SW20	SW21	SW20	SW20	SW21	SW18	WSW16	SW15	SSW17.0	S24
7-Jan	SW16	SW20	SW19	SW20	SW18	SW18	SW17	SW16	WSW16	WSW15	W14	W13	W11	W14	W11	WSW9	W13	WSW8	SW12	SW12	SW12	SW14	SW16	SW16	WSW13.8	SW20
8-Jan	SW17	SW15	SW15	SW13	SW10	S6	SSE8	ENE6	ENE7	ESE6	ESE7	SE6	SE8	SE8	E8	E8	E6	E7	E5	NE6	ENE5	ENE5	NE5	NNE4	SE3.8	SW17
9-Jan	NNE4	NNE3	NNW2	NNW3	NNW3	NW1	W3	WNW2	WNW4	WNW3	NW3	NNW4	NNW2	N0	SE1	S2	E1	NE3	ENE2	SE2	S1	SSE2	E2	E2	NNW1.0	NNE4
10-Jan	ESE3	SE1	SE2	SE2	SW1	SE1	SSE1	NW1	NE2	ENE2	ENE1	SSE1	SSE1	WSW1	NE1	NNE2	N2	NNE2	NE3	NE3	NE2	NNE2	NE2	NE2	ENE1.1	NE3
11-Jan	UO	UO	UO	UO	UO	SSE1	S1	S2	SW2	WSW1	UO	SE1	SE2	SE2	S2	SSE2	SSE3	S4	SSW6	SSW8	SSW7	S7	SSW8	SSW7	S3.5	SSW8
12-Jan	SSW7	S8	SSW8	S9	S7	S7	S9	SSW10	S11	SSW8	SSW8	SSW8	SSW7	SSW9	SSW8	SSW6	SSW7	SSW8	SSW7	SW6	SSW6	SSW7	SW7	SW6	SSW7.6	S11
13-Jan	SW4	SW3	SW2	S1	W1	N3	N3	NE3	NE6	NE7	ENE5	ENE4	ENE4	ENE4	ENE5	E4	ENE4	ENE4	ENE6	E5	E5	E5	ESE5	ESE4	ENE2.8	NE7
14-Jan	ESE4	ESE4	ESE4	ESE4	SE3	SE4	SSE4	S3	S2	S2	S3	SSW3	SW3	SW2	SW1	S0	WNW1	WNW2	SW2	SW3	WSW3	W3	WNW4	NW4	S1.4	SE4
15-Jan	NW4	NW4	NNW2	NNW2	NNW2	NNW2	NNE2	NNE2	UO	SSE1	UO	E2	ESE2	E2	SE1	ENE0	E2	E2	ENE2	ESE2	ENE1	ENE1	UO	ESE2	NE0.9	NW4
16-Jan	ESE2	SE2	SSE2	SE2	E3	ESE3	ESE3	ESE3	SE3	SE3	SE3	SSE3	SSE5	SE5	SE5	SSE5	SSE5	S5	S5	S5	S5	S5	S5	SSW5	SSE3.4	S5
17-Jan	SSW5	SSW5	S4	S5	SSW5	SSW4	SSW4	SSW4	SSW5	SSW5	SSW5	SSW5	SSW5	SSW4	SSW4	SSW5	SSW5	SSW5	SSW6	SSW5	SSW5	SSW6	SSW5	SSW5	SSW4.8	SSW6
18-Jan	SSW5	SSW5	S5	S5	S5	S5	S5	S5	S4	S5	S4	SSW4	S5	S4	S4	S4	S4	S4	S4	S4	SSW5	S6	S6	SSW6	S4.7	S6
19-Jan	SSW6	SSW16	SSW14	SW13	SW13	SW16	SW15	SW13	WSW13	WSW13	WSW13	W16	W16	W14	W12	SW12	SW16	SW14	WSW17	W20	WSW18	WSW19	SW16	SW17	WSW13.8	W20
20-Jan	SW15	SSW14	SW15	SW14	WSW16	W17	W18	W18	W19	W19	W18	WNW21	WNW17	WNW15	WSW12	WSW14	WSW15	WSW15	W14	SW13	W17	W21	W18	W15.6	WNW21	
21-Jan	WNW20	WNW18	WNW18	WNW18	W18	W16	W12	W16	WSW11	SW11	W14	W13	SW12	SW12	SW12	WSW14	WSW15	WSW15	WSW15	W14	SW13	W17	W21	W18	W14.2	W21
22-Jan	WNW18	WNW16	WNW15	NW16	NW15	NW16	NW17	WNW16	NW20	NW24	NW22	NW23	NW24	NW25	NNW25	NNW22	NNW24	NNW21	NNW19	NNW18	NNW14	NNW12	NW8	NW7	NW17.5	NW25
23-Jan	W6	WSW6	SSE3	SSE9	S12	SSW11	SSW12	SSW14	SSW14	SSW12	S11	S11	S11	S10	SSW8	WNW3	N7	N9	N9	N7	WNW2	WNW5	NNW7	NNW5	SSW4.2	SSW14
24-Jan	NE2	SSE3	SSW4	SSW6	SSW5	SSW6	SW8	SW10	SW9	SW9	WSW9	SW11	W12	W12	WNW13	NW16	NW16	NW13	NW14	NNW15	NNW13	NNW10	NNW10	NNW10	WNW6.3	NW16
25-Jan	NNW12	NNW10	NNW10	NNW7	N6	NNW7	NNW4	NW7	NW9	WNW8	WNW7	NW3	WSW3	WSW6	W7	NW5	SSW5	SSW9	SSW11	SW14	SW15	SW16	SSW17	SW17	W5.1	SSW17
26-Jan	SW18	WNW22	WNW22	WNW24	WNW25	NW29	NW29	NW26	NNW27	N25	N22	N21	NNW18	N14	NNW17	NNW16	NNW15	NNW16	NNW14	N13	NNE13	NNE13	NNE14	NNE14	NNW16.6	NW29
27-Jan	NE14	NE14	NNE13	NNE12	NNE13	NNE12	NNE12	NNE11	NNE9	N10	N8	N8	N8	NNW9	NNW11	NNW11	NNW10	NNW9	NNW10	NNW9	NNW12	NNW13	NNW13	NNW14	N10.1	NNW14
28-Jan	NNW14	NNW16	NNW19	NW17	NW17	NW18	NW20	NW20	NW21	NW18	NW19	NW20	NW20	NW20	NW20	NNW20	NNW20	NNW19	NNW22	NNW22	NNW21	NNW20	NNW20	N18	NNW19.0	NNW22
29-Jan	NNW15	NNW13	NNW14	NW14	NW12	WNW15	WNW15	WNW15	WNW17	WNW17	WNW16	W12	W11	WSW12	SW11	SW13	SSW17	SW20	SW20	WSW18	WNW16	NW16	NNW15	NNW16	WNW11.2	SW20
30-Jan	NNW15	NNW17	NNW16	NNW14	NNW14	NW14	NW14	NW13	WNW12	WNW13	W11	WNW8	WNW10	W11	WNW11	WNW10	WNW8	W5	W6	WNW7	NW5	NNW3	NNE3	NNE3	NW9.1	NNW17
31-Jan	NE4	ENE7	E8	E6	ENE4	NNE4	N5	N4	N3	NNE1	N2	NW2	WNW7	NNW8	W7	WNW8	WNW6	NW7	NW8	WNW6	WNW7	WNW10	WNW11	WNW13	NW3.8	WNW13

W5.1	W5.3	W5.4	W5.3	W5.6	W5.5	W5.8	W5.8	W5.8	W5.5	W6.0	W5.5	W5.4	W5.4	W4.9	W4.7	WSW5.3	WSW5.5	WSW5.7	W6.1	W5.7	W5.5	W5.3	W5.0	Diurnal Average
SW22	S23	WNW22	WNW24	WNW25	NW29	NW29	NW26	NNW27	N25	NW22	NW23	NW24	NW25	NNW25	NNW22	NNW24	SW22	NNW22	NNW22	SW21	NNW20	W21	SW20	Diurnal Maximum

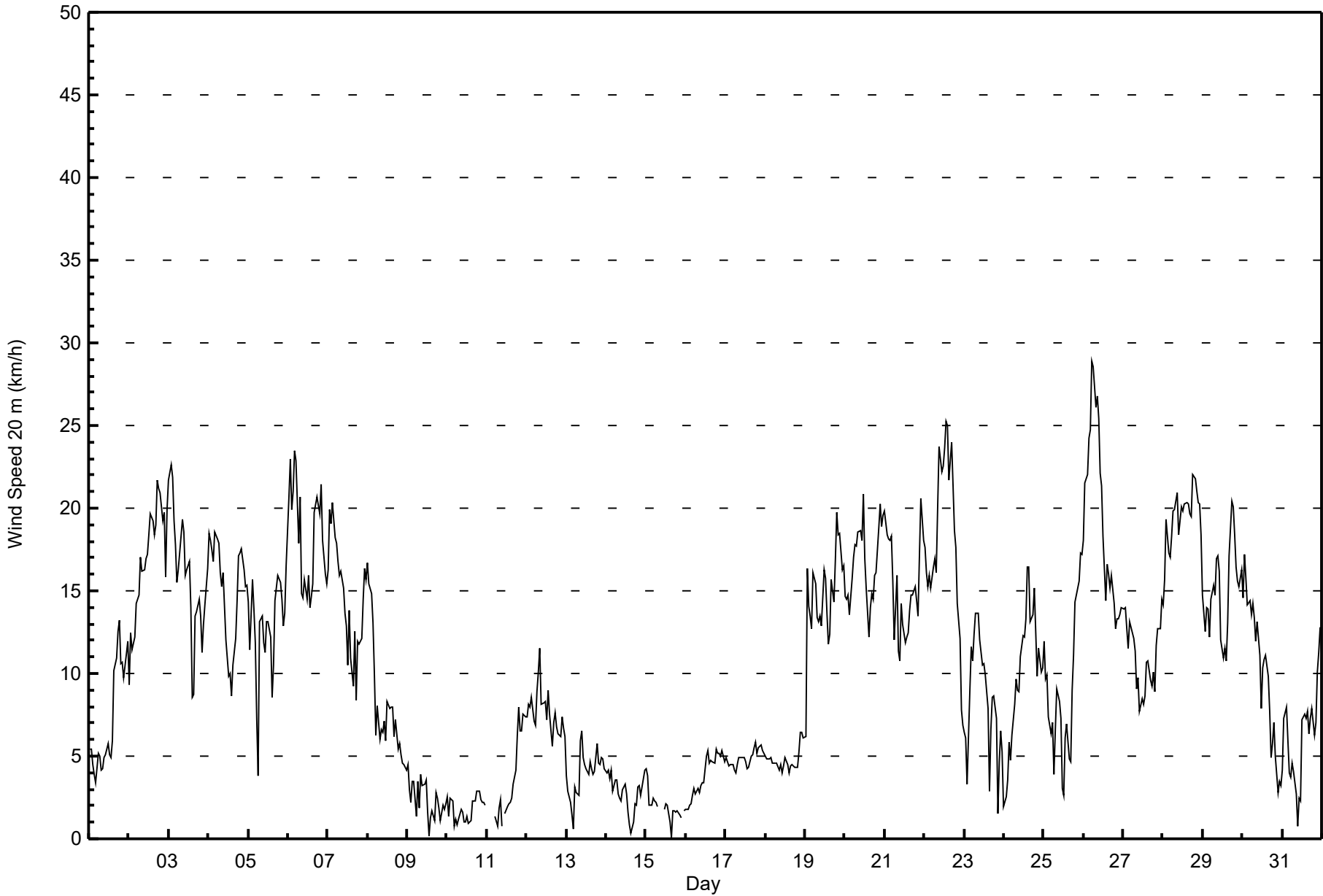
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 16 03:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																	Hours in Service: 744 Hours of Data: 735 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.8									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	3	2	2	3	2	2	2	2	3	3	3
2-Jan	3	3	3	3	2	3	2	3	3	3	3	3	4	5	4	4	4	5	5	5	4	5	4	5	5	5
3-Jan	5	5	5	4	4	4	3	4	4	4	4	4	4	4	3	2	3	2	3	3	3	3	3	4	5	5
4-Jan	5	4	4	5	5	5	5	4	4	4	4	3	3	3	3	3	4	4	4	4	4	4	4	4	5	5
5-Jan	3	3	4	3	2	2	2	1	2	2	2	3	3	3	2	2	3	3	3	3	2	2	3	4	4	4
6-Jan	5	6	5	5	6	6	6	5	5	4	6	5	4	4	4	4	5	4	4	4	4	4	4	3	3	6
7-Jan	3	3	3	4	3	3	3	3	3	4	4	3	3	4	4	2	3	2	2	1	2	2	2	2	4	4
8-Jan	3	3	3	3	3	2	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	1	1	3	3
9-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
10-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1
11-Jan	UO	UO	UO	UO	UO	1	1	1	1	1	UO	1	1	1	1	1	1	1	2	3	2	2	2	2	3	3
12-Jan	2	2	2	2	3	2	2	3	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	3	3
13-Jan	2	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
14-Jan	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1
15-Jan	1	1	0	0	0	1	0	1	UO	1	UO	1	1	0	1	1	0	0	0	1	1	1	UO	1	1	1
16-Jan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19-Jan	1	7	5	4	4	4	4	3	3	4	4	5	5	4	3	3	3	3	4	6	4	4	3	3	7	7
20-Jan	4	3	3	3	4	5	5	5	5	5	5	6	5	5	3	4	4	4	4	4	4	5	5	5	6	6
21-Jan	6	5	5	5	5	5	4	4	3	2	4	5	3	3	4	4	4	3	3	4	3	5	6	5	6	6
22-Jan	5	5	4	4	4	4	5	5	7	7	7	8	8	8	8	8	8	7	6	6	4	3	2	1	8	8
23-Jan	1	1	2	1	2	3	3	3	3	3	2	3	2	3	2	2	2	2	2	3	1	1	2	1	3	3
24-Jan	1	1	1	1	1	1	2	2	2	2	4	4	4	4	5	5	4	3	5	3	3	3	3	3	5	5
25-Jan	3	3	3	2	2	2	1	3	3	3	3	2	2	2	2	3	2	2	3	3	3	4	4	4	4	4
26-Jan	5	7	8	8	8	9	9	9	9	10	7	7	5	5	5	5	4	5	4	4	4	4	4	4	10	10
27-Jan	4	4	3	4	4	4	4	3	2	3	3	3	2	2	3	3	3	2	2	2	3	3	4	4	4	4
28-Jan	4	4	6	5	5	6	6	6	7	5	5	6	6	6	6	6	6	6	7	7	6	6	6	6	7	7
29-Jan	4	4	3	3	3	4	4	4	5	5	5	4	4	4	3	4	4	5	5	5	5	4	4	4	5	5
30-Jan	4	5	5	4	4	3	3	3	3	3	3	2	4	3	3	3	2	2	2	2	1	1	1	1	5	5
31-Jan	2	1	1	2	1	1	1	1	1	1	1	1	3	2	3	2	2	1	1	1	2	3	3	4	4	4
Diurnal Maximum																										
UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	240	32.65	32.65
6 - 11	160	21.77	54.42
12 - 19	269	36.60	91.02
20 - 28	64	8.71	99.73
29 - 38	2	0.27	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 735

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	8	12	13	16	13	13	20	16	36	29	15	8	10	10	9	12	240
6 - 11	8	2	3	4	6	2	3	2	16	32	12	12	15	19	7	17	160
12 - 19	3	9	2	0	0	0	0	3	10	28	59	27	32	42	22	32	269
20 - 28	3	0	0	0	0	0	0	1	6	0	17	1	2	8	14	12	64
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	23	18	20	19	15	23	22	68	89	103	48	59	79	54	73	735

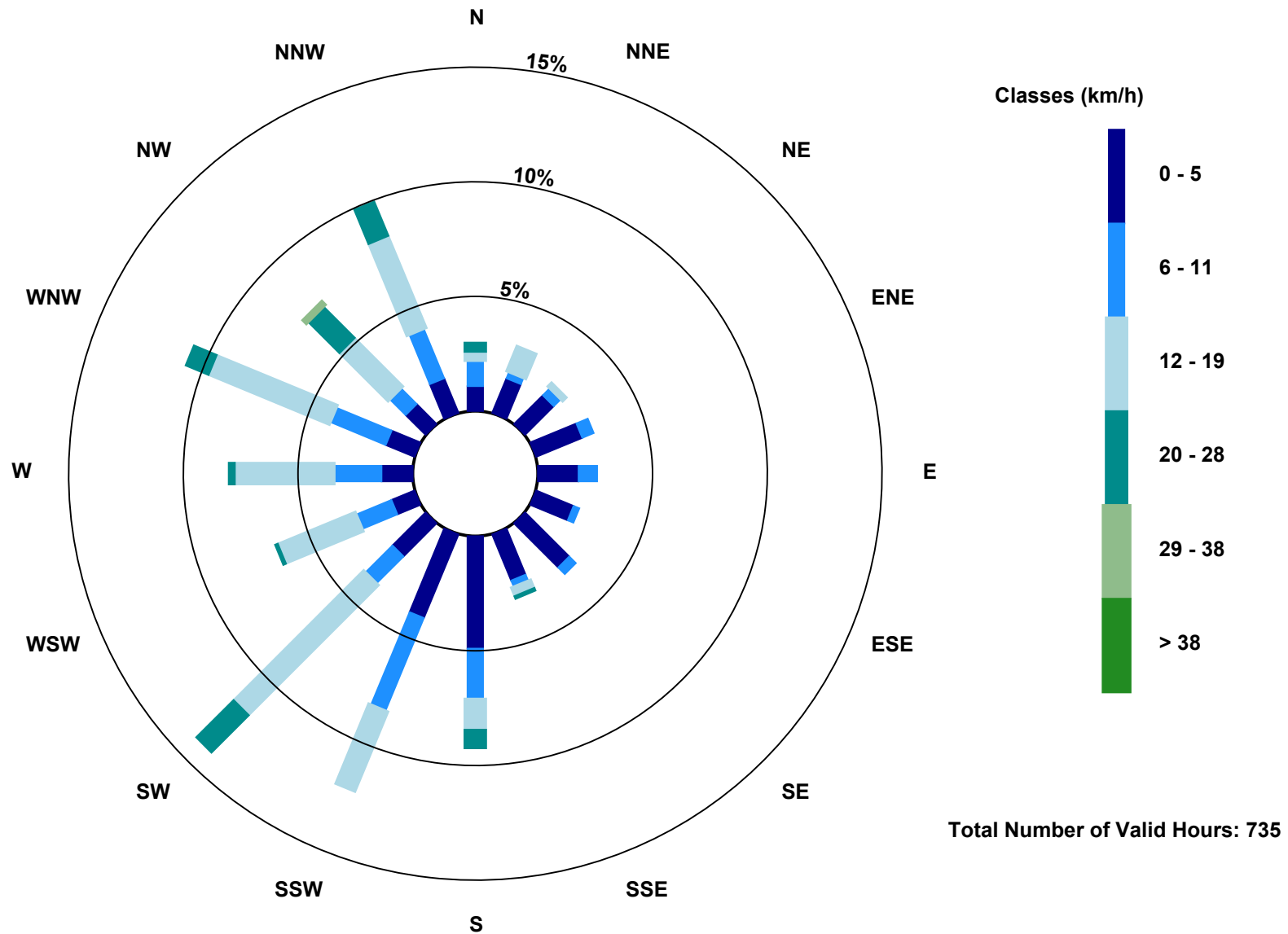
Total Number of Valid Hours: 735

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 20 m (WS20m) - km/h
Stony Mountain





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Stony Mountain - January 2023

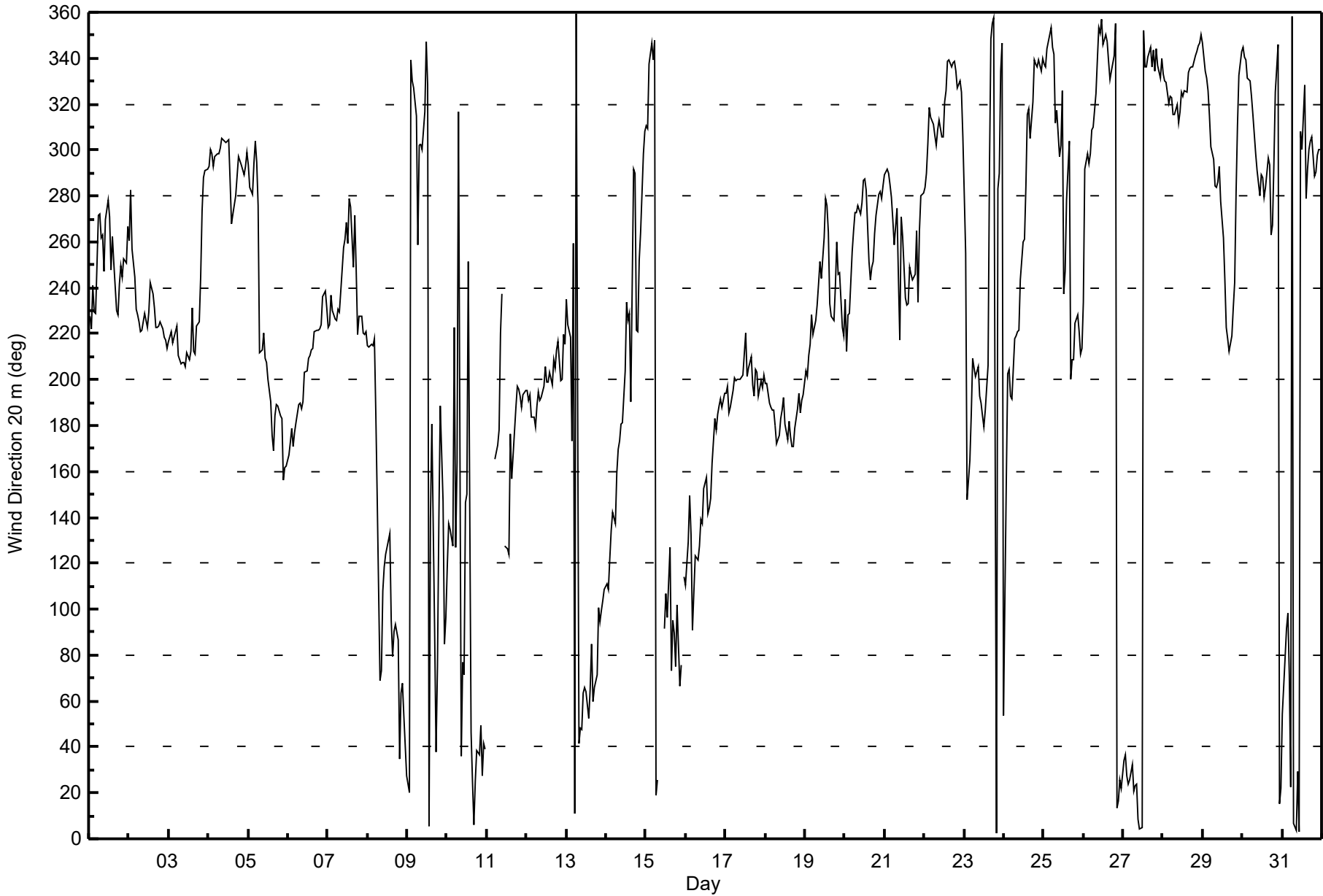
Direction of Maximum Speed: 309 deg on Jan 26 06:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 329.6 deg on Jan 28																						Hours of Data: 735			
Direction of Minimum Speed: 73 deg on Jan 15 16:00											Direction of Minimum Daily Speed Average: 0.9 deg on Jan 15											Hours of Missing Data: 9			
Monthly Average Direction: 263.9 deg																						Percent Operational Time: 98.8			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	228	222	241	229	229	271	272	262	263	247	270	278	271	248	263	251	230	228	241	250	245	253	251	267	249.2
2-Jan	260	283	257	245	231	228	225	221	222	229	226	223	229	242	237	231	223	223	223	225	222	218	217	214	229.1
3-Jan	217	221	216	218	221	224	211	207	208	207	206	212	209	212	231	212	211	223	225	245	273	288	291	292	224.7
4-Jan	293	300	298	293	297	298	298	301	305	304	304	304	287	268	272	280	289	297	295	293	289	293	299	295.1	
5-Jan	293	284	281	294	304	295	276	212	213	220	209	207	200	190	175	169	184	189	188	184	183	156	162	162	209.3
6-Jan	167	173	179	171	177	181	189	190	187	191	203	204	209	210	213	214	221	221	222	222	224	236	239	232	201.7
7-Jan	223	224	236	230	226	226	231	229	239	257	261	268	259	279	275	249	272	248	220	228	227	220	220	221	238.0
8-Jan	215	214	215	215	218	185	148	69	74	108	118	124	127	133	95	80	90	93	86	35	64	68	54	28	140.7
9-Jan	24	20	339	330	327	315	259	302	303	300	317	347	328	6	140	181	90	38	75	139	188	147	85	97	346.6
10-Jan	118	137	135	127	222	127	164	317	36	77	71	147	150	252	47	25	6	25	38	37	49	28	42	39	62.2
11-Jan	UO	UO	UO	UO	UO	165	172	178	220	237	UO	127	126	124	176	157	167	188	197	196	193	188	193	195	185.5
12-Jan	195	191	193	184	184	179	189	194	191	192	197	205	199	199	203	198	209	205	213	217	199	200	220	215	198.1
13-Jan	235	224	218	173	259	11	359	41	48	47	63	66	64	53	65	85	60	66	71	100	95	100	104	109	72.4
14-Jan	111	108	122	134	142	137	160	170	173	181	181	204	234	226	229	190	292	290	221	221	252	264	299	308	187.1
15-Jan	311	309	338	347	339	348	19	25	UO	168	UO	91	107	96	127	73	95	90	75	102	66	76	UO	114	34.4
16-Jan	110	129	149	132	91	107	123	121	127	139	137	153	157	141	144	148	163	183	178	185	189	191	188	194	156.9
17-Jan	194	197	186	188	195	201	199	200	200	200	202	211	220	201	205	210	197	193	204	203	193	199	197	202	200.0
18-Jan	198	198	190	188	186	186	180	172	176	183	187	192	181	174	182	175	171	171	179	187	194	186	191	194	184.7
19-Jan	204	202	210	215	228	220	226	233	242	251	244	262	279	276	264	233	228	226	240	260	246	246	223	219	237.3
20-Jan	235	212	228	229	256	265	273	273	276	272	277	287	287	282	251	243	249	252	263	272	281	282	279	285	265.4
21-Jan	289	292	290	285	279	270	259	274	244	217	271	262	235	233	233	249	246	243	246	265	234	265	280	281	263.6
22-Jan	284	290	302	318	314	311	306	302	309	313	306	306	321	326	339	339	336	338	338	335	327	330	325	306	318.7
23-Jan	280	255	148	165	185	209	205	202	206	193	190	184	179	186	206	292	349	355	358	3	283	290	335	346	212.9
24-Jan	54	156	203	205	193	192	218	219	221	221	243	260	261	284	315	318	305	321	339	337	336	339	334	340	290.4
25-Jan	337	336	344	347	353	345	342	312	317	297	302	326	238	247	278	304	200	209	209	225	228	229	211	214	266.0
26-Jan	234	291	298	294	298	309	310	325	339	353	351	357	346	350	347	338	331	334	341	355	13	16	26	22	331.0
27-Jan	34	37	28	24	26	32	21	23	24	9	4	5	352	336	336	341	345	336	344	334	344	337	332	340	2.3
28-Jan	333	330	329	320	323	323	316	316	320	312	317	325	323	326	325	334	335	336	336	341	343	345	347	350	329.6
29-Jan	346	334	331	326	315	302	296	284	284	286	293	278	262	244	223	218	213	219	231	242	282	311	332	343	282.6
30-Jan	345	340	340	331	330	323	315	307	298	291	280	289	288	279	284	296	294	263	268	294	325	346	15	22	311.2
31-Jan	54	66	92	98	71	23	358	7	4	29	3	308	300	328	279	291	300	304	306	289	290	298	300	300	321.9
263.7 262.5 265.5 259.6 264.3 265.9 263.3 259.8 263.6 263.8 265.3 266.7 262.0 264.0 269.0 266.4 257.3 254.7 257.8 263.4 262.9 269.1 271.2 272.6																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Stony Mountain - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Jan 31 10:00 Minimum Value: 9 deg on Jan 5 08:00 Percentiles: P ₁ = 11 P ₁₀ = 15 Q ₁ = 17 Median = 20 Q ₃ = 25 P ₉₀ = 30 P ₉₉ = 82																			Hours in Service: 744 Hours of Data: 735 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.8						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	18	18	19	23	34	29	25	23	24	20	27	25	28	24	26	24	16	16	16	17	17	21	19	20	34
2-Jan	24	20	20	13	12	15	13	15	15	16	16	16	16	17	17	16	15	16	18	17	17	18	18	17	24
3-Jan	18	17	18	16	17	20	16	16	16	16	19	19	19	21	25	19	15	15	15	16	19	16	17	19	25
4-Jan	20	18	18	20	19	19	18	16	17	18	20	21	22	23	25	25	21	20	17	18	20	21	20	17	25
5-Jan	16	19	20	15	11	15	47	9	11	12	18	20	19	17	16	12	15	15	14	14	14	12	12	14	47
6-Jan	18	20	18	17	18	19	22	21	23	22	24	23	23	23	21	21	19	16	16	17	16	19	17	17	24
7-Jan	14	15	13	14	14	14	13	13	17	19	21	22	30	22	24	23	20	32	14	11	15	10	12	11	32
8-Jan	14	12	15	16	16	23	18	23	14	16	13	23	12	15	15	15	18	11	17	16	21	24	30	37	37
9-Jan	18	26	48	41	37	66	29	50	34	24	20	13	25	84	70	81	49	23	20	31	61	29	22	17	84
10-Jan	19	60	32	34	82	89	88	68	39	42	45	63	48	82	29	24	20	21	17	18	19	19	20	18	89
11-Jan	UO	UO	UO	UO	UO	31	26	25	29	45	UO	28	34	31	44	33	27	27	26	26	26	24	25	24	45
12-Jan	24	25	23	24	36	22	24	23	24	29	24	26	27	25	26	29	24	25	27	26	25	23	27	28	36
13-Jan	42	33	50	77	67	15	10	29	15	18	20	18	18	18	16	24	16	18	16	18	17	18	17	18	77
14-Jan	17	17	21	19	29	19	22	25	24	27	28	28	30	41	51	93	45	17	25	18	24	26	21	21	93
15-Jan	19	20	15	18	15	16	20	18	UO	71	UO	26	20	20	30	84	18	22	26	26	22	21	UO	23	84
16-Jan	18	36	20	22	18	16	17	19	21	22	22	25	23	20	21	22	24	28	28	28	25	28	26	27	36
17-Jan	27	25	26	29	24	27	26	24	23	27	26	26	26	28	28	27	26	25	26	27	25	23	25	28	29
18-Jan	27	27	27	26	27	25	25	25	28	26	28	27	25	26	26	25	22	21	19	20	20	18	20	22	28
19-Jan	23	21	26	28	27	20	21	20	21	23	23	24	25	23	24	21	17	17	20	23	19	19	17	15	28
20-Jan	23	18	14	15	19	24	23	21	22	22	24	22	22	23	25	22	19	21	20	22	22	21	21	20	25
21-Jan	23	21	22	22	22	25	29	23	31	17	25	29	25	20	22	23	21	20	21	22	22	24	23	22	31
22-Jan	21	23	22	19	18	19	21	21	21	20	22	23	21	20	17	20	18	17	16	17	18	16	14	13	23
23-Jan	19	12	64	11	16	19	17	16	19	17	18	18	19	19	27	54	12	13	12	12	64	39	15	14	64
24-Jan	47	30	30	14	16	21	17	19	20	21	27	25	23	24	22	21	19	19	17	15	18	18	17	18	47
25-Jan	17	18	16	18	15	16	25	25	21	24	30	73	70	33	34	43	30	15	18	17	18	18	20	20	73
26-Jan	25	24	23	22	23	22	21	22	19	19	19	19	16	19	18	19	18	17	16	17	18	20	18	16	25
27-Jan	18	17	18	19	18	18	18	17	17	17	19	17	21	20	17	17	13	13	13	15	16	15	17	17	21
28-Jan	16	16	17	19	20	19	20	21	21	21	21	20	21	20	19	18	17	17	18	17	16	17	16	16	21
29-Jan	15	16	14	15	17	19	21	22	23	22	23	25	28	26	27	24	19	20	21	21	26	19	17	15	28
30-Jan	15	17	16	17	15	16	18	19	19	21	23	26	25	25	22	23	24	35	23	22	19	16	18	22	35
31-Jan	18	17	17	18	24	32	16	20	59	103	50	60	37	29	37	23	16	16	13	18	20	22	21	23	103
47 60 64 77 82 89 88 68 59 103 50 73 70 84 70 93 49 35 28 31 64 39 30 37																									
Diurnal Maximum																									
UO - Unstable Operation																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19 FIREBAG JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	36	36	100	48.5	0	9.6	0
H2S (ppb) Average	685	35	59	96.77	2.8	0	0.6	0
THC (ppm) Average	708	36	36	100	2.8	-	2.5	-
NO2 (ppb) Average	706	35	38	99.6	38.7	0	20.7	-
NO (ppb) Average	706	35	38	99.6	42.6	-	10.8	-
NOX (ppb) Average	706	35	38	99.6	80	-	28.9	-
Temperature 2 m (C) Average	744	0	0	100	0.2	-	-2.7	-
Relative Humidity (%) Average	744	0	0	100	100	-	96	-
Wind Speed 10 m (km/h) Average	731	0	13	98.25	33	-	22	-
Wind Direction 10 m (deg) Average	731	0	13	98.25	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1.75	4	-	0	0	0.1	0.3	1.2	6	48.5
H2S (ppb) Average	685	0.18	0.2	-	0	0	0.1	0.1	0.2	0.4	2.8
THC (ppm) Average	708	2.33	0.1	-	2.1	2.2	2.3	2.3	2.4	2.5	2.8
NO2 (ppb) Average	706	7.47	6.7	-	0.1	1.3	3.1	5.5	9.6	16.8	38.7
NO (ppb) Average	706	2.39	4.6	-	0	0	0.2	1	2.3	5.6	42.6
NOX (ppb) Average	706	9.86	10.6	-	0.1	1.4	3.9	6.5	12	21.6	80
Temperature 2 m (C) Average	744	-10.61	6	-	-28.8	-21.4	-11.4	-9.2	-6.9	-5.3	0.2
Relative Humidity (%) Average	744	88.83	5.9	-	71.9	79.3	85.1	90.9	92.9	95.2	100
Wind Speed 10 m (km/h) Average	731	9.1	5	-	0	4	5	8	12	16	33
Wind Direction 10 m (deg) Average	731	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	17 Jan 2023 14:00	18 Jan 2023 13:00	24	Maintenance - stabilization period after analyzer replacement
NO2	17 Jan 2023 12:00	17 Jan 2023 14:00	3	Maintenance - station operator activities
Wind Speed, Wind Direction	13 Jan 2023 02:00	13 Jan 2023 03:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	14 Jan 2023 22:00	15 Jan 2023 02:00	5	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	25 Jan 2023 05:00	25 Jan 2023 10:00	6	Flat line in sensor output signal - Sensor frozen

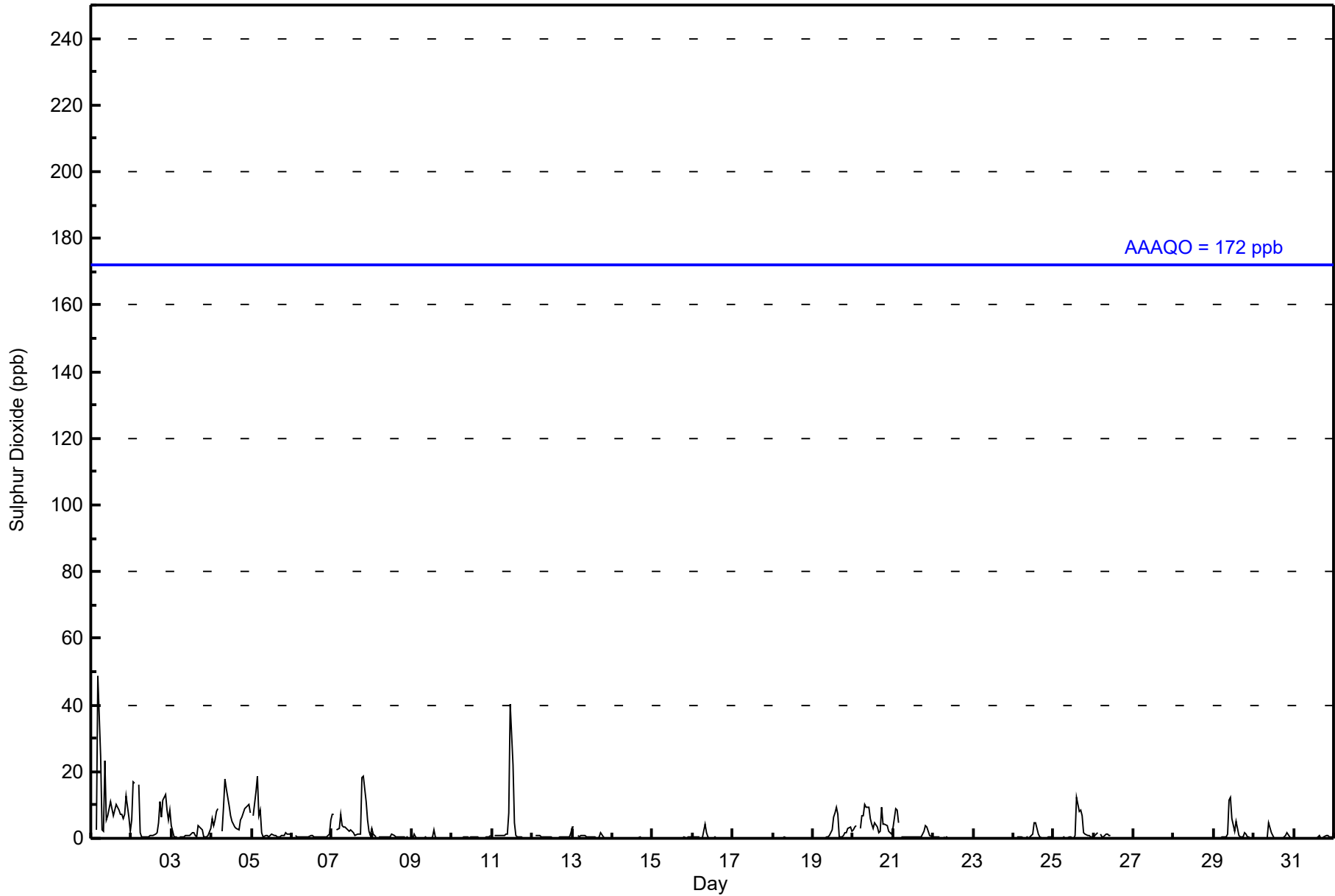


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 48.5 ppb on Jan 1 05:00		Maximum Daily Average: 9.6 ppb on Jan 1		Minimum Value: 0.0 ppb on Jan 15 10:00		Minimum Daily Average: 0.0 ppb on Jan 17		Hours of Data: 708																																									
Maximum Diurnal Average: 3.6 ppb at hour 5		Minimum Diurnal Average: 0.8 ppb at hour 7		Hours of Missing Data: 36		Hours of Calibration: 36		Percent Operational Time: 100.0																																									
Monthly Average: 1.75 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.2 P ₉₀ = 6.0 P ₉₉ = 18.3																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.1	0.1	Z	2.6	48.5	24.6	2.5	2.2	23.3	5.5	6.8	11.0	8.9	6.7	8.4	10.1	8.5	7.2	7.4	6.0	7.4	12.9	6.6	2.2	9.6	48.5																							
2-Jan	5.7	16.8	16.6	Z	15.9	1.8	0.4	0.4	0.3	0.3	0.4	0.8	0.9	0.8	1.2	1.7	4.6	10.8	6.2	11.3	13.1	8.5	5.4	8.7	5.8	16.8																							
3-Jan	4.0	0.5	0.3	0.3	Z	0.4	0.3	0.3	0.7	0.8	0.9	1.0	1.8	1.6	0.8	0.5	3.7	3.2	2.5	0.5	0.4	0.5	0.9	2.8	1.3	4.0																							
4-Jan	5.8	3.7	5.6	8.1	8.8	Z	2.2	9.3	17.8	14.9	9.6	7.0	5.0	4.1	3.3	3.1	2.7	5.6	6.2	7.5	8.9	9.8	10.1	7.7	7.3	17.8																							
5-Jan	Z	6.9	13.8	18.8	6.9	8.6	1.8	0.6	0.8	1.0	0.5	0.7	1.1	1.0	0.8	0.5	0.4	0.4	0.7	1.1	1.6	1.2	1.4	1.4	3.1	18.8																							
6-Jan	1.0	Z	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.6	0.7	0.7	0.6	0.6	0.4	0.4	0.3	0.4	0.6	0.5	0.5	1.4	5.5	0.8	5.5																							
7-Jan	7.3	7.0	Z	2.4	3.1	7.1	3.7	3.4	3.2	2.4	2.3	2.4	1.9	1.7	1.1	1.2	1.1	1.2	18.3	18.7	11.0	5.6	2.1	1.0	4.7	18.7																							
8-Jan	2.9	1.2	0.5	Z	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.6	1.1	0.9	0.6	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.6	2.9																							
9-Jan	0.2	1.4	0.3	0.1	Z	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.5	2.7	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.3	2.7																							
10-Jan	0.0	0.1	0.1	0.1	0.0	Z	0.1	0.2	0.4	0.3	0.2	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.7	0.2	0.7																							
11-Jan	Z	0.9	0.8	0.7	0.8	0.7	0.7	0.7	1.3	1.3	7.6	40.2	22.1	4.5	0.8	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	3.7	40.2																							
12-Jan	0.0	Z	0.9	1.0	0.7	0.5	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.3	1.6	0.4	1.6																							
13-Jan	3.5	3.3	Z	1.0	0.6	0.7	0.9	0.7	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	1.6	0.3	0.2	0.2	0.2	0.2	0.2	0.7	3.5																							
14-Jan	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3																						
15-Jan	0.1	0.1	0.2	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.3	0.3																						
16-Jan	0.4	0.4	0.4	0.3	0.3	Z	0.2	4.1	1.7	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	4.1																							
17-Jan	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.2																						
18-Jan	0.1	Z	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.2																						
19-Jan	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.7	2.4	6.2	7.5	9.4	7.2	0.5	0.4	0.8	1.5	1.5	3.1	3.3	2.1	2.1	9.4																							
20-Jan	2.6	3.5	3.6	Z	2.8	6.7	6.7	10.1	9.2	9.4	6.0	4.0	2.9	4.6	3.6	1.7	2.0	9.3	4.4	4.1	3.9	2.2	1.6	1.2	4.6	10.1																							
21-Jan	3.1	8.8	8.5	4.6	Z	0.5	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.6	2.0	4.0	3.4	2.0	0.9	0.6	1.8	8.8																								
22-Jan	0.4	0.3	0.4	0.3	0.4	Z	0.3	0.2	0.3	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4																							
23-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.2																						
24-Jan	0.1	Z	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	1.2	4.6	4.6	2.8	1.5	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.8	4.6																							
25-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.2	0.1	0.1	1.0	12.4	8.1	8.6	6.8	1.6	1.1	0.9	0.7	0.6	0.5	1.9	12.4																							
26-Jan	0.3	1.0	1.9	Z	1.5	0.4	0.3	1.2	1.3	0.9	1.0	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.9																							
27-Jan	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1																						
28-Jan	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2																						
29-Jan	Z	0.2	0.2	0.2	0.2	0.3	0.3	0.4	1.4	11.3	12.5	6.0	2.2	5.0	3.0	0.7	0.2	0.3	1.5	1.1	0.4	0.2	0.1	0.1	2.1	12.5																							
30-Jan	0.1	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.1	4.5	1.5	1.0	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.8	1.6	0.2	0.2	0.1	0.5	4.5																							
31-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	0.0	0.1	0.3	0.9	0.7	0.3	0.3	0.2	0.2	0.9																							
																								1.5	2.2	2.2	1.6	3.6	2.1	0.8	1.2	2.1	1.8	1.7	2.7	2.1	1.6	1.7	1.3	1.2	1.6	1.8	2.0	1.8	1.6	1.2	1.2	Diurnal Average	
																								7.3	16.8	16.6	18.8	48.5	24.6	6.7	10.1	23.3	14.9	12.5	40.2	22.1	7.5	12.4	10.1	8.6	10.8	18.3	18.7	13.1	12.9	10.1	8.7	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Firebag - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	685	96.75	96.75
11 - 20	18	2.54	99.29
21 - 60	5	0.71	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	34	8	14	5	9	36	39	107	89	130	53	31	13	12	25	68	673
11 - 20	0	0	0	0	0	0	0	1	4	9	4	0	0	0	0	0	18
21 - 60	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	5
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	8	14	5	9	36	39	108	94	140	60	31	13	12	25	68	696

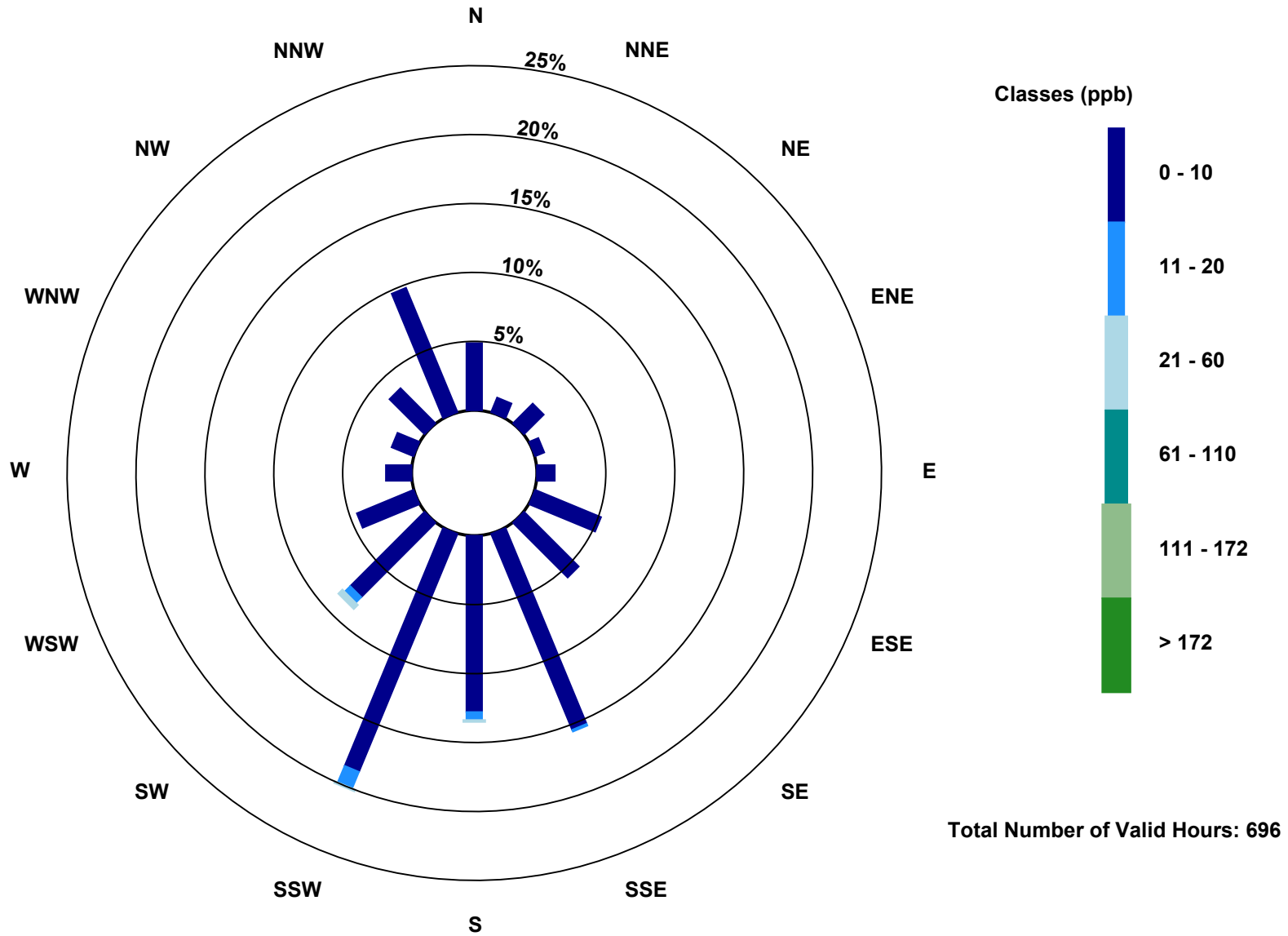
Total Number of Valid Hours: 696

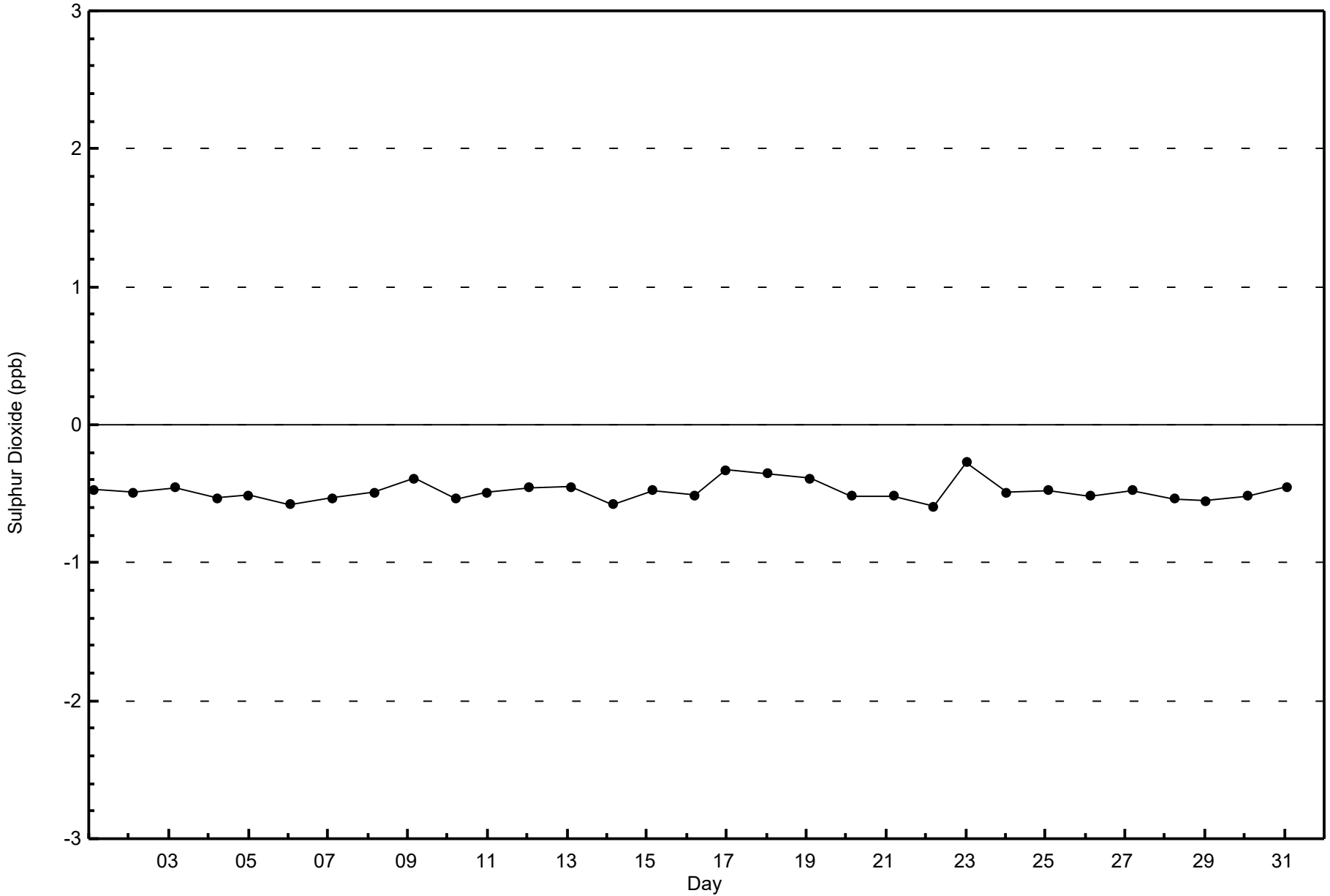
Total Number of Hours: 744

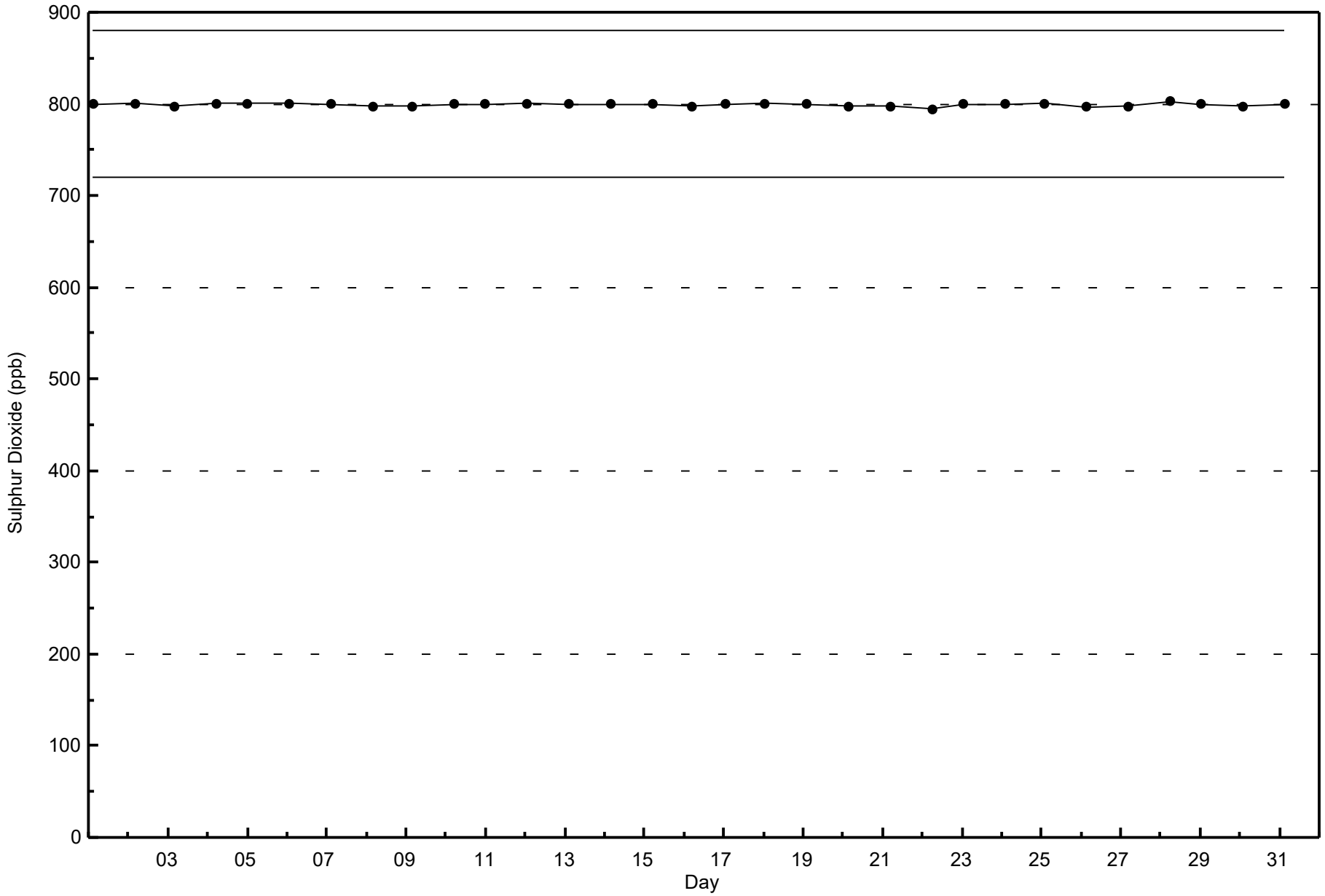


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Firebag







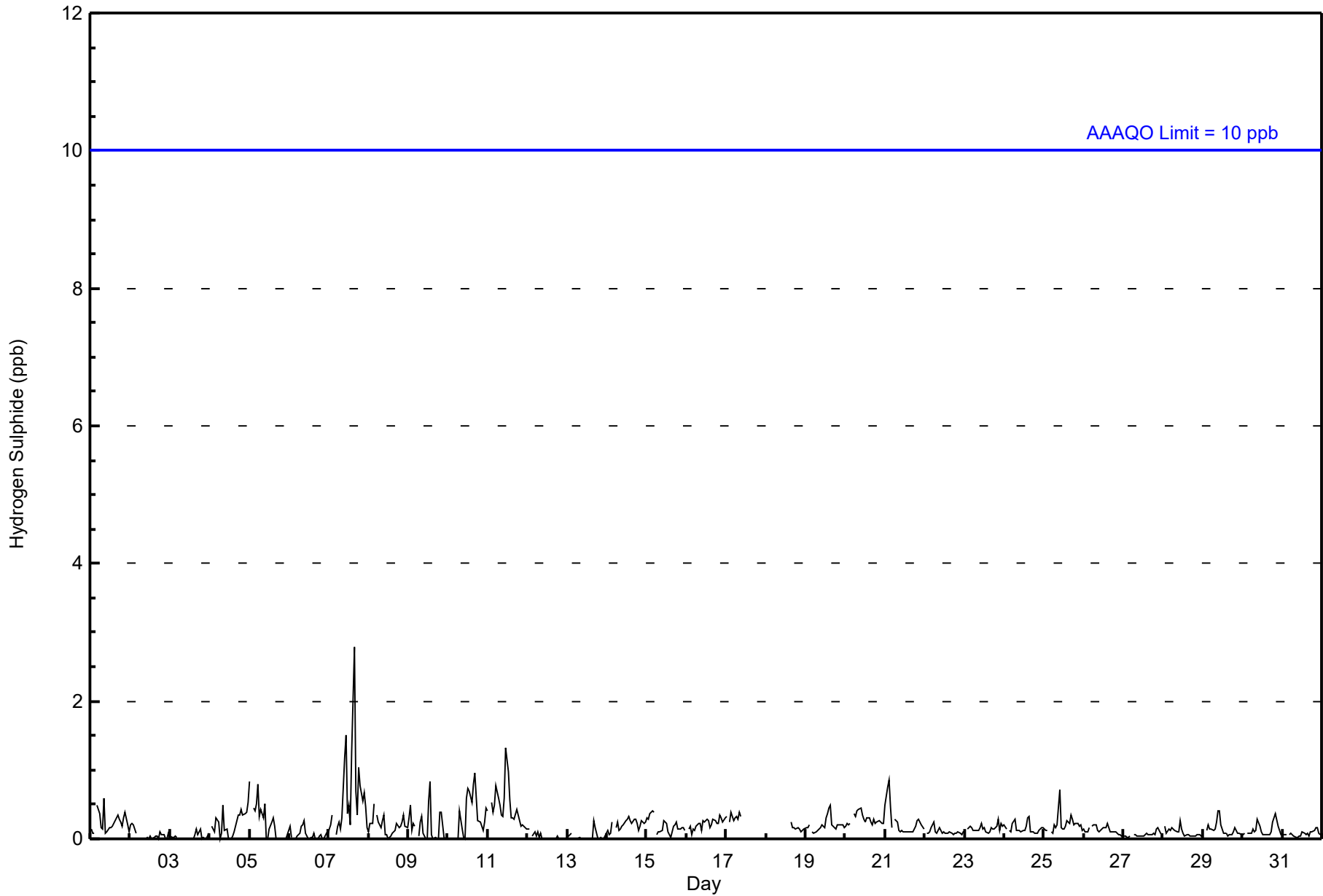


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 2.8 ppb on Jan 7 16:00		Maximum Daily Average: 0.6 ppb on Jan 7														Hours of Data:		685									
Minimum Value: 0.0 ppb on Jan 2 06:00		Minimum Daily Average: 0.0 ppb on Jan 13														Hours of Missing Data:		59									
Maximum Diurnal Average: 0.3 ppb at hour 16		Minimum Diurnal Average: 0.1 ppb at hour 24														Hours of Calibration:		35									
Monthly Average: 0.18 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.0														Percent Operational Time:		96.8									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.1	0.1	0.1	Z	0.5	0.4	0.2	0.1	0.6	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.2	0.1	0.2	0.6	
2-Jan	0.2	0.2	0.2	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	
3-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	
4-Jan	Z	0.2	0.1	0.1	0.3	0.2	0.0	0.1	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.5	
5-Jan	0.8	Z	0.4	0.4	0.5	0.8	0.3	0.4	0.3	0.5	0.0	0.0	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.8	
6-Jan	0.2	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.3	
7-Jan	0.1	0.2	0.4	Z	0.1	0.2	0.3	0.1	0.3	1.2	1.5	0.4	0.5	0.2	1.3	2.8	0.7	0.4	1.0	0.8	0.5	0.7	0.5	0.2	0.2	2.8	
8-Jan	0.1	0.2	0.2	0.5	Z	0.3	0.2	0.2	0.3	0.4	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.5	
9-Jan	0.3	0.5	0.1	0.2	0.2	Z	0.0	0.2	0.3	0.1	0.0	0.0	0.5	0.8	0.1	0.0	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.8	
10-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.6	0.7	0.7	0.5	0.8	1.0	0.6	0.3	0.2	0.2	0.1	0.2	0.5	1.0		
11-Jan	0.4	Z	0.5	0.4	0.5	0.8	0.6	0.5	0.3	0.3	0.6	1.3	1.0	0.6	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	1.3	0.5	
12-Jan	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
13-Jan	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
14-Jan	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.3	
15-Jan	0.3	0.3	0.4	0.4	0.4	Z	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.4	
16-Jan	Z	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	
17-Jan	0.3	Z	0.2	0.4	0.3	0.3	0.3	0.3	0.4	0.3	C	C	C	M	M	M	M	M	M	M	M	M	M	M	M	0.4	
18-Jan	M	M	M	M	M	M	M	M	M	M	M	M	M	C	C	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	
19-Jan	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.5	
20-Jan	0.2	0.2	0.2	0.2	Z	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	
21-Jan	0.5	0.8	0.8	0.5	0.2	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.8	
22-Jan	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
23-Jan	0.1	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.2	0.1	0.3	
24-Jan	0.2	0.1	Z	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	
25-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.2	0.7	0.2	0.1	0.1	0.2	0.3	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.7	
26-Jan	0.2	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	
27-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	
28-Jan	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.3	
29-Jan	0.1	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.4	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.4	
30-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.1	0.1	0.1	0.4	
31-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	
																								Diurnal Average		0.2	
																								Diurnal Maximum		0.8	
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Firebag - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Firebag - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	684	99.85	99.85
3 - 4	1	0.15	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 685

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	34	9	13	5	9	35	40	88	86	138	60	32	13	12	24	73	671
3 - 4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	9	13	5	9	35	40	88	86	138	61	32	13	12	24	73	672

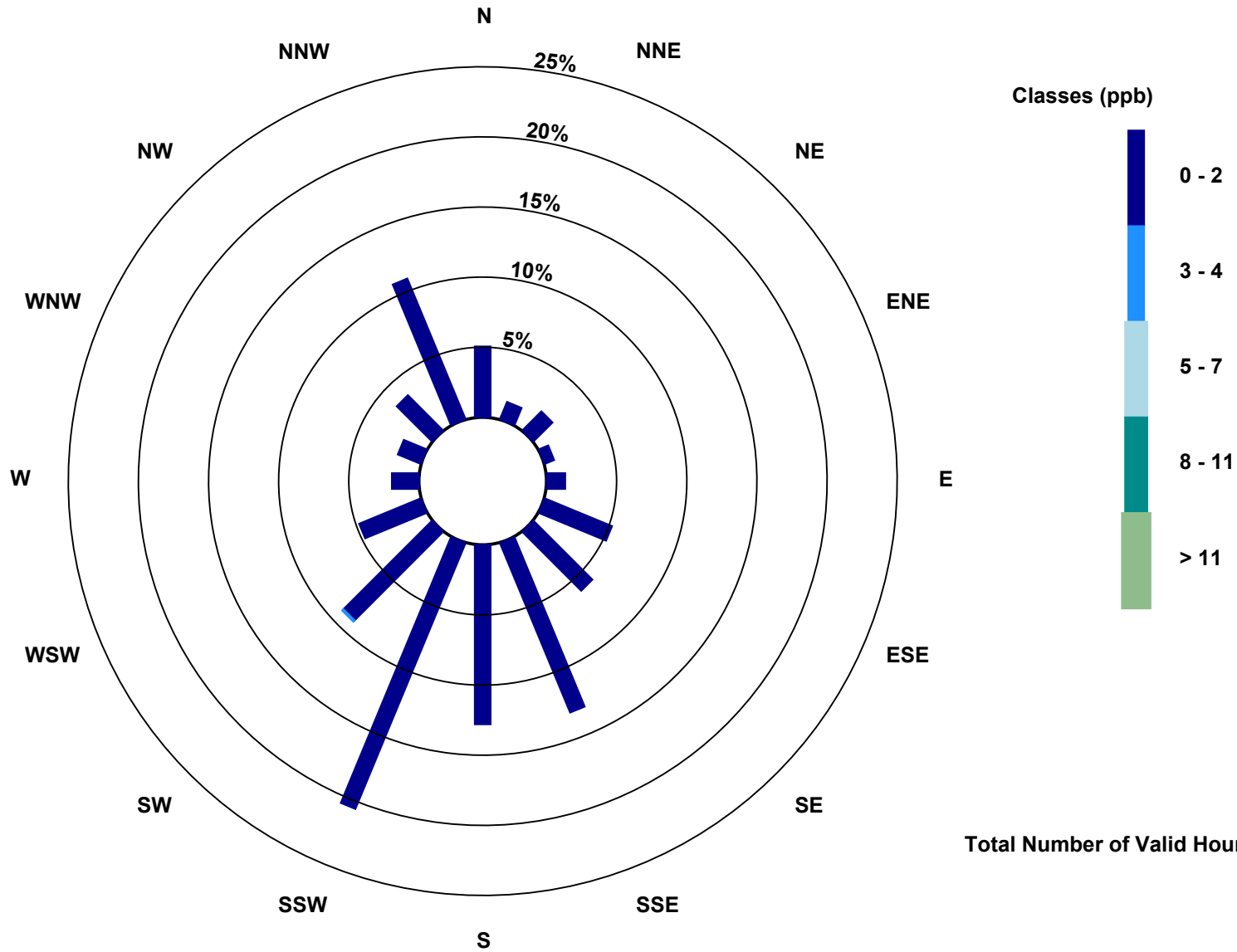
Total Number of Valid Hours: 672

Total Number of Hours: 744

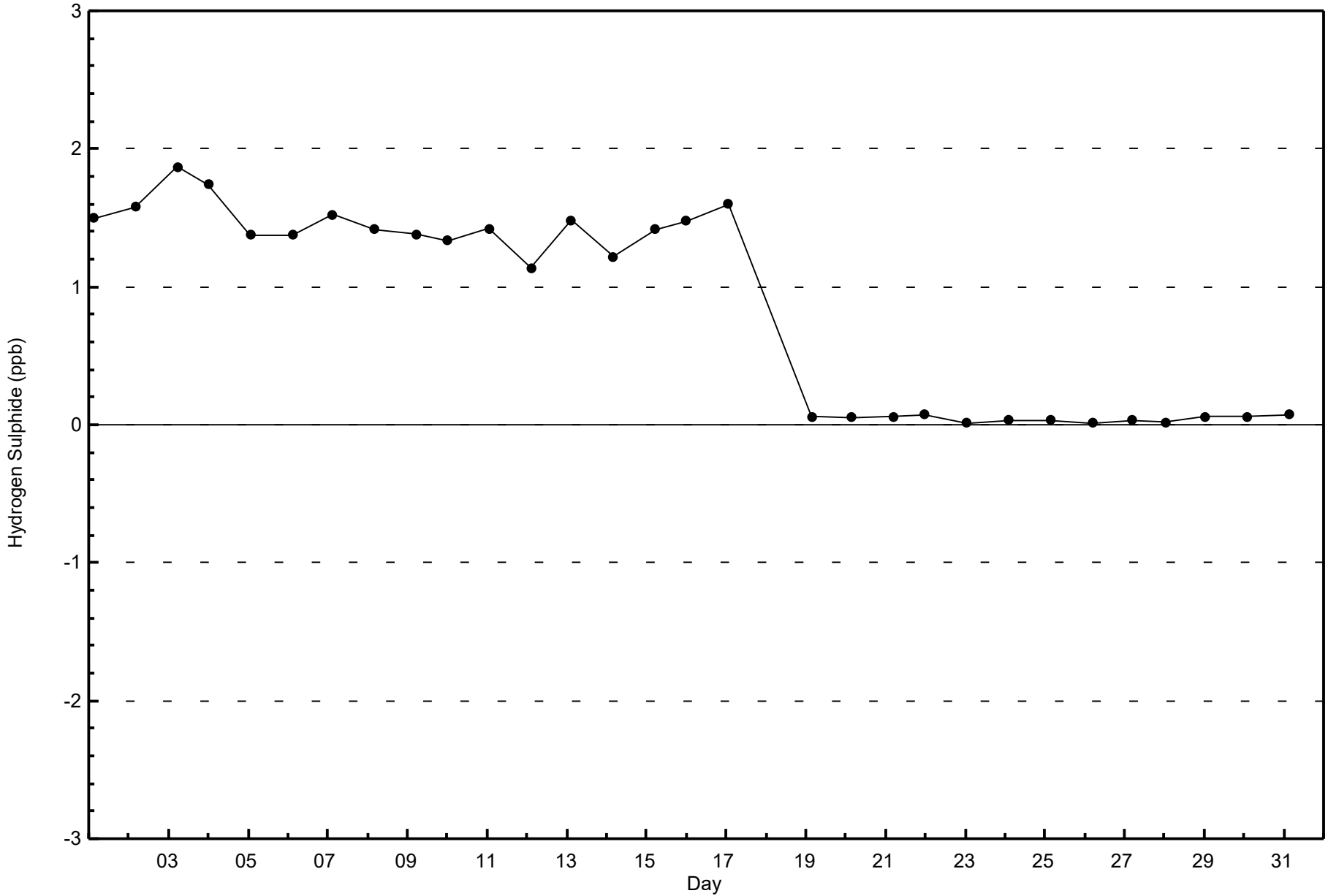


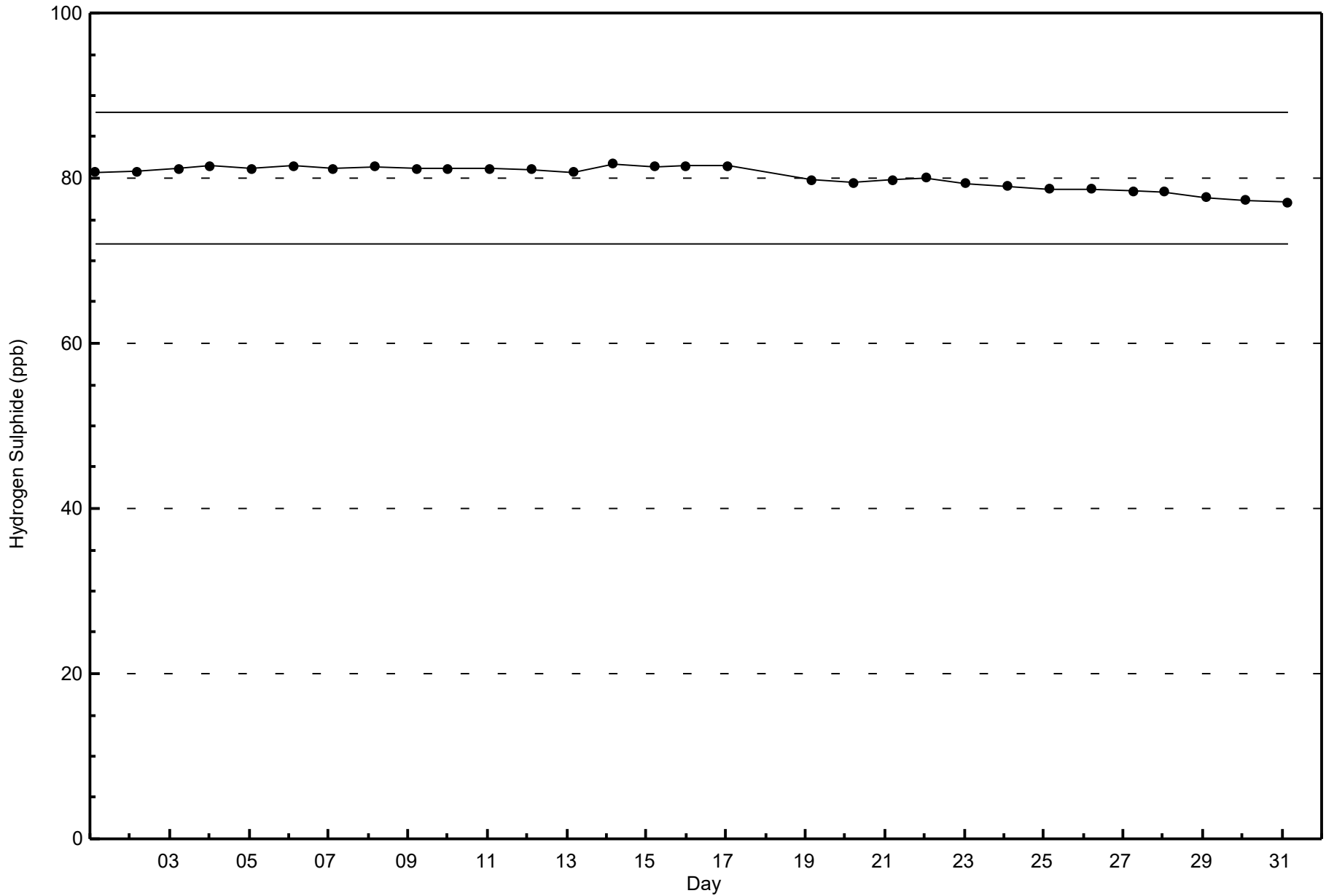
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Firebag



Total Number of Valid Hours: 672





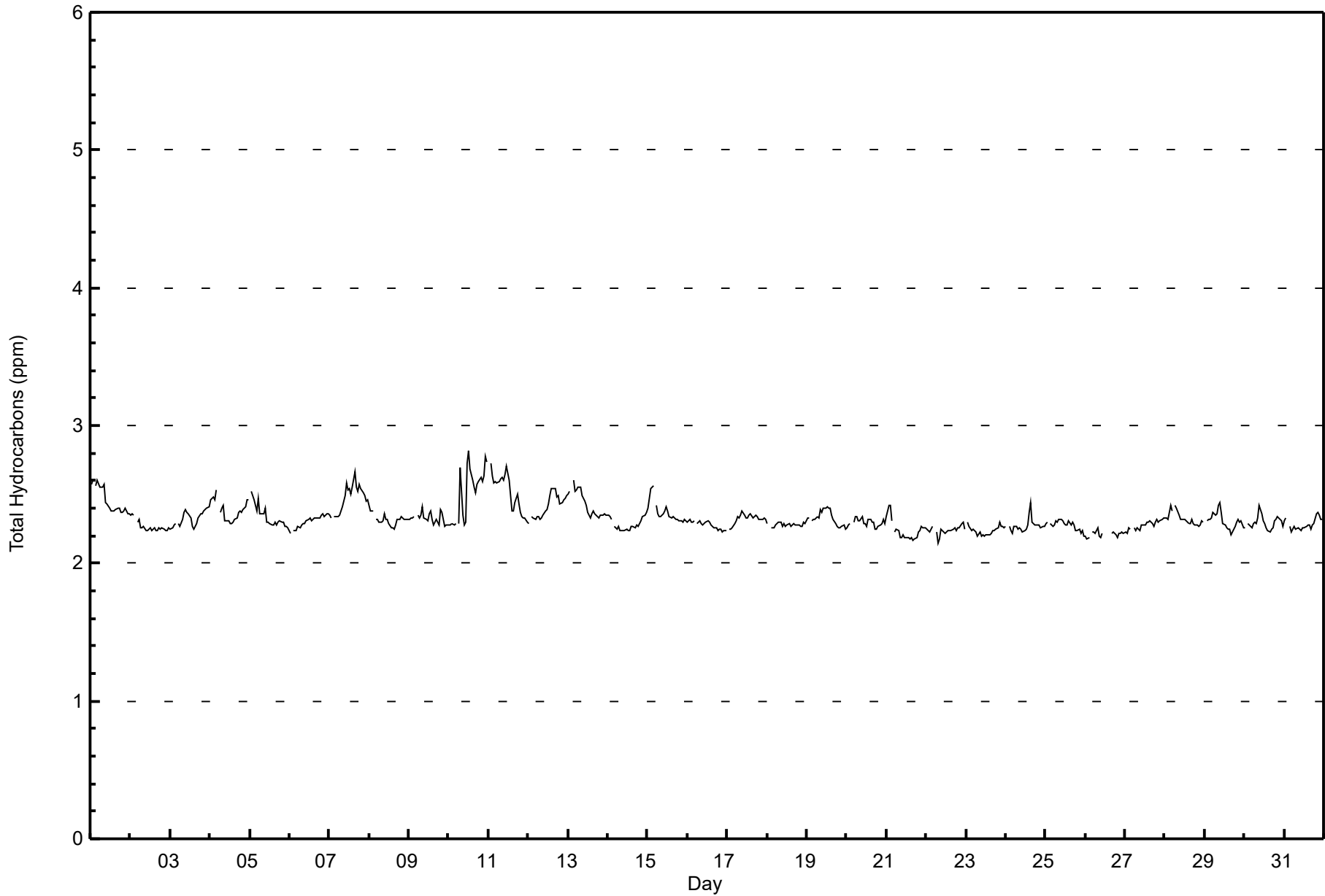


Maximum Value: 2.8 ppm on Jan 10 13:00		Maximum Daily Average: 2.5 ppm on Jan 11		Hours in Service: 744																						
Minimum Value: 2.1 ppm on Jan 22 08:00		Minimum Daily Average: 2.2 ppm on Jan 26		Hours of Data: 708																						
Maximum Diurnal Average: 2.4 ppm at hour 2		Minimum Diurnal Average: 2.3 ppm at hour 17		Hours of Missing Data: 36																						
Monthly Average: 2.33 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.5 P ₉₉ = 2.7		Hours of Calibration: 36																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.6	2.6	Z	2.6	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6
2-Jan	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.4
3-Jan	2.2	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4
4-Jan	2.5	2.5	2.5	2.5	2.5	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.5
5-Jan	Z	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5
6-Jan	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.4	2.4
7-Jan	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.6	2.5	2.5	2.5	2.6	2.7	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.7
8-Jan	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
9-Jan	2.3	2.3	2.3	2.3	Z	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4
10-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.7	2.4	2.3	2.3	2.7	2.8	2.7	2.6	2.6	2.5	2.6	2.6	2.6	2.6	2.6	2.8	2.7	2.5	2.8
11-Jan	Z	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.7
12-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.5	2.5	2.4	2.5
13-Jan	2.5	2.5	Z	2.6	2.5	2.5	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.6
14-Jan	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4
15-Jan	2.4	2.5	2.5	2.6	Z	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.6
16-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.3
17-Jan	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
18-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
19-Jan	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4
20-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3
21-Jan	2.3	2.4	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.4
22-Jan	2.2	2.2	2.2	2.2	2.3	Z	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3
23-Jan	Z	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3
24-Jan	2.3	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
25-Jan	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
26-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.2	2.2	2.2	C	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
27-Jan	2.2	2.2	2.3	2.2	Z	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
28-Jan	2.3	2.3	2.3	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
29-Jan	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
30-Jan	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4
31-Jan	2.3	2.3	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Firebag - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	708	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	34	8	14	5	9	36	39	108	94	140	60	31	13	12	25	68	696
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	8	14	5	9	36	39	108	94	140	60	31	13	12	25	68	696

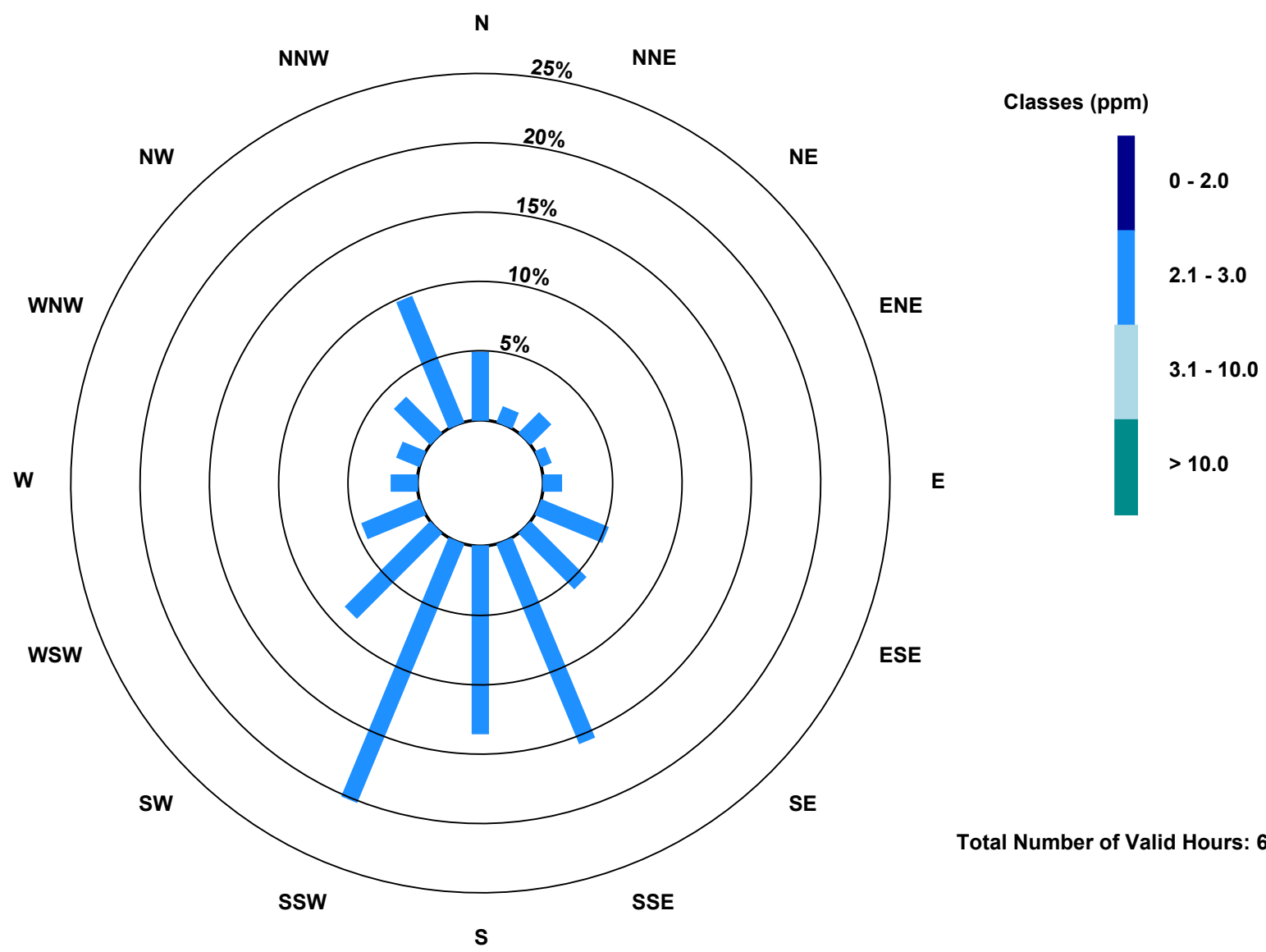
Total Number of Valid Hours: 696

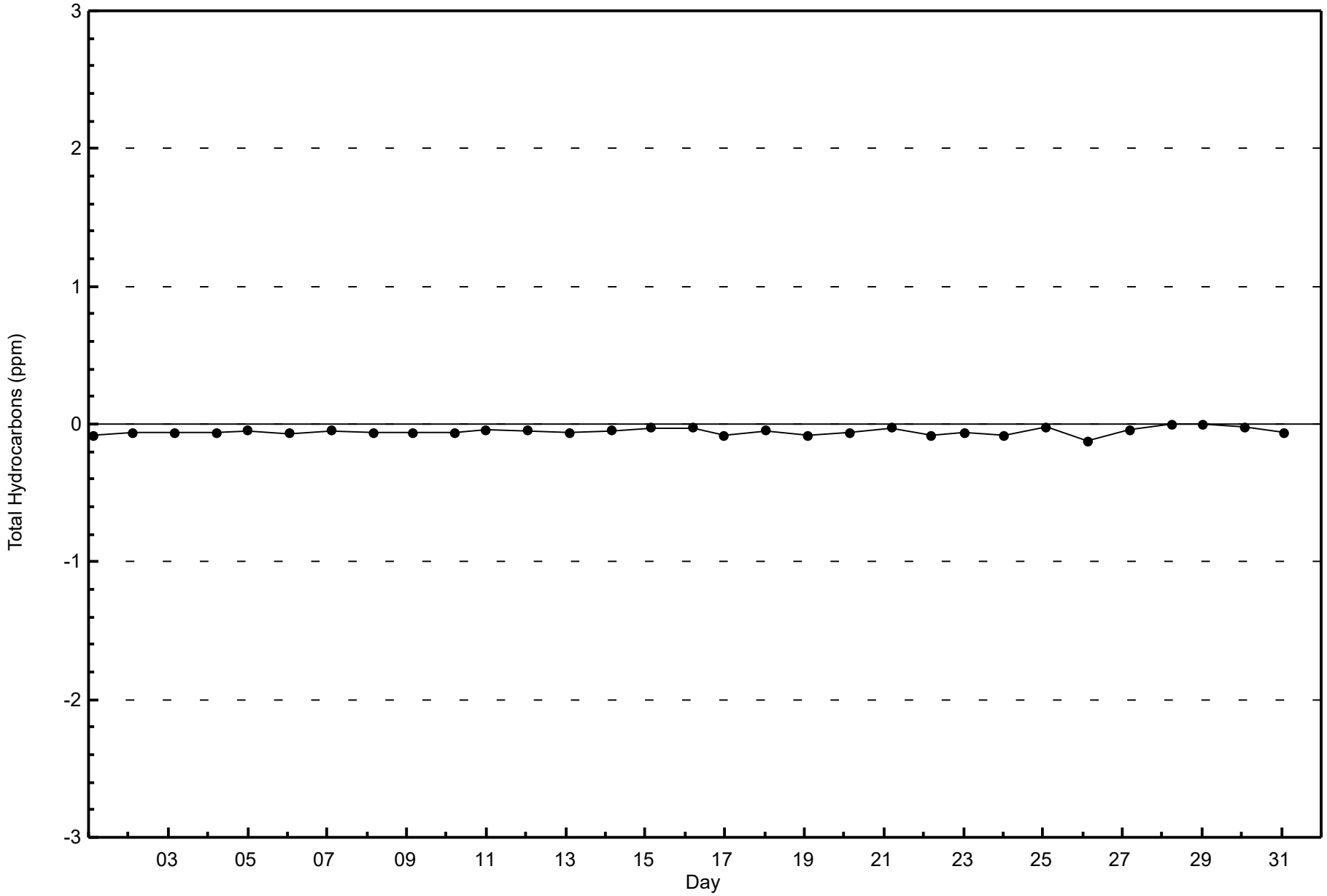
Total Number of Hours: 744

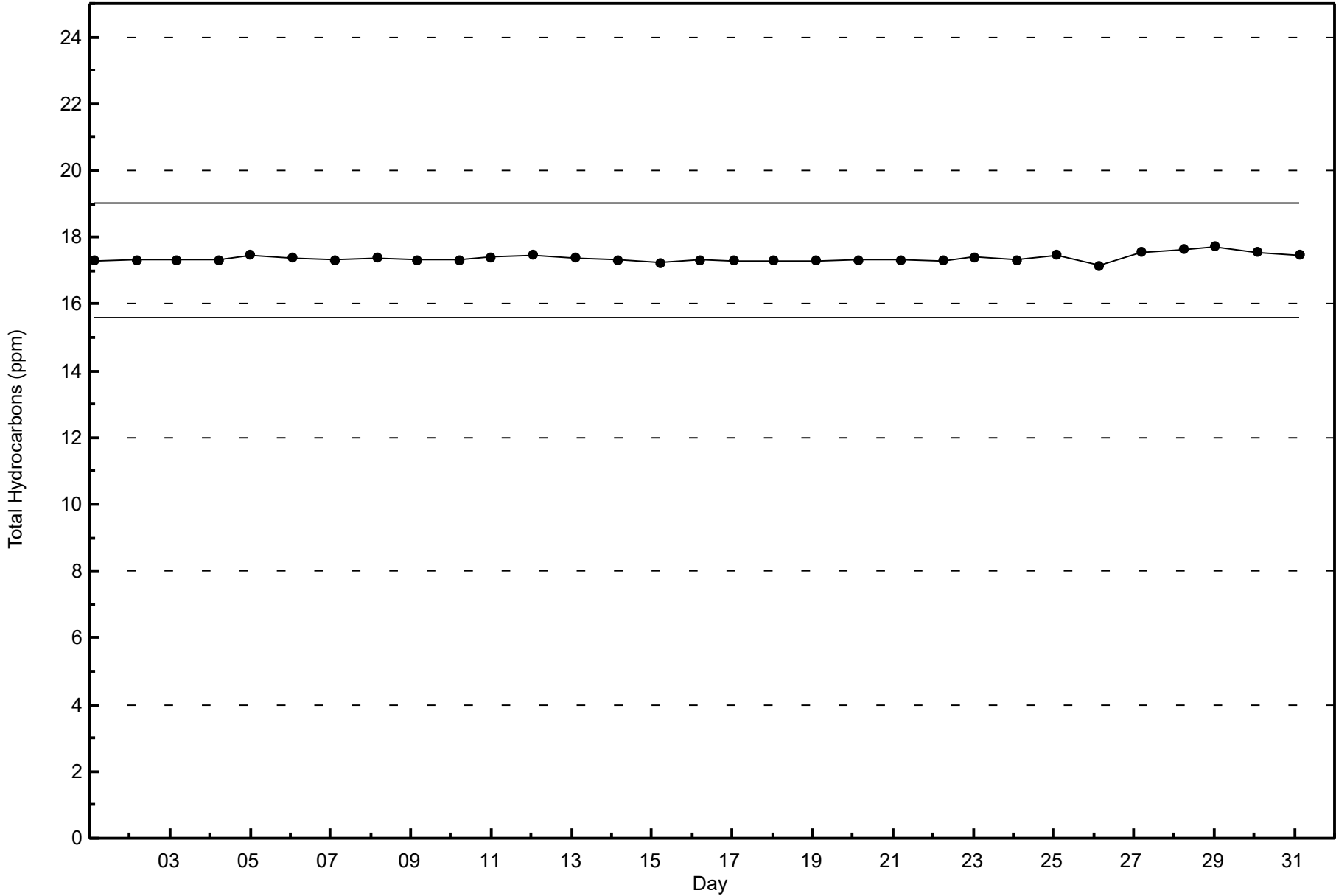


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Firebag









Wood Buffalo Environmental Association
Summary of Hour Averages

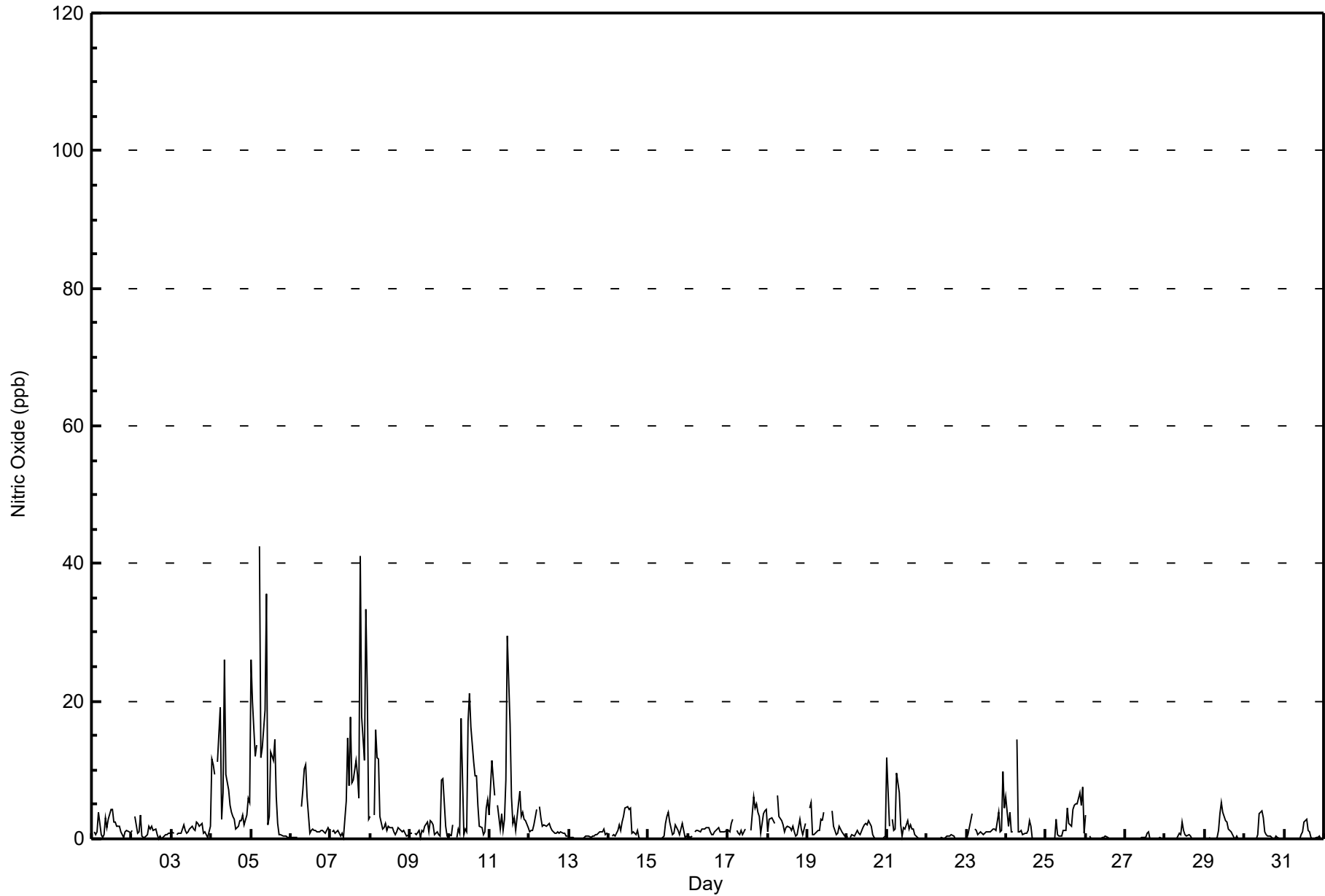
Nitric Oxide (NO) - ppb
Firebag - January 2023

Maximum Value: 42.6 ppb on Jan 5 06:00																				Maximum Daily Average: 10.8 ppb on Jan 5					Hours in Service: 744		
Minimum Value: 0.0 ppb on Jan 22 23:00																				Minimum Daily Average: 0.1 ppb on Jan 27					Hours of Data: 706		
Maximum Diurnal Average: 4.0 ppb at hour 13																				Minimum Diurnal Average: 1.2 ppb at hour 24					Hours of Missing Data: 38		
Monthly Average: 2.39 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 1.0 Q ₃ = 2.3 P ₉₀ = 5.6 P ₉₉ = 21.7					Hours of Calibration: 35		
																									Percent Operational Time: 99.6		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	Z	0.9	0.5	0.9	3.8	0.6	0.2	0.5	3.0	1.5	2.9	4.3	4.2	2.5	2.5	1.7	1.7	0.9	0.7	0.2	1.0	1.2	0.9	0.8	1.6	4.3	
2-Jan	1.3	Z	3.2	0.8	1.0	3.5	0.4	0.2	0.2	0.6	1.9	1.4	1.9	1.1	1.3	0.7	0.1	0.4	0.0	0.1	0.6	0.5	0.8	0.8	1.0	3.5	
3-Jan	1.0	0.8	Z	0.6	0.8	0.8	0.8	2.0	1.2	0.8	1.0	1.5	1.9	1.5	1.2	2.5	2.2	1.9	2.3	0.8	1.0	0.7	0.1	1.8	1.3	2.5	
4-Jan	11.5	10.7	9.3	Z	11.3	19.0	2.9	6.7	26.1	9.3	7.1	4.8	3.8	3.2	2.8	1.4	1.8	2.6	2.6	3.4	2.0	3.5	5.9	5.3	6.8	26.1	
5-Jan	26.0	19.9	12.1	13.6	Z	42.6	11.8	13.2	18.7	35.7	2.1	3.3	12.7	11.4	14.5	6.1	2.1	0.7	0.6	0.4	0.3	0.4	0.3	0.3	10.8	42.6	
6-Jan	0.2	0.2	0.2	0.2	0.2	Z	4.6	7.2	10.2	10.8	6.1	0.9	1.2	1.4	1.1	1.2	1.0	1.1	1.2	1.3	0.9	0.9	1.6	1.2	2.4	10.8	
7-Jan	Z	1.0	1.2	0.8	1.2	0.9	0.5	0.8	0.3	5.6	14.7	7.7	17.6	8.2	8.6	11.5	9.4	6.0	41.2	17.6	11.4	33.4	21.7	2.9	9.7	41.2	
8-Jan	3.2	Z	3.4	15.9	11.7	11.6	3.2	1.5	1.6	2.2	1.2	1.8	1.7	1.7	1.0	0.6	1.0	1.6	1.3	0.9	1.1	0.9	0.5	0.5	3.0	15.9	
9-Jan	0.7	0.9	Z	0.8	0.6	1.3	0.2	1.2	1.1	1.7	2.3	0.9	2.7	2.4	2.0	0.6	1.0	0.6	0.4	8.6	8.7	1.8	0.5	0.3	1.8	8.7	
10-Jan	0.6	0.3	2.1	Z	0.1	1.3	0.8	17.4	0.7	1.5	1.0	17.0	21.2	16.2	11.2	9.3	9.1	4.8	1.9	1.6	0.6	1.0	4.5	5.7	5.7	21.2	
11-Jan	3.5	11.3	8.8	6.2	Z	4.8	1.4	3.6	1.2	2.9	8.5	29.5	16.7	6.1	2.3	3.0	1.1	5.2	7.0	3.2	3.9	2.9	2.7	1.5	6.0	29.5	
12-Jan	0.9	1.2	1.2	2.1	4.2	Z	4.7	3.0	1.8	2.0	1.9	2.1	2.2	1.6	1.3	0.9	0.9	1.1	0.8	0.9	0.7	0.7	0.4	0.3	1.6	4.7	
13-Jan	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.2	0.3	0.3	0.7	0.6	1.0	1.1	1.0	1.4	0.7	0.7	0.4	1.4	
14-Jan	0.6	Z	0.5	0.6	0.5	1.2	2.0	1.2	2.4	3.2	4.5	4.6	4.3	4.4	0.9	1.0	0.7	1.2	0.2	0.1	0.0	0.0	0.0	0.0	1.5	4.6	
15-Jan	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.4	2.3	3.3	3.8	2.5	0.6	0.9	2.1	1.6	1.1	0.6	2.3	1.3	0.2	0.3	1.0	3.8	
16-Jan	0.3	0.2	0.4	Z	1.1	1.3	1.2	1.1	1.4	1.5	1.3	1.6	1.6	1.0	0.7	0.5	0.9	1.3	1.6	1.0	1.1	0.9	1.1	1.2	1.1	1.6	
17-Jan	1.2	1.1	2.1	2.8	Z	1.3	0.8	0.6	1.1	0.7	1.3	M	M	M	1.3	6.0	4.5	5.2	3.8	3.2	0.9	3.6	4.1	4.3	2.5	6.0	
18-Jan	1.0	2.8	3.0	2.6	2.3	Z	6.3	3.2	2.6	2.0	1.0	1.6	1.8	1.7	1.3	1.9	0.9	0.4	0.7	2.9	1.3	0.5	1.5	2.3	2.0	6.3	
19-Jan	Z	4.4	5.3	0.6	0.7	0.7	1.2	1.2	2.9	2.7	3.9	C	C	C	C	4.0	1.8	0.6	0.7	1.8	1.4	1.0	0.5	0.6	1.9	5.3	
20-Jan	0.2	Z	0.1	0.6	0.4	0.9	1.1	0.8	0.6	1.6	1.9	2.2	2.1	2.5	1.8	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.8	2.5	
21-Jan	11.8	1.8	Z	2.7	1.2	1.4	9.6	6.7	2.0	0.4	1.5	1.4	2.6	1.5	2.0	1.5	1.4	0.7	0.2	0.1	0.0	0.0	0.0	0.0	2.2	11.8	
22-Jan	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.1	0.5	0.5	0.4	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
23-Jan	0.2	0.7	1.7	3.6	Z	1.4	1.2	0.6	1.0	0.8	0.7	0.9	1.1	1.1	1.1	1.3	1.4	1.4	1.2	3.9	1.1	1.2	9.7	4.5	1.8	9.7	
24-Jan	6.1	1.9	3.9	1.0	1.0	Z	14.5	1.0	0.9	1.3	0.7	0.8	0.9	1.2	2.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	14.5	
25-Jan	Z	0.0	0.0	0.0	0.0	0.0	2.9	0.5	0.5	0.5	1.2	1.3	1.2	4.5	2.3	1.8	4.2	4.9	5.1	5.1	6.7	4.9	7.4	0.8	2.4	7.4	
26-Jan	3.5	Z	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.5	
27-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.9	1.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	1.0
28-Jan	0.0	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.7	0.6	2.4	1.3	0.7	0.4	0.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.4	
29-Jan	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.2	1.3	3.8	5.3	3.9	2.7	2.4	1.4	1.2	1.0	0.2	0.0	0.3	0.0	0.0	0.0	0.0	1.0	5.3	
30-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.5	3.6	4.0	3.1	1.0	0.6	0.5	0.5	0.3	0.0	0.1	0.5	0.2	0.0	0.0	0.0	0.6	4.0	
31-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	2.5	2.8	1.3	1.1	0.2	0.1	0.0	0.2	0.2	0.3	0.0	0.0	0.4	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Firebag - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	98.73	98.73
21 - 40	7	0.99	99.72
41 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	34	8	15	5	8	36	40	106	87	135	56	31	14	9	27	73	684
21 - 40	1	0	0	0	0	0	0	1	3	1	1	0	0	0	0	0	7
11 - 80	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	8	15	5	8	36	40	107	92	136	57	31	14	9	27	73	693

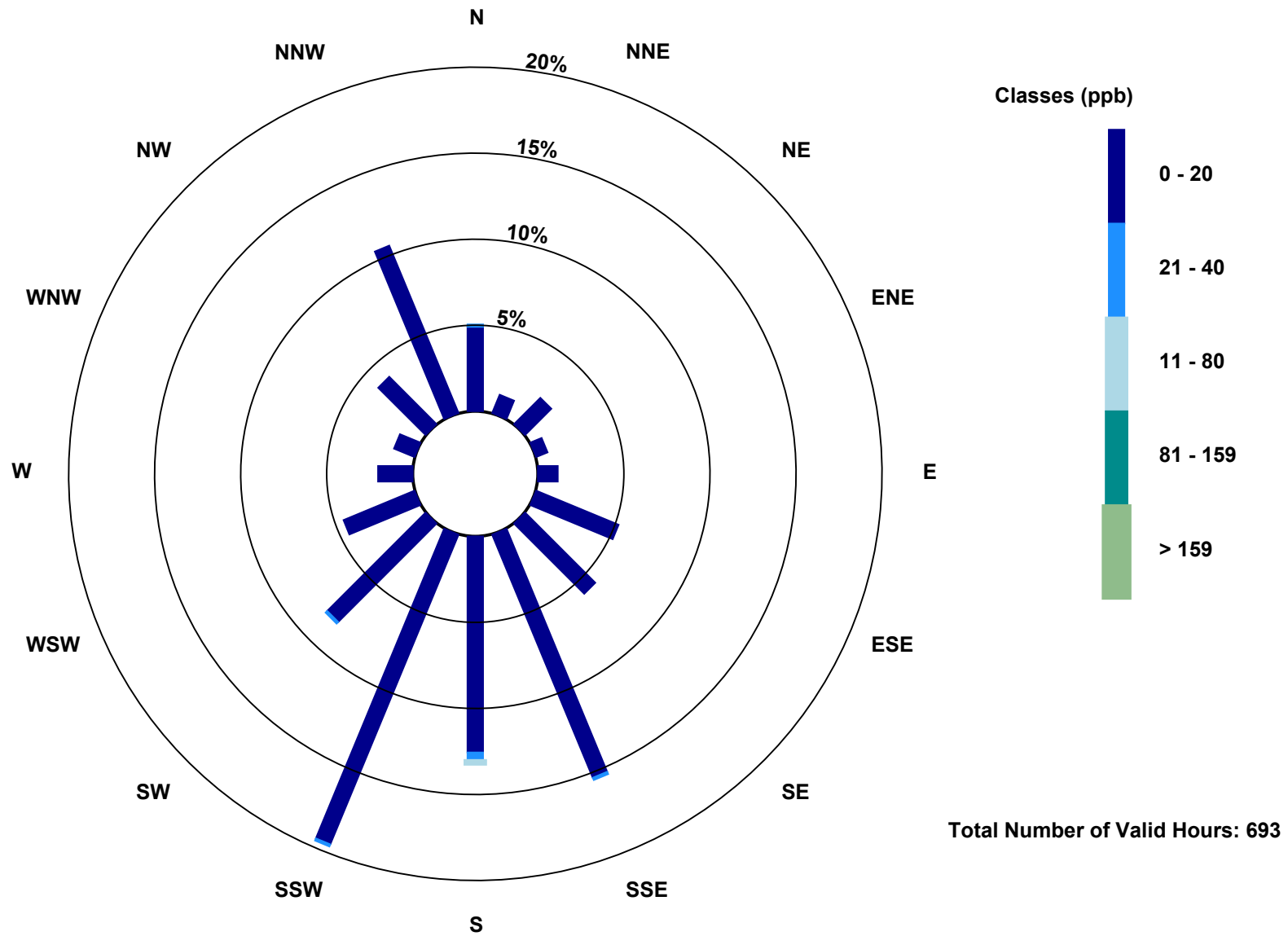
Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

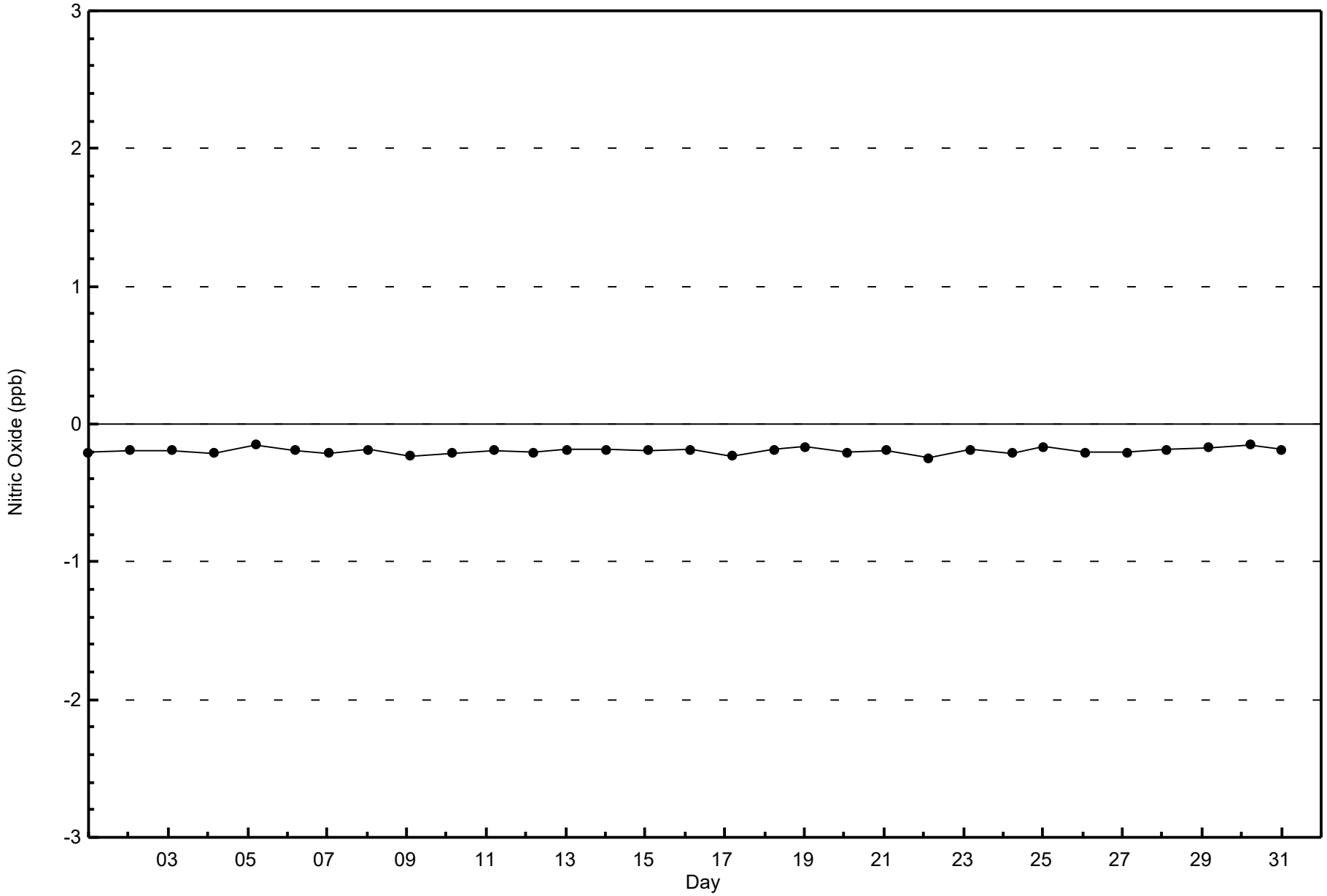
Nitric Oxide (NO) - ppb
Firebag





Wood Buffalo Environmental Association
Zero Responses

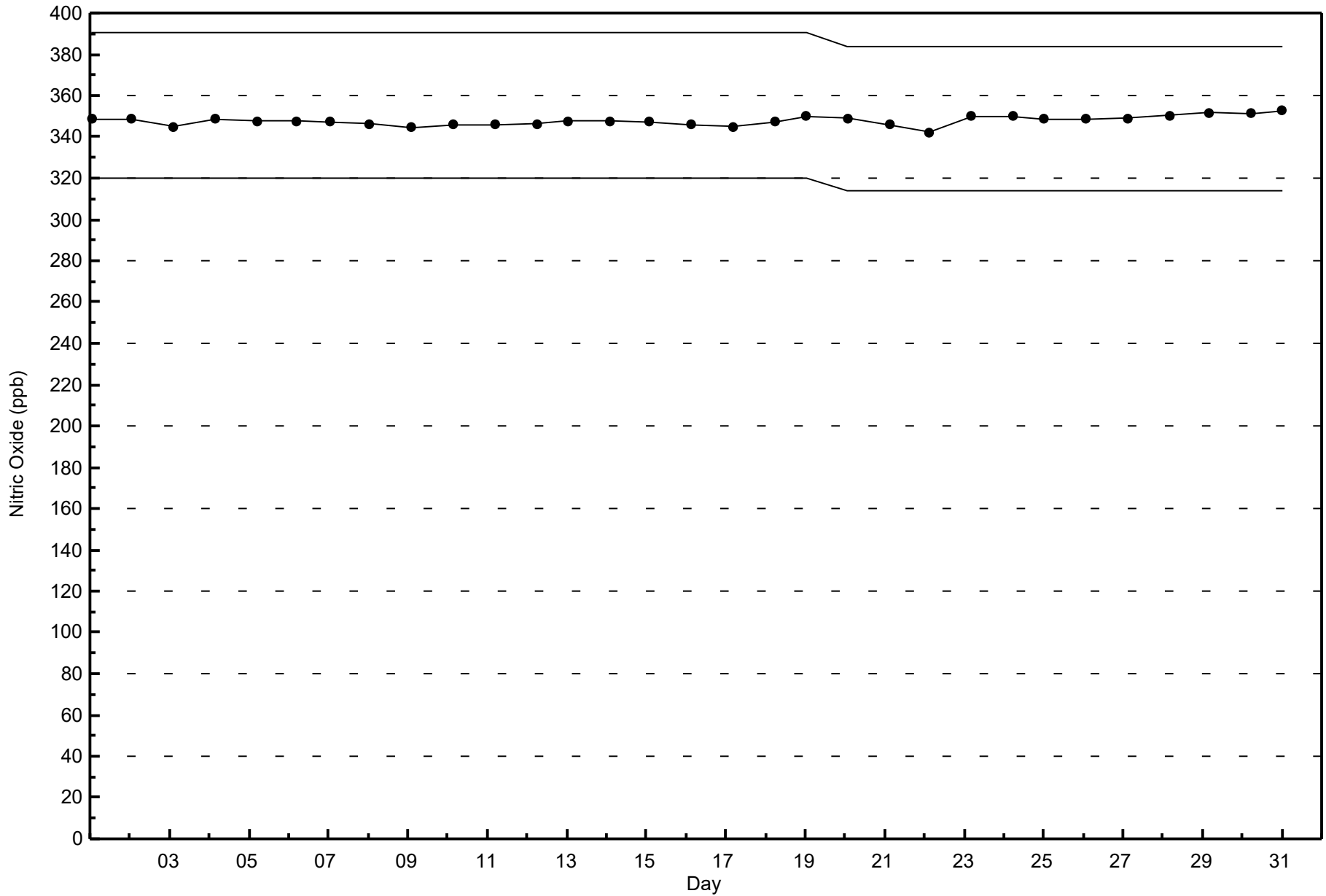
Nitric Oxide (NO) - ppb
Firebag - January 2023





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Firebag - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Firebag - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 38.7 ppb on Jan 5 01:00	Maximum Daily Average: 20.7 ppb on Jan 4		Hours of Data:	706
Minimum Value: 0.1 ppb on Jan 26 22:00	Minimum Daily Average: 1.4 ppb on Jan 27		Hours of Missing Data:	38
Maximum Diurnal Average: 9.8 ppb at hour 6	Minimum Diurnal Average: 5.4 ppb at hour 14		Hours of Calibration:	35
Monthly Average: 7.47 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 1.3 Q ₁ = 3.1 Median = 5.5 Q ₃ = 9.6 P ₉₀ = 16.8 P ₉₉ = 32.6		Percent Operational Time:	99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	Z	6.1	6.5	9.4	19.7	14.6	7.8	8.0	16.6	8.7	7.3	8.0	7.5	5.9	8.2	12.2	13.9	12.6	12.4	10.6	12.8	17.9	11.8	9.6	10.8	19.7
2-Jan	12.1	Z	18.2	12.9	11.2	6.6	2.4	1.8	2.5	2.8	3.8	2.8	4.0	2.5	4.0	4.5	6.0	9.9	7.8	10.1	11.6	7.6	5.5	7.2	6.9	18.2
3-Jan	5.5	5.6	Z	4.6	5.8	5.8	5.0	7.4	7.2	6.3	5.2	5.1	5.5	4.2	5.8	12.4	20.5	12.6	12.5	7.1	6.7	7.1	6.2	15.6	7.8	20.5
4-Jan	29.2	27.3	25.8	Z	29.1	32.3	16.9	24.7	33.6	26.2	16.7	10.5	8.3	8.0	8.5	10.5	15.5	20.1	21.0	20.3	17.7	22.0	26.3	25.6	20.7	33.6
5-Jan	38.7	36.1	29.2	32.6	Z	37.4	22.0	32.7	32.0	38.6	6.9	6.8	17.4	17.2	21.3	14.3	8.3	4.1	4.1	3.5	3.5	3.0	3.2	3.2	18.1	38.7
6-Jan	2.4	1.8	1.6	1.5	1.6	Z	8.9	13.4	15.9	16.7	8.6	2.9	2.8	3.3	3.7	4.3	5.4	4.4	5.8	6.9	6.3	5.0	7.0	8.6	6.0	16.7
7-Jan	Z	11.0	10.3	9.4	10.4	10.9	12.4	15.3	14.4	16.3	17.7	12.8	17.5	11.3	15.5	22.1	22.1	20.9	35.0	31.1	25.9	31.4	27.6	14.5	18.1	35.0
8-Jan	14.2	Z	9.9	19.6	18.2	19.1	11.3	7.2	10.7	10.0	4.2	4.9	5.2	4.7	3.9	4.0	7.8	9.9	6.3	6.5	6.0	6.0	4.2	4.4	8.6	19.6
9-Jan	6.2	6.1	Z	5.5	5.0	8.2	7.3	4.5	7.5	5.8	5.8	3.3	5.7	5.0	5.2	2.6	8.6	5.8	5.8	11.9	10.8	6.4	3.4	3.1	6.1	11.9
10-Jan	3.4	3.1	8.0	Z	3.0	9.0	12.9	14.7	8.8	8.4	5.6	16.8	18.7	18.6	18.1	18.2	20.0	20.3	18.3	19.4	15.5	16.7	21.0	21.2	13.9	21.2
11-Jan	20.9	22.3	20.7	20.2	Z	19.7	18.4	18.2	16.2	13.4	13.5	19.2	16.9	11.2	7.3	11.3	10.6	15.0	14.2	7.7	6.6	6.4	5.8	4.3	13.9	22.3
12-Jan	2.7	4.4	5.8	6.8	8.7	Z	8.2	7.0	6.3	5.6	4.3	4.2	4.3	3.9	4.0	3.9	4.6	5.0	4.4	5.0	3.5	4.4	2.7	5.2	5.0	8.7
13-Jan	Z	13.1	11.6	9.0	5.2	5.3	6.2	5.6	3.8	3.0	2.3	2.1	1.9	1.6	1.9	1.8	2.8	2.9	3.6	3.8	3.6	4.2	2.6	2.6	4.4	13.1
14-Jan	2.3	Z	1.7	1.9	1.4	3.0	4.0	2.8	4.9	5.7	8.2	7.6	7.4	8.1	3.4	3.8	5.1	6.5	3.8	3.7	6.2	6.6	6.9	8.6	4.9	8.6
15-Jan	7.3	9.1	Z	15.3	14.7	8.7	5.0	4.8	4.4	4.1	7.5	8.1	7.0	5.7	3.0	4.5	8.4	7.3	6.9	4.2	6.3	5.3	2.9	3.7	6.7	15.3
16-Jan	3.4	3.8	4.0	Z	5.2	5.7	5.1	3.9	4.3	3.6	4.0	3.6	3.3	2.7	2.3	2.0	2.9	3.3	3.5	2.7	2.9	2.3	2.6	2.9	3.5	5.7
17-Jan	2.8	2.7	4.1	5.8	Z	4.5	3.3	3.0	3.7	2.8	3.5	M	M	M	3.2	9.1	8.2	9.6	8.3	6.4	3.8	8.3	8.1	8.8	5.5	9.6
18-Jan	3.7	6.3	7.0	5.4	5.2	Z	10.3	7.1	6.4	4.7	2.6	3.2	2.9	2.7	2.9	4.1	3.5	2.9	2.7	5.2	3.7	2.5	4.1	5.3	4.5	10.3
19-Jan	Z	8.5	9.8	3.9	3.4	3.6	4.6	5.2	6.8	6.2	7.1	C	C	C	C	13.2	9.6	6.2	7.3	11.4	11.1	9.2	6.9	6.6	7.4	13.2
20-Jan	6.3	Z	4.9	4.7	6.2	11.8	14.1	13.7	13.1	11.5	7.4	5.6	5.0	6.7	6.5	5.5	4.4	6.5	4.0	5.3	4.7	4.2	6.0	8.1	7.2	14.1
21-Jan	26.7	18.7	Z	18.0	8.8	6.0	19.7	18.1	6.3	2.8	3.5	3.1	4.5	2.9	3.9	4.1	4.1	4.7	5.9	7.2	5.5	5.4	5.5	6.4	8.3	26.7
22-Jan	5.4	4.0	3.9	Z	6.7	8.4	3.9	2.1	2.9	4.8	0.3	0.4	1.3	1.5	1.0	1.8	1.6	0.2	0.2	0.2	0.3	0.2	0.2	0.2	2.2	8.4
23-Jan	1.2	3.8	4.8	9.6	Z	4.3	3.7	2.3	3.7	2.6	2.3	2.4	2.6	2.2	2.1	3.4	5.9	6.6	9.5	14.2	4.6	6.0	16.4	14.6	5.6	16.4
24-Jan	16.3	8.1	8.5	5.3	4.1	Z	19.8	4.8	3.6	3.3	1.8	2.4	3.1	5.1	10.0	10.6	1.4	0.9	0.7	0.5	0.4	0.4	0.3	0.3	4.9	19.8
25-Jan	Z	0.4	0.5	0.3	0.3	1.4	14.7	11.1	7.9	3.3	3.2	3.3	3.1	7.5	7.1	6.4	12.0	14.0	10.5	9.9	12.7	8.1	11.5	3.2	6.6	14.7
26-Jan	8.4	Z	3.4	5.0	6.1	5.5	3.1	4.7	1.3	0.7	0.9	1.3	1.5	0.7	0.3	0.6	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	2.0	8.4
27-Jan	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.5	2.0	2.7	0.5	0.5	0.7	2.9	1.6	6.7	6.0	2.5	3.5	1.4	6.7
28-Jan	4.8	4.0	2.8	Z	7.5	8.6	8.9	9.4	10.6	4.5	8.0	4.0	2.2	1.4	2.5	2.6	2.1	0.4	0.2	0.2	0.2	0.2	0.2	0.4	3.7	10.6
29-Jan	1.1	2.4	7.0	12.8	Z	15.2	9.6	13.4	11.4	13.5	11.3	6.6	4.2	4.3	2.9	2.7	3.0	4.3	5.8	11.8	6.1	2.4	2.2	1.7	6.8	15.2
30-Jan	1.4	0.9	1.3	0.2	2.6	Z	8.8	6.1	8.5	13.4	8.1	5.6	2.1	1.6	2.0	3.5	5.2	6.0	8.0	9.5	10.2	7.7	6.8	3.9	5.4	13.4
31-Jan	Z	3.2	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.5	1.5	2.2	4.2	4.9	3.3	4.4	3.6	11.4	11.7	11.7	15.2	16.2	5.7	3.0	4.5	16.2

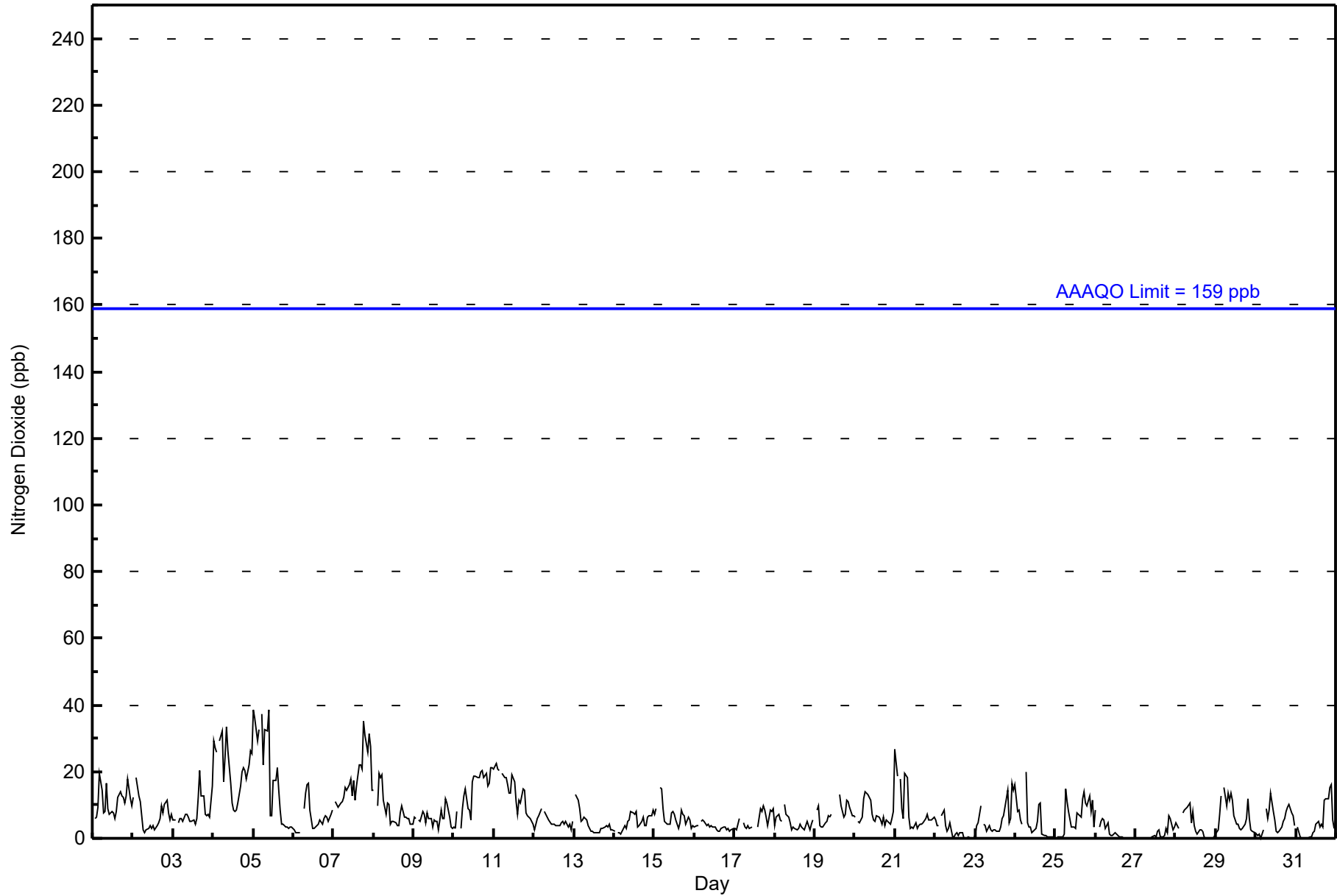
9.1	8.2	8.1	8.5	7.3	9.8	9.0	8.8	8.9	8.1	5.9	5.5	5.9	5.4	5.6	6.6	7.4	7.6	7.8	8.1	7.5	7.4	7.0	6.7	Diurnal Average	
38.7	36.1	29.2	32.6	29.1	37.4	22.0	32.7	33.6	38.6	17.7	19.2	18.7	18.6	21.3	22.1	22.1	20.9	35.0	31.1	25.9	31.4	27.6	25.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Firebag - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	669	94.76	94.76
21 - 40	37	5.24	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	34	8	15	5	8	34	40	103	78	127	54	31	12	9	27	71	656
21 - 40	1	0	0	0	0	2	0	4	14	9	3	0	2	0	0	2	37
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	8	15	5	8	36	40	107	92	136	57	31	14	9	27	73	693

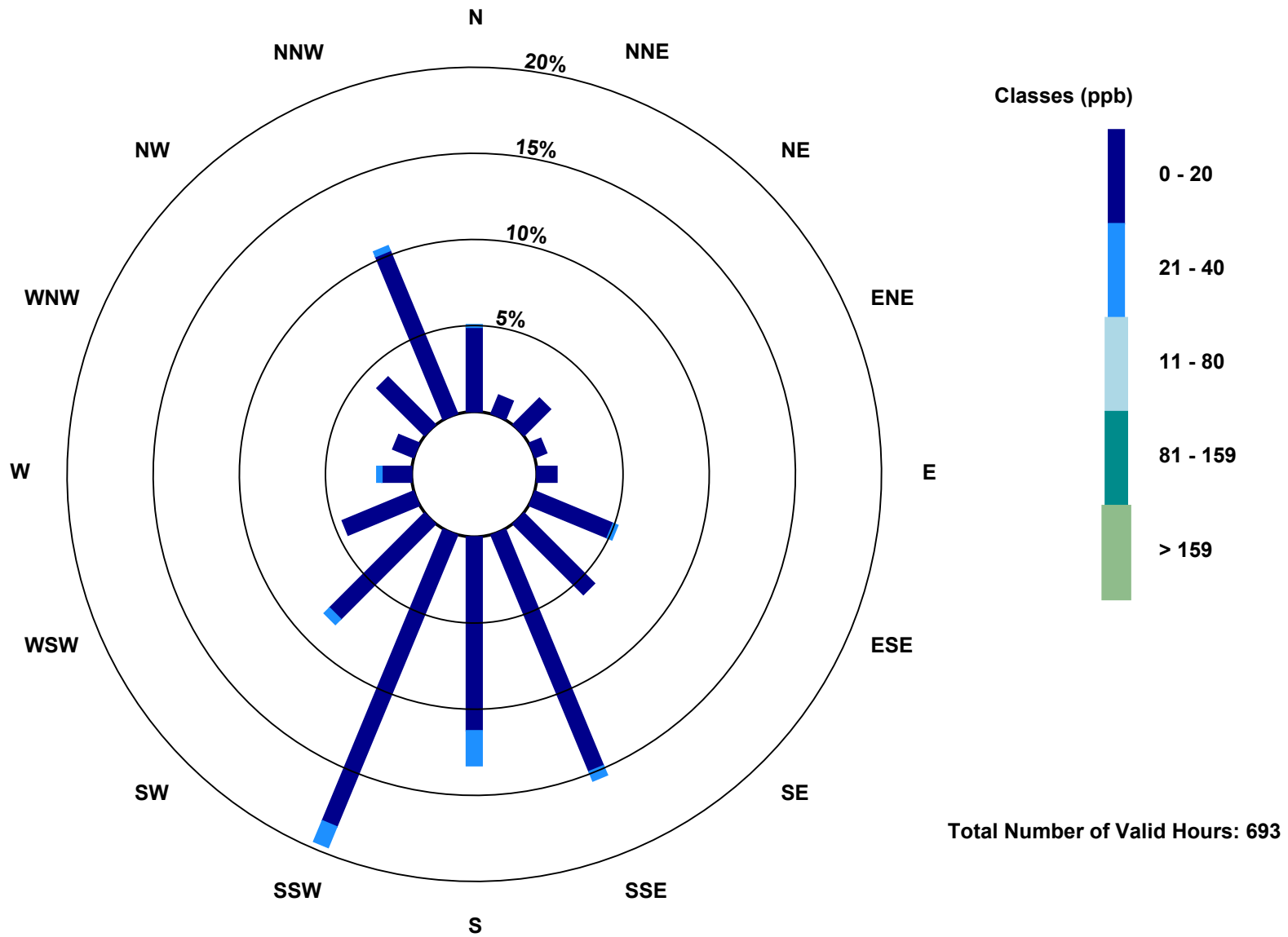
Total Number of Valid Hours: 693

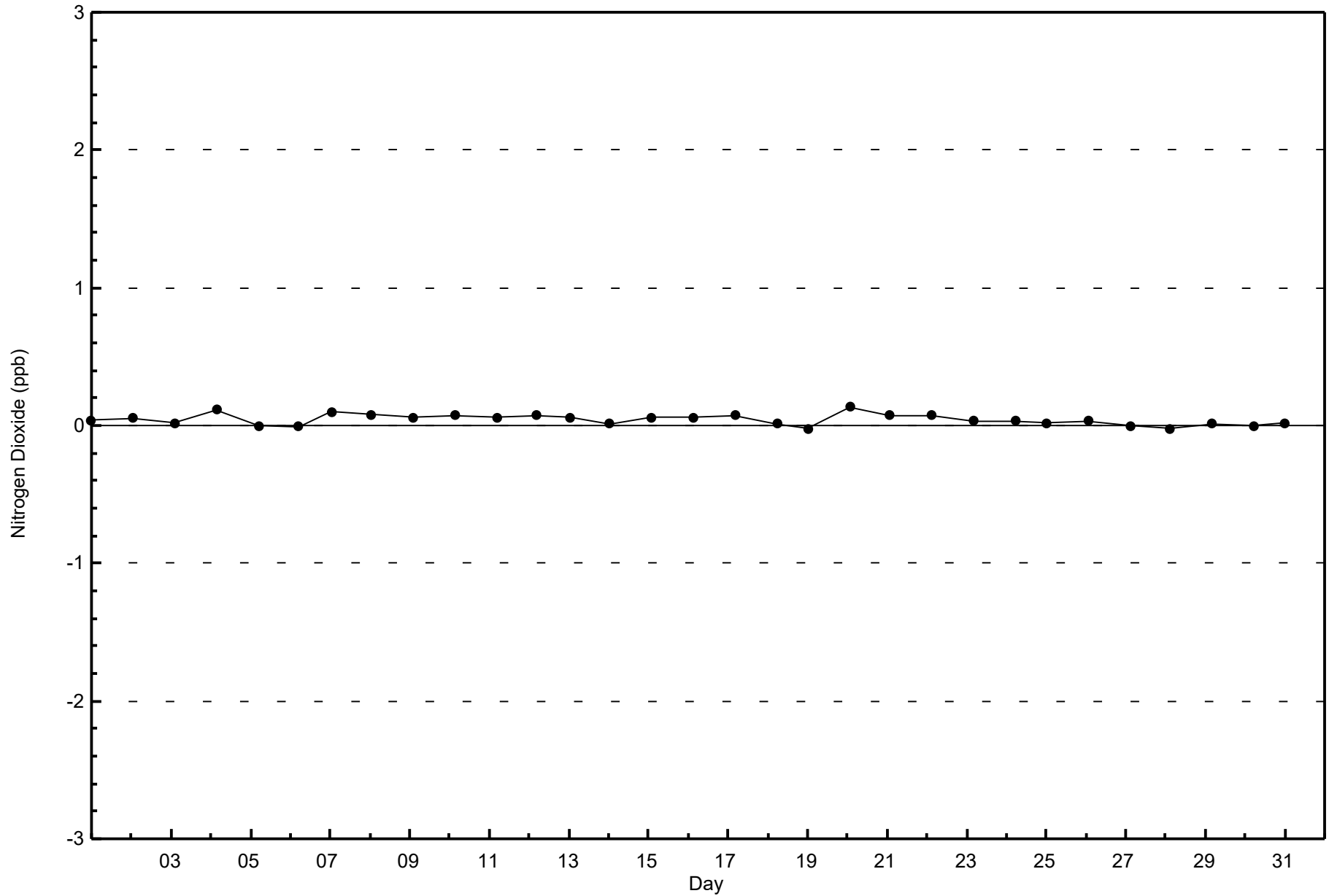
Total Number of Hours: 744

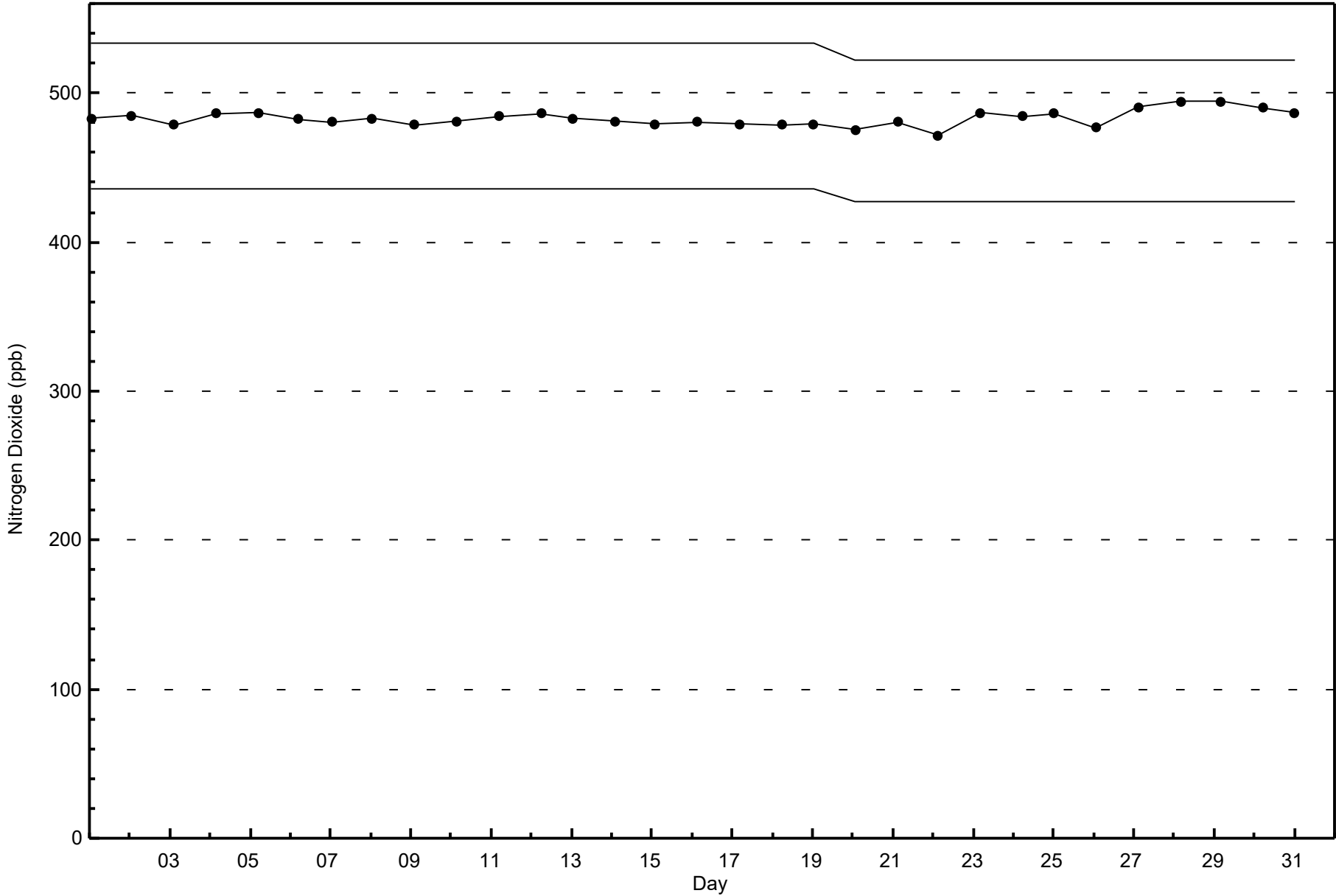


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Firebag









Wood Buffalo Environmental Association
Summary of Hour Averages

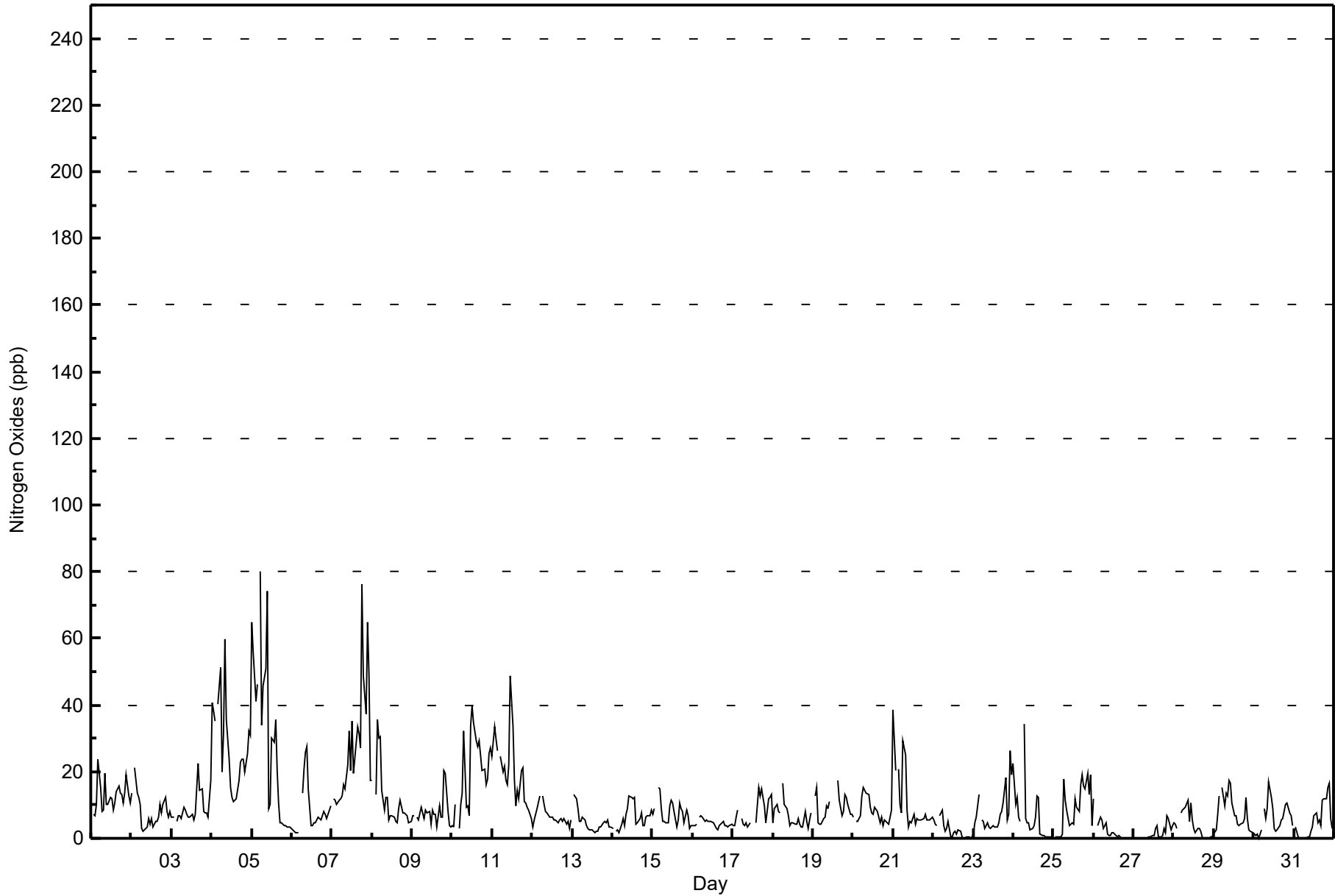
Nitrogen Oxides (NO_x) - ppb
Firebag - January 2023

Maximum Value: 80.0 ppb on Jan 5 06:00		Maximum Daily Average: 28.9 ppb on Jan 5		Hours in Service: 744																						
Minimum Value: 0.1 ppb on Jan 27 02:00		Minimum Daily Average: 1.6 ppb on Jan 27		Hours of Data: 706																						
Maximum Diurnal Average: 13.5 ppb at hour 6		Minimum Diurnal Average: 7.8 ppb at hour 24		Hours of Missing Data: 38																						
Monthly Average: 9.86 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 1.4 Q ₁ = 3.9 Median = 6.5 Q ₃ = 12.0 P ₉₀ = 21.6 P ₉₉ = 51.3		Hours of Calibration: 35																						
				Percent Operational Time: 99.6																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	Z	7.0	7.0	10.3	23.5	15.2	8.0	8.5	19.6	10.2	10.2	12.3	11.7	8.4	10.7	13.9	15.6	13.5	13.1	10.8	13.8	19.1	12.7	10.4	12.4	23.5
2-Jan	13.4	Z	21.4	13.7	12.2	10.1	2.8	2.0	2.7	3.4	5.7	4.2	5.9	3.6	5.3	5.2	6.1	10.3	7.8	10.2	12.2	8.1	6.3	8.0	7.9	21.4
3-Jan	6.5	6.4	Z	5.2	6.6	6.6	5.8	9.4	8.4	7.1	6.2	6.6	7.4	5.7	7.0	14.9	22.7	14.5	14.8	7.9	7.7	7.8	6.3	17.4	9.1	22.7
4-Jan	40.7	38.0	35.1	Z	40.4	51.3	19.8	31.4	59.7	35.5	23.8	15.3	12.1	11.2	11.3	11.9	17.3	22.7	23.6	23.7	19.7	25.5	32.2	30.9	27.5	59.7
5-Jan	64.7	56.0	41.3	46.2	Z	80.0	33.8	45.9	50.7	74.3	9.0	10.1	30.1	28.6	35.8	20.4	10.4	4.8	4.7	3.9	3.8	3.4	3.5	3.5	28.9	80.0
6-Jan	2.6	2.0	1.8	1.7	1.8	Z	13.5	20.6	26.1	27.5	14.7	3.8	4.0	4.7	4.8	5.5	6.4	5.5	7.0	8.2	7.2	5.9	8.6	9.8	8.4	27.5
7-Jan	Z	12.0	11.5	10.2	11.6	11.8	12.9	16.1	14.7	21.9	32.4	20.5	35.1	19.5	24.1	33.6	31.5	26.9	76.2	48.7	37.3	64.8	49.3	17.4	27.8	76.2
8-Jan	17.4	Z	13.3	35.5	29.9	30.7	14.5	8.7	12.3	12.2	5.4	6.7	6.9	6.4	4.9	4.6	8.8	11.5	7.6	7.4	7.1	6.9	4.7	4.9	11.7	35.5
9-Jan	6.9	7.0	Z	6.3	5.6	9.5	7.5	5.7	8.6	7.5	8.1	4.2	8.4	7.4	7.2	3.2	9.6	6.4	6.2	20.5	19.5	8.2	3.9	3.4	7.9	20.5
10-Jan	4.0	3.4	10.1	Z	3.1	10.3	13.7	32.1	9.5	9.9	6.6	33.8	39.9	34.8	29.3	27.5	29.1	25.1	20.2	21.0	16.1	17.7	25.5	26.9	19.6	39.9
11-Jan	24.4	33.6	29.5	26.4	Z	24.5	19.8	21.8	17.4	16.3	22.0	48.7	33.6	17.3	9.6	14.3	11.7	20.2	21.2	10.9	10.5	9.3	8.5	5.8	19.9	48.7
12-Jan	3.6	5.6	7.0	8.9	12.9	Z	12.9	10.0	8.1	7.6	6.2	6.3	6.5	5.5	5.3	4.8	5.5	6.1	5.2	5.9	4.2	5.1	3.1	5.5	6.6	12.9
13-Jan	Z	13.3	11.7	9.0	5.2	5.3	6.2	5.6	3.8	3.2	2.6	2.5	2.4	1.8	2.2	2.1	3.5	3.5	4.6	4.9	4.6	5.6	3.3	3.3	4.8	13.3
14-Jan	2.9	Z	2.2	2.5	1.9	4.2	6.0	4.0	7.3	8.9	12.7	12.2	11.7	12.5	4.3	4.8	5.8	7.7	4.0	3.8	6.2	6.6	6.9	8.6	6.4	12.7
15-Jan	7.3	9.1	Z	15.4	14.7	8.7	5.0	4.9	4.5	4.5	9.8	11.4	10.8	8.2	3.6	5.4	10.5	8.9	8.0	4.8	8.6	6.6	3.1	4.0	7.7	15.4
16-Jan	3.7	4.0	4.4	Z	6.3	7.0	6.3	5.0	5.7	5.1	5.3	5.2	4.9	3.7	3.0	2.5	3.8	4.6	5.1	3.7	4.0	3.2	3.7	4.1	4.5	7.0
17-Jan	4.0	3.8	6.2	8.6	Z	5.8	4.1	3.6	4.8	3.5	4.8	M	M	M	4.5	15.1	12.7	14.8	12.1	9.6	4.7	11.9	12.2	13.1	8.0	15.1
18-Jan	4.7	9.1	10.0	8.0	7.5	Z	16.6	10.3	9.0	6.7	3.6	4.8	4.7	4.4	4.2	6.0	4.4	3.3	3.4	8.1	5.0	3.0	5.6	7.6	6.5	16.6
19-Jan	Z	12.9	15.1	4.5	4.1	4.3	5.8	6.4	9.7	8.9	11.0	C	C	C	C	17.2	11.4	6.8	8.0	13.2	12.5	10.2	7.4	7.2	9.3	17.2
20-Jan	6.5	Z	5.0	5.3	6.6	12.7	15.2	14.5	13.7	13.1	9.3	7.8	7.1	9.2	8.3	6.2	4.5	6.5	4.0	5.3	4.7	4.2	6.3	8.4	8.0	15.2
21-Jan	38.5	20.5	Z	20.7	10.0	7.4	29.3	24.8	8.3	3.2	5.0	4.5	7.1	4.4	5.9	5.6	5.5	5.4	6.1	7.3	5.5	5.4	5.5	6.4	10.5	38.5
22-Jan	5.5	4.1	3.9	Z	6.8	8.5	4.0	2.1	3.0	5.1	0.4	0.5	1.8	2.0	1.4	2.4	2.0	0.2	0.2	0.2	0.3	0.2	0.2	0.2	2.4	8.5
23-Jan	1.4	4.5	6.5	13.2	Z	5.7	4.9	2.9	4.7	3.4	3.0	3.3	3.7	3.3	3.2	4.7	7.3	8.0	10.7	18.1	5.7	7.2	26.1	19.1	7.4	26.1
24-Jan	22.4	10.0	12.4	6.3	5.1	Z	34.3	5.8	4.5	4.6	2.5	3.2	4.0	6.3	12.7	12.4	1.4	0.9	0.7	0.5	0.4	0.4	0.3	0.3	6.6	34.3
25-Jan	Z	0.4	0.5	0.3	0.3	1.4	17.6	11.6	8.4	3.8	4.4	4.6	4.3	12.0	9.4	8.2	16.2	18.9	15.6	15.0	19.4	13.0	18.9	4.0	9.1	19.4
26-Jan	11.9	Z	3.8	5.0	6.2	5.5	3.1	4.7	1.3	0.7	1.0	1.6	1.8	0.8	0.4	0.7	0.4	0.2	0.2	0.2	0.2	0.1	0.2	0.2	2.2	11.9
27-Jan	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.9	0.7	2.9	3.7	0.6	0.5	0.7	3.0	1.6	6.8	6.1	2.6	3.6	1.6	6.8
28-Jan	4.8	4.1	2.9	Z	7.6	8.6	9.0	9.5	11.3	5.1	10.4	5.3	2.9	1.8	3.2	3.0	2.2	0.4	0.2	0.2	0.2	0.2	0.2	0.4	4.1	11.3
29-Jan	1.1	2.5	7.1	12.9	Z	15.3	9.7	13.6	12.7	17.3	16.6	10.5	6.9	6.7	4.3	3.9	4.0	4.5	5.8	12.1	6.1	2.4	2.2	1.7	7.8	17.3
30-Jan	1.4	0.9	1.3	0.2	2.6	Z	8.8	6.1	9.0	17.0	12.1	8.7	3.1	2.2	2.5	4.0	5.5	6.0	8.1	10.0	10.4	7.7	6.8	3.9	6.0	17.0
31-Jan	Z	3.2	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.5	2.0	3.2	6.7	7.7	4.6	5.5	3.8	11.5	11.7	11.9	15.4	16.5	5.7	3.0	5.0	16.5
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Firebag - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	630	89.24	89.24
21 - 40	60	8.50	97.73
41 - 80	16	2.27	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Firebag - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	30	8	14	4	7	33	40	92	72	123	48	31	12	9	26	68	617
21 - 40	5	0	1	1	1	3	0	13	10	11	7	0	2	0	1	5	60
11 - 80	0	0	0	0	0	0	0	2	10	2	2	0	0	0	0	0	16
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	8	15	5	8	36	40	107	92	136	57	31	14	9	27	73	693

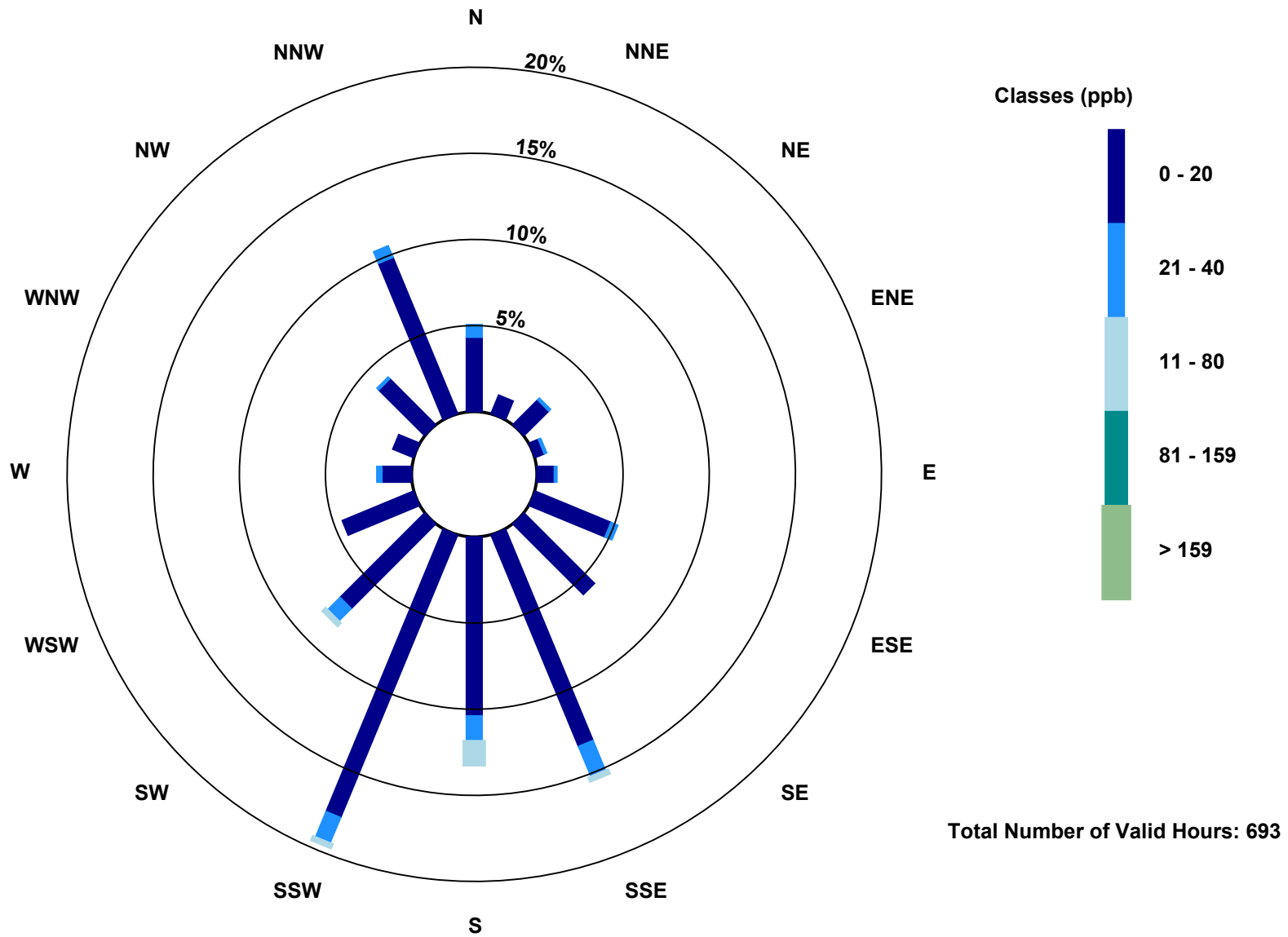
Total Number of Valid Hours: 693

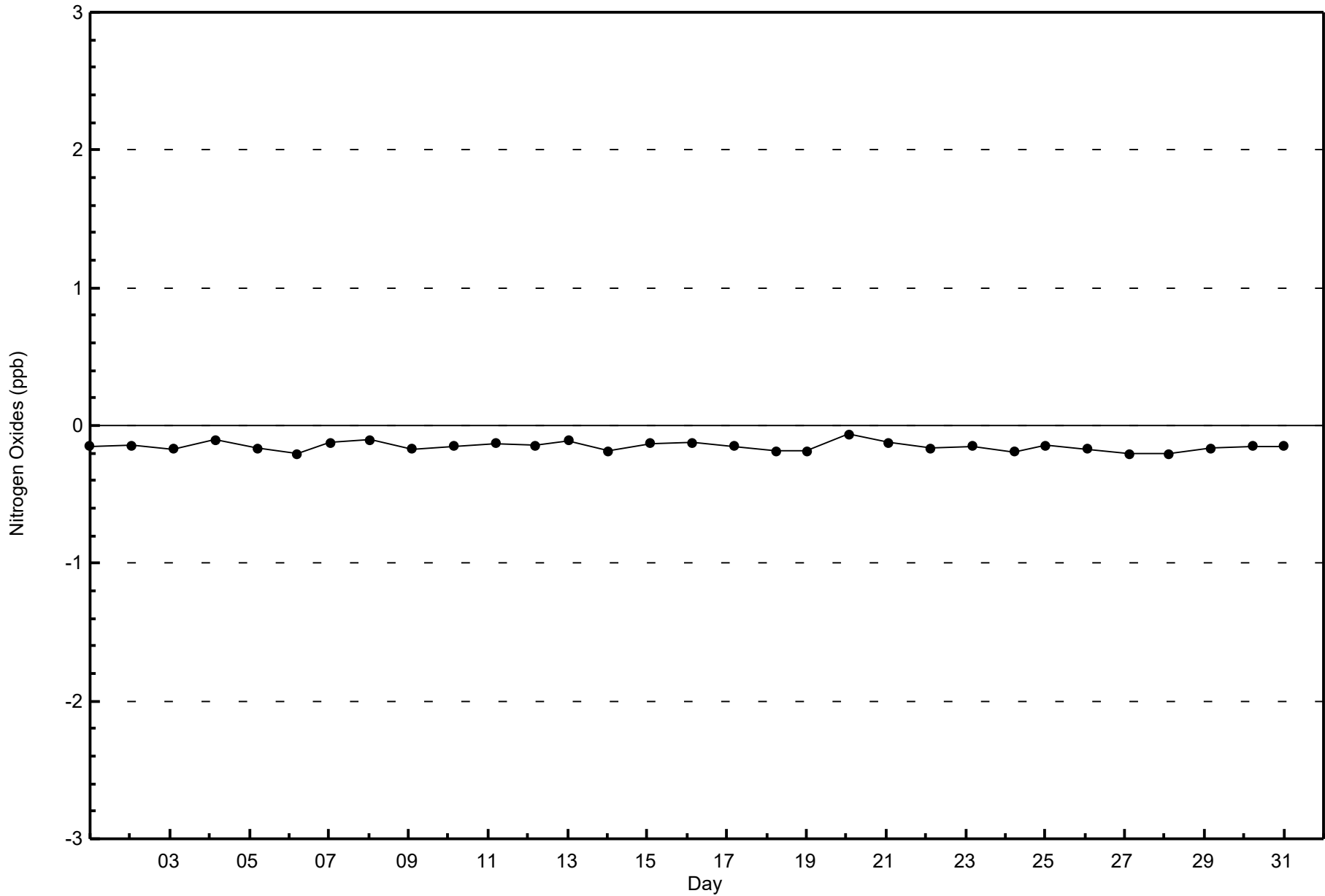
Total Number of Hours: 744

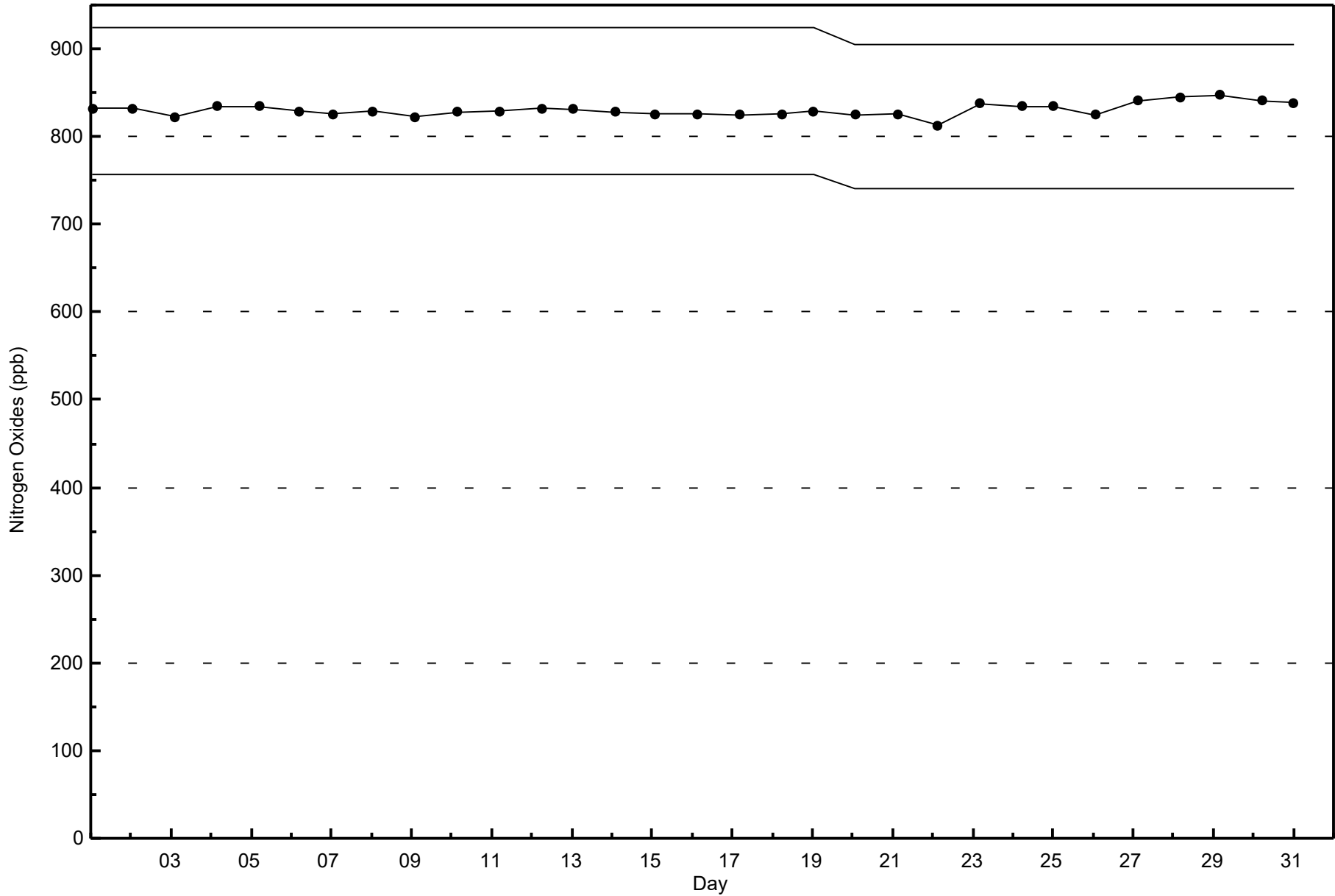


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Firebag





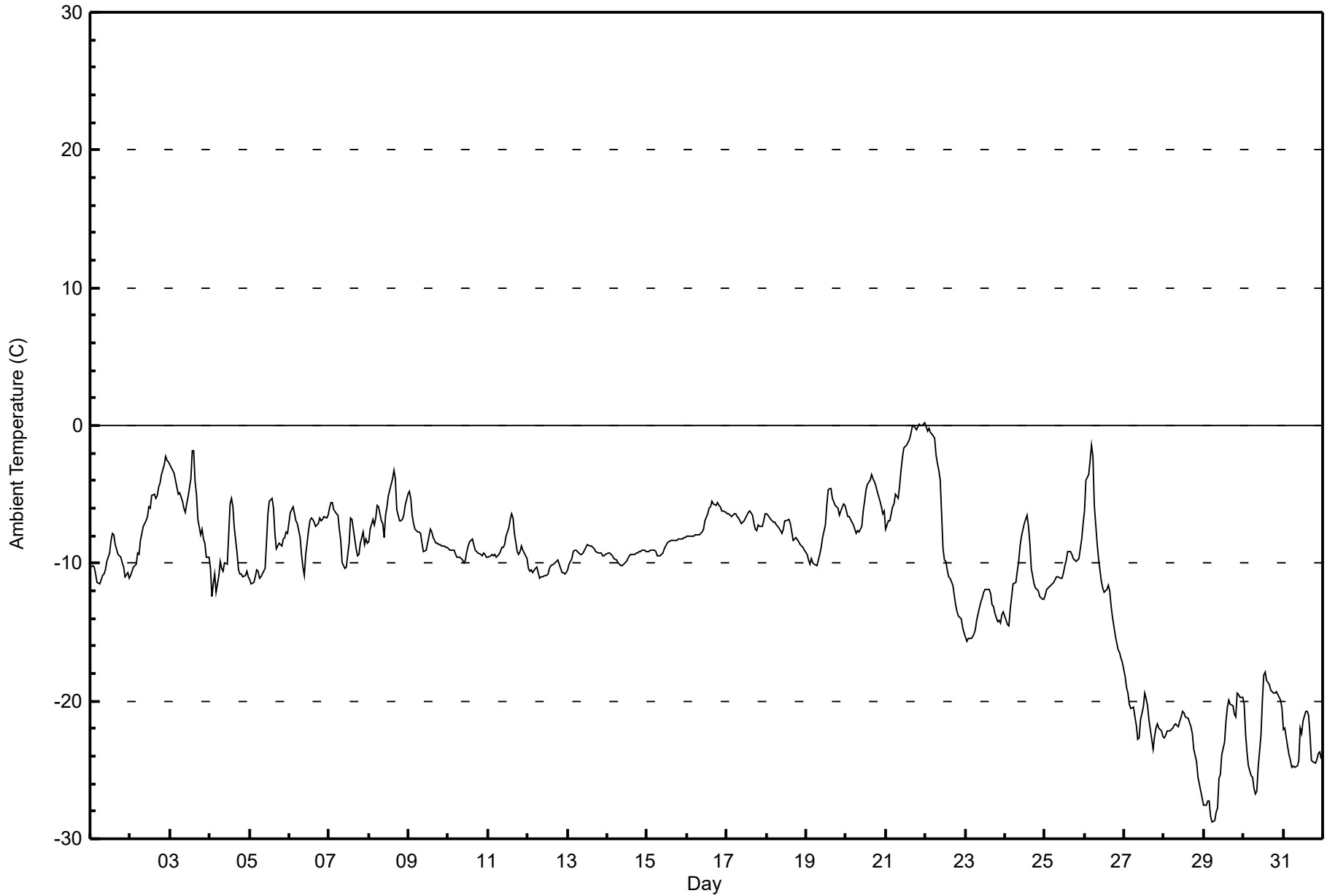




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Firebag - January 2023

Maximum Value: 0.2 C on Jan 22 00:00 Minimum Value: -28.8 C on Jan 29 06:00 Maximum Diurnal Average: -9.2 C at hour 14 Monthly Average: -10.61 C		Maximum Daily Average: -2.7 C on Jan 21 Minimum Daily Average: -23.8 C on Jan 29 Minimum Diurnal Average: -11.4 C at hour 9 Percentiles: P ₁ = -27.3 P ₁₀ = -21.4 Q ₁ = -11.4 Median = -9.2 Q ₃ = -6.9 P ₉₀ = -5.3 P ₉₉ = -0.2		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-10.2	-10.1	-10.3	-10.7	-11.4	-11.5	-11.2	-10.9	-10.7	-10.4	-9.9	-9.3	-8.3	-7.8	-7.9	-8.6	-9.4	-9.4	-9.5	-10.0	-10.3	-10.9	-10.7	-11.1	-10.0	-7.8																						
2-Jan	-10.9	-10.6	-10.2	-10.1	-9.2	-9.4	-8.3	-7.8	-7.4	-6.9	-6.7	-5.9	-6.0	-5.1	-5.0	-5.2	-5.1	-4.5	-4.2	-3.5	-2.8	-2.2	-2.6	-2.6	-6.3	-2.2																						
3-Jan	-2.9	-3.3	-3.5	-4.0	-4.5	-5.0	-4.9	-5.5	-6.0	-6.3	-5.7	-5.1	-3.8	-1.8	-1.8	-4.1	-5.0	-6.8	-7.9	-7.5	-8.2	-8.5	-9.6	-9.6	-5.5	-1.8																						
4-Jan	-10.4	-12.4	-11.4	-10.8	-12.1	-10.9	-9.8	-10.3	-10.6	-10.0	-10.0	-7.9	-5.7	-5.3	-5.9	-7.5	-9.2	-10.4	-10.8	-10.9	-10.9	-10.6	-11.0	-9.8	-5.3																							
5-Jan	-11.2	-11.5	-11.4	-11.0	-10.5	-10.6	-11.1	-11.0	-10.6	-10.4	-8.4	-6.4	-5.5	-5.3	-6.0	-7.8	-8.9	-8.7	-8.5	-8.8	-8.2	-8.1	-7.7	-7.8	-9.0	-5.3																						
6-Jan	-6.3	-6.1	-5.9	-6.4	-6.9	-7.1	-8.1	-9.4	-10.3	-10.9	-9.3	-7.6	-6.9	-6.7	-6.8	-7.0	-7.3	-7.1	-6.7	-6.9	-6.8	-6.6	-6.7	-6.5	-7.3	-5.9																						
7-Jan	-6.0	-5.6	-5.6	-6.1	-6.4	-6.6	-7.5	-8.3	-10.0	-10.4	-10.2	-9.3	-8.5	-6.7	-6.9	-8.2	-8.9	-9.5	-9.4	-8.5	-7.7	-8.7	-8.2	-8.5	-8.0	-5.6																						
8-Jan	-8.5	-7.6	-6.8	-7.3	-6.7	-5.8	-5.9	-7.0	-7.1	-8.2	-6.5	-5.9	-5.0	-4.3	-3.9	-3.3	-3.9	-6.1	-6.9	-6.9	-6.8	-6.5	-5.8	-5.0	-6.1	-3.3																						
9-Jan	-4.8	-5.3	-6.5	-7.2	-7.5	-7.8	-7.7	-7.8	-8.6	-9.1	-9.1	-8.6	-8.0	-7.5	-7.7	-8.1	-8.6	-8.5	-8.7	-8.7	-8.7	-8.7	-8.9	-8.9	-8.0	-4.8																						
10-Jan	-9.0	-9.1	-9.1	-9.1	-9.4	-9.5	-9.6	-9.6	-9.8	-9.9	-9.8	-9.1	-8.7	-8.4	-8.3	-8.6	-9.0	-9.2	-9.3	-9.4	-9.5	-9.3	-9.3	-9.5	-9.2	-8.3																						
11-Jan	-9.6	-9.4	-9.4	-9.4	-9.3	-9.6	-9.3	-9.1	-8.8	-8.8	-8.6	-8.0	-7.4	-6.8	-6.4	-6.7	-7.8	-9.2	-9.4	-9.1	-8.8	-9.1	-9.3	-9.7	-8.7	-6.4																						
12-Jan	-10.3	-10.6	-10.5	-10.7	-10.4	-10.3	-10.7	-11.1	-10.9	-11.0	-10.8	-10.9	-10.7	-10.4	-10.2	-10.1	-9.9	-9.9	-9.8	-10.1	-10.6	-10.7	-10.7	-10.7	-10.5	-9.8																						
13-Jan	-10.4	-10.1	-9.7	-9.2	-9.1	-9.1	-9.2	-9.4	-9.4	-9.3	-9.1	-8.8	-8.6	-8.7	-8.8	-8.8	-8.9	-9.1	-9.2	-9.3	-9.3	-9.4	-9.4	-9.4	-9.2	-8.6																						
14-Jan	-9.3	-9.3	-9.3	-9.4	-9.6	-9.8	-9.9	-10.1	-10.2	-10.2	-10.1	-9.9	-9.7	-9.5	-9.4	-9.4	-9.4	-9.3	-9.2	-9.2	-9.1	-9.1	-9.1	-9.2	-9.5	-9.1																						
15-Jan	-9.2	-9.1	-9.1	-9.1	-9.0	-9.2	-9.5	-9.5	-9.4	-9.2	-8.9	-8.7	-8.6	-8.4	-8.3	-8.3	-8.3	-8.3	-8.3	-8.3	-8.2	-8.2	-8.2	-8.1	-8.7	-8.1																						
16-Jan	-8.1	-8.0	-8.0	-8.0	-8.0	-7.9	-7.9	-7.9	-7.8	-7.7	-7.5	-6.9	-6.4	-6.0	-5.9	-5.5	-5.7	-5.8	-5.6	-5.8	-5.9	-6.2	-6.2	-6.3	-6.9	-5.5																						
17-Jan	-6.4	-6.4	-6.5	-6.6	-6.4	-6.4	-6.6	-6.7	-6.9	-7.1	-7.0	-6.7	-6.5	-6.3	-6.2	-6.5	-7.1	-7.5	-7.6	-7.2	-7.3	-7.4	-6.9	-6.4	-6.8	-6.2																						
18-Jan	-6.4	-6.5	-6.8	-6.9	-7.0	-7.0	-7.2	-7.3	-7.6	-7.9	-7.5	-6.9	-6.9	-6.8	-7.1	-7.7	-8.4	-8.3	-8.1	-8.5	-8.6	-8.7	-8.8	-9.0	-7.6	-6.4																						
19-Jan	-9.3	-9.7	-10.1	-9.6	-10.0	-10.1	-10.1	-9.7	-9.3	-8.9	-8.1	-7.2	-5.8	-4.7	-4.6	-4.5	-5.3	-5.8	-5.9	-6.0	-6.5	-6.2	-5.7	-5.8	-7.5	-4.5																						
20-Jan	-6.2	-6.6	-6.6	-6.8	-7.3	-7.5	-7.8	-7.7	-7.7	-7.4	-6.2	-5.5	-4.7	-4.3	-4.0	-3.6	-3.9	-4.1	-4.3	-4.8	-5.5	-5.9	-6.4	-6.2	-5.9	-3.6																						
21-Jan	-7.5	-7.0	-6.9	-6.4	-5.9	-5.7	-5.0	-5.3	-4.4	-3.2	-2.3	-1.6	-1.4	-1.2	-1.1	-0.6	-0.1	0.0	-0.3	-0.1	0.1	0.0	0.0	0.2	-2.7	0.2																						
22-Jan	-0.1	-0.4	-0.2	-0.5	-0.6	-0.9	-2.2	-2.8	-3.2	-4.0	-9.0	-9.8	-9.9	-10.5	-11.0	-11.1	-11.6	-12.3	-13.0	-13.5	-13.8	-14.0	-14.7	-15.1	-7.7	-0.1																						
23-Jan	-15.4	-15.6	-15.4	-15.4	-15.3	-15.2	-14.8	-14.1	-13.2	-12.8	-12.5	-12.1	-11.9	-11.9	-11.9	-12.2	-13.1	-13.1	-13.6	-14.3	-14.2	-14.3	-13.7	-13.6	-13.7	-11.9																						
24-Jan	-13.8	-14.5	-14.5	-13.4	-12.4	-11.5	-11.4	-10.6	-9.9	-8.8	-8.0	-7.1	-6.8	-6.6	-7.3	-8.5	-10.4	-11.4	-11.8	-11.9	-12.0	-12.4	-12.6	-12.6	-10.8	-6.6																						
25-Jan	-12.3	-11.9	-11.8	-11.7	-11.5	-11.4	-11.2	-11.0	-11.0	-11.1	-11.1	-11.0	-10.6	-10.2	-9.8	-9.1	-9.1	-9.4	-9.6	-9.8	-9.9	-9.6	-9.0	-8.3	-7.2	-10.3	-7.2																					
26-Jan	-6.2	-4.0	-3.6	-2.5	-1.4	-2.2	-5.8	-8.5	-9.7	-10.5	-11.3	-11.8	-12.1	-11.9	-11.6	-12.0	-13.1	-14.0	-15.3	-15.8	-16.2	-16.5	-16.9	-17.2	-10.4	-1.4																						
27-Jan	-18.2	-19.0	-19.4	-20.3	-20.6	-20.5	-21.1	-21.8	-22.8	-22.6	-21.4	-20.5	-19.4	-19.8	-20.3	-21.4	-22.7	-23.5	-22.6	-21.9	-21.7	-22.0	-22.2	-22.6	-21.2	-18.2																						
28-Jan	-22.7	-22.5	-22.2	-22.2	-22.1	-22.0	-21.8	-21.7	-21.8	-21.5	-21.2	-20.8	-20.8	-21.2	-21.2	-21.5	-21.9	-22.4	-23.4	-24.4	-25.5	-26.1	-26.6	-27.1	-22.7	-20.8																						
29-Jan	-27.5	-27.6	-27.3	-27.3	-28.4	-28.8	-28.7	-28.1	-27.8	-25.7	-25.3	-23.9	-23.0	-21.5	-20.5	-19.9	-20.2	-20.3	-21.0	-21.1	-19.4	-19.5	-19.7	-19.7	-23.8	-19.4																						
30-Jan	-20.3	-22.4	-23.7	-24.7	-25.4	-25.5	-26.3	-26.8	-26.5	-24.8	-22.5	-20.0	-18.1	-17.9	-18.5	-18.8	-19.2	-19.3	-19.4	-19.4	-19.3	-19.7	-19.9	-20.5	-21.6	-17.9																						
31-Jan	-22.1	-22.0	-23.3	-23.9	-24.3	-24.8	-24.7	-24.8	-24.7	-24.3	-21.9	-22.3	-21.4	-20.7	-20.7	-21.0	-22.5	-24.3	-24.4	-24.5	-24.2	-23.8	-23.7	-24.2	-23.3	-20.7																						
																								-10.7	-10.8	-10.8	-10.9	-10.9	-10.9	-11.1	-11.3	-11.4	-11.3	-10.8	-10.2	-9.6	-9.2	-9.5	-10.1	-10.6	-10.8	-10.8	-10.8	-10.9	-10.9	-11.0	Diurnal Average	
																								-0.1	-0.4	-0.2	-0.5	-0.6	-0.9	-2.2	-2.8	-3.2	-3.2	-2.3	-1.6	-1.4	-1.2	-1.1	-0.6	-0.1	0.0	-0.3	-0.1	0.1	0.0	0.0	0.2	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	98	13.17	13.17
-20 - 0	641	86.16	99.33
0 - 10	5	0.67	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

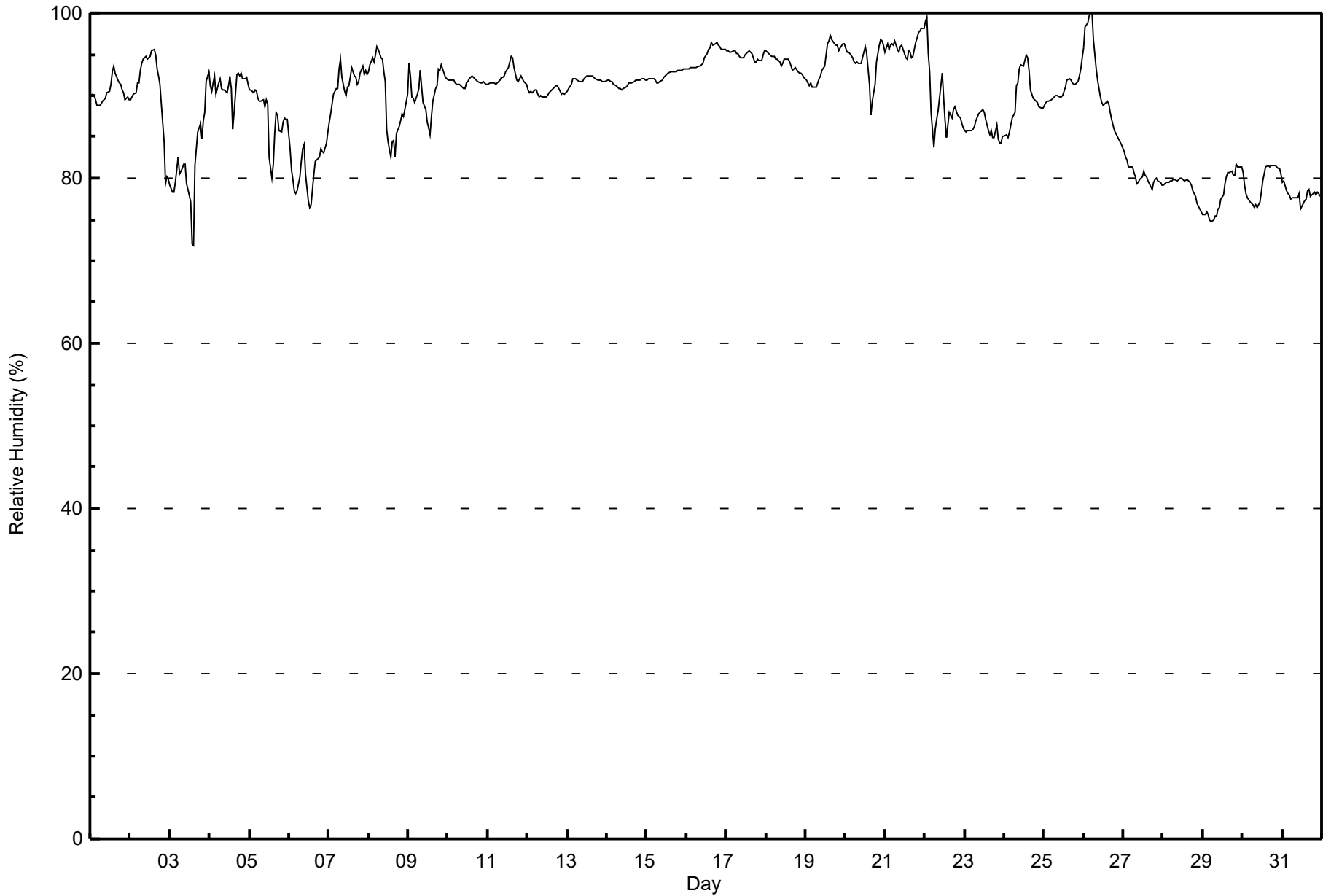
Relative Humidity (RH) - %
Firebag - January 2023

Maximum Value: 100.0 % on Jan 26 05:00																						Maximum Daily Average: 96.0 % on Jan 21																						Hours in Service: 744		
Minimum Value: 71.9 % on Jan 3 15:00																						Minimum Daily Average: 78.0 % on Jan 31																						Hours of Data: 744		
Maximum Diurnal Average: 89.2 % at hour 1																						Minimum Diurnal Average: 88.3 % at hour 14																						Hours of Missing Data: 0		
Monthly Average: 88.83 %																						Percentiles: P ₁ = 75.6 P ₁₀ = 79.3 Q ₁ = 85.1 Median = 90.9 Q ₃ = 92.9 P ₉₀ = 95.2 P ₉₉ = 98.1																						Hours of Calibration: 0		
																																												Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jan	90.0	90.2	90.0	89.4	88.8	88.8	89.0	89.3	89.5	89.7	90.3	90.5	91.4	92.8	93.5	92.7	91.8	91.6	91.3	90.7	90.3	89.6	89.8	89.4	90.4	93.5																				
2-Jan	89.6	89.9	90.2	90.4	91.5	91.5	93.1	93.9	94.3	94.7	94.4	94.6	94.7	95.5	95.5	94.8	93.3	92.3	91.4	89.0	84.4	79.3	80.2	79.8	90.8	95.5																				
3-Jan	79.1	78.2	78.3	79.6	80.9	82.5	80.4	81.2	81.6	81.8	79.3	78.6	77.1	72.1	71.9	81.6	83.5	85.7	86.6	84.7	87.0	87.9	91.6	92.9	81.8	92.9																				
4-Jan	91.2	90.4	91.6	92.4	90.2	91.6	92.1	90.9	90.7	90.7	90.4	91.1	92.3	90.9	86.0	88.0	92.5	92.7	92.3	92.6	92.1	92.1	92.3	91.3	91.2	92.7																				
5-Jan	90.7	90.6	90.4	90.7	90.5	89.7	89.4	89.3	89.5	88.6	89.6	89.0	82.6	79.9	81.7	85.4	88.0	87.7	85.7	85.6	86.8	87.3	87.1	87.2	87.6	90.7																				
6-Jan	83.5	81.0	79.8	78.5	78.1	78.4	80.3	82.1	83.5	84.0	80.5	77.4	76.5	76.8	78.6	80.6	82.1	82.5	82.6	83.6	83.2	83.1	84.3	85.6	81.1	85.6																				
7-Jan	86.9	87.7	89.0	90.2	90.9	90.9	93.3	94.5	92.3	90.5	90.1	91.0	91.1	92.3	93.4	92.4	92.1	91.4	91.7	92.7	93.5	92.5	93.1	92.6	91.5	94.5																				
8-Jan	92.8	93.8	94.7	94.1	94.9	95.9	95.6	94.5	94.3	92.9	91.8	86.0	84.4	82.5	84.4	84.5	82.6	85.4	86.3	86.9	87.7	87.4	88.4	90.1	89.7	95.9																				
9-Jan	93.9	92.4	89.8	89.7	89.2	90.1	90.8	93.0	91.0	89.2	88.3	86.8	86.1	85.2	87.4	89.3	90.8	91.1	93.2	93.1	93.7	92.6	92.1	92.1	90.5	93.9																				
10-Jan	91.9	91.8	91.8	91.8	91.5	91.3	91.3	91.3	91.1	90.9	90.9	91.5	91.7	92.1	92.4	92.2	92.0	91.8	91.7	91.6	91.5	91.7	91.6	91.4	91.6	92.4																				
11-Jan	91.3	91.5	91.5	91.6	91.6	91.4	91.7	91.9	92.3	92.2	92.3	92.8	93.4	94.1	94.7	94.6	93.4	91.9	91.8	92.0	92.4	92.0	91.8	91.3	92.3	94.7																				
12-Jan	90.6	90.4	90.4	90.3	90.6	90.7	90.2	89.8	90.0	89.9	89.9	89.8	90.0	90.3	90.6	90.9	91.0	91.1	91.2	90.9	90.2	90.3	90.2	90.3	90.4	91.2																				
13-Jan	90.5	90.9	91.3	92.0	92.0	92.0	91.9	91.7	91.7	91.8	92.0	92.1	92.4	92.3	92.3	92.4	92.2	92.0	91.9	91.9	91.8	91.7	91.7	91.7	91.8	92.4																				
14-Jan	91.8	91.8	91.7	91.7	91.4	91.3	91.1	90.9	90.8	90.8	90.8	91.0	91.2	91.5	91.6	91.6	91.7	91.8	91.8	91.9	91.9	92.0	92.0	91.9	91.5	92.0																				
15-Jan	91.9	92.0	92.0	92.1	92.1	91.8	91.5	91.5	91.7	91.9	92.2	92.3	92.5	92.6	92.8	92.9	92.9	92.9	92.9	93.0	93.1	93.1	93.1	93.2	92.4	93.2																				
16-Jan	93.3	93.3	93.3	93.3	93.4	93.5	93.5	93.5	93.6	93.7	93.9	94.5	95.2	95.5	95.8	96.4	96.2	96.2	96.4	96.1	96.0	95.6	95.7	95.6	94.7	96.4																				
17-Jan	95.4	95.4	95.3	95.2	95.4	95.4	95.2	95.1	94.8	94.5	94.6	94.8	95.1	95.3	95.4	95.1	94.5	94.1	94.0	94.5	94.3	94.3	94.9	95.4	94.9	95.4																				
18-Jan	95.4	95.3	95.0	94.8	94.7	94.7	94.5	94.3	94.0	93.6	93.9	94.4	94.4	94.1	93.6	93.1	93.2	93.4	93.0	92.8	92.7	92.5	92.3	93.9	95.4																					
19-Jan	91.9	91.4	91.2	91.6	91.1	91.1	91.0	91.5	92.0	92.4	93.0	93.6	94.9	96.2	96.7	97.2	96.7	96.3	96.1	96.0	95.4	95.8	96.3	96.3	94.0	97.2																				
20-Jan	95.8	95.3	95.3	95.0	94.5	94.1	93.9	94.0	93.9	93.9	94.7	95.3	95.9	95.1	91.4	87.6	89.4	90.4	91.3	94.0	96.2	96.8	96.6	96.2	94.0	96.8																				
21-Jan	95.2	96.3	95.7	96.1	96.2	96.1	96.7	95.7	95.3	96.0	96.1	95.6	94.5	94.4	95.5	95.2	94.5	94.7	96.5	97.0	97.6	97.8	98.1	98.2	96.0	98.2																				
22-Jan	99.0	99.5	95.1	92.8	87.9	83.7	85.9	87.1	88.1	89.7	92.7	89.7	86.9	84.9	86.4	88.0	87.3	88.3	88.7	88.2	87.7	87.2	86.6	86.0	89.1	99.5																				
23-Jan	85.7	85.6	85.8	85.7	85.8	86.0	86.2	86.9	87.8	88.0	88.2	88.3	87.9	87.2	85.8	85.3	85.8	84.9	85.0	86.4	84.8	84.2	84.3	85.1	86.1	88.3																				
24-Jan	85.1	85.3	85.0	85.6	86.5	87.3	88.0	91.1	91.6	93.2	93.7	93.6	94.2	95.0	94.6	93.0	90.7	89.7	89.4	89.3	89.2	88.7	88.5	88.5	89.9	95.0																				
25-Jan	88.7	89.1	89.3	89.4	89.5	89.7	89.9	90.1	90.0	89.8	89.8	90.1	90.5	91.0	91.8	92.0	91.9	91.6	91.4	91.4	91.7	92.4	93.3	94.6	90.8	94.6																				
26-Jan	95.8	98.3	98.8	99.6	100.0	100.0	96.9	93.3	91.8	90.9	89.8	89.1	88.9	89.1	89.4	88.9	88.0	87.1	85.8	85.5	85.0	84.8	84.4	84.1	91.0	100.0																				
27-Jan	83.1	82.5	82.2	81.4	81.3	81.3	80.7	80.2	79.3	79.4	79.9	80.1	80.8	80.3	80.1	79.7	78.9	78.6	79.5	79.8	79.9	79.7	79.5	79.2	80.3	83.1																				
28-Jan	79.2	79.3	79.6	79.5	79.6	79.6	79.9	79.9	79.7	79.9	79.9	80.1	79.9	79.7	79.8	79.7	79.6	79.2	78.4	77.8	77.0	76.6	76.2	75.9	79.0	80.1																				
29-Jan	75.6	75.6	75.9	75.6	75.0	74.8	74.9	75.4	75.4	76.2	76.4	77.4	78.1	79.4	80.1	80.7	80.7	80.8	80.3	80.4	81.8	81.4	81.3	81.4	78.1	81.8																				
30-Jan	80.7	79.1	78.2	77.6	77.1	77.0	76.7	76.4	76.8	76.4	77.1	78.4	79.7	80.5	81.4	81.4	81.4	81.6	81.5	81.6	81.6	81.1	81.2	80.5	79.4	81.6																				
31-Jan	79.4	79.7	78.5	78.1	77.9	77.5	77.7	77.6	77.6	77.6	78.1	76.3	76.7	77.4	77.5	78.5	78.7	77.9	78.0	78.3	78.0	78.4	78.1	77.9	78.0	79.7																				
																						89.2	89.2	88.9	88.9	88.7	88.7	88.8	89.0	88.9	88.9	88.9	88.6	88.4	88.3	88.5	88.9	88.9	88.9	89.0	89.0	89.0	88.7	88.9	89.0	Diurnal Average
																						99.0	99.5	98.8	99.6	100.0	100.0	96.9	95.7	95.3	96.0	96.1	95.6	95.9	96.2	96.7	97.2	96.7	96.3	96.5	97.0	97.6	97.8	98.1	98.2	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Firebag - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Firebag - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	105	14.11	14.11
80 - 100	637	85.62	99.73

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Firebag - January 2023

Maximum Speed: 33 km/h on Jan 26 07:00	Maximum Daily Speed Average: 20.9 km/h on Jan 6	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 15 09:00	Minimum Daily Speed Average: 0.9 km/h on Jan 10	Hours of Data: 731
Maximum Diurnal Speed Average: 5.3 km/h at hour 5	Minimum Diurnal Speed Average: 2.9 km/h at hour 17	Hours of Missing Data: 13
Monthly Average Velocity: 3.8 km/h 197.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 5 Median = 8 Q ₃ = 12 P ₉₀ = 16 P ₉₉ = 27	Percent Operational Time: 98.3

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	SSW8	SSW8	SSW6	SW8	SW6	SW7	SW6	SW6	SSW8	SSW9	SSW9	SSW10	SSW10	SW8	SW7	SW6	SSW7	SSW8	SW7	SW7	SSW7	SSW5	SSW6	SSW5	SSW7.2	SSW10	
2-Jan	SSW6	SSW7	SSW7	SSW7	S8	S8	S9	S11	S10	SSW10	SSW11	SSW10	SSW10	SSW12	SSW14	SW17	SW14	SW14	SW15	SW18	SW17	SSW19	SSW19	SSW18	SSW11.8	SSW19	
3-Jan	SSW17	SSW17	SSW17	SSW19	SSW18	SSW16	SSW15	S18	SSW16	SSW12	SSW12	S14	S13	SSW11	SSW9	S7	S7	S9	S11	S13	SSW11	S8	SW4	SSW6	SSW12.4	SSW19	
4-Jan	SSE3	W2	SW4	SSW5	SSW3	SW4	SW6	SSW6	SSW5	SW7	SW8	SW7	SW3	SW4	SSW5	SSW5	SSW6	SSW6	SSW6	SSW6	SSW6	SSW5	SSW5	SSW5	SSW5.0	SW8	
5-Jan	S4	S5	SSW5	S7	S7	S7	S8	S7	S8	S7	S9	S11	SSE12	S12	SSE13	SSE10	SE12	SSE17	SSE15	SSE18	SSE19	SSE22	SSE22	SSE20	SSE11.3	SSE22	
6-Jan	SSE25	SSE26	SSE31	SSE31	SSE30	SSE28	S28	S25	S21	S18	S19	S22	SSW19	SSW20	SSW20	SSW21	SSW19	SSW24	SSW20	SSW18	SSW19	SSW16	SSW17	SSW15	S20.9	SSE31	
7-Jan	SSW16	SSW12	SSW13	SSW11	SSW12	SW10	SSW7	WNW3	NE5	ENE6	ESE2	SE2	SSE1	S2	E4	SW3	ESE5	S6	S6	S5	SSE5	S5	SSE5	SSE6	S4.6	SSW16	
8-Jan	SSE7	SSE9	SSE8	SSE8	SSE8	SSE10	SSE8	SE8	SE7	SE6	SE10	SSE12	SSE13	SSE16	SE16	SE14	SE12	ESE9	ESE9	ESE7	ESE7	ESE7	SE9	SE9	SE9.2	SSE16	
9-Jan	SE8	ESE10	ESE8	S5	SE7	SSE4	N2	ENE4	ESE5	SE7	SSE5	S2	E4	ESE7	SE10	SSE9	SSE6	S6	S4	SW1	S6	SSE7	SSE6	SE4	SE5.0	ESE10	
10-Jan	SE6	SE5	SSE5	S5	SSE3	S4	SSE1	NE3	ESE4	SSE4	WNW0	N5	N5	NNW4	NNW3	NW5	N5	N5	NNW4	NNW4	NNW3	NW2	NNW5	NNW3	N0.9	SE6	
11-Jan	N2	ESE1	W3	SW2	WNW4	SW3	WSW2	SSW3	SW5	WSW5	SW4	SW6	S5	S7	SSW8	SSE8	SSE9	S8	S11	SSE12	SSE14	S13	SSE15	S14	S5.8	SSE15	
12-Jan	S15	S16	S14	S13	S14	S13	S14	S14	S15	SSW16	SSW15	SSW17	SSW16	SSW16	SSW14	SSW13	SSW12	S12	S13	S11	SSW10	SSW8	SW7	SSW5	S12.9	SSW17	
13-Jan	SSW2	UO	UO	N5	NNE6	NNE6	NNE6	NNE6	NE4	NE5	NE5	NE4	NE4	NE5	NE5	NE6	E6	E7	ESE6	ESE6	ESE6	ESE8	ESE9	SE9	ENE4.3	ESE9	
14-Jan	SE10	SE9	SE10	SE10	SSE12	SSE11	SSE11	SSE10	SE10	SE10	S9	S8	S7	S6	SSW6	SSW5	S4	S4	SSW3	SSW2	SW2	UO	UO	UO	SSE7.1	SSE12	
15-Jan	UO	UO	N1	NNE2	NNE0	NE1	NE1	ENE1	ENE0	ENE1	E2	SE3	SSE3	SSE4	SE3	SE3	SSE3	S3	SSE3	SSE3	SSE3	SSE4	ESE3	ESE2	SE1.8	SSE4	
16-Jan	ESE3	ESE2	E2	E3	ESE3	ESE4	E4	E5	ESE4	ESE5	ESE4	ESE5	ESE6	SE7	SE7	SE8	ESE8	SE9	SE8	SSE9	SSE11	SSE10	SSE10	SSE10	SE5.7	SSE11	
17-Jan	SSE9	SSE9	SSE9	S8	S8	S8	SSW8	S8	S8	S8	S7	S8	S8	SSW8	SSW7	S8	SSE8	SSE8	S7	SSE8	S7	S8	SSE8	SSE8	S7.8	SSE9	
18-Jan	SSE9	S9	S9	S9	SSE9	SSE9	SSE8	SSE9	SSE8	SSE8	SSE8	SSE8	SSE7	SSE7	SSE8	SSE7	SSE7	SSE8	SSE8	SSE8	SSE9	SSE9	SSE8	SSE8	SSE8.0	S9	
19-Jan	SSE8	SSE7	S8	SSW8	SSW8	SSW7	SSW7	SSW7	SSW6	SSW6	SSW5	SW6	SW5	SW5	SW5	SSW6	SSW6	SW6	SSW6	SSW7	SSW6	SSW6	SSW7	SSW7	SSW6.4	SSW8	
20-Jan	SW7	SW7	SW8	SW7	SSW7	SSW6	SSW7	SW8	SW8	SW8	SW8	SW8	SW8	WSW9	WSW9	WSW8	WSW10	WSW8	WSW9	SW9	SW6	SW6	SW6	SSW6	SW7.5	WSW10	
21-Jan	S5	SSW6	SSW5	S6	SSW7	SSW8	SSE6	S7	S10	SSW10	SSW12	SSW13	SSW14	S15	SSW16	SSW17	SSW16	SSW17	SW14	SW13	SW13	SW12	WSW13	WSW13	SSW10.4	SSW17	
22-Jan	WSW9	WSW11	WSW11	WSW11	W12	WSW10	WSW12	W15	W14	NW20	NNW29	NNW26	NNW25	NNW24	NNW26	NNW23	NNW24	NNW20	N17	N16	NNW16	N12	N9	NNW4	NW13.0	NNW29	
23-Jan	NW4	NW5	SSE7	S10	SSE11	SSE11	SE10	SE12	SE11	SE13	SE13	SE15	ESE13	ESE13	ESE12	ESE9	SE7	SE7	S3	ESE4	SE7	SSE7	SSE8	S6	SE7.8	SE15	
24-Jan	SSE6	SSE10	SSE10	S12	S14	S11	S10	SSW13	SSW15	SSW15	SSW14	SW14	WSW13	NNW11	NW12	NNW15	NNW15	NNW14	NNW12	NNW12	NNW10	N8	NNE5	NNE6	WSW3.3	SSW15	
25-Jan	NNE5	NE4	NE3	NE4	UO	UO	UO	UO	UO	UO	UO	SE5	SE3	ESE4	S6	SSW6	SSW6	S6	S7	SSE8	S9	S9	SSE9	SSE9	SSE11	SSE4.6	SSE11
26-Jan	S13	SSW15	SW14	WSW13	W12	NNW25	NNW33	NNW28	NNW20	NNW22	NNW18	NNW17	NW16	NNW15	NNW16	NNW19	NNW16	NNW18	N18	N16	N15	N12	N13	N12	NNW13.1	NNW33	
27-Jan	N12	N10	N10	N11	N10	N10	N9	N7	N6	N6	NNW9	NNW11	NNW8	NNW10	NNW10	NNW9	NNW8	NNW7	NNW10	NNW12	NNW11	NNW11	NNW12	NNW11	NNW9.3	NW12	
28-Jan	NW9	WNW7	WNW7	WNW6	W6	W6	W8	W7	WNW8	NW10	NW10	NNW12	NW13	NW13	NW13	NW14	NNW14	NNW14	NNW16	NNW16	NNW17	NNW14	NNW12	NNW14	NW10.6	NNW17	
29-Jan	NNW12	NW9	NW7	WNW5	WSW6	WSW5	WSW5	WSW6	SW6	SW7	SSW10	SSW9	SSW11	SSW11	SSW11	SSW11	SSW10	SW8	WSW5	NW8	NNW14	NNW14	NNW12	NNW13	W4.9	NNW14	
30-Jan	NNW14	NNW15	NNW12	NNW9	NW6	WNW5	W5	WSW4	WSW5	WSW5	WSW4	W4	NW6	NW6	NW5	NW4	WSW1	W2	SSW2	SSW2	N1	N3	N4	NNW6	NW4.3	NNW15	
31-Jan	NNW6	NNW8	N8	N6	NNW6	N5	NNW7	NNW6	NNW7	NNW5	NNW5	WNW5	NW4	WNW3	W3	WSW3	WSW2	SW3	WSW3	W3	NW4	NNW5	N4	N6	NNW4.1	NNW8	

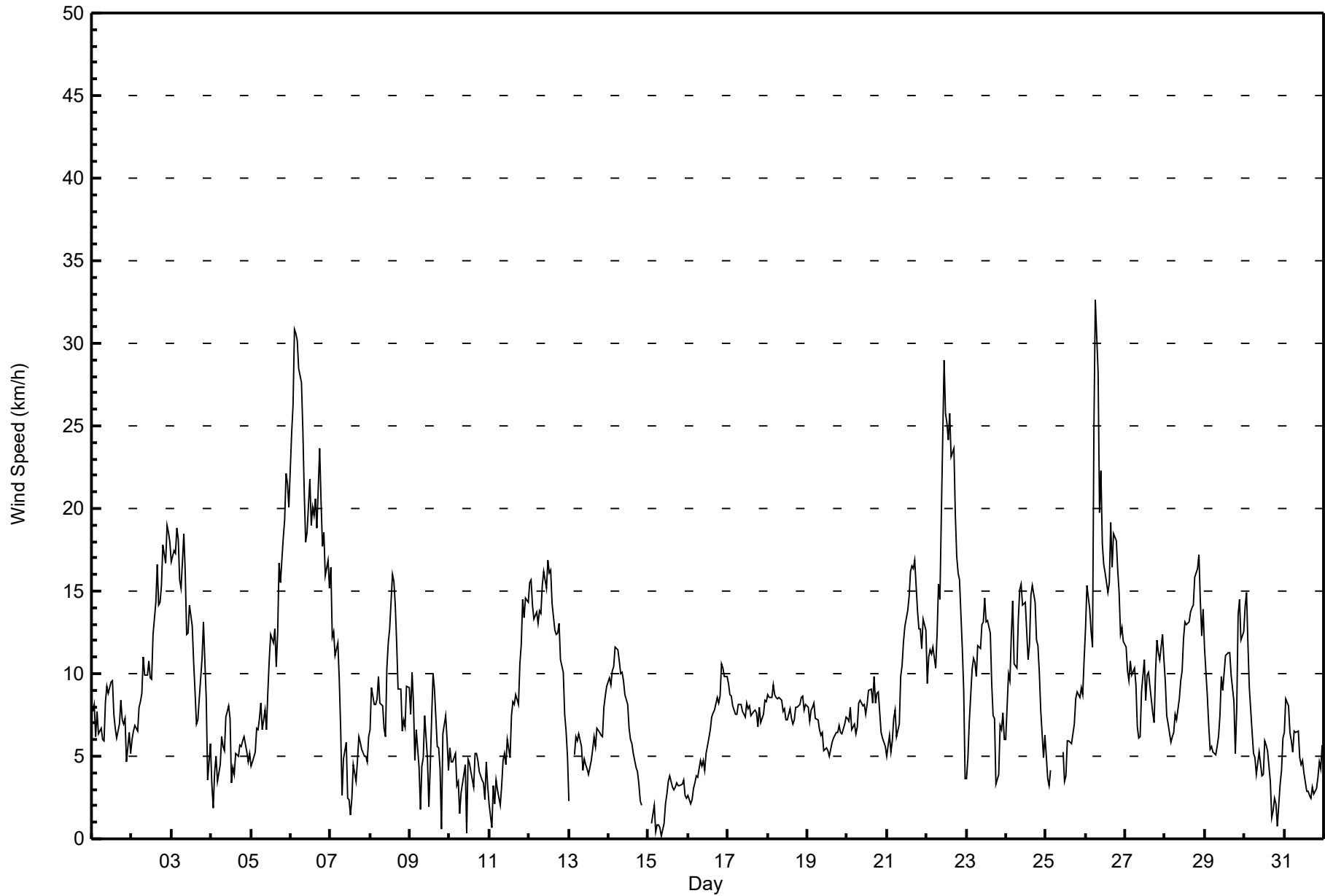
S3.8 S4.3 S4.8 SSW5.0 SSW5.3 SSW4.6 SSW3.9 SSW4.0	S4.4 SSW3.9 SSW3.8 SSW4.1 SSW3.7 SSW3.9 SSW3.5 SSW3.4 SSW2.9 SSW3.5 SSW3.3 SSW3.1 SSW3.0 SSW3.1 SSW3.2 SSW3.1	Diurnal Average
SSE25 SSE26 SSE31 SSE31 SSE30 SSE28 NNW33 NNW28	S21 NNW22 NNW29 NNW26 NNW25 NNW24 NNW26 NNW23 NNW24 SSW24 SSW20 SSE18 SSE19 SSE22 SSE22 SSE20	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Firebag - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	184	25.17	25.17
6 - 11	352	48.15	73.32
12 - 19	163	22.30	95.62
20 - 28	27	3.69	99.32
29 - 38	5	0.68	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 731

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	13	4	14	4	7	17	8	17	16	21	16	14	7	7	8	11	184
6 - 11	14	5	1	1	2	17	25	70	59	72	34	13	4	5	11	19	352
12 - 19	10	0	0	0	0	3	8	14	22	47	12	6	3	0	7	31	163
20 - 28	0	0	0	0	0	0	0	8	2	5	0	0	0	0	1	11	27
29 - 38	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	5
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	9	15	5	9	37	41	112	99	145	62	33	14	12	27	74	731

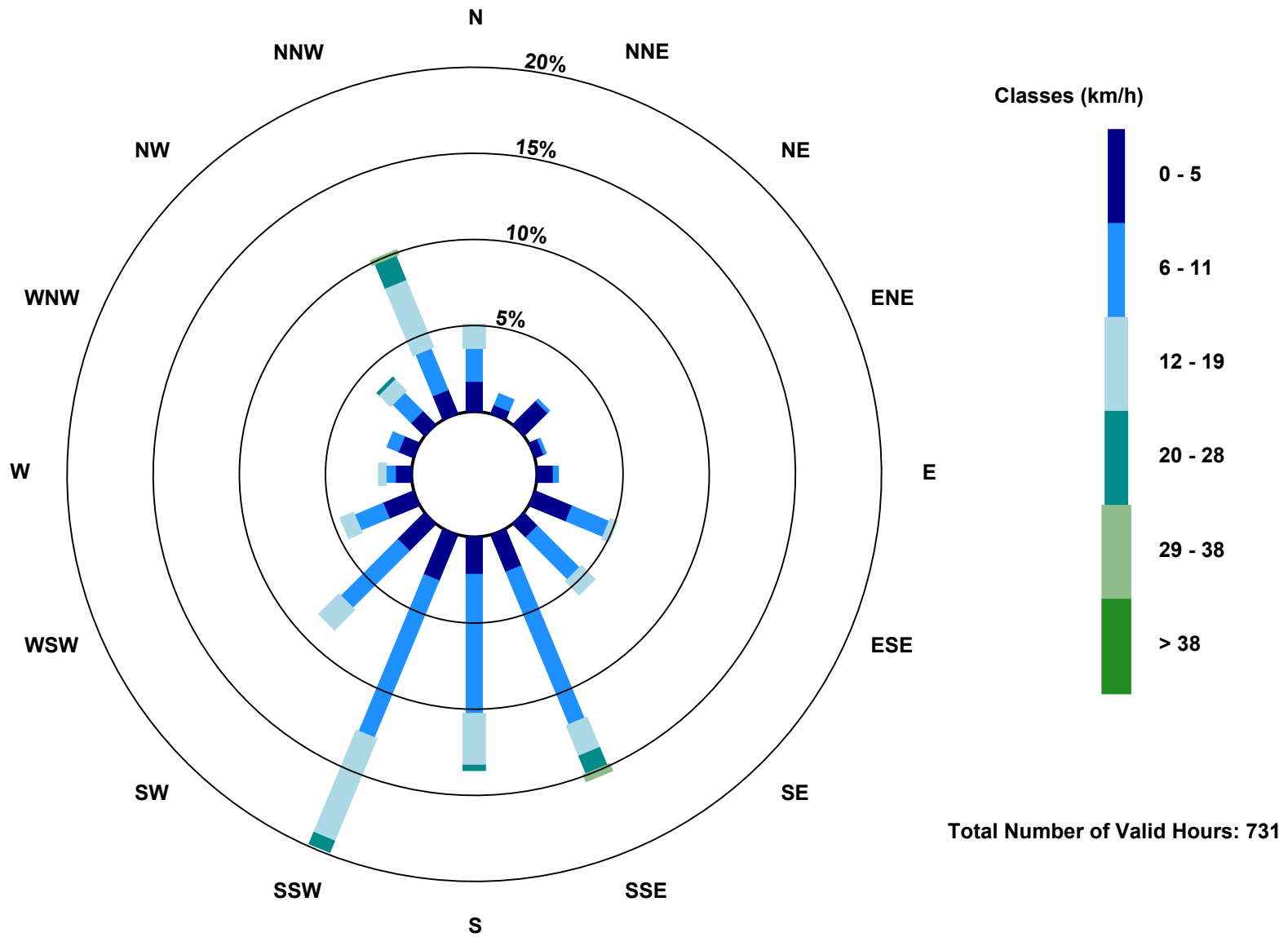
Total Number of Valid Hours: 731

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Firebag





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 22 10:00	Hours in Service: 744 Hours of Data: 731 Hours of Missing Data: 13 Hours of Calibration: 0 Percent Operational Time: 98.3
Minimum Value: 0 km/h on Jan 15 18:00	
Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 1 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 6	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
2-Jan	1	1	1	1	1	2	1	2	1	1	1	2	2	2	2	2	3	3	3	3	2	3	3	3	3
3-Jan	2	2	3	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	3	2	1	1	3
4-Jan	2	1	1	1	0	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2
5-Jan	1	1	1	1	0	1	1	1	1	0	1	2	2	2	2	2	2	3	2	2	2	3	3	3	3
6-Jan	4	4	4	4	5	4	4	4	3	3	4	3	3	3	4	3	3	3	3	3	2	2	2	2	5
7-Jan	2	5	4	2	1	2	1	2	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	5
8-Jan	2	1	2	2	1	1	2	1	2	2	2	1	2	3	2	2	2	2	3	3	2	1	2	2	3
9-Jan	2	2	2	1	1	1	1	1	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1	1	2
10-Jan	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
11-Jan	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2
12-Jan	2	2	2	2	2	2	2	2	3	2	3	3	2	2	3	2	2	2	2	2	2	2	2	1	3
13-Jan	1	UO	UO	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
14-Jan	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	2	2	2
15-Jan	UO	UO	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1
16-Jan	0	1	1	0	0	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	1	2
17-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2
18-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2
21-Jan	1	1	1	1	2	1	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	3
22-Jan	2	2	2	2	2	2	4	3	3	8	7	6	6	6	6	5	6	4	4	3	3	3	2	2	8
23-Jan	1	1	1	1	2	2	2	2	2	3	3	3	2	3	2	2	2	2	2	3	2	1	1	1	3
24-Jan	1	1	1	2	2	2	2	2	2	2	3	2	3	3	2	3	3	3	3	3	2	2	1	1	3
25-Jan	1	1	1	1	UO	UO	UO	UO	UO	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26-Jan	2	2	2	2	3	7	7	6	5	5	4	4	4	4	3	5	4	5	4	3	3	2	3	3	7
27-Jan	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	1	2	2	2	2	3	2	3
28-Jan	2	1	2	1	1	1	2	2	2	2	2	3	3	3	3	3	3	3	3	4	3	3	2	3	4
29-Jan	2	2	1	1	1	1	1	1	1	2	1	1	2	1	1	1	2	1	1	2	2	3	2	2	3
30-Jan	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	0	1	1	0	1	1	3
31-Jan	1	2	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	0	0	1	1	0	1	2
	4	5	4	4	5	7	7	6	5	8	7	6	6	6	6	5	6	5	4	4	3	3	3	3	

Diurnal Maximum

UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Firebag - January 2023

Direction of Maximum Speed: 336 deg on Jan 26 07:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 181.1 deg on Jan 6		Hours of Data:	731
Direction of Minimum Speed: 66 deg on Jan 15 09:00		Hours of Missing Data:	13
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 10		Percent Operational Time:	98.3
Monthly Average Direction: 197.4 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	197	201	212	226	228	222	220	215	202	202	204	210	211	219	218	216	208	211	214	217	213	198	206	197	211.1
2-Jan	203	205	204	194	183	181	181	191	183	192	194	205	201	211	209	216	224	219	223	220	216	212	210	210	206.9
3-Jan	204	193	196	197	194	192	194	188	194	194	195	186	188	205	197	177	186	169	181	182	200	191	219	199	192.5
4-Jan	166	273	216	199	206	215	215	200	199	214	218	223	231	223	221	208	207	209	204	205	204	198	205	197	209.4
5-Jan	178	182	194	190	177	171	174	174	172	173	188	184	164	169	165	150	142	154	152	156	155	156	156	155	163.1
6-Jan	159	161	160	158	158	164	169	169	169	169	182	190	199	201	198	200	198	202	206	203	197	199	202	209	181.1
7-Jan	211	208	205	201	211	215	211	289	39	64	118	129	155	188	81	218	102	186	188	186	153	175	158	152	188.5
8-Jan	157	162	156	166	168	168	153	142	125	140	146	151	156	156	142	142	136	120	110	123	109	121	145	145	144.6
9-Jan	129	110	121	170	137	153	357	61	107	142	162	188	99	118	134	149	168	170	172	228	171	162	168	136	140.4
10-Jan	135	138	167	183	163	174	160	41	111	164	295	351	6	342	341	315	356	5	345	336	346	326	339	347	7.9
11-Jan	350	119	263	227	288	229	243	208	226	239	215	214	189	183	196	166	156	170	169	160	163	169	165	176	182.6
12-Jan	180	183	184	178	174	182	175	179	188	193	195	192	195	197	196	197	194	191	191	190	199	207	214	204	189.4
13-Jan	192	UO	UO	6	28	19	22	29	44	41	41	43	50	50	54	56	84	95	112	113	115	114	123	124	71.7
14-Jan	127	134	137	142	151	156	157	159	162	163	171	171	169	173	197	196	183	177	195	210	236	UO	UO	UO	160.5
15-Jan	UO	UO	2	17	33	40	49	58	66	72	95	144	157	156	142	143	162	171	148	147	151	155	123	113	137.3
16-Jan	109	106	87	97	107	116	99	97	112	112	116	118	119	125	125	125	119	131	142	149	157	160	159	159	131.2
17-Jan	160	161	164	174	181	184	193	188	190	187	182	178	187	195	193	169	164	166	170	163	173	177	166	168	176.1
18-Jan	166	171	171	169	164	166	165	160	159	153	156	154	150	150	151	149	152	154	158	162	161	158	161	164	159.8
19-Jan	168	166	172	192	194	197	200	200	199	206	209	220	220	217	215	208	205	214	211	207	207	210	213	213	201.5
20-Jan	218	216	221	215	213	213	210	214	215	223	230	223	233	237	240	242	241	239	238	234	231	231	218	213	226.3
21-Jan	185	198	194	191	198	197	161	173	188	192	197	193	192	191	201	201	205	212	220	234	231	231	240	252	206.5
22-Jan	244	247	247	246	259	256	252	259	268	313	343	342	327	334	333	328	332	347	352	352	343	353	8	327	318.2
23-Jan	318	318	166	172	167	149	138	146	136	125	124	129	117	114	114	115	124	139	187	122	137	160	166	179	138.0
24-Jan	161	157	162	188	191	172	169	193	195	203	213	220	248	285	324	344	345	343	341	340	343	0	19	21	243.9
25-Jan	27	43	45	44	UO	UO	UO	UO	UO	UO	144	125	121	173	208	196	179	175	168	172	174	166	164	159	160.0
26-Jan	171	203	217	240	276	327	336	341	344	346	334	328	326	336	331	329	339	345	350	359	3	4	1	6	333.3
27-Jan	5	8	3	4	358	350	353	350	353	350	333	333	336	329	331	335	337	332	330	331	320	327	325	321	340.8
28-Jan	312	294	292	285	280	276	279	280	296	312	313	327	319	325	317	321	328	337	337	336	339	337	336	334	319.7
29-Jan	328	324	311	299	252	241	245	237	220	216	212	197	205	204	198	201	212	221	254	315	337	337	334	332	261.4
30-Jan	334	337	340	336	326	296	279	256	250	244	255	281	313	312	308	307	241	263	205	198	357	4	349	342	313.2
31-Jan	346	342	350	352	342	349	348	342	341	347	329	294	305	301	270	257	257	236	238	274	318	340	352	356	330.1

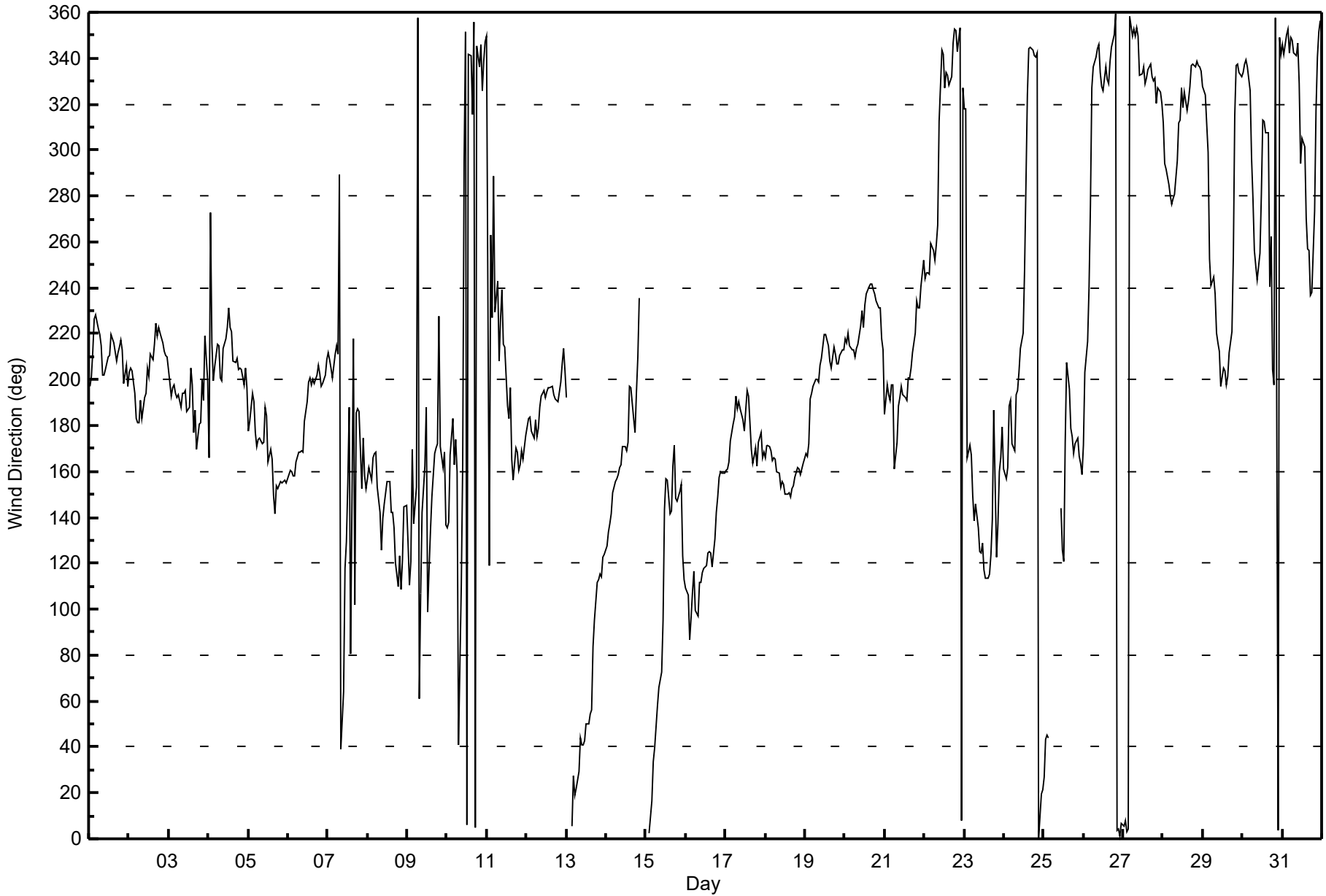
185.5	187.7	189.1	192.3	192.7	195.3	196.8	194.2	190.5	195.7	202.6	204.5	207.3	207.5	207.8	209.2	201.5	199.2	204.3	205.8	201.5	192.3	192.1	192.6
Diurnal Average																							

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Firebag - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Firebag - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 89 deg on Jan 10 11:00	Hours of Data: 731
Minimum Value: 0 deg on Jan 23 02:00	Hours of Missing Data: 13
Percentiles: P ₁ = 5 P ₁₀ = 8 Q ₁ = 9 Median = 11 Q ₃ = 14 P ₉₀ = 20 P ₉₉ = 57	Hours of Calibration: 0
	Percent Operational Time: 98.3

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	12	15	13	13	13	12	12	12	8	8	8	9	10	11	12	11	9	8	10	9	10	17	11	8	17
2-Jan	8	9	7	7	12	10	9	8	9	8	9	10	8	9	10	10	8	10	9	9	8	9	9	8	12
3-Jan	9	7	7	6	6	5	5	5	6	7	6	7	7	12	9	14	16	12	10	7	9	10	18	15	18
4-Jan	13	48	8	13	11	7	6	12	15	7	9	10	18	18	22	12	8	10	9	8	10	12	12	12	48
5-Jan	7	17	14	11	7	4	6	7	8	6	6	9	7	10	8	12	8	8	7	7	7	7	8	8	17
6-Jan	8	8	7	8	8	8	8	7	8	8	8	8	9	8	7	7	7	8	8	8	6	8	6	8	9
7-Jan	9	13	10	10	9	14	16	66	17	26	45	47	55	49	31	41	45	23	17	18	11	9	11	7	66
8-Jan	9	6	11	8	8	8	13	11	18	17	10	8	8	8	10	8	10	13	11	20	15	15	13	11	20
9-Jan	14	19	21	29	12	13	57	31	27	15	23	61	22	14	15	9	17	18	15	68	16	8	15	28	68
10-Jan	22	21	10	20	11	10	52	52	21	11	89	23	19	21	29	20	13	13	14	13	17	21	16	19	89
11-Jan	12	84	22	42	24	26	20	26	12	15	11	13	23	9	12	14	9	12	11	8	8	9	9	10	84
12-Jan	7	10	10	8	8	7	9	10	9	10	10	10	9	9	10	10	10	9	9	9	10	11	12	18	18
13-Jan	55	UO	UO	21	12	13	13	13	9	9	11	11	15	10	11	13	14	15	14	13	14	12	15	14	55
14-Jan	13	14	13	13	10	9	9	9	8	8	9	9	10	8	12	11	10	8	14	34	38	UO	UO	UO	38
15-Jan	UO	UO	17	13	9	6	4	4	5	11	12	23	16	12	11	10	14	12	8	12	12	14	17	23	23
16-Jan	20	20	12	12	13	15	13	13	15	15	15	14	13	13	12	13	13	14	10	11	9	8	8	8	20
17-Jan	8	8	8	10	8	10	9	8	9	8	11	10	10	10	11	10	7	8	11	9	25	12	8	9	25
18-Jan	14	10	9	10	9	10	9	9	10	9	8	10	10	9	9	10	10	9	10	10	9	9	9	9	14
19-Jan	9	8	9	9	9	9	9	8	9	8	9	9	9	10	9	8	8	9	9	8	8	9	8	8	10
20-Jan	8	8	8	10	12	8	8	9	9	11	9	11	9	11	11	11	10	10	10	9	8	8	8	10	12
21-Jan	9	7	13	8	11	12	8	10	8	8	9	8	7	6	7	8	8	9	10	9	8	9	10	13	13
22-Jan	15	11	10	11	12	13	17	12	14	27	15	14	12	13	11	11	13	13	12	14	12	15	19	20	27
23-Jan	0	0	51	10	9	13	14	12	15	13	13	12	12	11	11	13	15	13	54	45	16	10	14	20	54
24-Jan	20	7	10	7	8	13	10	8	8	8	10	11	13	20	14	13	13	12	12	11	11	15	19	14	20
25-Jan	14	19	25	12	UO	UO	UO	UO	UO	UO	12	17	23	12	12	13	14	10	9	9	8	8	7	7	25
26-Jan	12	8	10	16	20	14	12	13	14	13	14	12	12	12	11	14	12	12	15	12	15	14	15	14	20
27-Jan	15	13	12	13	12	13	11	12	3	9	12	11	11	12	13	12	11	11	11	11	12	12	13	12	15
28-Jan	12	13	12	14	15	16	16	16	13	13	11	14	13	13	13	13	13	13	12	13	12	13	12	11	16
29-Jan	12	12	12	20	14	12	12	11	11	10	10	7	9	9	7	9	11	11	19	17	12	12	11	11	20
30-Jan	12	10	11	10	9	19	11	9	13	13	18	24	20	19	19	33	63	69	22	39	23	11	15	9	69
31-Jan	12	12	15	13	14	13	14	15	14	14	17	21	23	42	50	38	17	7	11	17	10	12	10	12	50
	55	84	51	42	24	26	57	66	27	27	89	61	55	49	50	41	63	69	54	68	38	21	19	28	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20 MACKAY RIVER JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)

JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	709	35	35	100	25.9	0	5	0
H2S (ppb) Average	708	36	36	100	3	0	0.5	0
THC (ppm) Average	709	35	35	100	3.3	-	2.5	-
NO2 (ppb) Average	709	35	35	100	30.3	0	7.7	-
NO (ppb) Average	709	35	35	100	34.3	-	3.7	-
NOX (ppb) Average	709	35	35	100	58.6	-	10.7	-
Temperature 2 m (C) Average	744	0	0	100	1.8	-	-1.8	-
Relative Humidity (%) Average	744	0	0	100	96.9	-	94.3	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	22	-	12	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-
Precipitation (mm) Total	744	0	0	100	1.3	-	4	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.6	1.9	-	0	0	0	0.1	0.4	1.3	25.9
H2S (ppb) Average	708	0.31	0.2	-	0	0.2	0.2	0.3	0.3	0.5	3
THC (ppm) Average	709	2.4	0.1	-	2.2	2.3	2.3	2.4	2.4	2.6	3.3
NO2 (ppb) Average	709	2.98	3.9	-	0.1	0.5	1.1	2	3	5.6	30.3
NO (ppb) Average	709	0.26	1.7	-	0	0	0	0	0.1	0.4	34.3
NOX (ppb) Average	709	3.23	4.8	-	0.1	0.5	1.2	2.2	3.1	5.9	58.6
Temperature 2 m (C) Average	744	-9.84	5.7	-	-30.3	-18.9	-11.5	-8.8	-6.3	-4.1	1.8
Relative Humidity (%) Average	744	87.96	6.5	-	60.2	78.3	86.5	90.2	92.1	93.4	96.9
Wind Speed 10 m (km/h) Average	740	5.7	3	-	0	2	4	5	7	9	22
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	10.03	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	07 Jan 2023 20:00	07 Jan 2023 20:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	10 Jan 2023 21:00	10 Jan 2023 21:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 04:00	15 Jan 2023 05:00	2	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

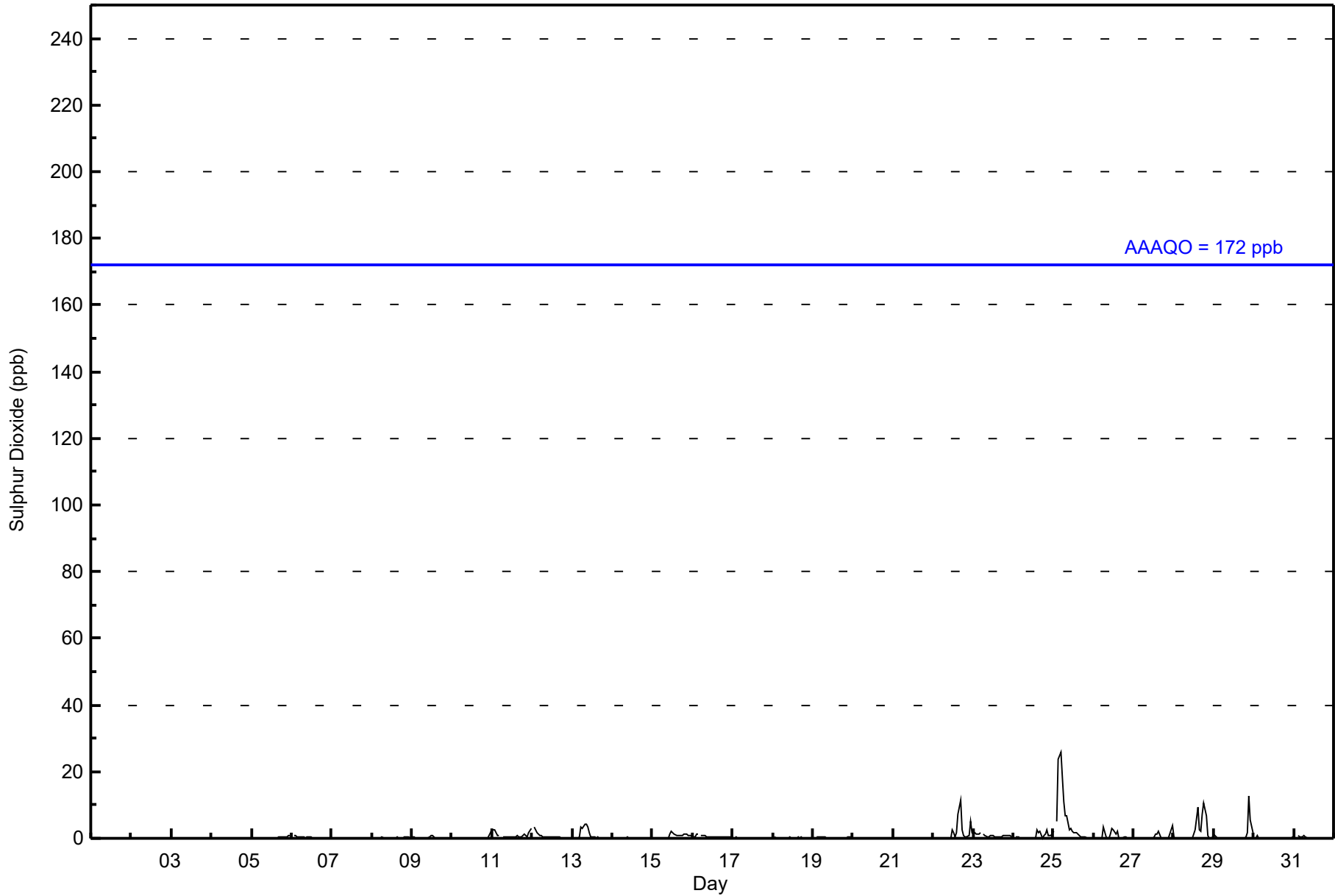
Mackay River - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 25.9 ppb on Jan 25 05:00		Maximum Daily Average: 5.0 ppb on Jan 25		Hours of Data: 709																	0.1		0.2																										
Minimum Value: 0.0 ppb on Jan 1 04:00		Minimum Daily Average: 0.0 ppb on Jan 20		Hours of Missing Data: 35																	0.0		0.1																										
Maximum Diurnal Average: 1.2 ppb at hour 4		Minimum Diurnal Average: 0.3 ppb at hour 10		Hours of Calibration: 35																	0.0		0.2																										
Monthly Average: 0.60 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.3 P ₉₉ = 9.3		Percent Operational Time: 100.0																	0.1		0.1																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2																							
2-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
3-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0																						
4-Jan	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
5-Jan	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.5	0.4	0.6	0.7	0.7	0.7	0.7																						
6-Jan	Z	0.8	0.8	0.6	0.4	0.5	0.6	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																						
7-Jan	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1																						
8-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.3	0.1	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.4																						
9-Jan	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.9	0.8	0.3	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.9																						
10-Jan	0.1	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9	1.7	0.2	0.2	1.7																						
11-Jan	2.4	2.7	1.5	1.0	0.7	Z	0.6	0.4	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.4	0.9	1.3	0.8	0.5	1.8	3.2	1.0	1.0	3.2																						
12-Jan	Z	3.5	2.7	1.8	1.1	0.7	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.6	3.5																						
13-Jan	0.1	Z	0.1	0.1	0.4	3.2	3.1	4.3	4.2	3.4	1.8	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	1.0	4.3																						
14-Jan	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.2																					
15-Jan	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	1.1	1.9	1.6	1.3	1.0	0.9	0.7	0.7	0.9	1.4	1.3	1.1	0.9	0.8	0.7	0.7	1.9	1.9																					
16-Jan	0.6	0.6	1.2	1.3	Z	1.0	0.7	0.7	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.5	1.3																						
17-Jan	0.2	0.2	0.3	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	C	C	C	C	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3																					
18-Jan	Z	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.0	0.1	0.1	0.0	0.1	0.1	0.3	0.3																					
19-Jan	0.1	Z	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.0	0.2	0.2	0.4	0.4																					
20-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																				
21-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1																				
22-Jan	0.1	0.1	0.0	0.1	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	2.4	1.7	0.2	1.6	7.3	11.2	2.6	0.7	0.5	0.3	0.9	4.9	1.7	1.6	11.2	11.2																					
23-Jan	1.1	1.8	1.3	1.4	1.8	Z	1.3	0.7	0.5	0.6	0.7	0.7	0.7	0.6	0.5	0.5	0.3	0.4	0.8	0.8	0.8	1.0	0.7	0.6	0.8	0.8	1.8	1.8																					
24-Jan	Z	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	2.6	1.5	2.3	0.2	1.0	1.2	2.5	1.0	0.7	1.8	0.7	2.6	2.6																					
25-Jan	2.3	Z	5.1	23.6	25.9	18.3	11.2	6.6	6.8	2.6	3.1	2.1	1.8	1.6	1.5	0.8	0.5	0.4	0.3	0.2	0.1	0.2	0.2	0.1	5.0	5.0	25.9	25.9																					
26-Jan	0.1	0.0	Z	0.1	0.1	0.1	3.4	0.4	0.2	0.1	1.3	2.8	2.4	1.3	2.1	0.2	0.2	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.7	0.7	3.4	3.4																					
27-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.3	1.2	1.4	2.3	0.0	0.1	0.0	0.0	0.0	0.1	2.6	3.7	0.6	0.6	3.7	3.7																					
28-Jan	0.5	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.7	9.4	2.7	2.1	7.4	10.6	6.8	0.8	0.2	0.1	0.1	1.9	1.9	10.6	10.6																					
29-Jan	1.4	0.5	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	1.9	12.8	5.6	1.7	1.1	1.1	12.8	12.8																					
30-Jan	Z	0.1	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.6	0.6																				
31-Jan	0.6	Z	1.0	0.5	0.3	0.2	1.0	0.5	0.1	0.1	0.2	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2	0.2	0.2	1.0	1.0																				
																								0.4	0.5	0.6	1.2	1.2	1.0	0.8	0.5	0.5	0.3	0.4	0.5	0.5	0.4	0.8	0.6	0.6	0.5	0.6	0.5	0.4	0.7	0.7	0.6	Diurnal Average	
																								2.4	3.5	5.1	23.6	25.9	18.3	11.2	6.6	6.8	3.4	3.1	2.8	2.4	2.7	9.4	7.3	11.2	7.4	10.6	6.8	2.5	12.8	5.6	3.7	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mackay River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mackay River - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	702	99.01	99.01
11 - 20	5	0.71	99.72
21 - 60	2	0.28	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	14	27	17	28	34	49	44	45	126	75	54	60	44	33	32	17	699
11 - 20	0	0	0	0	1	0	0	0	0	1	0	0	0	0	3	0	5
21 - 60	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	17	28	37	49	44	45	126	76	54	60	44	33	35	17	706

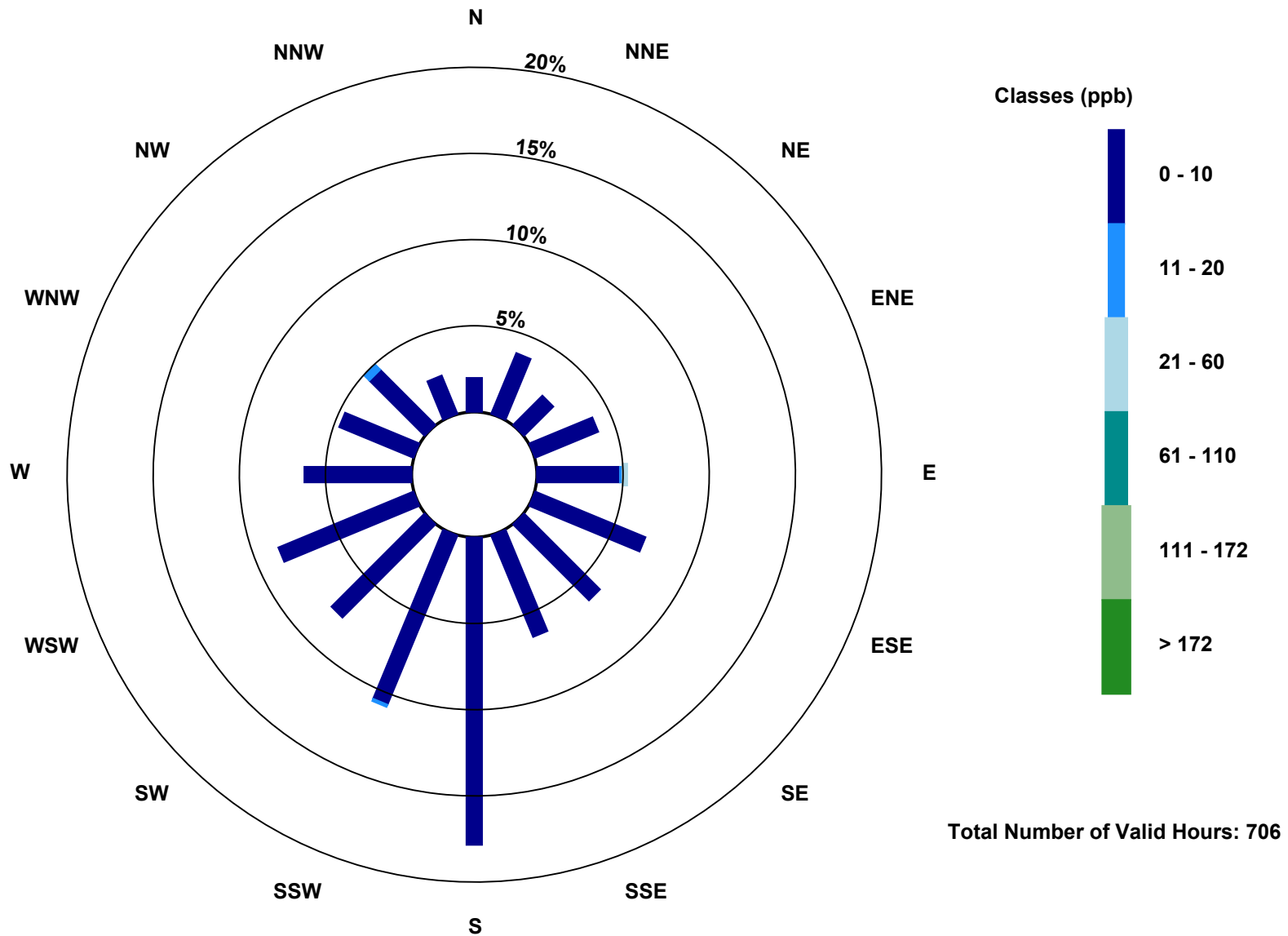
Total Number of Valid Hours: 706

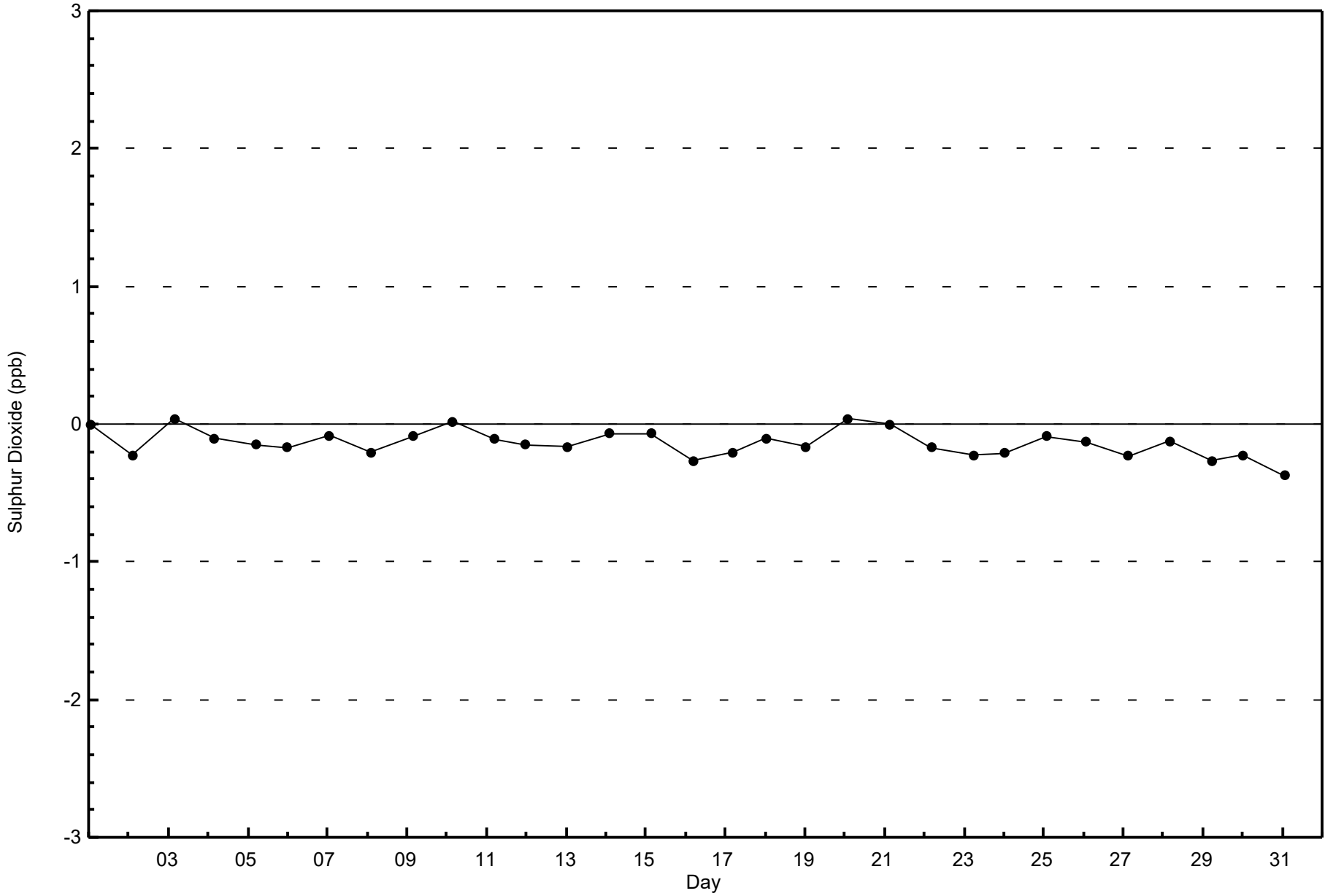
Total Number of Hours: 744

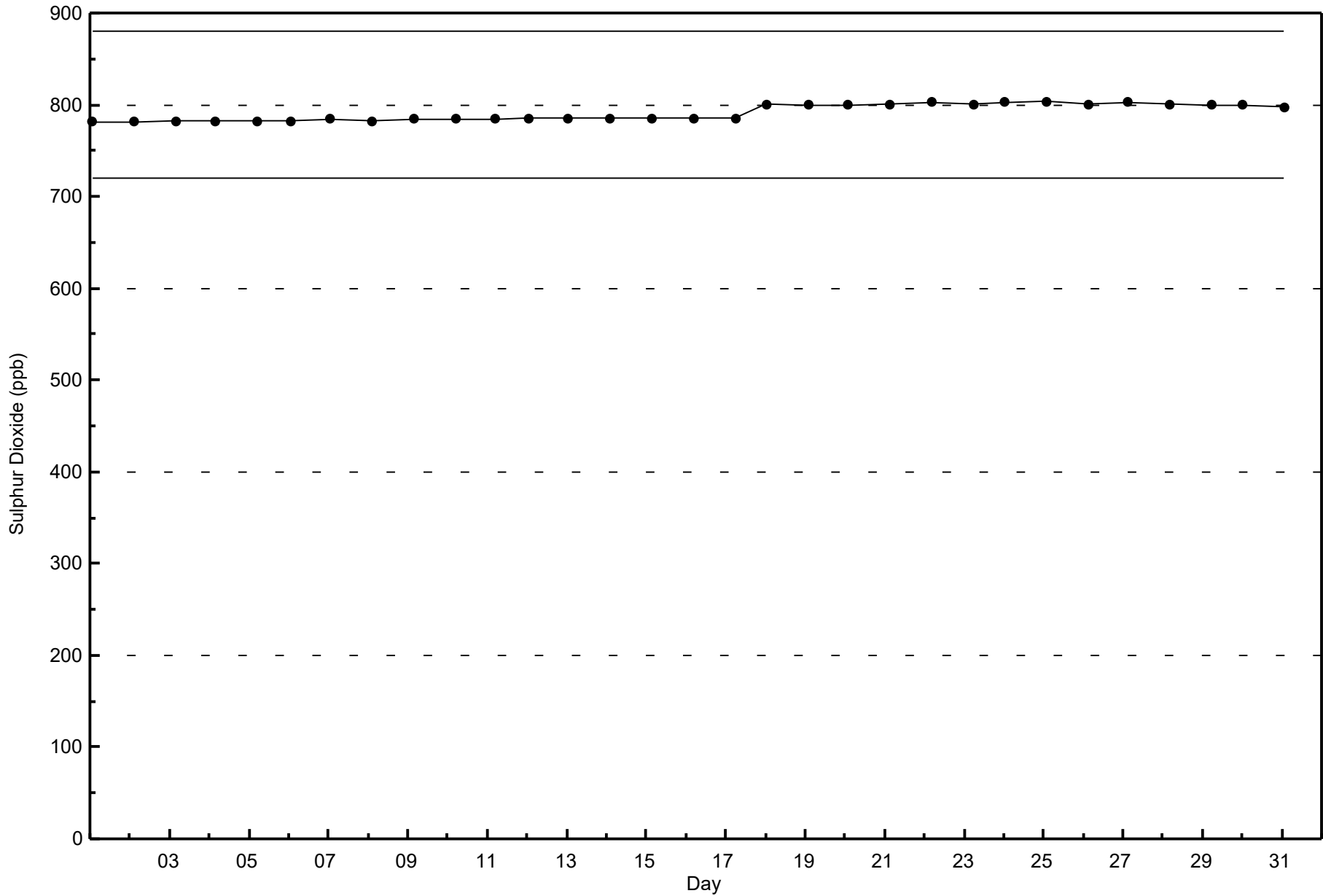


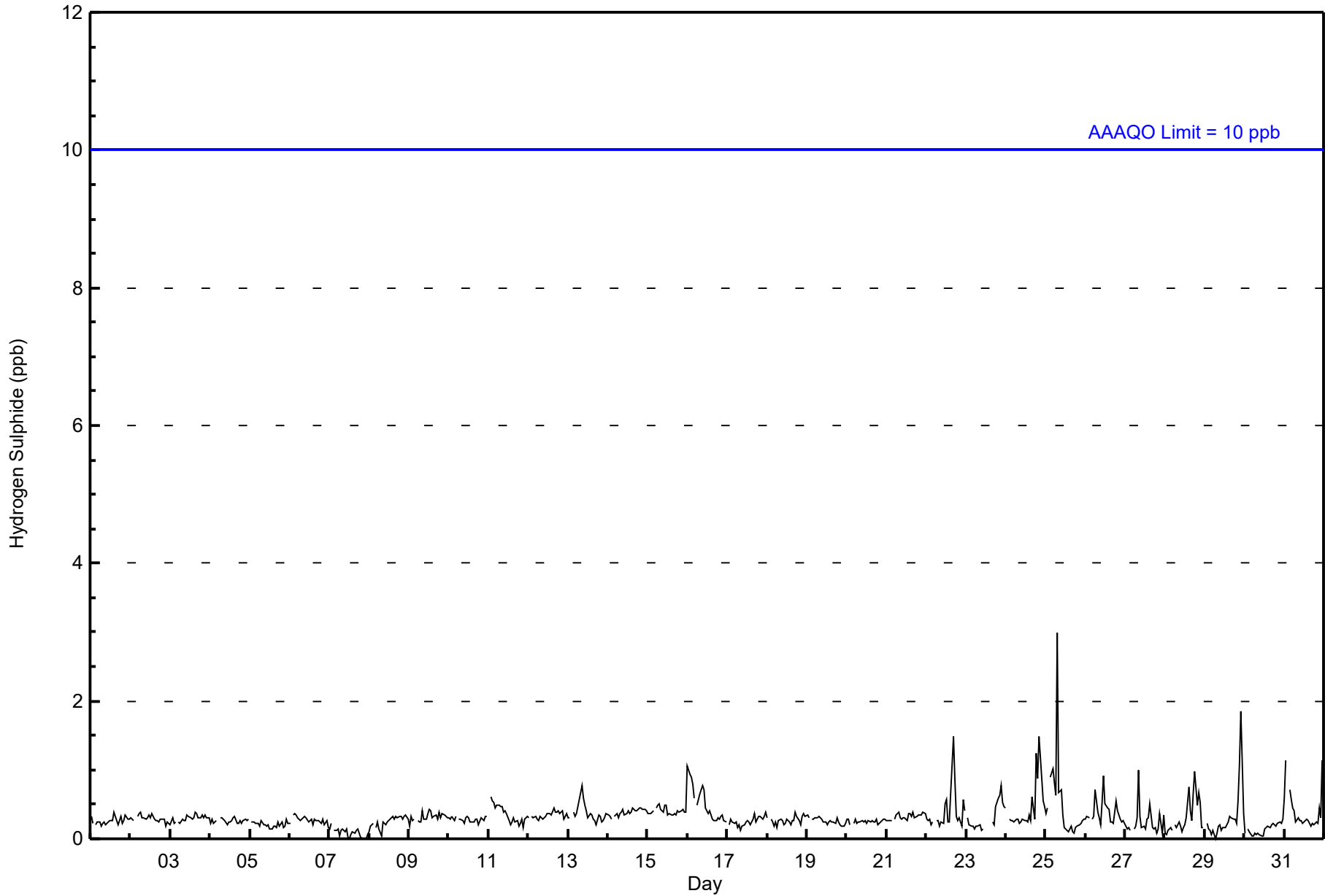
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Mackay River











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	99.86	99.86
3 - 4	1	0.14	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	14	27	15	25	38	51	43	43	129	78	53	61	46	30	34	17	704
3 - 4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	15	26	38	51	43	43	129	78	53	61	46	30	34	17	705

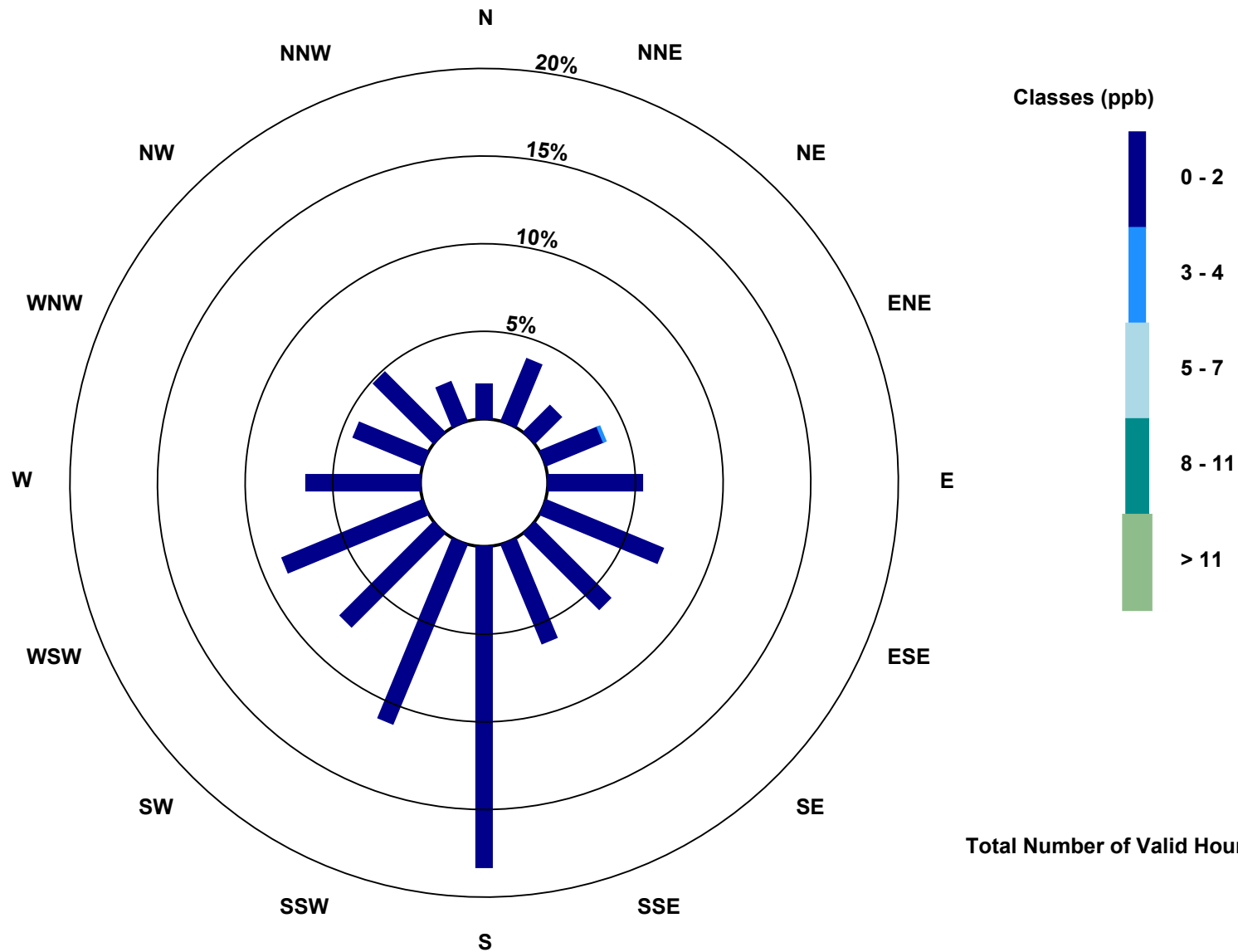
Total Number of Valid Hours: 705

Total Number of Hours: 744

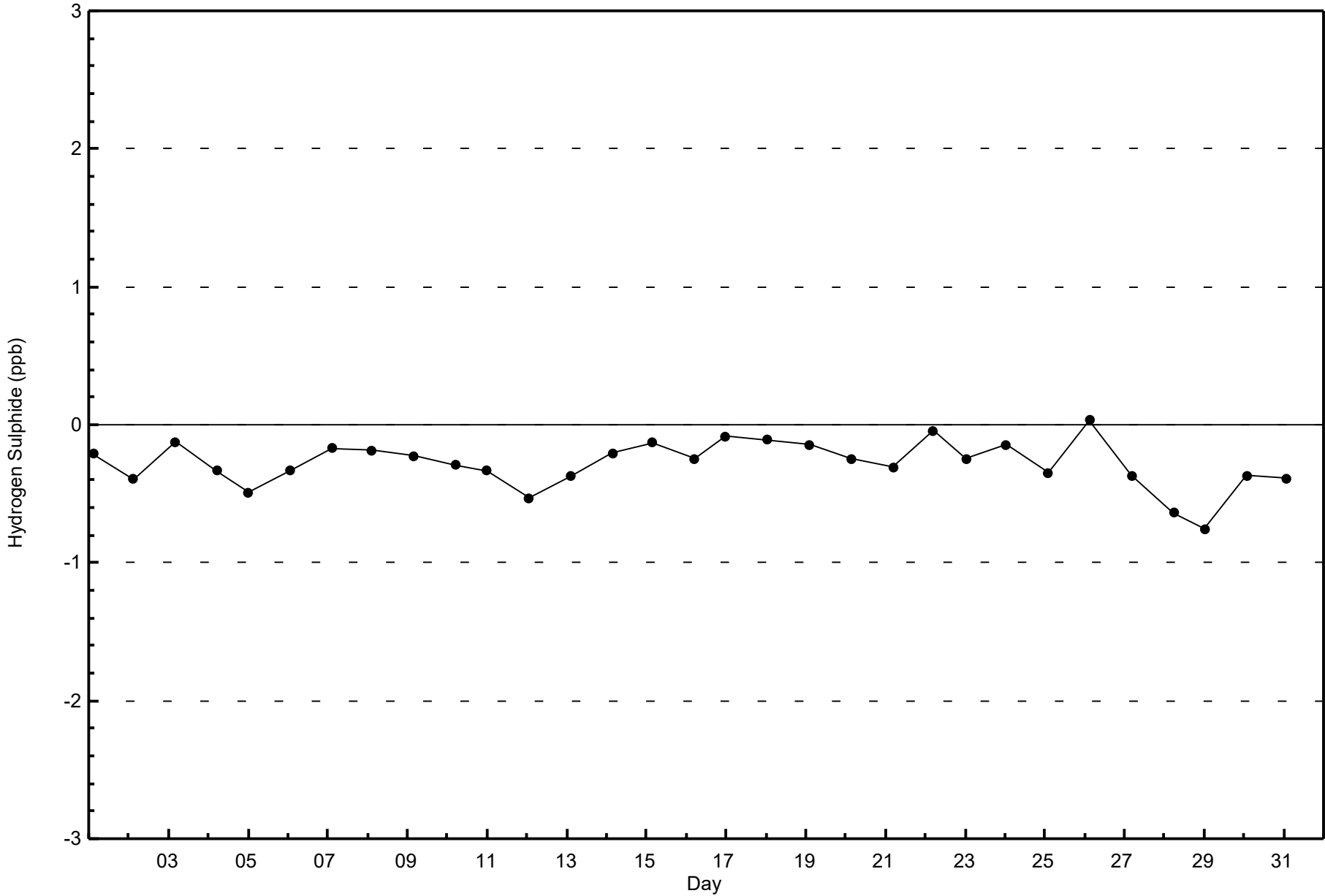


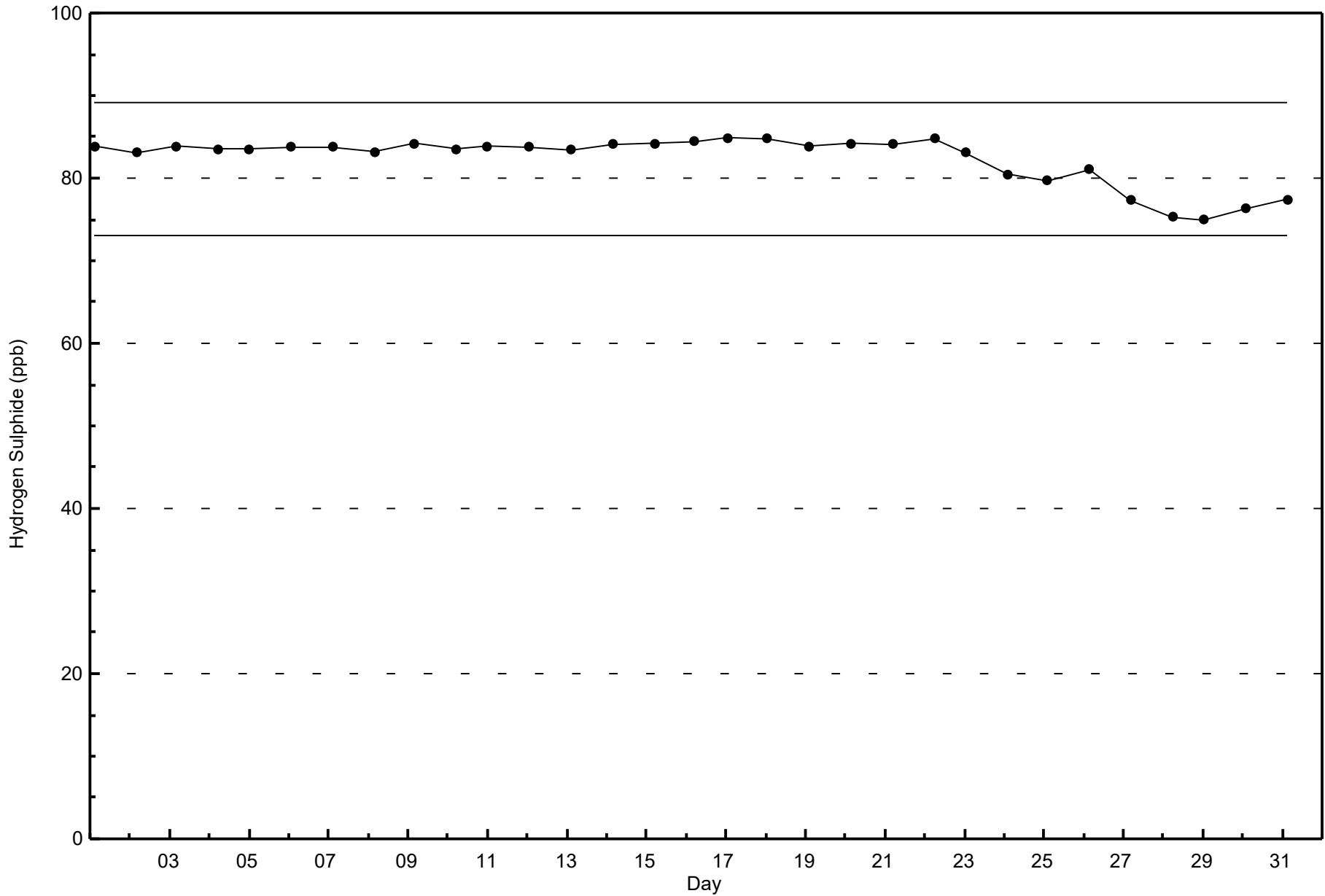
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Mackay River



Total Number of Valid Hours: 705





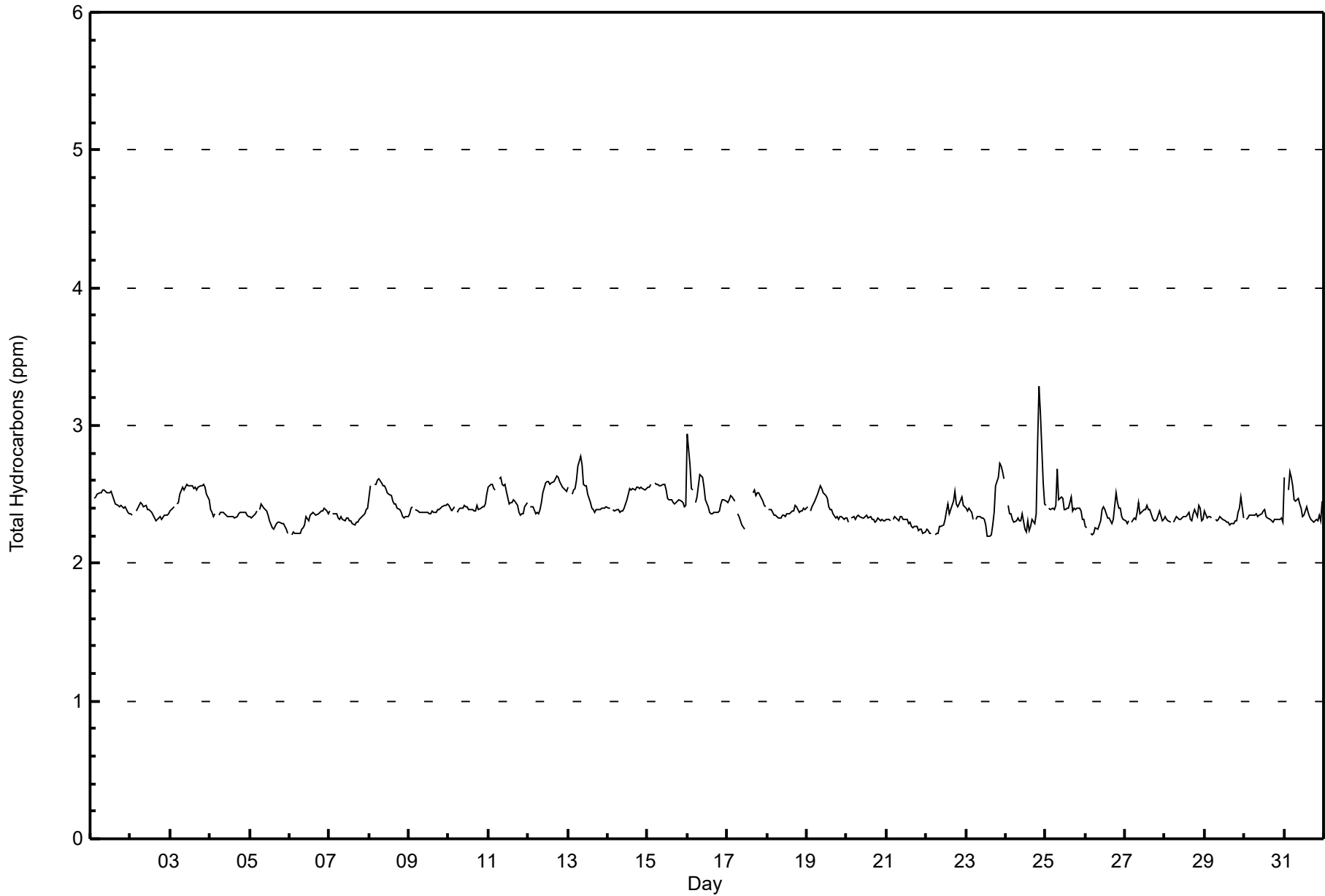


Maximum Value: 3.3 ppm on Jan 24 21:00		Maximum Daily Average: 2.5 ppm on Jan 3		Hours in Service: 744																																												
Minimum Value: 2.2 ppm on Jan 23 15:00		Minimum Daily Average: 2.3 ppm on Jan 21		Hours of Data: 709																																												
Maximum Diurnal Average: 2.4 ppm at hour 1		Minimum Diurnal Average: 2.4 ppm at hour 17		Hours of Missing Data: 35																																												
Monthly Average: 2.40 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.3 Q ₁ = 2.3 Median = 2.4 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 2.7		Hours of Calibration: 35																																												
				Percent Operational Time: 100.0																																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	2.6	Z	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6																						
2-Jan	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4																						
3-Jan	2.4	2.4	2.4	Z	2.4	2.4	2.5	2.6	2.5	2.6	2.6	2.6	2.6	2.5	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.6																						
4-Jan	2.4	2.4	2.3	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4																						
5-Jan	2.3	2.3	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.4																						
6-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3																						
7-Jan	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3																						
8-Jan	2.5	2.6	Z	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.5	2.6																						
9-Jan	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4																						
10-Jan	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.5																						
11-Jan	2.6	2.6	2.6	2.5	2.5	Z	2.6	2.6	2.6	2.6	2.6	2.5	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5																						
12-Jan	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.6																						
13-Jan	2.6	Z	2.5	2.5	2.5	2.6	2.7	2.8	2.7	2.6	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5																						
14-Jan	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.5	2.6	2.5	2.5	2.5	2.5	2.6																						
15-Jan	2.5	2.6	2.6	Z	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.6																						
16-Jan	2.9	2.7	2.5	2.5	Z	2.4	2.5	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.5	2.9																						
17-Jan	2.4	2.5	2.5	2.5	2.5	Z	2.4	2.3	2.3	2.3	2.3	C	C	C	C	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5																						
18-Jan	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4																						
19-Jan	2.4	Z	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6																						
20-Jan	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3																						
21-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3																						
22-Jan	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5																						
23-Jan	2.4	2.4	2.4	2.4	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.7	2.7	2.7	2.7	2.6	2.4	2.7																						
24-Jan	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.4	2.9	3.3	3.1	2.6	2.4	2.4	3.3																						
25-Jan	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.7	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.7																						
26-Jan	2.3	2.3	Z	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.5																						
27-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.4																						
28-Jan	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.4																						
29-Jan	2.4	2.3	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.3	2.3	2.5																						
30-Jan	Z	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																						
31-Jan	2.6	Z	2.5	2.7	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.7																						
																								2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Diurnal Average
																								2.9	2.7	2.6	2.7	2.6	2.6	2.7	2.8	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.9	3.3	3.1	2.7	2.6	Diurnal Maximum
Z - zerospan C - Calibration																																																



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mackay River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mackay River - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	707	99.72	99.72
3.1 - 10.0	2	0.28	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mackay River - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	14	27	17	26	37	49	44	45	126	76	54	60	44	33	35	17	704
3.1 - 10.0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	17	28	37	49	44	45	126	76	54	60	44	33	35	17	706

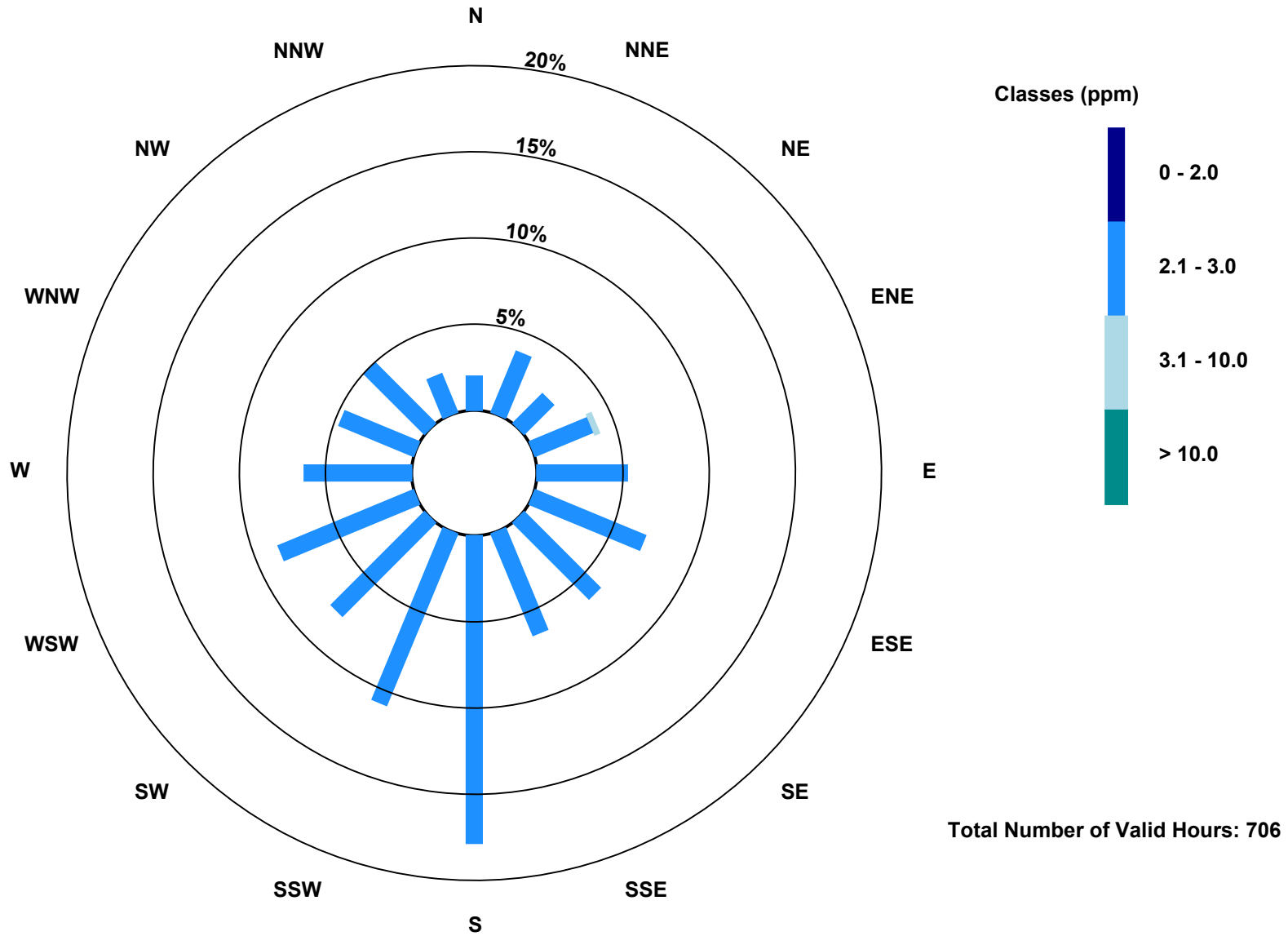
Total Number of Valid Hours: 706

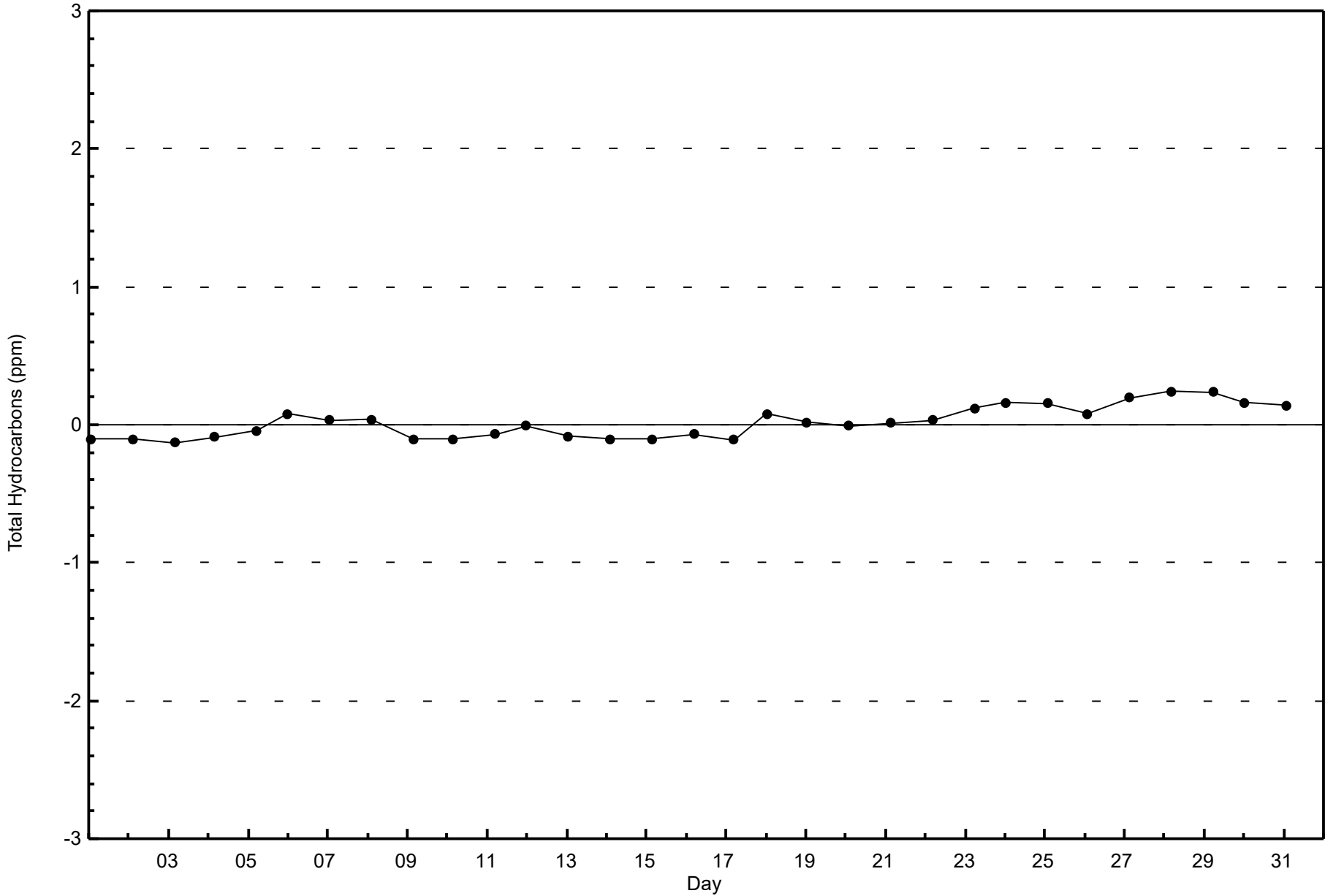
Total Number of Hours: 744

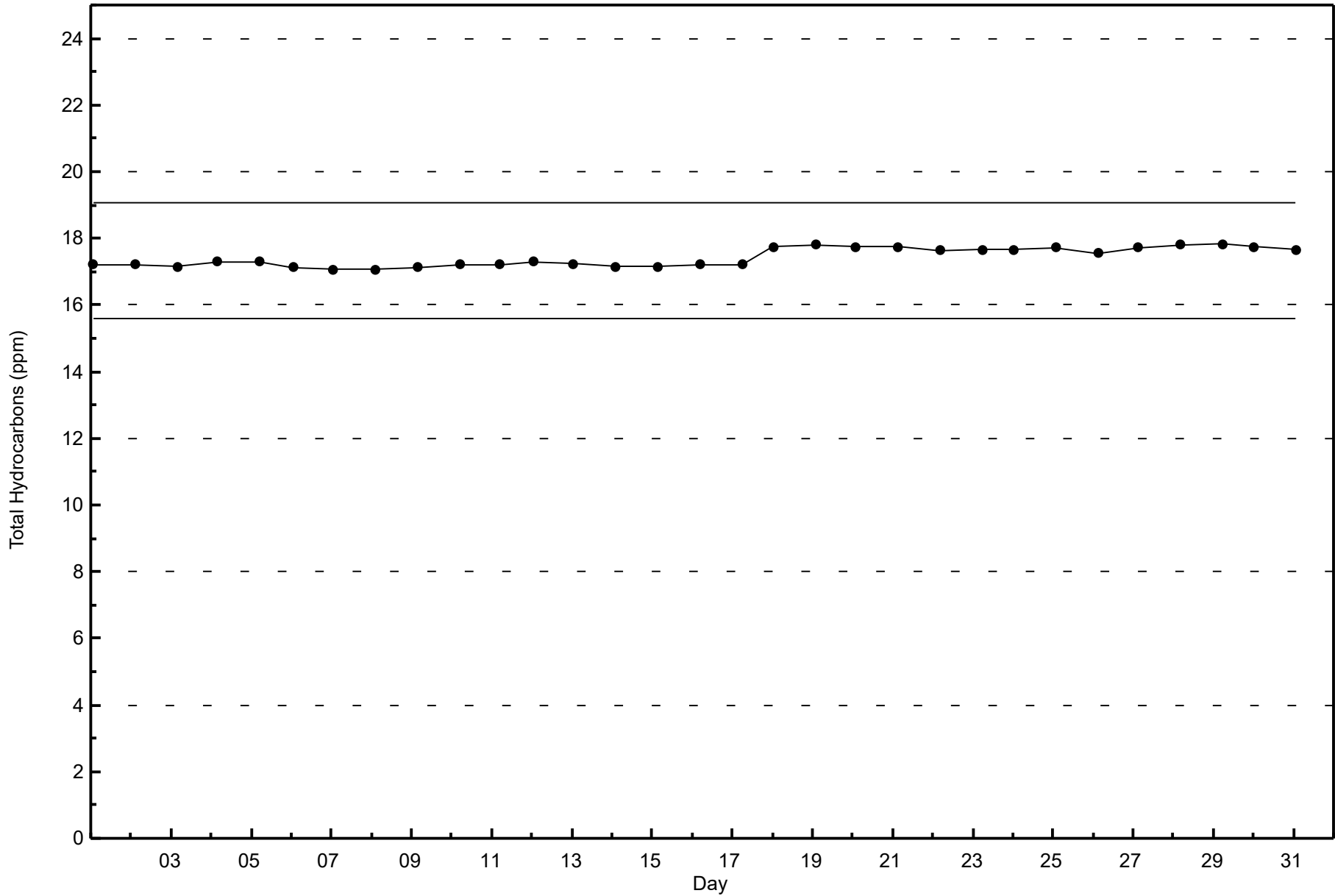


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

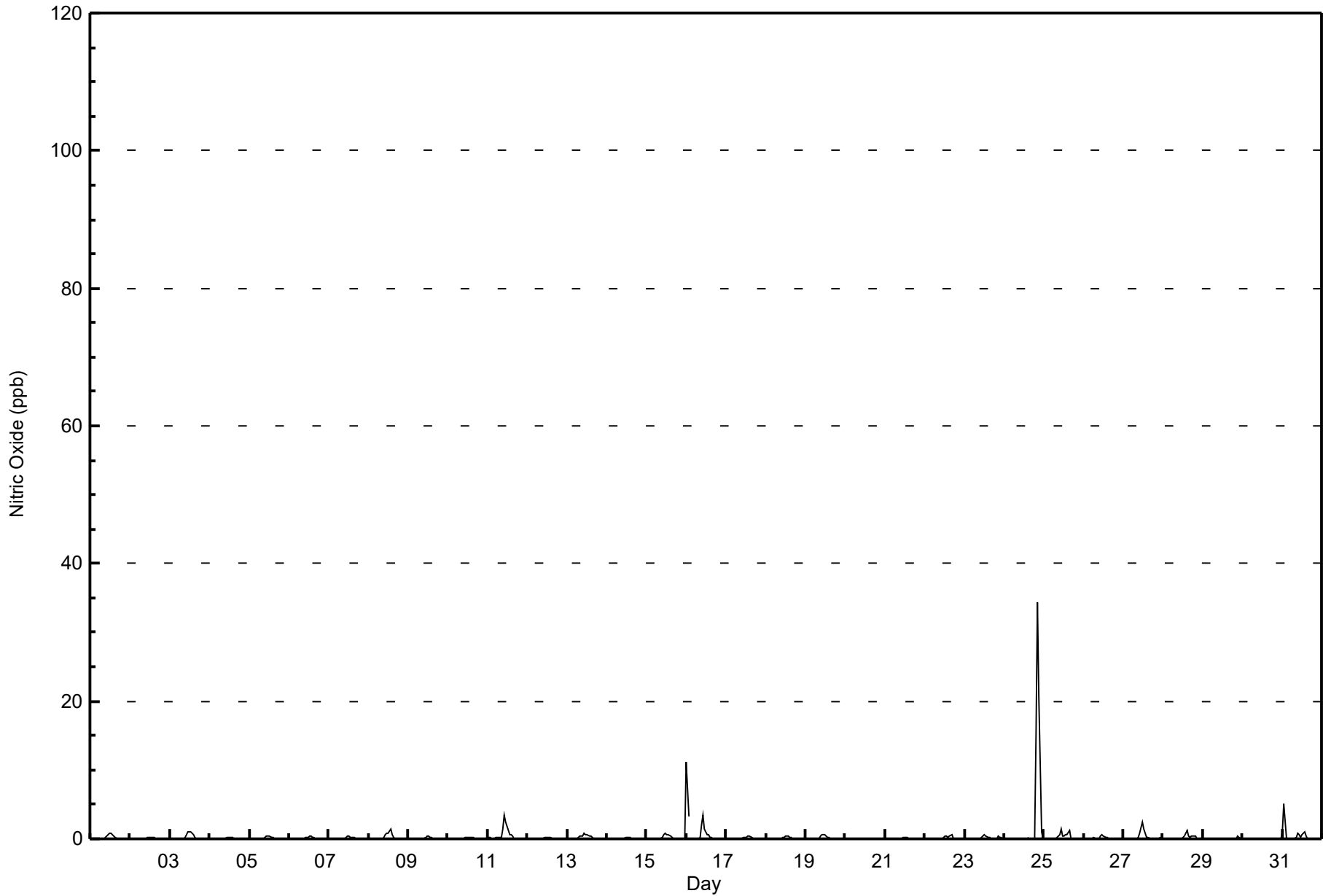
Nitric Oxide (NO) - ppb
Mackay River - January 2023

Maximum Value: 34.3 ppb on Jan 24 21:00																				Maximum Daily Average: 3.7 ppb on Jan 24					Hours in Service: 744		
Minimum Value: 0.0 ppb on Jan 1 18:00																				Minimum Daily Average: 0.0 ppb on Jan 30					Hours of Data: 709		
Maximum Diurnal Average: 1.1 ppb at hour 21																				Minimum Diurnal Average: 0.0 ppb at hour 5					Hours of Missing Data: 35		
Monthly Average: 0.26 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.4 P ₉₉ = 3.2					Hours of Calibration: 35		
																									Percent Operational Time: 100.0		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.5	0.7	0.8	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
2-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
3-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.0	1.0	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	
4-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
5-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
6-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
8-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.6	0.8	0.8	1.3	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	
9-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
10-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
11-Jan	0.2	0.3	0.1	Z	0.1	0.2	0.3	0.2	0.1	1.3	3.4	2.5	1.3	0.7	0.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4	
12-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.5	0.3	0.4	0.8	0.6	0.6	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
15-Jan	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.9	0.6	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	
16-Jan	11.1	3.3	Z	0.0	0.0	0.0	0.0	0.1	0.2	2.1	3.4	1.4	0.7	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	11.1	
17-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
18-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
19-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.7	0.6	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
21-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
22-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.1	0.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.4	0.3	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.6	
24-Jan	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.1	0.0	0.0	0.0	15.1	34.3	20.4	1.0	0.0	3.7	34.3	
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.2	0.5	1.4	0.4	0.5	0.6	0.5	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	
26-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4	0.5	0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.4	1.4	0.8	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.3	2.4	
28-Jan	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	1.3	0.4	0.2	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.2	1.3	
29-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.5	
30-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31-Jan	1.0	5.0	0.0	0.1	0.0	Z	0.0	0.0	0.1	0.9	0.7	0.3	0.5	0.9	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.0	
																								Diurnal Average			
																								Diurnal Maximum			
0.5 0.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.2 0.5 0.5 0.5 0.4 0.3 0.2 0.0 0.0 0.0 0.5 1.1 0.7 0.1 0.0																											
11.1 5.0 0.1 0.1 0.1 0.2 0.3 0.5 0.3 2.1 3.4 2.5 1.4 1.3 1.3 1.2 0.5 0.4 0.5 15.1 34.3 20.4 1.0 0.2																											
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Mackay River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	708	99.86	99.86
21 - 40	1	0.14	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	27	18	28	36	48	44	45	130	79	46	60	46	31	35	17	704
21 - 40	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	18	29	36	48	44	45	130	79	46	60	46	31	35	17	705

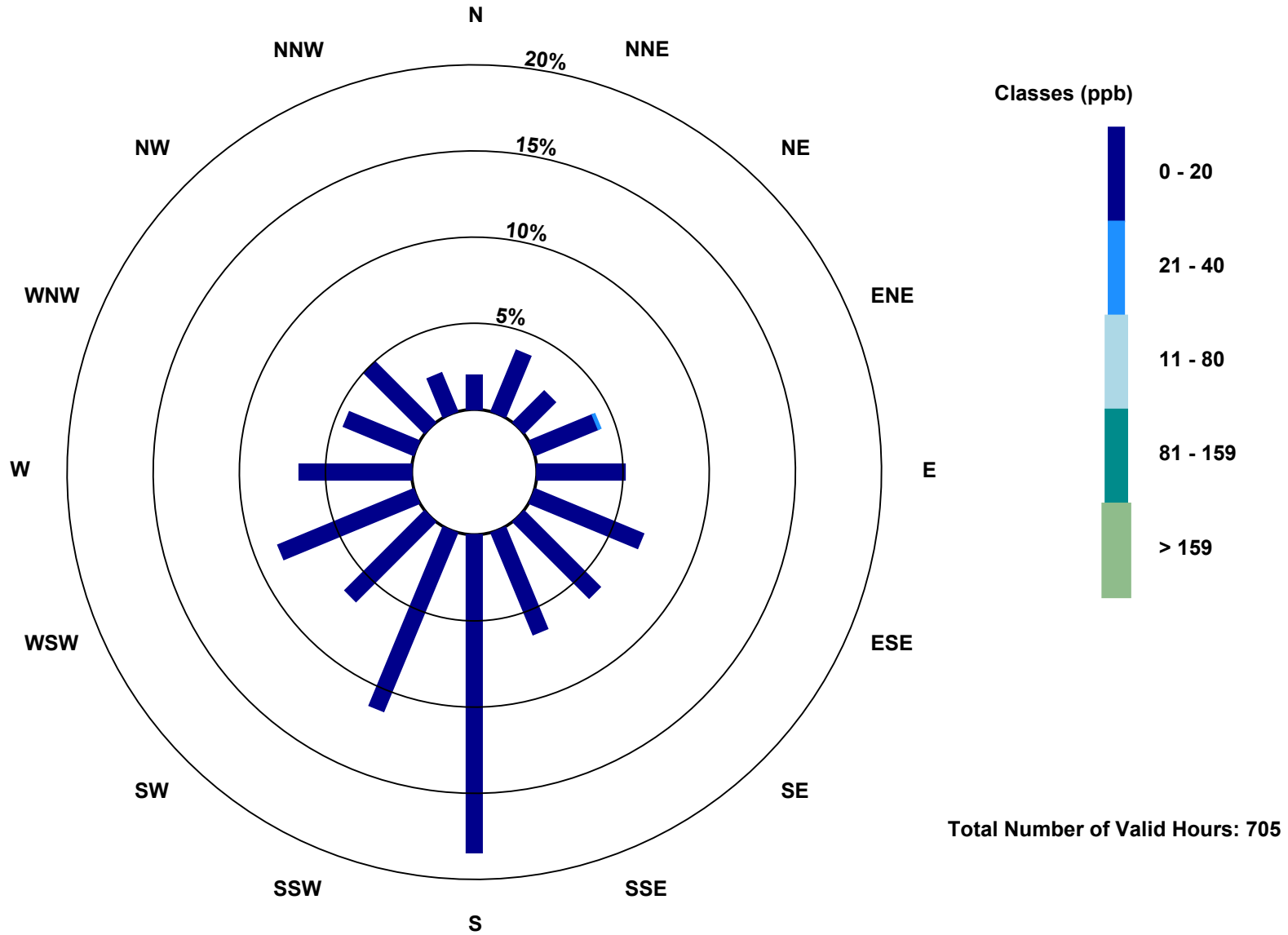
Total Number of Valid Hours: 705

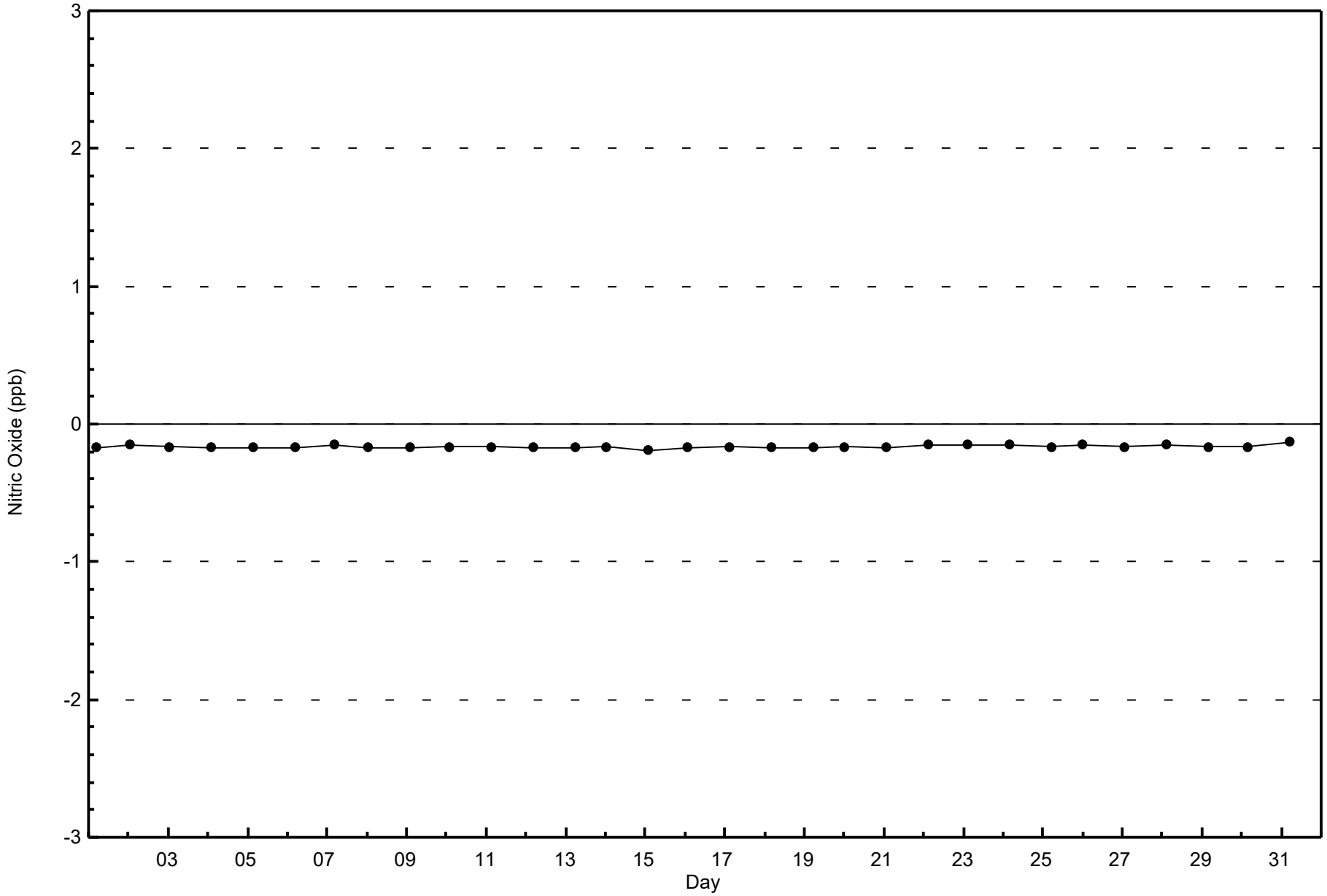
Total Number of Hours: 744

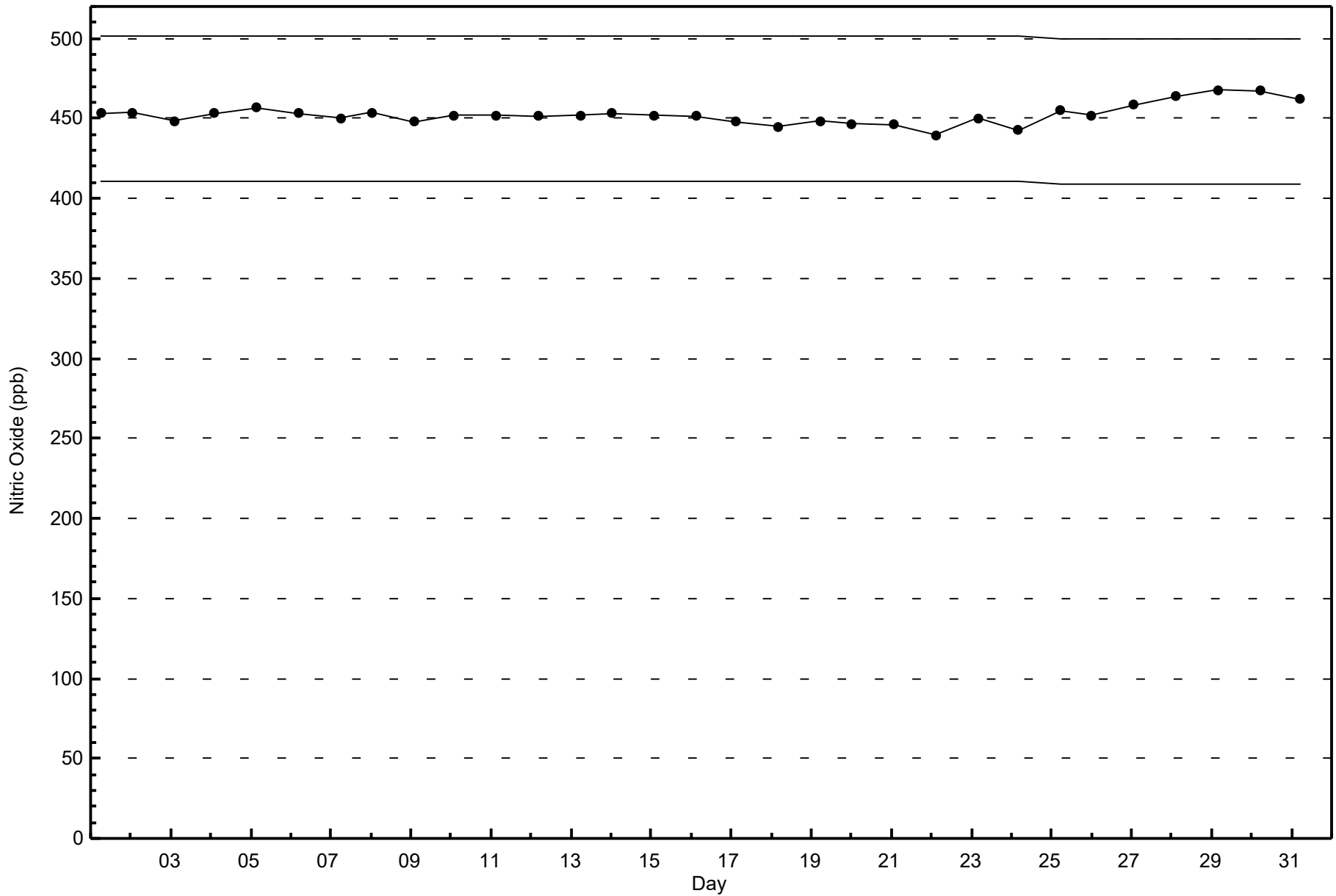


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Mackay River









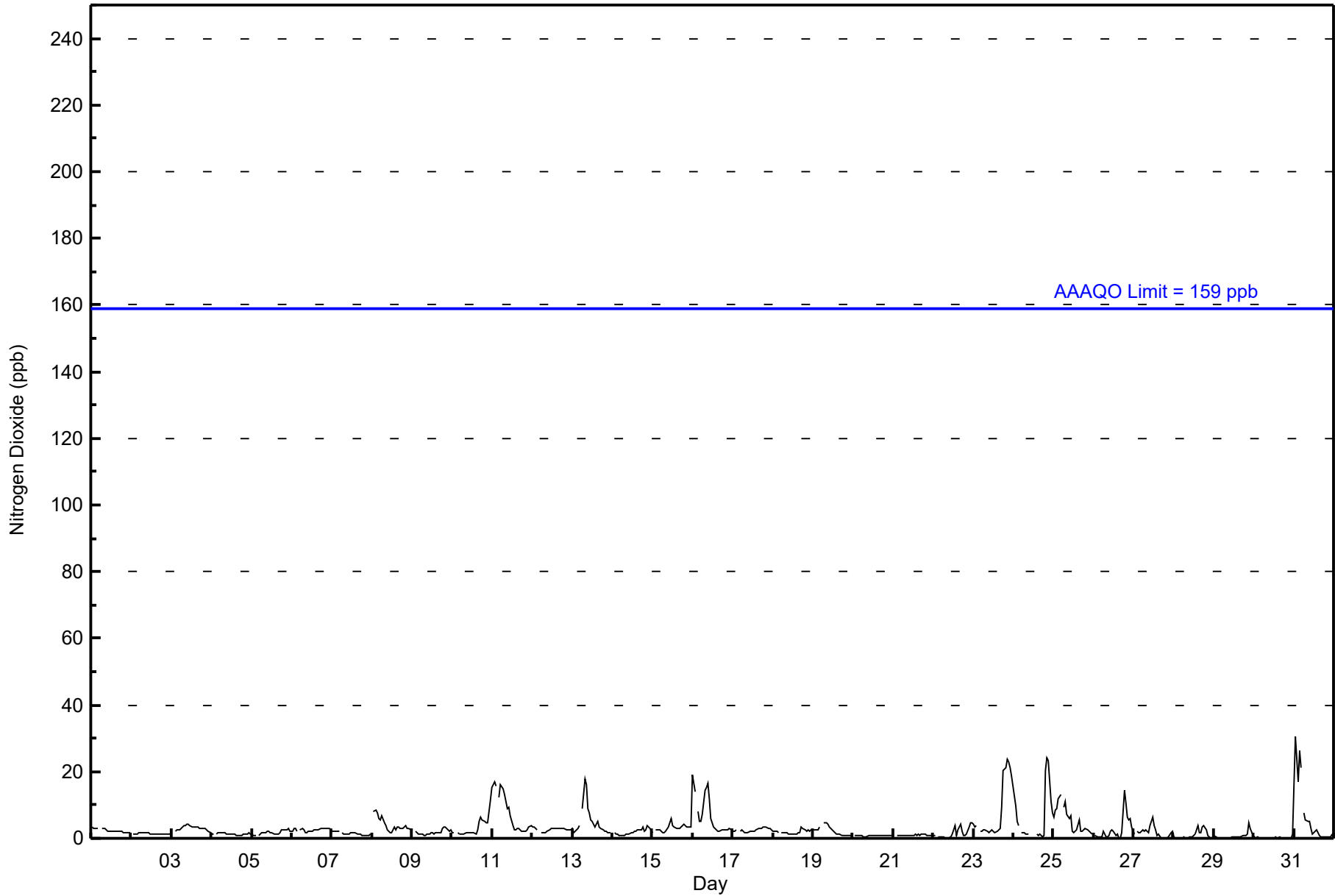
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Mackay River - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 30.3 ppb on Jan 31 02:00		Maximum Daily Average: 7.7 ppb on Jan 23																	Hours of Data:	709																													
Minimum Value: 0.1 ppb on Jan 30 07:00		Minimum Daily Average: 0.3 ppb on Jan 30																	Hours of Missing Data:	35																													
Maximum Diurnal Average: 4.6 ppb at hour 2		Minimum Diurnal Average: 1.9 ppb at hour 15																	Hours of Calibration:	35																													
Monthly Average: 2.98 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.1 Median = 2.0 Q ₃ = 3.0 P ₉₀ = 5.6 P ₉₉ = 21.0																	Percent Operational Time:	100.0																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	3.6	2.9	2.8	2.8	2.9	Z	2.9	2.8	2.8	2.6	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.0	2.0	1.8	1.7	1.6	1.6	1.5	2.4	3.6																							
2-Jan	Z	1.2	1.2	1.4	1.5	1.6	1.7	1.7	1.6	1.6	1.6	1.4	1.4	1.3	1.3	1.3	1.3	1.2	1.1	1.2	1.3	1.3	1.3	1.3	1.4	1.7																							
3-Jan	1.7	Z	2.2	2.4	2.4	2.4	3.1	3.9	3.9	4.1	4.2	3.9	3.6	3.5	3.4	3.4	3.2	3.0	3.1	3.1	3.0	2.5	2.0	1.6	3.0	4.2																							
4-Jan	1.3	1.2	Z	1.3	1.5	1.6	1.6	1.6	1.6	1.4	1.3	1.2	1.1	1.1	1.1	1.0	0.9	0.9	1.0	1.3	1.3	1.4	1.6	1.4	1.3	1.6																							
5-Jan	1.1	1.0	0.9	Z	1.0	1.4	1.8	1.6	1.9	2.3	2.1	1.9	1.6	1.4	1.2	1.2	1.4	1.9	2.5	2.7	2.5	2.7	2.8	2.2	1.8	2.8																							
6-Jan	2.2	3.0	2.9	2.3	Z	2.6	2.8	2.5	1.8	1.7	2.0	2.0	2.1	2.4	2.6	2.6	2.7	2.9	2.9	2.8	3.1	2.9	2.8	2.6	2.5	3.1																							
7-Jan	2.3	2.2	2.2	2.2	2.0	Z	1.6	1.2	1.3	1.3	1.3	1.6	1.8	1.6	1.7	1.4	1.3	1.1	0.9	0.8	0.7	0.7	0.9	1.4	1.5	2.3																							
8-Jan	Z	7.9	8.3	7.5	5.8	5.7	6.8	4.8	3.7	2.6	2.0	1.9	1.9	3.6	2.6	3.2	3.3	3.1	3.1	3.4	3.9	3.1	2.9	2.6	4.1	8.3																							
9-Jan	2.7	Z	2.0	1.7	1.4	1.3	1.2	1.0	1.0	1.1	1.3	1.9	1.7	1.2	1.5	1.8	1.8	1.8	3.1	3.4	3.3	2.5	2.2	2.4	1.9	3.4																							
10-Jan	1.7	1.5	Z	1.5	1.4	1.3	1.3	1.4	1.7	1.9	1.8	1.6	1.5	1.5	1.3	2.5	4.9	6.5	5.4	5.1	4.8	4.6	8.2	11.5	3.3	11.5																							
11-Jan	15.2	16.9	15.7	Z	12.4	16.0	15.0	13.1	11.2	8.8	9.5	6.7	4.0	2.7	2.7	3.0	2.9	2.2	2.2	2.3	2.1	2.6	3.4	3.9	7.6	16.9																							
12-Jan	3.3	3.2	2.8	2.4	Z	1.7	1.6	1.8	1.9	2.1	2.6	2.9	3.1	3.1	3.0	3.0	3.1	3.1	3.1	2.9	2.6	2.5	2.4	2.4	2.6	3.3																							
13-Jan	2.9	1.9	2.4	2.8	4.0	Z	9.1	17.7	15.9	9.1	7.5	5.7	4.9	3.6	4.2	4.9	3.6	2.9	2.6	2.2	2.0	1.6	1.6	1.7	5.0	17.7																							
14-Jan	Z	1.5	1.4	1.2	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.6	1.8	2.0	2.3	2.5	2.6	2.6	3.2	2.3	2.4	3.9	2.9	2.0	1.9	3.9																							
15-Jan	1.9	Z	2.4	2.5	2.5	2.1	1.8	1.7	2.0	3.5	4.8	6.1	3.7	3.2	3.0	3.1	3.1	3.3	3.9	4.2	3.4	3.4	3.3	3.2	3.1	6.1																							
16-Jan	18.9	14.1	Z	8.1	5.2	5.0	7.3	14.5	15.4	16.5	11.8	5.9	3.4	2.8	2.4	2.3	2.2	2.4	2.6	2.6	2.6	2.6	2.8	2.6	6.7	18.9																							
17-Jan	2.1	2.2	2.4	Z	2.2	2.4	2.2	1.9	1.9	1.9	2.2	2.2	2.2	2.2	2.5	2.8	3.0	3.1	3.4	3.5	3.3	3.0	2.8	2.4	2.5	3.5																							
18-Jan	2.3	2.2	2.0	1.7	Z	1.5	1.5	1.7	1.7	1.4	1.4	1.3	1.4	1.3	1.4	1.6	1.9	3.4	2.8	2.5	2.3	2.4	2.3	2.4	1.9	3.4																							
19-Jan	2.4	2.4	2.4	2.6	3.3	Z	4.5	4.7	4.8	4.1	3.2	2.7	2.1	1.7	1.4	1.3	1.2	1.0	0.9	1.0	1.0	1.0	1.0	1.0	2.2	4.8																							
20-Jan	Z	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9																							
21-Jan	0.9	Z	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.1	1.0	1.1	1.0	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.9	1.1																							
22-Jan	0.8	0.7	Z	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.3	1.2	2.4	4.0	1.0	2.5	4.2	2.1	0.9	1.0	1.2	3.5	4.7	4.7	1.6	4.7																							
23-Jan	4.2	3.2	3.8	Z	2.0	2.0	2.4	2.5	2.2	1.9	2.1	2.6	2.2	1.7	2.0	2.4	2.8	9.4	20.4	21.0	23.6	22.7	21.1	18.7	7.7	23.6																							
24-Jan	15.6	9.6	5.2	3.8	Z	1.9	1.5	1.4	1.2	1.1	C	C	C	C	1.4	1.0	1.4	0.6	0.9	20.2	24.3	23.3	11.1	7.6	7.0	24.3																							
25-Jan	6.4	8.3	8.9	12.0	13.1	Z	9.3	10.9	7.3	5.9	6.8	2.1	1.9	2.1	2.6	5.3	2.3	2.3	2.6	2.8	2.6	2.3	1.5	1.4	5.2	13.1																							
26-Jan	Z	0.8	0.6	0.5	0.4	0.4	2.2	0.4	0.3	0.8	2.2	2.5	2.1	1.0	1.3	0.2	0.2	1.9	14.3	10.8	6.5	5.5	6.0	3.4	2.8	14.3																							
27-Jan	1.4	Z	2.3	1.8	1.7	2.7	2.1	2.5	2.3	1.9	3.7	6.5	3.7	2.6	1.0	1.3	0.2	0.2	0.2	0.2	0.2	0.5	1.5	2.0	1.8	6.5																							
28-Jan	0.5	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.3	0.7	1.3	3.7	1.8	1.6	3.3	3.9	2.6	0.8	0.5	0.2	0.2	1.0	3.9																							
29-Jan	0.9	0.4	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.7	0.8	1.0	1.3	4.6	2.9	1.0	0.8	4.6																							
30-Jan	0.3	0.2	0.6	0.3	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.1	0.3	1.1																							
31-Jan	16.2	30.3	17.0	26.1	21.0	Z	7.8	5.6	5.2	5.2	2.9	1.2	1.7	2.5	1.7	0.8	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.4	6.5	30.3																							
																								4.3	4.6	3.6	3.5	3.5	2.3	3.1	3.4	3.2	2.9	2.8	2.4	2.1	2.0	1.9	2.0	2.0	2.3	3.1	3.6	3.6	3.6	3.2	3.0	Diurnal Average	
																								18.9	30.3	17.0	26.1	21.0	16.0	15.0	17.7	15.9	16.5	11.8	6.7	4.9	4.0	4.2	5.3	4.9	9.4	20.4	21.0	24.3	23.3	21.1	18.7	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	98.73	98.73
21 - 40	9	1.27	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	25	17	27	36	48	44	44	129	79	46	60	46	29	35	17	696
21 - 40	0	2	1	2	0	0	0	1	1	0	0	0	0	2	0	0	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	18	29	36	48	44	45	130	79	46	60	46	31	35	17	705

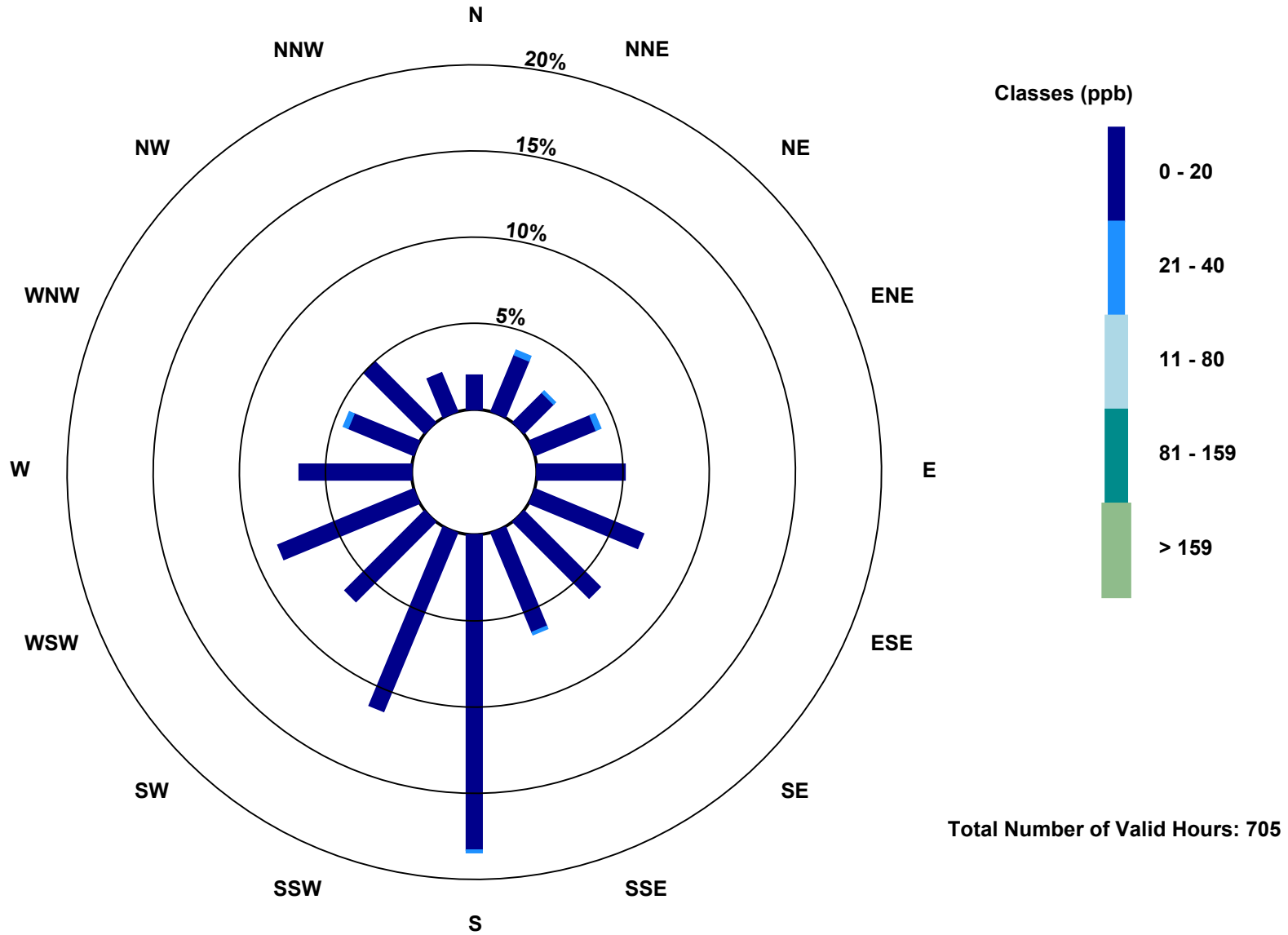
Total Number of Valid Hours: 705

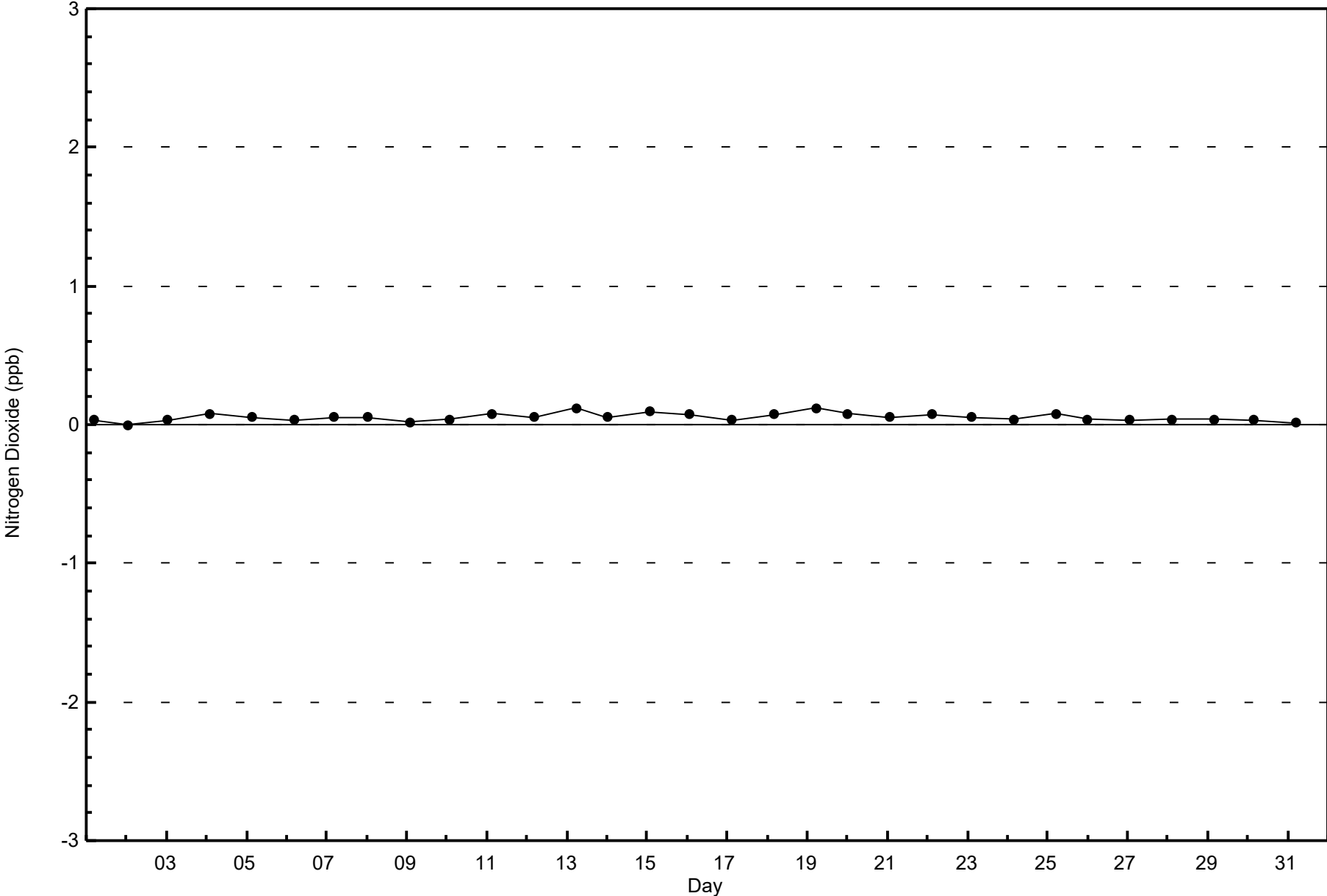
Total Number of Hours: 744

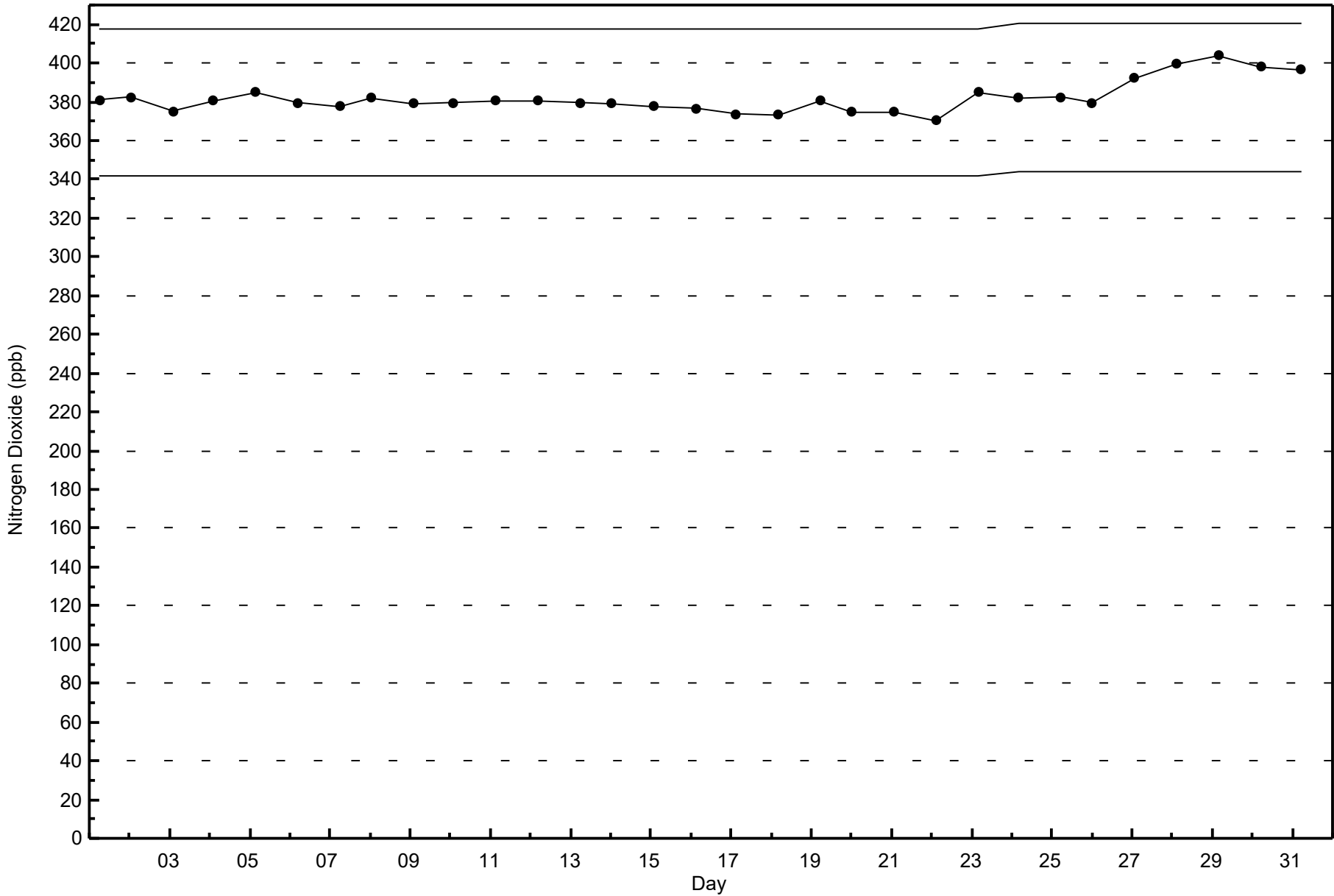


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

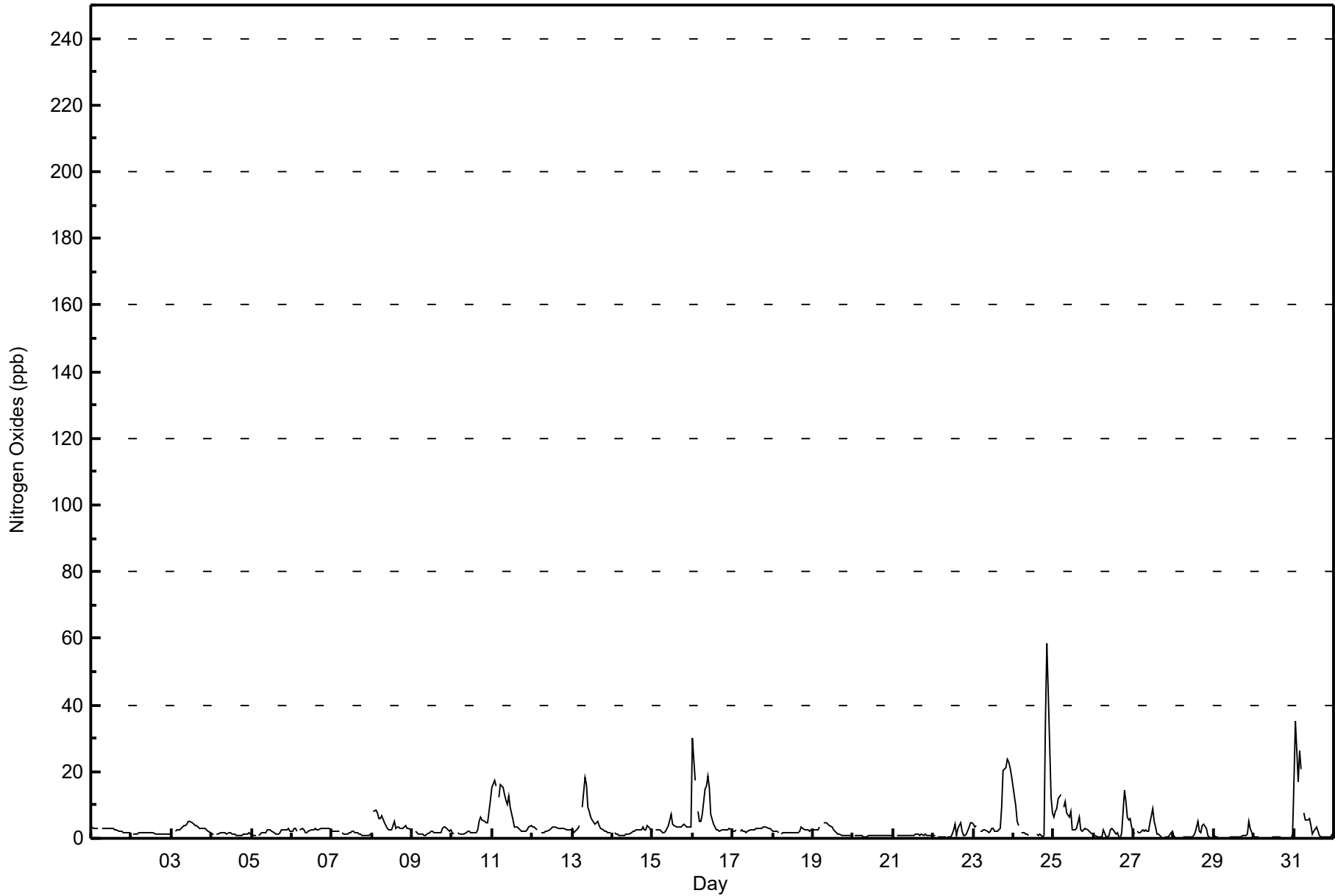
Nitrogen Oxides (NO_x) - ppb
Mackay River - January 2023

Maximum Value: 58.6 ppb on Jan 24 21:00																				Maximum Daily Average: 10.7 ppb on Jan 24					Hours in Service: 744				
Minimum Value: 0.1 ppb on Jan 30 07:00																				Minimum Daily Average: 0.3 ppb on Jan 30					Hours of Data: 709				
Maximum Diurnal Average: 4.9 ppb at hour 2																				Minimum Diurnal Average: 2.0 ppb at hour 17					Hours of Missing Data: 35				
Monthly Average: 3.23 ppb																				Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 1.2 Median = 2.2 Q ₃ = 3.1 P ₉₀ = 5.9 P ₉₉ = 22.7					Hours of Calibration: 35				
																				Percent Operational Time: 100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	3.6	2.9	2.8	2.8	2.9	Z	2.9	2.8	2.8	2.8	2.8	2.9	3.1	2.9	2.6	2.4	2.2	2.0	2.0	1.8	1.7	1.6	1.6	1.5	2.5	3.6			
2-Jan	Z	1.2	1.2	1.4	1.5	1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.2	1.3	1.3	1.3	1.3	1.4	1.7			
3-Jan	1.7	Z	2.2	2.4	2.4	2.4	3.1	3.9	3.9	4.3	4.9	4.9	4.6	4.3	4.0	3.7	3.2	3.0	3.1	3.1	3.0	2.5	2.0	1.6	3.2	4.9			
4-Jan	1.3	1.2	Z	1.3	1.5	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.3	1.2	1.1	0.9	0.9	1.0	1.3	1.3	1.4	1.6	1.4	1.3	1.6			
5-Jan	1.1	1.0	0.9	Z	1.0	1.4	1.8	1.6	1.9	2.4	2.5	2.4	2.0	1.6	1.4	1.3	1.4	1.9	2.5	2.7	2.5	2.7	2.8	2.2	1.9	2.8			
6-Jan	2.2	3.0	2.9	2.3	Z	2.6	2.8	2.5	1.8	1.8	2.2	2.3	2.5	2.7	2.8	2.7	2.7	2.9	2.9	2.8	3.1	2.9	2.8	2.6	2.6	3.1			
7-Jan	2.3	2.2	2.2	2.2	2.0	Z	1.6	1.2	1.3	1.4	1.5	1.9	2.1	1.9	1.9	1.5	1.3	1.1	0.9	0.8	0.7	0.7	0.9	1.4	1.5	2.3			
8-Jan	Z	8.0	8.4	7.6	5.9	5.8	6.8	4.8	3.7	2.9	2.6	2.7	2.7	4.9	3.1	3.4	3.3	3.1	3.1	3.4	3.9	3.1	2.9	2.6	4.3	8.4			
9-Jan	2.7	Z	2.0	1.7	1.4	1.3	1.2	1.0	1.0	1.2	1.5	2.3	2.2	1.5	1.7	1.9	1.8	1.8	3.1	3.4	3.3	2.5	2.2	2.4	2.0	3.4			
10-Jan	1.7	1.5	Z	1.5	1.4	1.3	1.3	1.4	1.7	2.0	2.0	1.9	1.8	1.8	1.5	2.6	4.9	6.5	5.4	5.1	4.8	4.6	8.2	11.5	3.3	11.5			
11-Jan	15.4	17.2	15.8	Z	12.5	16.2	15.3	13.3	11.3	10.1	12.9	9.2	5.3	3.4	3.4	3.4	2.9	2.2	2.2	2.3	2.1	2.6	3.4	3.9	8.1	17.2			
12-Jan	3.3	3.2	2.8	2.4	Z	1.7	1.6	1.8	1.9	2.2	2.7	3.1	3.3	3.3	3.2	3.1	3.1	3.1	3.1	2.9	2.6	2.5	2.4	2.4	2.7	3.3			
13-Jan	2.9	1.9	2.4	2.8	4.0	Z	9.2	18.2	16.2	9.5	8.3	6.3	5.5	4.0	4.5	5.1	3.6	2.9	2.6	2.2	2.0	1.6	1.6	1.7	5.2	18.2			
14-Jan	Z	1.5	1.4	1.2	1.0	1.0	1.0	1.1	1.2	1.4	1.7	2.0	2.2	2.5	2.6	2.6	2.6	3.2	3.2	2.3	2.4	3.9	2.9	2.0	1.9	3.9			
15-Jan	1.9	Z	2.4	2.6	2.5	2.1	1.8	1.7	2.0	3.7	5.4	7.0	4.3	3.7	3.4	3.3	3.2	3.3	3.9	4.2	3.4	3.4	3.3	3.2	3.3	7.0			
16-Jan	30.0	17.4	Z	8.1	5.2	5.0	7.3	14.6	15.6	18.6	15.2	7.3	4.1	3.3	2.6	2.4	2.2	2.4	2.6	2.6	2.6	2.6	2.8	2.6	7.7	30.0			
17-Jan	2.1	2.2	2.4	Z	2.2	2.4	2.2	1.9	1.9	2.0	2.4	2.5	2.5	2.6	2.8	3.0	3.1	3.1	3.4	3.5	3.3	3.0	2.8	2.4	2.6	3.5			
18-Jan	2.3	2.2	2.0	1.7	Z	1.5	1.5	1.7	1.7	1.5	1.6	1.6	1.7	1.6	1.7	1.8	2.0	3.4	2.8	2.5	2.3	2.4	2.3	2.4	2.0	3.4			
19-Jan	2.4	2.4	2.4	2.6	3.3	Z	4.5	4.7	4.8	4.4	3.9	3.3	2.6	2.0	1.6	1.4	1.2	1.0	0.9	1.0	1.0	1.0	1.0	1.0	2.4	4.8			
20-Jan	Z	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9			
21-Jan	0.9	Z	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.2	1.1	1.1	1.0	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.9	1.2			
22-Jan	0.8	0.7	Z	0.6	0.5	0.3	0.3	0.2	0.2	0.2	0.3	1.4	2.7	4.4	1.1	2.9	4.7	2.2	0.9	1.0	1.2	3.5	4.7	4.7	1.7	4.7			
23-Jan	4.2	3.2	3.8	Z	2.0	2.0	2.4	2.5	2.2	1.9	2.3	3.0	2.8	2.1	2.3	2.7	2.9	9.4	20.5	21.1	23.9	22.8	21.2	18.8	7.8	23.9			
24-Jan	15.7	9.6	5.2	3.8	Z	1.9	1.5	1.4	1.2	1.1	C	C	C	C	1.5	1.0	1.4	0.6	0.9	35.3	58.6	43.7	12.1	7.6	10.7	58.6			
25-Jan	6.4	8.3	8.9	12.0	13.1	Z	9.4	11.0	7.5	6.4	8.2	2.5	2.4	2.7	3.1	6.5	2.4	2.3	2.6	2.8	2.6	2.3	1.5	1.4	5.5	13.1			
26-Jan	Z	0.8	0.6	0.5	0.4	0.4	2.4	0.4	0.3	0.8	2.6	3.0	2.5	1.2	1.5	0.2	0.2	1.9	14.3	10.8	6.5	5.5	6.0	3.4	2.9	14.3			
27-Jan	1.4	Z	2.3	1.8	1.7	2.7	2.1	2.5	2.3	2.1	4.6	8.9	5.1	3.4	1.3	1.5	0.2	0.2	0.2	0.2	0.2	0.5	1.7	2.2	2.1	8.9			
28-Jan	0.6	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.3	1.0	1.7	5.0	2.2	1.8	3.7	4.4	2.9	0.8	0.5	0.2	0.2	1.2	5.0			
29-Jan	0.9	0.4	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.7	0.8	1.0	1.4	5.1	3.0	1.0	0.8	5.1			
30-Jan	0.3	0.2	0.6	0.3	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.1	0.3	1.1			
31-Jan	17.2	35.3	17.0	26.2	21.0	Z	7.8	5.6	5.3	6.1	3.6	1.5	2.2	3.4	2.1	0.9	0.4	0.4	0.4	0.4	0.3	0.4	0.4	1.4	6.9	35.3			
4.8 4.9 3.6 3.5 3.5 2.3 3.1 3.4 3.2 3.1 3.4 3.0 2.5 2.4 2.2 2.2 2.0 2.3 3.1 4.1 4.7 4.3 3.3 3.0																								Diurnal Average					
30.0 35.3 17.0 26.2 21.0 16.2 15.3 18.2 16.2 18.6 15.2 9.2 5.5 4.9 5.0 6.5 4.9 9.4 20.5 35.3 58.6 43.7 21.2 18.8																								Diurnal Maximum					
Z - zerospan C - Calibration																													



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Mackay River - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	98.31	98.31
21 - 40	10	1.41	99.72
41 - 80	2	0.28	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Mackay River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	13	24	17	27	36	48	44	44	129	79	46	60	46	29	34	17	693
21 - 40	1	3	1	0	0	0	0	1	1	0	0	0	0	2	1	0	10
41 - 80	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	27	18	29	36	48	44	45	130	79	46	60	46	31	35	17	705

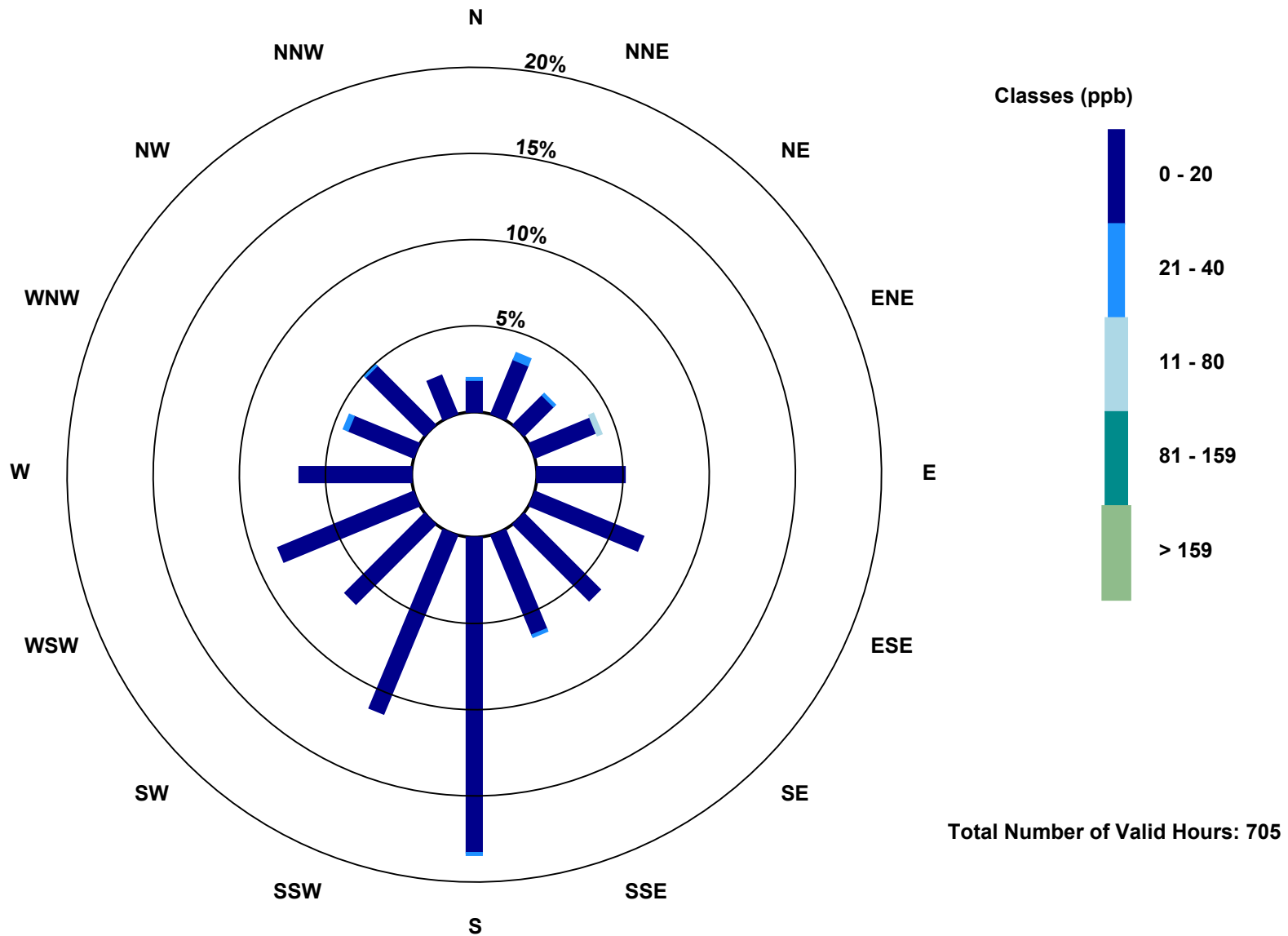
Total Number of Valid Hours: 705

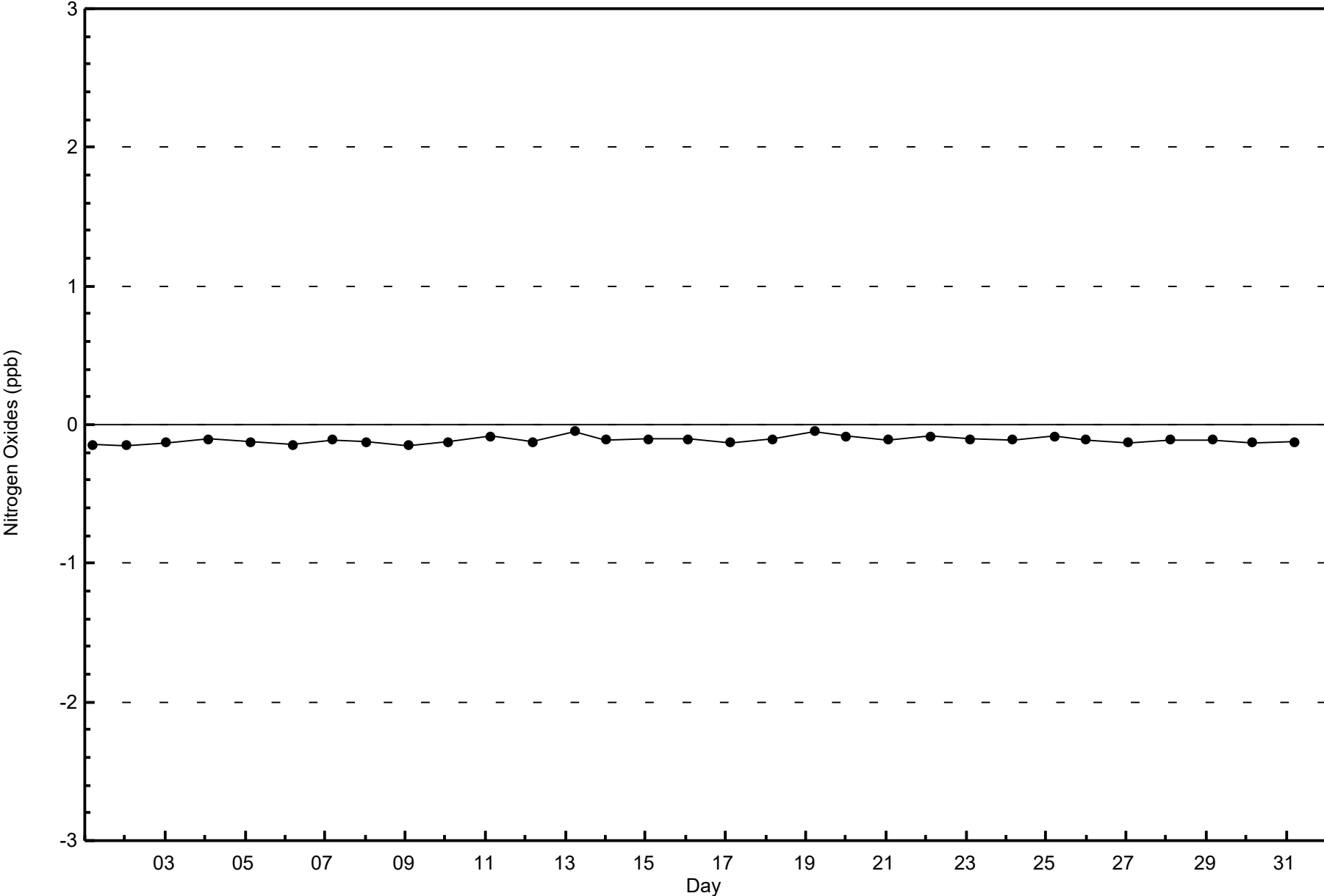
Total Number of Hours: 744

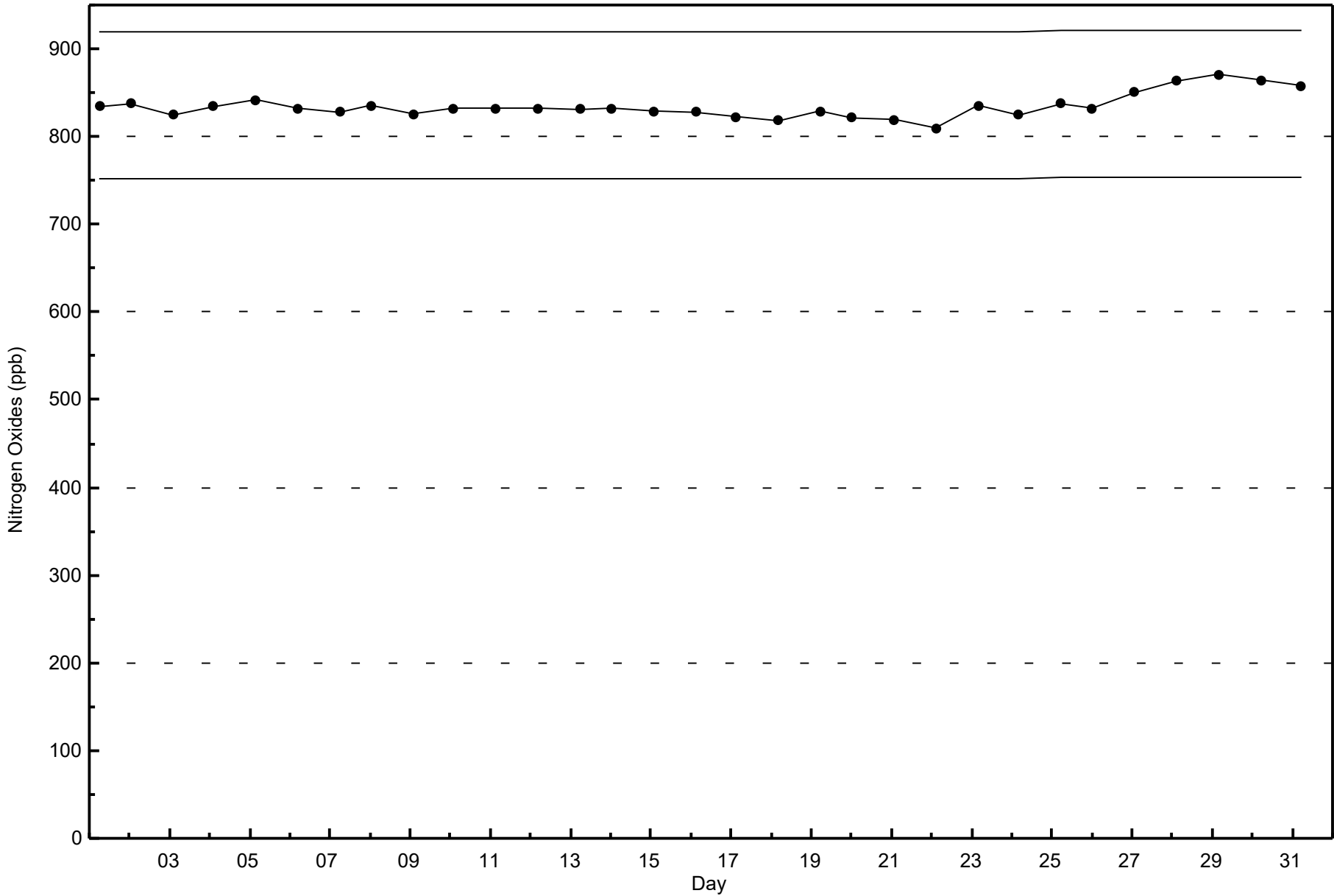


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Mackay River









Wood Buffalo Environmental Association
Summary of Hour Averages

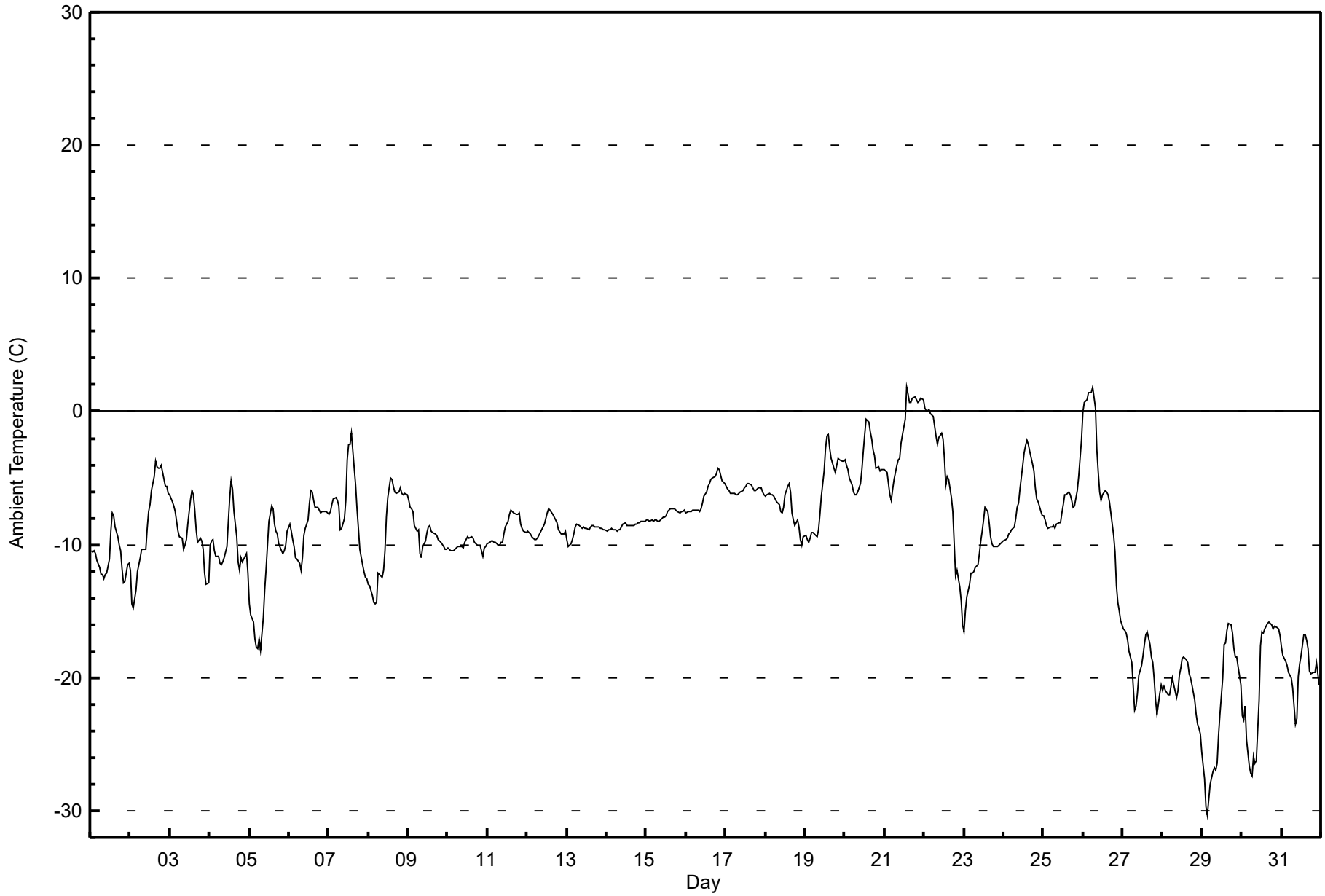
Ambient Temperature (AT) - C
Mackay River - January 2023

Maximum Value: 1.8 C on Jan 26 07:00 Maximum Daily Average: -1.8 C on Jan 21																						Hours in Service:	744			
Minimum Value: -30.3 C on Jan 29 04:00 Minimum Daily Average: -22.5 C on Jan 29																						Hours of Data:	744			
Maximum Diurnal Average: -7.5 C at hour 15 Minimum Diurnal Average: -11.3 C at hour 9																						Hours of Missing Data:	0			
Monthly Average: -9.84 C Percentiles: P ₁ = -27.1 P ₁₀ = -18.9 Q ₁ = -11.5 Median = -8.8 Q ₃ = -6.3 P ₉₀ = -4.1 P ₉₉ = 1.0																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.5	-10.6	-10.5	-10.7	-11.2	-11.7	-12.2	-12.2	-12.5	-12.3	-12.1	-11.1	-9.0	-7.6	-7.8	-8.7	-9.4	-10.0	-10.4	-11.8	-12.9	-12.8	-11.5	-11.4	-10.9	-7.6
2-Jan	-11.9	-14.5	-14.7	-13.4	-12.0	-11.5	-11.0	-10.3	-10.4	-10.4	-8.8	-7.5	-7.0	-5.9	-4.9	-3.8	-4.1	-4.2	-4.3	-4.0	-5.1	-5.7	-5.7	-6.1	-8.2	-3.8
3-Jan	-6.2	-6.8	-7.0	-7.5	-8.3	-9.0	-9.4	-9.6	-10.4	-10.1	-9.6	-8.5	-6.6	-5.9	-6.2	-7.4	-8.9	-9.8	-9.5	-9.8	-10.3	-12.2	-13.0	-12.9	-9.0	-5.9
4-Jan	-10.0	-9.7	-9.6	-10.4	-10.8	-10.9	-11.4	-11.5	-11.3	-11.0	-10.1	-8.3	-6.4	-5.2	-5.9	-7.5	-9.4	-11.3	-11.9	-11.0	-11.2	-10.9	-10.7	-12.1	-9.9	-5.2
5-Jan	-14.5	-15.2	-15.8	-17.0	-17.7	-17.8	-17.1	-17.9	-15.5	-13.5	-11.8	-10.0	-8.2	-7.1	-7.3	-8.5	-9.0	-9.2	-9.9	-10.5	-10.6	-10.4	-10.0	-9.0	-12.2	-7.1
6-Jan	-8.5	-9.0	-9.6	-10.1	-11.0	-11.1	-11.5	-11.9	-11.0	-9.3	-8.8	-8.1	-6.8	-6.0	-6.0	-6.7	-7.2	-7.2	-7.4	-7.6	-7.5	-7.5	-7.5	-7.6	-8.5	-6.0
7-Jan	-7.7	-7.5	-7.0	-6.6	-6.4	-6.7	-7.1	-8.9	-8.7	-8.1	-6.6	-3.7	-2.4	-2.4	-1.6	-4.2	-5.5	-7.3	-8.8	-10.3	-11.5	-12.0	-12.4	-12.6	-7.3	-1.6
8-Jan	-13.0	-13.1	-13.9	-14.4	-14.4	-14.3	-12.2	-12.3	-12.4	-11.9	-10.5	-7.9	-6.4	-5.0	-5.1	-5.6	-6.1	-6.2	-6.1	-5.7	-6.2	-6.3	-6.1	-6.2	-9.2	-5.0
9-Jan	-6.7	-7.2	-7.3	-7.5	-8.6	-9.0	-8.9	-10.7	-11.0	-10.1	-9.8	-9.1	-8.7	-8.6	-9.0	-9.1	-9.2	-9.3	-9.6	-9.7	-9.9	-10.1	-10.3	-10.4	-9.2	-6.7
10-Jan	-10.3	-10.3	-10.5	-10.4	-10.4	-10.2	-10.1	-10.1	-10.2	-10.3	-9.8	-9.7	-9.4	-9.6	-9.4	-9.5	-9.9	-9.9	-10.1	-10.1	-10.4	-10.8	-10.3	-10.1	-10.1	-9.4
11-Jan	-9.9	-9.8	-9.7	-9.7	-9.8	-9.8	-10.1	-10.0	-9.9	-9.8	-9.2	-8.7	-8.2	-7.7	-7.4	-7.5	-7.6	-7.7	-7.7	-7.6	-8.5	-8.8	-9.0	-9.1	-8.9	-7.4
12-Jan	-9.0	-9.1	-9.2	-9.4	-9.6	-9.6	-9.6	-9.3	-9.1	-8.9	-8.5	-8.1	-7.7	-7.4	-7.4	-7.7	-8.0	-8.1	-8.4	-8.9	-9.2	-9.2	-9.1	-9.0	-8.7	-7.4
13-Jan	-9.6	-10.1	-9.9	-9.7	-9.2	-8.7	-8.5	-8.6	-8.7	-8.7	-8.7	-8.7	-8.8	-8.8	-8.7	-8.6	-8.5	-8.6	-8.7	-8.7	-8.8	-8.8	-8.9	-8.9	-8.9	-8.5
14-Jan	-9.0	-8.9	-8.9	-8.7	-8.8	-8.9	-9.0	-8.9	-8.9	-8.7	-8.4	-8.3	-8.5	-8.6	-8.6	-8.5	-8.5	-8.5	-8.5	-8.4	-8.3	-8.3	-8.2	-8.2	-8.6	-8.2
15-Jan	-8.2	-8.2	-8.2	-8.2	-8.2	-8.1	-8.2	-8.2	-8.2	-8.1	-7.9	-7.9	-7.8	-7.5	-7.3	-7.3	-7.3	-7.3	-7.4	-7.5	-7.6	-7.5	-7.5	-7.4	-7.8	-7.3
16-Jan	-7.6	-7.5	-7.5	-7.5	-7.4	-7.4	-7.4	-7.4	-7.5	-7.3	-6.8	-6.3	-6.0	-5.6	-5.4	-5.1	-5.0	-4.9	-4.6	-4.3	-4.3	-4.8	-5.2	-5.4	-6.2	-4.3
17-Jan	-5.6	-5.8	-6.0	-6.1	-6.2	-6.2	-6.2	-6.2	-6.2	-6.1	-5.9	-5.7	-5.6	-5.4	-5.4	-5.5	-5.8	-5.9	-5.9	-5.9	-5.7	-5.7	-6.1	-6.2	-5.9	-5.4
18-Jan	-6.3	-6.2	-6.2	-6.2	-6.3	-6.3	-6.6	-6.8	-7.0	-7.5	-7.6	-7.2	-6.3	-5.6	-5.5	-6.0	-7.6	-8.1	-8.5	-8.1	-8.7	-9.6	-10.1	-9.4	-7.2	-5.5
19-Jan	-9.3	-9.6	-9.8	-9.5	-9.1	-9.1	-9.3	-9.4	-8.9	-7.7	-6.3	-4.4	-2.8	-1.9	-1.7	-2.7	-3.5	-4.2	-4.6	-4.1	-3.5	-3.7	-3.7	-3.7	-5.9	-1.7
20-Jan	-3.6	-4.0	-4.4	-5.0	-5.5	-6.0	-6.2	-6.3	-6.0	-5.4	-4.4	-3.0	-1.7	-0.6	-0.8	-1.5	-2.1	-2.8	-3.3	-4.2	-4.2	-4.5	-4.4	-4.4	-3.9	-0.6
21-Jan	-4.3	-4.6	-5.4	-6.2	-6.6	-5.8	-5.1	-4.0	-3.6	-3.5	-2.3	-1.8	-0.6	1.8	1.3	0.7	0.7	1.0	1.1	0.9	0.6	0.8	1.0	0.9	-1.8	1.8
22-Jan	0.3	0.0	0.0	0.1	-0.1	-0.3	-1.1	-1.8	-2.5	-2.0	-1.6	-2.1	-3.6	-5.5	-4.9	-5.1	-6.5	-7.5	-9.9	-12.4	-11.9	-13.2	-14.2	-16.0	-5.1	0.3
23-Jan	-16.6	-15.0	-13.9	-13.0	-12.2	-12.1	-12.0	-11.8	-11.5	-10.7	-9.8	-9.0	-8.1	-7.2	-7.5	-8.4	-9.4	-9.9	-10.1	-10.1	-10.2	-10.1	-10.0	-9.8	-10.8	-7.2
24-Jan	-9.7	-9.6	-9.5	-9.2	-9.1	-8.9	-8.6	-8.0	-7.2	-6.8	-5.9	-4.1	-3.1	-2.6	-2.1	-2.5	-3.0	-3.9	-4.4	-5.7	-6.6	-6.8	-7.5	-7.9	-6.4	-2.1
25-Jan	-7.8	-8.2	-8.5	-8.7	-8.7	-8.6	-8.5	-8.7	-8.5	-8.3	-8.3	-7.6	-7.0	-6.3	-6.2	-6.0	-6.2	-6.7	-7.2	-7.1	-6.0	-4.9	-3.5	-2.2	-7.1	-2.2
26-Jan	0.0	0.7	0.9	1.4	1.4	1.4	1.8	0.2	-2.9	-4.5	-6.0	-6.7	-6.2	-5.9	-6.0	-6.3	-6.8	-7.6	-9.3	-10.6	-13.1	-14.3	-15.0	-15.7	-5.4	1.8
27-Jan	-16.4	-16.5	-16.7	-17.2	-18.0	-18.8	-20.6	-22.5	-22.1	-21.1	-19.8	-19.1	-18.3	-17.5	-16.7	-16.6	-17.5	-18.5	-18.9	-20.2	-21.7	-22.7	-21.2	-20.6	-19.1	-16.4
28-Jan	-20.9	-20.7	-21.0	-21.3	-21.3	-20.6	-20.1	-20.5	-21.5	-21.0	-19.8	-19.3	-18.6	-18.4	-18.6	-18.9	-19.7	-20.0	-20.5	-21.7	-22.8	-23.5	-23.8	-24.2	-20.8	-18.4
29-Jan	-25.6	-27.6	-29.6	-30.3	-29.2	-28.0	-27.1	-26.7	-27.0	-26.4	-24.4	-22.8	-20.0	-17.5	-17.4	-16.4	-15.9	-16.0	-16.7	-17.8	-18.4	-18.5	-19.2	-20.5	-22.5	-15.9
30-Jan	-22.8	-23.1	-22.1	-24.7	-26.6	-27.1	-27.4	-25.9	-26.5	-26.2	-21.7	-17.6	-16.5	-16.6	-16.3	-15.9	-15.8	-15.9	-16.0	-16.3	-16.1	-16.2	-16.4	-16.8	-20.3	-15.8
31-Jan	-17.7	-18.3	-18.8	-19.1	-19.6	-19.9	-20.0	-20.8	-23.5	-23.0	-19.9	-19.0	-18.3	-16.8	-16.8	-17.2	-17.8	-19.5	-19.8	-19.6	-19.6	-18.9	-19.8	-20.6	-19.3	-16.8
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Mackay River - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mackay River - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	54	7.26	7.26
-20 - 0	668	89.78	97.04
0 - 10	22	2.96	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

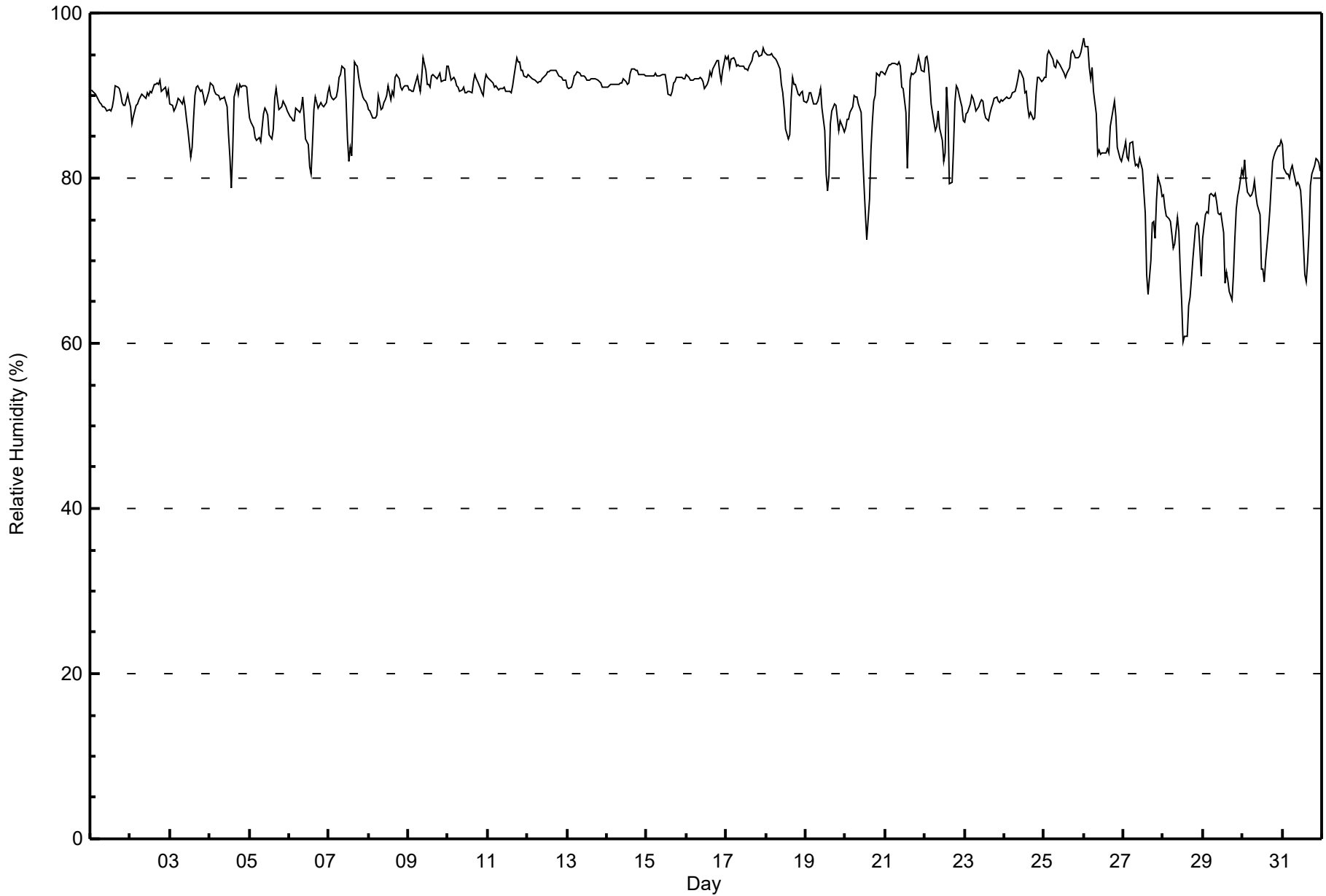
Relative Humidity (RH) - %
Mackay River - January 2023

Maximum Value: 96.9 % on Jan 26 01:00																						Maximum Daily Average: 94.3 % on Jan 17																						Hours in Service: 744			
Minimum Value: 60.2 % on Jan 28 13:00																						Minimum Daily Average: 70.5 % on Jan 28																						Hours of Data: 744			
Maximum Diurnal Average: 89.2 % at hour 1																						Minimum Diurnal Average: 84.0 % at hour 14																						Hours of Missing Data: 0			
Monthly Average: 87.96 %																						Percentiles: P ₁ = 66.1 P ₁₀ = 78.3 Q ₁ = 86.5 Median = 90.2 Q ₃ = 92.1 P ₉₀ = 93.4 P ₉₉ = 95.4																						Hours of Calibration: 0			
																																												Percent Operational Time: 100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	90.7	90.5	90.4	90.1	89.8	89.1	89.0	88.7	88.6	88.6	88.2	88.4	88.2	88.6	89.7	91.2	91.1	90.9	90.2	89.1	88.8	88.9	90.2	89.3	89.5	91.2																					
2-Jan	88.6	86.7	87.5	88.8	89.1	89.5	89.8	90.2	90.0	89.7	90.3	89.9	90.6	90.4	91.4	91.4	91.6	91.4	91.8	90.5	90.8	90.9	90.1	90.6	90.1	91.8																					
3-Jan	89.0	88.8	88.1	88.4	89.0	89.6	89.6	89.0	89.7	88.6	87.1	85.7	82.6	83.7	87.1	90.0	91.1	91.2	90.5	90.6	90.0	89.0	89.4	90.4	88.7	91.2																					
4-Jan	91.5	91.3	91.2	90.6	90.2	89.9	89.6	89.7	89.8	88.7	85.2	87.9	83.4	89.9	91.1	90.2	91.4	90.9	91.2	91.2	91.2	91.1	89.0	89.1	91.5	91.5																					
5-Jan	87.3	86.8	86.1	84.9	84.6	84.8	85.0	84.5	87.8	88.5	88.1	87.7	85.2	84.8	85.9	89.7	90.9	89.4	88.3	88.6	89.3	88.9	88.7	88.1	87.2	90.9																					
6-Jan	87.4	87.2	86.9	87.0	88.5	88.3	88.0	88.5	89.8	87.4	84.8	84.0	81.3	80.4	84.2	88.3	89.8	88.5	88.8	89.2	88.9	88.6	89.2	90.4	87.3	90.4																					
7-Jan	91.0	90.1	89.7	89.5	89.8	90.7	92.1	92.6	93.6	93.2	89.5	84.8	82.1	83.7	82.7	94.0	93.7	93.6	92.2	91.2	89.8	89.5	89.3	89.0	89.9	94.0																					
8-Jan	88.4	88.2	87.3	87.3	87.3	87.6	89.9	88.3	88.4	89.2	89.5	90.0	91.2	89.5	90.4	90.1	92.1	92.5	92.0	91.1	90.7	91.1	91.2	91.2	89.8	92.5																					
9-Jan	90.7	90.7	90.5	90.5	91.2	92.3	91.4	90.6	92.2	94.6	93.1	91.3	91.4	91.0	92.4	92.5	92.2	92.1	92.4	92.7	91.7	91.9	91.9	93.6	91.9	94.6																					
10-Jan	93.6	92.8	91.9	92.2	91.9	91.2	91.0	90.6	90.7	91.1	90.4	90.3	90.6	90.5	90.4	91.7	92.5	92.0	91.6	90.9	90.3	90.0	91.6	92.6	91.3	93.6																					
11-Jan	92.1	91.9	91.7	91.5	91.1	91.2	90.6	90.8	90.9	90.9	91.0	90.6	90.5	90.6	90.4	91.2	92.3	94.5	94.0	94.1	93.0	93.1	92.3	92.3	91.8	94.5																					
12-Jan	92.6	92.4	92.2	92.0	91.8	91.6	91.6	91.7	91.7	92.0	92.3	92.6	92.8	92.8	93.0	93.1	93.0	93.0	92.8	92.4	92.2	91.9	91.9	91.8	92.3	93.1																					
13-Jan	91.1	90.9	90.9	91.5	92.4	92.6	92.8	92.7	92.4	92.4	92.3	92.2	91.9	91.9	92.0	92.1	92.1	92.0	91.9	91.7	91.5	91.0	91.0	91.0	91.8	92.8																					
14-Jan	91.1	91.2	91.3	91.4	91.4	91.3	91.3	91.3	91.5	91.6	92.0	91.7	91.3	91.5	92.8	93.1	93.2	93.1	93.0	92.5	92.5	92.5	92.5	92.4	92.0	93.2																					
15-Jan	92.4	92.4	92.4	92.4	92.4	92.6	92.4	92.4	92.4	92.6	92.5	92.5	91.5	90.2	90.0	90.4	91.5	91.7	92.1	92.2	92.1	92.2	92.0	92.0	92.0	92.6																					
16-Jan	92.5	92.3	91.9	91.9	91.9	92.0	92.0	92.0	92.2	92.0	91.7	90.9	91.4	91.9	92.8	92.4	93.2	93.9	94.3	94.2	92.7	91.6	93.0	94.8	92.5	94.8																					
17-Jan	94.5	94.7	93.3	94.3	94.5	94.2	93.6	93.7	93.6	93.5	93.5	93.2	93.2	93.1	93.5	94.3	95.1	95.3	95.4	95.2	94.7	94.9	95.7	95.3	94.3	95.7																					
18-Jan	95.1	95.0	94.9	95.0	94.7	94.6	94.5	94.0	93.3	91.4	90.3	88.5	85.9	84.8	85.3	89.7	92.3	91.3	91.4	90.2	90.0	90.3	90.6	89.3	91.3	95.1																					
19-Jan	89.2	89.6	90.3	90.4	89.7	88.9	89.0	89.3	90.0	90.9	88.5	85.8	80.5	78.5	80.4	86.5	88.2	89.0	88.8	87.2	85.7	86.9	86.1	85.7	87.3	90.9																					
20-Jan	86.1	87.2	87.2	88.0	88.6	90.0	89.9	89.8	88.9	88.0	83.2	79.3	75.7	72.5	77.5	83.4	86.8	89.3	90.0	92.7	92.4	92.8	92.8	92.7	86.9	92.8																					
21-Jan	92.6	93.4	93.7	93.7	93.9	93.9	93.9	93.8	94.1	93.6	91.1	90.9	87.9	81.2	86.5	91.9	92.7	92.6	92.9	93.9	94.8	93.9	93.1	93.0	92.2	94.8																					
22-Jan	94.6	94.8	93.8	91.8	89.0	86.8	85.8	86.3	88.1	86.1	84.5	82.1	83.0	91.0	88.2	79.3	79.6	83.7	89.2	91.3	90.8	89.4	88.7	86.9	87.7	94.8																					
23-Jan	86.9	87.7	88.0	89.0	90.0	89.7	89.0	88.2	88.7	89.2	89.5	89.4	88.0	87.2	87.0	87.7	88.4	88.9	89.7	89.9	89.4	89.1	89.5	89.4	88.7	90.0																					
24-Jan	89.5	89.8	89.7	89.7	89.8	90.4	90.6	91.2	92.1	93.1	92.9	92.0	90.3	90.6	88.7	87.5	88.0	87.1	87.3	90.3	92.3	92.2	91.7	91.9	90.4	93.1																					
25-Jan	92.1	92.3	94.9	95.4	94.8	94.5	93.6	93.4	94.2	93.8	93.3	93.1	92.6	92.1	92.8	93.5	95.0	95.5	95.1	94.6	94.6	94.8	95.3	96.2	94.1	96.2																					
26-Jan	96.9	96.0	95.9	93.4	92.1	93.3	90.5	87.8	82.9	83.4	82.8	83.0	83.0	83.5	83.1	86.3	87.2	89.3	87.5	83.8	83.1	82.3	82.0	87.2	96.9																						
27-Jan	83.5	84.3	82.5	82.3	84.3	84.4	82.6	81.5	81.8	81.3	82.3	81.0	78.3	75.8	68.2	65.9	70.0	74.6	74.7	72.7	77.4	80.2	79.0	77.8	78.6	84.4																					
28-Jan	77.9	76.4	75.4	75.0	74.7	73.1	71.5	72.1	75.2	73.6	68.8	65.1	60.2	60.8	60.9	64.5	65.6	67.8	70.2	74.2	74.5	74.2	71.6	68.1	70.5	77.9																					
29-Jan	72.7	75.7	76.0	75.8	78.0	78.1	77.9	78.1	77.1	75.8	75.7	75.8	73.5	67.2	68.7	67.6	66.2	65.2	68.2	72.7	76.3	77.8	78.6	81.1	74.2	81.1																					
30-Jan	80.3	82.3	79.7	78.4	77.8	77.9	78.5	79.7	78.0	76.8	75.5	69.0	69.0	67.4	70.0	73.8	76.2	79.2	82.1	82.8	83.2	83.9	83.9	84.6	77.9	84.6																					
31-Jan	84.1	81.2	80.4	80.6	79.9	81.0	81.5	80.7	79.2	79.5	79.1	78.5	75.8	68.3	67.4	69.9	73.3	79.1	80.5	81.6	82.3	82.2	81.9	80.9	78.7	84.1																					
																						89.2	89.2	88.9	88.8	88.8	88.9	88.7	88.5	88.7	88.5	87.5	86.3	84.9	84.0	84.7	86.4	87.6	88.3	88.8	89.0	89.0	88.9	88.8	Diurnal Average		
																						96.9	96.0	95.9	95.4	94.8	94.6	94.5	94.0	94.2	94.6	93.5	93.2	93.2	93.1	93.5	94.3	95.1	95.5	95.4	95.2	94.8	94.9	95.7	96.2	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mackay River - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Mackay River - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	93	12.50	12.50
80 - 100	651	87.50	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

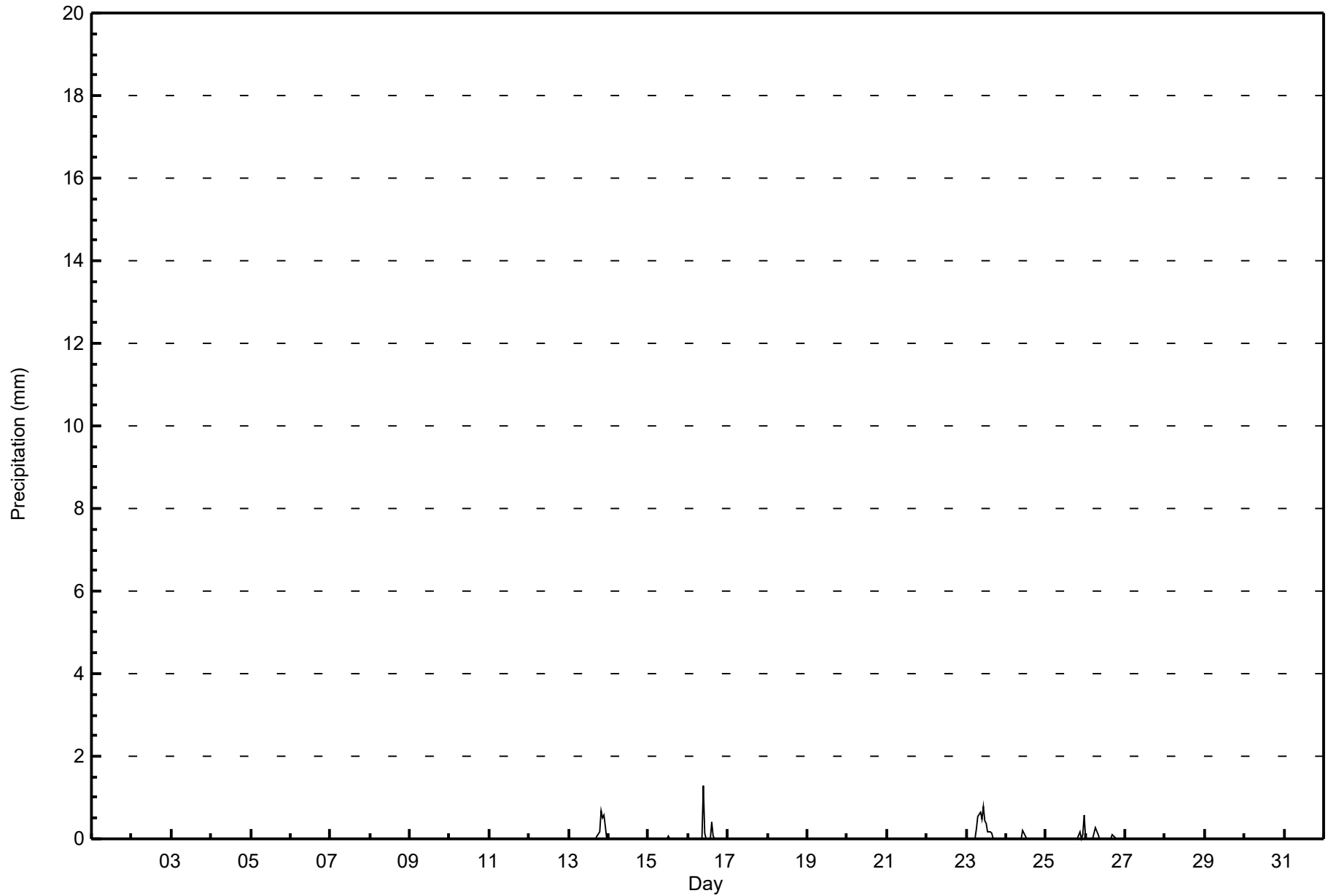


Maximum Value: 1.3 mm on Jan 16 10:00																				Maximum Daily Total: 4.0 mm on Jan 23					Hours in Service: 744																								
Minimum Value: 0.0 mm on Jan 1 01:00																				Minimum Daily Total: 0.0 mm on Jan 1					Hours of Data: 744																								
Maximum Diurnal Total: 1.8 mm at hour 10																				Minimum Diurnal Total: 0.0 mm at hour 1					Hours of Missing Data: 0																								
Monthly Total: 10.03 mm																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.0 P ₉₉ = 0.5					Hours of Calibration: 0																								
																									Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
3-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
4-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
5-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
7-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0															
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
20-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
21-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.6	0.5	0.8	0.4	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
26-Jan	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
29-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
30-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
31-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
																								0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.6	0.6	1.8	1.1	0.5	0.4	0.2	0.6	0.2	0.1	0.1	0.2	0.7	0.7	0.6	0.4	0.6	Diurnal Average	
																								0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.6	1.3	0.8	0.4	0.4	0.2	0.4	0.2	0.1	0.1	0.2	0.7	0.5	0.6	0.3	0.6	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Mackay River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Mackay River - January 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	732	98.39	98.39
0.4 - 0.5	6	0.81	99.19
0.6 - 0.7	4	0.54	99.73
0.8 - 1.4	2	0.27	100.00
1.5 - 10	0	0.00	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

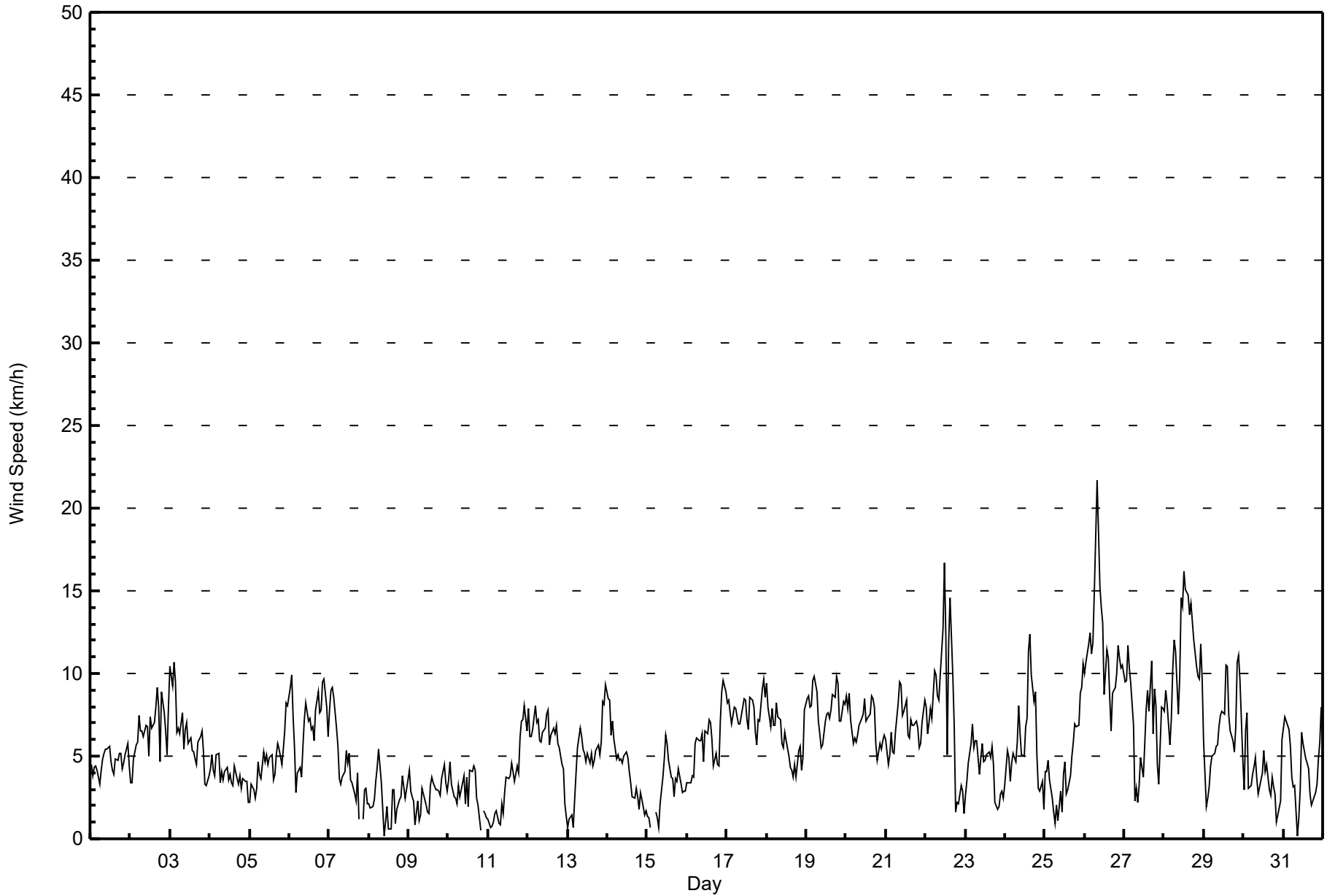


Maximum Speed: 22 km/h on Jan 26 08:00	Maximum Daily Speed Average: 10.7 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 8 10:00	Minimum Daily Speed Average: 1.8 km/h on Jan 10	Hours of Data: 740
Maximum Diurnal Speed Average: 2.7 km/h at hour 11	Minimum Diurnal Speed Average: 1.6 km/h at hour 23	Hours of Missing Data: 4
Monthly Average Velocity: 2.0 km/h 207.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 5 Q ₃ = 7 P ₉₀ = 9 P ₉₉ = 15	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	W4	W4	WSW4	WSW4	WSW4	SW3	SSW4	SSW5	S5	SSW5	S5	S6	S5	SSW4	SSW4	S5	SSW5	SSW5	S5	S4	S5	S5	SSW6	SSW4	SSW4.2	SSW6
2-Jan	SW3	SSE3	S5	S6	S6	S7	S6	S7	S6	S7	SSW7	SSW5	SSW7	S7	SSW7	SSW8	S9	S8	SSW5	S9	S8	S7	SW5	S8	S6.4	S9
3-Jan	S10	S9	SSW11	SSW9	SSW6	S7	S6	S8	S5	S7	S7	S6	S6	S5	S5	S5	S4	S6	S6	S7	S5	S3	SW3	WSW4	S6.2	SSW11
4-Jan	WSW4	WSW5	WSW4	W4	W5	W5	W3	W4	W4	WSW4	W4	W4	W4	WSW3	SW3	SW4	S4	SSW3	WSW4	W3	WSW4	WSW4	W3	W2	WSW3.6	W5
5-Jan	SW2	SSW3	SSE3	SE2	SE3	SE5	SSE4	SSE4	S5	S5	S5	S5	S5	S5	SSE4	SE4	SE5	SE6	SE5	SE4	ESE5	ESE7	ESE8	SE8	SSE4.2	ESE8
6-Jan	SE9	SE10	SE7	SE6	ESE3	SE4	SSE4	SSE4	S6	SSW7	SSW8	S7	SSW7	SSW7	S7	SSW6	S8	SSW9	S8	S8	S9	S10	S8	S6	S6.2	SE10
7-Jan	S8	S9	S9	SSW9	SSW7	SW6	SW4	SW3	W4	WSW4	SW5	WSW5	WSW5	WSW4	WSW3	S3	SSE2	S4	ESE1	UO	ESE1	SE3	ESE3	SE2	SSW3.7	S9
8-Jan	ESE2	SE2	ESE2	SE2	SE3	SE4	SE5	SSE3	SE2	WSW0	E1	SE2	NW1	NNW1	SE3	SE3	NE1	ENE2	ENE2	ENE3	E4	E3	E2	SE4	ESE2.0	SE5
9-Jan	ESE4	E3	E3	ENE2	NE1	NE2	ENE1	SE1	SSE3	SE3	ESE2	NNW2	E2	ESE3	SSE4	SSE3	S3	ESE3	ESE3	ESE3	SE4	SE4	ESE3	ESE3	ESE2.2	SE4
10-Jan	ESE4	ESE5	ESE3	ENE3	NE2	ENE2	NE3	E3	SE3	ESE4	NNE2	NNE4	NNE2	N4	N4	NE4	ESE4	ESE2	SSW2	N0	UO	N2	N2	SW1	ENE1.8	ESE5
11-Jan	WSW1	SSW1	W1	SW1	NNE2	NNE2	WSW1	WSW1	SW2	SSE2	S3	S4	S4	SSE4	SE5	SE4	SSE3	SE4	SE4	S6	S7	S7	S8	SSW7	S2.8	S8
12-Jan	S8	S6	S6	S7	S8	S7	SSW7	SSW6	SSW6	SSW6	SSW7	SSW8	SSW8	SSW6	SSW6	S7	SSW6	SSW7	SSW6	SSW5	SSW4	SW4	SW2	W1	SSW5.9	S8
13-Jan	WSW1	WSW1	NW1	NW1	N2	NE4	NNE6	NE7	NE6	ENE5	NE5	ENE5	ENE5	ENE5	ENE4	E5	E5	E6	E5	E6	E8	E8	E8	ESE9	ENE4.1	ESE9
14-Jan	ESE8	ESE8	ESE6	ESE7	SE6	ESE5	SE5	SE5	SSE5	SSW5	SSW5	WSW5	W4	W3	W3	WSW2	W3	W3	WSW2	W3	NNW2	WSW1	SW2	SSE1.9	ESE8	
15-Jan	W1	W1	NNW1	UO	UO	ENE2	ENE1	N1	E2	E4	ESE5	ESE6	ESE6	ESE5	E4	E4	E3	E4	E3	ESE4	E3	ENE3	ENE3	NE3	E2.5	ESE6
16-Jan	NNE3	NE3	E3	E4	E4	NE6	ENE6	ENE6	ENE6	ENE6	ENE5	E7	E6	E7	E7	E6	E4	ESE5	ESE4	SSE4	SSW7	SSW9	S10	S9	ESE3.7	S10
17-Jan	S8	S8	S8	S7	S8	SSW8	S7	S7	S7	SSW7	S8	S8	SSW7	S7	S9	S8	S8	S6	S6	S7	S7	S9	S10	S9	S7.7	S10
18-Jan	S9	S8	S7	S8	S7	S7	S8	SSE7	SSE7	SSE6	SSE6	SSE6	SSE6	SSE5	SE4	ESE4	ESE4	SE5	SE4	SSE5	SSE6	SSE4	SSE5	S8	SSE5.8	S9
19-Jan	S9	S9	S8	S8	SSW10	S10	S9	S7	S6	SSW5	SW6	SW7	SW8	SW8	SSW7	SW8	SSW9	SW9	SW10	SW9	SW7	SSW7	SSW8	SW8	SSW7.6	S10
20-Jan	SW9	WSW8	WSW9	WSW7	WSW6	WSW6	SW6	SW6	WSW7	SW7	WSW8	WSW8	WSW7	WSW7	SW8	SW9	SSW8	SW8	SW6	WSW5	W6	WSW5	WSW6	WSW6	WSW6.8	WSW9
21-Jan	WSW6	SW5	S5	S6	SSE5	SSE5	S6	S8	S9	SSW9	S7	S8	SSW8	SSW6	SSW6	S7	SSW7	SW7	SW7	SW7	SW5	WSW6	WSW7	W8	SSW6.0	S9
22-Jan	W8	W6	W7	W8	W7	W10	W10	W9	WSW8	W10	NNW13	NW17	NNW12	N5	NW12	NW15	NW10	NW7	WNN2	WNN2	N2	ENE3	E3	ESE2	WNN6.3	NW17
23-Jan	SSE3	SE3	ESE5	ESE6	SE7	ESE6	ESE6	SE6	ESE4	ESE5	ESE6	E5	ENE5	ENE5	NE5	NE5	N6	NNW4	NW2	WNN2	WNN2	SSE3	S3	SSE2	E2.7	SE7
24-Jan	SSE3	SSE5	S5	SE3	SSE5	SSE5	SSE5	S6	S8	SSW6	SW5	WSW5	W7	NNW7	NNW11	NNW12	NW10	NW8	NW9	N5	ENE3	ENE3	N3	NE2	W2.0	NNW12
25-Jan	ESE4	E4	ESE5	E4	E2	E2	SSW1	ENE2	SW1	NNE3	NE2	SE4	S5	E3	S3	SSW4	S5	SSE6	SSE7	SE7	SSE7	SSE9	S9	SSW11	SSE3.4	SSW11
26-Jan	WSW10	WSW11	W12	W12	W11	NNW12	NNW15	NNW22	NW19	NW15	NW14	NW13	NW9	NNW11	NNW11	NNW9	N7	NNE9	NNE9	NNE10	NE12	NE11	NNE10	NNE11	NW8.6	NNW22
27-Jan	NNE10	NNE10	NNE12	NNE10	NNE9	NNE7	NNW2	NW3	NNW2	NW3	N5	NNE4	N6	NNW8	NW9	NW8	NNW11	NNW6	NNW9	NW8	NW5	W3	NNW8	NNW8	NNW5.9	NNE12
28-Jan	NNW8	NNW9	W8	W6	W7	NNW10	NNW12	W11	W8	W10	NNW15	NNW14	NNW16	NNW15	NNW15	NNW14	NNW14	NW13	NW12	NW10	NW10	NW10	NNW12	NNW10	NNW10.7	NNW16
29-Jan	NNW6	W2	SSW2	WSW3	SW4	WSW5	WSW5	SW6	SSW6	SSW7	SSW7	SSW8	SW8	SSW11	S10	SSW7	SW7	WSW6	WSW5	NNW7	NW11	NW11	NW10	NNW5	WSW4.7	NW11
30-Jan	WSW3	NNW7	NNW8	W3	SW3	SW4	SW4	SW5	SW4	SW3	WSW4	WSW4	W5	W4	WSW4	WSW3	S3	S4	S3	ESE3	ESE1	ENE2	NNE2	NNE6	WSW2.2	NNW8
31-Jan	NNE7	NE7	NNE7	NNE7	NNE6	NNE4	NW3	NNW3	E0	ESE1	WSW3	NNW6	NNW6	WSW5	WSW5	WSW4	WSW3	S2	SSW2	SW3	WSW3	NNW5	NNW6	NW8	NW2.2	NW8

SSW2.2SSW2.3SSW2.2SSW2.2SSW2.1SSW1.9SSW2.2SSW2.2SSW2.6SSW2.6	SW2.7	SW2.5	SW2.5	SW2.2	SW2.0	SW2.1SSW1.9SSW1.8SSW1.6SSW1.7	S1.7	S1.9SSW1.6SSW1.8	Diurnal Average	
S10	WSW11	W12	W12	W11	NNW12	NNW15	NNW19	NNW15	NNW15	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Mackay River - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	386	52.16	52.16
6 - 11	326	44.05	96.22
12 - 19	27	3.65	99.86
20 - 28	1	0.14	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	11	12	13	25	30	39	36	34	37	23	30	45	29	8	8	6	386
6 - 11	3	16	5	4	9	14	9	12	98	56	24	19	18	15	17	7	326
12 - 19	0	1	1	0	0	0	0	0	0	0	0	0	2	10	10	3	27
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	29	19	29	39	53	45	46	135	79	54	64	49	33	35	17	740

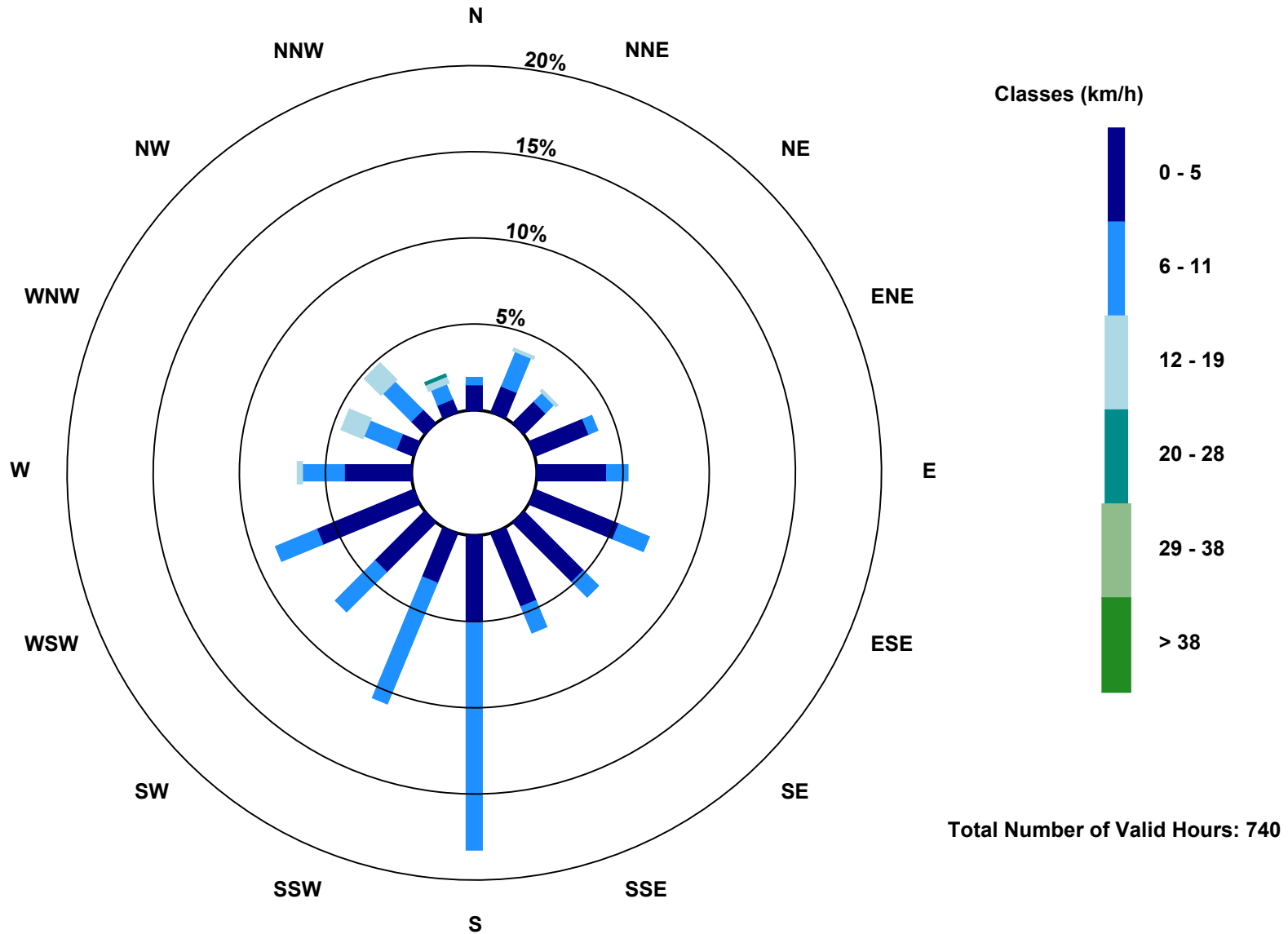
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Mackay River - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 08:00 Minimum Value: 0 km/h on Jan 5 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
2-Jan	1	1	1	1	2	2	2	2	1	1	2	1	2	2	2	2	2	3	2	2	2	2	2	3	3	
3-Jan	2	2	3	3	2	2	2	2	1	1	2	1	2	1	1	1	1	2	1	2	1	1	1	1	3	
4-Jan	1	2	2	1	2	2	1	2	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	
5-Jan	1	1	1	0	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	2	2	2	
6-Jan	2	3	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	3	
7-Jan	2	2	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1	UO	1	1	1	1	2	
8-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
10-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	1	1	1	1	
11-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
12-Jan	2	2	2	2	3	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	1	1	1	1	3
13-Jan	1	1	1	1	1	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	3	3	3	3	
14-Jan	3	2	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	3	
15-Jan	1	1	1	UO	UO	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	
16-Jan	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	3	3	3	3	
17-Jan	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3	2	3	2	2	2	2	3	3	3	3	
18-Jan	3	3	2	3	2	2	3	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	3	
19-Jan	2	2	2	2	2	2	2	2	2	1	2	2	3	3	2	2	2	2	3	3	2	2	2	3	3	
20-Jan	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	3	
21-Jan	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	3	3	3	3	
22-Jan	3	2	3	3	3	4	4	4	3	4	5	6	6	3	3	4	4	2	2	1	2	1	1	1	6	
23-Jan	1	1	1	1	2	2	2	2	1	1	2	1	1	2	2	2	2	1	1	1	1	1	1	1	2	
24-Jan	1	1	2	1	1	1	1	2	2	2	1	2	3	3	4	4	3	2	2	2	1	1	1	1	4	
25-Jan	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	2	1	2	2	2	2	2	3	3	3	
26-Jan	5	5	5	5	4	4	5	7	7	5	4	4	3	4	4	3	2	3	3	4	4	4	4	3	7	
27-Jan	3	3	4	3	3	2	1	1	1	1	2	1	2	2	3	3	3	2	4	4	4	2	1	3	4	
28-Jan	3	3	3	2	3	3	4	5	3	4	5	5	5	5	5	5	5	4	4	3	3	2	3	4	5	
29-Jan	2	2	1	1	1	2	2	2	1	2	2	2	3	4	3	2	3	3	2	2	3	4	3	2	4	
30-Jan	1	3	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2	3	
31-Jan	2	2	2	2	2	1	2	1	1	1	1	3	2	2	2	2	1	1	1	1	1	2	2	2	3	
Diurnal Maximum																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mackay River - January 2023

Direction of Maximum Speed: 327 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 298.3 deg on Jan 28	Hours of Data: 740
Direction of Minimum Speed: 248 deg on Jan 8 10:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 1.8 deg on Jan 10	Percent Operational Time: 99.5
Monthly Average Direction: 207.0 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	259	262	250	253	248	233	205	201	187	195	184	182	187	203	195	189	198	192	186	178	177	183	197	212	203.5
2-Jan	216	155	178	182	178	187	184	184	183	182	193	197	196	191	202	196	184	187	194	182	181	184	215	190	188.1
3-Jan	186	187	195	194	192	176	174	183	178	183	188	186	185	186	190	190	177	176	180	176	179	187	225	239	186.7
4-Jan	245	234	245	260	264	275	268	268	261	254	260	267	260	248	229	226	185	204	246	271	247	255	268	259	250.8
5-Jan	233	199	167	134	143	143	156	163	177	174	181	180	170	176	152	140	135	136	134	140	123	118	119	126	149.6
6-Jan	124	129	131	127	104	138	148	151	179	193	193	187	193	200	190	194	191	193	190	183	184	188	188	186	174.2
7-Jan	183	186	191	195	208	219	225	236	262	240	232	240	248	250	241	191	166	186	118	UO	119	134	119	145	205.0
8-Jan	110	126	110	143	146	136	141	160	132	248	88	132	317	337	131	140	38	77	59	57	90	91	101	124	117.8
9-Jan	118	91	80	67	48	49	63	128	152	134	107	332	91	114	151	161	171	110	104	116	136	128	120	123	117.6
10-Jan	108	113	114	78	54	59	35	96	135	102	33	12	33	7	5	37	103	103	192	350	UO	11	356	233	67.6
11-Jan	240	204	279	223	25	12	249	253	232	153	175	175	169	155	139	134	155	143	125	177	182	178	185	192	171.5
12-Jan	188	190	181	175	185	188	194	196	194	193	197	196	203	206	193	188	194	199	193	202	194	214	228	279	194.3
13-Jan	246	252	325	304	353	37	32	47	48	60	53	77	73	74	63	70	86	91	87	80	79	100	99	105	72.0
14-Jan	107	111	107	112	131	117	130	132	147	164	203	232	245	264	262	270	251	267	274	254	277	289	245	233	165.9
15-Jan	269	276	295	UO	UO	58	63	0	82	101	115	113	111	121	99	93	79	92	88	111	100	60	63	36	94.5
16-Jan	15	51	80	82	87	55	57	57	62	63	69	86	89	96	96	98	92	103	121	162	192	193	188	184	102.8
17-Jan	186	181	184	188	188	192	185	184	191	194	188	190	202	188	174	178	181	189	179	187	189	184	186	182	186.1
18-Jan	183	183	179	180	178	169	170	168	163	155	161	167	163	155	131	116	119	126	145	163	158	157	165	174	163.7
19-Jan	171	180	183	189	195	191	190	191	189	207	230	234	228	223	211	215	209	214	214	223	218	198	210	220	204.9
20-Jan	224	237	241	248	246	239	226	232	245	234	239	242	245	242	229	219	212	217	229	257	262	253	247	238	236.5
21-Jan	248	232	183	183	164	163	183	183	185	192	188	181	192	205	201	189	197	225	236	234	230	248	251	268	205.6
22-Jan	263	264	263	273	273	265	270	264	253	265	285	315	334	353	323	313	319	323	300	285	357	72	83	114	293.7
23-Jan	150	129	112	111	124	116	115	132	118	114	105	97	68	69	55	38	354	346	323	290	294	155	175	152	99.6
24-Jan	155	165	181	143	153	154	164	178	187	201	218	249	273	288	300	297	316	320	314	10	64	74	358	34	259.3
25-Jan	105	90	107	98	92	98	205	76	215	31	49	146	174	90	185	201	175	160	154	146	150	153	170	196	148.7
26-Jan	256	251	261	268	270	289	305	327	326	324	321	315	316	299	309	333	2	13	27	29	37	37	32	20	323.5
27-Jan	14	20	12	16	19	19	337	306	331	323	356	19	350	329	323	313	327	336	328	324	321	259	291	296	341.9
28-Jan	292	286	281	263	276	289	291	278	268	275	289	292	297	303	311	303	302	308	310	306	318	318	329	329	298.3
29-Jan	303	261	210	238	233	253	248	232	193	192	196	195	214	199	191	209	233	245	254	292	315	308	309	285	241.5
30-Jan	257	285	288	267	230	220	225	223	216	233	238	249	276	273	253	243	184	177	174	105	123	76	29	20	247.1
31-Jan	26	37	29	25	20	21	325	340	96	116	240	287	291	258	250	258	241	181	212	228	243	298	331	315	320.7

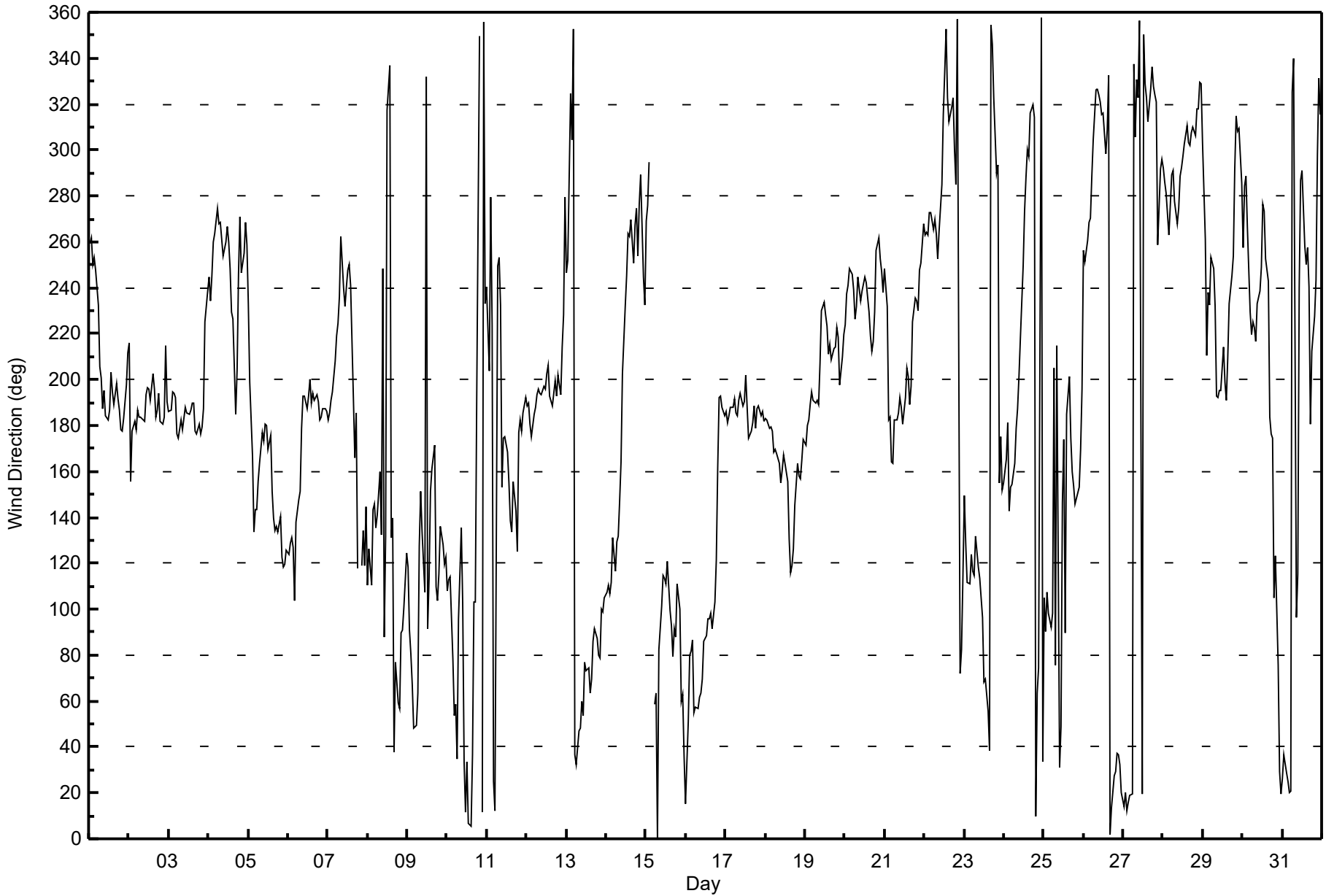
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 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Mackay River - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mackay River - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Jan 8 10:00 Minimum Value: 12 deg on Jan 8 07:00 Percentiles: P ₁ = 16 P ₁₀ = 19 Q ₁ = 22 Median = 27 Q ₃ = 36 P ₉₀ = 48 P ₉₉ = 79																		Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	51	48	52	51	44	37	20	22	23	21	22	21	23	25	21	21	21	18	18	19	23	15	22	23	52
2-Jan	31	20	17	21	26	23	26	20	18	18	23	22	20	21	22	20	17	21	32	17	22	25	30	22	32
3-Jan	18	18	18	20	20	18	19	17	18	18	18	19	19	20	20	23	22	17	17	18	21	32	29	30	32
4-Jan	38	37	45	50	51	45	43	38	50	50	46	52	53	55	29	30	19	25	35	29	31	37	25	29	55
5-Jan	29	24	31	33	25	13	24	21	14	16	19	19	25	28	33	34	20	25	24	30	24	16	19	21	34
6-Jan	20	21	24	28	39	34	27	29	22	19	21	19	26	26	19	17	17	20	19	18	20	19	19	16	39
7-Jan	16	16	19	19	23	25	29	33	34	30	23	50	40	59	37	63	58	24	42	UO	71	13	42	16	71
8-Jan	43	61	59	57	23	14	12	21	68	99	82	34	61	82	26	27	59	53	37	38	32	70	46	32	99
9-Jan	25	37	32	37	57	45	77	52	53	42	58	64	80	56	33	34	31	29	29	27	23	30	28	31	80
10-Jan	34	21	31	39	38	42	29	40	27	29	40	30	63	25	26	28	24	44	54	88	UO	23	31	31	88
11-Jan	44	81	29	42	29	36	50	33	28	57	35	34	31	34	29	29	31	29	31	27	27	24	25	25	81
12-Jan	25	30	25	27	24	24	24	30	26	25	23	24	27	30	24	25	25	25	24	29	28	27	44	38	44
13-Jan	57	51	29	38	26	33	29	29	30	34	31	35	38	39	34	39	37	33	33	35	36	25	27	20	57
14-Jan	19	19	25	18	22	25	23	24	24	29	32	39	40	48	45	47	45	44	36	38	26	26	25	25	48
15-Jan	17	20	47	UO	UO	26	34	25	43	27	23	24	23	25	29	33	30	27	27	23	26	24	26	24	47
16-Jan	20	29	31	32	31	25	23	32	27	28	32	30	29	27	27	23	26	20	21	29	24	24	22	23	32
17-Jan	23	25	25	25	22	26	22	21	24	23	23	24	28	24	23	26	30	30	30	24	25	25	25	26	30
18-Jan	23	25	26	25	25	29	28	27	27	27	30	29	26	28	26	17	15	19	27	29	26	24	27	23	30
19-Jan	24	19	20	20	21	19	19	19	20	21	34	35	32	30	25	23	22	25	25	28	27	21	24	28	35
20-Jan	33	39	46	53	45	42	31	36	45	44	45	47	55	49	34	25	23	25	45	37	43	47	41	42	55
21-Jan	45	42	18	17	22	24	25	17	17	18	20	19	23	25	23	19	20	32	36	35	34	48	50	43	50
22-Jan	38	40	46	40	36	41	40	46	46	45	34	22	37	35	20	20	24	21	78	59	55	36	40	45	78
23-Jan	25	23	19	18	42	29	19	24	33	22	19	29	30	31	28	31	24	25	21	37	65	28	30	35	65
24-Jan	22	24	24	23	20	18	20	20	22	27	30	49	44	31	25	24	21	21	19	29	29	37	31	58	58
25-Jan	28	28	19	27	36	62	77	46	81	48	77	39	29	48	60	41	26	26	24	22	21	23	25	23	81
26-Jan	45	47	47	41	41	27	24	21	21	19	22	21	22	23	25	24	30	25	24	26	25	25	27	25	47
27-Jan	25	24	25	24	22	22	46	21	16	17	27	44	28	21	20	21	20	21	22	18	19	27	30	25	46
28-Jan	24	26	29	40	41	26	26	33	44	36	30	27	26	24	22	23	23	22	20	19	17	17	19	20	44
29-Jan	21	60	32	24	30	45	40	33	20	18	20	22	31	32	24	25	36	51	41	25	18	21	19	25	60
30-Jan	38	24	20	25	23	22	24	22	26	33	38	57	51	50	43	51	25	17	20	27	55	31	21	21	57
31-Jan	25	26	26	24	23	29	35	33	88	61	51	39	44	48	56	46	43	35	33	19	29	36	20	19	88
Diurnal Maximum																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS21
CONKLIN
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	11.2	0	1.9	0
TRS(ppb) Average	708	36	36	100	0.7	0	0.6	0
THC(ppm) Average	673	34	71	95.03	2.5	-	2.3	-
NMHC(ppm) Average	673	34	71	95.03	0.125	-	0.079	-
CH4(ppm) Average	673	34	71	95.03	2.4	-	2.3	-
O3 (ppb) Average	709	35	35	100	38.8	0	36.9	-
NO2 (ppb) Average	708	36	36	100	18.6	0	6.7	-
NO (ppb) Average	708	36	36	100	7.8	-	1.2	-
NOX (ppb) Average	708	36	36	100	18.9	-	7.7	-
PM2.5 (ug/m3) Average	743	1	1	100	84.4	1	45.1	1
Temperature 2 m (C) Average	744	0	0	100	4.2	-	-1.6	-
Relative Humidity (%) Average	744	0	0	100	94.2	-	92.5	-
Wind Speed 10 m (km/h) Average	740	0	4	99.46	23	-	14	-
Wind Direction 10 m (deg) Average	740	0	4	99.46	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.38	0.8	-	0	0	0.1	0.2	0.4	0.8	11.2
TRS (ppb) Average	708	0.42	0.1	-	0.3	0.4	0.4	0.4	0.5	0.5	0.7
THC (ppm) Average	673	2.16	0.1	-	2	2.1	2.1	2.1	2.2	2.3	2.5
NMHC(ppm) Average	673	0.016	0.025	-	0	0	0	0	0	0.1	0.125
CH4(ppm) Average	673	2.15	0.1	-	2	2.1	2.1	2.1	2.2	2.3	2.4
O3 (ppb) Average	709	24.92	8.3	-	1.7	12.9	19.1	25.8	31.6	35.5	38.8
NO2 (ppb) Average	708	3.31	2.5	-	0.1	0.8	1.6	2.8	4.3	6.3	18.6
NO (ppb) Average	708	0.42	0.9	-	0	0	0	0.1	0.4	1	7.8
NOX (ppb) Average	708	3.74	2.9	-	0.2	0.9	1.8	3.1	4.8	7.1	18.9
PM2.5 (ug/m3) Average	743	9.21	10.1	-	0.3	1.3	3.2	6.2	11.9	18.2	84.4
Temperature 2 m (C) Average	744	-10.05	6	-	-27.3	-18.6	-14.2	-9.4	-6.2	-2.9	4.2
Relative Humidity (%) Average	744	84	7.7	-	56.6	71.7	81	86.7	89.6	91	94.2
Wind Speed 10 m (km/h) Average	740	6	4	-	0	1	3	5	9	11	23
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
 JANUARY 2023

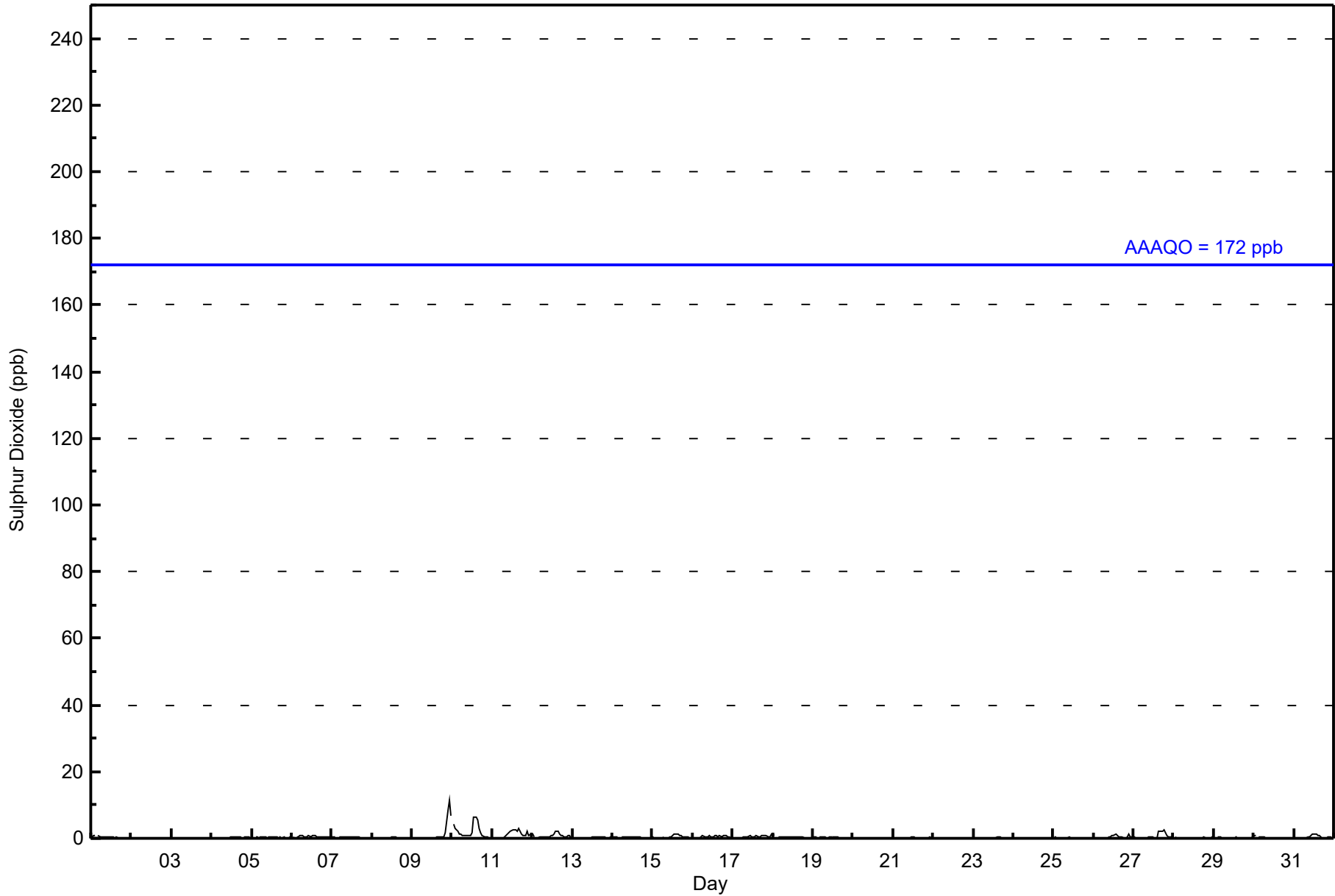
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	03 Jan 2023 07:00	03 Jan 2023 12:00	6	Unstable Operation - support gas depleted
THC/NMHC/CH4	04 Jan 2023 10:00	04 Jan 2023 14:00	5	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	30 Jan 2023 04:00	31 Jan 2023 03:00	24	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	31 Jan 2023 07:00	31 Jan 2023 07:00	1	Unstable Operation - excessive baseline noise
THC/NMHC/CH4	31 Jan 2023 09:00	31 Jan 2023 09:00	1	Maintenance - remote troubleshooting
Wind Speed, Wind Direction	08 Jan 2023 10:00	08 Jan 2023 10:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 03:00	11 Jan 2023 03:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 06:00	11 Jan 2023 06:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 01:00	31 Jan 2023 01:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	33	26	14	8	12	16	37	62	66	107	117	39	18	26	53	70	704
11 - 20	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	33	26	14	8	13	16	37	62	66	107	117	39	18	26	53	70	705

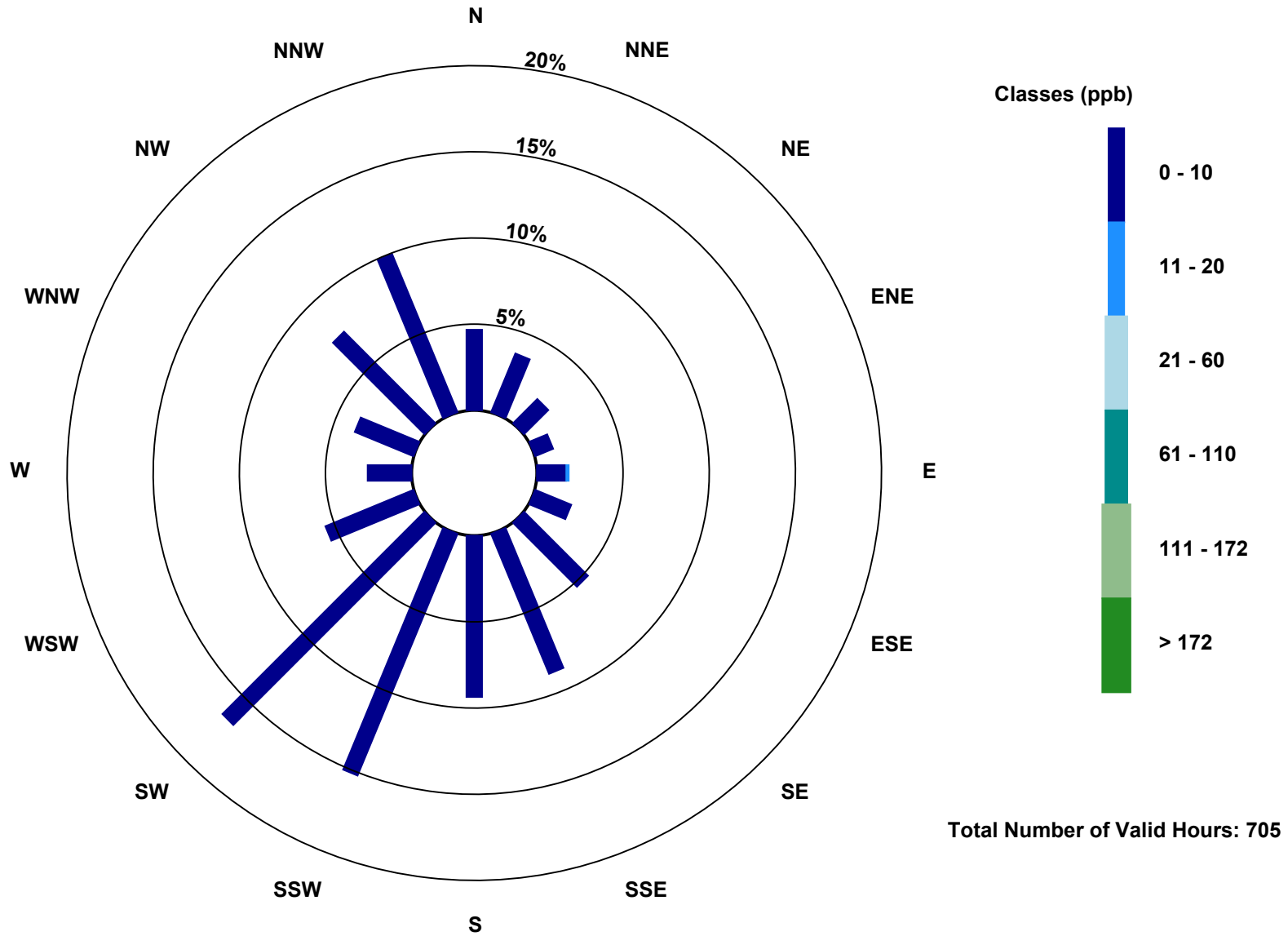
Total Number of Valid Hours: 705

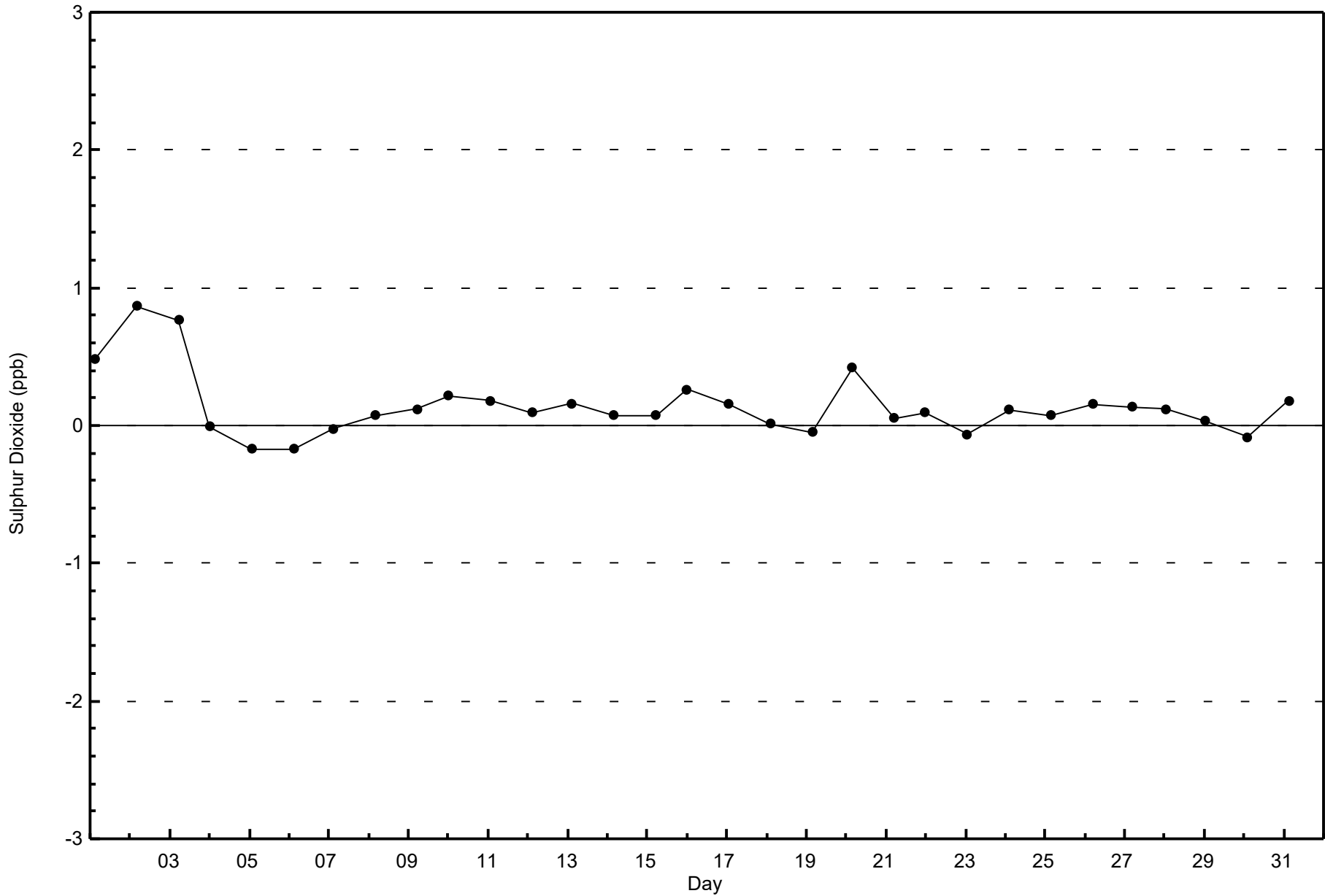
Total Number of Hours: 744

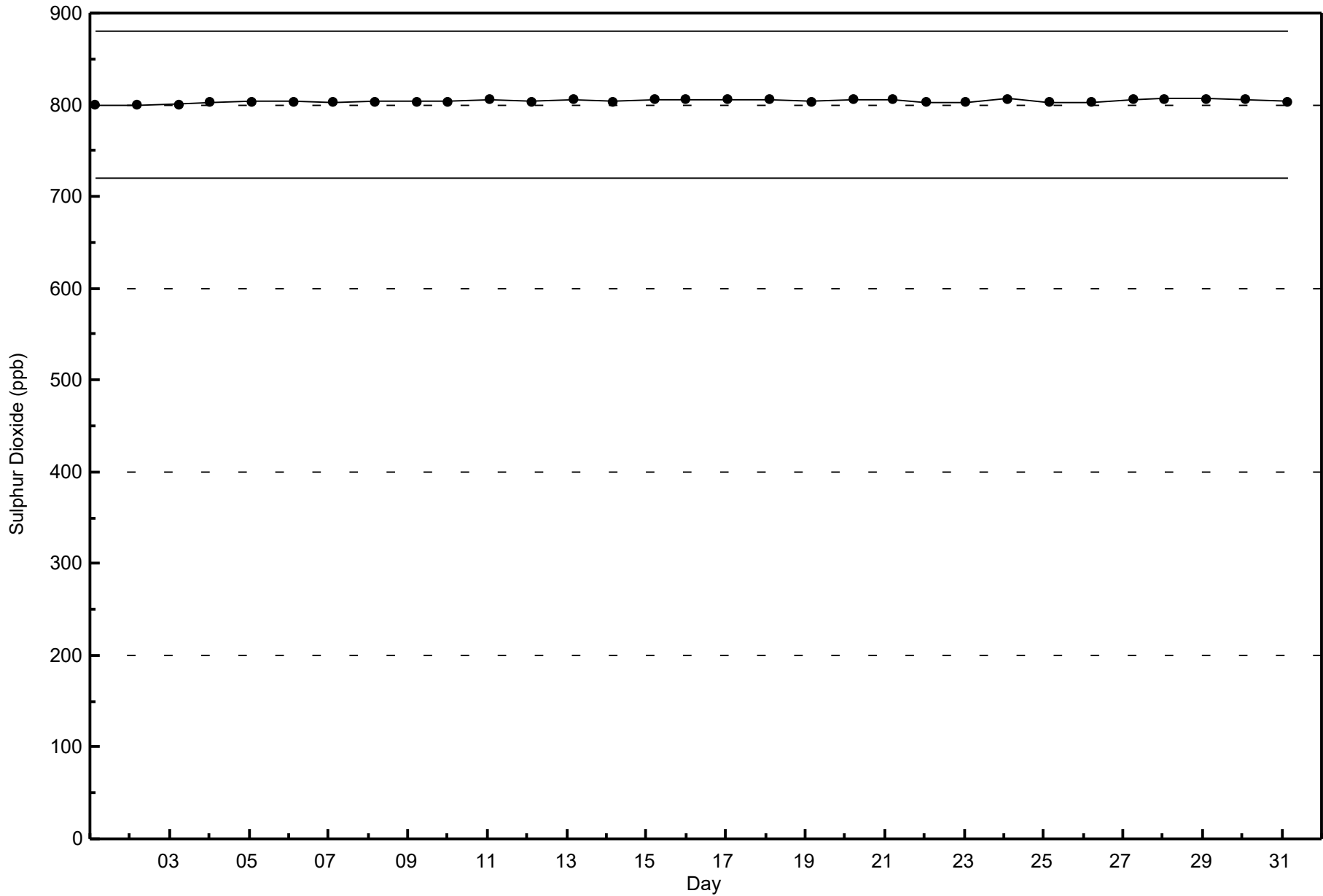


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Conklin

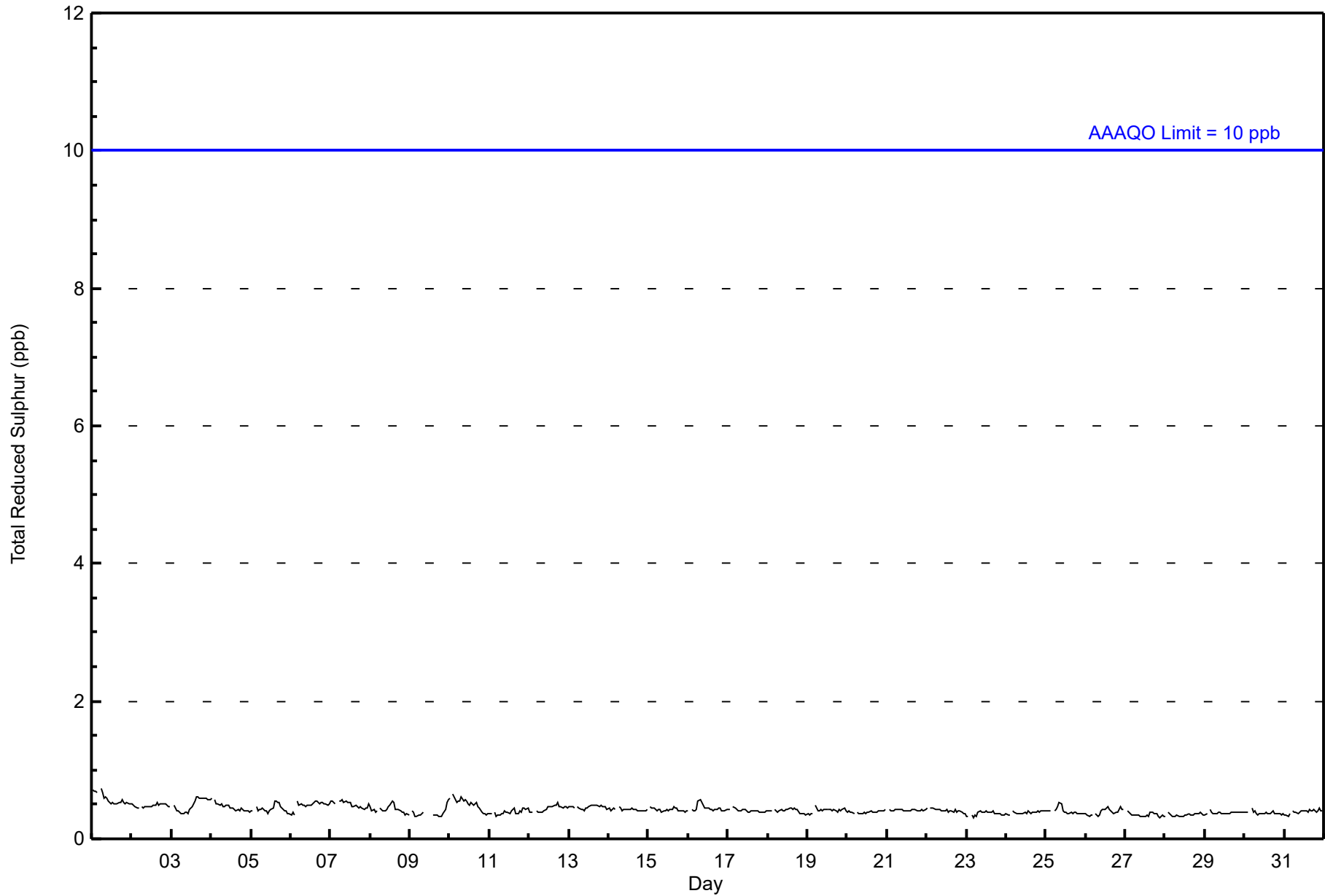








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 0.7 ppb on Jan 1 06:00		Maximum Daily Average: 0.6 ppb on Jan 1														Hours of Data:		708									
Minimum Value: 0.3 ppb on Jan 23 05:00		Minimum Daily Average: 0.3 ppb on Jan 28														Hours of Missing Data:		36									
Maximum Diurnal Average: 0.4 ppb at hour 16		Minimum Diurnal Average: 0.4 ppb at hour 5														Hours of Calibration:		36									
Monthly Average: 0.42 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.4 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.5 P ₉₀ = 0.5 P ₉₉ = 0.6														Percent Operational Time:		100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.7	0.7	0.7	0.7	Z	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.7	
2-Jan	0.5	0.5	0.5	0.4	0.5	Z	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3-Jan	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
4-Jan	0.6	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5-Jan	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
6-Jan	0.3	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7-Jan	0.5	0.5	0.5	0.5	Z	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.6
8-Jan	0.5	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5
9-Jan	Z	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	C	C	C	C	C	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.4	0.6
10-Jan	0.6	Z	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7
11-Jan	0.4	0.4	Z	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
12-Jan	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5
13-Jan	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5
14-Jan	0.4	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15-Jan	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
16-Jan	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6
17-Jan	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
18-Jan	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
19-Jan	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
20-Jan	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
21-Jan	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
22-Jan	0.5	Z	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
23-Jan	0.3	0.3	Z	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4
24-Jan	0.4	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
25-Jan	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
26-Jan	0.4	0.4	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5
27-Jan	Z	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
28-Jan	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
29-Jan	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
30-Jan	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
31-Jan	0.4	0.3	0.3	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5
																								Diurnal Average		0.4	
																								Diurnal Maximum		0.7	
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	34	27	14	8	13	17	39	58	67	107	116	38	19	26	51	71	705
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	27	14	8	13	17	39	58	67	107	116	38	19	26	51	71	705

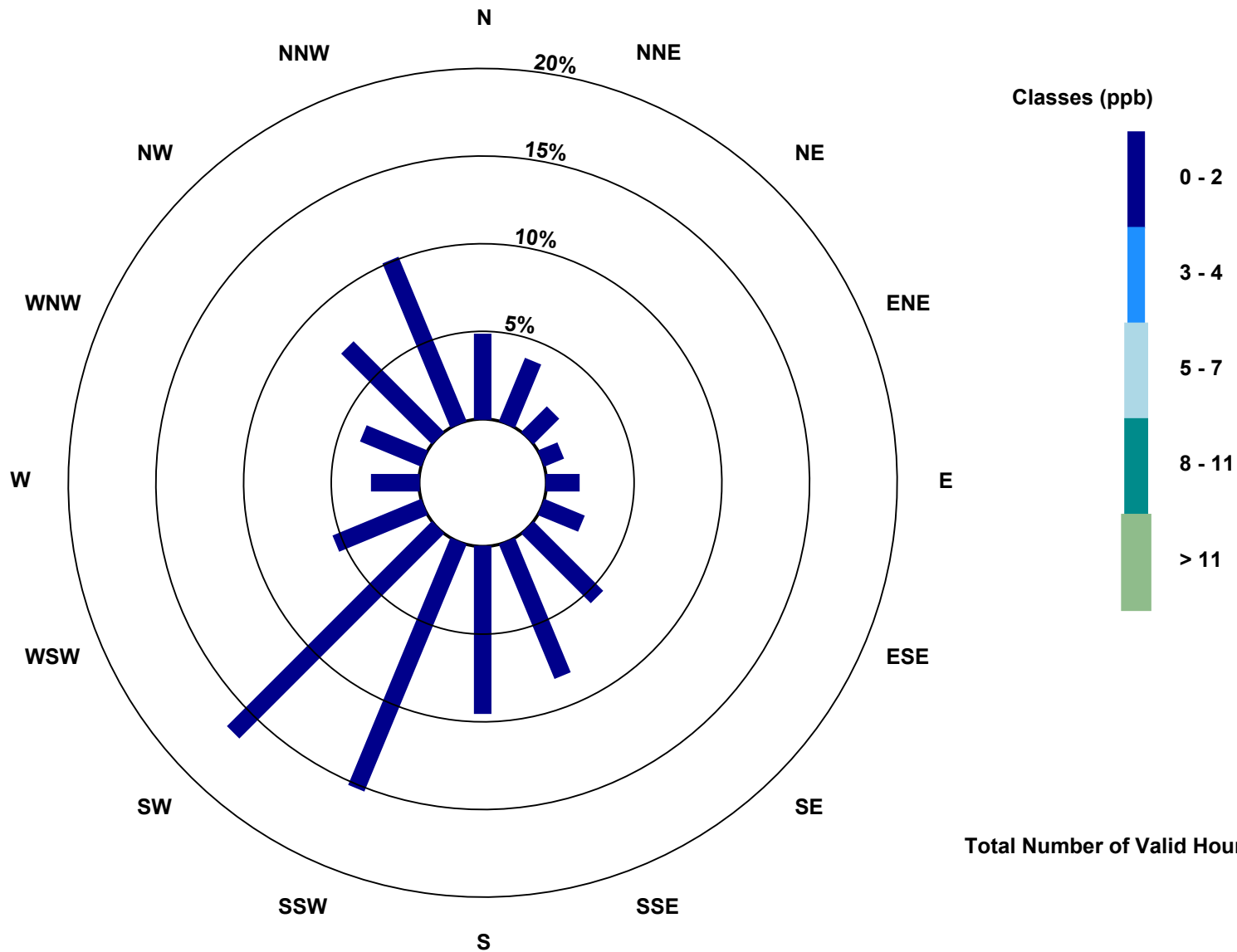
Total Number of Valid Hours: 705

Total Number of Hours: 744

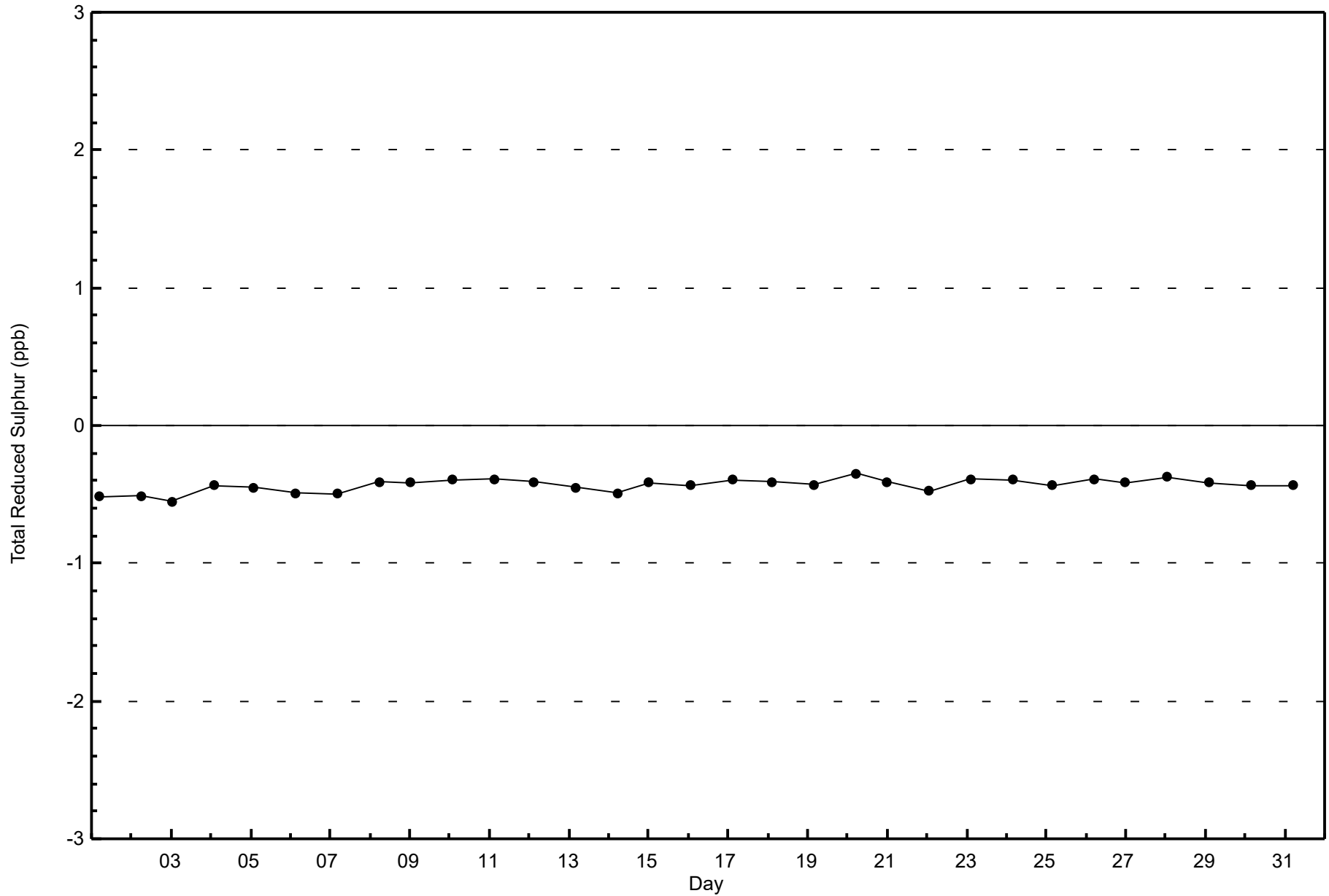


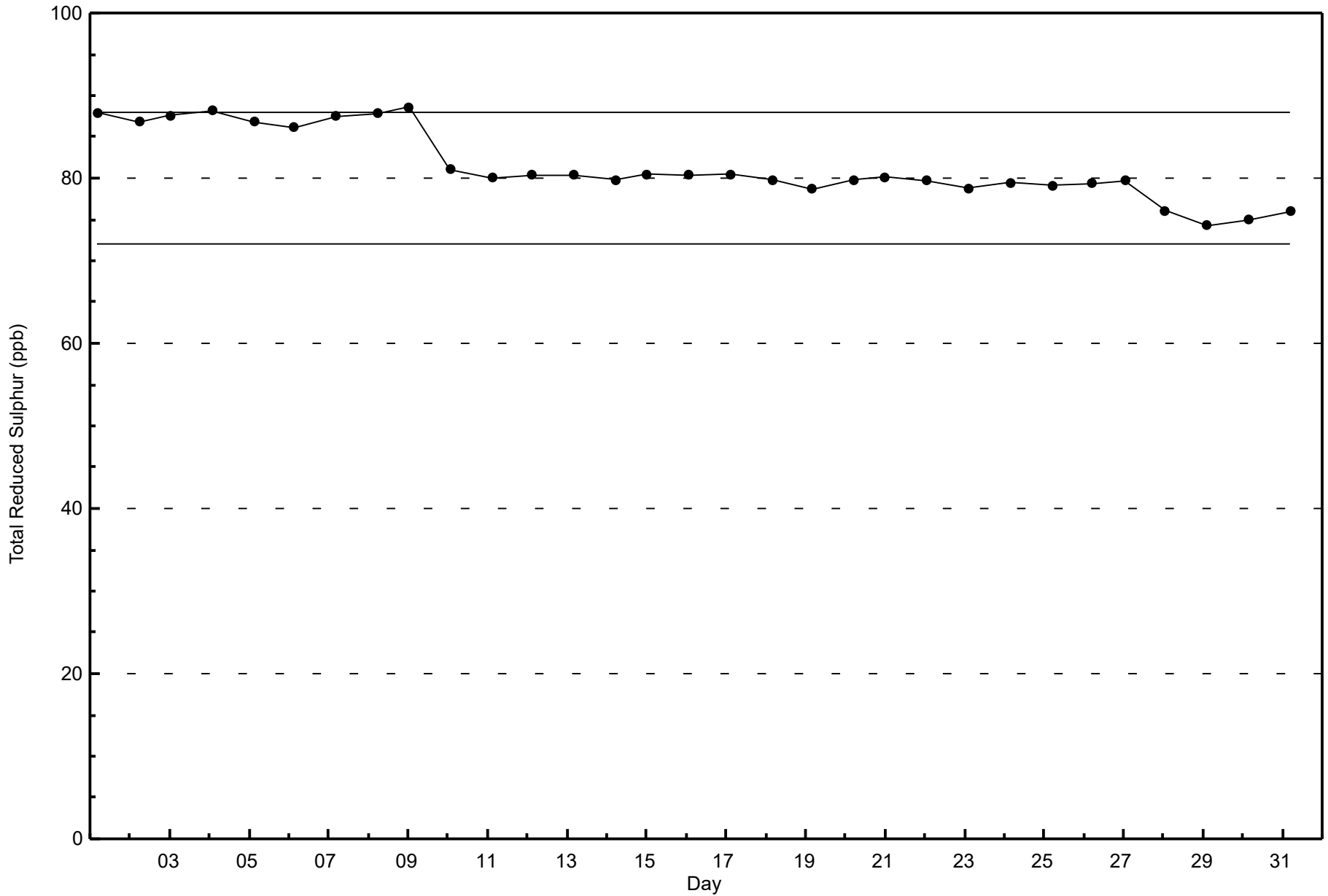
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Conklin



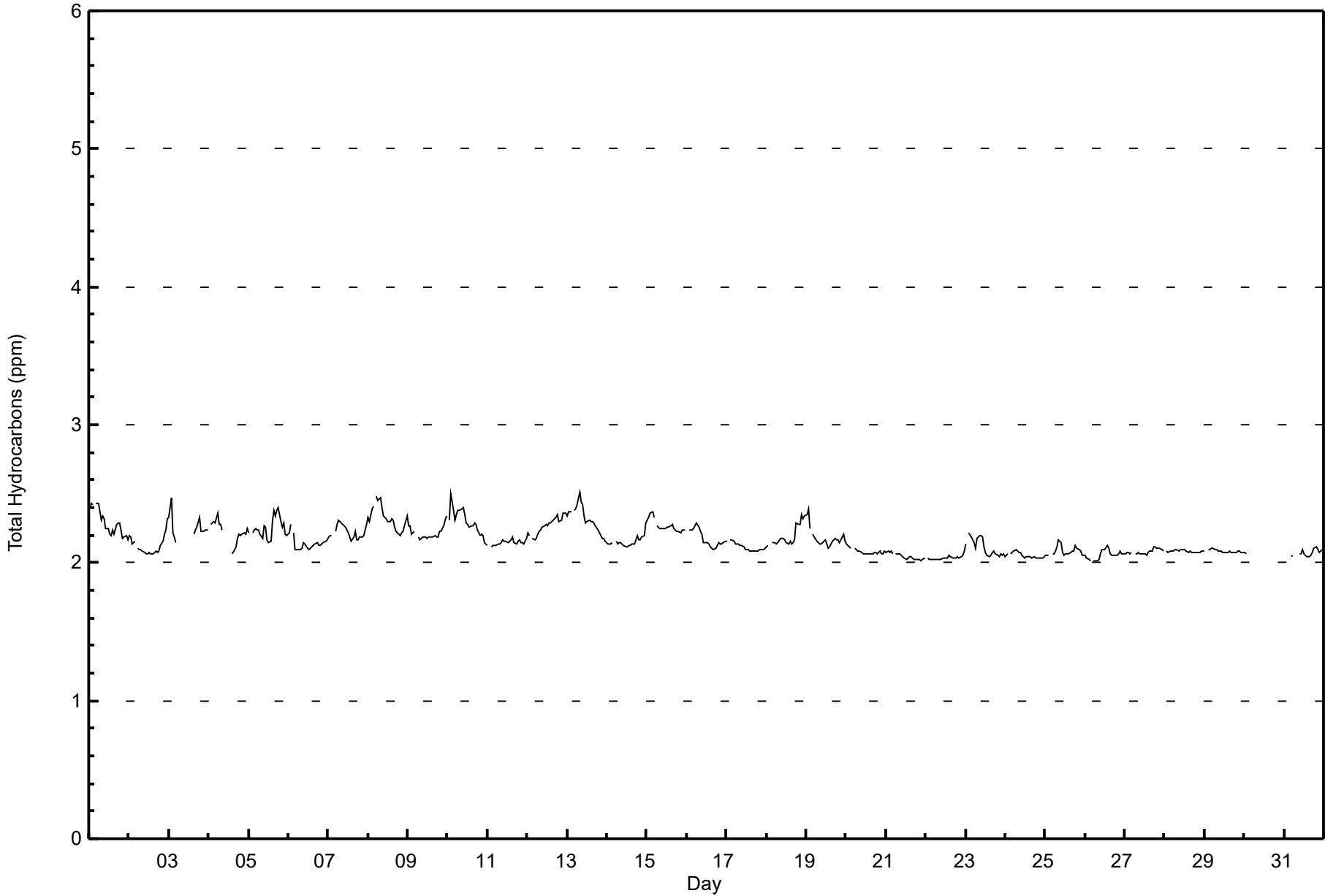
Total Number of Valid Hours: 705







Maximum Value: 2.5 ppm on Jan 13 08:00		Maximum Daily Average: 2.3 ppm on Jan 8		Hours in Service: 744																							
Minimum Value: 2.0 ppm on Jan 26 06:00		Minimum Daily Average: 2.0 ppm on Jan 22		Hours of Data: 673																							
Maximum Diurnal Average: 2.2 ppm at hour 2		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Missing Data: 71																							
Monthly Average: 2.16 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.4		Hours of Calibration: 34																							
				Percent Operational Time: 95.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.1	2.4
2-Jan	2.2	2.2	2.1	2.2	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.1	2.3	
3-Jan	2.3	2.5	2.2	2.2	2.1	Z	UO	UO	UO	UO	UO	UO	C	C	C	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	--	2.5	
4-Jan	Z	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.2	M	M	M	M	M	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	
5-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.2	2.3	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.3	2.4	
6-Jan	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3	
7-Jan	2.2	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	
8-Jan	2.3	2.3	2.4	2.4	Z	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.5	
9-Jan	2.3	2.3	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	
10-Jan	Z	2.3	2.5	2.4	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.5	
11-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	
12-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4	
13-Jan	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.5	
14-Jan	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	
15-Jan	2.3	2.3	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	
16-Jan	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	
17-Jan	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
18-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	
19-Jan	2.4	2.4	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.4	
20-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
21-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	
22-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	
23-Jan	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	
24-Jan	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
25-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
26-Jan	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
27-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
28-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
29-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
30-Jan	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	2.1
31-Jan	UO	UO	UO	Z	2.0	2.1	UO	2.1	M	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan				C - Calibration				M - Maintenance				UO - Unstable Operation															





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	64	9.51	9.51
2.1 - 3.0	609	90.49	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 673

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Conklin - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	1	0	0	0	2	2	11	3	1	11	19	14	64
2.1 - 3.0	31	25	14	8	11	16	36	60	61	102	102	34	12	12	30	52	606
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	25	14	8	12	16	36	60	63	104	113	37	13	23	49	66	670

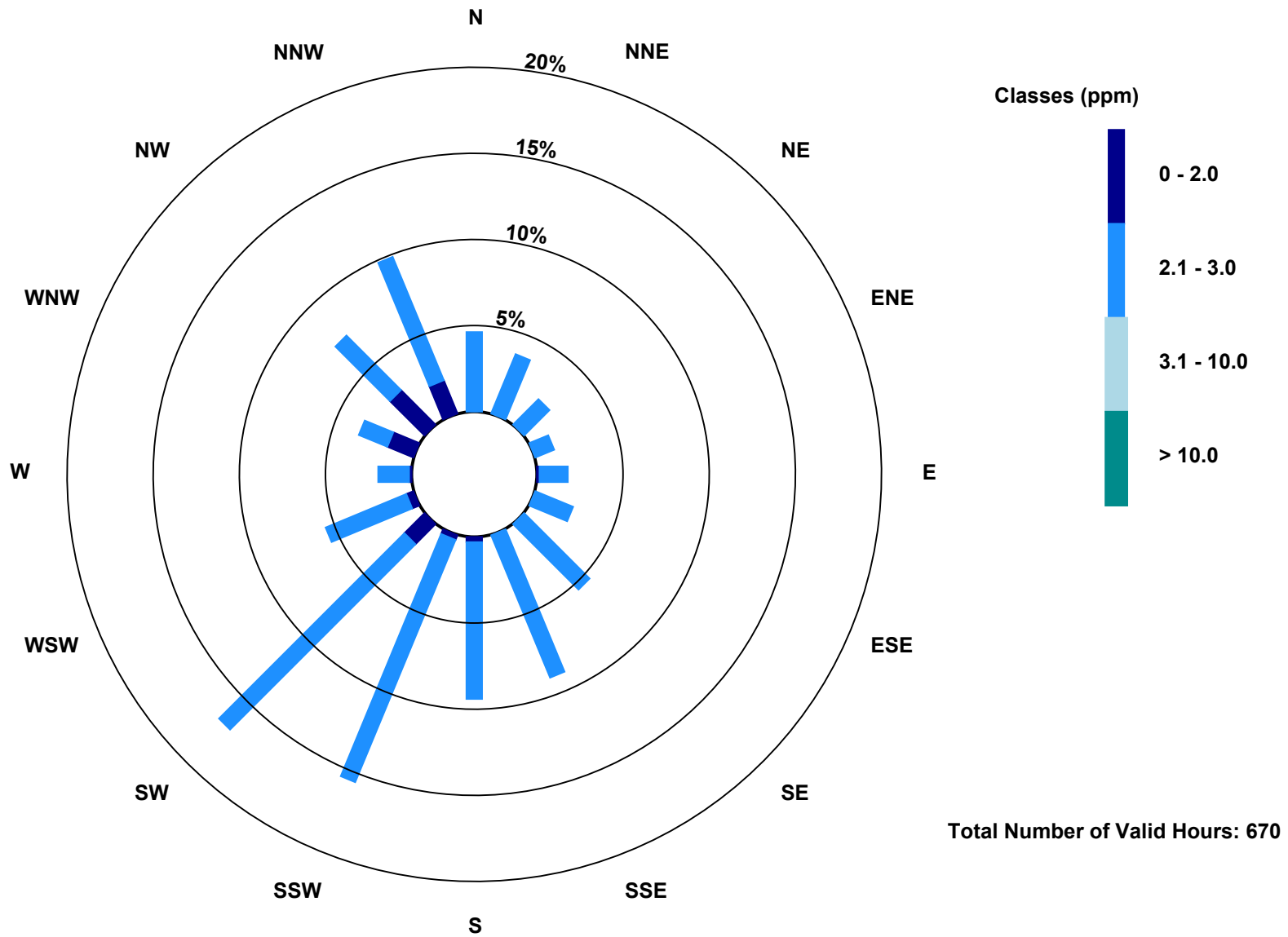
Total Number of Valid Hours: 670

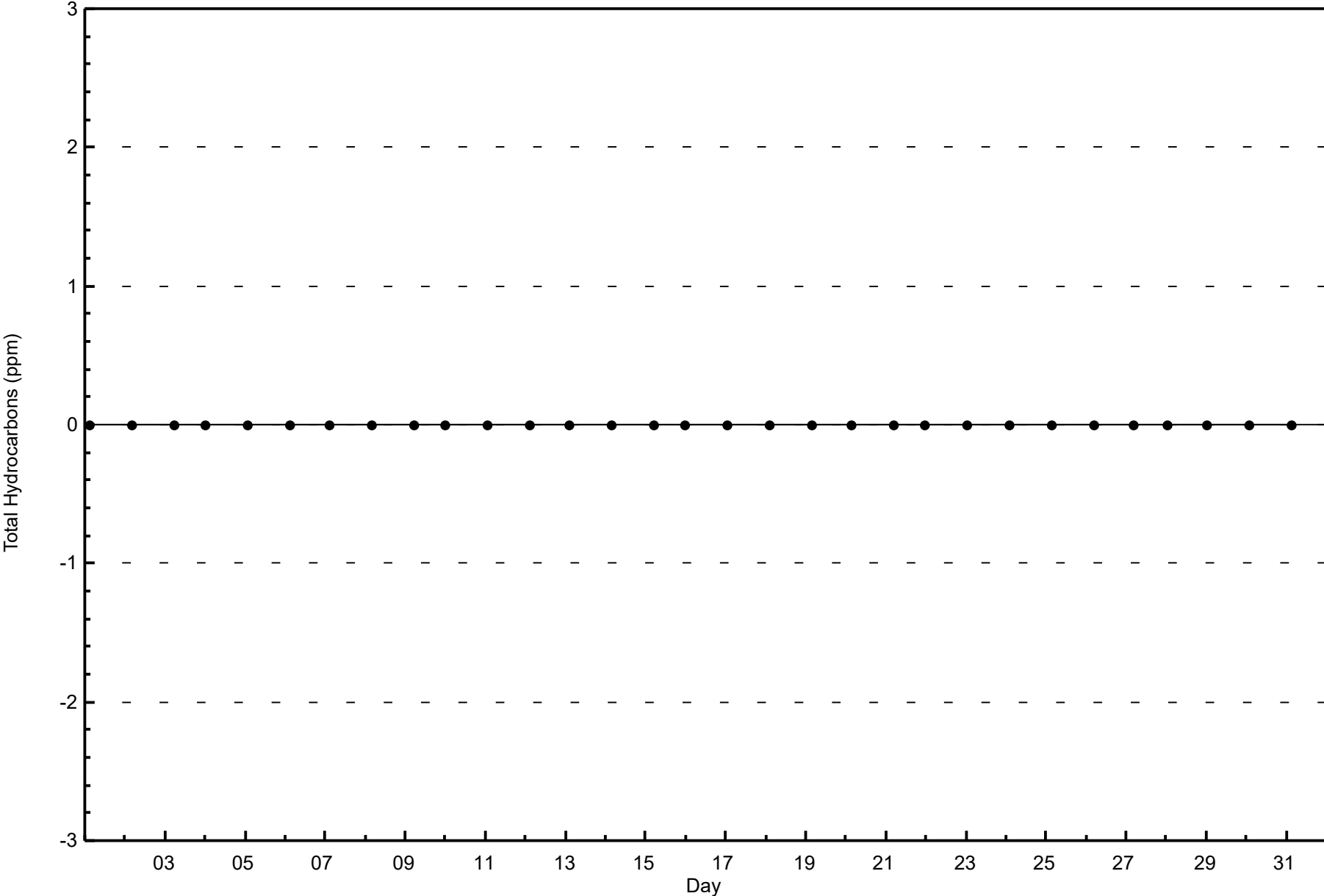
Total Number of Hours: 744

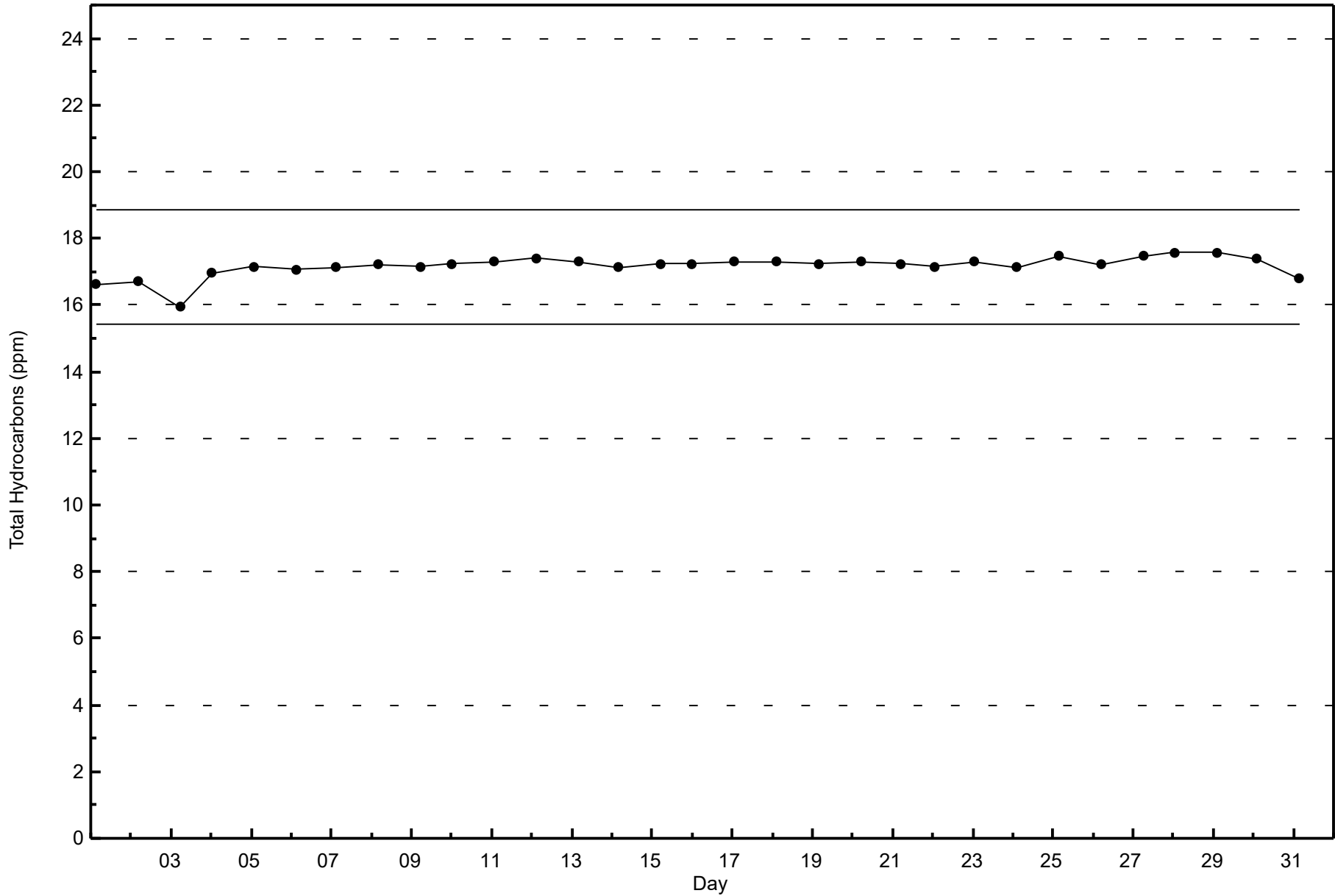


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Conklin





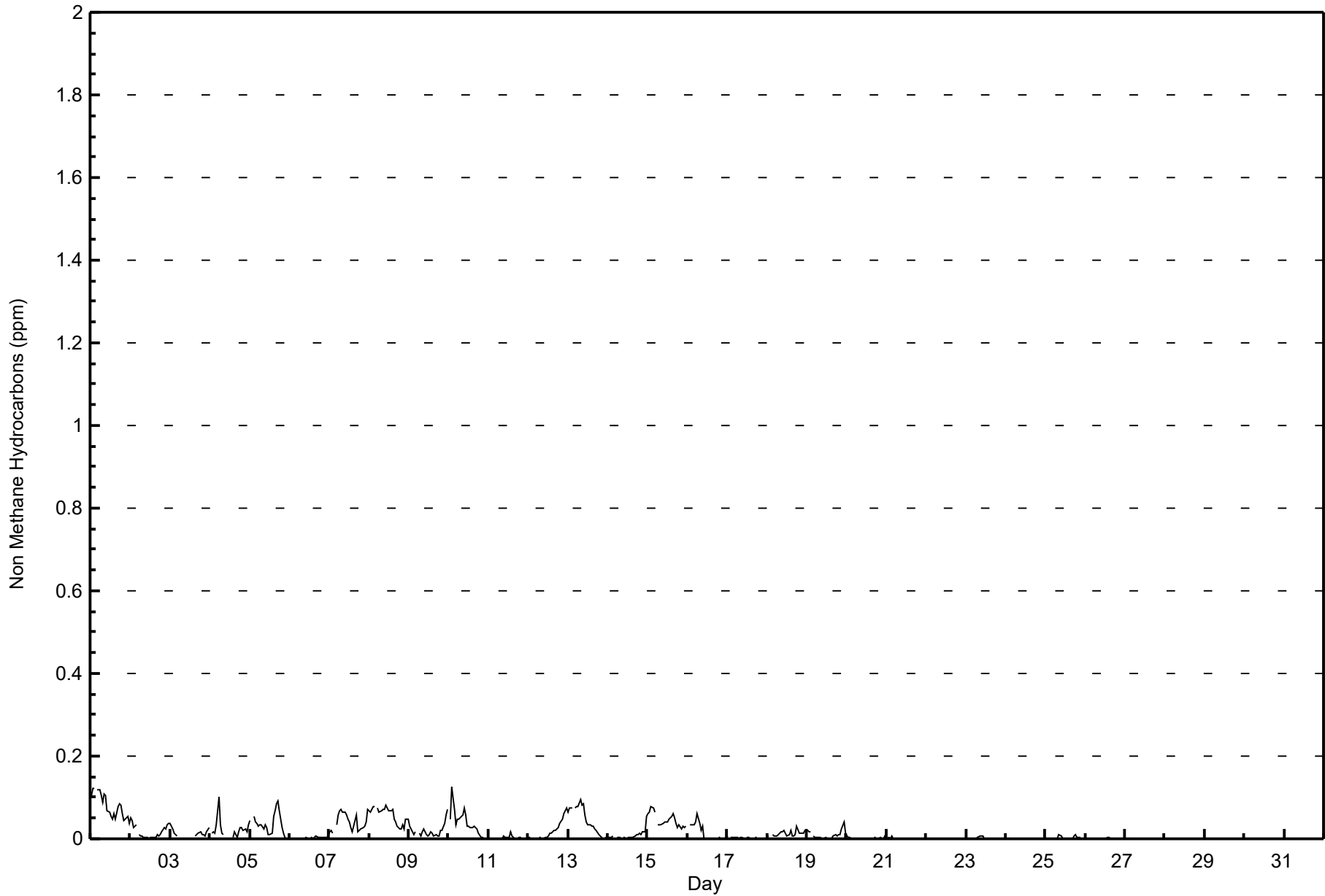




Summary of Hour Averages

Conklin - January 2023

Maximum Value: 0.125 ppm on Jan 10 03:00		Maximum Daily Average: 0.079 ppm on Jan 1		Hours in Service:	744																																						
Minimum Value: 0.000 ppm on Jan 6 01:00		Minimum Daily Average: 0.000 ppm on Jan 29		Hours of Data:	673																																						
Maximum Diurnal Average: 0.027 ppm at hour 3		Minimum Diurnal Average: 0.011 ppm at hour 21		Hours of Missing Data:	71																																						
Monthly Average: 0.016 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.1 P ₉₉ = 0.1		Hours of Calibration:	34																																						
				Percent Operational Time:	95.0																																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																			
1-Jan	0.105	0.120	0.121	Z	0.120	0.120	0.104	0.088	0.107	0.106	0.069	0.066	0.053	0.047	0.060	0.048	0.078	0.084	0.082	0.063	0.045	0.047	0.054	0.036	0.079	0.121																	
2-Jan	0.051	0.044	0.028	0.035	Z	0.011	0.007	0.007	0.005	0.004	0.004	0.001	0.004	0.003	0.003	0.005	0.009	0.007	0.010	0.018	0.026	0.023	0.035	0.037	0.016	0.051																	
3-Jan	0.036	0.023	0.012	0.009	0.008	Z	UO	UO	UO	UO	UO	UO	C	C	C	0.008	0.012	0.012	0.018	0.012	0.011	0.008	0.015	0.027	--	0.036																	
4-Jan	Z	0.015	0.018	0.015	0.035	0.102	0.033	0.015	0.011	M	M	M	M	M	0.002	0.016	0.004	0.018	0.027	0.026	0.019	0.023	0.017	0.035	0.024	0.102																	
5-Jan	0.046	Z	0.053	0.039	0.036	0.032	0.032	0.033	0.022	0.033	0.028	0.011	0.011	0.014	0.056	0.068	0.083	0.092	0.068	0.028	0.013	0.002	0.001	0.000	0.035	0.092																	
6-Jan	0.000	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.002	0.001	0.003	0.008	0.003	0.004	0.002	0.003	0.005	0.004	0.006	0.002	0.008																	
7-Jan	0.016	0.019	0.015	Z	0.034	0.057	0.069	0.070	0.065	0.063	0.056	0.047	0.040	0.027	0.017	0.044	0.059	0.018	0.020	0.024	0.029	0.030	0.041	0.072	0.041	0.072																	
8-Jan	0.068	0.064	0.078	0.079	Z	0.075	0.065	0.069	0.070	0.071	0.080	0.076	0.068	0.068	0.072	0.047	0.039	0.032	0.024	0.025	0.033	0.024	0.048	0.046	0.057	0.080																	
9-Jan	0.031	0.024	0.017	0.012	0.017	Z	0.015	0.008	0.016	0.022	0.010	0.006	0.010	0.016	0.012	0.007	0.012	0.008	0.007	0.020	0.021	0.039	0.059	0.073	0.020	0.073																	
10-Jan	Z	0.049	0.125	0.070	0.033	0.047	0.049	0.049	0.058	0.073	0.058	0.032	0.029	0.028	0.026	0.031	0.028	0.022	0.012	0.005	0.002	0.002	0.001	0.001	0.036	0.125																	
11-Jan	0.000	Z	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.008	0.003	0.003	0.002	0.019	0.007	0.004	0.000	0.000	0.004	0.002	0.001	0.001	0.001	0.001	0.003	0.019																	
12-Jan	0.005	0.004	Z	0.001	0.000	0.001	0.002	0.002	0.001	0.001	0.004	0.005	0.008	0.014	0.012	0.019	0.020	0.023	0.026	0.038	0.046	0.061	0.068	0.075	0.019	0.075																	
13-Jan	0.064	0.076	0.073	Z	0.076	0.079	0.079	0.095	0.080	0.086	0.059	0.040	0.033	0.033	0.031	0.030	0.025	0.020	0.011	0.007	0.003	0.002	0.000	0.003	0.044	0.095																	
14-Jan	0.005	0.003	0.004	0.008	Z	0.004	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.003	0.004	0.004	0.006	0.010	0.012	0.012	0.011	0.017	0.018	0.053	0.008	0.053																	
15-Jan	0.060	0.066	0.078	0.074	0.064	Z	0.036	0.035	0.033	0.037	0.039	0.042	0.039	0.049	0.053	0.062	0.050	0.038	0.026	0.033	0.024	0.031	0.027	0.029	0.045	0.078																	
16-Jan	Z	0.035	0.033	0.032	0.035	0.042	0.062	0.039	0.022	0.032	0.002	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.002	0.001	0.000	0.002	0.005	0.015	0.062																	
17-Jan	0.005	Z	0.003	0.003	0.004	0.003	0.002	0.002	0.003	0.004	0.002	0.001	0.002	0.003	0.002	0.001	0.002	0.003	0.000	0.001	0.000	0.000	0.001	0.001	0.002	0.005																	
18-Jan	0.002	0.006	Z	0.011	0.007	0.007	0.006	0.009	0.017	0.016	0.019	0.015	0.008	0.010	0.020	0.008	0.006	0.010	0.030	0.013	0.014	0.014	0.015	0.021	0.012	0.030																	
19-Jan	0.022	0.016	0.016	Z	0.007	0.004	0.002	0.002	0.002	0.001	0.002	0.004	0.001	0.000	0.001	0.001	0.006	0.011	0.008	0.009	0.010	0.022	0.041	0.014	0.009	0.041																	
20-Jan	0.007	0.003	0.002	0.001	Z	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.005	0.000	0.000	0.008	0.001	0.008																	
21-Jan	0.000	0.004	0.001	0.005	0.000	Z	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.001	0.005																	
22-Jan	Z	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001																	
23-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.002	0.006	0.008	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.008																	
24-Jan	0.000	0.000	Z	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001																	
25-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.011	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.012	0.005	0.004	0.002	0.001	0.000	0.002	0.012																	
26-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.004																	
27-Jan	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																	
28-Jan	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																	
29-Jan	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																	
30-Jan	0.000	0.000	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.000																
31-Jan	UO	UO	UO	Z	0.000	0.000	UO	0.000	M	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001																	
																								Diurnal Average		Diurnal Maximum																	
																								0.021 0.023 0.027 0.016 0.019 0.023 0.020 0.018 0.019 0.021 0.016 0.013 0.011 0.012 0.013 0.014 0.015 0.014 0.013 0.012 0.011 0.012 0.015 0.018																			
																								0.105 0.120 0.125 0.079 0.120 0.120 0.104 0.095 0.107 0.106 0.080 0.076 0.068 0.068 0.072 0.068 0.083 0.092 0.082 0.063 0.046 0.061 0.068 0.075																			
Z - zerospan																								C - Calibration				M - Maintenance				UO - Unstable Operation											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	378	56.17	56.17
0.006 - 0.05	224	33.28	89.45
0.06 - 0.1	71	10.55	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 673

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	18	16	5	0	3	6	16	21	27	55	62	24	8	19	43	53	376
0.006 - 0.05	9	7	8	6	8	7	18	26	33	46	29	11	4	2	2	8	224
0.06 - 0.1	4	2	1	2	1	3	2	13	3	3	22	2	1	2	4	5	70
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	25	14	8	12	16	36	60	63	104	113	37	13	23	49	66	670

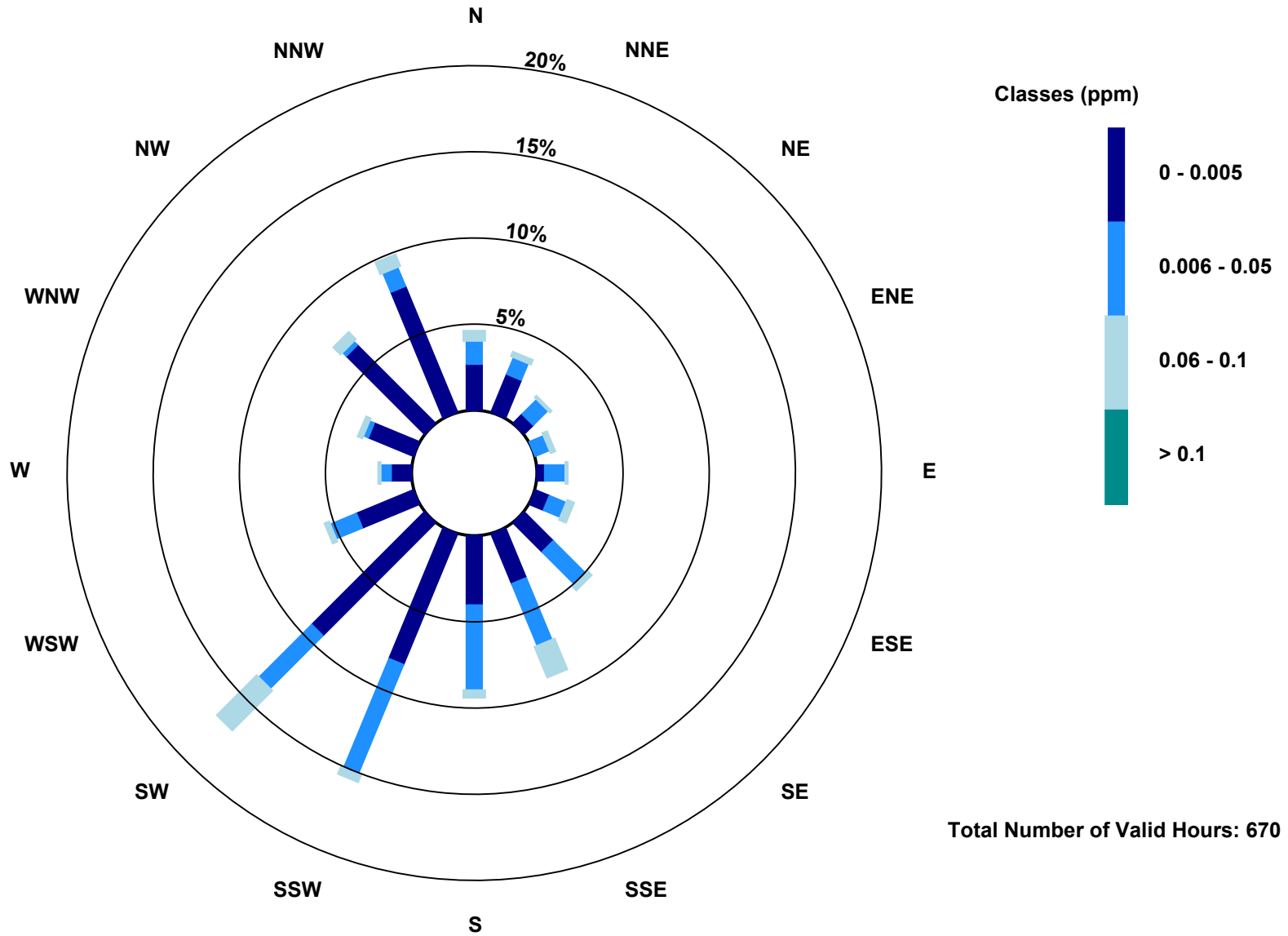
Total Number of Valid Hours: 670

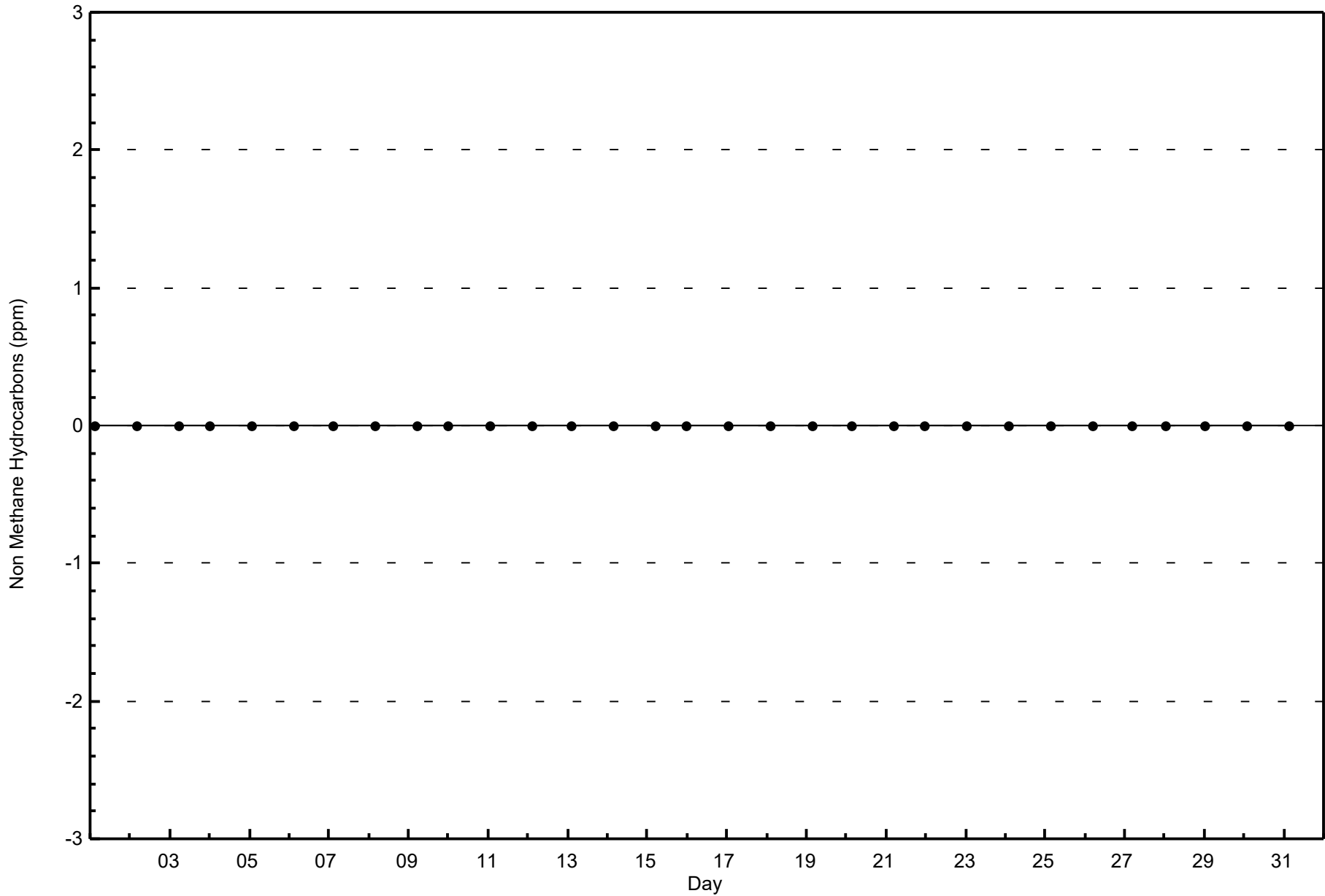
Total Number of Hours: 744

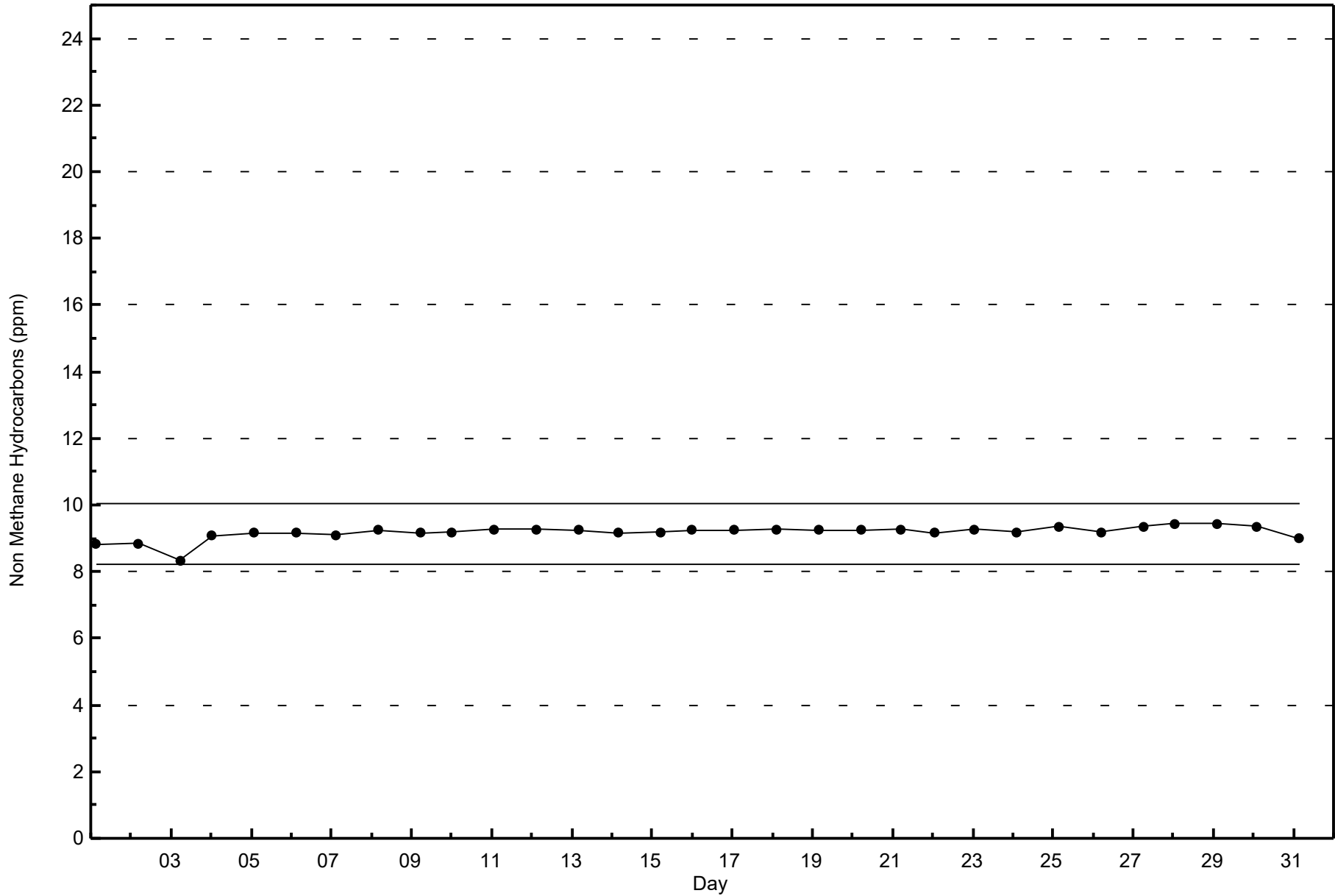


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

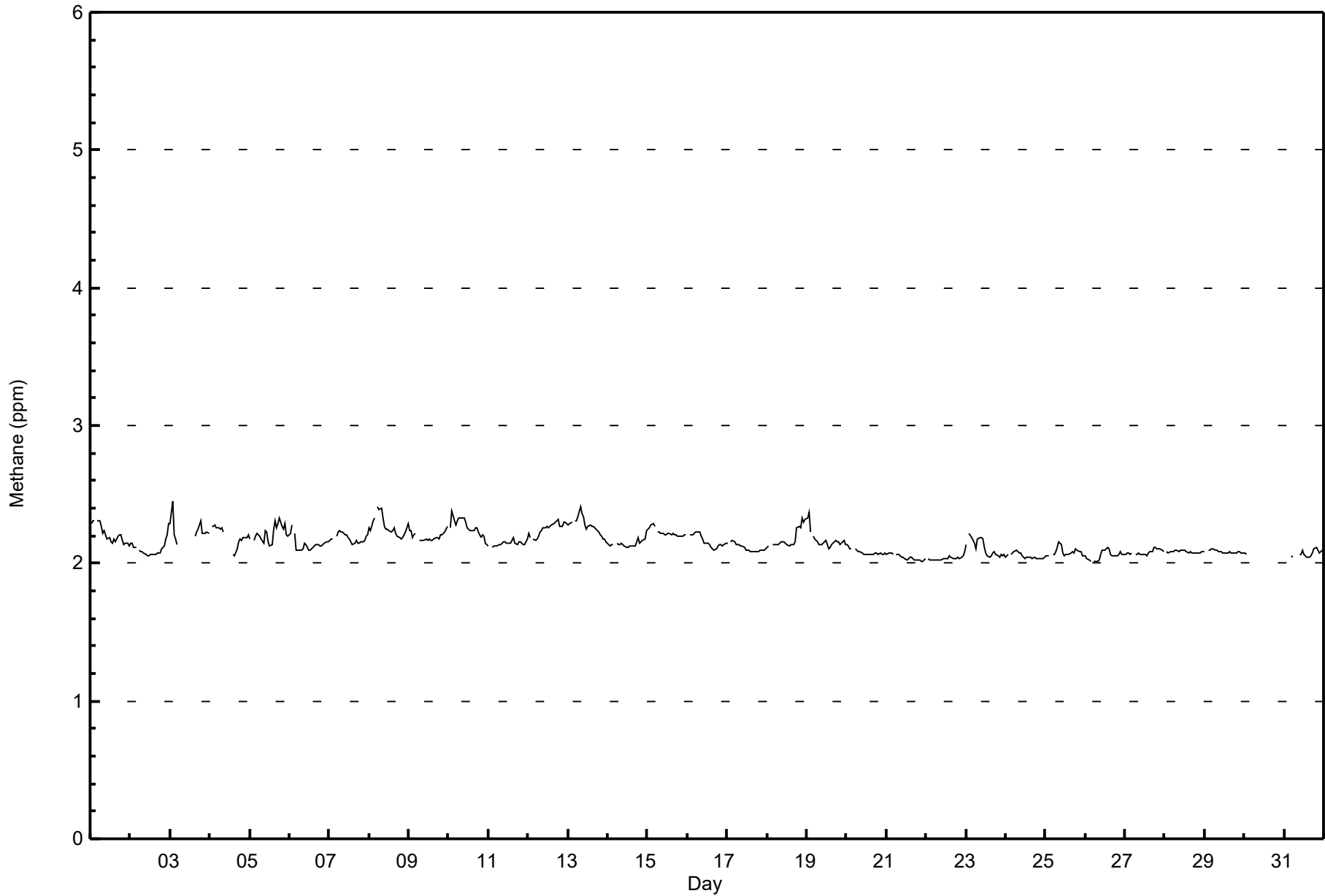
Conklin - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																				
Maximum Value: 2.4 ppm on Jan 3 02:00		Maximum Daily Average: 2.3 ppm on Jan 13		Hours of Data: 673																						
Minimum Value: 2.0 ppm on Jan 26 06:00		Minimum Daily Average: 2.0 ppm on Jan 22		Hours of Missing Data: 71																						
Maximum Diurnal Average: 2.2 ppm at hour 2		Minimum Diurnal Average: 2.1 ppm at hour 14		Hours of Calibration: 34																						
Monthly Average: 2.15 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.1 Q ₁ = 2.1 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.4		Percent Operational Time: 95.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.3
2-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3
3-Jan	2.3	2.4	2.2	2.2	2.1	Z	UO	UO	UO	UO	UO	UO	C	C	C	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4
4-Jan	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	M	M	M	M	M	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
5-Jan	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.3
6-Jan	2.2	2.3	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.3
7-Jan	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8-Jan	2.3	2.2	2.3	2.3	Z	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4
9-Jan	2.2	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3
10-Jan	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.4
11-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2
12-Jan	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
13-Jan	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4
14-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.2
15-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3
16-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
17-Jan	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
18-Jan	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3
19-Jan	2.3	2.4	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.4
20-Jan	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
21-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
22-Jan	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1
23-Jan	2.1	Z	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2
24-Jan	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
25-Jan	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
26-Jan	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
27-Jan	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
28-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
29-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
30-Jan	2.1	2.1	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	2.1
31-Jan	UO	UO	UO	Z	2.0	2.1	UO	2.1	M	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.2																								Diurnal Average		
2.3																								Diurnal Maximum		
Z - zerospan				C - Calibration				M - Maintenance				UO - Unstable Operation														



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Conklin - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	65	9.66	9.66
2.1 - 3.0	608	90.34	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 673

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	1	0	0	0	2	3	11	3	1	11	19	14	65
2.1 - 3.0	31	25	14	8	11	16	36	60	61	101	102	34	12	12	30	52	605
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	25	14	8	12	16	36	60	63	104	113	37	13	23	49	66	670

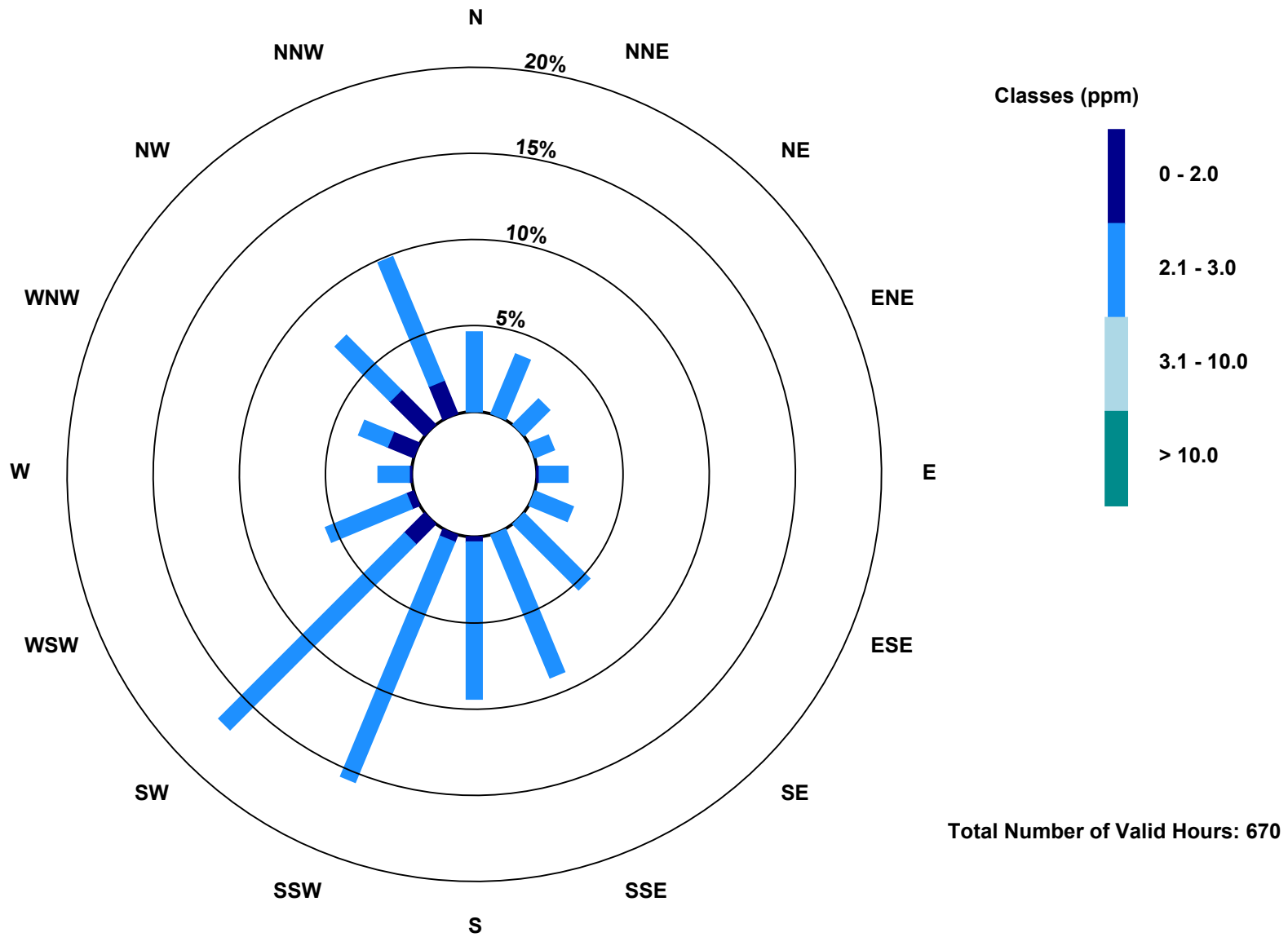
Total Number of Valid Hours: 670

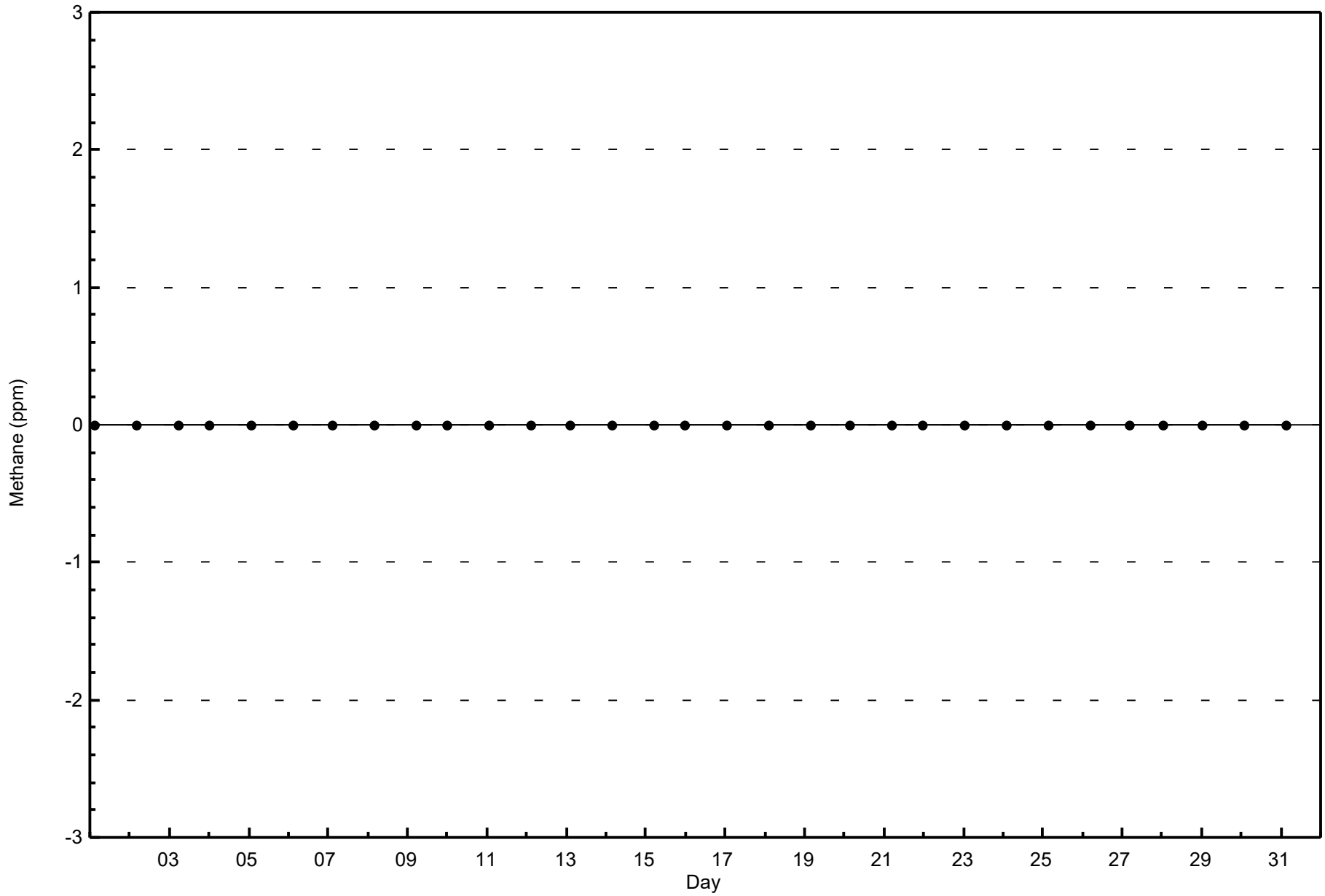
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Conklin

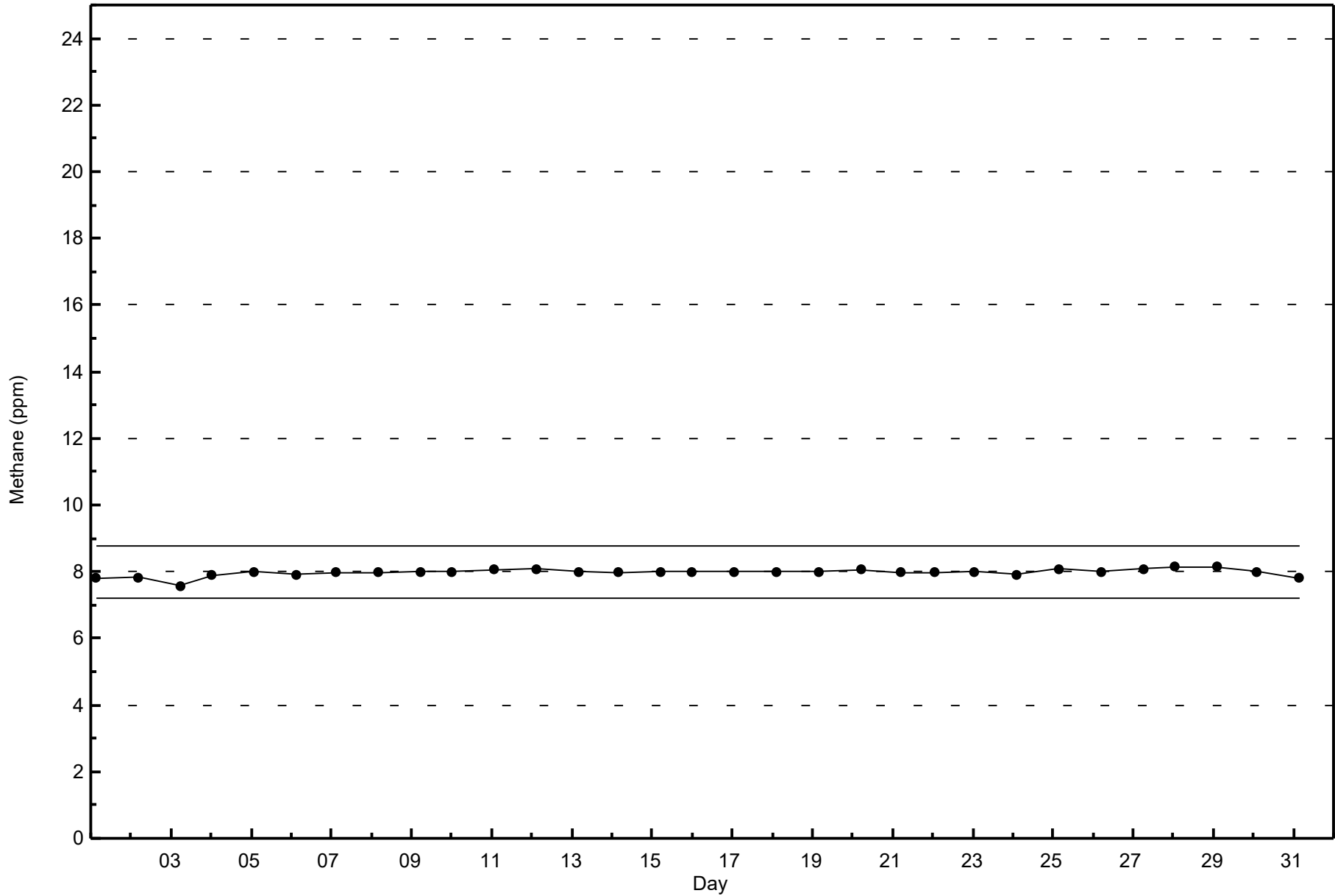






Wood Buffalo Environmental Association
Span Responses

Methane (CH₄) - ppm
Conklin - January 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

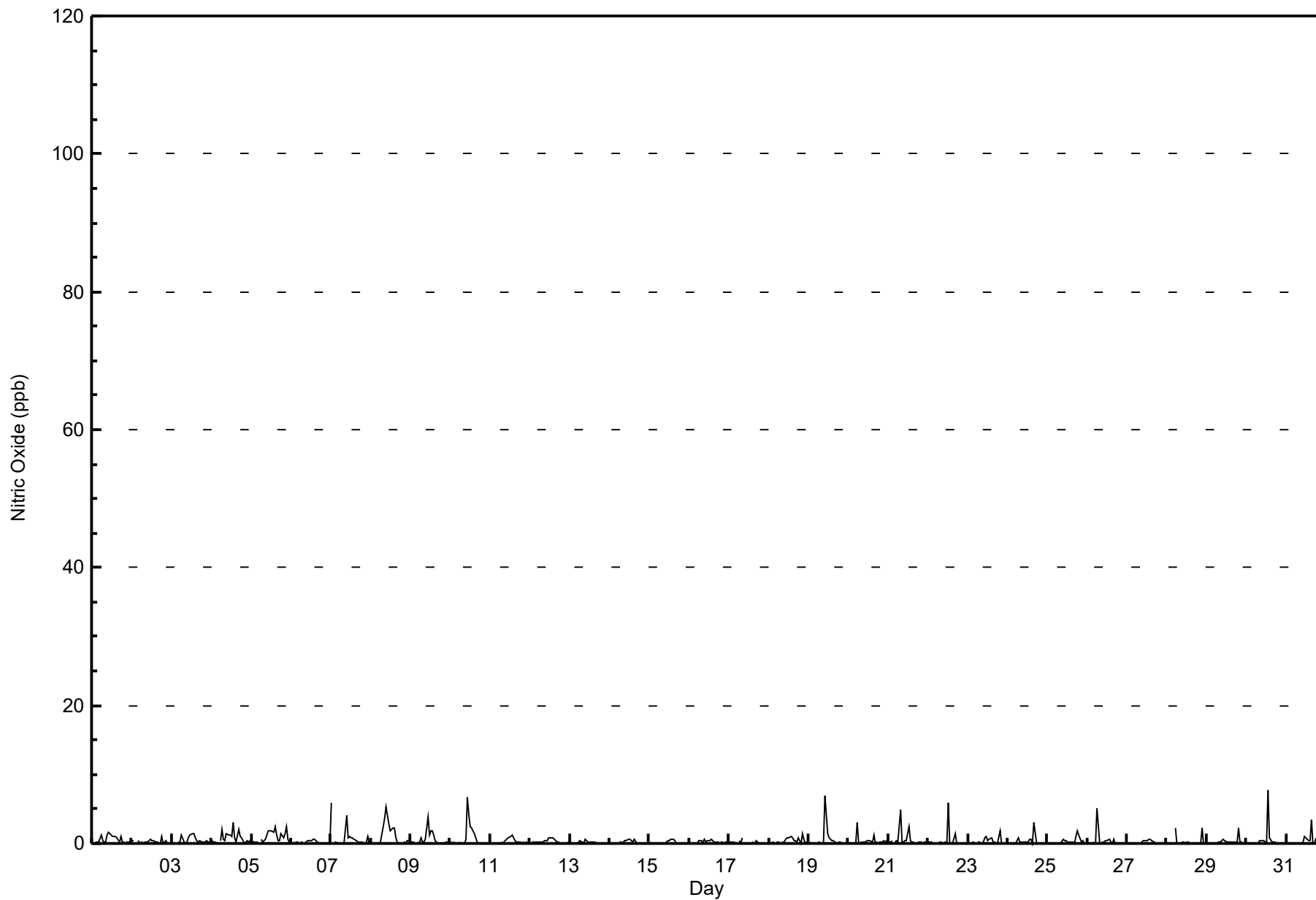
Nitric Oxide (NO) - ppb
Conklin - January 2023

Maximum Value: 7.8 ppb on Jan 30 14:00		Maximum Daily Average: 1.2 ppb on Jan 8		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Jan 3 01:00		Minimum Daily Average: 0.1 ppb on Jan 15		Hours of Data: 708																							
Maximum Diurnal Average: 1.2 ppb at hour 11		Minimum Diurnal Average: 0.1 ppb at hour 5		Hours of Missing Data: 36																							
Monthly Average: 0.42 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 1.0 P ₉₉ = 4.9		Hours of Calibration: 36																							
				Percent Operational Time: 100.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.1	Z	0.1	0.1	0.2	1.2	0.5	0.2	0.2	1.2	1.6	1.3	1.1	1.0	0.9	0.8	0.2	0.9	0.1	0.2	0.1	0.3	0.2	0.1	0.5	1.6	
2-Jan	0.4	0.3	Z	0.5	0.3	0.1	0.3	0.1	0.1	0.2	0.4	0.6	0.4	0.3	0.3	0.2	0.0	0.0	0.9	0.1	0.3	0.0	0.1	0.0	0.3	0.9	
3-Jan	0.0	0.0	0.0	Z	0.1	0.1	1.3	0.1	0.0	0.3	0.7	1.1	1.4	1.3	0.7	0.4	0.1	0.5	0.2	0.2	0.2	0.4	0.2	0.3	0.4	1.4	
4-Jan	0.5	0.1	0.2	0.2	Z	0.5	2.1	0.6	0.4	1.4	1.2	1.2	1.0	3.1	0.8	0.3	2.0	1.0	0.8	0.5	0.1	0.3	0.2	0.3	0.8	3.1	
5-Jan	0.6	0.1	0.2	0.1	0.0	Z	0.6	0.2	0.6	1.2	1.8	1.9	1.8	1.7	2.5	1.3	0.5	0.4	1.4	0.9	1.3	2.5	0.6	0.1	1.0	2.5	
6-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.5	0.5	0.5	0.5	0.6	0.3	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
7-Jan	5.8	Z	0.0	0.1	0.0	0.0	0.1	0.0	0.1	4.0	0.9	1.0	0.9	0.7	0.6	0.3	0.3	0.2	0.2	0.1	0.1	0.1	1.0	0.0	0.7	5.8	
8-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.1	2.4	3.7	5.3	4.0	2.9	1.9	2.3	2.3	0.9	0.2	0.0	0.0	0.0	0.1	0.1	0.5	0.3	1.2	5.3	
9-Jan	0.1	0.1	0.2	Z	0.1	0.1	0.7	0.2	0.1	0.5	3.9	1.1	1.8	1.8	1.2	0.4	0.1	0.0	0.0	0.1	0.0	0.3	0.3	0.1	0.6	3.9	
10-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.7	6.8	4.2	2.5	2.2	1.5	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	6.8	
11-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.3	0.6	0.9	1.0	1.2	0.9	0.4	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.1	0.3	1.2	
12-Jan	Z	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.4	0.4	0.9	0.7	0.8	0.8	0.4	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.9	
13-Jan	0.1	Z	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.7	0.4	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.7	
14-Jan	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.1	0.0	0.4	0.4	0.6	0.6	0.4	0.2	0.7	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.7	
15-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.6	0.7	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.7	
16-Jan	0.0	0.0	0.0	0.0	Z	0.1	0.3	0.3	0.2	0.5	0.3	0.4	0.4	0.6	0.4	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.6	
17-Jan	0.1	0.1	0.2	0.2	0.1	Z	0.3	0.0	0.9	C	C	C	C	C	0.3	0.1	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.9	
18-Jan	Z	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.5	0.8	0.9	0.9	0.8	0.4	0.3	0.3	0.9	0.0	1.3	0.6	0.0	0.2	0.4	1.3	
19-Jan	0.3	Z	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.2	7.0	1.5	0.8	0.5	0.5	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.5	7.0	
20-Jan	0.0	0.0	Z	0.0	0.0	3.1	0.3	0.1	0.2	0.1	0.2	0.4	0.4	0.3	0.2	1.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.5	0.4	3.1	
21-Jan	0.1	0.2	0.3	Z	0.2	0.3	0.3	4.9	0.3	0.3	0.3	0.4	2.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.5	4.9	
22-Jan	0.2	0.2	0.2	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	5.8	0.0	0.0	0.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.8	
23-Jan	0.2	0.0	0.0	0.2	0.1	Z	0.3	0.2	0.0	0.3	0.7	1.0	0.5	0.7	0.2	0.1	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.3	1.9	
24-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.2	0.1	0.1	0.1	0.2	0.6	0.5	0.1	3.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.0	
25-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.3	0.3	0.2	0.1	0.2	0.2	0.1	1.0	1.8	1.1	0.1	0.4	0.1	0.1	0.3	1.8	
26-Jan	0.0	0.1	Z	0.1	0.1	0.1	5.1	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.1	
27-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.6	0.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.6	
28-Jan	0.0	0.0	0.0	0.0	Z	2.2	0.1	0.1	0.0	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	2.2	0.0	0.1	0.3	2.2	
29-Jan	0.0	0.0	0.0	0.0	0.1	Z	0.2	0.2	0.3	0.4	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	2.3	0.1	0.1	0.1	0.1	0.3	2.3	
30-Jan	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.2	0.2	7.8	0.8	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	7.8	
31-Jan	0.0	Z	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	0.8	0.3	0.3	3.5	0.1	0.0	0.5	0.2	0.1	4.8	0.0	0.0	0.5	4.8	
		0.3	0.1	0.1	0.1	0.1	0.3	0.5	0.4	0.3	0.7	1.2	0.9	1.0	1.1	0.7	0.5	0.4	0.2	0.3	0.3	0.2	0.4	0.1	0.1	Diurnal Average	
		5.8	0.3	0.3	0.5	0.3	3.1	5.1	4.9	3.7	5.3	7.0	4.2	5.8	7.8	2.5	3.5	3.0	1.0	1.8	2.3	1.3	4.8	1.0	0.5	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	708	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705

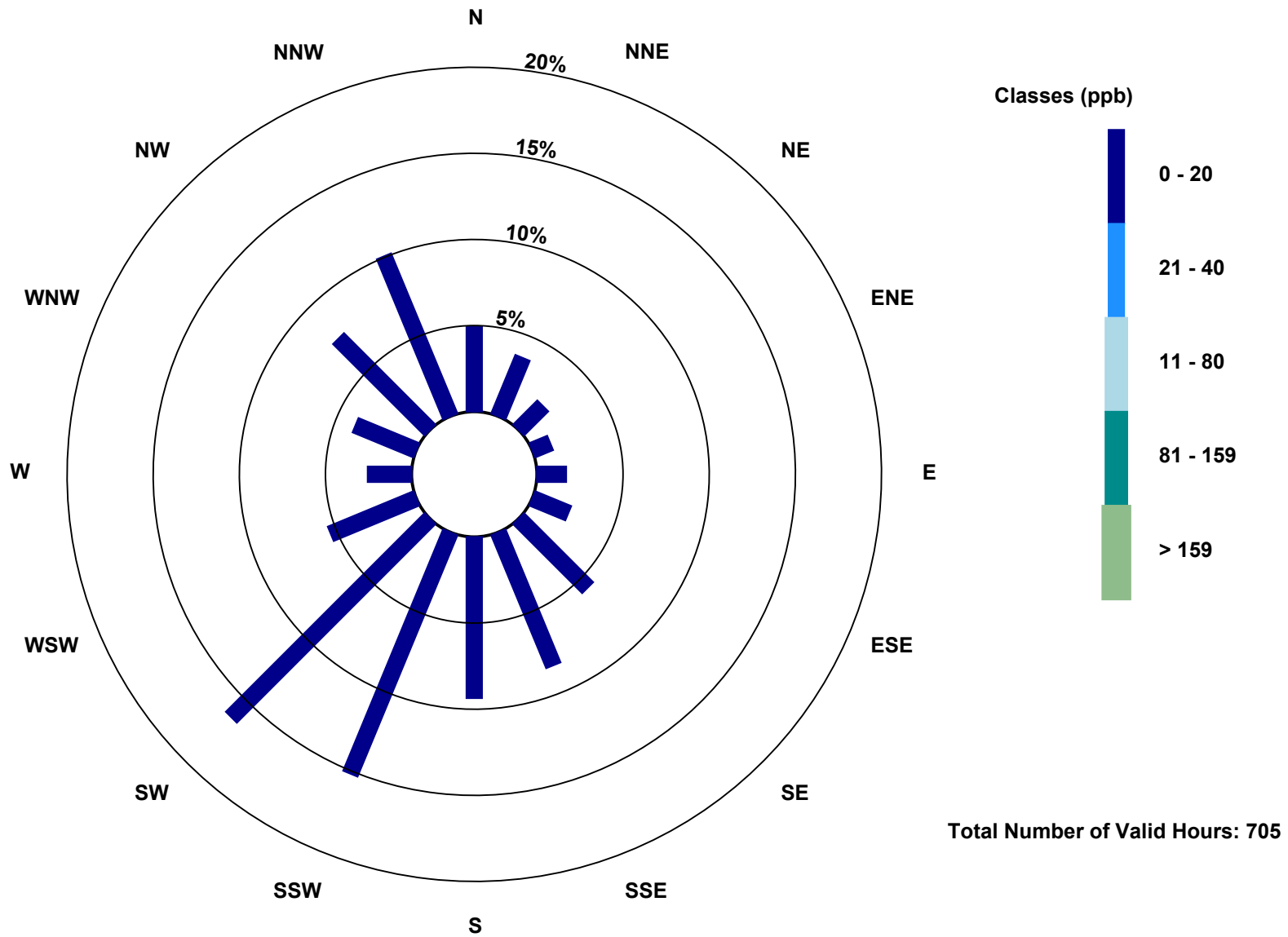
Total Number of Valid Hours: 705

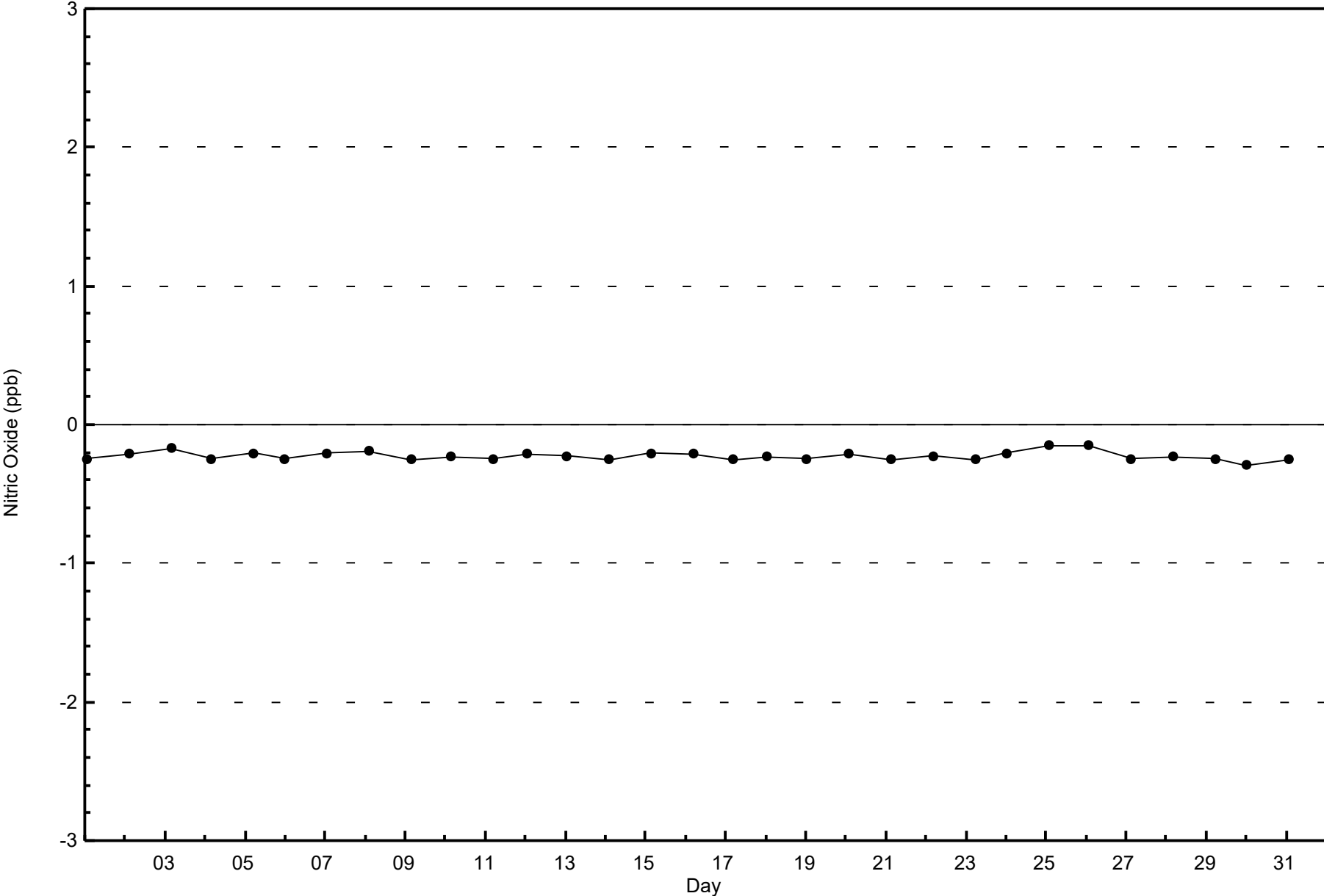
Total Number of Hours: 744

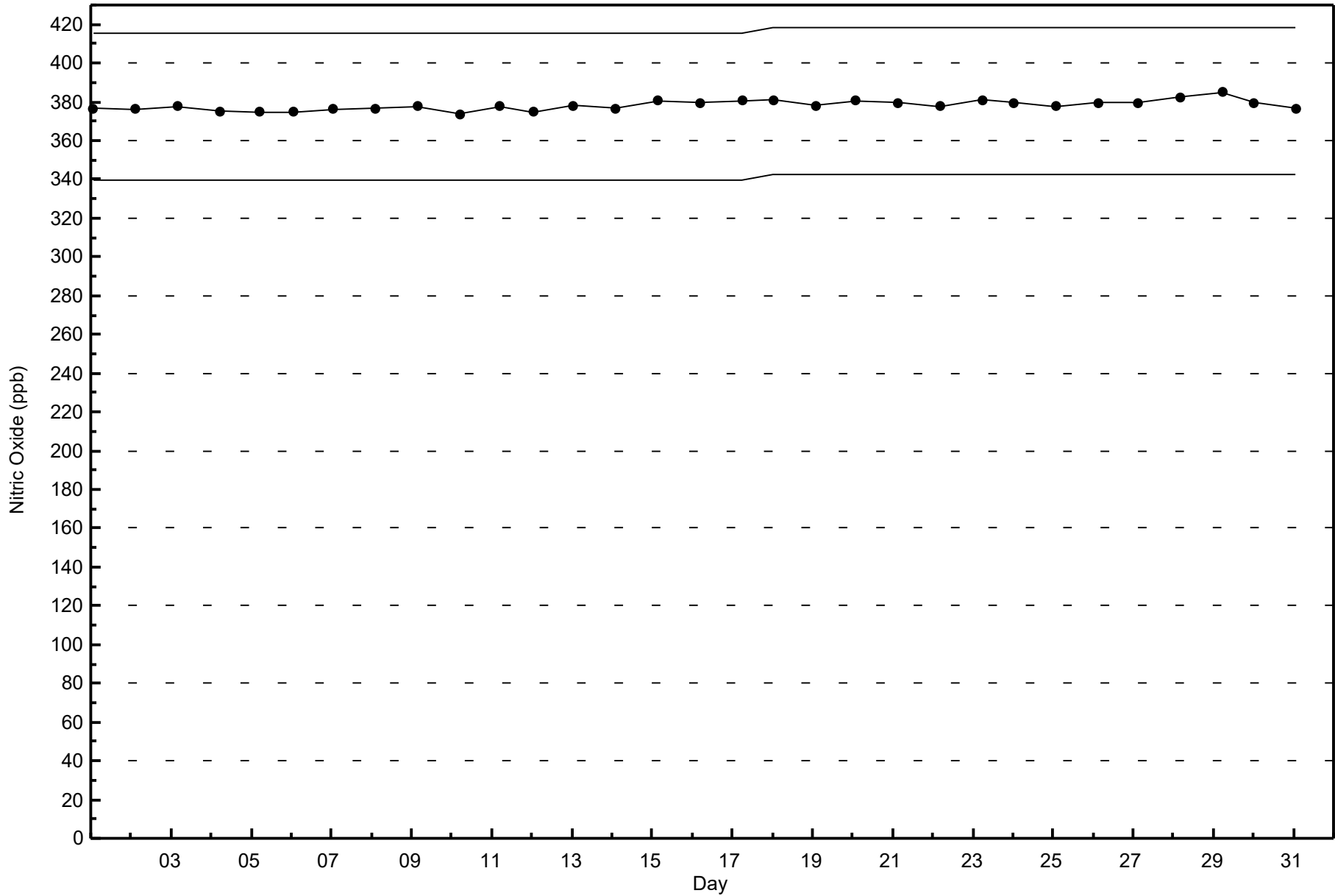


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Conklin









Wood Buffalo Environmental Association
Summary of Hour Averages

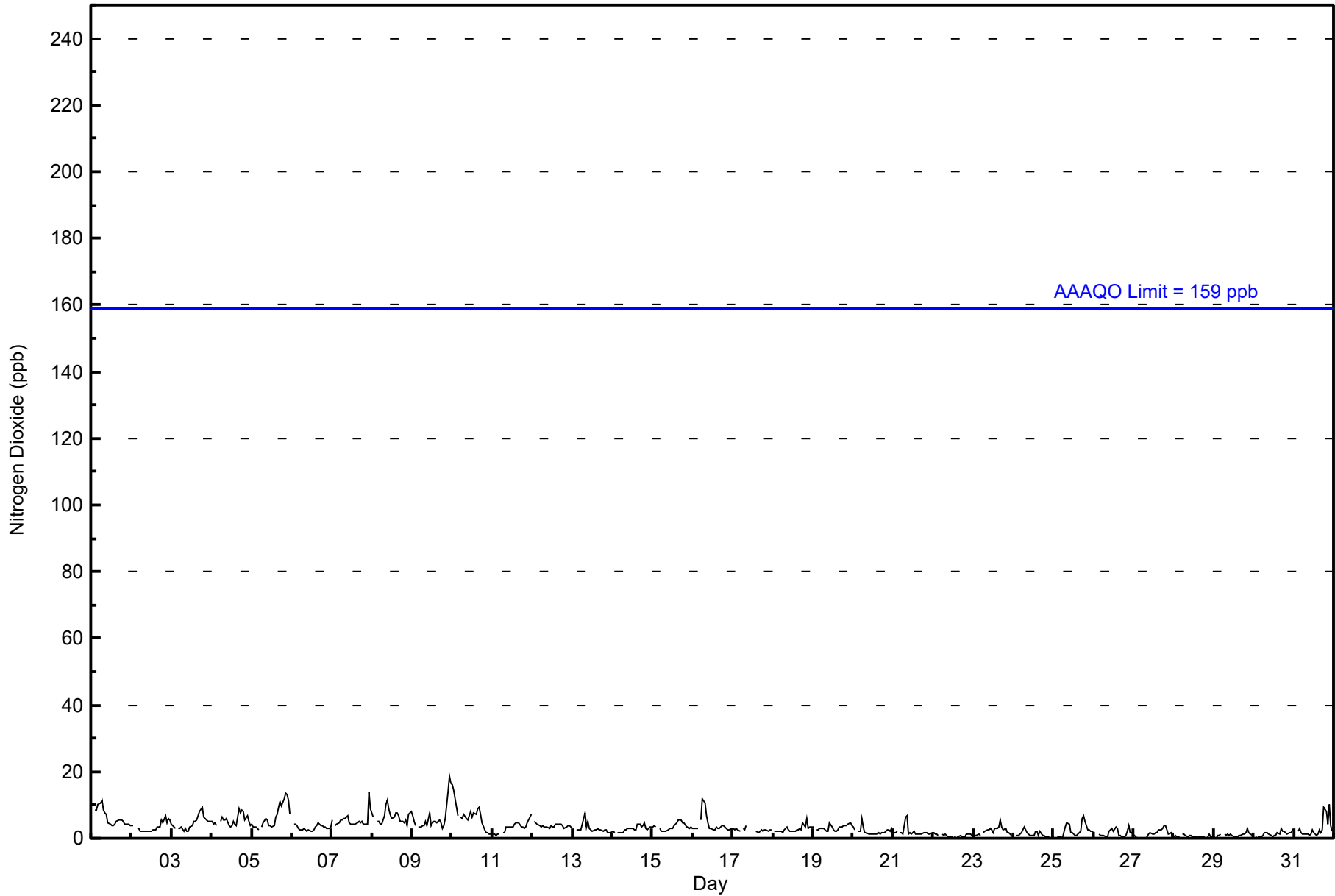
Nitrogen Dioxide (NO₂) - ppb
Conklin - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 18.6 ppb on Jan 9 23:00		Maximum Daily Average: 6.7 ppb on Jan 10																	Hours of Data:	708																												
Minimum Value: 0.1 ppb on Jan 30 03:00		Minimum Daily Average: 0.6 ppb on Jan 28																	Hours of Missing Data:	36																												
Maximum Diurnal Average: 4.0 ppb at hour 23		Minimum Diurnal Average: 2.5 ppb at hour 5																	Hours of Calibration:	36																												
Monthly Average: 3.31 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.8 Q ₁ = 1.6 Median = 2.8 Q ₃ = 4.3 P ₉₀ = 6.3 P ₉₉ = 13.2																	Percent Operational Time:	100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	6.5	Z	8.3	8.4	10.0	10.7	11.5	8.6	7.6	7.4	4.5	4.2	3.9	3.7	4.2	4.9	5.4	5.7	5.6	5.2	4.4	4.4	4.2	3.8	6.2	11.5																						
2-Jan	4.0	3.7	Z	3.1	3.1	2.2	2.1	2.1	2.2	2.3	2.3	2.2	2.3	2.6	2.6	3.2	3.5	3.4	5.6	4.6	6.7	4.6	6.1	5.6	3.5	6.7																						
3-Jan	4.4	3.3	3.0	Z	2.8	3.0	3.2	2.2	2.9	2.3	2.2	3.3	3.7	5.0	5.0	5.5	6.9	8.0	9.3	6.2	6.0	5.5	5.0	4.9	4.5	9.3																						
4-Jan	5.1	4.4	4.5	3.8	Z	5.1	6.4	5.4	5.5	5.9	3.7	3.4	3.8	5.0	4.3	3.9	9.1	7.8	8.3	8.1	5.7	6.7	5.2	3.9	5.4	9.1																						
5-Jan	4.3	3.2	3.3	3.0	2.7	Z	3.5	4.8	5.8	5.7	3.9	3.7	3.6	3.9	6.2	7.1	9.5	11.1	9.8	12.0	13.4	13.3	11.4	7.1	6.6	13.4																						
6-Jan	Z	4.3	4.4	3.7	2.9	2.5	2.6	2.8	2.6	2.3	2.4	2.1	2.1	2.6	3.2	4.0	4.5	3.9	3.8	3.2	3.3	3.1	3.0	3.2	3.2	4.5																						
7-Jan	5.4	Z	4.0	4.2	4.8	5.6	5.7	5.8	5.9	6.8	4.8	4.4	4.1	4.2	4.2	4.6	5.1	4.7	5.0	4.4	4.3	4.2	13.9	9.0	5.4	13.9																						
8-Jan	7.7	6.3	Z	5.1	4.9	4.4	4.1	6.8	10.2	11.3	8.8	7.2	6.1	6.3	7.5	7.7	6.6	5.2	5.1	4.5	5.6	3.8	7.0	8.0	6.5	11.3																						
9-Jan	6.9	5.2	3.9	Z	3.5	3.5	3.8	3.7	5.1	3.7	7.6	3.7	4.6	5.1	5.0	4.6	5.5	4.7	3.1	3.7	5.8	13.8	18.6	16.7	6.2	18.6																						
10-Jan	16.0	14.6	11.8	6.9	Z	6.3	6.1	7.1	6.1	5.5	6.6	8.0	6.2	7.6	7.4	9.1	9.2	7.1	4.5	2.4	1.9	1.6	1.2	1.2	6.7	16.0																						
11-Jan	1.1	1.1	0.9	1.4	1.2	Z	1.8	1.6	3.3	3.6	3.4	3.4	3.5	4.2	4.6	4.8	4.6	3.4	3.4	3.0	3.2	4.8	5.4	7.2	3.3	7.2																						
12-Jan	Z	5.1	4.6	4.2	3.9	3.6	3.7	3.5	3.2	3.4	3.1	3.7	3.2	3.3	4.1	4.1	4.3	4.1	3.8	3.1	3.3	3.9	3.7	3.3	3.7	5.1																						
13-Jan	2.8	Z	2.6	2.7	2.7	2.7	4.4	7.7	3.6	5.0	3.1	2.4	2.3	2.4	2.4	2.9	2.5	2.4	2.2	2.4	2.4	1.9	1.7	1.9	2.9	7.7																						
14-Jan	2.1	1.7	Z	1.8	1.7	1.8	1.8	2.7	2.5	2.8	3.0	3.1	3.1	2.6	2.6	4.4	4.2	3.2	3.9	4.6	3.0	2.7	3.3	3.6	2.9	4.6																						
15-Jan	3.4	3.8	3.5	Z	2.8	2.3	2.3	2.0	2.0	2.5	2.8	3.0	2.8	3.7	4.8	5.6	5.5	5.4	4.5	4.7	3.5	3.2	3.1	3.4	3.5	5.6																						
16-Jan	3.0	2.9	2.9	2.8	Z	5.4	11.7	10.5	6.8	4.7	3.0	2.8	2.5	2.7	3.5	2.9	3.1	3.9	3.9	3.2	3.0	2.5	2.6	2.8	4.0	11.7																						
17-Jan	2.9	2.7	2.9	2.6	2.3	Z	3.1	2.6	3.7	C	C	C	C	C	2.0	1.7	2.1	2.5	2.3	2.5	2.4	2.3	2.5	2.4	2.5	3.7																						
18-Jan	Z	2.3	2.3	2.2	2.0	2.1	1.9	2.4	3.3	2.4	2.1	2.3	2.1	2.1	2.6	2.4	2.9	2.7	4.6	3.3	6.0	3.0	3.2	3.6	2.8	6.0																						
19-Jan	3.6	Z	2.7	2.5	2.8	3.1	2.9	2.5	2.2	2.2	4.6	3.6	2.5	2.2	2.2	2.7	3.4	3.6	3.9	4.0	3.7	4.1	4.6	3.8	3.2	4.6																						
20-Jan	3.2	2.7	Z	2.1	2.0	5.9	3.2	1.6	1.7	1.4	1.2	1.4	1.4	1.4	1.1	1.6	1.4	1.6	1.7	1.9	2.5	2.5	2.1	2.9	2.1	5.9																						
21-Jan	1.8	1.5	2.0	Z	1.7	1.7	1.4	6.4	6.7	1.4	1.5	1.4	2.0	1.3	1.2	1.4	1.3	1.4	1.5	1.5	1.5	1.2	1.4	1.5	1.9	6.7																						
22-Jan	1.5	1.4	1.4	0.7	Z	1.1	1.0	1.1	0.9	0.6	0.5	0.6	0.1	0.3	0.2	0.5	1.0	0.4	0.3	0.3	1.1	1.2	1.2	0.9	0.8	1.5																						
23-Jan	1.3	1.0	0.9	1.1	1.0	Z	1.5	2.3	2.5	2.7	3.0	2.4	1.8	2.8	3.0	3.2	5.3	3.3	2.5	2.8	1.5	1.7	1.3	0.9	2.2	5.3																						
24-Jan	Z	0.8	0.9	0.9	1.3	1.6	3.5	2.4	1.6	1.2	0.9	1.0	0.8	2.1	2.0	0.7	2.3	1.0	0.7	0.3	0.4	0.4	0.2	0.3	1.2	3.5																						
25-Jan	0.4	Z	0.2	0.3	0.3	0.2	1.6	3.5	4.8	4.2	1.8	1.5	1.4	0.8	0.9	1.7	2.2	5.8	6.9	5.1	2.7	2.5	2.2	2.1	2.3	6.9																						
26-Jan	1.8	1.5	Z	1.1	0.8	0.8	1.0	0.4	0.3	2.2	2.7	3.1	2.2	3.6	2.8	0.7	0.8	0.6	0.4	1.0	2.3	3.9	1.5	1.7	1.6	3.9																						
27-Jan	0.9	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.4	1.4	1.8	1.4	1.2	1.6	1.9	2.6	2.5	2.9	3.7	3.7	2.5	1.4	1.6	0.4	1.4	3.7																						
28-Jan	0.4	1.0	0.4	0.6	Z	1.3	1.2	1.0	0.6	0.8	0.8	0.4	0.6	0.4	0.3	0.3	0.3	0.4	0.4	0.2	0.3	1.2	0.3	0.3	0.6	1.3																						
29-Jan	0.4	0.2	0.7	0.9	1.3	Z	1.2	0.9	1.2	1.0	1.2	0.8	0.6	0.4	0.5	0.8	0.7	1.1	1.1	1.7	2.8	1.8	1.1	0.9	1.0	2.8																						
30-Jan	Z	0.6	0.1	0.4	0.5	1.0	1.7	1.5	1.8	1.3	1.0	0.5	0.7	1.0	1.6	1.3	2.9	2.2	2.2	1.8	1.2	1.6	1.9	2.5	1.4	2.9																						
31-Jan	2.2	Z	2.3	2.8	1.6	1.1	1.1	1.1	1.3	1.0	1.4	2.5	1.7	1.0	1.3	2.7	1.9	2.7	9.2	8.0	4.4	10.3	3.7	2.3	2.9	10.3																						
																								3.6	3.0	2.9	2.7	2.5	3.0	3.3	3.5	3.5	3.3	3.0	2.8	2.6	2.9	3.1	3.3	3.9	3.7	4.0	3.7	3.6	3.8	4.0	3.6	Diurnal Average
																								16.0	14.6	11.8	8.4	10.0	10.7	11.7	10.5	10.2	11.3	8.8	8.0	6.2	7.6	7.5	9.1	9.5	11.1	9.8	12.0	13.4	13.8	18.6	16.7	Diurnal Maximum
Z - zerospan C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Conklin - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Conklin - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	708	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705

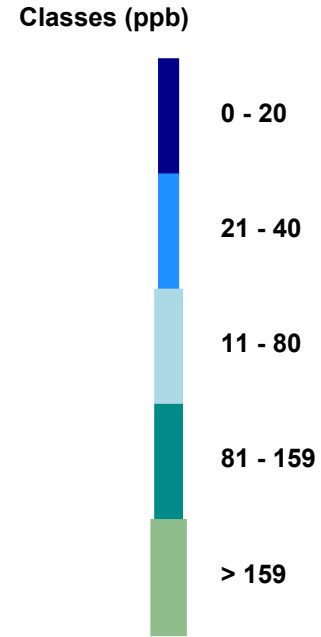
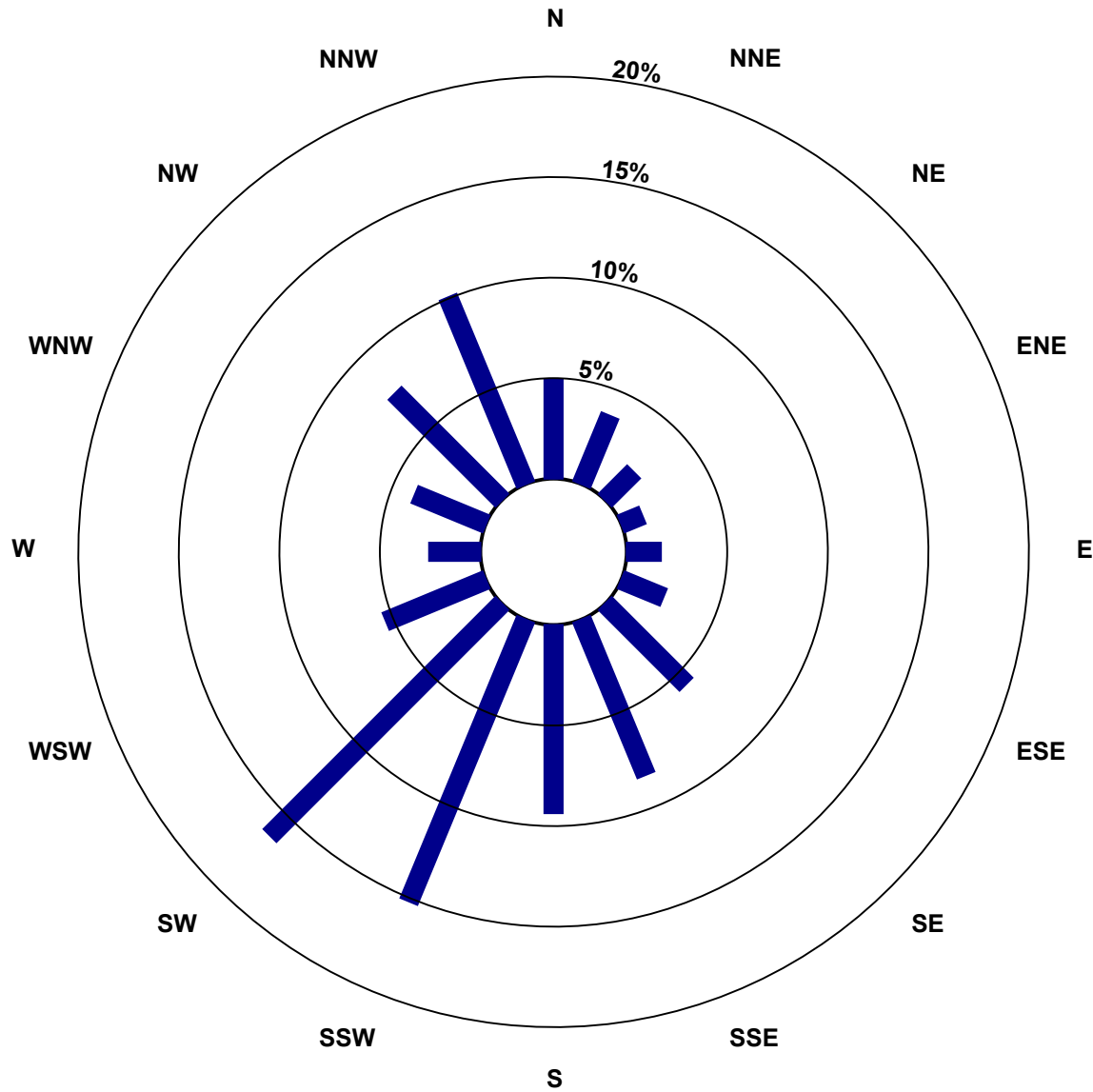
Total Number of Valid Hours: 705

Total Number of Hours: 744

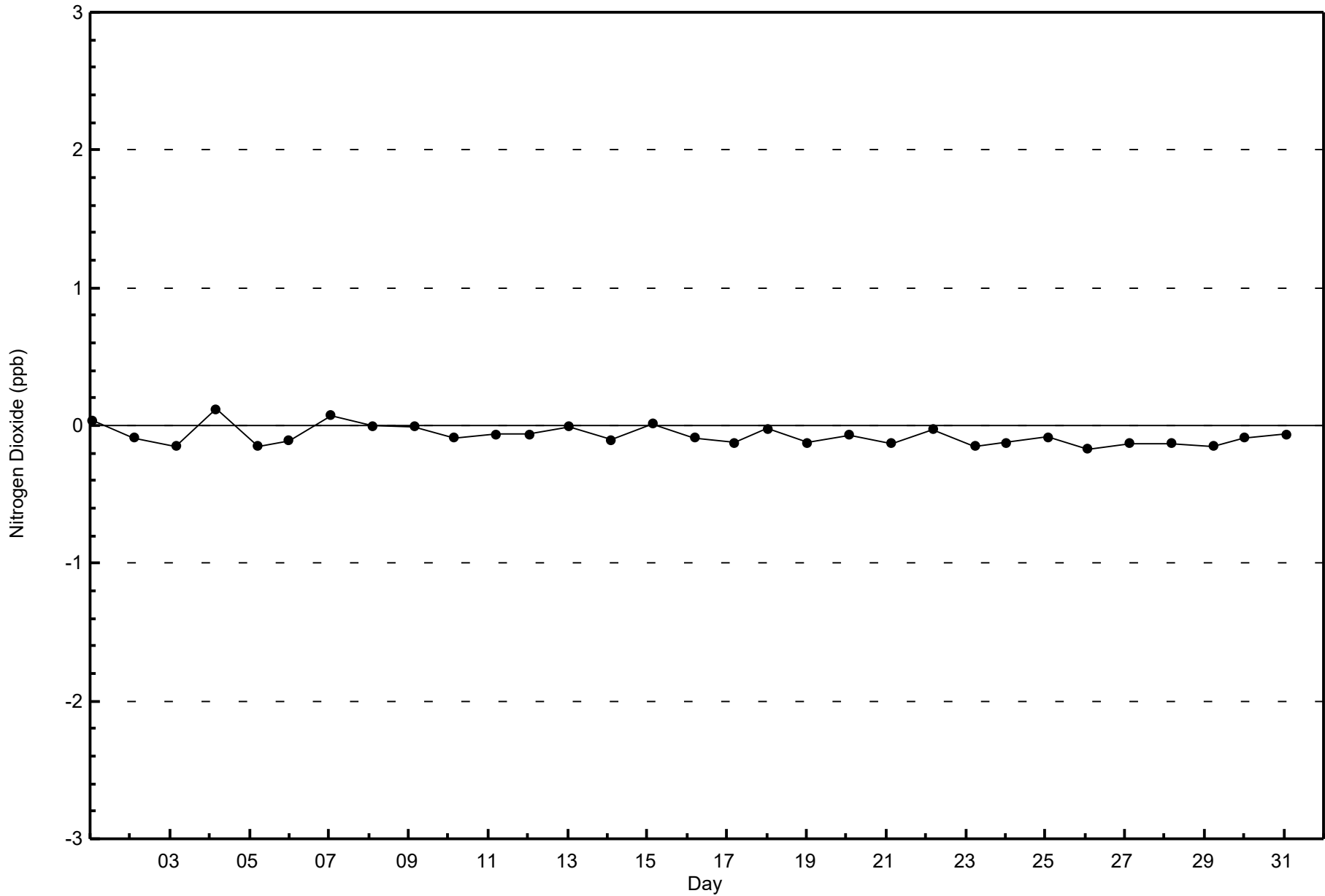


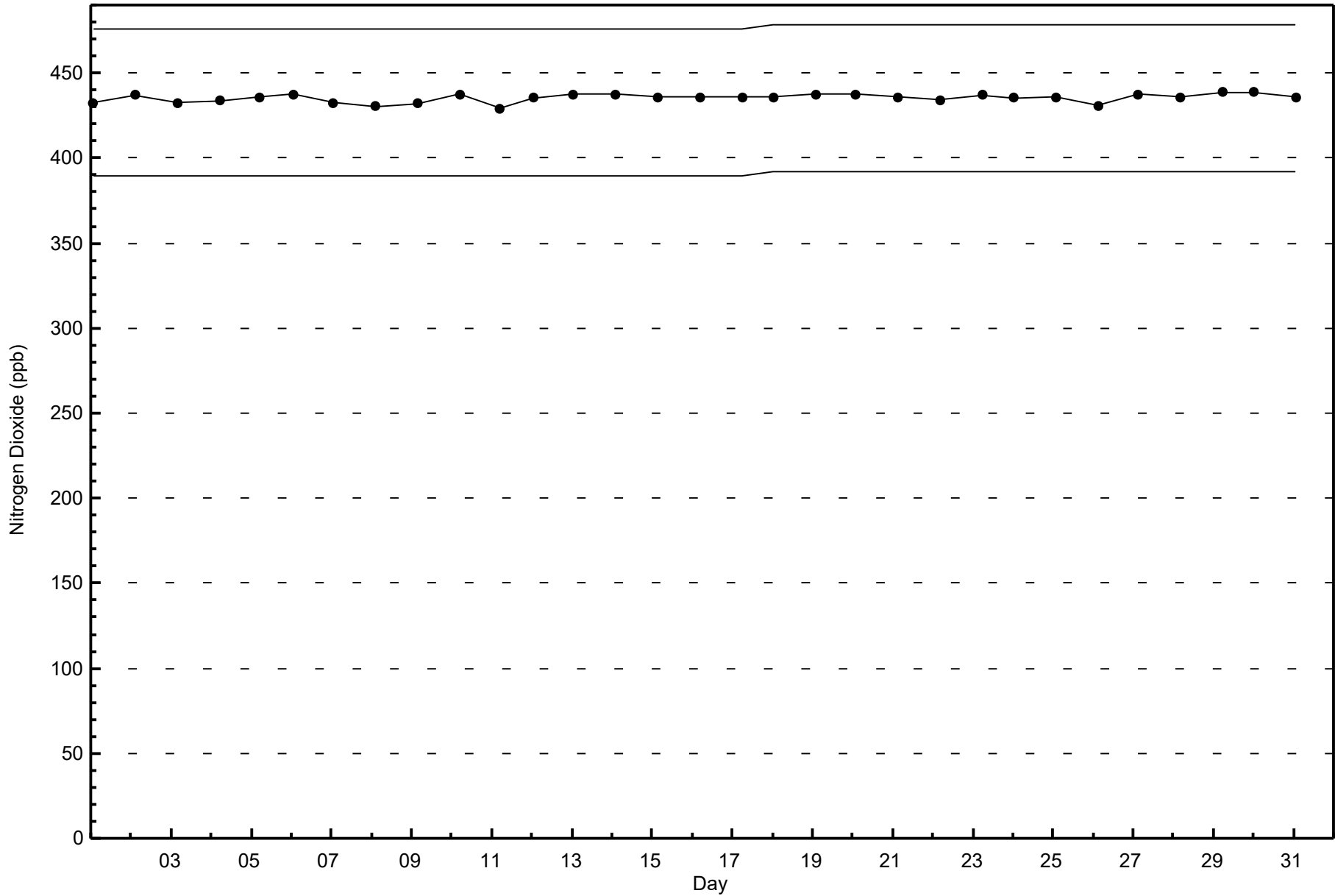
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Conklin



Total Number of Valid Hours: 705





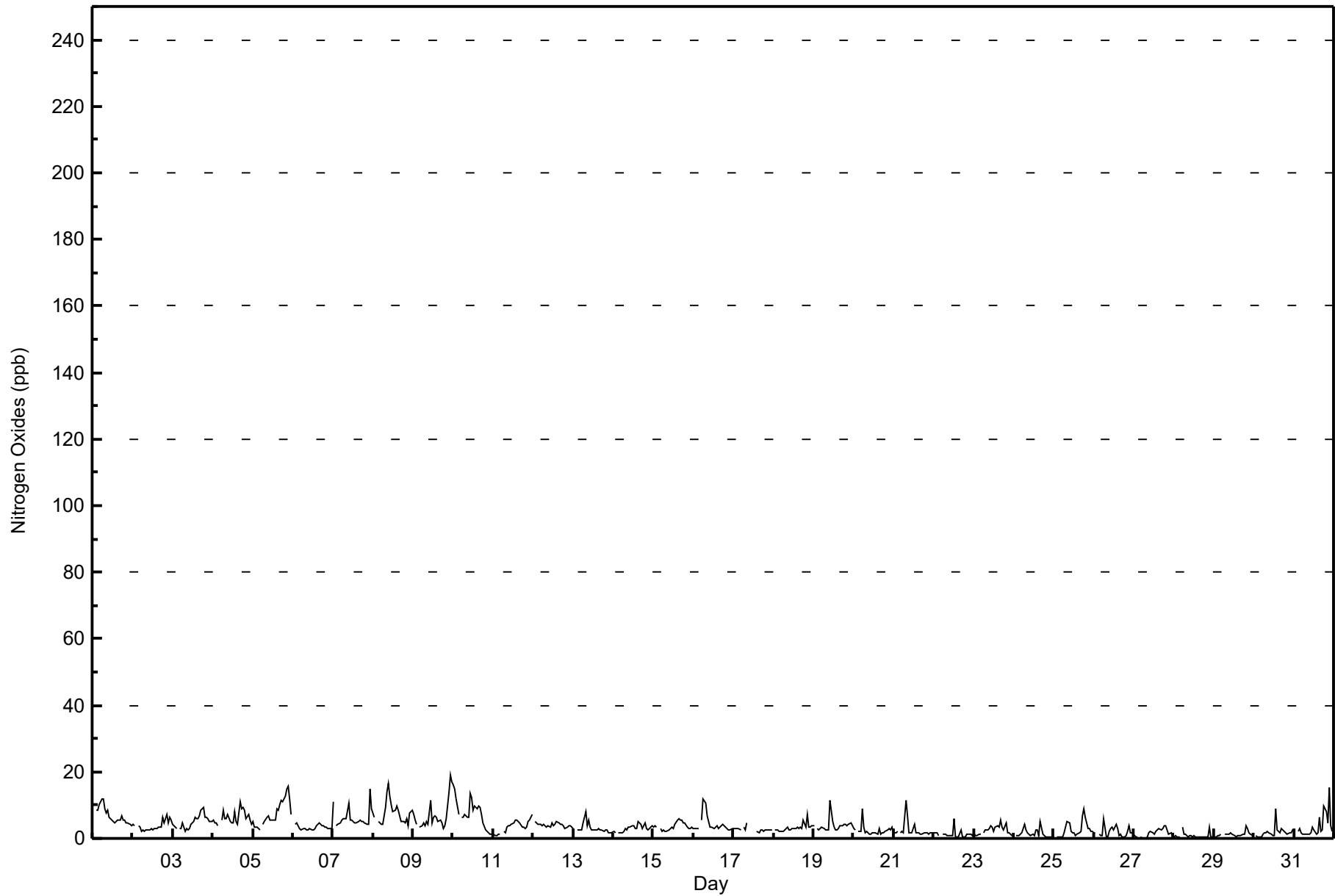


Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - January 2023

Maximum Value: 18.9 ppb on Jan 9 23:00		Maximum Daily Average: 7.7 ppb on Jan 8		Hours in Service: 744																						
Minimum Value: 0.2 ppb on Jan 27 07:00		Minimum Daily Average: 0.8 ppb on Jan 28		Hours of Data: 708																						
Maximum Diurnal Average: 4.3 ppb at hour 17		Minimum Diurnal Average: 2.6 ppb at hour 5		Hours of Missing Data: 36																						
Monthly Average: 3.74 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 1.8 Median = 3.1 Q ₃ = 4.8 P ₉₀ = 7.1 P ₉₉ = 14.7		Hours of Calibration: 36																						
				Percent Operational Time: 100.0																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.6	Z	8.4	8.5	10.2	11.9	12.0	8.8	7.8	8.6	6.1	5.5	5.0	4.7	5.1	5.7	5.6	6.6	5.7	5.4	4.5	4.7	4.4	3.9	6.8	12.0
2-Jan	4.4	4.0	Z	3.6	3.4	2.3	2.4	2.2	2.3	2.5	2.7	2.8	2.7	2.9	2.9	3.4	3.5	3.4	6.5	4.7	7.0	4.6	6.2	5.6	3.7	7.0
3-Jan	4.4	3.3	3.0	Z	2.9	3.1	4.5	2.3	2.9	2.6	2.9	4.4	5.1	6.3	5.7	5.9	7.0	8.5	9.5	6.4	6.2	5.9	5.2	5.2	4.9	9.5
4-Jan	5.6	4.5	4.7	4.0	Z	5.6	8.5	6.0	5.9	7.3	4.9	4.6	4.8	8.1	5.1	4.2	11.1	8.8	9.1	8.6	5.8	7.0	5.4	4.2	6.3	11.1
5-Jan	4.9	3.3	3.5	3.1	2.7	Z	4.1	5.0	6.4	6.9	5.7	5.6	5.4	5.6	8.7	8.4	10.0	11.5	11.2	12.9	14.7	15.8	12.0	7.2	7.6	15.8
6-Jan	Z	4.4	4.5	3.8	3.0	2.6	2.8	2.9	2.6	2.4	2.9	2.6	2.6	3.1	3.8	4.3	4.7	3.9	3.9	3.2	3.3	3.1	3.0	3.2	3.3	4.7
7-Jan	11.2	Z	4.0	4.3	4.8	5.6	5.8	5.8	6.0	10.8	5.7	5.4	5.0	4.9	4.8	4.9	5.4	4.9	5.2	4.5	4.4	4.3	14.9	9.0	6.2	14.9
8-Jan	7.7	6.3	Z	5.1	4.9	4.4	4.2	9.2	13.9	16.6	12.8	10.1	8.0	8.6	9.8	8.6	6.8	5.2	5.1	4.5	5.7	3.9	7.5	8.3	7.7	16.6
9-Jan	7.0	5.3	4.1	Z	3.6	3.6	4.5	3.9	5.2	4.2	11.5	4.8	6.4	6.9	6.2	5.0	5.6	4.7	3.1	3.8	5.8	14.1	18.9	16.8	6.7	18.9
10-Jan	16.1	14.7	11.9	7.0	Z	6.4	6.2	7.2	6.2	6.2	13.4	12.2	8.7	9.8	8.9	9.9	9.4	7.1	4.5	2.4	1.9	1.6	1.2	1.2	7.6	16.1
11-Jan	1.1	1.1	0.9	1.4	1.2	Z	1.9	1.6	3.5	3.9	4.0	4.3	4.5	5.4	5.5	5.2	4.8	3.6	3.6	3.1	3.4	4.9	5.7	7.3	3.6	7.3
12-Jan	Z	5.3	4.8	4.4	4.1	3.7	4.0	3.8	3.5	3.8	3.5	4.6	3.9	4.1	4.9	4.5	4.4	4.3	3.9	3.2	3.4	4.0	3.7	3.4	4.1	5.3
13-Jan	2.9	Z	2.6	2.7	2.7	2.7	4.8	8.0	3.6	5.7	3.5	2.7	2.5	2.6	2.5	3.1	2.5	2.4	2.2	2.4	2.5	1.9	1.7	1.9	3.0	8.0
14-Jan	2.1	1.7	Z	1.8	1.7	1.9	2.0	2.8	2.5	3.2	3.4	3.7	3.7	3.0	2.8	5.1	4.3	3.2	3.9	4.7	3.0	2.7	3.3	3.7	3.1	5.1
15-Jan	3.4	3.8	3.5	Z	2.8	2.3	2.3	2.0	2.0	2.6	3.0	3.4	3.1	4.3	5.5	5.9	5.6	5.5	4.5	4.8	3.5	3.2	3.1	3.4	3.6	5.9
16-Jan	3.0	2.9	2.9	2.8	Z	5.5	12.0	10.8	7.0	5.2	3.3	3.2	2.9	3.3	3.9	3.1	3.2	4.2	4.0	3.4	3.2	2.6	2.8	3.0	4.3	12.0
17-Jan	3.0	2.8	3.1	2.8	2.4	Z	3.4	2.6	4.6	C	C	C	C	C	2.3	1.8	2.5	2.6	2.3	2.5	2.5	2.3	2.5	2.5	2.7	4.6
18-Jan	Z	2.4	2.5	2.3	2.1	2.3	2.1	2.5	3.5	2.7	2.6	3.1	3.0	3.0	3.4	2.8	3.2	3.0	5.5	3.3	7.3	3.6	3.2	3.8	3.2	7.3
19-Jan	3.9	Z	2.8	2.5	2.8	3.2	3.1	2.5	2.3	2.4	11.6	5.1	3.3	2.7	2.7	3.0	3.6	3.7	4.0	4.2	3.8	4.2	4.6	3.8	3.7	11.6
20-Jan	3.2	2.7	Z	2.1	2.0	9.0	3.5	1.7	1.9	1.5	1.4	1.8	1.8	1.7	1.3	2.8	1.5	1.7	1.8	2.1	2.7	2.8	2.3	3.4	2.5	9.0
21-Jan	1.9	1.7	2.3	Z	1.9	2.0	1.7	11.3	7.0	1.7	1.8	1.8	4.3	1.6	1.5	1.6	1.4	1.5	1.6	1.7	1.6	1.3	1.6	1.7	2.5	11.3
22-Jan	1.7	1.6	1.6	0.7	Z	1.2	1.1	1.2	1.0	0.7	0.7	0.8	5.9	0.3	0.2	0.6	2.4	0.4	0.3	0.3	1.1	1.2	1.2	0.9	1.2	5.9
23-Jan	1.5	1.0	0.9	1.3	1.1	Z	1.8	2.5	2.5	3.0	3.7	3.4	2.3	3.3	3.7	3.4	5.4	3.3	2.5	4.7	1.5	1.7	1.3	0.9	2.5	5.4
24-Jan	Z	0.8	0.9	0.9	1.3	1.6	4.4	2.6	1.8	1.3	1.0	1.1	1.0	2.7	2.5	0.8	5.3	1.1	0.7	0.3	0.4	0.4	0.2	0.3	1.5	5.3
25-Jan	0.4	Z	0.2	0.3	0.3	0.2	1.6	3.5	4.9	4.8	2.1	1.8	1.6	0.9	1.1	1.9	2.3	6.8	8.7	6.2	2.8	2.9	2.3	2.2	2.6	8.7
26-Jan	1.8	1.6	Z	1.2	0.9	0.9	6.1	0.4	0.3	2.3	2.9	3.5	2.7	4.2	3.0	0.7	1.4	0.6	0.4	1.0	2.3	3.9	1.5	1.7	2.0	6.1
27-Jan	0.9	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.4	1.5	2.1	1.8	1.5	2.2	2.4	3.1	2.6	2.9	3.7	3.7	2.5	1.4	1.7	0.4	1.6	3.7
28-Jan	0.4	1.0	0.4	0.6	Z	3.5	1.3	1.1	0.6	1.0	1.0	0.5	0.8	0.5	0.4	0.3	0.4	0.4	0.4	0.2	0.3	3.4	0.3	0.4	0.8	3.5
29-Jan	0.4	0.2	0.7	0.9	1.4	Z	1.4	1.1	1.5	1.4	1.8	1.2	0.9	0.6	0.7	1.0	0.9	1.3	1.2	4.0	2.9	1.9	1.2	1.0	1.3	4.0
30-Jan	Z	0.7	0.2	0.4	0.6	1.1	1.8	1.6	2.1	1.6	1.5	0.7	0.9	8.8	2.4	1.5	3.1	2.4	2.2	1.8	1.2	1.6	1.9	2.5	1.9	8.8
31-Jan	2.2	Z	2.3	2.9	1.6	1.1	1.1	1.1	1.3	1.1	1.7	3.5	2.5	1.3	1.6	6.2	2.0	2.7	9.7	8.2	4.5	15.1	3.7	2.3	3.5	15.1
																								Diurnal Average		
																								Diurnal Maximum		
																								3.9 16.1		
																								3.1 14.7		
																								3.0 11.9		
																								2.8 8.5		
																								2.6 10.2		
																								3.4 11.9		
																								3.8 12.0		
																								3.8 11.3		
																								3.8 13.9		
																								4.0 16.6		
																								4.2 13.4		
																								3.7 12.2		
																								3.6 8.7		
																								3.9 9.8		
																								3.8 9.9		
																								4.3 11.1		
																								3.9 11.5		
																								4.2 11.2		
																								3.9 12.9		
																								3.7 14.7		
																								4.3 15.8		
																								4.1 18.9		
																								3.7 16.8		

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	708	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	26	14	8	12	16	40	59	66	107	115	38	18	27	53	71	705

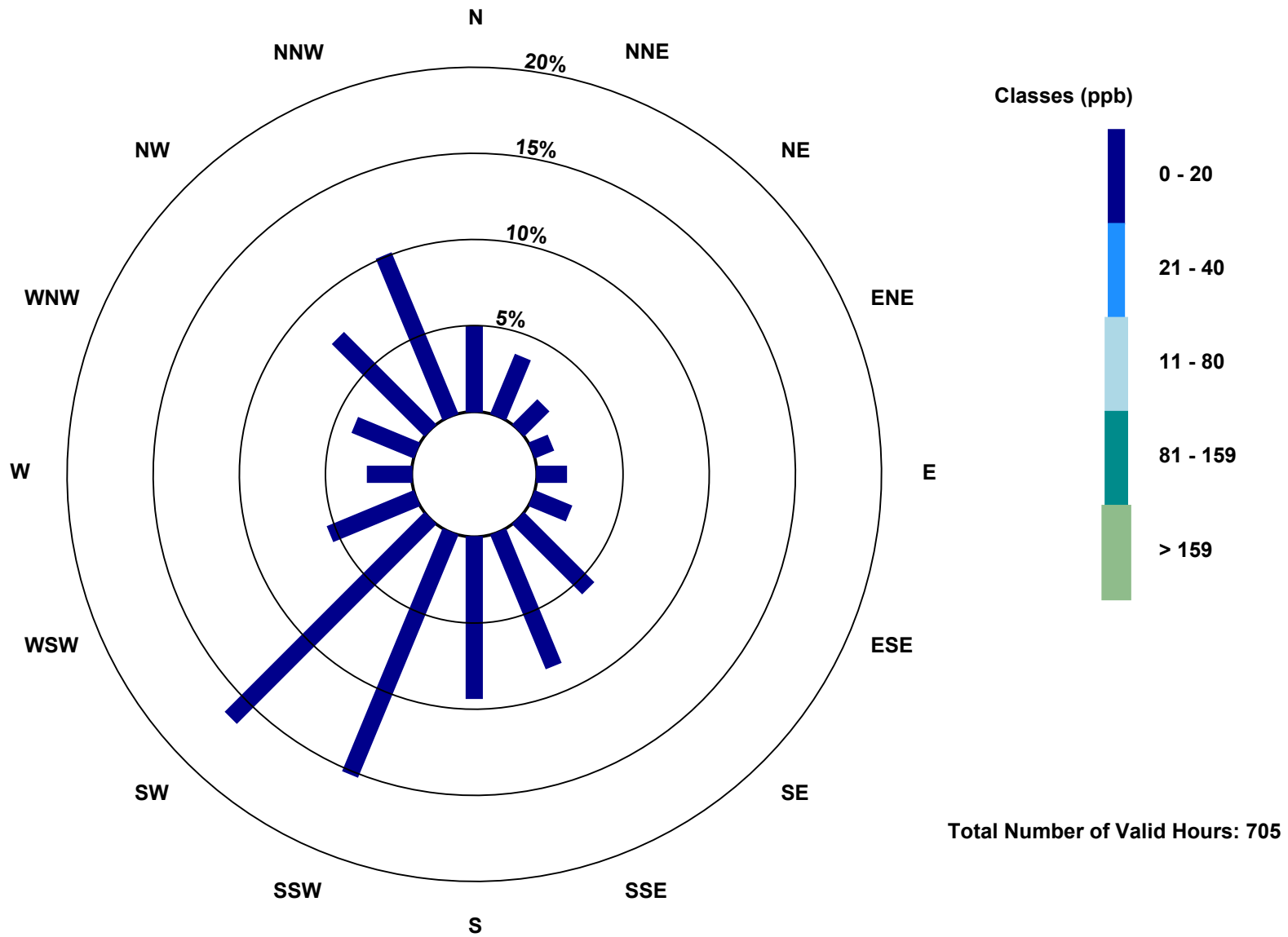
Total Number of Valid Hours: 705

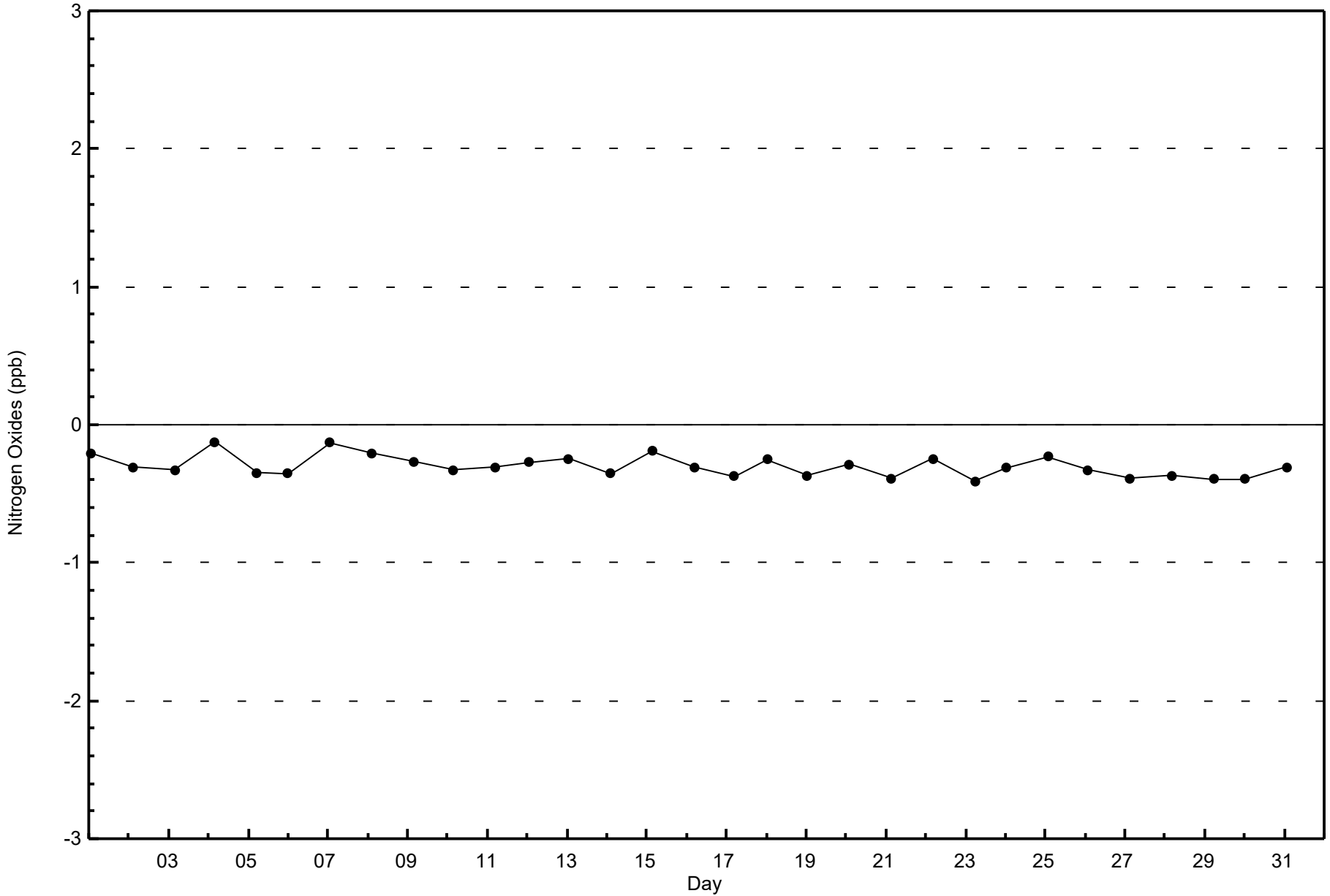
Total Number of Hours: 744

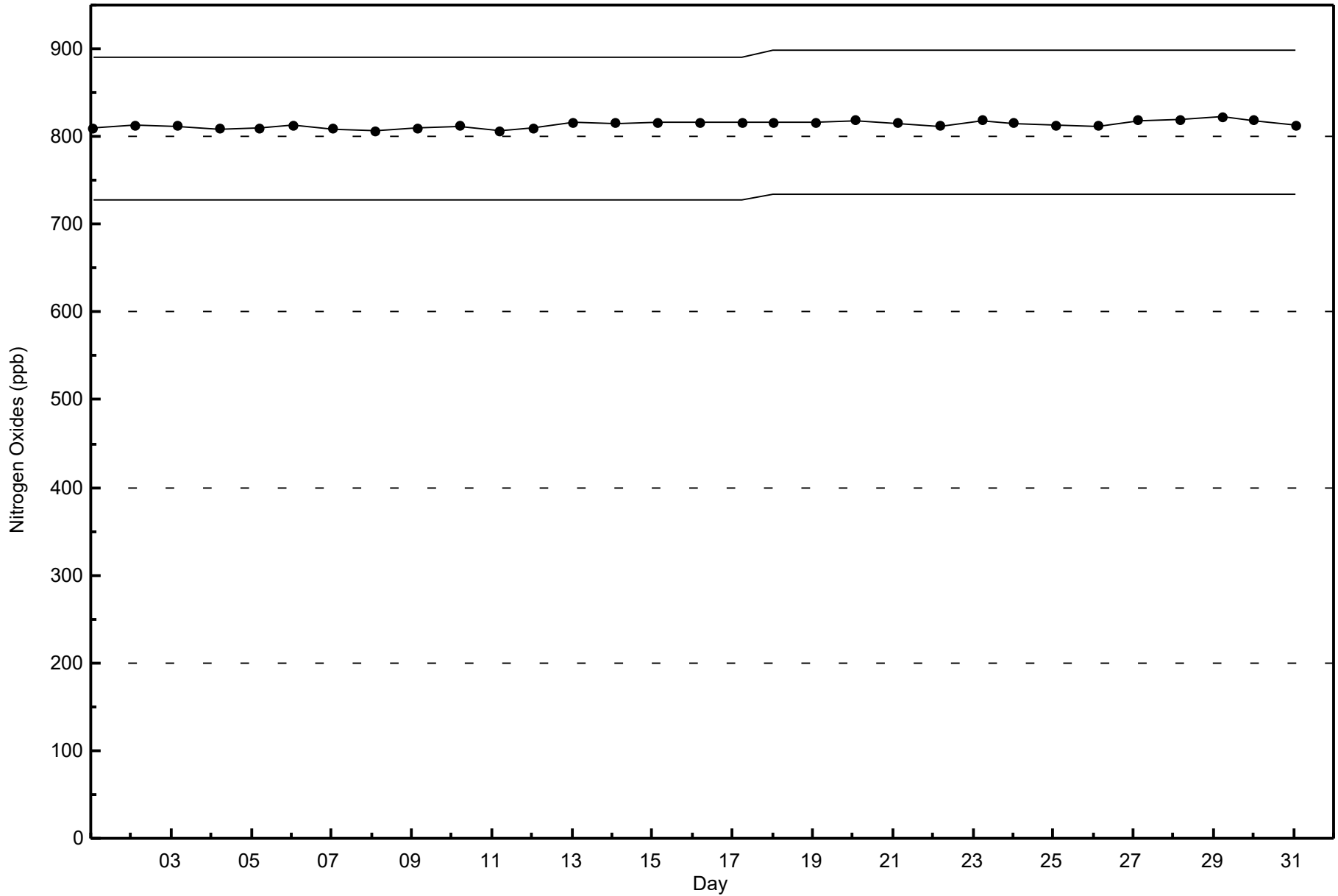


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

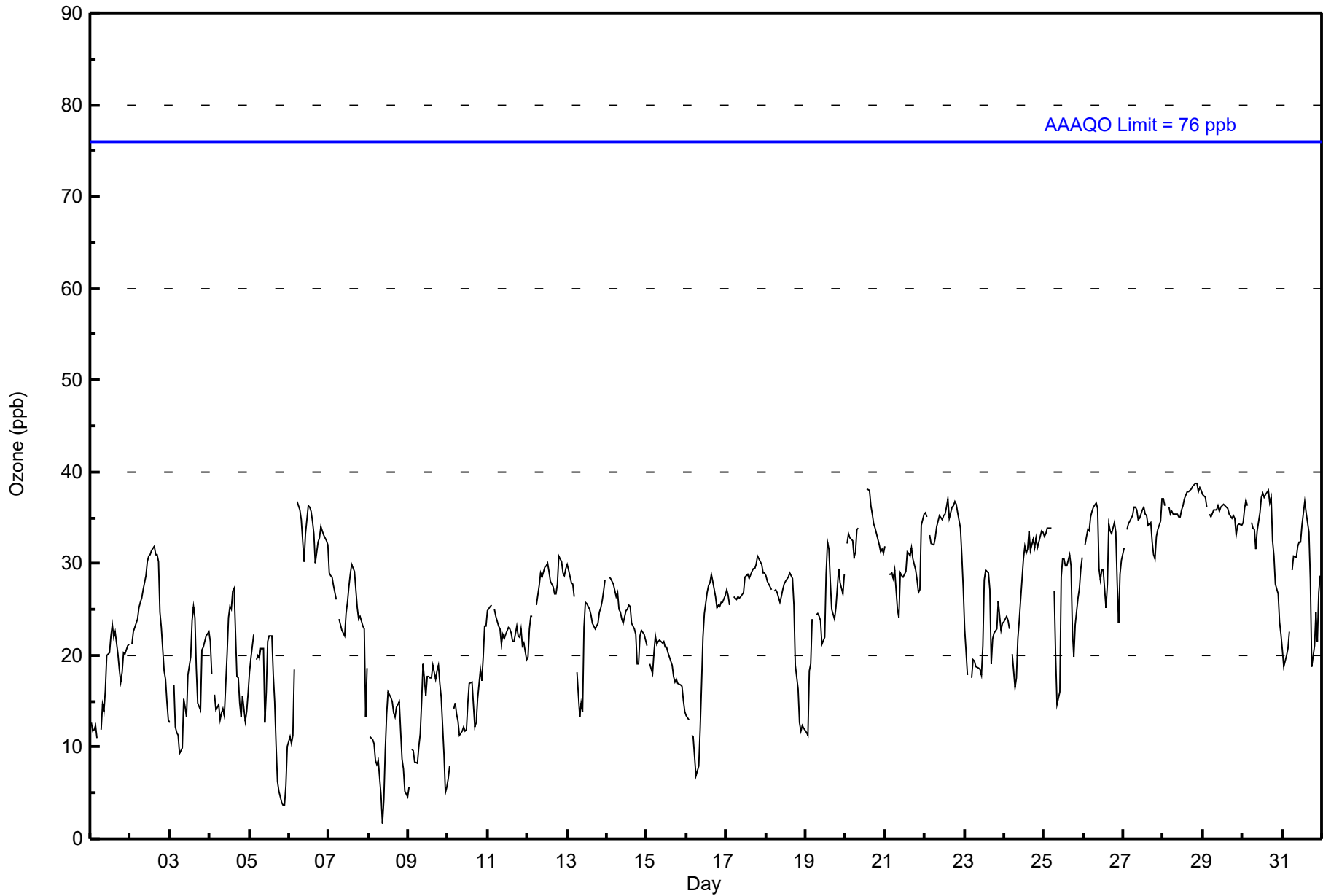
Conklin - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 38.8 ppb on Jan 28 20:00		Maximum Daily Average: 36.9 ppb on Jan 28																	709																														
Minimum Value: 1.7 ppb on Jan 8 09:00		Minimum Daily Average: 10.1 ppb on Jan 8																	35																														
Maximum Diurnal Average: 28.5 ppb at hour 14		Minimum Diurnal Average: 23.2 ppb at hour 1																	35																														
Monthly Average: 24.92 ppb		Percentiles: P ₁ = 5.0 P ₁₀ = 12.9 Q ₁ = 19.1 Median = 25.8 Q ₃ = 31.6 P ₉₀ = 35.5 P ₉₉ = 38.0																	100.0																														
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	12.7	11.7	12.0	12.4	11.0	Z	11.9	14.7	13.9	16.2	20.0	20.3	22.2	23.3	22.0	22.5	20.1	18.5	17.1	18.1	20.3	20.2	21.0	21.2	17.5	23.3																							
2-Jan	Z	21.2	22.6	23.5	24.0	25.2	25.8	26.3	27.1	28.6	30.2	30.8	31.0	31.4	31.8	31.0	30.9	30.3	24.8	23.0	18.4	17.4	14.9	13.0	25.4	31.8																							
3-Jan	12.7	Z	16.8	12.2	11.6	11.4	9.3	10.0	15.3	14.4	13.3	17.9	19.9	23.8	25.4	24.1	18.7	14.8	14.1	20.7	21.0	21.6	22.1	22.5	17.1	25.4																							
4-Jan	21.5	18.0	Z	15.7	14.1	14.7	13.0	13.7	14.1	13.4	20.2	24.1	25.3	25.0	27.1	27.3	17.8	17.5	14.7	13.3	15.6	12.8	13.9	15.8	17.8	27.3																							
5-Jan	18.2	19.7	22.3	Z	19.6	20.0	19.7	20.7	20.7	12.6	15.9	21.4	22.1	22.1	17.9	14.9	10.2	6.2	5.2	4.0	3.6	3.6	5.8	10.1	14.6	22.3																							
6-Jan	11.2	10.4	11.3	18.4	Z	36.8	35.8	34.8	32.5	30.3	33.3	36.3	36.1	35.7	34.7	33.3	30.0	32.4	32.7	34.1	33.6	33.1	32.5	32.0	30.1	36.8																							
7-Jan	29.0	28.6	28.6	27.6	26.0	Z	23.9	23.3	22.8	22.1	24.6	25.8	27.5	28.8	29.9	29.1	27.2	25.1	23.9	24.2	23.2	22.8	13.2	18.5	25.0	29.9																							
8-Jan	Z	11.1	10.8	10.3	8.5	8.0	8.5	4.7	1.7	4.3	9.6	13.6	16.0	15.4	15.0	13.8	13.3	14.3	14.9	11.8	8.6	7.6	5.2	4.6	10.1	16.0																							
9-Jan	5.7	Z	9.8	9.5	8.4	8.2	10.1	11.4	15.0	19.1	15.5	17.6	17.7	17.6	17.5	18.9	17.4	18.3	18.9	16.9	15.4	9.1	5.0	5.7	13.4	19.1																							
10-Jan	6.6	8.0	Z	14.1	14.9	13.6	12.9	11.3	11.8	12.1	11.8	11.9	14.8	17.0	17.1	14.7	12.2	12.6	15.2	18.4	17.3	19.8	23.3	23.2	14.5	23.3																							
11-Jan	24.9	25.4	25.4	Z	25.1	24.3	23.2	22.8	21.2	22.2	21.8	22.3	23.0	22.9	22.4	21.5	21.5	23.2	22.1	21.9	22.9	21.0	21.3	19.6	22.7	25.4																							
12-Jan	19.9	22.9	24.3	24.3	Z	25.5	26.5	27.6	29.0	28.5	29.6	29.7	30.0	29.1	28.1	27.5	26.8	26.7	27.7	30.8	30.2	28.9	28.7	29.4	27.5	30.8																							
13-Jan	29.9	29.3	27.9	27.8	26.4	Z	18.2	13.2	14.8	13.9	23.0	25.8	25.7	24.9	24.5	23.5	23.2	22.9	23.4	24.8	25.2	26.0	27.0	28.2	23.9	29.9																							
14-Jan	Z	28.5	28.4	28.0	27.7	26.4	26.8	25.1	24.7	23.9	23.5	24.8	25.0	25.5	25.3	23.4	22.9	22.3	19.1	19.1	22.2	22.7	22.2	21.7	24.3	28.5																							
15-Jan	21.1	Z	19.1	18.0	20.3	22.1	21.2	21.5	21.7	21.4	21.5	20.9	20.9	20.3	19.3	19.0	17.7	17.0	17.4	16.9	16.8	16.6	15.2	13.8	19.1	22.1																							
16-Jan	13.4	12.9	Z	11.2	11.1	9.0	6.9	7.9	11.9	16.8	21.9	24.6	26.8	27.5	27.9	28.8	28.1	26.3	25.1	25.5	25.3	25.7	25.8	26.6	20.3	28.8																							
17-Jan	27.1	26.6	25.4	Z	26.4	26.2	26.1	26.4	26.2	26.4	26.8	28.6	28.7	28.9	28.3	29.1	29.5	29.5	29.9	30.8	30.6	29.9	29.0	28.9	28.1	30.8																							
18-Jan	28.7	28.1	27.5	27.1	Z	27.0	27.1	26.8	25.7	26.4	27.2	27.7	28.1	28.6	29.0	28.7	28.3	25.4	19.0	16.3	12.7	11.7	12.3	12.0	24.0	29.0																							
19-Jan	11.6	11.3	18.3	19.0	24.0	Z	24.5	24.6	24.2	23.8	21.1	21.9	28.8	32.4	31.6	28.1	25.0	24.0	25.2	27.3	29.5	27.9	26.8	28.8	24.3	32.4																							
20-Jan	Z	32.1	33.2	32.8	32.5	30.7	31.3	33.7	33.9	C	C	C	C	38.1	38.0	36.4	35.4	34.4	33.8	33.2	32.0	31.3	31.5	31.0	33.4	38.1																							
21-Jan	31.9	Z	28.8	28.8	29.0	28.4	29.2	24.9	24.2	29.0	28.7	28.5	29.1	31.3	31.1	30.7	31.8	30.5	29.2	28.2	26.8	27.2	34.2	35.5	29.4	35.5																							
22-Jan	35.5	35.1	Z	33.0	32.1	32.0	32.8	34.1	34.6	35.2	34.8	35.2	35.5	36.2	37.1	34.9	36.2	36.4	36.7	36.5	35.5	33.9	30.8	27.3	34.4	37.1																							
23-Jan	22.9	20.4	17.9	Z	17.5	19.5	19.3	18.8	18.6	18.5	17.9	21.1	28.2	29.3	29.0	27.1	19.1	21.9	22.5	22.9	25.9	24.3	22.7	23.5	22.1	29.3																							
24-Jan	23.7	24.2	23.7	22.8	Z	20.1	16.5	17.6	21.8	23.7	26.1	30.4	31.9	31.1	31.6	33.5	31.5	32.7	31.7	32.8	31.8	32.3	33.6	33.4	27.8	33.6																							
25-Jan	32.9	33.3	33.8	33.9	33.8	Z	27.1	20.0	14.6	16.1	28.5	30.6	30.5	29.8	29.7	31.0	29.7	22.7	19.8	23.4	26.2	27.3	29.5	30.7	27.6	33.9																							
26-Jan	Z	32.0	33.7	33.5	35.0	35.7	36.1	36.7	36.0	29.4	28.3	29.3	29.3	25.2	27.8	34.4	33.6	33.2	34.5	33.4	27.9	23.5	28.9	30.4	31.6	36.7																							
27-Jan	31.7	Z	33.6	34.3	34.7	35.2	36.1	36.2	35.8	34.7	35.0	35.9	36.2	35.4	35.3	34.1	34.5	32.3	30.9	30.5	32.9	33.7	34.6	37.0	34.4	37.0																							
28-Jan	37.1	36.3	Z	36.2	35.4	35.7	35.4	35.4	35.4	35.0	35.1	35.8	36.3	37.1	37.8	37.9	37.9	38.1	38.4	38.8	38.8	37.9	38.3	38.0	36.9	38.8																							
29-Jan	37.6	37.3	36.2	Z	35.5	35.1	35.8	35.9	35.9	36.2	35.7	36.2	36.4	36.3	36.2	36.0	35.4	34.9	35.3	35.0	33.0	34.2	34.3	34.2	35.6	37.6																							
30-Jan	34.4	36.0	36.9	36.3	Z	34.4	33.8	33.7	31.6	33.5	35.6	37.3	37.7	37.1	37.5	37.9	36.6	37.3	32.5	30.7	27.8	26.7	23.7	22.3	33.5	37.9																							
31-Jan	20.6	18.8	20.0	20.7	22.6	Z	29.2	30.8	30.7	31.9	32.3	32.4	34.1	36.7	35.6	34.5	33.4	28.2	18.7	21.1	24.7	21.4	26.9	28.8	27.6	36.7																							
																								23.2	23.8	24.2	23.5	23.3	24.2	23.7	23.4	23.5	23.3	25.0	26.6	27.8	28.5	28.4	28.0	26.3	25.5	24.3	24.7	24.4	23.6	23.7	24.1	Diurnal Average	
																								37.6	37.3	36.9	36.3	35.5	36.8	36.1	36.7	36.0	36.2	35.7	37.3	37.7	38.1	38.0	37.9	37.9	38.1	38.4	38.8	38.8	37.9	38.3	38.0	Diurnal Maximum	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Conklin - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	204	28.77	28.77
21 - 50	505	71.23	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Conklin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	14	11	5	5	7	5	21	44	27	23	15	6	2	3	3	12	203
21 - 50	20	16	8	3	6	11	19	16	38	87	99	32	17	22	47	61	502
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	34	27	13	8	13	16	40	60	65	110	114	38	19	25	50	73	705

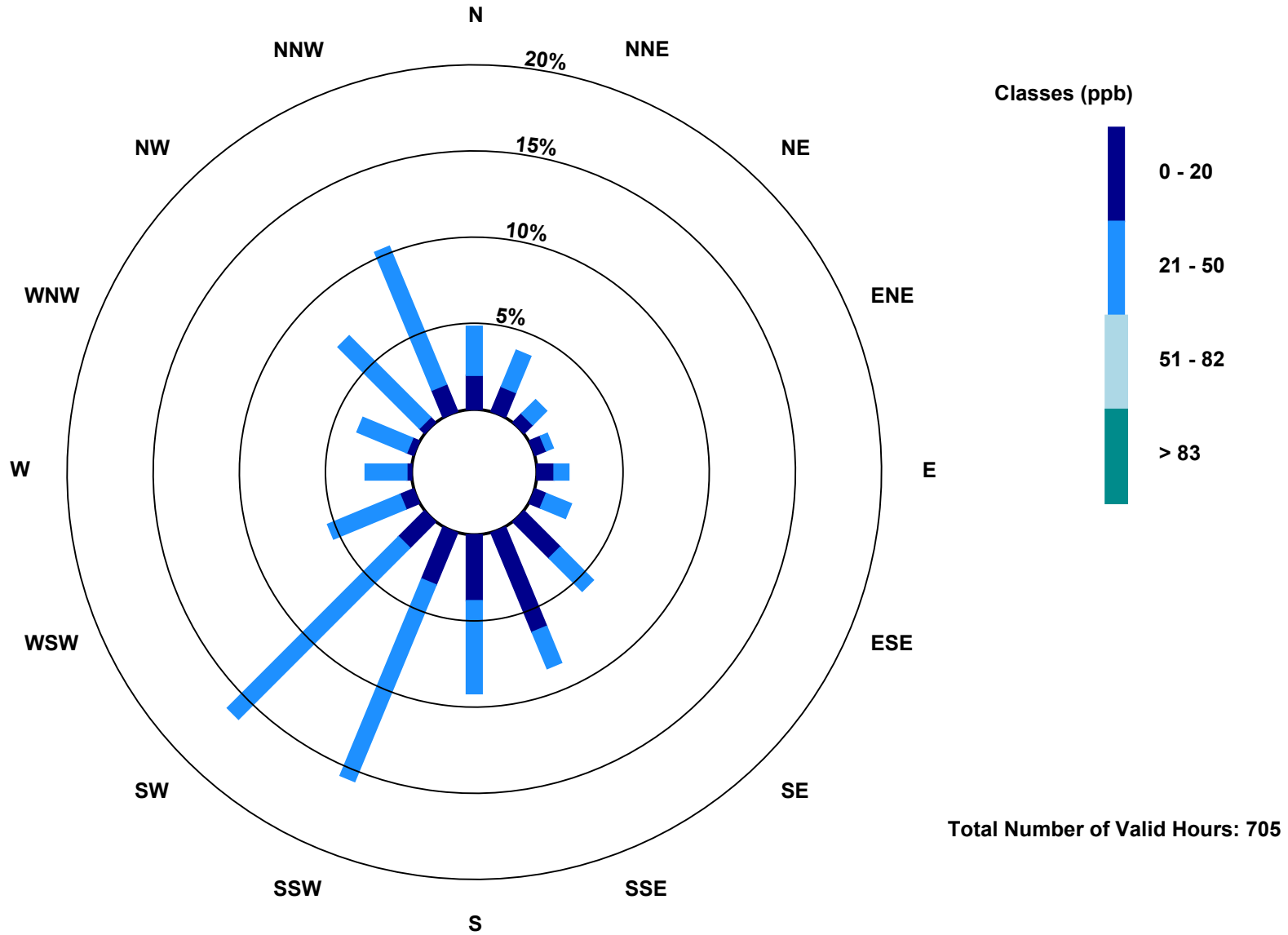
Total Number of Valid Hours: 705

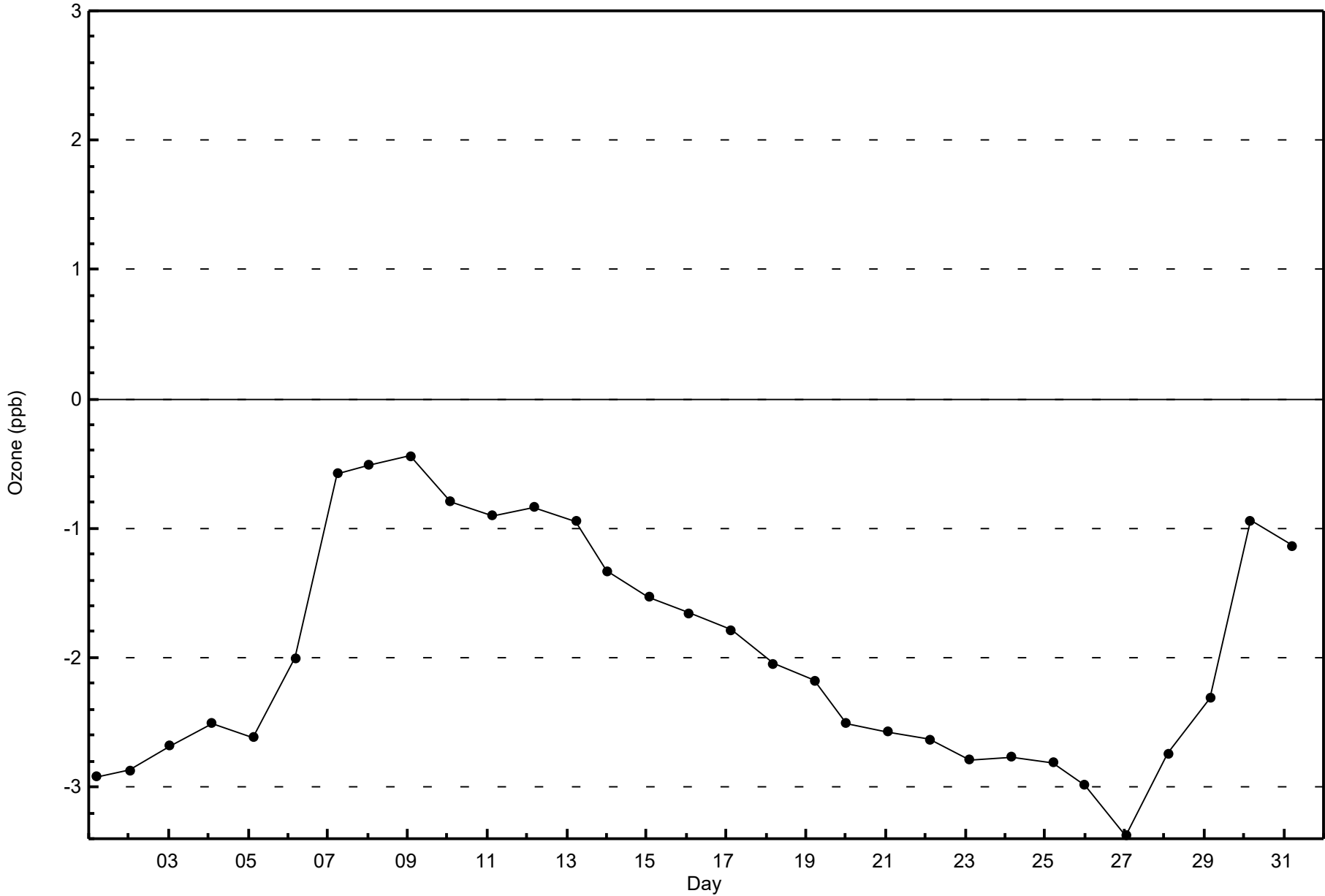
Total Number of Hours: 744

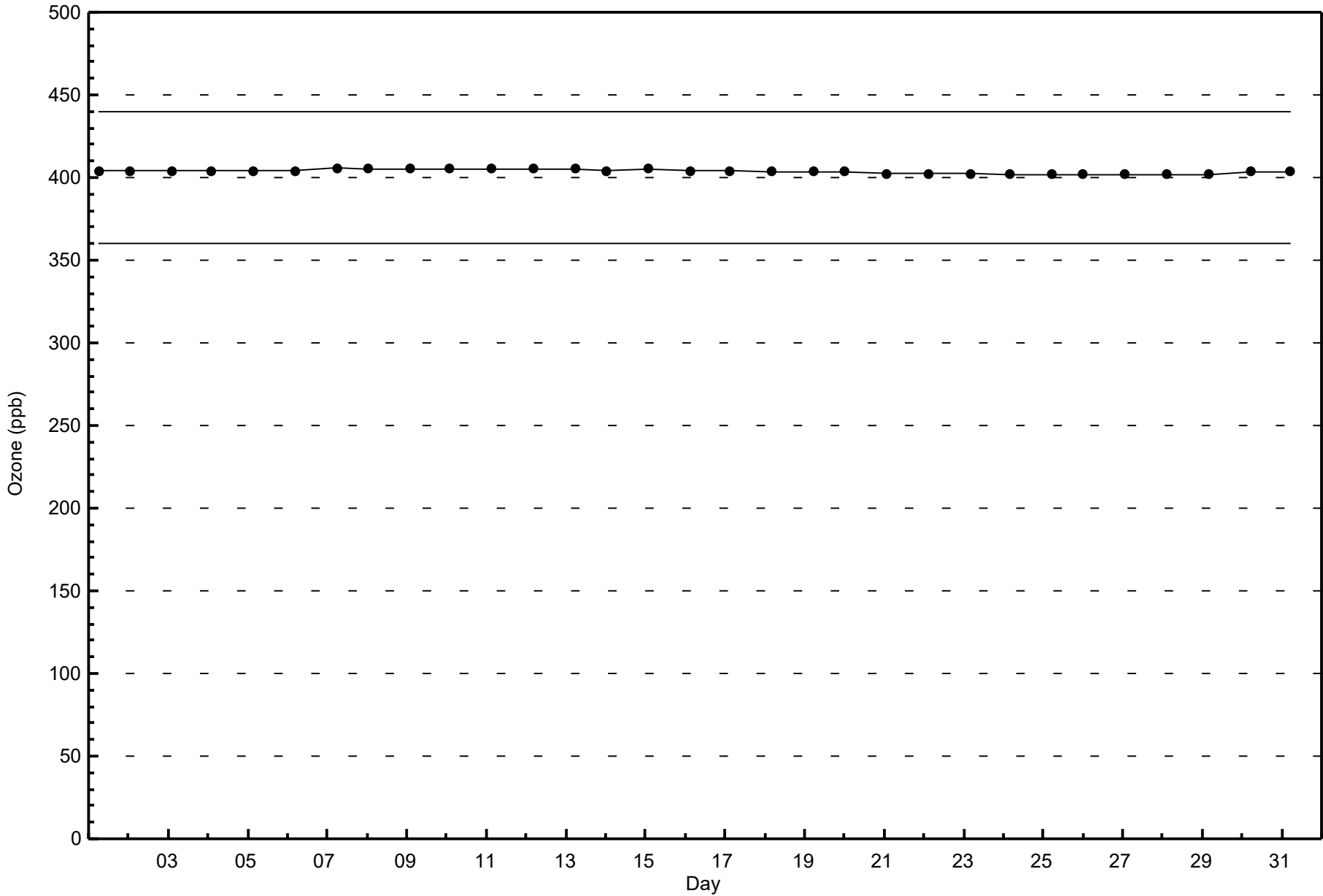


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Conklin





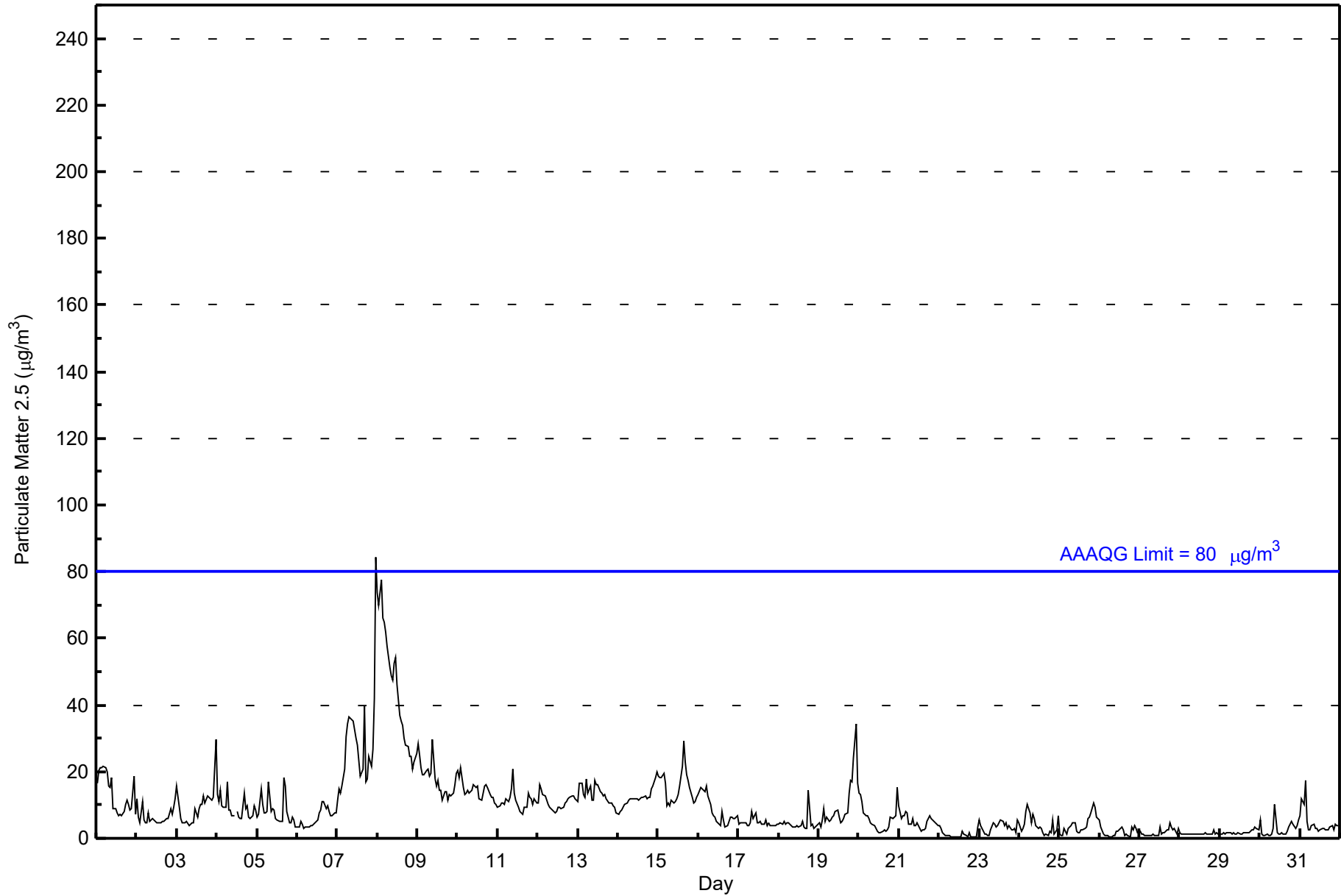




Summary of Hour Averages

Conklin - January 2023

Number of Exceedences (AAAQO):		1-hr: 1	24-hr: 1	Hours in Service: 744																	744					
Maximum Value: 84.4 µg/m ³ on Jan 8 00:00		Maximum Daily Average: 45.1 µg/m ³ on Jan 8																	Hours of Data: 743							
Minimum Value: 0.3 µg/m ³ on Jan 22 18:00		Minimum Daily Average: 1.1 µg/m ³ on Jan 22																	Hours of Missing Data: 1							
Maximum Diurnal Average: 11.6 µg/m ³ at hour 24		Minimum Diurnal Average: 7.4 µg/m ³ at hour 14																	Hours of Calibration: 1							
Monthly Average: 9.21 µg/m ³		Percentiles: P ₁ = 0.5 P ₁₀ = 1.3 Q ₁ = 3.2 Median = 6.2 Q ₃ = 11.9 P ₉₀ = 18.2 P ₉₉ = 56.4																	Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	16.3	20.3	21.1	21.3	21.6	21.0	19.9	15.9	15.1	18.1	8.8	8.7	7.5	6.7	7.0	6.6	8.1	10.3	11.5	10.2	8.5	8.9	18.5	7.2	13.3	21.6
2-Jan	11.7	6.2	4.5	11.2	5.4	4.7	4.6	7.8	5.1	5.9	5.5	4.9	4.8	4.6	4.5	5.2	5.1	5.6	6.0	5.8	8.8	7.4	9.5	11.9	6.5	11.9
3-Jan	15.5	9.4	5.9	4.7	4.5	4.5	5.2	3.9	4.3	4.6	4.8	8.8	6.3	8.8	10.1	10.2	12.6	10.5	12.8	12.5	11.9	11.5	12.4	29.6	9.4	29.6
4-Jan	13.1	11.0	14.4	9.7	9.2	9.3	17.1	8.3	8.5	6.7	7.0	C	8.2	6.3	5.9	5.9	13.7	8.9	9.8	6.4	5.9	6.7	9.8	8.3	9.1	17.1
5-Jan	6.4	7.2	15.0	10.3	7.7	7.4	8.2	17.2	8.2	8.8	8.3	5.9	5.6	5.2	5.1	5.3	18.0	15.5	8.2	4.8	4.8	6.3	5.4	3.3	8.3	18.0
6-Jan	3.5	3.3	5.0	4.4	3.2	3.3	3.4	3.6	3.8	3.9	4.3	4.9	5.7	7.8	8.6	11.0	11.1	8.9	9.6	7.9	6.8	6.9	7.5	7.7	6.1	11.1
7-Jan	11.6	14.7	13.7	15.5	20.6	30.4	34.2	36.4	36.1	35.4	32.6	30.1	28.0	23.4	18.8	20.7	39.8	16.9	17.8	24.5	21.7	26.8	41.8	84.4	28.2	84.4
8-Jan	73.5	69.8	77.6	66.2	65.0	61.9	57.8	51.2	48.5	47.6	52.5	54.4	46.1	36.9	35.2	33.9	30.0	28.2	27.5	24.4	24.8	20.8	22.7	25.3	45.1	77.6
9-Jan	28.2	25.1	21.1	19.2	18.9	20.2	20.7	18.7	19.5	29.5	17.7	15.8	17.5	14.6	14.6	11.5	13.8	14.0	11.3	13.0	12.6	13.4	16.0	19.5	17.8	29.5
10-Jan	20.4	18.3	21.1	15.2	13.2	13.6	14.5	13.5	14.2	16.1	15.6	15.1	15.7	11.9	11.6	13.4	15.5	15.9	15.1	13.0	12.4	12.2	10.5	10.4	14.5	21.1
11-Jan	9.3	9.7	10.6	10.5	10.4	11.8	11.1	12.2	14.7	20.7	13.7	11.6	9.2	8.0	7.4	7.4	9.3	9.4	13.5	12.4	12.0	10.2	12.1	10.7	11.2	20.7
12-Jan	10.6	16.1	14.9	13.1	12.5	11.4	10.3	9.3	8.9	8.6	7.8	8.2	9.5	9.4	9.1	9.5	10.4	11.2	11.7	12.4	12.6	12.8	11.9	11.6	11.0	16.1
13-Jan	10.9	16.6	16.5	12.9	12.5	18.0	13.6	15.7	11.4	11.4	17.3	16.2	16.3	14.0	13.7	12.6	12.9	11.9	10.8	10.4	10.6	9.9	9.4	7.5	13.0	18.0
14-Jan	7.4	7.9	8.6	9.5	10.1	10.4	11.6	11.8	11.9	11.8	11.7	11.4	11.7	12.2	12.3	12.8	11.9	12.3	12.3	14.6	15.6	18.1	20.0	12.1	20.0	
15-Jan	18.6	18.2	18.2	19.3	16.6	9.8	10.7	9.8	11.3	10.4	11.2	11.9	13.3	15.9	21.7	29.2	22.8	19.2	17.2	15.5	12.2	10.4	11.0	12.2	15.3	29.2
16-Jan	13.2	15.1	14.8	14.6	13.9	15.5	12.5	10.1	7.8	6.6	6.5	5.2	4.4	4.0	8.1	5.4	3.6	3.9	4.9	6.2	6.2	6.0	6.0	6.6	8.4	15.5
17-Jan	4.4	4.6	4.6	4.7	4.6	4.0	4.0	4.5	8.0	5.8	7.7	4.6	4.8	5.2	4.1	4.2	5.3	3.9	4.7	4.0	3.8	3.9	3.7	4.0	4.7	8.0
18-Jan	4.3	4.6	4.4	5.2	4.3	4.8	4.5	4.4	3.6	3.4	3.3	4.0	3.6	3.7	4.9	3.3	3.2	3.1	14.4	3.8	4.4	2.9	3.2	3.7	4.4	14.4
19-Jan	4.7	3.5	5.5	8.8	5.2	6.4	5.3	5.6	6.4	6.9	8.0	8.6	6.3	4.6	5.1	6.1	7.0	7.8	13.4	17.4	16.7	24.1	34.5	16.3	9.8	34.5
20-Jan	13.4	13.0	11.2	7.7	6.6	7.0	5.9	4.7	4.3	3.7	3.1	1.9	1.6	1.7	1.9	2.4	2.2	2.7	3.6	6.2	5.7	6.2	6.6	15.2	5.8	15.2
21-Jan	9.7	6.0	6.8	7.0	8.0	7.6	4.4	4.1	6.1	3.8	3.8	4.5	3.0	2.2	2.4	2.5	3.1	5.1	6.8	5.8	5.6	5.0	4.6	3.9	5.1	9.7
22-Jan	3.8	3.1	1.7	1.2	1.0	0.8	0.7	0.6	0.5	0.6	0.6	0.6	0.5	0.4	1.9	1.4	0.7	0.3	1.7	0.5	0.4	0.4	0.5	3.4	1.1	3.8
23-Jan	5.5	3.8	3.0	1.3	1.3	1.0	0.7	2.5	4.7	4.2	3.5	3.7	4.7	5.6	5.1	3.6	4.6	2.8	3.9	2.4	2.3	3.1	1.8	5.3	3.4	5.6
24-Jan	4.6	2.0	2.8	4.1	7.9	10.0	7.4	4.7	7.1	5.7	3.6	3.2	3.3	3.0	1.7	1.0	1.1	1.0	2.2	1.5	5.4	1.1	2.7	6.9	3.9	10.0
25-Jan	1.4	0.9	0.9	3.0	1.4	2.8	3.2	3.9	4.7	4.6	2.2	1.6	1.8	2.3	2.7	3.1	3.3	6.1	6.5	7.7	10.4	9.3	6.5	6.0	4.0	10.4
26-Jan	5.5	3.3	1.2	1.0	1.0	0.7	0.6	0.4	0.8	0.9	2.0	2.2	2.7	3.2	2.6	0.9	1.2	0.8	0.6	3.2	2.7	4.0	3.0	1.9	1.9	5.5
27-Jan	2.3	1.5	1.4	1.1	0.9	0.8	0.8	1.0	1.3	1.0	0.9	1.0	3.4	1.3	1.5	1.9	2.3	2.4	4.6	3.4	2.6	3.0	1.4	2.8	1.8	4.6
28-Jan	1.5	1.2	1.1	1.2	1.4	1.3	1.2	1.4	1.4	1.2	1.2	1.3	1.1	1.2	1.1	1.8	1.5	1.3	1.2	1.3	2.5	1.3	1.9	1.5	1.4	2.5
29-Jan	1.3	1.5	1.9	1.5	1.7	1.8	1.7	1.4	1.6	1.4	1.4	1.5	1.4	1.5	1.6	1.5	1.5	1.7	1.9	2.4	2.6	3.4	3.1	2.7	1.8	3.4
30-Jan	5.5	1.2	0.9	0.8	1.3	0.9	1.0	1.3	3.2	10.2	1.8	1.3	1.2	1.6	1.2	1.4	2.1	3.6	4.2	5.1	4.4	2.9	3.8	5.6	2.8	10.2
31-Jan	6.8	11.9	10.2	17.4	5.3	2.4	2.3	3.9	4.3	3.0	3.0	2.0	2.5	2.9	3.0	2.7	2.7	2.5	3.4	3.9	2.6	4.2	3.9	4.0	4.6	17.4
																								Diurnal Average		
																								Diurnal Maximum		
11.1 10.7 11.0 10.4 9.6 9.9 9.6 9.3 9.3 9.8 8.7 8.5 8.1 7.4 7.6 7.7 9.1 8.0 8.8 8.4 8.3 8.4 9.8 11.6																										
73.5 69.8 77.6 66.2 65.0 61.9 57.8 51.2 48.5 47.6 52.5 54.4 46.1 36.9 35.2 33.9 39.8 28.2 27.5 24.5 24.8 26.8 41.8 84.4																										
C - Calibration																										
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Conklin - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	341	45.90	45.90
6 - 15	289	38.90	84.79
16 - 25	77	10.36	95.15
26 - 80	35	4.71	99.87
> 81.0	1	0.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Conklin - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	14	16	5	0	3	0	11	30	30	34	34	19	13	24	49	59	341
6 - 15	14	9	7	5	7	14	25	22	25	66	62	15	4	1	2	8	286
16 - 25	4	2	1	3	3	3	4	5	10	11	16	4	2	2	4	3	77
26 - 80	3	1	1	0	0	0	2	5	5	3	7	1	0	1	0	5	34
> 81.0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Totals	35	28	14	8	13	17	42	63	70	114	119	39	19	28	55	75	739

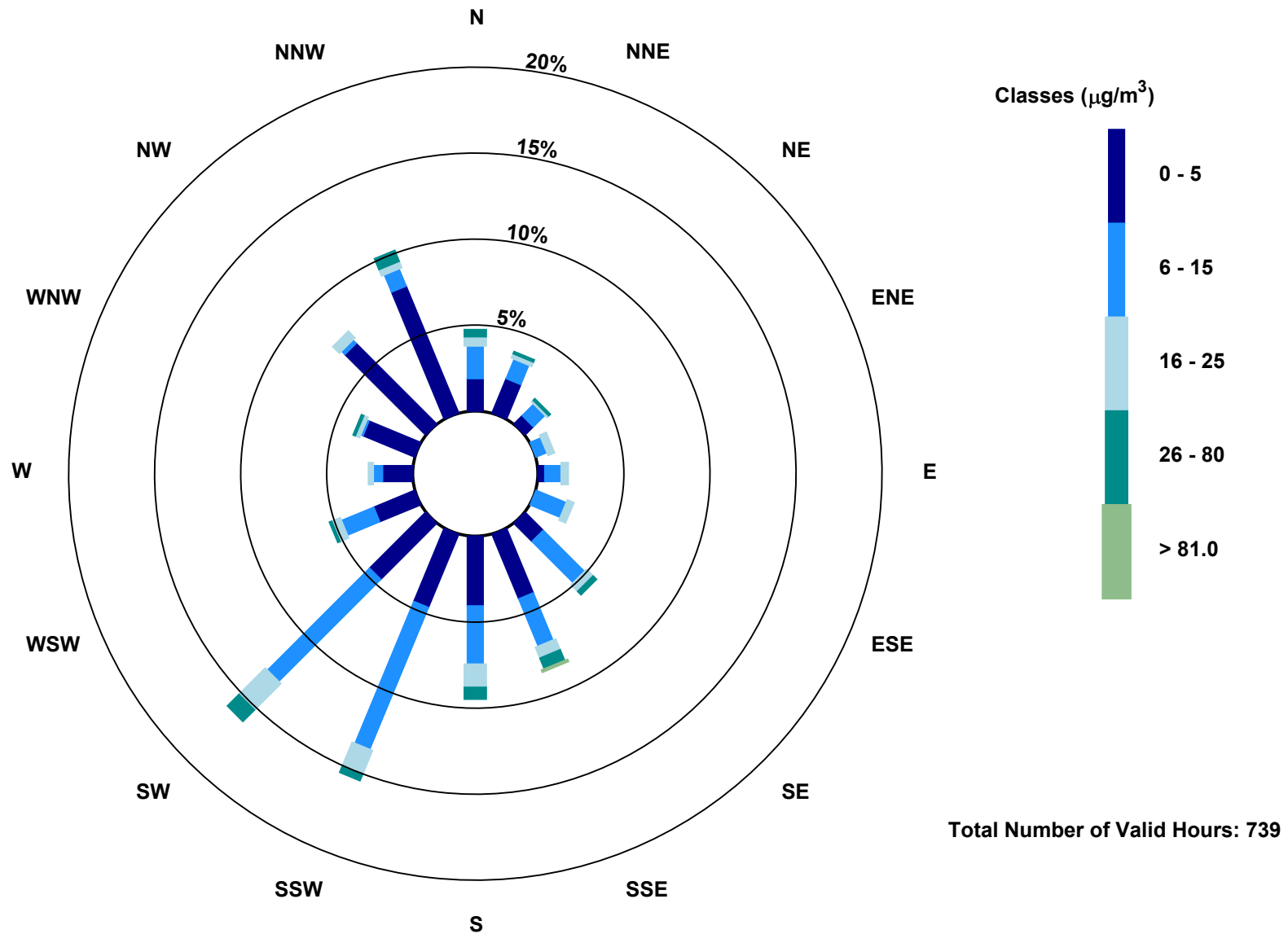
Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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

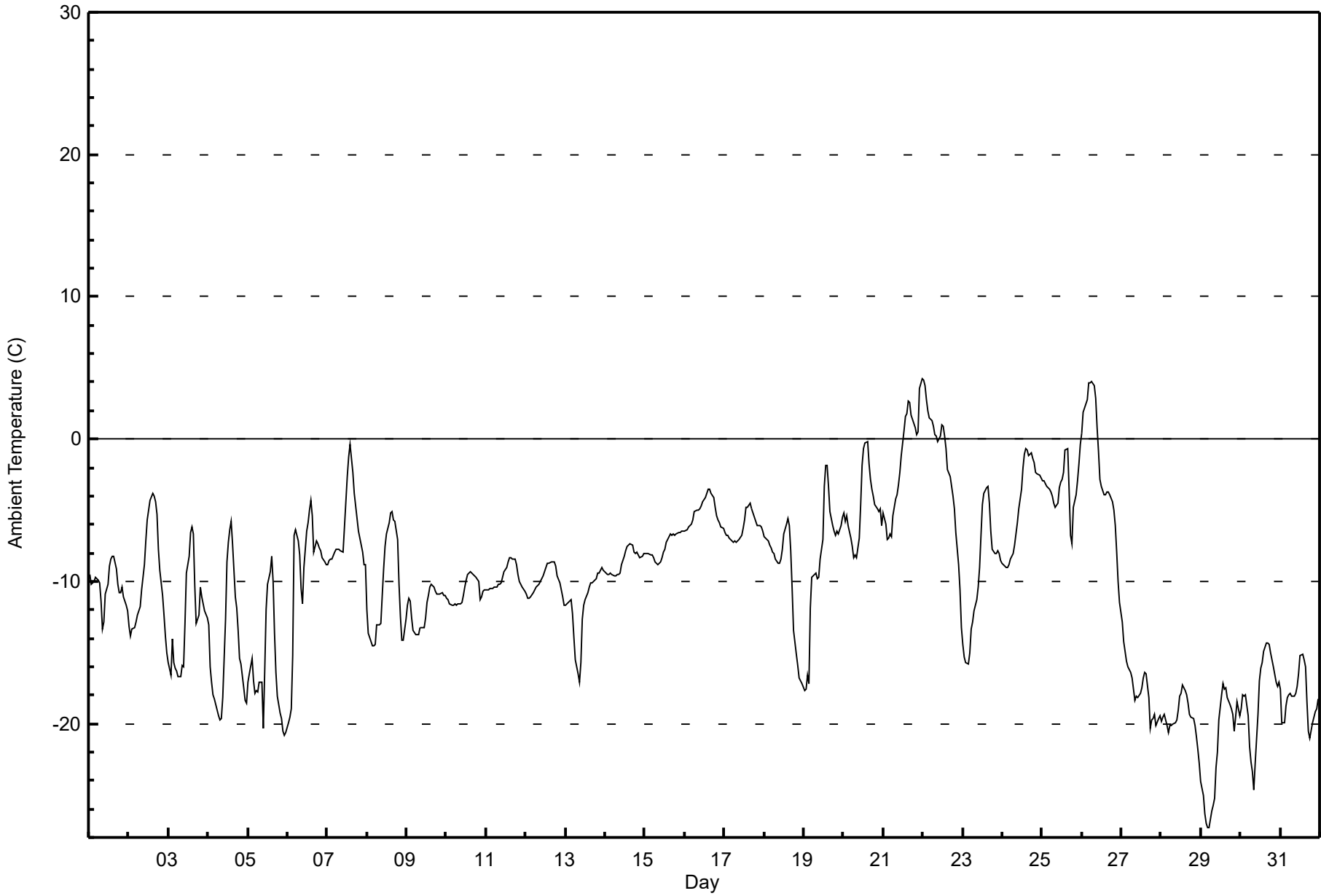




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Conklin - January 2023

Maximum Value: 4.2 C on Jan 22 00:00 Maximum Daily Average: -1.6 C on Jan 21 Minimum Value: -27.3 C on Jan 29 06:00 Minimum Daily Average: -21.8 C on Jan 29 Maximum Diurnal Average: -6.8 C at hour 15 Minimum Diurnal Average: -11.6 C at hour 4 Monthly Average: -10.05 C Percentiles: P ₁ = -24.9 P ₁₀ = -18.6 Q ₁ = -14.2 Median = -9.4 Q ₃ = -6.2 P ₉₀ = -2.9 P ₉₉ = 3.3																						Hours in Service: 744	Hours of Data: 744	Hours of Missing Data: 0	Hours of Calibration: 0	Percent Operational Time: 100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-9.5	-10.2	-10.1	-10.0	-9.8	-9.9	-10.1	-11.4	-13.3	-12.9	-10.8	-10.2	-8.9	-8.4	-8.3	-8.3	-9.1	-10.2	-10.8	-10.8	-10.4	-11.1	-11.7	-12.1	-10.3	-8.3
2-Jan	-13.2	-13.8	-13.3	-13.3	-12.9	-12.3	-12.1	-11.8	-10.6	-8.9	-7.2	-5.7	-5.0	-4.3	-3.8	-4.0	-4.4	-5.3	-7.7	-9.2	-11.0	-12.4	-13.8	-15.0	-9.6	-3.8
3-Jan	-15.7	-16.6	-14.0	-15.7	-16.1	-16.3	-16.7	-16.7	-15.9	-16.0	-13.0	-9.4	-8.2	-6.5	-6.2	-6.6	-10.3	-13.0	-12.4	-10.4	-11.1	-11.6	-12.1	-12.6	-12.6	-6.2
4-Jan	-13.0	-16.0	-17.1	-18.0	-18.2	-19.0	-19.5	-19.7	-19.6	-18.2	-12.6	-8.6	-7.2	-6.4	-5.8	-7.4	-11.1	-11.9	-13.4	-15.4	-15.8	-17.5	-18.4	-18.6	-14.5	-5.8
5-Jan	-17.1	-16.5	-15.4	-17.0	-17.9	-17.7	-17.8	-17.1	-17.1	-20.4	-16.3	-12.0	-10.2	-9.3	-8.3	-10.0	-13.6	-16.4	-18.1	-19.3	-19.6	-20.5	-20.8	-20.7	-16.2	-8.3
6-Jan	-20.0	-19.5	-18.9	-15.2	-6.8	-6.4	-7.2	-8.1	-10.5	-11.6	-9.0	-6.4	-5.9	-5.0	-4.3	-5.4	-8.0	-7.2	-7.3	-7.6	-7.9	-8.3	-8.7	-8.8	-9.3	-4.3
7-Jan	-8.8	-8.6	-8.5	-8.4	-7.9	-7.7	-7.7	-7.7	-7.9	-7.9	-6.2	-4.4	-2.6	-1.2	-0.4	-2.3	-3.8	-4.7	-5.6	-6.5	-7.5	-7.9	-8.8	-8.8	-6.3	-0.4
8-Jan	-12.0	-13.7	-14.3	-14.5	-14.5	-14.4	-13.0	-13.0	-13.0	-11.0	-9.1	-7.5	-6.7	-5.9	-5.2	-5.1	-5.7	-5.8	-7.1	-10.2	-12.4	-14.2	-14.1	-12.7	-10.6	-5.1
9-Jan	-11.7	-11.2	-11.4	-12.6	-13.5	-13.7	-13.8	-13.8	-13.3	-13.3	-13.3	-12.6	-11.5	-11.0	-10.4	-10.2	-10.4	-10.7	-10.9	-10.9	-10.9	-10.8	-11.0	-11.0	-11.8	-10.2
10-Jan	-11.2	-11.2	-11.5	-11.7	-11.7	-11.6	-11.7	-11.6	-11.5	-11.5	-11.0	-10.4	-9.9	-9.5	-9.3	-9.5	-9.6	-9.6	-9.7	-10.0	-11.2	-11.1	-10.7	-10.6	-10.7	-9.3
11-Jan	-10.6	-10.6	-10.5	-10.5	-10.5	-10.4	-10.4	-10.2	-10.2	-10.1	-9.7	-9.3	-9.0	-8.6	-8.3	-8.3	-8.4	-8.5	-8.8	-9.6	-10.0	-10.3	-10.4	-10.7	-9.7	-8.3
12-Jan	-10.9	-11.2	-11.2	-11.1	-10.8	-10.6	-10.5	-10.3	-10.2	-10.0	-9.7	-9.3	-9.0	-8.8	-8.7	-8.6	-8.6	-8.7	-9.0	-9.6	-10.1	-10.6	-11.1	-11.7	-10.0	-8.6
13-Jan	-11.7	-11.6	-11.4	-11.2	-12.2	-14.0	-15.5	-16.5	-17.0	-15.7	-12.7	-11.7	-11.2	-10.8	-10.4	-10.1	-10.1	-10.0	-9.8	-9.5	-9.4	-9.2	-9.1	-9.2	-11.7	-9.1
14-Jan	-9.4	-9.5	-9.5	-9.4	-9.5	-9.6	-9.6	-9.5	-9.5	-9.4	-8.8	-8.3	-7.8	-7.6	-7.5	-7.3	-7.5	-7.9	-8.1	-7.9	-8.2	-8.4	-8.2	-8.0	-8.6	-7.3
15-Jan	-8.0	-8.0	-8.0	-8.1	-8.1	-8.3	-8.6	-8.8	-8.8	-8.6	-8.3	-7.9	-7.7	-7.2	-6.9	-6.7	-6.7	-6.7	-6.8	-6.7	-6.6	-6.5	-6.5	-6.5	-7.5	-6.5
16-Jan	-6.4	-6.3	-6.2	-6.1	-6.0	-5.6	-5.1	-5.0	-4.9	-4.8	-4.4	-4.2	-3.8	-3.5	-3.6	-3.8	-4.1	-4.8	-5.4	-5.6	-5.9	-6.2	-6.3	-5.1	-3.5	
17-Jan	-6.5	-6.8	-6.8	-7.0	-7.2	-7.2	-7.2	-7.2	-7.1	-6.7	-6.3	-5.7	-4.8	-4.8	-4.5	-4.9	-5.2	-5.5	-5.8	-6.1	-6.1	-6.2	-6.5	-6.2	-4.5	
18-Jan	-6.9	-7.0	-7.2	-7.4	-7.7	-7.9	-8.1	-8.4	-8.7	-8.8	-8.4	-7.7	-6.7	-5.9	-5.6	-6.1	-7.9	-10.5	-13.5	-15.1	-15.9	-16.8	-17.0	-17.2	-9.7	-5.6
19-Jan	-17.6	-17.6	-16.6	-17.2	-11.9	-9.7	-9.5	-9.4	-9.8	-9.7	-8.5	-7.0	-3.4	-1.9	-1.8	-3.3	-5.1	-6.1	-6.4	-6.8	-6.5	-6.6	-6.1	-5.5	-8.5	-1.8
20-Jan	-5.2	-5.8	-5.4	-6.1	-7.0	-7.6	-8.3	-8.1	-8.3	-7.0	-4.6	-1.8	-0.7	-0.3	-0.2	-1.8	-2.9	-3.6	-4.1	-4.6	-4.9	-5.1	-4.9	-6.1	-4.8	-0.2
21-Jan	-5.2	-6.0	-7.1	-7.0	-6.7	-6.8	-5.4	-4.2	-3.9	-3.2	-2.3	-1.1	0.6	1.6	1.8	2.6	2.6	1.7	1.1	0.8	0.3	0.5	3.6	4.2	-1.6	4.2
22-Jan	4.1	3.8	2.8	1.9	1.4	1.2	0.9	0.3	0.2	-0.2	0.3	1.0	0.9	0.2	-0.7	-2.1	-2.6	-3.3	-4.0	-4.9	-6.5	-8.8	-10.6	-13.2	-1.6	4.1
23-Jan	-14.5	-15.3	-15.7	-15.8	-15.0	-13.3	-12.9	-12.1	-11.3	-10.4	-9.0	-6.8	-4.6	-3.8	-3.4	-3.3	-4.5	-6.4	-7.7	-8.1	-8.1	-7.8	-8.1	-8.6	-9.4	-3.3
24-Jan	-8.8	-9.0	-9.0	-9.0	-8.8	-8.4	-8.0	-7.4	-6.7	-5.9	-4.9	-3.5	-2.1	-1.1	-0.7	-0.8	-1.2	-1.0	-1.3	-1.6	-2.4	-2.4	-2.5	-2.7	-4.6	-0.7
25-Jan	-2.9	-2.9	-3.1	-3.4	-3.5	-3.7	-4.0	-4.5	-4.8	-4.5	-3.4	-3.1	-2.9	-2.4	-0.8	-0.7	-3.6	-6.8	-7.3	-4.8	-4.0	-2.9	-1.8	-0.4	-3.4	-0.4
26-Jan	0.4	1.9	2.5	2.7	3.9	4.0	4.0	3.8	2.9	0.8	-0.8	-2.9	-3.3	-3.9	-4.0	-3.7	-3.7	-3.9	-4.4	-5.0	-6.1	-7.9	-10.0	-11.5	-1.8	4.0
27-Jan	-12.9	-14.2	-14.9	-15.7	-16.0	-16.4	-16.8	-17.5	-18.4	-18.1	-18.1	-17.9	-17.4	-16.8	-16.4	-16.5	-18.1	-20.3	-19.7	-19.6	-19.4	-20.1	-19.6	-19.5	-17.5	-12.9
28-Jan	-19.8	-19.6	-19.3	-20.2	-20.6	-20.2	-20.1	-20.0	-19.9	-19.7	-19.0	-18.1	-17.9	-17.3	-17.7	-17.9	-18.6	-19.3	-19.5	-19.7	-20.2	-21.0	-21.8	-22.8	-19.6	-17.3
29-Jan	-24.0	-25.1	-26.3	-27.0	-27.3	-27.3	-26.1	-25.7	-25.2	-23.1	-22.0	-19.8	-18.0	-17.2	-17.6	-17.4	-18.2	-18.6	-19.0	-19.4	-20.5	-19.5	-18.5	-19.5	-21.8	-17.2
30-Jan	-18.9	-17.9	-18.0	-17.9	-19.4	-21.6	-22.7	-23.3	-24.6	-22.8	-19.3	-17.0	-16.1	-15.7	-14.9	-14.3	-14.3	-14.5	-15.1	-15.5	-16.0	-17.1	-17.4	-17.0	-18.0	-14.3
31-Jan	-17.6	-19.9	-20.0	-18.8	-18.2	-17.9	-17.9	-18.0	-18.1	-17.8	-17.4	-16.5	-15.2	-15.1	-15.5	-16.0	-18.4	-20.5	-21.0	-19.9	-19.5	-19.1	-18.9	-18.2	-18.2	-15.1
																								Diurnal Average		
																								Diurnal Maximum		





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Conklin - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	34	4.57	4.57
-20 - 0	675	90.73	95.30
0 - 10	35	4.70	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

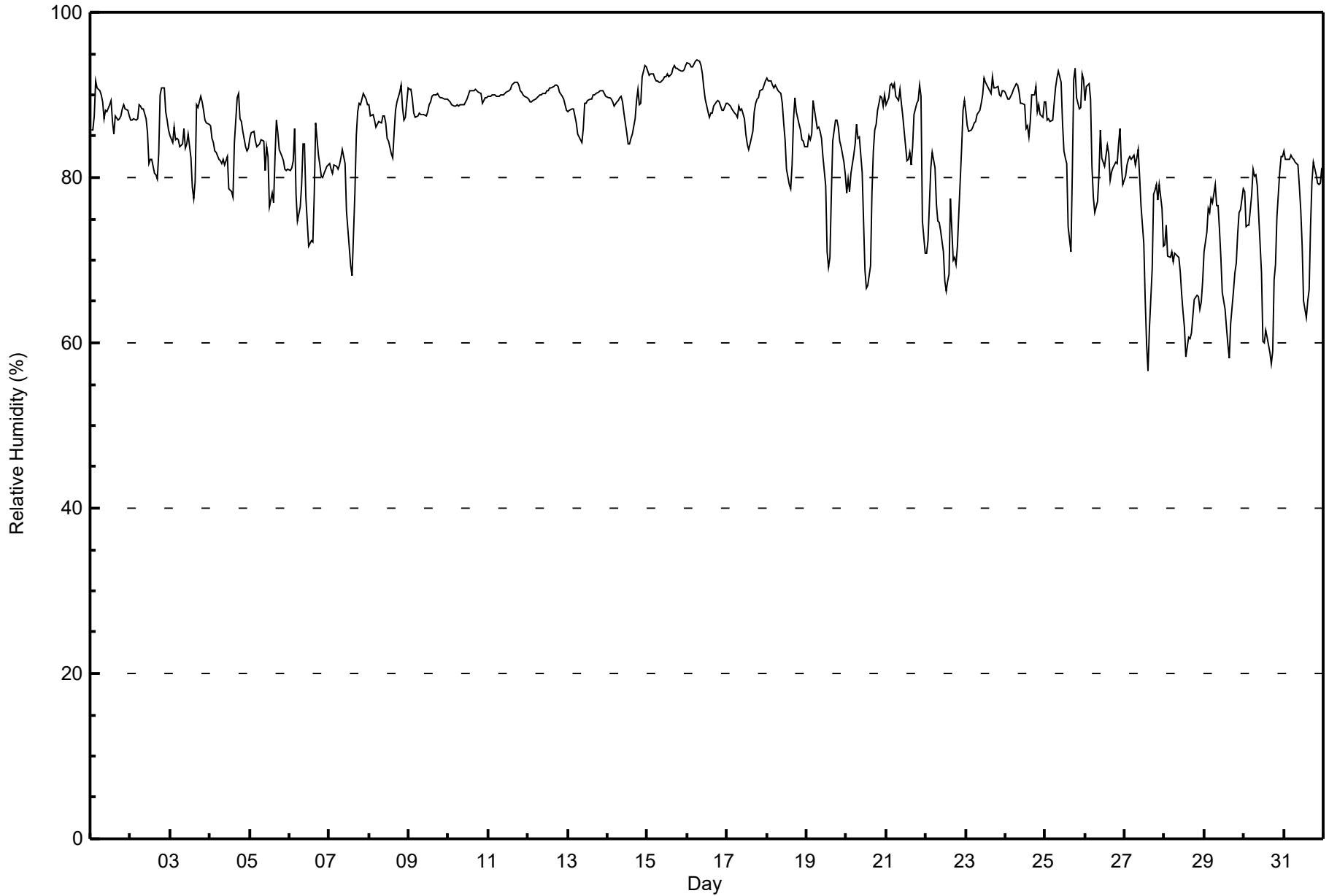
Conklin - January 2023

Maximum Value: 94.2 % on Jan 16 07:00 Maximum Daily Average: 92.5 % on Jan 15																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 56.6 % on Jan 27 15:00 Minimum Daily Average: 66.5 % on Jan 28 Maximum Diurnal Average: 85.8 % at hour 22 Minimum Diurnal Average: 78.3 % at hour 15 Monthly Average: 84.00 % Percentiles: P ₁ = 59.9 P ₁₀ = 71.7 Q ₁ = 81.0 Median = 86.7 Q ₃ = 89.6 P ₉₀ = 91.0 P ₉₉ = 93.5																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	85.7	85.8	87.5	91.8	90.9	90.5	90.0	89.1	87.1	88.1	88.0	88.8	89.3	86.7	85.2	87.4	87.0	87.1	87.5	88.4	88.8	88.3	88.2	87.4	88.1	91.8
2-Jan	87.0	86.9	87.1	87.0	87.2	88.8	88.6	88.3	88.3	87.0	85.4	81.8	82.2	82.3	80.6	80.4	79.9	82.9	90.0	90.8	90.8	88.0	86.9	85.8	86.0	90.8
3-Jan	85.2	84.2	86.1	84.5	84.7	84.5	83.7	84.1	86.0	83.6	84.1	85.3	82.3	78.8	77.4	79.4	88.8	88.6	89.9	89.2	88.1	87.0	86.7	86.5	84.9	89.9
4-Jan	86.2	84.7	84.3	83.2	83.1	82.2	82.0	81.6	82.2	81.5	82.6	78.7	78.4	78.2	77.7	84.2	89.7	90.1	87.2	86.7	85.6	83.8	83.2	83.6	83.4	90.1
5-Jan	84.8	85.4	85.7	84.5	83.8	83.9	84.1	84.6	84.5	80.8	83.8	82.6	76.5	78.1	77.0	82.5	87.0	85.4	83.5	82.5	82.0	81.1	80.8	81.0	82.7	87.0
6-Jan	80.9	81.2	82.0	85.9	78.0	74.8	76.5	79.1	84.0	84.1	77.6	71.8	72.0	72.4	72.2	77.9	86.7	82.7	81.4	80.2	80.0	80.5	81.3	81.6	79.4	86.7
7-Jan	81.7	81.0	80.5	81.4	81.3	81.0	81.4	82.5	83.3	81.8	76.0	73.7	71.6	69.4	68.1	78.1	85.2	87.9	89.0	88.8	90.1	89.8	89.6	88.8	81.8	90.1
8-Jan	88.9	87.5	87.6	86.9	86.1	86.4	86.8	86.6	87.5	87.4	86.6	84.8	84.5	82.9	82.4	85.5	88.2	89.2	90.3	91.2	88.5	87.0	87.2	90.9	87.1	91.2
9-Jan	90.7	90.7	89.5	87.9	87.2	87.5	87.8	87.6	87.6	87.6	87.5	87.9	88.8	89.1	89.8	90.0	90.0	90.1	89.8	89.6	89.6	89.5	89.5	89.4	88.9	90.7
10-Jan	89.2	89.1	88.8	88.7	88.7	88.8	88.7	88.8	88.8	88.9	89.2	89.5	90.0	90.5	90.6	90.6	90.5	90.4	90.1	89.0	89.4	89.6	89.7	89.5	89.5	90.6
11-Jan	89.8	89.9	90.0	90.1	90.0	89.8	89.9	90.0	90.1	90.1	90.1	90.4	90.5	90.7	91.1	91.4	91.5	91.5	91.2	90.6	90.3	90.0	89.9	89.7	90.3	91.5
12-Jan	89.4	89.2	89.2	89.3	89.5	89.7	89.8	90.0	90.0	90.1	90.2	90.5	90.6	90.9	90.9	91.0	91.1	91.1	90.9	90.4	89.9	89.5	88.9	88.2	90.0	91.1
13-Jan	88.0	88.1	88.4	88.2	87.4	86.6	85.2	84.5	84.2	85.9	89.0	89.3	89.5	89.6	90.0	90.1	90.2	90.4	90.6	90.6	90.5	90.2	89.9	88.6	88.6	90.6
14-Jan	89.6	89.6	89.4	89.1	88.6	89.2	89.3	89.6	89.8	89.2	87.8	85.3	84.1	84.1	84.7	85.3	87.1	89.3	90.6	88.8	89.0	92.3	93.5	93.3	88.7	93.5
15-Jan	93.0	92.3	92.5	92.5	92.1	91.8	91.6	91.5	91.6	91.9	92.2	92.3	92.6	92.2	92.5	93.1	93.5	93.3	93.2	93.0	92.9	92.9	93.1	93.5	92.5	93.5
16-Jan	93.9	93.8	93.4	93.4	93.7	94.0	94.2	94.1	93.5	92.6	90.8	89.5	88.0	87.3	87.7	87.8	88.6	89.2	89.3	89.2	88.6	88.1	88.2	88.9	90.7	94.2
17-Jan	89.0	88.8	88.7	88.3	87.7	87.6	87.2	88.6	88.1	88.2	87.1	85.3	84.0	83.4	84.0	85.6	88.0	89.0	89.5	89.7	90.5	90.7	91.1	91.7	88.0	91.7
18-Jan	92.1	91.7	91.7	91.2	90.8	91.1	90.9	90.4	90.1	89.1	86.5	84.5	81.0	79.1	78.7	81.6	86.9	89.7	88.0	86.4	85.8	84.5	84.5	83.7	87.1	92.1
19-Jan	83.8	85.0	84.5	85.2	89.3	88.1	86.0	86.1	85.7	84.8	82.5	79.1	71.0	69.1	70.3	77.8	84.3	87.0	87.0	86.2	84.4	83.7	81.8	80.4	82.6	89.3
20-Jan	78.2	79.8	78.4	80.6	82.8	84.1	86.4	84.8	84.9	80.8	74.8	68.7	66.6	67.0	69.3	78.1	83.2	85.8	86.5	88.2	89.9	89.7	88.7	90.1	81.1	90.1
21-Jan	88.8	89.7	91.2	91.4	90.9	91.4	89.8	89.3	90.6	89.1	87.5	85.5	82.0	82.3	83.0	81.5	83.7	87.7	88.9	89.3	91.2	89.8	74.7	70.8	86.7	91.4
22-Jan	70.9	72.4	76.7	81.2	83.1	81.1	76.9	74.7	74.7	73.5	71.0	67.5	66.2	67.4	68.3	77.4	70.0	70.4	69.5	71.7	75.8	83.6	88.2	89.3	75.1	89.3
23-Jan	88.0	86.3	85.6	85.7	86.1	86.6	86.8	87.6	88.2	89.0	90.1	92.1	91.5	91.2	90.5	90.2	92.2	90.8	90.8	91.1	90.0	89.9	90.5	90.6	89.2	92.2
24-Jan	90.3	89.5	89.4	89.8	90.2	90.7	91.4	91.1	90.4	89.0	88.9	88.7	86.0	86.3	84.9	86.8	90.0	90.0	91.1	88.0	88.8	87.6	87.3	89.1	89.0	91.4
25-Jan	89.1	86.9	87.1	86.8	87.0	89.1	90.8	92.1	92.8	91.5	86.6	83.2	82.4	81.7	74.0	71.0	80.7	91.8	93.2	89.7	88.3	88.6	92.6	91.9	87.0	93.2
26-Jan	89.3	91.0	91.4	89.5	81.4	77.6	75.7	77.2	80.3	85.8	82.3	81.8	81.3	83.8	82.9	79.6	80.7	81.3	81.9	81.6	84.0	85.9	81.5	79.2	82.8	91.4
27-Jan	80.2	81.5	82.3	82.6	82.2	82.8	81.5	82.4	83.4	80.1	76.6	72.1	65.3	59.8	56.6	61.8	69.0	77.9	78.4	79.1	77.3	79.2	76.3	71.7	75.8	83.4
28-Jan	71.8	74.3	70.5	70.3	71.0	69.8	70.9	70.8	70.3	68.6	65.9	63.7	61.9	58.3	60.7	60.5	61.1	63.2	65.2	65.8	65.7	64.0	65.0	67.4	66.5	74.3
29-Jan	71.1	73.4	76.2	75.7	77.4	77.0	79.1	76.6	76.6	73.7	70.4	66.1	64.1	61.8	59.8	58.1	62.3	66.3	68.5	69.7	73.2	75.8	76.0	78.6	71.1	79.1
30-Jan	78.2	74.0	74.2	74.2	78.0	81.0	80.2	80.3	78.9	75.4	68.4	60.2	60.0	61.5	60.7	58.8	57.4	59.0	67.6	69.4	75.2	80.6	82.6	82.5	71.6	82.6
31-Jan	83.2	82.1	82.2	82.2	82.7	82.4	82.2	81.9	81.5	79.0	76.2	71.8	65.1	63.1	65.1	66.4	74.1	79.5	81.8	80.3	79.4	79.2	79.3	81.3	77.6	83.2
85.4 85.3 85.5 85.8 85.6 85.5 85.3 85.3 85.6 84.8 83.1 81.0 79.3 78.7 78.3 80.3 83.2 84.8 85.6 85.4 85.6 85.8 85.4 85.4																						Diurnal Average				
93.9 93.8 93.4 93.4 93.7 94.0 94.2 94.1 93.5 92.6 92.2 92.3 92.6 92.2 92.5 93.1 93.5 93.3 93.2 93.0 92.9 92.9 93.5 93.5																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Conklin - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Conklin - January 2023

Maximum Speed: 23 km/h on Jan 26 10:00	Maximum Daily Speed Average: 11.5 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 10 14:00	Minimum Daily Speed Average: 0.5 km/h on Jan 8	Hours of Data: 740
Maximum Diurnal Speed Average: 3.6 km/h at hour 14	Minimum Diurnal Speed Average: 2.1 km/h at hour 4	Hours of Missing Data: 4
Monthly Average Velocity: 2.6 km/h 241.1 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 9 P ₉₀ = 11 P ₉₉ = 16	Percent Operational Time: 99.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	WSW7	SW9	SW9	SW10	SW9	SW7	SW5	SW4	SSW3	SW4	SW6	SW5	SW5	WSW8	SW8	SSW6	SW10	SW12	SW12	SW9	SW10	SW10	SW10	SW10	SW7.8	SW12
2-Jan	SSW7	SSW6	SSW9	SSW7	S7	SSW8	SSW7	SSW8	SSW11	SW8	SW10	SW14	WSW13	WSW14	WSW11	SW12	SW11	SW4	NNE3	NNW1	NNE2	E1	S2	SSE2	SW6.5	WSW14
3-Jan	N1	SE3	S4	SE3	SSE3	S2	SSE3	SE5	SSE3	NNE1	E1	NNE2	SSE3	SW3	W5	SW2	E1	SE0	SSW4	WSW3	SSW5	SSW6	SSW6	SSW7	S2.2	SSW7
4-Jan	SSW6	SSE3	S3	S3	SSE2	SSE3	SSE3	S2	SSW3	S3	SSW6	SW7	SW5	SW6	SW4	SW3	SSW4	SSW6	SSW5	SSW5	SSE3	S3	SSE3	S5	SSW3.6	SW7
5-Jan	SSW6	SSW5	SSW5	SSW5	S4	S5	S5	S5	S4	N1	SE4	SE4	SSE4	SSE5	SE4	SSE2	SSE3	SSE3	SSE2	SSE2	SSE3	S1	S2	S3.3	SSW6	
6-Jan	S4	S1	NW2	SSE6	S10	S10	S9	S9	SE2	SE5	SSW5	SSW8	SW11	SW9	SSW7	SSW6	WSW1	SSW5	SW11	SW12	SW12	SW11	SW11	SSW8	SSW6.5	SW12
7-Jan	SSW9	SW12	SSW10	SSW11	SW15	SW15	SW15	SW15	SW12	SSW7	SW8	SW10	SW10	SW6	SW6	SSW5	S6	S6	SSW6	S4	S5	S5	S3	SSE4	SSW8.2	SW15
8-Jan	SSE2	N1	SSE2	S1	SE0	SSE1	SSE1	N1	NNW1	UO	NNE1	WNW1	S2	SE2	NNW3	NNW4	NNW4	N3	NNW2	N2	WSW0	NW1	SSW1	WNW0	N0.5	NNW4
9-Jan	S2	S2	S2	S1	S1	S3	SSW4	SSW3	SSW2	SSW3	SSW3	SSE2	SSW1	SSW1	SE1	SSE2	ENE2	NE2	ENE2	SSE2	SSE0	SSE2	E1	ESE2	S1.4	SSW4
10-Jan	SE2	SE2	SSE3	SE2	ESE1	ESE1	SSW1	E1	ENE1	NNE1	W1	W0	WSW1	NNW0	SE1	NE2	N2	NNE2	NNE3	NNE2	N2	N3	N2	N2	NE0.6	SSE3
11-Jan	NNE2	N2	UO	N1	N1	UO	SE1	S1	SW2	S1	SE2	SE2	ESE2	ESE3	ESE2	SE2	SSE3	S4	S4	SSW4	SSW3	SW4	SSW5	SSW5	S1.7	SSW5
12-Jan	SSW4	SSW4	SSW4	S4	S3	S3	S5	SSW5	SSW7	SSW5	SSW6	SW5	SSW7	SW9	SSW8	SW7	SW6	SW8	SW9	SSW6	SW7	SW6	SW6	SW4	SSW5.6	SW9
13-Jan	WSW4	SSW3	ESE2	ESE3	NW1	NW1	WNW1	SSE0	N2	N1	ENE2	E5	NE5	NE4	E5	E4	NE3	ENE3	ENE4	ESE4	E4	ESE5	ESE5	ESE5	E2.1	NE5
14-Jan	ESE4	ESE4	SE4	SE5	SE4	SE5	SSE5	SSE4	SE4	SE4	SSE4	SSW5	WSW4	WSW4	WSW4	WSW3	W3	NNW2	S1	WSW3	WSW6	WSW4	W3	WNW4	S2.1	WSW6
15-Jan	NW4	NW3	NNW3	NNW4	NNW4	NNW5	N5	N4	NE2	W1	NNW1	ESE3	SE4	SE4	SE3	NE2	ENE2	E2	ENE2	E2	NNE2	N1	N2	NE0	NNE1.4	NNW5
16-Jan	NNW1	NW1	NE1	NNE1	NNE3	ESE1	ESE3	SE4	SE5	SE5	SSE9	SSE9	SSE10	SE9	SSE9	SSE8	S8	S11	S10	S8	S7	S8	SSW9	SSE5.3	S11	
17-Jan	SSW10	SSW8	S9	S9	SSW8	S6	SSW6	SSW8	SSW9	SSW8	SSW8	SW10	SW8	SSW8	SSW9	SW10	SW10	SSW9	SW7	SSW12	SSW11	SSW11	SSW12	SW10	SSW8.8	SSW12
18-Jan	SW11	SSW9	SSW10	SSW10	SSW10	SSW9	S9	S9	S8	S9	S8	SSW9	SSW9	S10	S9	SSE8	S8	SSE5	S4	SSE1	SSE2	S5	S4	SSE2	S7.2	SW11
19-Jan	SE1	SSE5	WSW1	SE1	WSW6	SW9	SW9	SW9	SW10	SW10	SW11	SW9	WSW8	W10	WSW8	SW9	SW11	SW12	SW12	SW10	SW12	SW13	WSW13	SW12	SW8.4	SW13
20-Jan	SW11	SW10	WSW11	SW11	SW11	SW9	SSW8	SW9	SW8	SW8	WSW9	WNW9	WNW9	W9	WSW9	WSW9	SW9	WSW9	WSW9	SW7	SSW7	SSW7	SSW7	SSW6	SW8.1	WSW11
21-Jan	SW5	SSW6	SSW7	SSW6	SSW6	SSW7	SW9	SW10	SW9	SW9	SSW6	SSW6	SW8	SW8	SW8	SW6	SW8	SW9	SW9	SW9	SW8	SW8	WNW12	WNW11	SW7.2	WNW12
22-Jan	WNW11	WNW10	WNW8	NW7	NW6	NW6	WNW8	NW8	NW9	NW11	NW11	NW12	NW15	NNW15	NNW18	NNW17	NNW16	NNW14	NNW13	NNW10	NW6	NW4	WNW1	W1	NW9.5	NNW18
23-Jan	SSE2	S2	SSE3	SSE3	SSE4	SSE2	SSE3	SSE2	SE2	SSE4	SSE3	SSE4	SSE6	S5	S5	NNE1	N7	N7	NNW5	N4	NW2	NW2	NNE3	NE2	SE0.8	N7
24-Jan	E2	E2	SE2	SE4	SE3	SSE3	SE3	S4	SSW4	SW3	WSW6	WSW7	W8	NW8	NW9	NW6	NW6	NNW7	NNW8	NNW5	NNW6	NNW6	NNW6	NNW6	WNW2.5	NW9
25-Jan	NNW5	NNW9	NNW8	NNW9	NNW8	NNW4	NNE4	NE1	SE3	NNW1	NW5	WNW2	W2	WSW6	S1	NW2	SE1	SSW3	SSW7	SSW7	SSW6	SW9	SSW8	SSW11	W2.2	SSW11
26-Jan	SW12	WNW11	WNW12	WNW14	WNW15	WNW14	NW13	NW14	NNW19	N23	NNW19	N22	NNW16	N17	N13	NNW11	NNW11	NNW11	NNW10	N11	NNE11	NNE9	NE11	NNE11	NNW11.4	N23
27-Jan	NNE10	NNE10	NNE10	NNE10	NE9	NNE9	NNE10	N9	NE7	NNE8	NNE7	N7	N7	NNW6	NW6	NW8	NNW8	NNW5	NNW4	NNW3	NNW7	NNW5	NW5	NNW9	N6.7	NNE10
28-Jan	NW7	NW7	NW11	NW9	NW8	NW10	NW10	NW11	NW11	NW9	NW9	NW12	NW11	NW15	NNW14	NNW15	NNW14	NNW12	NNW13	NNW15	NNW15	NNW15	NNW14	NNW11	NNW11.5	NNW15
29-Jan	NNW7	NNW7	NNW5	NW4	NW4	W3	NW5	WSW6	W6	WNW8	WNW7	W7	WSW7	SW9	SW10	SW9	SW11	SW10	WSW12	WSW15	SW4	NW6	NW6	NNW7	W5.5	WSW15
30-Jan	NNW7	NNW11	NNW11	NNW10	NW6	NW4	NW4	NW4	SW2	SSW6	SSW5	W4	W7	W9	W7	WNW5	WNW4	W3	W1	NNW1	N2	WSW1	S1	S1	WNW3.6	NNW11
31-Jan	UO	NNW2	WSW0	N2	NNW3	NNW3	NNW3	NNW2	N2	NNE2	N2	SSW1	SW3	WNW4	NW4	WNW4	NW2	NNW2	SSW2	SSW3	SSW4	SSW3	SSW2	WNW1	WNW1.2	WNW4

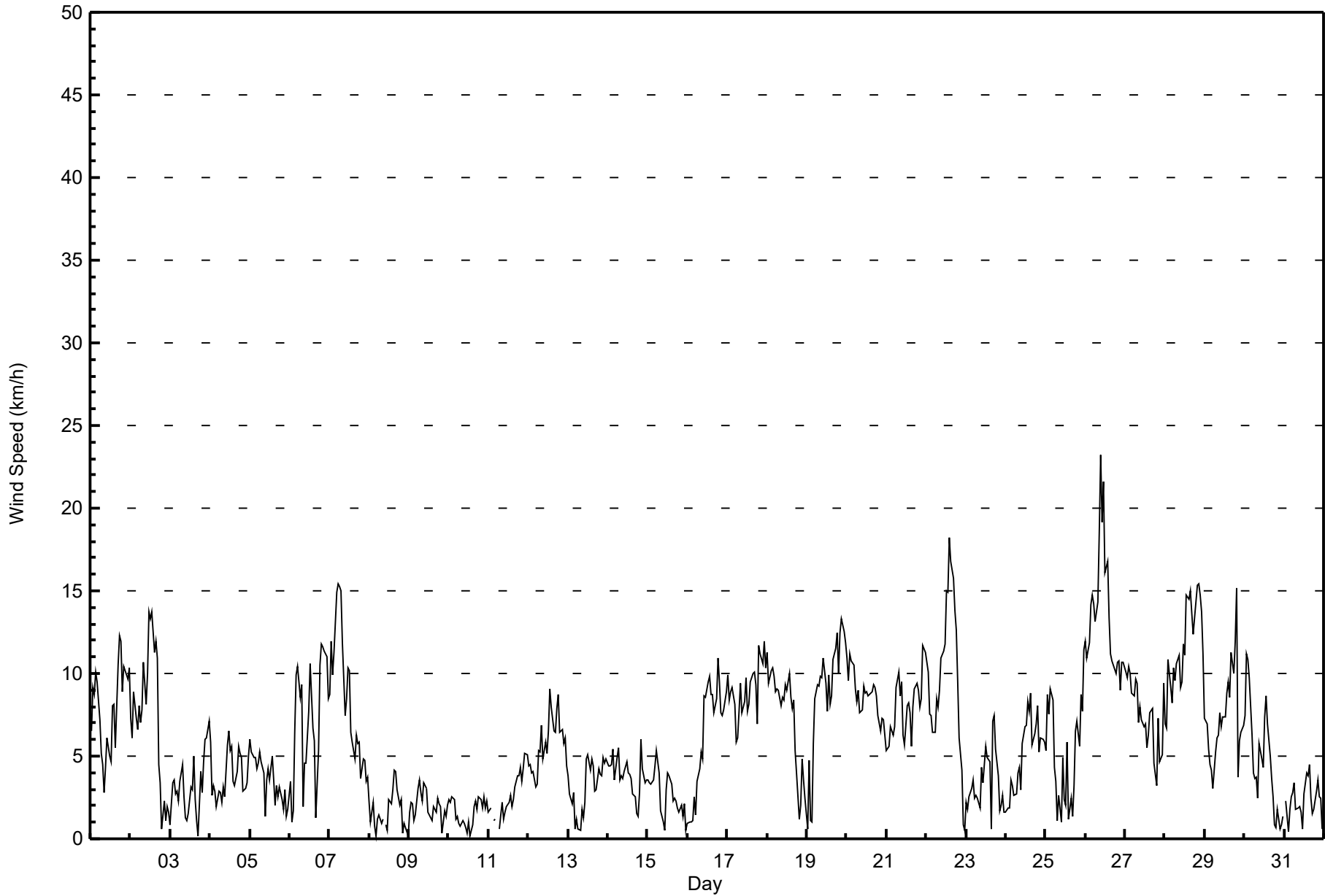
WSW2.6	WSW2.1	WSW2.2	WSW2.1	SW2.3	SW2.6	SW2.4	SW2.6	SW2.4	WSW2.1	WSW2.8	WSW2.9	WSW3.6	WSW3.6	WSW3.2	WSW2.8	WSW2.8	WSW2.8	WSW2.9	SW2.5	SW2.6	WSW2.4	WSW2.3	Diurnal Average		
SW12	SW12	WNW12	WNW14	SW15	SW15	SW15	SW15	NNW19	N23	NNW19	N22	NNW16	N17	NNW18	NNW17	NNW16	NNW14	NNW13	NNW15	NNW15	NNW15	NNW14	SW12	Diurnal Maximum	

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Conklin - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	384	51.89	51.89
6 - 11	298	40.27	92.16
12 - 19	56	7.57	99.73
20 - 28	2	0.27	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	25	17	11	8	13	17	40	55	46	43	20	14	12	12	20	31	384
6 - 11	6	11	3	0	0	0	2	8	24	69	82	20	7	11	29	26	298
12 - 19	2	0	0	0	0	0	0	0	0	2	18	5	0	5	6	18	56
20 - 28	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	35	28	14	8	13	17	42	63	70	114	120	39	19	28	55	75	740

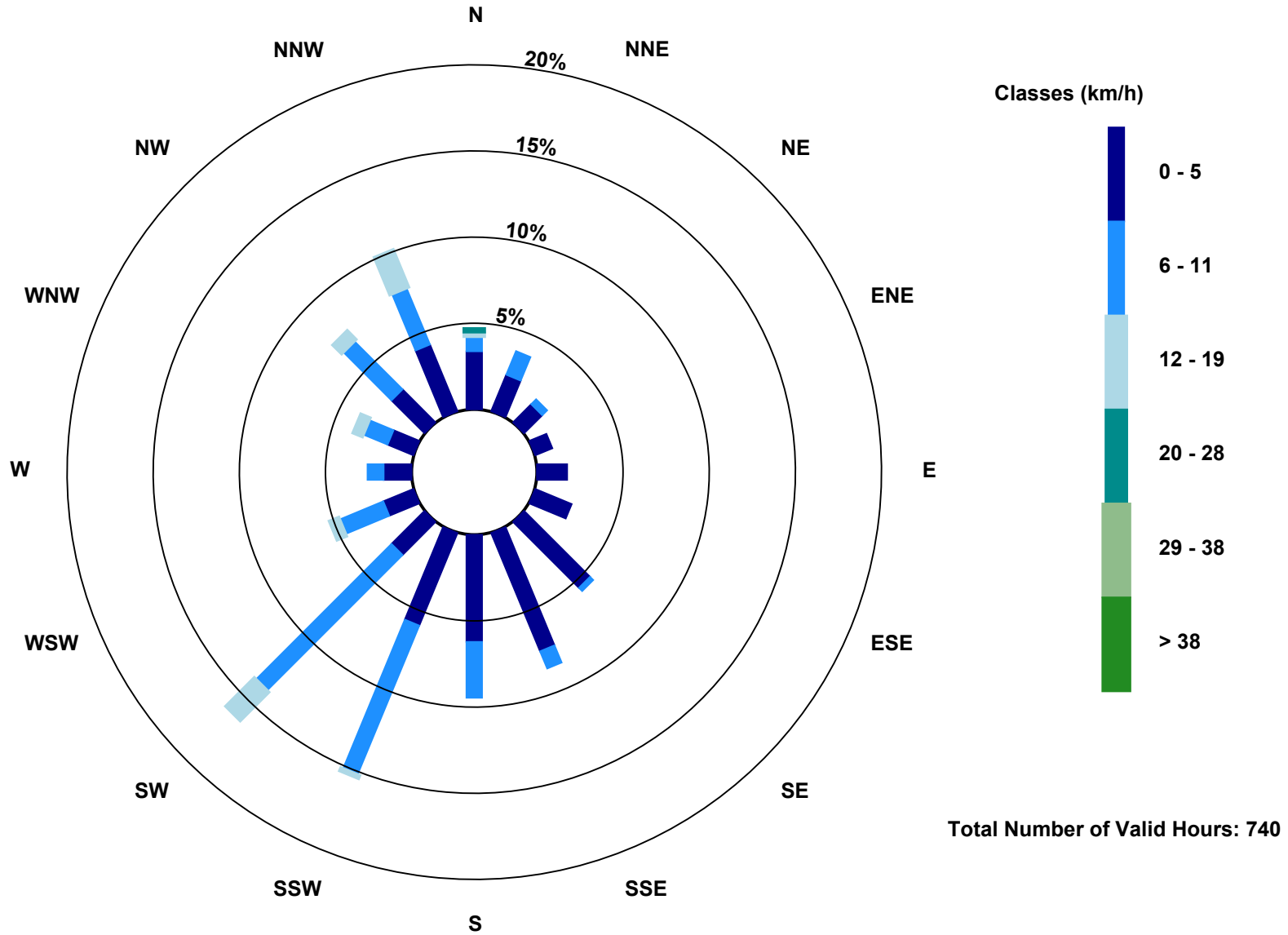
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Conklin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 9 20:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	2	3	2	2	2	2	2	1	1	2	1	1	1	2	2	2	3	3	4	3	3	2	3	2	4
2-Jan	2	2	2	2	1	3	2	2	3	3	3	4	4	4	3	3	4	3	1	1	1	1	1	1	4
3-Jan	1	1	2	1	2	1	1	2	1	1	1	1	0	1	3	1	1	1	2	2	1	2	1	2	3
4-Jan	2	1	1	1	1	0	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
5-Jan	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	2	2
6-Jan	1	1	1	3	3	3	3	2	2	1	3	3	3	3	2	2	2	3	3	3	3	3	3	2	3
7-Jan	3	4	3	3	4	4	4	3	5	2	3	3	3	2	1	1	1	1	3	1	1	1	1	1	5
8-Jan	1	1	1	1	1	1	1	1	1	UO	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2
9-Jan	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	2
10-Jan	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
11-Jan	1	1	UO	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12-Jan	1	1	1	1	1	1	1	1	2	2	2	2	2	3	2	2	2	3	3	2	2	2	2	2	3
13-Jan	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	2	1	1	1	2	2	2
14-Jan	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	2	2
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16-Jan	1	1	1	1	1	1	1	2	1	2	2	3	2	3	2	2	2	3	3	2	2	2	2	3	3
17-Jan	3	3	3	3	2	2	2	2	3	2	3	3	2	3	3	3	3	4	2	5	4	3	3	3	5
18-Jan	4	3	3	3	3	3	3	2	2	3	2	3	3	3	2	2	2	1	1	1	1	1	1	1	4
19-Jan	1	3	2	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	4
20-Jan	3	2	3	3	3	3	2	2	2	2	3	4	4	3	3	3	3	3	3	2	2	2	1	2	4
21-Jan	2	1	1	1	1	1	2	3	3	2	2	2	3	3	2	2	2	3	3	3	2	3	5	4	5
22-Jan	4	4	3	3	2	2	4	3	4	5	4	5	6	5	6	5	5	5	4	3	3	1	1	1	6
23-Jan	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	1	1	1	3
24-Jan	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	2	2	2	2	2	2	2	2	3
25-Jan	2	3	3	3	2	2	1	1	1	1	2	2	1	2	1	2	1	1	1	2	2	2	2	3	3
26-Jan	3	5	5	6	7	6	5	6	6	7	6	6	5	4	4	4	4	4	3	3	4	4	4	4	7
27-Jan	3	3	3	3	3	3	3	3	2	3	2	2	2	2	2	3	2	1	1	1	3	2	2	3	3
28-Jan	2	3	5	4	3	4	4	4	5	4	4	4	4	6	5	5	5	4	5	5	5	5	4	3	6
29-Jan	2	2	2	2	1	1	3	2	3	3	3	3	2	2	3	3	3	3	4	5	2	2	2	2	5
30-Jan	2	4	4	3	2	1	1	1	2	1	2	2	3	3	3	2	1	1	1	1	1	1	1	1	4
31-Jan	UO	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	2	1	1	1	2
Diurnal Maximum																								4	
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

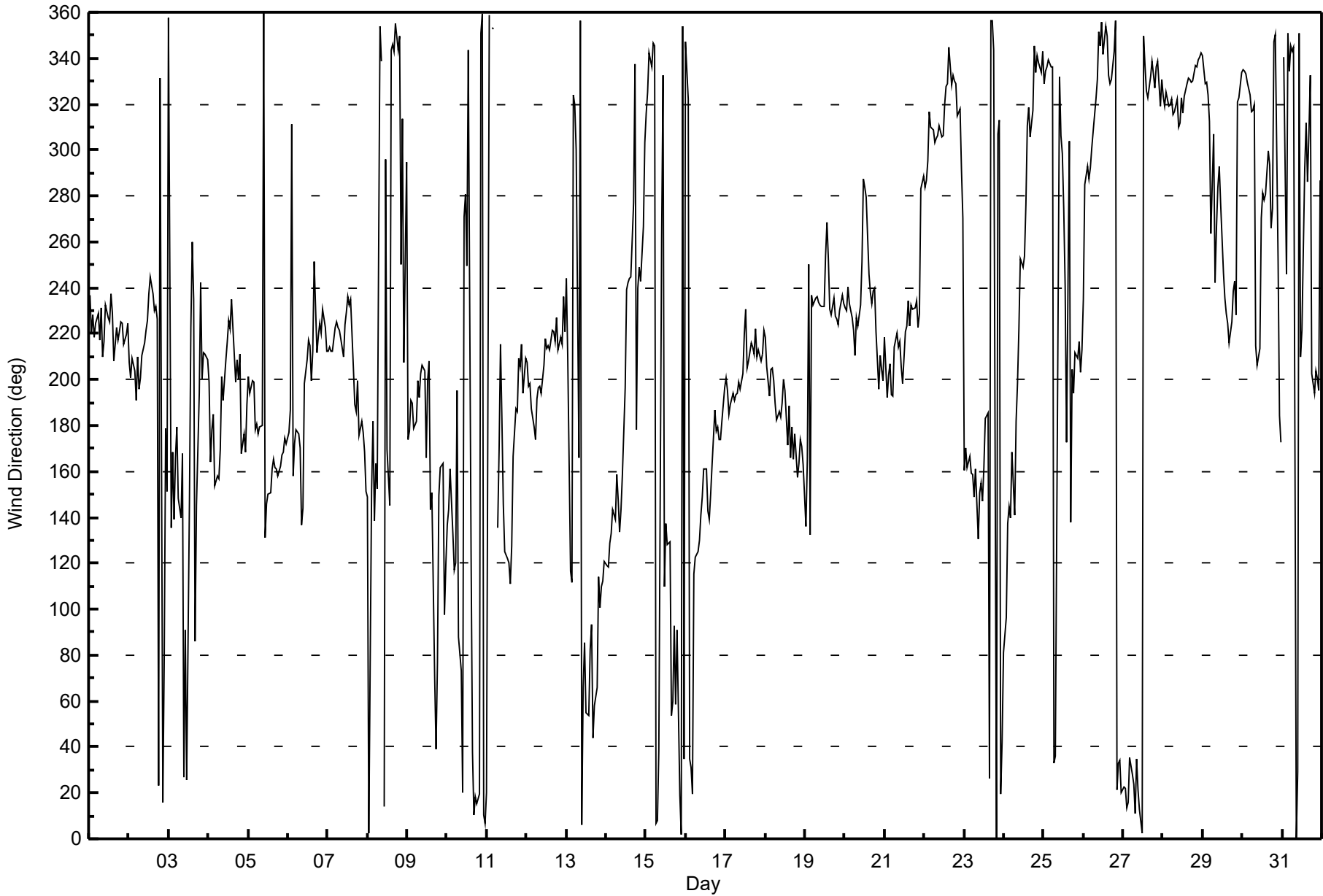
Wind Direction (WD) - deg
Conklin - January 2023

Direction of Maximum Speed: 352 deg on Jan 26 10:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 326.9 deg on Jan 28	Hours of Data: 740
Direction of Minimum Speed: 343 deg on Jan 10 14:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 0.5 deg on Jan 8	Percent Operational Time: 99.5
Monthly Average Direction: 241.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	237	220	228	219	224	229	217	231	210	217	232	227	225	237	229	208	222	217	221	225	225	216	219	225	223.4
2-Jan	207	201	209	204	191	210	196	201	211	216	222	226	238	244	237	230	232	226	23	331	16	79	179	152	219.6
3-Jan	358	136	169	139	166	180	148	140	168	27	91	26	148	223	260	235	86	145	194	242	200	212	211	209	188.5
4-Jan	199	164	178	185	154	158	157	170	201	191	209	216	226	222	235	222	199	209	200	211	168	176	168	189	197.5
5-Jan	201	194	199	199	178	181	176	179	180	360	131	146	150	151	161	166	162	161	158	162	167	168	175	172	172.8
6-Jan	177	186	311	158	172	178	176	171	137	144	198	209	217	215	199	213	251	211	219	225	220	231	223	213	202.9
7-Jan	213	214	212	212	223	225	223	222	218	210	224	230	236	232	235	205	189	186	200	176	182	177	169	151	214.0
8-Jan	149	3	152	182	139	164	152	354	339	UO	14	296	170	145	343	346	343	355	344	350	250	314	208	295	352.4
9-Jan	174	178	191	190	179	182	199	192	203	206	204	166	200	208	143	151	71	39	77	150	162	164	97	119	171.9
10-Jan	137	144	161	133	117	120	195	88	73	20	271	281	250	343	124	38	10	18	15	20	351	359	10	7	51.5
11-Jan	20	359	UO	353	353	UO	136	170	215	183	146	125	122	120	111	128	167	187	186	209	206	215	194	210	180.3
12-Jan	208	197	198	187	180	174	191	197	197	194	206	218	213	215	213	222	221	216	227	213	219	215	236	221	210.2
13-Jan	244	209	116	112	324	320	300	166	356	6	66	85	55	53	82	93	44	58	66	114	101	110	112	121	87.2
14-Jan	119	119	128	133	143	139	159	147	134	144	159	197	239	242	244	244	277	337	178	240	249	243	267	303	184.9
15-Jan	316	325	343	336	346	345	7	8	39	261	332	110	137	128	130	54	60	93	59	91	19	2	354	35	22.0
16-Jan	347	322	35	31	19	115	122	125	130	141	149	161	161	143	139	150	163	187	178	180	174	174	182	196	160.4
17-Jan	201	195	185	189	194	191	194	194	199	196	202	220	230	205	208	216	214	211	222	210	213	208	211	222	206.1
18-Jan	218	206	193	205	205	199	190	183	186	183	190	200	195	172	188	166	179	165	177	158	164	174	171	163	189.5
19-Jan	136	165	250	133	237	233	236	236	234	232	232	232	254	268	253	230	228	236	228	227	224	230	237	233	233.4
20-Jan	231	230	240	233	227	221	210	227	224	232	252	288	284	280	246	238	233	238	240	221	196	211	205	200	234.4
21-Jan	218	192	202	207	193	193	214	220	214	217	206	198	221	224	234	223	232	230	231	235	223	229	283	288	224.9
22-Jan	284	287	295	317	310	309	303	305	306	310	306	306	319	328	329	345	328	332	330	329	315	318	292	270	316.8
23-Jan	161	170	162	166	159	159	149	161	131	151	155	147	162	183	185	26	356	357	344	0	307	313	19	42	142.4
24-Jan	81	97	137	144	140	168	141	182	198	222	253	249	254	277	310	318	306	317	346	334	341	338	334	343	298.0
25-Jan	329	334	336	339	336	336	33	36	135	332	306	298	274	241	173	304	138	204	194	212	209	217	203	213	268.8
26-Jan	235	285	293	288	293	301	308	322	331	352	345	356	342	354	350	332	329	331	343	356	21	33	34	20	334.3
27-Jan	23	22	13	16	36	28	24	11	35	21	13	3	350	337	326	323	332	338	333	327	336	339	319	331	1.2
28-Jan	324	319	325	319	320	322	316	317	322	310	312	322	316	324	329	331	331	329	330	337	336	340	341	342	326.9
29-Jan	341	329	329	324	313	264	307	242	266	284	293	276	247	235	229	225	216	225	239	243	228	321	323	334	266.9
30-Jan	335	334	333	329	324	317	317	319	215	206	213	270	281	278	281	300	294	266	275	347	350	252	184	173	301.1
31-Jan	UO	341	246	351	334	345	343	345	0	29	351	210	222	292	312	286	308	333	202	194	204	201	196	287	296.7

237.9 243.7 244.3 236.4 235.5 229.8 223.7 225.0 227.9 239.7 240.9 244.9 246.5 250.3 253.9 258.4 255.0 249.1 242.7 242.6 235.3 231.4 236.4 239.9
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Jan 10 14:00 Minimum Value: 8 deg on Jan 18 19:00 Percentiles: P ₁ = 12 P ₁₀ = 17 Q ₁ = 19 Median = 23 Q ₃ = 33 P ₉₀ = 59 P ₉₉ = 90																		Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 0 Percent Operational Time: 99.5							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	34	23	21	15	17	18	14	18	29	26	19	17	19	18	19	21	20	14	18	22	17	14	18	17	34
2-Jan	17	20	14	16	19	28	22	22	20	38	26	21	23	20	22	22	25	71	28	96	66	66	53	64	96
3-Jan	86	17	49	44	36	48	34	17	68	53	72	66	12	35	34	46	70	92	42	57	28	17	16	13	92
4-Jan	21	13	25	17	23	16	20	25	22	47	13	12	19	16	39	31	13	14	12	14	34	33	20	23	47
5-Jan	13	21	20	19	17	21	15	21	17	61	32	9	13	10	14	20	13	18	17	48	45	20	19	62	62
6-Jan	14	82	74	21	17	19	22	17	76	16	57	27	19	19	21	19	91	53	22	19	20	19	18	24	91
7-Jan	25	22	27	22	19	17	17	17	54	29	27	19	17	17	19	16	18	37	33	20	25	24	18	54	
8-Jan	78	79	55	74	79	60	40	58	72	UO	58	91	22	42	41	17	24	28	20	19	90	49	84	80	91
9-Jan	25	30	29	85	68	21	21	24	24	16	19	33	33	65	51	41	46	31	49	25	78	29	57	29	85
10-Jan	19	21	27	21	48	49	74	73	52	64	59	89	52	103	75	35	24	21	21	21	14	14	17	21	103
11-Jan	22	18	UO	18	53	UO	57	19	28	26	25	19	23	26	35	27	22	22	23	23	24	23	22	20	57
12-Jan	19	23	23	20	52	22	20	18	20	24	21	23	21	21	22	21	21	23	26	20	21	24	31	52	
13-Jan	40	29	35	42	86	58	79	86	48	69	73	42	31	33	35	38	43	46	35	31	34	28	37	24	86
14-Jan	24	26	22	19	31	36	15	17	12	14	27	26	25	26	24	22	31	22	80	26	17	22	26	41	80
15-Jan	28	34	25	25	16	17	21	20	43	49	89	39	24	25	25	35	30	38	35	50	31	54	21	68	89
16-Jan	31	64	68	78	23	76	25	32	18	21	15	18	17	14	17	16	16	19	17	18	17	16	18	20	78
17-Jan	21	21	17	19	18	25	21	20	18	21	24	22	24	23	21	21	18	19	24	18	18	22	19	18	25
18-Jan	17	19	20	20	18	21	19	19	17	19	22	21	22	19	20	15	13	11	8	31	67	14	25	67	67
19-Jan	89	66	81	87	38	25	23	21	21	22	20	22	31	21	28	19	20	18	18	20	17	18	18	20	89
20-Jan	20	20	18	19	16	19	18	18	21	21	18	38	32	30	31	22	20	21	20	18	22	24	18	24	38
21-Jan	48	32	14	14	16	13	17	16	17	20	23	21	22	21	23	23	22	20	22	19	21	19	27	28	48
22-Jan	26	28	28	28	29	32	31	29	30	31	32	32	28	22	22	21	21	21	22	21	26	19	92	55	92
23-Jan	70	39	28	23	30	32	17	18	53	12	14	11	17	21	21	74	15	15	21	31	55	52	23	57	74
24-Jan	59	51	43	19	31	31	13	21	18	41	26	24	19	27	31	27	32	31	20	19	18	20	18	19	59
25-Jan	22	19	22	20	19	24	31	69	22	83	36	75	59	20	74	50	77	42	10	21	25	21	18	18	83
26-Jan	21	32	31	28	31	31	31	26	20	22	21	21	19	19	21	23	20	20	21	20	28	23	24	25	32
27-Jan	23	23	23	22	21	22	25	21	21	24	25	25	24	40	33	24	16	12	16	15	16	17	28	18	40
28-Jan	23	24	21	24	24	24	27	28	26	30	33	25	29	24	21	22	21	21	22	19	19	20	19	18	33
29-Jan	19	15	16	23	21	47	34	33	34	31	34	32	33	21	22	25	18	25	22	22	75	24	23	17	75
30-Jan	16	21	20	20	20	20	25	25	61	14	32	43	32	28	33	36	37	49	59	70	38	77	46	16	77
31-Jan	UO	23	80	66	18	34	19	42	60	57	81	87	52	46	31	26	34	54	27	21	21	17	24	94	94
Diurnal Maximum																									
89 82 81 87 86 76 79 86 76 83 89 91 59 103 75 74 91 92 80 96 90 77 92 94																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS22
JANVIER
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	660	35	84	93.41	6.7	0	1.5	0
TRS(ppb) Average	628	35	116	89.11	0.3	0	0.3	0
THC(ppm) Average	659	35	85	93.28	2.3	-	2.2	-
NMHC(ppm) Average	659	35	85	93.28	0.026	-	0.002	-
CH4(ppm) Average	659	35	85	93.28	2.3	-	2.2	-
O3 (ppb) Average	661	34	83	93.41	39.9	0	37.5	-
NO2 (ppb) Average	664	37	80	94.22	9.7	0	4.4	-
NO (ppb) Average	664	37	80	94.22	5.8	-	0.8	-
NOX (ppb) Average	664	37	80	94.22	14.1	-	4.9	-
PM2.5 (ug/m3) Average	699	2	45	94.22	65.4	0	27.3	0
Temperature 2 m (C) Average	744	0	0	100	4.3	-	-1.4	-
Relative Humidity (%) Average	744	0	0	100	94.7	-	90.4	-
Wind Speed 20 m (km/h) Average	741	0	3	99.6	26	-	15	-
Wind Direction 20 m (deg) Average	741	0	3	99.6	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	660	0.44	0.7	-	0	0	0.1	0.2	0.5	1	6.7
TRS (ppb) Average	628	0.16	0.1	-	0	0.1	0.1	0.2	0.2	0.2	0.3
THC (ppm) Average	659	2.12	0.1	-	2	2	2.1	2.1	2.2	2.2	2.3
NMHC(ppm) Average	659	0	0.001	-	0	0	0	0	0	0	0.026
CH4(ppm) Average	659	2.12	0.1	-	2	2	2.1	2.1	2.2	2.2	2.3
O3 (ppb) Average	661	27.72	6.3	-	8.6	18.1	24	28.2	31.7	36.1	39.9
NO2 (ppb) Average	664	2.32	1.7	-	0	0.3	1	2	3.3	4.6	9.7
NO (ppb) Average	664	0.19	0.4	-	0	0	0	0	0.2	0.5	5.8
NOX (ppb) Average	664	2.51	2	-	0	0.3	1.1	2.1	3.5	4.8	14.1
PM2.5 (ug/m3) Average	699	7.51	6.8	-	0.4	1.3	3	5.8	10.4	14.2	65.4
Temperature 2 m (C) Average	744	-9.28	5.6	-	-27.9	-17.9	-11.2	-8.6	-6.1	-3.3	4.3
Relative Humidity (%) Average	744	81.3	8.7	-	52.1	68.4	78.5	84.3	87.2	89.3	94.7
Wind Speed 20 m (km/h) Average	741	8.2	5	-	0	2	4	9	11	14	26
Wind Direction 20 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	17 Jan 2023 02:00	18 Jan 2023 01:00	24	Unstable Operations - Station door detached
TRS	18 Jan 2023 03:00	19 Jan 2023 12:00	34	Unstable Operations - Station door detached
TRS	19 Jan 2023 13:00	20 Jan 2023 11:00	23	Maintenance - stabilization
SO2, THC/NMHC/CH4	18 Jan 2023 02:00	19 Jan 2023 12:00	35	Unstable Operations - Station door detached
SO2, THC/NMHC/CH4	19 Jan 2023 13:00	20 Jan 2023 02:00	14	Maintenance - stabilization
O3	18 Jan 2023 04:00	19 Jan 2023 12:00	33	Unstable Operations - Station door detached
O3	19 Jan 2023 13:00	20 Jan 2023 04:00	16	Maintenance - stabilization
NO2	18 Jan 2023 06:00	19 Jan 2023 12:00	31	Unstable Operations - Station door detached
NO2	19 Jan 2023 13:00	20 Jan 2023 00:00	12	Maintenance - stabilization
PM2.5	17 Jan 2023 23:00	19 Jan 2023 12:00	38	Unstable Operations - Station door detached
PM2.5	19 Jan 2023 13:00	19 Jan 2023 17:00	5	Maintenance - stabilization
THC/NMHC/CH4	26 Jan 2023 14:00	26 Jan 2023 14:00	1	Maintenance - station operator activities
Wind Speed, Wind Direction	05 Jan 2023 17:00	05 Jan 2023 18:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 03:00	15 Jan 2023 03:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Janvier - January 2023

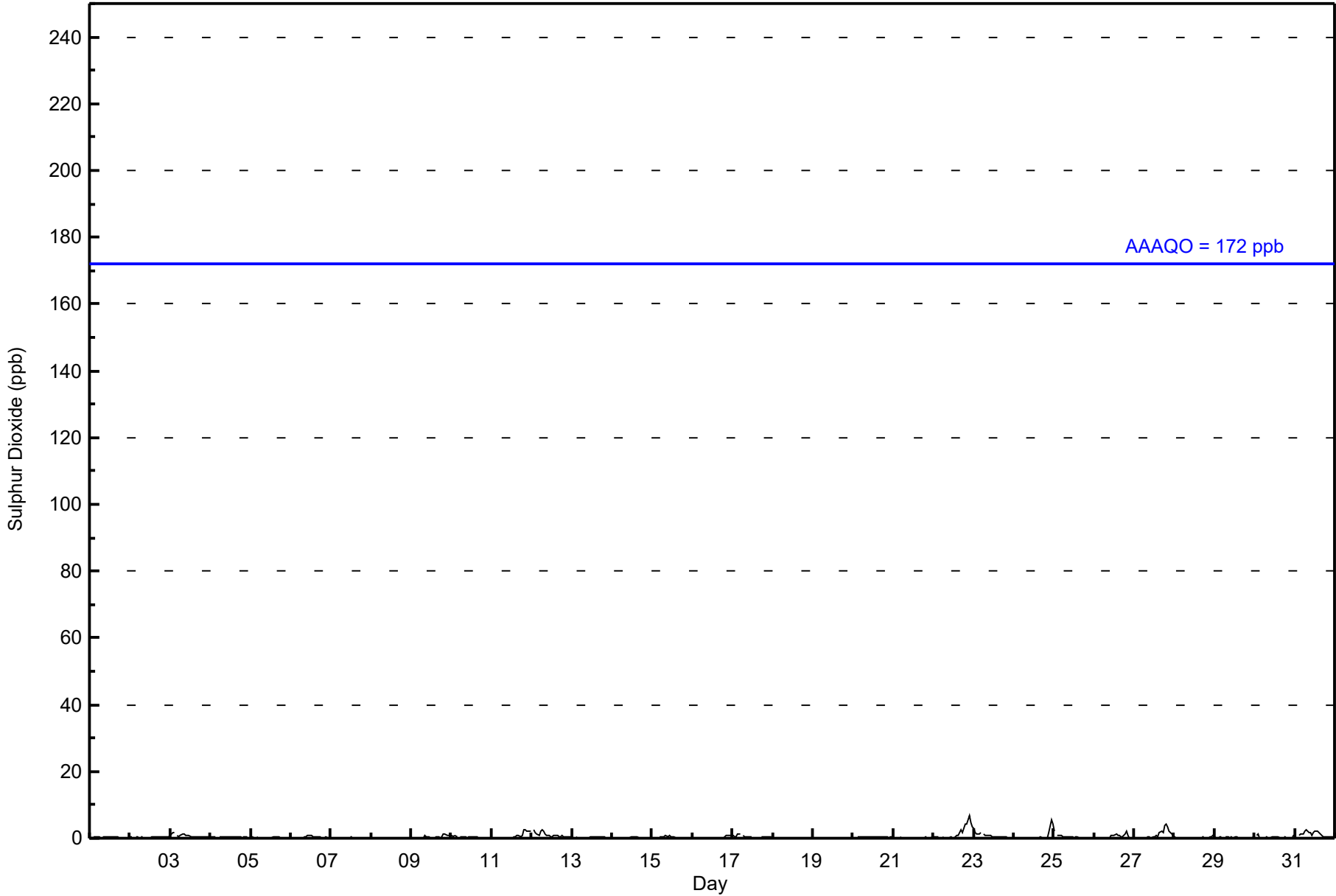
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 6.7 ppb on Jan 22 22:00		Maximum Daily Average: 1.5 ppb on Jan 22		Hours of Data: 660														Hours of Missing Data: 84		Hours of Calibration: 35							
Minimum Value: 0.0 ppb on Jan 6 05:00		Minimum Daily Average: 0.0 ppb on Jan 8		Hours of Calibration: 35														Percent Operational Time: 93.4									
Maximum Diurnal Average: 0.7 ppb at hour 23		Minimum Diurnal Average: 0.3 ppb at hour 6		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.0 P ₉₉ = 4.0																							
Monthly Average: 0.44 ppb																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.1	Z	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.6	0.5	0.4	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.6	
2-Jan	0.3	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.6	0.3	0.6	
3-Jan	0.9	1.5	1.8	Z	0.8	0.5	0.7	1.3	1.1	1.0	0.8	0.7	0.5	0.4	0.4	0.5	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.7	1.8	
4-Jan	0.4	0.4	0.4	0.5	Z	0.4	0.4	0.3	0.4	0.5	0.4	0.6	0.5	0.6	0.4	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.4	0.6	
5-Jan	0.2	0.2	0.2	0.2	0.3	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.5	0.6	0.4	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.6	
6-Jan	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.8	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.8	
7-Jan	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	
8-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
9-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.7	0.6	0.4	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.5	1.1	1.2	0.8	0.9	1.1	0.4	1.2	
10-Jan	0.7	0.5	0.7	0.6	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.3	0.7	
11-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.6	1.0	0.7	0.3	0.7	2.6	2.6	2.0	1.9	2.2	0.7	2.6	
12-Jan	Z	2.6	1.6	1.3	0.7	2.0	2.5	2.1	1.2	1.0	0.7	0.4	0.6	0.8	0.8	0.8	0.5	0.6	0.8	0.6	0.2	0.4	0.6	0.6	1.0	2.6	
13-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.2	0.5	
14-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.3	0.6	0.5	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.6	
15-Jan	0.1	0.1	0.1	Z	0.4	0.3	0.4	0.3	0.7	0.6	0.6	0.5	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7	
16-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.8	1.0	1.0	0.2	1.0	
17-Jan	0.7	0.5	0.4	1.3	1.4	Z	0.8	0.6	0.6	0.4	0.4	0.3	C	C	C	C	C	0.6	0.4	0.3	0.3	0.3	0.4	0.3	0.5	1.4	
18-Jan	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
20-Jan	M	M	Z	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.3	0.3	0.4	
21-Jan	0.2	0.2	0.1	Z	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.3	
22-Jan	0.2	0.3	0.3	0.3	Z	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.9	0.7	2.4	1.9	2.9	4.2	4.4	6.7	4.7	3.4	1.5	6.7	
23-Jan	3.0	1.7	1.4	1.3	1.7	Z	1.2	1.0	0.9	0.8	0.6	0.6	0.4	0.4	0.4	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.8	3.0	
24-Jan	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	1.6	5.5	4.3	0.6	5.5	
25-Jan	1.9	Z	1.0	0.9	0.8	0.6	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.9	
26-Jan	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.7	0.8	0.8	1.4	1.0	0.7	0.3	0.5	1.2	2.0	1.0	0.2	0.2	0.1	0.5	2.0	
27-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.0	0.0	0.3	0.3	0.2	0.3	0.3	0.8	0.5	1.5	2.2	1.5	3.9	4.4	3.5	2.0	1.4	0.7	1.1	4.4	
28-Jan	0.3	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.3	0.8	0.1	0.8	
29-Jan	0.5	0.1	0.1	0.5	0.4	Z	0.4	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.3	0.2	0.5	
30-Jan	Z	0.8	1.3	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.5	0.2	0.3	0.3	0.3	0.1	0.2	0.1	0.3	0.2	0.2	0.2	0.2	1.0	0.3	1.3	
31-Jan	0.8	Z	1.0	1.1	1.5	1.3	2.1	2.4	1.7	1.6	1.0	1.5	1.9	2.0	1.6	1.5	1.0	0.6	0.5	0.5	0.2	0.3	0.6	0.5	1.2	2.4	
																								Diurnal Average		Diurnal Maximum	
																								0.5		3.0	
																								0.4		2.6	
																								0.5		1.8	
																								0.4		1.3	
																								0.4		1.7	
																								0.3		2.0	
																								0.4		2.5	
																								0.4		2.4	
																								0.4		1.7	
																								0.3		1.6	
																								0.4		1.0	
																								0.3		1.5	
																								0.4		1.9	
																								0.5		2.0	
																								0.4		1.6	
																								0.4		1.5	
																								0.4		2.4	
																								0.3		1.9	
																								0.5		3.9	
																								0.7		4.4	
																								0.6		4.4	
																								0.6		6.7	
																								0.7		5.5	
																								0.6		4.3	

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Janvier - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	660	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 660

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Janvier - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	44	95	21	14	12	10	17	12	29	166	125	22	12	24	33	21	657
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	95	21	14	12	10	17	12	29	166	125	22	12	24	33	21	657

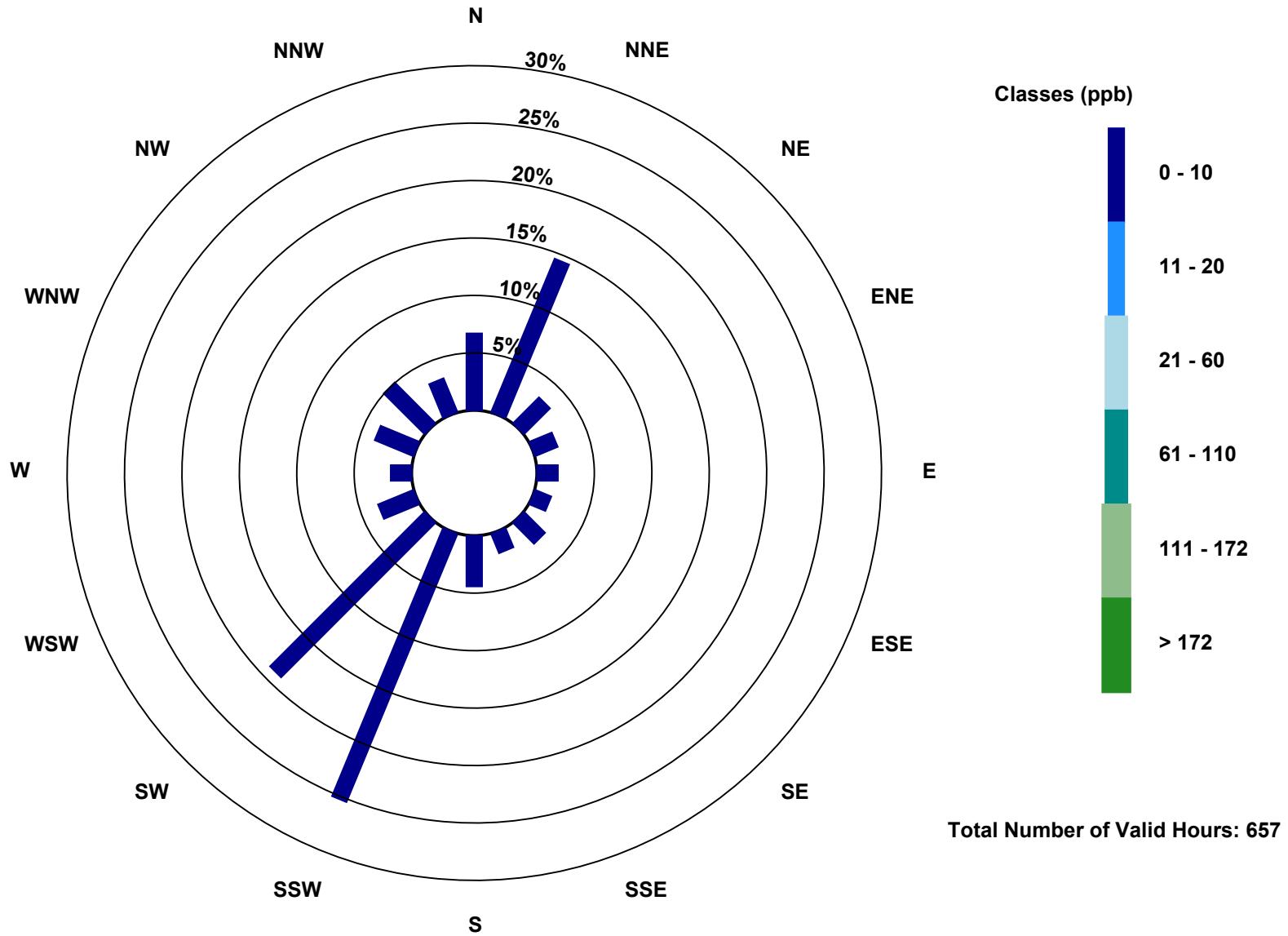
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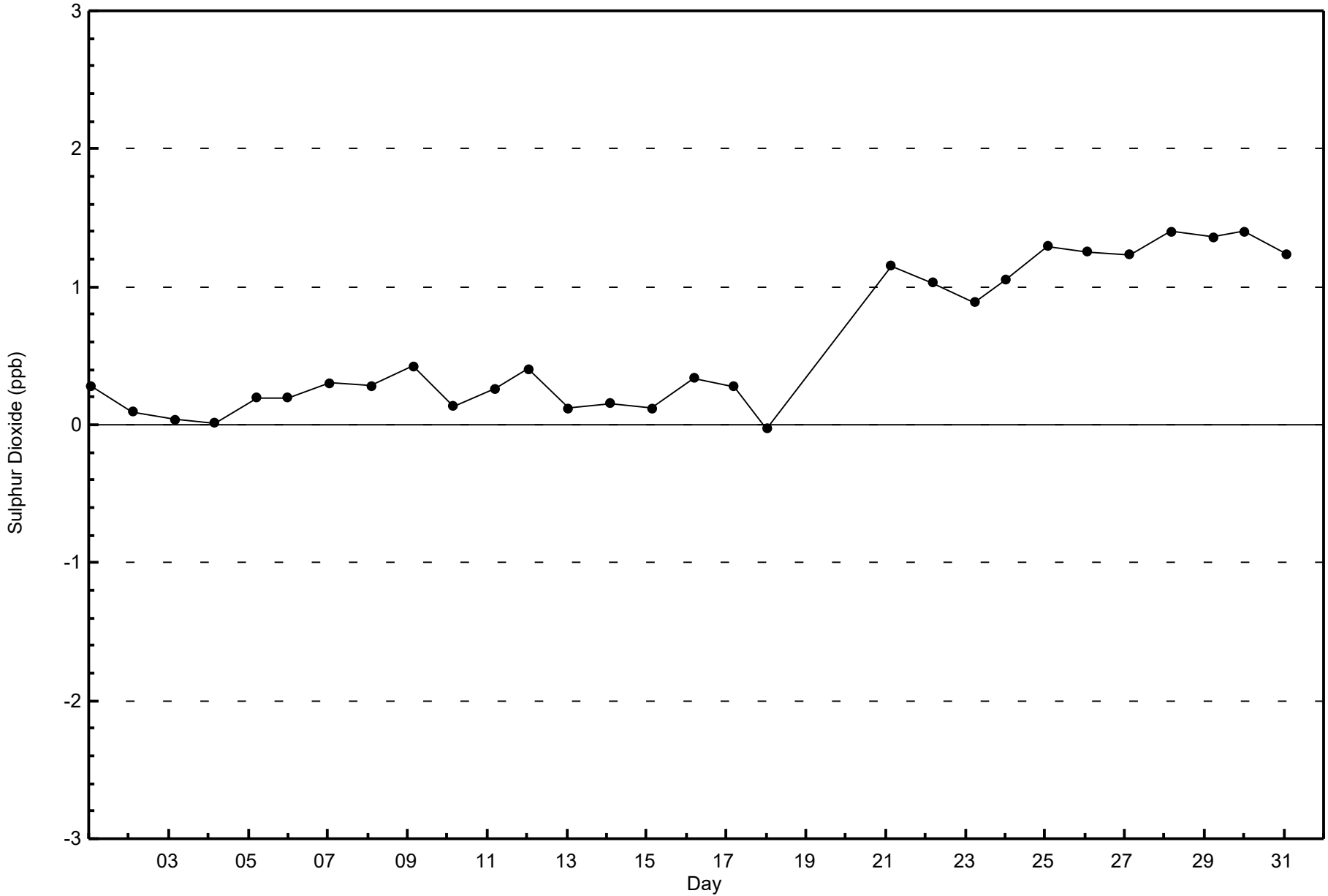
Total Number of Hours: 744

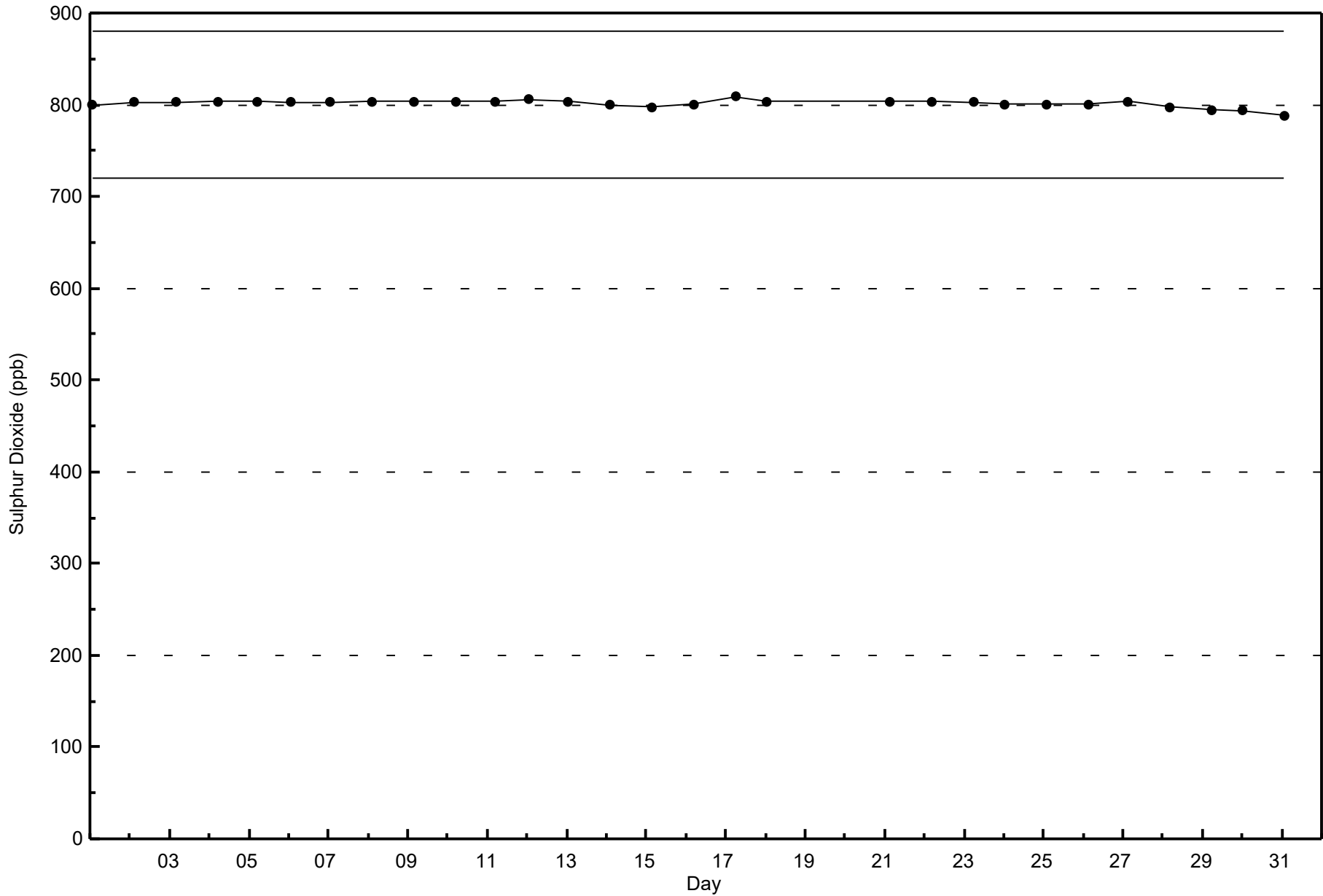


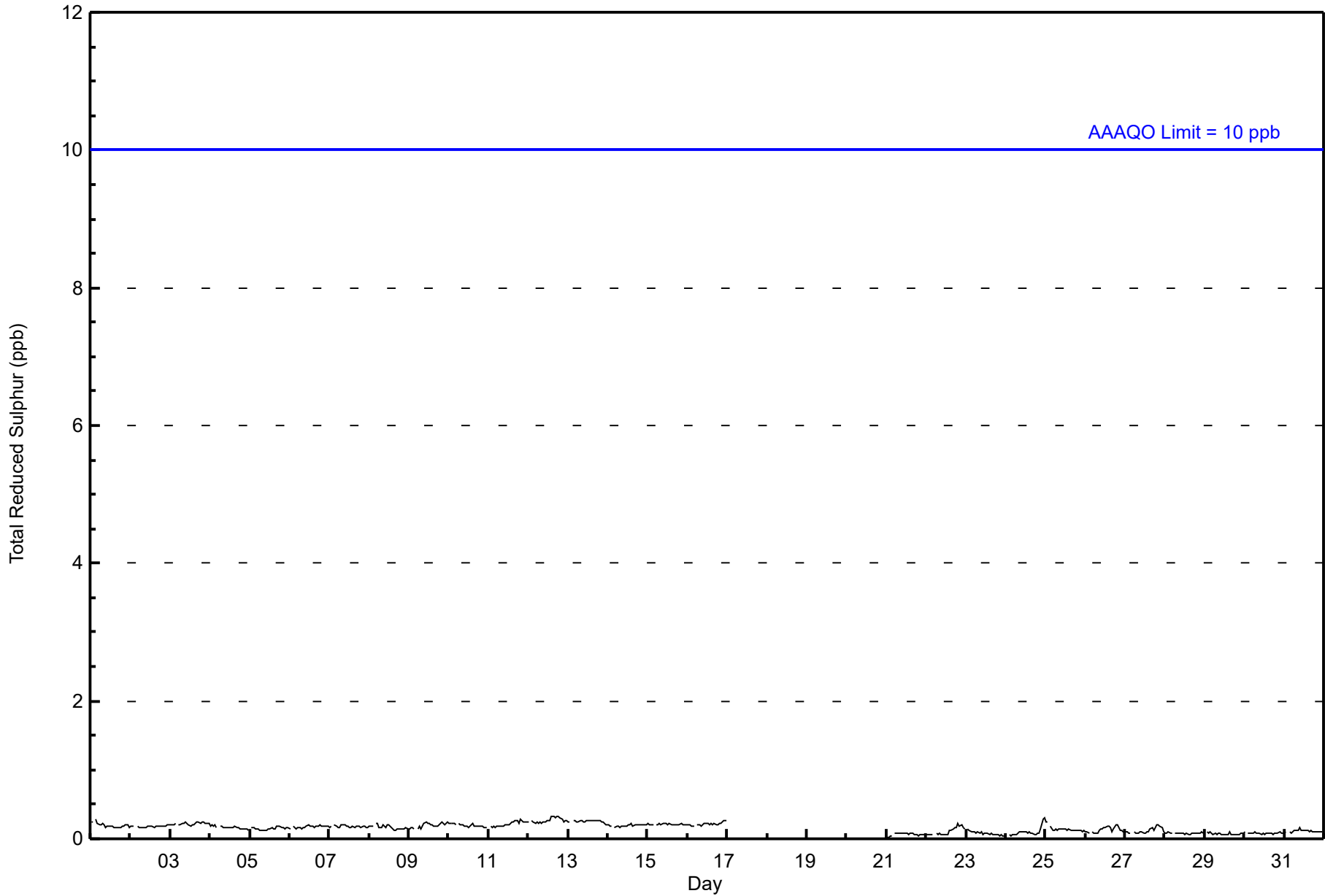
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Janvier











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	628	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 628

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Janvier - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	45	93	21	14	12	10	16	12	23	154	117	20	11	23	33	21	625
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	93	21	14	12	10	16	12	23	154	117	20	11	23	33	21	625

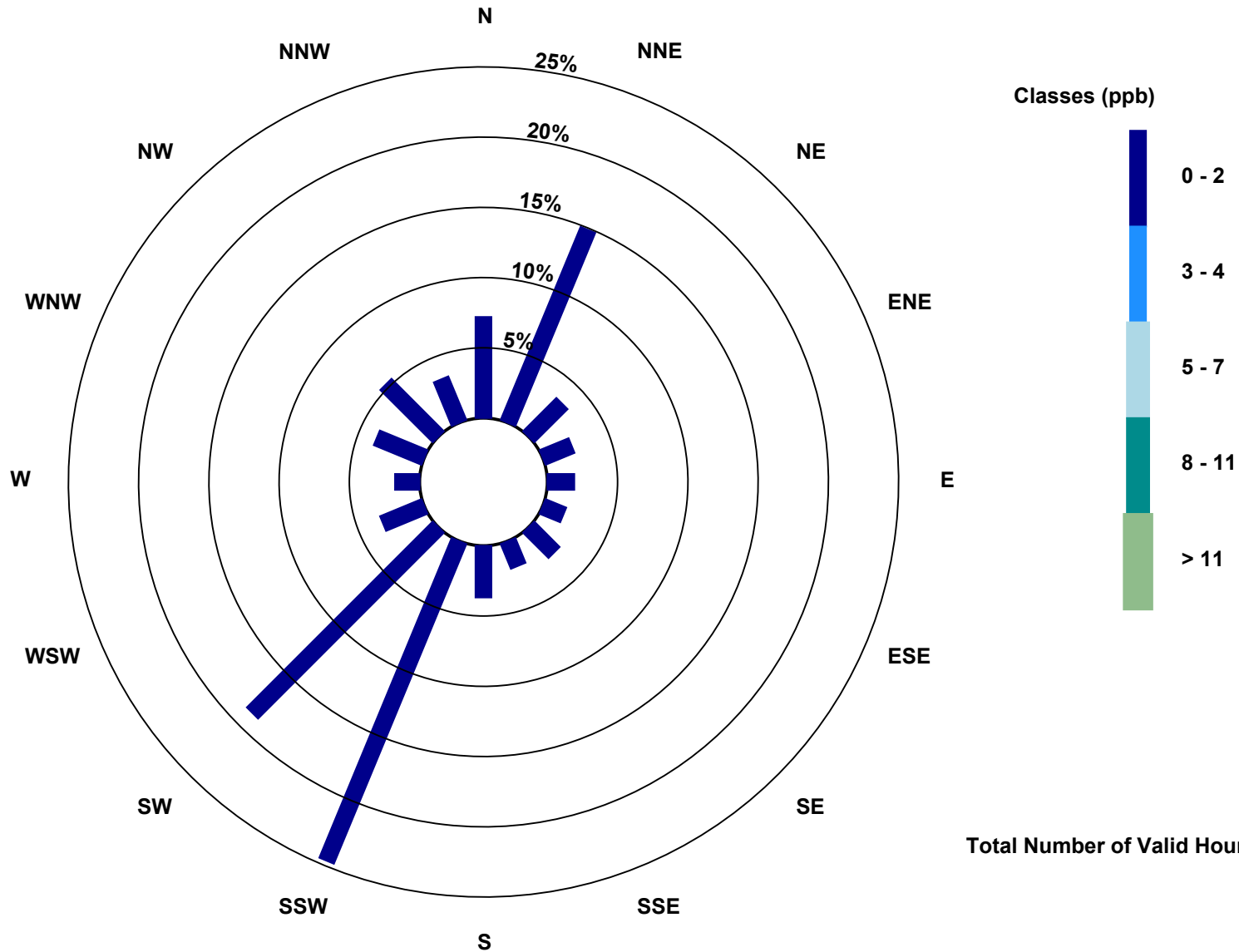
Total Number of Valid Hours: 625

Total Number of Hours: 744

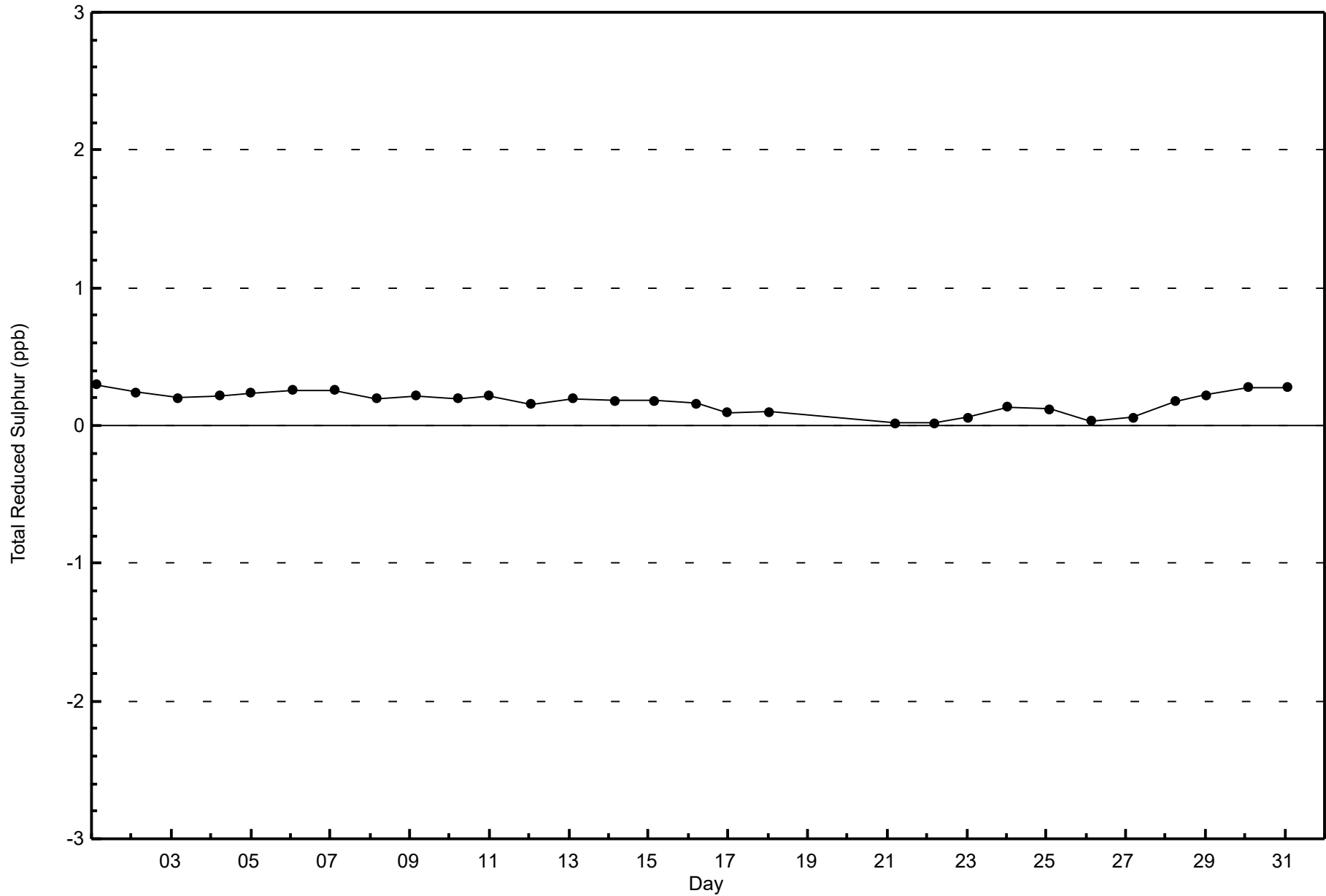


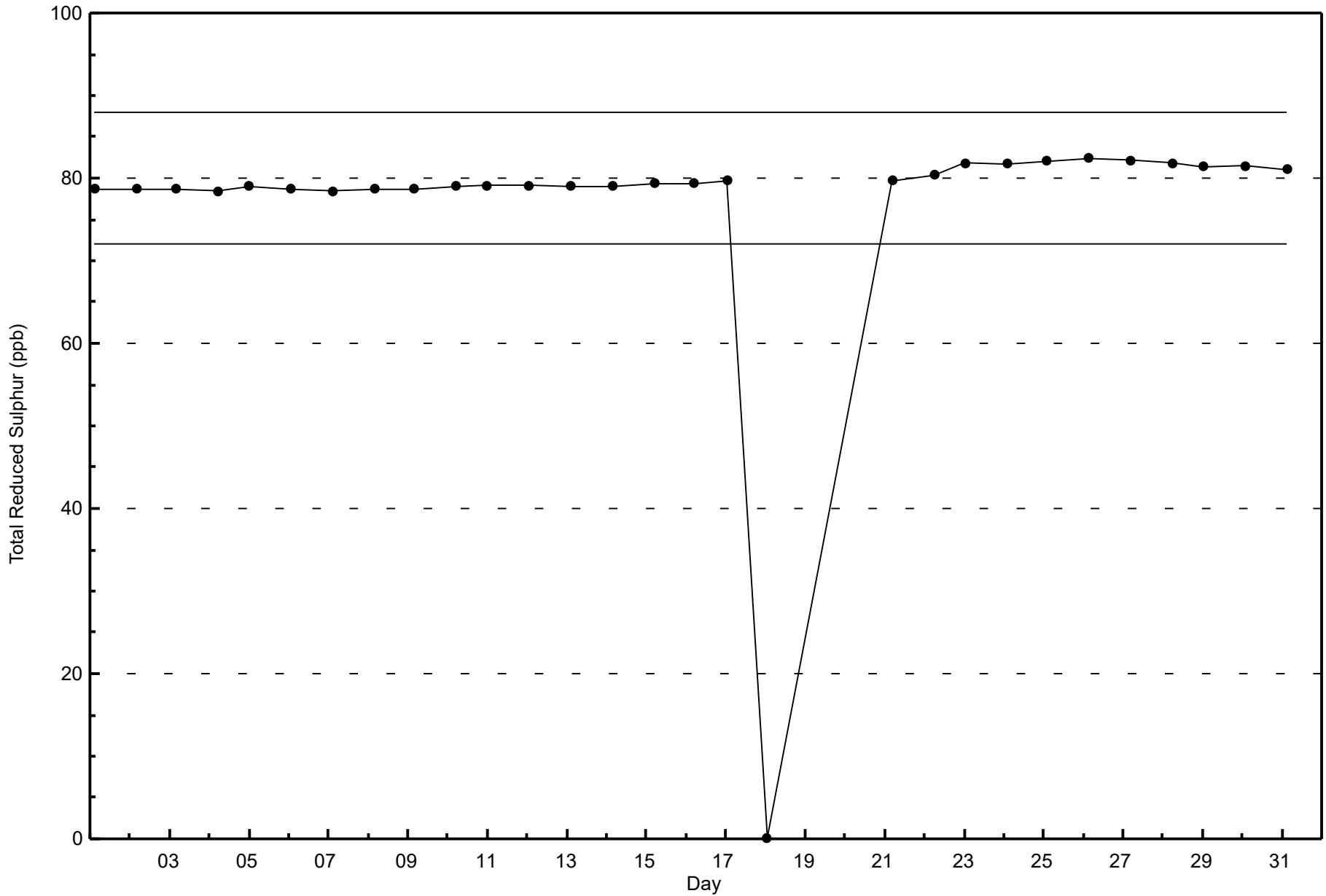
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Janvier



Total Number of Valid Hours: 625

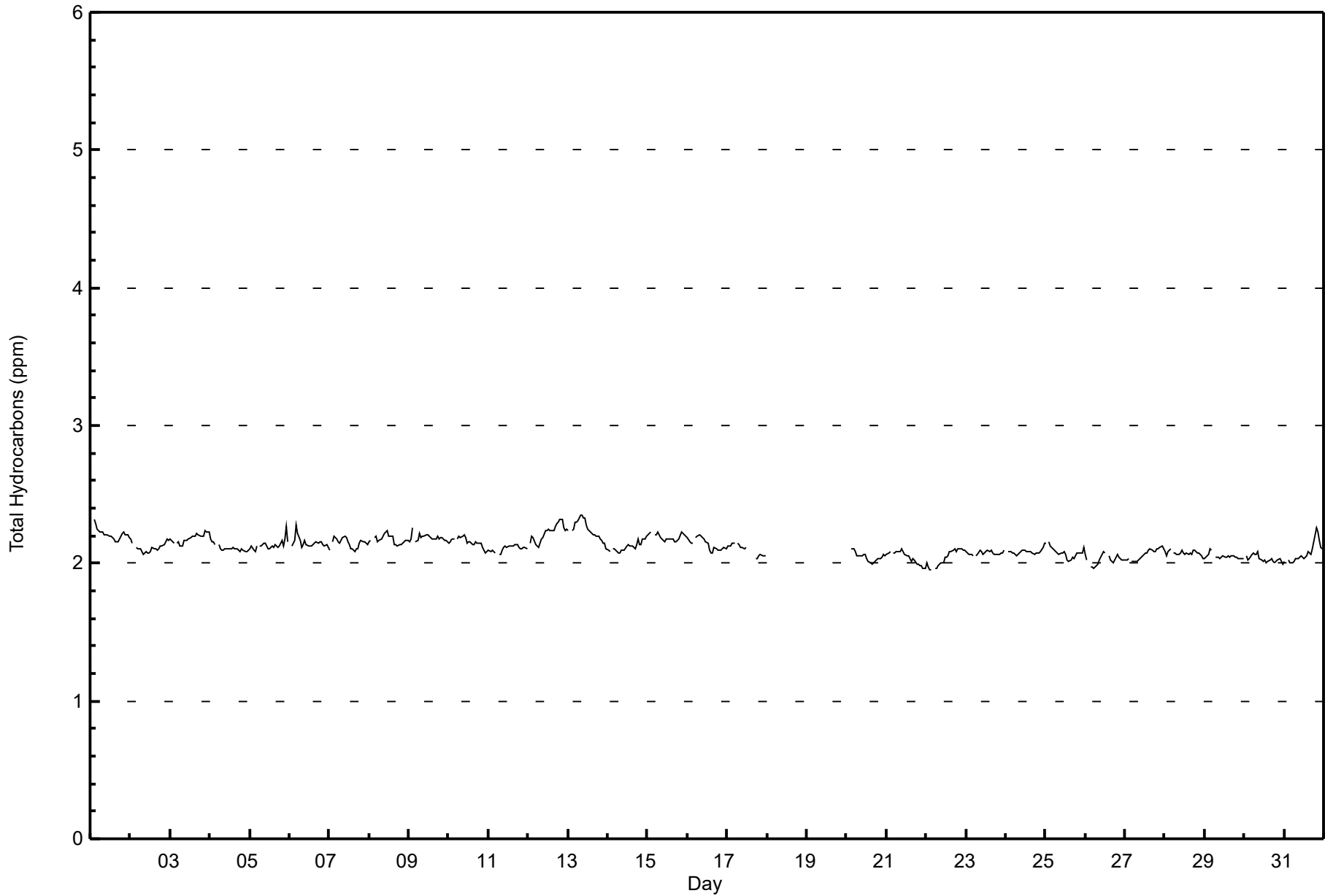






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Janvier - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	111	16.84	16.84
2.1 - 3.0	548	83.16	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 659

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Janvier - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	9	24	2	1	0	0	0	0	1	12	23	13	5	10	7	4	111
2.1 - 3.0	35	71	19	13	12	10	17	12	28	154	102	9	7	14	26	16	545
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	95	21	14	12	10	17	12	29	166	125	22	12	24	33	20	656

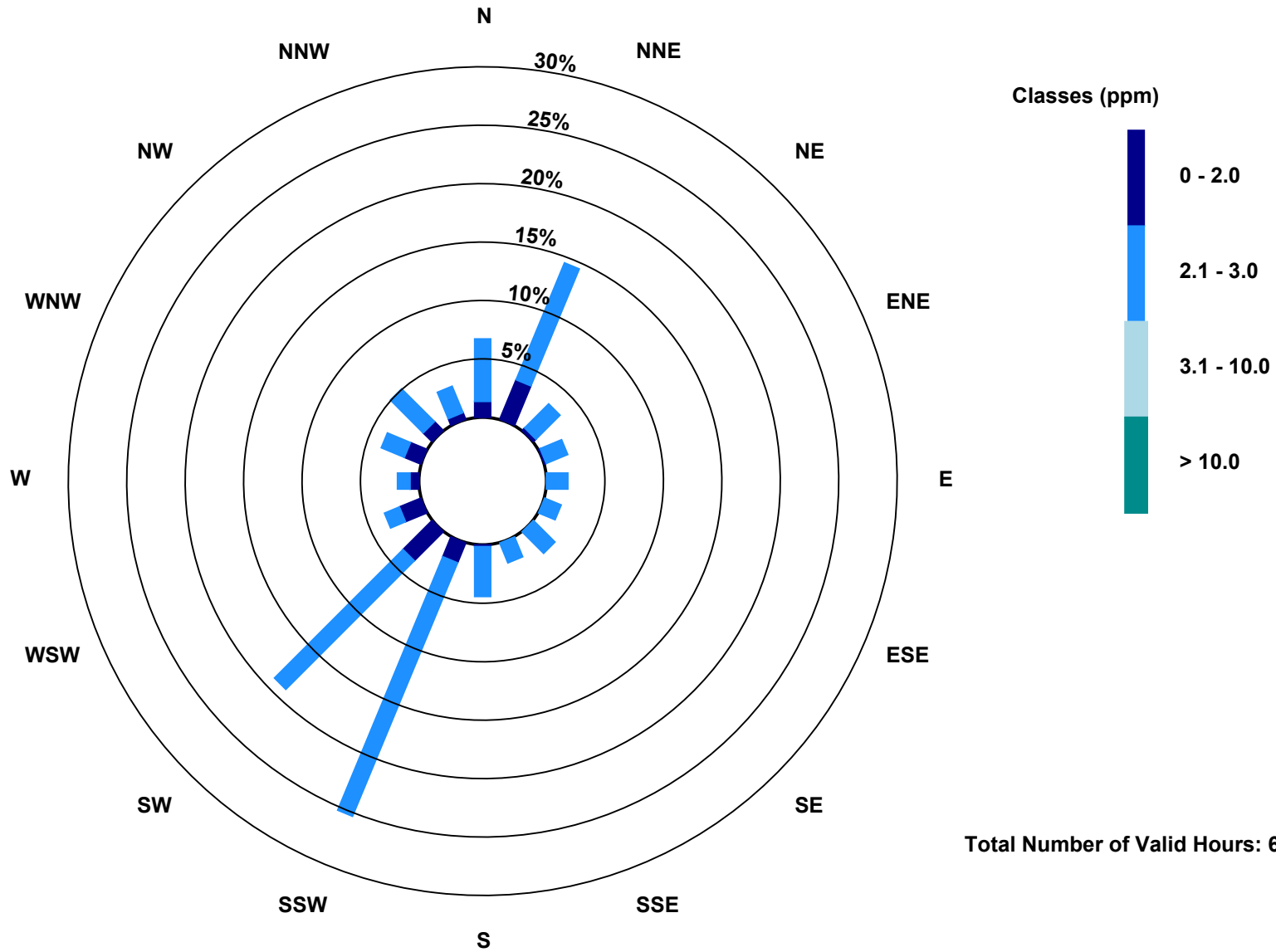
Total Number of Valid Hours: 656

Total Number of Hours: 744

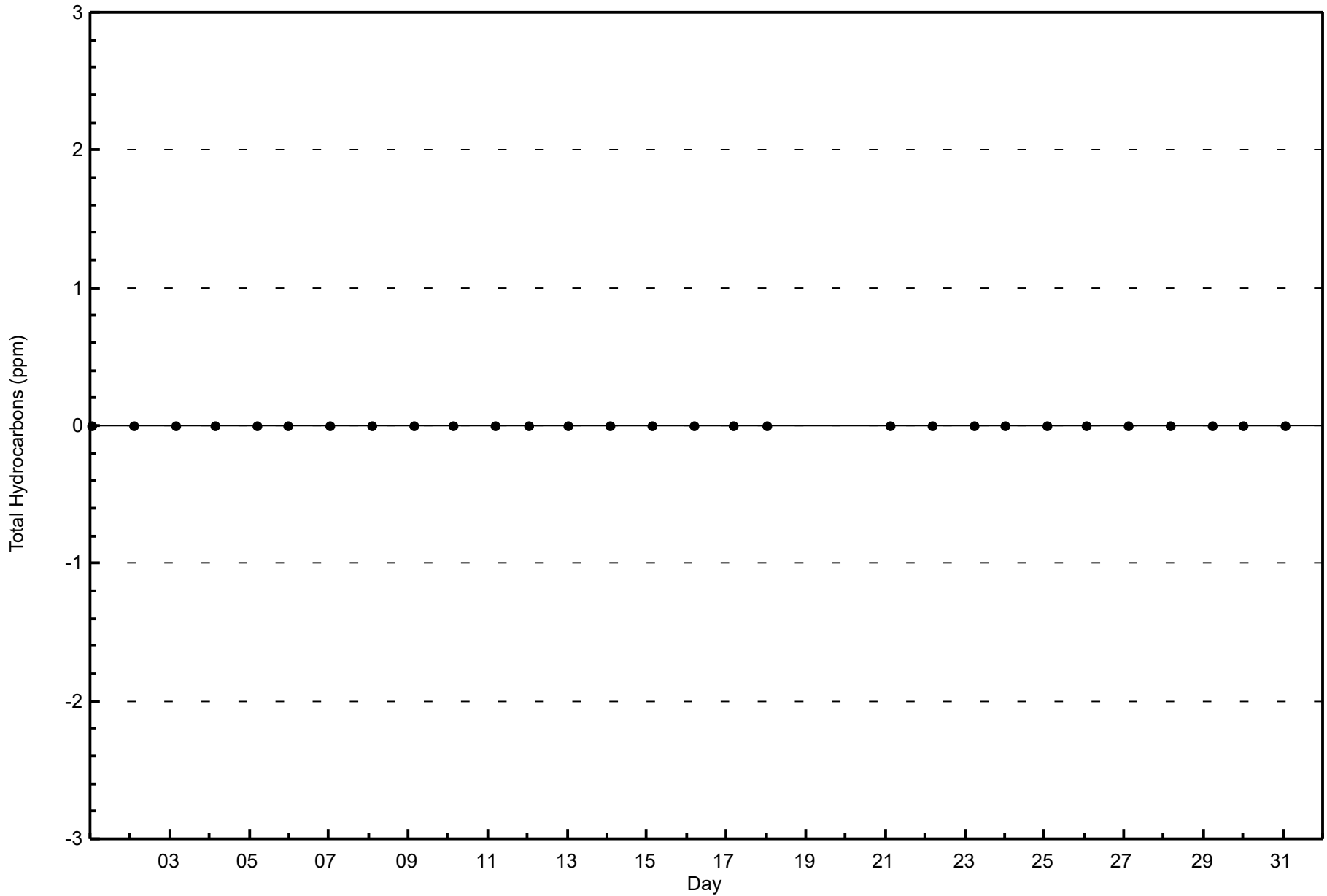


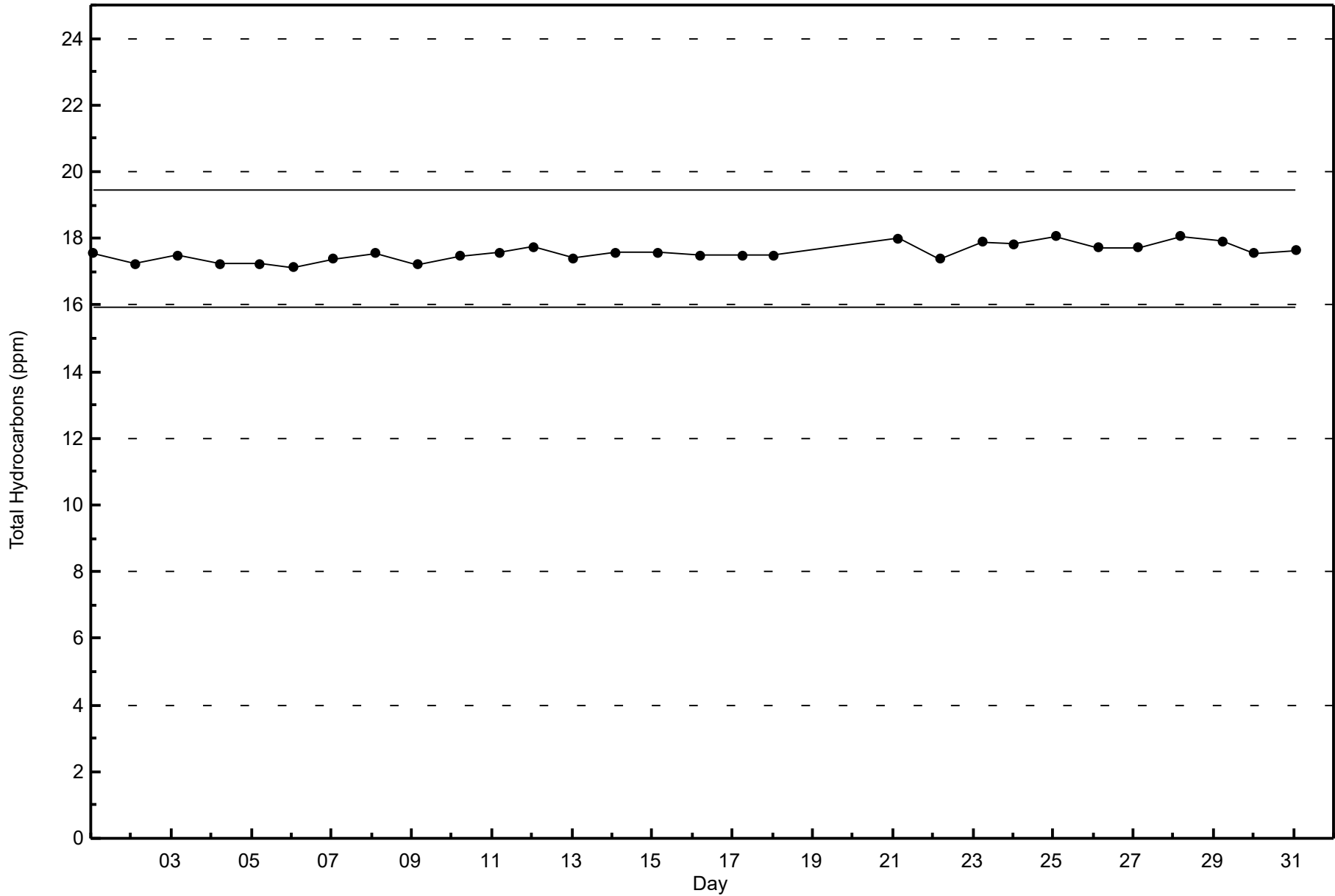
Wood Buffalo Environmental Association
Wind Rose Jan 2023

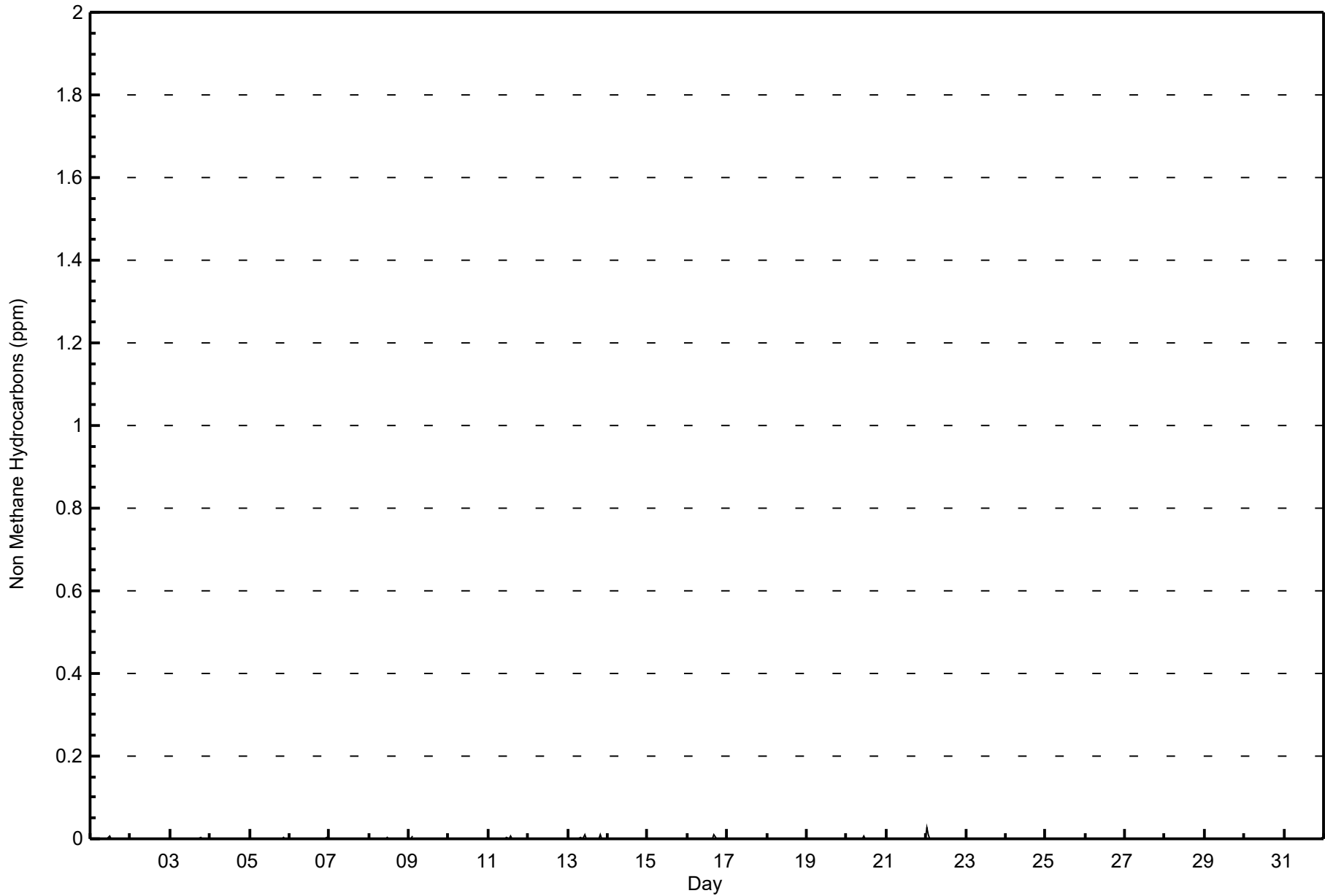
Total Hydrocarbons (THC) - ppm
Janvier



Total Number of Valid Hours: 656









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	650	98.63	98.63
0.006 - 0.05	9	1.37	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 659

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	44	94	20	14	12	10	16	11	29	165	122	22	12	24	33	19	647
0.006 - 0.05	0	1	1	0	0	0	1	1	0	1	3	0	0	0	0	1	9
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	95	21	14	12	10	17	12	29	166	125	22	12	24	33	20	656

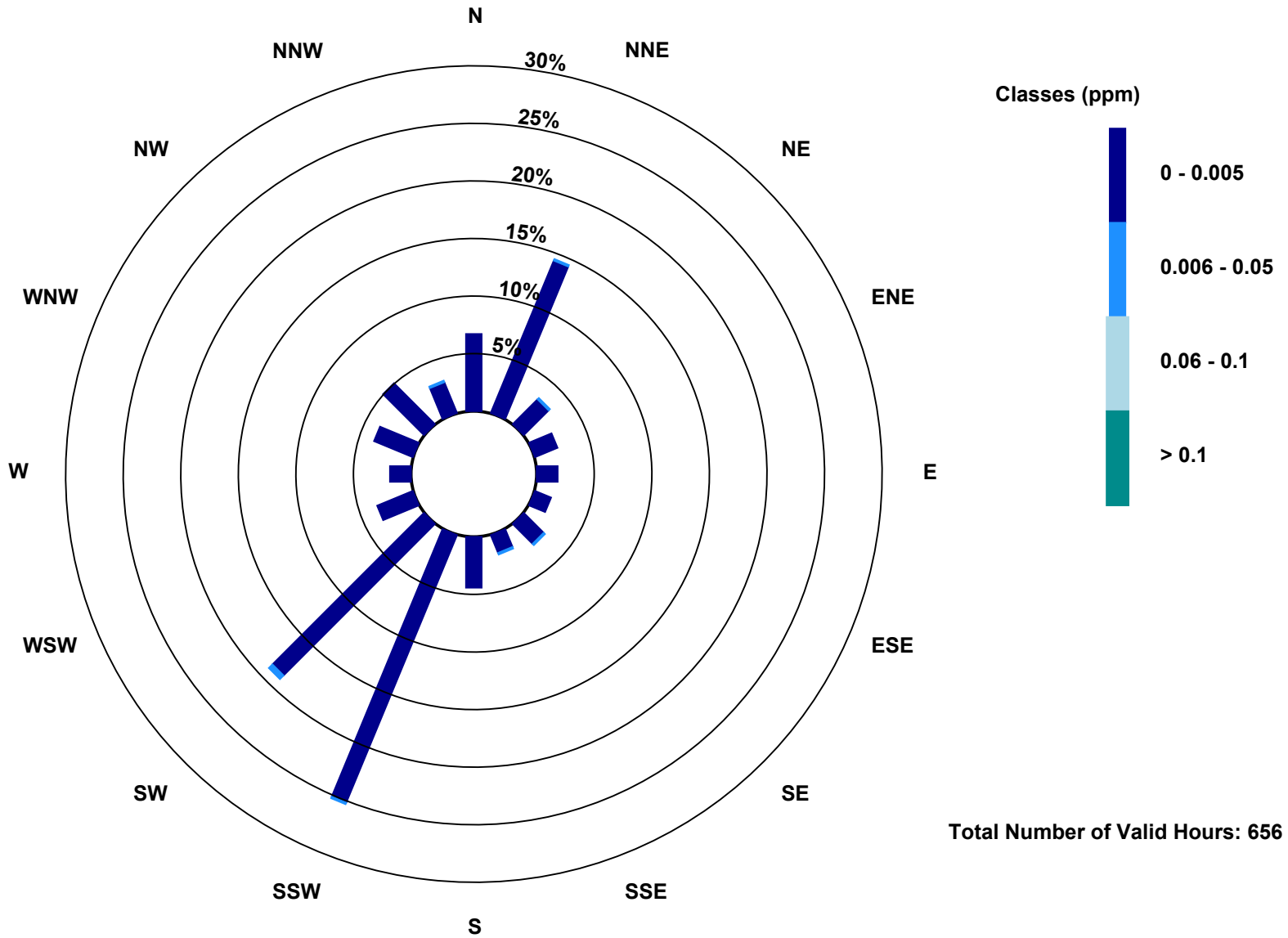
Total Number of Valid Hours: 656

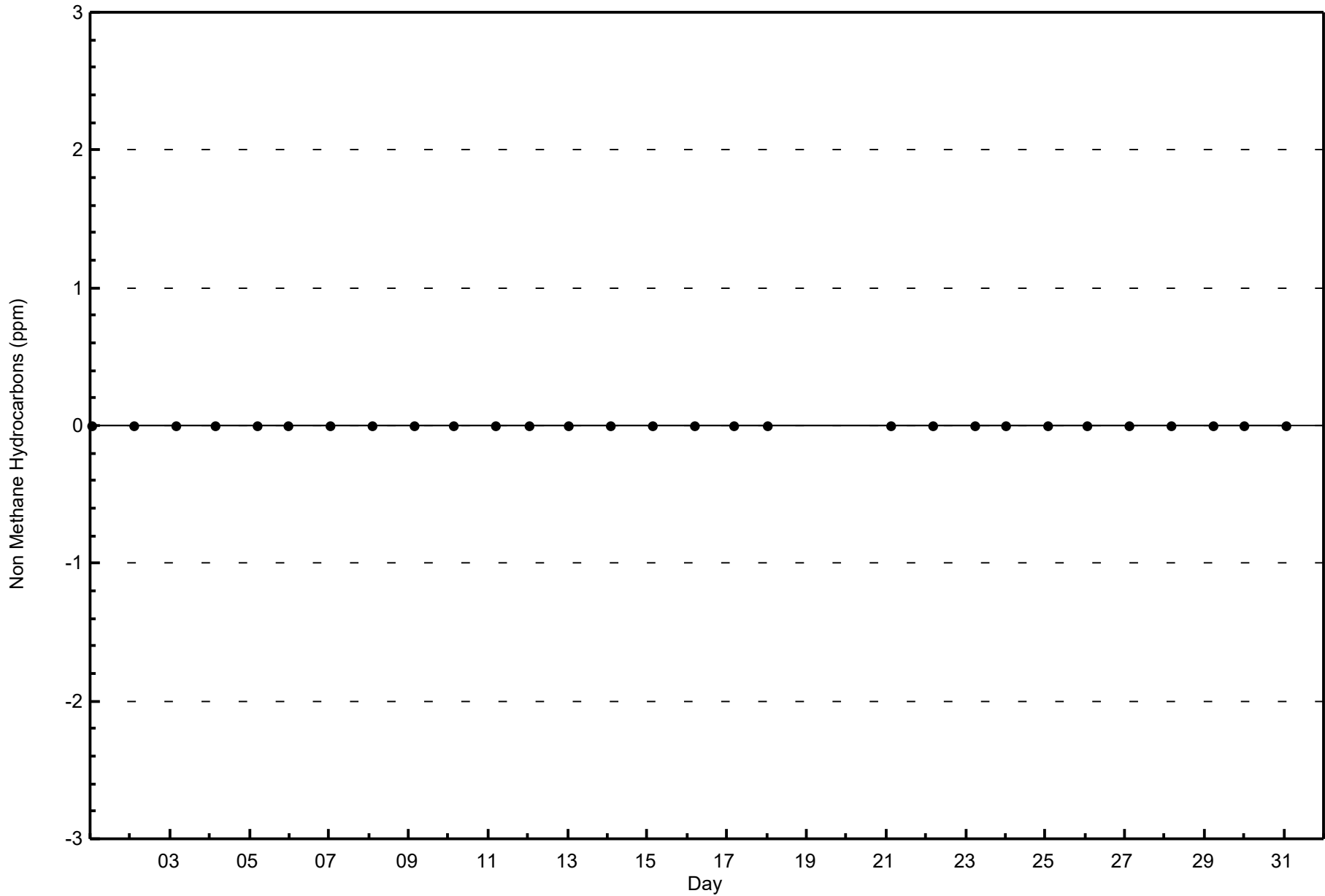
Total Number of Hours: 744

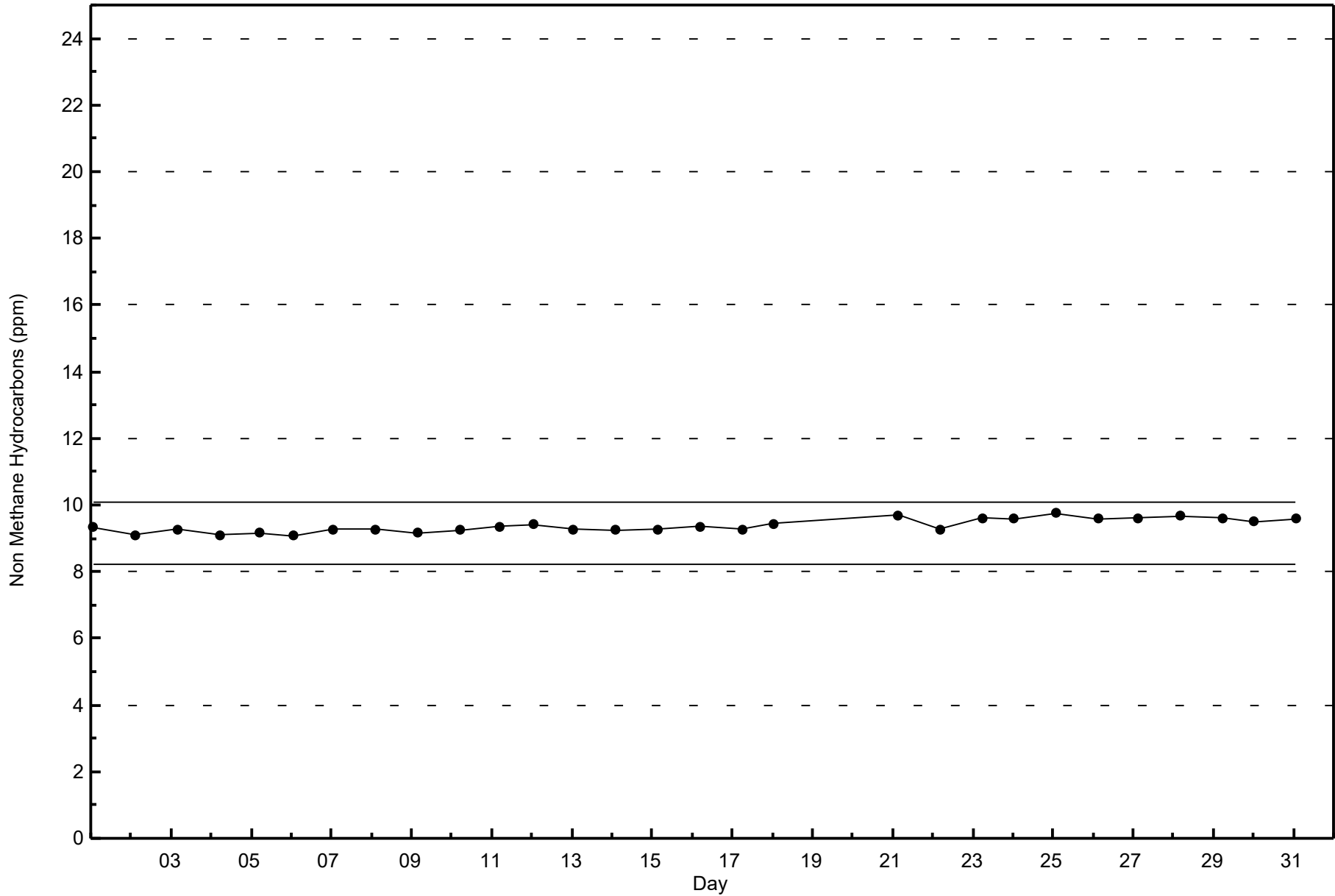


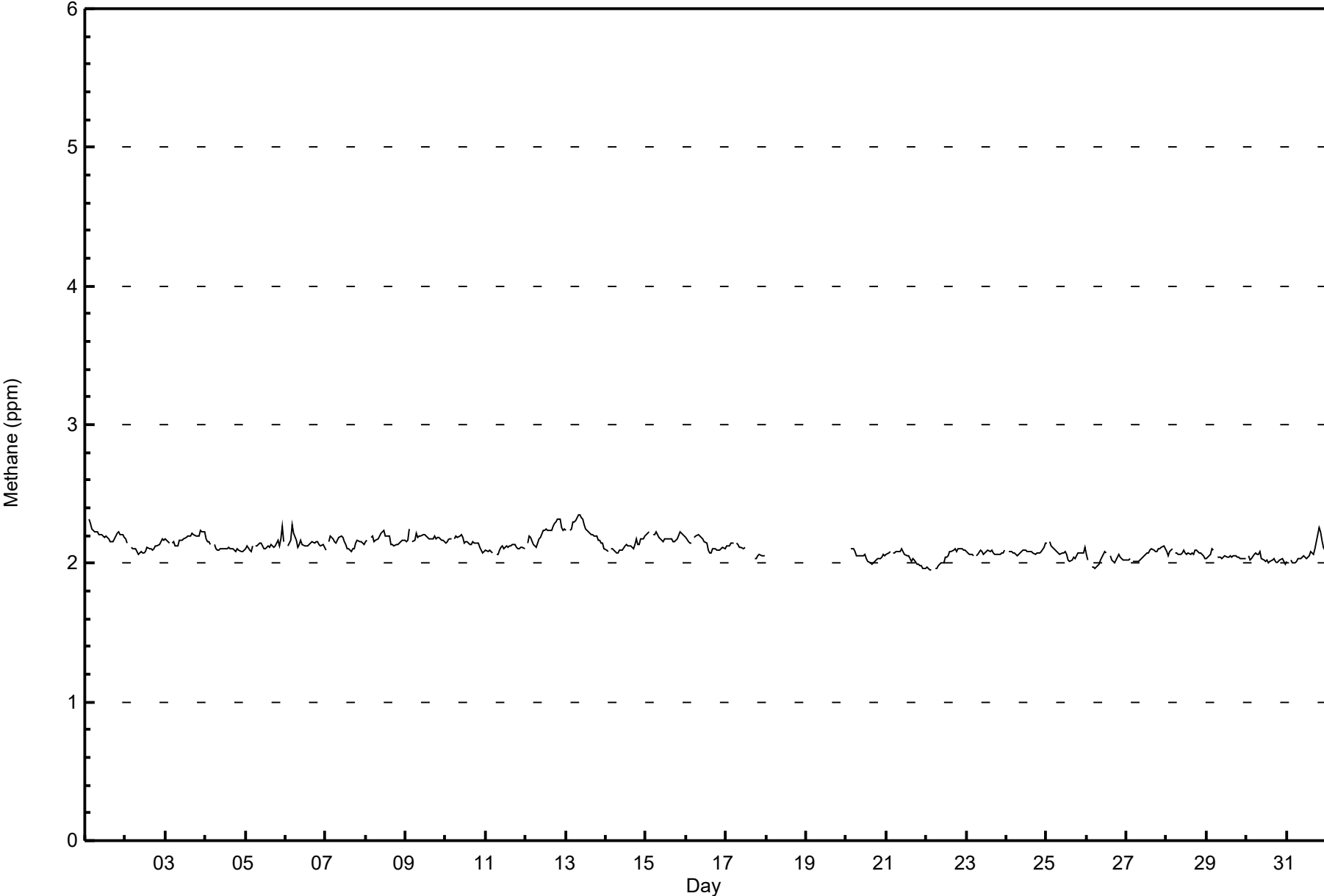
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Janvier











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Janvier - January 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	111	16.84	16.84
2.1 - 3.0	548	83.16	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 659

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Janvier - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	9	24	2	1	0	0	0	0	1	12	23	13	5	10	7	4	111
2.1 - 3.0	35	71	19	13	12	10	17	12	28	154	102	9	7	14	26	16	545
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	95	21	14	12	10	17	12	29	166	125	22	12	24	33	20	656

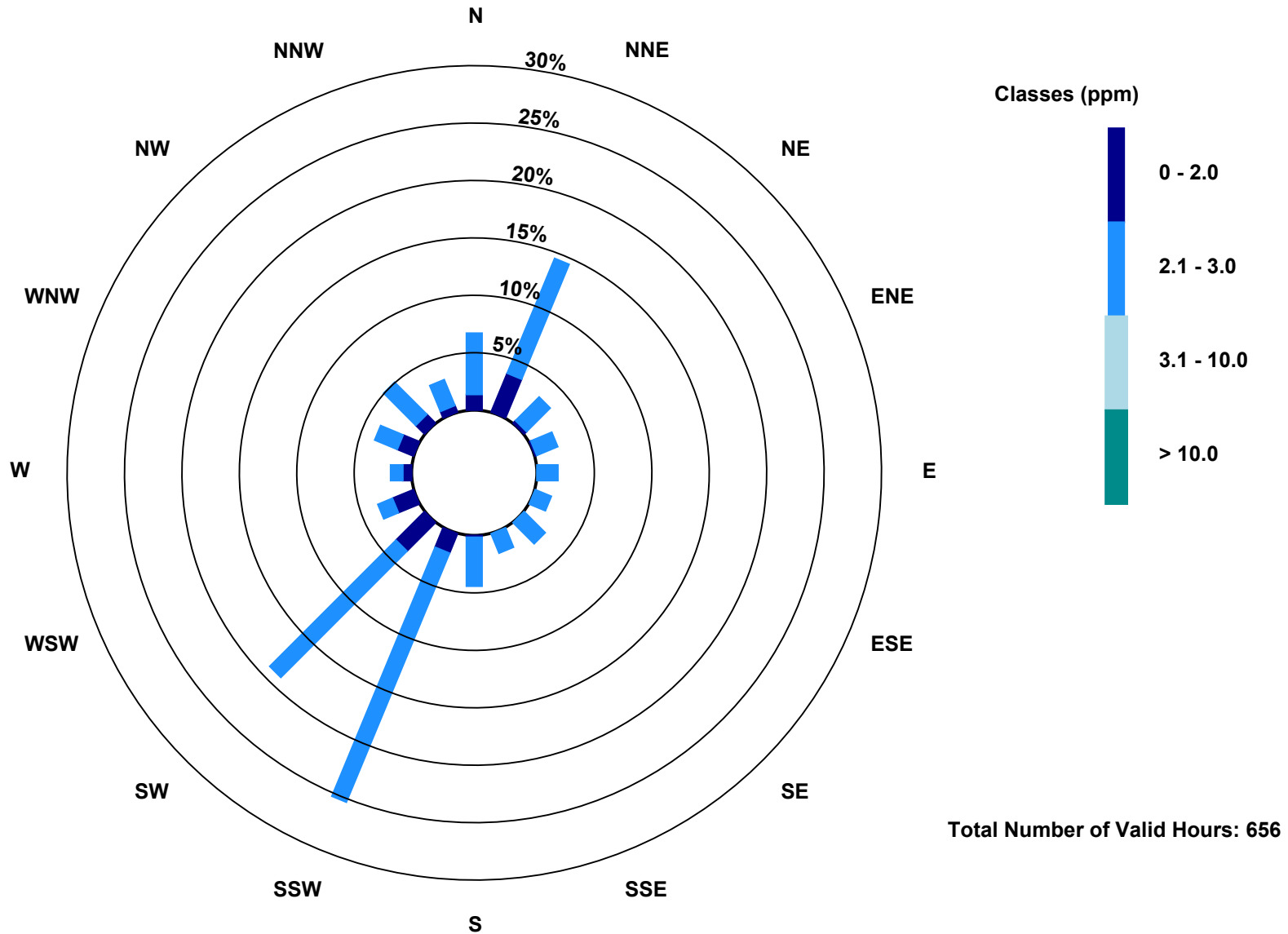
Total Number of Valid Hours: 656

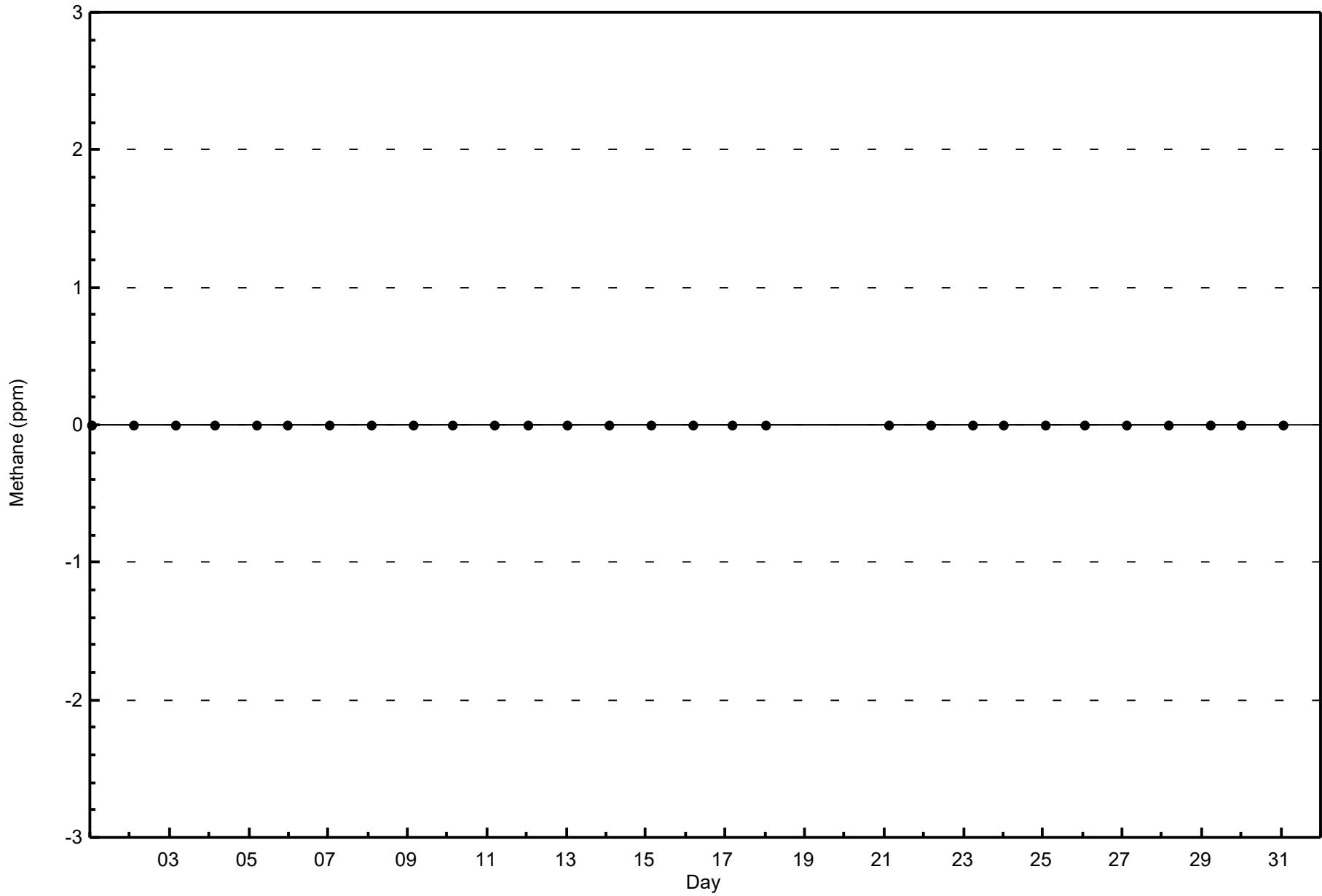
Total Number of Hours: 744

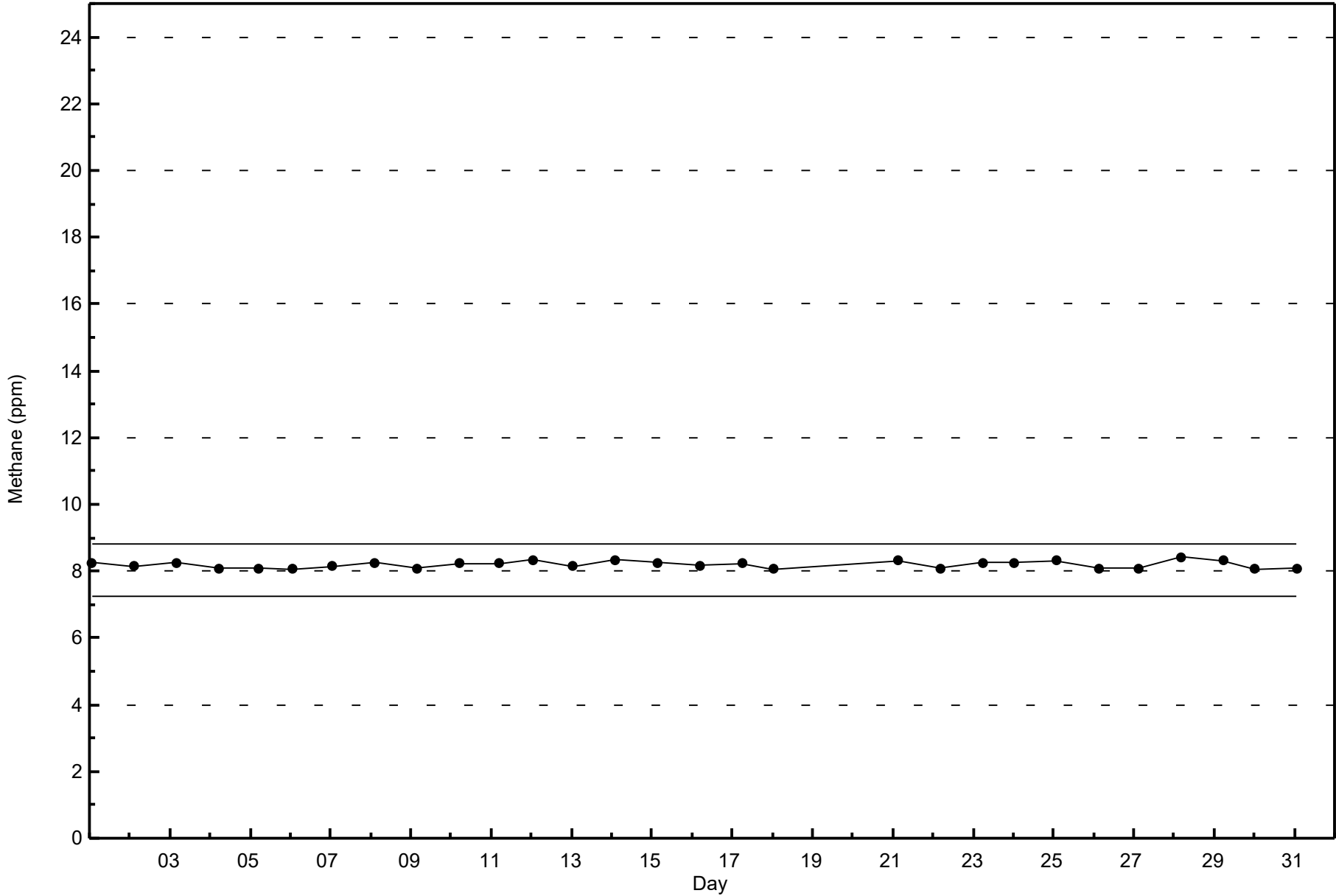


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

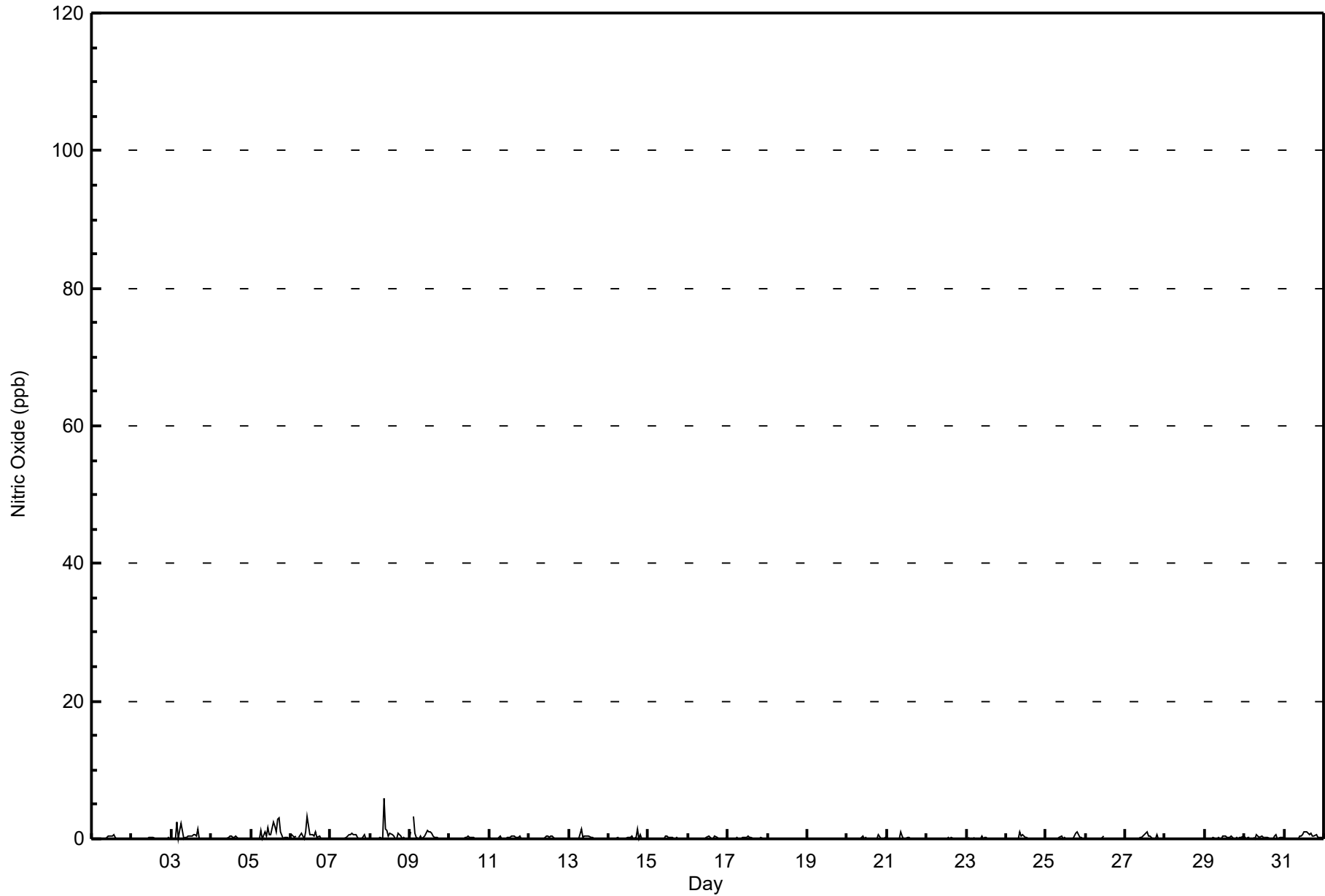
Nitric Oxide (NO) - ppb
Janvier - January 2023

Maximum Value: 5.8 ppb on Jan 8 09:00																				Maximum Daily Average: 0.8 ppb on Jan 5					Hours in Service: 744	
Minimum Value: 0.0 ppb on Jan 1 01:00																				Minimum Daily Average: 0.0 ppb on Jan 28					Hours of Data: 664	
Maximum Diurnal Average: 0.4 ppb at hour 11																				Minimum Diurnal Average: 0.0 ppb at hour 5					Hours of Missing Data: 80	
Monthly Average: 0.19 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.2 P ₉₀ = 0.5 P ₉₉ = 2.2					Hours of Calibration: 37	
																									Percent Operational Time: 94.2	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.4	0.4	0.5	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
2-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.3
3-Jan	0.0	Z	0.0	2.4	0.0	1.3	2.2	0.0	0.2	0.2	0.5	0.5	0.5	0.6	0.5	0.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
4-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.3	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
5-Jan	0.0	0.0	0.0	Z	0.0	0.0	1.1	0.1	1.1	0.4	1.5	0.6	0.6	2.4	1.8	1.0	2.8	3.0	1.0	0.1	0.3	0.2	0.2	0.1	0.8	3.0
6-Jan	0.6	0.3	0.3	0.4	Z	0.1	0.9	0.4	0.1	1.0	3.3	0.6	0.6	0.6	0.4	1.0	0.2	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.5	3.3
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.2	0.3	0.5	0.5	0.9	0.6	0.5	0.2	0.1	0.0	0.0	0.5	0.0	0.0	0.1	0.2	0.9
8-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	5.8	1.4	1.2	0.5	0.9	0.5	0.4	0.1	0.1	0.9	0.3	0.0	0.2	0.1	0.0	0.1	0.6	5.8
9-Jan	0.9	Z	3.3	0.8	0.1	0.1	0.3	0.0	0.1	0.5	1.2	1.0	1.0	0.9	0.5	0.2	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.5	3.3
10-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
11-Jan	0.2	0.0	0.0	Z	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.3	0.2	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.5
12-Jan	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.5	0.3	0.2	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.5
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	1.4	0.1	0.5	0.4	0.5	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4
14-Jan	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.2	0.2	0.4	0.1	0.2	1.5	0.0	0.5	0.0	0.0	0.0	0.0	0.2	1.5
15-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.2	0.3	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
16-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.1	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4
17-Jan	0.0	0.0	0.0	Z	0.1	0.2	0.0	0.0	0.0	0.3	0.2	0.2	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.4
18-Jan	0.0	0.0	0.0	0.0	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.0
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	0.0
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.3	0.6	
21-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0
22-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2
23-Jan	0.0	0.0	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
24-Jan	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	1.0	0.3	0.7	0.3	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
25-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.4	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.5	0.8	1.1	0.3	0.1	0.0	0.0	1.1	
26-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	C	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.5	
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.9	1.0	0.5	0.3	0.1	0.0	0.0	0.6	0.0	0.0	0.0	0.0	1.0	
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29-Jan	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.3	0.0	0.1	0.4	0.3	0.1	0.1	0.3	0.3	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.4	
30-Jan	0.2	0.1	0.1	0.2	Z	0.1	0.1	0.6	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.0	0.0	0.1	0.3	0.7	0.0	0.1	0.2	0.1	0.7	
31-Jan	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.4	0.4	0.7	1.0	1.0	0.8	0.6	0.9	0.5	0.5	0.7	0.3	0.1	0.1	0.2	1.0	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	664	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 664

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661

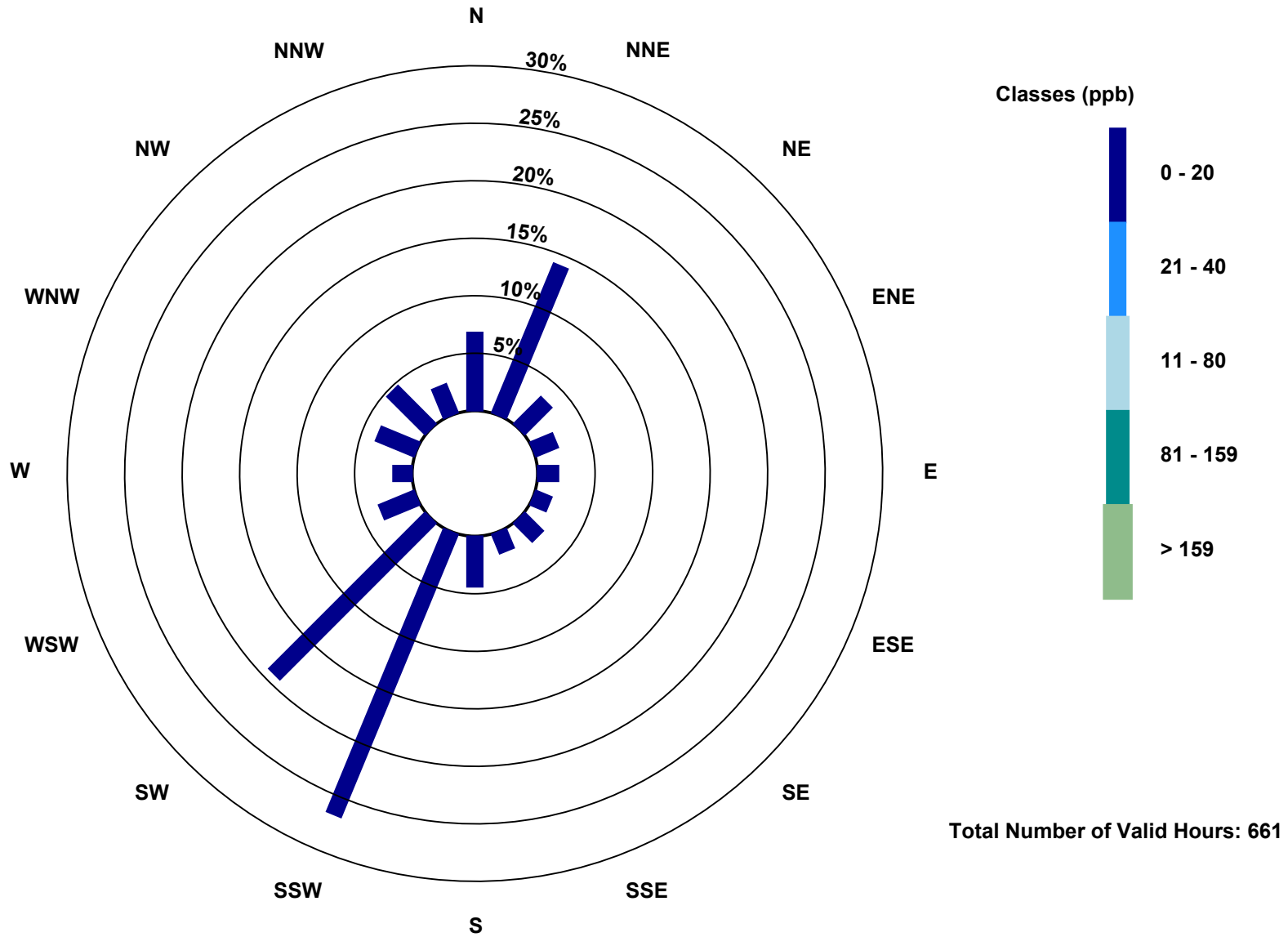
Total Number of Valid Hours: 661

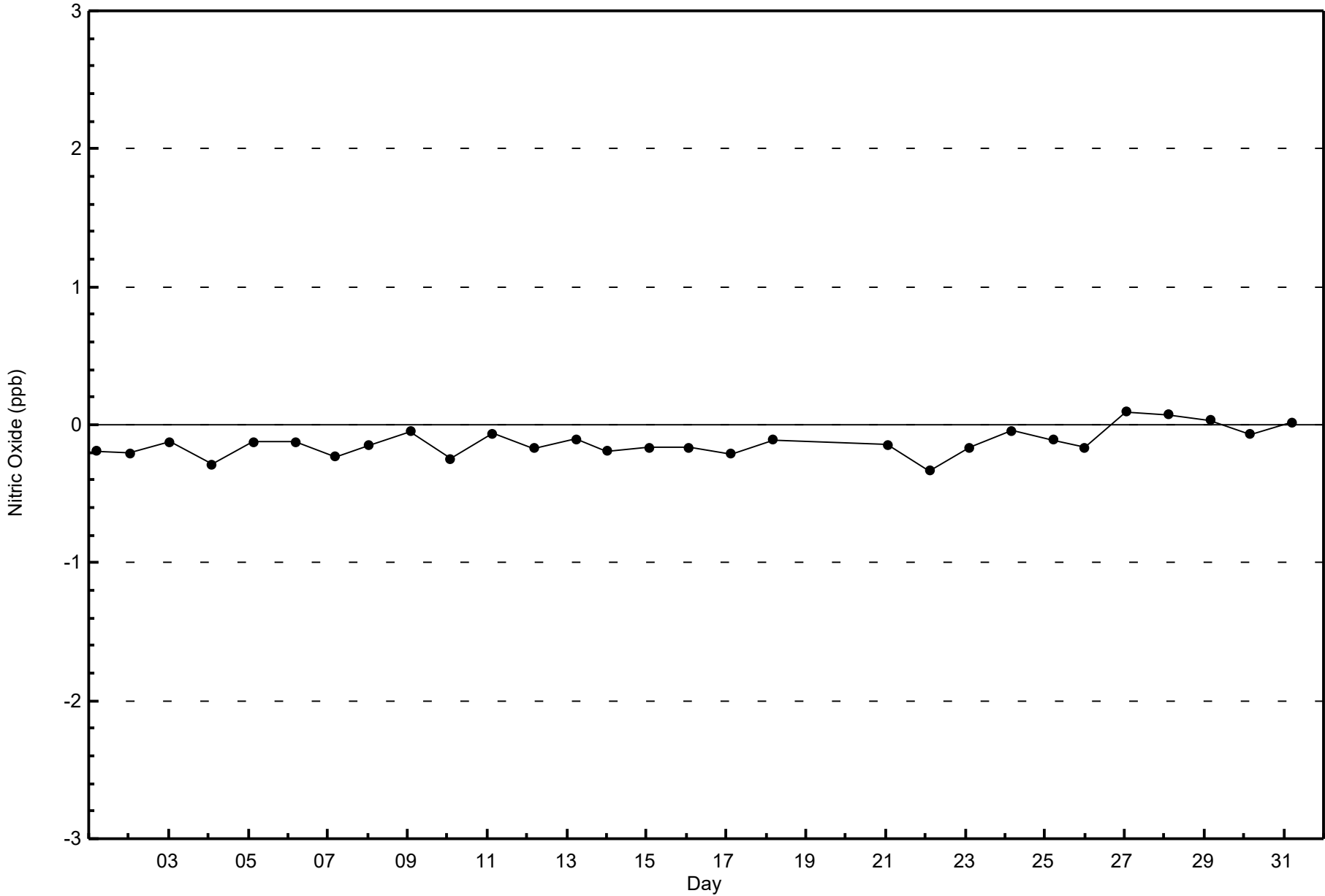
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Janvier

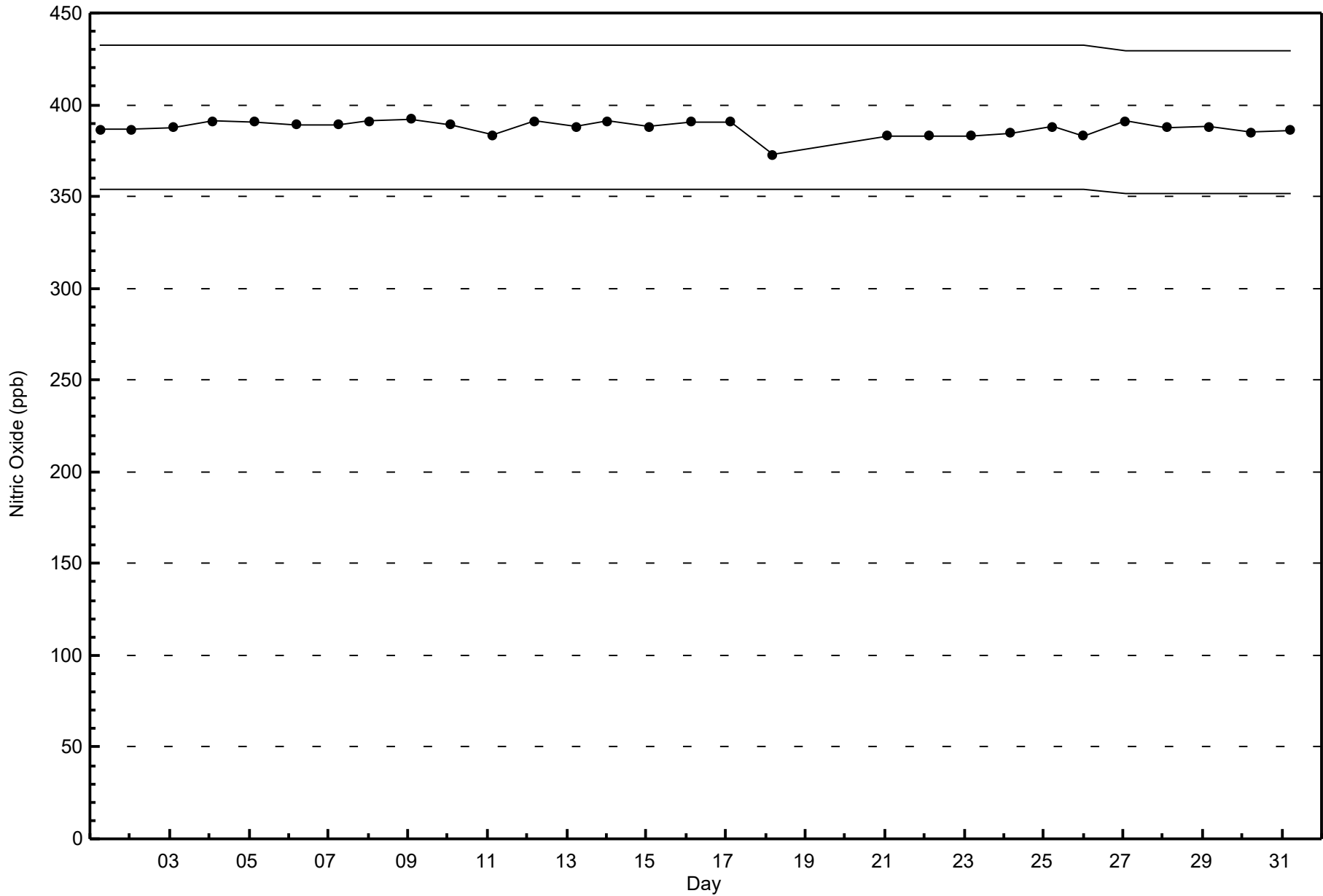






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Janvier - January 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

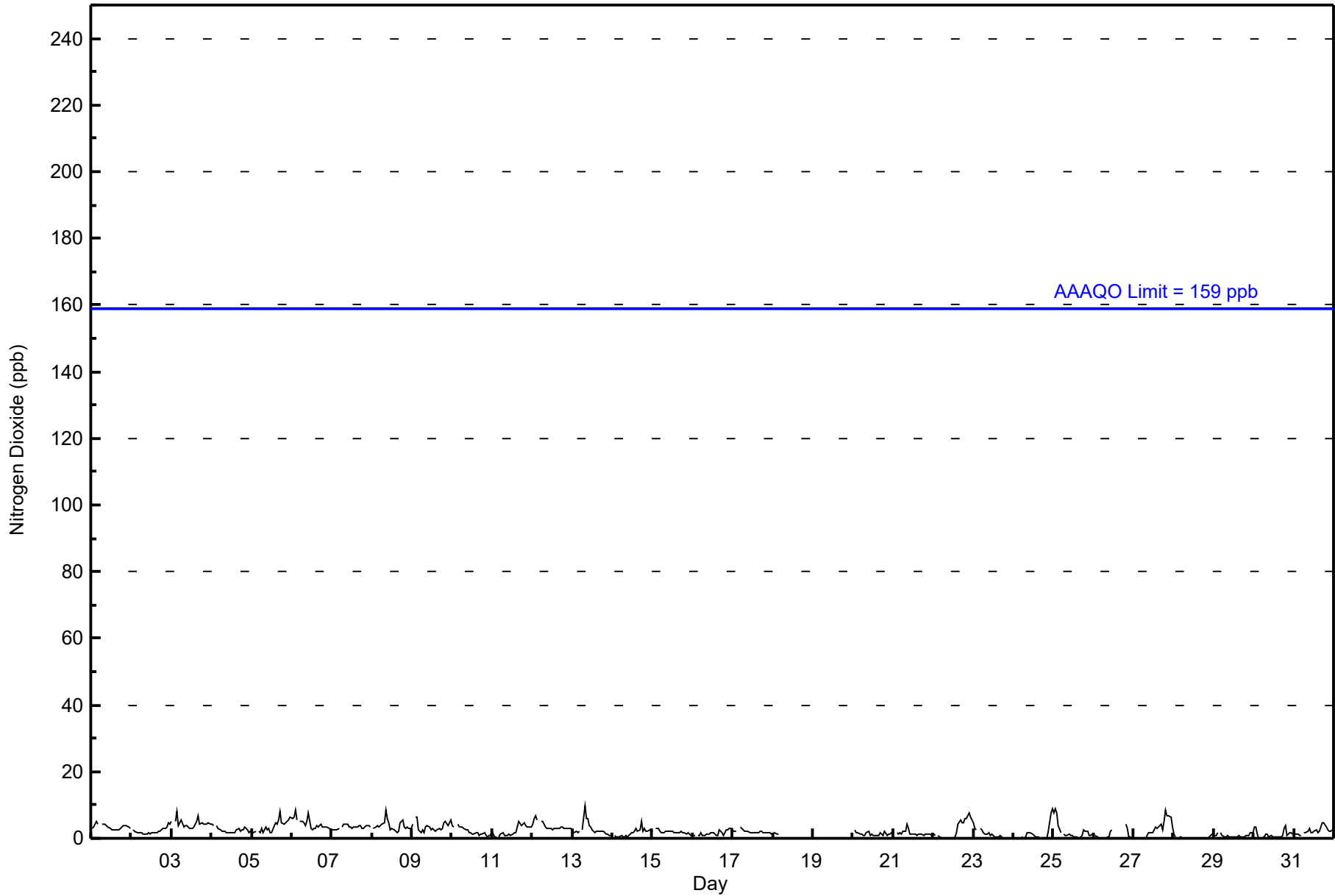
Janvier - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 9.7 ppb on Jan 13 08:00		Maximum Daily Average: 4.4 ppb on Jan 3																	Hours of Data:	664																													
Minimum Value: 0.0 ppb on Jan 22 07:00		Minimum Daily Average: 0.3 ppb on Jan 28																	Hours of Missing Data:	80																													
Maximum Diurnal Average: 2.8 ppb at hour 20		Minimum Diurnal Average: 1.7 ppb at hour 13																	Hours of Calibration:	37																													
Monthly Average: 2.32 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 1.0 Median = 2.0 Q ₃ = 3.3 P ₉₀ = 4.6 P ₉₉ = 8.0																	Percent Operational Time:	94.2																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	3.1	3.5	4.3	4.9	4.2	Z	4.4	4.3	4.1	3.8	3.2	2.8	2.4	2.7	2.5	2.5	2.6	2.9	3.6	3.8	3.8	3.7	3.4	3.0	3.5	4.9																							
2-Jan	Z	2.6	2.3	1.9	1.8	1.9	1.5	1.3	1.3	1.4	1.5	1.3	1.7	1.6	1.6	1.6	2.0	2.3	2.5	3.1	3.0	3.5	4.7	4.4	2.2	4.7																							
3-Jan	5.0	Z	5.0	8.1	3.8	4.8	5.4	3.6	3.9	3.7	3.4	3.1	3.1	3.3	4.2	5.0	6.6	4.3	4.5	4.1	4.1	4.1	4.7	4.2	4.4	8.1																							
4-Jan	4.1	3.7	Z	3.9	3.0	2.5	2.2	2.2	2.1	1.8	1.6	1.7	1.9	1.8	1.9	2.7	2.8	2.3	2.4	2.4	3.4	2.4	1.9	2.1	2.5	4.1																							
5-Jan	1.8	1.8	2.0	Z	2.0	1.7	3.0	1.9	3.2	2.4	3.0	1.7	1.6	3.9	4.8	4.3	5.6	8.0	4.6	4.1	4.8	5.1	5.3	6.3	3.6	8.0																							
6-Jan	6.1	6.5	8.5	5.5	Z	5.0	5.1	4.6	4.0	4.9	7.7	2.9	2.5	2.8	3.1	3.7	3.6	4.1	3.6	3.5	3.5	3.2	3.0	2.6	4.3	8.5																							
7-Jan	2.6	2.4	2.7	2.7	2.8	Z	3.6	4.2	4.4	4.3	3.6	3.2	3.0	3.3	3.5	3.5	3.7	3.7	2.9	2.8	4.0	3.8	4.0	3.4	3.4	4.4																							
8-Jan	Z	3.0	3.3	3.9	3.6	4.0	4.3	4.6	8.3	6.1	4.6	2.7	2.9	2.4	2.0	1.9	2.2	4.5	5.6	3.3	2.8	3.3	2.9	2.8	3.7	8.3																							
9-Jan	4.1	Z	6.5	6.5	2.6	1.9	2.4	1.9	3.6	4.0	3.6	2.7	2.8	2.6	2.3	2.7	3.0	2.7	2.9	4.7	5.0	4.0	4.7	5.4	3.6	6.5																							
10-Jan	3.9	3.6	Z	4.1	3.5	3.3	3.3	2.8	2.7	2.4	1.9	1.7	1.3	1.4	1.7	1.5	1.0	1.4	1.3	1.7	0.9	0.5	0.7	0.7	2.1	4.1																							
11-Jan	2.2	0.3	0.3	Z	0.6	1.1	1.9	0.8	0.7	1.0	1.2	0.9	1.2	1.5	1.7	3.4	5.2	4.0	4.2	4.5	3.8	3.3	3.2	3.5	2.2	5.2																							
12-Jan	4.1	6.0	6.8	5.3	Z	5.2	5.2	4.4	3.4	2.8	3.1	2.8	2.5	2.8	3.0	3.0	3.0	3.2	3.4	3.1	2.8	2.8	2.8	2.8	3.7	6.8																							
13-Jan	2.1	1.9	2.1	1.9	2.1	Z	2.7	9.7	6.0	6.1	3.9	3.2	2.7	1.8	2.0	2.2	2.1	2.2	2.1	1.7	1.3	1.3	1.0	0.7	2.7	9.7																							
14-Jan	Z	0.7	0.4	0.3	0.4	1.0	0.5	0.4	0.7	0.6	0.7	1.7	1.9	2.2	2.8	2.3	2.7	5.2	2.3	2.8	2.1	2.3	2.5	2.3	1.7	5.2																							
15-Jan	2.2	Z	3.0	2.8	2.1	1.8	1.6	1.6	2.0	2.1	2.0	2.2	2.0	1.7	1.8	1.8	1.6	2.1	1.7	1.5	1.4	1.5	1.1	1.0	1.9	3.0																							
16-Jan	0.9	0.7	Z	0.9	0.8	1.5	0.8	0.7	1.1	1.2	1.3	1.6	1.7	1.2	0.8	1.0	2.7	1.5	1.0	1.7	2.5	2.7	2.9	3.0	1.5	3.0																							
17-Jan	2.3	2.0	2.3	Z	3.6	2.8	2.5	2.3	2.2	2.2	1.9	1.8	1.8	1.7	1.8	1.8	2.2	2.3	1.7	1.6	1.7	1.8	1.8	1.4	2.1	3.6																							
18-Jan	1.2	1.5	1.3	1.4	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	1.5																							
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																						
20-Jan	Z	2.6	1.8	1.5	1.3	1.2	1.0	0.9	1.5	2.2	1.0	1.2	0.8	0.8	0.7	1.0	1.6	1.2	1.0	2.0	0.9	1.3	1.3	1.6	1.3	2.6																							
21-Jan	1.4	Z	1.7	1.2	1.6	1.3	2.0	2.3	4.3	2.9	1.1	1.1	1.1	1.2	0.9	1.2	1.4	1.2	1.0	1.2	1.2	1.2	1.4	1.0	1.5	4.3																							
22-Jan	1.1	0.9	Z	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.7	4.1	5.7	4.7	4.8	5.9	6.0	7.7	6.5	5.7	2.5	7.7																							
23-Jan	4.7	3.0	2.4	Z	2.8	2.7	1.9	1.3	1.3	1.6	1.0	1.1	1.0	0.3	0.3	0.5	0.8	0.3	0.0	0.0	0.0	0.2	0.0	0.0	1.2	4.7																							
24-Jan	0.0	0.0	0.0	0.2	Z	0.3	0.2	0.5	1.8	1.8	1.7	1.1	0.7	0.5	0.4	0.3	0.2	0.0	0.0	0.0	0.0	2.0	7.5	8.9	1.2	8.9																							
25-Jan	7.6	8.8	7.6	4.0	1.5	Z	1.1	0.8	0.9	1.2	0.8	0.8	0.6	0.6	0.4	0.1	0.3	1.0	2.7	2.0	2.0	0.9	0.7	1.2	2.1	8.8																							
26-Jan	Z	1.0	0.4	0.2	0.0	0.0	0.0	0.0	0.5	0.6	2.2	2.7	C	C	C	C	C	C	C	4.3	3.0	0.6	0.5	0.1	--	4.3																							
27-Jan	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	1.0	1.6	1.7	1.9	2.6	3.4	2.8	3.5	4.2	2.7	5.2	8.5	6.7	6.6	6.3	3.5	2.7	8.5																							
28-Jan	1.2	0.3	Z	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.9	1.3	0.3	1.3																							
29-Jan	1.0	0.7	1.5	Z	1.5	0.9	0.5	0.4	0.8	0.4	0.3	0.5	0.4	0.4	0.3	0.7	0.5	0.5	0.5	0.7	0.9	1.0	1.5	1.9	0.8	1.9																							
30-Jan	3.3	3.3	1.2	0.1	Z	0.5	0.5	1.2	1.3	0.6	0.7	0.4	0.3	0.3	0.4	0.3	0.3	0.9	2.9	4.0	1.0	1.9	1.9	1.1	1.2	4.0																							
31-Jan	1.4	1.1	1.1	0.9	1.0	Z	1.5	1.5	2.0	2.8	1.6	1.9	2.3	2.4	1.9	2.1	3.4	4.8	4.6	3.4	2.4	2.1	2.2	2.6	2.2	4.8																							
																								2.7	2.5	2.7	2.5	1.9	1.9	2.0	2.1	2.4	2.3	2.1	1.8	1.7	1.8	1.8	2.1	2.5	2.7	2.6	2.8	2.6	2.6	2.8	2.7	Diurnal Average	
																								7.6	8.8	8.5	8.1	4.2	5.2	5.4	9.7	8.3	6.1	7.7	3.2	3.1	3.9	4.8	5.0	6.6	8.0	5.6	8.5	6.7	7.7	7.5	8.9	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				UO - Unstable Operation																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Janvier - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	664	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 664

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661

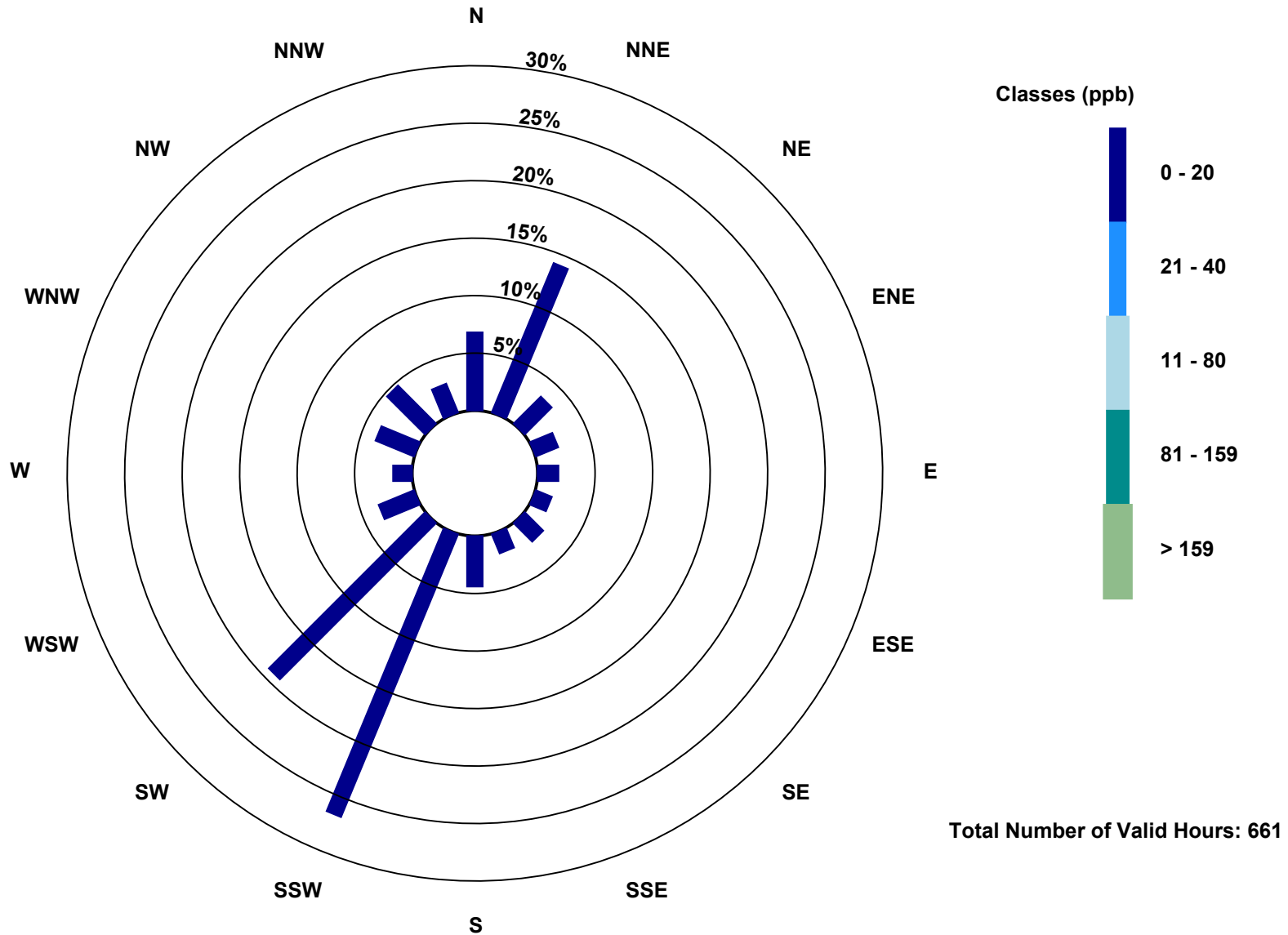
Total Number of Valid Hours: 661

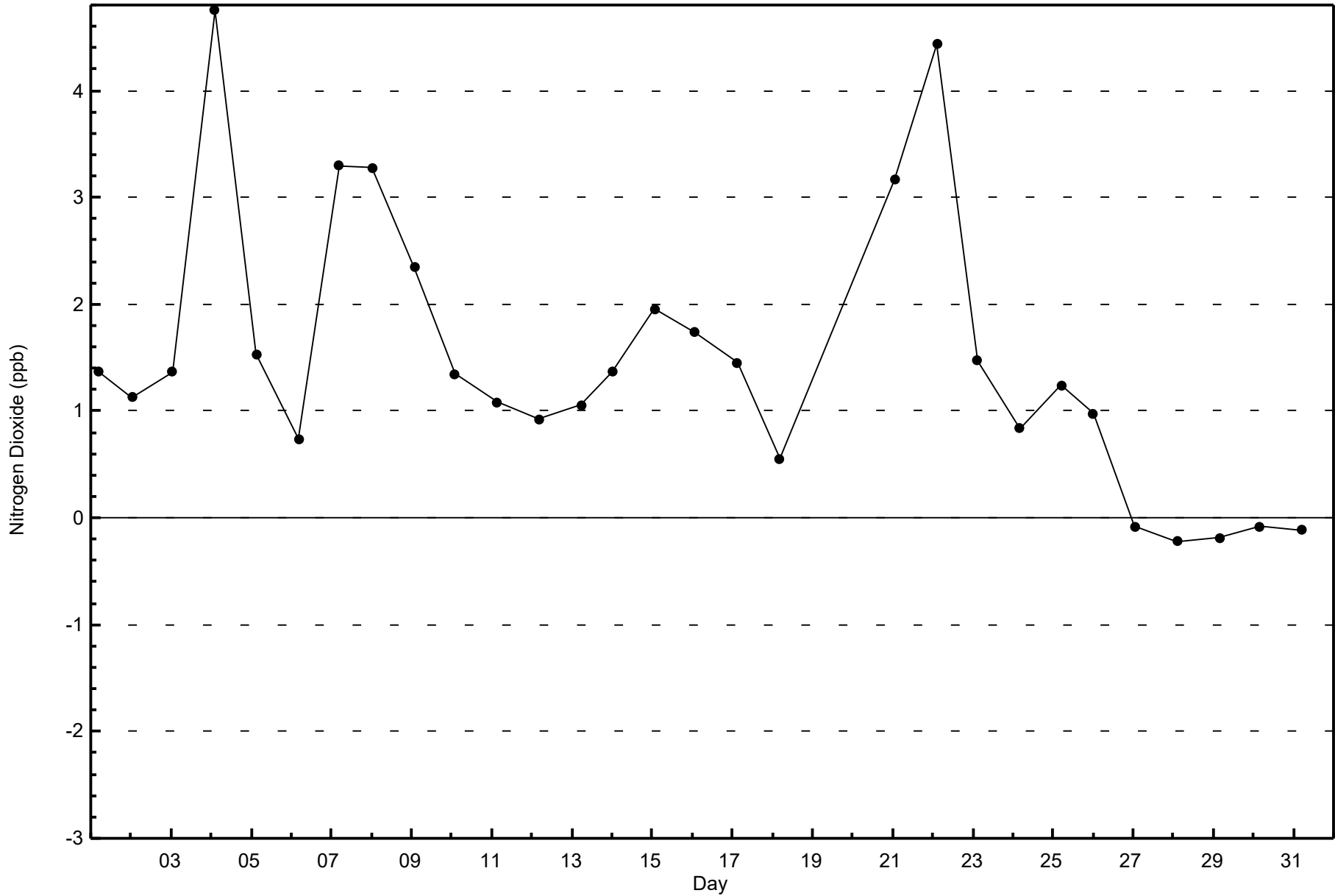
Total Number of Hours: 744

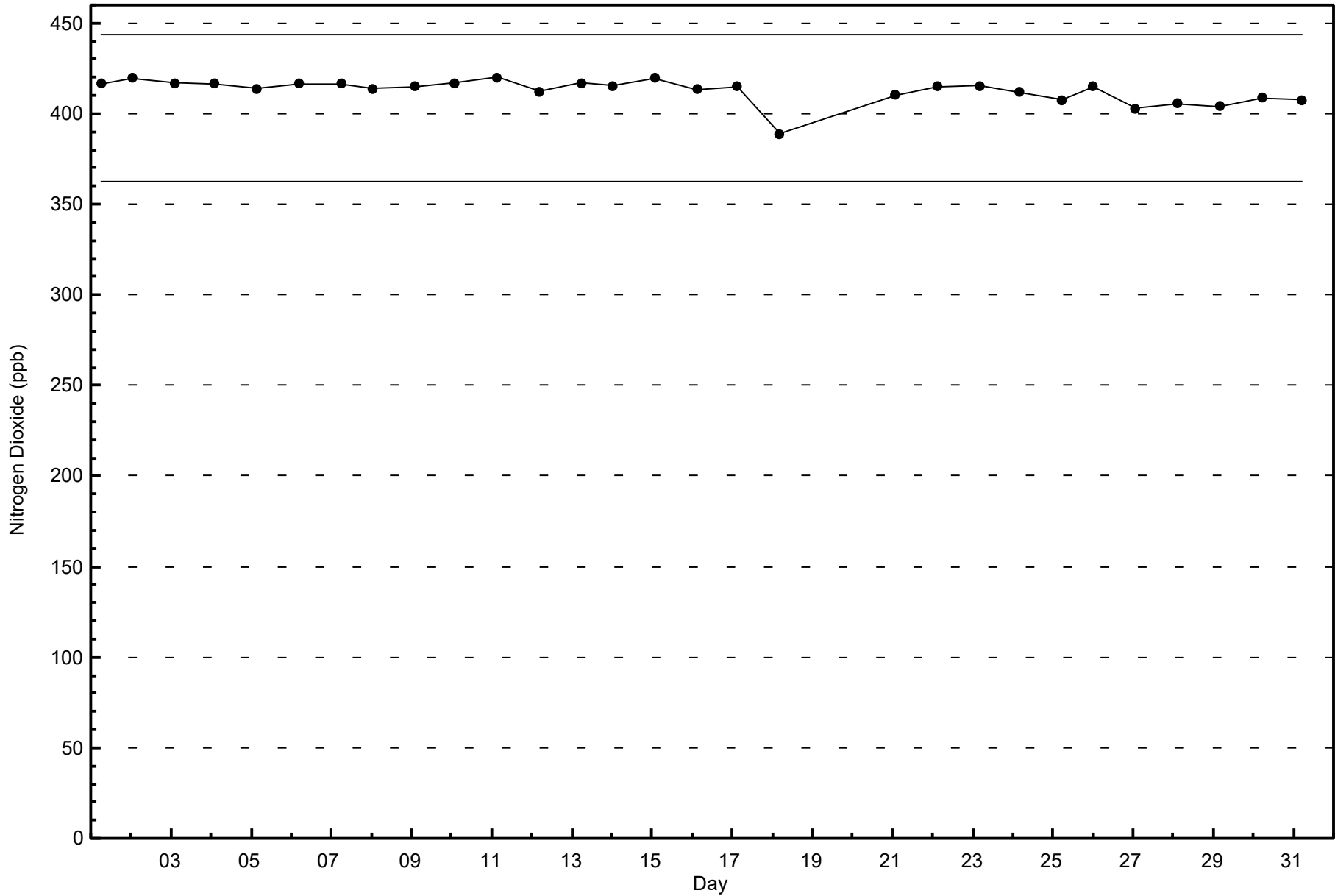


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Janvier









Wood Buffalo Environmental Association
Summary of Hour Averages

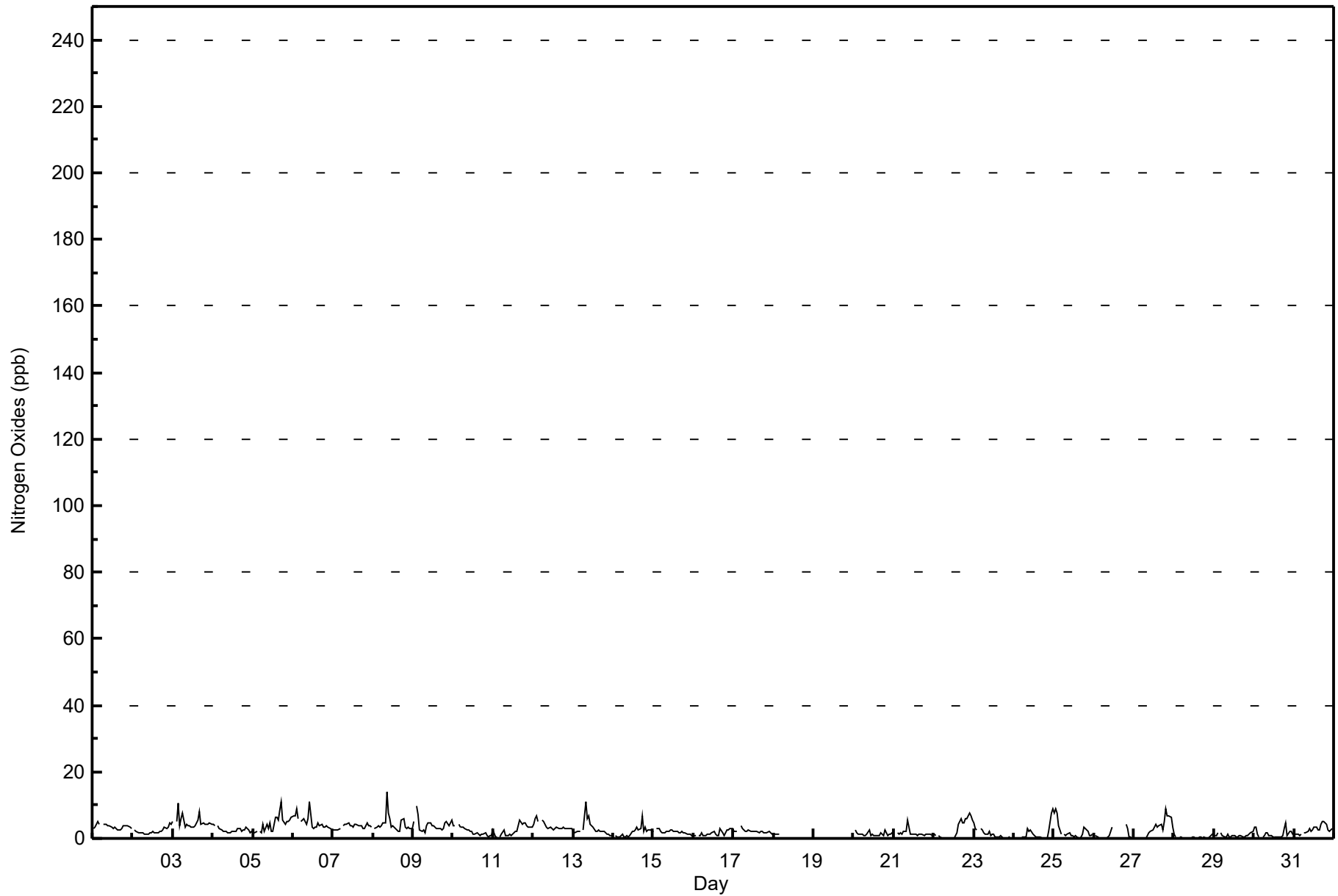
Nitrogen Oxides (NO_x) - ppb
Janvier - January 2023

Maximum Value: 14.1 ppb on Jan 8 09:00		Maximum Daily Average: 4.9 ppb on Jan 3		Hours in Service: 744																									
Minimum Value: 0.0 ppb on Jan 22 07:00		Minimum Daily Average: 0.3 ppb on Jan 28		Hours of Data: 664																									
Maximum Diurnal Average: 3.0 ppb at hour 20		Minimum Diurnal Average: 1.9 ppb at hour 5		Hours of Missing Data: 80																									
Monthly Average: 2.51 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 1.1 Median = 2.1 Q ₃ = 3.5 P ₉₀ = 4.8 P ₉₉ = 8.9		Hours of Calibration: 37																									
				Percent Operational Time: 94.2																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	3.1	3.5	4.3	4.9	4.2	Z	4.4	4.3	4.1	4.0	3.6	3.2	2.9	3.3	2.8	2.5	2.6	2.9	3.6	3.8	3.8	3.7	3.4	3.0	3.6	4.9			
2-Jan	Z	2.6	2.3	1.9	1.8	1.9	1.5	1.3	1.3	1.4	1.6	1.5	2.0	1.8	1.7	1.6	2.0	2.3	2.6	3.2	3.0	3.5	4.8	4.4	2.3	4.8			
3-Jan	5.0	Z	5.0	10.5	3.8	6.1	7.6	3.6	4.1	3.9	3.9	3.6	3.6	3.9	4.7	5.4	8.0	4.3	4.5	4.1	4.1	4.1	4.7	4.2	4.9	10.5			
4-Jan	4.1	3.7	Z	3.9	3.0	2.5	2.2	2.2	2.1	1.8	1.7	2.1	2.3	2.1	2.1	3.1	2.9	2.3	2.4	2.4	3.4	2.4	1.9	2.1	2.5	4.1			
5-Jan	1.8	1.8	2.0	Z	2.0	1.7	4.1	2.0	4.3	2.8	4.5	2.3	2.2	6.3	6.6	5.3	8.4	11.0	5.6	4.2	5.1	5.3	5.5	6.4	4.4	11.0			
6-Jan	6.7	6.8	8.8	5.9	Z	5.1	6.0	5.0	4.1	5.9	11.0	3.5	3.1	3.4	3.5	4.7	3.8	4.4	3.6	3.5	3.6	3.2	3.0	2.6	4.8	11.0			
7-Jan	2.6	2.4	2.7	2.7	2.8	Z	3.6	4.3	4.4	4.5	3.9	3.7	3.5	4.2	4.1	4.0	3.9	3.8	2.9	2.8	4.5	3.8	4.0	3.5	3.6	4.5			
8-Jan	Z	3.0	3.3	3.9	3.6	4.0	4.5	4.7	14.1	7.5	5.8	3.2	3.8	2.9	2.4	2.0	2.3	5.4	5.9	3.3	3.0	3.4	2.9	2.9	4.3	14.1			
9-Jan	5.0	Z	9.8	7.3	2.7	2.0	2.7	1.9	3.7	4.5	4.8	3.7	3.8	3.5	2.8	2.9	3.2	2.7	3.0	4.8	5.0	4.0	4.7	5.5	4.1	9.8			
10-Jan	3.9	3.6	Z	4.1	3.5	3.3	3.3	2.8	2.7	2.6	2.2	2.0	1.4	1.5	1.8	1.5	1.0	1.4	1.3	1.7	0.9	0.5	0.7	0.8	2.1	4.1			
11-Jan	2.4	0.3	0.3	Z	0.6	1.1	2.4	0.8	0.7	1.0	1.3	1.1	1.5	1.9	2.2	3.7	5.4	4.3	4.7	4.5	3.8	3.3	3.2	3.5	2.3	5.4			
12-Jan	4.1	6.0	6.8	5.3	Z	5.3	5.2	4.4	3.4	2.8	3.6	3.1	2.7	3.1	3.4	3.1	3.0	3.2	3.4	3.1	2.9	2.9	2.8	2.8	3.8	6.8			
13-Jan	2.1	1.9	2.1	1.9	2.1	Z	2.7	11.1	6.1	6.6	4.3	3.7	3.2	2.0	2.1	2.3	2.1	2.2	2.1	1.7	1.3	1.3	1.0	0.7	2.9	11.1			
14-Jan	Z	0.7	0.4	0.3	0.4	1.1	0.5	0.4	0.8	0.6	0.7	2.0	2.1	2.4	3.2	2.4	2.9	6.7	2.3	3.3	2.1	2.3	2.5	2.3	1.8	6.7			
15-Jan	2.2	Z	3.0	2.8	2.1	1.8	1.6	1.6	2.0	2.2	2.4	2.6	2.2	2.0	2.1	1.8	1.6	2.3	1.7	1.5	1.4	1.5	1.1	1.0	1.9	3.0			
16-Jan	0.9	0.7	Z	0.9	0.8	1.5	0.8	0.7	1.1	1.2	1.4	1.9	2.1	1.3	0.8	1.0	3.1	1.7	1.0	1.7	2.5	2.7	2.9	3.1	1.6	3.1			
17-Jan	2.3	2.0	2.3	Z	3.7	3.0	2.5	2.3	2.2	2.5	2.1	2.0	2.2	1.9	2.0	1.9	2.2	2.3	1.7	1.6	1.8	1.9	1.8	1.4	2.2	3.7			
18-Jan	1.2	1.5	1.3	1.4	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	1.5			
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--		
20-Jan	Z	2.6	1.8	1.5	1.3	1.2	1.0	0.9	1.5	2.5	1.0	1.4	0.8	0.8	0.7	1.0	1.6	1.2	1.0	2.6	0.9	1.3	1.3	1.9	1.4	2.6			
21-Jan	1.4	Z	1.7	1.2	1.6	1.3	2.1	2.3	5.3	3.2	1.2	1.2	1.2	1.3	0.9	1.2	1.4	1.2	1.0	1.2	1.2	1.2	1.4	1.0	1.6	5.3			
22-Jan	1.1	0.9	Z	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7	4.3	5.8	4.7	4.8	5.9	6.0	7.7	6.6	5.7	2.5	7.7			
23-Jan	4.7	3.0	2.5	Z	2.9	2.7	1.9	1.3	1.3	2.0	1.0	1.3	1.1	0.3	0.3	0.5	0.8	0.3	0.0	0.0	0.0	0.2	0.0	0.0	1.2	4.7			
24-Jan	0.0	0.1	0.0	0.2	Z	0.3	0.2	0.5	2.8	2.1	2.4	1.4	0.9	0.5	0.4	0.4	0.2	0.0	0.0	0.0	0.0	2.0	7.5	8.9	1.3	8.9			
25-Jan	7.6	8.8	7.6	4.0	1.5	Z	1.1	0.8	1.2	1.6	0.9	0.9	0.6	0.7	0.5	0.1	0.3	1.5	3.5	3.1	2.3	1.0	0.7	1.2	2.2	8.8			
26-Jan	Z	1.0	0.4	0.2	0.0	0.0	0.0	0.0	0.5	0.6	2.3	3.2	C	C	C	C	C	C	C	4.3	3.0	0.6	0.5	0.1	--	4.3			
27-Jan	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	1.0	1.7	2.0	2.5	3.5	4.4	3.3	3.8	4.3	2.7	5.2	9.1	6.7	6.6	6.3	3.5	2.9	9.1			
28-Jan	1.2	0.3	Z	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.4	0.9	1.3	0.3	1.3			
29-Jan	1.0	0.7	1.5	Z	1.5	1.0	0.5	0.4	1.1	0.4	0.4	0.9	0.7	0.5	0.4	1.0	0.8	0.5	0.6	0.8	0.9	1.1	1.7	2.2	0.9	2.2			
30-Jan	3.5	3.4	1.3	0.3	Z	0.6	0.6	1.8	1.7	0.8	1.0	0.6	0.6	0.5	0.6	0.3	0.3	1.0	3.2	4.7	1.0	2.0	2.1	1.2	1.4	4.7			
31-Jan	1.4	1.1	1.1	0.9	1.1	Z	1.5	1.5	2.0	3.2	2.0	2.6	3.3	3.4	2.7	2.7	4.3	5.3	5.1	4.1	2.7	2.2	2.3	2.8	2.6	5.3			
																								Diurnal Average					
																								Diurnal Maximum					
																								2.8 2.5 2.9 2.7 1.9 2.0 2.2 2.2 2.7 2.6 2.5 2.1 2.1 2.2 2.1 2.3 2.8 2.9 2.8 3.0 2.7 2.6 2.8 2.8					
																								7.6 8.8 9.8 10.5 4.2 6.1 7.6 11.1 14.1 7.5 11.0 3.7 3.8 6.3 6.6 5.4 8.4 11.0 5.9 9.1 6.7 7.7 7.5 8.9					
Z - zerospan																								C - Calibration		M - Maintenance		UO - Unstable Operation	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Janvier - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	664	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 664

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	45	93	22	14	12	10	15	12	29	176	127	22	11	24	31	18	661

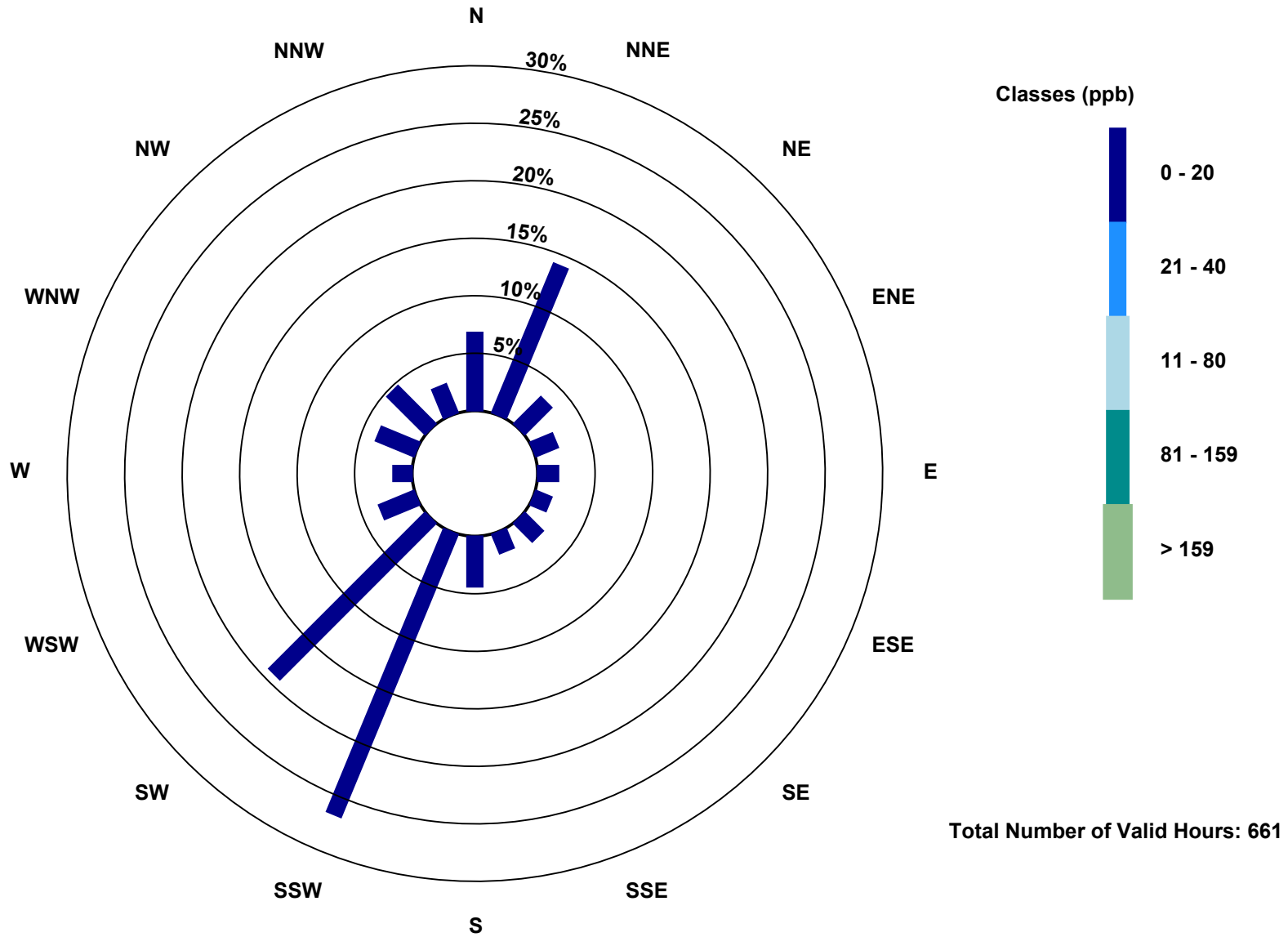
Total Number of Valid Hours: 661

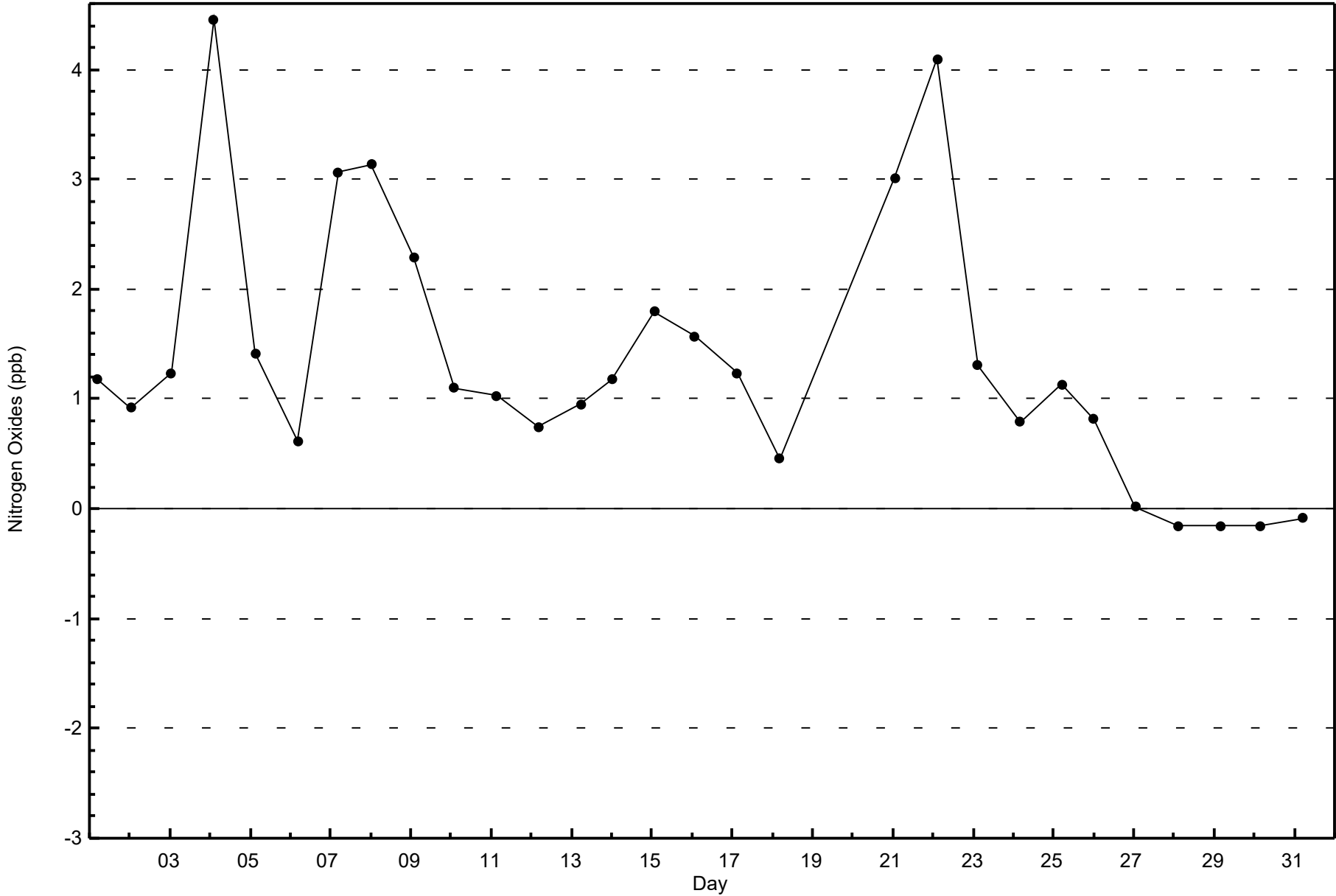
Total Number of Hours: 744

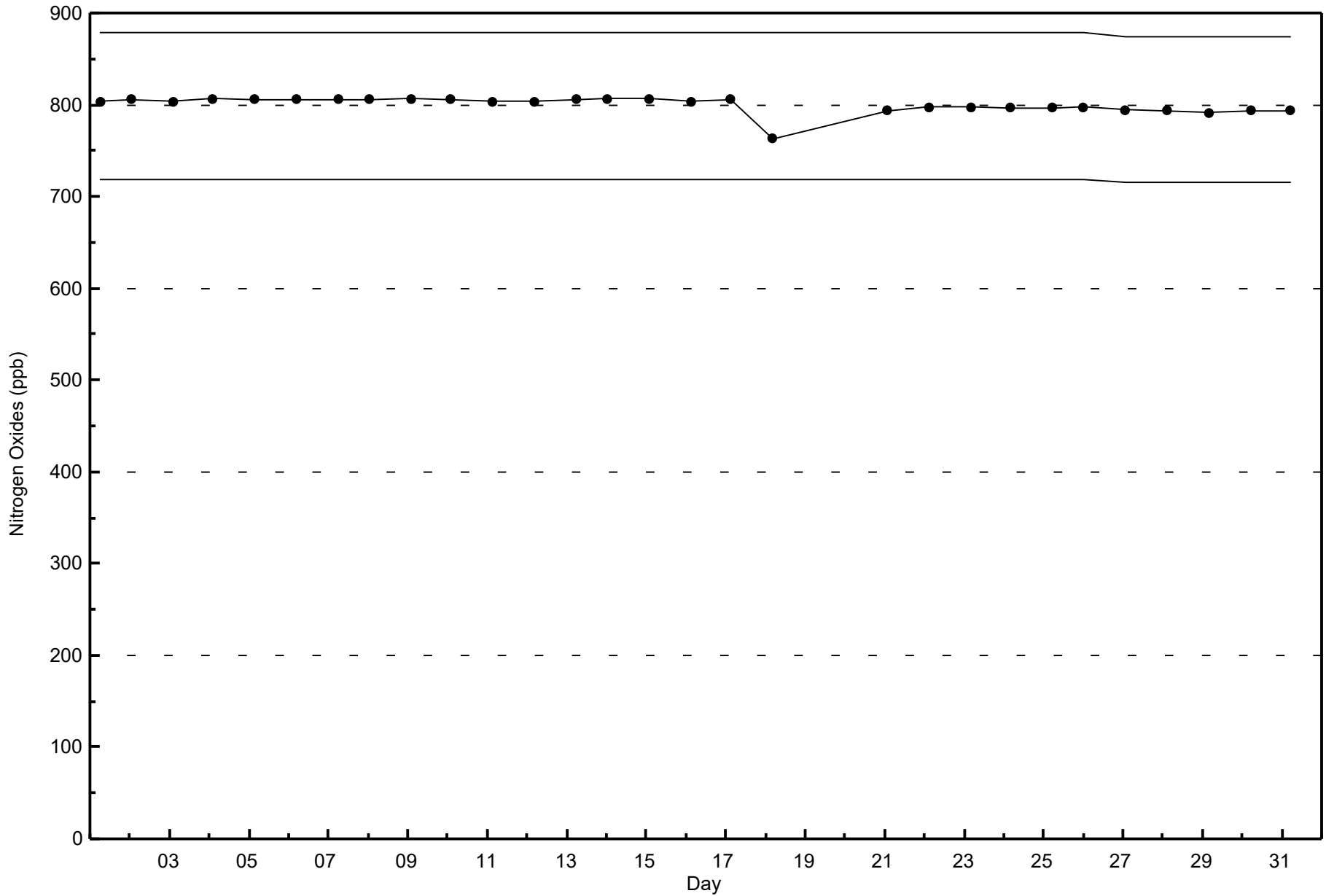


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Janvier









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

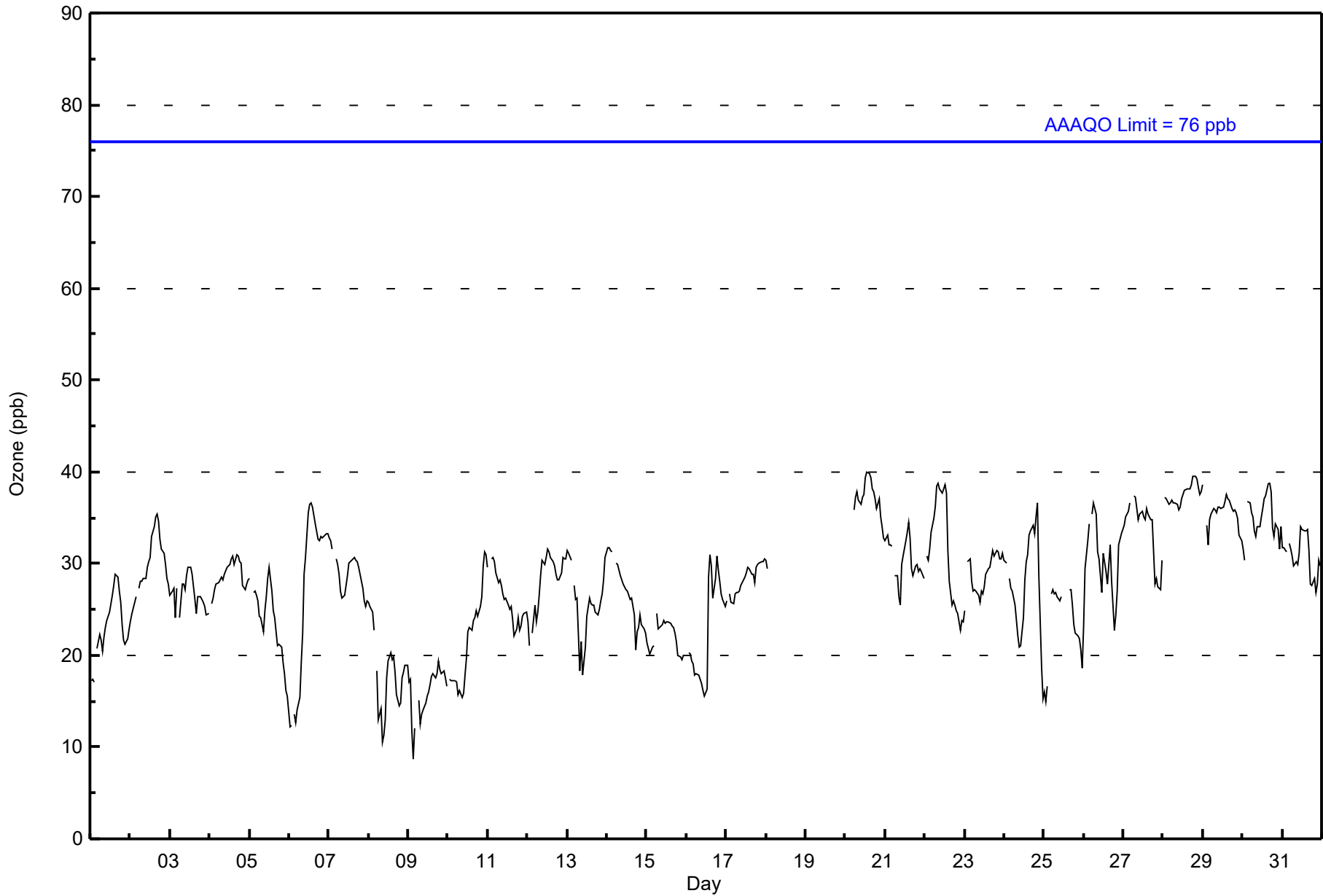
Janvier - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 39.9 ppb on Jan 20 14:00		Maximum Daily Average: 37.5 ppb on Jan 28																	Hours of Data:	661																													
Minimum Value: 8.6 ppb on Jan 9 04:00		Minimum Daily Average: 15.9 ppb on Jan 9																	Hours of Missing Data:	83																													
Maximum Diurnal Average: 30.1 ppb at hour 14		Minimum Diurnal Average: 26.1 ppb at hour 2																	Hours of Calibration:	34																													
Monthly Average: 27.72 ppb		Percentiles: P ₁ = 12.5 P ₁₀ = 18.1 Q ₁ = 24.0 Median = 28.2 Q ₃ = 31.7 P ₉₀ = 36.1 P ₉₉ = 39.0																	Percent Operational Time:	93.4																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	17.3	17.4	17.0	Z	20.8	22.2	21.6	20.4	22.0	23.1	23.8	24.8	25.7	26.5	27.6	28.8	28.5	27.0	25.9	23.4	21.7	21.2	21.9	22.8	23.1	28.8																							
2-Jan	23.8	24.6	25.2	26.4	Z	27.3	28.0	28.0	28.4	28.3	29.6	30.3	30.7	32.9	34.1	35.1	35.5	34.6	32.7	31.6	31.1	30.0	28.3	27.8	29.8	35.5																							
3-Jan	26.6	26.9	27.4	24.2	27.4	Z	24.2	27.7	27.8	27.2	28.7	29.6	29.6	28.8	27.5	26.1	24.5	26.4	26.4	26.1	25.7	25.3	24.3	24.6	26.7	29.6																							
4-Jan	Z	25.6	26.2	27.2	27.8	27.9	28.3	28.5	28.3	28.8	29.6	29.7	29.9	30.5	30.9	29.8	30.9	30.8	30.2	30.0	27.6	27.2	27.8	28.2	28.8	30.9																							
5-Jan	28.4	Z	26.8	27.1	26.6	26.0	24.3	24.1	22.5	24.9	26.4	28.3	29.6	27.0	24.8	24.0	22.6	21.1	21.2	21.0	19.3	18.0	16.2	15.6	23.7	29.6																							
6-Jan	12.3	12.4	Z	13.6	12.6	14.1	15.4	19.3	22.4	28.8	30.7	35.5	36.4	36.6	36.1	35.3	34.3	32.6	32.4	33.0	32.8	33.0	33.2	33.3	27.2	36.6																							
7-Jan	32.8	32.4	31.6	Z	30.5	29.9	28.8	26.9	26.2	26.5	27.6	28.7	30.0	30.2	30.4	30.7	30.4	30.2	29.5	28.8	27.4	25.9	25.3	25.9	29.0	32.8																							
8-Jan	25.8	25.3	24.7	22.7	Z	18.3	13.0	14.1	10.5	11.3	13.0	17.5	19.4	20.2	19.6	19.8	18.1	15.7	14.4	14.8	17.5	18.1	19.0	19.0	17.9	25.8																							
9-Jan	17.2	17.4	11.8	8.6	12.0	Z	15.1	12.6	13.6	14.1	14.8	15.6	15.9	16.7	17.7	18.0	17.5	18.0	19.4	18.4	18.0	18.3	17.5	16.7	15.9	19.4																							
10-Jan	Z	17.4	17.2	17.2	17.3	17.0	15.7	16.1	15.4	15.8	17.9	19.7	22.6	23.0	22.7	23.8	24.0	24.8	24.3	25.4	26.5	29.8	31.2	30.9	21.6	31.2																							
11-Jan	29.6	Z	30.5	30.6	30.2	29.0	27.8	28.3	27.7	26.7	26.1	26.2	25.4	25.0	25.3	24.0	22.1	22.8	24.1	22.7	23.1	24.2	24.5	24.7	26.1	30.6																							
12-Jan	23.6	21.1	Z	22.4	25.4	23.7	24.6	26.6	28.6	30.4	29.9	30.7	31.6	31.2	30.7	30.2	29.8	28.8	28.2	28.2	28.9	30.6	30.6	30.6	28.1	31.6																							
13-Jan	31.4	31.1	30.4	Z	27.7	26.0	26.2	18.3	21.5	17.8	19.3	20.9	24.3	26.3	25.6	25.5	25.4	24.8	24.3	25.0	25.9	26.8	28.2	30.6	25.4	31.4																							
14-Jan	31.7	31.7	31.4	31.3	Z	30.1	29.9	29.3	28.7	28.2	27.7	27.2	27.0	26.5	26.1	26.2	24.4	20.6	22.6	23.1	24.4	23.3	22.8	22.4	26.8	31.7																							
15-Jan	21.4	20.8	20.2	20.8	21.0	Z	24.6	23.0	23.0	23.4	23.8	23.6	23.7	23.0	23.7	23.5	23.2	23.1	22.4	21.6	19.9	19.9	19.5	20.0	20.0	22.0	24.6																						
16-Jan	Z	20.3	20.1	19.3	19.0	17.8	18.0	17.9	17.5	16.9	16.2	15.6	16.3	28.6	31.0	29.7	26.2	28.3	30.8	29.2	28.0	26.6	26.1	25.4	22.8	31.0																							
17-Jan	25.9	Z	26.7	25.8	25.7	26.7	26.9	26.9	27.1	27.6	28.2	28.6	29.0	29.7	29.5	28.8	28.8	27.9	29.6	29.8	30.0	30.2	30.2	30.5	28.3	30.5																							
18-Jan	30.4	29.5	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	30.4																						
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																						
20-Jan	M	M	M	M	Z	35.8	37.2	37.9	37.0	36.5	37.2	37.6	39.4	39.9	39.8	39.4	38.1	37.8	37.1	36.1	37.0	35.1	34.0	32.8	37.1	39.9																							
21-Jan	32.5	33.0	32.0	32.1	31.9	Z	28.6	28.7	26.4	25.5	29.9	30.8	32.5	33.4	34.5	32.8	29.4	28.6	29.7	29.9	29.1	29.4	29.1	28.3	30.4	34.5																							
22-Jan	Z	30.9	30.4	31.5	33.4	34.9	36.1	38.5	38.8	38.1	37.6	38.2	38.5	37.6	31.4	28.1	25.5	26.0	25.5	24.8	24.6	22.7	23.8	23.6	31.3	38.8																							
23-Jan	24.9	Z	30.2	30.5	28.1	27.1	27.2	27.1	26.6	25.8	26.9	26.6	27.4	28.9	29.4	29.6	30.5	31.4	30.9	31.5	31.3	30.6	30.5	31.2	28.9	31.5																							
24-Jan	30.3	30.1	Z	28.4	27.2	26.9	25.4	23.8	22.1	20.8	21.0	24.1	28.3	30.2	31.0	33.2	33.5	34.2	33.2	35.1	36.6	28.7	18.6	15.3	27.7	36.6																							
25-Jan	16.1	15.0	16.6	Z	26.7	27.2	26.6	26.8	26.4	25.9	26.5	C	C	C	C	27.1	27.1	25.5	23.4	22.5	22.2	21.8	20.6	18.6	23.3	27.2																							
26-Jan	23.2	29.4	32.5	34.2	Z	35.3	36.5	35.4	31.3	30.6	28.6	26.9	31.1	29.2	27.8	29.8	32.1	28.0	22.8	24.4	27.0	32.0	32.6	33.3	30.2	36.5																							
27-Jan	34.1	35.1	35.4	35.8	36.6	Z	37.3	37.3	36.0	34.7	35.4	35.7	35.1	34.8	36.1	35.3	34.8	34.8	31.3	27.7	28.4	27.5	27.1	30.3	33.8	37.3																							
28-Jan	Z	37.3	37.1	36.5	36.6	36.9	36.6	36.6	36.4	35.9	36.1	37.0	37.5	38.0	38.2	38.2	38.1	38.6	39.5	39.5	39.2	38.4	37.5	37.8	37.5	39.5																							
29-Jan	38.5	Z	34.1	32.1	34.8	35.4	36.0	35.8	35.6	36.1	36.2	35.9	36.1	36.8	37.5	37.1	36.9	36.1	35.7	35.9	35.5	34.9	33.1	32.4	35.6	38.5																							
30-Jan	31.5	30.3	Z	36.8	36.7	35.6	35.0	33.5	33.0	34.1	34.0	35.2	36.1	37.1	37.4	38.7	38.7	37.8	33.9	33.0	34.3	33.7	31.6	34.0	34.9	38.7																							
31-Jan	31.8	31.7	31.3	Z	32.2	31.6	30.8	29.7	30.3	29.9	31.1	34.0	33.8	33.5	33.6	33.7	31.4	27.8	27.6	28.3	26.8	27.8	30.4	29.7	30.8	34.0																							
																								26.7	26.1	26.9	26.7	27.0	27.6	27.1	26.9	26.6	26.7	27.4	28.4	29.4	30.1	30.0	29.7	29.1	28.4	27.9	27.5	27.6	27.3	26.8	26.8	Diurnal Average	
																								38.5	37.3	37.1	36.8	36.7	36.9	37.3	38.5	38.8	38.1	37.6	38.2	39.4	39.9	39.8	39.4	38.7	38.6	39.5	39.5	39.2	38.4	37.5	37.8	Diurnal Maximum	
Z - zerospan																								C - Calibration						M - Maintenance						UO - Unstable Operation													
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Janvier - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	95	14.37	14.37
21 - 50	566	85.63	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 661

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Ozone (O₃) - ppb
Janvier - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	16	29	6	3	4	1	3	5	1	7	3	1	1	1	3	10	94
21 - 50	30	62	15	10	7	9	14	8	27	168	119	22	12	21	30	10	564
51 - 82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	46	91	21	13	11	10	17	13	28	175	122	23	13	22	33	20	658

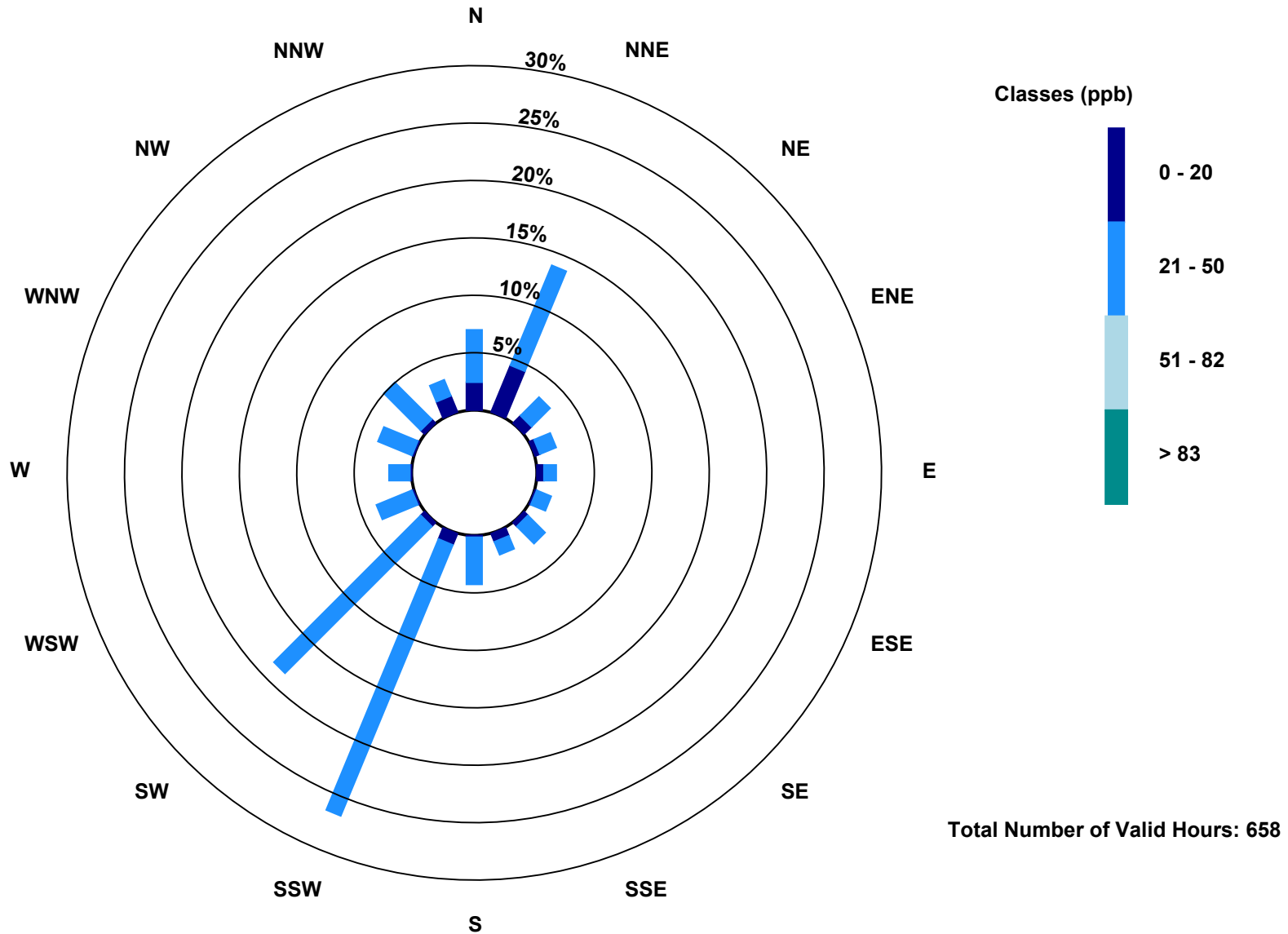
Total Number of Valid Hours: 658

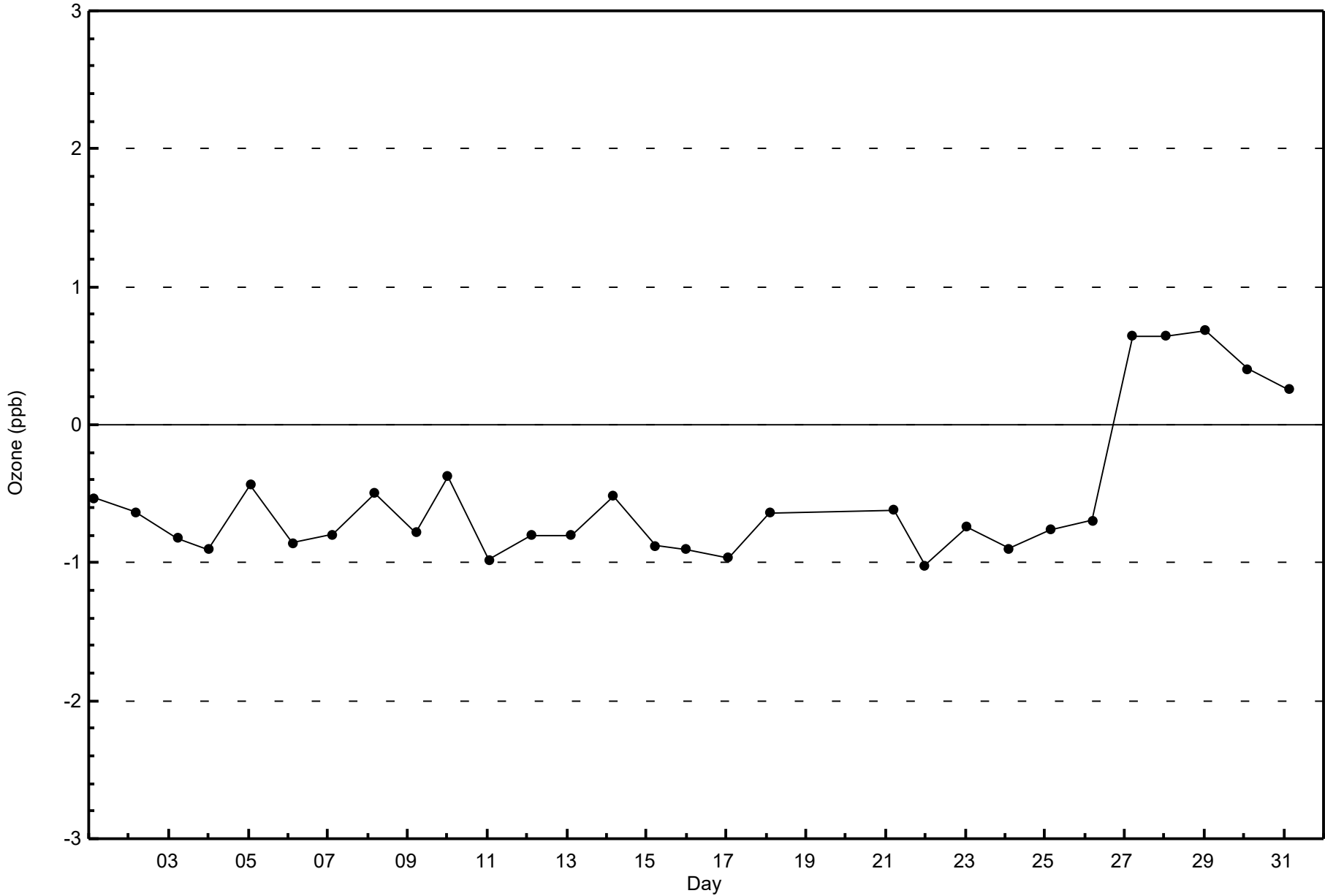
Total Number of Hours: 744

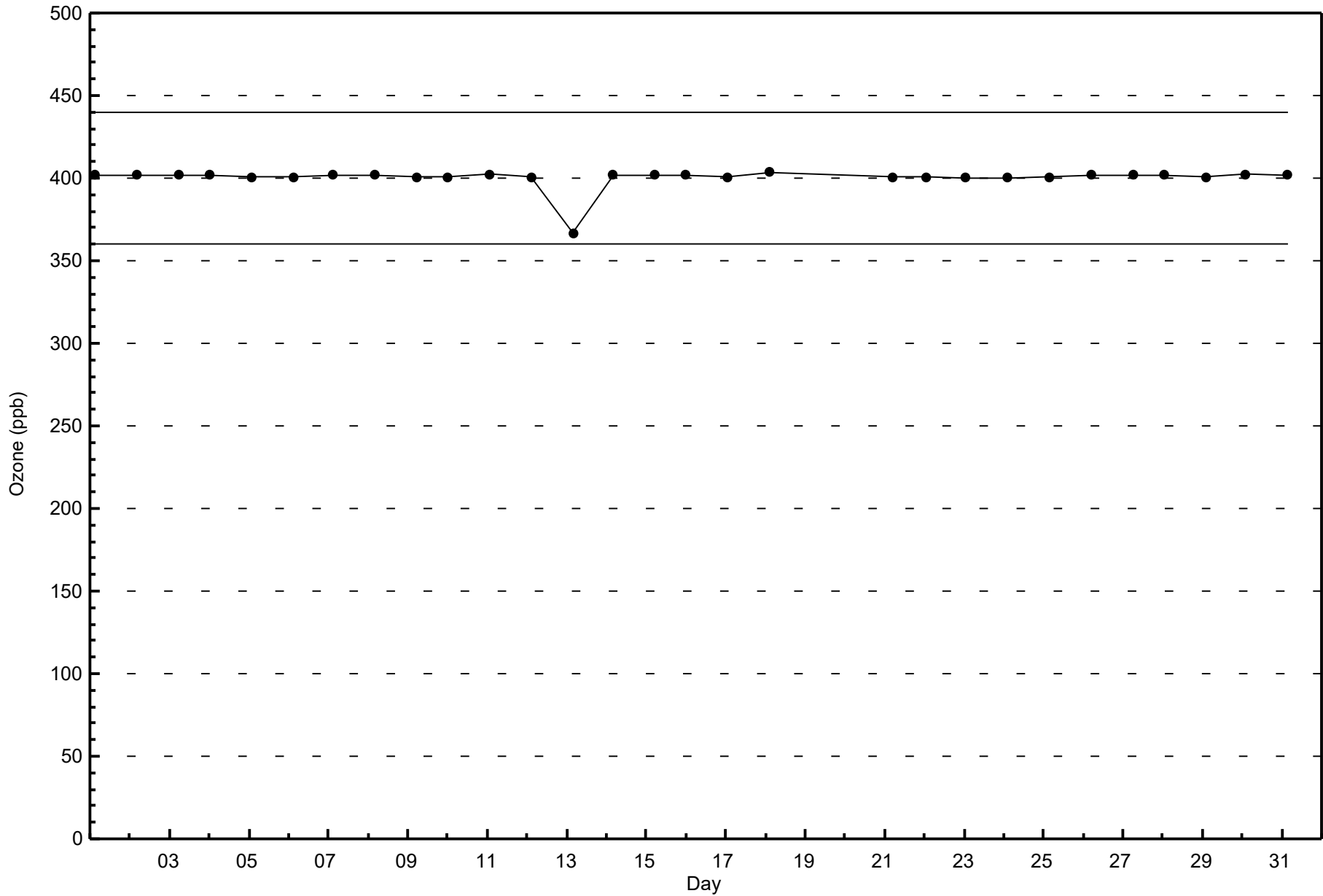


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Ozone (O₃) - ppb
Janvier





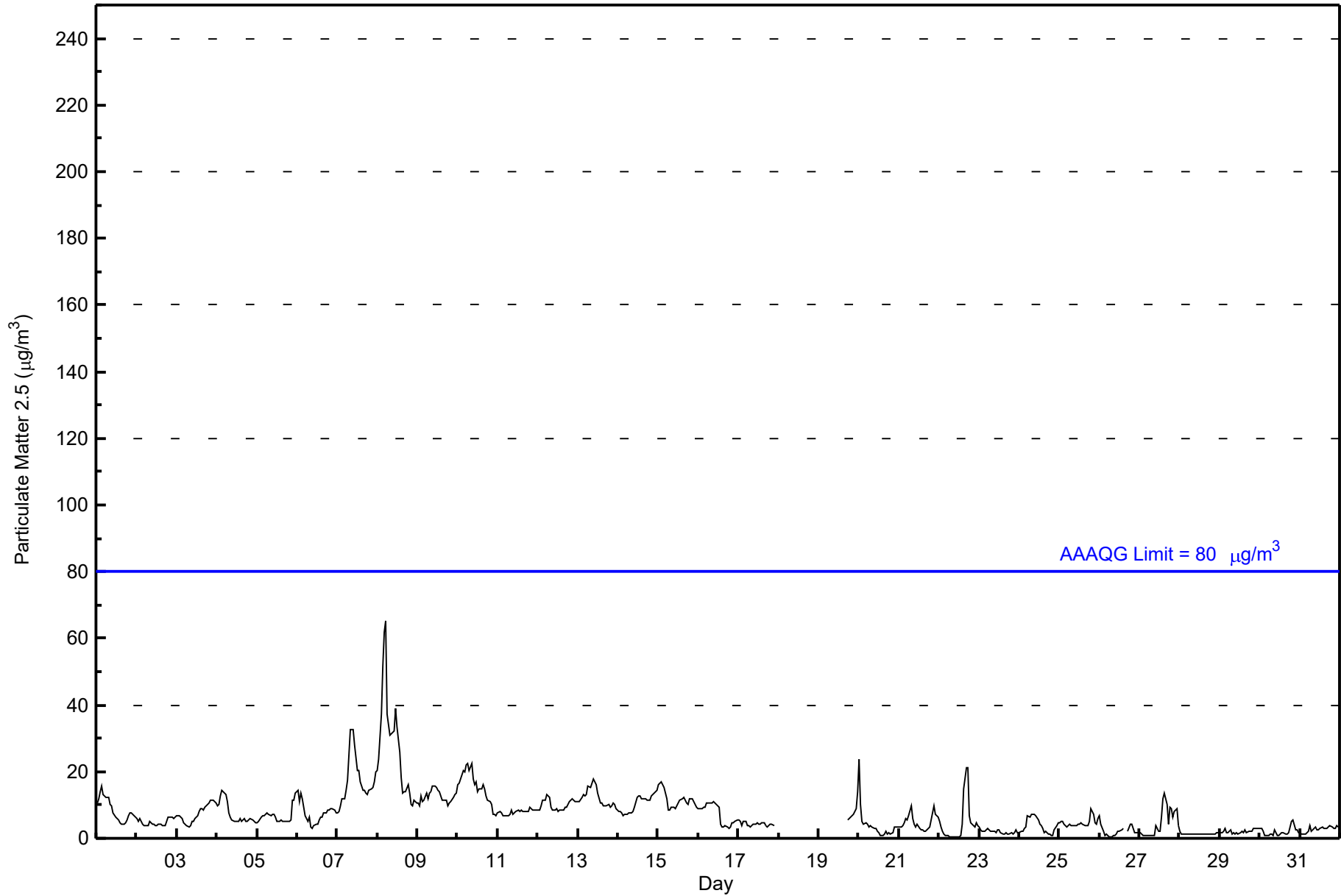




Summary of Hour Averages

Janvier - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744						
Maximum Value: 65.4 µg/m ³ on Jan 8 06:00		Maximum Daily Average: 27.3 µg/m ³ on Jan 8																	Hours of Data: 699								
Minimum Value: 0.4 µg/m ³ on Jan 22 12:00		Minimum Daily Average: 1.3 µg/m ³ on Jan 28																	Hours of Missing Data: 45								
Maximum Diurnal Average: 9.0 µg/m ³ at hour 6		Minimum Diurnal Average: 6.5 µg/m ³ at hour 18																	Hours of Calibration: 2								
Monthly Average: 7.51 µg/m ³		Percentiles: P ₁ = 0.5 P ₁₀ = 1.3 Q ₁ = 3.0 Median = 5.8 Q ₃ = 10.4 P ₉₀ = 14.2 P ₉₉ = 32.8																	Percent Operational Time: 94.2								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	10.6	11.9	14.0	15.8	13.1	12.2	12.1	12.3	10.2	9.7	7.7	6.4	6.1	5.6	4.7	4.3	4.3	4.7	5.3	6.9	7.7	7.5	6.9	6.3	8.6	15.8	
2-Jan	5.8	5.2	5.8	4.2	3.8	3.7	3.7	3.8	5.1	4.1	4.2	3.9	4.0	4.1	4.1	4.0	3.6	4.0	5.2	6.3	6.4	6.2	6.1	6.5	4.7	6.5	
3-Jan	6.9	6.7	6.5	5.9	4.9	4.1	3.7	3.4	3.7	5.3	5.2	5.9	6.7	8.1	9.1	8.9	8.6	9.5	10.2	10.8	11.3	11.6	11.5	10.7	7.5	11.6	
4-Jan	9.8	10.1	12.5	14.2	13.9	13.3	10.8	7.7	6.3	5.5	4.9	5.0	5.1	5.0	5.8	5.0	6.1	5.0	5.0	5.6	6.0	5.6	5.0	4.8	7.4	14.2	
5-Jan	4.9	5.1	6.3	6.8	6.9	7.4	7.6	7.3	6.9	7.2	7.0	6.2	5.3	5.3	5.3	5.1	5.0	5.0	4.9	5.2	5.5	11.4	11.3	13.6	6.8	13.6	
6-Jan	14.5	11.1	13.7	11.9	9.4	6.9	5.2	6.3	3.4	3.1	3.7	4.1	4.4	5.6	6.3	6.4	7.5	7.7	8.5	8.3	9.0	9.0	8.3	7.5	7.6	14.5	
7-Jan	7.6	7.9	9.7	11.9	12.0	14.4	17.2	24.9	32.6	32.8	28.0	24.1	20.5	20.2	16.8	14.2	14.3	13.7	13.1	14.2	14.8	15.4	17.1	20.0	17.4	32.8	
8-Jan	20.5	23.5	37.4	51.9	62.0	65.4	37.3	31.1	31.3	31.7	32.0	39.2	33.7	25.7	18.1	13.5	14.2	13.9	16.3	13.6	10.2	9.7	11.4	10.7	27.3	65.4	
9-Jan	10.4	9.9	12.5	10.9	11.5	13.6	11.9	13.4	14.1	15.8	15.6	15.1	14.3	14.0	12.8	11.5	11.3	11.4	9.8	10.4	11.0	12.2	13.3	13.5	12.5	15.8	
10-Jan	15.9	16.4	18.0	20.2	19.9	22.0	22.4	20.5	22.3	17.9	16.2	16.9	13.8	14.6	14.9	16.0	14.8	12.8	11.6	10.9	10.2	7.4	7.3	6.6	15.4	22.4	
11-Jan	7.5	7.8	7.6	6.9	6.7	6.6	6.6	7.1	8.6	7.4	7.5	8.3	8.6	8.0	8.6	8.0	8.3	8.0	8.0	9.4	9.0	8.5	8.6	8.6	7.9	9.4	
12-Jan	8.4	8.5	9.6	11.3	11.5	13.1	12.9	12.4	9.5	8.3	8.4	8.8	8.0	8.4	8.3	8.5	9.2	9.2	10.1	11.0	11.9	11.5	10.9	11.1	10.0	13.1	
13-Jan	10.9	11.1	12.3	13.2	12.9	13.0	15.6	15.4	16.4	17.7	17.1	15.9	13.6	10.5	10.4	9.6	9.9	9.9	10.0	9.3	9.7	10.7	10.3	8.7	12.3	17.7	
14-Jan	8.1	7.9	7.6	6.9	7.0	7.2	7.4	7.6	7.8	8.1	9.4	12.4	12.9	12.6	12.0	11.8	11.9	11.3	11.5	12.7	13.3	13.9	14.3	10.3	14.3		
15-Jan	16.0	16.4	17.0	15.2	13.7	12.1	8.4	8.7	9.2	9.2	9.0	9.6	10.5	11.2	12.0	12.4	11.6	10.5	10.1	11.7	11.8	10.9	10.0	9.5	11.5	17.0	
16-Jan	9.1	9.0	9.0	9.1	9.3	10.5	10.6	10.8	10.7	10.9	10.6	10.4	9.3	4.1	3.3	3.5	3.8	3.4	2.8	3.5	4.7	4.9	5.1	5.6	7.2	10.9	
17-Jan	5.6	5.2	3.9	5.1	5.2	3.8	3.7	3.5	3.8	4.2	4.4	4.5	4.4	4.4	4.6	4.6	3.6	3.2	3.7	4.4	4.4	4.0	4.0	4.0	4.3	5.6	
18-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
19-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	M	5.6	5.8	6.2	6.8	7.4	8.8	14.2	--	14.2	
20-Jan	23.9	10.2	5.3	4.4	4.6	4.1	3.5	3.7	3.3	3.1	3.0	2.1	1.6	0.9	0.9	1.3	2.0	1.2	1.5	1.2	1.8	3.4	3.6	3.3	3.9	23.9	
21-Jan	3.3	3.5	3.8	4.7	6.1	5.6	6.7	9.6	5.9	4.1	3.5	4.0	2.8	2.5	2.3	2.1	2.1	2.4	3.2	5.5	7.7	9.8	7.2	6.5	4.8	9.8	
22-Jan	5.2	3.3	2.3	1.3	0.9	0.7	0.6	0.5	0.4	0.5	0.5	0.4	0.4	0.7	4.4	14.9	21.1	21.0	6.8	4.8	4.1	3.5	4.5	3.8	4.4	21.1	
23-Jan	3.6	2.4	2.0	2.1	2.4	2.8	2.6	2.3	2.0	2.1	1.7	2.4	2.6	1.7	1.2	1.2	1.5	1.3	1.3	1.5	1.4	1.8	2.4	1.8	2.0	3.6	
24-Jan	1.6	1.9	2.2	3.0	3.5	6.7	6.3	7.4	7.0	7.3	6.9	5.7	4.2	3.7	2.9	1.9	2.3	1.3	1.1	0.9	1.1	2.3	3.9	4.5	3.7	7.4	
25-Jan	4.7	5.1	5.2	4.3	3.6	3.9	4.2	3.9	3.9	3.9	3.6	4.2	4.3	4.7	4.3	3.7	3.8	4.0	5.2	8.7	7.3	4.8	4.1	5.9	4.6	8.7	
26-Jan	6.7	4.1	2.0	1.0	1.1	0.8	0.5	0.5	0.8	0.9	1.1	2.0	1.9	2.7	2.9	C	C	2.0	4.3	4.1	2.9	1.7	1.5	1.5	2.1	6.7	
27-Jan	1.6	1.2	0.9	0.9	0.8	0.9	0.8	0.7	0.8	1.0	3.9	2.2	2.3	6.2	11.9	13.6	10.2	4.1	9.3	8.9	6.5	8.1	8.7	3.7	4.5	13.6	
28-Jan	2.0	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.9	1.7	1.3	2.0	
29-Jan	1.7	1.6	2.0	2.8	1.9	1.6	2.4	1.4	1.6	1.3	1.7	1.4	1.6	2.2	1.6	2.5	1.6	2.0	2.2	2.3	3.0	3.1	2.9	3.2	2.1	3.2	
30-Jan	2.9	2.9	2.3	1.0	1.0	0.9	1.2	1.2	1.0	2.5	0.9	1.0	1.4	1.7	1.6	1.1	1.3	1.6	3.3	5.0	5.5	2.4	2.7	1.7	2.0	5.5	
31-Jan	1.7	1.5	1.4	1.3	1.6	2.2	3.7	2.3	3.1	3.5	2.5	2.5	3.0	3.3	2.9	2.9	3.1	3.3	3.9	3.5	3.0	2.9	3.6	3.6	2.8	3.9	
8.0 7.3 8.1 8.6 8.7 9.0 8.0 8.0 8.0 7.9 7.6 7.8 7.2 6.9 6.7 6.9 7.1 6.5 6.5 6.9 7.0 7.1 7.3 7.4																								Diurnal Average			
23.9 23.5 37.4 51.9 62.0 65.4 37.3 31.1 32.6 32.8 32.0 39.2 33.7 25.7 18.1 16.0 21.1 21.0 16.3 14.2 14.8 15.4 17.1 20.0																								Diurnal Maximum			
C - Calibration M - Maintenance UO - Unstable Operation																											
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Janvier - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	335	47.93	47.93
6 - 15	310	44.35	92.27
16 - 25	39	5.58	97.85
26 - 80	15	2.15	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Janvier - January 2023

Concentration Ranges (µg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	21	51	8	4	3	3	9	6	18	72	54	17	9	20	29	9	333
6 - 15	19	33	12	10	8	8	7	7	12	91	78	6	3	5	4	7	310
16 - 25	7	9	1	0	1	0	1	0	0	9	4	0	1	0	1	4	38
26 - 80	1	4	1	0	0	0	0	0	0	6	2	0	0	0	1	0	15
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	22	14	12	11	17	13	30	178	138	23	13	25	35	20	696

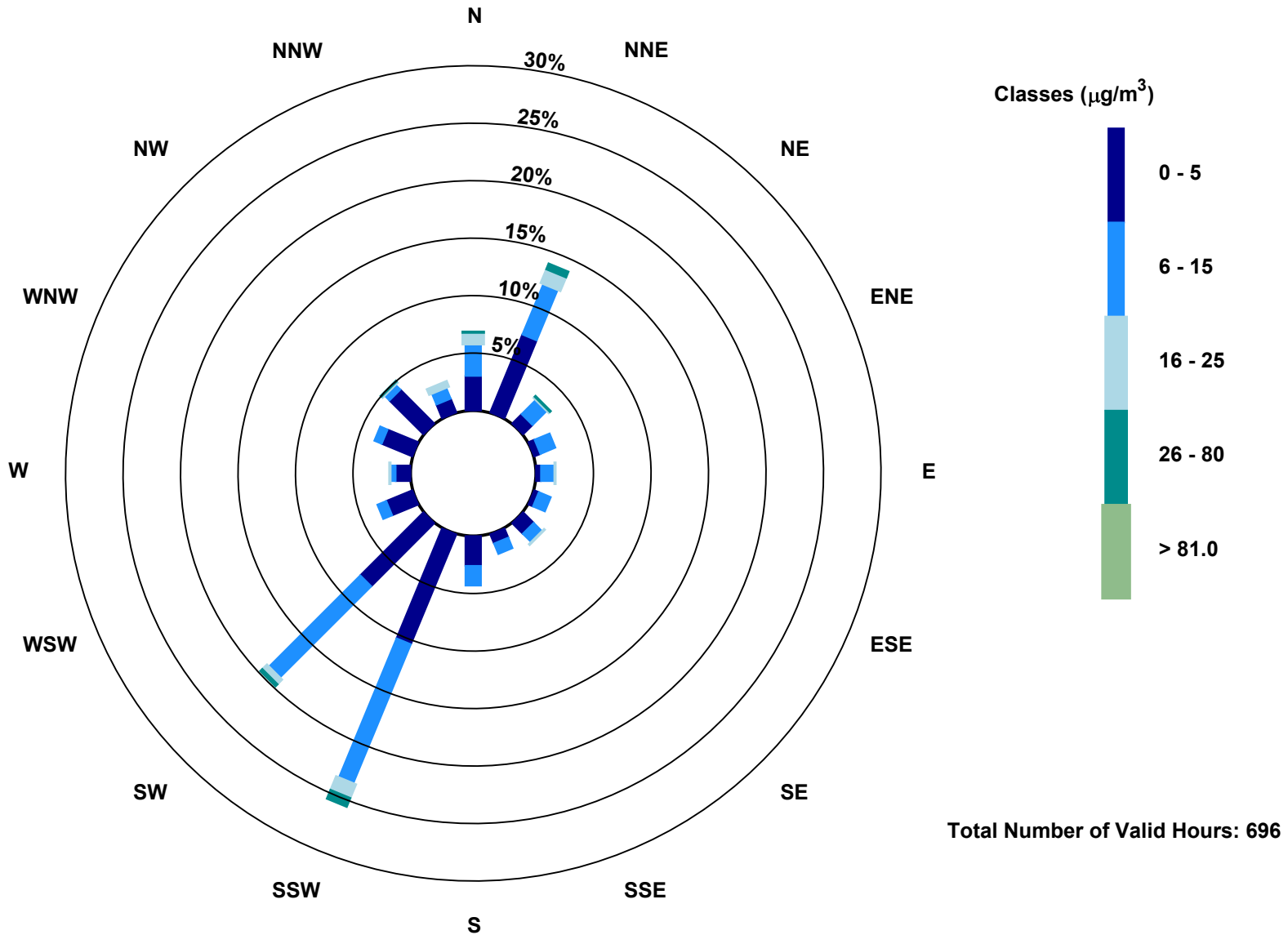
Total Number of Valid Hours: 696

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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



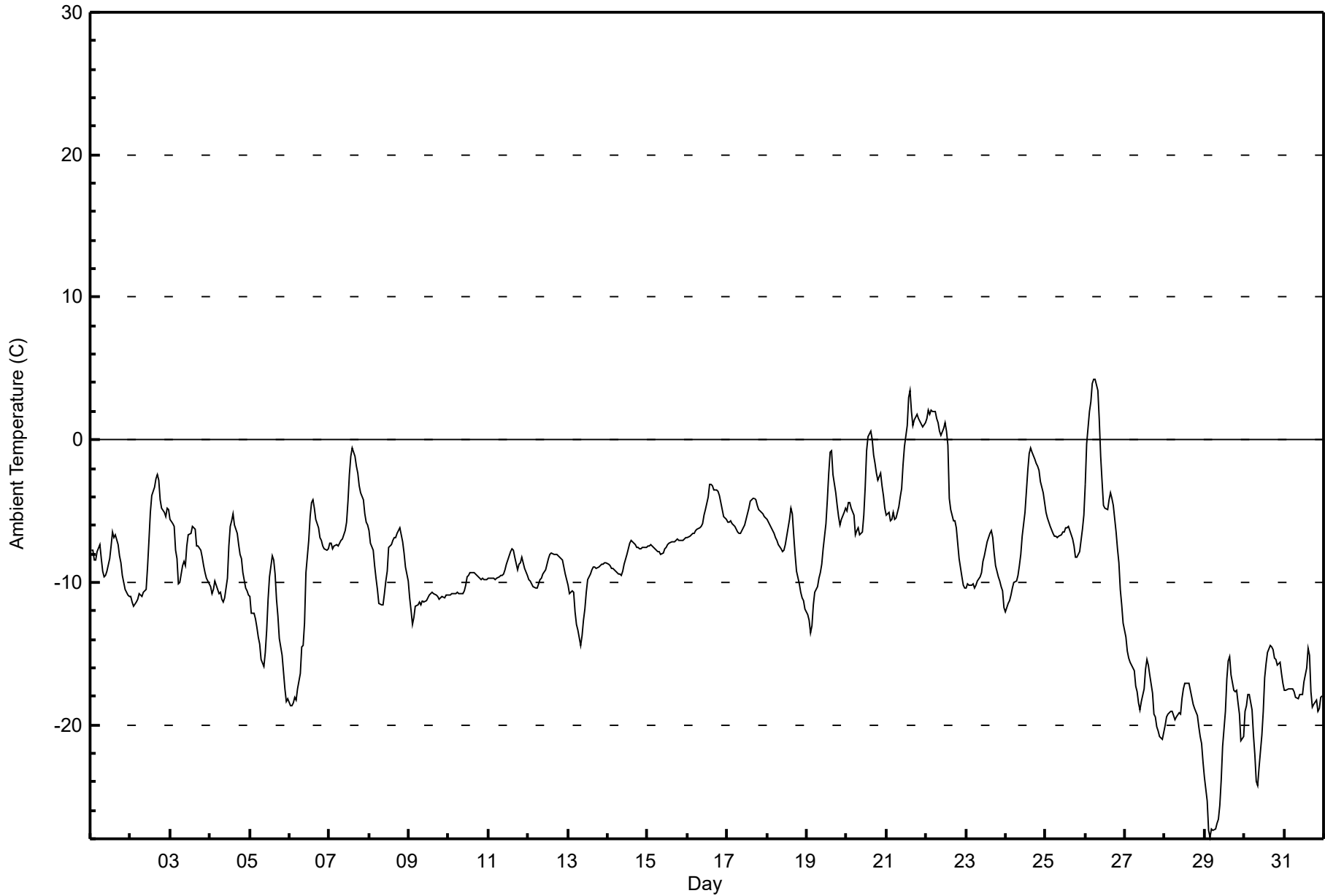
Total Number of Valid Hours: 696



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Janvier - January 2023

Maximum Value: 4.3 C on Jan 26 07:00 Maximum Daily Average: -1.4 C on Jan 21		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -27.9 C on Jan 29 04:00 Minimum Daily Average: -21.9 C on Jan 29 Maximum Diurnal Average: -6.8 C at hour 15 Minimum Diurnal Average: -10.7 C at hour 9 Monthly Average: -9.28 C Percentiles: P ₁ = -25.5 P ₁₀ = -17.9 Q ₁ = -11.2 Median = -8.6 Q ₃ = -6.1 P ₉₀ = -3.3 P ₉₉ = 2.1																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-7.7	-7.7	-8.4	-8.4	-7.8	-7.4	-8.3	-9.2	-9.6	-9.5	-9.2	-8.3	-7.5	-6.4	-6.9	-6.7	-7.4	-8.1	-8.6	-9.5	-10.0	-10.5	-10.9	-11.0	-8.5	-6.4
2-Jan	-11.0	-11.3	-11.7	-11.4	-11.1	-10.8	-10.9	-11.0	-10.7	-10.5	-9.0	-7.0	-5.1	-3.9	-3.3	-2.7	-2.4	-2.8	-4.2	-4.8	-5.1	-5.4	-4.8	-4.9	-7.3	-2.4
3-Jan	-5.6	-5.9	-6.1	-7.7	-8.4	-10.1	-10.0	-8.8	-8.6	-8.8	-7.5	-6.7	-6.5	-6.1	-6.3	-7.5	-7.4	-7.8	-8.2	-8.9	-9.3	-9.7	-10.1	-7.8	-5.6	
4-Jan	-10.3	-10.8	-10.5	-9.9	-10.2	-10.8	-10.7	-11.1	-11.4	-11.1	-9.7	-7.4	-6.1	-5.7	-5.2	-5.9	-6.6	-7.3	-8.0	-8.3	-9.3	-10.4	-10.6	-10.9	-9.1	-5.2
5-Jan	-11.0	-12.2	-12.2	-12.5	-13.1	-13.8	-14.3	-15.4	-15.9	-14.9	-13.4	-11.2	-9.6	-8.2	-8.4	-9.5	-11.1	-12.4	-13.9	-15.1	-16.3	-17.5	-18.4	-18.2	-13.3	-8.2
6-Jan	-18.7	-18.7	-18.5	-18.1	-18.3	-17.5	-16.4	-14.6	-14.4	-12.9	-9.3	-7.1	-5.4	-4.4	-4.2	-4.8	-5.6	-6.2	-6.9	-7.1	-7.5	-7.7	-7.8	-7.6	-10.8	-4.2
7-Jan	-7.3	-7.3	-7.6	-7.4	-7.4	-7.5	-7.3	-7.0	-7.0	-6.4	-5.8	-4.3	-2.5	-1.2	-0.5	-1.1	-1.8	-2.3	-3.2	-3.8	-4.2	-5.1	-5.8	-6.0	-5.0	-0.5
8-Jan	-6.4	-7.3	-7.7	-8.8	-9.7	-10.5	-11.5	-11.6	-11.6	-10.8	-9.9	-9.3	-7.5	-7.3	-7.1	-6.9	-6.8	-6.6	-6.2	-6.7	-7.2	-7.9	-8.9	-9.9	-8.5	-6.2
9-Jan	-11.1	-11.9	-12.9	-12.4	-11.7	-11.6	-11.4	-11.6	-11.3	-11.3	-11.2	-11.1	-10.9	-10.8	-10.7	-10.8	-10.9	-11.0	-11.2	-11.1	-11.0	-11.1	-10.9	-10.9	-11.3	-10.7
10-Jan	-10.9	-10.9	-10.8	-10.8	-10.8	-10.7	-10.8	-10.8	-10.8	-10.6	-10.2	-9.6	-9.5	-9.3	-9.4	-9.4	-9.5	-9.6	-9.8	-9.7	-9.8	-9.8	-9.8	-9.8	-10.1	-9.3
11-Jan	-9.8	-9.7	-9.7	-9.8	-9.8	-9.7	-9.6	-9.5	-9.5	-9.4	-9.1	-8.7	-8.2	-7.8	-7.6	-7.7	-8.2	-9.1	-8.7	-8.6	-8.3	-8.6	-9.0	-9.5	-9.0	-7.6
12-Jan	-9.8	-9.9	-10.1	-10.3	-10.4	-10.4	-10.1	-9.8	-9.7	-9.5	-9.1	-8.7	-8.3	-8.0	-8.0	-8.0	-8.0	-8.1	-8.1	-8.2	-8.5	-8.9	-9.4	-9.8	-9.1	-8.0
13-Jan	-10.2	-10.8	-10.6	-10.7	-12.1	-12.9	-13.4	-14.4	-13.7	-12.6	-11.9	-10.7	-9.8	-9.4	-9.1	-8.9	-8.9	-9.0	-9.0	-8.8	-8.8	-8.8	-8.6	-8.6	-10.5	-8.6
14-Jan	-8.7	-8.8	-9.0	-9.1	-9.2	-9.3	-9.4	-9.4	-9.5	-9.3	-8.8	-8.1	-7.7	-7.2	-7.1	-7.1	-7.4	-7.6	-7.5	-7.6	-7.6	-7.6	-7.6	-7.5	-8.2	-7.1
15-Jan	-7.5	-7.5	-7.4	-7.5	-7.6	-7.7	-7.8	-7.9	-8.0	-8.0	-7.7	-7.5	-7.3	-7.3	-7.2	-7.1	-7.1	-7.1	-7.0	-7.1	-7.1	-7.0	-7.0	-6.9	-7.4	-6.9
16-Jan	-6.8	-6.8	-6.7	-6.6	-6.5	-6.4	-6.3	-6.2	-6.1	-5.8	-5.3	-4.9	-4.0	-3.1	-3.2	-3.2	-3.5	-3.5	-3.6	-4.0	-4.4	-4.9	-5.4	-5.6	-5.1	-3.1
17-Jan	-5.8	-5.8	-5.7	-5.8	-6.1	-6.3	-6.5	-6.6	-6.5	-6.3	-5.9	-5.6	-5.1	-4.8	-4.3	-4.1	-4.1	-4.2	-4.6	-4.9	-5.0	-5.2	-5.4	-5.5	-5.4	-4.1
18-Jan	-5.6	-5.8	-6.2	-6.4	-6.6	-6.8	-7.1	-7.4	-7.7	-7.9	-7.7	-7.4	-6.8	-5.6	-4.8	-5.2	-6.7	-8.1	-9.2	-10.1	-10.7	-11.1	-11.3	-11.9	-7.7	-4.8
19-Jan	-12.3	-12.7	-13.5	-13.1	-11.6	-10.7	-10.3	-9.7	-9.3	-8.8	-7.6	-5.9	-4.2	-2.3	-0.9	-0.8	-2.5	-3.7	-4.6	-5.4	-6.0	-5.6	-5.1	-4.8	-7.1	-0.8
20-Jan	-5.0	-4.4	-4.4	-4.8	-5.3	-6.7	-6.4	-6.1	-6.7	-6.5	-5.3	-3.3	-0.8	0.2	0.6	0.0	-1.0	-1.7	-2.3	-2.8	-2.3	-3.2	-4.0	-4.8	-3.6	0.6
21-Jan	-5.3	-5.1	-5.7	-5.6	-5.1	-5.6	-5.5	-4.7	-4.0	-3.4	-1.7	-0.5	1.0	2.9	3.4	2.0	1.0	1.4	1.8	1.5	1.3	1.1	0.9	1.2	-1.4	3.4
22-Jan	1.5	2.1	1.8	2.1	2.0	2.0	1.5	1.2	0.6	0.3	0.8	1.2	0.6	-0.4	-4.1	-4.9	-5.6	-5.7	-6.2	-7.2	-8.3	-9.6	-10.2	-10.4	-2.3	2.1
23-Jan	-10.4	-10.1	-10.2	-10.2	-10.1	-10.4	-10.2	-9.9	-9.6	-9.3	-8.5	-8.1	-7.7	-7.2	-6.6	-6.4	-6.9	-7.9	-8.8	-9.6	-9.9	-10.3	-10.6	-11.7	-9.2	-6.4
24-Jan	-12.0	-11.5	-11.3	-10.9	-10.4	-10.0	-9.9	-9.5	-8.9	-8.0	-6.7	-5.1	-3.6	-2.1	-1.0	-0.6	-0.9	-1.4	-1.7	-1.8	-2.1	-2.9	-3.7	-4.4	-5.9	-0.6
25-Jan	-5.1	-5.5	-5.8	-6.1	-6.6	-6.7	-6.8	-6.8	-6.8	-6.7	-6.4	-6.5	-6.2	-6.2	-6.1	-6.6	-6.9	-7.5	-8.2	-8.3	-7.8	-7.0	-6.2	-5.3	-6.6	-5.1
26-Jan	-3.2	-0.2	1.9	2.7	3.9	4.2	4.3	3.5	1.4	-1.2	-3.0	-4.6	-4.8	-4.9	-4.2	-3.7	-4.1	-4.6	-6.5	-7.6	-8.6	-10.5	-11.6	-12.9	-3.1	4.3
27-Jan	-13.8	-14.8	-15.3	-15.6	-15.8	-16.2	-17.3	-17.7	-18.5	-19.0	-18.4	-17.5	-16.1	-15.4	-15.9	-16.5	-17.8	-19.2	-19.4	-20.1	-20.4	-20.8	-21.0	-20.5	-17.6	-13.8
28-Jan	-20.0	-19.4	-19.3	-19.0	-19.0	-19.4	-19.6	-19.4	-19.1	-19.2	-18.1	-17.5	-17.1	-17.1	-17.1	-17.6	-18.1	-18.5	-18.8	-19.4	-20.1	-20.8	-21.3	-22.6	-19.1	-17.1
29-Jan	-23.6	-25.3	-27.4	-27.9	-27.3	-27.4	-27.3	-26.9	-26.6	-25.7	-23.9	-21.6	-19.0	-16.7	-15.5	-15.2	-16.5	-17.6	-17.7	-17.6	-18.5	-19.2	-21.1	-20.9	-21.9	-15.2
30-Jan	-19.1	-18.7	-17.8	-17.9	-19.0	-20.7	-22.1	-23.9	-24.2	-23.0	-20.7	-19.0	-16.7	-15.8	-14.9	-14.4	-14.5	-14.7	-15.3	-15.4	-15.8	-15.6	-16.4	-17.1	-18.0	-14.4
31-Jan	-17.6	-17.6	-17.5	-17.5	-17.5	-17.5	-17.7	-18.1	-18.2	-17.9	-17.8	-17.9	-17.0	-16.0	-14.6	-15.1	-17.6	-18.8	-18.6	-18.3	-19.1	-18.9	-18.1	-17.9	-17.6	-14.6
	-10.0	-10.1	-10.2	-10.2	-10.3	-10.5	-10.6	-10.7	-10.7	-10.4	-9.6	-8.7	-7.7	-7.0	-6.8	-7.0	-7.6	-8.1	-8.5	-8.9	-9.3	-9.7	-10.0	-10.2	Diurnal Average	
	1.5	2.1	1.9	2.7	3.9	4.2	4.3	3.5	1.4	0.3	0.8	1.2	1.0	2.9	3.4	2.0	1.0	1.4	1.8	1.5	1.3	1.1	0.9	1.2	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Janvier - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	29	3.90	3.90
-20 - 0	680	91.40	95.30
0 - 10	35	4.70	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

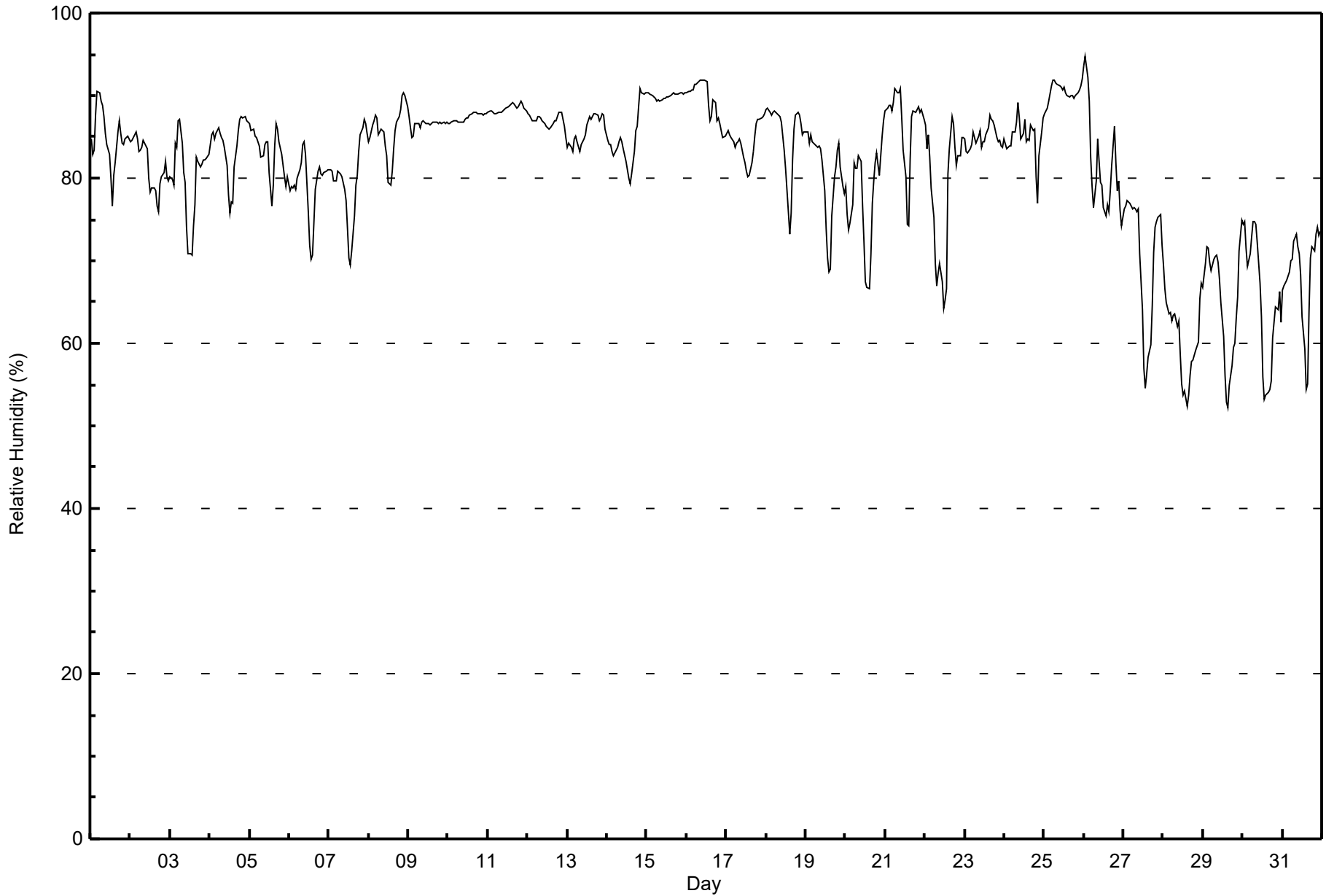
Relative Humidity (RH) - %
Janvier - January 2023

Maximum Value: 94.7 % on Jan 26 02:00 Maximum Daily Average: 90.4 % on Jan 25																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 52.1 % on Jan 29 16:00 Minimum Daily Average: 60.6 % on Jan 28 Maximum Diurnal Average: 83.2 % at hour 1 Minimum Diurnal Average: 75.5 % at hour 14 Monthly Average: 81.30 % Percentiles: P ₁ = 54.1 P ₁₀ = 68.4 Q ₁ = 78.5 Median = 84.3 Q ₃ = 87.2 P ₉₀ = 89.3 P ₉₉ = 91.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	84.7	82.9	83.4	87.6	90.5	90.4	89.3	88.9	87.4	85.4	84.0	82.8	80.1	76.6	80.3	81.9	85.6	87.0	85.5	84.3	84.0	84.7	85.1	84.8	84.9	90.5
2-Jan	84.5	84.5	84.9	85.5	84.7	83.2	83.3	83.7	84.6	83.9	83.5	80.0	78.3	78.7	78.7	78.4	76.6	75.9	79.4	80.2	80.7	82.1	80.2	79.6	81.5	85.5
3-Jan	80.3	79.8	79.2	84.2	83.8	86.9	87.1	84.3	80.6	79.4	74.1	70.8	70.8	70.6	74.3	76.8	82.5	82.1	81.4	81.7	82.2	82.2	82.4	82.9	80.0	87.1
4-Jan	84.0	85.3	85.6	84.8	85.4	86.2	85.4	84.9	84.6	83.7	81.6	77.9	75.8	77.1	76.9	81.4	83.9	85.8	87.1	87.5	87.3	87.4	87.0	86.8	83.9	87.5
5-Jan	86.6	85.8	85.9	85.0	84.9	84.5	83.8	82.5	82.7	84.0	84.4	80.7	76.6	79.1	83.8	86.7	85.9	84.4	82.9	81.5	80.2	79.1	80.1	83.1	86.7	86.7
6-Jan	78.5	79.0	78.8	79.2	78.7	80.0	81.0	81.8	84.0	84.4	82.9	76.0	71.9	70.2	70.6	74.5	78.7	80.8	81.3	80.5	80.4	80.7	80.8	81.0	79.0	84.4
7-Jan	81.1	81.1	80.9	79.7	79.7	80.8	80.7	80.5	80.2	78.7	77.3	73.9	70.3	69.4	71.1	75.4	79.2	80.4	83.3	85.3	86.1	87.2	86.7	85.5	79.8	87.2
8-Jan	84.4	84.9	86.4	86.9	87.6	87.2	85.2	85.9	85.7	85.7	83.8	82.7	79.5	79.2	80.8	83.5	85.8	86.8	87.5	88.2	89.9	90.4	90.0	88.7	85.7	90.4
9-Jan	87.4	86.0	84.8	85.0	86.6	86.6	86.6	86.2	86.9	87.0	86.7	86.6	86.7	86.5	86.7	86.8	86.8	86.8	86.7	86.7	86.7	86.7	86.7	86.7	86.5	87.4
10-Jan	86.7	86.7	86.9	86.9	86.9	86.9	86.8	86.8	86.7	86.8	87.1	87.3	87.3	87.7	87.7	88.0	88.0	88.0	87.8	87.7	87.8	87.7	87.8	87.8	87.3	88.0
11-Jan	88.0	88.1	88.1	87.9	87.8	87.9	87.9	87.9	88.0	88.1	88.3	88.5	88.7	88.9	89.0	89.1	88.9	88.4	88.7	88.9	89.3	89.0	88.5	88.1	88.4	89.3
12-Jan	87.7	87.6	87.3	87.0	86.9	87.0	87.4	87.5	87.2	86.9	86.5	86.3	86.2	85.9	86.1	86.7	87.0	87.0	87.5	88.0	88.0	87.2	86.3	84.9	86.9	88.0
13-Jan	83.7	84.2	83.8	83.2	84.8	85.1	84.4	83.2	84.1	84.5	84.8	85.3	86.4	87.5	87.2	87.5	87.7	87.7	87.6	86.9	87.3	87.9	87.6	85.9	85.8	87.9
14-Jan	84.6	84.1	84.0	83.2	82.8	83.3	83.7	84.4	84.9	84.4	83.6	82.1	81.0	80.0	79.3	80.6	83.2	85.8	86.2	88.6	90.8	90.4	90.2	90.3	84.7	90.8
15-Jan	90.3	90.4	90.3	90.0	89.9	89.7	89.4	89.5	89.3	89.5	89.6	89.7	89.8	89.8	89.9	90.2	90.3	90.1	90.2	90.2	90.3	90.4	90.2	90.3	90.0	90.4
16-Jan	90.3	90.5	90.6	90.7	90.7	91.3	91.4	91.7	91.9	91.9	91.9	91.9	91.7	88.7	86.9	87.5	89.5	89.2	86.9	87.3	86.6	85.8	85.0	85.0	89.4	91.9
17-Jan	85.4	85.7	85.2	84.9	84.3	83.7	84.2	84.4	84.7	84.3	82.5	81.8	80.9	80.1	80.3	81.8	83.2	85.0	86.5	87.2	87.1	87.4	87.5	87.7	84.4	87.7
18-Jan	88.3	88.4	87.9	87.7	88.0	88.1	88.1	87.8	87.5	86.8	85.1	83.4	81.2	75.8	73.2	75.7	82.3	86.0	87.6	87.9	87.7	86.6	85.3	85.6	85.1	88.4
19-Jan	85.5	85.6	84.3	85.2	84.5	84.3	83.9	83.7	83.8	83.5	82.2	78.5	73.9	70.3	68.7	69.0	75.5	80.1	81.4	83.4	84.3	81.4	79.0	78.1	80.4	85.6
20-Jan	79.0	75.5	73.8	74.6	76.7	81.8	81.2	81.2	82.7	82.0	76.8	72.3	67.5	66.8	66.5	70.9	77.0	79.6	81.9	83.1	80.4	82.8	85.0	87.0	77.8	87.0
21-Jan	88.2	88.4	88.9	88.9	88.1	89.1	90.9	90.4	90.4	90.8	87.3	83.4	80.1	74.5	74.3	82.1	87.5	88.1	87.9	88.3	88.6	88.0	88.4	87.1	86.6	90.9
22-Jan	86.5	83.5	85.3	82.6	78.8	75.2	69.7	67.0	68.5	69.6	67.4	64.2	65.2	66.5	80.5	83.5	87.5	86.6	83.7	81.5	82.8	82.7	84.9	84.9	77.9	87.5
23-Jan	84.8	83.2	83.1	83.5	84.0	85.6	85.0	84.2	85.1	85.8	83.7	84.4	84.3	85.3	86.1	87.6	87.2	86.9	86.5	84.9	84.4	84.5	83.9	83.8	84.9	87.6
24-Jan	84.8	83.6	83.7	83.8	84.0	85.6	86.8	89.1	87.3	84.7	85.4	87.1	84.5	84.7	84.5	86.5	85.8	85.9	80.2	77.0	82.6	85.5	87.3	84.8	89.1	89.1
25-Jan	87.7	88.1	88.4	89.3	91.1	91.9	91.9	91.5	91.4	91.2	91.0	90.7	91.0	90.4	90.1	89.8	90.0	90.1	89.7	90.0	90.3	90.6	91.1	92.0	90.4	92.0
26-Jan	93.6	94.7	92.3	89.3	82.5	79.0	76.5	79.7	84.8	82.0	79.5	79.1	76.4	75.5	76.7	76.0	78.5	81.5	86.4	81.9	78.5	79.6	76.1	74.2	81.4	94.7
27-Jan	76.2	76.5	77.4	77.2	76.9	76.3	76.4	76.3	75.9	76.3	70.9	64.0	56.9	54.5	56.3	58.4	59.8	64.6	71.0	74.0	74.7	75.3	75.6	71.9	70.6	77.4
28-Jan	69.5	66.6	64.9	63.5	63.8	62.7	63.4	63.5	62.0	62.7	58.7	55.1	53.8	54.2	52.4	53.8	56.1	57.7	58.0	59.1	59.6	60.1	65.4	67.3	60.6	69.5
29-Jan	66.7	69.7	71.6	71.5	69.8	68.8	70.1	70.5	70.6	69.8	67.9	64.9	60.9	56.0	52.8	52.1	54.9	57.2	59.4	60.0	63.0	65.6	71.1	74.9	65.0	74.9
30-Jan	74.4	74.7	71.5	69.3	70.8	73.0	74.8	74.7	74.3	72.1	67.3	63.2	55.9	53.3	53.7	54.0	54.4	55.5	60.7	62.5	64.5	64.1	66.3	62.6	65.3	74.8
31-Jan	66.4	67.0	67.6	68.1	68.7	70.0	70.3	72.3	73.1	71.7	70.8	68.3	63.2	59.3	54.5	55.1	63.9	70.3	71.6	71.2	73.3	74.0	73.0	73.5	68.2	74.0
83.2 83.0 82.8 82.8 82.7 83.0 82.8 82.7 83.0 82.6 80.8 78.9 76.9 75.5 76.0 77.6 80.1 81.4 82.3 82.3 82.4 82.7 83.0 82.8																						Diurnal Average				
93.6 94.7 92.3 90.7 91.1 91.9 91.9 91.7 91.9 91.9 91.9 91.9 91.9 91.7 90.4 90.1 90.2 90.3 90.1 90.2 90.2 90.8 90.6 91.1 92.0																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Janvier - January 2023





Maximum Speed: 26 km/h on Jan 26 07:00	Maximum Daily Speed Average: 13.5 km/h on Jan 2	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 16 13:00	Minimum Daily Speed Average: 0.7 km/h on Jan 8	Hours of Data: 741
Maximum Diurnal Speed Average: 4.7 km/h at hour 3	Minimum Diurnal Speed Average: 3.2 km/h at hour 17	Hours of Missing Data: 3
Monthly Average Velocity: 4.0 km/h 227.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 9 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 19	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SSW10	SW11	SW13	SW9	SSW9	SW9	SW7	SW7	SW10	SW10	SSW11	SW12	SW13	SW12	SW10	SSW10	SSW11	SW12	SW13	SW14	SSW13	SSW12	SSW13	SW10.8	SW14	
2-Jan	SW11	SSW11	SW10	SSW11	SW12	SSW15	SSW15	SSW13	SW12	SW11	SSW13	SSW10	SSW11	SSW12	SSW13	SSW16	SSW17	SSW18	SSW18	SW16	SSW15	SSW13	SSW16	SSW16	SSW13.5	SSW18
3-Jan	SW12	SW12	SW10	SSW8	SSW9	SW6	SSW10	SSW13	SSW13	SSW12	SSW12	SSW13	SSW10	SSW12	SSW11	SSW8	SSW11	SW10	SW12	SW13	SSW13	SSW13	SSW13	SSW12	SSW11.2	SW13
4-Jan	SW11	SW11	SW12	SW12	SW10	SW10	SW9	SW11	SW11	SW10	SSW10	SW8	SW8	SSW9	SW9	SW10	SW11	SW10	SW9	SW10	SW9	SSW10	SSW10	SSW9.9	SW12	
5-Jan	SSW10	SSW10	SW9	SSW10	SSW9	SSW9	SSW9	SSW9	SSW10	SSW10	SSW9	SSW9	SSW10	SSW6	SW4	SSW4	UO	UO	SSW2	SW1	NNE1	N0	NW1	NNE3	SSW6.1	SSW10
6-Jan	N2	NNE3	NNE1	SSE3	SSE3	SSE5	SSE7	S9	S7	S8	SSW11	SSW12	SW10	SW11	SSW11	SSW12	SSW13	SSW14	SSW15	SSW14	SSW13	SSW13	SSW14	SSW16	SSW8.7	SSW16
7-Jan	SSW16	SSW16	SSW17	SSW18	SSW16	SSW16	SSW16	SW15	SW14	SW15	SSW13	SSW14	SSW12	SSW11	SSW11	SW10	SW10	SW10	SW9	SSW9	SW10	SSW11	SSW10	SSW12	SSW12.8	SSW18
8-Jan	SSW11	SSW10	SSW10	SSW9	SSW8	NE2	NNE3	NNE3	SSW1	SSW2	NNE4	NW2	NNE4	N4	N5	NNE6	NNE3	NNE3	NNE5	NNE5	NNE6	N4	NNE5	NNE5	N0.7	SSW11
9-Jan	NNE3	N3	NNW1	SSW3	NNW1	ENE3	SE3	SSW3	SE2	E3	SE2	SSE3	E2	E3	ENE3	E2	WSW1	NNE3	ENE3	ESE1	W1	NNW1	ENE1	NE0	E1.0	SE3
10-Jan	N1	NNW2	NW1	NNE2	NNW2	N2	N2	NNW2	N2	NNE3	N1	NNW1	WNW1	NNE2	NNE3	NNE3	N2	NNE3	NNE3	NNE3	NNE3	NNE3	NNE3	N2	N2.0	NNE3
11-Jan	W2	NNW2	NW2	NNW2	SW2	S2	S2	SSW2	WSW2	SW3	SSW3	SSW3	S2	SSE2	S4	S4	SSW4	SSW4	SSW5	SSW6	SSW6	SW6	SSW6	SW7	SSW3.0	SW7
12-Jan	SW7	SSW6	SSW6	SSW7	SSW7	SSW6	SSW6	SSW8	SSW8	SSW7	SSW8	SW8	SSW10	SW12	SW10	SW9	SW9	SW9	SW10	SW9	SW8	SSW11	SW11	SSW10	SSW8.4	SW12
13-Jan	SW7	SSW5	SSW6	SW4	WSW4	SW4	N1	NNW2	NNE3	NNE4	NNE4	NE4	NE6	NE8	ENE6	NE8	NE7	NNE5	NE6	NE7	ENE5	NE6	ENE5	ENE5	NE2.4	NE8
14-Jan	ESE6	ESE5	ESE6	ESE6	ESE5	SE5	SE4	E3	E5	SE4	SSE5	S6	SSW6	SSW5	WSW4	WSW3	S1	SSW3	S3	S3	SW4	SW4	SW5	WSW5	SSE2.7	SSW6
15-Jan	SW3	W2	UO	N2	NW2	NW2	NNW1	NE4	NE4	NE2	ESE1	SE2	E3	ENE3	NE2	ENE3	E2	E1	NNE3	NNE3	NNW2	N3	NNW2	NE1.4	NE4	
16-Jan	NNE4	N4	N3	NNW2	NNE4	NNE3	NNE4	NNE3	N3	NNE3	N3	N3	SSW0	SSE7	SE9	SE5	SE3	S5	SSE7	S9	S11	S10	S10	S10	SSE2.2	S11
17-Jan	SSE8	S8	S8	S10	SSW12	SSW11	S11	S8	S9	S11	SSW11	SSW12	SW12	SSW12	SSW9	SSW6	SSW10	SSW8	SSW16	SSW15	SSW14	SSW12	SSW12	SSW13	SSW10.5	SSW16
18-Jan	SSW12	SSW10	SSW12	SSW10	SSW10	SSW11	SSW10	SSW12	SSW10	S9	S11	SSW13	SSW13	S11	S10	S10	SSE9	SSE8	S7	SSE7	SSE7	SSE7	S6	S4	S9.3	SSW13
19-Jan	S5	SSE5	S6	SSW9	SSW11	SSW13	SSW13	SSW12	SW14	SW12	SW14	SW14	SSW11	SSW10	SW9	SW10	SSW11	SW15	SSW15	SSW15	SW14	SW16	SW15	SW11	SSW11.4	SW16
20-Jan	SW11	SW14	SW14	SW13	SW12	SSW9	SSW11	SW14	SW12	SW12	SW9	SW9	WSW10	WSW14	WSW14	SW12	SW12	SW13	SSW13	SSW11	WSW14	SW12	SW12	SW10	SW11.5	WSW14
21-Jan	SSW11	SSW13	SSW11	SSW11	SW11	SSW10	SW9	SW8	SSW7	SSW8	SSW10	SW9	SSW10	SSW10	SW11	SSW9	S9	SSW10	SW11	SW11	SW12	SW13	SW11	SW12	SSW10.1	SSW13
22-Jan	SW11	SW10	WSW9	WNW9	NW11	NNW11	NNW12	NNW15	NNW17	NNW18	NNW20	NNW17	NW18	NW17	N12	NNE10	NNE8	NNE7	NNE10	NNE6	NNE6	NNE8	NE8	NNE4	NW8.1	WNW20
23-Jan	NNE3	E4	SE4	SE4	SE5	SSE3	SE4	SSE3	S2	ESE2	NNE2	N3	NNE5	NNE6	NNE8	N7	NNE10	NNE9	NNE10	NNE7	NNE4	N3	NNE6	NNE5	NE3.4	NNE10
24-Jan	WNW2	SE2	S4	SSW3	SE3	SE3	SSW3	SW6	SSW5	S4	SSW9	SW11	SW10	WSW10	W7	NW12	NW9	NNW5	NW11	WNW13	NNE7	NNE7	NE7	W2.8	WNW13	
25-Jan	NE6	NE6	NE6	NNE6	NNE5	NNE3	E4	ENE3	ESE3	ENE4	ENE4	NE5	NNW1	NNE6	NNE5	N3	NNE3	NNW2	NNE2	SSW2	SSW3	S5	SSE5	SSW3	NE2.3	NE6
26-Jan	SW10	WSW11	W14	W19	NNW25	NNW25	NW26	NW20	NNW19	N20	N21	N15	NNW13	NNW11	NW11	NNW9	NNW7	N8	NNE12	N12	NNE15	NNE14	NNE15	NNE15	NNW11.6	NW26
27-Jan	NNE15	NNE16	NNE12	NNE11	NNE13	NNE15	NNE11	N9	N10	NNE7	NNE8	NNE7	N7	N9	NNE10	N8	N8	N6	N6	N5	N7	WNW4	W6	WNW8	N8.2	NNE16
28-Jan	WNW9	NW11	NW10	NW13	NW13	NNW15	NNW12	NNW12	NW16	NNW14	NW14	NW16	NW17	NW18	NW17	NW15	NW14	NW15	NW14	NW12	NNW13	NNW10	N11	N12	NW12.9	NW18
29-Jan	N9	NNW4	W4	W6	WSW9	WSW8	WSW11	SW12	SW11	SSW11	SSW10	SSW11	SSW12	SW11	SW11	SSW13	SSW13	SW15	SW14	WSW10	SW9	SW9	WSW7	NW4	SW8.4	SW15
30-Jan	N6	NW5	NW8	NW8	NW8	NNW5	W6	SW5	SW8	SW8	SSW7	SSW11	SW11	SW10	WSW8	W9	W4	W5	WSW4	W3	WSW5	WSW5	NE5	ENE4	W4.4	SSW11
31-Jan	N3	N2	N3	N3	NNE4	NNE3	NNE6	NNE6	NE4	NNE3	NNE6	NNE6	NE5	NNE4	NNE2	E5	ESE4	SW3	SSW5	SW5	SSW5	SSW7	SW6	SW6	NNE1.0	SSW7

SSW3.7	SSW3.8	SSW4.7	SSW4.5	SSW4.5	SSW4.2	SSW4.1	SSW4.4	SSW4.3	SSW4.1	SSW4.2	SSW4.7	SSW4.6	SSW4.2	SSW3.6	SSW3.3	SSW3.2	SSW3.9	SSW3.8	SSW4.0	SSW4.1	SSW4.2	SSW3.6	SSW3.5	Diurnal Average
SSW16	SSW16	SSW17	W19	NNW25	NNW25	NW26	NW20	NNW19	N20	N21	NNW17	NW18	NW18	NW17	SSW16	SSW17	SSW18	SSW18	SW16	NNE15	SW16	SSW16	SSW16	Diurnal Maximum

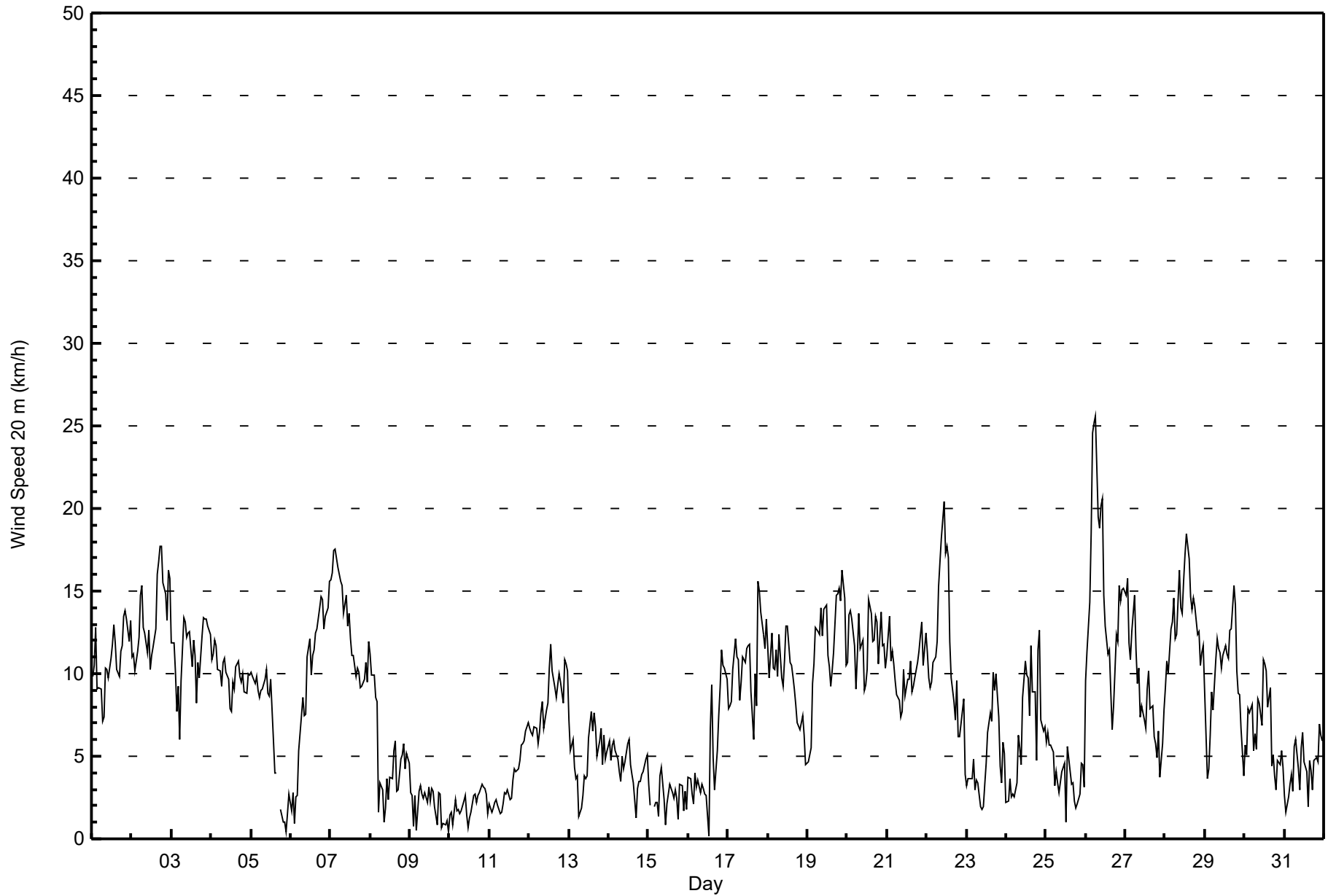
UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Janvier - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 26 07:00 Minimum Value: 0 km/h on Jan 11 03:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 7														Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6											
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	2	3	4	3	2	2	2	1	2	2	3	2	3	3	3	3	3	2	3	3	3	3	3	3	4
2-Jan	2	3	3	2	3	3	3	3	3	3	3	2	4	3	2	3	3	3	3	3	3	3	3	3	4
3-Jan	3	2	3	2	2	1	1	2	2	3	2	2	2	3	2	2	2	2	3	3	2	3	2	2	3
4-Jan	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	3
5-Jan	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	UO	UO	1	1	1	1	1	1	2
6-Jan	1	1	1	2	1	2	2	2	2	2	2	3	3	3	2	2	2	2	3	3	3	3	3	3	3
7-Jan	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	1	1	2	2	2	2	3
8-Jan	2	2	2	2	3	2	1	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	3
9-Jan	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
10-Jan	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1
11-Jan	0	1	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2
12-Jan	2	2	2	2	2	1	2	2	2	2	2	2	3	3	3	3	3	3	4	3	3	3	3	3	4
13-Jan	2	1	1	1	1	1	1	1	1	1	1	1	3	2	2	2	2	2	1	2	1	1	2	2	3
14-Jan	2	2	2	2	2	1	2	1	1	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	2
15-Jan	1	1	UO	1	1	1	1	2	1	1	2	1	1	1	1	0	1	1	1	1	1	1	1	1	2
16-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	1	1	2	4	3	3	3	3	4
17-Jan	2	2	2	3	3	3	2	2	2	2	3	3	3	3	3	2	3	2	4	4	4	4	4	3	4
18-Jan	3	2	3	3	3	3	3	3	3	2	3	3	3	3	2	3	2	2	1	1	1	2	2	1	3
19-Jan	1	1	1	2	3	3	3	2	3	3	4	4	3	2	2	3	3	3	3	3	3	4	4	3	4
20-Jan	2	3	3	3	3	2	2	3	2	3	3	2	4	4	4	3	3	3	3	3	3	3	3	2	4
21-Jan	2	2	2	2	2	2	1	2	3	2	3	2	2	3	3	2	2	2	2	3	3	3	3	3	3
22-Jan	2	3	2	2	3	3	3	4	5	6	6	6	7	7	6	3	3	2	3	2	2	2	2	1	7
23-Jan	1	1	1	1	2	1	2	1	1	1	1	1	1	2	2	2	3	2	2	2	1	1	2	3	3
24-Jan	1	1	1	1	1	1	1	1	1	1	2	3	3	3	2	3	3	4	2	4	3	2	1	2	4
25-Jan	1	1	1	2	2	1	1	1	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	2	2
26-Jan	2	3	5	5	6	7	9	8	8	8	8	6	5	5	4	4	3	4	4	4	5	5	5	4	9
27-Jan	4	4	3	3	4	4	4	3	3	2	2	2	3	3	3	3	2	2	2	2	2	1	2	2	4
28-Jan	2	4	4	4	4	4	3	4	5	4	5	6	6	6	7	6	5	5	5	5	6	5	4	4	7
29-Jan	3	2	2	1	2	2	3	3	3	2	3	2	3	3	3	4	3	4	4	3	2	2	2	1	4
30-Jan	2	2	4	3	3	2	2	1	2	2	2	2	3	3	3	3	1	1	1	1	2	1	2	2	4
31-Jan	1	1	1	1	1	1	2	2	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	2
Diurnal Maximum																									
UO - Unstable Operation																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Janvier - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	252	34.01	34.01
6 - 11	315	42.51	76.52
12 - 19	167	22.54	99.06
20 - 28	7	0.94	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Janvier - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	28	57	10	13	12	8	16	10	15	24	13	9	7	7	8	15	252
6 - 11	14	30	12	1	0	3	1	9	25	103	84	11	4	4	10	4	315
12 - 19	4	10	0	0	0	0	0	0	0	72	47	3	2	11	15	3	167
20 - 28	2	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	7
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	48	97	22	14	12	11	17	19	40	199	144	23	13	25	35	22	741

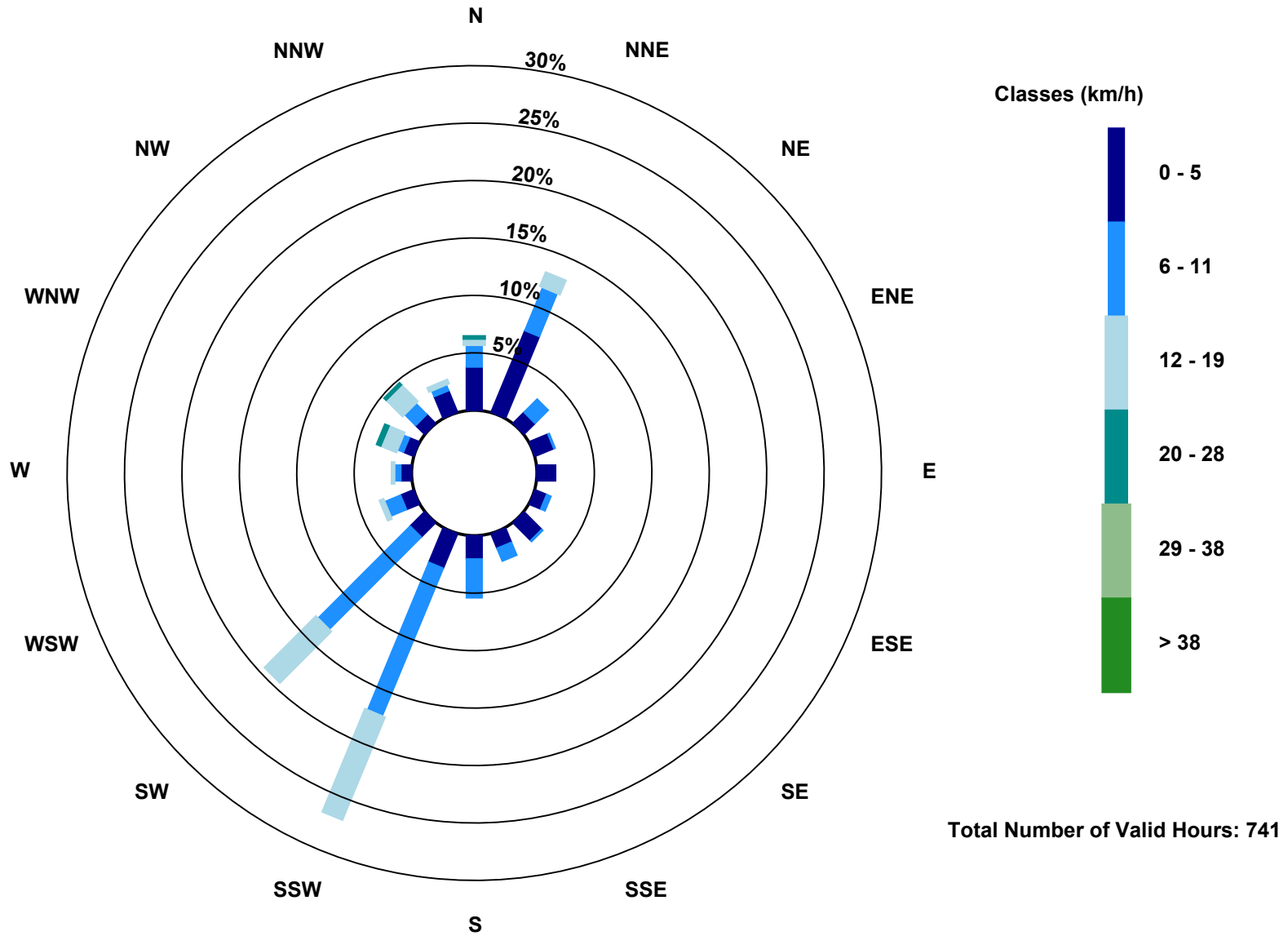
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed 20 m (WS20m) - km/h
Janvier





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Janvier - January 2023

Direction of Maximum Speed: 308 deg on Jan 26 07:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 211.0 deg on Jan 2	Hours of Data: 741
Direction of Minimum Speed: 204 deg on Jan 16 13:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.7 deg on Jan 8	Percent Operational Time: 99.6
Monthly Average Direction: 227.4 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	210	222	223	230	209	224	229	234	235	219	222	213	218	216	218	223	211	212	216	216	219	212	213	212	218.4
2-Jan	215	212	219	207	216	214	212	210	222	223	213	199	208	210	199	212	208	203	205	218	211	213	208	211	211.0
3-Jan	220	214	215	212	203	215	213	211	211	210	204	206	203	208	207	211	201	222	219	221	213	211	208	211	211.1
4-Jan	218	216	219	222	227	230	220	214	217	215	210	216	220	210	220	216	226	223	223	221	219	215	210	214	218.4
5-Jan	209	207	214	206	210	212	205	200	207	203	203	203	204	207	220	192	UO	UO	211	216	21	358	326	32	207.1
6-Jan	3	28	14	168	163	166	164	177	184	184	207	208	220	219	209	198	203	207	207	208	199	197	204	207	200.4
7-Jan	211	212	209	207	211	213	209	215	219	216	209	204	203	199	211	227	232	229	217	213	219	204	213	212	212.5
8-Jan	209	199	204	206	197	54	12	19	197	202	27	309	18	11	9	23	15	25	29	18	17	10	23	22	0.3
9-Jan	21	2	329	213	338	62	125	195	135	99	138	147	100	94	77	100	257	13	62	117	271	291	78	55	93.5
10-Jan	7	333	314	27	348	5	359	347	7	14	359	336	288	19	22	19	10	27	19	25	23	13	24	359	10.0
11-Jan	279	285	313	293	217	182	181	202	245	223	206	201	187	151	178	187	194	193	201	197	202	216	213	219	207.9
12-Jan	214	209	213	200	201	193	197	203	205	204	206	216	212	216	221	224	214	214	215	218	216	212	222	213	212.0
13-Jan	232	213	201	231	248	235	7	347	28	26	25	34	38	50	60	54	50	30	43	50	64	53	63	76	48.0
14-Jan	106	105	109	114	104	131	125	101	101	125	156	183	195	208	257	258	183	195	178	172	224	232	234	238	160.7
15-Jan	230	270	UO	6	309	313	334	37	48	42	106	133	93	88	68	47	70	92	82	18	19	343	9	347	36.8
16-Jan	13	6	11	346	27	21	12	17	10	26	6	353	204	166	145	132	136	175	161	173	180	177	178	174	151.0
17-Jan	166	175	189	186	195	195	190	178	183	190	203	207	215	208	207	208	207	201	198	199	203	206	202	203	197.5
18-Jan	197	197	193	206	209	209	193	194	193	190	191	196	197	189	182	175	161	160	173	166	157	160	174	183	187.7
19-Jan	191	167	187	201	212	211	205	204	219	217	227	221	209	200	221	234	210	219	205	210	216	225	228	225	213.7
20-Jan	219	224	228	228	229	209	207	228	218	226	216	222	257	257	247	234	219	214	212	197	249	226	231	218	226.3
21-Jan	205	204	201	207	219	213	217	215	210	198	204	214	205	212	220	199	188	207	223	220	223	228	220	220	212.0
22-Jan	216	226	242	284	306	298	293	298	289	286	294	301	311	324	0	12	12	12	24	13	17	31	42	13	313.3
23-Jan	28	87	126	142	133	164	132	147	182	102	32	9	15	13	14	10	22	25	22	23	20	354	22	26	36.2
24-Jan	297	145	188	195	133	146	204	220	199	176	201	215	217	241	271	304	321	322	338	315	302	22	25	37	269.9
25-Jan	37	38	42	15	17	15	83	72	105	72	63	54	345	18	31	2	24	336	31	199	203	175	168	205	46.2
26-Jan	218	243	265	281	284	291	308	319	345	358	353	349	345	338	320	327	340	10	21	7	13	18	16	24	330.6
27-Jan	22	29	17	27	23	30	16	9	9	15	16	13	353	7	12	358	3	11	1	3	357	300	269	294	9.7
28-Jan	293	315	310	308	304	300	294	296	306	296	307	313	313	311	314	317	312	310	314	324	334	336	355	1	313.3
29-Jan	356	345	263	266	256	237	237	227	222	213	212	202	209	222	219	212	205	214	223	243	231	228	238	324	227.9
30-Jan	356	325	313	320	310	294	259	236	229	222	212	203	227	231	239	275	272	260	258	275	239	237	43	67	258.8
31-Jan	11	354	1	5	17	23	20	28	36	19	14	25	34	21	28	82	107	223	208	220	213	213	219	217	17.5

221.4 219.3 224.0 230.7 235.9 234.5 229.6 228.9 230.8 224.8 228.0 224.8 231.7 234.1 235.4 238.4 223.5 226.0 218.8 225.3 229.9 219.8 219.1 219.1
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



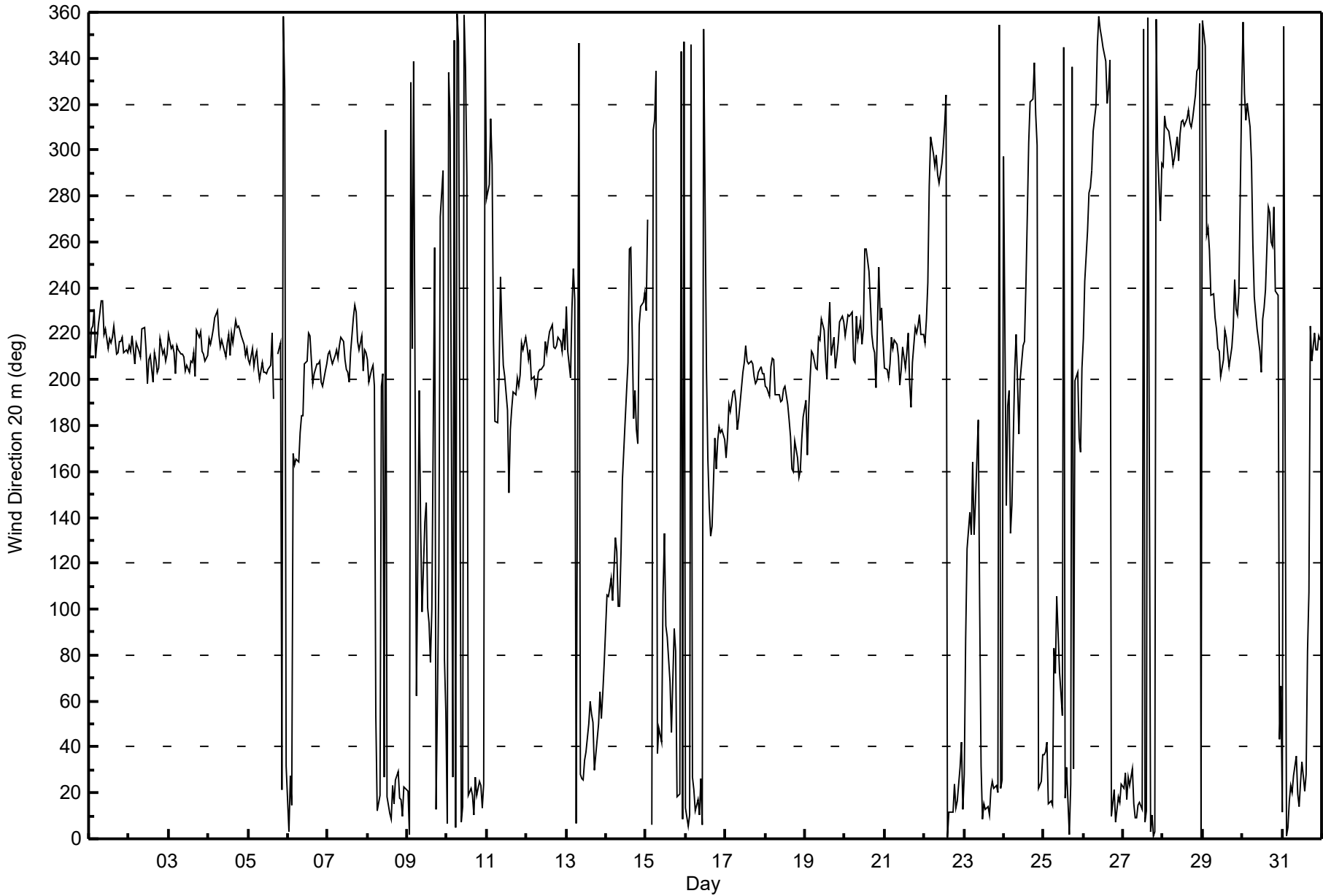
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Janvier - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 103 deg on Jan 9 05:00	Hours of Data: 741
Minimum Value: 8 deg on Jan 5 04:00	Hours of Missing Data: 3
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 15 Median = 19 Q ₃ = 25 P ₉₀ = 35 P ₉₉ = 76	Hours of Calibration: 0
	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	16	17	19	25	18	18	16	12	16	17	20	16	18	18	16	17	19	13	18	19	17	15	15	15	25
2-Jan	17	16	13	13	16	16	16	15	17	16	15	13	22	18	14	14	13	13	13	16	16	14	13	13	22
3-Jan	15	14	15	13	10	15	9	11	12	12	13	14	15	16	14	15	12	16	15	17	13	13	13	13	17
4-Jan	15	13	13	16	15	15	15	13	14	13	12	20	17	15	17	15	15	15	14	12	13	13	11	12	20
5-Jan	13	10	12	8	9	10	10	8	10	10	12	13	13	15	16	15	UO	UO	53	59	70	81	40	36	81
6-Jan	54	33	42	51	55	35	14	17	14	17	13	16	19	20	16	12	11	12	13	16	15	13	13	14	55
7-Jan	13	14	13	11	13	15	14	14	17	14	14	13	14	13	13	14	14	13	12	13	14	11	11	12	17
8-Jan	12	11	10	10	13	62	19	49	86	51	25	33	24	18	19	15	44	21	11	18	14	14	9	11	86
9-Jan	17	30	72	43	103	24	38	31	26	23	42	32	47	26	26	44	67	23	30	75	51	38	48	71	103
10-Jan	20	41	41	18	33	29	36	28	31	20	26	78	64	38	16	18	21	13	13	17	20	20	19	44	78
11-Jan	13	17	17	21	21	23	37	33	21	22	21	22	28	32	27	23	19	13	18	19	22	21	22	20	37
12-Jan	20	19	20	17	19	16	18	19	19	22	18	23	23	21	22	20	19	20	19	19	20	18	21	19	23
13-Jan	26	19	16	20	18	21	38	31	43	14	14	21	26	18	16	16	18	30	12	17	29	16	24	27	43
14-Jan	24	34	30	27	30	23	25	15	15	24	25	28	22	33	32	24	50	29	25	20	25	18	17	18	50
15-Jan	23	32	UO	56	41	33	68	19	17	61	72	41	35	25	30	15	22	42	51	15	15	33	14	32	72
16-Jan	16	19	23	34	18	31	21	22	36	31	20	32	94	27	23	26	30	23	23	22	17	16	17	18	94
17-Jan	18	19	17	15	16	17	15	16	16	15	17	20	20	18	20	24	18	16	16	17	18	20	19	17	24
18-Jan	19	17	17	19	18	17	16	16	19	19	19	15	16	18	19	18	20	17	17	14	13	15	16	14	20
19-Jan	27	15	17	13	22	16	15	16	18	17	19	18	19	14	21	18	17	17	15	15	18	17	17	15	27
20-Jan	14	15	17	16	15	16	13	15	18	17	22	19	24	18	19	19	18	18	19	17	17	19	16	15	24
21-Jan	11	10	12	14	14	14	13	15	17	15	18	19	15	19	17	21	14	15	16	19	18	17	16	17	21
22-Jan	16	19	19	17	18	19	18	21	18	18	18	22	30	34	30	28	21	25	17	24	20	12	13	30	34
23-Jan	26	34	27	34	27	43	36	29	43	67	38	23	16	15	16	21	15	14	17	15	16	40	22	42	67
24-Jan	78	56	31	43	29	52	40	18	20	16	17	19	21	19	33	20	32	31	30	23	18	24	15	17	78
25-Jan	12	15	17	21	22	27	23	31	28	22	27	65	90	24	33	31	21	33	70	29	20	15	16	76	90
26-Jan	25	21	21	18	17	17	22	30	36	29	34	34	34	35	26	35	35	33	16	21	20	19	20	16	36
27-Jan	19	16	20	18	18	15	19	23	22	20	19	25	40	25	21	32	20	18	22	21	21	29	14	14	40
28-Jan	16	21	21	22	18	17	17	17	21	16	26	27	25	23	27	29	22	23	23	32	38	41	31	27	41
29-Jan	25	31	30	21	13	19	16	17	17	16	19	14	20	20	19	20	18	17	19	20	19	22	17	29	31
30-Jan	20	28	25	29	20	27	20	18	12	15	21	16	23	21	26	18	19	19	15	19	15	11	37	22	37
31-Jan	23	33	28	25	28	35	26	21	31	37	26	18	21	44	74	24	23	53	16	13	12	9	13	12	74
	78	56	72	56	103	62	68	49	86	67	72	78	94	44	74	44	67	53	70	75	70	81	48	76	
Diurnal Maximum																									

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23 FORT HILLS JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
 JANUARY 2023

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	709	35	35	100	10.9	0	3.1	0
TRS(ppb) Average	708	36	36	100	2.3	0	1.1	0
THC(ppm) Average	677	34	67	95.56	6.5	-	3.1	-
NMHC(ppm) Average	677	34	67	95.56	0.711	-	0.343	-
CH4(ppm) Average	677	34	67	95.56	5.8	-	2.8	-
NO2 (ppb) Average	707	37	37	100	47.4	0	27.8	-
NO (ppb) Average	707	37	37	100	133.5	-	53	-
NOX (ppb) Average	707	37	37	100	168.6	-	78.7	-
PM2.5 (ug/m3) Average	743	1	1	100	65	0	28.5	0
Temperature 2 m (C) Average	744	0	0	100	3.8	-	-3.3	-
Relative Humidity (%) Average	744	0	0	100	95.8	-	91.9	-
Wind Speed 10 m (km/h) Average	736	0	8	98.92	28	-	19	-
Wind Direction 10 m (deg) Average	736	0	8	98.92	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	0.99	1.5	-	0	0.1	0.1	0.3	1.2	3	10.9
TRS (ppb) Average	708	0.43	0.3	-	0.1	0.2	0.2	0.3	0.5	0.9	2.3
THC (ppm) Average	677	2.41	0.5	-	1.9	2	2.1	2.3	2.6	2.9	6.5
NMHC(ppm) Average	677	0.115	0.118	-	0	0	0	0.1	0.2	0.3	0.711
CH4(ppm) Average	677	2.3	0.4	-	1.9	2	2.1	2.2	2.4	2.7	5.8
NO2 (ppb) Average	707	16.23	9.5	-	0.2	4.1	8.6	15.7	23.2	28	47.4
NO (ppb) Average	707	12	20.7	-	0	0	0.2	2.9	13.7	39.3	133.5
NOX (ppb) Average	707	28.22	27.9	-	0.2	4.4	9.6	19.6	36.4	66	168.6
PM2.5 (ug/m3) Average	743	9.55	7.6	-	1	2	3.7	7.7	13.1	19.5	65
Temperature 2 m (C) Average	744	-10.63	5.6	-	-28.5	-18.8	-13.1	-9.4	-7.2	-4.6	3.8
Relative Humidity (%) Average	744	85	8.1	-	51.8	74.3	83.2	87.5	90.3	91.7	95.8
Wind Speed 10 m (km/h) Average	736	10	5	-	0	3	6	9	13	18	28
Wind Direction 10 m (deg) Average	736	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
 JANUARY 2023

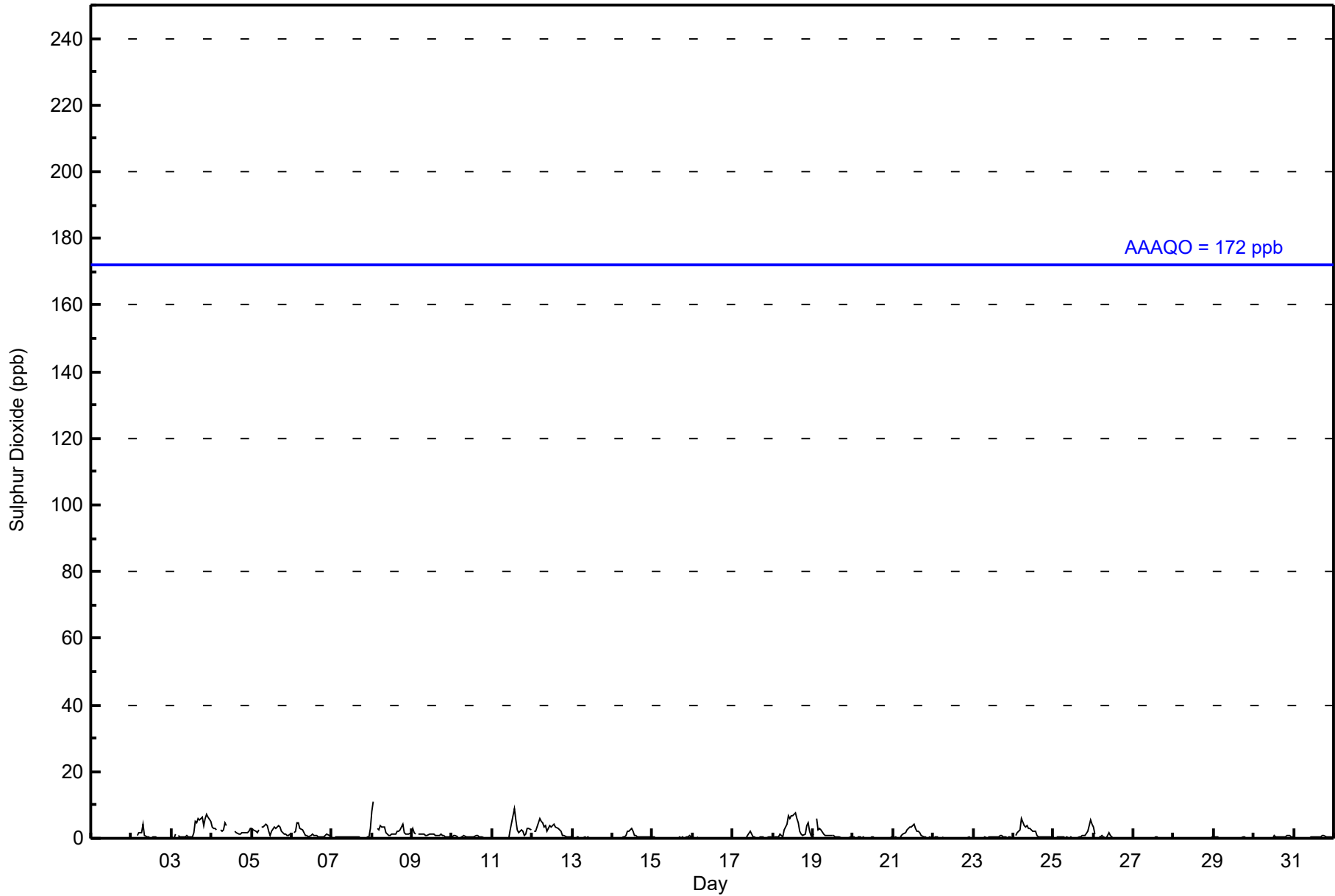
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	17 Jan 2023 07:00	18 Jan 2023 11:00	29	Analyzer Failure - sample pump failure
THC/NMHC/CH4	18 Jan 2023 12:00	18 Jan 2023 15:00	4	Maintenance - replaced sample pump
Wind Speed, Wind Direction	08 Jan 2023 23:00	08 Jan 2023 23:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	14 Jan 2023 22:00	14 Jan 2023 22:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 19:00	15 Jan 2023 22:00	4	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	23 Jan 2023 18:00	23 Jan 2023 18:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 09:00	31 Jan 2023 09:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	118	63	16	5	3	11	57	135	125	53	23	6	6	15	24	40	700
11 - 20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	135	126	53	23	6	6	15	24	40	701

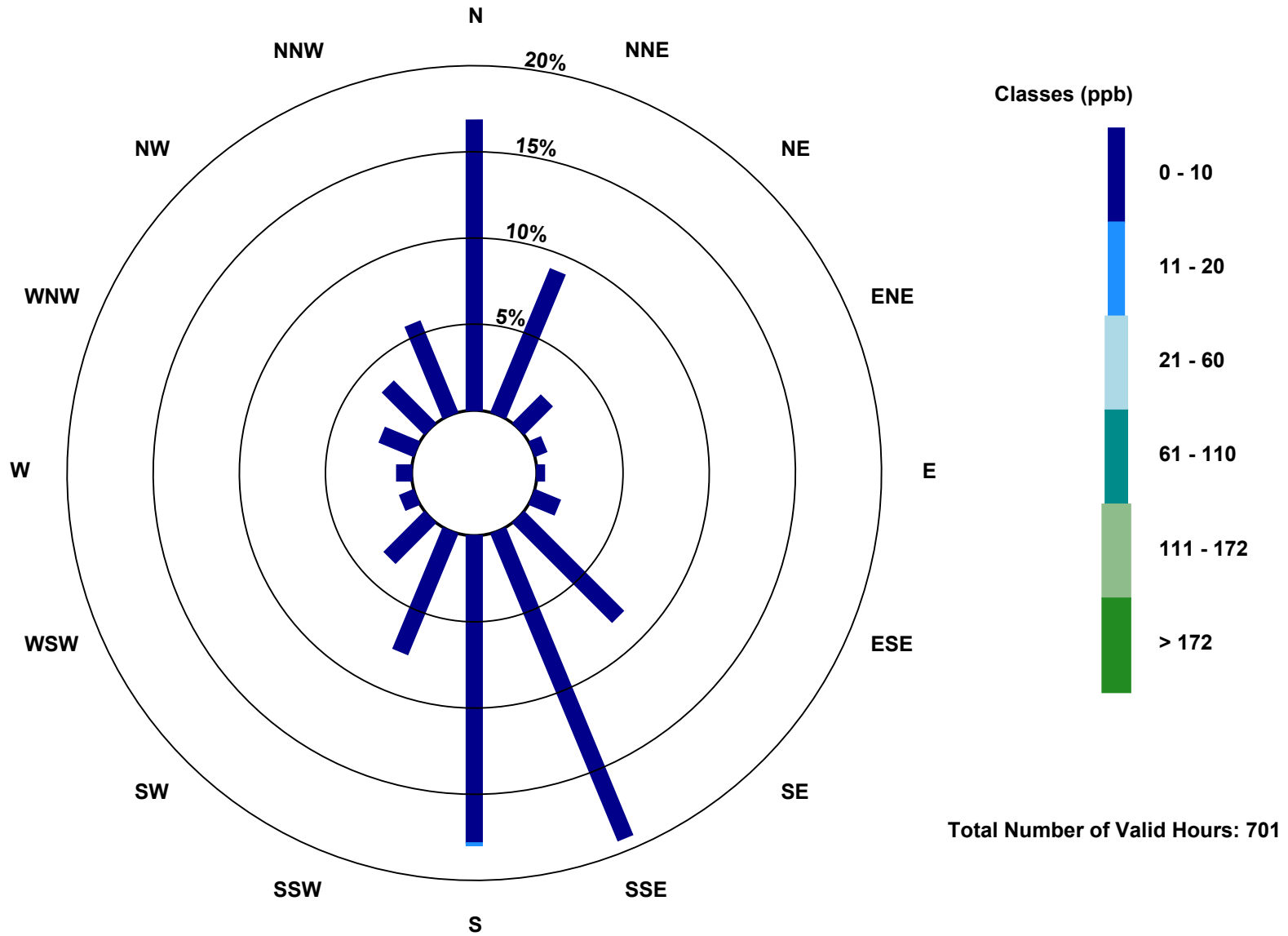
Total Number of Valid Hours: 701

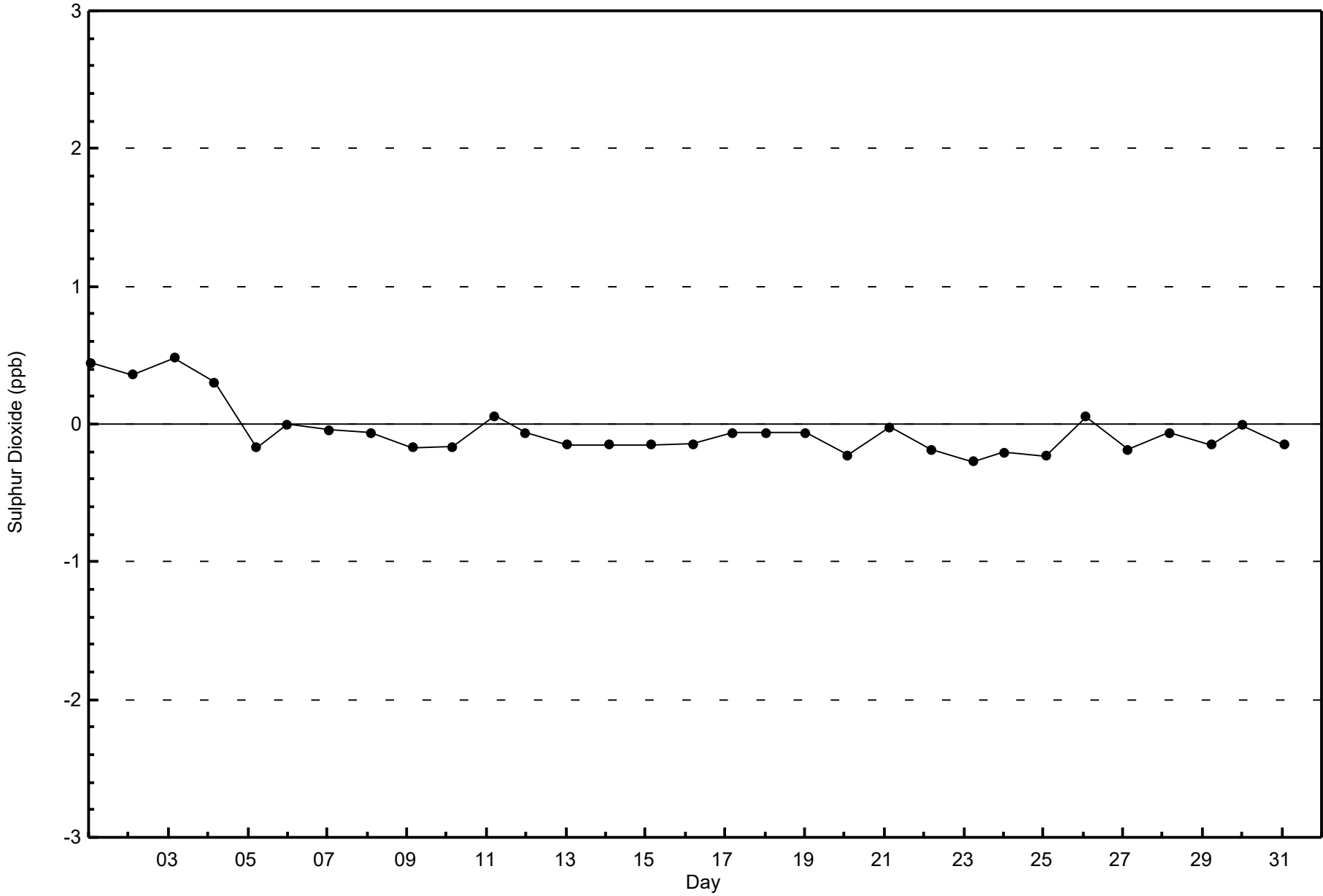
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Fort Hills

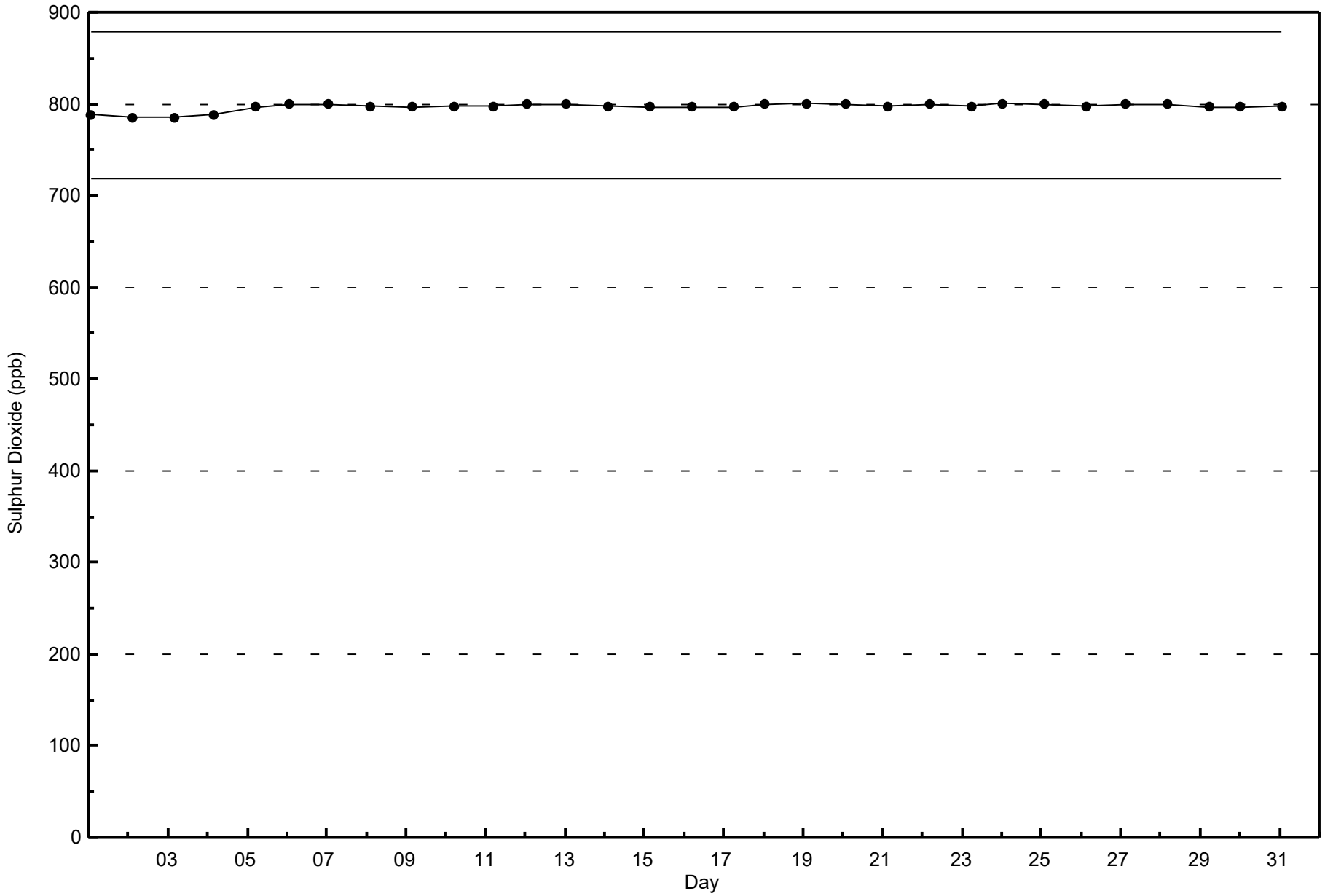






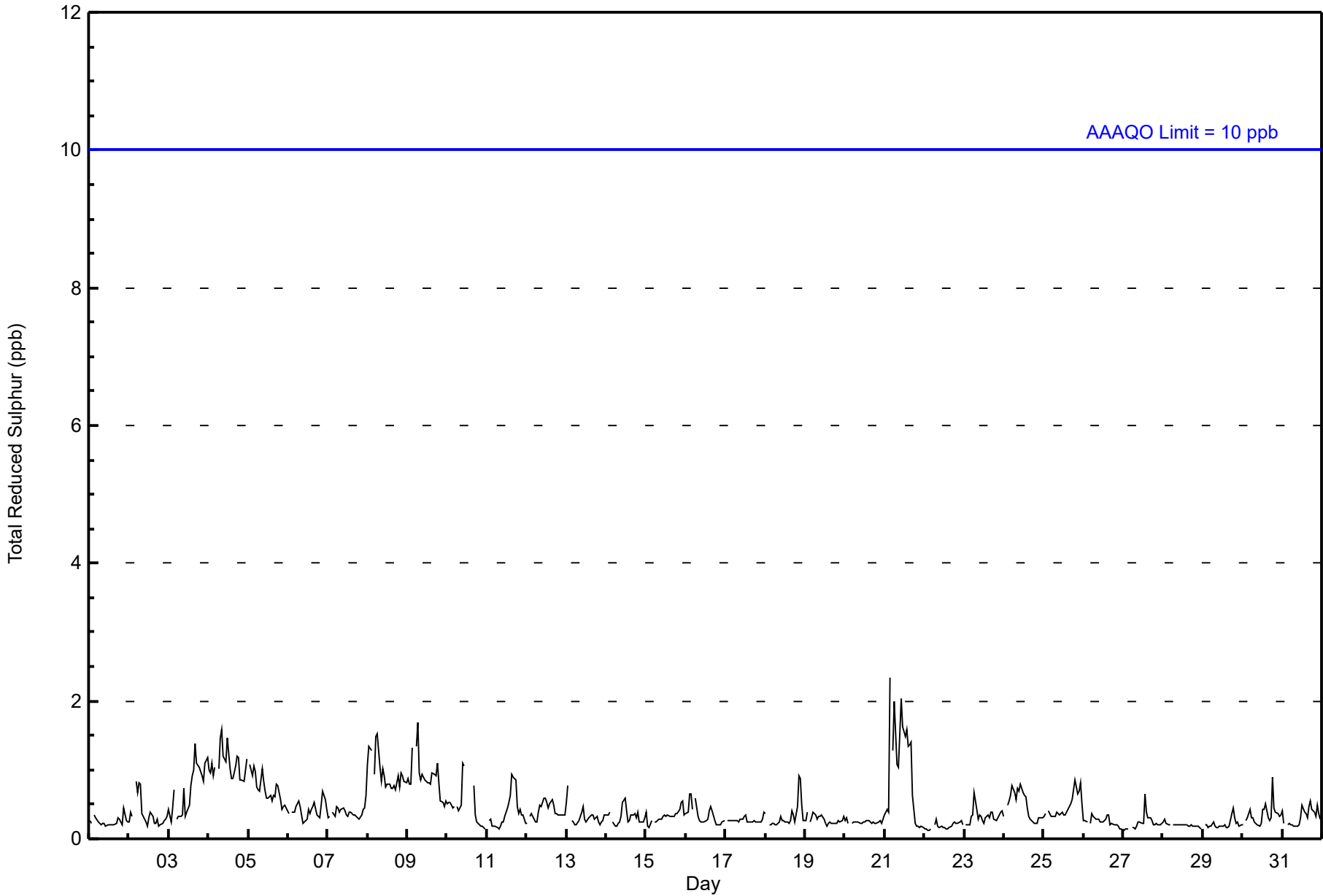
Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Fort Hills - January 2023





Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 2.3 ppb on Jan 21 04:00		Maximum Daily Average: 1.1 ppb on Jan 4		Hours of Data: 708														708																															
Minimum Value: 0.1 ppb on Jan 22 04:00		Minimum Daily Average: 0.2 ppb on Jan 22		Hours of Missing Data: 36														36																															
Maximum Diurnal Average: 0.5 ppb at hour 7		Minimum Diurnal Average: 0.4 ppb at hour 20		Hours of Calibration: 36														36																															
Monthly Average: 0.43 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 0.9 P ₉₉ = 1.5		Percent Operational Time: 100.0														100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.3	0.2	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.3	0.2	0.2	0.4	0.4																						
2-Jan	0.3	0.4	0.3	Z	0.8	0.7	0.8	0.8	0.4	0.3	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4																						
3-Jan	0.4	0.2	0.4	0.7	Z	0.3	0.3	0.3	0.4	0.7	0.3	0.4	0.5	0.8	0.9	1.0	1.4	1.1	1.0	1.0	0.9	0.8	1.1	1.2	0.7	1.4																							
4-Jan	1.0	1.0	1.1	0.9	1.0	Z	1.0	1.5	1.6	1.2	1.1	1.5	1.2	1.0	0.9	1.0	1.2	1.2	0.9	0.8	0.8	1.0	1.2	1.1	1.6																								
5-Jan	Z	1.1	0.9	1.1	1.0	0.8	0.7	0.7	1.0	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.6	0.4	0.5	0.5	0.5	0.7	1.1																							
6-Jan	0.4	Z	0.4	0.4	0.4	0.5	0.6	0.5	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.3	0.3	0.3	0.5	0.7	0.6	0.4	0.4	0.7																							
7-Jan	0.3	0.3	Z	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.6	0.4	0.6																							
8-Jan	1.1	1.3	1.3	Z	0.9	1.5	1.5	1.0	0.8	1.0	0.9	0.7	0.8	0.8	0.7	0.7	0.8	0.7	0.9	0.8	1.0	0.9	0.8	0.8	1.0	1.5																							
9-Jan	0.9	0.8	0.8	1.3	Z	1.3	1.7	1.0	0.9	0.9	0.8	0.8	0.8	0.8	1.0	0.9	0.9	1.1	0.8	0.5	0.5	0.5	0.5	0.9	1.7																								
10-Jan	0.5	0.5	0.5	0.5	0.5	Z	0.5	0.4	0.5	1.1	1.1	C	C	C	C	C	0.8	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.5	1.1																							
11-Jan	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.9	0.9	0.8	0.5	0.4	0.4	0.3	0.3	0.2	0.4	0.9																							
12-Jan	0.2	Z	0.3	0.4	0.3	0.2	0.2	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.6	0.6																							
13-Jan	0.5	0.8	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.8	0.8																							
14-Jan	0.3	0.3	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.6	0.4	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.2	0.2	0.2	0.3	0.6	0.6																							
15-Jan	0.4	0.2	0.2	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.3	0.3	0.6																							
16-Jan	0.4	0.4	0.6	0.7	0.4	Z	0.6	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.7																							
17-Jan	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4																							
18-Jan	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.5	0.9	0.9	0.5	0.3	0.3	0.9																							
19-Jan	0.3	0.4	Z	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.4																							
20-Jan	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3																							
21-Jan	0.3	0.4	0.4	2.3	Z	1.3	2.0	1.1	1.0	1.5	2.0	1.6	1.5	1.6	1.3	1.4	1.4	0.6	0.2	0.2	0.2	0.2	0.2	0.2	1.0	2.3																							
22-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3																							
23-Jan	Z	0.2	0.2	0.2	0.3	0.3	0.7	0.6	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.7																							
24-Jan	0.3	Z	0.5	0.6	0.6	0.8	0.7	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.8																							
25-Jan	0.3	0.4	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.7	0.7	0.8	0.5	0.5	0.8																							
26-Jan	0.3	0.3	0.2	Z	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4																							
27-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.7	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7																							
28-Jan	0.3	0.3	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
29-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.5																							
30-Jan	0.2	Z	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.5	0.3	0.3	0.3	0.9	0.4	0.4	0.4	0.3	0.3	0.3	0.9																							
31-Jan	0.4	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.4	0.3	0.5	0.6	0.4	0.4	0.3	0.5	0.4	0.3	0.3	0.6																							
																								0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average
																								1.1	1.3	1.3	2.3	1.0	1.5	2.0	1.5	1.6	1.5	2.0	1.6	1.5	1.6	1.3	1.4	1.4	1.2	1.2	1.0	1.0	0.9	1.1	1.2	0.4	Diurnal Maximum
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	115	63	16	5	2	12	60	138	127	54	24	5	4	15	22	38	700
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	115	63	16	5	2	12	60	138	127	54	24	5	4	15	22	38	700

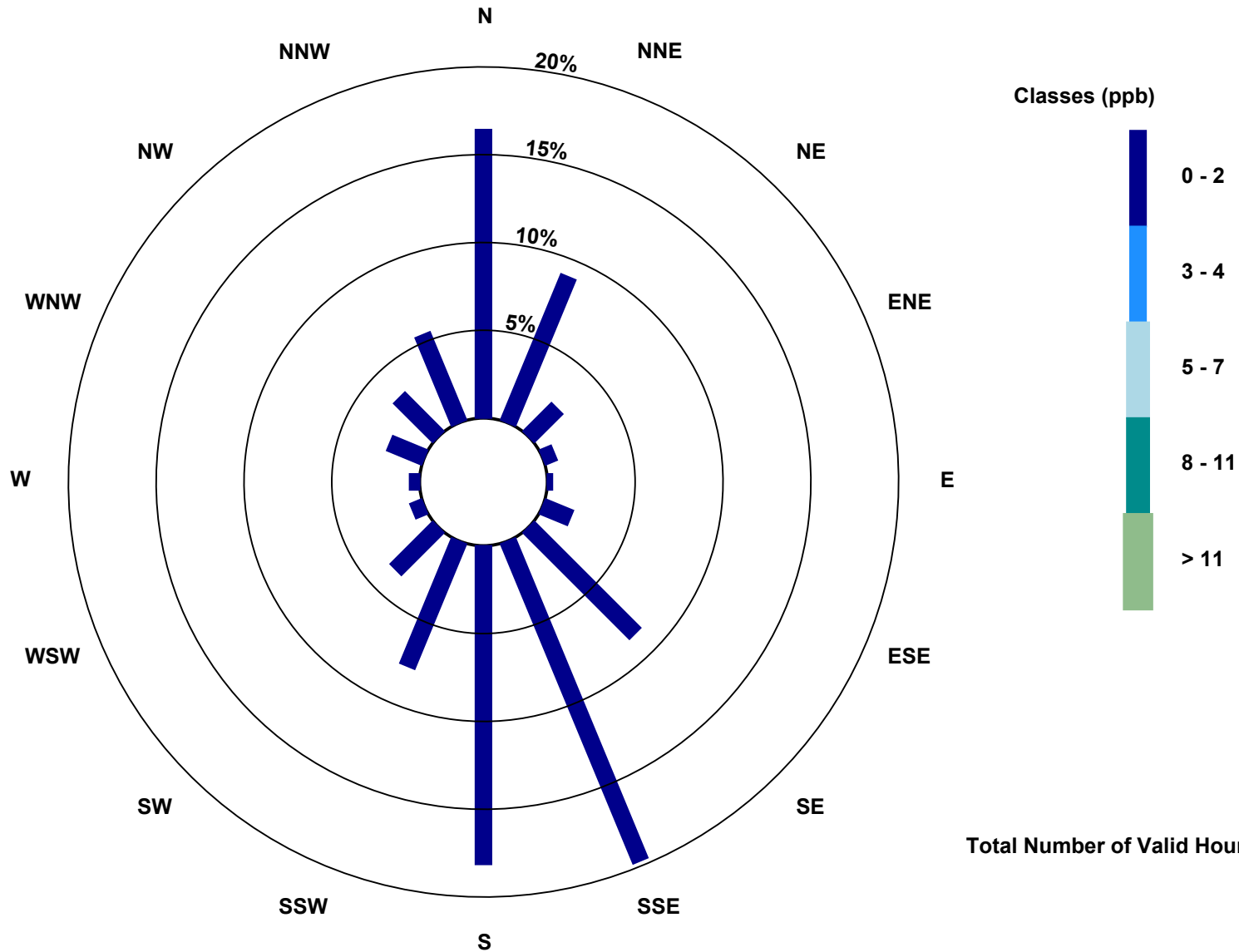
Total Number of Valid Hours: 700

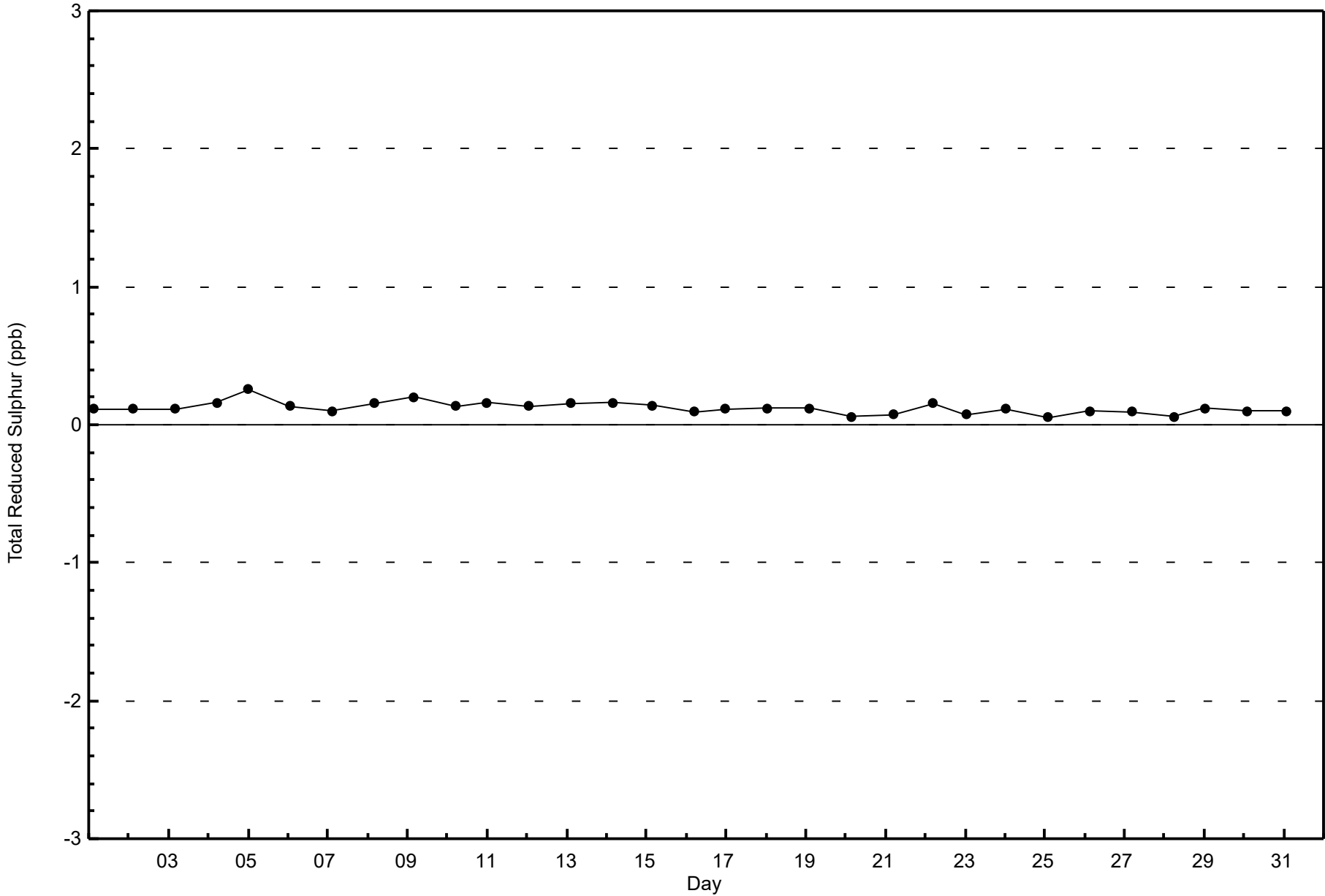
Total Number of Hours: 744

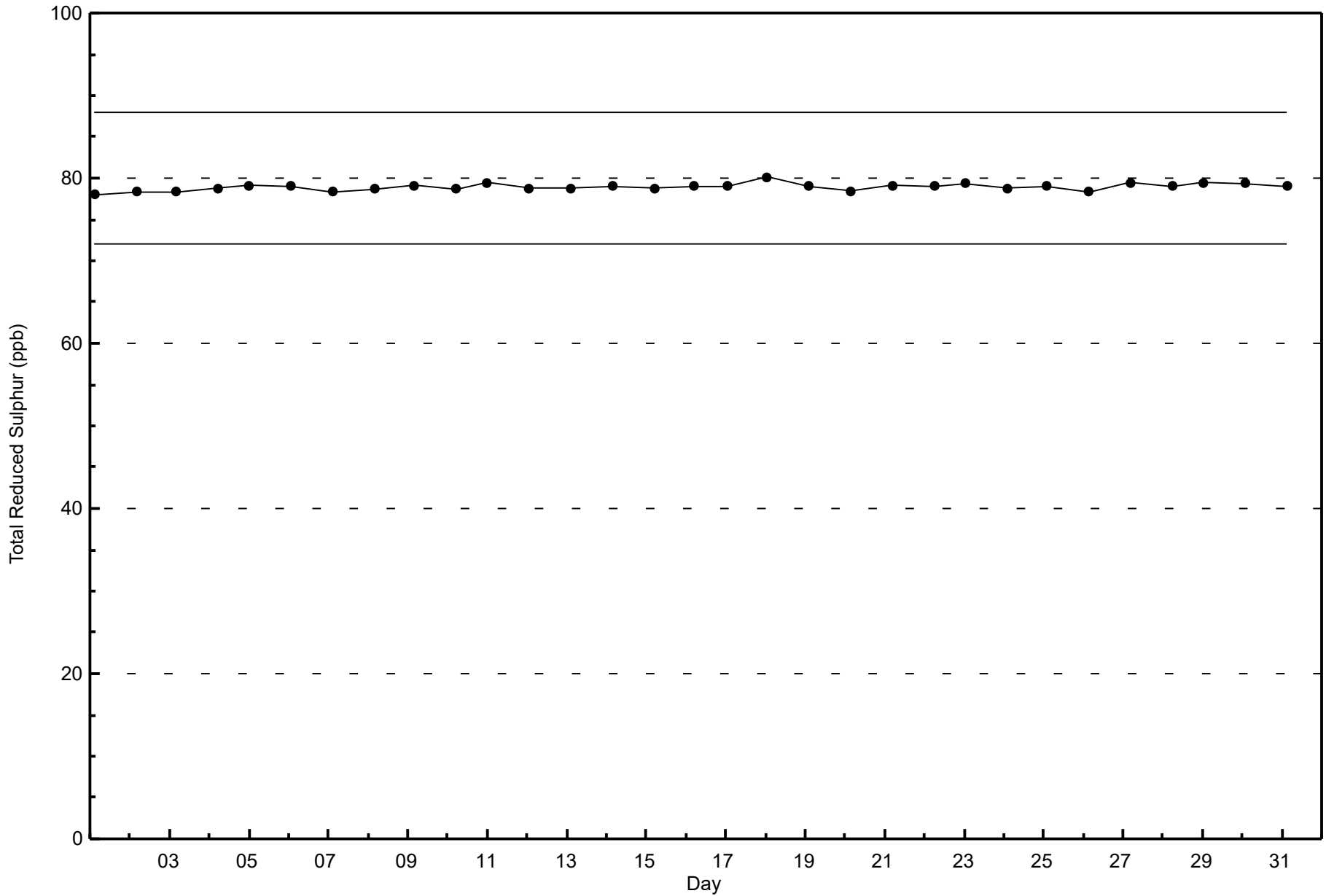


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills









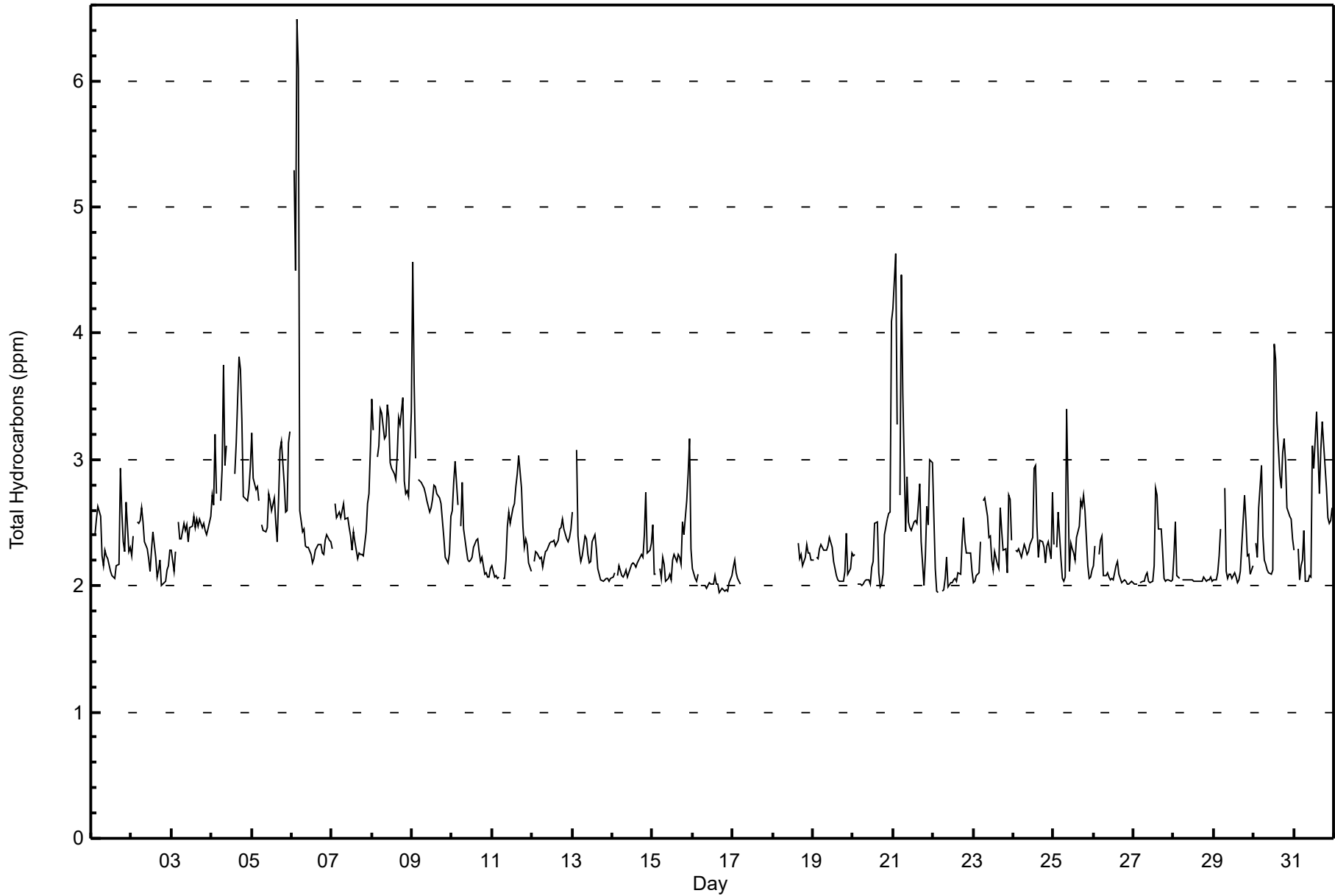
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																																											
Maximum Value: 6.5 ppm on Jan 6 04:00		Maximum Daily Average: 3.1 ppm on Jan 8		Hours of Data: 677																																													
Minimum Value: 1.9 ppm on Jan 16 17:00		Minimum Daily Average: 2.0 ppm on Jan 16		Hours of Missing Data: 67																																													
Maximum Diurnal Average: 2.6 ppm at hour 2		Minimum Diurnal Average: 2.3 ppm at hour 11		Hours of Calibration: 34																																													
Monthly Average: 2.41 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.3 Q ₃ = 2.6 P ₉₀ = 2.9 P ₉₉ = 4.3		Percent Operational Time: 95.6																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	2.3	Z	2.4	2.5	2.6	2.6	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.9	2.6	2.3	2.3	2.7	2.3	2.3	2.3	2.9	2.9																						
2-Jan	2.2	2.4	Z	2.5	2.5	2.5	2.6	2.5	2.3	2.3	2.2	2.1	2.3	2.4	2.2	2.1	2.1	2.2	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.6	2.6																					
3-Jan	2.3	2.1	2.3	Z	2.5	2.4	2.4	2.5	2.4	2.5	2.3	2.5	2.5	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6																					
4-Jan	2.7	2.6	3.2	2.7	Z	2.7	2.9	3.7	3.0	3.1	C	C	C	C	2.9	3.1	3.8	3.7	3.3	2.7	2.7	2.8	2.9	2.9	2.9	3.0	3.8	3.8																					
5-Jan	3.2	2.8	2.8	2.8	2.7	Z	2.5	2.4	2.4	2.5	2.7	2.7	2.6	2.7	2.5	2.3	2.7	3.1	3.1	2.8	2.6	2.6	3.1	3.2	2.7	2.7	3.2	3.2																					
6-Jan	Z	5.3	4.5	6.5	6.1	2.6	2.4	2.5	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.4	2.4	2.4	2.4	2.9	2.9	6.5	6.5																					
7-Jan	2.3	Z	2.7	2.5	2.6	2.5	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.4	2.3	2.2	2.3	2.3	2.2	2.2	2.4	2.6	2.7	3.1	2.5	2.5	3.1	3.1																					
8-Jan	3.5	3.2	Z	3.0	3.1	3.4	3.4	3.2	3.2	3.4	3.3	3.0	2.9	2.9	2.8	3.0	3.3	3.3	3.5	2.8	2.7	2.7	2.7	3.4	3.1	3.1	3.5	3.5																					
9-Jan	4.6	3.6	3.0	Z	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.6	2.7	2.8	2.8	2.7	2.7	2.6	2.5	2.4	2.2	2.2	2.3	2.6	2.8	2.8	4.6	4.6																					
10-Jan	2.6	2.8	3.0	2.6	Z	2.5	2.8	2.5	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.4	2.4	3.0	3.0																					
11-Jan	2.2	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.2	2.5	2.6	2.5	2.6	2.7	2.8	2.9	3.0	2.8	2.5	2.3	2.4	2.3	2.2	2.1	2.4	2.4	3.0	3.0																					
12-Jan	Z	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.5	2.3	2.3	2.5	2.5																					
13-Jan	2.6	Z	3.1	2.4	2.3	2.2	2.2	2.4	2.4	2.3	2.2	2.2	2.3	2.4	2.3	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.3	2.3	3.1	3.1																					
14-Jan	2.1	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.7	2.3	2.3	2.3	2.2	2.2	2.7	2.7																					
15-Jan	2.5	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.0	2.2	2.3	2.2	2.2	2.2	2.2	2.5	2.4	2.7	2.9	3.2	2.3	2.3	2.3	3.2	3.2																					
16-Jan	2.1	2.1	2.0	2.1	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1																					
17-Jan	2.1	2.2	2.1	2.1	2.0	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF																					
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3																					
19-Jan	2.2	Z	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.4	2.1	2.1	2.3	2.2	2.2	2.4	2.4																					
20-Jan	2.2	2.2	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.2	2.2	2.5	2.5	2.1	2.0	2.0	2.1	2.4	2.5	2.6	2.6	4.1	2.3	2.3	4.1	4.1																					
21-Jan	4.2	4.6	3.3	Z	2.7	4.5	3.5	2.4	2.9	2.5	2.5	2.4	2.5	2.5	2.5	2.6	2.8	2.4	2.0	2.2	2.6	2.5	3.0	3.0	2.9	2.9	4.6	4.6																					
22-Jan	2.6	2.1	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.3	2.5	2.3	2.3	2.3	2.3	2.1	2.1	2.1	2.6	2.6																					
23-Jan	2.0	2.0	2.1	2.1	2.3	Z	2.7	2.7	2.6	2.4	2.4	2.2	2.1	2.3	2.2	2.1	2.6	2.4	2.3	2.3	2.1	2.7	2.7	2.4	2.3	2.3	2.7	2.7																					
24-Jan	Z	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.4	2.9	3.0	2.5	2.2	2.4	2.4	2.3	2.2	2.3	2.3	2.2	2.7	2.4	2.4	3.0	3.0																					
25-Jan	2.3	Z	2.3	2.6	2.2	2.1	2.0	2.1	3.4	2.1	2.3	2.3	2.3	2.2	2.4	2.5	2.7	2.6	2.7	2.6	2.2	2.1	2.1	2.1	2.4	2.4	3.4	3.4																					
26-Jan	2.2	2.3	Z	2.2	2.4	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4	2.4																					
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.2	2.8	2.7	2.4	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.8	2.8																					
28-Jan	2.2	2.5	2.1	2.1	Z	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.5	2.5																					
29-Jan	2.0	2.0	2.1	2.2	2.5	Z	2.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.5	2.7	2.5	2.2	2.2	2.1	2.2	2.2	2.8	2.8																					
30-Jan	Z	2.3	2.2	2.6	2.9	2.4	2.2	2.2	2.1	2.1	2.1	2.1	2.1	3.9	3.8	3.3	2.9	2.8	3.1	3.2	3.0	2.6	2.6	2.5	2.4	2.7	2.7	3.9	3.9																				
31-Jan	2.3	Z	2.3	2.0	2.2	2.2	2.4	2.0	2.0	2.1	2.1	3.1	2.9	3.4	3.1	2.7	3.1	3.3	3.1	2.8	2.5	2.5	2.5	2.6	2.6	2.6	3.4	3.4																					
																								2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.4	2.4	2.5	Diurnal Average	
																								4.6	5.3	4.5	6.5	6.1	4.5	3.5	3.7	3.4	3.4	3.3	3.1	3.9	3.8	3.3	3.1	3.8	3.7	3.5	3.0	2.7	2.9	3.2	4.1	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				AF - Analyzer Failure																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort Hills - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	95	14.03	14.03
2.1 - 3.0	530	78.29	92.32
3.1 - 10.0	52	7.68	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	29	16	0	0	0	0	0	0	6	12	3	0	3	3	10	12	94
2.1 - 3.0	84	45	14	4	3	6	46	126	86	31	19	4	3	12	12	28	523
3.1 - 10.0	5	2	2	1	0	5	11	8	10	3	1	2	0	0	2	0	52
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

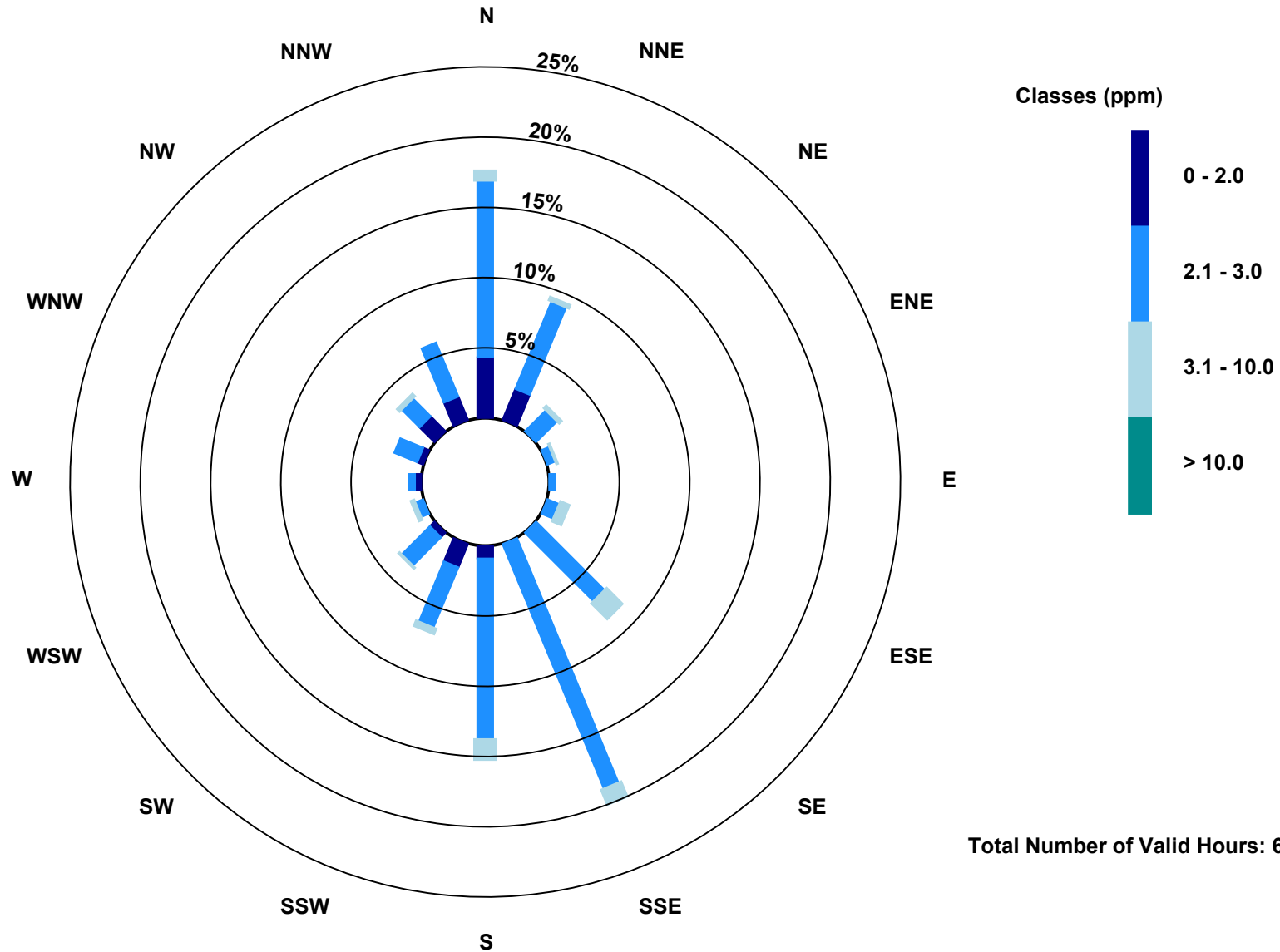
Total Number of Valid Hours: 669

Total Number of Hours: 744

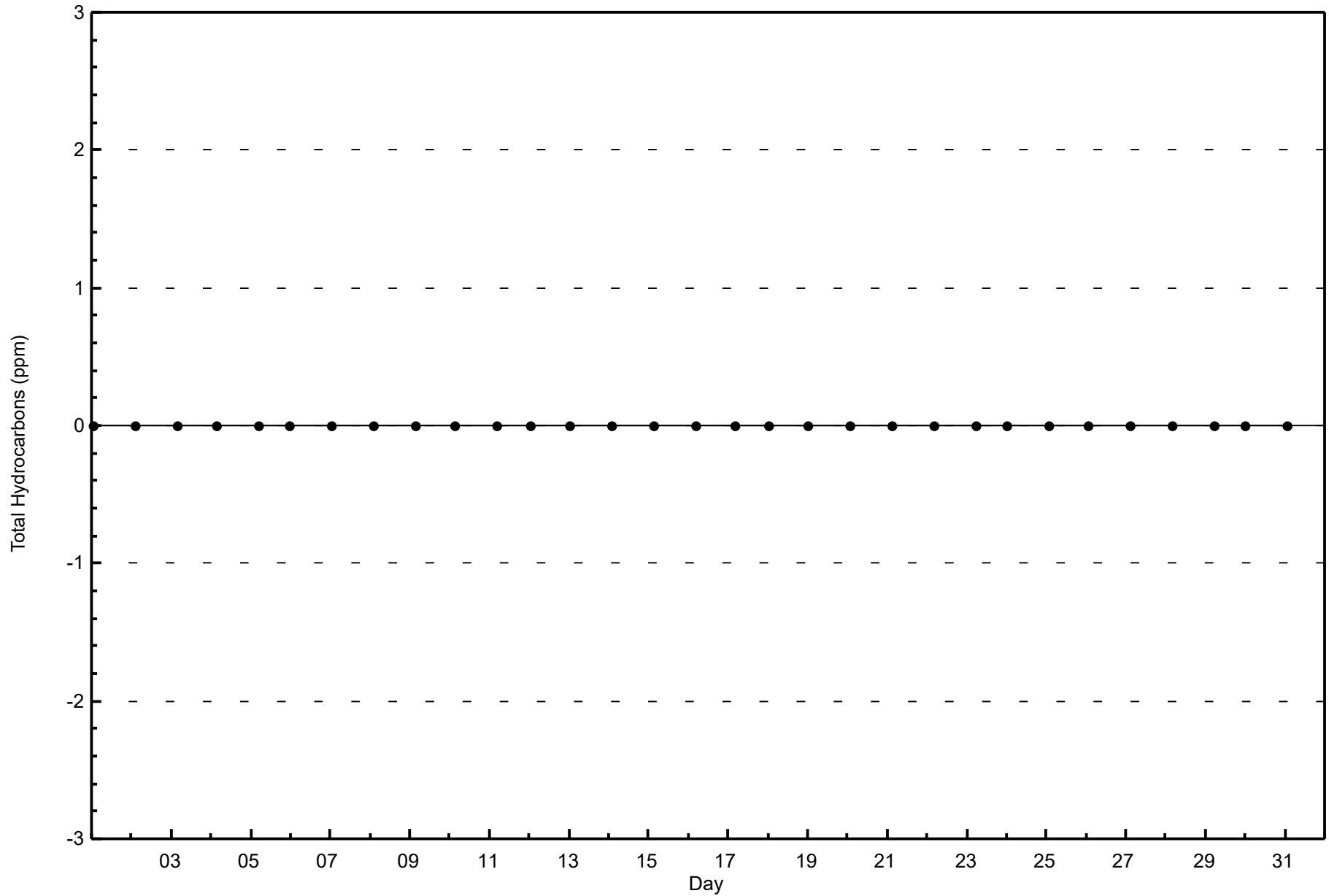


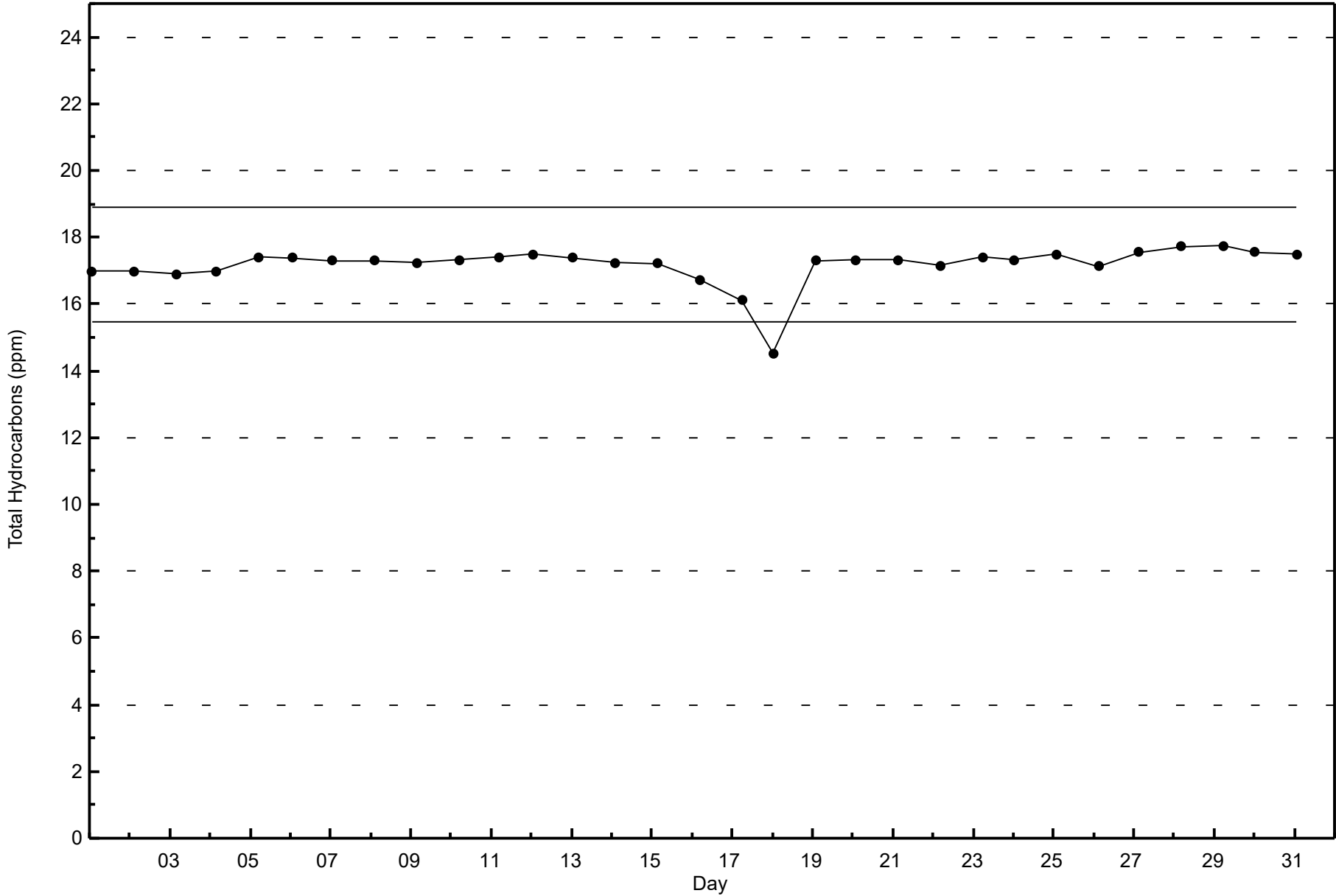
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Fort Hills



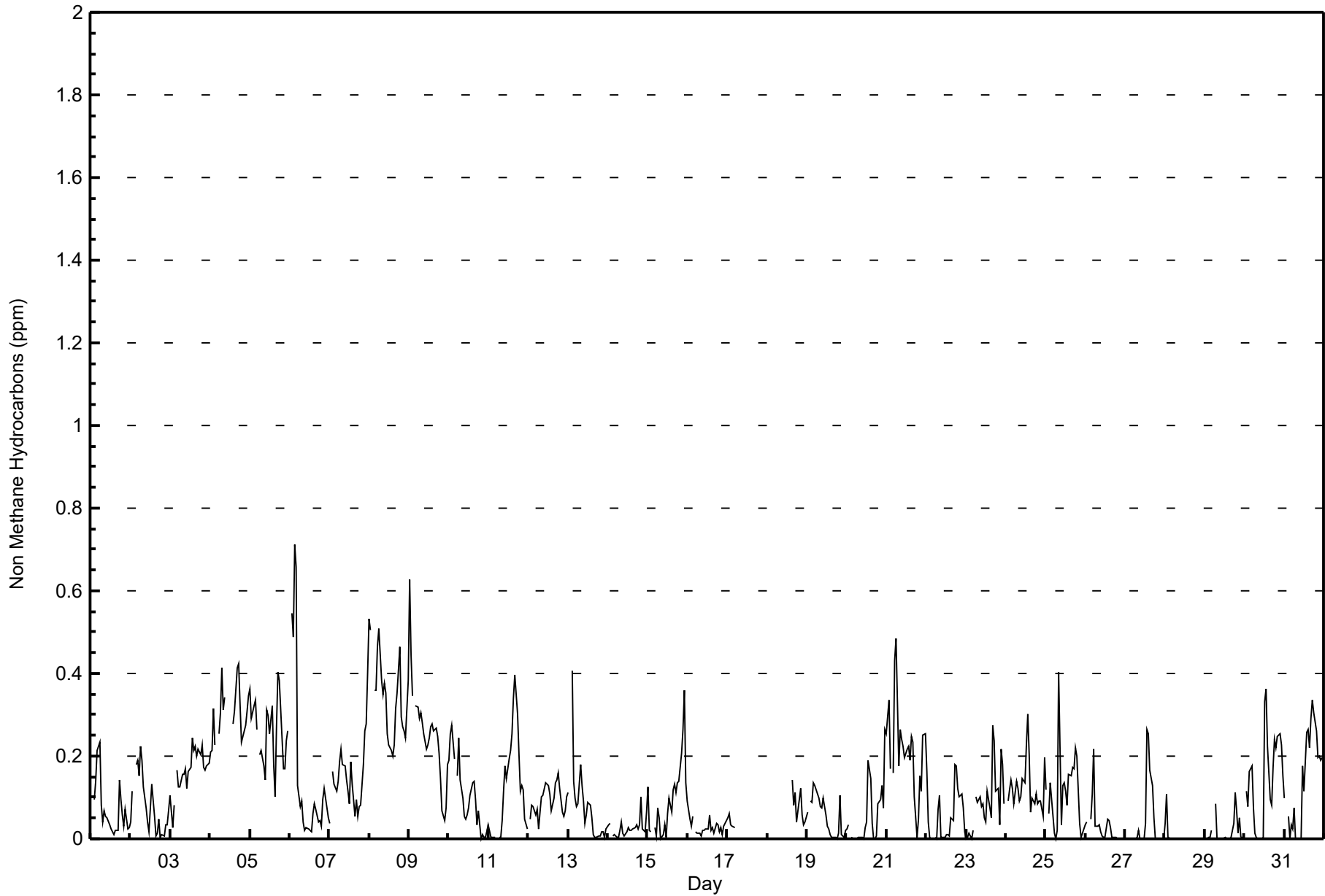
Total Number of Valid Hours: 669







Maximum Value: 0.711 ppm on Jan 6 04:00																								Maximum Daily Average: 0.343 ppm on Jan 8																								Hours in Service: 744	
Minimum Value: 0.000 ppm on Jan 20 05:00																								Minimum Daily Average: 0.007 ppm on Jan 28																								Hours of Data: 677	
Maximum Diurnal Average: 0.142 ppm at hour 14																								Minimum Diurnal Average: 0.084 ppm at hour 12																								Hours of Missing Data: 67	
Monthly Average: 0.115 ppm																								Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.5																								Hours of Calibration: 34	
																																																Percent Operational Time: 95.6	
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.050	Z	0.094	0.140	0.215	0.236	0.081	0.042	0.069	0.054	0.051	0.032	0.025	0.018	0.011	0.020	0.019	0.143	0.095	0.057	0.029	0.073	0.022	0.026	0.070	0.236																							
2-Jan	0.042	0.116	Z	0.179	0.189	0.153	0.225	0.189	0.125	0.073	0.039	0.016	0.076	0.131	0.055	0.008	0.013	0.048	0.004	0.009	0.006	0.036	0.036	0.069	0.080	0.225																							
3-Jan	0.104	0.028	0.082	Z	0.168	0.125	0.125	0.158	0.157	0.171	0.121	0.163	0.174	0.246	0.212	0.224	0.201	0.216	0.203	0.227	0.174	0.167	0.176	0.184	0.165	0.246																							
4-Jan	0.209	0.212	0.315	0.228	Z	0.254	0.306	0.414	0.311	0.341	C	C	C	C	0.277	0.307	0.413	0.423	0.324	0.234	0.248	0.276	0.307	0.345	0.302	0.423																							
5-Jan	0.363	0.290	0.324	0.334	0.265	Z	0.204	0.212	0.176	0.141	0.311	0.299	0.255	0.322	0.204	0.103	0.272	0.403	0.383	0.241	0.170	0.169	0.239	0.260	0.257	0.403																							
6-Jan	Z	0.546	0.488	0.711	0.657	0.128	0.077	0.090	0.041	0.021	0.026	0.024	0.021	0.018	0.059	0.086	0.071	0.041	0.044	0.032	0.093	0.121	0.073	0.051	0.153	0.711																							
7-Jan	0.037	Z	0.162	0.134	0.115	0.139	0.187	0.218	0.180	0.178	0.141	0.115	0.085	0.187	0.132	0.054	0.096	0.053	0.077	0.081	0.181	0.262	0.279	0.399	0.152	0.399																							
8-Jan	0.532	0.504	Z	0.359	0.359	0.465	0.508	0.383	0.350	0.375	0.354	0.253	0.226	0.212	0.201	0.227	0.314	0.351	0.464	0.295	0.271	0.263	0.243	0.383	0.343	0.532																							
9-Jan	0.628	0.443	0.346	Z	0.323	0.319	0.291	0.305	0.280	0.255	0.218	0.228	0.244	0.270	0.278	0.262	0.269	0.249	0.208	0.145	0.068	0.043	0.076	0.178	0.257	0.628																							
10-Jan	0.189	0.255	0.276	0.195	Z	0.154	0.246	0.143	0.097	0.055	0.046	0.059	0.074	0.105	0.136	0.139	0.096	0.035	0.068	0.001	0.010	0.002	0.003	0.017	0.104	0.276																							
11-Jan	0.034	0.003	0.003	0.004	0.003	Z	0.003	0.004	0.045	0.116	0.176	0.146	0.192	0.213	0.253	0.338	0.396	0.301	0.205	0.117	0.129	0.119	0.049	0.025	0.125	0.396																							
12-Jan	Z	0.047	0.080	0.079	0.058	0.071	0.025	0.066	0.103	0.104	0.137	0.133	0.128	0.108	0.068	0.097	0.136	0.143	0.158	0.121	0.065	0.056	0.069	0.100	0.094	0.158																							
13-Jan	0.111	Z	0.406	0.140	0.099	0.078	0.086	0.179	0.129	0.093	0.037	0.057	0.088	0.082	0.049	0.009	0.004	0.004	0.005	0.006	0.017	0.018	0.003	0.025	0.075	0.406																							
14-Jan	0.035	0.038	Z	0.006	0.009	0.002	0.002	0.020	0.042	0.014	0.006	0.016	0.028	0.022	0.019	0.024	0.026	0.033	0.024	0.035	0.100	0.023	0.017	0.065	0.026	0.100																							
15-Jan	0.126	0.022	0.019	Z	0.028	0.007	0.075	0.050	0.001	0.010	0.035	0.005	0.060	0.022	0.066	0.117	0.132	0.113	0.135	0.140	0.208	0.265	0.360	0.137	0.096	0.360																							
16-Jan	0.092	0.047	0.030	0.056	Z	0.017	0.015	0.015	0.006	0.019	0.022	0.022	0.025	0.058	0.019	0.026	0.015	0.037	0.032	0.016	0.027	0.010	0.031	0.045	0.030	0.092																							
17-Jan	0.052	0.062	0.035	0.031	0.029	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	0.062																							
18-Jan	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	0.141	0.082	0.111	0.042	0.095	0.121	0.058	0.035	0.039	--	0.141																							
19-Jan	0.065	Z	0.090	0.088	0.135	0.127	0.107	0.100	0.078	0.075	0.097	0.059	0.031	0.023	0.009	0.005	0.003	0.005	0.001	0.015	0.106	0.009	0.005	0.021	0.054	0.135																							
20-Jan	0.025	0.033	Z	0.003	0.000	0.000	0.001	0.002	0.003	0.002	0.001	0.026	0.041	0.190	0.145	0.036	0.001	0.001	0.008	0.085	0.094	0.130	0.074	0.264	0.051	0.264																							
21-Jan	0.253	0.336	0.170	Z	0.160	0.429	0.485	0.176	0.266	0.239	0.223	0.196	0.218	0.224	0.190	0.248	0.235	0.102	0.003	0.048	0.152	0.117	0.252	0.253	0.216	0.485																							
22-Jan	0.163	0.040	0.002	0.000	Z	0.002	0.001	0.070	0.105	0.004	0.003	0.005	0.010	0.010	0.005	0.050	0.044	0.178	0.176	0.123	0.101	0.109	0.076	0.016	0.056	0.178																							
23-Jan	0.000	0.002	0.012	0.001	0.022	Z	0.103	0.089	0.101	0.079	0.086	0.050	0.042	0.116	0.076	0.052	0.275	0.237	0.116	0.122	0.035	0.218	0.178	0.085	0.091	0.275																							
24-Jan	Z	0.092	0.119	0.143	0.121	0.083	0.139	0.122	0.090	0.103	0.144	0.135	0.227	0.300	0.202	0.066	0.099	0.084	0.109	0.086	0.091	0.093	0.056	0.195	0.126	0.300																							
25-Jan	0.120	Z	0.060	0.136	0.054	0.015	0.001	0.022	0.404	0.033	0.128	0.134	0.117	0.081	0.156	0.154	0.172	0.169	0.219	0.199	0.037	0.003	0.015	0.024	0.107	0.404																							
26-Jan	0.033	0.041	Z	0.048	0.108	0.217	0.032	0.030	0.035	0.018	0.008	0.003	0.002	0.049	0.043	0.028	0.003	0.002	0.005	0.001	0.001	0.000	0.000	0.001	0.031	0.217																							
27-Jan	0.001	0.000	0.001	Z	0.000	0.000	0.000	0.005	0.022	0.002	0.000	0.000	0.037	0.265	0.255	0.166	0.128	0.051	0.002	0.000	0.000	0.000	0.000	0.000	0.041	0.265																							
28-Jan	0.039	0.108	0.002	0.000	Z	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.007	0.108																							
29-Jan	0.000	0.000	0.005	0.003	0.022	Z	0.084	0.001	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.001	0.002	0.038	0.113	0.068	0.013	0.052	0.005	0.005	0.018	0.113																							
30-Jan	Z	0.115	0.077	0.162	0.178	0.074	0.013	0.003	0.000	0.001	0.000	0.002	0.332	0.362	0.222	0.095	0.081	0.172	0.241	0.219	0.247	0.255	0.227	0.153	0.140	0.362																							
31-Jan	0.098	Z	0.056	0.000	0.032	0.024	0.073	0.001	0.001	0.001	0.001	0.177	0.116	0.258	0.266	0.220	0.293	0.337	0.305	0.261	0.198	0.201	0.188	0.197	0.144	0.337																							
																								0.131	0.141	0.130	0.127	0.134	0.125	0.121	0.107	0.111	0.089	0.086	0.084	0.103	0.142	0.124	0.110	0.130	0.136	0.126	0.103	0.100	0.105	0.103	0.119	Diurnal Average	
																								0.628	0.546	0.488	0.711	0.657	0.465	0.508	0.414	0.404	0.375	0.354	0.299	0.332	0.362	0.278	0.338	0.413	0.423	0.464	0.295	0.271	0.276	0.360	0.399	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				AF - Analyzer Failure																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	122	18.02	18.02
0.006 - 0.05	161	23.78	41.80
0.06 - 0.1	187	27.62	69.42
> 0.1	207	30.58	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	21	21	0	0	0	0	4	3	14	14	5	1	4	8	11	15	121
0.006 - 0.05	42	18	3	0	0	1	5	20	38	16	8	1	0	1	2	5	160
0.06 - 0.1	25	16	8	4	2	3	12	56	24	7	5	2	2	4	2	13	185
> 0.1	30	8	5	1	1	7	36	55	26	9	5	2	0	2	9	7	203
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

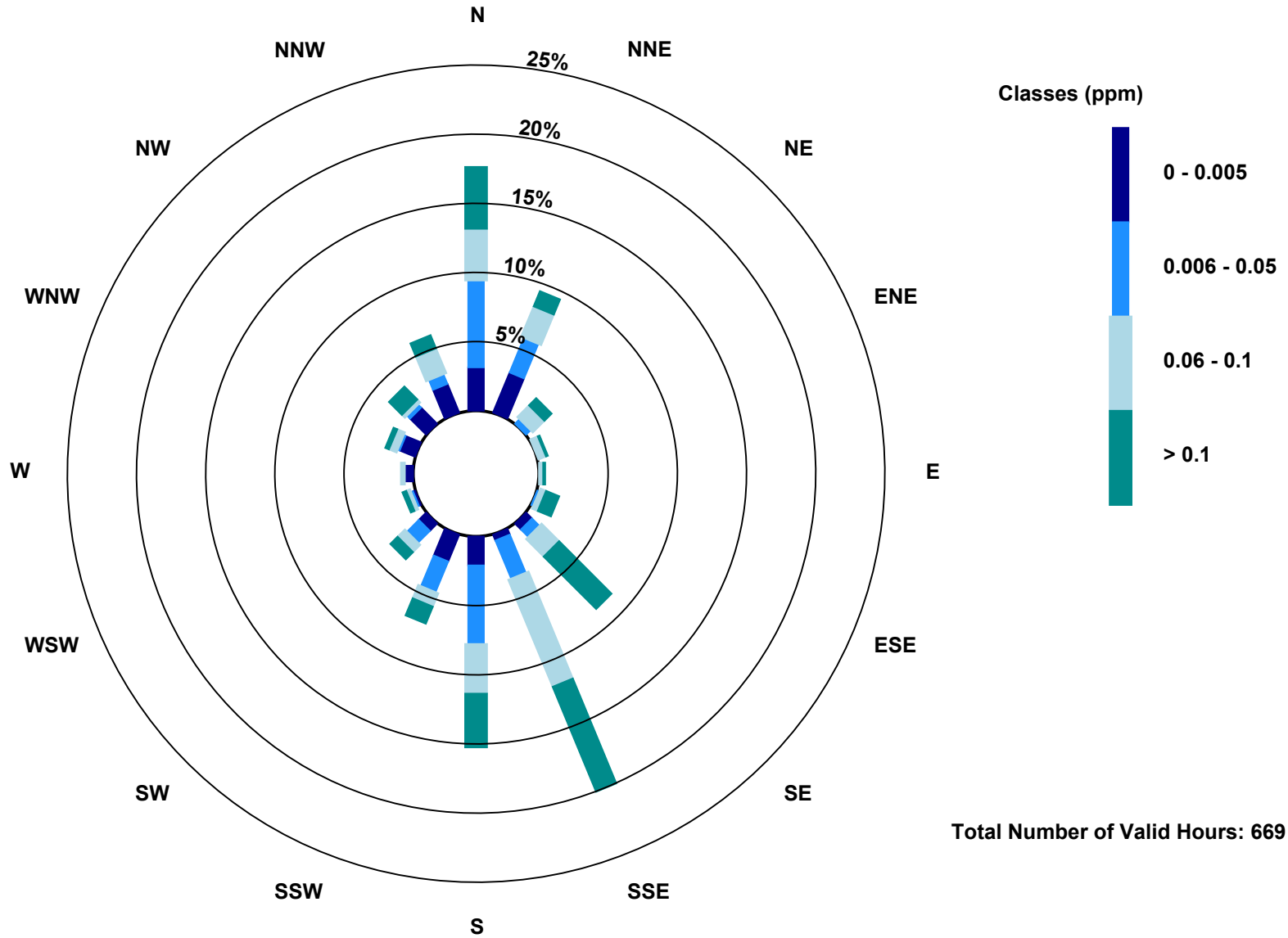
Total Number of Valid Hours: 669

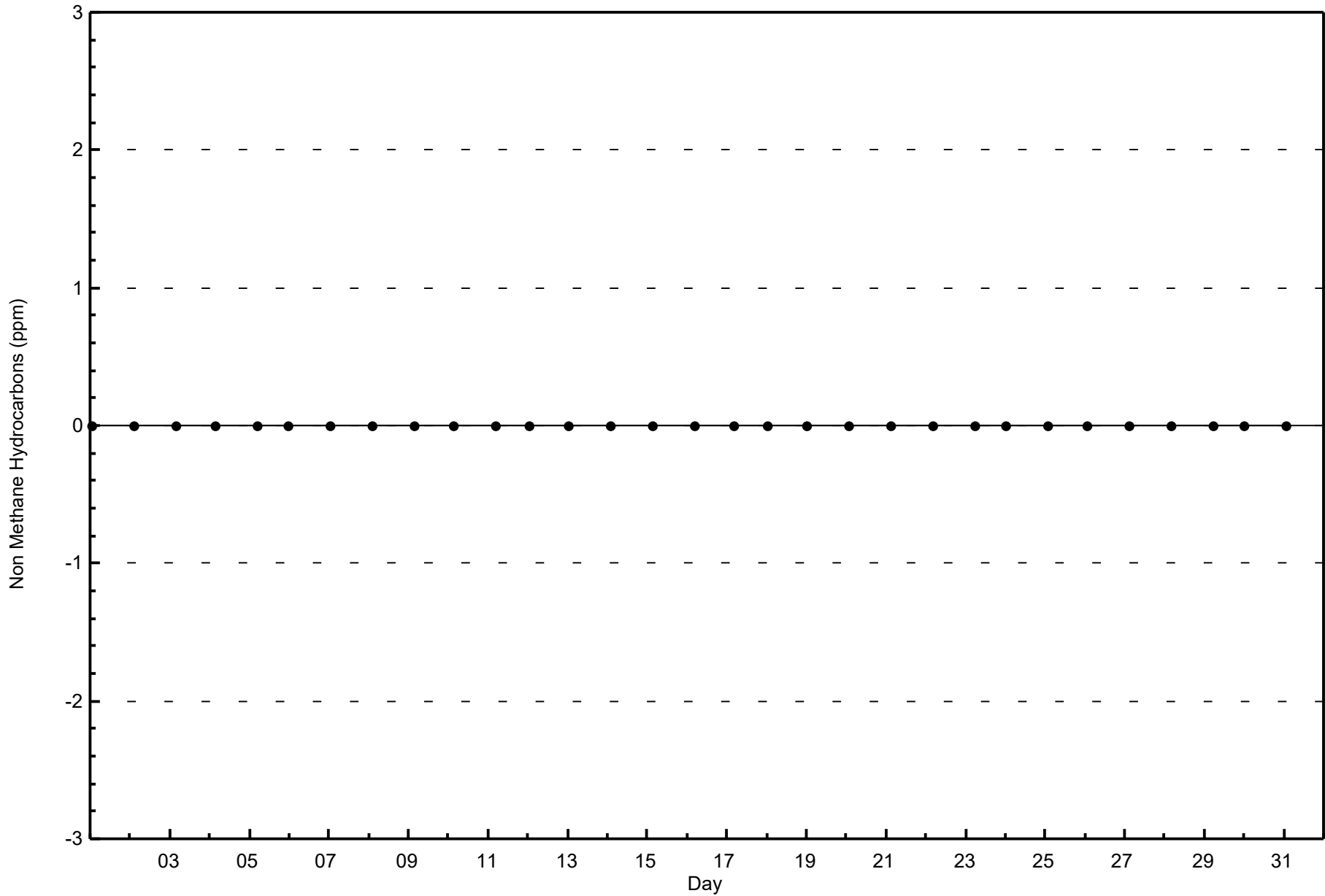
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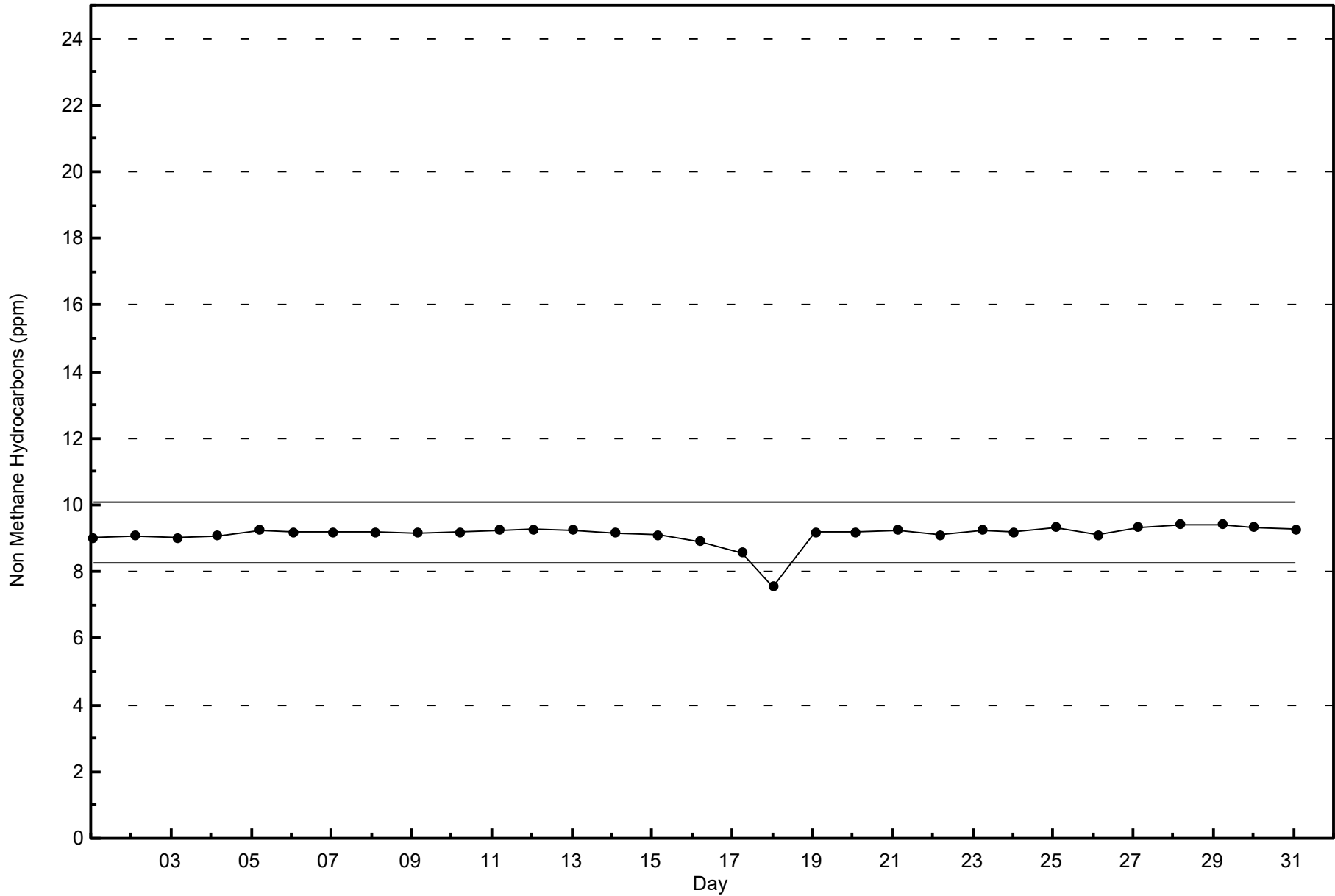


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills



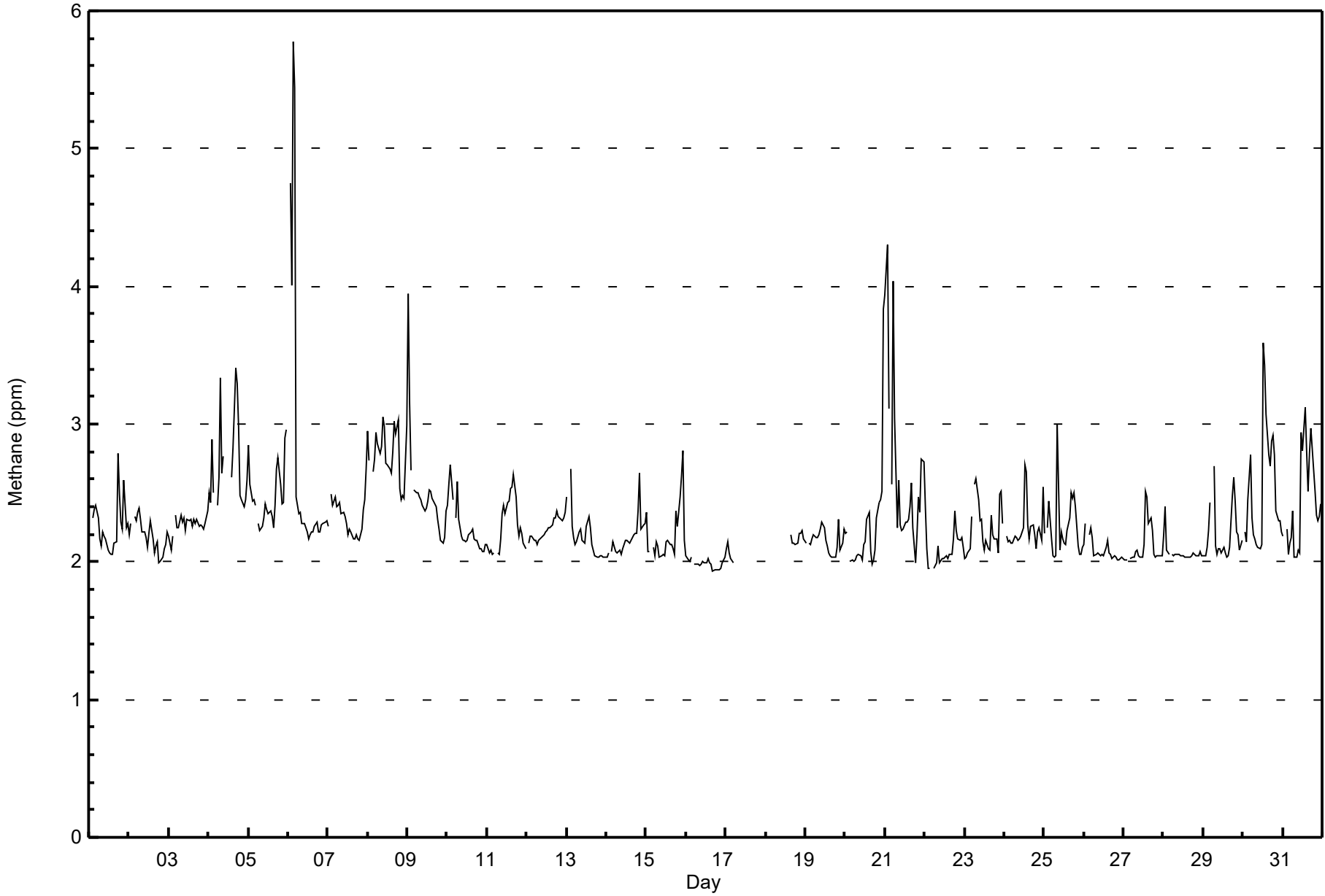






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort Hills - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	117	17.28	17.28
2.1 - 3.0	541	79.91	97.19
3.1 - 10.0	19	2.81	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Fort Hills - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	39	21	0	0	0	0	0	0	7	15	3	1	3	4	10	13	116
2.1 - 3.0	79	42	15	5	3	10	49	132	93	30	19	4	3	11	12	27	534
3.1 - 10.0	0	0	1	0	0	1	8	2	2	1	1	1	0	0	2	0	19
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	118	63	16	5	3	11	57	134	102	46	23	6	6	15	24	40	669

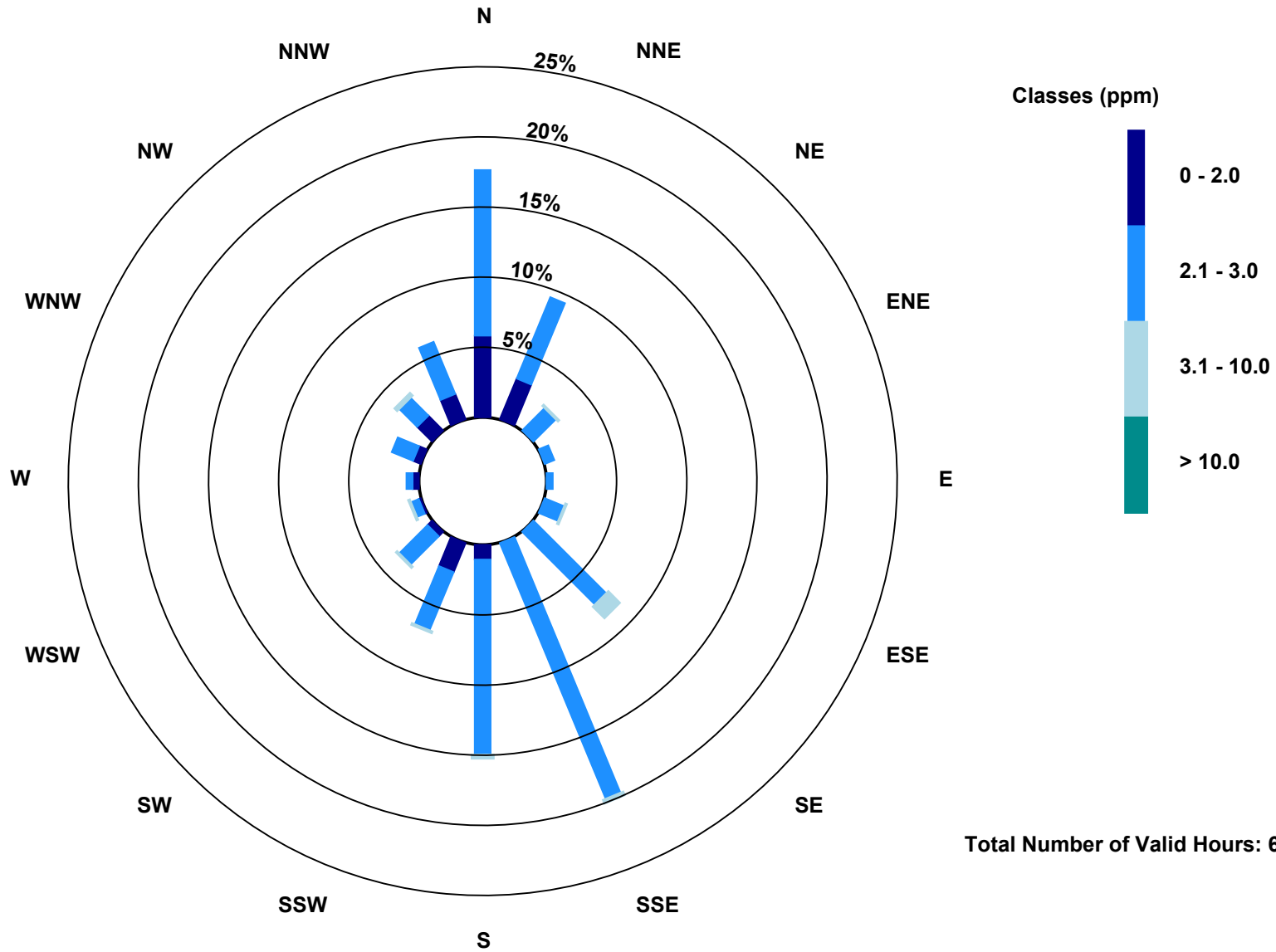
Total Number of Valid Hours: 669

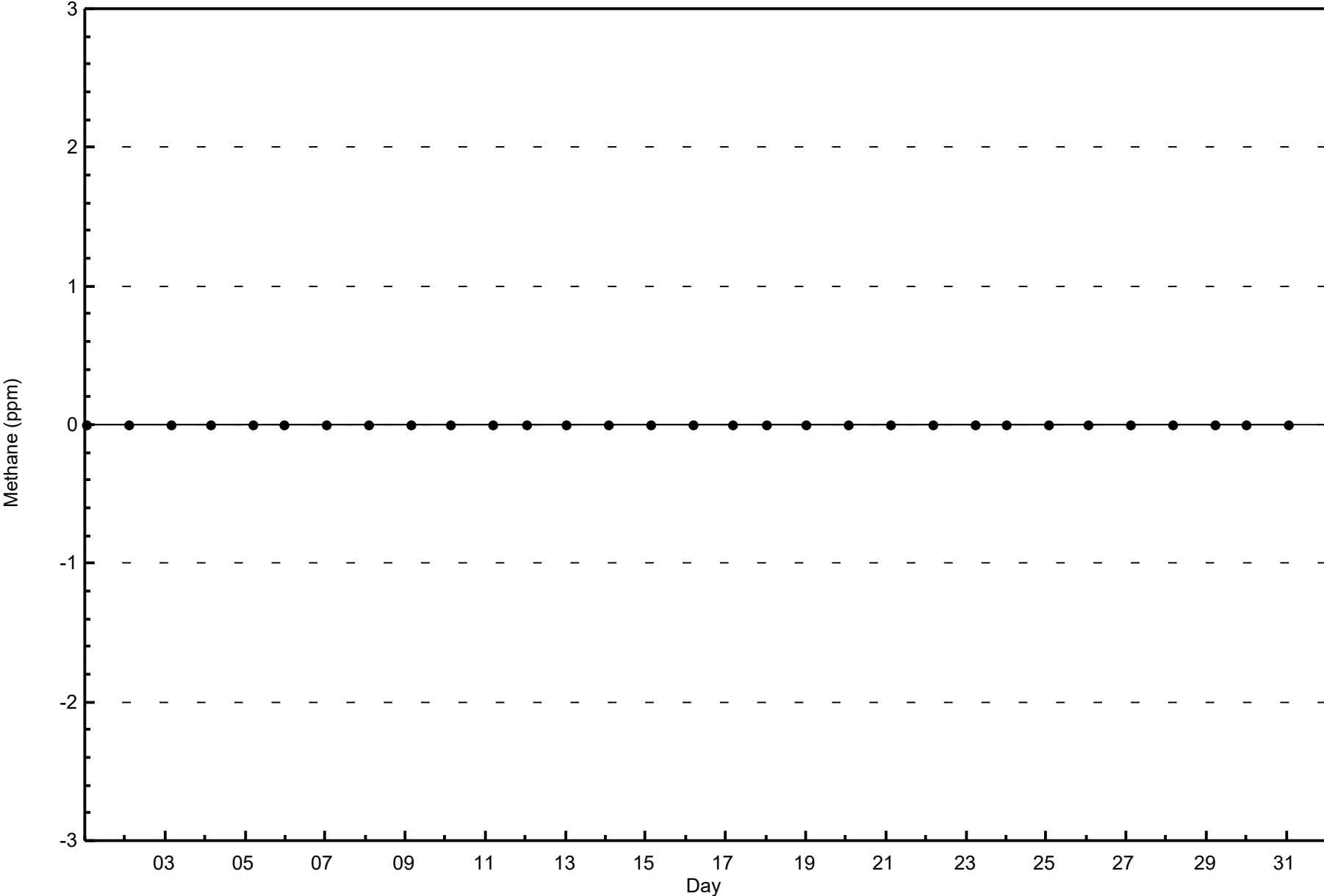
Total Number of Hours: 744

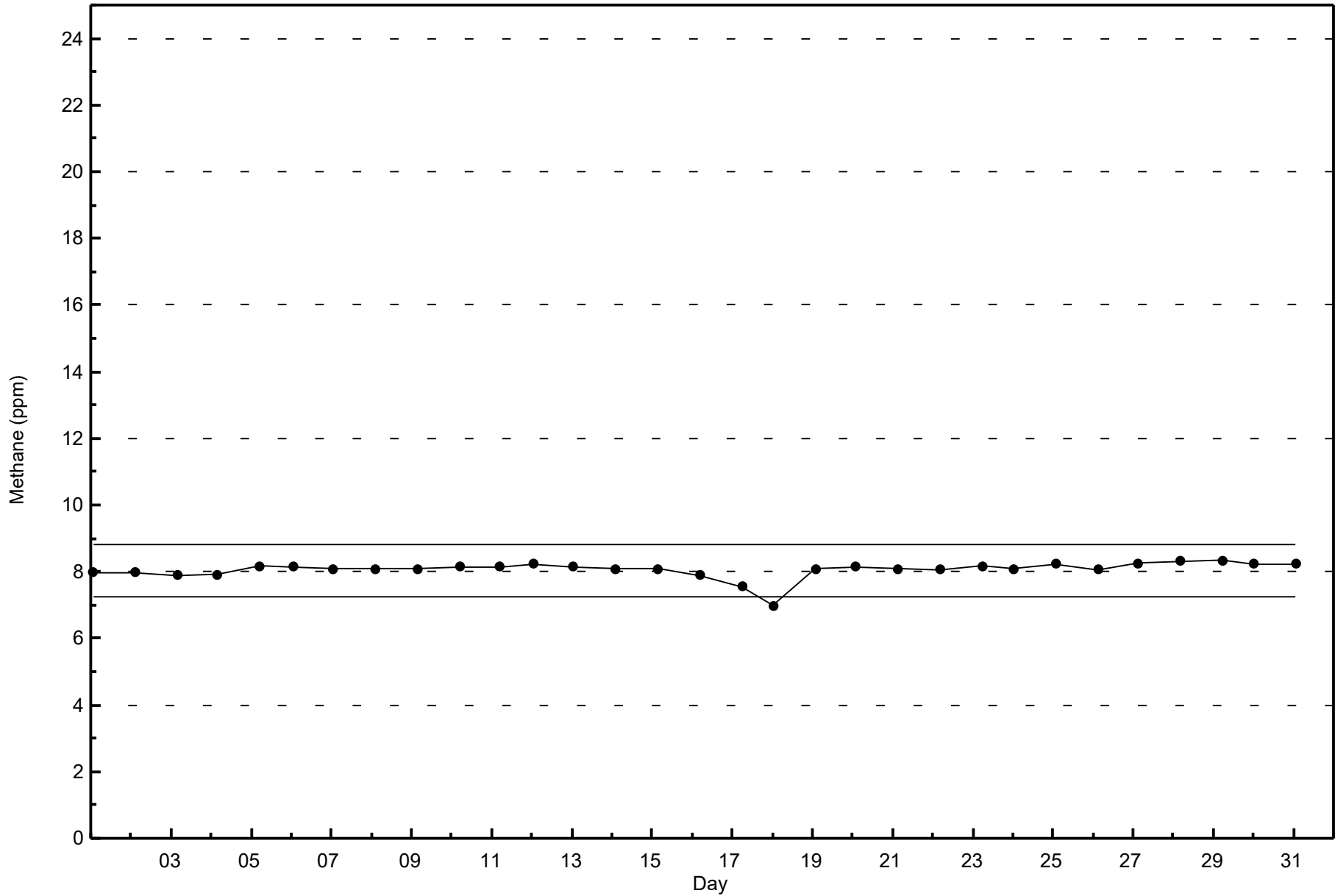


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Fort Hills









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitric Oxide (NO) - ppb
Fort Hills - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 133.5 ppb on Jan 6 04:00	Maximum Daily Average: 53.0 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.0 ppb on Jan 1 08:00	Minimum Daily Average: 0.3 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 19.1 ppb at hour 18	Minimum Diurnal Average: 6.7 ppb at hour 21		Hours of Calibration:	37
Monthly Average: 12.00 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 2.9 Q ₃ = 13.7 P ₉₀ = 39.3 P ₉₉ = 104.1		Percent Operational Time:	100.0

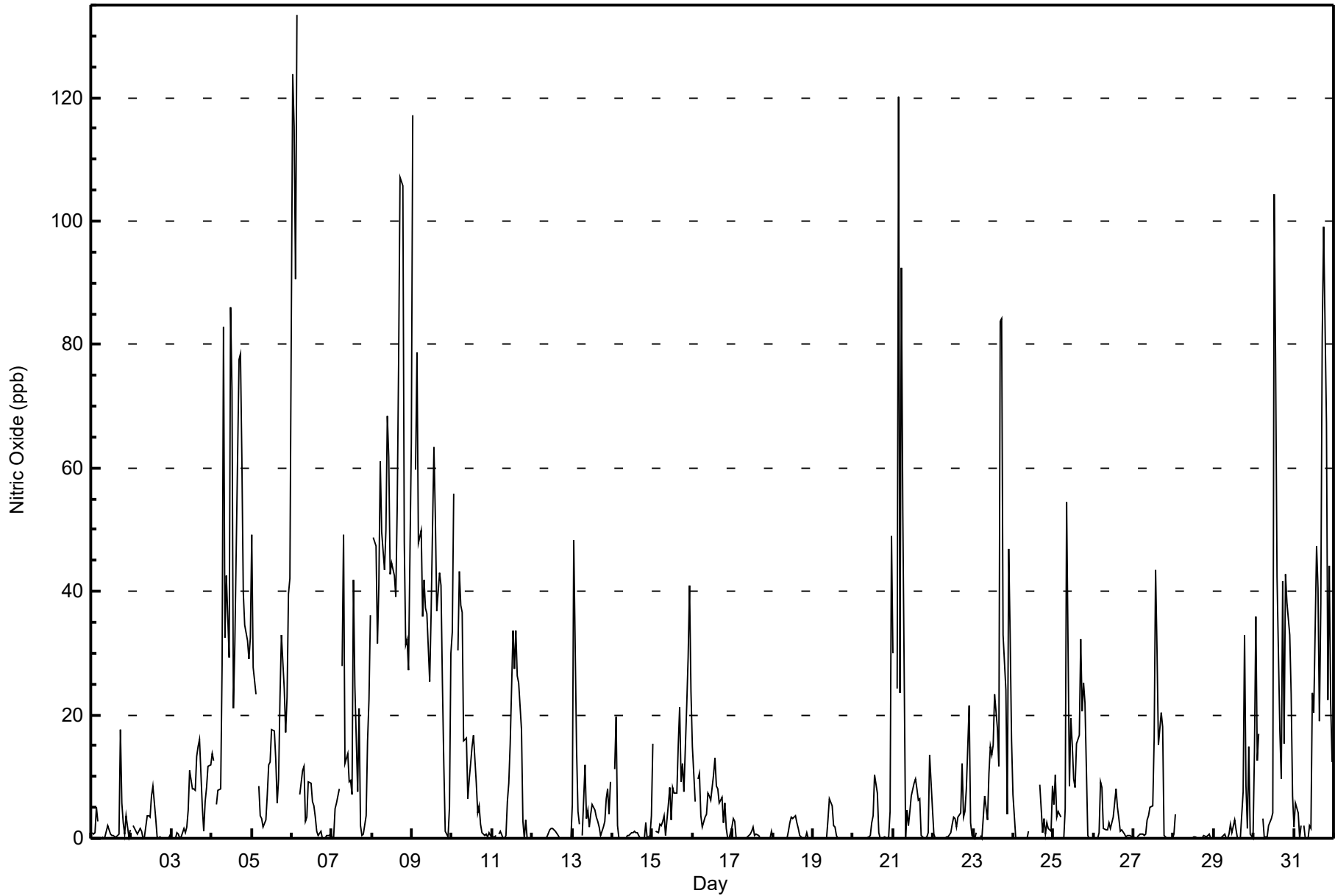
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.9	0.6	0.8	5.1	2.7	Z	0.1	0.0	0.2	1.1	2.0	0.6	0.5	0.5	0.3	0.2	0.6	17.5	5.6	2.5	0.7	3.7	0.3	1.4	2.1	17.5
2-Jan	Z	2.0	1.5	0.8	1.0	1.5	1.1	0.1	0.2	3.6	3.6	3.4	6.8	8.4	3.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.3	1.7	8.4
3-Jan	0.0	Z	0.0	0.9	0.7	0.0	0.2	1.6	0.9	1.9	4.6	11.1	7.9	8.0	7.8	13.3	14.9	16.0	4.9	1.1	6.0	8.3	11.7	12.0	5.8	16.0
4-Jan	13.6	12.6	Z	5.5	7.7	8.0	28.2	82.9	32.4	42.6	29.2	85.9	72.5	21.1	31.4	46.8	77.6	78.5	61.7	39.9	34.6	32.1	29.1	32.5	39.4	85.9
5-Jan	49.2	27.6	23.3	Z	8.4	3.8	3.2	1.8	3.0	7.0	11.8	12.3	17.6	17.4	12.9	5.8	9.7	23.0	32.9	24.2	17.1	23.0	39.5	42.1	18.1	49.2
6-Jan	123.8	115.2	90.6	133.5	Z	7.1	11.1	11.7	2.7	3.5	9.1	8.9	5.9	5.4	3.5	1.2	0.4	1.1	0.0	0.0	0.0	0.5	0.5	0.9	23.3	133.5
7-Jan	0.0	0.2	4.7	5.7	8.1	Z	28.0	49.1	12.2	13.8	9.3	9.3	7.1	41.9	24.8	7.6	21.0	2.0	0.5	0.7	3.6	15.9	22.4	36.2	14.1	49.1
8-Jan	Z	48.9	47.4	31.7	41.0	61.1	49.6	43.4	49.9	68.5	61.7	42.7	44.7	42.6	39.1	53.8	77.3	107.0	105.8	48.0	31.3	32.2	27.2	64.1	53.0	107.0
9-Jan	117.2	Z	59.8	78.7	47.8	49.9	35.9	41.8	37.4	36.3	25.4	36.4	50.2	63.4	51.8	36.8	42.9	40.9	25.2	11.8	1.2	0.2	5.1	30.1	40.3	117.2
10-Jan	33.4	55.9	Z	30.5	43.2	37.8	36.5	15.7	16.2	6.4	9.6	12.2	14.8	16.6	8.8	4.0	5.3	2.3	0.8	0.4	0.6	0.3	0.9	0.4	15.3	55.9
11-Jan	0.2	0.2	0.5	Z	0.7	1.1	0.0	0.0	0.3	6.0	8.9	15.4	33.5	27.6	33.6	26.3	25.2	17.7	2.6	0.0	2.9	0.0	0.0	0.0	8.8	33.6
12-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	1.4	1.7	1.5	1.4	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7
13-Jan	5.4	48.2	14.5	4.3	2.3	Z	0.4	11.8	3.2	4.6	1.8	3.9	5.4	4.7	3.3	2.7	1.8	0.4	1.8	2.8	6.4	8.1	4.0	9.1	6.6	48.2
14-Jan	Z	11.2	19.8	2.2	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.9	0.9	1.1	1.0	0.9	0.1	0.0	0.0	0.0	2.4	0.0	0.5	3.7	2.0	19.8
15-Jan	15.3	Z	1.2	0.8	2.4	2.0	2.7	3.7	0.5	5.4	8.1	2.9	8.3	7.3	7.3	15.2	21.2	9.2	12.1	7.5	21.4	29.3	40.9	23.8	10.8	40.9
16-Jan	14.8	5.8	Z	9.6	10.4	3.8	1.9	3.4	3.9	7.3	6.8	6.1	10.2	13.1	8.4	7.9	5.7	6.6	2.5	5.7	1.5	0.0	0.0	1.9	6.0	14.8
17-Jan	3.2	2.7	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.3	1.8	0.6	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	3.2
18-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.2	2.5	3.4	3.2	3.6	2.5	1.7	0.4	0.2	0.0	0.1	0.9	0.0	0.0	0.0	0.9	3.6
19-Jan	0.0	0.1	0.0	0.0	0.0	Z	0.0	0.0	0.1	3.0	6.3	5.2	2.2	1.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	6.3
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	2.6	3.7	10.3	7.2	0.9	0.0	0.0	0.0	0.2	0.0	0.3	4.4	49.0	3.5	49.0
21-Jan	30.0	Z	24.2	120.1	23.5	92.4	52.9	0.1	4.5	2.1	4.3	6.9	8.9	9.7	8.0	6.3	6.5	0.5	0.0	0.0	0.1	0.9	13.6	4.8	18.3	120.1
22-Jan	0.7	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.3	0.2	1.0	2.3	3.5	3.2	1.8	3.3	4.2	12.1	3.5	4.3	7.9	21.4	2.5	0.5	3.2	21.4
23-Jan	0.5	0.0	1.0	Z	0.4	0.0	3.4	6.8	3.1	10.5	14.8	13.4	15.2	23.3	17.8	11.7	83.8	84.1	33.0	23.9	3.9	46.9	33.1	15.9	19.4	84.1
24-Jan	7.2	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.1	C	C	C	C	C	C	8.6	1.0	3.3	0.6	2.6	1.5	1.2	8.4	--	8.6
25-Jan	5.5	10.4	3.4	4.3	3.4	Z	0.0	4.7	54.6	8.5	19.5	15.0	9.6	8.2	15.4	16.7	32.2	20.5	25.2	22.0	0.4	0.0	0.0	0.0	12.2	54.6
26-Jan	Z	0.0	0.0	1.0	9.2	8.2	1.7	1.5	1.3	2.5	1.6	2.6	3.4	8.0	5.1	3.3	1.0	1.4	0.6	0.3	0.5	0.4	0.4	0.3	2.4	9.2
27-Jan	0.1	Z	0.1	0.4	0.6	0.6	0.4	0.8	3.1	3.6	5.0	5.3	16.3	43.5	30.6	15.1	20.4	18.1	0.5	0.2	0.0	0.0	0.0	0.0	7.2	43.5
28-Jan	0.8	3.9	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.4	0.2	0.4	0.6	0.1	0.1	0.3	3.9
29-Jan	0.0	0.0	0.0	Z	0.0	0.1	0.6	0.0	0.0	0.6	2.3	0.9	2.9	1.5	0.0	0.0	0.0	7.6	33.0	8.5	1.6	14.9	0.7	0.0	3.3	33.0
30-Jan	13.9	36.0	12.5	17.0	Z	3.2	0.1	0.2	0.3	2.0	3.1	4.0	104.4	76.6	42.3	17.4	9.5	41.7	15.3	42.8	38.3	32.9	23.3	6.9	23.6	104.4
31-Jan	1.9	5.7	4.1	0.1	2.0	Z	2.1	0.1	0.1	2.0	1.5	23.5	20.4	47.3	40.5	18.9	37.9	81.2	99.0	67.2	22.5	44.1	21.6	12.3	24.2	99.0
	16.8	14.9	11.9	17.4	8.3	11.2	8.4	9.1	7.4	8.0	8.6	11.3	16.1	17.3	13.7	10.6	16.4	19.1	15.2	10.2	6.7	10.2	9.1	11.5		Diurnal Average
	123.8	115.2	90.6	133.5	47.8	92.4	52.9	82.9	54.6	68.5	61.7	85.9	104.4	76.6	51.8	53.8	83.8	107.0	105.8	67.2	38.3	46.9	40.9	64.1		Diurnal Maximum

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	569	80.48	80.48
21 - 40	70	9.90	90.38
41 - 80	52	7.36	97.74
81 - 159	15	2.12	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	85	57	13	4	2	5	42	115	103	50	21	4	6	12	17	29	565
21 - 40	17	1	1	0	0	3	8	14	10	2	0	1	0	2	4	4	67
11 - 80	15	1	2	1	1	3	5	9	9	1	0	0	0	0	1	4	52
81 - 159	2	2	0	0	0	0	4	1	1	0	2	1	0	0	1	0	14
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	119	61	16	5	3	11	59	139	123	53	23	6	6	14	23	37	698

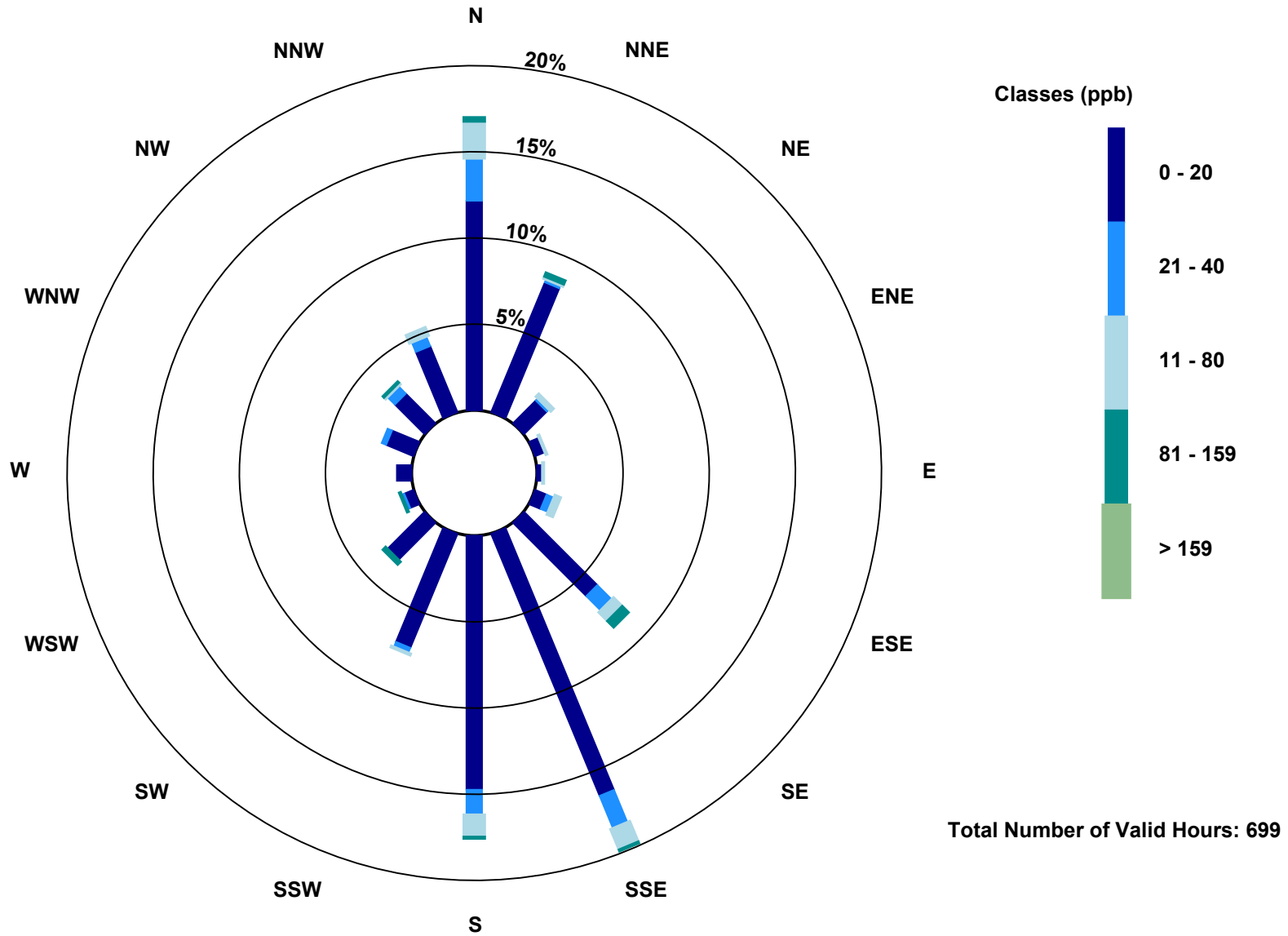
Total Number of Valid Hours: 699

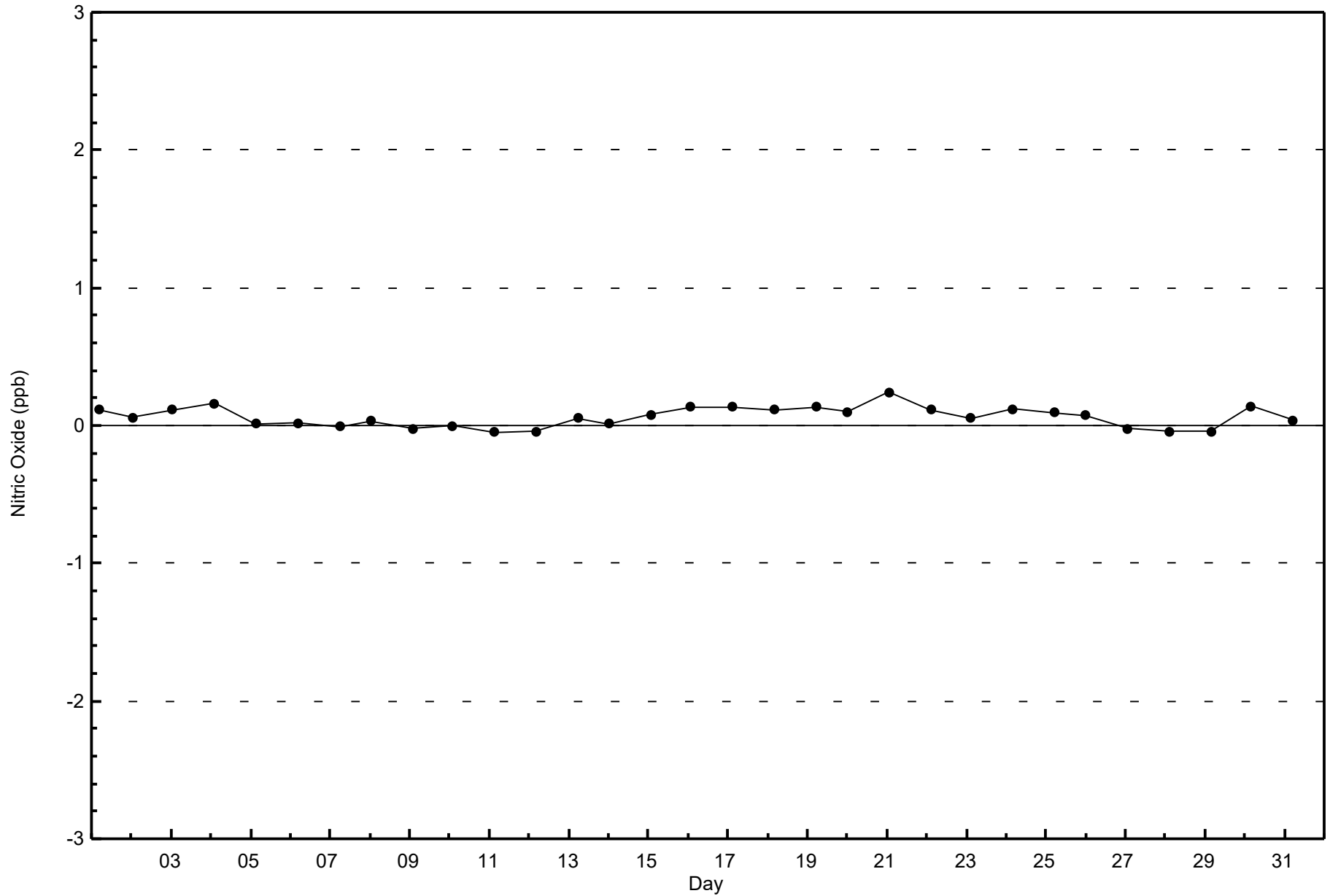
Total Number of Hours: 744

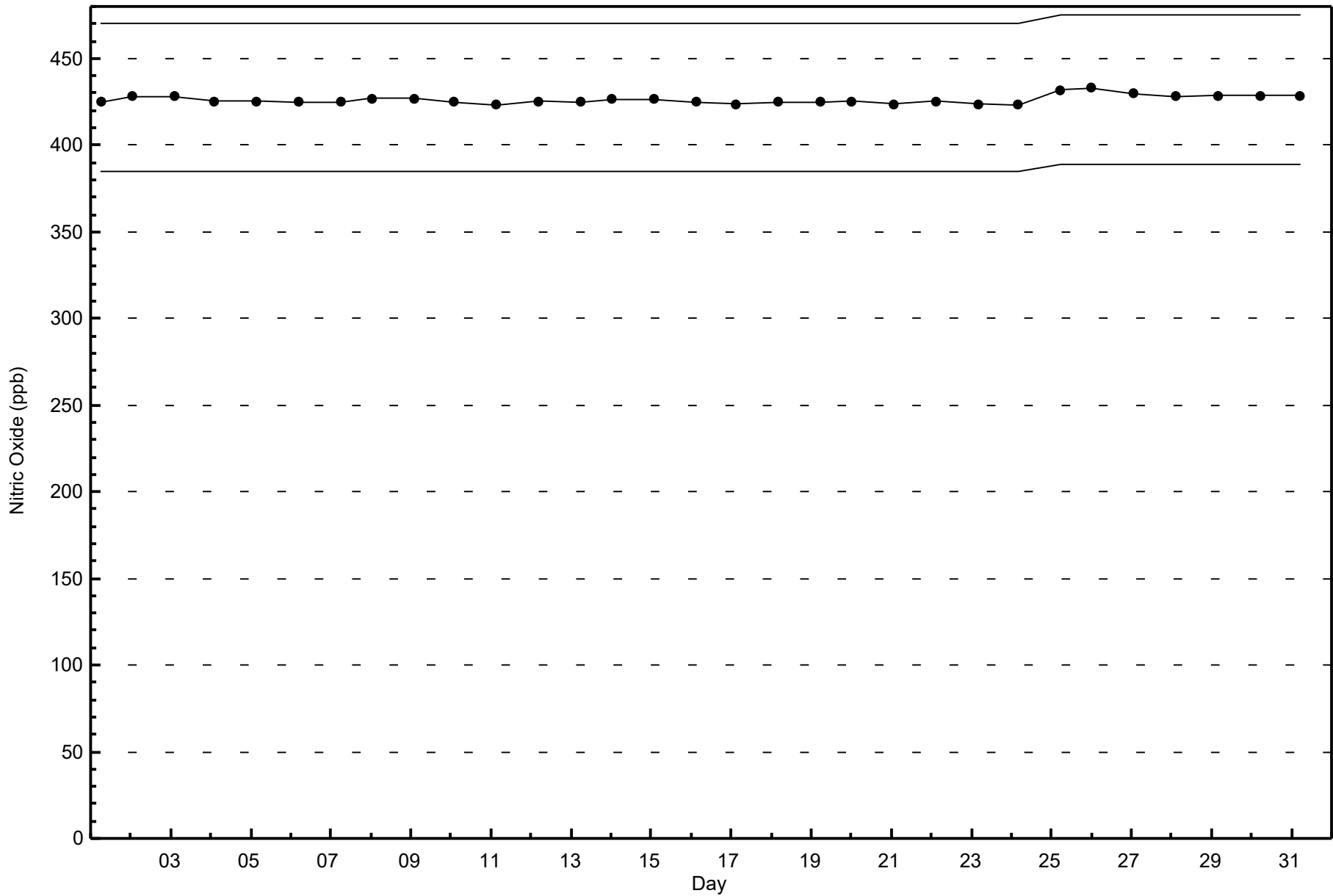


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

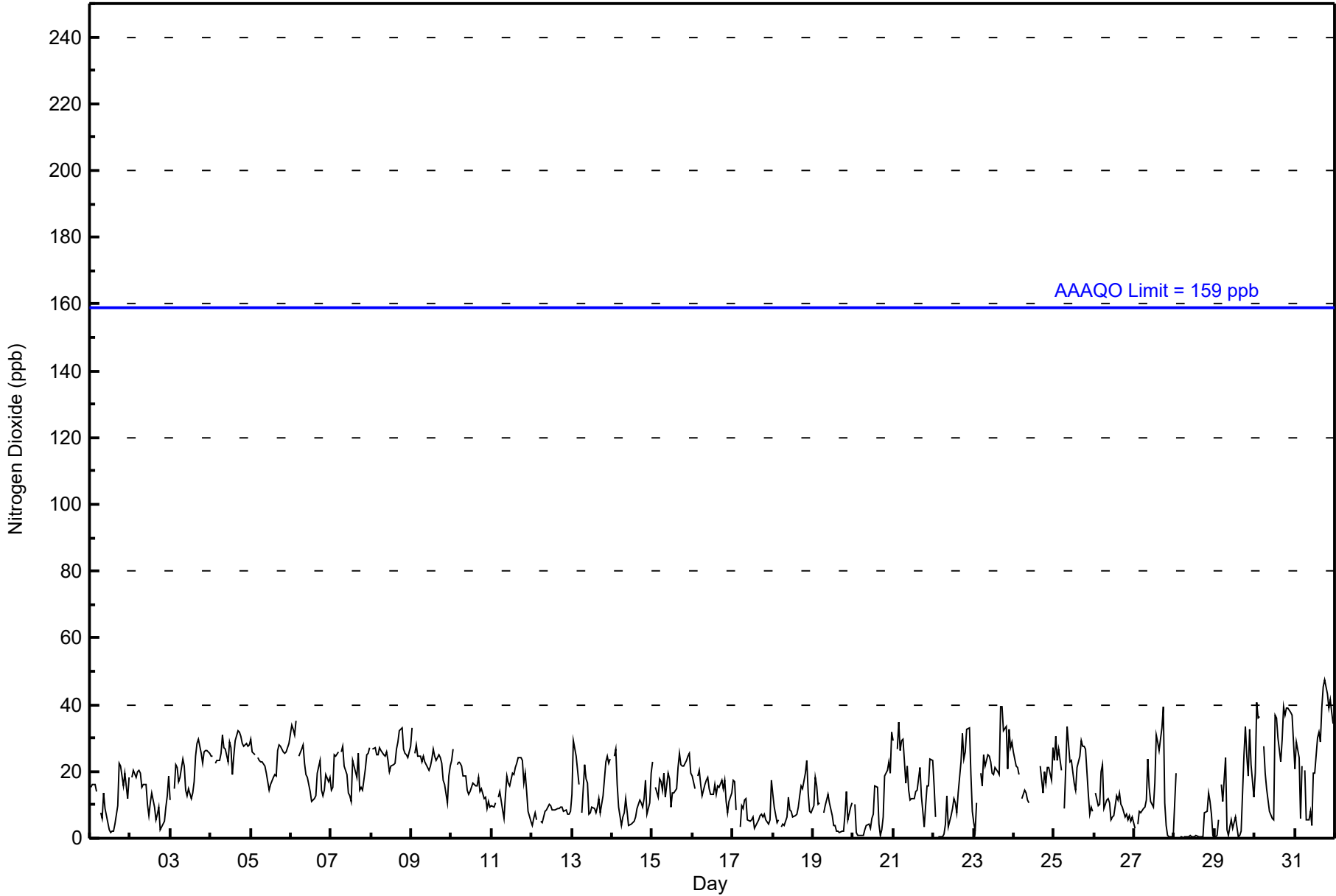
Fort Hills - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 47.4 ppb on Jan 31 19:00		Maximum Daily Average: 27.8 ppb on Jan 30																	Hours of Data:	707							
Minimum Value: 0.2 ppb on Jan 28 06:00		Minimum Daily Average: 3.7 ppb on Jan 28																	Hours of Missing Data:	37							
Maximum Diurnal Average: 20.4 ppb at hour 18		Minimum Diurnal Average: 11.3 ppb at hour 12																	Hours of Calibration:	37							
Monthly Average: 16.23 ppb		Percentiles: P ₁ = 0.5 P ₁₀ = 4.1 Q ₁ = 8.6 Median = 15.7 Q ₃ = 23.2 P ₉₀ = 28.0 P ₉₉ = 39.3																	Percent Operational Time:	100.0							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	15.1	16.0	15.9	16.2	14.0	Z	7.6	6.1	13.5	8.7	6.9	2.6	1.7	2.0	2.3	4.2	9.7	22.5	21.7	18.6	15.7	19.7	11.8	18.2	11.8	22.5	
2-Jan	Z	18.4	20.2	18.4	20.1	20.5	19.3	15.2	16.2	16.0	10.2	6.7	10.7	13.5	9.3	5.3	7.2	9.5	2.4	3.2	5.0	9.5	12.6	18.6	12.5	20.5	
3-Jan	11.5	Z	14.8	21.9	21.1	16.8	18.1	23.8	21.5	14.6	12.6	14.9	11.9	13.7	16.8	24.6	28.4	29.6	25.3	22.4	25.7	26.1	26.3	25.6	20.3	29.6	
4-Jan	24.7	24.6	Z	22.6	23.5	23.4	25.6	31.0	27.2	26.6	22.9	28.8	27.0	19.1	24.4	29.4	32.1	31.6	30.6	28.2	27.7	28.6	27.7	28.0	26.8	32.1	
5-Jan	29.7	26.0	25.2	Z	24.0	23.1	22.9	22.8	21.6	19.7	16.8	14.2	16.0	18.1	18.9	18.6	26.2	27.8	27.5	25.9	25.3	26.0	27.2	28.3	23.1	29.7	
6-Jan	33.9	32.6	30.9	35.1	Z	24.4	26.9	27.8	22.5	19.1	18.2	14.0	11.0	11.4	12.0	12.5	19.4	23.2	14.3	12.7	14.2	19.0	17.0	18.4	20.5	35.1	
7-Jan	14.3	15.1	25.2	24.5	25.8	Z	25.9	27.4	21.6	19.1	13.6	12.6	11.0	23.4	21.5	18.2	25.3	14.4	15.4	14.3	20.7	24.9	25.6	27.2	20.3	27.4	
8-Jan	Z	26.9	27.0	24.8	24.9	27.0	26.4	24.9	24.4	26.0	23.1	20.1	21.4	22.0	22.5	26.5	28.8	32.0	33.1	26.6	25.5	24.8	24.1	27.6	25.7	33.1	
9-Jan	33.1	Z	25.5	28.0	24.6	24.7	22.9	24.6	22.9	22.0	20.3	21.8	23.8	26.9	24.6	23.4	24.9	24.0	22.4	17.3	15.9	10.8	18.6	21.8	22.8	33.1	
10-Jan	23.5	26.5	Z	22.2	22.9	22.3	21.8	18.6	18.8	14.2	13.2	13.8	15.1	16.6	15.6	15.6	18.4	14.1	14.9	11.7	12.3	8.8	11.2	9.4	16.6	26.5	
11-Jan	9.7	9.4	10.7	Z	12.3	14.1	8.6	6.0	12.6	18.6	16.7	15.8	19.3	19.1	21.3	22.4	24.0	24.3	23.4	16.4	19.5	13.9	8.2	5.0	15.3	24.3	
12-Jan	4.0	6.0	7.6	5.6	Z	5.0	4.8	6.3	7.9	8.4	10.0	9.7	8.5	8.4	8.6	9.0	9.1	9.4	9.3	8.2	8.3	7.3	7.2	7.9	7.7	10.0	
13-Jan	13.3	29.4	24.7	20.4	15.9	Z	7.7	22.0	17.9	16.5	7.2	7.8	9.3	9.1	7.6	9.5	11.7	7.7	12.7	17.9	22.7	24.4	22.4	23.8	15.7	29.4	
14-Jan	Z	24.6	26.5	15.9	9.5	3.8	6.4	7.6	11.9	8.2	3.9	4.3	4.5	5.0	6.2	8.8	11.5	10.8	9.4	11.8	17.4	7.4	10.7	19.3	10.7	26.5	
15-Jan	22.9	Z	15.4	12.2	17.7	17.1	14.3	19.6	12.1	19.3	17.6	9.4	13.6	13.5	14.9	21.1	25.4	22.2	21.5	21.4	23.2	24.6	25.6	19.5	18.4	25.6	
16-Jan	18.6	15.0	Z	18.8	20.5	15.9	12.8	16.3	17.5	18.3	14.7	13.0	13.2	16.1	13.0	15.6	15.2	17.2	15.0	17.4	11.0	7.6	11.2	13.7	15.1	20.5	
17-Jan	17.2	17.1	8.5	Z	3.5	9.9	9.0	11.3	11.9	5.7	4.9	5.6	6.4	3.1	3.7	5.5	6.7	7.1	6.3	7.4	5.6	4.2	5.7	17.3	8.0	17.3	
18-Jan	13.1	9.2	4.8	5.5	Z	3.6	4.3	3.8	6.4	12.1	8.5	7.9	6.5	6.9	7.2	9.3	12.9	15.7	14.7	19.4	23.4	13.7	8.1	7.5	9.8	23.4	
19-Jan	9.9	18.4	15.5	10.1	10.5	Z	7.6	9.8	11.3	13.0	10.6	6.9	3.7	3.7	2.3	2.1	1.9	2.1	2.1	7.2	13.9	5.3	9.5	10.5	8.2	18.4	
20-Jan	Z	10.2	1.7	0.8	0.7	0.7	1.0	2.4	3.9	4.3	2.9	5.9	7.1	15.7	15.4	4.3	0.9	2.4	6.5	18.7	20.5	22.7	19.6	31.9	8.7	31.9	
21-Jan	29.3	Z	26.5	34.6	26.1	29.2	29.5	16.5	21.6	14.2	11.6	11.8	12.0	13.9	14.4	17.7	21.2	12.9	3.2	9.7	15.6	15.8	23.6	23.1	18.9	34.6	
22-Jan	15.8	6.2	Z	0.3	0.3	0.6	1.1	4.3	12.7	3.6	6.6	8.8	12.0	10.6	7.8	13.7	22.8	31.2	23.6	26.0	32.5	32.9	18.9	8.2	13.1	32.9	
23-Jan	4.8	2.0	10.5	Z	19.3	15.8	24.9	21.5	25.0	24.4	23.0	19.7	19.0	21.2	20.0	19.2	39.3	39.3	32.0	33.3	20.9	32.8	27.3	28.7	22.8	39.3	
24-Jan	25.9	21.8	21.2	18.9	Z	12.0	14.6	13.7	11.5	10.5	C	C	C	C	C	C	21.5	13.4	19.8	16.4	21.3	21.2	17.3	27.2	--	27.2	
25-Jan	23.2	30.7	23.3	26.7	20.5	Z	8.7	20.6	33.4	23.0	23.2	19.9	16.4	14.4	21.1	24.7	29.2	27.7	27.4	26.7	13.1	7.2	9.4	8.0	20.8	33.4	
26-Jan	Z	13.5	9.9	10.3	19.9	22.0	8.8	11.3	11.7	10.6	5.7	6.5	6.9	12.8	11.3	13.4	10.3	9.4	6.3	7.3	5.6	6.8	5.2	6.2	10.1	22.0	
27-Jan	3.0	Z	4.1	8.1	7.5	9.0	9.4	11.5	23.7	15.4	11.2	9.5	16.5	31.0	28.8	26.3	33.1	39.3	10.5	3.7	1.0	0.6	0.6	0.6	13.2	39.3	
28-Jan	10.2	19.6	Z	0.5	0.6	0.2	0.4	0.6	0.5	0.8	0.5	0.4	0.5	0.7	0.5	0.6	0.3	0.5	7.8	8.2	13.4	10.9	7.4	0.9	3.7	19.6	
29-Jan	0.2	1.0	5.7	Z	16.1	10.9	24.0	2.6	1.0	3.4	5.5	2.9	6.4	3.6	0.6	0.8	2.3	25.1	33.5	24.5	18.7	32.6	22.0	12.3	11.1	33.5	
30-Jan	19.6	40.5	36.2	36.3	Z	27.5	19.7	14.8	11.4	8.2	6.0	5.5	36.7	35.9	30.1	23.0	29.7	39.5	36.9	38.8	38.8	37.8	37.0	28.9	27.8	40.5	
31-Jan	20.6	29.0	24.1	6.0	21.4	Z	20.2	5.7	5.7	8.1	3.8	19.3	19.5	30.2	31.7	29.0	38.9	45.3	47.4	43.2	39.1	41.5	37.9	34.4	26.2	47.4	
		17.2	18.8	17.8	17.1	16.3	15.2	14.7	14.5	15.5	14.0	11.7	11.3	12.9	14.7	14.5	15.1	19.0	20.4	18.6	18.2	18.5	18.4	17.3	18.0	Diurnal Average	
		33.9	40.5	36.2	36.3	26.1	29.2	29.5	31.0	33.4	26.6	23.2	28.8	36.7	35.9	31.7	29.4	39.3	45.3	47.4	43.2	39.1	41.5	37.9	34.4	Diurnal Maximum	
Z - zerospan		C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 159 ppb																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	461	65.21	65.21
21 - 40	241	34.09	99.29
41 - 80	5	0.71	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



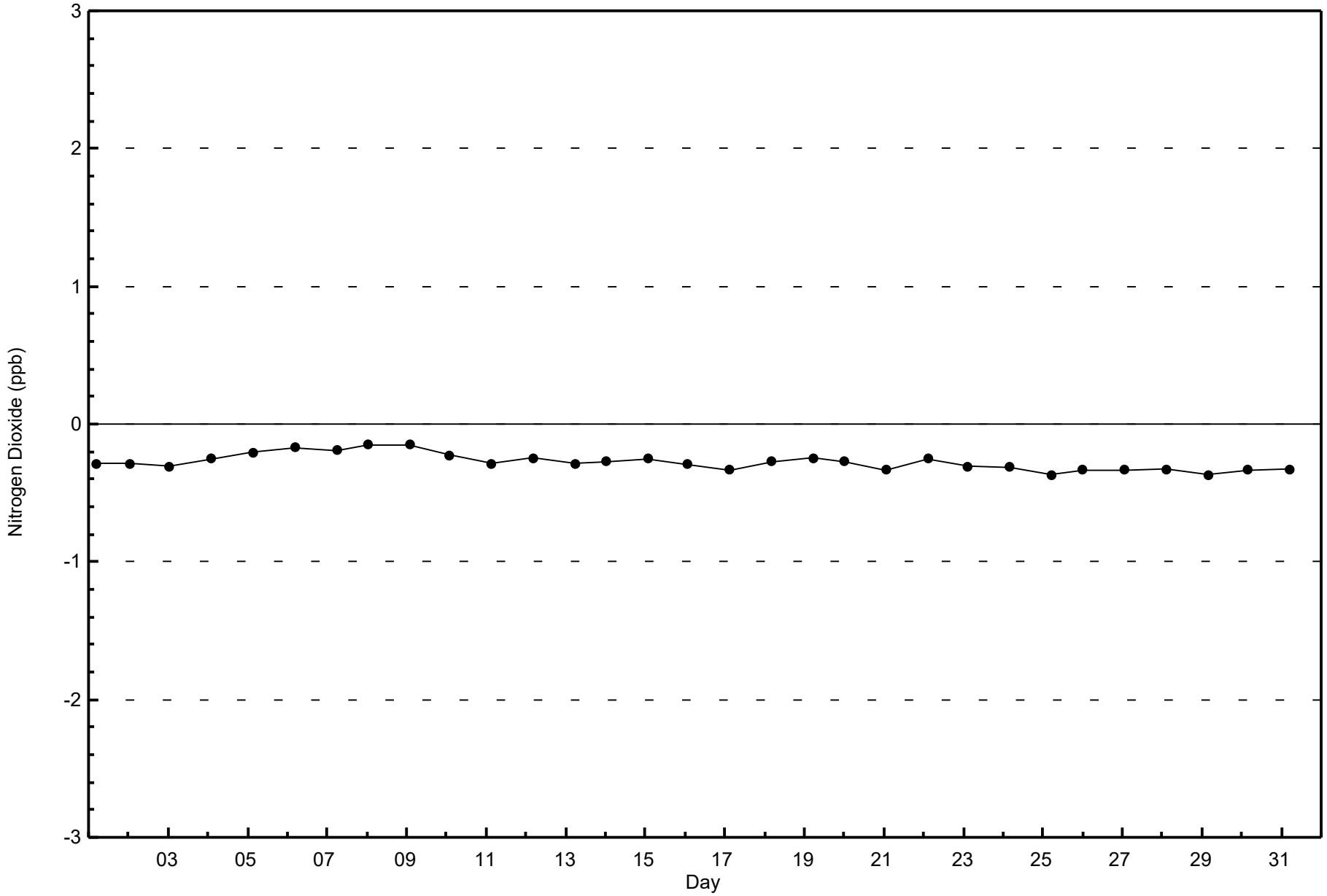
**Wood Buffalo Environmental Association
Frequency Distribution**

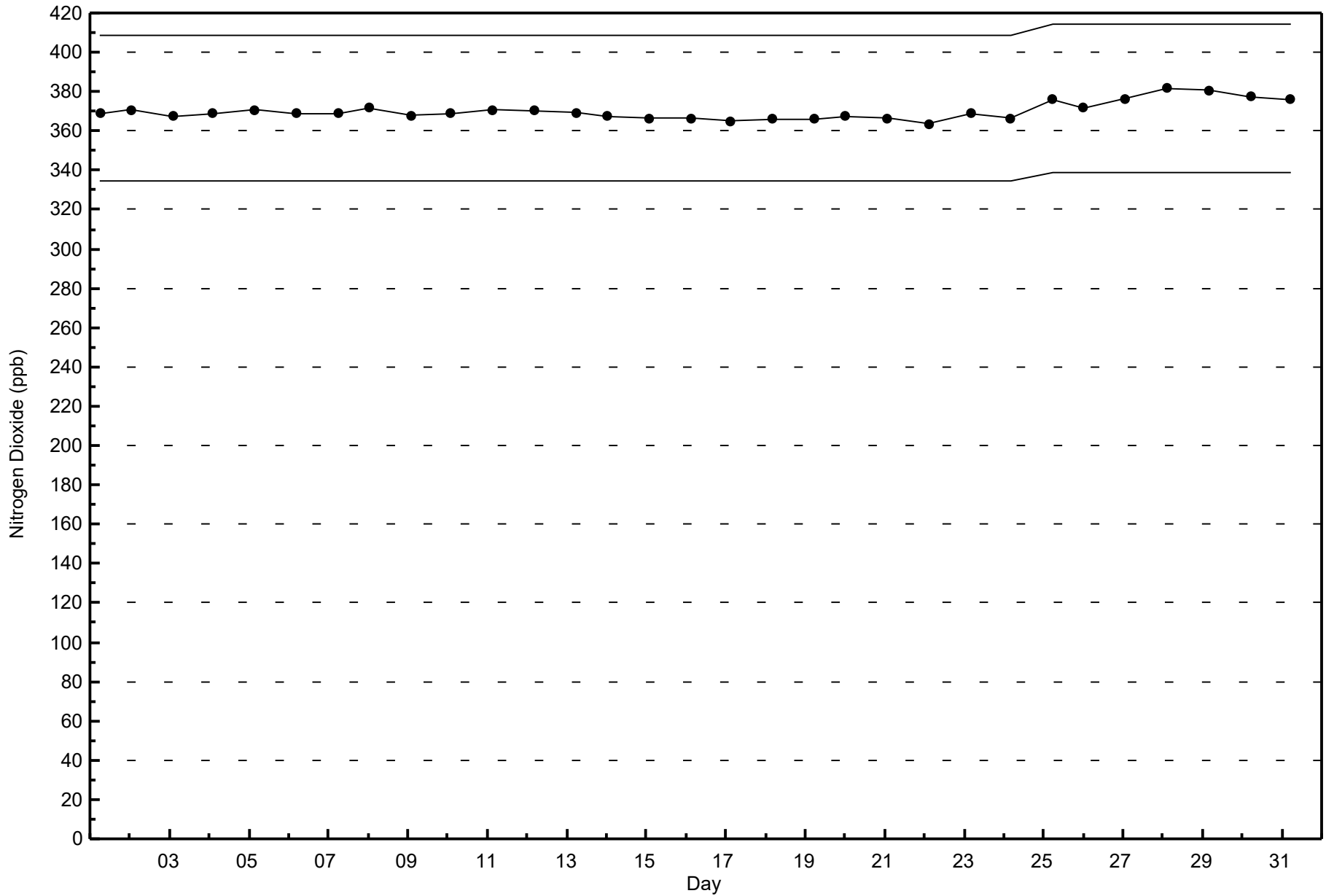
**Nitrogen Dioxide (NO₂) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	70	45	5	2	1	2	27	87	97	42	17	4	6	12	15	27	459
21 - 40	48	14	11	3	2	9	32	52	26	11	6	2	0	2	8	9	235
11 - 80	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	120	61	16	5	3	11	59	139	123	53	23	6	6	14	23	37	699

Total Number of Valid Hours: 699

Total Number of Hours: 744







Wood Buffalo Environmental Association
Summary of Hour Averages

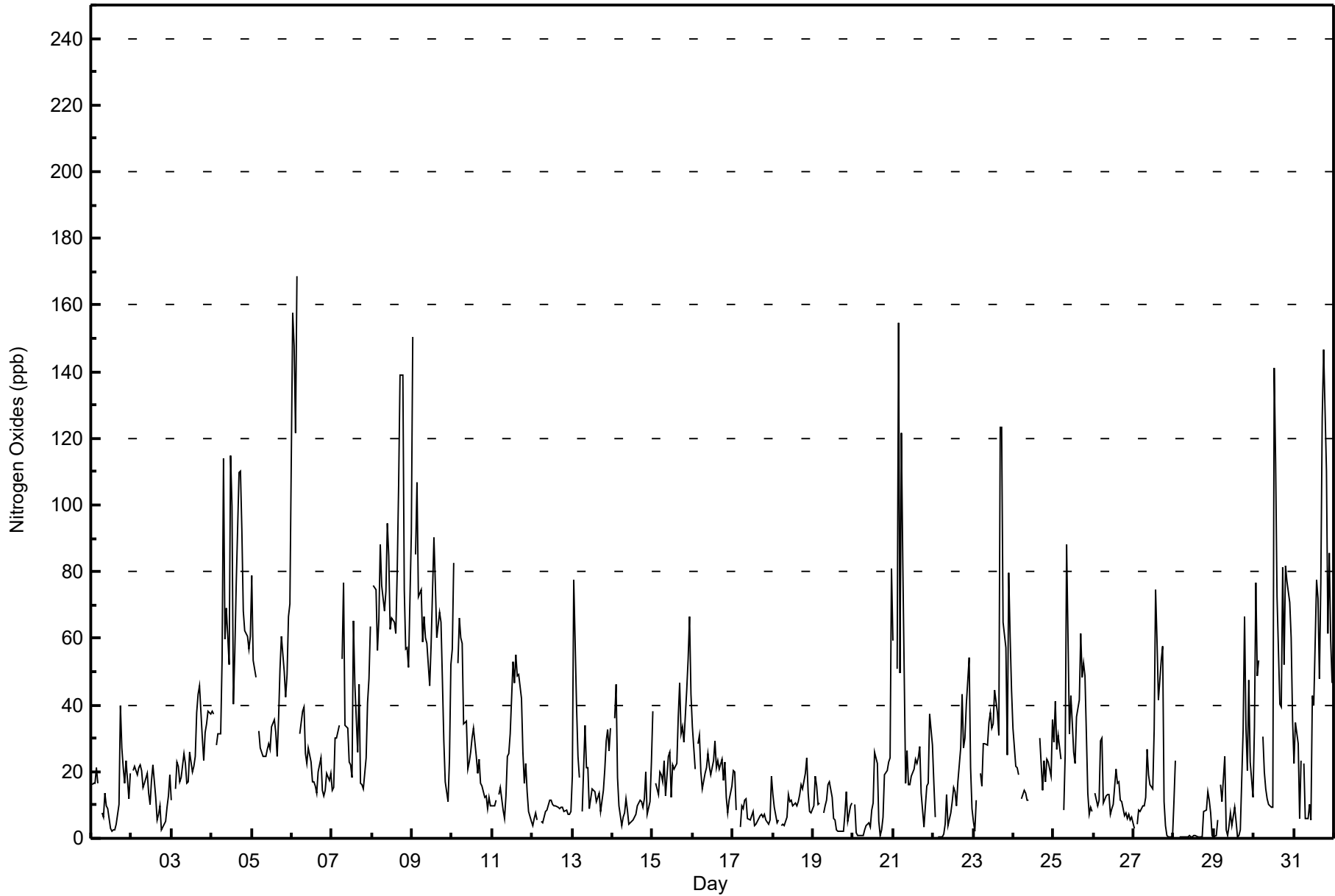
Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 168.6 ppb on Jan 6 04:00	Maximum Daily Average: 78.7 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.2 ppb on Jan 28 06:00	Minimum Daily Average: 4.0 ppb on Jan 28		Hours of Missing Data:	37
Maximum Diurnal Average: 39.4 ppb at hour 18	Minimum Diurnal Average: 20.3 ppb at hour 11		Hours of Calibration:	37
Monthly Average: 28.22 ppb	Percentiles: P ₁ = 0.5 P ₁₀ = 4.4 Q ₁ = 9.6 Median = 19.6 Q ₃ = 36.4 P ₉₀ = 66.0 P ₉₉ = 139.0		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	16.0	16.6	16.7	21.3	16.7	Z	7.7	6.1	13.7	9.8	8.9	3.2	2.2	2.5	2.6	4.4	10.3	40.0	27.3	21.1	16.4	23.4	12.1	19.6	13.8	40.0
2-Jan	Z	20.4	21.7	19.2	21.1	22.0	20.4	15.3	16.4	19.6	13.8	10.1	17.5	21.9	12.4	5.6	7.2	9.7	2.4	3.2	5.0	9.5	12.7	18.9	14.2	22.0
3-Jan	11.5	Z	14.8	22.8	21.8	16.8	18.3	25.4	22.4	16.5	17.2	26.0	19.8	21.7	24.6	37.9	43.3	45.6	30.2	23.5	31.7	34.4	38.0	37.5	26.2	45.6
4-Jan	38.3	37.2	Z	28.1	31.2	31.4	53.8	113.9	59.6	69.2	52.1	114.7	99.5	40.2	55.8	76.2	109.7	110.1	92.3	68.1	62.3	60.7	56.8	60.5	66.2	114.7
5-Jan	78.9	53.6	48.5	Z	32.4	26.9	26.1	24.6	24.6	26.7	28.6	26.5	33.6	35.5	31.8	24.4	35.9	50.8	60.4	50.1	42.4	49.0	66.7	70.4	41.2	78.9
6-Jan	157.7	147.8	121.5	168.6	Z	31.5	38.0	39.5	25.2	22.6	27.3	22.9	16.9	16.8	15.5	13.7	19.8	24.3	14.3	12.7	14.2	19.5	17.5	19.3	43.8	168.6
7-Jan	14.3	15.3	29.9	30.2	33.9	Z	53.9	76.5	33.8	32.9	22.9	21.9	18.1	65.3	46.3	25.8	46.3	16.4	15.9	15.0	24.3	40.8	48.0	63.4	34.4	76.5
8-Jan	Z	75.8	74.4	56.5	65.9	88.1	76.0	68.3	74.3	94.5	84.8	62.8	66.1	64.6	61.6	80.3	106.1	139.0	138.9	74.6	56.8	57.1	51.3	91.7	78.7	139.0
9-Jan	150.3	Z	85.3	106.7	72.4	74.6	58.8	66.4	60.3	58.3	45.7	58.2	74.0	90.3	76.4	60.2	67.8	64.9	47.6	29.1	17.1	11.0	23.7	51.9	63.1	150.3
10-Jan	56.9	82.4	Z	52.7	66.1	60.1	58.3	34.3	35.0	20.6	22.8	26.0	29.9	33.2	24.4	19.6	23.7	16.4	15.7	12.1	12.9	9.1	12.1	9.8	31.9	82.4
11-Jan	9.9	9.6	11.2	Z	13.0	15.2	8.6	6.0	12.9	24.6	25.6	31.2	52.8	46.7	54.9	48.7	49.2	42.0	26.0	16.4	22.4	13.9	8.2	5.0	24.1	54.9
12-Jan	4.0	6.0	7.6	5.6	Z	5.0	4.8	6.3	7.9	8.7	11.4	11.4	10.0	9.8	9.7	9.5	9.1	9.4	9.3	8.2	8.3	7.3	7.2	7.9	8.0	11.4
13-Jan	18.7	77.6	39.2	24.7	18.2	Z	8.1	33.8	21.1	21.1	9.0	11.7	14.7	13.8	10.9	12.2	13.5	8.1	14.5	20.7	29.1	32.5	26.4	32.9	22.3	77.6
14-Jan	Z	35.8	46.3	18.1	9.5	3.8	6.4	7.6	11.9	8.6	4.3	5.2	5.4	6.1	7.2	9.7	11.6	10.8	9.4	11.8	19.8	7.4	11.2	23.0	12.7	46.3
15-Jan	38.2	Z	16.6	13.0	20.1	19.1	17.0	23.3	12.6	24.7	25.7	12.3	21.9	20.8	22.2	36.3	46.6	31.4	33.6	28.9	44.6	53.9	66.5	43.3	29.2	66.5
16-Jan	33.4	20.8	Z	28.4	30.9	19.7	14.7	19.7	21.4	25.6	21.5	19.1	23.4	29.2	21.4	23.5	20.9	23.8	17.5	23.1	12.5	7.6	11.2	15.6	21.1	33.4
17-Jan	20.4	19.8	8.5	Z	3.5	9.9	9.0	11.3	11.9	5.9	5.6	6.9	8.2	3.7	4.3	5.9	6.7	7.1	6.3	7.4	5.6	4.2	5.7	18.5	8.5	20.4
18-Jan	13.1	9.2	4.8	5.5	Z	3.6	4.3	3.8	6.4	13.3	11.0	11.3	9.7	10.5	9.7	11.0	13.3	15.9	14.7	19.5	24.3	13.7	8.1	7.5	10.6	24.3
19-Jan	9.9	18.5	15.5	10.1	10.5	Z	7.6	9.8	11.4	16.0	16.9	12.1	5.9	5.4	2.7	2.2	1.9	2.1	2.1	7.2	13.9	5.3	9.5	10.5	9.0	18.5
20-Jan	Z	10.2	1.7	0.8	0.7	0.7	1.0	2.4	3.9	4.6	3.5	8.5	10.8	26.0	22.6	5.2	0.9	2.4	6.5	18.9	20.5	23.0	24.0	80.9	12.2	80.9
21-Jan	59.3	Z	50.7	154.7	49.6	121.6	82.4	16.6	26.1	16.3	15.9	18.7	20.9	23.6	22.4	24.0	27.7	13.4	3.2	9.7	15.7	16.7	37.2	27.9	37.1	154.7
22-Jan	16.5	6.3	Z	0.3	0.3	0.6	1.1	4.3	13.0	3.8	7.6	11.1	15.5	13.8	9.6	17.0	27.0	43.3	27.1	30.3	40.4	54.3	21.4	8.7	16.2	54.3
23-Jan	5.3	2.0	11.5	Z	19.7	15.8	28.3	28.3	28.1	34.9	37.8	33.1	34.2	44.5	37.8	30.9	123.1	123.4	65.0	57.2	24.8	79.7	60.4	44.6	42.2	123.4
24-Jan	33.1	21.8	21.2	18.9	Z	12.0	14.6	13.7	11.5	11.6	C	C	C	C	C	C	30.1	14.4	23.1	17.0	23.9	22.7	18.5	35.6	--	35.6
25-Jan	28.7	41.1	26.7	31.0	23.9	Z	8.7	25.3	88.0	31.5	42.7	34.9	26.0	22.6	36.5	41.4	61.4	48.2	52.6	48.7	13.5	7.2	9.4	8.0	33.0	88.0
26-Jan	Z	13.5	9.9	11.3	29.1	30.2	10.5	12.8	13.0	13.1	7.3	9.1	10.3	20.8	16.4	16.7	11.3	10.8	6.9	7.6	6.1	7.2	5.6	6.5	12.4	30.2
27-Jan	3.1	Z	4.2	8.5	8.1	9.6	9.8	12.3	26.8	19.0	16.2	14.8	32.8	74.5	59.4	41.4	53.5	57.4	11.0	3.9	1.0	0.6	0.6	0.6	20.4	74.5
28-Jan	11.0	23.5	Z	0.5	0.6	0.2	0.4	0.6	0.5	0.8	0.6	0.5	0.7	0.8	0.5	0.6	0.3	0.5	8.2	8.4	13.8	11.5	7.5	1.0	4.0	23.5
29-Jan	0.2	1.0	5.7	Z	16.1	11.0	24.6	2.6	1.0	4.0	7.8	3.8	9.3	5.1	0.6	0.8	2.3	32.7	66.5	33.0	20.3	47.5	22.7	12.3	14.4	66.5
30-Jan	33.5	76.5	48.7	53.3	Z	30.7	19.8	15.0	11.7	10.2	9.1	9.5	141.1	112.5	72.4	40.4	39.2	81.2	52.2	81.6	77.1	70.7	60.3	35.8	51.4	141.1
31-Jan	22.5	34.7	28.2	6.1	23.4	Z	22.3	5.8	5.8	10.1	5.3	42.8	39.9	77.5	72.2	47.9	76.8	126.5	146.4	110.4	61.6	85.6	59.5	46.7	50.4	146.4

34.0	33.7	29.7	34.5	24.6	26.4	23.1	23.6	23.0	21.9	20.3	22.7	29.0	32.0	28.2	25.8	35.4	39.4	33.8	28.4	25.2	28.6	26.5	29.5	Diurnal Average	
157.7	147.8	121.5	168.6	72.4	121.6	82.4	113.9	88.0	94.5	84.8	114.7	141.1	112.5	76.4	80.3	123.1	139.0	146.4	110.4	77.1	85.6	66.7	91.7	Diurnal Maximum	

Z - zerospan C - Calibration





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	370	52.33	52.33
21 - 40	179	25.32	77.65
41 - 80	121	17.11	94.77
81 - 159	34	4.81	99.58
> 159	1	0.14	99.72

Total Number of Valid Hours: 707

Total Number of Hours: 744



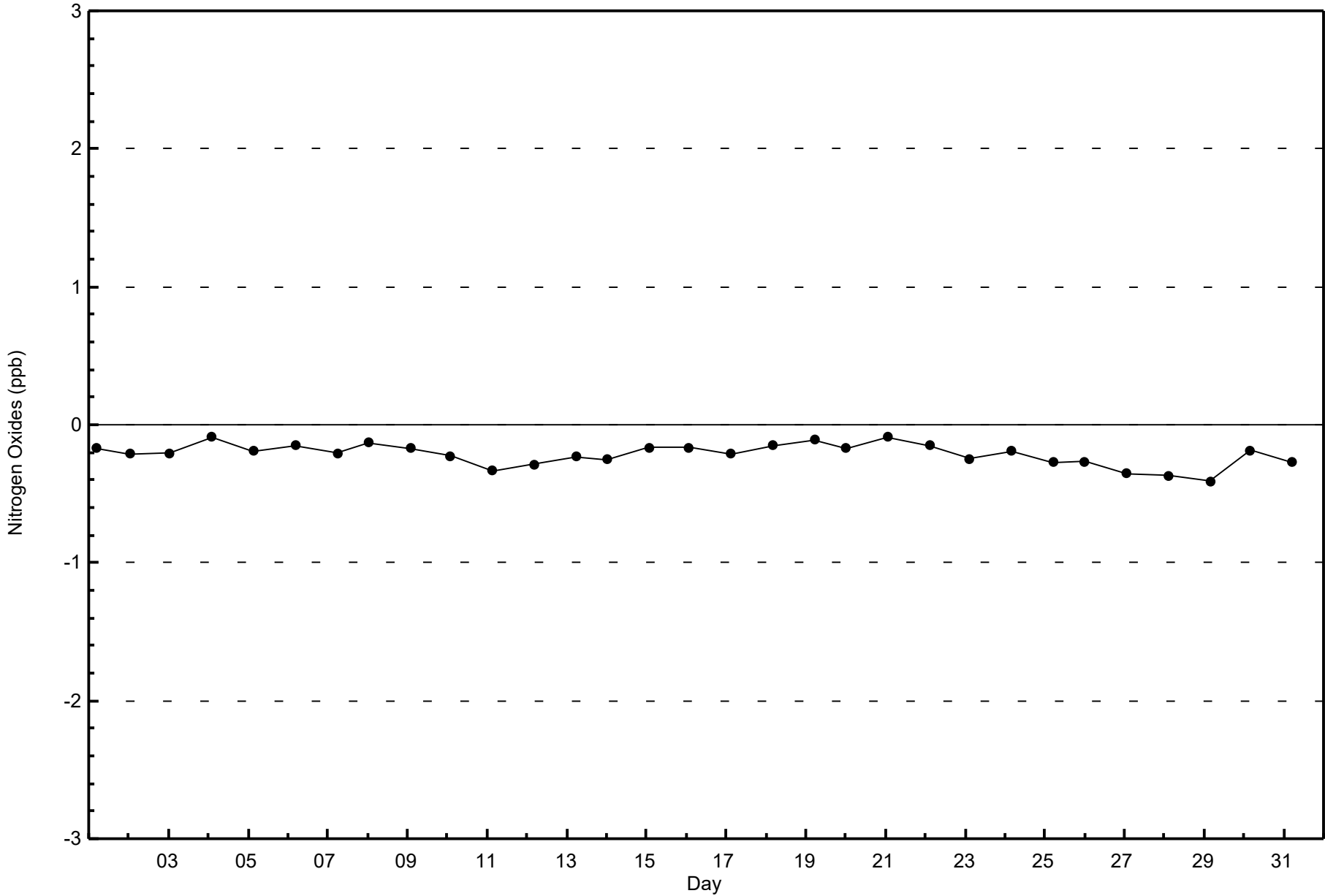
**Wood Buffalo Environmental Association
Frequency Distribution**

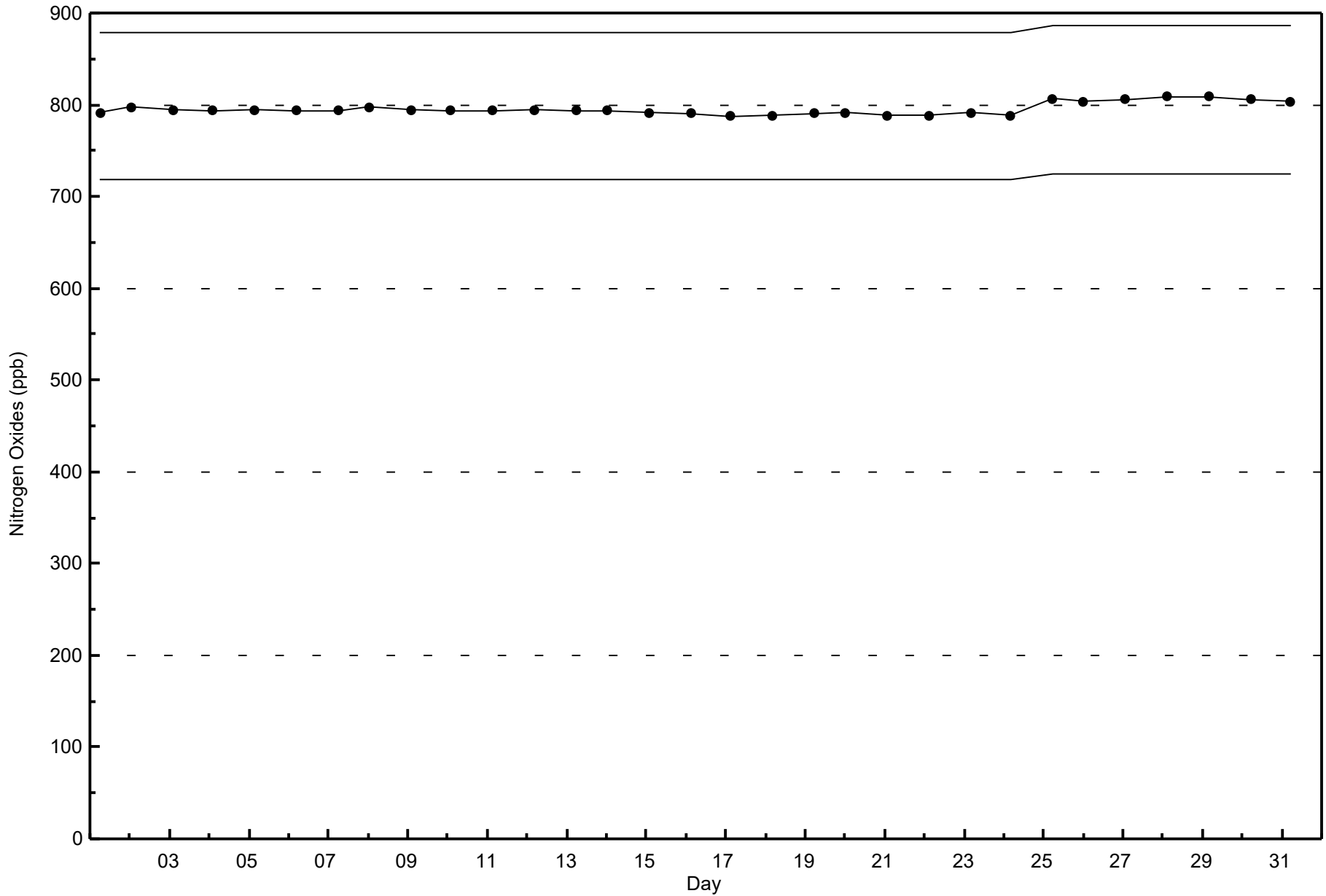
**Nitrogen Oxides (NO_x) - ppb
Fort Hills - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	33	41	3	1	1	1	14	75	93	39	16	3	5	10	13	20	368
21 - 40	48	16	9	3	1	2	27	36	7	9	4	1	1	2	2	9	177
11 - 80	31	1	3	0	1	7	12	23	19	5	1	1	0	2	6	6	118
81 - 159	8	3	1	1	0	0	5	5	4	0	1	1	0	0	2	2	33
> 159	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Totals	120	61	16	5	3	10	58	139	123	53	23	6	6	14	23	37	697

Total Number of Valid Hours: 699

Total Number of Hours: 744



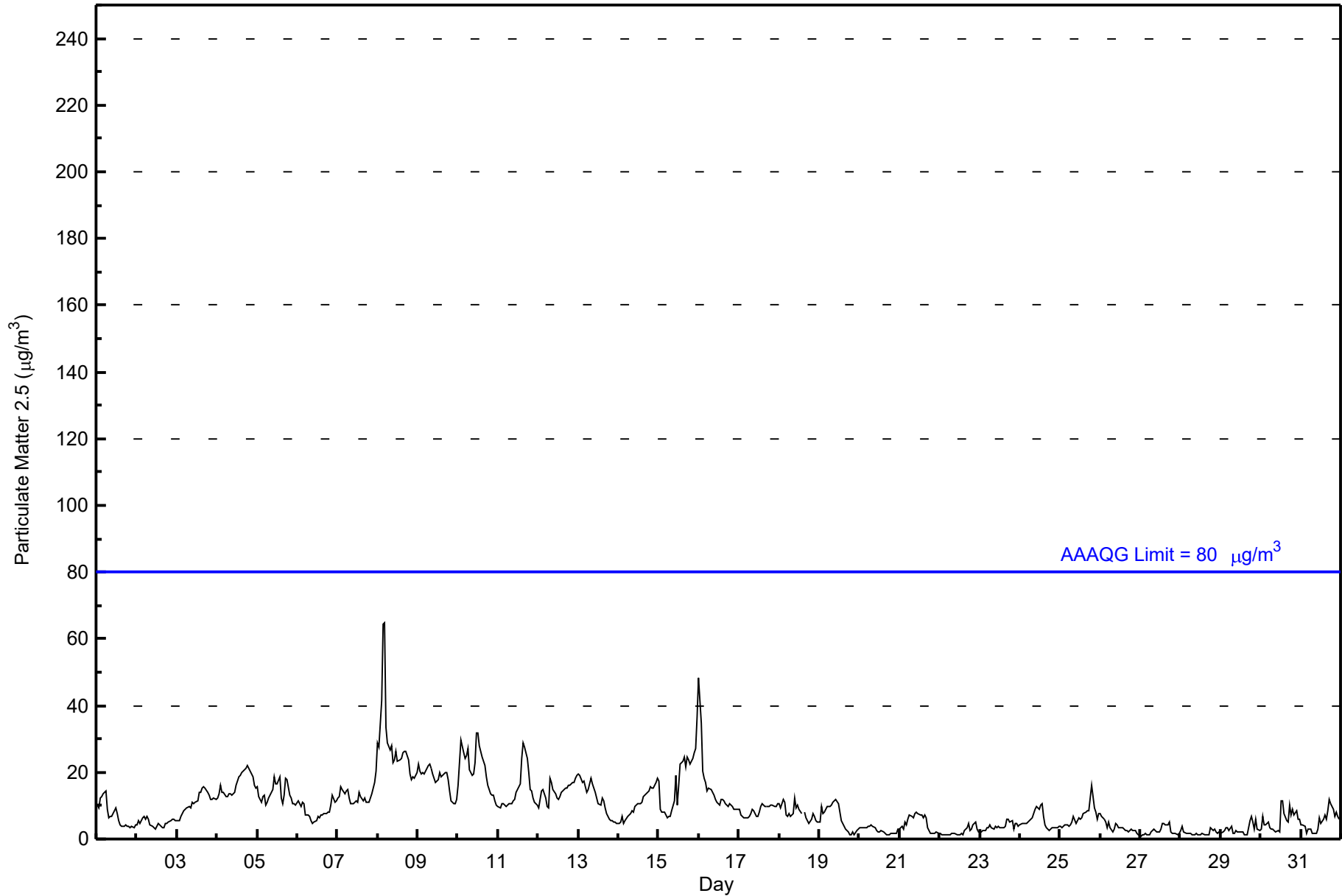




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 65.0 µg/m ³ on Jan 8 05:00	Maximum Daily Average: 28.5 µg/m ³ on Jan 8		Hours of Data:	743
Minimum Value: 1.0 µg/m ³ on Jan 27 01:00	Minimum Daily Average: 1.9 µg/m ³ on Jan 28		Hours of Missing Data:	1
Maximum Diurnal Average: 10.6 µg/m ³ at hour 4	Minimum Diurnal Average: 8.5 µg/m ³ at hour 23		Hours of Calibration:	1
Monthly Average: 9.55 µg/m ³	Percentiles: P ₁ = 1.2 P ₁₀ = 2.0 Q ₁ = 3.7 Median = 7.7 Q ₃ = 13.1 P ₉₀ = 19.5 P ₉₉ = 31.7		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	10.4	9.5	12.4	12.6	13.4	14.4	8.8	6.4	6.8	6.7	7.6	9.1	7.7	5.5	4.4	3.9	3.8	4.3	3.9	3.7	3.5	3.8	3.4	4.3	7.1	14.4																							
2-Jan	4.0	5.3	4.7	6.2	6.7	5.8	6.9	6.0	4.1	3.6	3.3	2.9	4.0	4.5	3.7	3.3	3.5	4.6	4.7	5.2	5.5	5.9	5.8	5.6	4.8	6.9																							
3-Jan	5.5	5.3	6.7	7.4	8.3	8.9	9.2	9.9	9.3	10.9	10.5	11.0	11.4	13.8	14.1	15.4	15.6	15.1	13.8	13.3	12.0	11.7	12.2	11.7	11.0	15.6																							
4-Jan	12.3	13.3	16.1	14.1	14.2	12.8	12.7	13.6	13.5	13.2	14.1	16.1	17.4	18.5	19.3	19.7	20.7	21.0	21.9	21.1	20.4	18.5	16.2	15.1	16.5	21.9																							
5-Jan	15.6	12.8	11.0	12.8	13.1	10.1	11.0	12.3	13.8	14.8	18.8	16.4	16.7	18.8	12.5	10.5	13.3	18.3	17.7	13.0	12.1	10.7	10.7	10.0	13.6	18.8																							
6-Jan	11.5	10.8	9.7	11.1	10.6	7.1	7.2	6.7	5.6	4.7	5.3	5.6	6.6	6.4	7.2	7.4	7.8	7.8	8.0	8.0	10.4	13.0	11.1	11.6	8.4	13.0																							
7-Jan	12.4	12.8	15.7	14.8	13.4	14.5	14.9	12.2	10.4	10.8	11.0	11.3	11.2	13.8	12.6	11.3	12.2	11.1	10.9	11.1	13.4	15.1	16.7	20.4	13.1	20.4																							
8-Jan	28.6	27.6	41.4	64.4	65.0	33.3	29.0	26.6	27.8	22.7	23.7	26.4	23.2	23.8	24.2	25.8	26.2	26.2	23.9	19.6	17.9	18.5	18.4	19.7	28.5	65.0																							
9-Jan	22.3	20.4	19.5	20.0	19.7	21.1	21.8	22.5	21.3	19.5	17.0	17.4	18.0	19.8	18.5	18.9	20.1	19.9	17.8	14.4	11.3	10.5	10.7	11.9	18.1	22.5																							
10-Jan	16.2	23.0	29.5	25.9	24.4	24.8	27.1	20.8	19.2	19.6	23.0	31.7	31.7	28.1	24.4	23.4	22.2	18.7	15.9	13.4	13.1	13.1	11.5	10.1	21.3	31.7																							
11-Jan	9.6	9.2	10.5	10.5	10.2	9.6	10.6	10.5	10.5	11.3	12.0	14.2	15.7	16.5	24.2	28.6	27.5	24.2	19.8	15.0	14.4	12.1	11.1	10.4	14.5	28.6																							
12-Jan	9.5	11.7	14.3	14.7	12.1	10.0	9.4	18.2	16.8	14.6	13.6	12.2	11.9	12.8	14.1	14.7	15.2	15.5	15.9	16.1	16.8	17.1	18.1	19.2	14.4	19.2																							
13-Jan	19.3	19.2	17.0	17.2	15.6	14.1	15.0	18.1	16.6	15.2	14.1	12.3	10.5	10.2	12.5	11.5	9.4	7.5	5.8	5.6	5.6	5.2	4.9	4.8	12.0	19.3																							
14-Jan	4.9	5.2	6.6	4.8	5.3	6.6	7.1	7.7	8.4	8.3	9.7	10.7	10.5	10.5	11.1	12.7	13.6	13.9	14.3	15.6	15.3	15.3	16.7	18.2	10.6	18.2																							
15-Jan	17.6	9.0	8.0	7.8	7.4	6.2	6.6	6.6	8.6	11.6	19.0	10.0	15.9	22.5	23.2	24.5	21.5	24.4	23.7	22.6	24.0	25.7	27.2	36.5	17.1	36.5																							
16-Jan	48.4	34.8	20.4	18.4	16.8	14.4	15.2	14.9	13.9	13.0	11.8	10.9	10.4	11.9	11.7	11.5	10.8	9.8	10.7	10.2	9.9	9.0	9.0	9.0	14.9	48.4																							
17-Jan	8.7	7.3	6.8	6.5	6.4	6.4	7.0	7.6	8.8	8.4	6.9	6.8	7.9	9.6	10.6	9.9	9.9	9.9	9.9	10.4	10.1	9.7	9.9	10.6	8.6	10.6																							
18-Jan	10.6	9.5	12.0	10.9	7.1	6.8	7.8	6.7	7.5	12.1	9.5	10.4	8.7	7.6	C	8.0	6.5	5.5	4.7	5.9	7.6	6.8	5.5	4.9	7.9	12.1																							
19-Jan	5.2	9.9	7.6	8.0	9.0	9.7	9.9	10.2	11.2	11.3	11.9	10.4	7.9	5.6	4.6	3.8	3.0	2.2	1.5	1.3	2.0	1.5	2.6	2.8	6.4	11.9																							
20-Jan	3.2	3.4	3.2	3.3	3.6	3.8	3.9	4.1	3.7	3.3	2.6	2.2	2.1	2.5	2.1	1.5	1.2	1.3	1.5	1.8	1.8	1.9	1.7	3.1	2.6	4.1																							
21-Jan	3.0	3.7	3.0	5.3	4.2	6.0	7.3	6.9	6.4	7.7	8.0	7.5	7.0	7.1	6.3	7.1	6.4	3.6	1.5	1.5	1.7	1.7	2.1	1.8	4.9	8.0																							
22-Jan	1.5	1.2	1.1	1.2	1.4	1.5	1.2	1.5	1.7	1.8	1.4	1.2	1.3	1.6	1.4	2.3	3.2	4.5	2.7	3.0	4.2	5.2	3.1	2.3	2.1	5.2																							
23-Jan	2.1	2.0	2.6	2.6	3.3	3.2	4.4	3.3	3.0	3.8	3.4	3.7	3.4	3.3	3.5	3.7	5.9	5.8	5.0	5.6	2.9	4.8	4.5	3.7	3.7	5.9																							
24-Jan	4.2	4.7	4.8	4.9	4.7	5.0	5.8	6.2	7.8	8.8	9.6	8.9	10.0	10.6	6.7	4.4	3.5	2.4	3.0	3.3	3.4	3.3	3.5	3.9	5.6	10.6																							
25-Jan	3.9	3.5	3.7	4.1	4.1	4.0	4.1	5.0	6.9	4.5	5.4	6.3	6.1	6.2	7.7	8.0	8.6	8.3	12.2	16.0	9.5	7.9	5.8	7.5	6.6	16.0																							
26-Jan	7.8	6.6	6.1	5.0	3.5	5.0	3.4	2.1	3.1	4.7	4.2	3.6	3.2	3.5	3.1	2.6	2.5	2.1	2.8	2.4	2.5	2.6	1.8	1.4	3.6	7.8																							
27-Jan	1.0	1.1	1.1	1.6	1.2	1.4	2.0	2.4	2.8	2.5	2.1	2.1	3.0	4.8	4.8	4.4	4.4	5.0	2.2	1.8	1.6	1.5	1.4	1.6	2.4	5.0																							
28-Jan	2.5	3.9	2.0	1.7	1.9	1.6	1.5	1.5	1.4	1.5	1.5	1.4	1.4	1.5	1.4	1.3	1.4	1.3	3.5	2.7	3.2	2.0	1.8	2.0	1.9	3.9																							
29-Jan	1.8	1.9	2.7	3.4	3.4	2.5	3.8	1.8	1.6	2.6	2.3	1.9	2.1	2.0	1.3	1.2	1.3	5.3	6.6	5.0	3.1	6.0	3.1	2.4	2.9	6.6																							
30-Jan	2.9	6.6	4.1	4.1	5.0	3.5	3.1	3.0	2.6	2.1	2.6	2.3	11.4	11.3	7.7	5.4	4.9	10.2	7.3	9.1	7.2	8.5	6.0	5.8	5.7	11.4																							
31-Jan	4.1	4.1	3.8	1.7	3.1	2.9	2.8	1.6	1.6	1.6	2.9	6.6	4.7	5.9	7.1	6.1	8.6	11.9	10.8	8.9	6.7	7.9	6.8	5.8	5.3	11.9																							
																								10.0	9.7	9.9	10.6	10.3	8.9	9.0	8.9	8.9	9.3	9.5	9.8	10.3	10.2	10.1	10.2	10.4	9.8	9.3	8.8	8.9	8.5	9.0	Diurnal Average		
																								48.4	34.8	41.4	64.4	65.0	33.3	29.0	26.6	27.8	22.7	23.7	31.7	31.7	28.1	24.4	28.6	27.5	26.2	23.9	22.6	24.0	25.7	27.2	36.5	Diurnal Maximum	

C - Calibration
 Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Fort Hills - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	271	36.47	36.47
6 - 15	341	45.90	82.37
16 - 25	105	14.13	96.50
26 - 80	26	3.50	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Hills - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	32	42	12	3	3	2	18	32	27	30	20	2	3	12	15	17	270
6 - 15	51	18	3	1	0	8	33	87	83	25	4	3	3	2	4	14	339
16 - 25	32	5	2	1	0	2	11	22	9	1	0	1	0	1	5	9	101
26 - 80	9	0	0	0	0	0	1	2	11	0	0	0	0	1	1	0	25
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	65	17	5	3	12	63	143	130	56	24	6	6	16	25	40	735

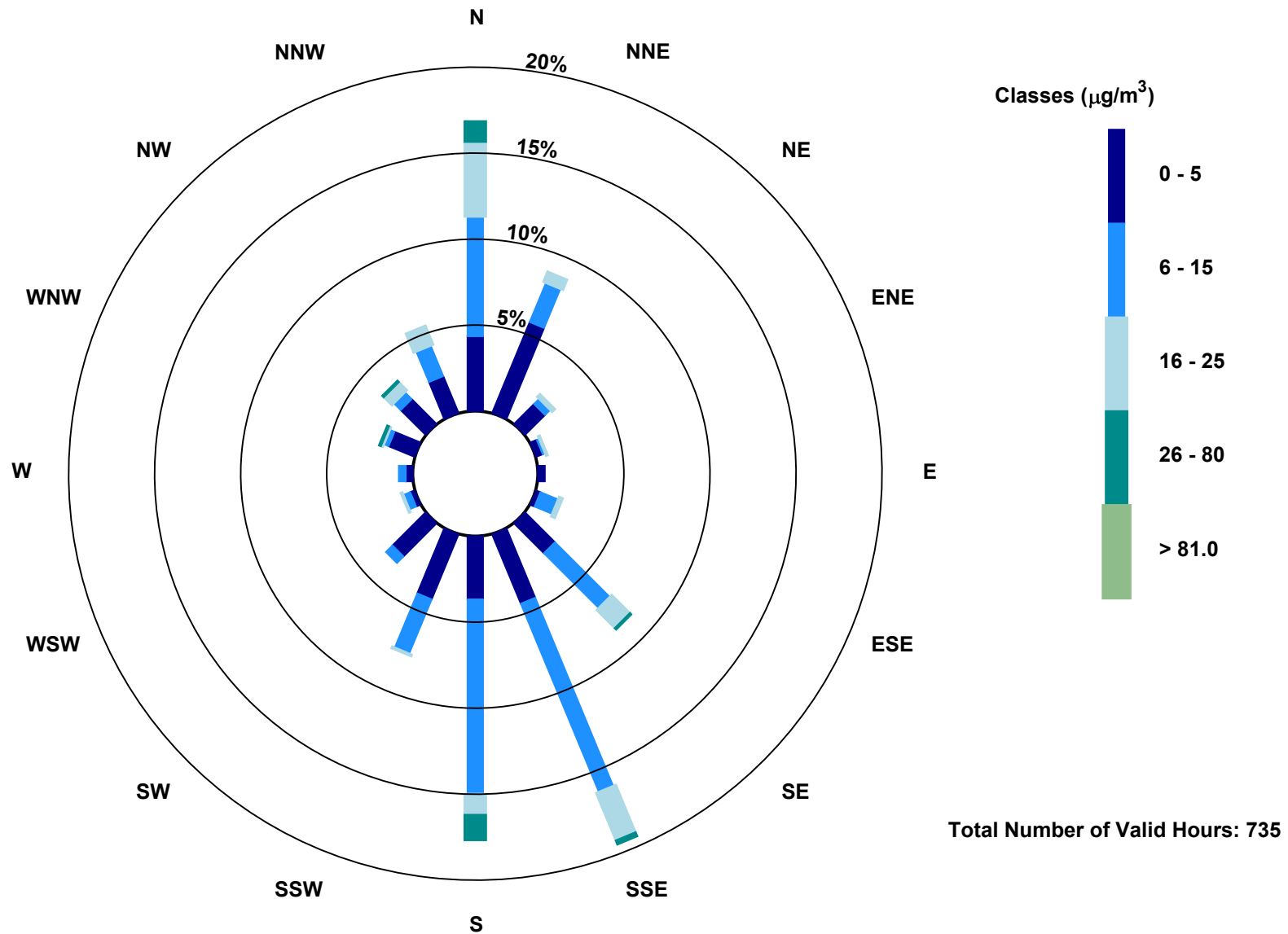
Total Number of Valid Hours: 735

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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



Total Number of Valid Hours: 735



Wood Buffalo Environmental Association
Summary of Hour Averages

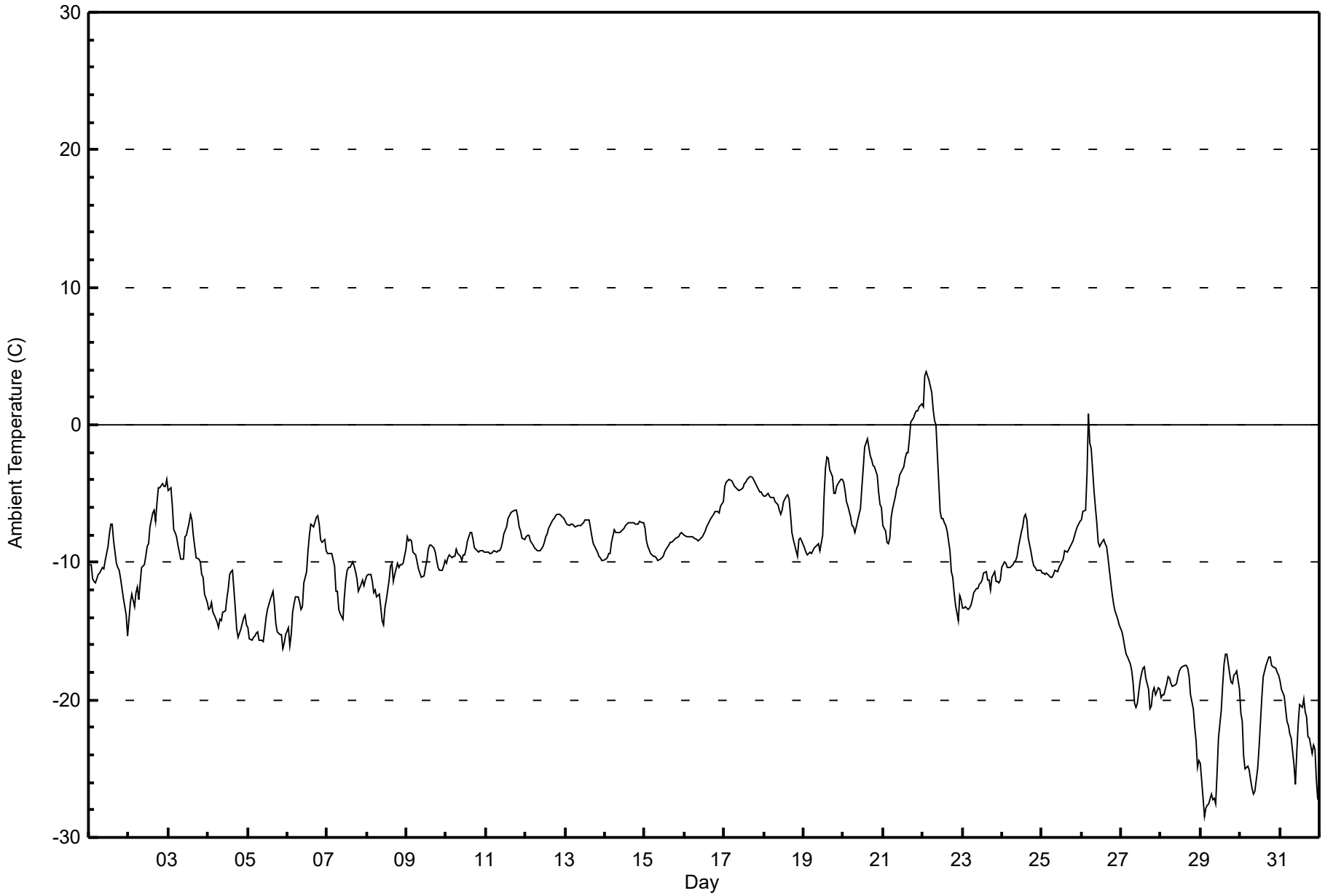
Ambient Temperature (AT) - C
Fort Hills - January 2023

Maximum Value: 3.8 C on Jan 22 03:00 Maximum Daily Average: -3.3 C on Jan 21																						Hours in Service:	744			
Minimum Value: -28.5 C on Jan 29 03:00 Minimum Daily Average: -22.5 C on Jan 29																						Hours of Data:	744			
Maximum Diurnal Average: -9.0 C at hour 15 Minimum Diurnal Average: -11.8 C at hour 10																						Hours of Missing Data:	0			
Monthly Average: -10.63 C Percentiles: P ₁ = -27.2 P ₁₀ = -18.8 Q ₁ = -13.1 Median = -9.4 Q ₃ = -7.2 P ₉₀ = -4.6 P ₉₉ = 1.2																						Hours of Calibration:	0			
																						Percent Operational Time:	100.0			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.1	-10.2	-11.2	-11.4	-11.5	-10.9	-10.7	-10.6	-10.3	-10.5	-9.8	-8.8	-8.0	-7.2	-7.2	-8.5	-10.1	-10.4	-10.5	-11.2	-11.9	-12.6	-13.8	-15.4	-10.5	-7.2
2-Jan	-14.2	-12.9	-12.3	-13.2	-12.2	-11.8	-12.7	-11.5	-10.4	-10.2	-9.5	-8.9	-8.6	-7.5	-6.4	-6.2	-7.0	-5.7	-4.6	-4.6	-4.3	-4.5	-4.5	-4.0	-8.6	-4.0
3-Jan	-4.8	-4.6	-5.9	-7.7	-7.9	-8.2	-8.8	-9.7	-9.7	-9.7	-8.1	-8.0	-7.1	-6.5	-6.9	-8.1	-8.8	-9.6	-9.8	-10.0	-10.9	-11.1	-12.3	-12.9	-8.6	-4.6
4-Jan	-13.4	-13.3	-12.9	-13.6	-13.8	-14.4	-14.7	-14.1	-14.3	-13.6	-13.5	-12.6	-11.9	-10.9	-10.7	-10.6	-13.3	-14.9	-15.4	-15.1	-14.8	-14.0	-13.9	-14.5	-13.5	-10.6
5-Jan	-14.8	-15.6	-15.7	-15.5	-15.3	-15.2	-15.1	-15.6	-15.7	-15.8	-15.0	-14.0	-13.4	-12.7	-12.4	-12.1	-13.1	-14.4	-15.0	-15.2	-15.3	-16.3	-15.9	-15.2	-14.8	-12.1
6-Jan	-14.8	-16.1	-15.3	-13.6	-13.1	-12.5	-12.5	-12.9	-13.4	-13.2	-11.5	-10.7	-9.2	-8.1	-7.3	-7.3	-7.4	-6.7	-6.6	-7.2	-8.3	-8.5	-8.3	-9.2	-10.6	-6.6
7-Jan	-9.3	-9.3	-9.4	-9.3	-10.2	-12.1	-12.1	-13.4	-13.7	-14.1	-12.6	-11.3	-10.6	-10.3	-10.3	-9.9	-10.3	-10.6	-11.2	-12.1	-11.6	-11.3	-11.7	-11.3	-11.2	-9.3
8-Jan	-11.0	-10.9	-10.9	-11.4	-12.2	-12.0	-12.5	-12.3	-13.2	-14.2	-14.5	-13.3	-12.8	-11.2	-10.3	-10.1	-11.4	-10.9	-10.0	-10.4	-10.2	-10.2	-10.0	-9.1	-11.5	-9.1
9-Jan	-8.2	-8.5	-8.3	-8.4	-9.3	-9.5	-9.9	-10.5	-10.8	-11.1	-11.0	-10.4	-9.9	-9.0	-8.8	-8.8	-9.0	-9.2	-9.8	-10.3	-10.6	-10.6	-10.2	-9.9	-9.7	-8.2
10-Jan	-10.1	-9.7	-9.5	-9.7	-9.6	-9.6	-9.1	-9.3	-9.6	-9.8	-9.5	-9.4	-9.1	-8.5	-7.8	-7.8	-8.4	-9.0	-9.1	-9.2	-9.2	-9.1	-9.2	-9.2	-9.2	-7.8
11-Jan	-9.3	-9.3	-9.3	-9.4	-9.2	-9.2	-9.2	-9.2	-9.1	-9.0	-8.6	-8.0	-7.4	-6.8	-6.6	-6.4	-6.3	-6.2	-6.2	-6.7	-7.4	-7.7	-8.2	-8.4	-8.0	-6.2
12-Jan	-8.1	-8.0	-8.0	-8.5	-8.7	-9.0	-9.1	-9.1	-9.1	-9.1	-8.9	-8.5	-8.2	-7.9	-7.6	-7.2	-7.0	-6.8	-6.6	-6.5	-6.5	-6.6	-6.7	-6.8	-7.8	-6.5
13-Jan	-7.0	-7.2	-7.3	-7.2	-7.2	-7.3	-7.4	-7.3	-7.3	-7.3	-7.2	-7.1	-6.9	-6.9	-6.9	-7.5	-8.1	-8.7	-9.0	-9.3	-9.5	-9.7	-9.9	-9.9	-7.9	-6.9
14-Jan	-9.8	-9.6	-9.3	-9.3	-8.6	-7.7	-7.8	-7.8	-7.8	-7.9	-7.7	-7.6	-7.4	-7.2	-7.1	-7.1	-7.1	-7.2	-7.2	-7.2	-7.2	-7.1	-7.1	-7.1	-7.8	-7.1
15-Jan	-7.5	-8.5	-8.8	-9.3	-9.4	-9.6	-9.6	-9.7	-9.9	-9.8	-9.7	-9.6	-9.3	-9.0	-8.7	-8.5	-8.5	-8.4	-8.3	-8.3	-8.1	-7.9	-7.9	-7.9	-8.8	-7.5
16-Jan	-8.1	-8.1	-8.2	-8.1	-8.1	-8.2	-8.3	-8.4	-8.5	-8.4	-8.2	-8.1	-7.8	-7.4	-7.2	-7.1	-6.8	-6.5	-6.3	-6.3	-6.3	-6.4	-5.9	-5.6	-7.4	-5.6
17-Jan	-4.5	-4.2	-4.1	-4.0	-4.1	-4.3	-4.5	-4.6	-4.6	-4.8	-4.7	-4.5	-4.2	-4.1	-3.9	-3.7	-3.8	-3.9	-4.1	-4.3	-4.5	-4.9	-4.9	-5.1	-4.4	-3.7
18-Jan	-5.2	-5.2	-4.9	-5.1	-5.3	-5.2	-5.2	-5.6	-5.8	-6.2	-6.5	-6.2	-5.6	-5.1	-5.1	-5.4	-6.5	-7.8	-8.3	-9.1	-9.6	-8.3	-8.2	-8.5	-6.4	-4.9
19-Jan	-8.9	-9.3	-9.5	-9.3	-9.2	-9.4	-8.9	-8.8	-8.8	-8.7	-9.2	-8.1	-5.2	-3.2	-2.3	-2.4	-3.2	-3.8	-5.0	-5.0	-4.4	-4.3	-3.9	-4.0	-6.4	-2.3
20-Jan	-4.2	-4.8	-5.6	-5.9	-6.7	-7.4	-7.4	-7.9	-7.4	-6.5	-6.1	-4.6	-3.2	-1.6	-1.0	-1.7	-2.2	-2.6	-2.9	-3.0	-3.7	-4.9	-5.8	-6.0	-4.7	-1.0
21-Jan	-7.3	-7.8	-8.6	-8.6	-8.2	-6.7	-6.1	-5.2	-4.6	-4.3	-3.7	-3.5	-3.0	-2.5	-2.0	-2.0	-1.0	0.2	0.5	0.8	1.1	1.0	1.3	1.5	-3.3	1.5
22-Jan	1.3	3.6	3.8	3.6	3.3	2.3	1.1	0.4	0.0	-2.2	-6.3	-6.8	-6.8	-7.1	-7.4	-7.7	-9.1	-10.7	-11.1	-12.2	-13.1	-14.2	-12.4	-12.7	-5.0	3.8
23-Jan	-13.3	-13.3	-13.3	-13.4	-13.3	-13.2	-12.7	-12.2	-11.9	-11.9	-11.6	-11.5	-11.3	-10.8	-10.7	-11.2	-11.3	-12.0	-11.1	-10.6	-11.4	-11.4	-11.5	-11.3	-11.9	-10.6
24-Jan	-10.4	-10.0	-10.1	-10.3	-10.3	-10.4	-10.2	-10.0	-9.8	-9.5	-8.9	-7.9	-7.4	-6.8	-6.5	-6.9	-8.2	-9.3	-9.8	-10.3	-10.4	-10.6	-10.6	-10.6	-9.4	-6.5
25-Jan	-10.7	-10.8	-10.9	-10.8	-11.0	-11.1	-11.1	-10.9	-10.5	-10.7	-10.4	-10.2	-10.0	-9.8	-9.1	-9.3	-9.0	-8.8	-8.7	-8.5	-7.8	-7.5	-7.2	-7.0	-9.7	-7.0
26-Jan	-6.9	-6.4	-6.2	-3.6	0.8	-1.3	-1.7	-4.8	-6.0	-7.1	-8.6	-8.9	-8.7	-8.4	-8.6	-8.9	-9.7	-10.5	-12.3	-13.0	-13.5	-13.9	-14.1	-14.6	-8.2	0.8
27-Jan	-15.0	-15.6	-16.2	-16.7	-16.8	-17.4	-17.9	-18.8	-20.2	-20.5	-20.3	-18.6	-18.1	-17.7	-17.6	-18.4	-19.3	-20.6	-20.5	-19.5	-19.1	-19.6	-19.1	-19.2	-18.4	-15.0
28-Jan	-19.9	-19.6	-19.6	-18.8	-18.3	-18.4	-18.8	-19.1	-19.0	-18.8	-18.3	-17.9	-17.7	-17.6	-17.5	-17.4	-17.7	-18.3	-19.6	-20.6	-22.0	-23.0	-24.9	-24.4	-19.5	-17.4
29-Jan	-24.6	-27.2	-28.5	-27.9	-27.6	-27.6	-26.8	-27.3	-27.1	-27.6	-25.3	-22.7	-20.8	-18.9	-17.4	-16.7	-16.7	-18.1	-18.8	-18.9	-18.2	-18.1	-17.9	-19.2	-22.5	-16.7
30-Jan	-20.9	-21.5	-24.1	-25.1	-24.8	-25.1	-25.8	-26.4	-26.8	-26.7	-25.1	-23.5	-21.7	-19.8	-18.3	-17.5	-17.1	-16.9	-16.8	-17.5	-17.6	-17.7	-18.0	-18.2	-21.4	-16.8
31-Jan	-18.6	-19.2	-19.7	-20.7	-21.6	-21.9	-22.5	-22.7	-24.7	-26.1	-23.8	-21.8	-20.4	-20.6	-19.9	-20.8	-21.3	-22.7	-22.8	-23.9	-23.3	-23.6	-25.9	-27.3	-22.3	-18.6
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort Hills - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	56	7.53	7.53
-20 - 0	671	90.19	97.72
0 - 10	17	2.28	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

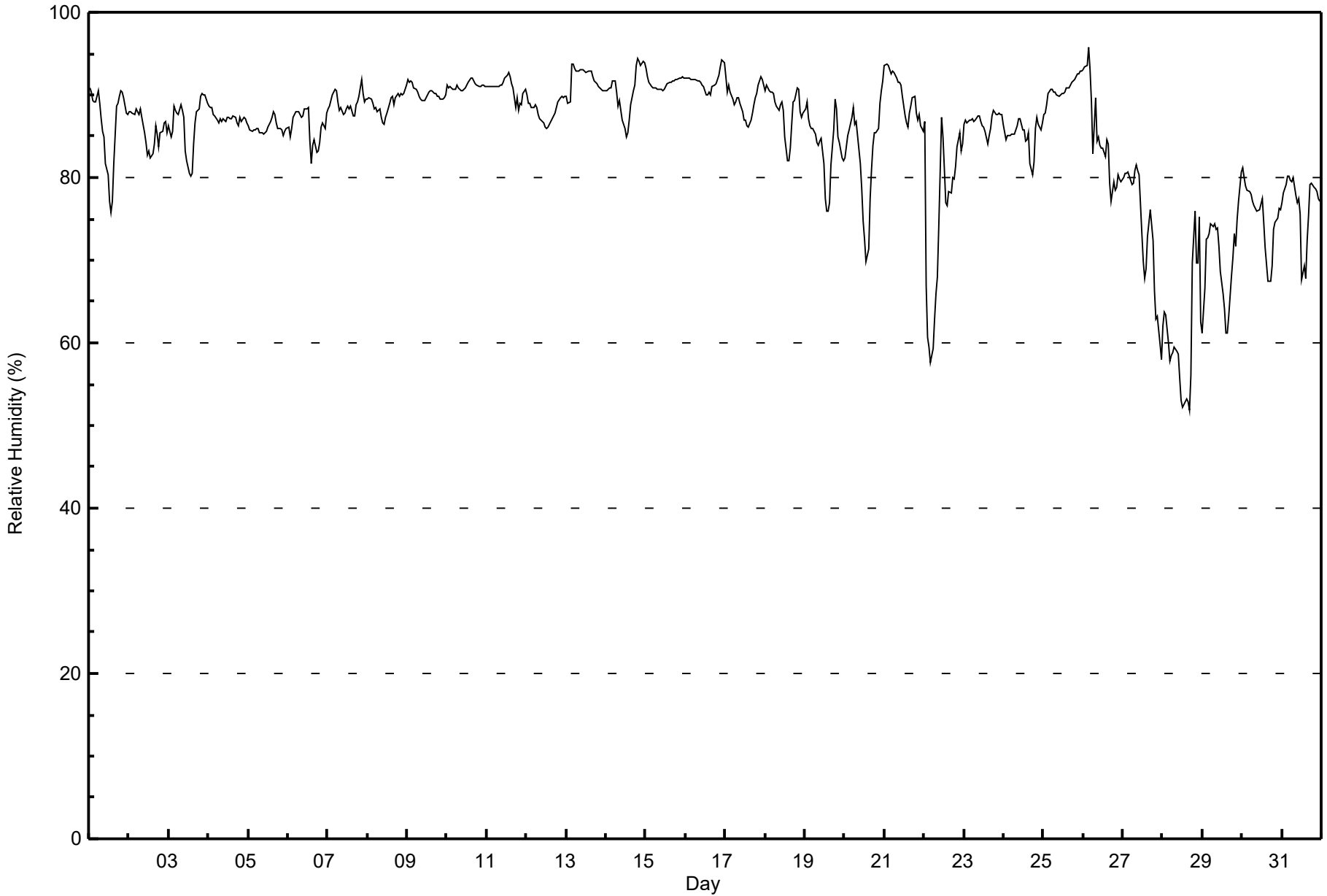
Fort Hills - January 2023

Maximum Value: 95.8 % on Jan 26 04:00 Maximum Daily Average: 91.9 % on Jan 13																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 51.8 % on Jan 28 17:00 Minimum Daily Average: 60.5 % on Jan 28 Maximum Diurnal Average: 86.5 % at hour 1 Minimum Diurnal Average: 82.0 % at hour 15 Monthly Average: 85.00 % Percentiles: P ₁ = 56.7 P ₁₀ = 74.3 Q ₁ = 83.2 Median = 87.5 Q ₃ = 90.3 P ₉₀ = 91.7 P ₉₉ = 93.7																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	90.8	90.4	89.3	89.1	89.2	90.6	89.0	87.1	85.6	84.9	81.7	80.3	77.1	75.8	77.1	81.7	88.6	89.0	89.9	90.4	90.4	89.6	87.8	87.6	86.4	90.8
2-Jan	88.0	88.0	87.8	87.6	88.4	87.9	87.6	88.3	87.3	85.5	84.3	82.7	83.2	82.4	82.9	84.2	86.3	85.2	83.8	85.5	85.6	86.6	86.8	85.4	85.9	88.4
3-Jan	86.3	84.9	85.7	88.6	88.1	87.8	87.7	88.8	88.2	87.3	83.2	82.0	80.5	80.2	80.6	84.1	86.5	88.0	88.4	89.8	90.2	89.9	89.9	89.0	86.5	90.2
4-Jan	88.6	88.5	88.5	87.7	87.4	86.9	86.6	87.0	86.8	87.1	86.8	87.2	87.2	87.2	87.2	87.4	87.3	86.6	86.3	87.3	86.8	87.3	87.2	86.6	87.2	88.6
5-Jan	86.3	85.7	85.5	85.7	85.8	85.9	85.9	85.5	85.4	85.3	85.5	85.7	86.1	86.7	87.3	87.9	87.6	86.6	86.0	86.0	85.8	85.1	85.6	85.9	86.0	87.9
6-Jan	86.1	84.8	85.9	87.3	87.6	88.0	87.9	87.7	87.3	87.5	88.4	88.3	88.5	84.5	81.8	83.9	84.6	83.0	83.2	84.2	86.1	86.7	85.9	87.9	86.1	88.5
7-Jan	88.3	88.7	89.3	90.1	90.6	90.5	89.1	88.1	88.6	87.6	87.8	88.3	88.6	88.3	88.6	87.5	87.4	88.8	89.1	89.8	91.8	90.2	89.1	89.5	89.0	91.8
8-Jan	89.5	89.6	89.6	89.1	88.4	88.6	88.0	88.3	87.3	86.5	86.4	87.3	87.8	89.0	89.7	89.9	88.8	89.7	90.2	89.9	90.1	90.0	90.2	91.1	89.0	91.1
9-Jan	91.8	91.5	91.7	91.6	90.8	90.7	90.3	89.8	89.6	89.2	89.3	89.6	90.0	90.3	90.5	90.5	90.3	90.2	89.8	89.8	89.5	89.5	89.7	90.0	90.2	91.8
10-Jan	91.3	90.9	91.0	90.7	90.8	90.6	91.2	90.8	90.6	90.5	90.7	90.9	91.1	91.5	92.0	92.0	91.7	91.3	91.2	91.1	91.0	91.2	91.1	91.0	91.1	92.0
11-Jan	91.1	91.1	91.0	90.9	91.0	91.1	91.0	91.0	91.1	91.2	91.6	92.0	92.3	92.7	92.2	91.3	90.8	88.5	89.7	88.2	89.0	88.8	90.2	90.7	90.8	92.7
12-Jan	89.9	89.1	89.1	88.5	88.5	88.9	88.5	87.6	87.1	87.0	86.6	86.2	85.9	86.1	86.5	87.1	87.5	87.8	88.5	89.1	89.7	89.8	89.7	89.9	88.1	89.9
13-Jan	89.8	88.9	89.1	93.7	93.7	93.2	92.9	92.9	93.0	93.0	92.8	92.8	92.8	92.9	92.8	92.2	91.7	91.4	91.0	90.9	90.6	90.5	90.5	91.9	91.9	93.7
14-Jan	90.6	90.7	90.9	90.9	91.7	91.6	90.4	88.7	89.3	88.2	87.0	85.9	84.9	85.4	87.0	88.8	90.5	91.2	93.5	94.5	94.1	93.6	94.0	93.8	90.3	94.5
15-Jan	93.3	92.2	91.6	91.1	90.9	90.8	90.9	90.7	90.6	90.6	90.6	90.6	91.0	91.3	91.6	91.6	91.7	91.8	91.8	92.0	92.1	92.2	92.1	91.4	91.4	93.3
16-Jan	92.0	92.0	92.0	91.9	91.8	91.8	91.9	91.8	91.7	91.5	91.2	91.1	90.1	90.0	90.4	90.1	91.1	91.2	91.4	91.8	92.3	93.4	94.2	93.9	91.7	94.2
17-Jan	92.3	90.4	91.2	90.3	89.5	88.8	89.2	89.7	89.7	89.0	87.9	87.0	87.0	86.3	86.1	87.0	87.8	88.7	89.7	90.2	91.1	92.2	91.9	91.2	89.3	92.3
18-Jan	90.5	91.1	90.6	90.3	90.4	90.1	89.2	88.7	88.1	88.8	89.1	88.1	85.0	82.1	82.0	83.5	86.5	89.2	89.4	90.8	90.7	88.0	87.3	87.8	88.2	91.1
19-Jan	88.3	89.1	87.1	86.2	86.0	86.0	85.2	84.3	83.9	84.5	84.8	81.8	77.4	75.9	75.9	77.0	81.6	85.8	89.5	88.3	84.9	84.2	82.4	82.0	83.8	89.5
20-Jan	82.4	83.7	85.1	85.7	87.3	88.5	86.5	86.8	85.1	81.7	78.7	74.7	72.6	69.8	71.4	77.4	81.1	83.8	85.4	85.4	85.9	89.0	90.5	91.7	82.9	91.7
21-Jan	93.6	93.8	93.6	93.0	92.5	92.8	92.8	92.1	91.6	91.6	91.2	89.8	87.5	86.7	86.1	87.8	88.7	89.7	89.8	87.8	86.9	87.6	86.3	85.5	89.9	93.8
22-Jan	86.7	67.0	60.7	59.5	57.6	59.4	62.9	65.9	67.9	74.0	87.3	85.0	81.0	77.0	76.6	78.4	78.1	80.0	79.8	81.4	83.7	85.4	83.2	84.0	75.1	87.3
23-Jan	86.4	87.0	86.6	87.0	86.9	87.2	86.8	86.9	87.5	87.5	86.8	86.3	86.2	85.6	84.1	85.1	85.9	87.4	88.2	87.6	87.7	87.8	87.6	87.6	86.8	88.2
24-Jan	86.5	84.5	85.2	85.1	85.1	85.3	85.2	85.7	86.3	87.1	87.2	85.8	85.7	84.4	84.7	85.4	81.7	80.3	81.9	85.9	87.2	86.4	85.8	86.6	85.2	87.2
25-Jan	87.7	87.8	88.9	90.1	90.6	90.7	90.3	90.3	90.1	89.9	90.0	90.2	90.1	90.3	90.8	90.9	91.3	91.5	91.7	91.9	92.5	92.6	92.8	92.9	90.7	92.9
26-Jan	93.1	93.5	93.5	95.8	93.0	89.2	82.9	89.6	84.4	84.9	83.8	83.6	83.5	82.6	84.5	84.1	79.3	77.2	79.5	78.5	78.8	80.3	79.9	79.4	84.8	95.8
27-Jan	80.0	80.5	80.5	80.8	80.2	79.1	79.4	80.8	81.5	80.9	80.4	73.3	69.8	67.9	69.0	73.0	76.1	74.2	72.4	66.3	63.0	63.2	59.8	57.9	73.7	81.5
28-Jan	62.1	63.7	63.4	60.0	57.9	58.5	58.8	59.6	59.0	58.6	55.8	53.1	52.2	52.5	53.3	52.9	51.8	56.1	69.7	75.9	69.7	69.6	75.3	62.6	60.5	75.9
29-Jan	61.2	66.7	72.6	72.7	73.1	74.4	74.1	74.5	73.6	74.0	71.7	68.7	65.9	64.1	61.2	61.3	63.3	68.2	70.4	73.3	71.6	74.9	77.2	80.7	70.4	80.7
30-Jan	81.1	80.0	79.0	78.4	78.3	77.9	77.2	76.7	76.2	75.9	76.2	76.8	77.5	74.7	71.5	67.4	67.5	67.5	69.3	73.8	74.6	75.1	76.3	76.0	75.2	81.1
31-Jan	76.9	78.2	79.2	80.3	80.1	79.7	79.5	80.0	77.7	77.0	77.4	75.6	67.6	69.3	67.9	72.4	75.5	79.1	79.4	78.8	78.7	78.3	77.4	77.0	76.8	80.3
86.5 85.9 86.0 86.1 85.9 85.9 85.4 85.7 85.2 85.1 84.9 83.9 82.8 82.0 82.0 83.0 83.8 84.5 85.5 86.0 85.9 86.1 86.1 85.7																						Diurnal Average				
93.6 93.8 93.6 95.8 93.7 93.2 92.9 92.9 93.0 93.0 93.0 92.8 92.8 92.8 92.9 92.8 92.2 91.8 93.5 94.5 94.1 93.6 94.2 93.9																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort Hills - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Fort Hills - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	20	2.69	2.69
60 - 80	121	16.26	18.95
80 - 100	603	81.05	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Fort Hills - January 2023

Maximum Speed: 28 km/h on Jan 26 08:00	Maximum Daily Speed Average: 16.8 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 9 01:00	Minimum Daily Speed Average: 1.1 km/h on Jan 7	Hours of Data: 736
Maximum Diurnal Speed Average: 4.1 km/h at hour 13	Minimum Diurnal Speed Average: 1.1 km/h at hour 20	Hours of Missing Data: 8
Monthly Average Velocity: 2.8 km/h 162.1 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 13 P ₉₀ = 18 P ₉₉ = 25	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S7	SSW4	W4	W3	SSW6	SSE7	S11	S12	SSE13	S13	S16	S16	S14	S10	SSW10	SSE10	SSE12	SE13	SE11	SE5	SSE8	S6	SSE4	S3	S8.4	S16
2-Jan	S7	SSE9	SSE10	SSE10	SSE11	SSE14	SSE12	SSE12	SSE15	SSE19	S17	SSE18	SSE20	SSE20	S20	S16	SE15	SSE14	S15	S14	S14	S14	SSE15	SSE13	SSE14.0	SSE20
3-Jan	SSE12	S13	SSE13	SE16	SE15	SSE13	SSE11	SE13	SSE14	SSE13	S13	SSE14	SSE14	SSE14	SE10	SE10	SSE13	SSE12	SSE12	S6	SE7	SSE4	SSE7	SSE5	SSE11.3	SE16
4-Jan	SSE6	SSE9	SE9	SSE9	SE7	SSE9	SSE9	SE9	SE9	SE10	SE9	SE7	SSE6	SSE6	SSE2	NE0	S1	SSE2	SSE5	SSE5	SSE8	SE7	SE6	SSE6.5	SE10	
5-Jan	SSE4	S5	SSE7	SE9	SSE10	SSE11	SSE9	SE8	SE9	SSE8	SE8	SE9	SE12	SE10	SSE12	SSE13	SSE7	SSE4	S5	S6	S6	SSW3	SSW4	SSW4	SSE7.2	SSE13
6-Jan	SW2	WSW2	S3	SW5	SSW5	SSW8	SSW7	SSW8	SSW7	SSW7	SSW9	SSW7	S11	S16	SSE17	SSE18	SSE18	S21	S23	SSE22	SSE19	SSE17	SSE15	SSE12	S11.0	S23
7-Jan	SE12	SE13	SE13	SE9	SSE5	NNW2	N6	N8	N7	NW3	NW3	NNW5	NNW3	N3	NNW5	N6	N7	NNW5	S3	S5	SSW7	S6	SE6	SE7	ESE1.1	SE13
8-Jan	S5	S6	S6	S6	S5	S7	S5	SSE6	S4	SSE5	S5	S5	SSE4	SSE2	SSE2	SE3	N3	N4	N3	NNW4	NNW3	NW3	UO	ENE1	S2.4	S7
9-Jan	NW0	NW1	NW2	N4	N5	NNW5	N6	N4	NNW4	N5	N6	N4	N3	N3	N4	N5	N5	N7	N10	NNW8	NNW6	NNW6	ENE1	WNW2	N4.3	N10
10-Jan	N4	N2	WNW2	NW3	N3	NW1	S3	NNW2	N3	NNW5	N7	N9	N7	N5	N2	NNW3	N9	NNE11	N6	N6	N6	N7	NNE8	NNE8	N4.7	NNE11
11-Jan	N8	N7	N5	NNW4	N4	N3	W2	WSW3	S2	SE6	SSE8	S10	S9	SSE10	SSE11	SSE10	S9	SSW11	S12	S10	SSE11	SSE16	SSE17	S18	SSE5.7	S18
12-Jan	S18	S18	S16	S19	S19	SSE21	SSE20	SSE21	SSE21	SSE20	SSE20	SSE18	SSE21	SSE21	SSE18	S17	SSE16	SSE17	S16	S15	SSE12	S11	SSE6	SSE6	SSE16.8	SSE21
13-Jan	SE5	ESE5	NE5	NNE9	NNE11	NNE13	NNE11	NNE8	NNE6	N9	NNE10	NNE11	NE7	NE8	NE10	NNE14	NNE14	N13	N12	N11	NNE10	N9	N9	N8	NNE8.8	NNE14
14-Jan	N7	N6	N5	NW2	S4	S11	S12	SSE12	SSE11	S9	S11	S13	SSW12	S11	S10	S9	SSE8	SSE7	SE4	ESE5	SSE3	UO	N3	N6	S5.2	S13
15-Jan	N9	N10	N10	NNE10	N7	N7	NNE6	N6	N6	N6	N5	NNW5	NNW4	NNW4	N4	N3	WNW1	WSW2	UO	UO	UO	UO	N4	N7	N5.5	N10
16-Jan	N9	N9	N11	N9	N9	N9	N10	N10	N12	N9	N11	N12	N13	N11	N13	N13	N12	N10	N7	N6	NNW5	NW3	SSW4	S6	N8.4	N13
17-Jan	S11	SSW12	SSW11	SSW13	S14	S14	S14	S13	S13	S14	S16	S14	SSW13	SSW16	SSW16	SSW12	S15	S15	S13	SSW13	SSW15	S17	S14	S13	S13.7	S17
18-Jan	S11	SSE14	SSW18	S19	S16	S16	S18	S18	S18	S19	S17	S19	S21	S18	S18	S13	SSE13	SSE13	SSE11	SSE11	SSE12	S17	S20	S19	S16.1	S21
19-Jan	S18	S17	S16	S16	S20	S20	SSE21	S18	S16	SSE13	SE12	SE11	S10	SW15	SSW13	SSW14	SSW14	SSW12	SSW10	SSW15	SSW12	SSW13	SW15	SW18	S13.8	SSE21
20-Jan	SW21	SSW14	SSW14	SSW16	SSW13	S13	SSW11	S10	SSW15	SSW15	SSW15	SW16	SW21	SW15	SW14	SW16	SSW15	SW16	SW14	SW15	SW7	SSE6	SE9	SE9	SSW12.7	SW21
21-Jan	SE9	SE7	SSE6	SSE9	SE10	SE13	SSE10	SSE12	SSE13	SSE14	SSE13	SE13	SE12	SE12	SE8	SE12	SSE9	SSW7	SSW9	SSW11	SSW9	SW10	SW12	SW11	SSE8.9	SSE14
22-Jan	SW11	WNW12	NW22	WNW24	NW18	W13	W15	WSW14	WNW11	N19	NNE27	NNE23	NNE11	NNE13	NNE14	NNE11	NE6	NE6	NE12	NE9	NNE6	NE6	NE8	NNE7	NNW8.1	NNE27
23-Jan	NNW6	N4	SE1	S4	SSW4	S5	SSE6	SSE6	ESE1	NNE4	N6	N9	N10	N11	N9	N9	NNE6	UO	N5	N8	N7	NE3	NW2	SSW2	N3.0	N11
24-Jan	SSE7	SSE11	S10	SSE10	SSE13	S13	S13	SSE14	S11	SSE14	SSE15	SE7	ESE6	NNW8	NNE11	NNE13	NE11	ENE9	NNE8	NNE8	ENE7	ENE7	E5	NNE5	SE4.6	SSE15
25-Jan	NE5	SE4	E1	NNE2	N4	NNW4	NNW5	NNE5	NNE4	N5	NW3	N7	N5	NNW3	SSW1	SSE4	S8	S7	S7	S8	S13	S13	S9	SW9	S1.3	S13
26-Jan	S11	SSE16	SE12	SSW5	NNW8	NNE17	N25	NNE28	N25	NNE27	NNE24	NNE19	NNE13	NNE11	NNE12	NNE13	NNE21	NNE25	NNE25	NNE27	NNE26	NNE23	NNE22	NNE23	NNE15.8	NNE28
27-Jan	N22	N21	N19	NNE17	N16	NNE17	NNE15	NNE13	NNE10	N6	W3	N3	SE3	E4	SSE1	SE4	N4	N7	NNW8	NW8	NW7	NW13	NNW12	NW7	N8.4	N22
28-Jan	WSW7	WNW6	WNW5	NW9	WNW9	WNW13	WNW15	WNW14	WNW13	WNW9	NW13	NW16	NNW18	NNW20	NW14	NNW19	NNW19	NNW18	N15	NNE17	N15	N10	N5	NNW11	NW11.0	NNW20
29-Jan	NW7	SW3	S7	SSW9	S6	SSW7	S5	S8	S10	SSE11	SSE13	S17	S17	S18	SSW21	SW23	SW15	SSE8	ESE3	NNW7	NNW5	N7	NNW4	NNW4	SSW6.5	SW23
30-Jan	N8	NNE7	SW3	SSE6	SSE5	SSE7	SSE6	SE6	SE7	SSE6	SE6	SE8	SE9	SE9	SE8	SE8	SE6	ESE5	ESE1	NNW3	N8	N7	N8	N14	ESE3.0	N14
31-Jan	NNE17	NE13	NNE13	NNE12	NNE9	NE7	NE7	N4	UO	NW3	WNW4	WSW2	ESE5	ESE6	ESE7	ESE8	E5	N5	NNE4	NNW3	N6	N7	NNW4	NW4	NNE4.7	NNE17

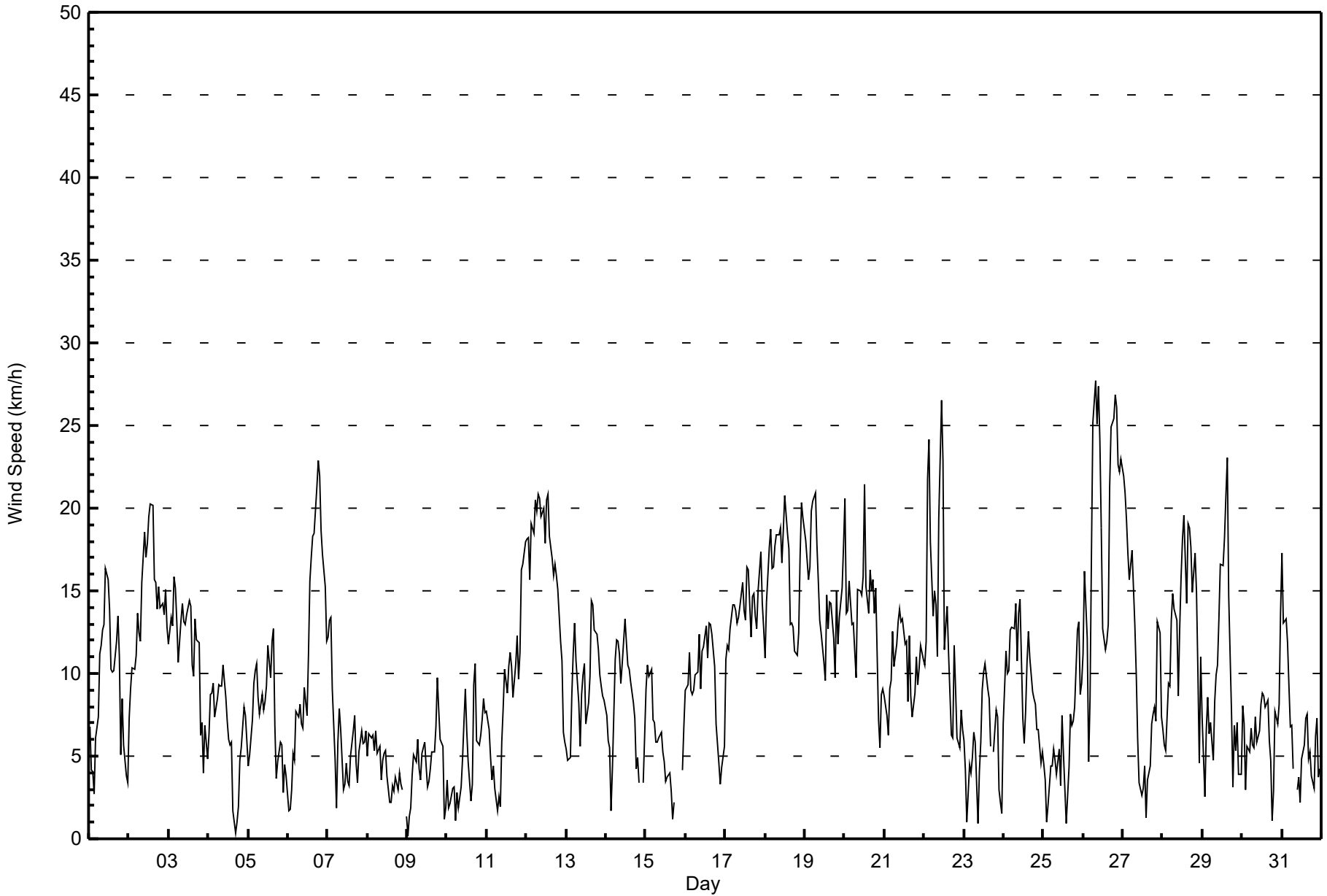
S2.2 SSE2.7 SSE2.5 S2.8 SSE2.9 SSE3.7 SSE3.3 SSE3.8 SSE3.9 SSE3.4 SSE3.4 SSE3.2 SSE4.1 SSE3.8 SSE3.6 SSE3.2 SE2.5 SSE2.2 SSE2.0 S1.1 SSE1.4 SSE1.9 SSE2.2 S1.3	Diurnal Average
N22 N21 NW22WNW24 S20 SSE21 N25 NNE28 N25 NNE27 NNE27 NNE23 SW21 SSE21 SSW21 SW23 NNE21 NNE25 NNE25 NNE27 NNE26 NNE23 NNE22 NNE23	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Fort Hills - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Hills - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	174	23.64	23.64
6 - 11	291	39.54	63.18
12 - 19	229	31.11	94.29
20 - 28	42	5.71	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 736

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Hills - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	38	6	4	2	3	8	7	19	19	10	4	4	4	6	14	26	174
6 - 11	69	26	11	3	0	4	40	54	41	20	5	1	0	4	5	8	291
12 - 19	13	20	2	0	0	0	16	59	64	25	12	1	2	5	5	5	229
20 - 28	4	13	0	0	0	0	0	11	7	1	3	0	0	1	1	1	42
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	124	65	17	5	3	12	63	143	131	56	24	6	6	16	25	40	736

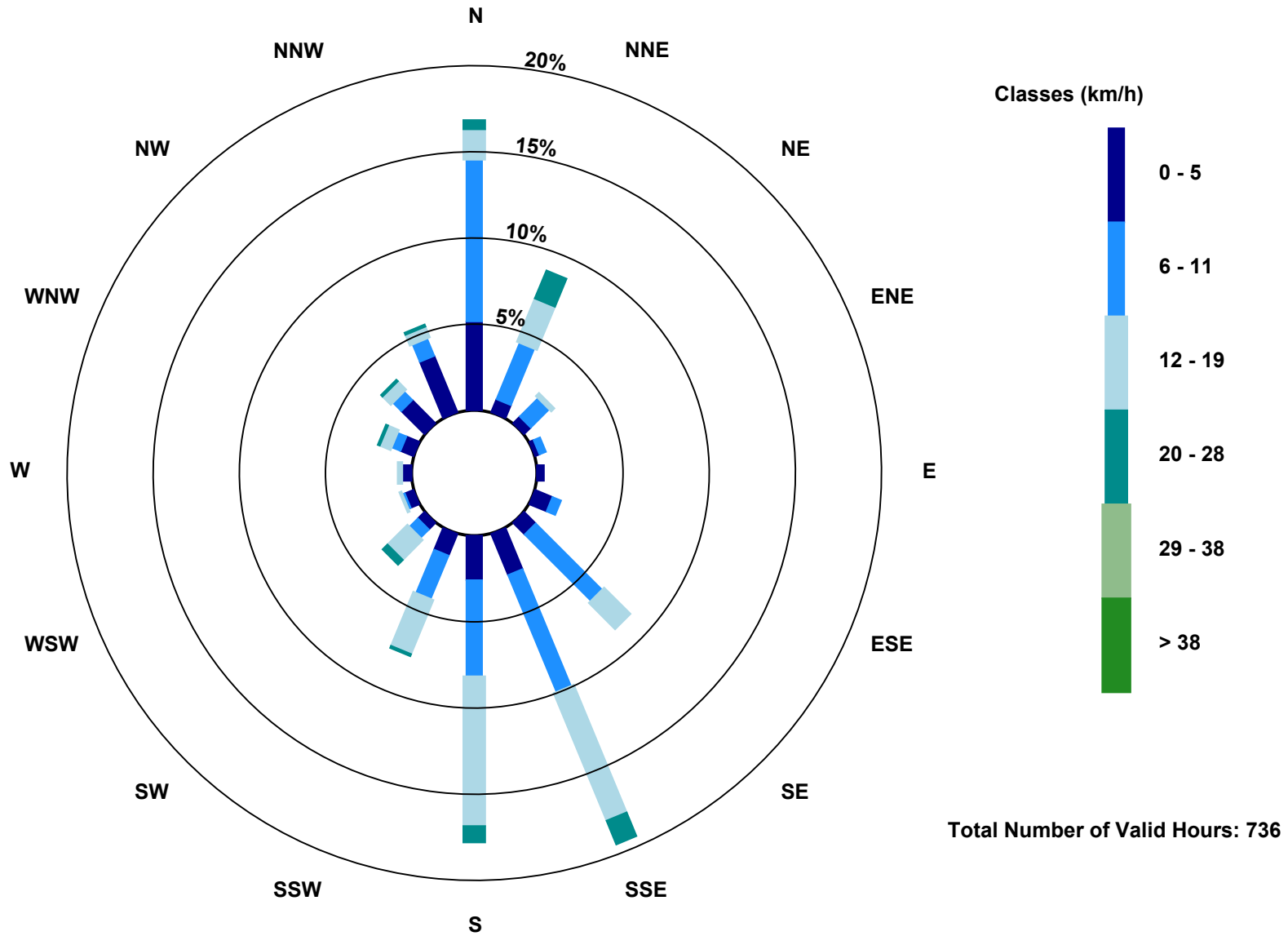
Total Number of Valid Hours: 736

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort Hills - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 22 05:00	Hours in Service: 744 Hours of Data: 736 Hours of Missing Data: 8 Hours of Calibration: 0 Percent Operational Time: 98.9
Minimum Value: 0 km/h on Jan 15 16:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5	

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	1	1	1	1	2	1	2	1	2	2	2	2	2	2	2	2	1	1	2	1	1	2	1	3	3
2-Jan	1	1	1	1	2	1	2	3	3	3	2	2	4	3	3	2	3	3	4	3	3	3	3	3	4
3-Jan	2	3	2	1	2	2	2	1	1	2	2	2	1	1	1	1	2	2	2	2	2	3	2	1	3
4-Jan	2	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	2
5-Jan	1	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	2	2	1	1	2
6-Jan	2	1	1	1	2	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	3	4	4	2	4
7-Jan	1	1	2	3	3	3	2	2	3	2	1	1	1	2	1	2	2	2	1	1	2	1	1	1	3
8-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	UO	1	1
9-Jan	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	2	1	1	2
10-Jan	1	1	0	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	1	2
11-Jan	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	2	2	2	2	2	2	2	2
12-Jan	2	2	2	3	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
13-Jan	2	1	3	2	2	2	2	2	2	3	2	2	1	1	3	2	2	2	2	2	2	1	1	1	3
14-Jan	1	1	1	1	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	UO	1	1	3
15-Jan	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	UO	UO	UO	UO	2	1	2
16-Jan	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2
17-Jan	2	1	1	2	2	2	2	2	1	2	2	2	2	3	2	2	2	2	2	2	3	2	2	1	3
18-Jan	1	2	2	3	2	3	3	2	3	3	3	4	3	2	3	2	1	1	2	1	2	2	2	2	4
19-Jan	3	2	2	3	2	3	2	3	3	1	1	1	2	3	2	2	2	2	2	2	3	3	2	3	3
20-Jan	2	3	2	2	2	2	2	2	3	2	3	3	3	3	2	2	2	2	2	2	4	1	1	1	4
21-Jan	2	1	1	1	2	1	1	2	2	2	2	2	1	2	2	1	2	1	2	1	2	2	2	2	2
22-Jan	2	4	6	6	9	4	5	3	5	5	5	6	3	3	3	2	3	2	3	3	1	3	2	1	9
23-Jan	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	2	UO	1	2	1	1	2	1	2
24-Jan	2	2	1	1	2	2	2	2	2	3	3	1	1	2	2	3	3	2	2	2	2	1	1	1	3
25-Jan	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1	2	2	1	2	2
26-Jan	3	3	3	2	3	4	7	6	4	4	5	4	3	3	2	3	3	4	4	5	5	5	4	4	7
27-Jan	4	4	4	3	4	3	3	3	2	3	1	1	1	1	2	2	2	1	2	3	2	2	3	2	4
28-Jan	1	2	3	2	2	5	3	3	3	2	3	4	5	3	4	5	5	4	3	4	3	3	2	2	5
29-Jan	2	1	2	1	1	1	1	1	1	2	2	3	3	3	3	3	3	2	2	2	1	2	1	1	3
30-Jan	3	3	2	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	3	2	2	1	6	6
31-Jan	3	2	3	3	2	1	2	3	UO	1	1	1	1	2	2	1	2	1	2	2	1	4	2	2	4
	4	4	6	6	9	5	7	6	5	5	5	6	5	3	4	5	5	4	4	5	5	5	4	6	
Diurnal Maximum																									

UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort Hills - January 2023

Direction of Maximum Speed: 14 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 167.5 deg on Jan 12	Hours of Data: 736
Direction of Minimum Speed: 320 deg on Jan 9 01:00	Hours of Missing Data: 8
Direction of Minimum Daily Speed Average: 1.1 deg on Jan 7	Percent Operational Time: 98.9
Monthly Average Direction: 162.1 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	176	200	267	262	194	168	169	176	165	169	182	187	187	190	202	157	153	143	143	128	153	169	157	190	172.8
2-Jan	188	151	154	151	157	151	148	151	164	160	173	166	168	166	176	175	137	167	188	185	190	172	166	168	166.0
3-Jan	166	177	154	136	144	154	149	144	149	152	173	156	153	157	146	145	150	149	161	173	142	147	154	168	153.5
4-Jan	153	150	144	148	146	153	147	145	136	144	139	145	148	153	149	165	50	174	160	150	155	150	144	145	147.0
5-Jan	160	177	147	141	148	147	152	143	145	148	144	140	140	135	152	160	154	166	172	182	184	206	201	200	154.1
6-Jan	215	253	173	218	211	197	212	201	210	202	202	196	173	171	166	166	167	173	170	168	154	160	151	148	174.1
7-Jan	145	137	135	130	161	339	1	356	353	306	321	339	340	354	328	2	351	342	177	176	209	188	140	145	112.0
8-Jan	169	177	169	183	177	179	189	160	176	166	171	171	155	157	149	128	355	3	354	342	337	308	UO	77	170.9
9-Jan	320	312	316	2	3	346	357	1	348	350	0	357	351	349	358	356	356	356	1	341	343	336	60	297	351.9
10-Jan	2	351	302	324	8	312	170	333	352	342	2	3	1	9	353	341	7	14	355	354	359	2	15	16	0.4
11-Jan	8	10	353	346	358	356	262	254	186	144	150	173	176	168	157	159	171	196	183	174	161	166	162	169	167.0
12-Jan	169	174	173	169	176	168	168	168	166	167	166	165	165	164	164	169	164	167	172	169	166	170	151	159	167.5
13-Jan	125	105	49	17	17	14	21	32	23	10	20	20	42	44	22	18	11	11	11	12	5	4	5	21.8	
14-Jan	4	356	356	314	174	173	169	166	166	186	188	185	193	187	183	175	165	163	139	116	168	UO	3	358	173.7
15-Jan	8	10	7	12	8	9	15	355	354	3	356	339	337	335	353	10	296	239	UO	UO	UO	UO	354	359	0.4
16-Jan	0	358	6	5	6	4	6	3	7	7	10	3	6	9	5	5	2	9	357	1	339	320	199	188	3.2
17-Jan	186	197	194	193	185	182	184	183	179	171	171	182	201	206	197	198	186	187	185	195	193	191	188	178	188.0
18-Jan	171	167	196	187	176	183	178	176	177	185	185	182	181	180	181	179	163	162	164	165	160	169	178	178	177.0
19-Jan	180	177	176	175	172	172	168	175	172	154	139	143	188	215	193	196	205	205	197	213	212	201	229	222	186.1
20-Jan	223	206	198	202	199	190	194	182	206	204	204	216	223	230	226	219	209	219	232	235	223	154	142	130	208.6
21-Jan	145	133	148	150	143	137	148	153	148	150	157	146	135	142	145	143	152	196	202	209	207	220	232	232	163.0
22-Jan	215	296	308	301	306	269	268	247	283	355	17	13	27	23	12	29	44	40	47	35	25	39	43	31	343.8
23-Jan	339	349	126	187	192	186	164	149	107	12	356	360	4	5	0	6	12	UO	355	8	356	38	322	197	4.9
24-Jan	158	164	170	160	166	179	171	160	181	159	155	138	114	12	20	25	36	58	25	21	59	58	84	25	124.4
25-Jan	35	146	88	31	358	330	337	23	24	6	325	10	354	285	213	150	169	183	189	185	173	171	184	217	179.3
26-Jan	186	155	139	198	344	25	5	14	11	12	18	20	18	29	17	25	20	15	24	19	15	16	19	15	19.8
27-Jan	7	8	10	23	9	22	17	23	32	6	276	9	133	98	161	130	8	10	332	311	309	321	335	324	4.5
28-Jan	240	284	289	307	287	288	292	283	293	284	317	318	331	344	326	342	333	330	11	12	11	4	3	339	325.1
29-Jan	307	227	189	200	179	202	181	181	189	152	155	181	171	191	213	221	218	147	115	332	344	11	331	329	195.8
30-Jan	354	19	230	163	157	147	149	144	136	153	126	131	132	128	124	134	132	123	110	342	7	360	4	7	107.2
31-Jan	30	35	33	21	28	50	42	8	UO	307	284	241	105	113	118	116	101	11	16	342	352	1	335	318	32.3

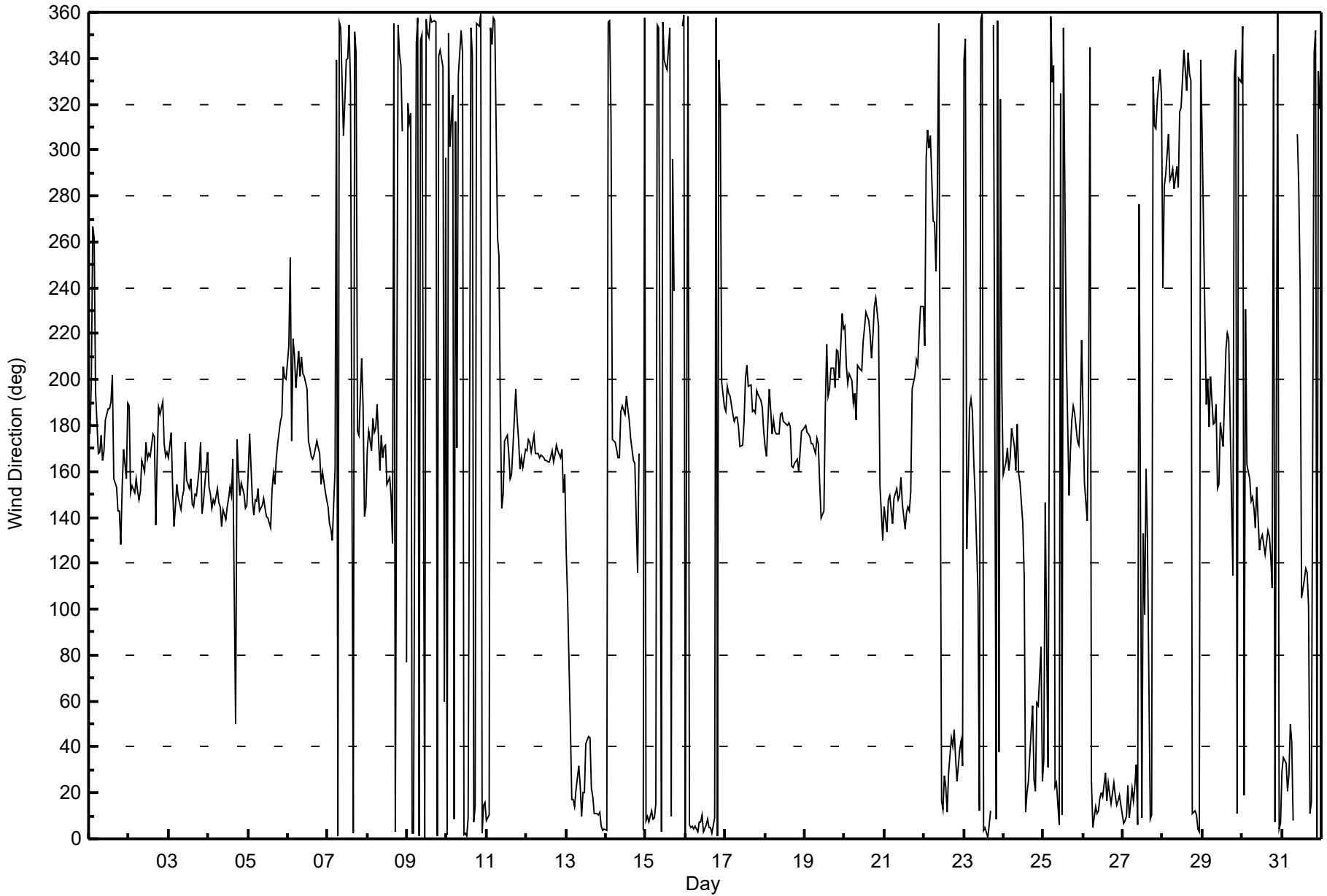
171.2 159.7 165.5 172.2 168.4 165.6 166.6 161.6 165.8 155.7 155.7 157.2 162.5 164.6 168.7 156.5 142.9 152.2 149.5 179.5 160.2 161.5 159.1 175.0
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Fort Hills - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort Hills - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 98 deg on Jan 4 17:00	Hours of Data: 736
Minimum Value: 4 deg on Jan 18 18:00	Hours of Missing Data: 8
Percentiles: P ₁ = 6 P ₁₀ = 7 Q ₁ = 9 Median = 11 Q ₃ = 18 P ₉₀ = 31 P ₉₉ = 84	Hours of Calibration: 0
	Percent Operational Time: 98.9

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	14	17	14	34	8	10	10	9	8	8	10	9	11	21	12	24	10	10	14	32	12	13	25	41	41
2-Jan	7	11	11	9	10	10	9	14	10	11	10	14	15	9	13	9	12	27	18	12	11	15	15	13	27
3-Jan	10	12	22	6	6	13	11	8	6	12	8	9	5	6	8	8	6	7	9	22	11	41	14	17	41
4-Jan	10	9	7	7	7	7	7	13	10	6	7	8	7	20	13	90	98	79	39	19	12	5	8	8	98
5-Jan	12	13	7	6	5	6	7	8	7	11	8	8	8	7	9	6	14	25	20	10	18	32	17	25	32
6-Jan	24	20	19	19	10	10	7	8	5	6	8	22	11	11	9	8	10	9	9	9	11	17	20	13	24
7-Jan	7	10	9	20	51	84	25	27	10	41	35	24	37	56	26	20	18	24	60	21	15	14	14	12	84
8-Jan	13	10	10	10	11	8	10	11	24	18	10	8	16	23	21	10	47	9	26	22	20	14	UO	55	55
9-Jan	90	45	49	11	14	18	10	35	30	17	11	10	26	20	14	13	12	11	12	12	14	30	66	83	90
10-Jan	13	28	17	28	13	57	14	53	18	12	10	11	11	13	23	16	9	7	18	13	10	11	8	7	57
11-Jan	8	8	24	19	14	28	34	30	48	19	7	12	9	14	7	7	15	9	7	9	13	7	7	7	48
12-Jan	9	8	7	7	8	7	8	8	7	7	7	7	7	7	7	7	7	6	7	8	10	15	18	27	27
13-Jan	21	24	41	12	11	9	9	11	31	12	10	11	12	10	16	8	8	8	9	9	8	11	11	11	41
14-Jan	11	11	17	46	54	10	9	8	8	11	9	10	8	9	8	8	7	8	18	11	24	UO	UO	19	54
15-Jan	8	7	10	8	8	10	8	15	14	9	12	12	24	9	17	10	46	13	UO	UO	UO	UO	16	12	46
16-Jan	10	12	11	11	10	10	10	12	10	12	9	12	10	9	12	11	11	9	10	10	9	12	34	20	34
17-Jan	10	7	11	7	7	7	8	8	8	8	8	9	16	12	9	7	9	9	8	8	8	9	12	7	16
18-Jan	10	11	10	9	8	10	10	8	8	8	9	8	8	7	7	7	6	4	6	5	7	8	7	7	11
19-Jan	7	8	7	10	9	7	8	10	11	11	9	8	21	12	9	8	7	6	19	10	20	19	7	7	21
20-Jan	6	21	12	8	11	8	18	17	12	9	8	15	8	9	10	8	7	8	7	5	44	15	16	12	44
21-Jan	15	9	16	6	10	6	9	10	8	9	8	8	8	9	24	6	21	27	13	10	10	11	8	11	27
22-Jan	13	25	13	13	21	21	13	19	35	39	10	11	15	10	12	13	42	19	12	19	10	20	14	31	42
23-Jan	13	27	86	13	31	12	13	14	84	34	26	11	10	8	11	14	14	UO	17	11	17	52	77	79	86
24-Jan	11	9	9	11	9	8	9	7	10	12	9	19	51	14	12	13	13	17	14	10	14	15	26	26	51
25-Jan	43	19	82	72	27	33	14	26	32	20	39	10	20	35	82	37	14	16	16	13	8	10	17	13	82
26-Jan	22	9	15	49	53	10	15	9	11	10	9	9	9	11	8	10	9	11	10	9	11	12	11	13	53
27-Jan	13	13	11	10	12	9	9	8	10	36	24	29	25	24	84	48	44	19	14	13	15	9	12	28	84
28-Jan	15	35	25	15	13	16	12	10	14	19	13	15	12	12	11	14	11	11	21	9	11	13	42	8	42
29-Jan	23	55	20	8	22	21	30	12	11	8	14	10	19	12	10	8	8	31	56	27	20	10	39	30	56
30-Jan	21	38	45	20	14	15	23	21	14	14	6	7	10	8	10	7	13	15	91	54	11	13	10	21	91
31-Jan	9	11	11	9	9	18	19	17	UO	44	19	59	25	21	18	13	38	10	41	80	12	29	21	29	80
	90	55	86	72	54	84	34	53	84	44	39	59	51	56	84	90	98	79	91	80	44	52	77	83	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO ₂ (ppb) Average	605	30	139	85.35	15.3	0	3.2	0
H ₂ S(ppb) Average	603	32	141	85.35	3.2	0	1.3	0
Temperature 2 m (C) Average	662	0	82	88.98	2.2	0	-3.7	0
Relative Humidity (%) Average	534	0	210	71.77	95	-	91	-
Wind Speed 10 m (km/h) Average	514	0	230	69.09	13	0	8	0
Wind Direction 10 m (deg) Average	514	0	230	69.09	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
 JANAURY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	605	1.11	1.6	-	0	0.1	0.2	0.6	1.4	2.6	15.3
H2S (ppb) Average	603	0.53	0.4	-	0	0.2	0.2	0.4	0.7	1	3.2
Temperature 2 m (C) Average	662	-9.43	4.4	-	-23	-15.9	-11.4	-8.8	-7.1	-4.6	2.2
Relative Humidity (%) Average	662	86.13	5.6	-	54.4	80	83.9	87.1	89.9	91.3	97.5
Wind Speed 10 m (km/h) Average	641	4.5	3	-	0	1	3	4	6	8	16
Wind Direction 10 m (deg) Average	641	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMÂTISIWIN (AMS25)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, H2S	27 Jan 2023 12:00	01 Feb 2023 00:00	109	Station power failure
Meteorological Parameters	28 Jan 2023 15:00	01 Feb 2023 00:00	82	Station power failure
Wind Speed, Wind Direction	05 Jan 2023 19:00	23 Jan 2023 21:00	21	Flat line in sensor output signal

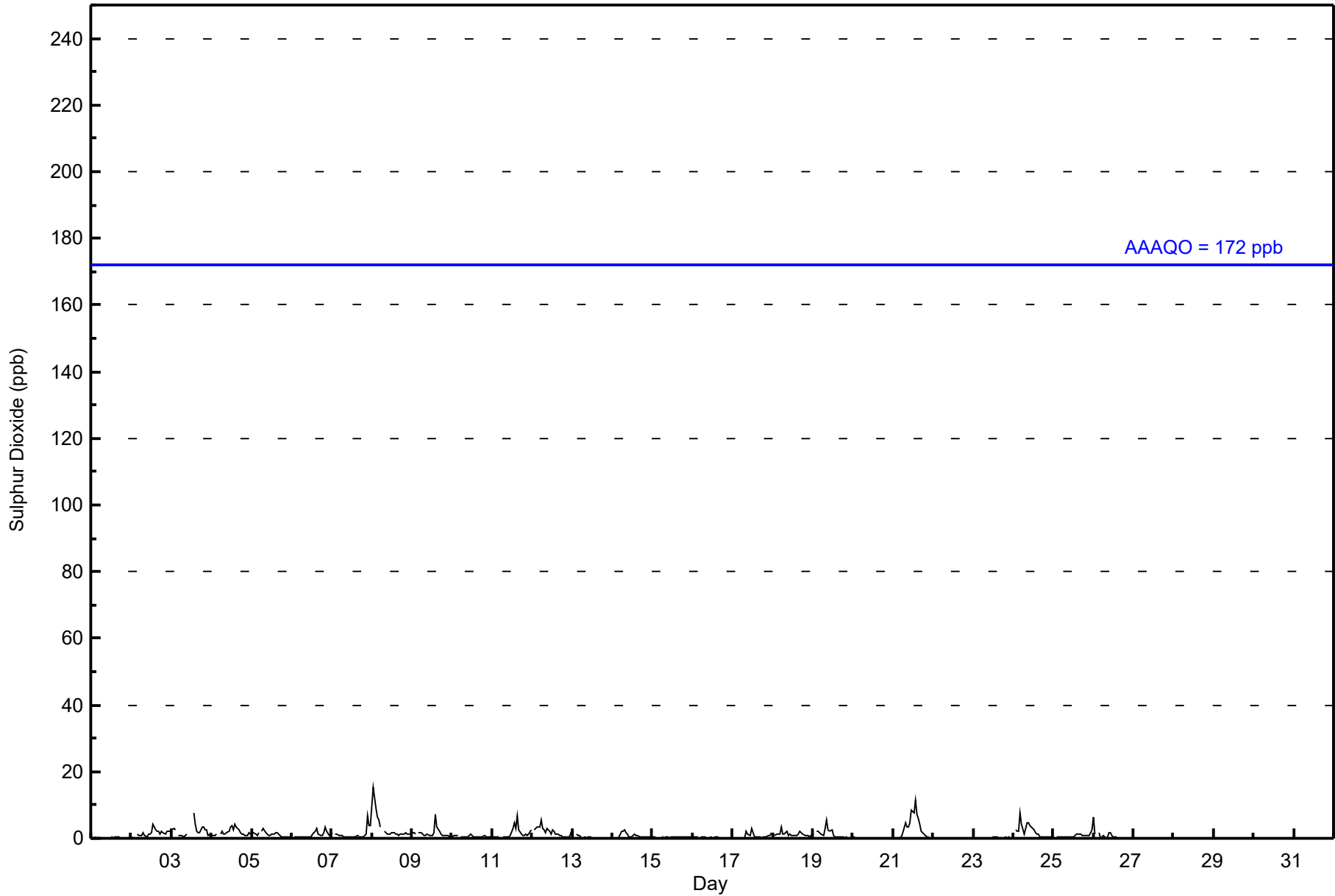


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 15.3 ppb on Jan 8 02:00 Maximum Daily Average: 3.2 ppb on Jan 8																	Hours in Service: 744 Hours of Data: 605 Hours of Missing Data: 139 Hours of Calibration: 30 Percent Operational Time: 85.4										
Minimum Value: 0.0 ppb on Jan 17 04:00 Minimum Daily Average: 0.0 ppb on Jan 22 Maximum Diurnal Average: 1.8 ppb at hour 14 Minimum Diurnal Average: 0.7 ppb at hour 23 Monthly Average: 1.11 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.6 Q ₃ = 1.4 P ₉₀ = 2.6 P ₉₉ = 7.8																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.3	Z	0.4	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.4	
2-Jan	0.0	0.2	Z	1.1	0.7	0.8	0.8	1.5	0.9	0.6	1.4	1.3	1.8	4.3	2.7	2.2	2.3	1.4	2.1	1.9	1.3	2.0	2.0	1.9	1.5	4.3	
3-Jan	2.5	3.2	2.5	Z	1.0	0.9	0.8	0.6	0.7	1.1	C	C	C	7.8	4.2	1.9	1.6	1.7	3.6	3.6	2.7	2.6	0.8	1.4	2.3	7.8	
4-Jan	0.8	0.9	0.9	1.3	Z	1.3	2.1	1.4	1.3	1.8	2.2	3.5	3.7	2.6	4.1	3.3	2.6	1.7	1.4	1.2	0.8	1.0	1.6	1.2	1.9	4.1	
5-Jan	1.6	1.5	1.1	1.0	1.6	Z	2.3	2.8	1.5	1.2	0.8	0.9	1.2	1.4	1.7	1.5	1.1	0.8	0.5	0.4	0.5	0.6	0.6	0.6	1.2	2.8	
6-Jan	Z	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.5	1.4	1.5	2.0	3.0	1.4	0.7	0.8	1.7	3.5	2.3	0.7	0.9	1.1	3.5
7-Jan	1.5	Z	1.1	1.3	0.9	0.8	0.7	0.6	0.3	0.3	0.4	0.4	0.5	0.4	0.5	0.7	0.5	0.6	0.5	0.6	1.2	6.8	3.7	3.9	1.2	6.8	
8-Jan	9.9	15.3	9.1	6.5	5.4	3.5	Z	1.9	1.8	1.3	1.5	1.3	1.7	1.7	1.4	1.1	0.8	1.2	1.1	1.3	1.5	1.2	1.2	1.3	3.2	15.3	
9-Jan	1.5	1.6	1.4	Z	1.8	1.5	1.2	0.8	1.0	1.1	1.0	0.9	0.8	1.8	7.4	3.5	2.2	1.1	1.0	0.9	0.8	0.7	0.5	0.5	1.5	7.4	
10-Jan	0.5	0.7	0.8	0.8	Z	0.6	0.5	0.5	0.4	0.5	0.7	1.1	0.9	0.6	0.5	0.5	0.4	0.4	0.6	0.7	0.6	0.4	0.3	0.3	0.6	1.1	
11-Jan	0.4	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.9	3.1	4.5	2.8	6.9	2.7	1.2	1.0	0.7	1.1	0.9	1.5	2.5	1.4	6.9	
12-Jan	Z	2.3	2.8	3.3	3.2	5.7	2.9	2.5	1.7	3.0	2.1	1.3	2.4	2.3	1.4	1.4	1.0	0.8	0.5	0.4	0.4	0.3	0.5	1.6	1.9	5.7	
13-Jan	2.7	Z	1.5	0.9	0.8	0.6	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.4	2.7	
14-Jan	0.1	0.1	Z	0.1	0.2	2.0	2.0	2.6	1.9	1.3	0.5	0.4	1.0	1.5	1.0	0.7	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.8	2.6
15-Jan	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.4	0.4	0.5	0.5	0.3	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5
16-Jan	0.5	0.5	0.4	0.4	Z	0.4	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.2	0.5	
17-Jan	0.2	0.1	0.1	0.0	0.0	Z	0.1	0.1	2.0	1.2	0.7	2.9	1.6	0.5	0.4	0.3	0.3	0.2	0.2	0.5	0.6	0.7	0.7	1.5	0.6	2.9	
18-Jan	Z	0.7	1.3	1.1	1.2	3.3	1.2	1.4	2.3	1.0	1.1	0.8	1.0	0.8	0.9	1.1	2.1	1.5	1.1	0.9	0.7	0.7	0.5	0.6	1.2	3.3	
19-Jan	1.3	Z	1.9	2.2	1.6	1.3	0.8	3.0	5.6	2.5	2.3	2.4	1.0	0.5	0.3	0.4	0.3	0.6	0.4	0.2	0.2	0.2	0.2	0.3	1.3	5.6	
20-Jan	0.3	0.2	Z	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.3	
21-Jan	0.1	0.1	0.1	Z	0.5	0.5	1.7	4.7	3.3	3.2	4.5	8.4	7.6	11.4	7.2	5.9	4.3	2.0	1.1	0.8	0.5	0.3	0.2	0.2	3.0	11.4	
22-Jan	0.1	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
23-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.2	0.2	0.2	0.2	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.4	
24-Jan	Z	2.4	2.0	2.0	7.8	4.2	1.2	2.8	4.8	4.8	3.6	2.8	2.6	1.6	1.2	1.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	2.1	7.8	
25-Jan	0.4	Z	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.8	1.3	1.3	1.2	1.0	1.0	0.7	1.0	0.9	1.5	2.6	0.8	2.6	
26-Jan	6.4	1.3	Z	1.6	0.1	0.2	0.6	0.2	0.5	1.6	1.6	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.7	6.4	
27-Jan	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.1	
28-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--	
1.4 1.5 1.3 1.1 1.3 1.3 0.8 1.1 1.2 1.1 1.0 1.3 1.4 1.8 1.6 1.5 1.0 0.7 0.7 0.7 0.7 0.9 0.7 0.9																								Diurnal Average			
9.9 15.3 9.1 6.5 7.8 5.7 2.9 4.7 5.6 4.8 4.5 8.4 7.6 11.4 7.4 6.9 4.3 2.0 3.6 3.6 3.5 6.8 3.7 3.9																								Diurnal Maximum			
Z - zerospan C - Calibration PF - Power Failure Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	603	99.67	99.67
11 - 20	2	0.33	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 605

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	77	39	16	6	4	4	39	249	38	11	12	9	11	10	8	49	582
11 - 20	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	77	39	16	6	4	4	39	251	38	11	12	9	11	10	8	49	584

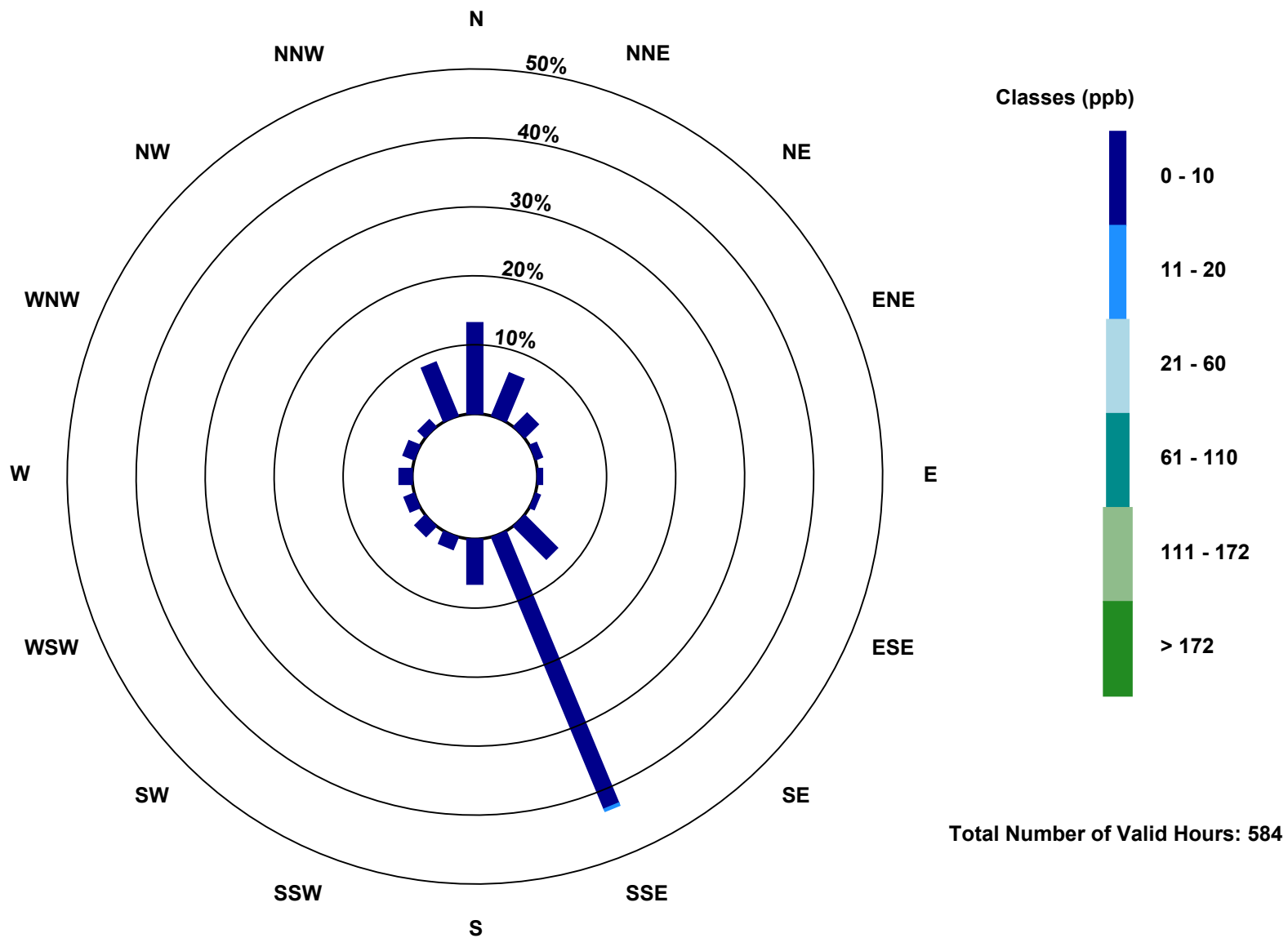
Total Number of Valid Hours: 584

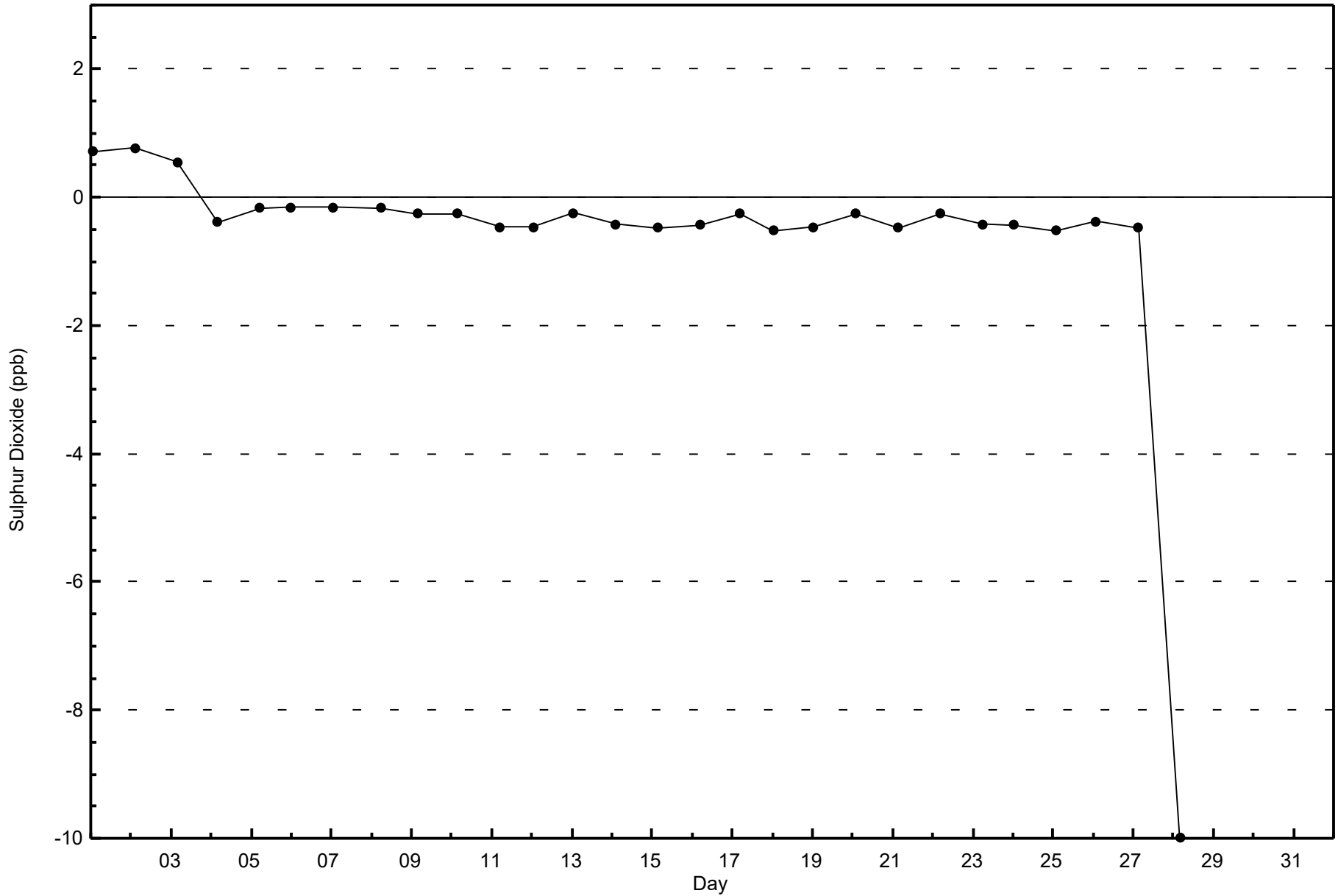
Total Number of Hours: 744

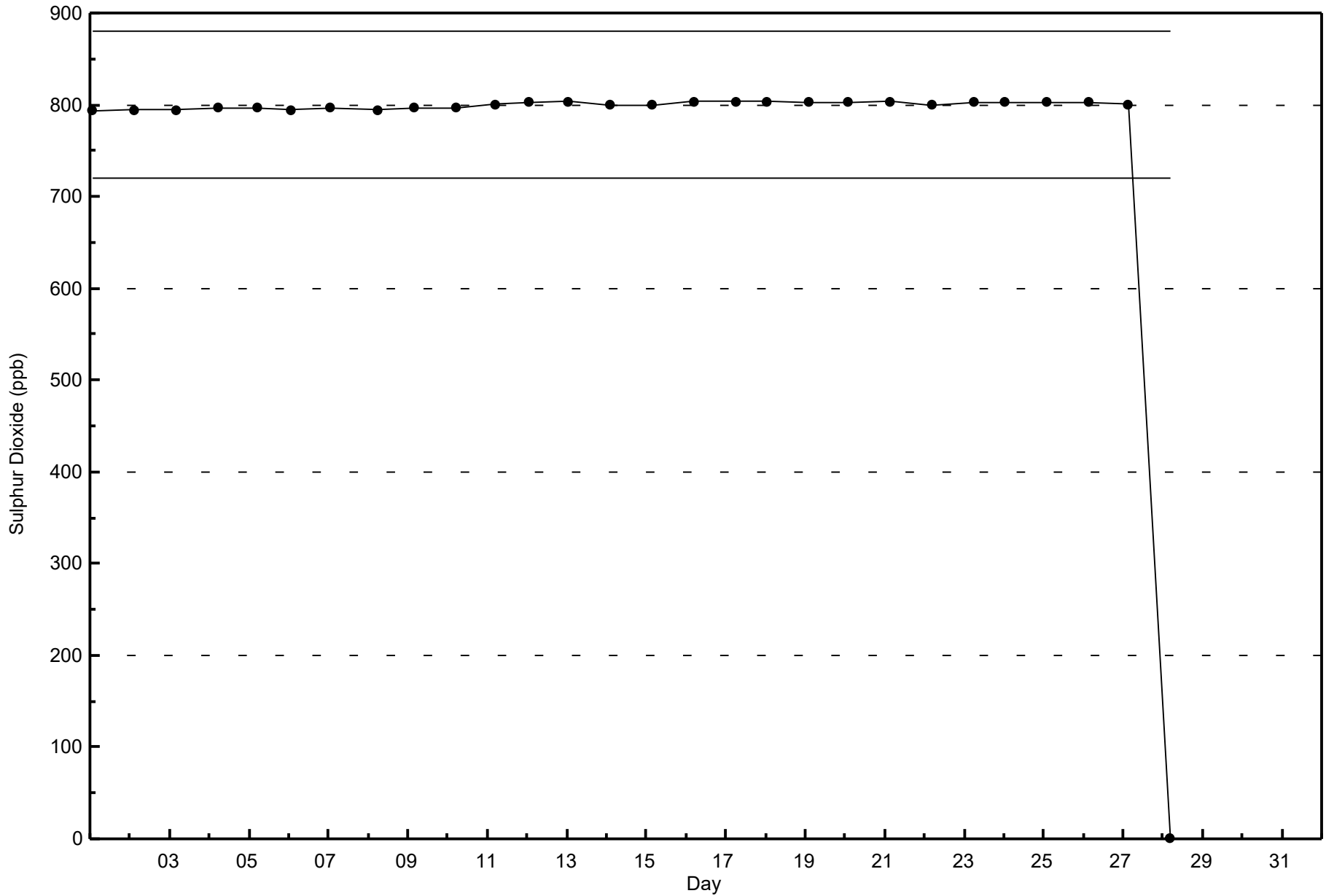


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin

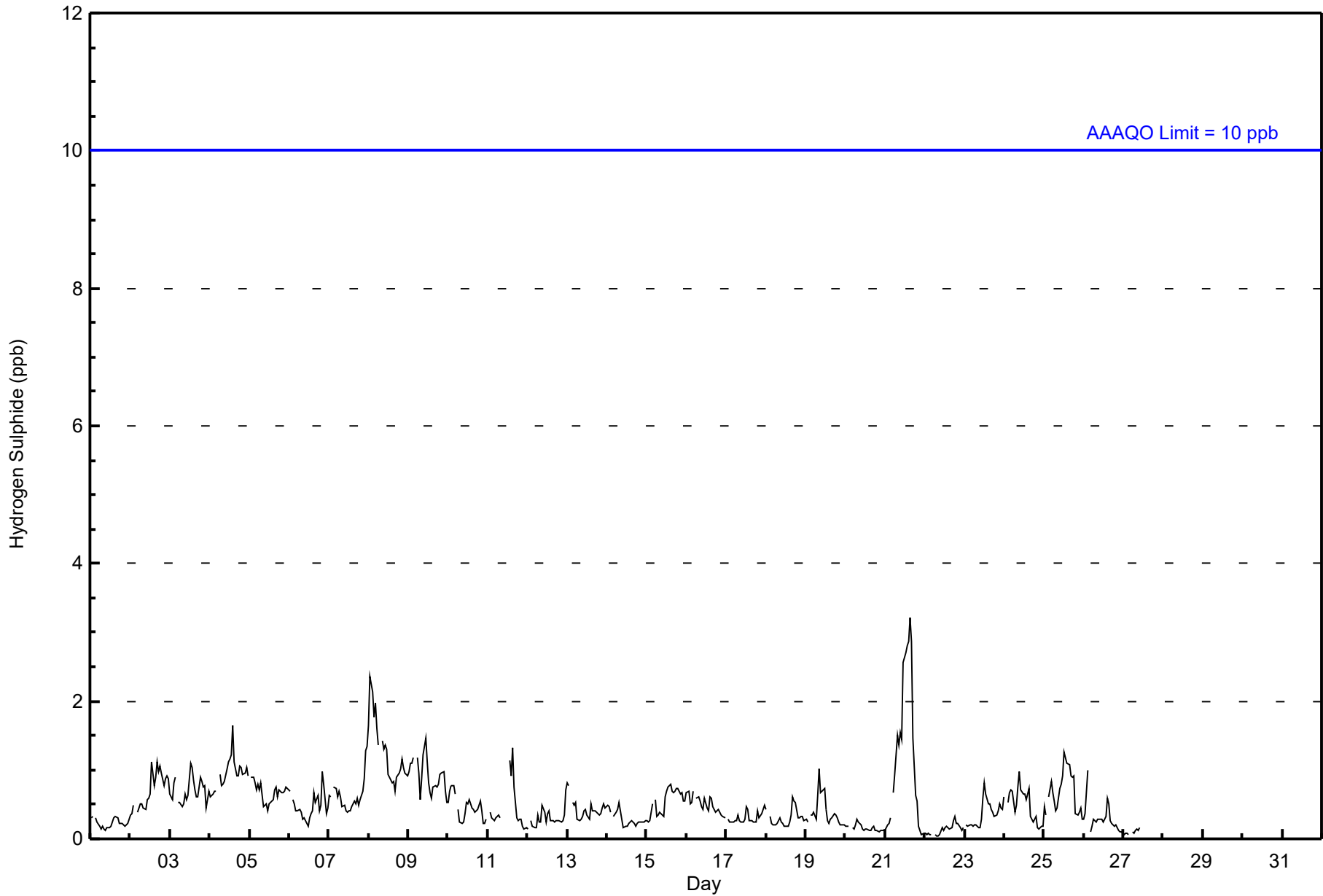








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																			
Maximum Value: 3.2 ppb on Jan 21 16:00		Maximum Daily Average: 1.3 ppb on Jan 8				Hours of Data:		603																			
Minimum Value: 0.0 ppb on Jan 22 08:00		Minimum Daily Average: 0.1 ppb on Jan 22				Hours of Missing Data:		141																			
Maximum Diurnal Average: 0.7 ppb at hour 16		Minimum Diurnal Average: 0.4 ppb at hour 8				Hours of Calibration:		32																			
Monthly Average: 0.53 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.4 Q ₃ = 0.7 P ₉₀ = 1.0 P ₉₉ = 2.4				Percent Operational Time:		85.4																			
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.3	0.3	Z	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	
2-Jan	0.3	0.4	0.5	Z	0.4	0.4	0.5	0.5	0.4	0.4	0.6	0.6	0.6	1.1	0.8	0.9	1.1	1.0	1.1	1.0	0.8	0.9	0.9	0.9	0.7	1.1	
3-Jan	0.6	0.6	0.8	0.9	Z	0.5	0.5	0.5	0.5	0.7	0.6	0.6	1.1	1.0	0.9	0.7	0.6	0.6	0.9	0.8	0.7	0.8	0.4	0.7	0.7	1.1	
4-Jan	0.6	0.6	0.7	0.7	0.7	Z	0.9	0.8	0.8	0.8	1.0	1.1	1.2	1.2	1.6	1.1	0.9	0.9	1.1	1.0	0.9	1.0	1.0	0.9	0.9	1.6	
5-Jan	Z	0.9	0.9	0.8	0.7	0.8	0.7	0.8	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.9	
6-Jan	0.7	Z	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.7	0.5	0.6	0.4	0.5	1.0	0.8	0.4	0.4	0.5	1.0	
7-Jan	0.6	0.6	Z	0.8	0.7	0.6	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.9	1.3	1.3	0.6	1.3	
8-Jan	1.7	2.4	2.1	1.8	2.0	1.6	1.4	Z	1.4	1.3	1.4	1.3	0.9	0.9	0.8	0.8	0.7	0.9	1.0	1.0	1.2	1.0	1.0	0.9	1.3	2.4	
9-Jan	1.0	1.1	1.1	1.2	Z	1.2	1.0	0.6	0.9	1.2	1.5	1.1	0.8	0.7	0.6	0.8	0.8	0.8	0.8	0.9	1.0	1.0	0.7	0.5	0.9	1.5	
10-Jan	0.5	0.7	0.8	0.8	0.7	Z	0.4	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.2	0.2	0.3	0.4	0.8	
11-Jan	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	C	C	C	C	C	1.1	0.9	1.3	0.8	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.4	1.3	
12-Jan	0.1	Z	0.3	0.2	0.2	0.2	0.4	0.2	0.2	0.5	0.4	0.2	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.7	0.3	0.7	
13-Jan	0.8	0.8	Z	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.8	
14-Jan	0.5	0.5	0.4	Z	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.5	
15-Jan	0.3	0.2	0.3	0.5	Z	0.6	0.3	0.4	0.4	0.3	0.3	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.8	
16-Jan	0.7	0.7	0.5	0.5	0.7	Z	0.6	0.6	0.6	0.5	0.4	0.6	0.5	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.7	
17-Jan	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.3	0.4	0.4	0.5	0.3	0.5	
18-Jan	0.4	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.6	
19-Jan	0.3	0.3	Z	0.3	0.3	0.4	0.3	0.6	1.0	0.7	0.7	0.7	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.4	1.0	
20-Jan	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	
21-Jan	0.1	0.2	0.2	0.3	Z	0.7	0.9	1.5	1.4	1.6	1.5	2.6	2.7	2.8	2.9	3.2	2.9	1.5	0.6	0.6	0.2	0.1	0.1	0.1	1.2	3.2	
22-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.3	
23-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.8	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.8	
24-Jan	0.6	Z	0.5	0.7	0.7	0.7	0.4	0.5	0.7	1.0	0.7	0.7	0.7	0.6	0.7	0.7	0.3	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.5	1.0	
25-Jan	0.5	0.3	Z	0.6	0.8	0.7	0.6	0.4	0.5	0.7	0.8	0.9	1.3	1.2	1.1	1.1	0.9	0.9	0.9	0.4	0.4	0.4	0.5	0.3	0.7	1.3	
26-Jan	0.3	0.4	1.0	Z	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.6	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	1.0	
27-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.2	
28-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
																								Diurnal Average			
																								Diurnal Maximum			
																								0.5 1.7			
																								0.5 2.4			
																								0.5 2.1			
																								0.5 1.8			
																								0.5 2.0			
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																								0.5 1.2			
																								0.5 1.0			
																								0.4 1.3			
																								0.5 1.3			
																								Z - zerospan C - Calibration PF - Power Failure			
																								Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb			





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	597	99.00	99.01
3 - 4	6	1.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 603

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	77	40	16	5	2	5	37	247	40	12	10	8	11	9	9	49	577
3 - 4	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	77	40	16	5	2	5	37	253	40	12	10	8	11	9	9	49	583

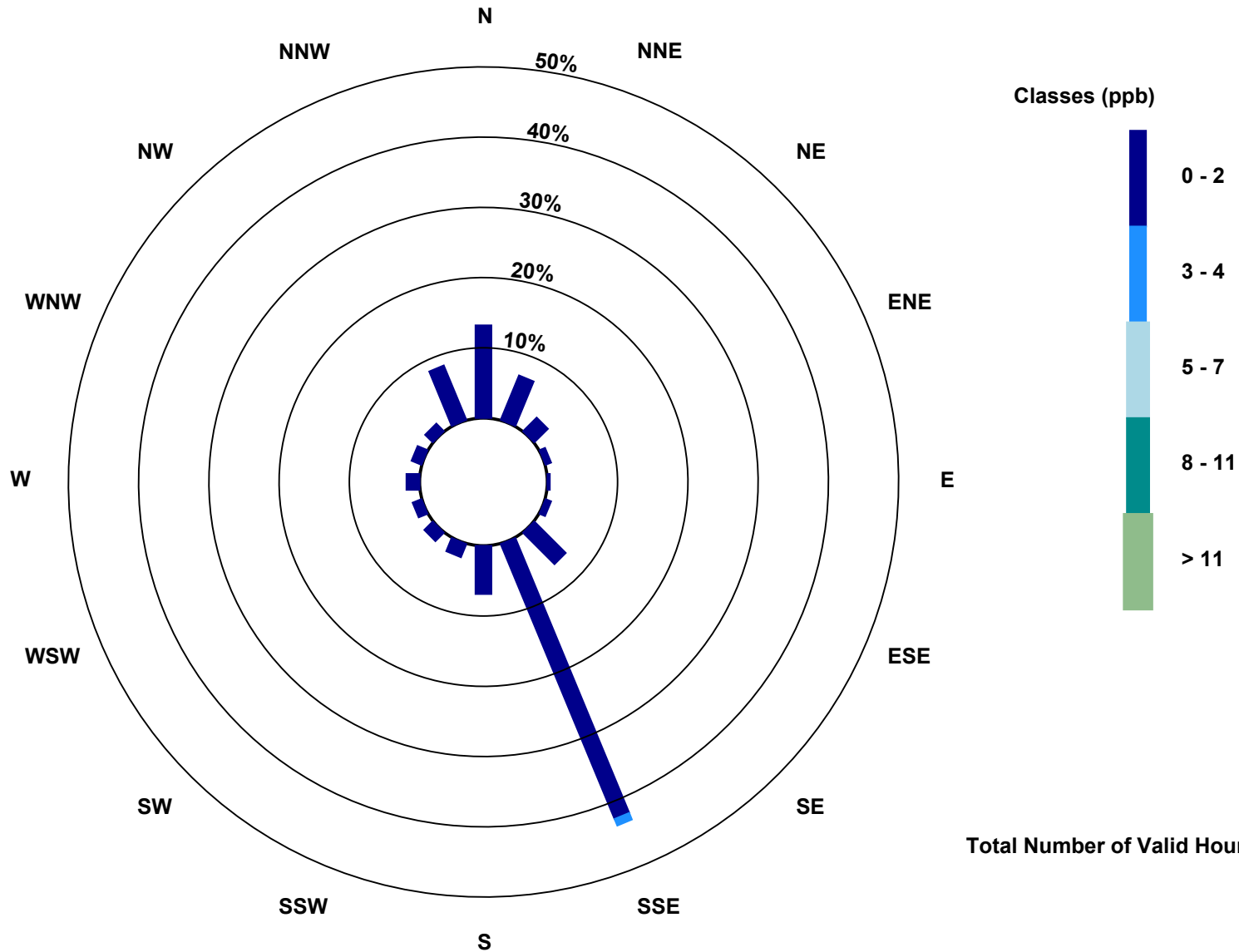
Total Number of Valid Hours: 583

Total Number of Hours: 744

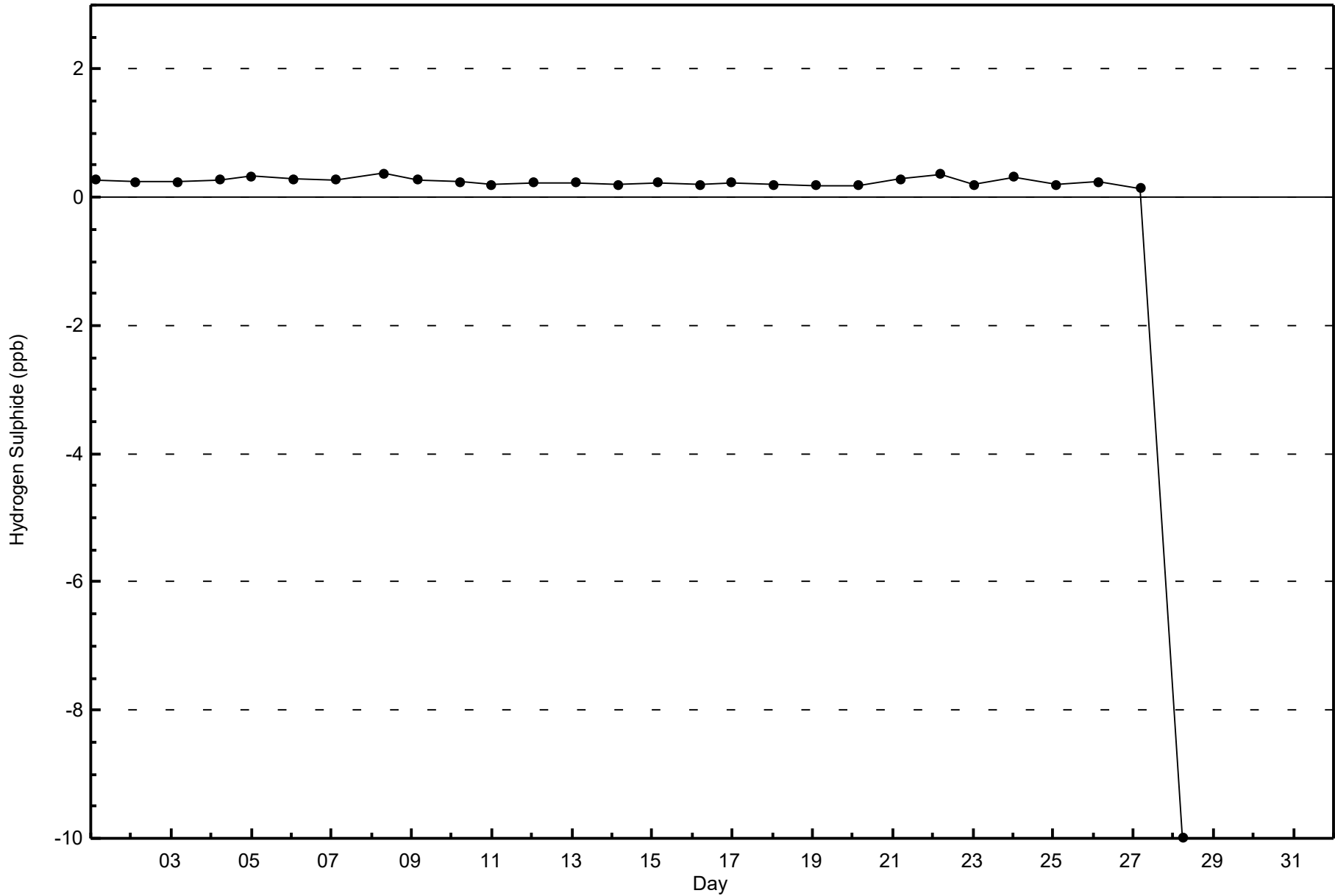


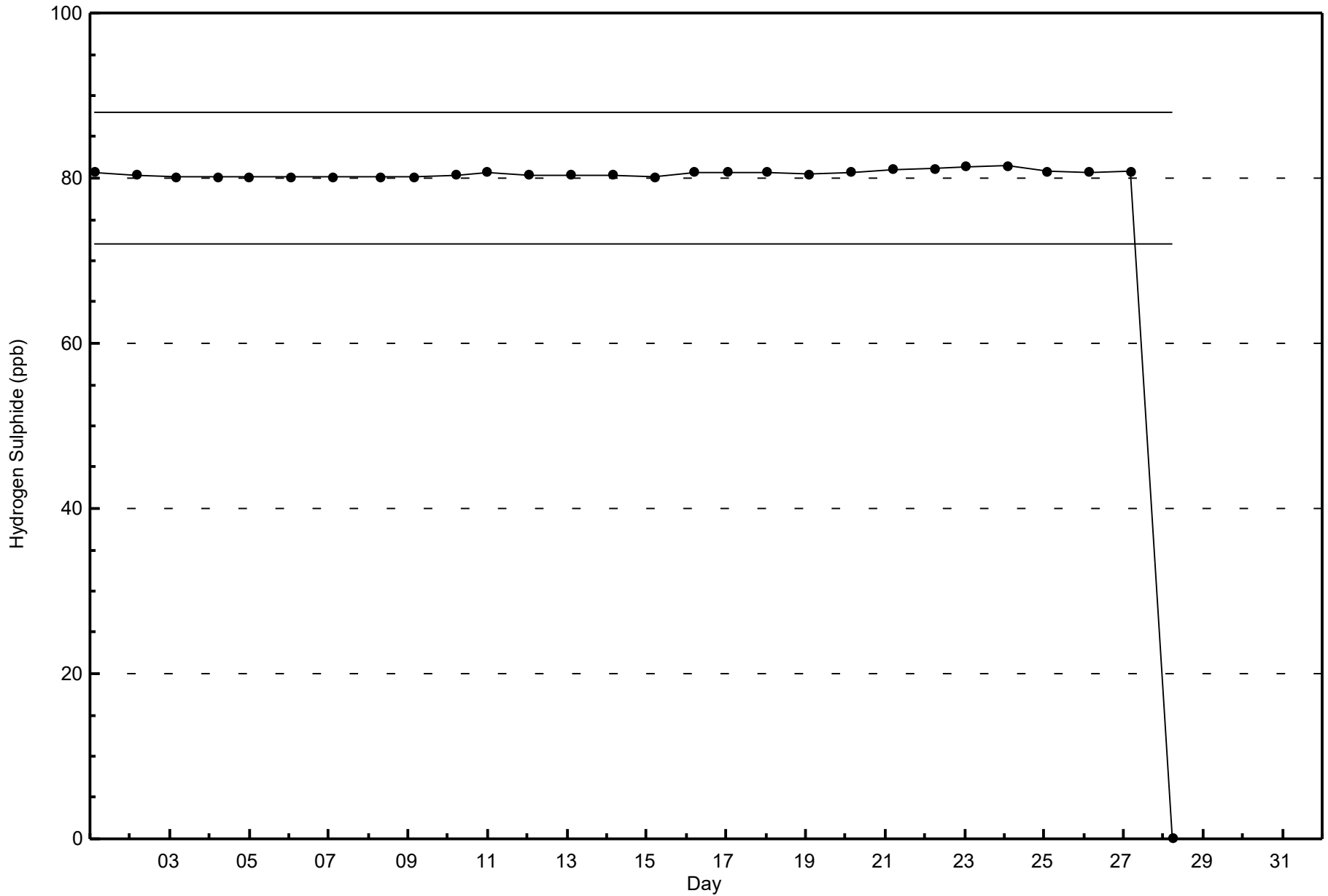
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin



Total Number of Valid Hours: 583





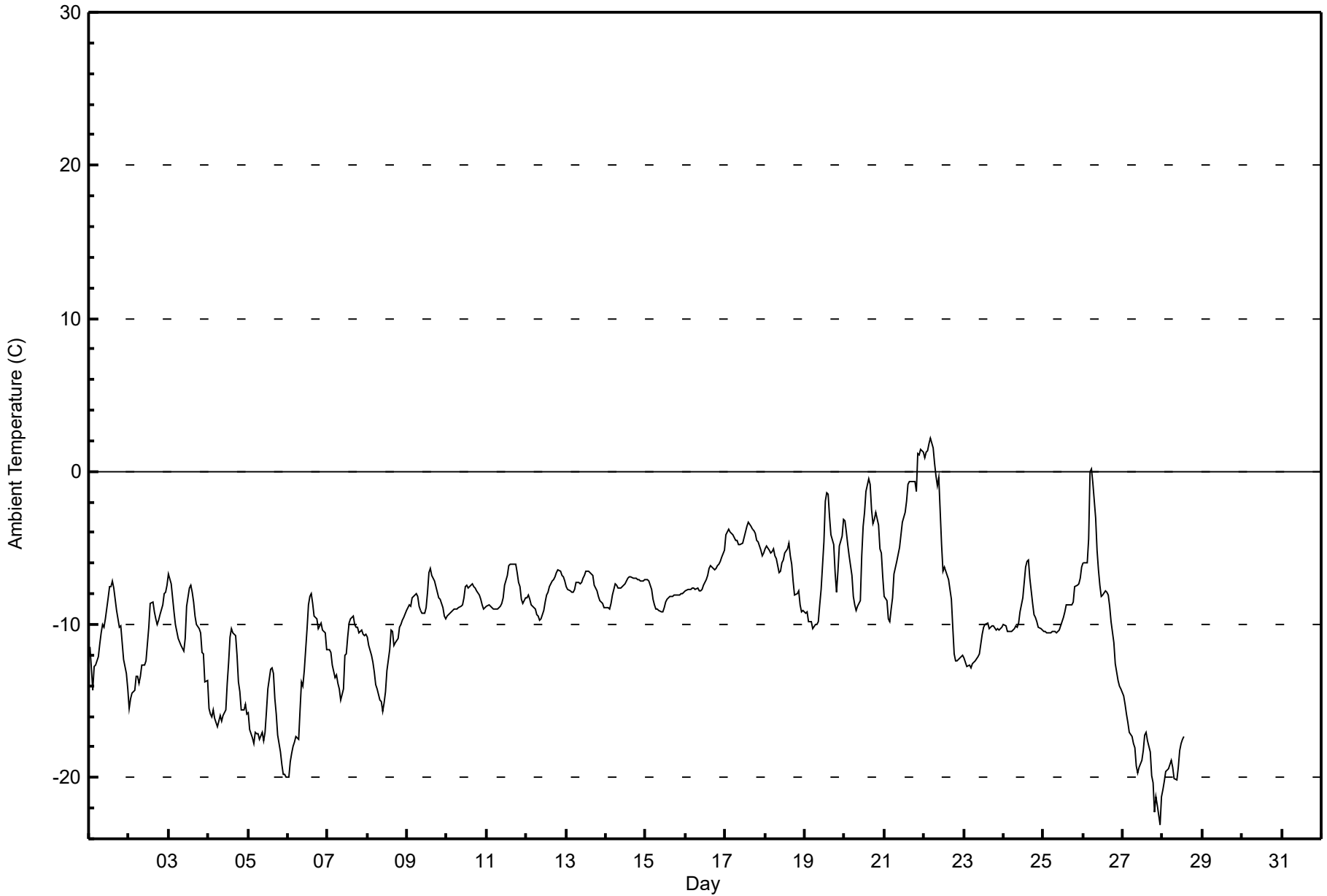


Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - January 2023

Maximum Value: 2.2 C on Jan 22 05:00		Maximum Daily Average: -3.7 C on Jan 21		Hours in Service: 744																							
Minimum Value: -23.0 C on Jan 27 23:00		Minimum Daily Average: -18.7 C on Jan 27		Hours of Data: 662																							
Maximum Diurnal Average: -7.3 C at hour 15		Minimum Diurnal Average: -10.5 C at hour 9		Hours of Missing Data: 82																							
Monthly Average: -9.43 C		Percentiles: P ₁ = -20.3 P ₁₀ = -15.9 Q ₁ = -11.4 Median = -8.8 Q ₃ = -7.1 P ₉₀ = -4.6 P ₉₉ = 1.2		Hours of Calibration: 0																							
				Percent Operational Time: 89.0																							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-11.4	-12.9	-14.3	-12.7	-12.6	-12.1	-11.2	-10.5	-10.0	-10.2	-9.6	-8.3	-7.5	-7.5	-7.1	-7.6	-9.1	-9.6	-10.1	-10.1	-11.2	-12.2	-13.2	-14.2	-10.6	-7.1	
2-Jan	-15.5	-14.8	-14.4	-14.3	-13.4	-13.4	-13.8	-13.4	-12.6	-12.7	-12.4	-11.2	-10.2	-8.6	-8.5	-9.2	-9.6	-10.0	-9.7	-9.4	-8.7	-7.9	-7.9	-7.4	-11.2	-7.4	
3-Jan	-6.7	-7.4	-8.3	-9.1	-10.0	-10.4	-10.9	-11.4	-11.5	-11.7	-10.9	-8.8	-7.6	-7.5	-7.9	-8.5	-9.4	-10.0	-10.2	-10.6	-11.8	-11.9	-13.7	-13.6	-10.0	-6.7	
4-Jan	-15.4	-15.9	-16.1	-15.6	-16.1	-16.7	-16.4	-15.9	-16.3	-15.9	-15.6	-13.9	-12.5	-10.8	-10.2	-10.5	-10.7	-12.0	-13.8	-14.3	-15.6	-15.5	-15.2	-15.9	-14.5	-10.2	
5-Jan	-15.8	-16.8	-17.4	-17.8	-17.0	-17.1	-17.1	-17.5	-17.1	-17.6	-17.0	-15.7	-14.2	-12.9	-12.8	-13.2	-14.8	-15.8	-17.3	-18.3	-19.1	-19.8	-19.8	-20.0	-16.8	-12.8	
6-Jan	-19.9	-19.0	-18.4	-17.9	-17.6	-17.3	-17.5	-15.6	-13.8	-14.0	-13.1	-10.3	-8.8	-8.2	-8.0	-8.6	-9.4	-9.6	-10.3	-10.1	-9.9	-10.3	-10.5	-11.6	-12.9	-8.0	
7-Jan	-11.6	-11.7	-11.8	-12.6	-13.5	-13.3	-13.9	-14.2	-14.9	-14.2	-12.0	-11.9	-10.9	-9.9	-9.7	-9.4	-10.0	-10.2	-10.2	-10.5	-10.4	-10.6	-10.7	-10.6	-11.6	-9.4	
8-Jan	-10.8	-11.3	-12.0	-12.5	-13.1	-14.0	-14.2	-15.0	-15.0	-15.7	-15.1	-14.4	-13.1	-11.7	-10.3	-10.5	-11.4	-11.2	-10.9	-10.2	-10.0	-9.8	-9.5	-9.0	-12.1	-9.0	
9-Jan	-8.9	-8.7	-8.8	-8.3	-8.2	-8.0	-8.1	-8.8	-9.1	-9.3	-9.2	-8.9	-7.9	-6.6	-6.4	-6.8	-7.1	-7.5	-7.9	-8.2	-8.4	-8.9	-9.5	-9.6	-8.3	-6.4	
10-Jan	-9.5	-9.3	-9.2	-9.1	-8.9	-9.0	-9.0	-8.9	-8.8	-8.7	-8.2	-7.5	-7.4	-7.6	-7.4	-7.3	-7.6	-7.6	-7.8	-8.1	-8.3	-8.7	-9.0	-8.9	-8.4	-7.3	
11-Jan	-8.8	-8.7	-8.8	-8.9	-9.0	-9.0	-9.0	-8.9	-8.8	-8.6	-8.3	-7.4	-6.8	-6.1	-6.1	-6.1	-6.1	-6.1	-6.6	-7.3	-7.5	-8.4	-8.6	-8.2	-7.8	-6.1	
12-Jan	-8.3	-8.1	-8.3	-8.7	-8.9	-9.0	-9.3	-9.5	-9.7	-9.6	-9.1	-8.6	-8.1	-7.9	-7.5	-7.1	-7.0	-6.9	-6.6	-6.4	-6.6	-6.8	-6.9	-7.2	-8.0	-6.4	
13-Jan	-7.5	-7.7	-7.8	-7.9	-7.9	-7.7	-7.2	-7.3	-7.3	-7.3	-7.0	-6.8	-6.5	-6.6	-6.6	-6.7	-6.8	-7.4	-7.8	-8.2	-8.5	-8.5	-8.6	-8.9	-7.5	-6.5	
14-Jan	-8.9	-8.9	-9.0	-8.7	-8.1	-7.4	-7.5	-7.6	-7.7	-7.6	-7.5	-7.4	-7.1	-7.0	-6.9	-6.8	-7.0	-7.0	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1	-7.5	-6.8	
15-Jan	-7.1	-7.1	-7.2	-7.7	-8.3	-8.7	-9.0	-9.0	-9.1	-9.2	-9.2	-8.9	-8.6	-8.4	-8.1	-8.2	-8.2	-8.1	-8.1	-8.1	-8.1	-8.0	-8.0	-7.9	-8.3	-7.1	
16-Jan	-7.8	-7.7	-7.7	-7.7	-7.7	-7.6	-7.7	-7.6	-7.8	-7.8	-7.7	-7.4	-7.1	-6.8	-6.3	-6.1	-6.3	-6.4	-6.3	-6.2	-6.1	-5.9	-5.6	-5.2	-6.9	-5.2	
17-Jan	-4.2	-4.0	-3.8	-3.9	-4.1	-4.3	-4.5	-4.5	-4.8	-4.8	-4.7	-4.3	-4.0	-3.6	-3.3	-3.6	-3.7	-3.8	-4.0	-4.5	-4.6	-5.2	-5.5	-5.3	-4.3	-3.3	
18-Jan	-5.0	-4.9	-5.1	-5.3	-5.2	-5.1	-5.5	-5.7	-6.6	-6.5	-6.0	-5.8	-5.3	-5.0	-4.7	-5.5	-6.1	-7.2	-8.1	-7.9	-7.8	-8.7	-9.2	-9.0	-6.3	-4.7	
19-Jan	-9.3	-9.2	-9.8	-9.8	-9.8	-10.3	-10.0	-10.0	-9.8	-8.7	-7.7	-4.6	-2.0	-1.4	-1.5	-3.0	-4.2	-4.7	-6.6	-7.9	-6.5	-4.9	-4.2	-3.1	-6.6	-1.4	
20-Jan	-3.2	-4.0	-4.8	-5.5	-6.8	-8.2	-8.7	-9.1	-8.8	-8.4	-5.5	-3.6	-2.7	-1.3	-0.5	-0.9	-2.5	-3.4	-3.1	-2.7	-3.5	-5.1	-5.4	-6.9	-4.8	-0.5	
21-Jan	-8.1	-8.5	-9.7	-9.8	-9.0	-8.2	-6.7	-5.9	-5.4	-5.0	-4.2	-3.3	-2.6	-2.0	-0.8	-0.7	-0.7	-0.7	-0.7	-1.3	1.1	1.1	1.5	1.3	-3.7	1.5	
22-Jan	0.9	1.3	1.4	1.8	2.2	1.5	0.5	-0.3	-0.9	-0.4	-4.8	-6.5	-6.2	-6.5	-6.8	-7.1	-8.4	-10.2	-11.9	-12.4	-12.4	-12.2	-12.1	-12.0	-5.1	2.2	
23-Jan	-12.2	-12.5	-12.8	-12.7	-12.8	-12.6	-12.5	-12.3	-12.1	-11.9	-11.3	-10.6	-10.2	-10.0	-9.9	-10.3	-10.1	-10.1	-10.1	-10.4	-10.3	-10.4	-10.3	-10.2	-11.2	-9.9	
24-Jan	-10.0	-10.1	-10.5	-10.4	-10.5	-10.5	-10.3	-10.1	-10.2	-9.9	-9.2	-8.2	-7.2	-6.3	-5.9	-5.8	-7.0	-8.7	-8.7	-9.4	-9.6	-9.9	-10.2	-10.3	-10.4	-9.2	-5.8
25-Jan	-10.5	-10.5	-10.5	-10.6	-10.5	-10.5	-10.5	-10.4	-10.5	-10.4	-10.5	-10.1	-9.8	-9.5	-9.2	-8.7	-8.7	-8.7	-8.7	-8.6	-7.5	-7.4	-7.4	-7.0	-6.2	-9.3	-6.2
26-Jan	-6.0	-5.9	-6.0	-4.4	0.0	0.2	-0.8	-3.0	-5.1	-6.4	-7.4	-8.1	-8.1	-7.8	-7.9	-8.0	-8.8	-9.8	-11.2	-12.5	-13.1	-13.7	-14.1	-14.2	-7.6	0.2	
27-Jan	-14.7	-15.2	-15.8	-16.4	-17.0	-17.4	-17.8	-18.1	-19.2	-19.7	-19.3	-18.9	-18.2	-17.2	-17.1	-17.5	-18.3	-19.9	-20.4	-22.3	-21.3	-21.8	-23.0	-21.2	-18.7	-14.7	
28-Jan	-20.8	-20.2	-19.6	-19.4	-19.2	-18.9	-19.3	-20.0	-20.1	-19.3	-18.3	-17.8	-17.5	-17.3	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	-17.3
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
																								Diurnal Average			
																								Diurnal Maximum			
																								-9.9 0.9			
																								-10.0 1.3			
																								-10.2 1.4			
																								-10.2 1.8			
																								-10.1 2.2			
																								-10.2 1.5			
																								-10.3 0.5			
																								-10.4 -0.3			
																								-10.5 -0.9			
																								-10.4 -0.4			
																								-10.0 -4.2			
																								-9.2 -3.3			
																								-8.5 -2.0			
																								-7.9 -1.3			
																								-7.3 -0.5			
																								-7.5 -0.7			
																								-8.1 -0.7			
																								-8.6 -0.7			
																								-9.1 -0.7			
																								-9.3 -1.3			
																								-9.4 1.1			
																								-9.6 1.1			
																								-9.8 1.5			
																								-9.7 1.3			

PF - Power Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	10	1.51	1.51
-20 - 0	640	96.68	98.19
0 - 10	12	1.81	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 662

Total Number of Hours: 744



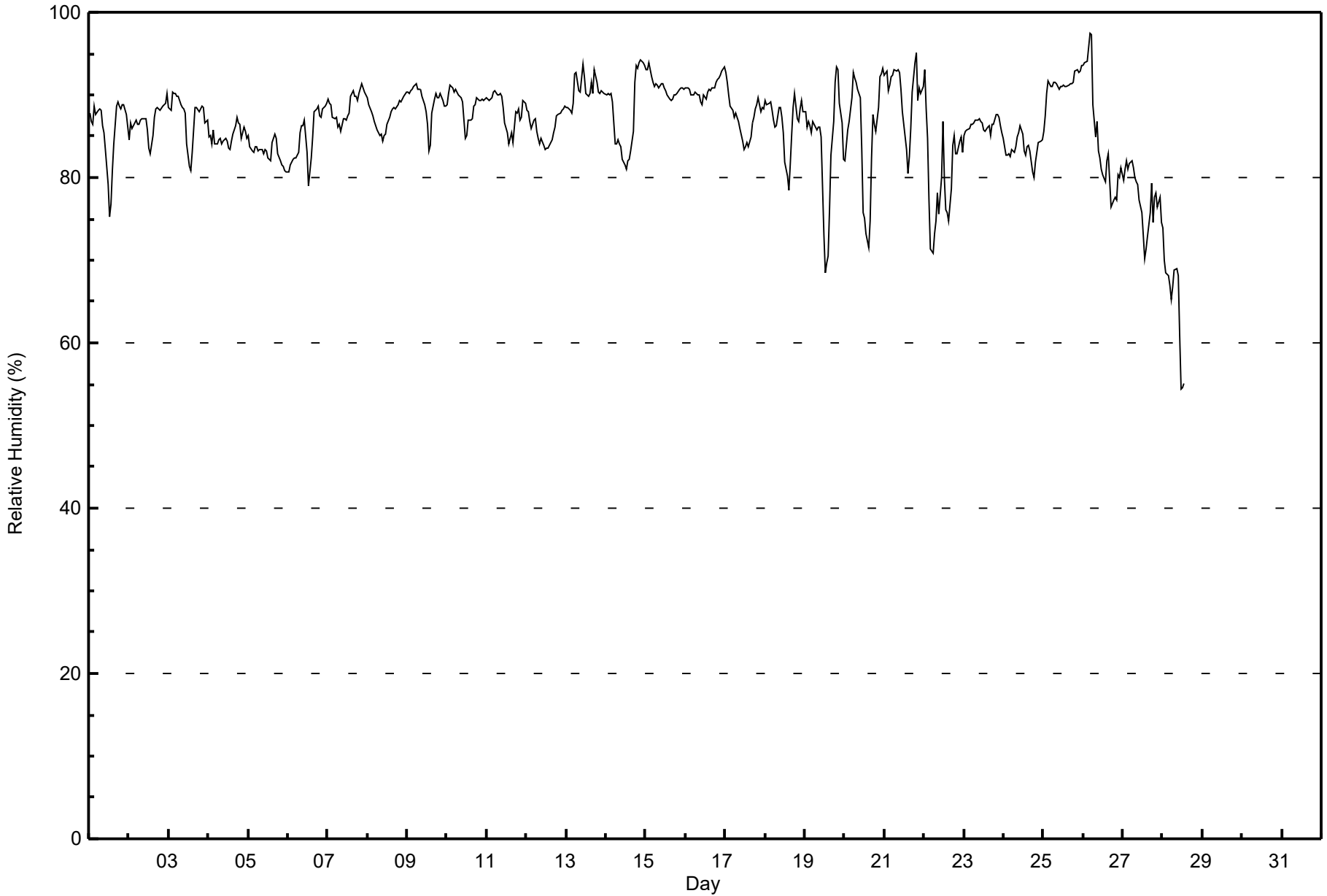
Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

Waskow ohci Pimatisiwin - January 2023

Maximum Value: 97.5 % on Jan 26 05:00 Maximum Daily Average: 91.2 % on Jan 25																						Hours in Service: 744 Hours of Data: 662				
Minimum Value: 54.4 % on Jan 28 12:00 Minimum Daily Average: 77.6 % on Jan 27 Maximum Diurnal Average: 88.1 % at hour 22 Minimum Diurnal Average: 81.5 % at hour 14 Monthly Average: 86.13 % Percentiles: P ₁ = 67.6 P ₁₀ = 80.0 Q ₁ = 83.9 Median = 87.1 Q ₃ = 89.9 P ₉₀ = 91.3 P ₉₉ = 93.9																						Hours of Missing Data: 82 Hours of Calibration: 0 Percent Operational Time: 89.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	87.9	86.7	86.4	88.6	87.7	88.1	88.3	88.2	86.4	85.4	83.4	79.2	75.2	76.7	80.8	84.1	88.7	89.2	88.6	88.3	88.8	88.8	87.6	86.2	85.8	89.2
2-Jan	84.5	86.7	86.0	86.6	87.0	86.4	86.5	87.0	87.2	87.1	87.2	85.7	83.6	83.0	85.0	87.3	88.4	88.5	88.3	88.1	88.7	88.8	89.0	90.2	86.9	90.2
3-Jan	88.5	88.1	90.4	90.1	90.1	89.8	89.9	88.9	88.5	88.2	87.9	84.1	81.3	80.9	83.0	85.8	88.4	88.5	88.0	88.3	88.6	88.5	86.6	86.9	87.5	90.4
4-Jan	84.9	85.0	84.0	85.8	84.1	84.1	84.5	84.7	84.1	84.5	84.7	84.4	83.6	83.4	84.4	85.3	86.3	87.3	86.7	86.5	84.7	86.1	85.7	84.8	85.0	87.3
5-Jan	85.1	83.7	83.2	83.1	83.8	83.7	83.2	83.3	83.4	82.9	83.4	83.2	82.4	82.0	84.2	84.8	85.3	84.8	82.9	82.0	81.5	81.4	80.8	80.8	83.1	85.3
6-Jan	80.6	81.6	81.9	82.3	82.3	82.4	83.1	85.5	86.3	86.3	86.9	83.0	79.0	80.7	82.4	85.0	88.0	88.3	88.7	87.5	87.3	88.3	88.7	89.0	84.8	89.0
7-Jan	89.4	89.0	88.8	87.4	87.1	87.3	86.1	86.5	85.6	87.1	87.1	87.0	87.4	87.9	89.9	90.6	89.8	89.9	89.3	90.2	91.4	90.9	90.4	90.1	88.6	91.4
8-Jan	89.7	88.9	88.0	87.5	86.8	86.2	85.7	85.1	85.2	84.5	85.0	85.3	86.5	87.4	87.9	88.3	88.5	88.3	88.9	89.3	89.2	89.5	89.9	90.4	87.6	90.4
9-Jan	90.3	90.2	90.5	90.7	90.9	91.3	90.7	90.6	90.7	89.8	88.8	88.0	86.5	83.2	83.9	87.8	89.5	90.1	89.7	89.6	90.2	89.3	88.7	88.6	89.2	91.3
10-Jan	88.8	90.2	91.2	90.8	90.3	90.7	90.3	89.9	89.7	89.2	86.9	84.7	85.1	87.0	86.9	87.2	88.6	88.9	89.7	89.3	89.3	89.5	89.3	89.5	88.9	91.2
11-Jan	89.7	89.3	89.6	89.6	90.3	90.6	90.0	89.9	90.1	89.8	88.5	86.6	85.4	84.1	84.7	85.4	84.2	88.0	87.9	88.3	86.9	87.3	89.4	89.0	88.1	90.6
12-Jan	88.1	87.9	86.7	85.9	86.9	87.1	85.6	84.8	84.1	84.7	83.9	83.4	83.5	83.5	83.8	84.6	85.4	86.0	87.4	87.6	87.7	88.1	88.3	88.6	86.0	88.6
13-Jan	88.5	88.5	88.2	87.8	88.9	92.5	92.8	90.5	90.3	92.1	93.7	92.2	90.1	89.9	90.2	91.5	90.2	93.1	91.6	90.3	90.2	90.5	90.4	90.2	90.6	93.7
14-Jan	90.0	90.1	90.0	90.2	89.2	84.1	84.1	84.6	84.1	83.7	82.3	81.5	81.1	82.0	82.3	83.3	85.6	91.6	93.6	93.2	93.9	94.2	93.9	93.5	87.6	94.2
15-Jan	93.0	93.0	93.8	92.2	91.6	90.9	91.3	91.2	90.9	91.3	91.3	90.9	90.5	90.0	89.5	89.3	89.5	90.1	90.1	90.3	90.6	90.8	90.8	90.7	91.0	93.8
16-Jan	90.8	90.9	90.6	90.1	90.0	90.1	90.3	90.0	90.0	89.2	88.9	90.1	89.5	90.4	90.6	90.6	90.9	90.9	91.6	91.8	92.1	92.4	92.9	93.4	90.7	93.4
17-Jan	92.7	91.4	90.0	88.7	88.1	87.3	87.7	87.3	86.8	85.9	84.4	83.4	83.8	84.3	83.7	85.0	86.7	87.3	88.3	88.9	89.7	88.0	88.5	88.3	87.3	92.7
18-Jan	89.4	88.9	89.0	89.2	88.2	86.9	86.2	86.2	88.6	88.4	87.2	85.4	81.9	80.2	78.5	81.7	85.3	88.5	90.2	87.1	86.7	88.4	89.3	88.0	86.6	90.2
19-Jan	88.0	86.1	86.9	86.3	85.4	86.8	86.2	85.7	86.0	86.1	85.0	73.1	68.6	69.7	70.5	76.2	82.7	86.8	91.6	93.3	93.0	89.0	86.6	82.3	83.8	93.3
20-Jan	82.1	83.9	85.8	86.8	89.6	92.7	92.0	91.5	90.7	89.7	83.5	75.8	75.1	73.2	71.5	74.7	82.3	87.6	86.5	85.5	88.4	92.2	92.5	93.2	85.3	93.2
21-Jan	92.3	92.9	90.5	91.2	92.2	92.4	93.0	92.9	93.0	92.7	90.6	87.9	84.9	83.3	80.5	82.6	85.9	90.4	94.0	95.0	89.3	90.9	90.2	91.0	90.0	95.0
22-Jan	93.1	88.2	84.7	77.3	71.3	70.8	73.3	74.8	78.1	75.6	80.0	86.7	79.8	76.2	75.7	74.8	78.7	83.9	85.0	82.9	82.9	84.4	84.9	83.0	80.3	93.1
23-Jan	85.1	85.7	85.8	85.9	86.4	86.4	86.5	87.0	87.0	87.1	86.8	86.6	85.8	85.5	86.0	86.2	85.1	86.4	86.4	87.7	87.6	87.3	86.3	85.5	86.3	87.7
24-Jan	84.8	82.7	82.8	82.8	82.5	83.4	83.0	83.8	85.0	85.4	86.3	85.2	83.2	82.7	83.7	83.9	83.2	80.6	80.0	81.8	83.0	84.3	84.5	84.6	83.5	86.3
25-Jan	85.6	87.4	90.2	91.7	91.0	91.1	91.6	91.6	91.3	90.7	91.1	91.1	91.2	91.1	91.1	91.2	91.4	91.4	91.6	92.9	93.0	92.8	92.8	93.5	91.2	93.5
26-Jan	93.6	93.9	94.1	95.8	97.5	97.3	88.9	84.9	86.8	83.3	82.4	81.0	80.3	79.5	82.0	82.8	79.6	76.5	77.2	77.6	77.3	80.3	80.0	81.2	84.7	97.5
27-Jan	79.7	81.0	82.0	81.1	81.7	82.0	81.1	80.1	79.5	79.2	77.4	75.7	73.1	70.2	71.3	73.0	75.8	79.4	74.6	77.6	78.2	76.5	77.6	74.6	77.6	82.0
28-Jan	74.0	70.0	68.5	68.1	67.0	65.2	66.8	68.7	69.0	68.1	60.9	54.4	54.6	55.1	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	74.0
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	--
																								Diurnal Average		
																								Diurnal Maximum		
PF - Power Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	3	0.45	0.45
60 - 80	63	9.52	9.97
80 - 100	596	90.03	100.00

Total Number of Valid Hours: 662

Total Number of Hours: 744

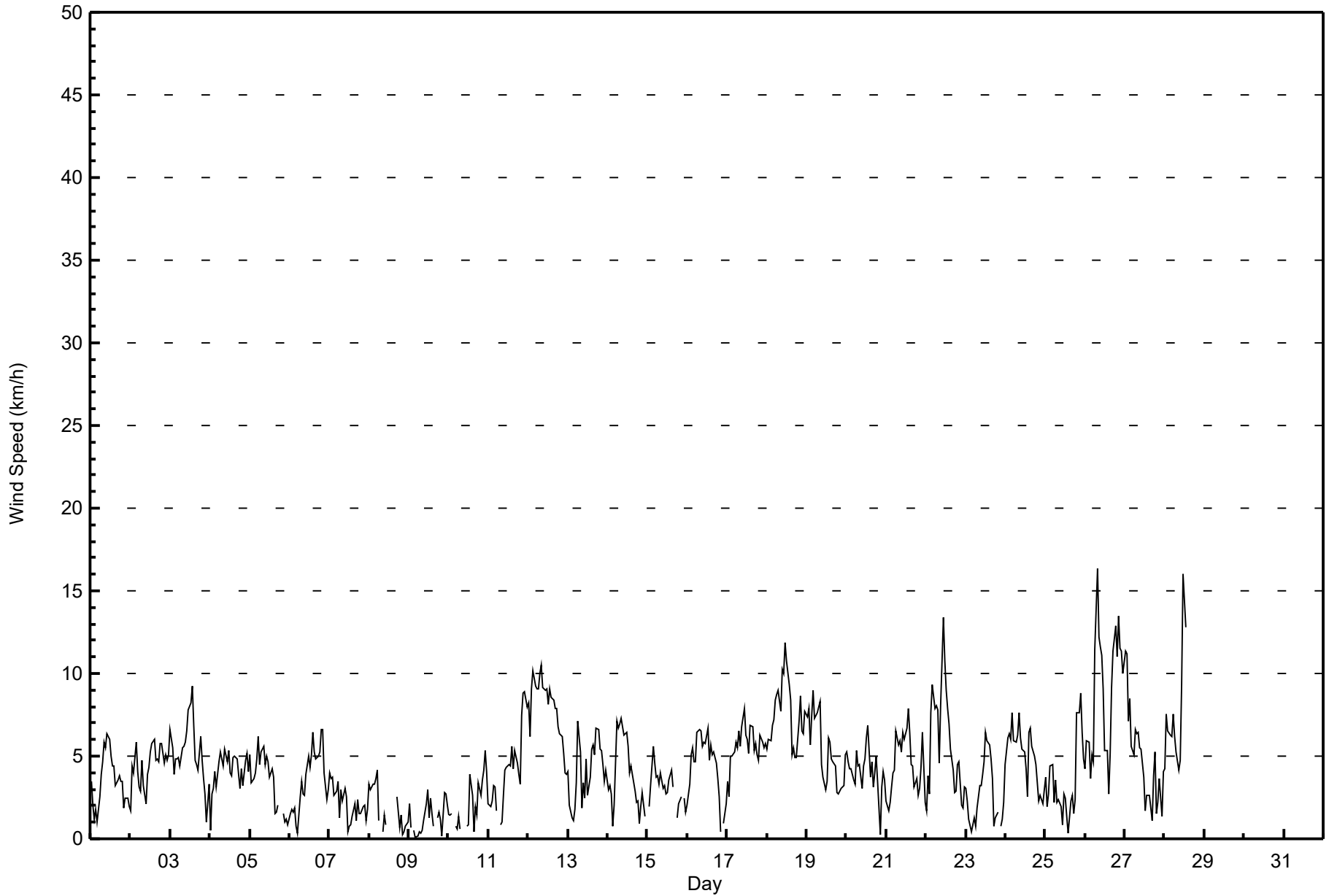


Maximum Speed: 16 km/h on Jan 26 08:00	Maximum Daily Speed Average: 7.9 km/h on Jan 12	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 9 05:00	Minimum Daily Speed Average: 0.6 km/h on Jan 7	Hours of Data: 641
Maximum Diurnal Speed Average: 2.0 km/h at hour 15	Minimum Diurnal Speed Average: 0.9 km/h at hour 19	Hours of Missing Data: 103
Monthly Average Velocity: 1.4 km/h 148.1 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 4 Q ₃ = 6 P ₉₀ = 8 P ₉₉ = 13	Percent Operational Time: 86.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SSE4	S2	SW1	W2	SE1	SE3	SSE4	SSE5	SSE6	SSE5	SSE6	SSE6	SSE5	SSE4	S4	SSE3	SSE4	SSE4	SE3	SSE3	SE2	SSE2	SSE2	SSE2	SSE3.4	SSE6
2-Jan	S2	SSE4	SSE4	SSE6	SSE4	SSE3	SSE3	SSE5	SE3	SSE2	SSE4	SSE4	SSE5	SSE6	SSE6	SSE5	SSE5	SSE5	SSE6	SSE6	SSE5	SSE5	SSE5	SSE5	SSE4.4	SSE6
3-Jan	SSE7	SSE6	S4	SSE5	S5	SSE5	SSE4	SSE6	SSE6	SSE6	SSE7	SSE8	SSE9	SSE7	SSE5	SSE4	SSE4	SSE6	SSE5	SSE4	S3	SE1	S3	SSE5.2	SSE9	
4-Jan	SW1	SSE3	SSE3	SSE4	SSE3	SSE5	SSE5	SSE4	SSE5	SSE5	SSE5	SSE4	SE4	SE4	SSE5	SSE5	SSE4	SSE3	SSE4	SSE3	SSE5	SSE5	SSE4	SSE4.1	SSE5	
5-Jan	SSE5	SSE3	SSE4	SSE4	SSE5	SSE6	SSE4	SSE5	SSE6	SSE4	SSE5	SSE5	SE4	SSE4	SSE4	S2	S2	S2	UO	UO	SW1	SW1	WNW1	W1	SSE3.3	SSE6
6-Jan	NW2	WNW2	W2	WNW2	WSW1	WSW0	S3	S4	SSE3	S3	S4	SSE5	SSE4	SE5	SSE6	SSE5	SSE5	SSE5	SSE5	SSE7	SSE7	S4	SSE2	SSE3	SSE3.1	SSE7
7-Jan	S4	SSE4	SSE4	S3	SSE3	S3	W1	NNW3	NNW2	WNW3	NNW3	N0	ENE1	SSE1	WNW1	N2	W1	N2	NNW2	SSE2	SSW2	SW2	SW1	SSW2	SSW0.6	S4
8-Jan	SSE3	SSE3	SSE3	SSE3	SSE4	SSE4	S1	UO	SSW0	SSE1	SW1	UO	S2	UO	UO	UO	UO	NNW3	NW1	N1	NNE0	NNE0	NE1	NE1	SSE1.1	SSE4
9-Jan	N2	NNW1	UO	NNW1	SW0	WNW0	SW0	SSE0	NNE1	N1	N2	N3	N1	SE2	SSE2	E1	UO	NNE1	N2	NE1	ESE0	NNE3	N3	N2	NNE0.9	N3
10-Jan	N1	N1	NNW2	UO	SSW1	E1	SSE1	ESE1	UO	SSE2	UO	ESE1	NE1	N4	NNE3	ENE0	NNE2	N1	NNW3	NNW3	NNW4	N4	NNW5	NNW4	N1.5	NNW5
11-Jan	NNW2	NNW2	NNW2	NW3	NNW3	NNE2	UO	S1	E1	SSE3	SSE4	SE4	SE4	SE4	SSE6	SE4	SSE5	SSE5	SSE4	SSE3	SSE7	SE9	SSE9	SSE8	SSE2.9	SSE9
12-Jan	SSE8	SSE6	SSE9	SSE10	SSE9	SSE9	SE9	SSE10	SSE11	SSE9	SSE9	SSE9	SE8	SSE9	SSE9	SSE8	SSE8	SSE8	SSE7	SSE6	SSE6	SSE5	SE4	SE4	SSE7.9	SSE11
13-Jan	SE4	ESE2	ENE1	NNE1	WNW2	NW3	N7	NNE5	N2	N3	N2	N5	NE3	NNE4	NE5	NE6	NNE5	N7	N7	N5	N5	N3	N4	N3.4	N7	
14-Jan	N3	NNW3	NNW3	NW1	SSE2	SE7	SE7	SSE7	SSE7	SSE6	SE6	SE6	SE6	SSE4	SSE4	SSE4	SSE3	SE2	SSE2	SE1	S2	SSE3	SE1	UO	SSE3.1	SSE7
15-Jan	UO	N2	N3	N6	N5	N4	N4	NNW3	NNW4	N3	N3	N3	N3	NNE4	NNE4	NNE3	UO	UO	NNW1	NNW2	NNW3	UO	N2	NNW2	N3.1	N6
16-Jan	NNW2	N3	NNW5	NNW5	NNW5	NNW5	NNW6	NNW7	NNW7	NNW6	N6	N6	N7	N5	NNW6	NNW5	NNW5	NNW4	N3	SSE0	UO	SE1	SE2	NNW4.2	N7	
17-Jan	S3	SSE3	S5	SSE5	SSE5	S6	SSE6	SSE7	SSE6	SSE7	SSE8	SSE6	SSE6	SSE5	SSE7	SSE7	S5	S6	S5	SSE5	S6	SSE6	SSE5	SSE6	SSE5.5	SSE8
18-Jan	SSE5	SSE6	SSE6	SSE7	SSE7	SSE8	SSE9	SSE9	S8	SSE10	SSE10	SSE12	SSE11	SSE9	SSE8	SSE5	SSE6	SSE5	SSE5	SSE7	SSE9	SE7	SE6	SSE8	SSE7.6	SSE12
19-Jan	SSE7	SSE8	SSE6	SSE7	SSE9	SSE7	SSE8	SSE8	SSE8	SSE4	SSE4	SSE3	SSE3	SSW6	S6	SSE5	SSE5	SSE4	SSE3	S3	SE3	SE3	S3	SSW5	SSE5.2	SSE9
20-Jan	SSW5	S5	S4	S4	SSE4	SSE3	SSE5	SSE4	SSE4	SSE3	SSW4	SSW5	WSW6	WSW7	SW4	SW5	SSE3	SSW4	SSW5	W3	E0	SSE3	S4	SSE4	S3.5	WSW7
21-Jan	SSE2	SSE2	SSE2	S3	SSE4	SSE4	SSE7	SSE6	SSE6	SSE5	SSE6	SSE6	SSE7	SSE8	SSE6	SSE4	SSE4	SSE3	S4	SSE3	SW3	WSW4	WSW6	S2	SSE4.0	SSE8
22-Jan	S2	W4	WSW3	W8	W9	W8	W8	WSW5	WNW8	NNE13	N11	N9	NNE8	NNE7	NNE5	NNE4	N3	NE3	NNE4	N5	NNE2	NE2	N3	NNW3.5	NNE13	
23-Jan	NNW3	N2	NNW1	NE0	N1	NW1	ENE1	NNW2	NNW3	N3	NNW4	N5	N6	N6	NNW6	NNW5	NNW4	WNW1	NW1	SE2	UO	ESE1	S1	SE2	NNW2.1	N6
24-Jan	SE4	SE6	SSE6	SE6	SSE8	SSE6	SSE6	SE6	SSE8	SE6	SSE5	SSE5	SE4	NNE3	N6	N7	NE6	NE5	NNE5	NE3	NE2	ENE3	NE2	N3	ESE2.8	SSE8
25-Jan	N4	NNE2	NNE3	NNW4	NNW4	NNW2	NW4	NNE2	N2	NNE2	NE1	NNE3	N2	NW1	NE0	SE2	SSE3	SE2	SSE8	SSE8	SSE9	SSE6	S5	ESE0.7	SSE9	
26-Jan	S4	SSE6	SSE6	WSW4	WNW5	NNW5	N11	N16	N12	N12	N11	N9	NNE5	NNE5	ENE3	NNE5	NNE9	N11	NNE13	NNE11	N13	N12	N11	N10	N6.9	N16
27-Jan	NNE11	N11	NNE7	N8	N6	NNW5	N7	N6	NNE6	NNE6	NNE5	NNE4	N2	ESE3	NE3	NNE3	N1	NW4	NW5	NNW2	WSW2	W4	NNW1	WNW4	N4.0	NNE11
28-Jan	W4	W8	W7	W6	WSW6	W8	W6	W5	W4	W5	WNW9	NW16	NW14	NW13	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	---	NW16
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	---	---
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	---	---
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	---	---

SSE1.4 SSE1.3 SSE1.5 S1.3 S1.5 SSE1.7 SSE1.4 SSE1.5 SSE1.7 SSE1.5 SE1.4 SE1.3 SE1.3 SE1.6 SE2.0 SE1.5 SE1.7 SE1.0 SE0.9 SE1.4 SE1.4 SE1.6 SE1.2 SSE1.3	Diurnal Average
NNE11 N11 SSE9 SSE10 W9 SSE9 N11 N16 N12 N12 NNE13 NW16 NW14 NW13 SSE9 SSE8 NNE9 N11 NNE13 NNE11 N13 N12 N11 N10	Diurnal Maximum

UO - Unstable Operation PF - Power Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - January 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	449	70.05	70.05
6 - 11	181	28.24	98.28
12 - 19	11	1.72	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 641

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - January 2023

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	52	33	15	6	4	6	29	153	39	11	12	7	12	10	12	48	449
6 - 11	24	8	2	0	0	0	11	109	4	1	0	4	10	2	0	6	181
12 - 19	5	2	0	0	0	0	0	1	0	0	0	0	0	0	3	0	11
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	81	43	17	6	4	6	40	263	43	12	12	11	22	12	15	54	641

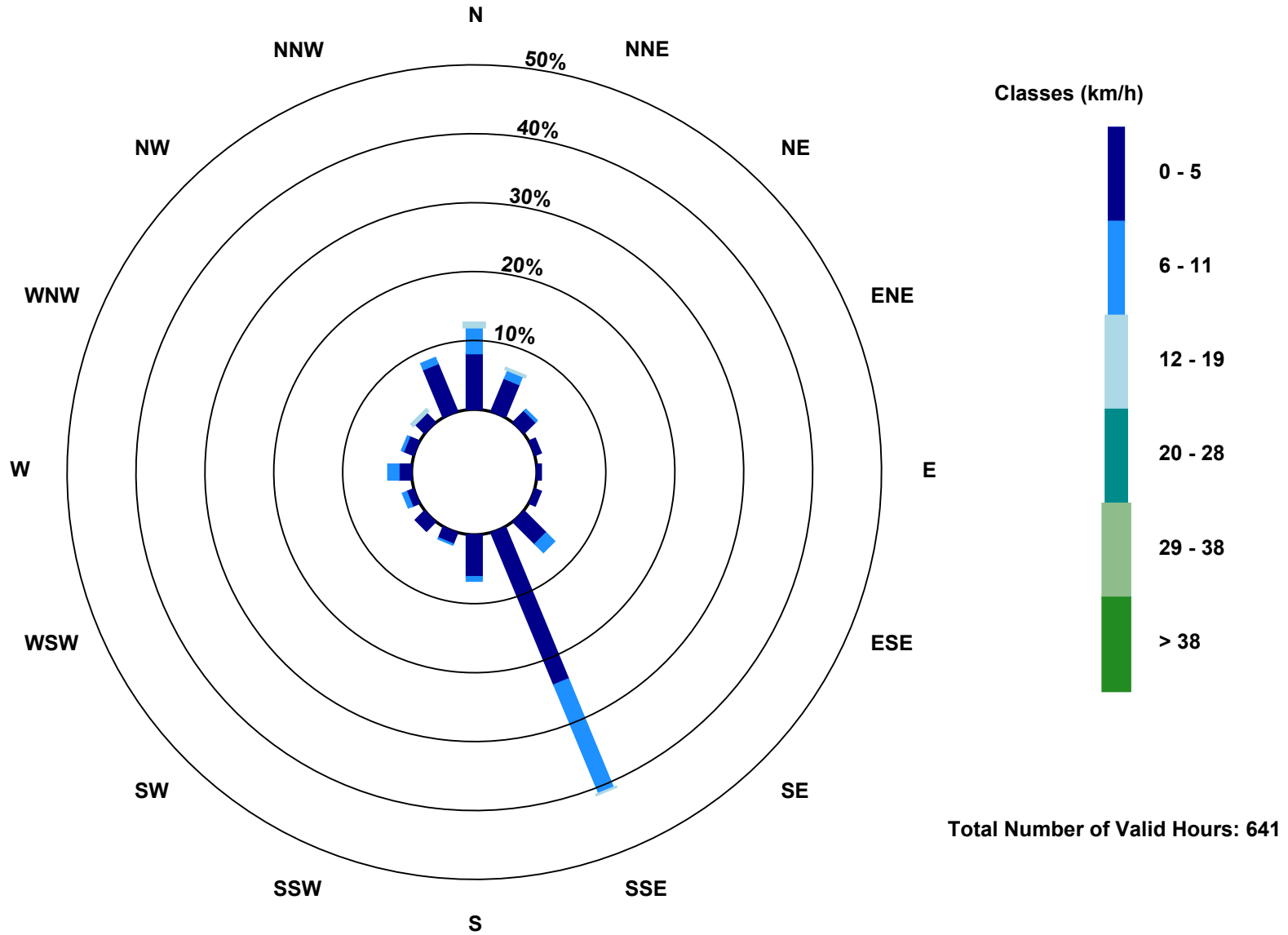
Total Number of Valid Hours: 641

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h

Waskow ohci Pimatisiwin - January 2023

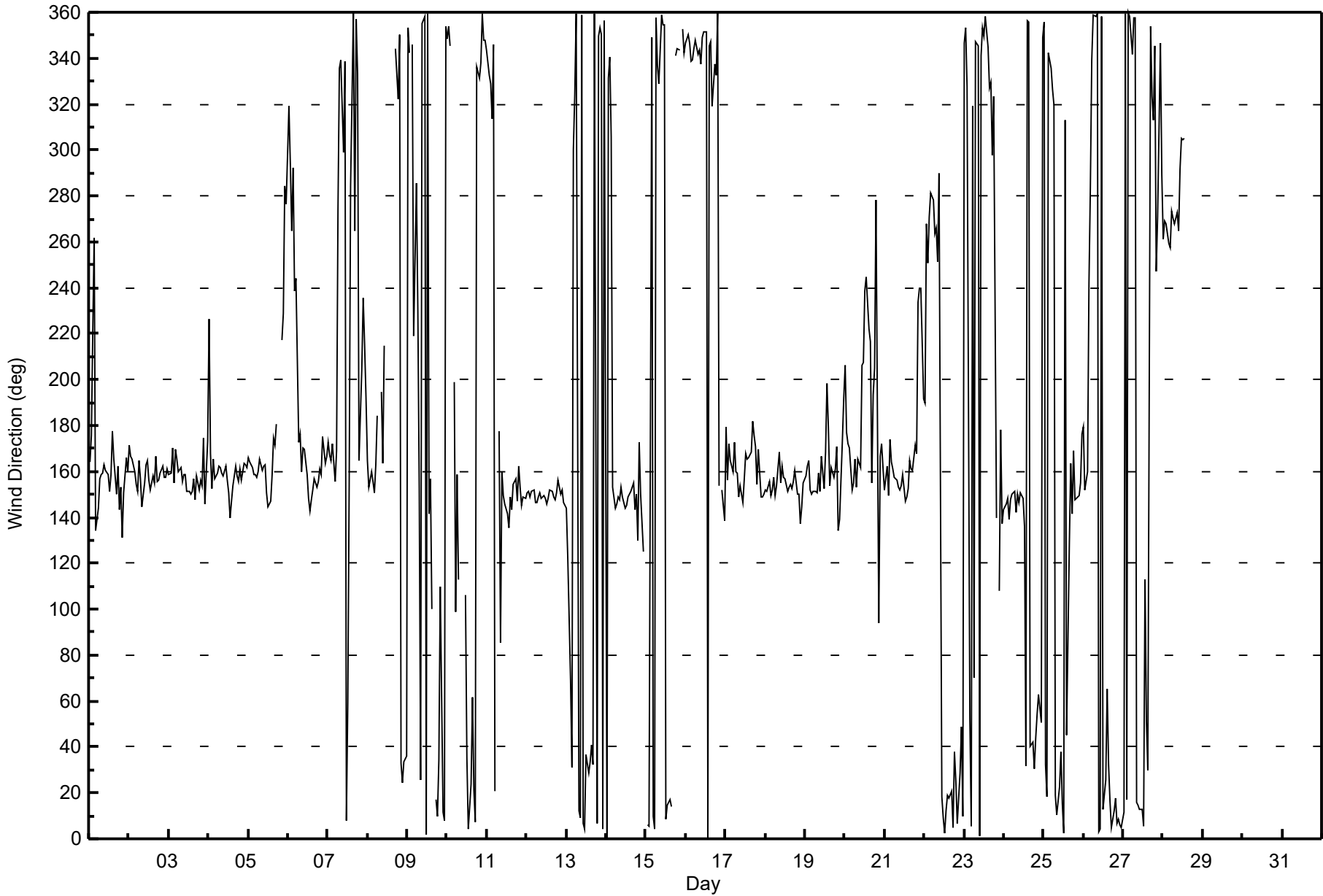
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Jan 26 08:00 Minimum Value: 0 km/h on Jan 15 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 1 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5														Hours in Service: 744 Hours of Data: 641 Hours of Missing Data: 103 Hours of Calibration: 0 Percent Operational Time: 86.2												
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	1	1	1	1	1	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	2
2-Jan	1	1	1	2	1	1	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	2	
3-Jan	2	2	2	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	2	2	1	2	1	1	2	
4-Jan	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
5-Jan	1	1	1	1	1	1	2	1	1	1	1	2	1	2	1	1	1	1	UO	UO	1	2	1	1	2	
6-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	2	2	1	1	2	
7-Jan	1	1	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
8-Jan	1	1	1	1	1	1	1	UO	1	1	1	UO	1	UO	UO	UO	UO	1	1	1	1	1	1	1	1	
9-Jan	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	UO	1	1	1	1	1	1	
10-Jan	1	1	1	UO	1	1	1	1	UO	1	UO	1	1	1	1	1	1	1	2	1	1	1	1	1	2	
11-Jan	1	1	1	1	1	1	UO	1	1	1	1	1	1	1	2	2	2	2	1	1	3	3	3	2	3	
12-Jan	2	2	3	3	3	3	3	3	3	3	3	3	2	3	3	2	2	2	2	2	2	1	1	1	3	
13-Jan	1	1	1	1	1	2	2	2	1	1	1	1	1	1	2	2	2	2	2	1	2	1	1	1	2	
14-Jan	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	UO	
15-Jan	UO	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	UO	UO	1	1	1	UO	1	1	2	
16-Jan	1	1	1	1	1	1	2	2	2	1	2	2	2	2	1	2	1	1	1	1	1	1	UO	1	2	
17-Jan	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	3	
18-Jan	2	2	2	2	3	3	2	3	3	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	4	
19-Jan	2	3	2	2	2	2	2	2	3	2	1	1	1	3	2	1	1	1	1	1	1	1	1	2	3	
20-Jan	2	2	2	1	1	1	1	2	1	1	2	3	3	3	2	2	1	1	2	2	2	1	1	3		
21-Jan	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	
22-Jan	1	2	1	4	3	3	3	3	3	4	5	4	3	2	2	2	2	1	1	2	2	2	1	5		
23-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	UO	1	1	2		
24-Jan	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	1	1	2		
25-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	3	2	3		
26-Jan	2	2	2	2	3	3	5	5	5	4	4	3	2	2	1	2	4	4	5	4	5	4	3	5		
27-Jan	4	3	3	3	4	2	2	2	2	2	2	2	1	1	1	1	1	1	2	2	1	1	2	4		
28-Jan	2	3	2	2	2	3	2	2	2	2	5	5	4	4	PF	PF	PF	PF	PF	PF	PF	PF	PF	5		
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--		
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--		
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--		
Diurnal Maximum																										
UO - Unstable Operation PF - Power Failure																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - January 2023

Direction of Maximum Speed: 358 deg on Jan 26 08:00																						Hours in Service: 744				
Direction of Maximum Daily Speed Average: 149.5 deg on Jan 12																						Hours of Data: 641				
Direction of Minimum Speed: 219 deg on Jan 9 05:00											Direction of Minimum Daily Speed Average: 0.6 deg on Jan 7											Hours of Missing Data: 103				
Monthly Average Direction: 148.1 deg																						Percent Operational Time: 86.2				
Day	Hourly Period Ending At (MST)																								Daily Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	164	176	221	262	134	144	157	158	159	163	161	158	151	159	177	165	150	162	144	153	131	151	166	160	160.1	
2-Jan	171	166	165	160	154	151	165	157	145	155	163	165	156	152	158	155	166	156	156	159	162	158	157	161	158.7	
3-Jan	159	159	170	155	170	165	160	162	156	159	159	151	151	150	151	157	148	158	152	156	153	174	146	173	157.3	
4-Jan	226	168	153	165	157	159	162	162	159	158	163	156	150	140	147	154	162	158	156	161	156	164	163	162	158.5	
5-Jan	166	164	162	159	159	158	160	166	161	162	163	151	145	147	158	174	172	181	UO	UO	217	229	284	276	163.2	
6-Jan	319	293	265	293	239	244	173	176	160	170	169	159	148	143	148	152	157	153	156	161	159	175	163	166	163.1	
7-Jan	172	167	165	172	156	169	274	335	339	299	339	8	59	154	285	360	265	357	333	165	205	236	215	192	213.0	
8-Jan	164	153	160	155	151	163	185	UO	195	163	215	UO	186	UO	UO	UO	UO	344	322	350	33	24	34	36	158.5	
9-Jan	354	342	UO	346	219	286	230	152	26	355	358	2	359	142	157	100	UO	UO	17	10	34	110	12	8	354	13.1
10-Jan	349	354	346	UO	199	99	158	113	UO	147	UO	106	36	5	24	62	21	7	336	331	338	359	348	348	359.1	
11-Jan	343	333	329	314	346	21	UO	177	85	160	149	146	142	136	149	143	154	157	147	163	153	145	149	148	146.7	
12-Jan	151	151	149	151	152	147	146	149	151	148	149	148	146	148	152	151	149	148	151	156	150	152	146	145	149.5	
13-Jan	144	123	69	31	300	324	359	12	9	359	7	4	36	29	34	41	32	360	7	350	353	350	4	356	10.9	
14-Jan	0	331	341	306	153	144	146	149	148	153	149	144	145	149	150	151	155	143	150	130	173	150	125	UO	146.6	
15-Jan	UO	6	6	349	10	4	358	337	329	359	355	355	9	15	17	14	UO	UO	341	344	343	UO	353	342	357.3	
16-Jan	346	350	347	339	339	344	348	341	343	337	349	351	351	1	346	347	319	337	333	360	154	UO	152	138	344.9	
17-Jan	179	156	172	165	160	173	160	159	149	154	147	157	168	165	166	168	182	175	171	154	170	149	149	150	162.0	
18-Jan	152	152	156	149	152	157	149	154	169	155	162	157	157	151	153	154	153	155	161	150	150	137	144	155	153.9	
19-Jan	158	162	165	152	150	151	151	151	159	151	166	152	168	198	179	154	162	158	161	171	134	139	173	192	160.4	
20-Jan	206	177	172	170	152	155	165	153	165	162	206	207	238	245	222	217	155	193	205	278	94	167	172	162	190.7	
21-Jan	152	162	149	174	164	161	157	156	153	152	154	159	147	149	152	165	161	160	171	168	234	240	240	191	165.8	
22-Jan	190	268	251	271	281	279	264	266	251	290	18	9	3	12	19	18	21	5	38	25	7	28	49	10	333.2	
23-Jan	346	353	328	52	6	319	70	347	345	1	341	353	349	358	345	327	329	298	323	139	UO	108	178	138	348.3	
24-Jan	144	146	148	139	148	150	151	142	150	146	151	148	136	32	356	356	41	42	30	44	54	63	51	349	114.9	
25-Jan	356	32	18	342	336	327	319	19	11	23	38	15	2	313	45	128	164	141	169	148	149	150	155	176	106.6	
26-Jan	180	152	160	241	283	339	359	358	359	3	4	358	13	26	65	33	17	5	12	18	7	9	6	5	6.5	
27-Jan	12	360	17	360	358	342	357	358	16	15	13	13	5	113	51	30	354	324	313	346	247	271	346	290	358.0	
28-Jan	261	269	268	259	257	273	270	268	273	265	292	305	305	305	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
160.0 165.1 163.3 181.1 173.2 168.4 159.4 151.6 149.3 151.3 137.6 134.2 139.6 135.6 135.4 128.4 135.8 130.0 128.1 131.9 143.2 143.6 142.2 153.4																										
Diurnal Average																										
UO - Unstable Operation PF - Power Failure																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 96 deg on Jan 9 05:00	Hours of Data: 641
Minimum Value: 11 deg on Jan 15 02:00	Hours of Missing Data: 103
Percentiles: P ₁ = 15 P ₁₀ = 18 Q ₁ = 21 Median = 23 Q ₃ = 34 P ₉₀ = 58 P ₉₉ = 89	Hours of Calibration: 0
	Percent Operational Time: 86.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	23	55	58	58	70	26	22	19	23	23	22	23	23	27	48	30	21	29	35	49	51	23	24	54	70
2-Jan	29	21	22	19	28	33	40	22	33	59	20	27	23	18	23	15	18	20	16	15	24	23	24	25	59
3-Jan	20	21	26	23	17	16	22	16	20	20	20	19	20	19	19	19	29	19	22	22	39	73	81	52	81
4-Jan	79	25	32	18	23	18	15	22	18	16	17	23	26	28	21	20	15	26	25	14	20	15	17	17	79
5-Jan	15	15	20	21	19	17	16	15	17	18	19	22	25	21	24	15	65	17	UO	UO	23	90	65	74	90
6-Jan	56	32	65	23	65	62	22	21	18	34	22	21	24	22	19	20	17	22	21	22	21	28	46	18	65
7-Jan	14	23	15	19	37	32	76	32	43	20	47	84	72	80	73	53	93	48	49	37	31	44	64	25	93
8-Jan	30	24	28	20	21	19	80	UO	88	41	53	UO	25	UO	UO	UO	UO	15	83	61	79	81	70	35	88
9-Jan	31	76	UO	38	96	82	89	75	42	24	21	20	70	31	48	64	UO	37	26	21	79	14	16	27	96
10-Jan	19	20	15	UO	58	45	54	49	UO	23	UO	94	84	25	39	68	20	17	16	23	20	15	18	15	94
11-Jan	18	27	26	23	25	25	UO	43	42	24	18	21	24	23	22	26	24	26	20	34	23	21	23	22	43
12-Jan	20	21	21	22	22	22	20	21	20	22	22	21	23	21	24	22	20	20	19	22	24	22	25	23	25
13-Jan	24	48	59	32	50	39	20	23	21	17	24	22	26	24	26	23	26	21	18	18	17	18	27	27	59
14-Jan	33	22	39	92	68	22	20	22	22	21	23	20	24	23	22	21	20	23	17	45	31	20	39	UO	92
15-Jan	UO	11	17	17	25	23	21	21	15	17	23	20	25	18	18	19	UO	UO	28	13	20	UO	14	19	28
16-Jan	23	20	17	16	16	17	18	15	20	19	21	20	21	23	21	31	18	18	15	40	79	UO	73	30	79
17-Jan	34	53	31	31	23	27	26	23	22	25	23	23	24	26	26	29	32	32	32	26	27	23	17	22	53
18-Jan	30	27	27	20	24	29	21	21	24	23	23	19	21	20	22	23	25	19	19	19	19	19	23	20	30
19-Jan	20	23	23	19	18	17	19	20	18	33	23	28	30	40	37	22	18	19	22	33	26	44	46	45	46
20-Jan	46	40	54	30	22	19	15	25	21	58	52	57	47	41	67	39	25	30	40	72	93	46	28	25	93
21-Jan	68	52	30	36	22	23	21	23	25	29	25	19	22	22	23	22	19	19	51	78	54	41	77	78	
22-Jan	83	54	57	39	31	30	33	32	56	32	24	23	21	20	22	23	24	23	39	22	24	40	26	31	83
23-Jan	27	26	58	88	35	43	55	30	25	30	21	23	18	19	15	16	29	88	60	50	UO	74	68	39	88
24-Jan	22	20	23	22	20	24	21	21	22	18	21	24	63	19	33	22	25	24	27	29	19	25	36	63	
25-Jan	29	25	24	21	18	47	20	46	37	49	69	40	42	71	89	35	30	45	45	22	23	22	28	43	89
26-Jan	51	23	25	60	74	52	25	22	24	22	23	22	26	33	23	28	23	21	24	26	24	23	21	21	74
27-Jan	23	22	25	22	33	27	21	21	22	23	21	36	60	41	28	25	76	27	17	52	42	15	75	26	76
28-Jan	25	24	25	28	31	24	29	24	40	35	26	20	20	21	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	40
29-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
30-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
31-Jan	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--
	83	76	65	92	96	82	89	75	88	59	69	94	84	80	89	68	93	88	83	72	93	90	81	77	

Diurnal Maximum

UO - Unstable Operation PF - Power Failure



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26 CHRISTINA LAKE JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2(ppb) Average	660	35	84	93.41	6.7	0	1.5	0
TRS(ppb) Average	628	35	116	89.11	0.3	0	0.3	0
THC(ppm) Average	659	35	85	93.28	2.3	-	2.2	-
NMHC(ppm) Average	659	35	85	93.28	0.026	-	0.002	-
CH4(ppm) Average	659	35	85	93.28	2.3	-	2.2	-
O3 (ppb) Average	661	34	83	93.41	39.9	0	37.5	-
NO2 (ppb) Average	664	37	80	94.22	9.7	0	4.4	-
NO (ppb) Average	664	37	80	94.22	5.8	-	0.8	-
NOX (ppb) Average	664	37	80	94.22	14.1	-	4.9	-
PM2.5 (ug/m3) Average	699	2	45	94.22	65.4	0	27.3	0
Temperature 2 m (C) Average	744	0	0	100	4.3	-	-1.4	-
Relative Humidity (%) Average	744	0	0	100	94.7	-	90.4	-
Wind Speed 20 m (km/h) Average	741	0	3	99.6	26	-	15	-
Wind Direction 20 m (deg) Average	741	0	3	99.6	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	1.73	3.7	-	0	0.2	0.3	0.7	1.5	3.7	50.2
H2S (ppb) Average	707	0.21	0.2	-	0	0	0.1	0.2	0.3	0.4	1.4
NO2 (ppb) Average	707	5.96	4.5	-	0.1	2.2	3.1	4.6	6.9	11.7	28.2
NO (ppb) Average	707	2.62	5.7	-	0	0	0.2	0.7	2.1	6.3	48.6
NOX (ppb) Average	707	8.58	9.5	-	0.1	2.5	3.5	5.5	9.3	18.6	76.8
Temperature 2 m (C) Average	744	-8.96	5.8	-	-26.4	-17.7	-11.6	-8.6	-5.1	-2.6	4.9
Relative Humidity (%) Average	744	83.8	8.4	-	56.5	71	78.1	87.3	89.9	91.6	95.2
Wind Speed 10 m (km/h) Average	708	9.5	6	-	0	3	5	9	12	18	33
Wind Direction 10 m (deg) Average	708	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	15 Jan 2023 04:00	16 Jan 2023 15:00	36	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association
Summary of Hour Averages

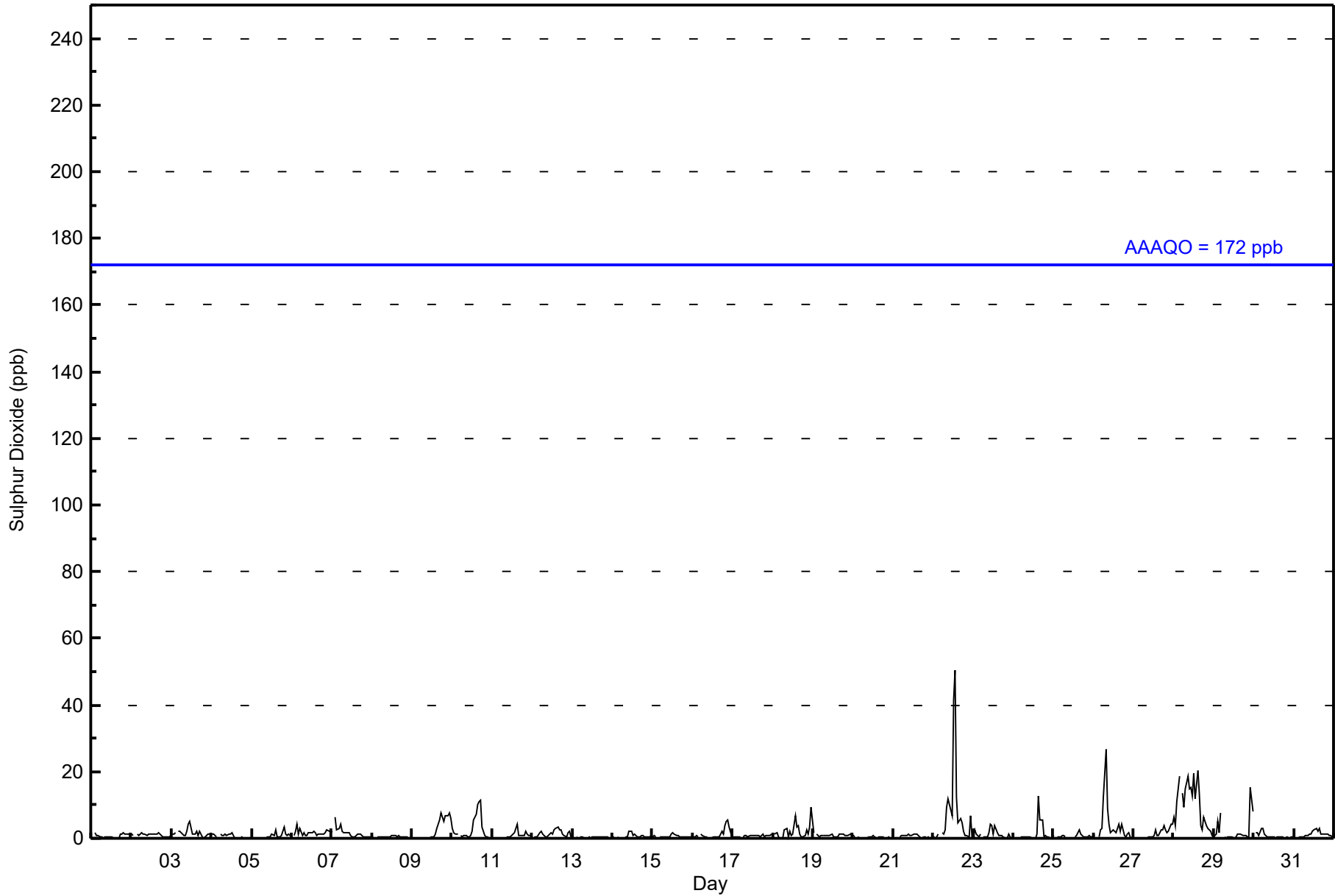
Sulphur Dioxide (SO₂) - ppb
Christina Lake - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 744																									
Maximum Value: 50.2 ppb on Jan 22 14:00		Maximum Daily Average: 10.0 ppb on Jan 28																									
Minimum Value: 0.0 ppb on Jan 4 15:00		Minimum Daily Average: 0.3 ppb on Jan 13																									
Maximum Diurnal Average: 3.4 ppb at hour 14		Minimum Diurnal Average: 0.9 ppb at hour 2																									
Monthly Average: 1.73 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.7 Q ₃ = 1.5 P ₉₀ = 3.7 P ₉₉ = 15.4																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	1.1	Z	1.5	0.8	0.9	0.5	0.3	0.2	0.3	0.4	0.6	0.4	0.3	0.2	0.2	0.1	0.1	1.1	1.3	1.6	1.4	1.2	1.1	0.8	0.7	1.6	
2-Jan	1.3	1.0	Z	1.2	0.8	1.4	1.6	1.3	1.3	0.8	1.3	1.1	1.1	1.1	1.1	1.4	1.5	1.3	0.8	0.5	0.5	0.3	0.4	0.6	1.0	1.6	
3-Jan	1.1	1.4	1.6	Z	2.0	2.3	1.5	0.9	0.8	2.0	4.2	4.9	1.4	1.2	1.4	2.2	0.7	2.1	0.4	0.2	0.4	0.9	1.2	1.4	1.6	4.9	
4-Jan	1.5	1.3	0.9	0.6	Z	1.1	0.7	1.0	1.1	0.9	1.1	1.2	1.9	0.9	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.6	1.9	
5-Jan	0.2	0.1	0.0	0.1	0.0	Z	0.1	0.1	0.1	0.5	0.4	0.6	1.1	0.9	2.6	0.6	0.5	0.3	0.8	3.2	1.1	0.9	1.1	0.8	0.7	3.2	
6-Jan	Z	0.8	2.2	4.3	1.2	3.0	1.0	1.9	0.9	1.0	1.8	1.5	1.7	2.0	1.7	0.8	1.1	1.1	1.1	1.1	1.9	2.7	2.1	1.8	1.7	4.3	
7-Jan	2.0	Z	6.3	2.4	3.1	4.0	2.0	1.6	1.8	1.7	1.8	0.7	0.6	0.5	0.5	1.1	1.1	1.2	0.6	0.4	0.4	0.4	0.3	0.3	1.5	6.3	
8-Jan	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.7	0.6	0.7	0.4	0.3	0.3	0.5	0.4	0.2	0.1	0.4	0.8	
9-Jan	0.2	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.5	0.3	1.3	2.9	5.4	7.7	6.5	4.9	6.9	6.8	7.7	6.1	2.5	7.7	
10-Jan	2.8	1.6	1.3	1.2	Z	0.9	0.6	0.6	0.7	0.6	0.6	0.8	2.0	5.6	7.0	10.1	11.0	11.3	3.2	0.7	0.5	0.3	0.2	0.2	2.8	11.3	
11-Jan	0.1	0.1	0.1	0.2	0.2	Z	0.2	0.1	0.2	0.3	0.3	0.6	1.3	1.8	3.2	4.1	0.9	0.8	0.7	1.0	2.0	1.3	1.1	0.9	0.9	4.1	
12-Jan	Z	0.5	0.3	0.3	1.8	2.0	1.2	0.7	0.6	0.6	1.1	1.8	1.4	2.6	3.0	3.4	2.7	2.5	1.3	0.9	0.4	1.8	2.1	0.6	1.5	3.4	
13-Jan	0.3	Z	0.2	0.1	0.2	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.5	
14-Jan	0.2	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.3	2.1	1.9	1.0	1.1	0.9	0.6	0.6	1.0	0.6	0.3	0.3	0.5	0.5	0.7	0.6	2.1	
15-Jan	0.6	0.7	0.6	Z	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.4	1.4	1.8	1.2	0.9	1.0	0.6	0.6	0.4	0.4	0.3	0.3	0.4	0.3	0.6	1.8
16-Jan	0.3	0.3	0.7	0.6	Z	1.2	0.7	0.5	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.5	0.6	2.2	1.1	3.7	5.1	5.4	3.2	0.6	1.2	5.4	
17-Jan	0.4	0.5	0.6	0.5	0.3	Z	0.5	1.0	0.7	0.6	1.0	1.0	0.6	0.8	1.0	1.0	0.4	0.9	1.1	0.4	0.9	0.8	1.0	1.2	0.8	1.2	
18-Jan	Z	1.4	1.9	0.5	0.2	0.1	0.2	2.4	2.8	0.5	2.1	0.7	1.5	6.9	3.3	4.0	1.2	0.5	0.5	0.7	2.7	1.2	3.4	9.4	2.1	9.4	
19-Jan	1.8	Z	1.2	1.0	0.6	0.8	1.0	1.0	0.9	0.7	0.9	1.1	0.6	0.6	0.6	0.6	1.2	1.1	1.1	0.8	0.7	0.9	1.2	1.2	0.9	1.8	
20-Jan	0.7	0.6	Z	0.6	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.8	0.4	0.1	0.3	0.4	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.8	
21-Jan	0.2	0.1	0.2	Z	0.5	0.8	0.8	0.9	0.9	1.2	1.0	1.0	1.2	1.3	1.3	0.8	0.3	0.2	0.4	0.3	0.2	0.4	0.0	0.3	0.6	1.3	
22-Jan	0.2	0.0	0.4	1.4	Z	1.5	1.5	2.6	9.4	12.0	8.4	6.7	41.4	50.2	12.5	4.8	5.9	4.7	1.9	0.9	0.8	0.4	7.0	0.5	7.6	50.2	
23-Jan	0.8	2.5	1.2	0.6	1.3	Z	0.6	0.4	0.6	1.6	4.1	4.0	1.3	3.7	1.7	1.0	0.9	0.9	0.4	0.2	0.2	1.1	0.2	0.1	1.3	4.1	
24-Jan	Z	0.2	0.1	0.1	0.2	0.6	0.4	0.3	0.3	0.4	0.4	0.1	0.1	0.2	1.2	12.7	5.7	5.4	0.6	0.6	0.5	0.4	0.2	0.3	1.3	12.7	
25-Jan	0.7	Z	0.2	0.3	0.2	0.8	0.7	0.5	C	C	C	C	C	0.5	0.9	2.6	1.2	0.7	0.5	0.6	0.6	0.6	0.4	0.2	0.7	2.6	
26-Jan	0.6	0.7	Z	0.5	2.4	3.0	12.2	26.6	8.9	4.2	1.7	2.1	2.4	1.5	3.1	4.4	2.1	4.0	0.9	0.5	1.1	1.7	0.3	0.2	3.7	26.6	
27-Jan	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.7	2.3	0.9	1.0	2.5	2.7	3.9	2.7	1.9	2.0	4.3	4.2	1.3	4.3	
28-Jan	6.5	4.0	11.0	18.7	Z	13.5	9.2	14.9	18.5	14.7	15.4	12.8	19.5	12.0	20.4	13.2	4.0	2.7	6.6	3.7	2.8	2.6	2.0	1.0	10.0	20.4	
29-Jan	0.5	1.3	5.2	1.9	7.7	Z	0.3	0.2	0.2	0.2	0.4	0.4	0.2	0.5	1.5	1.1	1.1	0.7	0.8	0.7	0.4	0.4	15.3	8.1	2.1	15.3	
30-Jan	Z	1.9	1.8	0.8	3.0	3.1	1.3	0.8	0.5	0.3	0.4	0.3	0.4	0.1	0.2	0.4	0.3	0.2	0.1	0.2	0.5	0.2	0.4	0.3	0.8	3.1	
31-Jan	0.2	Z	0.2	0.4	0.4	0.3	0.4	0.8	0.8	1.1	1.4	2.3	2.5	2.8	1.9	2.8	1.1	1.1	1.1	1.3	1.1	1.0	1.0	0.5	1.2	2.8	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.9 6.5 0.9 4.0 1.5 11.0 1.5 18.7 1.1 7.7 1.6 13.5 1.3 12.2 1.8 26.6 2.0 18.5 1.6 14.7 1.8 15.4 1.7 12.8 3.0 19.5 3.4 12.0 2.4 20.4 2.6 13.2 1.8 11.0 1.9 11.3 1.3 6.6 1.1 4.9 1.2 6.8 1.9 15.3 1.4 9.4			
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Christina Lake - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	686	96.89	96.89
11 - 20	19	2.68	99.58
21 - 60	3	0.42	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	6	23	25	22	16	13	29	44	79	145	87	80	16	9	36	22	652
11 - 20	0	0	2	0	0	0	0	0	0	0	0	0	0	9	8	0	19
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	23	27	22	16	13	29	44	79	145	87	80	16	19	46	22	674

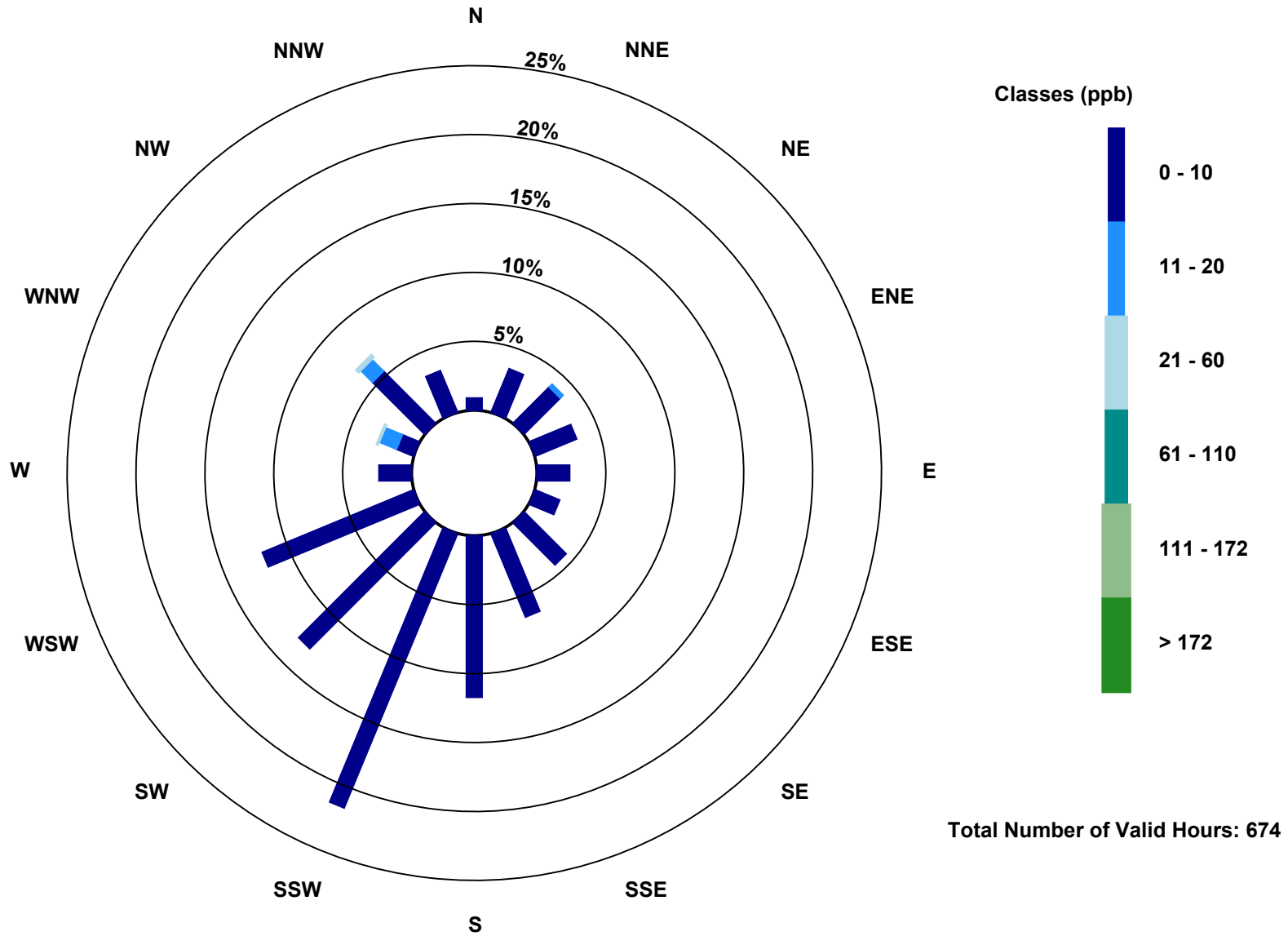
Total Number of Valid Hours: 674

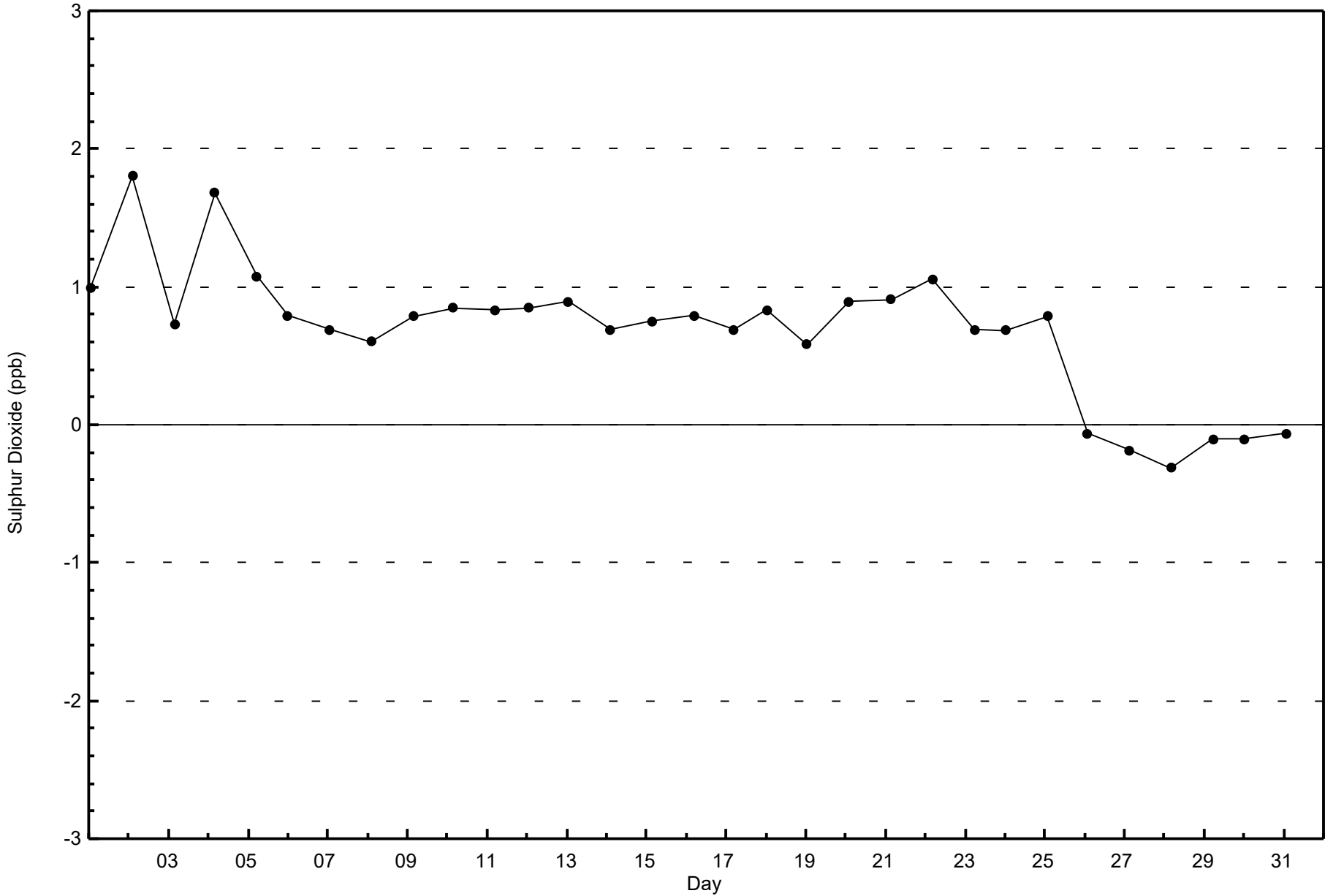
Total Number of Hours: 744

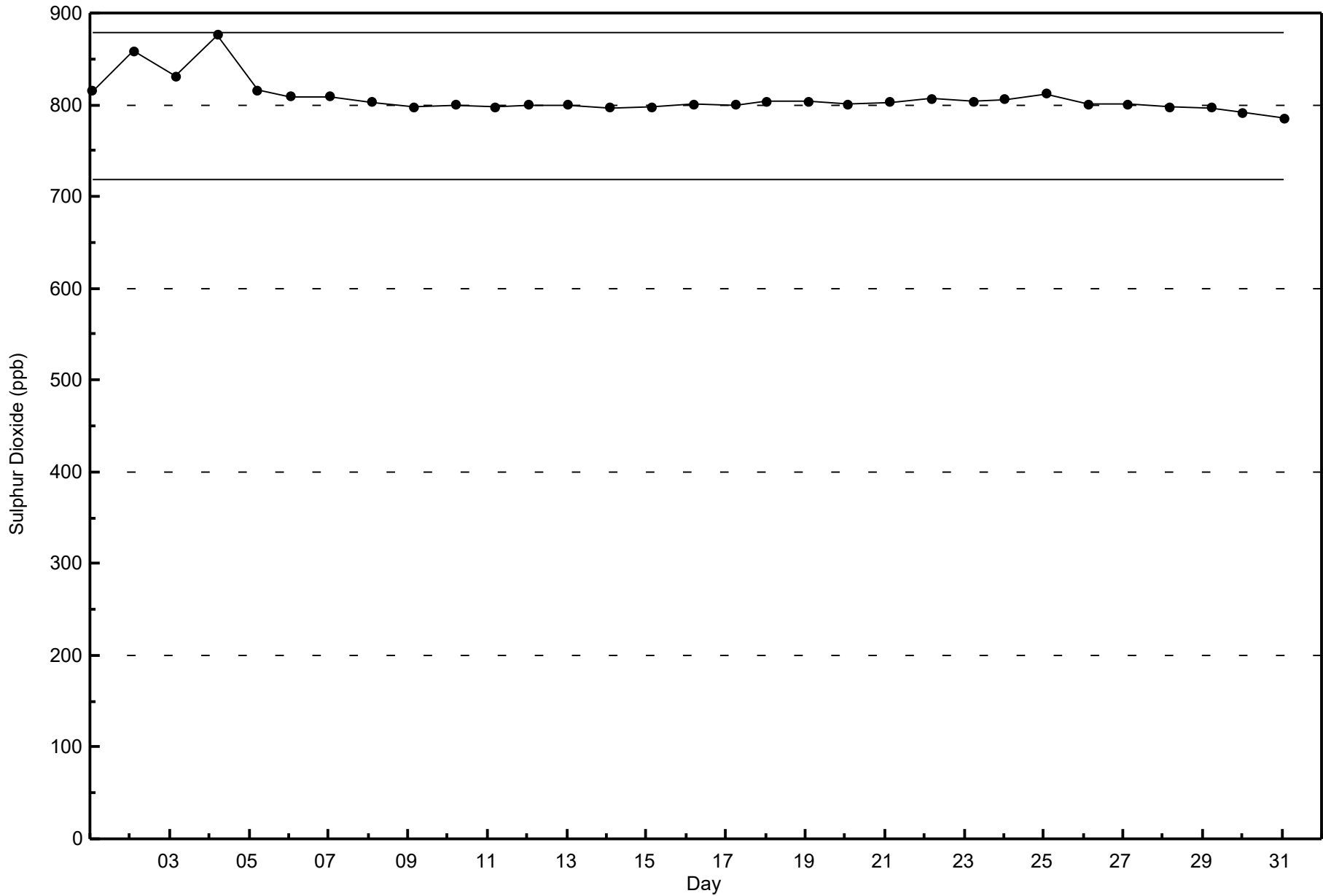


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Christina Lake





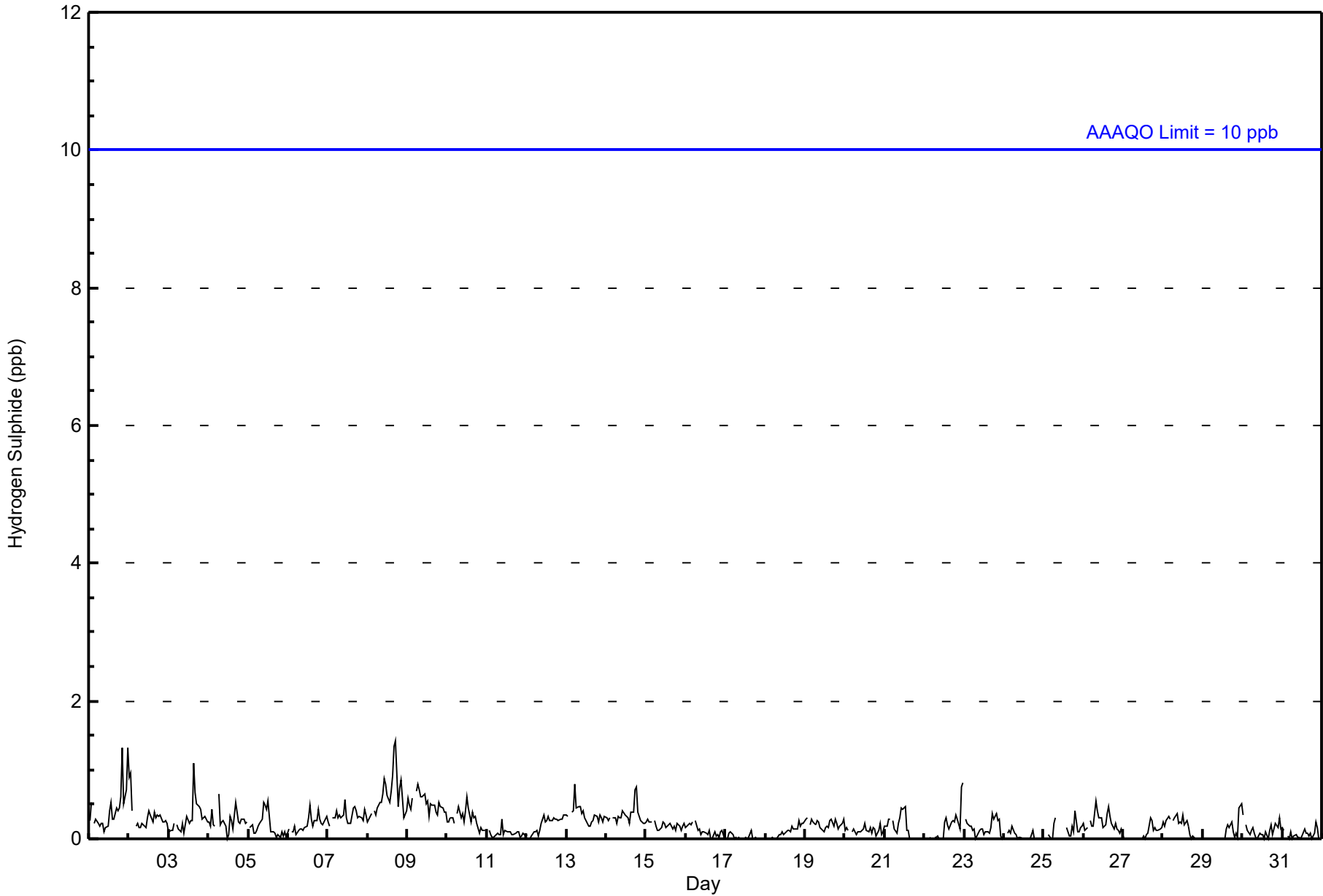




Wood Buffalo Environmental Association
Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb
Christina Lake - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 1.4 ppb on Jan 8 18:00		Maximum Daily Average: 0.6 ppb on Jan 8														Hours of Data:		707									
Minimum Value: 0.0 ppb on Jan 12 03:00		Minimum Daily Average: 0.0 ppb on Jan 17														Hours of Missing Data:		37									
Maximum Diurnal Average: 0.3 ppb at hour 18		Minimum Diurnal Average: 0.2 ppb at hour 5														Hours of Calibration:		37									
Monthly Average: 0.21 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.4 P ₉₉ = 0.9														Percent Operational Time:		100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.3	0.5	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.5	0.3	0.3	0.5	0.4	0.4	0.6	1.3	0.5	0.7	1.3	0.4	1.3	
2-Jan	0.9	1.0	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.4	0.3	0.4	0.3	0.4	0.2	0.2	0.3	0.2	0.3	1.0	
3-Jan	0.1	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.2	0.1	0.2	0.3	0.2	0.3	0.3	1.1	0.7	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.3	1.1	
4-Jan	0.3	0.2	0.4	0.2	0.2	Z	0.6	0.2	0.3	0.3	0.2	0.0	0.1	0.3	0.3	0.1	0.5	0.4	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.6	
5-Jan	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.4	0.6	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.2	0.6	
6-Jan	0.1	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.3	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.5	
7-Jan	0.2	0.2	Z	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.6	0.3	0.2	0.2	0.2	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.6	
8-Jan	0.2	0.3	0.4	Z	0.4	0.3	0.4	0.5	0.5	0.7	0.9	0.8	0.6	0.5	0.7	0.9	1.3	1.4	0.5	0.7	0.9	0.6	0.3	0.4	0.6	1.4	
9-Jan	0.6	0.5	0.4	0.6	Z	0.7	0.8	0.7	0.6	0.6	0.6	0.5	0.6	0.3	0.5	0.5	0.5	0.4	0.3	0.5	0.5	0.5	0.4	0.4	0.5	0.8	
10-Jan	0.3	0.2	0.3	0.3	0.2	Z	0.4	0.5	0.3	0.4	0.2	0.4	0.6	0.4	0.2	0.4	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.6	
11-Jan	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.3	
12-Jan	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	
13-Jan	0.4	0.3	Z	0.4	0.4	0.8	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.2	0.4	0.3	0.2	0.8	
14-Jan	0.3	0.3	0.3	Z	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.4	0.4	0.7	0.8	0.4	0.3	0.3	0.2	0.2	0.3	0.8	
15-Jan	0.2	0.3	0.2	0.2	Z	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	
16-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.3	
17-Jan	Z	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
18-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.3	
19-Jan	0.3	0.3	Z	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.2	0.3	
20-Jan	0.1	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	
21-Jan	0.2	0.2	0.3	0.3	Z	0.3	0.1	0.1	0.2	0.3	0.5	0.4	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	
22-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.8	0.8	0.8	
23-Jan	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.4	0.3	0.3	0.0	0.0	0.2	0.4	
24-Jan	0.0	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
25-Jan	0.0	0.0	Z	0.1	0.0	0.0	0.2	0.3	C	C	C	C	C	C	C	0.2	0.0	0.0	0.2	0.1	0.4	0.1	0.1	0.2	0.2	0.4	
26-Jan	0.2	0.1	0.2	Z	0.3	0.2	0.2	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.4	0.5	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.5	
27-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.3	
28-Jan	0.2	0.2	0.3	0.3	0.3	Z	0.3	0.3	0.4	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	
29-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.0	0.4	0.5	0.1	0.5	
30-Jan	0.4	Z	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.4	
31-Jan	0.2	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.0	0.0	0.1	0.2	
																								Diurnal Average		0.2	
																								Diurnal Maximum		0.9	
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	6	23	27	22	16	15	28	41	78	147	87	81	16	19	47	20	673
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	23	27	22	16	15	28	41	78	147	87	81	16	19	47	20	673

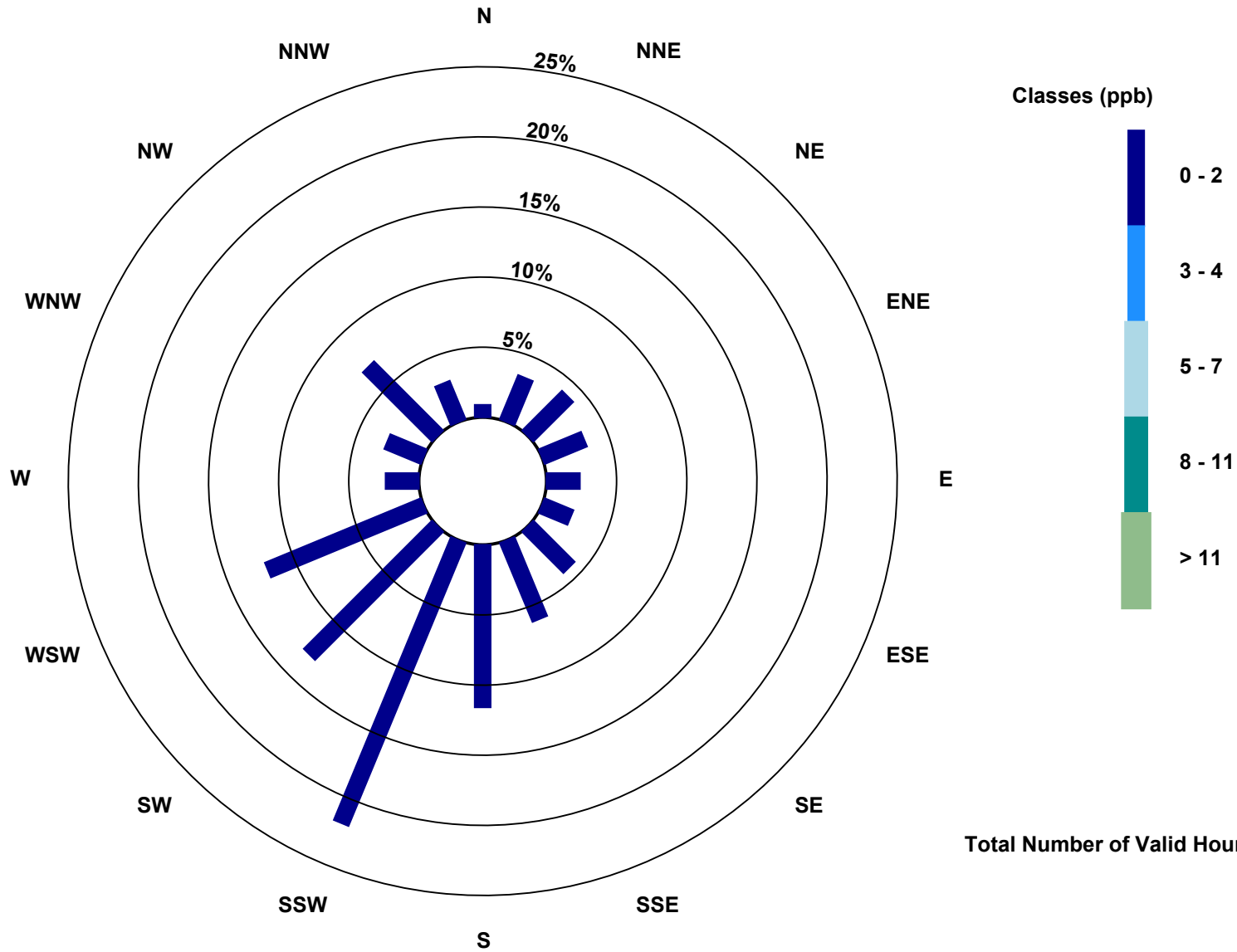
Total Number of Valid Hours: 673

Total Number of Hours: 744

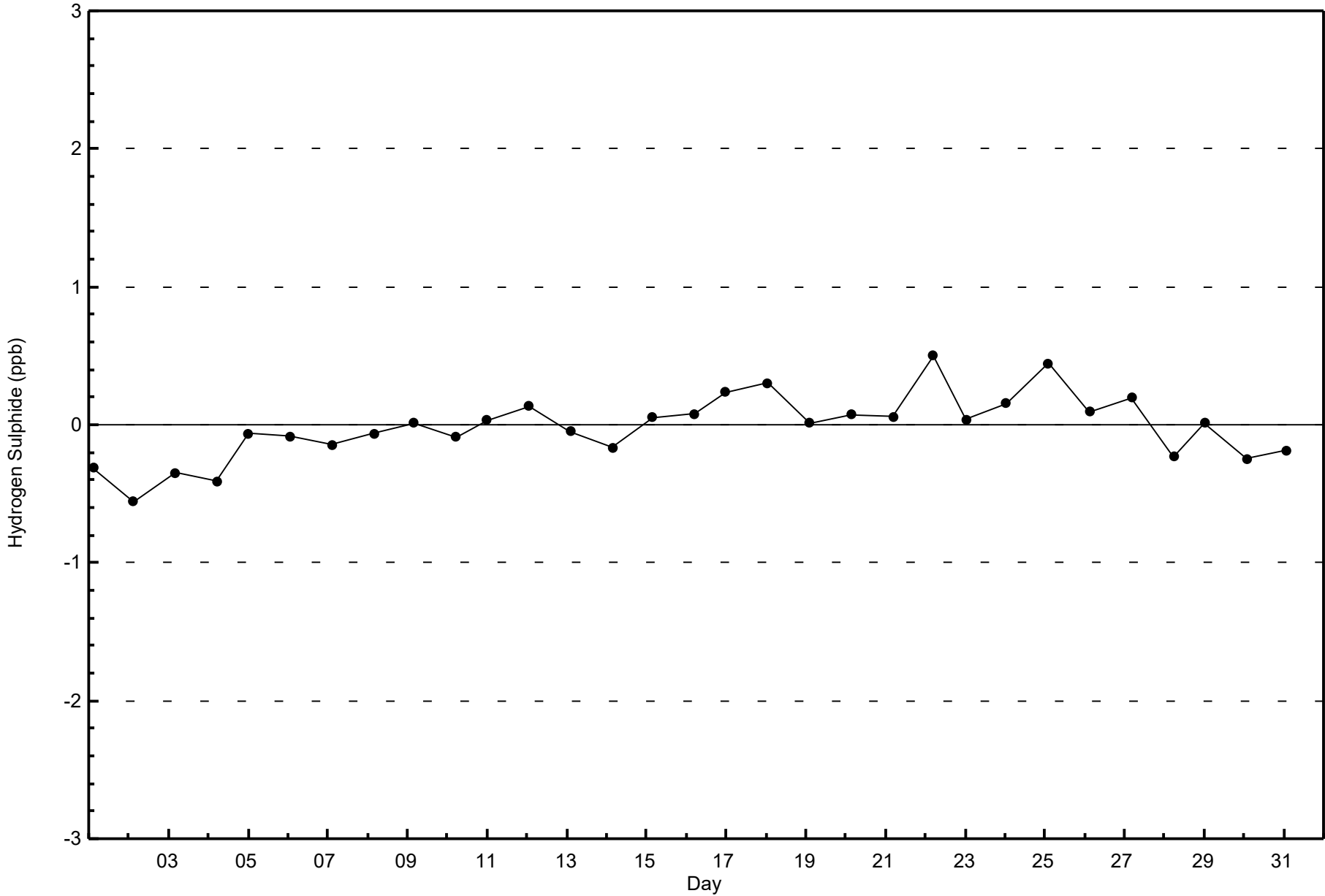


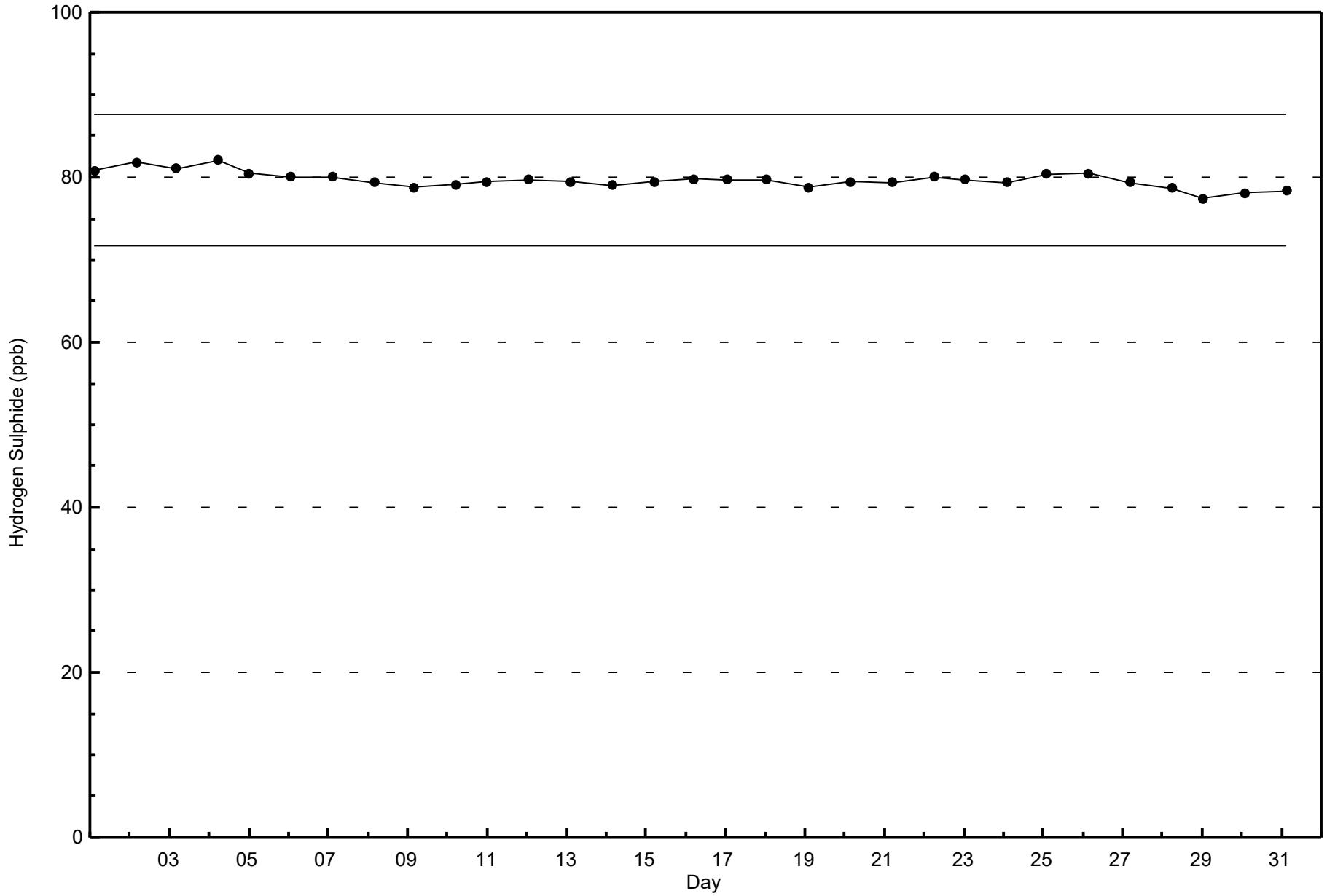
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Christina Lake



Total Number of Valid Hours: 673







Wood Buffalo Environmental Association
Summary of Hour Averages

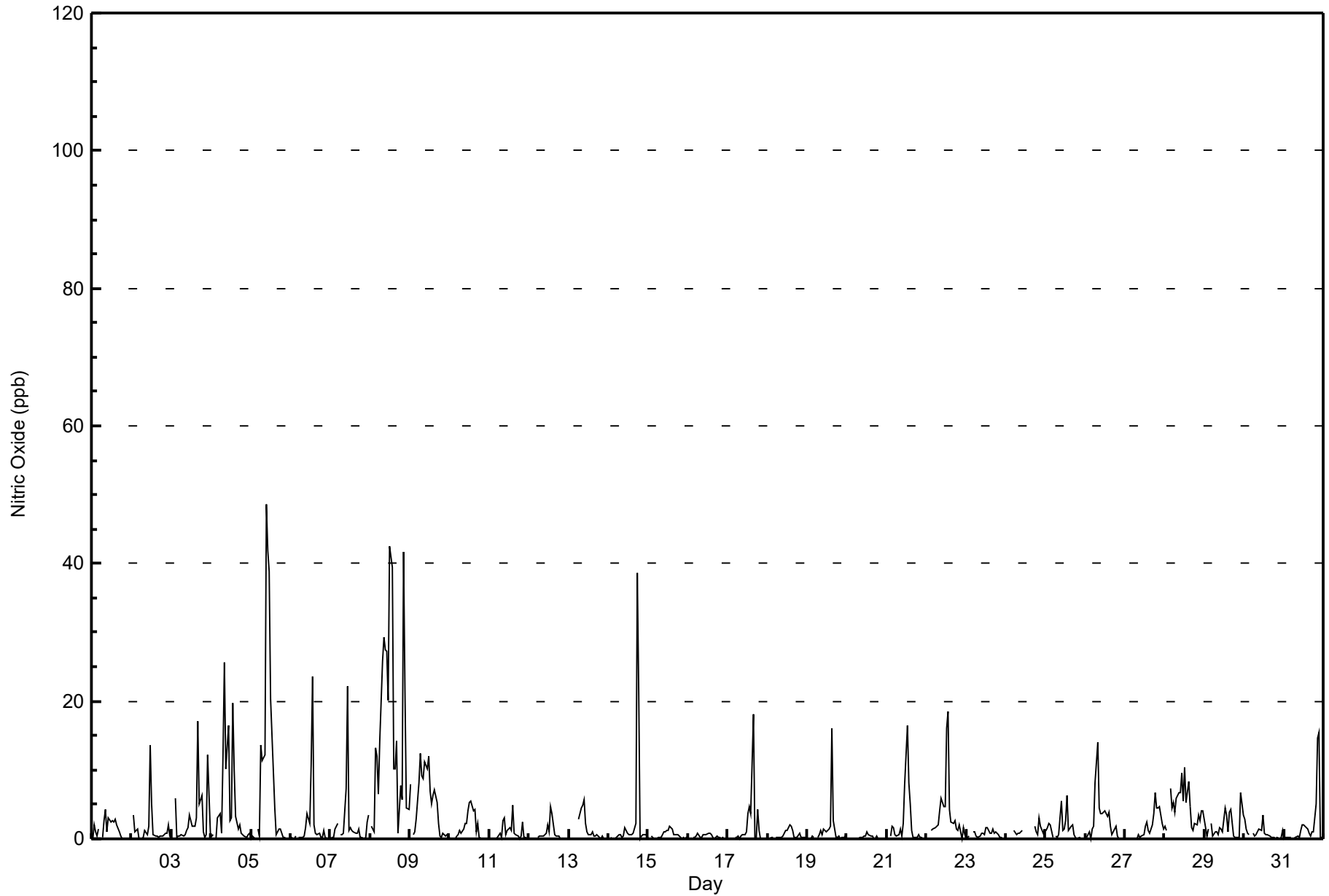
Nitric Oxide (NO) - ppb
Christina Lake - January 2023

Maximum Value: 48.6 ppb on Jan 5 10:00		Maximum Daily Average: 16.6 ppb on Jan 8		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Jan 2 06:00		Minimum Daily Average: 0.2 ppb on Jan 20		Hours of Data: 707																																													
Maximum Diurnal Average: 6.0 ppb at hour 14		Minimum Diurnal Average: 0.5 ppb at hour 2		Hours of Missing Data: 37																																													
Monthly Average: 2.62 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.7 Q ₃ = 2.1 P ₉₀ = 6.3 P ₉₉ = 29.2		Hours of Calibration: 37																																													
				Percent Operational Time: 100.0																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.1	2.1	1.1	0.4	1.3	Z	0.1	2.7	4.3	1.1	3.1	2.5	2.6	2.5	2.9	2.1	1.0	0.4	0.1	0.1	0.1	0.0	0.0	0.1	1.3	4.3																							
2-Jan	Z	3.5	0.9	1.5	0.0	0.0	0.1	0.2	1.3	0.6	1.8	13.7	5.0	0.6	0.5	0.4	0.2	0.4	0.4	0.4	0.8	0.7	2.1	0.4	1.5	13.7																							
3-Jan	0.0	Z	5.9	0.3	0.3	0.4	0.5	0.5	0.6	1.2	1.7	3.6	1.8	1.9	1.9	3.1	17.1	5.0	6.3	1.0	0.1	0.7	12.3	0.8	2.9	17.1																							
4-Jan	0.3	0.6	Z	0.1	3.1	3.6	0.8	11.9	25.7	10.2	16.4	2.7	3.0	19.8	10.0	3.2	1.4	1.9	0.8	0.5	0.5	0.2	0.6	0.8	5.1	25.7																							
5-Jan	0.0	0.3	0.0	Z	1.5	0.4	13.6	11.5	12.2	48.6	41.9	38.9	20.4	9.7	4.4	0.5	1.0	1.4	1.5	0.1	0.1	0.1	0.0	0.0	9.1	48.6																							
6-Jan	0.2	0.0	0.0	0.4	Z	0.2	0.3	0.2	0.5	1.7	3.6	2.2	10.7	23.5	2.1	0.9	0.6	0.7	0.2	0.2	1.3	0.2	0.0	0.4	2.2	23.5																							
7-Jan	0.0	0.1	0.1	1.4	2.2	Z	0.6	0.6	0.8	7.4	22.1	1.3	1.7	1.1	0.9	0.8	0.9	1.4	0.3	0.3	0.0	0.3	2.5	3.5	2.2	22.1																							
8-Jan	Z	1.7	0.9	13.1	12.1	6.6	14.2	25.8	29.3	27.6	27.2	20.2	42.4	39.4	10.2	10.2	14.1	0.9	7.8	5.7	41.7	21.7	4.6	4.3	16.6	42.4																							
9-Jan	7.9	Z	0.6	1.0	2.8	8.2	12.3	9.2	8.8	11.3	10.1	12.1	6.9	5.1	6.3	7.0	5.2	2.3	0.4	0.2	0.7	0.4	0.7	0.7	5.2	12.3																							
10-Jan	0.1	0.1	Z	0.1	0.5	0.6	1.1	0.8	1.5	2.3	2.3	4.0	5.3	5.5	4.2	4.2	0.9	2.3	0.2	0.0	0.0	0.0	0.0	0.0	1.6	5.5																							
11-Jan	0.0	0.0	0.0	Z	0.0	0.2	0.7	0.2	2.7	3.0	0.6	1.2	1.6	1.2	5.0	0.8	0.5	0.5	0.1	0.5	2.5	0.2	0.2	0.0	0.9	5.0																							
12-Jan	0.0	0.0	0.1	0.1	Z	0.2	0.5	0.5	0.5	0.4	0.7	2.1	1.1	4.7	3.6	0.7	0.3	0.5	0.4	0.1	0.1	0.1	0.0	0.0	0.7	4.7																							
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	2.9	4.5	4.9	5.8	2.3	1.1	0.7	0.6	1.1	0.4	0.3	0.6	0.1	0.1	0.3	0.0	0.0	0.0	1.1	5.8																							
14-Jan	Z	0.1	0.0	0.0	0.0	0.4	0.5	0.5	0.1	0.5	1.5	0.7	0.6	0.6	0.8	2.2	38.6	21.6	0.1	0.4	0.6	0.6	0.4	0.4	3.1	38.6																							
15-Jan	0.1	Z	0.3	0.1	0.1	0.1	0.2	0.2	0.2	1.0	1.0	1.3	1.2	1.8	1.4	0.7	0.7	0.7	0.5	0.4	0.0	0.1	0.0	0.2	0.5	1.8																							
16-Jan	0.0	0.0	Z	0.1	0.3	0.5	0.9	0.2	0.3	0.6	0.6	0.7	0.8	0.7	0.5	0.2	0.1	0.4	0.2	0.1	0.0	0.1	0.1	0.1	0.3	0.9																							
17-Jan	0.1	0.1	0.0	Z	0.2	0.2	0.4	0.1	0.3	0.7	0.7	1.0	3.6	4.7	3.7	18.1	0.1	0.2	4.3	1.2	0.1	0.0	0.0	0.0	1.7	18.1																							
18-Jan	0.0	0.0	0.2	0.1	Z	0.2	0.3	0.2	0.1	0.4	0.8	1.1	1.1	2.0	1.8	1.2	0.3	0.2	0.2	0.8	0.2	0.1	0.1	0.2	0.5	2.0																							
19-Jan	0.1	0.1	0.0	0.4	0.2	Z	0.2	0.5	1.2	0.7	1.5	1.1	1.3	1.5	1.7	16.1	2.7	0.2	0.2	0.3	0.1	0.1	0.2	0.7	1.3	16.1																							
20-Jan	Z	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.5	0.5	1.0	0.7	0.5	0.4	0.1	0.1	0.4	0.1	0.0	0.0	0.0	0.0	0.2	1.0																							
21-Jan	0.0	Z	0.5	1.9	1.7	0.7	0.5	0.6	1.4	0.5	2.2	8.0	16.5	8.2	5.1	1.3	0.3	0.3	0.3	0.5	0.1	0.2	0.0	0.1	2.2	16.5																							
22-Jan	0.0	0.1	Z	1.1	1.5	1.6	1.8	2.1	4.2	5.9	4.8	4.8	16.0	18.5	4.4	2.4	2.1	2.7	1.5	1.2	2.1	0.1	1.7	0.7	3.5	18.5																							
23-Jan	0.2	0.2	0.4	Z	1.1	1.0	0.4	0.2	0.5	0.7	0.8	0.7	1.5	1.7	0.9	0.9	1.5	0.8	1.1	0.5	0.1	0.2	0.0	0.0	0.7	1.7																							
24-Jan	0.0	0.0	0.1	0.0	Z	1.2	0.5	0.7	0.8	1.0	1.2	C	C	C	C	C	C	1.8	1.1	0.5	3.1	1.8	0.9	1.1	--	3.1																							
25-Jan	1.2	1.6	2.2	2.1	0.3	Z	0.4	0.2	0.6	5.6	1.3	1.5	2.6	6.3	1.3	1.7	2.1	0.7	0.3	0.1	0.2	0.1	0.1	0.1	1.4	6.3																							
26-Jan	Z	0.2	1.1	0.1	1.4	1.8	8.1	14.0	4.6	3.7	3.6	3.8	4.0	3.3	3.9	1.8	0.6	1.1	1.8	0.4	0.0	0.0	0.1	0.1	2.6	14.0																							
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.2	0.3	0.5	1.9	2.4	1.2	0.8	2.1	3.6	6.7	4.6	4.4	4.8	2.3	1.5	1.6	6.7																							
28-Jan	1.8	1.1	Z	7.4	4.4	5.2	3.9	5.9	6.7	6.7	9.6	5.6	10.5	5.2	8.4	4.7	1.7	1.2	2.3	2.1	3.4	2.6	4.1	4.0	4.7	10.5																							
29-Jan	2.9	0.3	1.5	Z	2.3	0.4	1.0	1.0	0.6	1.6	1.4	1.0	4.4	3.5	0.9	4.0	4.3	0.5	0.1	0.2	0.1	0.1	6.8	3.5	1.8	6.8																							
30-Jan	2.8	1.5	0.8	0.6	Z	0.8	0.5	0.6	1.0	1.4	1.2	3.5	0.8	0.7	0.5	0.4	0.2	0.3	0.1	0.1	0.3	0.1	0.2	1.2	0.9	3.5																							
31-Jan	0.0	0.2	0.2	0.1	0.2	Z	0.0	0.1	0.5	0.3	1.3	2.0	2.1	1.7	1.3	0.9	0.4	1.1	0.9	5.1	14.7	15.5	0.3	0.1	2.1	15.5																							
																								0.7	0.5	0.7	1.2	1.4	1.4	2.2	3.1	3.8	4.9	5.4	4.8	5.8	6.0	3.0	3.0	2.2	2.3	2.0	0.9	2.5	1.7	1.3	0.8	Diurnal Average	
																								7.9	3.5	5.9	13.1	12.1	8.2	14.2	25.8	29.3	48.6	41.9	38.9	42.4	39.4	10.2	18.1	17.1	38.6	21.6	5.7	41.7	21.7	12.3	4.3	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Christina Lake - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	691	97.74	97.74
21 - 40	12	1.70	99.43
41 - 80	4	0.57	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	22	25	19	18	13	30	41	77	145	81	75	17	19	45	22	656
21 - 40	0	0	0	2	1	1	0	0	1	4	3	0	0	0	0	0	12
11 - 80	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	4
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	22	26	22	19	14	31	41	78	149	84	76	17	19	45	22	672

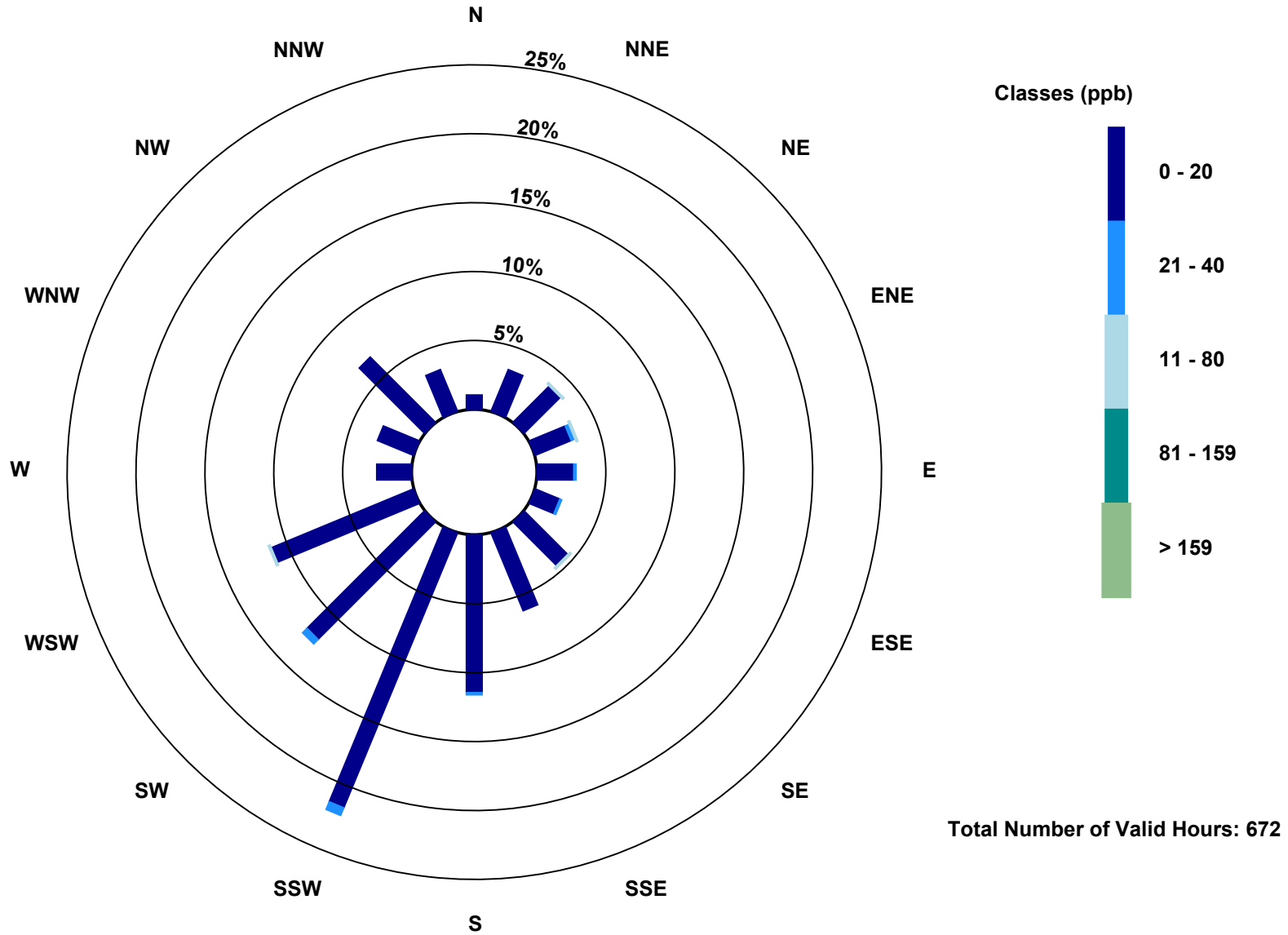
Total Number of Valid Hours: 672

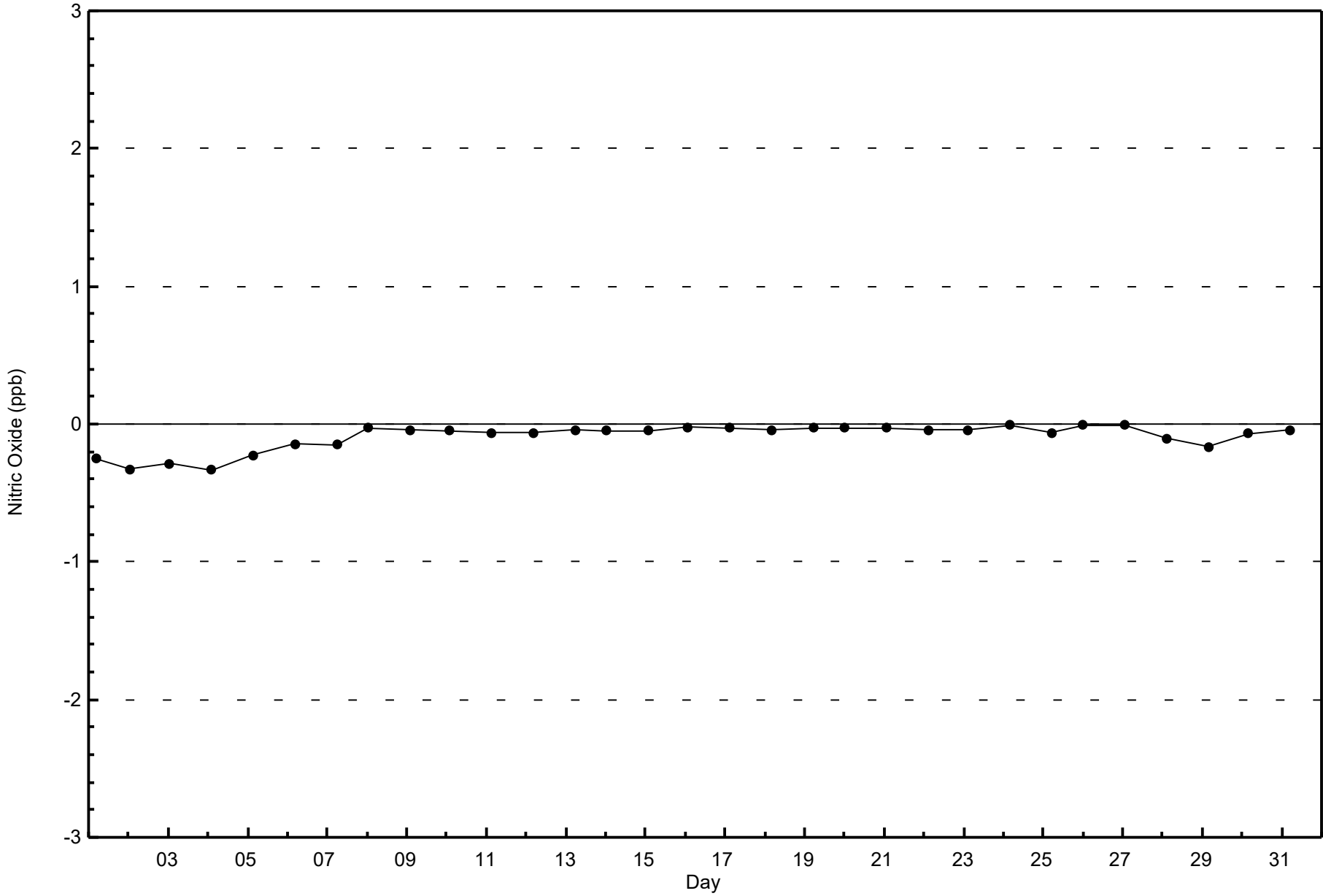
Total Number of Hours: 744

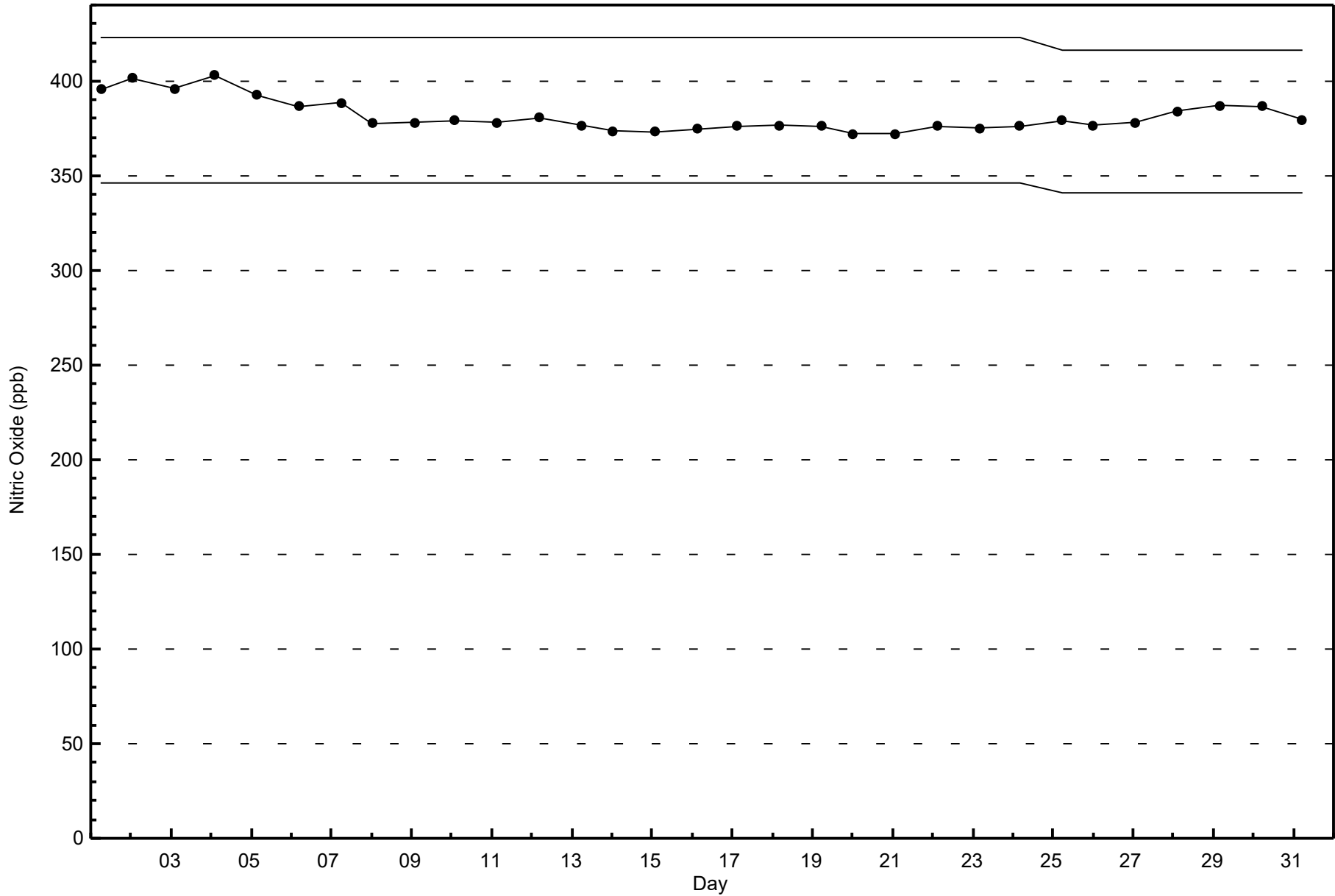


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - January 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 28.2 ppb on Jan 5 10:00	Maximum Daily Average: 17.4 ppb on Jan 8		Hours of Data:	707
Minimum Value: 0.1 ppb on Jan 27 06:00	Minimum Daily Average: 2.7 ppb on Jan 20		Hours of Missing Data:	37
Maximum Diurnal Average: 7.4 ppb at hour 18	Minimum Diurnal Average: 4.1 ppb at hour 2		Hours of Calibration:	37
Monthly Average: 5.96 ppb	Percentiles: P ₁ = 0.8 P ₁₀ = 2.2 Q ₁ = 3.1 Median = 4.6 Q ₃ = 6.9 P ₉₀ = 11.7 P ₉₉ = 21.0		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.7	9.5	10.2	7.1	8.1	Z	6.6	9.3	11.1	4.7	7.3	5.8	6.7	6.0	8.3	6.9	6.0	6.1	6.7	5.9	5.2	4.7	4.9	3.9	6.9	11.1
2-Jan	Z	5.8	4.3	4.7	3.0	3.4	3.5	3.0	3.9	2.8	4.0	9.2	6.4	3.5	3.4	4.8	5.1	6.5	4.8	5.4	4.7	7.3	11.7	8.5	5.2	11.7
3-Jan	4.6	Z	5.7	6.2	5.2	6.0	7.1	6.0	5.2	6.9	7.7	9.8	6.8	6.4	7.5	11.8	17.4	18.7	18.9	9.5	6.7	6.6	9.0	6.8	8.5	18.9
4-Jan	6.0	6.8	Z	4.5	8.8	7.1	10.0	15.3	18.0	16.6	20.1	6.4	6.7	12.1	11.6	15.4	8.6	9.0	6.4	5.6	4.8	5.1	4.7	4.7	9.3	20.1
5-Jan	3.4	4.3	3.6	Z	5.5	5.3	14.7	16.0	18.1	28.2	25.8	23.5	18.2	7.5	5.4	3.0	5.0	6.7	6.6	6.5	4.5	3.4	3.4	2.9	9.6	28.2
6-Jan	3.7	2.4	3.4	4.6	Z	3.8	2.4	2.8	2.8	4.2	5.6	4.0	7.9	11.8	5.4	5.6	7.7	9.5	7.3	6.2	7.4	6.4	5.5	6.3	5.5	11.8
7-Jan	5.0	6.1	7.4	6.7	9.8	Z	8.2	8.3	8.3	12.4	16.1	4.9	5.1	4.4	5.1	6.6	6.5	8.7	5.5	5.1	2.9	5.8	9.0	3.8	7.0	16.1
8-Jan	Z	7.4	10.6	20.4	18.8	16.5	18.5	19.3	20.0	19.6	19.9	17.9	25.1	23.7	14.2	17.3	24.7	9.3	16.1	16.4	19.2	17.3	13.7	13.5	17.4	25.1
9-Jan	14.2	Z	9.4	7.9	9.7	10.8	14.2	15.0	15.5	15.5	13.3	15.4	11.1	9.9	13.2	17.4	22.6	21.0	16.1	16.8	19.8	18.2	18.9	15.3	14.8	22.6
10-Jan	8.8	6.4	Z	5.8	5.7	8.6	8.4	9.4	10.5	8.8	6.3	7.6	8.8	10.3	10.6	15.2	15.6	18.1	6.8	2.2	1.6	1.4	1.2	0.9	7.8	18.1
11-Jan	1.0	1.0	1.0	Z	1.3	2.0	4.1	2.8	3.7	5.5	2.4	4.0	3.5	2.8	4.7	4.0	2.6	3.5	2.8	3.0	4.6	3.5	5.0	4.8	3.2	5.5
12-Jan	4.6	3.3	3.8	3.4	Z	4.2	3.6	2.8	3.0	3.6	3.5	5.2	3.5	6.6	6.6	5.6	6.2	5.9	4.9	4.3	3.5	4.9	5.5	4.3	4.5	6.6
13-Jan	4.3	4.4	3.6	3.2	3.5	Z	17.5	12.7	16.4	17.2	8.2	4.0	3.1	3.3	3.5	3.1	3.9	3.8	2.2	1.9	2.0	1.5	0.9	0.8	5.4	17.5
14-Jan	Z	1.1	1.1	1.2	1.3	2.0	2.8	2.8	3.5	3.8	4.4	3.8	3.2	3.5	4.5	5.0	11.7	20.8	14.7	4.4	6.6	7.2	6.3	6.0	5.3	20.8
15-Jan	5.1	Z	4.1	3.7	3.5	3.3	3.1	4.4	4.3	6.1	5.2	4.5	3.7	4.5	4.8	4.6	3.4	3.5	2.8	2.7	2.3	2.6	3.3	3.9	3.9	6.1
16-Jan	4.7	5.5	Z	9.8	10.8	11.5	7.7	4.3	3.6	2.5	2.4	2.2	2.5	3.1	2.6	1.7	2.8	4.5	3.6	5.3	5.8	5.6	3.8	2.3	4.7	11.5
17-Jan	2.6	2.5	2.6	Z	2.9	2.6	2.8	2.8	2.9	3.1	3.0	2.9	4.5	5.2	3.5	7.5	2.5	3.3	5.7	3.7	3.2	3.1	3.3	3.3	3.5	7.5
18-Jan	3.1	3.3	3.7	2.6	Z	2.3	2.8	4.3	4.2	3.1	3.5	2.8	2.8	4.8	3.5	5.3	4.0	3.5	5.2	7.5	9.2	7.7	7.6	10.8	4.7	10.8
19-Jan	5.7	5.2	3.5	3.6	4.3	Z	4.8	5.6	7.1	5.1	5.2	3.8	3.4	3.8	3.7	10.1	7.1	8.9	6.8	5.2	4.9	5.2	4.7	4.1	5.3	10.1
20-Jan	Z	3.3	3.2	2.9	2.4	2.5	3.1	2.4	3.0	2.3	1.9	1.7	2.9	2.3	1.8	3.4	2.6	3.5	4.0	2.9	2.4	2.4	2.5	2.3	2.7	4.0
21-Jan	1.9	Z	2.9	4.7	4.9	4.1	3.5	4.2	5.0	3.6	5.6	9.4	9.4	7.3	5.4	4.1	3.3	3.6	4.1	3.4	2.9	3.0	1.4	2.1	4.3	9.4
22-Jan	1.5	2.3	Z	4.8	5.7	5.0	5.4	6.5	7.5	7.8	6.5	5.2	13.9	15.9	5.6	3.9	3.8	4.3	3.0	2.8	4.6	0.5	5.0	4.3	5.5	15.9
23-Jan	3.9	6.4	6.4	Z	6.2	6.7	3.3	3.1	2.4	3.3	4.2	3.5	2.4	4.6	3.2	4.2	6.6	5.5	3.3	2.1	1.9	2.7	1.4	1.0	3.8	6.7
24-Jan	1.7	1.8	2.8	3.1	Z	3.6	3.4	2.9	2.8	2.8	3.2	C	C	C	C	C	C	5.0	2.9	1.4	6.1	4.2	2.4	2.8	--	6.1
25-Jan	3.1	3.9	4.9	5.2	2.1	Z	7.4	7.5	8.4	10.1	3.6	2.9	4.1	6.3	2.9	5.6	9.3	6.9	3.0	2.8	3.7	3.4	3.1	1.8	4.9	10.1
26-Jan	Z	2.3	3.0	1.9	3.4	3.8	9.5	14.6	6.6	5.4	5.3	5.7	5.9	5.7	6.4	3.8	1.8	2.5	3.7	1.8	3.8	3.8	1.2	1.1	4.5	14.6
27-Jan	0.4	Z	0.2	0.2	0.2	0.1	0.8	1.4	1.6	1.1	1.4	1.4	3.1	3.2	2.4	2.6	5.5	6.6	11.6	9.1	8.5	8.9	6.0	3.2	3.5	11.6
28-Jan	3.0	2.5	Z	9.6	6.2	7.7	6.3	8.2	9.1	7.7	7.8	5.3	8.2	5.0	8.0	6.0	2.2	1.7	3.3	2.9	4.9	3.9	5.9	5.6	5.7	9.6
29-Jan	4.6	0.8	2.2	Z	6.0	6.0	10.2	8.6	4.9	3.1	3.2	2.0	4.0	3.7	2.5	5.8	5.1	2.6	2.7	3.0	2.9	3.4	10.7	5.3	4.5	10.7
30-Jan	4.9	3.2	1.6	1.6	Z	2.7	2.7	6.2	7.5	5.3	2.9	3.9	1.8	1.8	1.9	1.9	2.4	5.9	7.6	2.8	2.5	1.8	4.6	3.2	3.5	7.6
31-Jan	3.3	4.8	3.3	1.8	1.6	Z	2.2	2.6	4.3	2.2	4.5	4.2	3.6	2.4	2.6	3.2	4.1	11.0	10.3	10.9	14.6	16.7	6.5	5.7	5.5	16.7

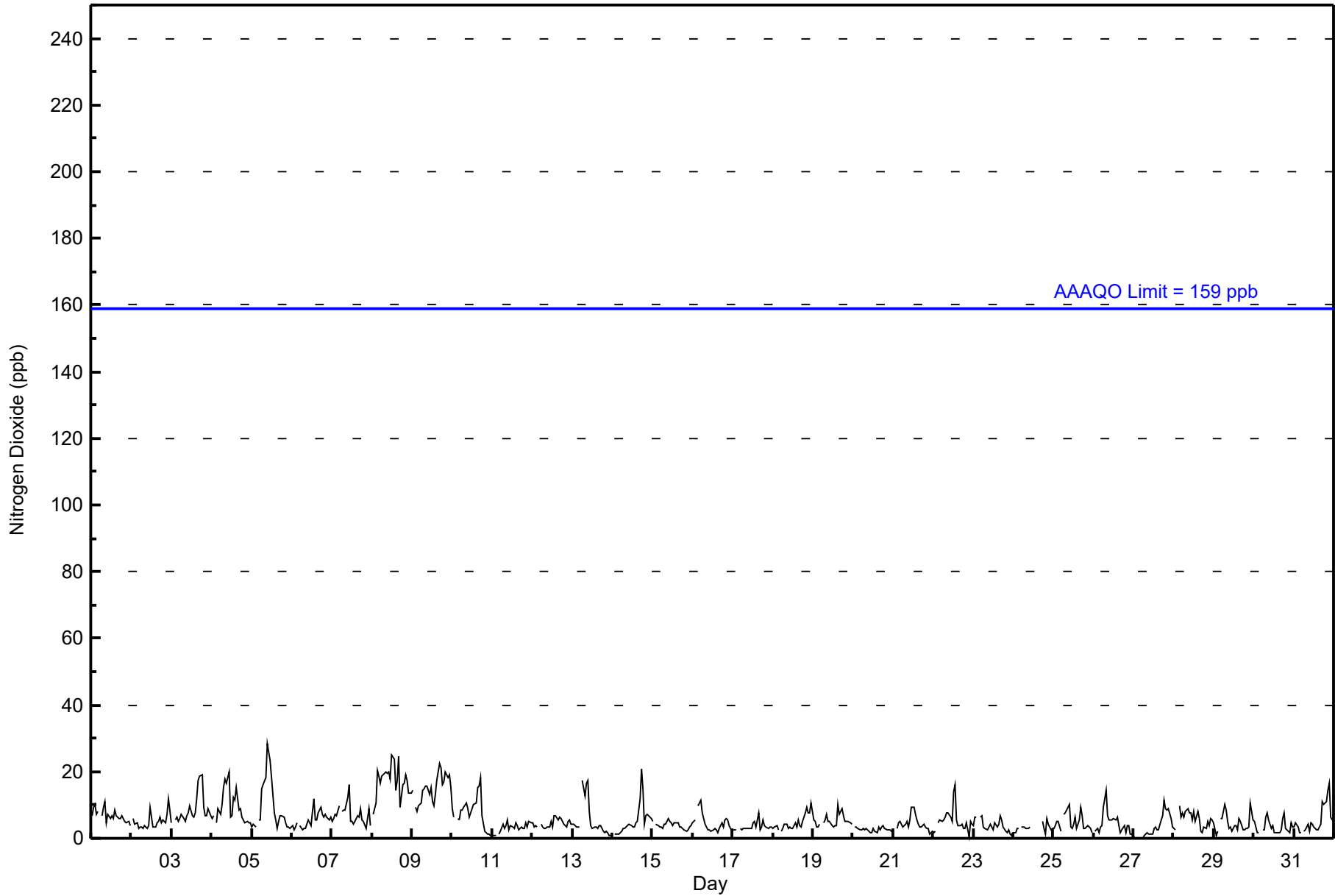
4.3	4.1	4.2	5.0	5.4	5.3	6.5	6.9	7.3	7.2	6.9	6.1	6.4	6.4	5.5	6.5	7.0	7.4	6.6	5.3	5.7	5.6	5.6	4.7	Diurnal Average	
14.2	9.5	10.6	20.4	18.8	16.5	18.5	19.3	20.0	28.2	25.8	23.5	25.1	23.7	14.2	17.4	24.7	21.0	18.9	16.8	19.8	18.2	18.9	15.3	Diurnal Maximum	

Z - zerospan C - Calibration
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	98.73	98.73
21 - 40	9	1.27	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	22	25	18	18	14	30	41	78	149	83	76	16	19	45	22	663
21 - 40	0	0	1	4	1	0	1	0	0	0	1	0	1	0	0	0	9
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	22	26	22	19	14	31	41	78	149	84	76	17	19	45	22	672

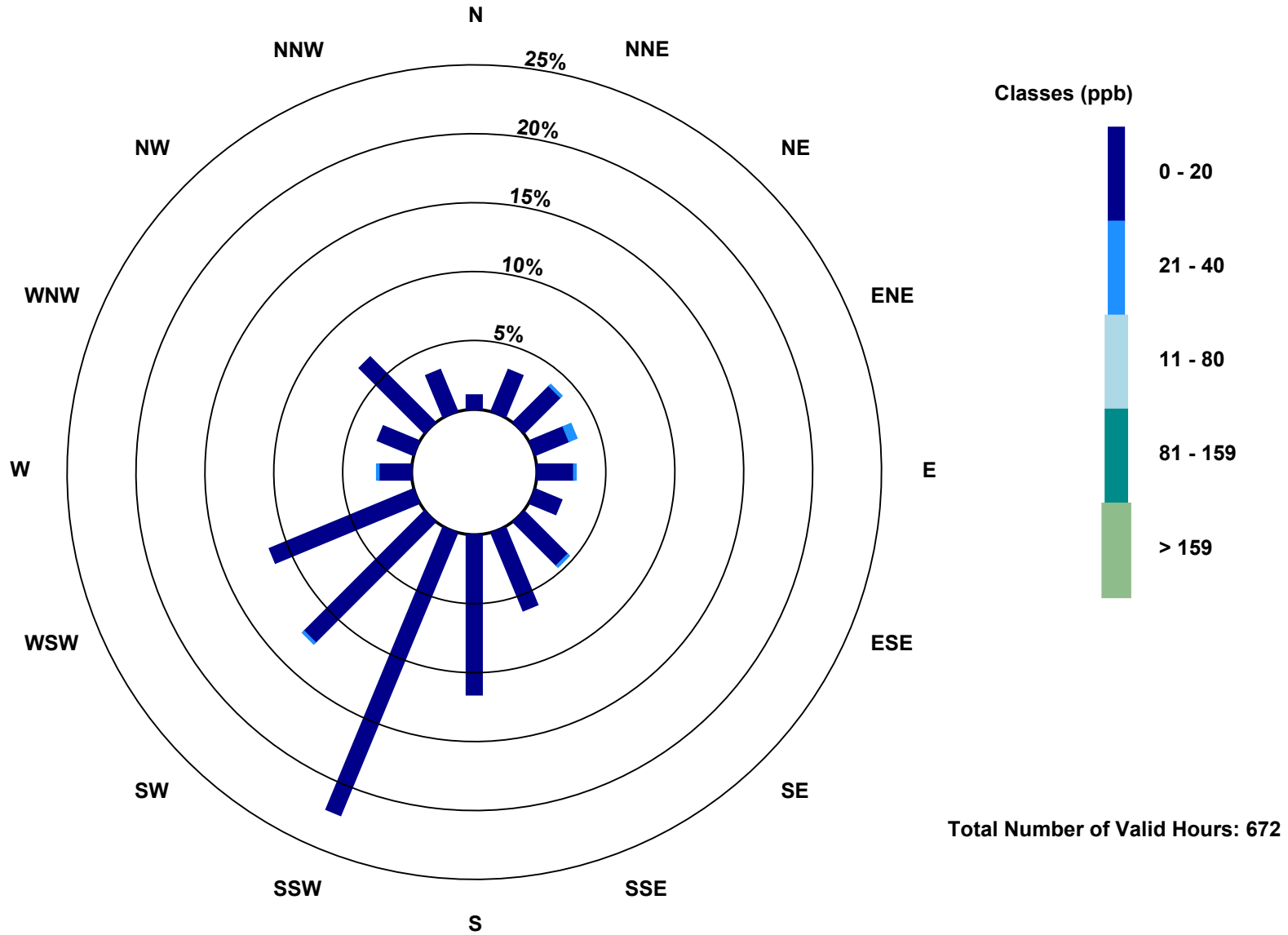
Total Number of Valid Hours: 672

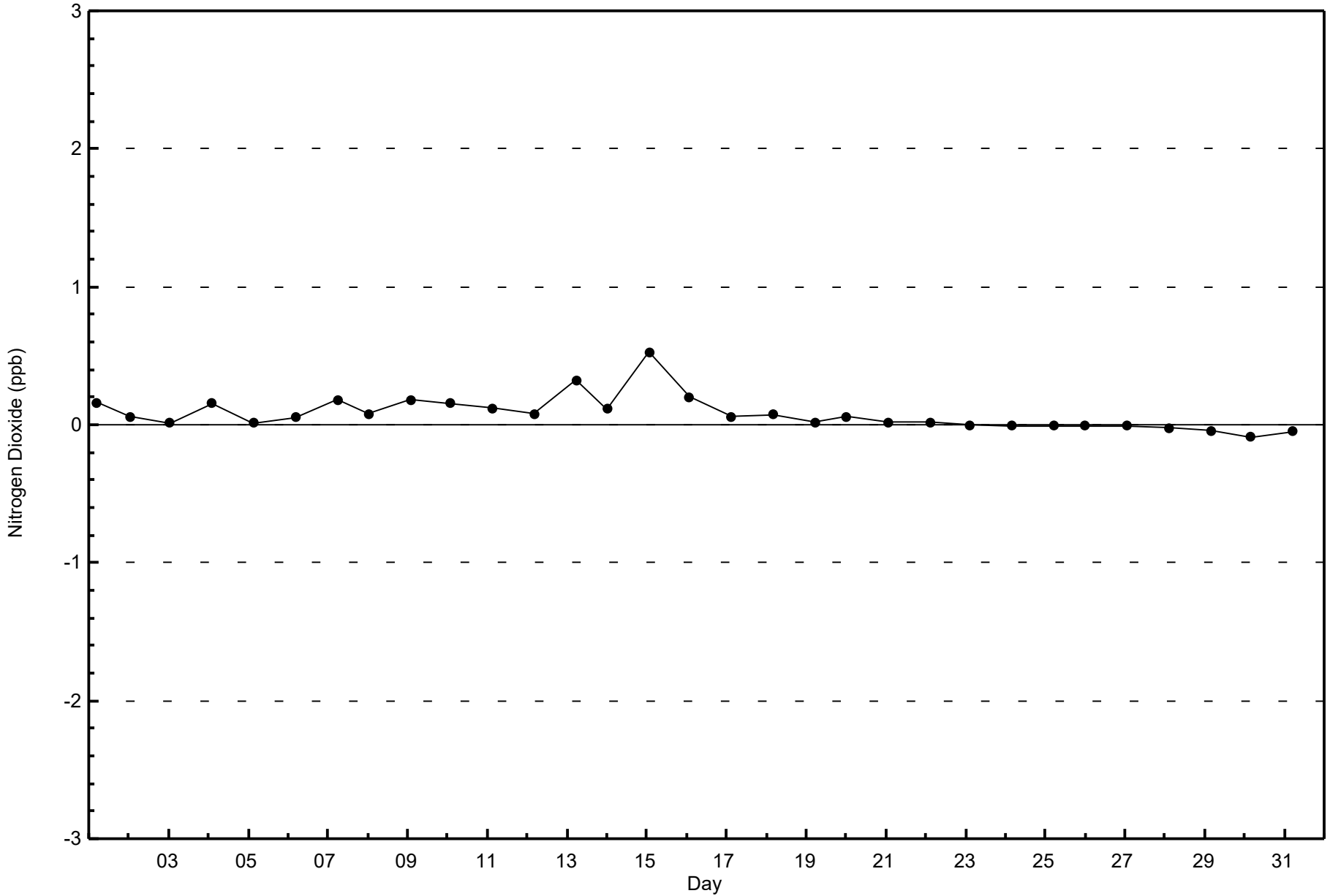
Total Number of Hours: 744

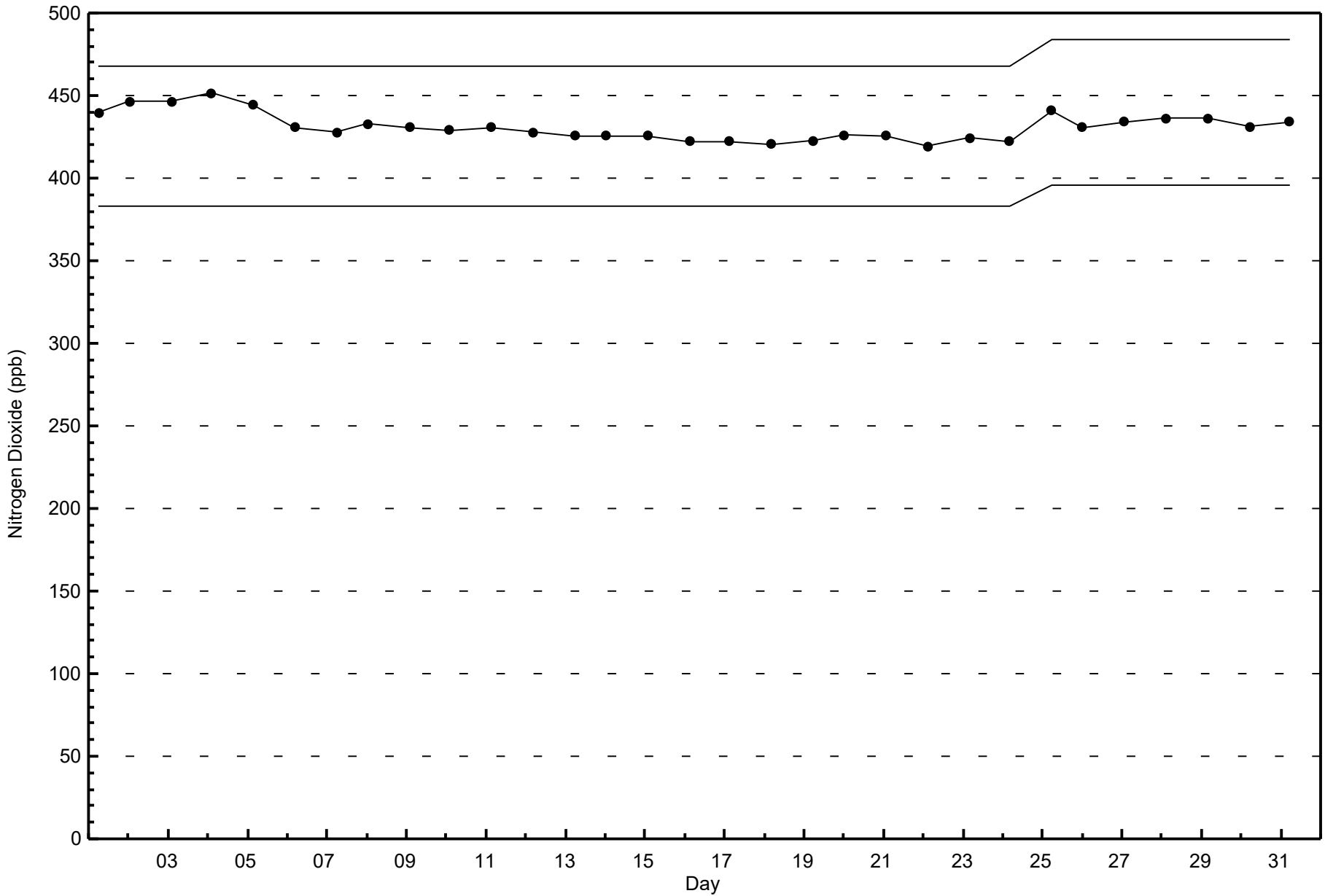


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

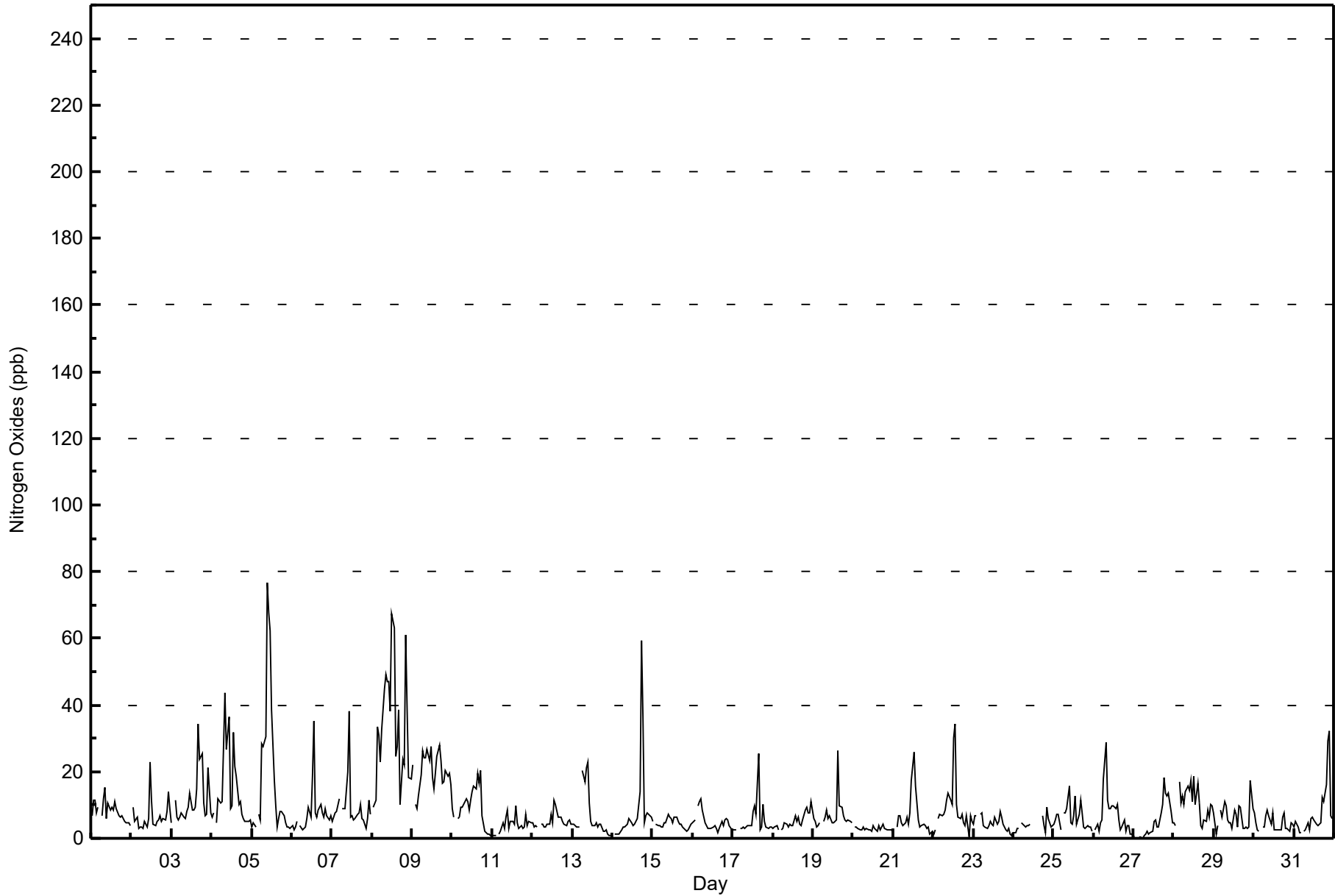
Nitrogen Oxides (NO_x) - ppb
Christina Lake - January 2023

Maximum Value: 76.8 ppb on Jan 5 10:00 Maximum Daily Average: 34.0 ppb on Jan 8																				Hours in Service: 744 Hours of Data: 707						
Minimum Value: 0.1 ppb on Jan 27 06:00 Minimum Daily Average: 2.9 ppb on Jan 20 Maximum Diurnal Average: 12.3 ppb at hour 14 Minimum Diurnal Average: 4.6 ppb at hour 2 Monthly Average: 8.58 ppb Percentiles: P ₁ = 0.9 P ₁₀ = 2.5 Q ₁ = 3.5 Median = 5.5 Q ₃ = 9.3 P ₉₀ = 18.6 P ₉₉ = 49.2																				Hours of Missing Data: 37 Hours of Calibration: 37 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.8	11.6	11.3	7.5	9.4	Z	6.7	12.0	15.4	5.8	10.4	8.3	9.3	8.5	11.2	9.0	7.0	6.5	6.8	6.0	5.3	4.7	4.9	4.0	8.2	15.4
2-Jan	Z	9.3	5.2	6.2	3.0	3.4	3.6	3.2	5.2	3.4	5.8	22.9	11.4	4.1	3.9	5.2	5.3	6.9	5.2	5.8	5.5	8.0	13.8	8.9	6.8	22.9
3-Jan	4.6	Z	11.6	6.5	5.5	6.4	7.6	6.5	5.8	8.1	9.4	13.4	8.6	8.3	9.4	14.9	34.5	23.7	25.2	10.5	6.8	7.3	21.3	7.6	11.5	34.5
4-Jan	6.3	7.4	Z	4.6	11.9	10.7	10.8	27.2	43.7	26.8	36.5	9.1	9.7	31.9	21.6	18.6	10.0	10.9	7.2	6.1	5.3	5.3	5.3	5.5	14.5	43.7
5-Jan	3.4	4.6	3.6	Z	7.0	5.7	28.3	27.5	30.3	76.8	67.7	62.4	38.6	17.2	9.8	3.5	6.0	8.1	8.1	6.6	4.6	3.5	3.4	2.9	18.7	76.8
6-Jan	3.9	2.4	3.4	5.0	Z	4.0	2.7	3.0	3.3	5.9	9.2	6.2	18.6	35.3	7.5	6.5	8.3	10.2	7.5	6.4	8.7	6.6	5.5	6.7	7.7	35.3
7-Jan	5.0	6.2	7.5	8.1	12.0	Z	8.8	8.9	9.1	19.8	38.2	6.2	6.8	5.5	6.0	7.4	7.4	10.1	5.8	5.4	2.9	6.1	11.5	7.3	9.2	38.2
8-Jan	Z	9.1	11.5	33.5	30.9	23.1	32.7	45.1	49.3	47.2	47.1	38.1	67.5	63.1	24.4	27.5	38.8	10.2	23.9	22.1	60.9	39.0	18.3	17.8	34.0	67.5
9-Jan	22.1	Z	10.0	8.9	12.5	19.0	26.5	24.2	24.3	26.8	23.4	27.5	18.0	15.0	19.5	24.4	27.8	23.3	16.5	17.0	20.5	18.6	19.6	16.0	20.1	27.8
10-Jan	8.9	6.5	Z	5.9	6.2	9.2	9.5	10.2	12.0	11.1	8.6	11.6	14.1	15.8	14.8	19.4	16.5	20.4	7.0	2.2	1.6	1.4	1.2	0.9	9.3	20.4
11-Jan	1.0	1.0	1.0	Z	1.3	2.2	4.8	3.0	6.4	8.5	3.0	5.2	5.1	4.0	9.7	4.8	3.1	4.0	2.9	3.5	7.1	3.7	5.2	4.8	4.1	9.7
12-Jan	4.6	3.3	3.9	3.5	Z	4.4	4.1	3.3	3.5	4.0	4.2	7.3	4.6	11.3	10.2	6.3	6.5	6.4	5.3	4.4	3.6	5.0	5.5	4.3	5.2	11.3
13-Jan	4.3	4.4	3.6	3.2	3.5	Z	20.4	17.2	21.3	23.0	10.5	5.1	3.8	3.9	4.6	3.5	4.2	4.4	2.3	2.0	2.3	1.5	0.9	0.8	6.5	23.0
14-Jan	Z	1.2	1.1	1.2	1.3	2.4	3.3	3.3	3.6	4.3	5.9	4.5	3.8	4.1	5.1	5.8	13.9	59.4	36.3	4.5	7.0	7.8	6.9	6.4	8.4	59.4
15-Jan	5.2	Z	4.4	3.8	3.6	3.4	3.3	4.6	4.5	7.1	6.2	5.8	4.9	6.3	6.2	5.3	4.1	4.2	3.3	3.1	2.3	2.7	3.3	4.1	4.4	7.1
16-Jan	4.7	5.5	Z	9.9	11.1	12.0	8.6	4.5	3.9	3.1	3.0	2.9	3.3	3.8	3.1	1.9	2.9	4.9	3.8	5.4	5.8	5.7	3.9	2.4	5.0	12.0
17-Jan	2.7	2.6	2.6	Z	3.1	2.8	3.2	2.9	3.2	3.8	3.7	3.9	8.1	9.9	7.2	25.6	2.6	3.5	10.0	4.9	3.3	3.1	3.3	3.3	5.2	25.6
18-Jan	3.1	3.3	3.9	2.7	Z	2.5	3.1	4.5	4.3	3.5	4.3	3.9	3.9	6.8	5.3	6.5	4.3	3.7	5.4	8.3	9.4	7.8	7.7	11.0	5.2	11.0
19-Jan	5.8	5.3	3.5	4.0	4.5	Z	5.0	6.1	8.3	5.8	6.7	4.9	4.7	5.3	5.4	26.2	9.8	9.1	7.0	5.5	5.0	5.3	4.9	4.8	6.6	26.2
20-Jan	Z	3.3	3.3	3.0	2.4	2.6	3.2	2.5	3.1	2.5	2.4	2.2	3.9	3.0	2.3	3.8	2.7	3.6	4.4	3.0	2.4	2.4	2.5	2.3	2.9	4.4
21-Jan	1.9	Z	3.4	6.6	6.6	4.8	4.0	4.8	6.4	4.1	7.8	17.4	25.9	15.5	10.5	5.4	3.6	3.9	4.4	3.9	3.0	3.2	1.4	2.2	6.6	25.9
22-Jan	1.5	2.4	Z	5.9	7.2	6.6	7.2	8.6	11.7	13.7	11.3	10.0	29.9	34.4	10.0	6.3	5.9	7.0	4.5	4.0	6.7	0.6	6.7	5.0	9.0	34.4
23-Jan	4.1	6.6	6.8	Z	7.3	7.7	3.7	3.3	2.9	4.0	5.0	4.2	3.9	6.3	4.1	5.1	8.1	6.3	4.4	2.6	2.0	2.9	1.4	1.0	4.5	8.1
24-Jan	1.7	1.8	2.9	3.1	Z	4.8	3.9	3.6	3.6	3.8	4.4	C	C	C	C	C	C	6.8	4.0	1.9	9.2	6.0	3.3	3.9	--	9.2
25-Jan	4.3	5.5	7.1	7.3	2.4	Z	7.8	7.7	9.0	15.7	4.9	4.4	6.7	12.6	4.2	7.3	11.4	7.6	3.3	2.9	3.9	3.5	3.2	1.9	6.3	15.7
26-Jan	Z	2.5	4.1	2.0	4.8	5.6	17.6	28.6	11.2	9.1	8.9	9.5	9.9	9.0	10.3	5.6	2.4	3.6	5.5	2.2	3.8	3.8	1.3	1.2	7.1	28.6
27-Jan	0.4	Z	0.2	0.2	0.2	0.1	0.9	1.5	2.1	1.3	1.7	1.9	5.0	5.6	3.6	3.4	7.6	10.2	18.3	13.7	12.9	13.7	8.3	4.7	5.1	18.3
28-Jan	4.8	3.6	Z	17.0	10.6	12.9	10.2	14.1	15.8	14.4	17.4	10.9	18.7	10.2	16.4	10.7	3.9	2.9	5.6	5.0	8.3	6.5	10.0	9.6	10.4	18.7
29-Jan	7.5	1.1	3.7	Z	8.3	6.4	11.2	9.6	5.5	4.7	4.6	3.0	8.4	7.2	3.4	9.8	9.4	3.1	2.8	3.2	3.0	3.5	17.5	8.8	6.3	17.5
30-Jan	7.7	4.7	2.4	2.2	Z	3.5	3.2	6.8	8.5	6.7	4.1	7.4	2.6	2.5	2.4	2.3	2.6	6.2	7.7	2.9	2.8	1.9	4.8	4.4	4.4	8.5
31-Jan	3.3	5.0	3.5	1.9	1.8	Z	2.2	2.7	4.8	2.5	5.8	6.2	5.7	4.1	3.9	4.1	4.5	12.1	11.2	16.0	29.3	32.2	6.8	5.8	7.6	32.2
5.0 4.6 4.8 6.3 6.9 6.6 8.6 10.0 11.0 12.2 12.3 10.9 12.2 12.3 8.5 9.5 9.2 9.8 8.6 6.2 8.2 7.2 6.9 5.5																								Diurnal Average		
22.1 11.6 11.6 33.5 30.9 23.1 32.7 45.1 49.3 76.8 67.7 62.4 67.5 63.1 24.4 27.5 38.8 59.4 36.3 22.1 60.9 39.0 21.3 17.8																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	647	91.51	91.51
21 - 40	48	6.79	98.30
41 - 80	12	1.70	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	7	22	23	14	16	13	29	36	74	137	69	73	16	18	43	22	612
21 - 40	0	0	2	5	2	0	1	5	3	11	13	2	1	1	2	0	48
11 - 80	0	0	1	3	1	1	1	0	1	1	2	1	0	0	0	0	12
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	22	26	22	19	14	31	41	78	149	84	76	17	19	45	22	672

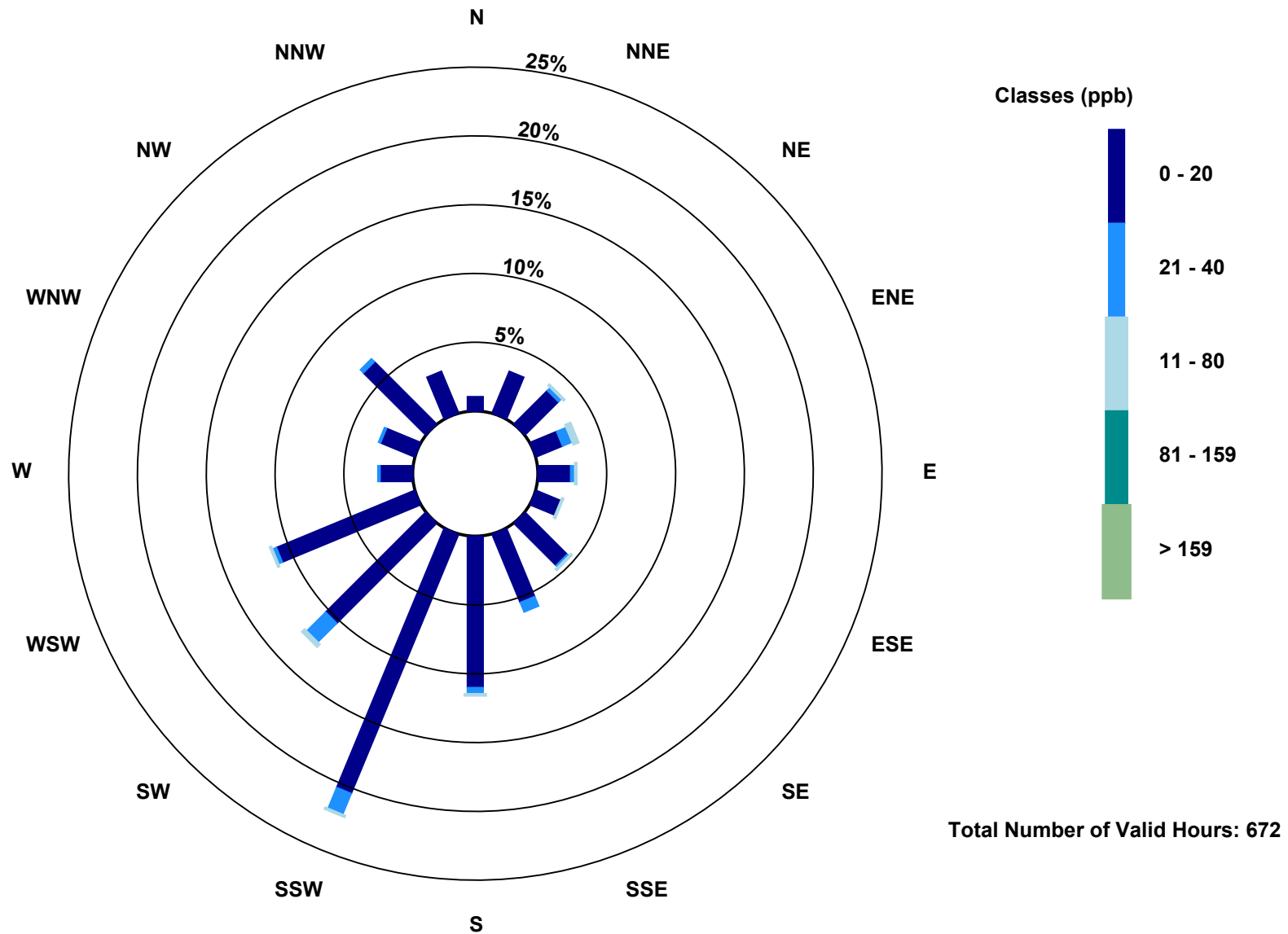
Total Number of Valid Hours: 672

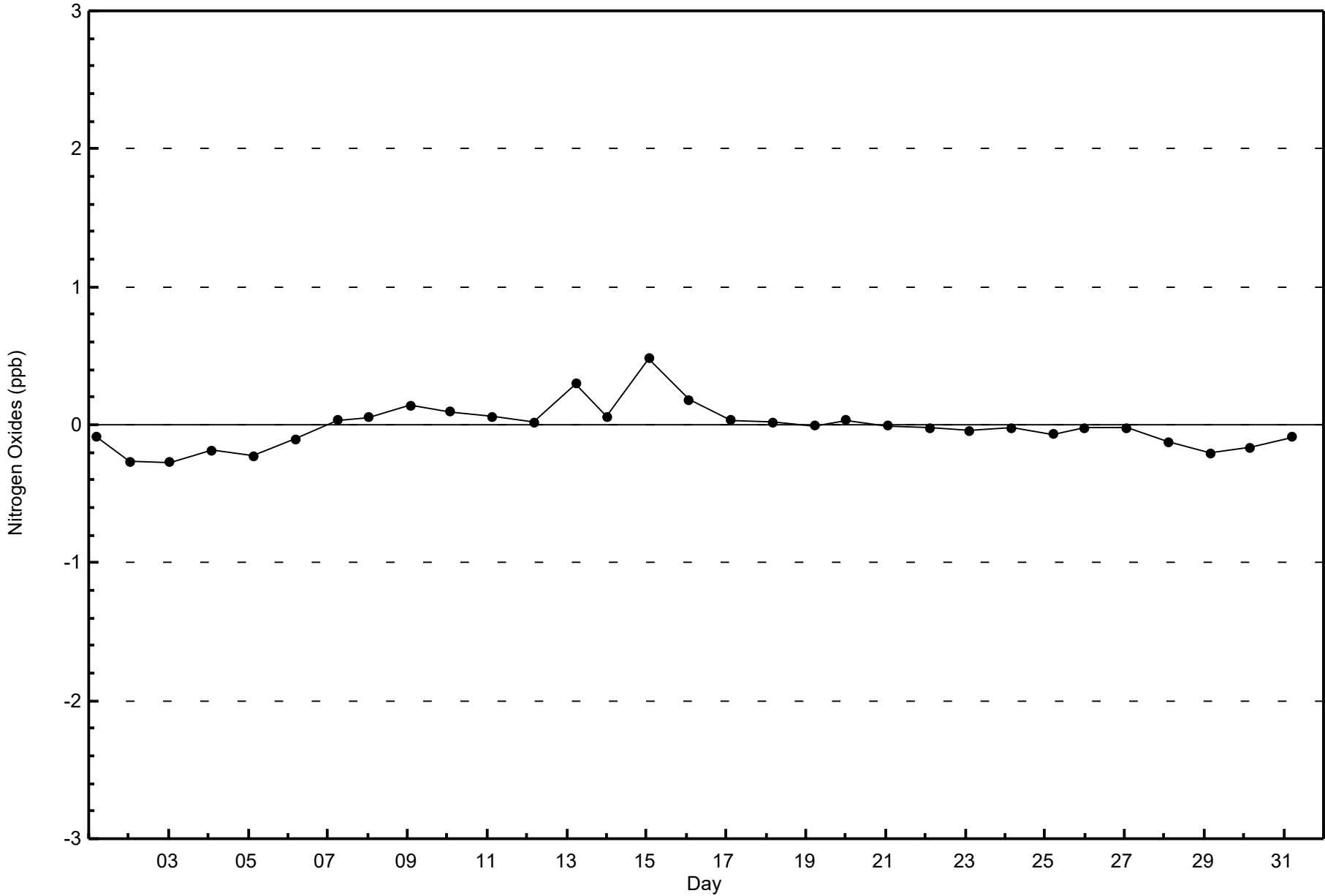
Total Number of Hours: 744

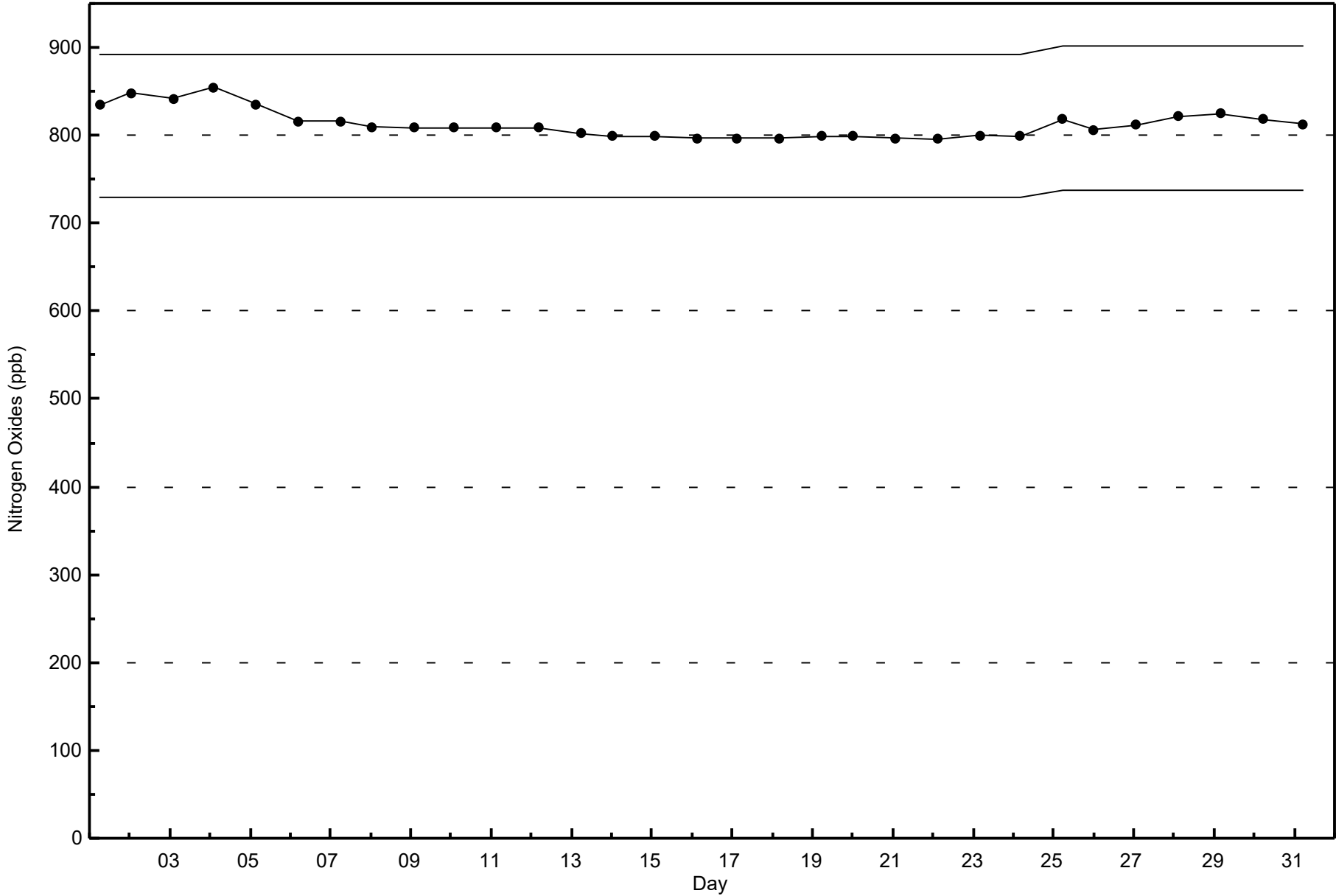


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Christina Lake









Wood Buffalo Environmental Association
Summary of Hour Averages

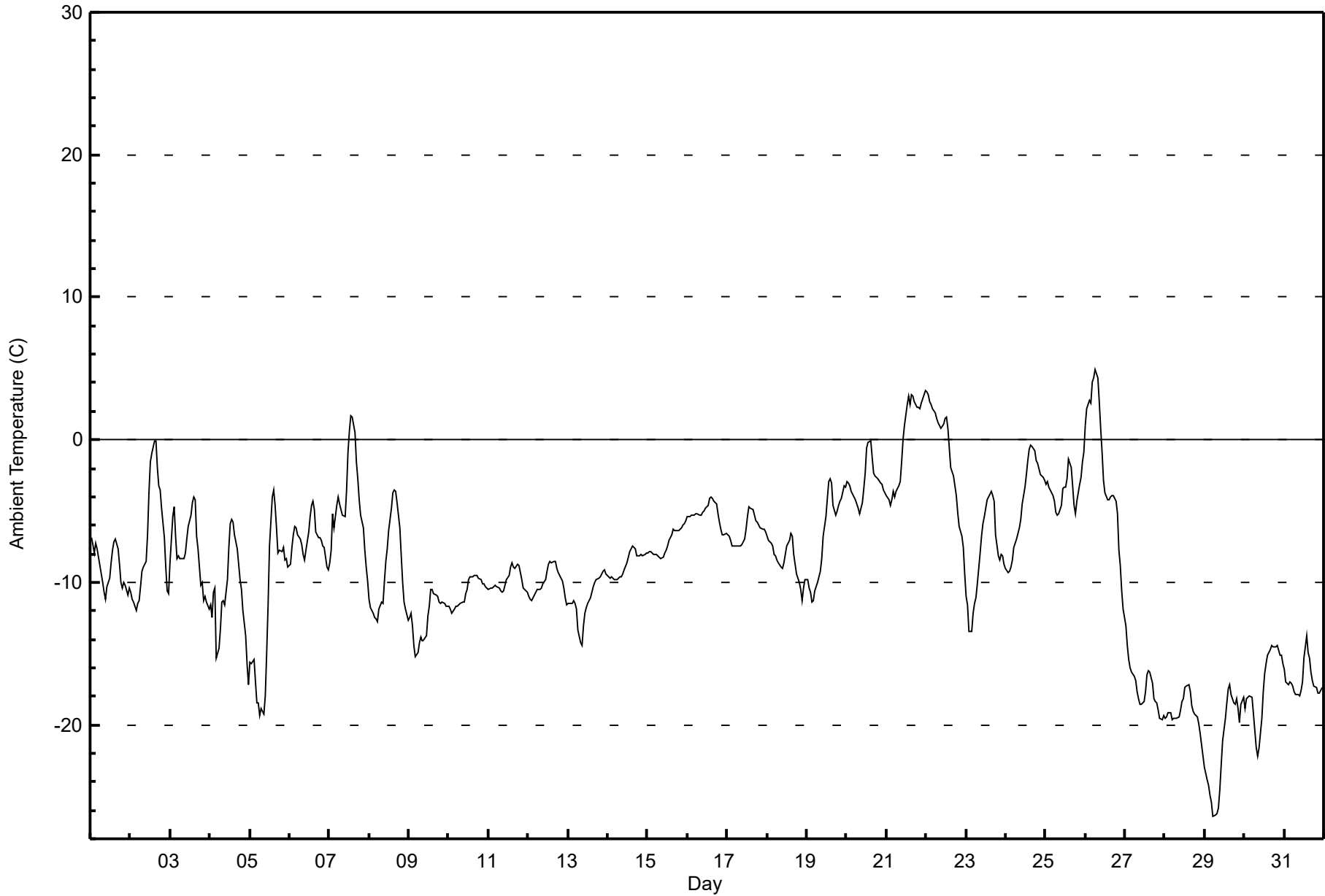
Ambient Temperature (AT) - C
Christina Lake - January 2023

Maximum Value: 4.9 C on Jan 26 07:00 Maximum Daily Average: -0.1 C on Jan 21																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: -26.4 C on Jan 29 06:00 Minimum Daily Average: -21.5 C on Jan 29 Maximum Diurnal Average: -6.3 C at hour 15 Minimum Diurnal Average: -10.3 C at hour 9 Monthly Average: -8.96 C Percentiles: P ₁ = -24.1 P ₁₀ = -17.7 Q ₁ = -11.6 Median = -8.6 Q ₃ = -5.1 P ₉₀ = -2.6 P ₉₉ = 3.1																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-6.8	-7.4	-7.9	-7.2	-7.7	-8.9	-9.4	-10.0	-10.7	-11.2	-10.3	-9.7	-8.7	-7.7	-7.2	-6.9	-7.7	-8.8	-10.0	-10.4	-10.0	-10.2	-10.9	-10.4	-9.0	-6.8
2-Jan	-10.7	-11.1	-11.4	-11.9	-11.4	-11.3	-10.3	-9.3	-8.9	-8.5	-6.6	-3.7	-1.6	-1.0	-0.1	-0.1	-2.0	-3.2	-3.5	-4.8	-6.8	-9.0	-10.6	-10.8	-7.0	-0.1
3-Jan	-8.6	-5.4	-4.7	-6.8	-8.3	-8.2	-8.3	-8.4	-8.3	-8.0	-7.0	-6.1	-5.3	-4.4	-4.0	-4.2	-6.8	-7.6	-10.2	-10.1	-11.3	-11.0	-11.4	-11.9	-7.8	-4.0
4-Jan	-11.6	-12.4	-10.7	-10.4	-15.4	-14.6	-13.3	-11.4	-11.3	-11.6	-9.8	-7.6	-5.9	-5.6	-5.7	-6.6	-7.6	-8.7	-9.8	-10.5	-12.0	-13.7	-15.7	-17.2	-10.8	-5.6
5-Jan	-15.6	-15.7	-15.4	-17.0	-18.5	-19.3	-18.9	-19.3	-18.0	-14.9	-11.6	-7.4	-4.1	-3.5	-4.6	-6.1	-8.0	-7.7	-7.8	-7.5	-8.4	-8.3	-8.9	-11.9	-3.5	
6-Jan	-8.8	-7.6	-6.7	-6.1	-6.2	-6.6	-6.9	-7.4	-8.1	-8.4	-7.8	-6.4	-5.4	-4.6	-4.3	-4.9	-6.5	-6.9	-6.9	-7.1	-7.4	-7.6	-9.0	-9.1	-6.9	-4.3
7-Jan	-8.6	-7.7	-5.2	-6.1	-4.6	-4.0	-4.5	-4.9	-5.3	-5.4	-3.5	-0.9	0.6	1.7	1.6	0.5	-1.6	-2.7	-4.2	-5.3	-6.2	-7.8	-9.0	-9.9	-4.3	1.7
8-Jan	-11.2	-11.8	-12.1	-12.4	-12.6	-12.8	-11.9	-11.3	-11.5	-9.9	-8.5	-7.7	-6.4	-4.8	-3.7	-3.6	-3.6	-4.4	-6.2	-8.1	-10.0	-11.4	-11.9	-12.7	-9.2	-3.6
9-Jan	-12.5	-12.1	-13.0	-14.5	-15.3	-14.9	-14.3	-13.9	-14.1	-14.1	-13.7	-12.4	-11.7	-10.5	-10.5	-10.8	-10.9	-11.0	-11.3	-11.5	-11.4	-11.5	-11.6	-11.7	-12.5	-10.5
10-Jan	-11.7	-11.9	-12.1	-11.9	-11.7	-11.7	-11.6	-11.5	-11.3	-11.3	-10.8	-10.5	-9.8	-9.6	-9.6	-9.5	-9.6	-9.5	-9.7	-9.9	-10.1	-10.1	-10.3	-10.4	-10.7	-9.5
11-Jan	-10.5	-10.4	-10.4	-10.3	-10.2	-10.3	-10.4	-10.6	-10.7	-10.6	-10.2	-9.8	-9.5	-8.9	-8.6	-8.9	-9.0	-8.7	-8.8	-9.3	-9.9	-10.4	-10.5	-10.7	-9.9	-8.6
12-Jan	-11.0	-11.2	-11.3	-11.1	-10.7	-10.5	-10.5	-10.5	-10.4	-10.1	-9.8	-9.3	-8.7	-8.5	-8.6	-8.6	-8.6	-9.0	-9.3	-9.5	-9.9	-10.4	-11.1	-11.6	-10.0	-8.5
13-Jan	-11.5	-11.5	-11.5	-11.3	-11.5	-11.9	-13.4	-14.3	-14.4	-13.1	-12.2	-11.8	-11.5	-11.1	-10.7	-10.3	-10.0	-9.8	-9.7	-9.6	-9.4	-9.2	-9.1	-9.4	-11.2	-9.1
14-Jan	-9.6	-9.7	-9.6	-9.7	-9.8	-9.8	-9.8	-9.6	-9.6	-9.5	-9.1	-8.7	-8.3	-7.9	-7.6	-7.5	-7.7	-8.1	-8.2	-8.1	-8.0	-8.2	-8.1	-8.0	-8.8	-7.5
15-Jan	-7.9	-7.8	-7.9	-8.0	-8.0	-8.0	-8.1	-8.3	-8.3	-8.2	-7.9	-7.7	-7.5	-7.1	-6.7	-6.3	-6.4	-6.4	-6.4	-6.3	-6.2	-6.0	-5.9	-5.7	-7.2	-5.7
16-Jan	-5.4	-5.4	-5.3	-5.3	-5.3	-5.2	-5.2	-5.3	-5.3	-5.1	-5.0	-4.8	-4.6	-4.1	-4.0	-4.1	-4.3	-4.6	-5.2	-5.8	-6.3	-6.7	-6.7	-6.6	-5.2	-4.0
17-Jan	-6.6	-6.8	-7.1	-7.4	-7.5	-7.5	-7.5	-7.4	-7.4	-7.3	-6.9	-6.3	-5.4	-4.7	-4.8	-4.9	-5.3	-5.7	-5.8	-5.9	-6.1	-6.3	-6.3	-6.5	-6.4	-4.7
18-Jan	-6.8	-7.1	-7.3	-7.5	-8.0	-8.1	-8.4	-8.7	-8.9	-9.0	-8.7	-8.1	-7.4	-7.1	-6.6	-6.8	-8.1	-8.7	-9.4	-10.0	-10.5	-11.2	-10.4	-9.8	-8.4	-6.6
19-Jan	-9.9	-10.4	-10.7	-11.4	-11.3	-10.6	-10.0	-9.6	-9.2	-8.4	-6.7	-5.4	-4.1	-2.9	-2.7	-3.0	-4.6	-5.3	-4.9	-4.6	-4.3	-4.1	-3.3	-3.3	-6.7	-2.7
20-Jan	-2.9	-3.1	-3.2	-3.7	-4.0	-4.3	-4.5	-4.8	-5.2	-4.4	-3.4	-2.4	-0.6	-0.2	-0.1	-1.3	-2.3	-2.5	-2.6	-2.8	-3.0	-3.2	-3.5	-3.7	-3.0	-0.1
21-Jan	-3.9	-4.2	-4.6	-4.3	-3.6	-4.0	-3.7	-3.2	-3.0	-1.6	0.0	1.0	2.4	3.1	2.5	3.2	3.0	2.7	2.3	2.2	2.2	2.6	2.8	3.4	-0.1	3.4
22-Jan	3.4	3.1	2.7	2.5	2.2	1.9	1.5	1.2	1.0	0.8	1.1	1.5	1.6	0.8	-0.5	-1.9	-2.5	-3.2	-3.9	-5.1	-6.0	-6.7	-7.5	-9.4	-0.9	3.4
23-Jan	-11.0	-11.6	-13.5	-13.4	-12.2	-11.5	-11.1	-10.1	-8.0	-6.7	-5.9	-5.4	-4.8	-4.3	-3.8	-3.7	-3.9	-4.3	-6.7	-8.2	-8.4	-8.0	-8.2	-8.7	-8.0	-3.7
24-Jan	-9.0	-9.3	-9.2	-9.0	-8.4	-7.6	-7.0	-6.6	-6.2	-5.5	-4.5	-3.3	-2.4	-1.4	-0.7	-0.3	-0.5	-0.8	-1.4	-1.6	-2.1	-2.4	-2.6	-2.8	-4.4	-0.3
25-Jan	-3.1	-3.0	-3.4	-3.5	-3.9	-4.3	-5.1	-5.3	-5.2	-4.6	-3.5	-3.4	-3.3	-2.7	-1.3	-1.9	-3.2	-4.6	-5.2	-4.3	-3.2	-2.6	-1.5	-0.8	-3.5	-0.8
26-Jan	1.0	2.1	2.8	2.5	4.0	4.4	4.9	4.3	2.7	0.8	-0.8	-2.8	-3.7	-4.2	-4.2	-4.0	-3.9	-4.0	-4.3	-5.2	-7.7	-8.8	-10.6	-11.8	-1.9	4.9
27-Jan	-13.1	-14.5	-15.4	-16.0	-16.3	-16.6	-16.9	-17.7	-18.2	-18.6	-18.6	-18.4	-17.6	-16.5	-16.2	-16.3	-17.1	-18.2	-18.4	-18.5	-18.9	-19.5	-19.6	-19.4	-17.4	-13.1
28-Jan	-19.5	-19.4	-19.1	-19.2	-19.7	-19.6	-19.6	-19.5	-19.4	-19.0	-18.3	-18.1	-17.4	-17.3	-17.2	-17.7	-18.6	-19.1	-19.2	-19.4	-19.9	-20.6	-21.4	-22.2	-19.2	-17.2
29-Jan	-23.0	-23.9	-24.3	-25.0	-25.4	-26.4	-26.4	-26.3	-25.8	-24.6	-22.8	-21.1	-19.6	-18.5	-17.5	-17.1	-17.9	-18.5	-18.6	-18.2	-18.9	-19.9	-18.6	-18.1	-21.5	-17.1
30-Jan	-18.9	-18.2	-18.0	-18.0	-18.1	-19.2	-20.5	-21.6	-22.2	-21.7	-19.5	-17.7	-16.4	-15.7	-15.1	-14.7	-14.5	-14.5	-14.5	-14.5	-14.4	-15.1	-15.1	-15.7	-17.2	-14.4
31-Jan	-16.2	-17.0	-17.2	-17.0	-17.1	-17.3	-17.6	-17.9	-17.9	-18.0	-17.6	-16.9	-15.3	-13.7	-14.9	-15.3	-16.3	-16.9	-17.3	-17.4	-17.8	-17.8	-17.6	-17.4	-16.9	-13.7
	-9.7	-9.7	-9.8	-10.0	-10.2	-10.3	-10.3	-10.3	-10.3	-10.0	-9.1	-8.2	-7.3	-6.6	-6.3	-6.5	-7.2	-7.8	-8.3	-8.6	-9.1	-9.5	-9.8	-10.0	Diurnal Average	
	3.4	3.1	2.8	2.5	4.0	4.4	4.9	4.3	2.7	0.8	1.1	1.5	2.4	3.1	2.5	3.2	3.0	2.7	2.3	2.2	2.2	2.6	2.8	3.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Christina Lake - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Christina Lake - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	19	2.55	2.55
-20 - 0	683	91.80	94.35
0 - 10	42	5.65	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

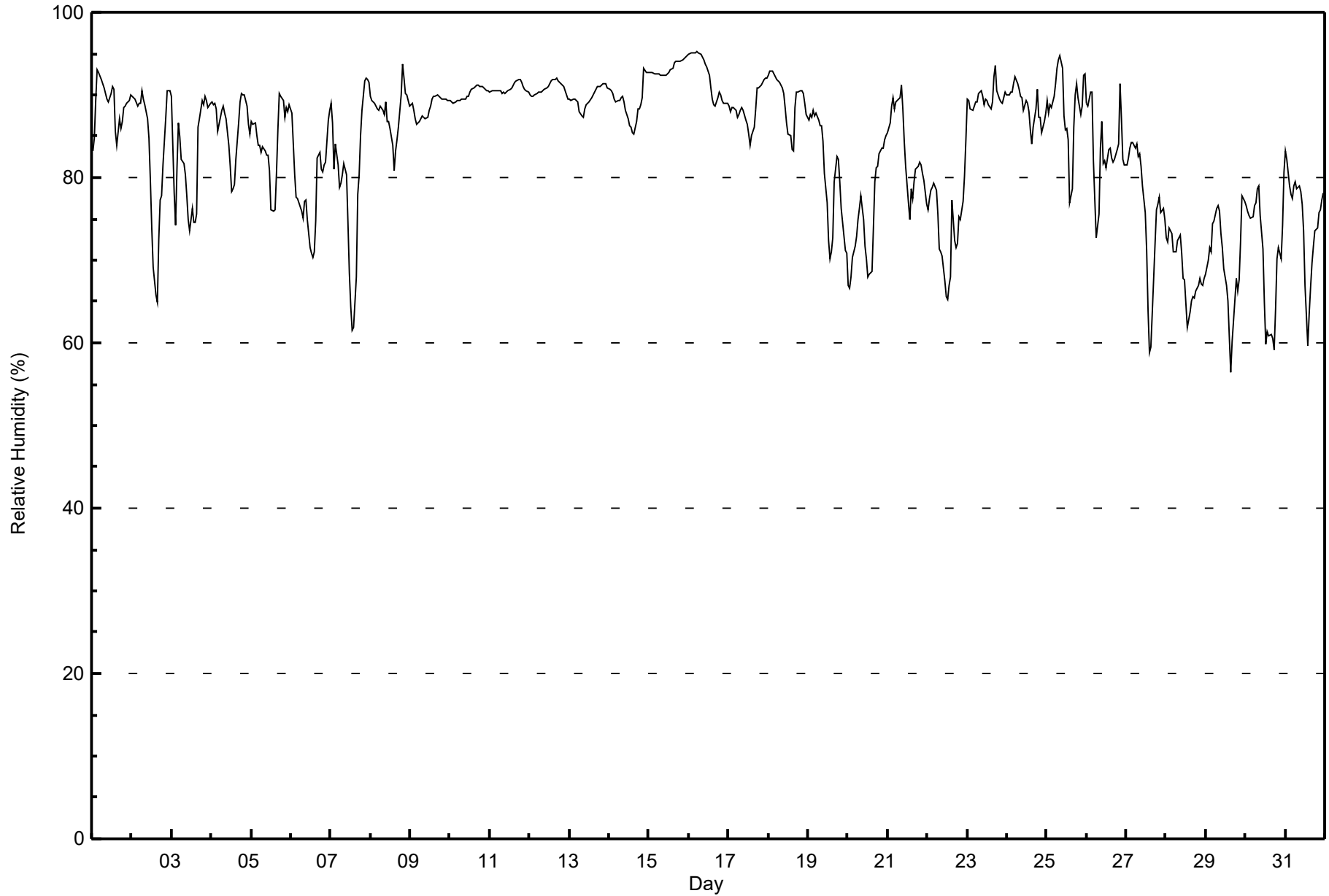
Relative Humidity (RH) - %
Christina Lake - January 2023

Maximum Value: 95.2 % on Jan 16 06:00 Maximum Daily Average: 93.2 % on Jan 15																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 56.5 % on Jan 29 16:00 Minimum Daily Average: 68.6 % on Jan 28 Maximum Diurnal Average: 86.1 % at hour 1 Minimum Diurnal Average: 77.9 % at hour 15 Monthly Average: 83.80 % Percentiles: P ₁ = 60.6 P ₁₀ = 71.0 Q ₁ = 78.1 Median = 87.3 Q ₃ = 89.9 P ₉₀ = 91.6 P ₉₉ = 94.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	83.2	84.7	89.4	93.1	92.7	91.8	91.4	90.9	90.2	89.4	89.2	90.1	91.1	90.7	85.6	83.9	87.2	85.9	86.7	88.5	88.7	89.0	89.3	89.9	88.9	93.1
2-Jan	89.8	89.7	89.4	88.6	88.9	88.9	90.5	89.5	88.8	87.2	84.8	79.6	74.0	69.2	65.8	64.9	72.5	77.3	77.8	81.5	87.3	90.6	90.6	90.5	83.2	90.6
3-Jan	89.8	78.2	74.2	81.3	86.5	85.0	82.3	81.8	80.4	77.8	74.9	73.6	76.3	74.6	74.6	75.5	86.1	87.1	89.3	88.8	89.9	89.2	88.4	89.1	82.3	89.9
4-Jan	89.2	88.8	89.0	88.3	85.7	87.3	88.2	88.7	87.7	87.1	84.0	81.4	78.3	78.7	79.1	82.2	86.6	89.2	90.1	90.0	90.0	88.7	86.5	85.3	86.2	90.1
5-Jan	86.7	86.4	86.7	85.2	83.9	83.9	83.1	83.7	83.1	82.7	82.7	80.8	76.1	75.9	76.1	80.5	85.7	90.2	89.9	89.4	87.3	88.5	88.0	88.8	84.4	90.2
6-Jan	87.8	84.0	80.4	77.6	77.4	77.0	76.0	75.1	77.2	77.3	75.0	71.6	70.9	70.3	71.0	74.8	82.4	83.0	80.9	80.7	81.5	81.8	86.9	88.2	78.7	88.2
7-Jan	89.0	86.5	81.1	84.0	81.6	78.8	79.4	80.3	81.7	80.3	74.5	68.4	64.5	61.6	61.9	67.9	77.9	80.3	85.1	88.1	91.6	92.0	91.9	91.5	80.0	92.0
8-Jan	89.9	89.4	89.0	88.7	88.3	88.1	88.7	88.1	87.6	89.1	86.9	86.9	85.9	83.9	80.9	83.2	84.5	86.2	90.0	93.7	92.0	90.2	89.9	88.7	87.9	93.7
9-Jan	88.8	89.0	88.2	87.1	86.4	86.7	87.2	87.4	87.2	87.2	87.3	88.2	88.6	89.6	89.8	89.8	89.9	89.9	89.6	89.5	89.5	89.4	89.3	89.3	88.5	89.9
10-Jan	89.3	89.1	89.0	89.2	89.3	89.3	89.4	89.5	89.6	89.5	89.8	89.9	90.4	90.6	90.8	91.0	91.1	91.2	91.1	90.9	90.8	90.7	90.6	90.5	90.1	91.2
11-Jan	90.4	90.5	90.5	90.5	90.6	90.5	90.4	90.2	90.3	90.2	90.4	90.5	90.7	90.9	91.2	91.6	91.6	91.9	91.9	91.5	91.0	90.6	90.5	90.3	90.8	91.9
12-Jan	90.1	89.8	89.8	89.9	90.2	90.4	90.4	90.4	90.5	90.7	90.8	91.1	91.4	91.7	91.8	91.8	92.0	91.7	91.5	91.3	91.0	90.6	90.0	89.6	90.8	92.0
13-Jan	89.5	89.4	89.5	89.4	89.3	89.1	88.0	87.4	87.2	88.2	88.7	89.0	89.1	89.7	90.0	90.4	90.7	91.0	91.1	91.2	91.3	91.4	91.4	90.9	89.7	91.4
14-Jan	90.7	90.6	90.2	89.5	89.1	89.3	89.3	89.7	89.9	89.2	88.2	87.2	86.3	86.1	85.4	85.3	86.7	88.3	88.4	88.9	89.7	93.2	92.7	92.7	89.0	93.2
15-Jan	92.7	92.8	92.7	92.6	92.6	92.6	92.5	92.4	92.4	92.4	92.4	92.5	92.7	93.0	93.3	93.8	94.0	94.0	94.1	94.1	94.3	94.4	94.6	94.8	93.2	94.8
16-Jan	95.0	95.1	95.1	95.1	95.1	95.2	95.2	94.9	94.6	94.2	93.8	93.4	92.3	90.8	89.5	88.8	88.6	89.7	90.4	90.1	89.2	89.0	89.0	89.0	92.2	95.2
17-Jan	88.7	87.9	88.4	88.5	88.1	87.3	87.6	88.2	88.4	88.1	87.0	86.4	85.3	83.9	85.1	86.1	88.3	90.8	90.8	91.0	91.3	91.9	92.1	92.1	88.5	92.1
18-Jan	92.3	92.9	92.9	92.6	92.2	91.8	91.7	91.6	90.9	90.2	88.6	86.7	85.3	85.0	83.4	83.2	88.4	90.3	90.3	90.5	90.5	90.3	89.0	87.6	89.5	92.9
19-Jan	87.0	87.7	87.4	88.2	87.5	87.8	86.9	86.3	86.3	84.4	80.5	76.9	72.3	70.2	71.1	72.7	79.6	82.5	82.2	79.6	76.3	74.5	71.2	70.8	80.4	88.2
20-Jan	66.9	66.7	68.0	70.3	71.8	72.9	74.8	76.2	77.8	74.9	71.6	70.2	67.9	68.2	68.7	73.9	79.5	81.2	81.3	82.9	83.6	83.6	84.5	85.1	75.1	85.1
21-Jan	85.5	86.6	88.7	89.7	88.3	89.1	89.4	89.7	91.3	88.3	84.4	81.3	76.9	74.9	78.6	77.4	79.6	81.1	81.4	81.8	81.5	80.5	79.7	76.7	83.4	91.3
22-Jan	76.2	77.5	78.5	78.9	79.3	78.5	75.6	71.3	71.0	70.6	67.5	65.6	65.3	66.9	68.0	77.3	72.4	71.6	72.0	75.3	74.9	77.0	80.1	84.5	74.0	84.5
23-Jan	89.4	89.3	88.2	88.1	88.6	89.1	89.2	90.2	90.6	89.9	88.7	89.6	89.3	88.8	88.3	89.1	92.2	93.6	90.5	89.5	89.2	89.0	89.6	90.4	89.6	93.6
24-Jan	90.0	89.9	90.4	90.3	91.4	92.2	91.4	90.7	89.8	89.7	88.1	89.3	88.9	88.0	85.8	84.1	86.2	88.3	90.7	87.3	87.2	85.5	86.8	87.7	88.7	92.2
25-Jan	89.3	87.8	88.9	88.5	89.9	91.4	93.2	94.3	94.8	93.2	87.4	85.8	85.9	84.5	77.0	78.6	86.1	90.0	91.3	89.6	87.7	88.7	92.3	92.5	88.7	94.8
26-Jan	89.0	88.6	90.3	90.3	82.0	77.3	72.7	75.6	83.6	86.8	81.8	82.0	83.3	83.6	82.3	81.9	82.3	83.4	84.1	91.3	87.0	82.2	81.5	83.5	91.3	
27-Jan	81.5	82.4	83.6	84.3	84.3	83.6	84.1	82.5	82.8	81.3	79.0	75.7	71.2	64.0	58.7	59.4	67.7	72.1	76.1	76.7	77.7	75.7	76.2	74.9	76.5	84.3
28-Jan	72.8	72.3	74.0	73.2	71.1	71.0	71.1	72.3	73.1	70.9	67.8	67.7	64.8	61.9	63.8	65.0	65.5	65.5	66.2	66.9	67.8	67.2	67.0	67.8	68.6	74.0
29-Jan	68.3	69.9	71.5	71.1	74.4	74.7	76.3	76.6	75.9	73.3	71.6	69.0	66.9	65.1	60.7	56.5	60.2	65.3	67.8	66.3	67.7	72.1	77.8	77.1	69.8	77.8
30-Jan	76.5	75.9	75.4	75.1	75.3	76.6	76.9	78.6	79.0	75.3	71.4	64.9	59.8	61.4	60.8	61.1	60.5	59.1	64.0	70.2	71.5	70.1	74.2	80.7	70.6	80.7
31-Jan	83.2	82.3	78.9	78.0	77.4	79.0	79.5	78.6	79.0	78.3	76.8	73.5	67.0	59.6	63.6	66.7	69.7	71.8	73.5	73.9	75.8	76.0	77.3	78.1	74.9	83.2
86.1 85.5 85.4 85.7 85.5 85.4 85.2 85.2 85.6 84.8 82.8 81.2 79.6 78.5 77.9 79.0 82.1 83.6 84.5 85.0 85.5 85.4 85.8 86.0																						Diurnal Average				
95.0 95.1 95.1 95.1 95.1 95.2 95.2 94.9 94.8 94.2 93.8 93.4 92.7 93.0 93.3 93.8 94.0 94.0 94.1 94.1 94.3 94.4 94.6 94.8																						Diurnal Maximum				



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Christina Lake - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	6	0.81	0.81
60 - 80	208	27.96	28.76
80 - 100	530	71.24	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

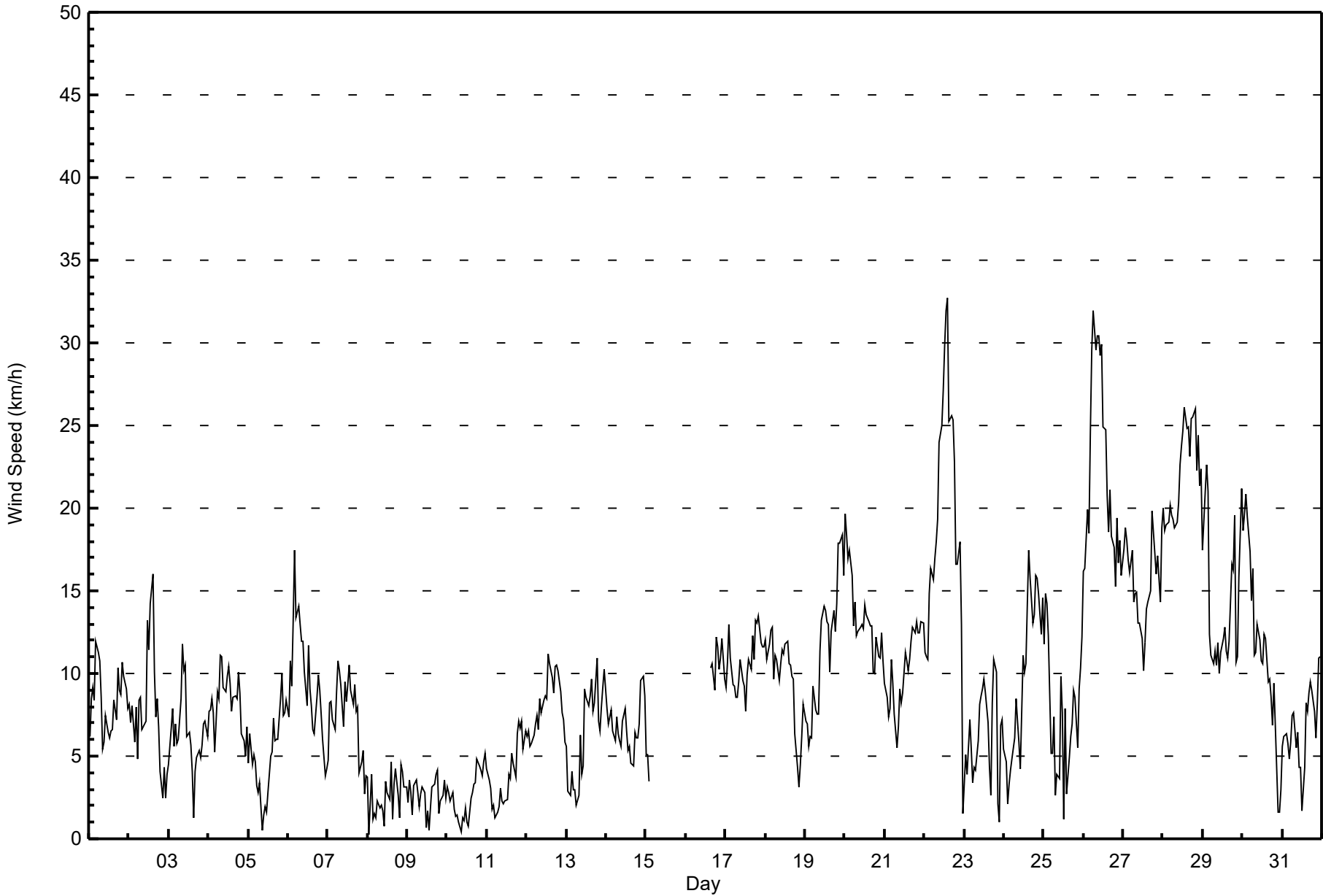


Maximum Speed: 33 km/h on Jan 22 15:00	Maximum Daily Speed Average: 21.7 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 8 02:00	Minimum Daily Speed Average: 0.9 km/h on Jan 8	Hours of Data: 708
Maximum Diurnal Speed Average: 6.1 km/h at hour 14	Minimum Diurnal Speed Average: 3.0 km/h at hour 1	Hours of Missing Data: 36
Monthly Average Velocity: 4.2 km/h 244.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 9 Q ₃ = 12 P ₉₀ = 18 P ₉₉ = 30	Percent Operational Time: 95.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Jan	SW6	SW8	WSW9	WSW8	SW12	WSW11	WSW11	SW9	SW5	SSW6	WSW7	SW6	SW6	SW7	SW7	SW8	SW7	SSW10	SSW9	SSW9	SW11	SSW10	SSW9	SW8	SW8.1	SW12		
2-Jan	SW8	SSW7	SSW8	S6	SSW8	SSW5	SSW8	SSW9	S7	S7	S7	SSW13	SW11	SW14	SW16	SW10	SSW7	SSW8	SSW7	SSW4	SSE2	ESE4	SSE2	SE4	SSW7.0	SW16		
3-Jan	SSE4	SSW7	S8	SE6	SE7	S6	SSW6	SSW9	SSW12	SSW10	SSW10	SSW6	S6	SSE4	ENE1	SSW4	SW5	SW5	SW5	SSW6	SSW7	SSW7	SSW6	SSW5.8	SSW12			
4-Jan	SSW8	SSW8	SW8	SSW8	SSW5	SSW9	SW8	SW11	SW11	WSW9	SW9	SW10	WSW10	SW9	SW8	SW9	SSW9	SSW8	SSW10	SSW9	S6	SSW6	S5	SSW7	SSW8.0	SW11		
5-Jan	S5	SW6	SW4	S5	SSW5	SSW3	SSW3	SW3	E1	NE1	SE2	ENE2	SSE3	S5	SE5	SSE7	SE6	SSE6	SE6	S8	SSE10	SSE7	SE8	SE8	SSE4.2	SSE10		
6-Jan	ESE7	SSE11	SSE9	S13	SSE17	S13	S14	S13	S12	SSW12	S10	SSW8	SSW12	SSW9	SSW8	S7	SSW6	SSW9	SW10	SSW9	SSW8	SSW6	S4	SSE4	S9.0	SSE17		
7-Jan	S5	SSW8	SSW8	SSW7	SW7	SW9	SSW11	SSW10	SSW9	SSW7	SW10	WSW8	SW9	WSW10	WSW9	SSW8	SSW9	SSW8	SSW8	SSW4	SSW5	SSW5	SSW3	SSW4	SSW7.3	SSW11		
8-Jan	S4	NNE0	E4	SSE1	ENE1	SSE1	SSE2	ENE2	SSW2	S2	ESE1	E3	ENE3	E2	NE5	SE1	W3	NNE4	WSW3	S1	WSW5	SSW4	S3	SSW3	SSE0.9	NE5		
9-Jan	SSW2	S4	SSW3	S1	SSE3	SSW4	SW3	SSW2	S3	SSW3	S3	S1	SE2	WSW1	ENE2	ENE3	ENE3	ENE4	E4	SSE2	ESE2	E3	E4	ESE2	SE1.5	E4		
10-Jan	SE3	S3	SSE2	SE3	SSW2	SSW1	SSW1	SW1	NE0	SSE1	S1	WSW2	WSW1	N1	NE2	NE3	NE3	NE3	NE5	NNE4	NE4	NE4	NE5	NNE5	ENE1.2	NNE5		
11-Jan	NE4	NE4	NE3	NE2	NNE2	SE1	ESE2	SSE2	SSW3	SW2	S2	SE2	SE2	SE4	S4	SSE5	SSE5	S4	SSW6	SSW7	S7	S7	SSW5	S6	S2.5	S7		
12-Jan	S6	S6	SSW6	S6	S6	S7	S7	SSW7	SSW8	S8	SSW8	SSW9	SSW8	SSW11	SSW11	SSW10	SSW9	SSW10	SSW11	SSW10	SSW9	S8	SSW7	SSW6	SSW8.0	SSW11		
13-Jan	SW6	WSW3	SSE3	SSE4	SSE3	NNE3	SE2	SSW3	NE6	ENE4	NE4	ENE9	E9	ENE8	ENE9	E10	ENE8	ENE8	ENE11	E7	E6	E8	ESE9	ESE10	E4.9	ENE11		
14-Jan	ESE8	ESE7	ESE7	SE8	SE6	SE6	SSE7	SSE6	SE6	SSE6	S7	S8	SSW7	SSW5	SSW6	SSW5	SSW4	SW6	SSW6	SSW6	WSW7	WSW10	WSW10	SW9	S4.8	WSW10		
15-Jan	SW5	WSW5	NNE3	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SW5	
16-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	SSW12		
17-Jan	S9	S11	S13	S11	S9	S9	S9	SSW9	S10	S11	S10	SSW9	SSW8	SSW10	S11	SSW10	SSW12	SSW11	SSW13	SSW13	SSW14	SSW12	SSW12	SW12	SSW10.5	SSW14		
18-Jan	SSW12	SSW11	SSW12	S13	SSW13	S10	SSW11	S11	S10	S11	S11	S11	S12	S12	S11	SSE11	SSE10	SSE10	SSE6	SE4	SSE3	SE5	SSE6	S8	S9.2	SSW13		
19-Jan	SSW7	S7	S6	SSW6	SW6	SSW9	SSW8	SSW8	SW8	WSW11	WSW13	WSW14	WSW14	WSW13	WSW13	SW10	SW13	SW14	SW13	SW14	SW18	SW18	SW18	SW16	SW11.1	SW18		
20-Jan	SW20	SW18	SW17	SW17	WSW16	WSW13	WSW14	WSW12	WSW13	WSW13	WSW13	WSW13	WSW13	WSW14	WSW14	WSW13	WSW13	WSW13	WSW10	WSW10	WSW12	WSW11	WSW11	WSW12	WSW11	WSW13.3	SW20	
21-Jan	WSW9	SW9	SW7	SW8	SW11	SSW9	SSW8	SSW6	S7	SW9	SW8	SW9	SW11	SW11	SW10	SW11	WSW12	WSW13	SW12	WSW13	SW12	WSW12	WSW13	W13	SW9.7	WSW13		
22-Jan	W11	WSW11	WSW11	W15	W16	W16	W17	W18	W19	W24	W25	W27	W27	W27	W30	NW32	NW33	NW25	NW26	NW25	NNW23	N17	NNW17	NW18	NW13	ENE2	W17.9	NW33
23-Jan	SE3	SE5	ESE4	SSE7	SE5	SSE3	E4	ESE4	SSW6	S8	S9	SSE9	SSE10	S9	S7	S4	SE3	N8	N11	NNE10	N2	W1	NE7	NE7	SE2.5	N11		
24-Jan	NE5	ENE5	SE2	SE3	SSE4	SSE5	SSW6	SSW9	SSW7	SSW6	SSW4	WSW11	WSW10	WSW11	W14	W17	W17	W16	W16	W13	NNW14	NW16	NNW16	NNW15	NW12	NW15	W15.6	W17
25-Jan	NNW12	NW15	NNW14	NNW12	NNE5	ENE5	NE7	E3	E4	SSW4	NNW10	N8	E1	SW8	SSW3	E5	ESE6	SSW7	SSW9	SSW9	SSW5	S9	SSW10	SSW12	W1.4	NW15		
26-Jan	SW16	W16	W20	W18	W25	W30	NNW32	NW30	NW30	NNW30	NNW29	NNW30	NNW25	NNW21	NW19	NW21	NW18	NNW18	N15	NE19	NNE17	NNE18	NNE16	NW17.7	W17.7	NNW32		
27-Jan	NNE18	NNE19	NNE18	NNE17	NNE16	NNE17	NNE14	NE15	NNE15	NNE13	NNE13	NNE12	NNW10	NW12	NW14	NW14	NW15	NW20	NNW19	NNW17	NNW16	NNW17	NW14	NW19	N13.2	NW20		
28-Jan	NW20	NW19	NW19	NW19	W20	W20	W20	W19	NW19	W20	W20	W23	NW24	W25	NW26	NW25	NW25	NW23	NW25	NW26	NW26	NW22	NW24	NNW21	NNW22	NW21.7	NW26	
29-Jan	NW17	NW21	NW23	NW21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W21	W11.2	NW23	
30-Jan	NW19	NW20	NW21	NW19	NW17	W14	W16	WSW11	WSW11	WSW11	WSW13	WSW12	SW11	WSW11	WSW12	WSW12	WSW10	WSW10	SW9	WSW7	WSW9	W11	W11	W11	W11	W9.3	NW21	
31-Jan	NE6	ENE6	E6	ESE6	E5	NE6	NE7	NE8	ENE6	NE6	ENE4	ENE4	S2	WSW4	WSW8	W8	WSW9	WSW9	WSW9	WSW8	SW6	SW8	SW11	SW11	WSW1.1	SW11		

WSW3.0WSW3.6WSW3.2WSW3.5 SW4.1WSW4.4WSW4.8 SW4.4WSW4.1WSW4.5WSW4.9WSW4.5WSW5.5WSW6.1WSW5.6WSW4.2WSW4.6WSW4.8WSW4.6WSW4.3WSW3.4WSW3.4WSW3.5WSW3.1	Diurnal Average
NW20 NW21 NW23 NW21 W25 W30W11W32 NW30 NW30 NNW30 NNW29 NNW30 NNW25 NNW21 NNW19 NNW21 NNW18 NNW17 NNW16 NNW15 NNW14 NNW13 NNW12 NNW11 NNW10 NNW9 NNW8 NNW7 NNW6 NNW5 NNW4 NNW3 NNW2 NNW1	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	183	25.85	25.85
6 - 11	324	45.76	71.61
12 - 19	151	21.33	92.94
20 - 28	40	5.65	98.59
29 - 38	10	1.41	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	9	17	15	13	7	20	25	21	33	11	8	2	0	0	0	183
6 - 11	3	1	9	8	6	8	11	19	51	103	56	44	2	2	0	1	324
12 - 19	2	14	2	0	0	0	0	1	11	16	22	29	11	9	22	12	151
20 - 28	0	0	0	0	0	0	0	0	0	0	1	1	2	8	22	6	40
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	3	10
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	7	24	28	23	19	15	31	45	83	152	90	82	18	21	48	22	708

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Christina Lake - January 2023

Direction of Maximum Speed: 317 deg on Jan 22 15:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 311.8 deg on Jan 28	Hours of Data: 708
Direction of Minimum Speed: 27 deg on Jan 8 02:00	Hours of Missing Data: 36
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 8	Percent Operational Time: 95.2
Monthly Average Direction: 244.9 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	228	221	245	254	231	246	243	233	220	195	242	234	222	216	232	230	220	212	213	208	216	204	209	217	225.1
2-Jan	215	211	202	189	197	192	193	196	188	180	184	209	219	230	236	219	193	196	193	204	161	121	154	126	202.1
3-Jan	162	198	188	130	139	173	202	193	195	194	193	209	198	181	160	77	193	234	221	218	194	205	202	213	191.6
4-Jan	198	211	221	213	212	203	228	232	235	238	232	227	239	228	232	235	206	200	197	195	190	205	187	210	217.3
5-Jan	186	220	215	185	197	195	211	214	80	48	142	58	158	188	144	151	142	154	125	171	166	150	138	126	163.8
6-Jan	123	148	165	175	168	183	185	176	188	192	191	193	208	208	209	183	196	209	217	210	207	202	186	157	186.6
7-Jan	182	203	203	198	220	218	210	208	209	204	222	245	235	248	237	206	208	199	204	207	206	208	209	199	213.9
8-Jan	187	27	86	150	74	157	148	76	205	179	104	100	77	84	35	137	264	29	245	169	239	208	179	208	149.5
9-Jan	200	181	199	176	151	207	222	213	188	205	189	176	136	257	59	62	58	72	90	160	119	97	98	123	145.7
10-Jan	139	179	165	125	201	210	194	216	45	155	186	238	258	1	49	54	39	45	38	32	38	39	35	28	60.7
11-Jan	41	36	39	52	26	128	115	164	203	215	186	130	142	137	172	167	150	185	210	198	184	189	196	190	171.1
12-Jan	186	187	193	183	183	184	188	192	192	191	196	207	202	201	211	197	207	195	210	204	195	189	200	197	196.6
13-Jan	229	238	165	147	149	28	137	200	36	72	48	78	79	68	77	79	62	67	69	90	83	92	106	114	85.6
14-Jan	108	102	122	128	128	133	150	154	141	151	169	184	199	194	203	196	210	220	211	206	239	244	244	231	179.7
15-Jan	228	248	21	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
16-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	137	154	175	193	179	179	174	184	189	--
17-Jan	188	189	185	187	189	190	191	192	188	187	191	195	204	200	188	198	199	194	204	200	199	204	207	216	195.4
18-Jan	206	200	192	186	198	191	194	183	183	190	188	190	186	180	174	168	162	165	149	136	149	129	155	169	181.1
19-Jan	196	178	177	203	214	213	208	210	222	237	238	241	247	244	240	235	222	227	216	232	236	229	229	222	226.2
20-Jan	234	235	231	233	240	251	252	251	256	252	252	249	261	253	251	237	240	237	244	253	249	251	251	247	245.5
21-Jan	248	234	218	216	215	211	198	192	179	219	220	214	222	230	216	228	240	237	233	239	234	241	252	264	228.3
22-Jan	259	253	256	273	279	277	276	281	285	289	288	287	303	310	317	325	320	323	331	350	333	320	311	60	302.0
23-Jan	134	134	122	167	139	154	99	119	194	187	183	165	163	175	178	178	125	350	350	15	3	268	52	45	140.7
24-Jan	48	73	138	135	157	148	201	201	199	192	193	245	248	256	271	292	282	299	328	319	334	334	314	325	287.2
25-Jan	319	321	334	330	22	60	56	97	93	199	301	5	93	225	206	88	120	201	200	209	194	190	192	201	261.5
26-Jan	224	264	274	269	277	281	292	312	320	337	338	340	338	338	330	319	317	320	328	11	35	30	27	20	321.5
27-Jan	27	26	33	27	25	28	31	34	14	28	30	29	339	318	313	316	317	325	334	330	333	332	314	318	356.0
28-Jan	317	308	313	305	290	295	290	301	308	297	293	315	303	317	314	316	317	317	317	317	326	325	332	336	311.8
29-Jan	326	314	315	313	286	244	244	251	244	239	239	228	232	231	225	222	212	217	232	237	259	251	298	312	262.9
30-Jan	325	319	317	317	312	295	280	257	251	243	246	227	240	246	250	253	243	235	244	247	292	27	215	148	275.9
31-Jan	55	76	95	114	88	44	38	46	58	45	61	74	183	251	258	263	248	249	250	240	221	229	233	236	237.4

244.5 247.6 247.8 239.4 233.8 237.4 237.5 234.8 239.2 237.9 244.4 247.7 248.4 251.4 255.1 248.2 244.1 249.3 251.6 247.9 248.1 243.7 244.5 246.8
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Averages

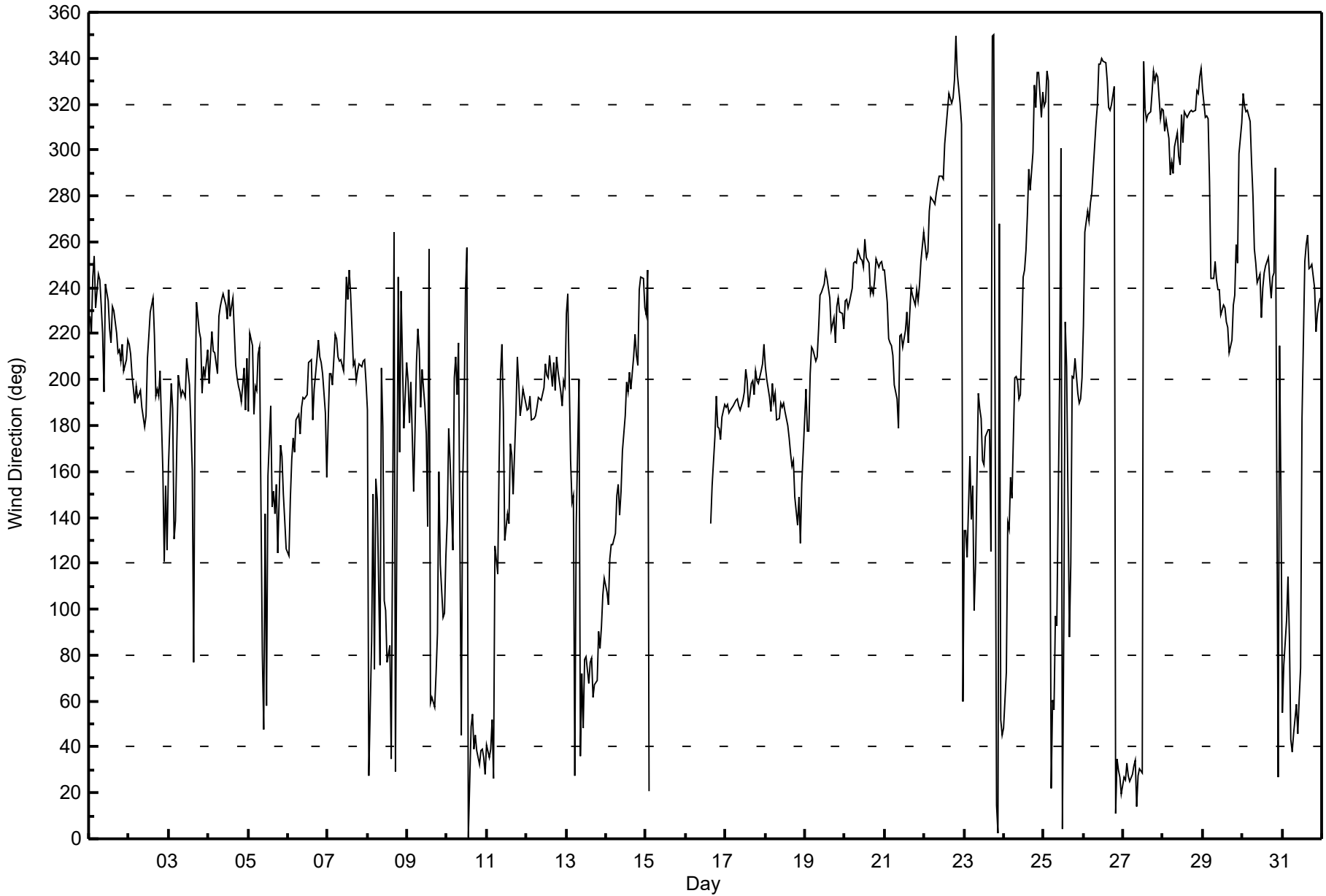
Wind Direction (WD) - deg
Christina Lake - January 2023

Direction of Maximum Speed: 317 deg on Jan 22 15:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 311.8 deg on Jan 28		Hours of Data:	708
Direction of Minimum Speed: 27 deg on Jan 8 02:00		Hours of Missing Data:	36
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 8		Percent Operational Time:	95.2
Monthly Average Direction: 244.9 deg			

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	228	221	245	254	231	246	243	233	220	195	242	234	222	216	232	230	220	212	213	208	216	204	209	217	225.1
2-Jan	215	211	202	189	197	192	193	196	188	180	184	209	219	230	236	219	193	196	193	204	161	121	154	126	202.1
3-Jan	162	198	188	130	139	173	202	193	195	194	193	209	198	181	160	77	193	234	221	218	194	205	202	213	191.6
4-Jan	198	211	221	213	212	203	228	232	235	238	232	227	239	228	232	235	206	200	197	195	190	205	187	210	217.3
5-Jan	186	220	215	185	197	195	211	214	80	48	142	58	158	188	144	151	142	154	125	171	166	150	138	126	163.8
6-Jan	123	148	165	175	168	183	185	176	188	192	191	193	208	208	209	183	196	209	217	210	207	202	186	157	186.6
7-Jan	182	203	203	198	220	218	210	208	209	204	222	245	235	248	237	206	208	199	204	207	206	208	209	199	213.9
8-Jan	187	27	86	150	74	157	148	76	205	179	104	100	77	84	35	137	264	29	245	169	239	208	179	208	149.5
9-Jan	200	181	199	176	151	207	222	213	188	205	189	176	136	257	59	62	58	72	90	160	119	97	98	123	145.7
10-Jan	139	179	165	125	201	210	194	216	45	155	186	238	258	1	49	54	39	45	38	32	38	39	35	28	60.7
11-Jan	41	36	39	52	26	128	115	164	203	215	186	130	142	137	172	167	150	185	210	198	184	189	196	190	171.1
12-Jan	186	187	193	183	183	184	188	192	192	191	196	207	202	201	211	197	207	195	210	204	195	189	200	197	196.6
13-Jan	229	238	165	147	149	28	137	200	36	72	48	78	79	68	77	79	62	67	69	90	83	92	106	114	85.6
14-Jan	108	102	122	128	128	133	150	154	141	151	169	184	199	194	203	196	210	220	211	206	239	244	244	231	179.7
15-Jan	228	248	21	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
16-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	137	154	175	193	179	179	174	184	189	--
17-Jan	188	189	185	187	189	190	191	192	188	187	191	195	204	200	188	198	199	194	204	200	199	204	207	216	195.4
18-Jan	206	200	192	186	198	191	194	183	183	190	188	190	186	180	174	168	162	165	149	136	149	129	155	169	181.1
19-Jan	196	178	177	203	214	213	208	210	222	237	238	241	247	244	240	235	222	227	216	232	236	229	229	222	226.2
20-Jan	234	235	231	233	240	251	252	251	256	252	252	249	261	253	251	237	240	237	244	253	249	251	251	247	245.5
21-Jan	248	234	218	216	215	211	198	192	179	219	220	214	222	230	216	228	240	237	233	239	234	241	252	264	228.3
22-Jan	259	253	256	273	279	277	276	281	285	289	288	287	303	310	317	325	320	323	331	350	333	320	311	60	302.0
23-Jan	134	134	122	167	139	154	99	119	194	187	183	165	163	175	178	178	125	350	350	15	3	268	52	45	140.7
24-Jan	48	73	138	135	157	148	201	201	199	192	193	245	248	256	271	292	282	299	328	319	334	334	314	325	287.2
25-Jan	319	321	334	330	22	60	56	97	93	199	301	5	93	225	206	88	120	201	200	209	194	190	192	201	261.5
26-Jan	224	264	274	269	277	281	292	312	320	337	338	340	338	338	330	319	317	320	328	11	35	30	27	20	321.5
27-Jan	27	26	33	27	25	28	31	34	14	28	30	29	339	318	313	316	317	325	334	330	333	332	314	318	356.0
28-Jan	317	308	313	305	290	295	290	301	308	297	293	315	303	317	314	316	317	317	317	317	326	325	332	336	311.8
29-Jan	326	314	315	313	286	244	244	251	244	239	239	228	232	231	225	222	212	217	232	237	259	251	298	312	262.9
30-Jan	325	319	317	317	312	295	280	257	251	243	246	227	240	246	250	253	243	235	244	247	292	27	215	148	275.9
31-Jan	55	76	95	114	88	44	38	46	58	45	61	74	183	251	258	263	248	249	250	240	221	229	233	236	237.4

244.5 247.6 247.8 239.4 233.8 237.4 237.5 234.8 239.2 237.9 244.4 247.7 248.4 251.4 255.1 248.2 244.1 249.3 251.6 247.9 248.1 243.7 244.5 246.8
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 98 deg on Jan 8 11:00	Hours of Data: 708
Minimum Value: 5 deg on Jan 4 19:00	Hours of Missing Data: 36
Percentiles: P ₁ = 6 P ₁₀ = 10 Q ₁ = 12 Median = 15 Q ₃ = 19 P ₉₀ = 41 P ₉₉ = 82	Hours of Calibration: 0
	Percent Operational Time: 95.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	18	11	14	19	13	16	14	13	15	7	16	17	14	12	15	12	16	12	10	10	10	10	10	9	19
2-Jan	9	14	10	14	10	17	14	10	33	20	16	10	15	12	11	21	14	10	15	39	47	39	55	33	55
3-Jan	24	17	14	18	10	17	18	8	10	11	12	17	16	17	14	55	50	16	18	34	16	6	9	7	55
4-Jan	10	6	9	11	15	6	8	5	7	6	8	10	12	13	16	15	7	10	5	10	10	29	28	17	29
5-Jan	21	14	25	12	12	18	17	22	80	76	25	63	57	17	23	15	12	13	25	17	15	20	14	11	80
6-Jan	13	10	20	17	12	14	16	19	14	13	14	15	14	15	14	14	9	10	10	11	11	11	19	21	21
7-Jan	21	10	8	19	27	12	11	10	10	12	14	17	14	14	14	10	5	7	7	8	9	7	54	18	54
8-Jan	34	87	23	70	57	63	45	71	51	51	98	21	20	49	9	65	36	11	69	61	8	22	13	53	98
9-Jan	59	13	32	48	43	13	28	70	18	25	30	82	51	75	68	18	20	11	13	41	24	26	13	21	82
10-Jan	18	31	33	19	36	44	63	66	97	60	54	48	54	74	21	24	14	11	9	8	6	10	7	7	97
11-Jan	9	12	12	41	23	66	47	56	16	20	25	21	23	17	24	17	17	20	14	17	19	19	16	18	66
12-Jan	15	14	18	17	21	19	15	15	14	17	14	15	15	14	14	13	14	13	18	16	15	13	19	15	21
13-Jan	28	41	30	34	34	70	52	65	22	39	53	18	13	14	13	11	13	13	12	16	16	12	13	12	70
14-Jan	11	14	24	15	18	14	14	12	11	16	12	16	16	15	24	15	24	13	10	19	12	10	9	12	24
15-Jan	31	52	52	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	52
16-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	12	15	16	17	15	14	14	12	13	17
17-Jan	13	14	12	12	12	13	13	13	13	13	13	14	16	18	16	13	15	16	15	16	14	14	15	13	18
18-Jan	17	14	14	13	17	15	14	13	12	12	14	15	14	15	14	10	12	14	14	23	41	27	23	27	41
19-Jan	31	26	28	10	27	13	14	12	14	11	12	15	15	12	12	14	11	10	11	17	11	10	11	10	31
20-Jan	11	10	11	13	12	18	16	16	17	17	17	16	18	16	17	14	11	13	21	18	15	16	16	15	21
21-Jan	15	13	11	15	10	11	10	16	15	15	13	11	12	15	14	13	14	12	13	14	12	19	17	18	19
22-Jan	18	16	17	18	16	17	16	16	18	14	15	14	15	14	12	15	13	15	17	19	14	8	11	97	97
23-Jan	40	18	31	7	20	31	22	27	18	13	14	15	11	16	13	15	39	49	22	19	89	96	23	19	96
24-Jan	10	16	59	21	16	40	13	14	11	11	32	15	16	18	19	17	32	16	11	10	12	13	14	59	59
25-Jan	20	12	12	15	69	44	47	48	38	48	26	42	85	15	78	13	30	8	9	13	18	15	12	15	85
26-Jan	15	19	17	17	15	15	13	13	14	17	11	14	14	12	16	11	10	10	13	23	8	11	13	12	23
27-Jan	11	11	10	11	12	11	16	9	14	11	10	12	32	20	12	14	15	13	10	9	14	12	16	14	32
28-Jan	10	18	17	17	13	15	14	17	16	18	16	14	18	13	13	10	9	10	11	12	14	15	14	11	18
29-Jan	14	8	8	8	31	15	12	16	13	12	12	15	14	13	14	15	14	13	13	13	19	14	25	10	31
30-Jan	13	12	11	11	15	18	17	17	15	10	15	13	15	18	18	17	12	15	13	15	63	81	78	40	81
31-Jan	21	14	11	16	10	11	9	10	27	13	25	24	82	61	30	31	15	13	21	23	53	11	7	7	82
	59	87	59	70	69	70	63	71	97	76	98	82	85	75	78	65	50	49	69	61	89	96	78	97	
	Diurnal Maximum																								

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	705	34	39	99.33	11.1	0	3.3	0
H2S (ppb) Average	703	35	41	99.19	1.3	0	0.4	0
NO2 (ppb) Average	701	36	43	99.06	22.1	0	8.7	-
NO (ppb) Average	701	36	43	99.06	4.8	-	0.8	-
NOX (ppb) Average	701	36	43	99.06	24.1	-	9.5	-
Temperature 2 m (C) Average	741	0	3	99.6	2.9	-	-1.3	-
Relative Humidity (%) Average	741	0	3	99.6	95.8	-	93.3	-
Wind Speed 10 m (km/h) Average	735	0	9	98.79	17	-	12	-
Wind Direction 10 m (deg) Average	735	0	9	98.79	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	705	0.75	1.2	-	0	0	0.2	0.4	0.8	1.6	11.1
H2S (ppb) Average	703	0.24	0.1	-	0	0.1	0.2	0.2	0.3	0.3	1.3
NO2 (ppb) Average	701	2.74	2.7	-	0	0.5	1.3	2.1	3.3	5	22.1
NO (ppb) Average	701	0.32	0.5	-	0	0	0	0.2	0.4	0.8	4.8
NOX (ppb) Average	701	3.07	2.8	-	0	0.7	1.5	2.4	3.7	5.7	24.1
Temperature 2 m (C) Average	741	-9.24	5.6	-	-28	-18.3	-11.3	-8.8	-5.6	-3.1	2.9
Relative Humidity (%) Average	741	85.58	6.9	-	60.5	75.3	82.5	88	90.2	92.3	95.8
Wind Speed 10 m (km/h) Average	735	6.4	4	-	0	2	3	6	9	11	17
Wind Direction 10 m (deg) Average	735	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	10 Jan 2023 09:00	10 Jan 2023 09:00	1	Maintenance - station logger/modem reset
ALL PARAMETERS	20 Jan 2023 08:00	20 Jan 2023 08:00	1	Maintenance - station logger/modem reset
ALL PARAMETERS	29 Jan 2023 09:00	29 Jan 2023 09:00	1	DAS Failure - data not recorded
SO2	20 Jan 2023 14:00	20 Jan 2023 15:00	2	Maintenance - WBEA internal audit
H2S	20 Jan 2023 12:00	20 Jan 2023 14:00	3	Maintenance - WBEA internal audit
NO2	20 Jan 2023 12:00	20 Jan 2023 15:00	4	Maintenance - WBEA internal audit
Wind Speed, Wind Direction	08 Jan 2023 21:00	08 Jan 2023 21:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 07:00	11 Jan 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	13 Jan 2023 07:00	13 Jan 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 17:00	15 Jan 2023 17:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 22:00	15 Jan 2023 23:00	2	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

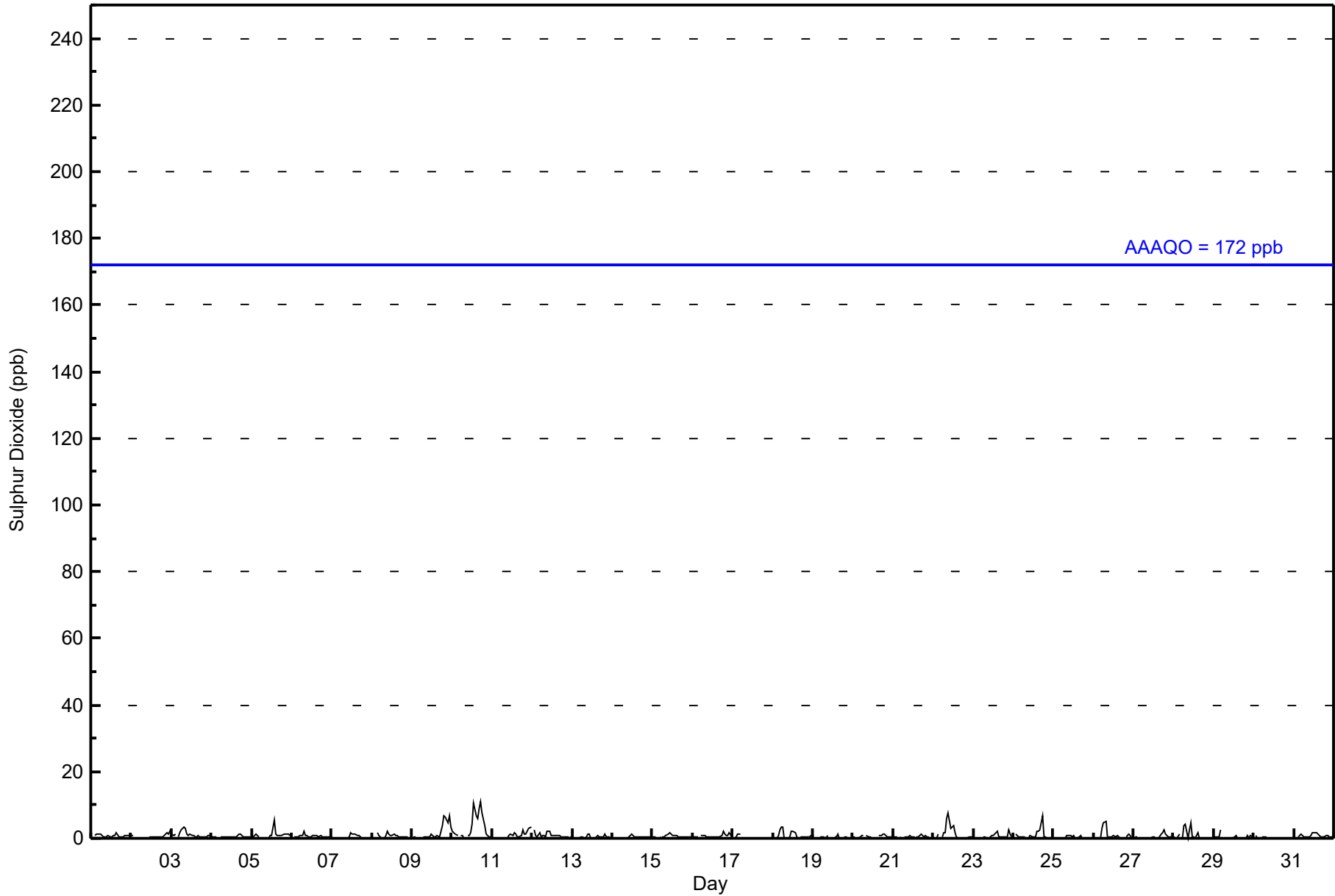
Jackfish 2/3 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 11.1 ppb on Jan 10 18:00		Maximum Daily Average: 3.3 ppb on Jan 10																	705							
Minimum Value: 0.0 ppb on Jan 5 08:00		Minimum Daily Average: 0.1 ppb on Jan 17																	39							
Maximum Diurnal Average: 1.2 ppb at hour 14		Minimum Diurnal Average: 0.4 ppb at hour 1																	34							
Monthly Average: 0.75 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.4 Q ₃ = 0.8 P ₉₀ = 1.6 P ₉₉ = 6.8																	99.3							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.5	Z	0.9	1.4	1.1	1.4	0.7	0.4	0.4	0.6	0.9	0.3	0.3	1.0	0.9	1.6	0.5	0.3	0.3	0.4	1.0	0.9	0.8	1.0	0.8	1.6
2-Jan	0.9	0.9	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.4	0.3	0.4	0.3	0.4	1.2	1.8	1.2	1.9	0.5	1.9
3-Jan	1.2	0.8	1.4	Z	0.5	1.7	2.4	3.2	3.2	1.3	0.9	1.4	0.8	0.7	0.5	0.4	0.9	0.4	0.3	0.3	0.3	0.4	1.0	0.8	1.1	3.2
4-Jan	0.5	0.5	0.5	Z	0.4	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	1.2	1.3	0.7	0.3	0.3	0.3	0.4	0.2	0.5	1.3	
5-Jan	0.3	0.3	1.1	0.6	0.3	Z	0.0	0.0	0.1	0.1	0.2	0.7	1.0	5.5	1.2	0.9	0.7	0.7	1.0	1.1	1.2	1.3	1.2	0.9	0.9	5.5
6-Jan	Z	0.5	0.5	0.6	0.6	0.8	0.8	2.3	0.9	0.7	0.6	0.5	0.7	0.7	0.7	0.7	0.6	0.8	0.5	0.3	0.3	0.2	0.5	0.5	0.7	2.3
7-Jan	0.3	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.6	1.4	1.1	1.2	0.7	0.8	0.4	0.1	0.2	0.1	0.1	0.1	0.2	0.4	1.6
8-Jan	0.2	0.5	Z	1.8	0.8	0.3	0.1	0.2	0.8	2.0	1.5	1.0	1.0	1.2	0.8	0.7	0.5	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.7	2.0
9-Jan	0.2	0.3	0.6	Z	0.0	0.0	0.2	0.5	0.4	0.4	0.4	1.2	0.7	0.3	0.5	0.8	0.6	1.9	4.0	6.8	6.3	4.6	7.0	3.2	1.8	7.0
10-Jan	2.2	1.7	1.2	1.0	Z	0.8	0.7	0.6	M	0.8	0.7	1.6	4.2	10.5	6.7	5.7	8.8	11.1	7.8	3.9	1.2	0.8	0.4	0.3	3.3	11.1
11-Jan	0.1	0.2	0.2	0.2	0.1	Z	0.0	0.0	0.0	0.1	1.0	1.4	1.0	1.6	1.5	0.5	0.5	0.7	2.4	1.2	1.2	2.3	2.8	3.6	1.0	3.6
12-Jan	Z	2.4	0.6	0.5	1.5	0.6	0.8	0.8	0.4	2.1	2.3	1.1	1.0	1.0	0.9	0.9	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.9	2.4
13-Jan	0.2	Z	0.1	0.0	0.1	0.2	0.3	0.1	0.2	1.2	1.1	0.2	0.2	0.2	1.0	0.3	0.3	0.3	0.4	1.2	0.3	0.4	0.2	0.1	0.4	1.2
14-Jan	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.3	1.1	0.7	0.3	0.3	0.4	0.3	0.3	0.5	0.4	0.2	0.2	0.3	0.3	0.3	1.1
15-Jan	0.3	0.4	0.3	Z	0.3	0.2	0.3	0.4	0.6	1.4	1.5	1.4	1.0	0.9	0.8	0.6	0.5	0.5	0.4	0.5	0.4	0.2	0.3	0.2	0.6	1.5
16-Jan	0.3	0.5	0.5	0.6	Z	0.9	1.0	1.0	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.8	2.0	1.1	0.8	0.8	1.8	0.5	0.7	2.0
17-Jan	0.2	0.2	0.2	1.1	1.2	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2
18-Jan	Z	0.0	0.0	0.7	2.7	3.2	3.3	0.2	0.0	0.1	0.3	2.2	1.9	1.7	0.2	0.2	0.1	0.3	0.3	0.4	0.6	0.6	0.6	0.6	0.9	3.3
19-Jan	0.9	Z	0.0	0.0	0.1	0.4	0.3	0.2	0.4	0.8	C	C	C	0.4	0.5	1.1	0.1	0.0	0.1	0.5	0.2	0.2	0.1	0.0	0.3	1.1
20-Jan	0.2	0.6	Z	0.2	0.5	0.7	0.7	M	1.0	0.5	0.4	0.1	0.2	M	M	0.7	0.8	1.0	1.3	1.4	0.5	0.5	0.5	0.5	0.6	1.4
21-Jan	0.3	0.4	0.5	Z	0.3	0.2	0.2	0.3	0.5	0.4	0.7	0.3	0.3	0.2	0.3	0.4	1.0	1.1	0.4	0.7	0.6	0.5	0.1	0.1	0.4	1.1
22-Jan	0.0	0.0	0.0	1.5	Z	0.6	1.8	1.7	5.9	7.8	3.0	3.6	3.7	1.6	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	1.4	7.8
23-Jan	0.2	0.2	0.1	0.2	0.2	Z	0.4	0.4	0.1	0.1	0.6	0.7	0.7	1.2	2.0	0.6	0.4	0.5	0.3	0.3	0.5	2.7	1.1	0.3	0.6	2.7
24-Jan	Z	1.4	0.9	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.6	0.4	0.4	0.3	2.0	1.9	2.7	6.9	0.5	0.3	0.2	0.1	0.1	0.1	0.9	6.9
25-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	1.0	0.2	0.7	0.0	0.0	0.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
26-Jan	0.0	0.1	Z	0.0	0.0	2.8	4.5	5.1	0.1	0.3	0.5	0.4	0.7	0.6	0.8	0.2	0.2	0.1	0.1	0.1	0.8	1.1	0.7	0.2	0.8	5.1
27-Jan	0.1	0.2	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.1	0.1	0.2	1.3	1.6	2.6	1.5	0.7	0.5	0.4	0.3	0.5	2.6
28-Jan	0.2	0.2	0.1	1.3	Z	0.0	3.8	4.4	0.2	2.7	4.6	0.4	0.5	0.1	1.8	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.9	4.6
29-Jan	0.3	0.2	0.3	0.3	2.3	Z	0.0	0.0	DF	0.0	0.1	0.1	0.5	0.9	0.2	0.1	0.0	0.0	0.0	0.1	0.8	0.1	0.8	0.3	0.3	2.3
30-Jan	Z	0.7	0.0	0.1	0.1	0.2	0.6	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.7
31-Jan	0.2	Z	0.3	1.0	1.4	0.9	0.3	0.2	0.2	0.5	0.7	1.7	1.7	1.5	1.2	0.8	0.4	0.3	0.6	0.9	0.7	0.6	0.5	0.3	0.7	1.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.4 0.5 0.4 0.5 0.6 0.7 0.8 0.8 0.6 0.8 0.8 0.8 0.9 1.2 0.9 0.8 0.8 1.1 0.9 0.8 0.7 0.7 0.8 0.6		
																								2.2 2.4 1.4 1.8 2.7 3.2 4.5 5.1 5.9 7.8 4.6 3.6 4.2 10.5 6.7 5.7 8.8 11.1 7.8 6.8 6.3 4.6 7.0 3.6		
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	703	99.72	99.72
11 - 20	2	0.28	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	0	2	2	5	3	2	9	18	25	73	37	12	1	0	0	0	189
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	2	2	5	3	2	9	18	25	73	37	12	1	0	0	0	189

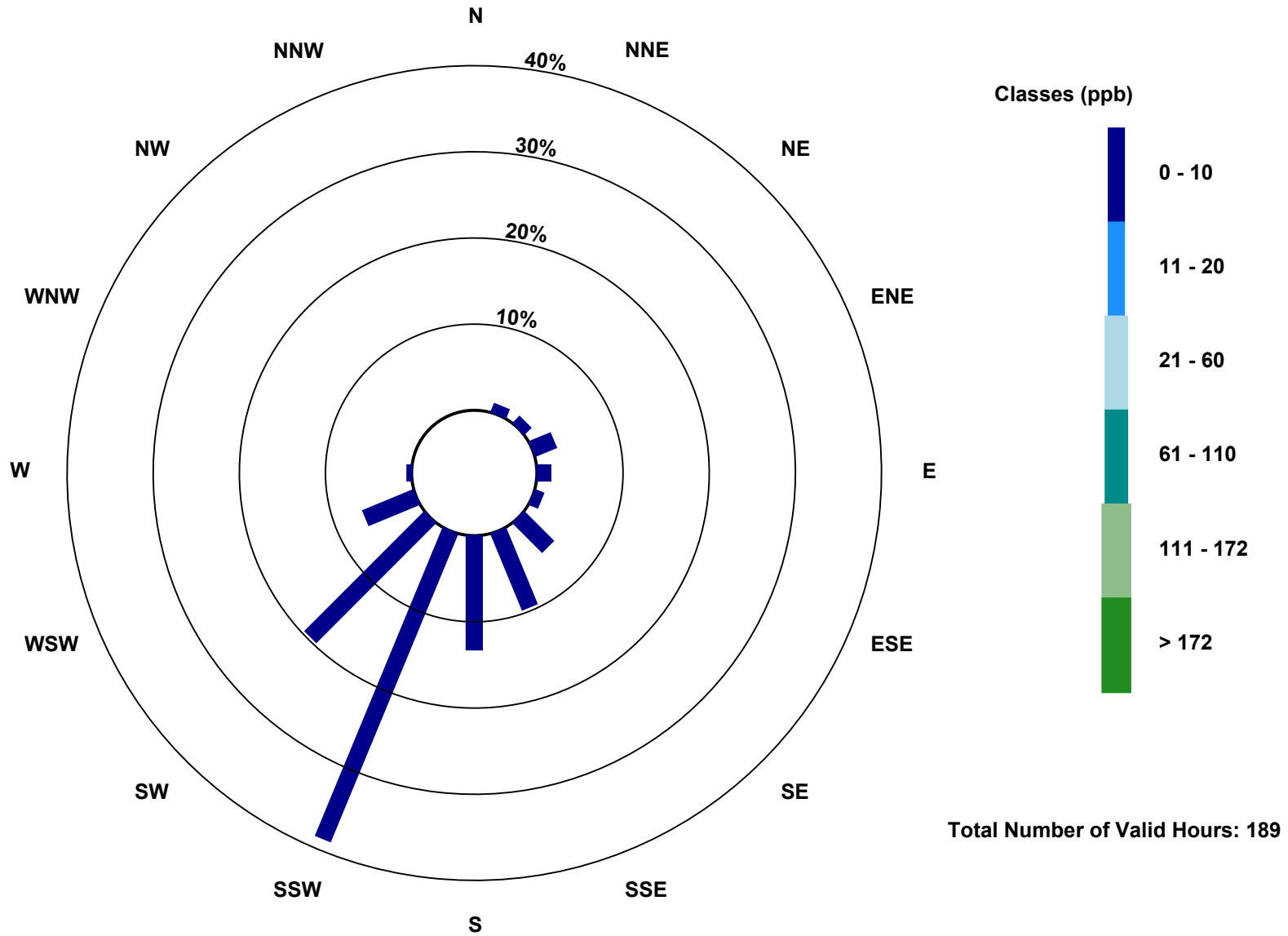
Total Number of Valid Hours: 189

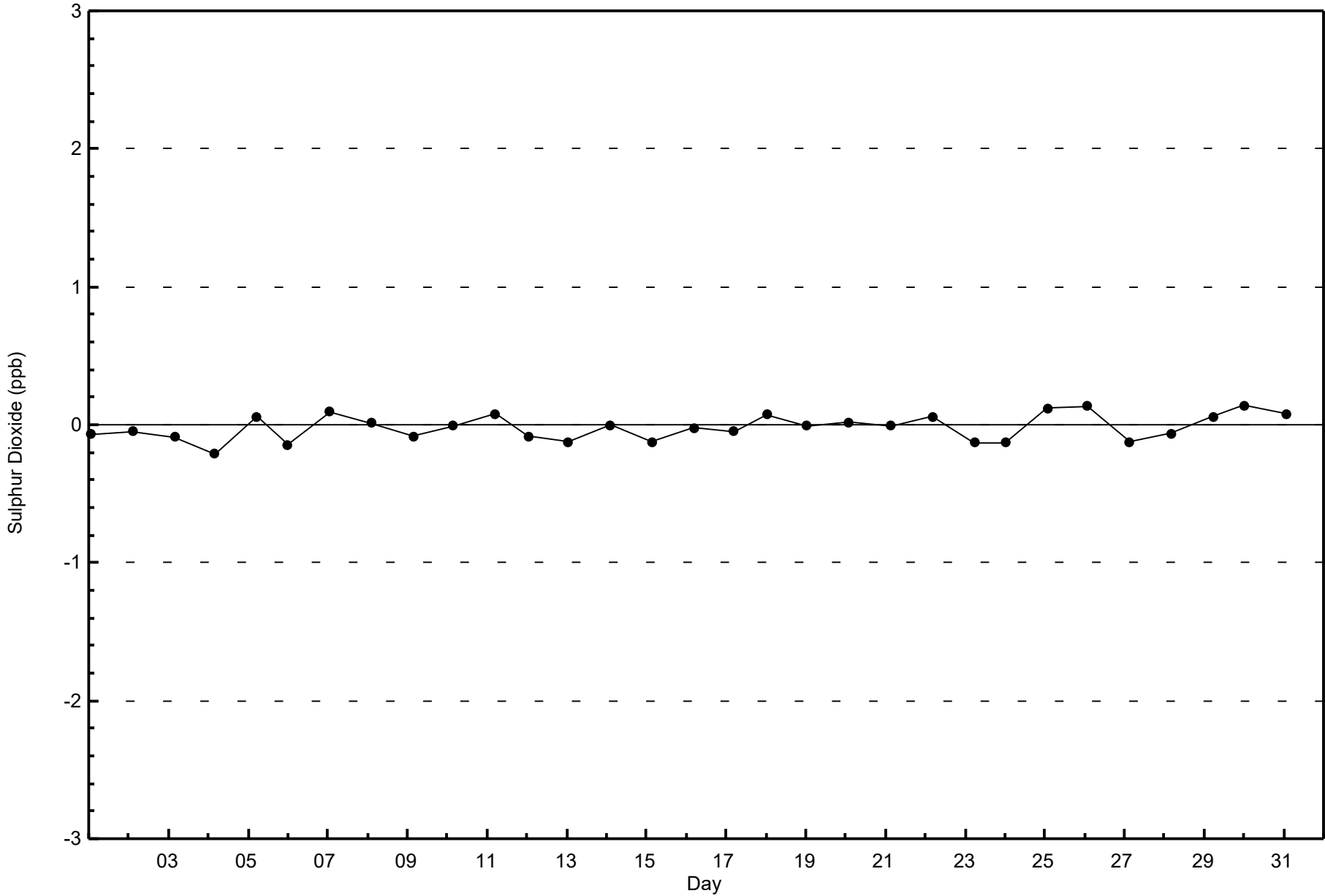
Total Number of Hours: 744

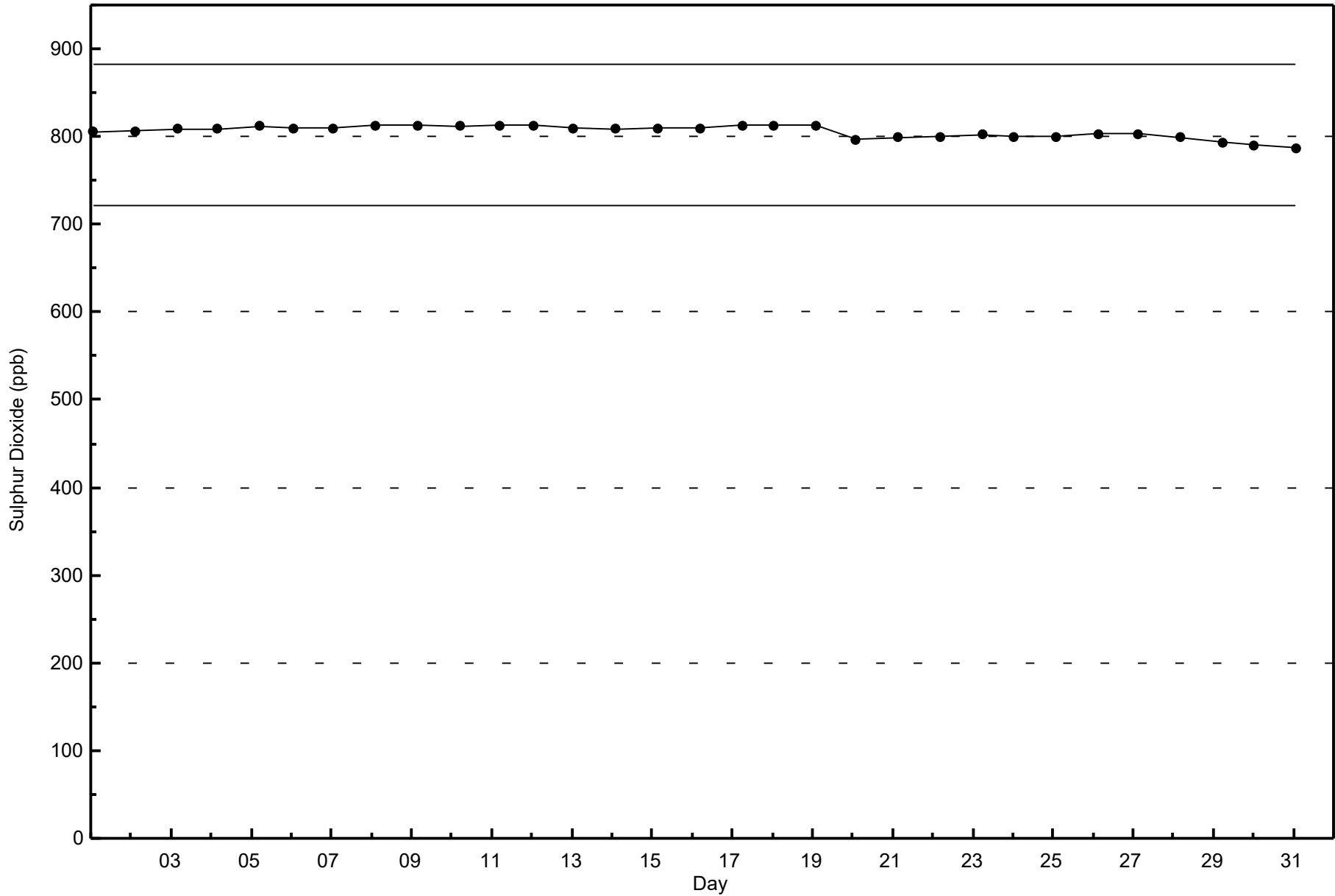


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

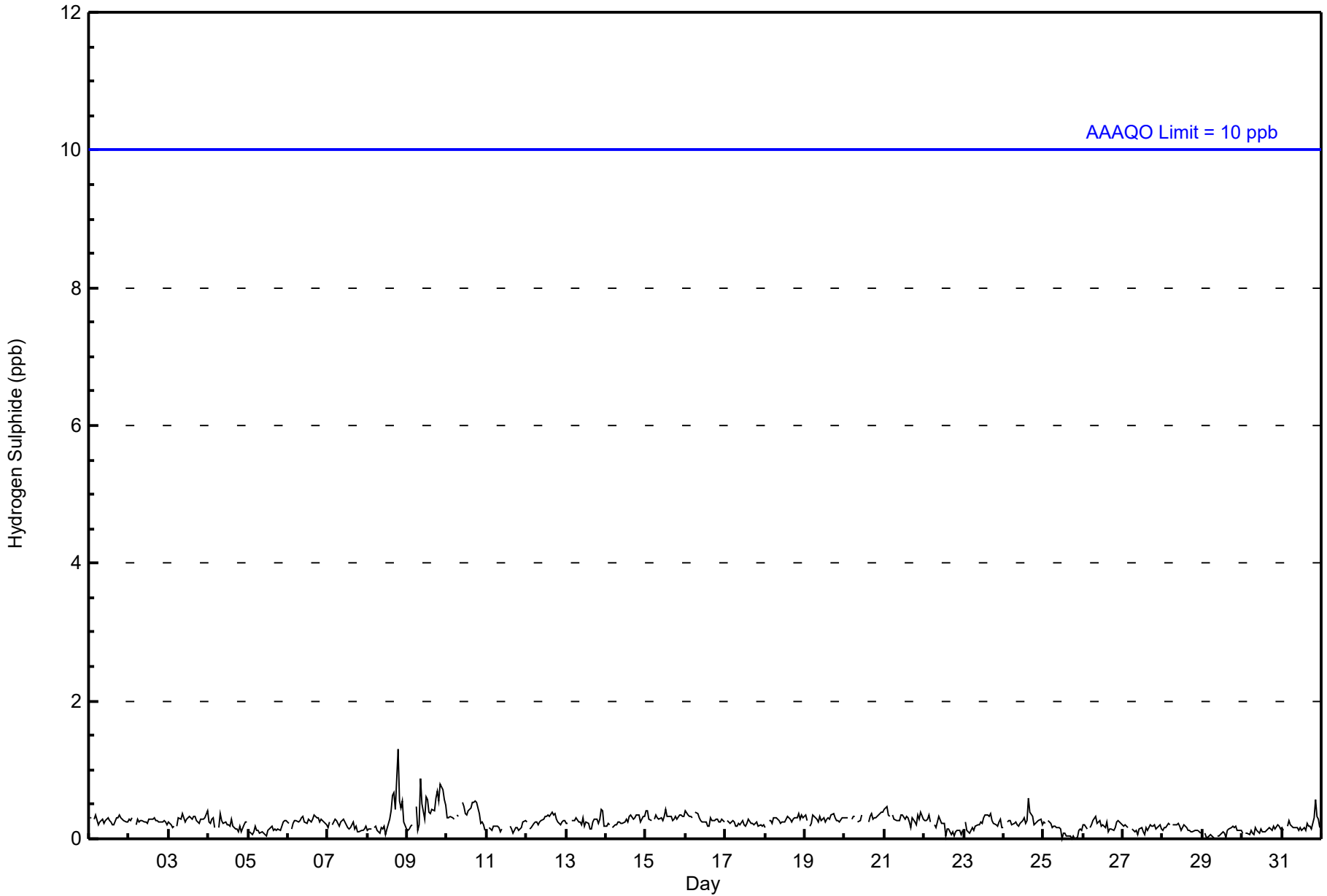
Jackfish 2/3 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744									
Maximum Value: 1.3 ppb on Jan 8 19:00		Maximum Daily Average: 0.4 ppb on Jan 9														Hours of Data:		703											
Minimum Value: 0.0 ppb on Jan 25 12:00		Minimum Daily Average: 0.1 ppb on Jan 29														Hours of Missing Data:		41											
Maximum Diurnal Average: 0.3 ppb at hour 19		Minimum Diurnal Average: 0.2 ppb at hour 3														Hours of Calibration:		35											
Monthly Average: 0.24 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.3 P ₉₉ = 0.6														Percent Operational Time:		99.2											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.4			
2-Jan	0.3	0.3	0.3	Z	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3			
3-Jan	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4			
4-Jan	0.3	0.2	0.3	0.3	0.2	Z	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.3			
5-Jan	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3			
6-Jan	0.2	Z	0.1	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.3			
7-Jan	0.2	0.3	Z	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3			
8-Jan	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.3	0.4	0.6	0.7	0.4	1.3	0.6	0.4	0.5	0.2	0.1	0.3	1.3			
9-Jan	0.1	0.1	0.2	0.2	Z	0.5	0.1	0.2	0.9	0.5	0.3	0.6	0.6	0.4	0.4	0.4	0.4	0.6	0.7	0.5	0.8	0.7	0.6	0.5	0.4	0.9			
10-Jan	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.3	M	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.1	0.4	0.6			
11-Jan	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	C	C	C	C	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.3			
12-Jan	0.2	Z	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.4			
13-Jan	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.2	0.3	0.4			
14-Jan	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3			
15-Jan	0.4	0.4	0.3	0.3	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4			
16-Jan	0.4	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.4			
17-Jan	Z	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3			
18-Jan	0.2	Z	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4			
19-Jan	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4			
20-Jan	0.3	0.3	0.3	Z	0.3	0.3	0.3	M	0.2	0.3	0.3	M	M	M	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4			
21-Jan	0.4	0.5	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.4	0.3	0.3	0.5			
22-Jan	0.3	0.3	0.3	0.3	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2			
23-Jan	Z	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.4			
24-Jan	0.2	Z	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.6			
25-Jan	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3			
26-Jan	0.2	0.2	0.1	Z	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3			
27-Jan	0.2	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2			
28-Jan	0.1	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2			
29-Jan	Z	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DF	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2			
30-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2			
31-Jan	0.2	0.1	Z	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.3	0.6	0.3	0.3	0.2	0.2	0.6			
																								Diurnal Average		0.2		0.3	
																								Diurnal Maximum		0.4		0.5	
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																													
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																													



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	6	15	28	26	8	8	19	18	53	110	139	118	40	28	36	45	697
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	15	28	26	8	8	19	18	53	110	139	118	40	28	36	45	697

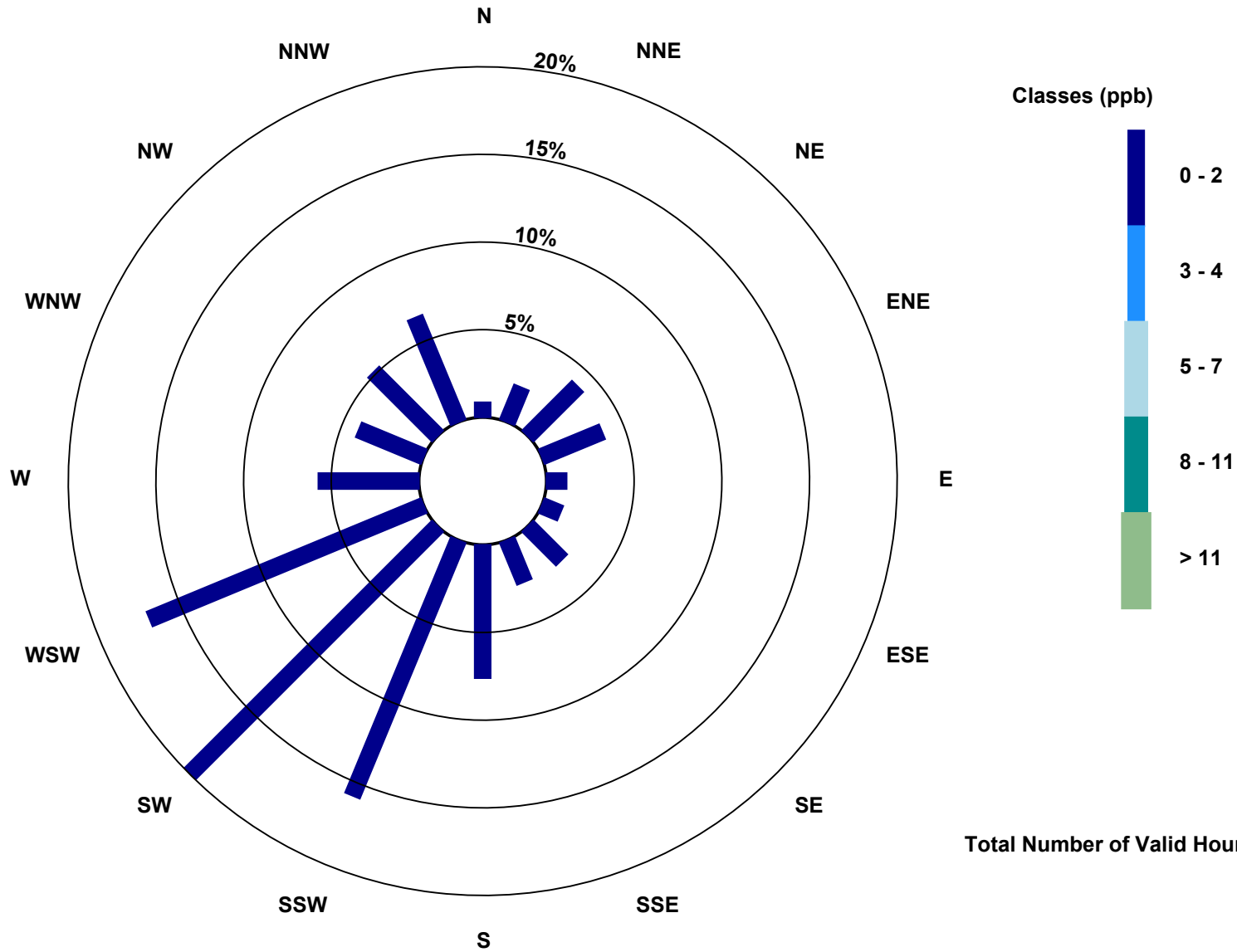
Total Number of Valid Hours: 697

Total Number of Hours: 744

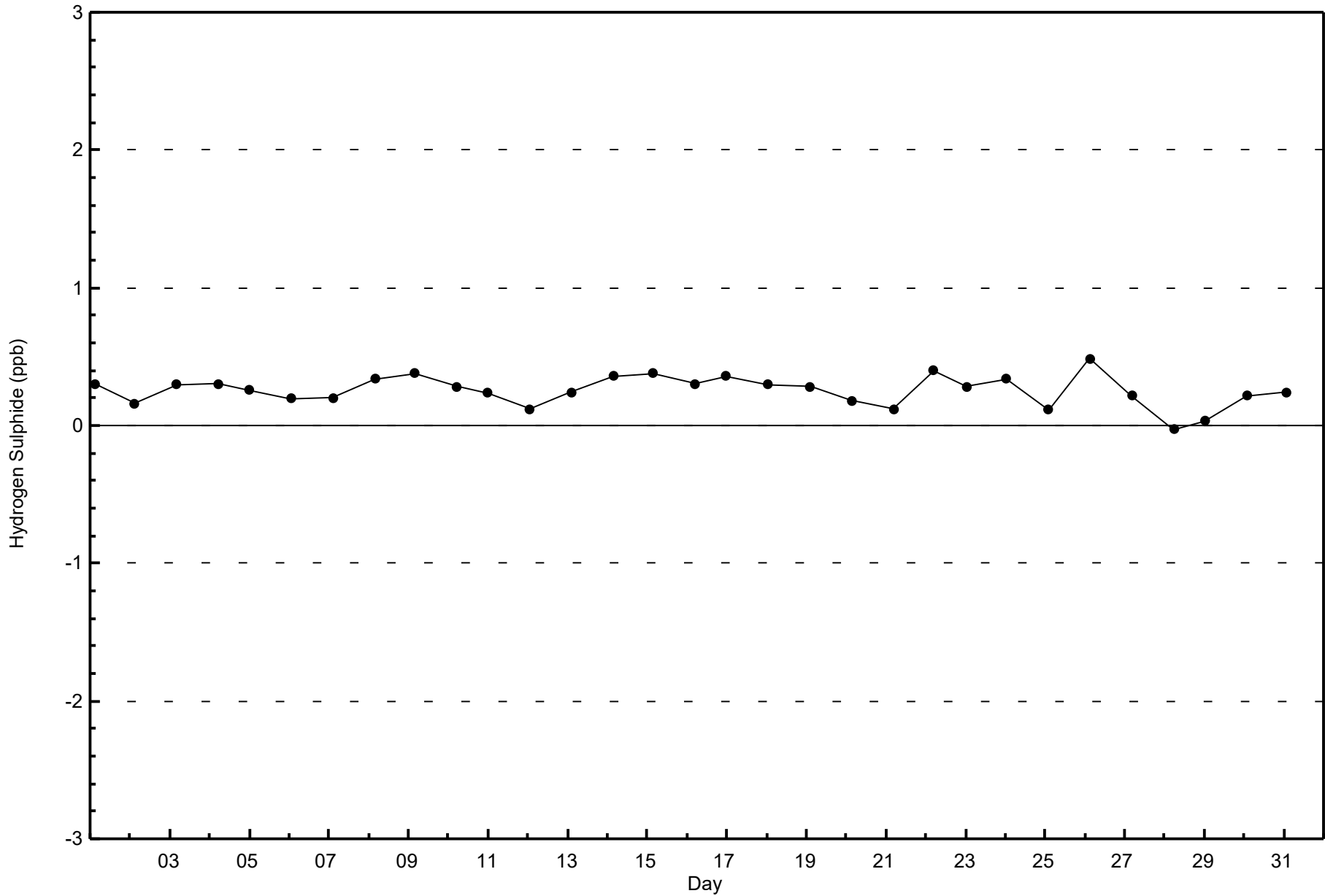


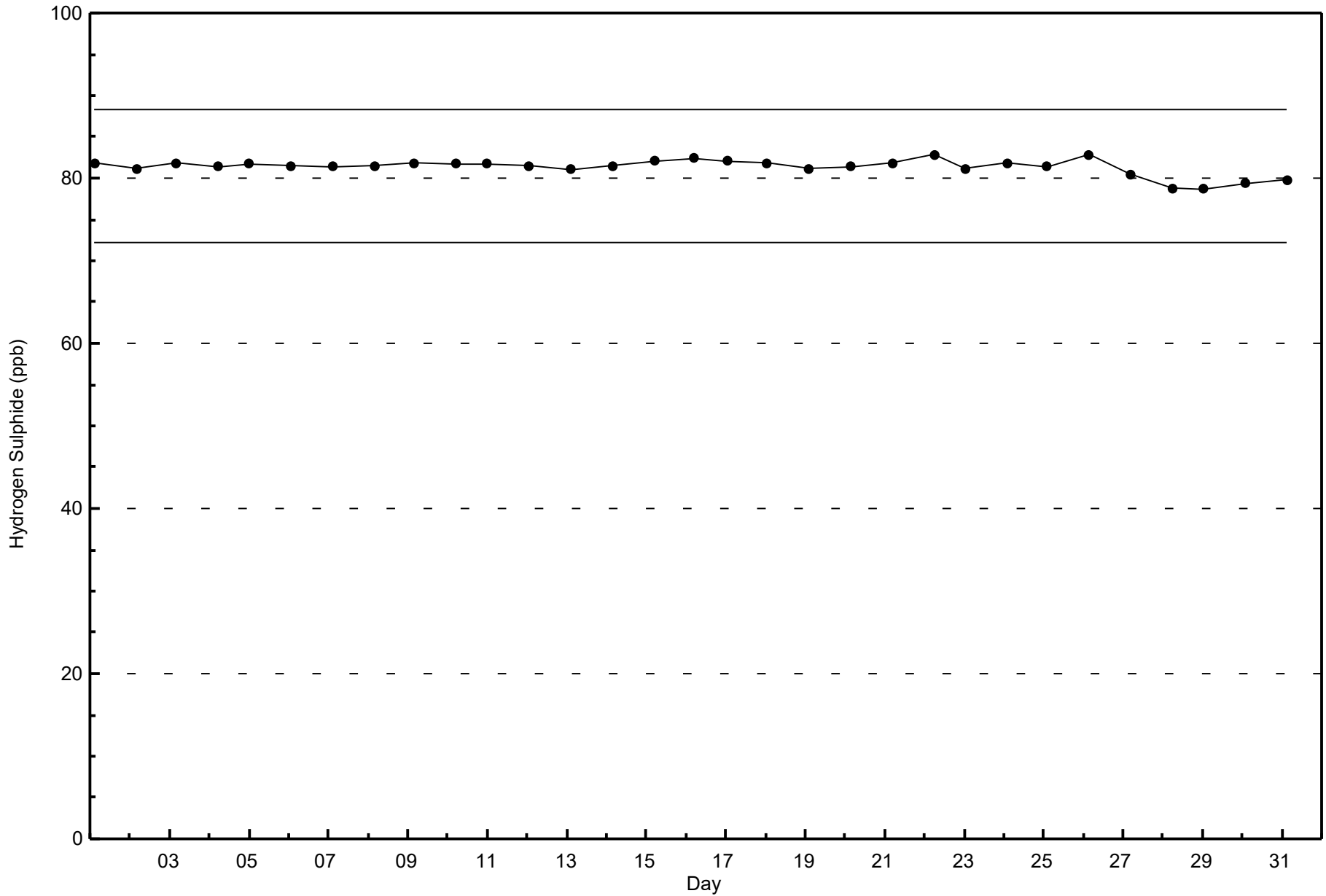
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3



Total Number of Valid Hours: 697







Wood Buffalo Environmental Association

Summary of Hour Averages

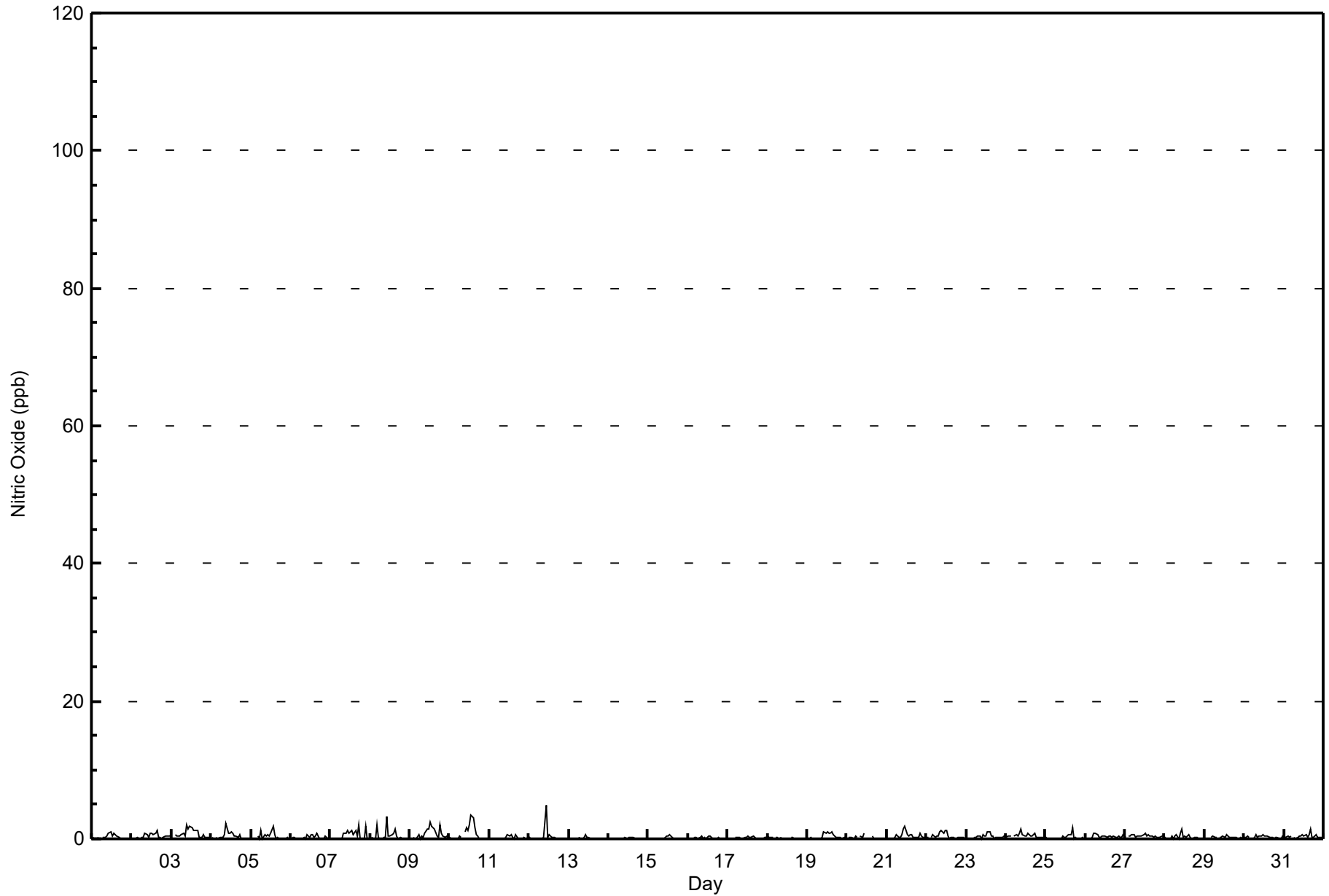
Nitric Oxide (NO) - ppb
Jackfish 2/3 - January 2023

Maximum Value: 4.8 ppb on Jan 12 11:00																				Maximum Daily Average: 0.8 ppb on Jan 3					Hours in Service: 744				
Minimum Value: 0.0 ppb on Jan 1 19:00																				Minimum Daily Average: 0.0 ppb on Jan 14					Hours of Data: 701				
Maximum Diurnal Average: 0.9 ppb at hour 11																				Minimum Diurnal Average: 0.1 ppb at hour 2					Hours of Missing Data: 43				
Monthly Average: 0.32 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.8 P ₉₉ = 2.1					Hours of Calibration: 36				
																				Percent Operational Time: 99.1									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	0.2	0.0	0.0	0.1	0.2	Z	0.1	0.3	0.2	0.3	0.9	1.1	0.5	0.9	0.6	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1			
2-Jan	Z	0.0	0.0	0.2	0.0	0.0	0.2	0.2	0.8	0.7	0.2	0.8	0.8	0.6	0.7	1.1	0.3	0.1	0.1	0.2	0.4	0.3	0.4	0.5	0.4	1.1			
3-Jan	0.5	Z	0.5	0.3	0.5	0.4	0.6	0.8	0.5	2.1	1.4	1.9	1.6	1.3	1.2	1.3	1.3	0.1	0.2	0.7	0.1	0.2	0.2	0.1	0.8	2.1			
4-Jan	0.1	0.3	Z	0.2	0.0	0.2	0.3	0.1	0.5	2.2	0.8	0.9	0.9	0.7	0.4	0.4	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2			
5-Jan	0.0	0.0	0.0	Z	0.5	0.0	1.2	0.0	0.5	0.3	0.6	0.5	0.7	1.8	0.5	0.0	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.3	1.8				
6-Jan	0.0	0.2	0.1	0.1	Z	0.1	0.0	0.0	0.3	0.0	0.6	0.3	0.6	0.6	0.2	0.4	0.9	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.9			
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.9	0.9	1.1	0.8	1.0	1.3	0.5	1.2	0.3	2.0	0.0	0.0	0.0	1.9	0.0	0.0	0.5	2.0			
8-Jan	Z	0.3	0.0	0.0	2.1	0.2	0.1	0.0	0.1	0.2	3.3	0.3	0.3	0.6	0.8	1.5	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.5	3.3			
9-Jan	0.0	Z	0.1	0.0	0.1	0.7	0.0	0.5	0.2	0.9	1.4	1.5	2.5	1.9	1.7	1.5	0.3	0.1	2.0	0.7	0.4	0.2	0.3	0.3	0.8	2.5			
10-Jan	0.1	0.0	Z	0.1	0.1	0.0	0.4	0.2	M	1.0	1.6	1.3	2.0	3.4	3.0	1.7	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.7	3.4			
11-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.5	0.6	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.6			
12-Jan	0.2	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	4.8	0.3	0.6	0.4	0.3	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.8			
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.2	0.0	0.0	0.1	0.6	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6			
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3			
15-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6			
16-Jan	0.0	0.0	Z	0.0	0.1	0.2	0.0	0.1	0.4	0.0	0.2	0.1	0.5	0.4	0.2	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.5			
17-Jan	0.0	0.0	0.1	Z	0.1	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.4			
18-Jan	0.3	0.3	0.3	0.1	Z	0.3	0.3	0.1	0.2	C	C	C	C	C	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3			
19-Jan	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.9	0.9	1.0	0.9	0.7	1.0	0.6	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.3	1.0			
20-Jan	Z	0.2	0.1	0.2	0.0	0.4	0.2	M	0.3	0.2	0.7	M	M	M	M	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.7			
21-Jan	0.0	Z	0.0	0.0	0.1	0.2	0.6	0.3	0.2	0.7	1.5	1.9	0.6	0.5	0.7	0.6	0.1	0.2	0.3	0.1	0.9	0.4	0.3	0.3	0.5	1.9			
22-Jan	0.2	0.2	Z	0.3	0.5	0.2	0.3	0.5	1.1	1.2	0.7	1.3	1.2	0.4	0.1	0.3	0.1	0.1	0.0	0.3	0.2	0.2	0.1	0.0	0.4	1.3			
23-Jan	0.0	0.1	0.0	Z	0.0	0.3	0.2	0.5	0.4	0.1	0.6	0.4	0.5	1.1	1.0	0.4	0.5	0.0	0.2	0.2	0.2	0.2	0.2	0.4	0.3	1.1			
24-Jan	0.3	0.4	0.4	0.5	Z	0.4	0.6	0.5	0.9	1.3	0.6	0.3	0.4	0.8	0.7	0.4	0.5	0.7	0.3	0.2	0.2	0.2	0.2	0.0	0.5	1.3			
25-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.4	0.1	0.2	0.4	0.7	0.7	1.7	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.2	1.7			
26-Jan	Z	0.1	0.0	0.0	0.1	0.7	0.8	0.7	0.2	0.1	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.2	0.3	0.4	0.2	0.3	0.5	0.3	0.8			
27-Jan	0.2	Z	0.3	0.4	0.6	0.6	0.2	0.4	0.3	0.3	0.5	0.5	0.8	0.5	0.6	0.4	0.4	0.3	0.4	0.2	0.3	0.1	0.4	0.4	0.4	0.8			
28-Jan	0.3	0.1	Z	0.0	0.4	0.1	0.4	0.5	0.0	0.7	1.4	0.2	0.4	0.3	0.6	0.3	0.0	0.0	0.1	0.2	0.0	0.1	0.1	0.0	0.3	1.4			
29-Jan	0.1	0.1	0.0	Z	0.1	0.3	0.2	0.2	DF	0.3	0.3	0.5	0.3	0.6	0.4	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.6			
30-Jan	0.2	0.1	0.4	0.2	Z	0.0	0.2	0.5	0.3	0.4	0.4	0.6	0.3	0.5	0.3	0.3	0.3	0.2	0.0	0.2	0.2	0.0	0.0	0.3	0.3	0.6			
31-Jan	0.1	0.1	0.3	0.2	0.4	Z	0.2	0.0	0.2	0.4	0.4	0.6	0.5	0.5	0.2	0.6	1.5	0.2	0.1	0.6	0.2	0.2	0.2	0.1	0.3	1.5			
																								Diurnal Average					
																								Diurnal Maximum					
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																													



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 2/3 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	15	29	25	9	8	19	20	53	104	141	118	38	29	34	47	695
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	15	29	25	9	8	19	20	53	104	141	118	38	29	34	47	695

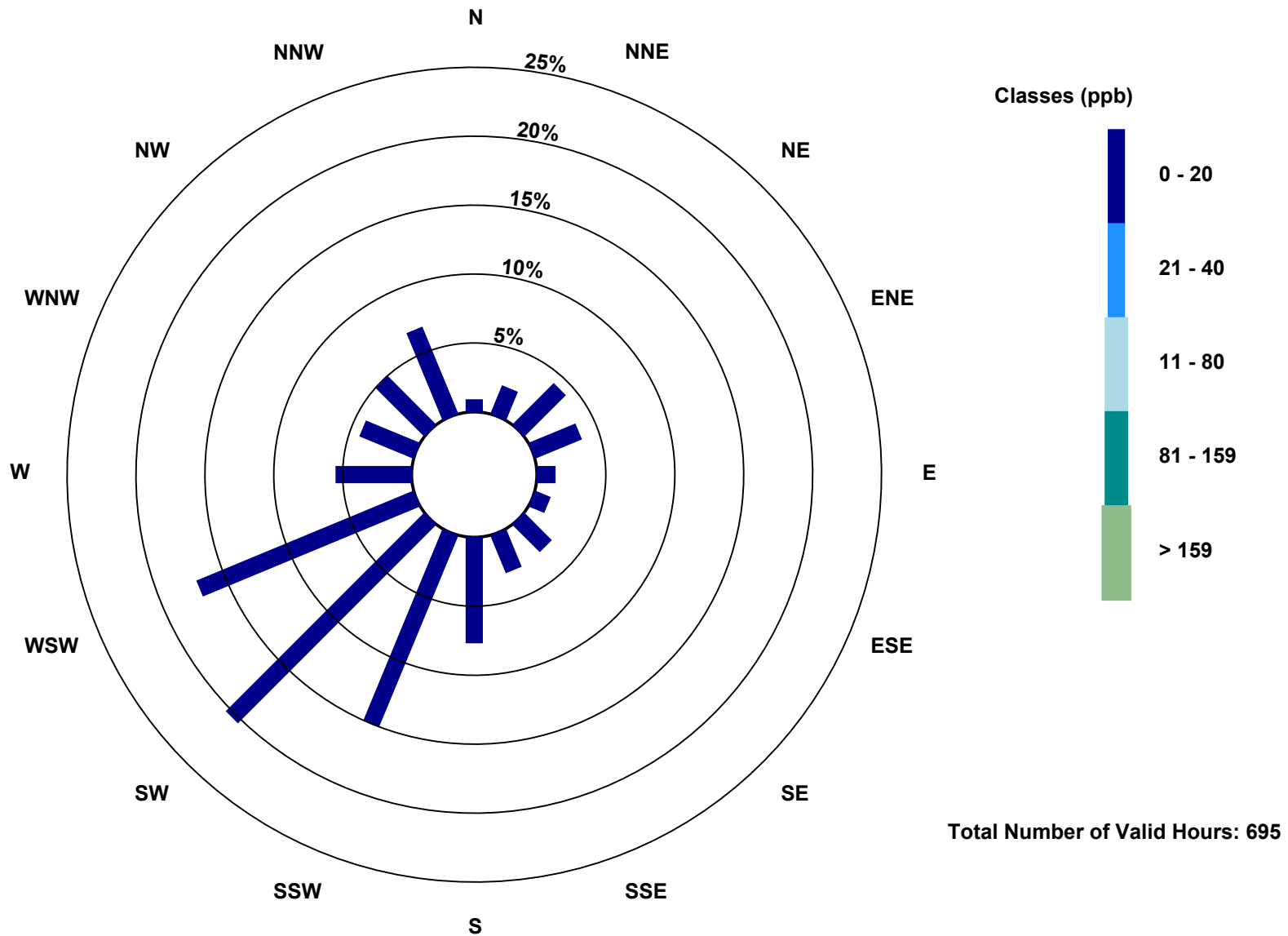
Total Number of Valid Hours: 695

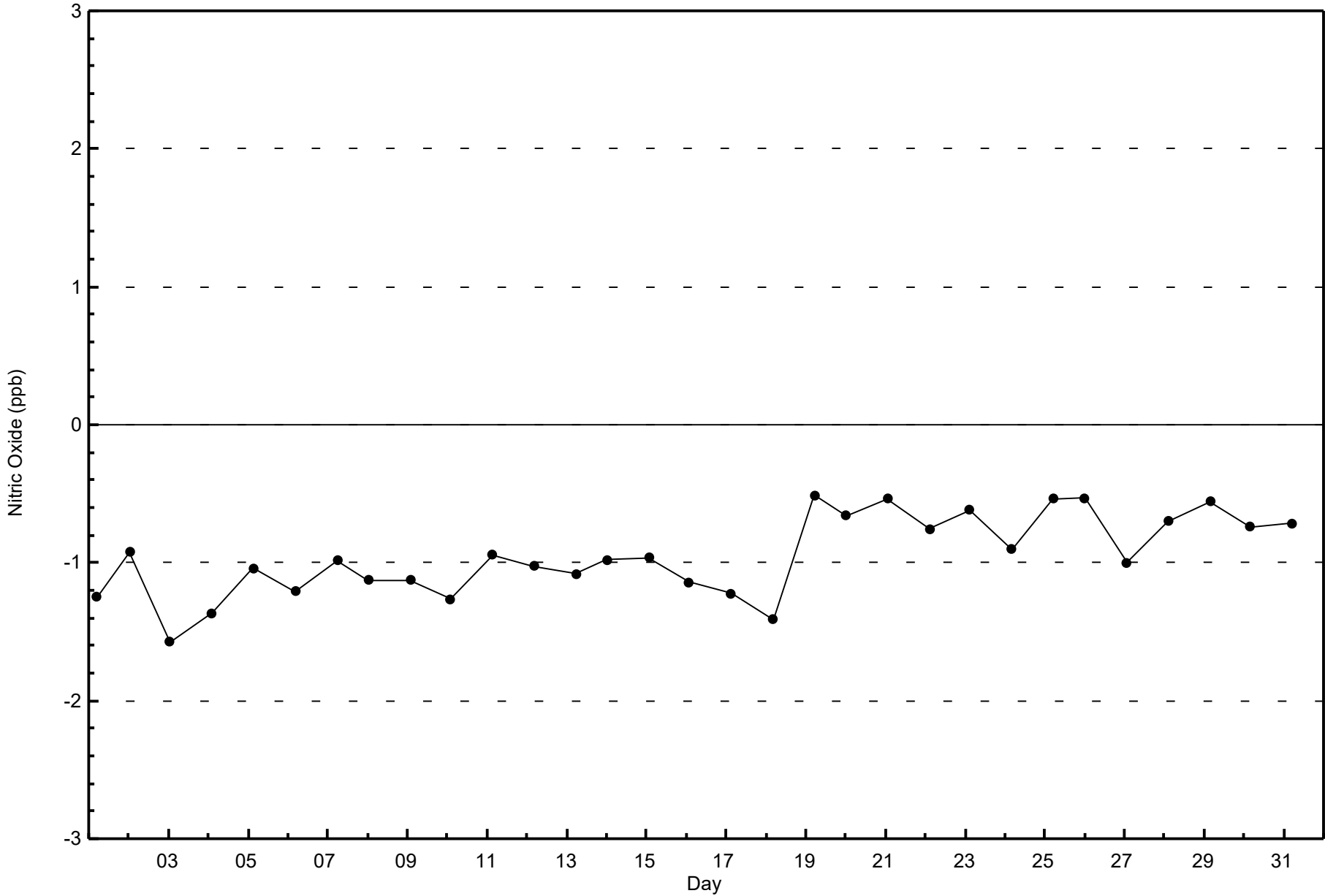
Total Number of Hours: 744

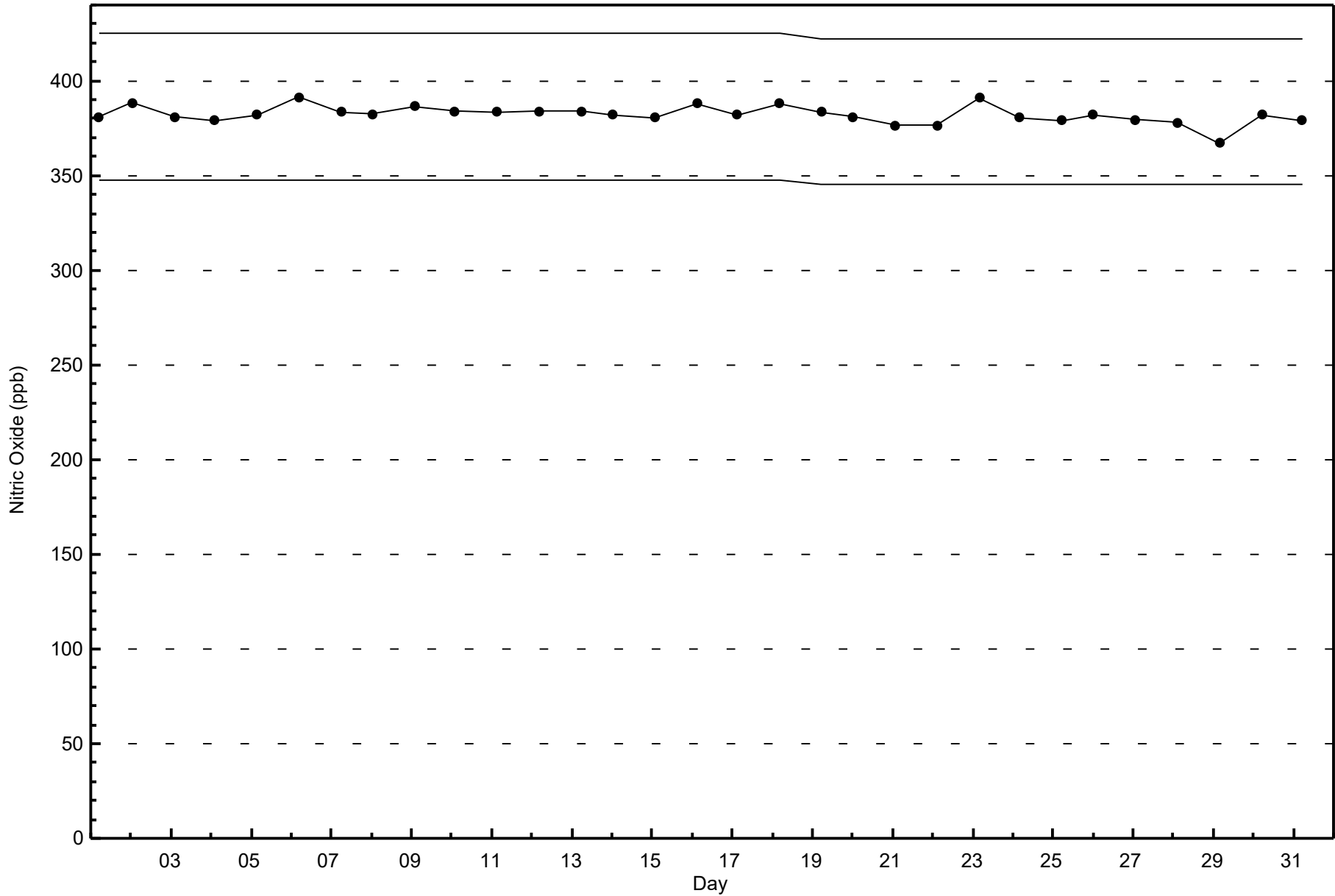


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

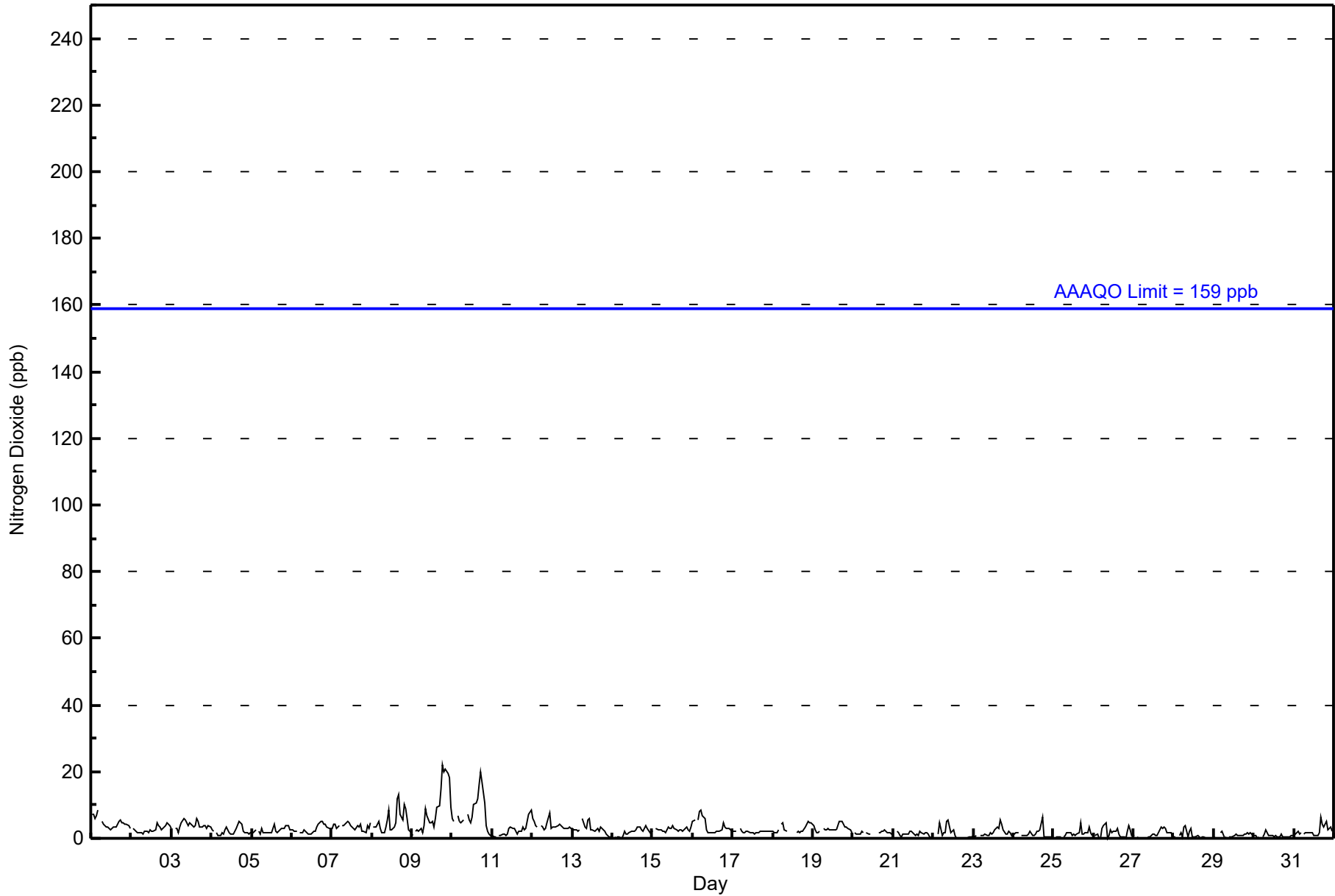
Jackfish 2/3 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 22.1 ppb on Jan 9 19:00				Maximum Daily Average: 8.7 ppb on Jan 9		Hours of Data:														701																													
Minimum Value: 0.0 ppb on Jan 22 00:00				Minimum Daily Average: 0.8 ppb on Jan 30		Hours of Missing Data:														43																													
Maximum Diurnal Average: 4.0 ppb at hour 18				Minimum Diurnal Average: 2.0 ppb at hour 3		Hours of Calibration:														36																													
Monthly Average: 2.74 ppb				Percentiles: P ₁ = 0.0 P ₁₀ = 0.5 Q ₁ = 1.3 Median = 2.1 Q ₃ = 3.3 P ₉₀ = 5.0 P ₉₉ = 16.0		Percent Operational Time:														99.1																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	7.1	7.2	6.1	6.7	8.3	Z	5.2	4.4	3.8	3.3	3.4	2.6	2.8	3.2	3.3	3.6	4.9	5.6	4.7	4.6	4.1	4.4	4.0	2.8	4.6	8.3																							
2-Jan	Z	3.0	2.6	1.5	1.5	1.7	1.8	1.2	2.3	2.1	1.7	2.6	2.1	2.0	2.5	4.8	3.8	3.3	2.5	3.0	3.9	4.7	4.3	3.7	2.7	4.8																							
3-Jan	3.0	Z	2.9	2.8	1.8	3.3	4.6	5.9	5.7	4.8	4.0	4.7	3.8	3.6	4.0	5.8	5.1	3.2	3.6	3.9	3.9	3.1	4.0	3.3	3.9	5.9																							
4-Jan	2.4	2.2	Z	1.5	1.0	1.0	1.5	1.2	2.4	3.2	1.7	1.1	1.4	1.4	2.0	3.1	4.9	4.5	4.1	2.1	1.6	1.7	1.4	1.7	2.1	4.9																							
5-Jan	1.8	1.5	2.4	Z	2.2	1.2	3.0	1.6	1.8	1.6	1.8	1.9	1.5	4.4	2.2	1.6	2.3	2.7	3.1	3.0	3.7	3.7	3.8	2.7	2.4	4.4																							
6-Jan	2.4	2.1	2.1	2.1	Z	1.7	1.7	2.6	2.0	1.8	1.4	1.3	1.7	2.0	2.2	3.3	4.2	5.0	4.9	4.4	4.3	3.2	2.9	2.8	2.7	5.0																							
7-Jan	3.0	4.4	4.1	2.8	4.0	Z	4.0	3.7	4.4	5.0	4.6	4.0	3.2	3.1	2.5	4.0	3.2	4.1	2.3	2.1	1.6	3.9	2.8	4.8	3.5	5.0																							
8-Jan	Z	3.5	3.2	4.1	5.2	2.8	1.8	1.6	3.4	5.5	8.4	2.7	2.5	3.6	4.7	12.0	13.1	7.4	5.7	10.1	9.1	5.8	2.4	1.7	5.2	13.1																							
9-Jan	0.9	Z	2.2	2.5	2.3	3.0	1.8	4.0	8.8	6.8	4.6	4.8	4.9	3.6	6.0	9.4	9.8	15.0	22.1	20.1	20.7	19.3	18.1	9.5	8.7	22.1																							
10-Jan	5.9	5.0	Z	6.8	5.2	4.8	4.9	5.4	M	7.0	5.4	4.5	6.4	10.0	10.7	11.8	16.0	19.8	16.9	10.6	3.7	2.3	1.2	0.9	7.5	19.8																							
11-Jan	0.7	0.5	0.6	Z	0.9	0.8	1.1	1.2	0.9	1.4	3.1	3.3	3.1	2.8	2.2	1.4	2.3	2.1	3.3	2.6	3.0	5.0	7.0	8.5	2.5	8.5																							
12-Jan	5.8	5.2	4.0	3.3	Z	3.7	3.3	2.4	2.8	4.5	7.6	3.1	3.4	3.6	3.3	4.0	4.3	3.9	3.4	2.9	2.9	3.1	3.2	2.8	3.8	7.6																							
13-Jan	2.9	2.7	2.6	2.1	2.4	Z	5.9	3.3	2.8	5.7	5.9	2.7	2.4	2.2	2.5	2.9	2.3	3.4	2.5	2.2	1.3	0.9	0.4	0.4	2.7	5.9																							
14-Jan	Z	0.3	0.2	0.3	0.3	0.2	0.8	2.1	1.4	1.4	1.9	2.3	2.2	2.0	2.5	3.3	3.5	2.7	2.3	2.9	3.8	2.8	1.8	2.1	1.9	3.8																							
15-Jan	2.0	Z	3.0	2.5	2.6	2.5	2.3	2.0	1.9	3.6	3.1	3.0	3.9	2.8	2.4	2.2	2.6	2.4	2.2	2.6	3.2	2.6	2.2	3.5	2.7	3.9																							
16-Jan	5.0	5.3	Z	5.4	8.0	8.4	6.9	5.9	2.5	1.8	1.9	1.6	1.9	1.5	2.0	2.1	2.3	2.7	4.7	3.3	3.0	2.8	2.9	2.2	3.7	8.4																							
17-Jan	2.2	2.1	2.1	Z	2.8	2.1	1.8	1.9	2.0	2.0	1.9	1.7	1.6	1.4	1.7	1.6	2.0	2.1	2.1	2.1	2.1	2.3	2.1	2.1	2.0	2.8																							
18-Jan	2.0	1.8	1.7	2.5	Z	4.2	4.6	2.4	2.0	C	C	C	C	C	1.6	2.0	1.6	2.1	2.1	3.2	4.2	4.9	4.7	4.6	2.9	4.9																							
19-Jan	3.9	2.4	1.7	1.7	2.0	Z	3.0	2.6	2.6	3.0	2.7	2.7	2.7	2.5	2.5	4.0	5.0	5.2	4.4	3.4	3.3	3.0	2.6	1.9	3.0	5.2																							
20-Jan	Z	1.7	1.4	1.1	1.4	2.1	1.9	M	1.8	1.4	1.1	M	M	M	M	1.5	1.6	2.3	2.3	2.6	1.8	1.9	1.6	1.3	1.7	2.6																							
21-Jan	0.8	Z	2.0	1.9	0.8	0.6	1.2	1.2	1.4	1.1	2.0	2.1	1.2	0.9	1.3	1.0	2.0	1.9	1.1	1.5	1.7	1.1	0.4	0.0	1.3	2.1																							
22-Jan	0.0	0.0	Z	1.4	4.5	0.7	1.7	1.7	5.0	5.5	1.9	2.2	2.5	0.7	0.2	0.0	0.1	0.1	0.0	0.0	0.1	0.4	0.4	0.6	1.3	5.5																							
23-Jan	1.0	0.6	1.0	Z	0.9	0.8	1.0	1.1	0.8	0.7	1.6	1.4	1.5	2.7	3.6	2.9	5.7	4.4	2.5	1.2	1.4	2.0	1.8	0.8	1.8	5.7																							
24-Jan	0.8	1.5	1.5	1.5	Z	1.0	0.9	0.8	0.9	1.4	2.2	0.8	1.0	1.2	2.1	2.2	2.7	6.4	0.6	0.4	0.5	0.5	0.3	0.2	1.4	6.4																							
25-Jan	0.2	0.1	0.3	0.3	0.3	Z	0.5	0.8	1.6	1.5	1.6	0.9	1.2	0.7	1.3	1.9	4.5	1.4	1.2	1.7	1.9	3.6	1.7	1.0	1.3	4.5																							
26-Jan	Z	1.0	1.3	0.0	0.2	3.1	4.0	4.5	0.0	1.0	2.6	1.5	2.1	2.2	3.1	1.3	0.6	0.5	0.4	0.2	2.2	4.0	2.4	0.8	1.7	4.5																							
27-Jan	0.8	Z	0.6	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.6	1.3	1.4	0.9	1.0	1.9	3.3	2.9	3.6	3.1	1.8	1.7	1.5	0.4	1.2	3.6																							
28-Jan	0.3	0.4	Z	0.9	1.7	0.3	3.3	3.9	0.4	2.1	3.0	0.4	0.3	0.3	1.0	0.4	0.2	0.3	0.3	0.1	0.0	0.0	0.0	0.1	0.9	3.9																							
29-Jan	0.3	0.1	0.2	Z	1.8	2.2	0.2	0.3	DF	0.4	0.3	0.3	0.8	1.3	0.8	1.0	0.7	1.0	1.4	1.1	1.9	1.2	1.9	0.9	0.9	2.2																							
30-Jan	1.0	0.7	0.2	0.4	Z	0.6	1.3	2.6	1.6	0.8	0.7	0.8	0.4	0.7	0.5	0.6	1.2	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.8	2.6																							
31-Jan	0.7	1.2	2.0	1.3	1.8	Z	1.4	1.9	1.5	1.6	1.5	1.7	0.9	0.8	0.8	1.6	6.5	4.1	3.2	5.0	2.6	2.9	3.3	2.3	2.2	6.5																							
																								2.2	2.2	2.0	2.2	2.5	2.1	2.5	2.5	2.4	2.7	2.8	2.2	2.2	2.3	2.6	3.2	3.9	4.0	3.7	3.4	3.2	3.2	2.8	2.3	Diurnal Average	
																								7.1	7.2	6.1	6.8	8.3	8.4	6.9	5.9	8.8	7.0	8.4	4.8	6.4	10.0	10.7	12.0	16.0	19.8	22.1	20.1	20.7	19.3	18.1	9.5	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	99.71	99.71
21 - 40	2	0.29	100.00
11 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	15	29	24	9	8	19	20	52	104	141	118	38	29	34	47	693
21 - 40	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	15	29	25	9	8	19	20	53	104	141	118	38	29	34	47	695

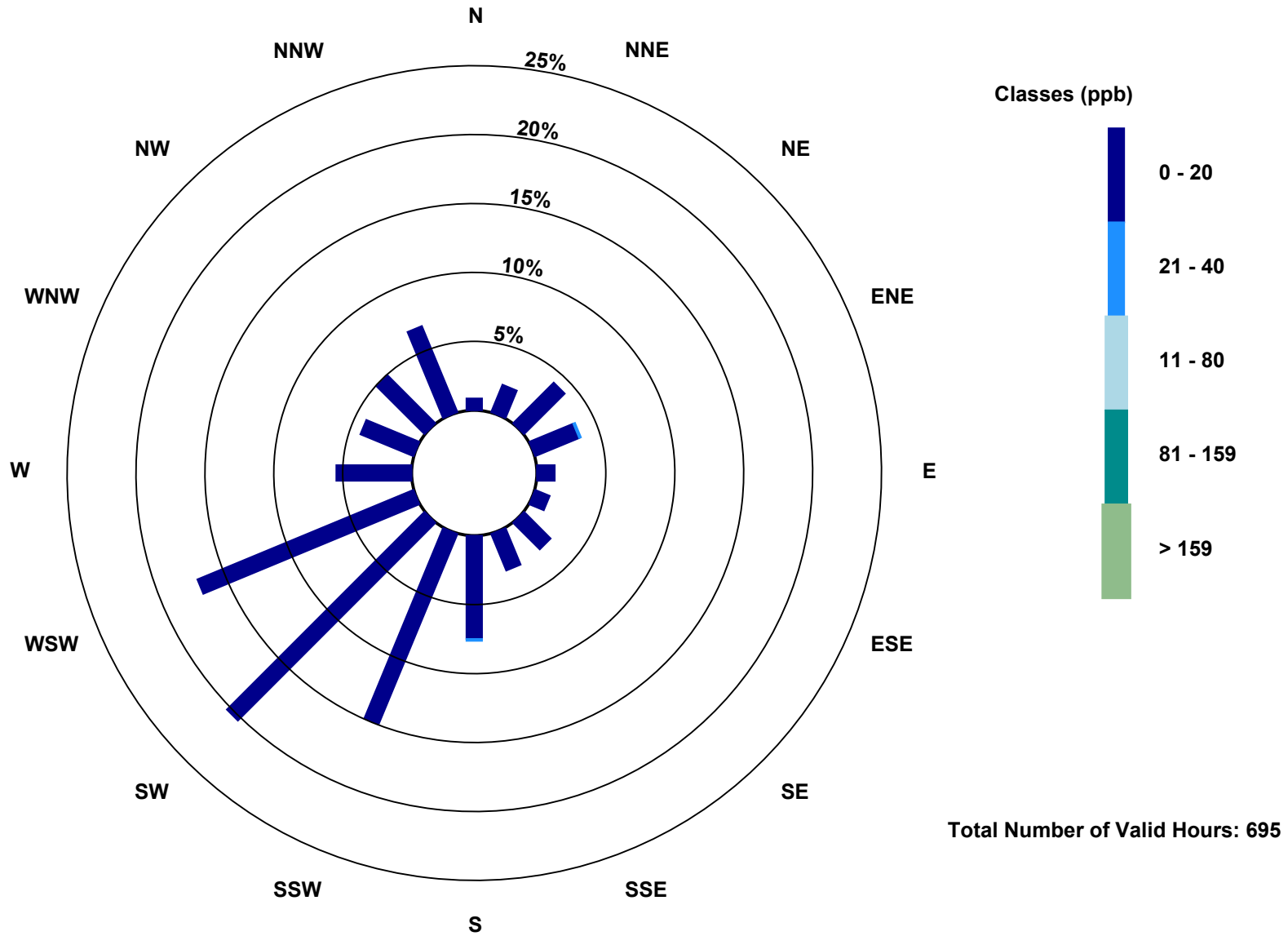
Total Number of Valid Hours: 695

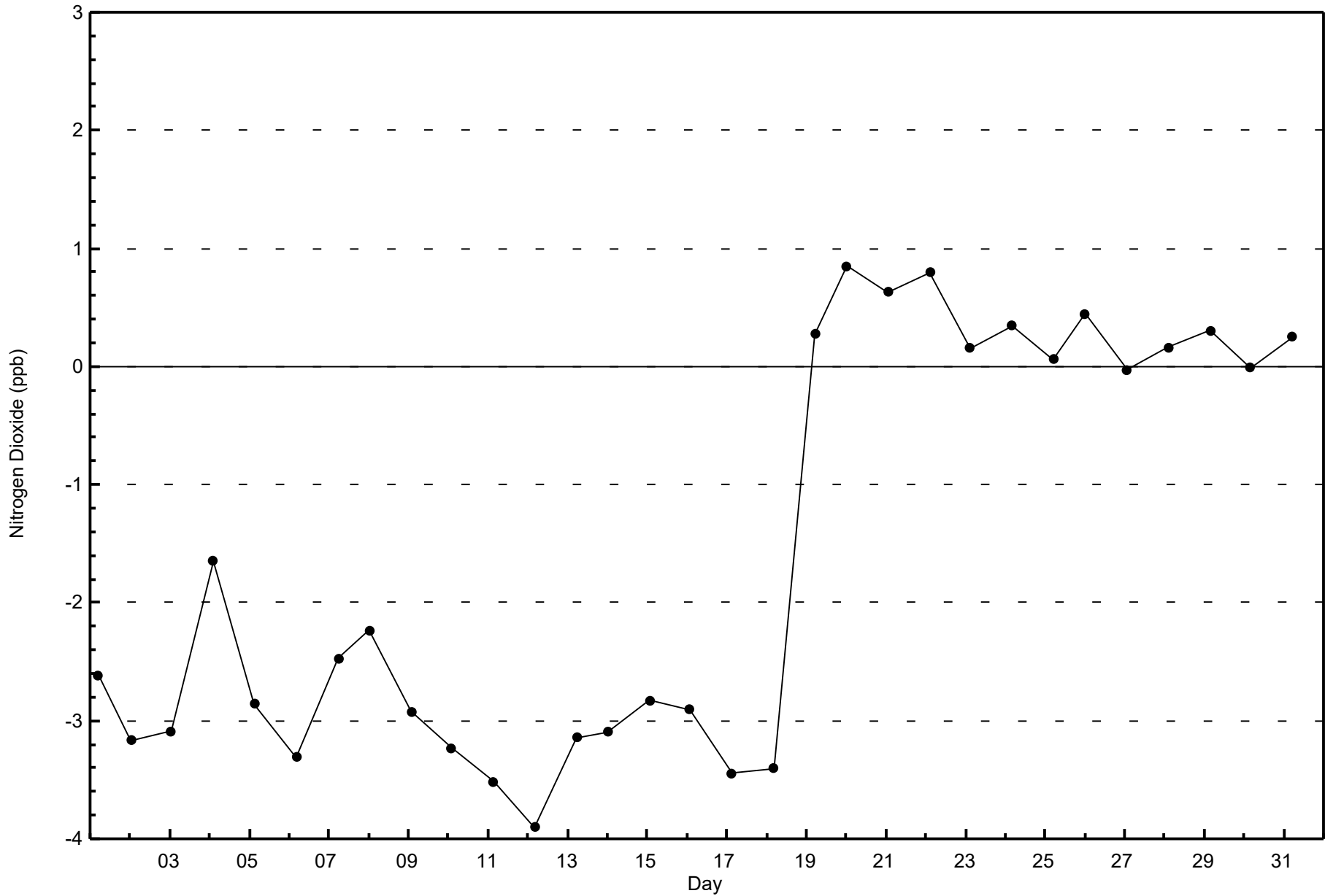
Total Number of Hours: 744

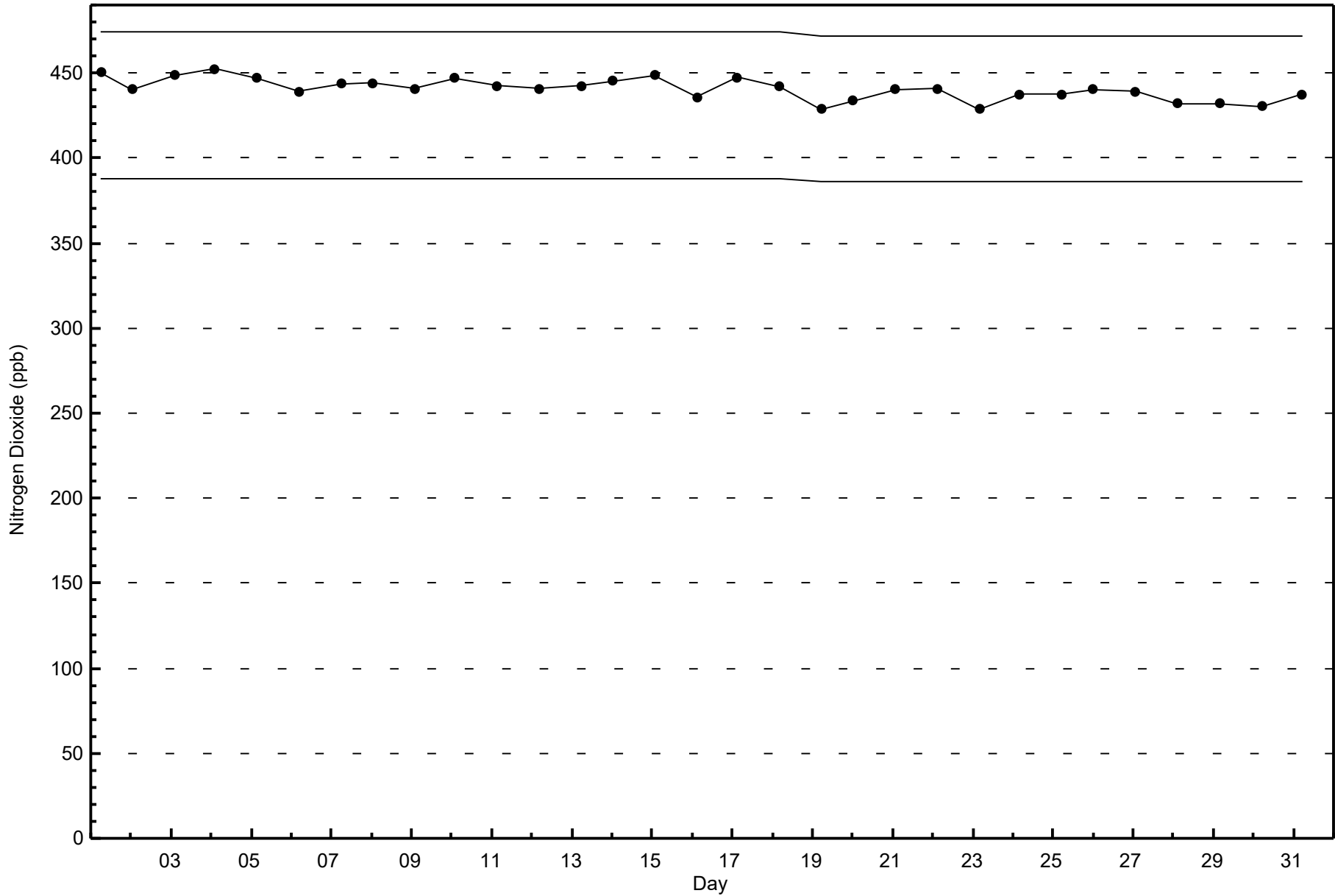


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

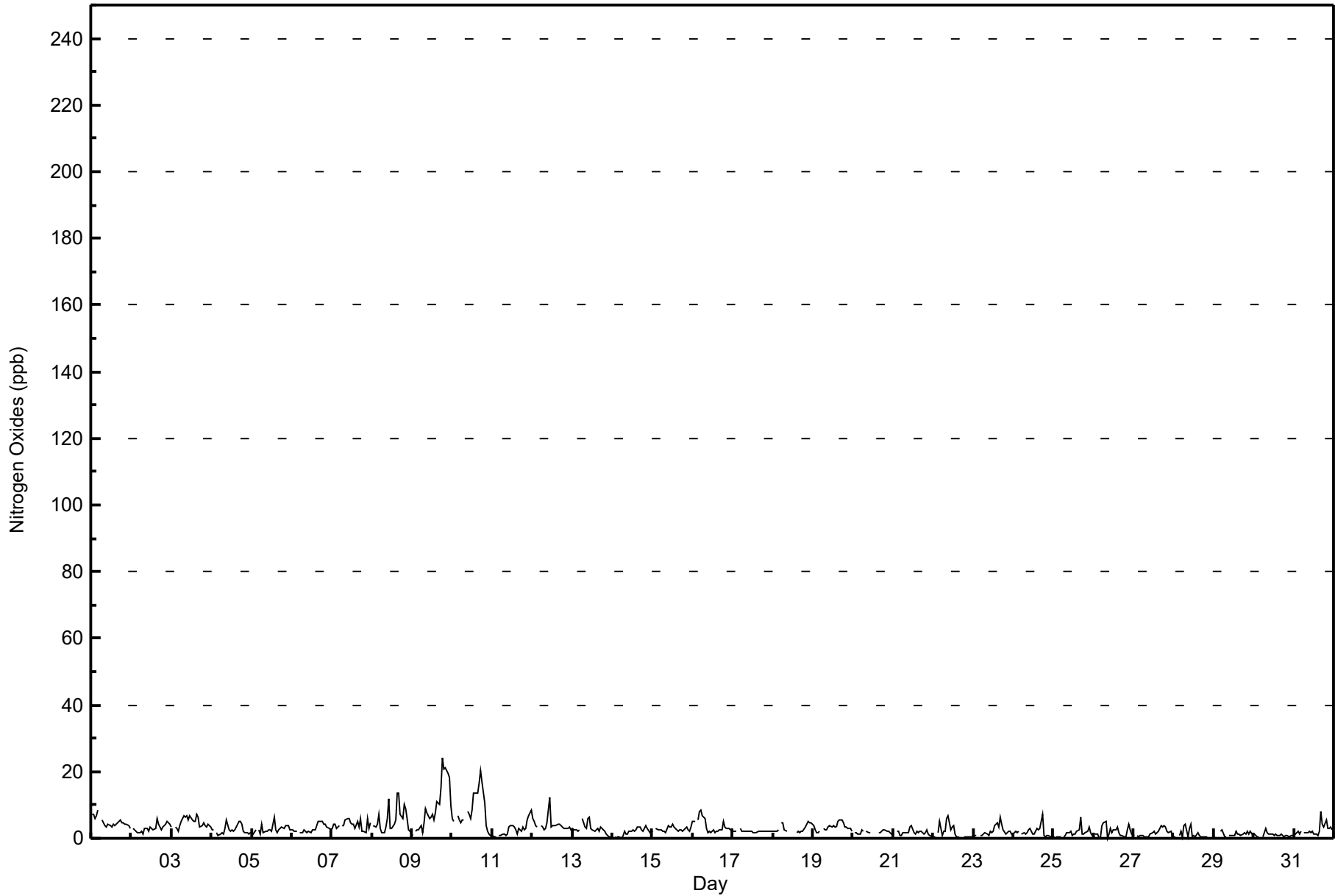
Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - January 2023

Maximum Value: 24.1 ppb on Jan 9 19:00		Maximum Daily Average: 9.5 ppb on Jan 9		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Jan 22 19:00		Minimum Daily Average: 1.0 ppb on Jan 30		Hours of Data: 701																																													
Maximum Diurnal Average: 4.3 ppb at hour 17		Minimum Diurnal Average: 2.1 ppb at hour 3		Hours of Missing Data: 43																																													
Monthly Average: 3.07 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 1.5 Median = 2.4 Q ₃ = 3.7 P ₉₀ = 5.7 P ₉₉ = 16.5		Hours of Calibration: 36																																													
				Percent Operational Time: 99.1																																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	7.3	7.2	6.1	6.8	8.5	Z	5.3	4.7	4.0	3.6	4.3	3.7	3.3	4.1	3.9	4.1	5.1	5.7	4.7	4.6	4.1	4.4	4.0	2.8	4.9	8.5																							
2-Jan	Z	3.0	2.6	1.7	1.5	1.7	2.0	1.4	3.1	2.8	1.9	3.4	2.9	2.6	3.2	5.9	4.1	3.4	2.6	3.2	4.3	5.0	4.7	4.2	3.1	5.9																							
3-Jan	3.5	Z	3.4	3.1	2.3	3.7	5.2	6.7	6.2	6.9	5.4	6.6	5.4	4.9	5.2	7.1	6.4	3.3	3.8	4.6	4.0	3.3	4.2	3.4	4.7	7.1																							
4-Jan	2.5	2.5	Z	1.7	1.0	1.2	1.8	1.3	2.9	5.4	2.5	2.0	2.3	2.1	2.4	3.5	5.2	5.0	4.1	2.1	1.6	1.7	1.4	1.7	2.5	5.4																							
5-Jan	1.8	1.5	2.4	Z	2.7	1.2	4.2	1.6	2.3	1.9	2.4	2.4	2.2	6.2	2.7	1.6	2.5	2.8	3.2	3.0	3.7	3.7	3.9	2.7	2.7	6.2																							
6-Jan	2.4	2.3	2.2	2.2	Z	1.8	1.7	2.6	2.3	1.8	2.0	1.6	2.3	2.6	2.4	3.7	5.1	5.0	4.9	4.4	4.3	3.6	2.9	2.8	2.9	5.1																							
7-Jan	3.0	4.4	4.1	2.8	4.0	Z	4.0	3.7	5.3	5.9	5.7	4.8	4.2	4.4	3.0	5.2	3.5	6.1	2.3	2.1	1.6	5.8	2.8	4.8	4.1	6.1																							
8-Jan	Z	3.8	3.2	4.1	7.3	3.0	1.9	1.6	3.5	5.7	11.7	3.0	2.8	4.2	5.5	13.5	13.6	7.4	5.9	10.1	9.1	5.8	2.4	1.7	5.7	13.6																							
9-Jan	0.9	Z	2.3	2.5	2.4	3.7	1.8	4.5	9.0	7.7	6.0	6.3	7.4	5.5	7.7	10.9	10.1	15.1	24.1	20.8	21.1	19.5	18.4	9.8	9.5	24.1																							
10-Jan	6.0	5.0	Z	6.9	5.3	4.8	5.3	5.6	M	8.0	7.0	5.8	8.4	13.4	13.7	13.5	16.5	20.2	17.0	10.6	3.7	2.3	1.2	0.9	8.2	20.2																							
11-Jan	0.7	0.5	0.6	Z	0.9	0.8	1.1	1.2	0.9	1.4	3.4	3.8	3.6	3.4	2.4	1.4	2.8	2.1	3.3	2.6	3.0	5.3	7.0	8.5	2.6	8.5																							
12-Jan	6.0	5.2	4.0	3.3	Z	3.7	3.3	2.4	2.8	4.8	12.4	3.4	4.0	4.0	3.6	4.3	4.3	4.0	3.4	2.9	2.9	3.1	3.2	2.8	4.1	12.4																							
13-Jan	2.9	2.7	2.6	2.1	2.4	Z	6.1	3.3	2.8	5.8	6.5	2.8	2.5	2.2	2.6	2.9	2.3	3.4	2.5	2.2	1.3	0.9	0.4	0.4	2.8	6.5																							
14-Jan	Z	0.3	0.2	0.3	0.3	0.2	0.8	2.1	1.4	1.4	2.0	2.3	2.5	2.2	2.7	3.4	3.5	2.7	2.3	2.9	3.8	2.8	1.8	2.1	1.9	3.8																							
15-Jan	2.0	Z	3.0	2.5	2.6	2.5	2.3	2.0	1.9	3.7	3.3	3.4	4.3	3.4	2.6	2.2	2.6	2.4	2.2	2.6	3.2	2.6	2.2	3.5	2.7	4.3																							
16-Jan	5.0	5.3	Z	5.4	8.1	8.6	6.9	6.0	2.9	1.8	2.1	1.7	2.4	1.9	2.2	2.2	2.4	2.7	4.9	3.3	3.0	2.8	2.9	2.2	3.8	8.6																							
17-Jan	2.2	2.1	2.2	Z	2.9	2.2	2.0	2.1	2.0	2.1	2.1	1.9	1.9	1.7	1.9	2.0	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	2.9																							
18-Jan	2.3	2.1	2.0	2.6	Z	4.5	4.9	2.5	2.2	C	C	C	C	C	1.8	2.2	1.6	2.1	2.1	3.2	4.2	4.9	4.7	4.7	3.0	4.9																							
19-Jan	3.9	2.4	1.8	1.7	2.0	Z	3.0	2.6	2.6	3.3	3.6	3.6	3.7	3.4	3.2	5.0	5.6	5.5	4.5	3.6	3.4	3.1	2.8	2.0	3.3	5.6																							
20-Jan	Z	1.9	1.5	1.3	1.4	2.5	2.1	M	2.1	1.6	1.8	M	M	M	M	1.8	1.6	2.3	2.4	2.7	1.9	2.0	1.7	1.3	1.9	2.7																							
21-Jan	0.8	Z	2.0	1.9	0.9	0.8	1.8	1.5	1.6	1.8	3.5	4.0	1.8	1.4	2.0	1.6	2.1	2.1	1.4	1.6	2.6	1.5	0.7	0.3	1.7	4.0																							
22-Jan	0.2	0.2	Z	1.7	5.0	0.9	2.0	2.2	6.1	6.7	2.6	3.5	3.7	1.1	0.3	0.3	0.2	0.2	0.0	0.3	0.3	0.6	0.5	0.6	1.7	6.7																							
23-Jan	1.0	0.7	1.0	Z	0.9	1.1	1.2	1.6	1.2	0.8	2.2	1.8	2.0	3.8	4.6	3.3	6.2	4.4	2.7	1.4	1.6	2.2	2.0	1.2	2.1	6.2																							
24-Jan	1.1	1.9	1.9	2.0	Z	1.4	1.5	1.3	1.8	2.7	2.8	1.1	1.4	2.0	2.8	2.6	3.2	7.1	0.9	0.6	0.7	0.7	0.5	0.2	1.8	7.1																							
25-Jan	0.3	0.1	0.3	0.3	0.3	Z	0.5	0.9	1.6	1.6	2.0	1.0	1.4	1.1	2.0	2.6	6.2	1.4	1.4	1.7	1.9	3.6	1.9	1.0	1.5	6.2																							
26-Jan	Z	1.1	1.3	0.0	0.3	3.8	4.8	5.2	0.2	1.1	3.0	1.9	2.4	2.5	3.5	1.7	0.9	0.9	0.6	0.5	2.6	4.2	2.7	1.3	2.0	5.2																							
27-Jan	1.0	Z	0.9	0.5	0.7	0.7	0.3	0.5	0.5	0.6	1.1	1.8	2.2	1.4	1.6	2.3	3.7	3.2	4.0	3.3	2.1	1.8	1.9	0.8	1.6	4.0																							
28-Jan	0.6	0.5	Z	0.9	2.1	0.4	3.7	4.4	0.4	2.8	4.4	0.6	0.7	0.6	1.6	0.7	0.2	0.3	0.4	0.3	0.0	0.1	0.1	0.1	1.1	4.4																							
29-Jan	0.4	0.2	0.2	Z	1.9	2.5	0.4	0.5	DF	0.7	0.6	0.8	1.1	1.9	1.2	1.2	0.8	1.1	1.6	1.3	2.0	1.3	2.0	0.9	1.1	2.5																							
30-Jan	1.2	0.8	0.6	0.6	Z	0.6	1.5	3.1	1.9	1.2	1.1	1.4	0.7	1.2	0.8	0.9	1.5	0.7	0.5	0.7	0.7	0.5	0.7	1.0	1.0	3.1																							
31-Jan	0.8	1.3	2.3	1.5	2.2	Z	1.6	1.9	1.7	2.0	1.9	2.3	1.4	1.3	1.0	2.2	8.0	4.3	3.3	5.6	2.8	3.1	3.5	2.4	2.5	8.0																							
																								2.3	2.3	2.1	2.3	2.7	2.3	2.8	2.7	2.7	3.3	3.7	2.9	2.9	3.1	3.1	3.7	4.3	4.2	3.8	3.6	3.3	3.4	3.0	2.4	Diurnal Average	
																								7.3	7.2	6.1	6.9	8.5	8.6	6.9	6.7	9.0	8.0	12.4	6.6	8.4	13.4	13.7	13.5	16.5	20.2	24.1	20.8	21.1	19.5	18.4	9.8	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure																																							



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	99.57	99.57
21 - 40	3	0.43	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	6	15	29	24	9	8	19	20	51	104	141	118	38	29	34	47	692
21 - 40	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	3
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	15	29	25	9	8	19	20	53	104	141	118	38	29	34	47	695

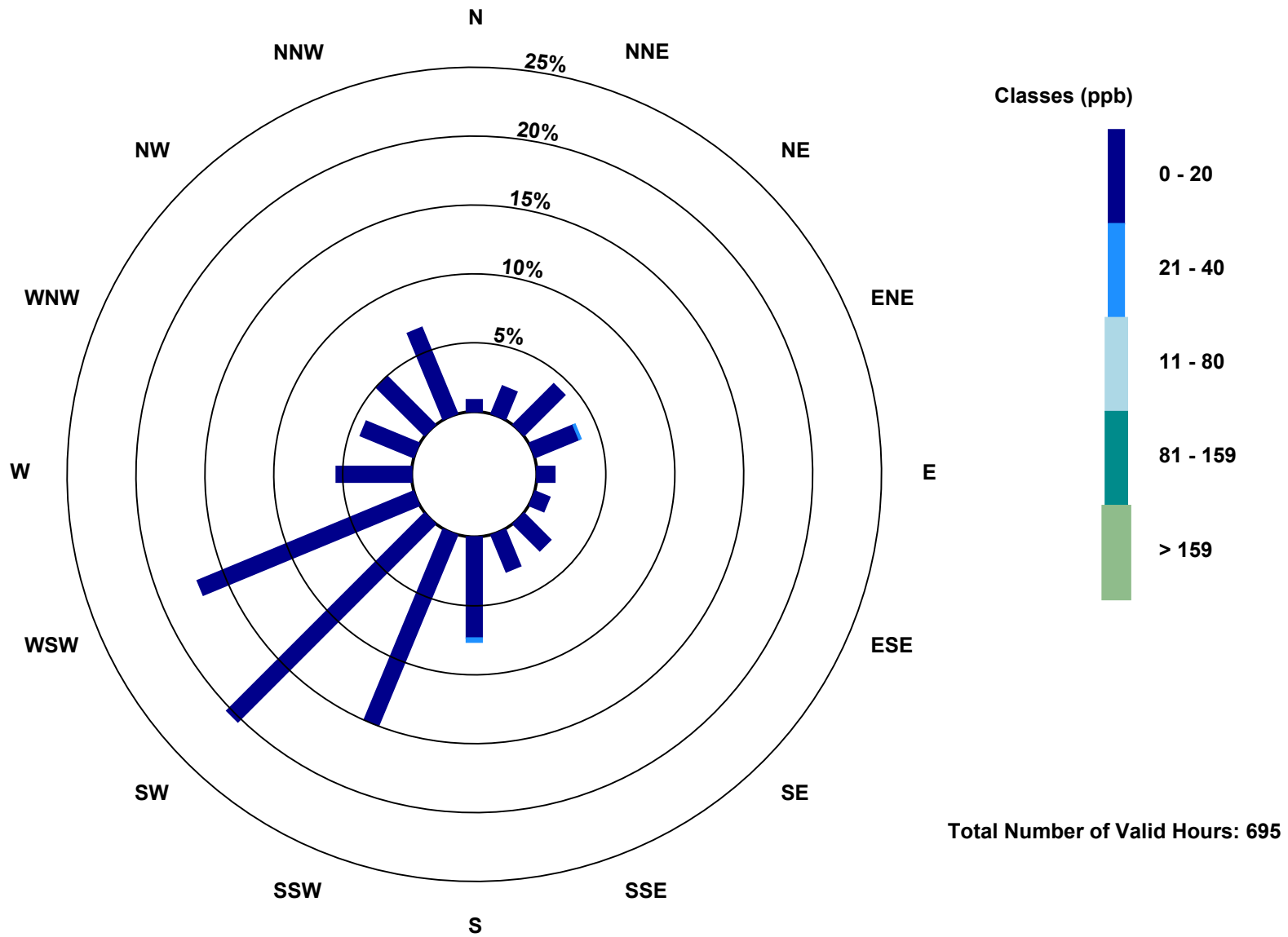
Total Number of Valid Hours: 695

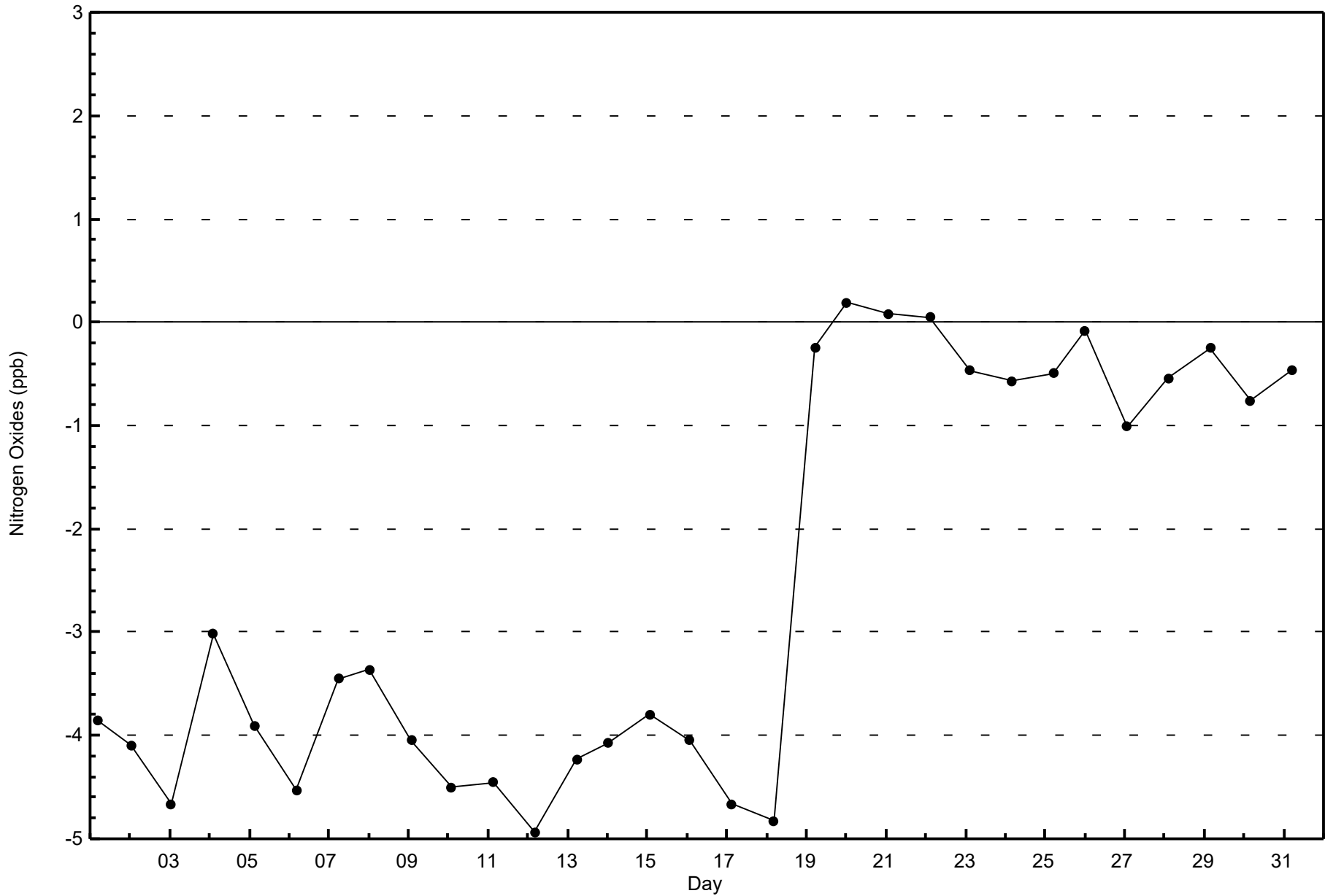
Total Number of Hours: 744

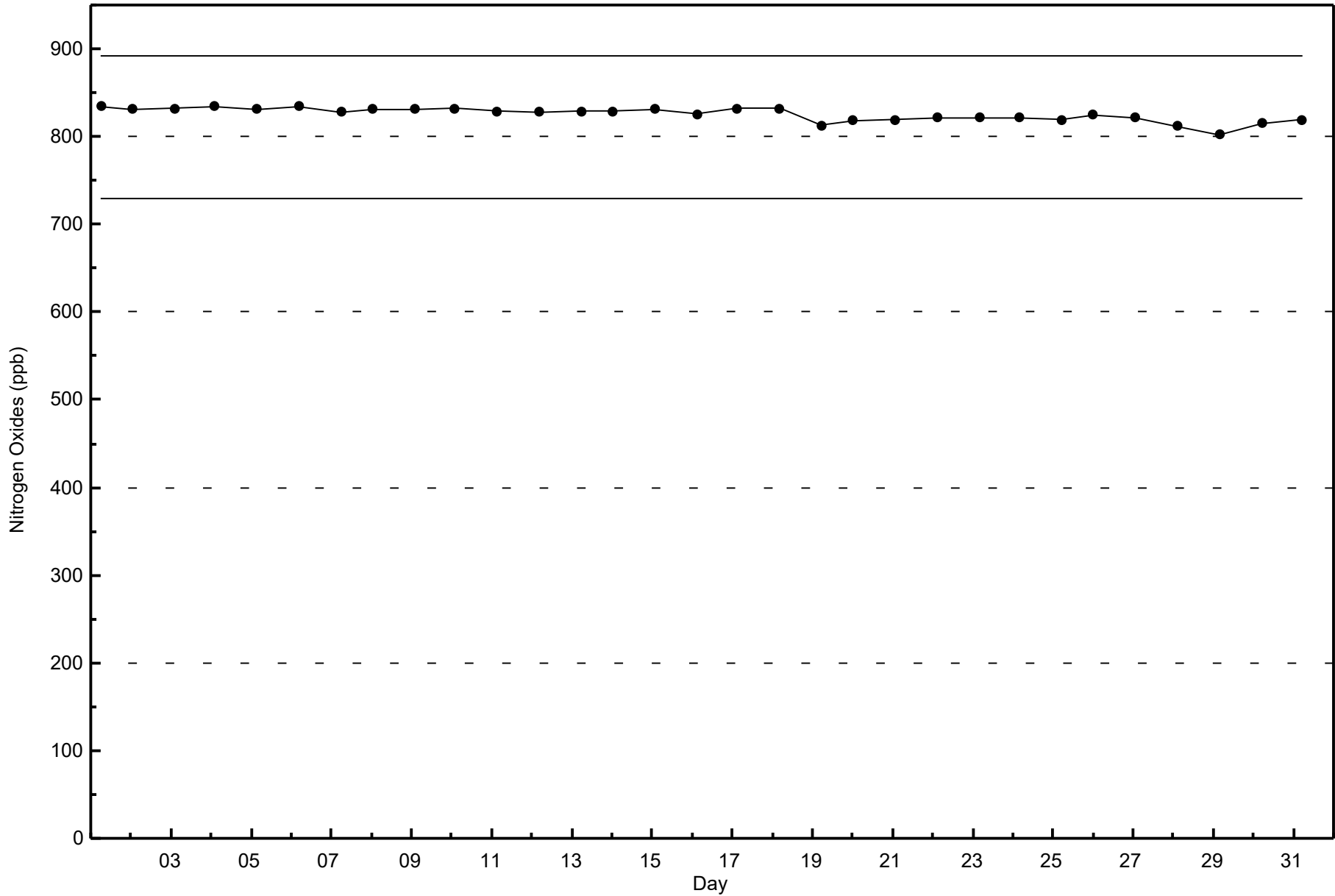


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3





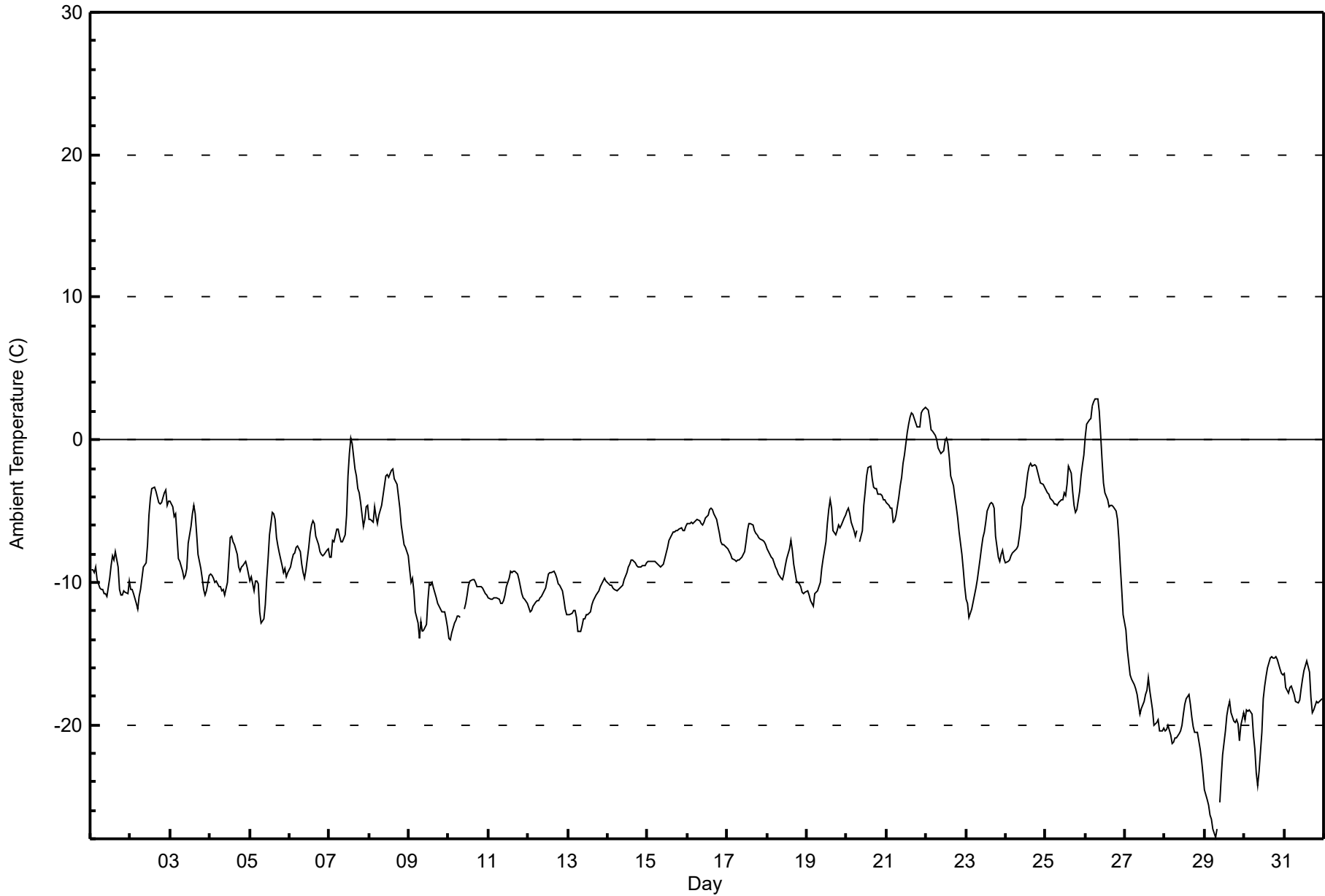




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Jackfish 2/3 - January 2023

Maximum Value: 2.9 C on Jan 26 08:00 Maximum Daily Average: -1.3 C on Jan 21		Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																																														
Minimum Value: -28.0 C on Jan 29 07:00 Minimum Daily Average: -22.5 C on Jan 29 Maximum Diurnal Average: -7.2 C at hour 15 Minimum Diurnal Average: -10.6 C at hour 8 Monthly Average: -9.24 C Percentiles: P ₁ = -24.9 P ₁₀ = -18.3 Q ₁ = -11.3 Median = -8.8 Q ₃ = -5.6 P ₉₀ = -3.1 P ₉₉ = 2.0																																																
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	-9.1	-9.1	-9.4	-9.0	-9.9	-10.4	-10.5	-10.5	-10.8	-10.8	-11.0	-9.7	-8.8	-8.1	-8.5	-7.9	-9.0	-10.5	-10.9	-10.9	-10.6	-10.7	-10.8	-9.9	-9.9	-7.9																						
2-Jan	-10.5	-10.5	-10.8	-11.5	-11.9	-11.0	-10.5	-9.7	-8.9	-8.6	-7.4	-5.2	-4.1	-3.5	-3.3	-3.7	-4.0	-4.4	-4.5	-4.4	-3.7	-3.5	-4.6	-4.3	-6.9	-3.3																						
3-Jan	-4.3	-4.7	-5.4	-5.2	-6.8	-8.3	-8.5	-9.3	-9.7	-9.5	-9.0	-7.2	-6.1	-5.2	-4.6	-5.2	-6.6	-8.0	-9.0	-9.8	-10.5	-10.9	-10.6	-9.5	-7.7	-4.3																						
4-Jan	-9.4	-9.5	-9.8	-10.0	-9.9	-10.3	-10.3	-10.6	-10.5	-10.9	-10.0	-8.4	-6.8	-6.7	-7.2	-7.4	-8.0	-8.9	-9.2	-8.9	-8.8	-8.5	-8.9	-9.4	-9.1	-6.7																						
5-Jan	-9.9	-9.6	-10.6	-9.9	-9.9	-10.2	-12.0	-12.8	-12.6	-11.6	-9.9	-8.4	-6.7	-5.1	-5.2	-5.6	-6.8	-7.4	-8.0	-8.8	-9.3	-9.0	-9.6	-9.4	-9.1	-5.1																						
6-Jan	-8.9	-8.5	-8.1	-8.0	-7.6	-7.4	-7.8	-8.7	-9.3	-9.7	-9.1	-7.5	-6.6	-6.0	-5.7	-5.9	-6.8	-7.3	-7.8	-8.0	-8.2	-8.1	-7.7	-7.6	-7.8	-5.7																						
7-Jan	-8.3	-8.2	-7.1	-7.2	-6.3	-6.3	-6.8	-7.2	-7.2	-6.7	-5.3	-2.6	-1.0	0.2	-0.3	-2.0	-2.5	-3.4	-3.7	-4.4	-6.1	-5.6	-4.7	-4.6	-4.9	0.2																						
8-Jan	-5.5	-5.6	-5.8	-4.7	-5.4	-5.9	-5.3	-4.6	-3.9	-3.2	-2.6	-2.4	-2.6	-2.2	-2.1	-2.8	-3.0	-3.1	-4.8	-6.0	-6.7	-7.3	-7.6	-8.1	-4.6	-2.1																						
9-Jan	-9.2	-10.0	-9.7	-10.6	-12.1	-12.9	-14.0	-12.7	-13.4	-13.4	-13.0	-11.3	-10.1	-10.2	-10.0	-10.4	-11.1	-11.4	-11.7	-11.9	-12.0	-12.1	-12.5	-13.2	-11.6	-9.2																						
10-Jan	-13.9	-14.0	-13.5	-12.8	-12.7	-12.4	-12.4	-12.5	M	-11.9	-11.5	-10.9	-10.2	-9.9	-9.8	-9.8	-10.0	-10.3	-10.3	-10.3	-10.4	-10.6	-10.8	-10.9	-11.4	-9.8																						
11-Jan	-11.1	-11.1	-11.2	-11.1	-11.1	-11.1	-11.2	-11.4	-11.5	-11.3	-10.9	-10.3	-9.7	-9.3	-9.3	-9.2	-9.2	-9.4	-9.8	-10.3	-10.8	-11.1	-11.2	-11.5	-10.6	-9.2																						
12-Jan	-11.8	-12.0	-12.0	-11.7	-11.4	-11.3	-11.3	-11.1	-11.0	-10.8	-10.4	-9.9	-9.4	-9.3	-9.4	-9.2	-9.4	-9.7	-10.1	-10.3	-10.6	-11.2	-11.9	-12.2	-10.7	-9.2																						
13-Jan	-12.3	-12.3	-12.1	-11.9	-11.9	-12.5	-13.4	-13.5	-13.1	-12.6	-12.5	-12.3	-12.3	-12.1	-11.5	-11.3	-11.1	-10.9	-10.6	-10.3	-10.1	-9.9	-9.8	-9.9	-11.7	-9.8																						
14-Jan	-10.1	-10.2	-10.3	-10.4	-10.5	-10.6	-10.5	-10.4	-10.3	-10.2	-9.9	-9.4	-9.0	-8.7	-8.5	-8.4	-8.6	-8.9	-8.9	-8.9	-8.9	-8.8	-8.8	-8.7	-9.5	-8.4																						
15-Jan	-8.6	-8.5	-8.5	-8.5	-8.6	-8.6	-8.7	-8.8	-8.9	-8.7	-8.3	-7.9	-7.6	-7.1	-6.7	-6.5	-6.5	-6.4	-6.4	-6.3	-6.2	-6.4	-6.4	-6.0	-7.5	-6.0																						
16-Jan	-5.9	-5.9	-5.8	-5.9	-5.8	-5.7	-5.6	-5.6	-5.9	-6.0	-5.8	-5.5	-5.3	-4.9	-4.8	-4.9	-5.2	-5.6	-6.1	-6.6	-7.2	-7.4	-7.4	-7.5	-5.9	-4.8																						
17-Jan	-7.7	-7.9	-8.1	-8.3	-8.4	-8.5	-8.4	-8.4	-8.4	-8.2	-7.8	-7.2	-6.4	-5.9	-5.9	-5.9	-6.4	-6.6	-6.6	-6.8	-7.0	-7.1	-7.1	-7.3	-7.3	-5.9																						
18-Jan	-7.7	-7.9	-8.2	-8.4	-8.7	-8.9	-9.1	-9.4	-9.7	-9.8	-9.4	-8.8	-8.3	-7.6	-7.1	-7.7	-8.8	-9.3	-9.9	-10.1	-10.3	-10.7	-10.8	-10.7	-9.0	-7.1																						
19-Jan	-10.6	-10.9	-11.3	-11.5	-11.7	-10.8	-10.6	-10.3	-10.0	-9.1	-8.4	-7.2	-5.9	-4.9	-4.3	-4.8	-6.4	-6.6	-6.3	-5.9	-6.2	-6.0	-5.5	-5.3	-7.9	-4.3																						
20-Jan	-5.0	-4.8	-5.2	-5.8	-6.4	-6.7	-6.4	M	-7.2	-6.4	-4.6	-3.6	-2.6	-2.0	-1.8	-2.8	-3.3	-3.4	-3.4	-3.8	-3.8	-3.9	-4.2	-4.2	-4.4	-1.8																						
21-Jan	-4.4	-4.6	-4.8	-4.8	-5.8	-5.7	-5.3	-4.0	-3.2	-2.6	-1.7	-1.0	0.5	1.1	1.6	1.9	1.8	1.5	0.9	0.9	0.9	1.9	2.0	2.3	-1.3	2.3																						
22-Jan	2.2	2.1	1.5	0.7	0.6	0.3	0.0	-0.5	-0.8	-1.0	-0.8	-0.1	0.1	-0.3	-1.2	-2.6	-3.3	-4.0	-4.7	-5.5	-6.4	-8.0	-9.1	-10.3	-2.1	2.2																						
23-Jan	-11.2	-11.5	-12.5	-11.9	-11.4	-10.9	-10.4	-9.8	-8.3	-7.5	-6.9	-6.4	-5.8	-5.0	-4.5	-4.4	-4.5	-4.8	-6.7	-8.2	-8.6	-8.0	-7.8	-8.4	-8.1	-4.4																						
24-Jan	-8.6	-8.5	-8.4	-8.2	-8.0	-7.8	-7.7	-7.4	-6.8	-6.0	-4.7	-4.0	-3.1	-2.4	-1.8	-1.7	-1.8	-1.7	-1.9	-2.2	-2.6	-3.1	-3.2	-3.3	-4.8	-1.7																						
25-Jan	-3.5	-3.7	-3.8	-4.1	-4.3	-4.5	-4.5	-4.6	-4.4	-4.2	-4.2	-3.8	-3.9	-3.1	-1.8	-2.3	-3.6	-4.6	-5.1	-4.9	-3.6	-2.6	-1.8	-1.0	-3.7	-1.0																						
26-Jan	0.3	1.1	1.4	1.5	2.3	2.7	2.9	2.9	2.0	0.3	-1.4	-3.0	-3.7	-4.2	-4.7	-4.6	-4.6	-4.7	-5.0	-5.6	-6.9	-8.9	-10.5	-12.2	-2.6	2.9																						
27-Jan	-13.4	-14.7	-15.6	-16.5	-16.8	-17.2	-17.5	-17.9	-18.5	-19.3	-18.8	-18.4	-17.9	-17.6	-16.7	-17.6	-18.9	-20.0	-19.9	-19.8	-19.6	-20.4	-20.5	-20.2	-18.1	-13.4																						
28-Jan	-20.5	-20.4	-20.0	-20.8	-21.3	-21.2	-20.9	-20.9	-20.6	-20.5	-20.0	-19.2	-18.6	-18.1	-17.9	-18.6	-19.4	-20.1	-20.5	-20.6	-21.2	-21.7	-22.5	-23.5	-20.4	-17.9																						
29-Jan	-24.5	-25.2	-25.7	-26.3	-26.6	-27.3	-28.0	-27.3	DF	-25.4	-23.7	-22.1	-20.5	-19.3	-18.8	-18.4	-19.1	-19.7	-19.8	-19.6	-20.0	-21.1	-20.1	-19.2	-22.5	-18.4																						
30-Jan	-19.7	-18.9	-19.0	-19.0	-19.2	-20.7	-21.7	-23.4	-24.3	-23.3	-20.5	-18.2	-17.3	-16.6	-16.1	-15.3	-15.2	-15.4	-15.4	-15.2	-15.5	-16.1	-16.4	-16.5	-18.3	-15.2																						
31-Jan	-16.4	-17.4	-17.7	-17.3	-17.3	-17.6	-17.9	-18.3	-18.5	-18.3	-17.5	-16.8	-16.2	-15.5	-15.9	-16.3	-18.0	-19.1	-19.0	-18.3	-18.5	-18.3	-18.2	-18.1	-17.6	-15.5																						
																								-9.7	-9.8	-9.9	-10.0	-10.2	-10.3	-10.5	-10.6	-9.9	-10.2	-9.6	-8.7	-7.9	-7.4	-7.2	-7.5	-8.0	-8.5	-8.9	-9.1	-9.3	-9.5	-9.6	-9.7	Diurnal Average
																								2.2	2.1	1.5	1.5	2.3	2.7	2.9	2.9	2.0	0.3	-0.8	-0.1	0.5	1.1	1.6	1.9	1.8	1.5	0.9	0.9	0.9	1.9	2.0	2.3	Diurnal Maximum
M - Maintenance DF - DAS Failure																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Jackfish 2/3 - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	42	5.67	5.67
-20 - 0	668	90.15	95.82
0 - 10	31	4.18	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

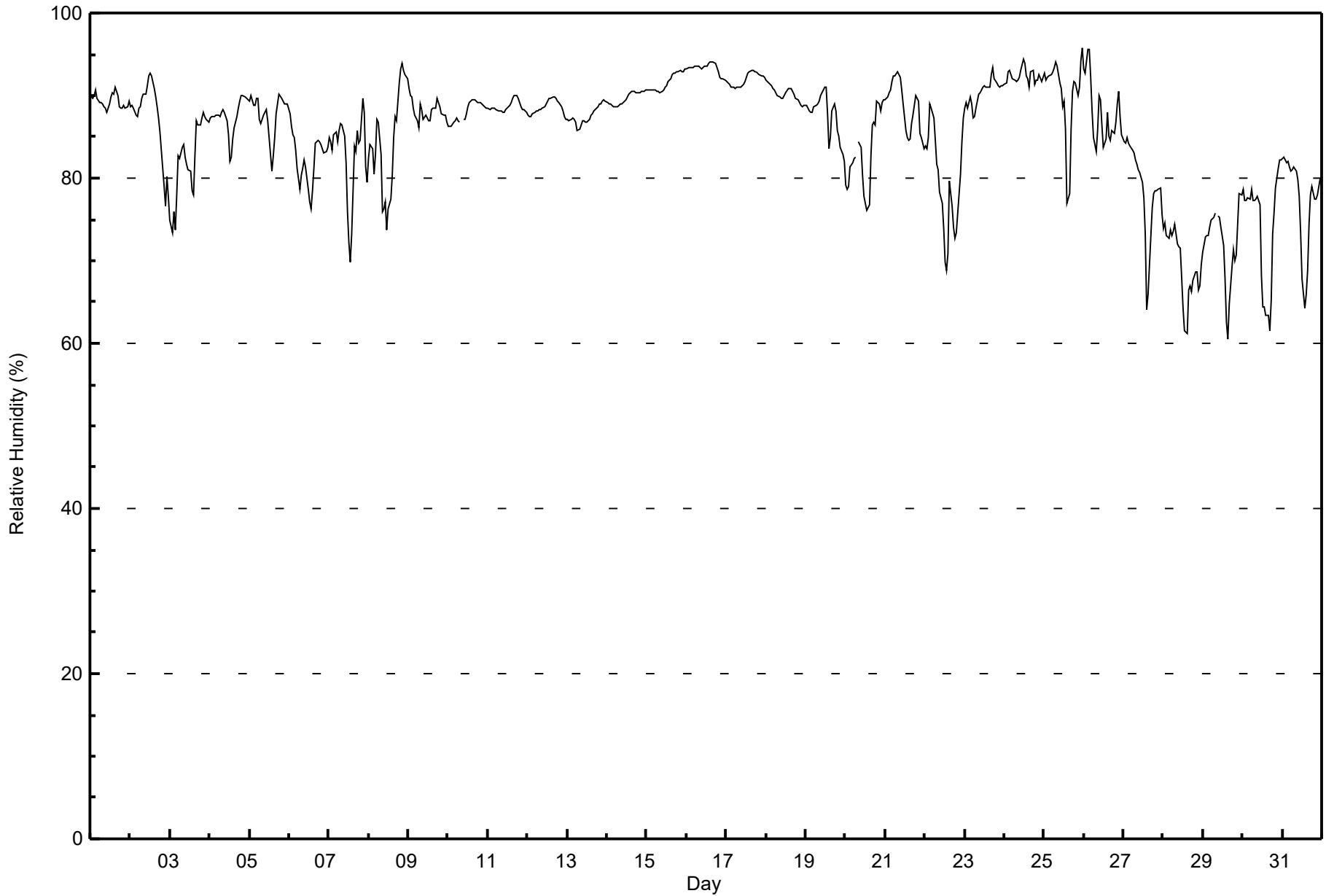
Relative Humidity (RH) - %
Jackfish 2/3 - January 2023

Maximum Value: 95.8 % on Jan 26 00:00																						Maximum Daily Average: 93.3 % on Jan 16																						Hours in Service: 744		
Minimum Value: 60.5 % on Jan 29 16:00																						Minimum Daily Average: 69.4 % on Jan 28																						Hours of Data: 741		
Maximum Diurnal Average: 86.6 % at hour 6																						Minimum Diurnal Average: 82.1 % at hour 15																						Hours of Missing Data: 3		
Monthly Average: 85.58 %																						Percentiles: P ₁ = 64.2 P ₁₀ = 75.3 Q ₁ = 82.5 Median = 88.0 Q ₃ = 90.2 P ₉₀ = 92.3 P ₉₉ = 94.1																						Hours of Calibration: 0		
																																												Percent Operational Time: 99.6		
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jan	89.8	89.7	90.0	90.6	89.7	89.1	89.1	88.9	88.6	88.4	88.1	89.0	89.8	90.4	90.2	90.9	90.0	88.6	88.4	88.5	88.8	88.5	88.6	89.4	89.3	90.9																				
2-Jan	88.6	88.8	88.4	87.7	87.5	88.4	88.7	89.6	90.2	90.2	91.2	92.3	92.7	92.4	90.8	89.8	88.7	87.3	85.6	83.4	79.0	76.6	80.1	77.9	87.3	92.7																				
3-Jan	74.9	73.3	76.0	73.7	77.9	82.7	82.3	83.8	84.2	82.5	81.6	81.0	80.9	78.5	78.0	82.7	86.9	86.4	86.4	87.2	88.0	87.5	87.1	86.8	82.1	88.0																				
4-Jan	87.2	87.4	87.4	87.5	87.6	87.7	87.5	88.0	88.4	88.0	87.0	85.3	82.1	82.6	84.8	86.1	87.5	88.5	89.3	90.0	90.0	89.8	89.7	89.5	87.4	90.0																				
5-Jan	89.3	90.0	88.8	88.8	89.7	89.6	87.0	86.7	87.6	87.9	88.4	87.0	84.9	80.9	82.8	84.9	87.8	89.1	90.2	89.7	89.3	89.0	89.0	89.0	87.8	90.2																				
6-Jan	87.8	86.3	85.3	85.0	83.4	81.3	78.7	80.4	81.2	82.2	81.4	78.6	77.1	76.3	78.4	81.2	84.2	84.6	84.5	84.0	83.6	83.1	83.2	83.7	82.3	87.8																				
7-Jan	84.9	84.4	83.3	85.3	85.6	84.5	85.7	86.6	86.4	85.2	81.9	76.0	72.2	69.8	73.2	84.0	83.2	85.7	84.3	84.7	89.6	88.0	81.4	79.5	82.7	89.6																				
8-Jan	82.3	84.0	83.6	80.5	82.8	87.1	86.8	83.0	75.9	76.3	77.1	73.8	76.3	77.5	80.4	84.9	87.5	87.0	91.6	93.3	93.8	93.1	92.6	92.1	84.3	93.8																				
9-Jan	90.9	90.1	89.8	88.5	87.6	87.0	86.0	89.0	88.4	87.2	87.6	87.3	87.0	86.9	88.3	88.5	88.5	89.7	89.1	88.6	87.8	87.6	87.6	86.8	88.2	90.9																				
10-Jan	86.2	86.2	86.3	86.7	87.0	87.2	87.0	86.7	M	87.1	87.2	87.8	88.7	89.2	89.5	89.6	89.5	89.4	89.2	89.2	89.1	88.8	88.6	88.4	88.0	89.6																				
11-Jan	88.4	88.4	88.4	88.5	88.5	88.4	88.1	88.1	88.1	88.0	88.0	88.3	88.6	88.8	89.2	89.7	90.0	90.0	89.6	89.1	88.6	88.4	88.2	88.0	88.6	90.0																				
12-Jan	87.7	87.4	87.5	87.8	88.0	88.1	88.1	88.3	88.4	88.5	88.7	89.0	89.4	89.6	89.6	89.8	89.9	89.6	89.3	89.1	88.7	88.1	87.5	87.2	88.5	89.9																				
13-Jan	87.1	87.0	87.2	87.3	87.2	86.7	85.8	85.9	86.4	86.9	86.9	86.8	86.7	87.1	87.6	87.9	88.1	88.4	88.7	88.9	89.1	89.3	89.4	89.3	87.6	89.4																				
14-Jan	89.1	89.0	88.9	88.8	88.7	88.7	88.7	88.9	88.9	88.9	89.1	89.5	89.8	90.1	90.4	90.5	90.5	90.3	90.3	90.3	90.5	90.5	90.5	90.7	89.6	90.7																				
15-Jan	90.7	90.7	90.7	90.7	90.6	90.6	90.5	90.4	90.3	90.5	90.7	91.0	91.3	91.6	92.1	92.5	92.6	92.7	92.8	92.9	93.0	92.8	92.9	93.2	91.6	93.2																				
16-Jan	93.3	93.4	93.4	93.4	93.5	93.6	93.6	93.6	93.4	93.3	93.3	93.5	93.6	93.9	94.1	94.1	94.1	93.8	93.4	92.8	92.3	92.1	92.0	91.9	93.3	94.1																				
17-Jan	91.7	91.6	91.4	91.1	91.0	90.9	91.0	91.0	91.0	91.1	91.3	91.7	92.3	92.7	92.9	93.1	93.0	92.9	92.8	92.7	92.5	92.4	92.4	92.2	91.9	93.1																				
18-Jan	91.8	91.6	91.4	91.2	90.9	90.6	90.4	90.1	89.8	89.6	89.6	89.9	90.4	90.8	90.9	90.9	90.6	90.2	89.6	89.4	89.2	88.8	88.7	88.8	90.2	91.8																				
19-Jan	88.9	88.5	88.2	88.0	87.9	88.6	88.8	89.0	89.3	90.0	90.3	91.0	91.0	87.8	83.6	84.9	88.2	89.0	88.2	85.8	85.0	83.7	82.9	82.0	87.5	91.0																				
20-Jan	79.2	78.6	79.0	81.4	81.8	82.5	82.6	M	84.4	83.7	80.3	77.9	77.0	76.2	76.8	82.7	86.4	86.8	86.5	89.3	89.0	88.1	89.2	89.4	83.0	89.4																				
21-Jan	89.5	89.8	90.4	90.6	91.8	92.4	92.4	92.8	92.6	92.2	90.7	89.1	85.7	85.0	84.6	84.8	86.6	87.6	90.0	89.7	89.4	85.5	85.0	83.5	88.8	92.8																				
22-Jan	84.0	83.5	84.9	89.0	88.5	87.4	84.6	81.7	81.1	78.3	77.0	74.0	69.8	68.8	70.9	79.6	76.5	74.1	72.8	73.5	75.8	80.5	84.4	87.4	79.5	89.0																				
23-Jan	88.4	89.1	88.5	89.9	89.0	87.3	87.4	88.5	90.1	90.3	90.7	91.0	91.1	91.0	91.1	92.6	93.4	92.1	91.6	91.1	91.0	91.2	91.3	90.4	93.4																					
24-Jan	91.3	91.5	92.8	93.0	92.5	92.0	91.9	91.7	91.9	92.2	93.1	94.4	93.9	92.3	92.0	91.0	93.0	93.1	91.4	91.8	91.9	92.5	91.7	92.3	92.3	94.4																				
25-Jan	92.7	91.8	92.2	92.4	92.6	93.0	93.4	94.1	93.6	91.5	90.9	88.6	89.3	85.9	76.9	78.1	86.0	90.4	91.8	91.5	90.0	90.9	94.3	95.8	90.3	95.8																				
26-Jan	93.2	92.7	95.7	95.6	92.2	88.1	85.0	83.3	85.9	90.1	89.6	86.4	83.7	84.7	87.9	85.1	84.6	85.7	85.5	86.8	89.0	90.6	87.5	85.2	88.1	95.7																				
27-Jan	84.5	84.3	84.9	84.3	83.9	83.4	83.0	82.2	81.7	81.1	80.6	79.5	77.6	73.2	64.1	66.0	73.0	76.5	78.2	78.4	78.5	78.7	78.7	75.7	78.8	84.9																				
28-Jan	73.9	74.6	73.0	72.7	73.7	73.1	73.6	74.3	72.0	71.7	71.5	68.0	64.3	61.6	61.1	66.4	67.0	66.2	67.7	68.6	68.7	66.4	66.9	69.5	69.4	74.6																				
29-Jan	71.1	72.9	73.1	73.1	74.0	75.0	75.3	75.8	DF	75.4	75.3	74.0	71.8	67.8	62.6	60.5	64.8	69.4	71.3	69.9	70.6	74.4	78.1	77.9	71.9	78.1																				
30-Jan	78.7	77.3	77.3	77.6	77.4	78.7	77.4	77.2	77.4	77.8	76.8	68.1	64.4	64.3	63.3	63.3	61.6	65.2	73.2	75.8	78.8	81.2	82.1	82.2	74.0	82.2																				
31-Jan	82.3	82.5	81.9	82.1	81.3	80.8	81.0	81.4	80.9	79.9	77.8	73.4	67.7	64.2	66.0	68.9	74.4	78.0	79.0	77.5	77.4	77.9	79.0	79.9	77.3	82.5																				
																						86.4	86.3	86.4	86.5	86.6	86.6	86.2	86.4	86.5	86.0	85.6	84.3	83.3	82.3	82.1	83.6	85.1	85.8	86.2	86.3	86.4	86.3	86.5	86.3	Diurnal Average
																						93.3	93.4	95.7	95.6	93.5	93.6	93.6	94.1	93.6	93.3	93.3	94.4	93.9	93.9	94.1	94.1	94.1	93.8	93.4	93.3	93.8	93.1	94.3	95.8	Diurnal Maximum
M - Maintenance																						DF - DAS Failure																								



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 2/3 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 2/3 - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	0	0.00	0.00
60 - 80	143	19.30	19.30
80 - 100	598	80.70	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



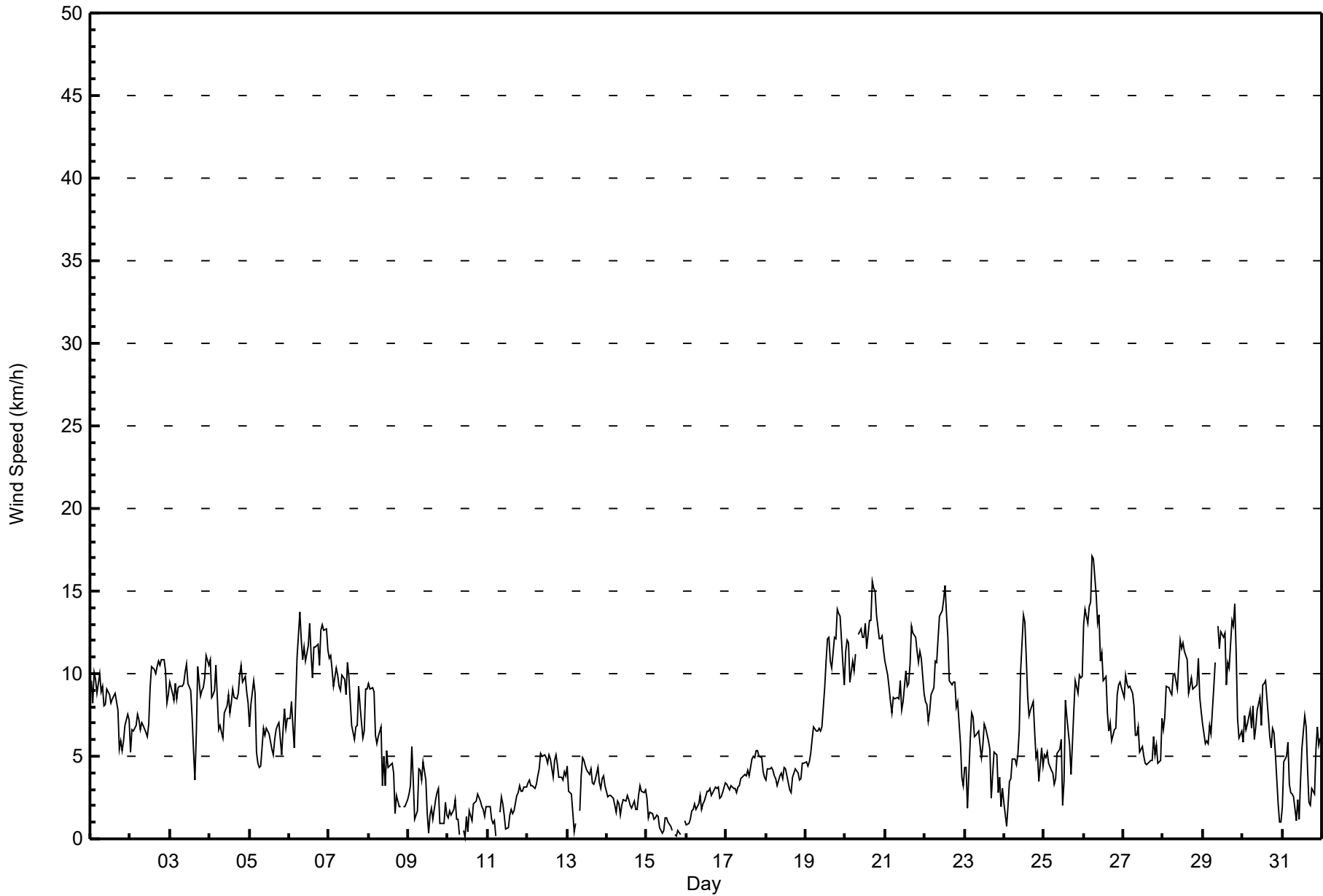
Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 2/3 - January 2023

Maximum Speed: 17 km/h on Jan 26 06:00 Minimum Speed Value: 0 km/h on Jan 10 11:00 Maximum Diurnal Speed Average: 5.1 km/h at hour 13 Monthly Average Velocity: 4.0 km/h 244.8 deg		Maximum Daily Speed Average: 12.3 km/h on Jan 20 Minimum Daily Speed Average: 0.4 km/h on Jan 15 Minimum Diurnal Speed Average: 3.3 km/h at hour 24 Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 3 Median = 6 Q ₃ = 9 P ₉₀ = 11 P ₉₉ = 14		Hours in Service: 744 Hours of Data: 735 Hours of Missing Data: 9 Percent Operational Time: 98.8																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	WSW10	SW8WSW10	WSW10	SW9WSW10	WSW9	WSW9	WSW8	WSW8	WSW9	WSW9	WSW8	WSW9	WSW9	WSW9	WSW8	WS5	WSW6	WS5	WS6	WS7	WSW8	WSW7	WSW8.0	WSW10		
2-Jan	SW5	WSW7	SW6	SSW7	SSW8	SW7	SSW7	SSW7	SSW7	SSW6	SSW6	SW7	SW9WSW10	SW10	SW10	SW10	SW11	SSW10	SW11	SW11	SW10	SW8	SSW9	WSW8.2	SW11	
3-Jan	SW9	SSW9	SSW8	SSW9	SSW9	S9	S9	SSW9	SSW9	SSW10	SSW11	SSW9	SSW9	SW7	SW5	SW4	SW6	SSW10	SW9	SW9	SW9	SW10	SW11WSW10	SSW8.5	SW11	
4-Jan	WSW11	W9	W9	WSW9WSW11	WSW7	W7	W6	W6	WSW8	WSW8	WSW9	W8	WSW8	WSW9	WSW9	WSW8	WSW9WSW10	WSW10	W9WSW10	WSW9	WSW8	WSW8.5	WSW11			
5-Jan	WSW7	WSW8WSW10	WSW9	WSW5	WS5	S4	S4	SSW7	SSW6	SSW7	SSW7	SSW6	S5	S5	S6	S7	S7	S7	S5	S7	S8	S7	S7	SSW5.7	WSW10	
6-Jan	S7	S8	S7	SSW6	SSW8	SSW11	SSW14	SSW12	SSW11	SSW12	SW11	SW12	SW13	SW11	SW10	SW12	SW12	SW12	SW11	SW13	SW13	SW13	SW13	SW11	SSW10.5	SSW14
7-Jan	SW11	SW11	SW10	SSW9	SW10	SSW9	SW9	SW10	SW10	SW9WSW11	WSW10	WSW8	SW7	SW6	SW7	SSW7	SSW9	SSW8	SSW6	SSW7	SSW9	SSW9	SSW9	SSW9	SSW8.6	SW11
8-Jan	SSW9	SSW9	SSW9	SSW9	S6	S6	S6	S7	S3	SSE5	S3	SSE5	SE4	ESE5	ENE5	ENE4	ESE2	ENE3	E2	ENE2	UO	SSE2	SE2	SSE2	SSW3.6	SSW9
9-Jan	SSE3	S3	SSW6	SW4	SE1	S2	SSW4	WSW4	WSW4	WSW5	WSW4	WNW2	SSE0	SSW1	NE2	NE1	NE2	ENE3	ENE3	S1	S1	ENE1	E2	ESE1	SSW1.0	SSW6
10-Jan	S1	S2	SE1	SE2	SSW2	S1	SSW1	SSW0	M	ESE0	SSW0	SW1	SSE0	SW2	E1	ENE2	NE2	NE2	NE3	NE2	ENE2	NE2	NE1	NNE2	E0.6	NE3
11-Jan	NE2	NE2	NE1	ENE1	ENE1	SE0	UO	SSW2	SW3	SW2	SW1	WSW1	S1	SSE1	S2	SE2	SSW2	SSW3	SSW3	SW3	SW3	SW3	SSW3	SSW3	SSW1.2	SW3
12-Jan	SSW3	SSW4	SSW3	SSW3	SSW3	SSW3	SSW4	SW4	SSW5	SSW5	SW5	SW5	SW5	SW5	SW5	SSW4	SW5	SW5	SW4	SW4	SSW4	SW4	SW4	SW4	SSW4.1	SSW5
13-Jan	WSW4	SW3	SW3	SSW2	WNW0	NNE1	UO	NE2	NE4	ENE5	ENE4	ENE4	ENE4	ENE3	ENE3	ENE4	ENE4	ENE4	E3	E3	E4	ESE4	ESE3	E2.2	ENE5	
14-Jan	SE3	SE3	SE3	SE3	SSE2	SSE2	S2	S2	S1	S2	S2	SSW2	SW3	SW2	SW2	SW2	SW2	WSW2	SW2	SW3	WSW3	WSW3	WSW3	WSW3	SSW1.7	WSW3
15-Jan	WSW2	W1	NE2	NE2	NNE1	NE1	ENE1	ENE1	ENE1	SE0	S0	SE1	SE1	SSE1	S1	SE1	UO	SE0	E0	SE0	ESE0	UO	UO	SE1	E0.4	WSW2
16-Jan	SE1	SE1	S1	S2	SSE2	SSE2	SSE2	SE2	SE3	SSE2	SSE2	S2	S3	SSE3	SSE3	S3	S3	SSW3	SSW3	S3	SSW2	SSW3	SSW3	SSW3	S2.1	SW3
17-Jan	SW3	SSW3	SSW3	SSW3	SSW3	SW3	SW3	SW3	SW3	SW4	SW4	SW4	SW4	SW4	SSW4	SW5	SW5	SSW5	SSW5	SW5	SW5	SW5	SW4	SW4	SSW3.9	SW5
18-Jan	SW4	SW4	SW4	SW4	SW4	SSW4	SSW4	SSW3	SSW4	SSW4	SSW4	SW4	SSW4	SSW3	SSW3	SSW3	S4	SSW4	S4	SSW4	SSW4	SSW4	SSW5	S5	SSW3.8	SSW5
19-Jan	SW5	SSW4	SW5	SW5	SW6	SW7	SW6	SW7	WSW7	WSW7	WSW7	WSW9WSW11	WSW12	WSW12	WSW11	SW10	WSW12	WSW12	WSW14	WSW14	WSW13	SW11	SW9	WSW8.8	WSW14	
20-Jan	WSW11	WSW12	WSW12	SW10	WSW11	WSW10	WSW11	M	WSW12	WSW13	WSW12	W12	W13	WSW12	WSW13	WSW13	WSW16	WSW15	WSW15	WSW14	WSW12	WSW12	WSW12	WSW11	WSW12.3	WSW16
21-Jan	WSW11	WSW10	WSW9	SW8	SSW8	SSW9	SSW8	SW9	SW8	WSW10	SW8	SW8	SW10	SW9	SW9	WSW11	WSW13	WSW12	WSW12	WSW11	WSW11	WSW11	W11	W9	WSW9.5	WSW13
22-Jan	W8	W8	W7	WNW8	WNW9	WNW9	WNW11	WNW11	WNW12	WNW13	WNW14	WNW14	NW15	NW14	NW12	NNW10	NNW9	NW9	NW10	NW8	NW8	NW6	NW4	WSW3	WNW9.1	NW15
23-Jan	WSW4	SW4	SSE2	S6	S8	SSW7	SSW6	SSW6	SSW7	SSW6	S5	S6	S7	S7	SSW6	SW5	WNW2	NNW4	N5	N5	N3	WNW4	N2	NNE3	SSW2.9	S8
24-Jan	NE2	NE1	SW2	SW4	SSW4	S5	SSW5	SSW4	SSW5	SW7	WSW10	WSW14	WSW13	W11	WNW9	NW7	WNW8	WNW8	NNW7	NNW5	NNW5	NNW4	NNW5	NNW4	WSW4.1	WSW14
25-Jan	NNW5	NNW5	NNW5	NNW5	NNW4	NNW4	NNW3	WNW4	NNW5	WNW5	WNW6	W2	WSW3	WSW8	WSW7	WSW6	SW4	SW6	SSW8	SW10	SSW9	SW10	SW10	SW10	WSW4.1	SW10
26-Jan	SW13	W14	WNW13	W14	WNW14	WNW17	WNW17	NW15	NW13	NNW14	NNW11	NNW11	NNW10	N10	N8	NNW7	NW7	NNW6	NNW7	N7	NNE9	NE9	NE10	NNE9	NW8.1	WNW17
27-Jan	NNE9	NE10	NE9	NE9	NE9	NE9	NE8	NNE6	NNE6	NE7	NNE5	NNE6	NNW5	NW5	NNW5	NNW5	NNW5	NNW6	NNW5	NNW6	NNW5	NNW5	NW5	NNW7	N5.6	NE10
28-Jan	NW7	NW7	NW9	NW9	NW9	NW9	NW10	NW10	NW9	NW11	NW12	NW12	NW12	NW11	NW11	NW9	NW9	NW10	NNW9	NNW9	NNW9	NNW11	NNW9	NNW8	NW9.4	WNW12
29-Jan	NNW7	NW6	NNW6	NW6	WNW7	WNW6	W9	W11	DF	W13	W12	WSW13	WSW12	WSW12	SW9	SW11	SW10	SW13	WSW13	WSW14	WSW11	W7	NW6	NNW7	W8.1	WSW14
30-Jan	NNW6	NNW7	NNW7	NNW7	NW8	NW7	NW8	WNW6	W7	W8	W9	W7	WSW9	W9	W10	W7	W6	WSW6	WSW7	W6	W5	WNW2	NE1	ENE1	WNW5.6	W10
31-Jan	NE2	ENE5	E5	E6	ESE3	NE3	NNE3	NNE3	NE1	NNE2	NNE1	W4	W6	WSW7	W7	W4	W2	W2	W3	W3	WSW5	WSW7	W6	W6	WNW1.5	WSW7
WSW3.7WSW3.6WSW3.4WSW3.4WSW3.5WSW3.5WSW4.1WSW3.7WSW3.9WSW4.1WSW4.4WSW4.6WSW5.1WSW5.0WSW4.3WSW3.9WSW4.3WSW4.2WSW4.1WSW4.3WSW4.2WSW4.0WSW3.7WSW3.3																								Diurnal Average		
SW13 W14WNW13 W14WNW14WNW17WNW17 NW15 NW13NNW14WNW14WNW14 NW15 NW14WSW13WSW13WSW16WSW15WSW15WSW14WSW14WSW13 SW13 SW11																								Diurnal Maximum		
M - Maintenance DF - DAS Failure UO - Unstable Operation																										
All monthly, daily, and diurnal averages have been calculated using vector methods																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	337	45.85	45.85
6 - 11	329	44.76	90.61
12 - 19	69	9.39	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 735

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	4	9	23	26	8	8	21	20	34	58	69	17	9	8	3	20	337
6 - 11	2	7	8	0	1	0	0	0	22	54	66	75	28	12	27	27	329
12 - 19	0	0	0	0	0	0	0	0	0	3	11	32	6	9	7	1	69
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	6	16	31	26	9	8	21	20	56	115	146	124	43	29	37	48	735

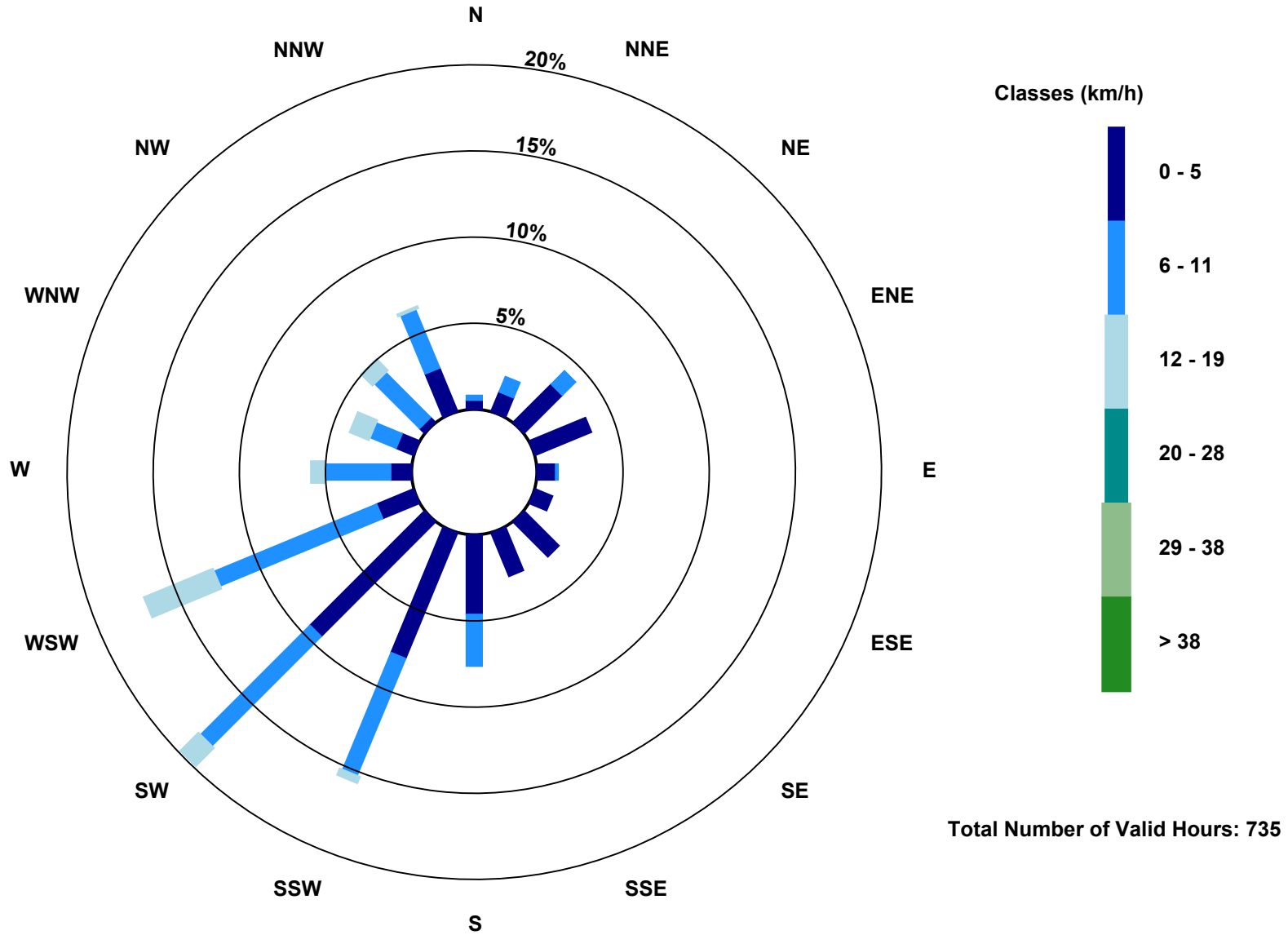
Total Number of Valid Hours: 735

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Jackfish 2/3





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Jackfish 2/3 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 06:00 Minimum Value: 0 km/h on Jan 11 06:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 735 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.8																				
Day	Hourly Period Ending At (MST)																								Daily Maximum												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24													
1-Jan	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	2	3												
2-Jan	1	2	2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	2	3	2	2	3												
3-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2												
4-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2												
5-Jan	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	3	3												
6-Jan	3	3	3	2	3	4	4	4	3	3	3	3	4	4	3	3	2	3	2	3	3	3	3	2	4												
7-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	1	2	2	2	2												
8-Jan	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	UO	1	1	1	2												
9-Jan	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2												
10-Jan	1	1	1	1	1	1	2	2	M	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2												
11-Jan	1	1	1	1	1	0	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
12-Jan	1	1	1	1	1	1	1	1	2	1	1	2	1	2	2	1	1	2	1	1	1	1	1	1	2												
13-Jan	2	1	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2												
14-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	1	0	1	1	UO	UO	1	1												
16-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
17-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	2												
18-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
19-Jan	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	2	3	3	3	3	3	3	3												
20-Jan	3	3	3	3	2	2	3	M	2	3	3	3	4	3	3	3	4	3	3	3	3	2	2	2	4												
21-Jan	2	2	2	2	1	1	2	2	2	2	2	2	2	3	2	4	3	3	3	2	2	3	3	3	4												
22-Jan	2	3	2	3	3	3	4	4	5	5	5	6	6	6	5	5	4	5	4	4	3	2	2	1	6												
23-Jan	1	2	2	2	2	2	1	1	2	2	1	2	2	2	2	2	1	2	2	2	1	1	1	1	2												
24-Jan	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3	3	3	2	2	1	2	2	3												
25-Jan	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	1	1	1	2	2	2	2	3	3	3												
26-Jan	4	4	6	4	6	7	7	7	6	5	5	5	5	4	3	3	3	3	3	3	3	3	4	3	7												
27-Jan	4	3	3	4	3	3	4	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	4	4												
28-Jan	3	3	4	4	3	4	4	4	4	4	5	5	5	4	5	4	4	4	4	4	4	5	4	3	5												
29-Jan	3	3	2	2	3	2	2	2	DF	3	3	3	3	3	3	3	3	3	4	3	4	3	2	3	4												
30-Jan	3	3	3	3	4	3	3	2	2	2	4	2	3	3	3	3	2	1	2	1	2	1	1	1	4												
31-Jan	1	1	1	2	2	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	2	2												
																	Diurnal Maximum																				
																	M - Maintenance							DF - DAS Failure							UO - Unstable Operation						



Wood Buffalo Environmental Association
Summary of Hour Averages

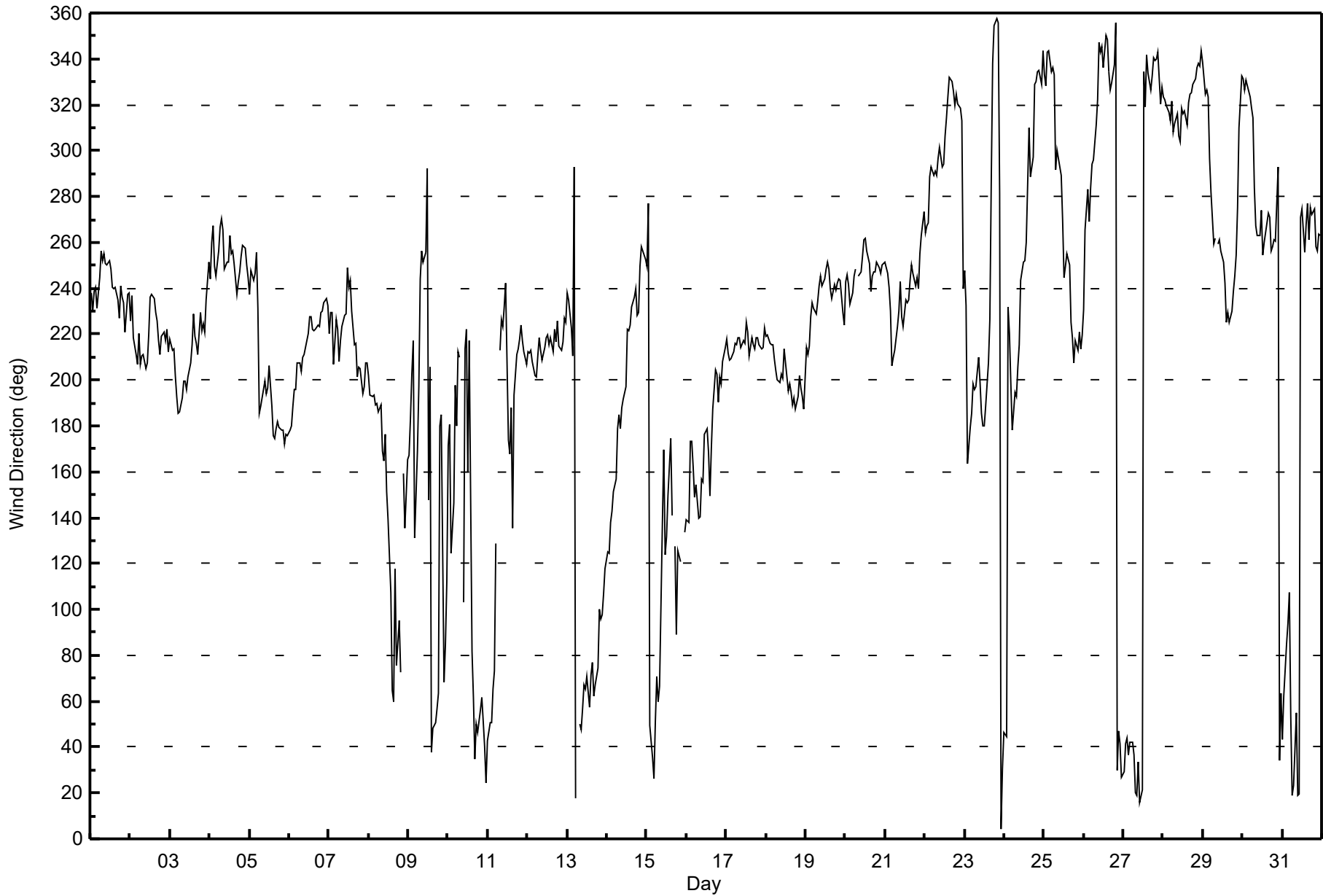
Wind Direction (WD) - deg
Jackfish 2/3 - January 2023

Direction of Maximum Speed: 294 deg on Jan 26 06:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 247.8 deg on Jan 20	Hours of Data: 735
Direction of Minimum Speed: 213 deg on Jan 10 11:00	Direction of Minimum Daily Speed Average: 0.4 deg on Jan 15
Direction of Minimum Speed: 213 deg on Jan 10 11:00	Hours of Missing Data: 9
Monthly Average Direction: 244.8 deg	Percent Operational Time: 98.8

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	238	230	239	240	231	245	256	252	255	251	250	252	248	240	240	240	235	227	241	236	233	221	237	238	241.3
2-Jan	226	237	218	211	207	220	207	211	211	205	208	220	236	237	235	230	226	217	211	219	221	217	222	212	220.1
3-Jan	218	213	213	202	193	185	186	192	200	199	196	201	208	215	229	219	216	211	229	221	224	221	235	251	211.2
4-Jan	244	260	267	250	245	256	267	271	266	249	252	251	263	255	256	251	237	243	247	254	259	257	250	245	253.2
5-Jan	237	247	244	246	256	231	185	189	196	200	194	197	207	189	176	174	179	182	180	178	178	172	176	176	200.2
6-Jan	178	180	188	196	196	207	208	204	210	211	214	220	228	228	222	222	222	224	223	229	230	234	236	233	216.8
7-Jan	221	229	230	207	227	222	208	217	223	228	229	249	241	244	230	215	216	201	206	205	194	197	208	207	220.2
8-Jan	202	193	193	193	189	190	186	189	169	165	176	151	139	107	65	60	118	76	95	72	UO	159	136	166	168.7
9-Jan	167	183	202	217	131	169	197	244	256	252	256	292	148	206	38	48	50	57	64	180	185	68	85	112	199.4
10-Jan	171	180	124	146	198	180	212	210	M	103	213	222	160	217	82	62	35	50	47	56	61	51	40	24	91.5
11-Jan	43	51	51	65	73	129	UO	213	226	224	232	242	174	168	188	136	193	211	213	218	224	217	213	207	203.3
12-Jan	212	212	213	208	202	201	210	219	213	209	214	218	219	216	218	213	222	217	226	215	213	217	227	225	215.5
13-Jan	238	235	223	210	293	18	UO	50	48	57	67	66	71	58	71	77	62	67	74	100	96	98	107	118	79.1
14-Jan	125	124	138	143	152	157	179	185	179	188	191	197	222	221	224	232	236	240	228	229	250	258	254	252	203.8
15-Jan	249	277	49	36	26	51	71	60	67	136	170	124	132	150	175	141	UO	127	89	126	121	UO	UO	134	96.1
16-Jan	139	138	173	173	162	149	154	140	140	157	156	176	179	168	150	170	188	204	202	190	201	198	208	214	176.6
17-Jan	218	212	209	210	212	216	215	218	219	214	217	216	225	221	211	219	216	213	218	219	215	214	214	223	216.2
18-Jan	219	219	216	215	216	209	205	200	199	203	201	214	208	195	198	195	189	192	188	193	202	196	193	187	202.4
19-Jan	214	211	215	227	234	231	229	234	241	245	241	244	248	251	248	240	236	242	239	242	244	244	229	224	238.3
20-Jan	243	246	241	233	238	245	248	M	245	247	254	261	262	256	251	239	245	247	247	251	249	247	250	251	247.8
21-Jan	251	247	240	230	206	210	213	224	230	243	228	223	235	233	235	243	250	246	241	244	240	255	263	274	239.1
22-Jan	264	267	269	289	293	289	291	289	297	302	293	294	307	314	323	332	330	326	320	325	320	319	313	240	302.3
23-Jan	248	233	164	179	186	199	196	197	210	199	186	180	180	189	208	227	286	338	354	357	356	282	4	31	209.2
24-Jan	46	44	232	220	199	178	195	193	206	215	244	252	252	260	285	310	288	297	329	330	334	335	329	344	267.7
25-Jan	333	328	343	344	334	336	333	292	300	293	289	270	244	250	255	250	225	219	207	217	213	221	214	219	255.9
26-Jan	231	266	283	269	284	294	296	311	322	347	343	346	336	350	349	334	326	330	337	356	30	47	42	27	321.1
27-Jan	30	41	44	36	42	42	36	20	19	34	16	22	334	319	342	334	327	332	340	339	340	343	320	328	10.2
28-Jan	324	322	320	317	313	322	308	312	316	306	304	319	316	317	311	321	325	325	329	331	336	338	337	343	320.7
29-Jan	338	325	327	323	297	282	259	262	DF	259	261	256	251	242	225	229	225	230	238	246	254	275	310	333	260.9
30-Jan	331	327	331	328	323	319	315	284	267	263	263	274	255	260	264	273	271	256	258	261	261	293	34	64	284.2
31-Jan	43	62	85	94	107	54	19	23	55	19	19	271	275	255	268	277	261	275	272	274	258	256	264	263	282.9

240.7 244.8 243.6 237.0 237.9 240.7 240.3 242.1 243.9 245.7 246.3 248.7 249.9 249.0 251.5 248.0 245.6 243.5 245.4 245.6 246.3 243.4 244.2 243.7
 Diurnal Average

M - Maintenance DF - DAS Failure UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 2/3 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 98 deg on Jan 10 11:00 Minimum Value: 7 deg on Jan 5 09:00 Percentiles: P ₁ = 11 P ₁₀ = 15 Q ₁ = 17 Median = 26 Q ₃ = 37 P ₉₀ = 46 P ₉₉ = 81																		Hours in Service: 744 Hours of Data: 735 Hours of Missing Data: 9 Hours of Calibration: 0 Percent Operational Time: 98.8							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	15	15	15	16	18	17	19	14	13	16	14	14	16	16	15	15	17	18	16	19	17	16	14	16	19
2-Jan	18	17	19	17	13	17	17	17	19	16	18	19	18	17	17	17	17	17	17	16	18	19	17	20	20
3-Jan	18	19	20	19	16	13	13	14	14	13	12	15	16	21	22	32	20	15	16	14	14	13	15	14	32
4-Jan	15	18	20	15	13	19	22	23	20	13	12	14	20	14	14	16	16	16	14	14	12	13	14	23	
5-Jan	17	15	14	13	10	18	8	8	7	9	11	17	18	22	22	26	24	28	27	36	34	39	36	40	40
6-Jan	39	35	38	34	34	29	25	29	25	21	19	20	21	23	22	19	17	17	16	15	15	15	15	39	
7-Jan	16	14	15	16	16	15	16	16	15	15	13	12	13	17	16	13	18	14	13	13	10	14	14	18	
8-Jan	12	13	11	11	14	11	11	15	60	41	37	42	40	31	26	17	70	25	33	29	UO	34	46	22	70
9-Jan	39	19	14	62	46	32	16	17	16	13	19	46	90	68	53	50	22	25	22	66	48	41	24	38	90
10-Jan	39	53	30	43	42	82	91	84	M	95	98	51	60	40	62	43	48	34	31	32	33	37	53	48	98
11-Jan	45	43	51	46	39	63	UO	21	23	28	32	85	67	46	39	32	36	34	29	30	31	30	28	31	85
12-Jan	24	24	26	27	36	29	28	27	27	29	27	30	26	28	28	28	24	27	28	27	30	30	29	24	36
13-Jan	26	24	24	52	68	75	UO	34	20	22	27	28	27	24	27	27	24	23	29	30	26	28	28	32	75
14-Jan	32	30	35	39	41	30	39	32	26	26	26	32	25	24	24	26	18	26	22	27	16	28	25	20	41
15-Jan	22	67	38	39	61	50	34	35	55	66	32	29	36	35	47	32	UO	53	52	44	39	UO	UO	19	67
16-Jan	19	33	44	25	34	32	43	47	41	48	50	57	47	43	44	50	42	31	33	37	40	34	37	28	57
17-Jan	27	30	30	29	28	28	28	25	24	21	24	23	22	25	25	23	25	27	26	26	25	27	28	29	30
18-Jan	31	30	28	31	29	33	40	48	36	32	32	25	28	32	37	34	32	30	30	32	28	31	26	26	48
19-Jan	24	24	23	21	20	17	17	16	15	15	15	15	20	18	15	17	16	16	16	18	17	16	21	21	24
20-Jan	18	14	17	19	15	16	16	M	14	15	17	22	20	19	17	17	15	14	15	14	15	14	15	14	22
21-Jan	14	14	15	18	13	15	14	18	18	15	19	17	18	20	20	19	15	15	16	14	16	17	21	32	32
22-Jan	19	29	28	31	28	32	32	32	32	35	36	35	39	40	42	49	46	45	44	39	36	36	48	31	49
23-Jan	21	20	46	17	18	17	19	18	23	26	26	26	25	25	23	21	34	36	36	36	50	27	65	30	65
24-Jan	56	78	58	22	27	18	18	20	20	18	21	16	15	21	33	41	37	35	44	54	43	39	42	41	78
25-Jan	47	46	42	51	44	41	46	41	40	36	34	80	49	18	22	17	20	19	17	18	17	18	21	25	80
26-Jan	21	26	31	25	34	32	32	39	41	45	48	48	48	44	44	42	43	44	43	39	40	28	33	37	48
27-Jan	40	33	31	38	29	29	36	42	42	36	46	43	40	46	47	40	40	34	33	28	41	45	39	41	47
28-Jan	48	43	41	36	33	38	34	38	42	36	37	38	40	40	42	40	44	38	43	42	43	44	44	45	48
29-Jan	37	43	34	32	32	29	13	17	DF	15	17	18	20	19	23	20	20	21	19	17	16	26	35	41	43
30-Jan	40	45	48	39	43	39	33	23	15	19	31	28	22	25	24	32	28	21	15	16	26	59	57	45	59
31-Jan	16	20	22	25	48	34	40	47	81	53	67	54	41	26	26	32	33	49	22	25	12	11	19	21	81
Diurnal Maximum																									
M - Maintenance						DF - DAS Failure						UO - Unstable Operation													



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS29
SURMONT 2
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	708	36	36	100	12.5	0	1.7	0
H2S (ppb) Average	707	36	37	99.87	0.6	0	0.2	0
THC(ppm) Average	708	36	36	100	2.8	-	2.6	-
NO2 (ppb) Average	705	36	39	99.6	20.3	0	5.2	-
NO (ppb) Average	705	36	39	99.6	2.1	-	0.4	-
NOX (ppb) Average	705	36	39	99.6	21.9	-	5.6	-
PM2.5 (ug/m3) Average	743	1	1	100	43.3	0	17.1	0
Temperature 2 m (C) Average	744	0	0	100	3.6	-	-1.7	-
Relative Humidity (%) Average	742	0	2	99.73	98.5	-	93.7	-
Wind Speed 10 m (km/h) Average	738	0	6	99.19	18	-	11	-
Wind Direction 10 m (deg) Average	738	0	6	99.19	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	708	0.53	0.9	-	0	0	0.1	0.2	0.5	1.2	12.5
H2S (ppb) Average	707	0.1	0.1	-	0	0	0	0.1	0.2	0.2	0.6
THC (ppm) Average	708	2.34	0.1	-	2.1	2.2	2.3	2.3	2.4	2.5	2.8
NO2 (ppb) Average	705	2.67	2.5	-	0.3	0.8	1.3	2	3.2	5	20.3
NO (ppb) Average	705	0.14	0.3	-	0	0	0	0	0.2	0.4	2.1
NOX (ppb) Average	705	2.81	2.6	-	0.3	0.8	1.4	2.1	3.4	5.3	21.9
PM2.5 (ug/m3) Average	743	5.21	5.1	-	0.4	1.1	2.1	3.8	7.3	9.8	43.3
Temperature 2 m (C) Average	744	-9.59	5.7	-	-27.5	-18.3	-11.8	-9.2	-6.6	-2.7	3.6
Relative Humidity (%) Average	742	85.72	8.2	-	52	72.8	84	88.8	90.9	92.4	98.5
Wind Speed 10 m (km/h) Average	738	4.6	3	-	0	1	2	4	6	9	18
Wind Direction 10 m (deg) Average	738	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2	03 Jan 2023 13:00	03 Jan 2023 13:00	1	Maintenance - sample manifold cleaned
NO2	01 Jan 2023 10:00	01 Jan 2023 11:00	2	Maintenance - remote troubleshooting
Relative Humidity	02 Jan 2023 19:00	02 Jan 2023 20:00	2	Unstable Operation - excessive sensor signal noise
Wind Speed, Wind Direction	03 Jan 2023 19:00	03 Jan 2023 20:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 08:00	11 Jan 2023 08:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	24 Jan 2023 00:00	24 Jan 2023 00:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	30 Jan 2023 22:00	30 Jan 2023 22:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 23:00	31 Jan 2023 23:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

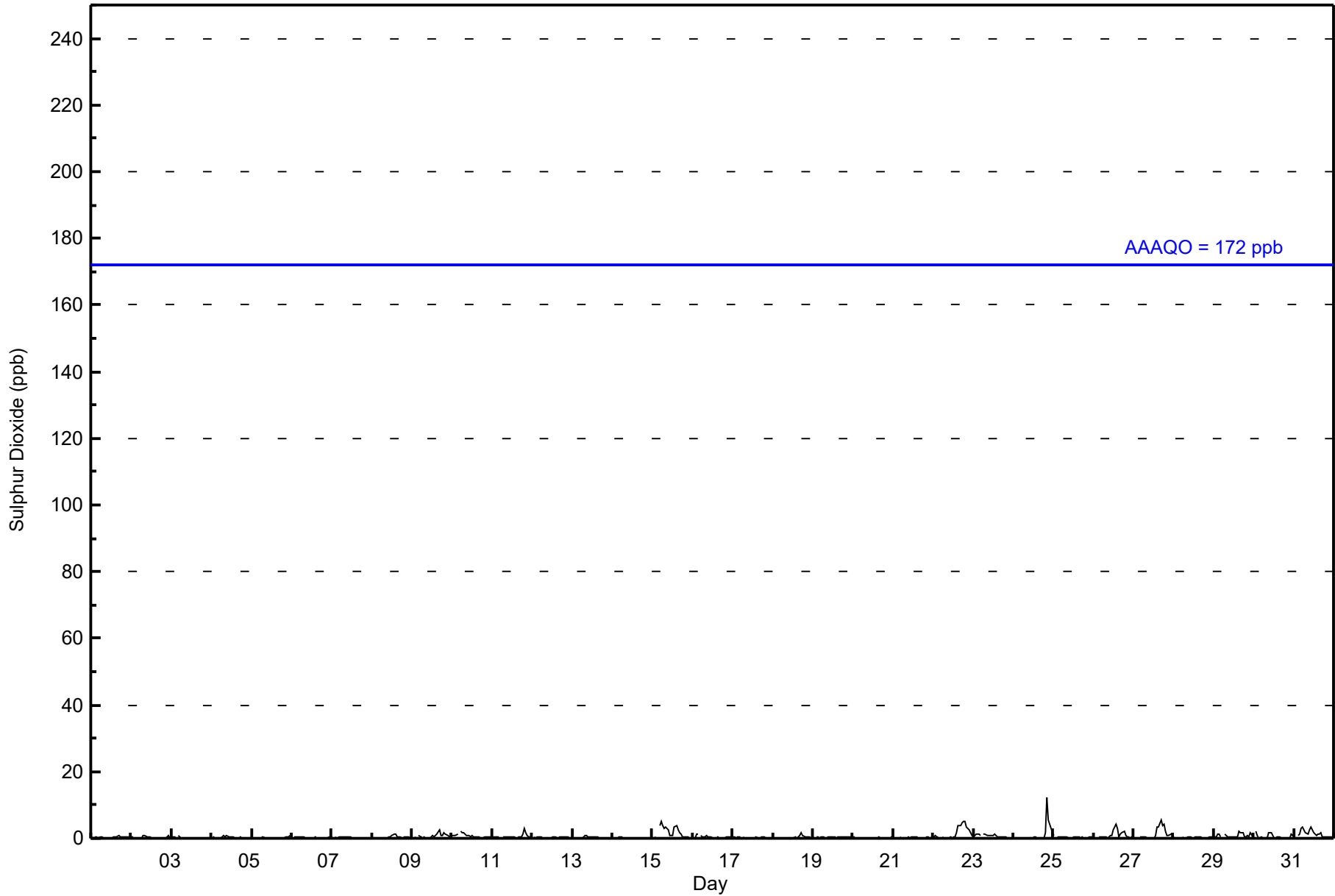
Surmont 2 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0		Hours in Service: 744																									
Maximum Value: 12.5 ppb on Jan 24 21:00		Maximum Daily Average: 1.7 ppb on Jan 15																									
Minimum Value: 0.0 ppb on Jan 2 21:00		Hours of Data: 708																									
Maximum Diurnal Average: 0.8 ppb at hour 21		Hours of Missing Data: 36																									
Monthly Average: 0.53 ppb		Hours of Calibration: 36																									
		Percent Operational Time: 100.0																									
		Minimum Daily Average: 0.1 ppb on Jan 14																									
		Minimum Diurnal Average: 0.3 ppb at hour 1																									
		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.2 P ₉₉ = 4.3																									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.3	Z	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.6	0.6	0.6	0.4	0.4	0.4	0.2	0.3	0.3	0.6	
2-Jan	0.4	0.4	Z	0.2	0.1	0.1	0.1	0.7	0.8	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.1	0.1	0.2	0.0	0.2	0.7	0.2	0.2	0.8	
3-Jan	0.4	0.4	0.3	Z	0.7	0.6	0.1	0.0	0.0	0.0	0.0	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	
4-Jan	0.2	0.3	0.1	0.1	Z	0.1	0.2	0.7	0.3	0.8	0.5	0.3	0.5	0.4	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.8	
5-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.3	0.3	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.6	0.7	0.1	0.7
6-Jan	Z	0.5	0.2	0.3	0.3	0.5	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.2	0.5	
7-Jan	0.4	Z	0.3	0.1	0.6	0.5	0.3	0.3	0.2	0.2	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
8-Jan	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.9	1.4	1.1	0.6	0.3	0.2	0.2	0.4	0.2	0.2	0.2	0.1	0.3	1.4	
9-Jan	0.1	0.1	0.3	Z	0.7	0.5	0.2	0.4	0.1	0.1	0.1	0.6	0.8	0.5	0.9	1.4	2.3	0.9	1.0	1.7	1.4	0.8	0.5	0.6	0.7	2.3	
10-Jan	0.8	0.8	1.0	1.2	Z	2.1	1.8	1.8	0.9	0.8	0.8	0.4	0.7	0.6	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.4	0.3	0.4	0.7	2.1	
11-Jan	0.3	0.4	0.4	0.4	0.3	Z	0.4	0.5	0.6	0.3	0.3	0.4	0.5	0.2	0.2	0.2	0.3	0.6	1.2	2.8	1.9	0.7	0.4	0.3	0.6	2.8	
12-Jan	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.4	
13-Jan	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.3	0.7	
14-Jan	0.0	0.2	Z	0.1	0.3	0.3	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.3	
15-Jan	0.2	0.2	0.4	Z	3.9	5.1	3.6	3.0	3.3	2.4	0.8	0.8	1.0	3.2	3.7	2.6	1.8	1.5	0.5	0.5	0.4	0.2	0.1	0.1	1.7	5.1	
16-Jan	0.1	0.2	1.4	1.2	Z	0.7	0.4	0.2	0.8	0.2	0.3	0.4	0.2	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	1.4	
17-Jan	0.3	0.3	0.2	0.3	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.2	0.1	0.1	0.0	0.0	0.2	0.4	
18-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.6	1.7	0.9	0.6	0.5	0.3	0.3	0.2	0.3	1.7	
19-Jan	0.2	Z	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.5	0.3	0.4	0.5	0.6	0.6	0.3	0.3	0.3	0.6	
20-Jan	0.2	0.3	Z	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	
21-Jan	0.2	0.1	0.1	Z	0.2	0.1	0.1	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	
22-Jan	0.6	0.8	0.5	0.3	Z	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	1.6	4.0	3.7	4.6	5.2	4.9	3.4	2.6	1.5	1.0	1.6	5.2	
23-Jan	1.0	1.0	1.3	1.3	1.0	Z	1.2	1.2	0.9	0.9	0.8	0.7	0.8	1.2	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.2	0.7	1.3	
24-Jan	Z	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.2	1.8	12.5	5.3	2.8	1.7	1.1	12.5	
25-Jan	1.0	Z	0.1	0.2	0.4	0.2	0.4	0.3	0.3	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	1.0	
26-Jan	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.7	0.9	2.6	4.2	2.8	0.6	1.1	1.5	2.2	0.8	0.3	0.3	0.2	0.2	0.9	4.2	
27-Jan	0.1	0.2	0.1	Z	0.2	0.4	0.6	0.3	0.1	0.0	0.1	0.1	0.1	1.0	3.6	3.5	5.4	3.9	4.3	2.0	1.0	0.8	1.2	1.4	1.3	5.4	
28-Jan	0.2	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.3	
29-Jan	0.2	0.4	1.1	1.3	0.5	Z	1.2	0.9	0.4	0.4	0.3	0.5	0.6	0.5	0.4	2.3	1.7	1.8	0.3	0.4	0.9	0.4	1.6	0.6	0.8	2.3	
30-Jan	Z	2.3	0.9	0.2	0.2	0.2	0.0	0.1	0.1	1.6	1.8	0.8	0.1	0.1	0.6	0.6	0.1	0.1	0.2	0.1	0.2	0.2	1.1	1.0	0.5	2.3	
31-Jan	1.2	Z	0.7	1.2	2.8	3.5	2.6	1.5	1.4	2.7	3.4	2.7	1.5	1.0	1.1	1.4	1.7	0.6	0.3	0.3	0.3	0.3	0.3	0.2	1.4	3.5	
																								Diurnal Average			
																								Diurnal Maximum			
0.3 0.4 0.4 0.4 0.5 0.6 0.5 0.5 0.4 0.4 0.4 0.4 0.5 0.6 0.7 0.7 0.7 0.7 0.7 0.6 0.8 0.5 0.5 0.4																											
1.2 2.3 1.4 1.3 3.9 5.1 3.6 3.0 3.3 2.7 3.4 2.7 2.6 4.2 3.7 4.0 5.4 4.6 5.2 4.9 12.5 5.3 2.8 1.7																											
Z - zerospan C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	39	11	7	8	9	72	116	57	37	21	25	65	70	68	45	51	701
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	11	7	8	9	72	116	57	37	21	25	65	70	68	45	52	702

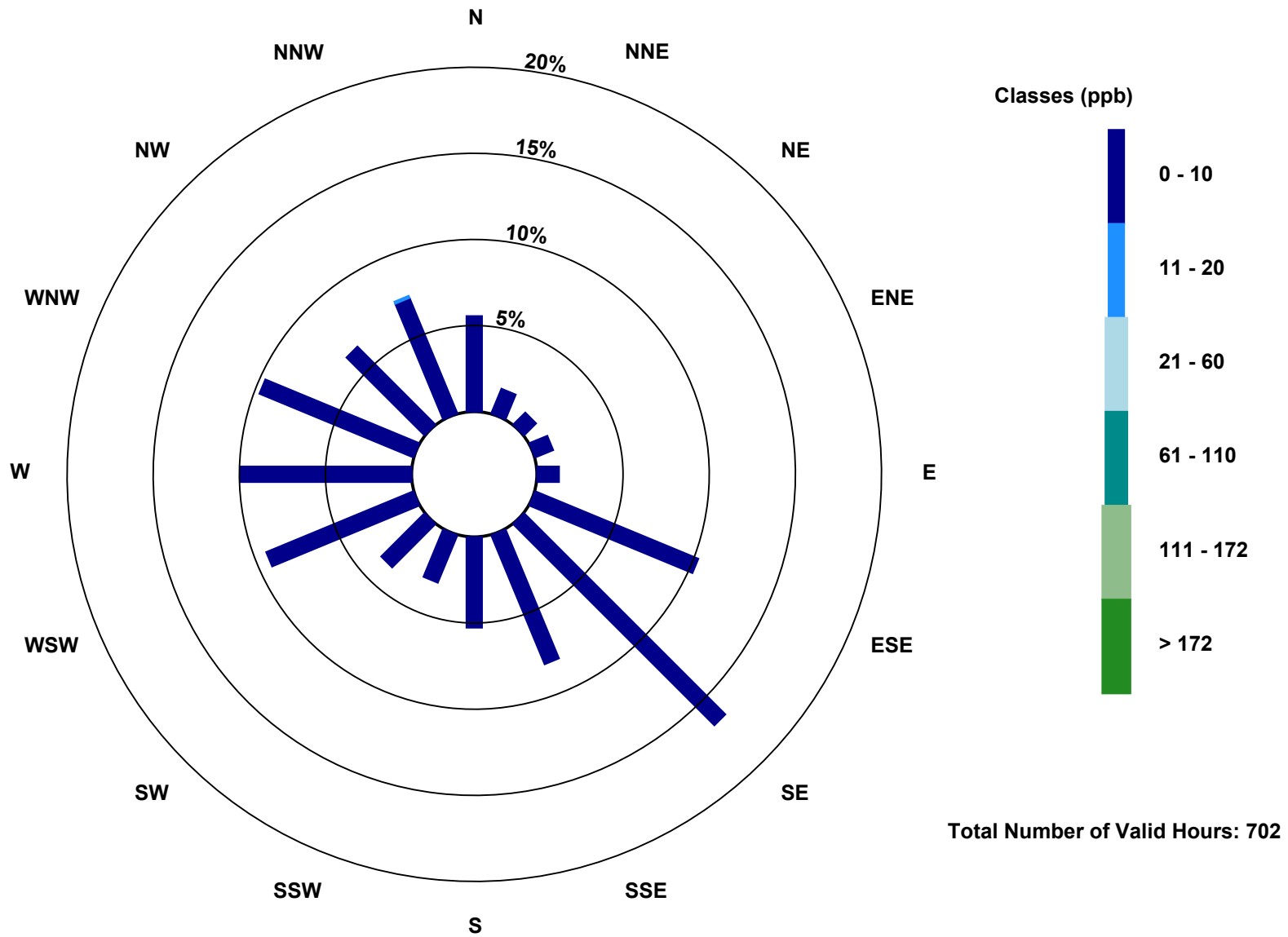
Total Number of Valid Hours: 702

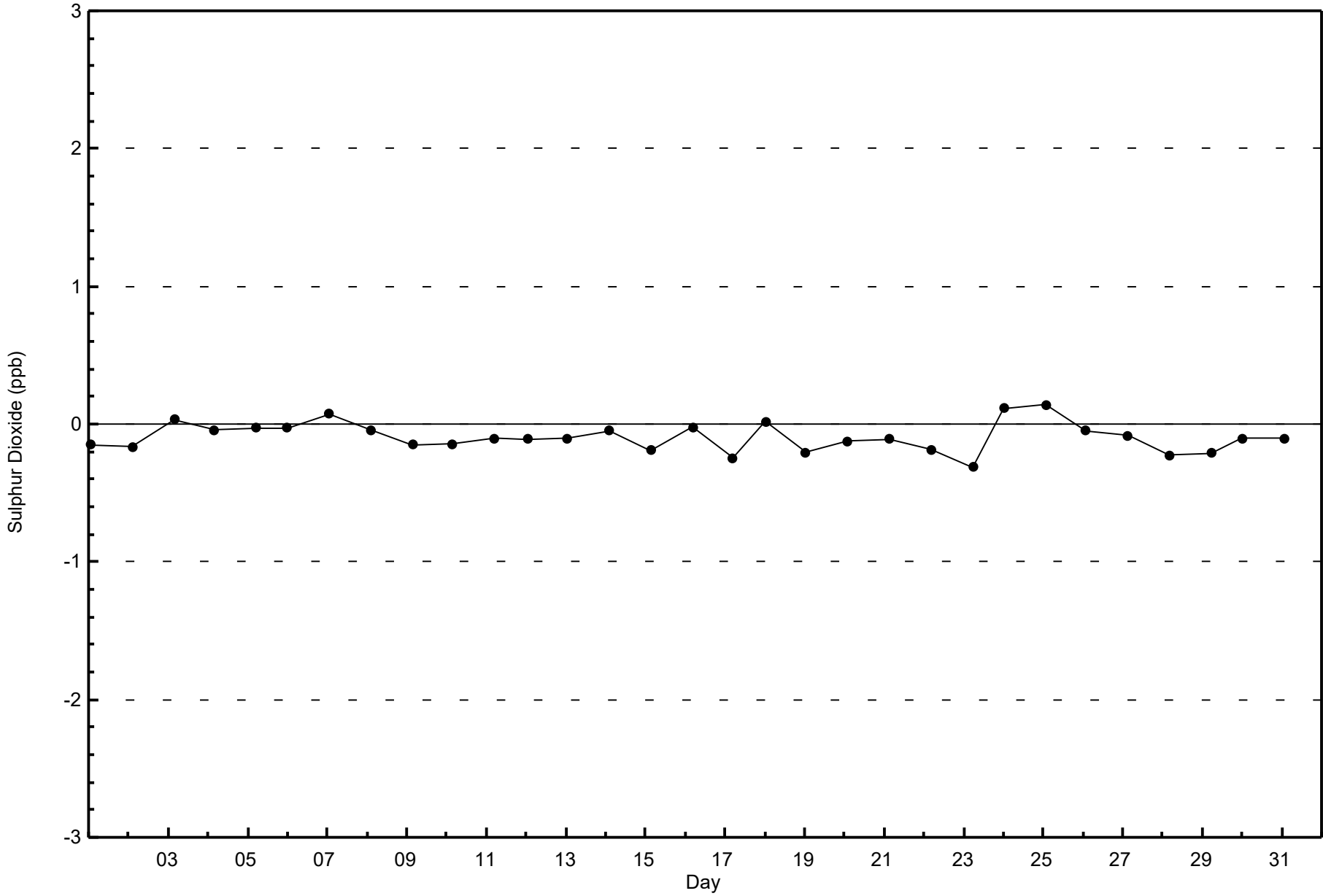
Total Number of Hours: 744

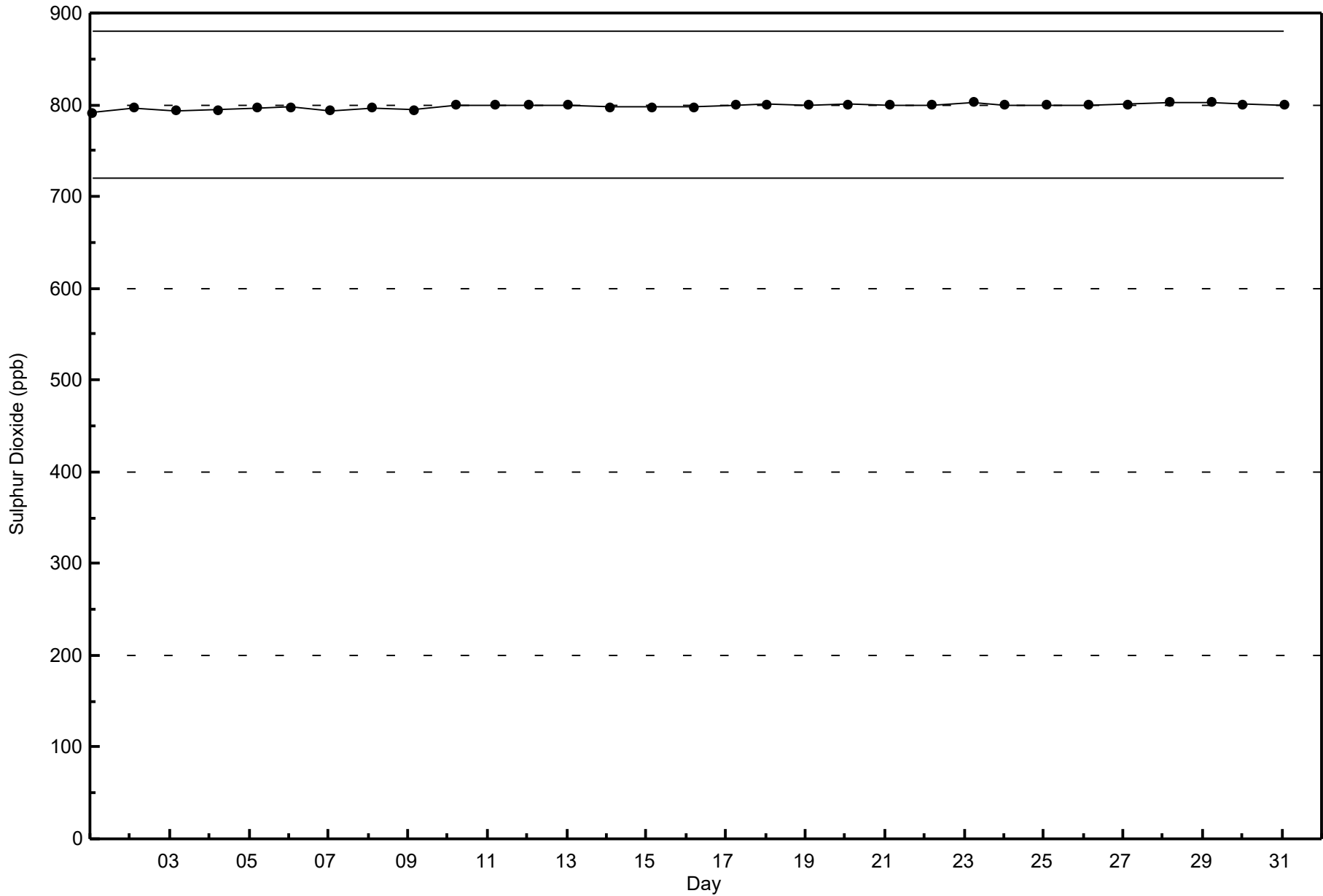


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Surmont 2

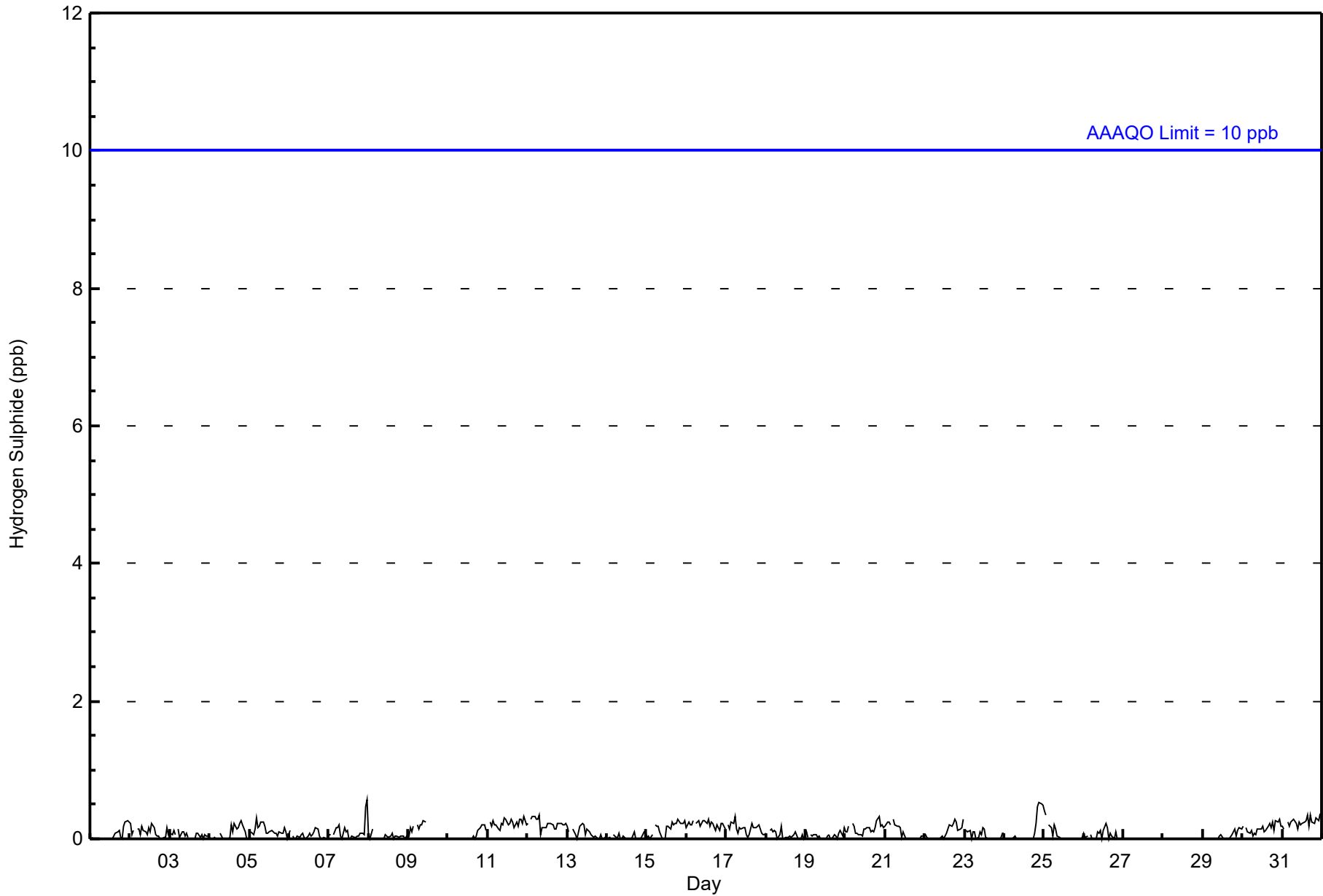








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 0.6 ppb on Jan 8 00:00		Maximum Daily Average: 0.2 ppb on Jan 31														Hours of Data:		707									
Minimum Value: 0.0 ppb on Jan 1 01:00		Minimum Daily Average: 0.0 ppb on Jan 27														Hours of Missing Data:		37									
Maximum Diurnal Average: 0.1 ppb at hour 23		Minimum Diurnal Average: 0.1 ppb at hour 12														Hours of Calibration:		36									
Monthly Average: 0.10 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.2 P ₉₉ = 0.4														Percent Operational Time:		99.9									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.3	0.3	0.1	0.3		
2-Jan	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	
3-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.0	M	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	
4-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.3	
5-Jan	Z	0.1	0.1	0.1	0.3	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.3	
6-Jan	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
7-Jan	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.6	0.1	0.6	
8-Jan	0.1	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	
9-Jan	0.0	0.2	0.1	0.2	Z	0.2	0.1	0.2	0.2	0.3	0.2	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
10-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.2	
11-Jan	Z	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	
12-Jan	0.2	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
13-Jan	0.2	0.1	Z	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
14-Jan	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	
15-Jan	0.0	0.0	0.0	0.1	Z	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.1	0.3	
16-Jan	0.2	0.2	0.2	0.2	0.3	Z	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.3	
17-Jan	Z	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	
18-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.2	
19-Jan	0.1	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.2	
20-Jan	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.3	
21-Jan	0.2	0.3	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
22-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.2	0.3	0.1	0.3	
23-Jan	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	
24-Jan	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.5	0.5	0.5	0.1	0.5	
25-Jan	0.4	0.3	Z	0.2	0.2	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
26-Jan	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
27-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.2	
30-Jan	0.2	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.3	
31-Jan	0.2	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.2	0.4	
																								Diurnal Average		0.1	
																								Diurnal Maximum		0.6	
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	707	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



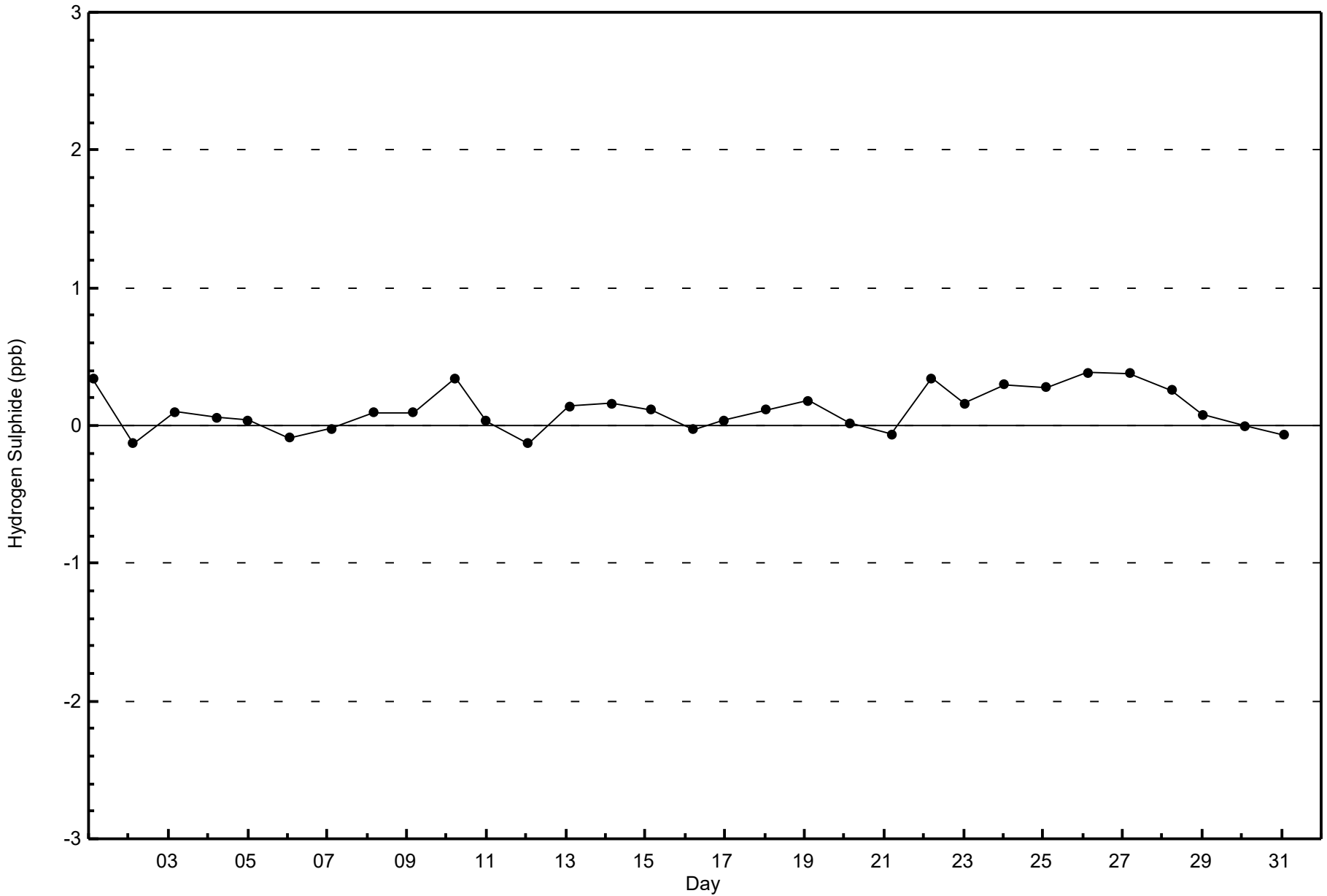
**Wood Buffalo Environmental Association
Frequency Distribution**

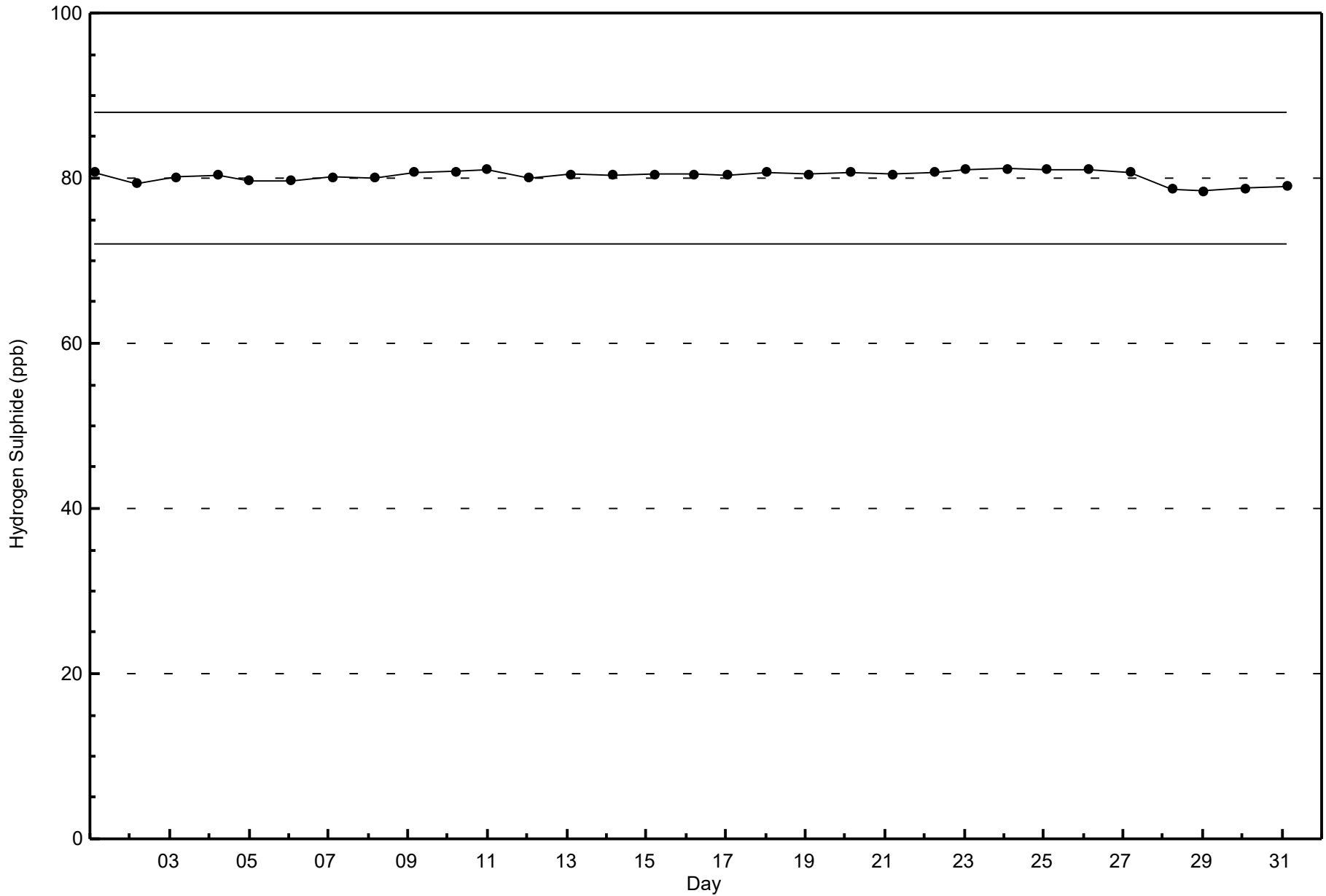
**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	38	12	7	8	9	69	116	56	36	21	29	64	72	67	47	50	701
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	38	12	7	8	9	69	116	56	36	21	29	64	72	67	47	50	701

Total Number of Valid Hours: 701

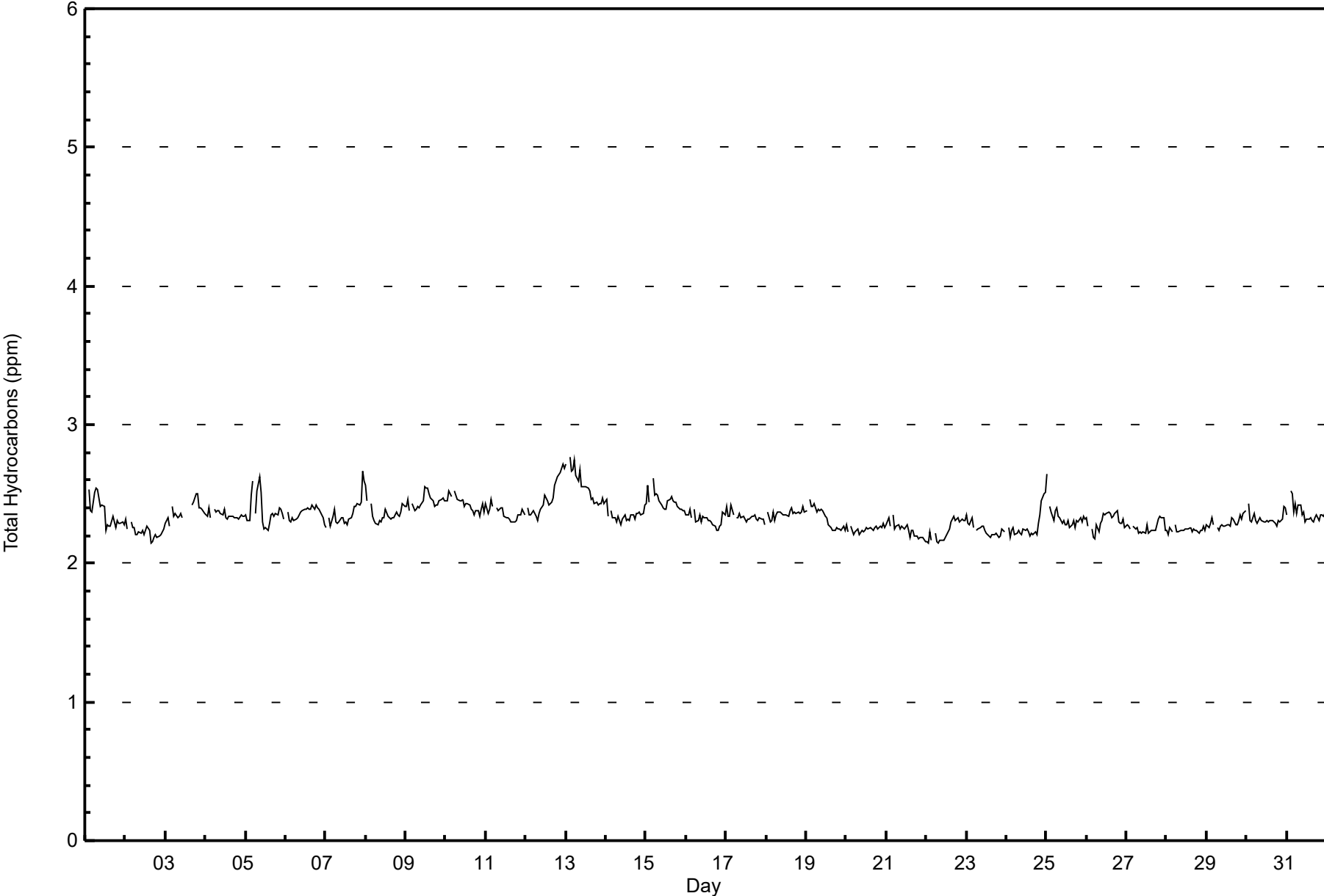
Total Number of Hours: 744







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																744																										
Maximum Value: 2.8 ppm on Jan 13 03:00		Maximum Daily Average: 2.6 ppm on Jan 13		Hours of Data: 708																708																												
Minimum Value: 2.1 ppm on Jan 2 16:00		Minimum Daily Average: 2.2 ppm on Jan 2		Hours of Missing Data: 36																36																												
Maximum Diurnal Average: 2.4 ppm at hour 1		Minimum Diurnal Average: 2.3 ppm at hour 15		Hours of Calibration: 36																36																												
Monthly Average: 2.34 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.5 P ₉₉ = 2.7		Percent Operational Time: 100.0																100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	2.5	Z	2.5	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5																						
2-Jan	2.3	2.2	Z	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3																						
3-Jan	2.3	2.3	2.3	Z	2.4	2.3	2.4	2.3	2.3	2.4	2.3	C	C	C	C	C	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5																						
4-Jan	2.4	2.3	2.4	2.3	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																						
5-Jan	2.4	2.3	2.3	2.5	2.6	Z	2.4	2.5	2.6	2.5	2.3	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.4	2.4	2.4	2.3	2.6																						
6-Jan	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.4																						
7-Jan	2.3	Z	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.7	2.6	2.4	2.7																						
8-Jan	2.6	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.6																						
9-Jan	2.4	2.5	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.6																						
10-Jan	2.5	2.4	2.5	2.5	Z	2.5	2.5	2.5	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.5																						
11-Jan	2.4	2.4	2.4	2.5	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.4	2.3	2.4	2.5																						
12-Jan	Z	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.5	2.7																						
13-Jan	2.7	Z	2.8	2.7	2.7	2.7	2.6	2.6	2.7	2.6	2.6	2.5	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.6	2.8																						
14-Jan	2.5	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.5																						
15-Jan	2.4	2.6	2.4	Z	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.6																						
16-Jan	2.4	2.4	2.4	2.3	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4																						
17-Jan	2.4	2.3	2.3	2.4	2.4	Z	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4																						
18-Jan	Z	2.4	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4																						
19-Jan	2.4	Z	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.5																							
20-Jan	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.3																						
21-Jan	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																						
22-Jan	2.2	2.1	2.2	2.2	Z	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3																						
23-Jan	2.4	2.3	2.3	2.3	2.3	Z	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4																						
24-Jan	Z	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.5	2.3	2.5																						
25-Jan	2.6	Z	2.4	2.4	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.6																						
26-Jan	2.3	2.3	Z	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4																						
27-Jan	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3																						
28-Jan	2.2	2.2	2.3	2.2	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.3																						
29-Jan	2.3	2.3	2.3	2.3	2.3	Z	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3																						
30-Jan	Z	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3																						
31-Jan	2.3	Z	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.5																						
2.4																								2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	Diurnal Average		
2.7																								2.6	2.8	2.7	2.7	2.7	2.6	2.6	2.7	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.7	2.7	2.7	Diurnal Maximum	
Z - zerospan																								C - Calibration																								





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	708	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	39	11	7	8	9	72	116	57	37	21	25	65	70	68	45	52	702
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	39	11	7	8	9	72	116	57	37	21	25	65	70	68	45	52	702

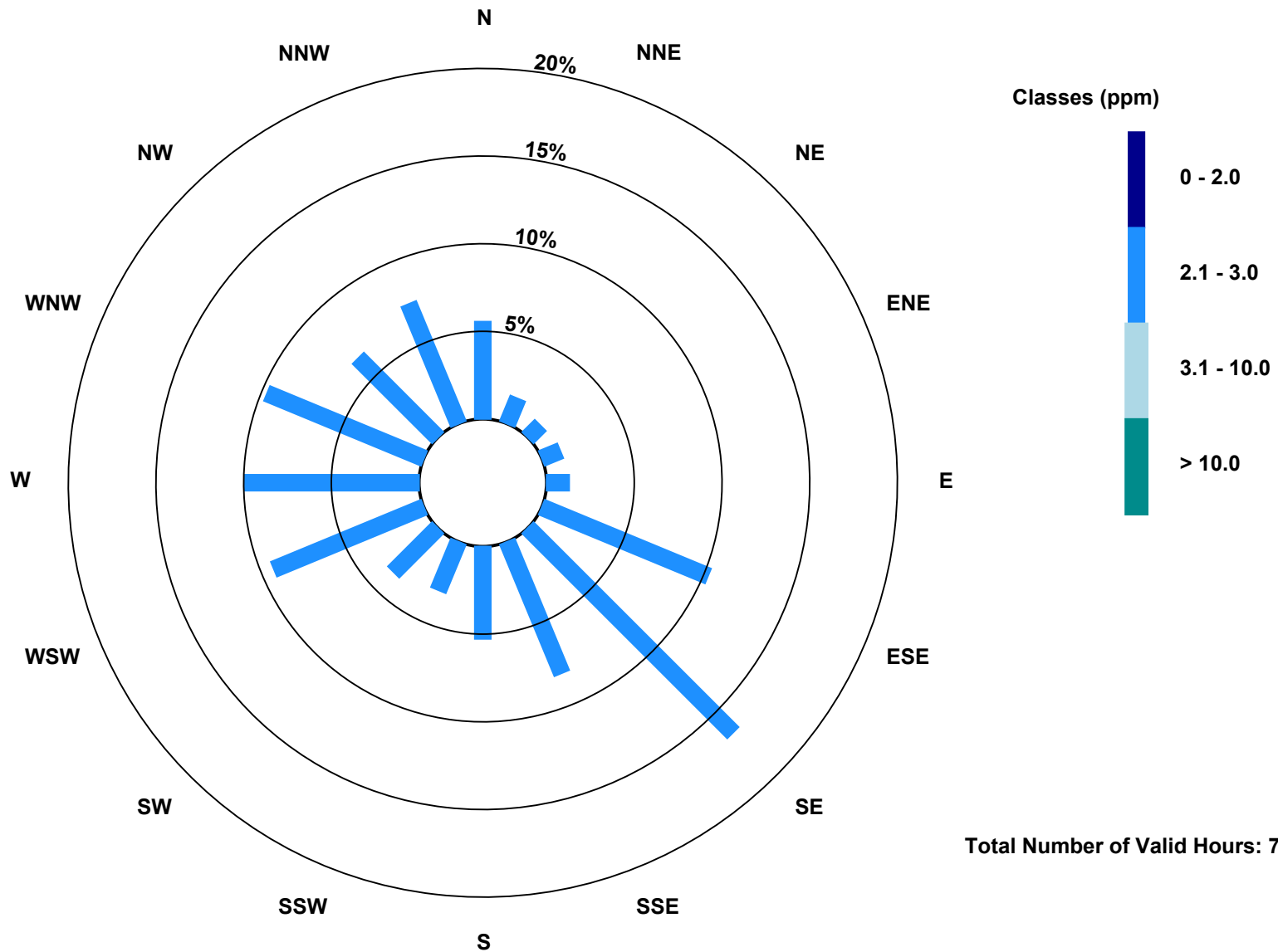
Total Number of Valid Hours: 702

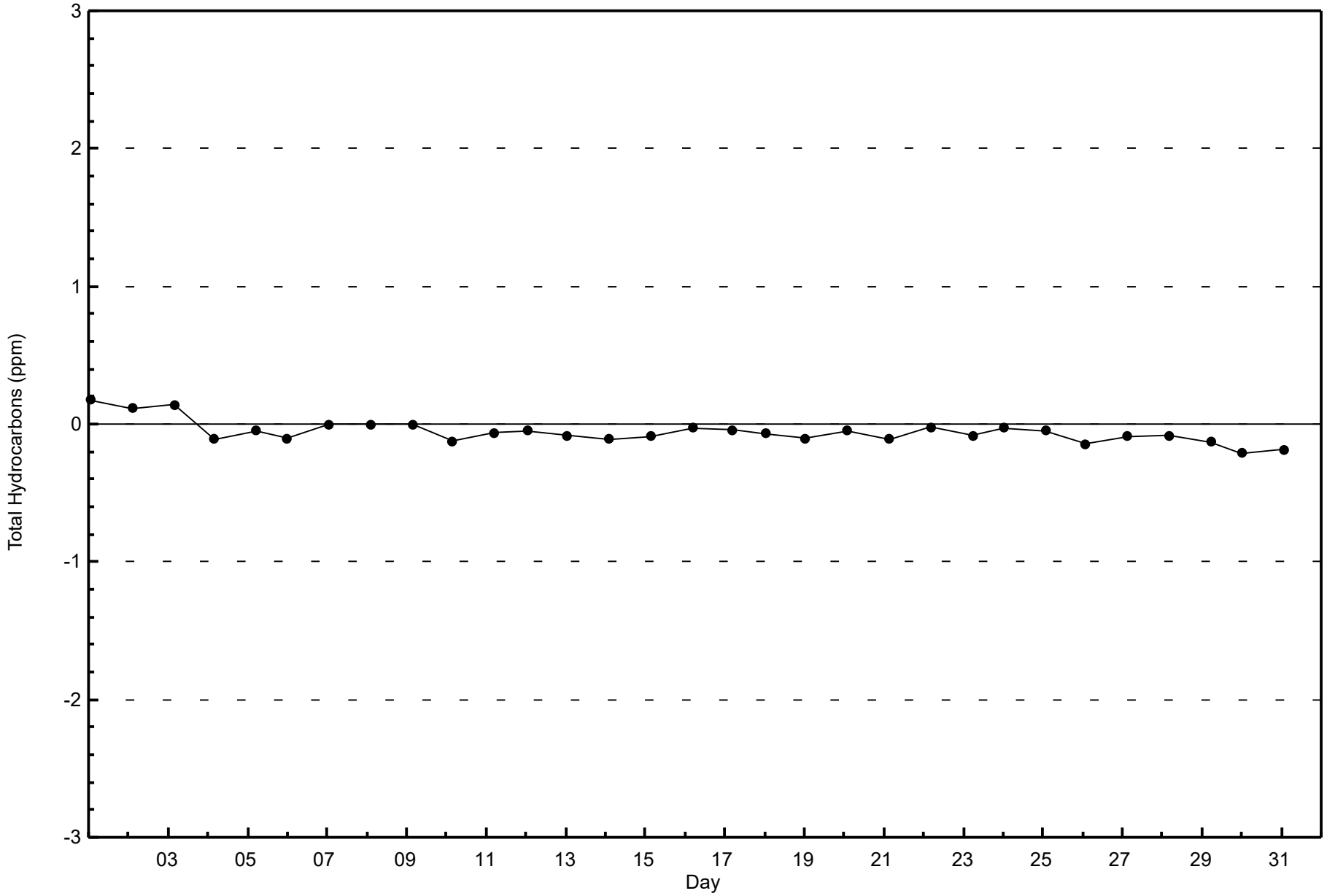
Total Number of Hours: 744

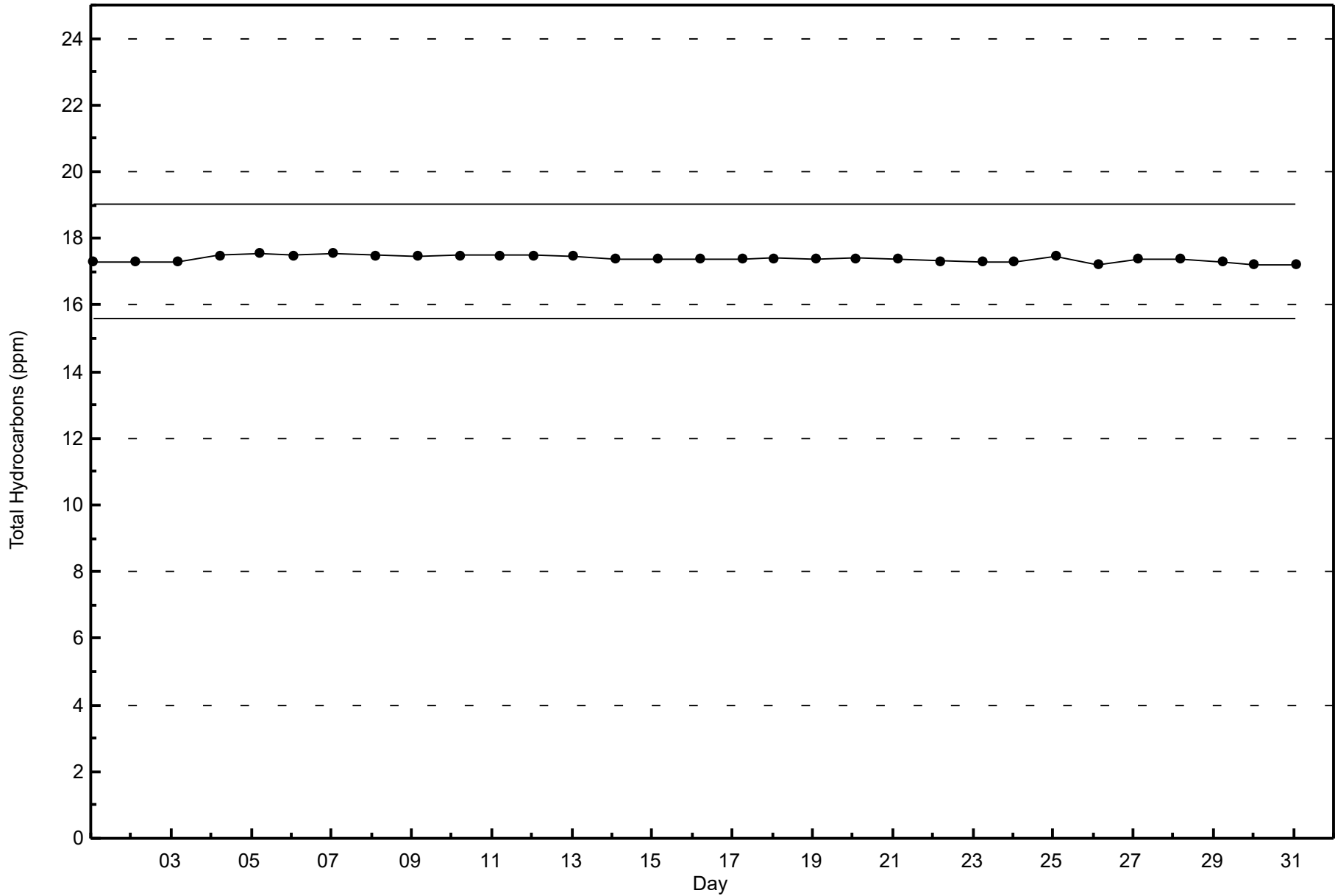


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Surmont 2









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

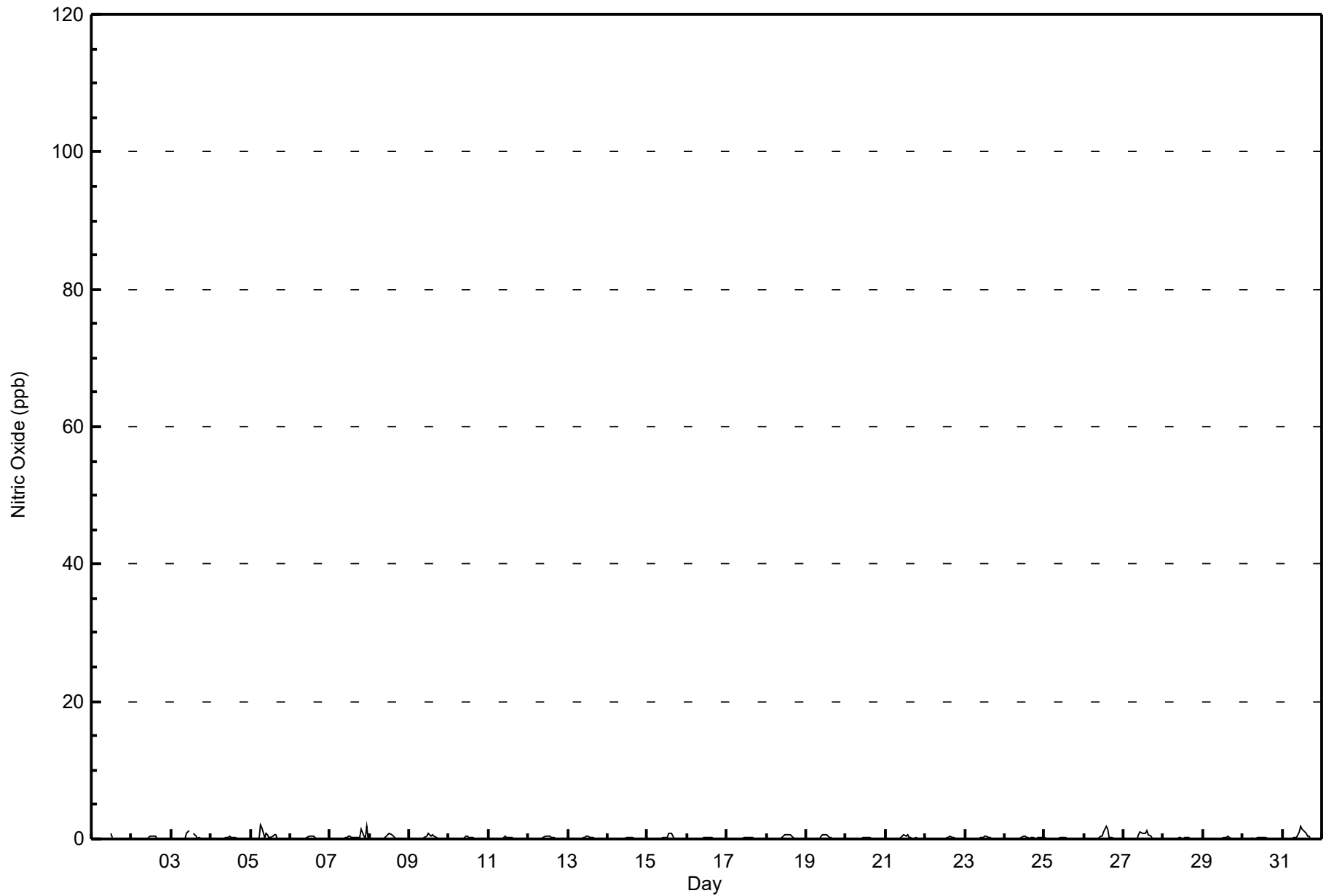
Surmont 2 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 2.1 ppb on Jan 5 07:00		Maximum Daily Average: 0.4 ppb on Jan 31														Hours of Data:		705									
Minimum Value: 0.0 ppb on Jan 1 01:00		Minimum Daily Average: 0.0 ppb on Jan 28														Hours of Missing Data:		39									
Maximum Diurnal Average: 0.4 ppb at hour 14		Minimum Diurnal Average: 0.0 ppb at hour 5														Hours of Calibration:		36									
Monthly Average: 0.14 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.2 P ₉₀ = 0.4 P ₉₉ = 1.4														Percent Operational Time:		99.6									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	M	M	0.9	0.2	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	--	0.9	
2-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.3	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.4
3-Jan	0.1	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.8	0.9	1.1	M	0.8	0.6	0.3	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.1	
4-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
5-Jan	0.0	0.0	0.0	Z	0.1	0.0	2.1	1.6	0.2	0.7	0.5	0.2	0.2	0.4	0.7	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1	
6-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	
7-Jan	0.1	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.1	0.3	0.5	0.3	0.3	0.3	0.3	0.1	0.2	0.2	1.4	0.5	0.2	1.9	0.1	0.3	1.9	
8-Jan	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	0.8	0.7	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
9-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.6	0.5	0.6	0.3	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.7	
10-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
11-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4	
12-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
13-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	
15-Jan	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.8	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	
16-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
17-Jan	0.1	0.1	0.1	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	
18-Jan	0.1	0.0	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.6	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	
19-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.5	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	
21-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.6	
22-Jan	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3	
24-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.4	
25-Jan	0.2	0.1	0.1	0.1	0.1	Z	0.0	0.0	0.0	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
26-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.9	1.9	1.4	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3	1.9	
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.0	0.9	0.9	0.9	1.2	0.6	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	1.2	
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.0	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	
29-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.4	
30-Jan	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	
31-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.6	1.1	1.8	1.4	1.1	0.9	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.8	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan		C - Calibration				M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Surmont 2 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Surmont 2 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	13	7	8	8	72	115	55	39	23	26	64	70	67	43	53	699
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	13	7	8	8	72	115	55	39	23	26	64	70	67	43	53	699

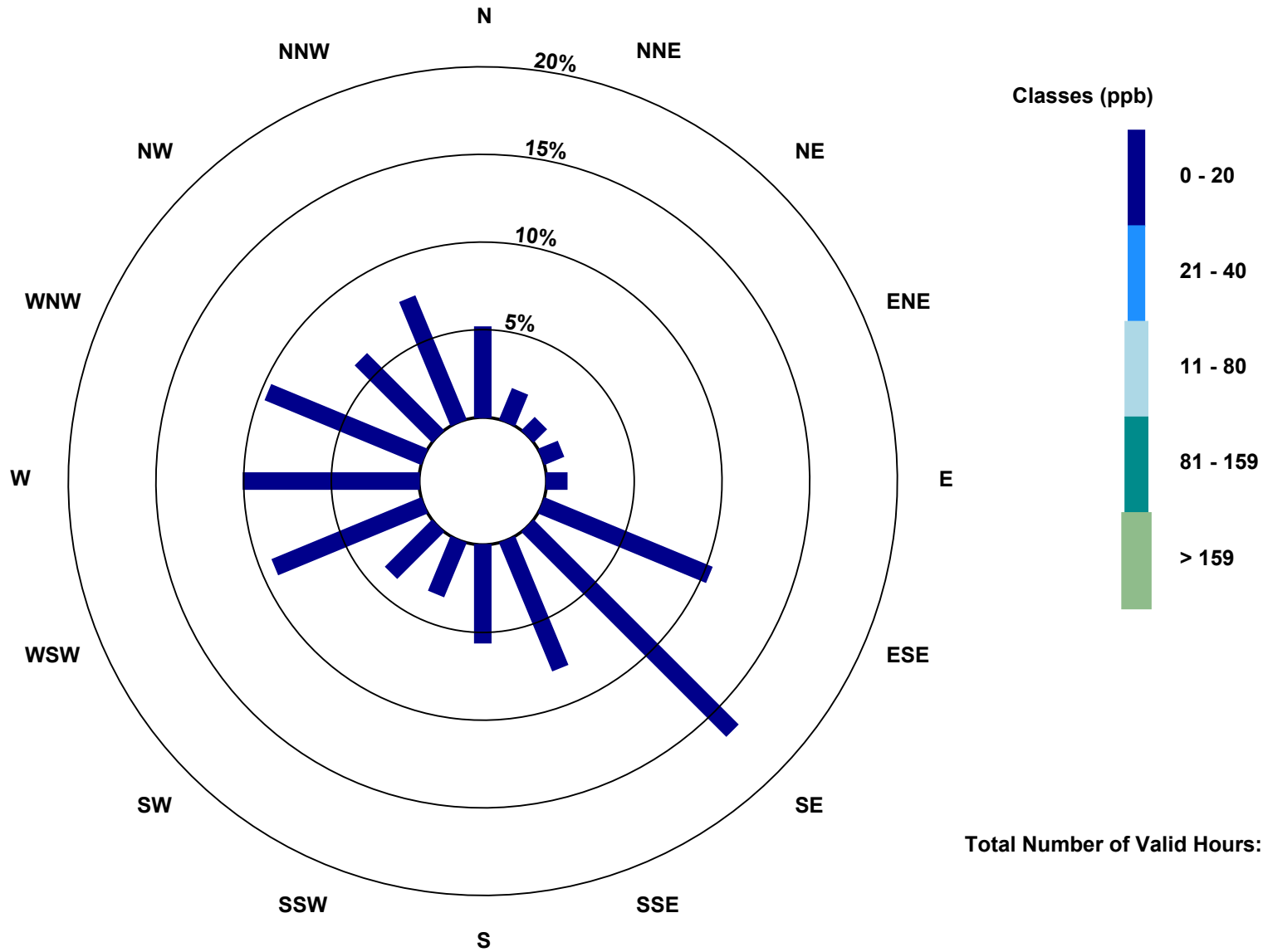
Total Number of Valid Hours: 699

Total Number of Hours: 744

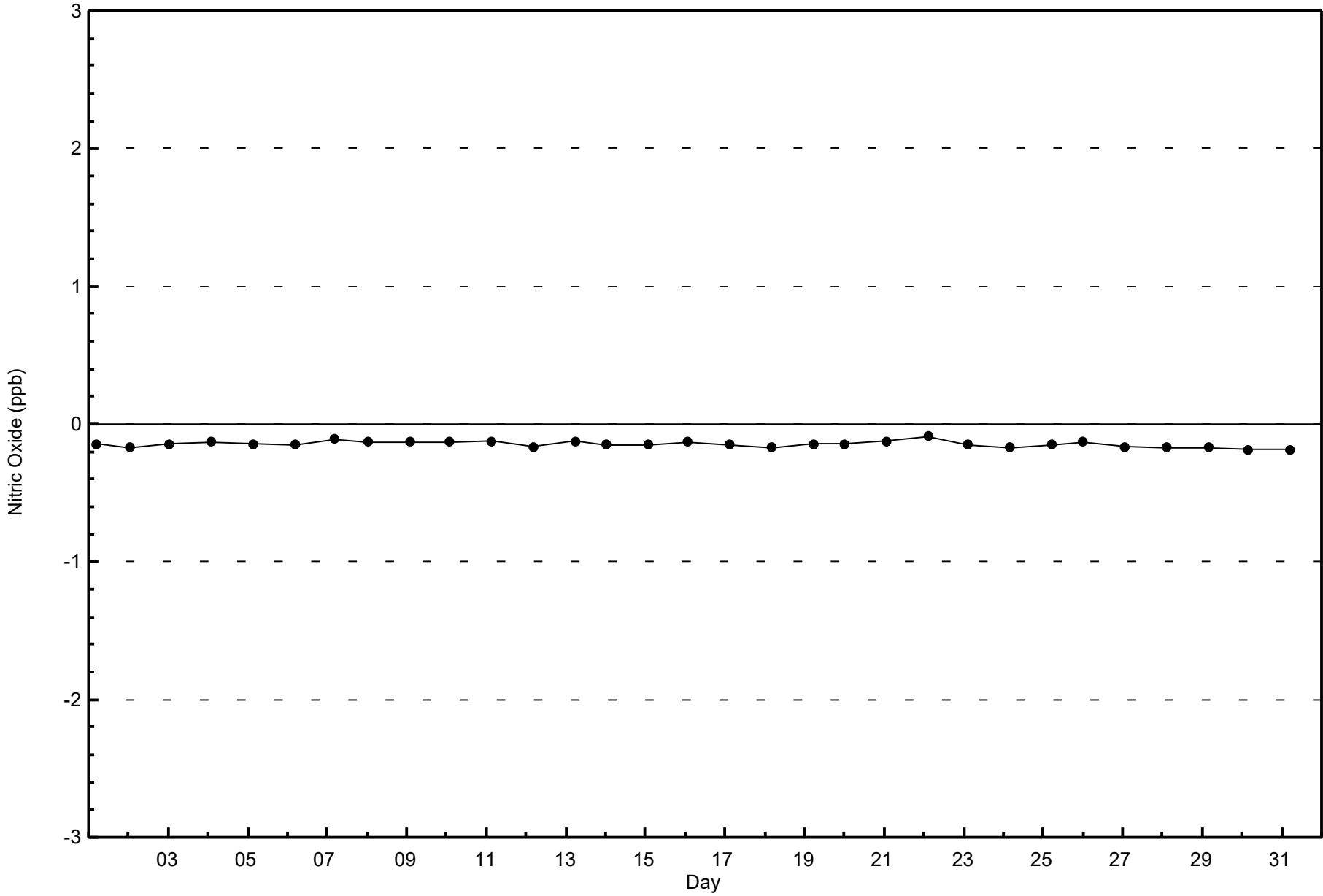


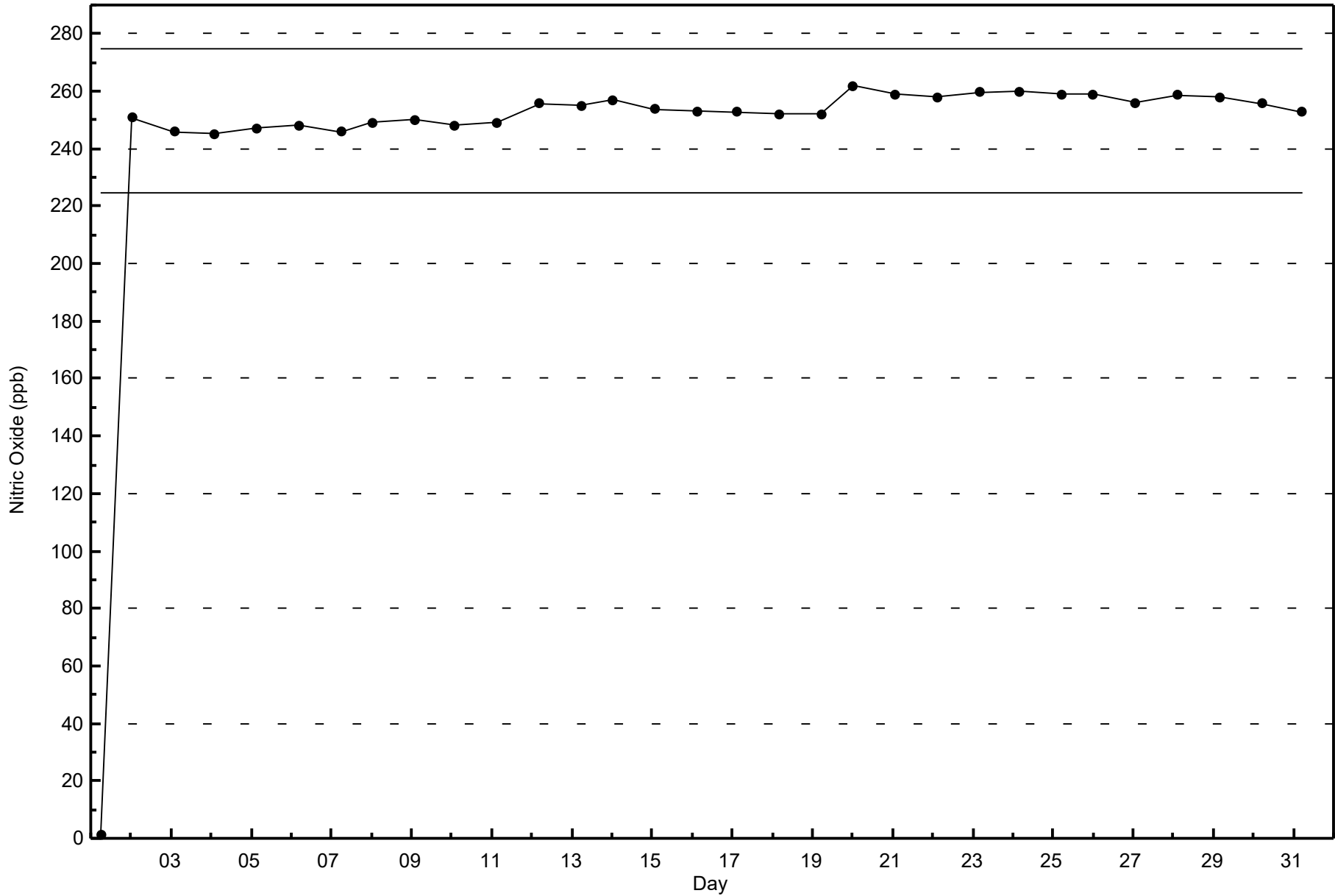
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Surmont 2



Total Number of Valid Hours: 699







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

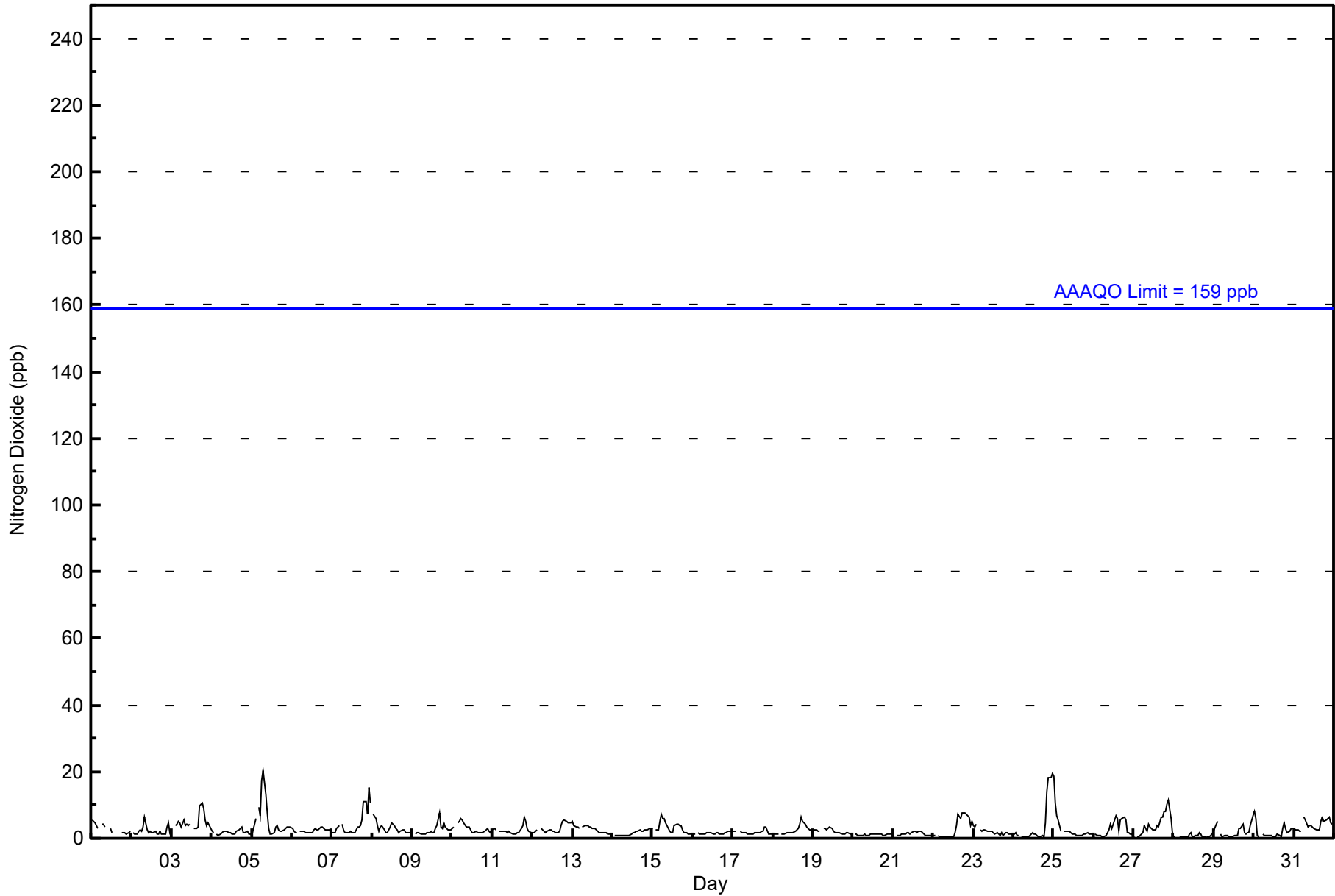
Surmont 2 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744							
Maximum Value: 20.3 ppb on Jan 5 08:00		Maximum Daily Average: 5.2 ppb on Jan 5														Hours of Data:		705									
Minimum Value: 0.3 ppb on Jan 22 09:00		Minimum Daily Average: 0.7 ppb on Jan 28														Hours of Missing Data:		39									
Maximum Diurnal Average: 3.5 ppb at hour 20		Minimum Diurnal Average: 1.8 ppb at hour 13														Hours of Calibration:		36									
Monthly Average: 2.67 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.8 Q ₁ = 1.3 Median = 2.0 Q ₃ = 3.2 P ₉₀ = 5.0 P ₉₉ = 14.1														Percent Operational Time:		99.6									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	5.6	4.9	4.5	3.8	2.8	Z	4.3	4.2	3.4	M	M	2.8	1.7	C	C	C	C	C	1.8	1.6	1.5	1.4	1.9	2.1	--	5.6	
2-Jan	Z	1.6	1.4	1.4	2.0	2.5	2.0	3.6	6.4	2.7	1.8	2.0	1.8	1.9	2.0	1.3	1.1	2.0	1.3	1.1	1.4	3.2	4.6	1.9	2.2	6.4	
3-Jan	2.4	Z	3.7	4.2	5.0	4.5	3.6	5.3	3.7	4.3	4.0	4.1	M	2.8	2.8	3.1	3.5	9.6	10.8	8.7	5.4	4.0	4.7	3.0	4.7	10.8	
4-Jan	2.1	1.5	Z	1.2	1.0	1.3	1.6	2.2	2.2	2.2	1.7	1.5	1.4	1.2	1.3	2.2	2.7	3.1	3.2	1.5	1.5	2.2	1.4	1.2	1.8	3.2	
5-Jan	1.0	2.5	5.8	Z	9.4	6.8	17.5	20.3	13.1	7.6	2.9	1.3	1.1	1.6	3.4	4.0	2.7	2.2	2.3	2.4	2.9	3.3	3.3	3.3	5.2	20.3	
6-Jan	3.0	2.3	1.5	1.5	Z	2.2	2.2	2.0	1.9	1.7	1.8	1.9	1.9	2.5	3.1	2.4	2.6	3.3	3.2	2.8	2.5	2.6	2.5	1.8	2.3	3.3	
7-Jan	1.6	1.9	1.6	2.9	4.0	Z	4.1	2.4	1.7	1.5	1.7	2.1	1.6	1.5	1.8	3.4	3.5	3.7	5.5	11.1	11.0	7.3	15.3	10.6	4.4	15.3	
8-Jan	Z	7.2	5.9	3.9	2.3	3.6	3.9	2.7	1.8	1.8	2.4	3.5	4.7	3.8	2.8	2.5	1.9	2.2	2.4	2.4	1.9	1.7	1.7	1.9	3.0	7.2	
9-Jan	2.2	Z	1.4	1.5	1.6	1.4	1.1	1.2	1.3	1.6	1.6	2.3	1.8	1.8	2.9	3.7	7.5	3.2	3.1	4.8	3.2	2.6	2.4	2.7	2.5	7.5	
10-Jan	2.9	3.2	Z	4.5	5.2	5.9	5.4	4.7	3.5	3.2	3.4	2.5	1.7	1.6	2.1	1.8	1.7	1.7	1.5	2.1	2.6	3.1	2.0	1.8	3.0	5.9	
11-Jan	2.4	3.1	2.6	Z	2.1	2.2	2.2	2.2	2.1	1.8	2.0	1.7	1.2	1.1	1.1	1.5	1.9	3.1	3.9	6.3	4.9	3.0	2.0	1.6	2.4	6.3	
12-Jan	1.6	1.9	2.1	2.7	Z	3.1	2.4	2.1	1.8	2.1	2.4	2.4	2.3	2.2	1.8	1.8	2.2	3.8	4.9	5.3	5.0	4.5	4.8	4.5	2.9	5.3	
13-Jan	4.9	4.0	3.4	3.6	2.9	Z	3.2	3.8	3.9	3.9	3.6	3.3	3.1	2.9	2.7	2.3	1.8	1.9	1.9	1.8	1.7	1.3	1.3	1.1	2.8	4.9	
14-Jan	Z	0.9	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	1.2	1.6	1.8	2.2	2.2	2.2	2.4	2.2	2.3	2.5	2.6	2.7	3.0	3.0	1.6	3.0	
15-Jan	2.8	Z	2.4	2.6	4.9	7.2	6.1	5.8	4.5	2.9	2.2	1.9	1.8	3.7	4.4	4.4	3.9	3.7	2.4	1.9	1.6	1.4	1.3	1.3	3.3	7.2	
16-Jan	1.2	1.2	Z	1.7	1.1	1.2	1.2	1.1	1.7	1.5	1.6	1.6	1.3	1.4	1.5	1.5	1.3	1.1	1.1	1.5	1.8	2.0	2.0	2.0	1.5	2.0	
17-Jan	2.0	2.0	2.0	Z	2.2	1.9	1.8	1.7	1.5	1.4	1.3	1.3	1.4	1.5	1.6	1.6	1.8	2.1	2.3	3.6	3.4	1.3	1.1	1.1	1.8	3.6	
18-Jan	1.1	1.3	1.2	1.2	Z	1.3	1.2	1.4	1.5	1.5	1.7	1.8	1.9	2.2	2.4	2.8	4.1	6.2	5.2	4.1	3.3	2.8	2.7	2.6	2.4	6.2	
19-Jan	2.5	2.5	2.4	2.3	2.1	Z	2.8	2.9	2.7	3.1	3.4	2.9	2.3	1.9	1.7	1.6	1.9	1.4	1.4	1.4	1.5	1.5	1.3	1.3	2.1	3.4	
20-Jan	Z	1.3	1.1	1.0	0.9	0.9	1.0	1.1	1.0	0.9	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.3	1.0	1.0	1.1	1.3	1.1	1.1	1.1	1.3	
21-Jan	1.1	Z	0.9	1.0	1.0	1.1	1.1	1.4	1.8	1.7	1.4	1.9	2.1	2.1	1.7	2.2	2.2	2.0	1.4	0.9	0.9	0.8	0.9	0.9	1.4	2.2	
22-Jan	1.0	1.0	Z	0.7	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.6	1.6	3.7	7.2	6.0	7.7	7.7	7.7	7.3	6.4	4.0	5.0	3.1	7.7	
23-Jan	4.0	3.5	4.1	Z	2.7	2.3	2.7	2.7	2.3	2.3	2.1	2.1	1.8	1.4	1.6	1.3	1.0	1.6	0.8	1.9	1.6	1.2	1.3	1.1	2.1	4.1	
24-Jan	1.0	1.8	0.9	0.7	Z	0.5	0.5	0.5	0.6	0.6	1.0	1.6	1.3	1.1	0.8	0.6	0.6	1.0	0.5	4.8	14.1	18.4	18.4	19.3	3.9	19.3	
25-Jan	18.7	10.7	6.6	5.5	2.0	Z	2.0	2.2	2.1	2.3	1.6	1.4	1.1	1.1	0.8	0.8	0.7	0.9	1.2	1.4	1.5	1.3	1.2	1.4	3.0	18.7	
26-Jan	Z	1.2	1.0	0.7	0.7	0.6	0.5	0.7	1.9	2.7	4.1	2.8	4.4	6.9	5.9	2.2	5.3	6.0	6.5	5.6	1.7	1.8	1.3	1.1	2.9	6.9	
27-Jan	0.3	Z	0.4	0.5	0.7	1.9	4.0	3.1	2.0	4.1	3.3	2.4	2.4	2.4	3.9	3.6	6.3	6.3	8.1	8.0	10.3	11.4	5.8	1.4	4.0	11.4	
28-Jan	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.3	1.1	1.7	0.5	0.4	0.8	0.7	1.5	1.1	0.6	0.6	0.5	0.5	0.6	0.7	1.3	0.7	1.7	
29-Jan	2.2	4.2	5.0	Z	1.2	0.5	0.8	0.9	0.8	0.6	0.4	0.4	0.7	0.7	0.8	2.8	2.8	4.1	1.5	1.4	1.8	1.7	4.0	6.7	2.0	6.7	
30-Jan	8.2	6.1	0.9	0.4	Z	1.1	0.8	0.8	0.7	1.0	0.9	0.6	0.5	0.5	1.1	0.7	0.5	3.0	4.5	3.1	1.7	2.0	3.0	3.1	2.0	8.2	
31-Jan	2.8	2.4	2.4	2.2	2.0	Z	6.4	5.7	3.4	3.9	3.9	3.4	3.0	2.6	2.5	2.7	5.0	6.4	4.9	5.3	5.8	6.3	4.8	4.2	4.0	6.4	
																								Diurnal Average		3.1	
																								Diurnal Maximum		19.3	
Z - zerospan C - Calibration M - Maintenance																											
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	705	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	13	7	8	8	72	115	55	39	23	26	64	70	67	43	53	699
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	13	7	8	8	72	115	55	39	23	26	64	70	67	43	53	699

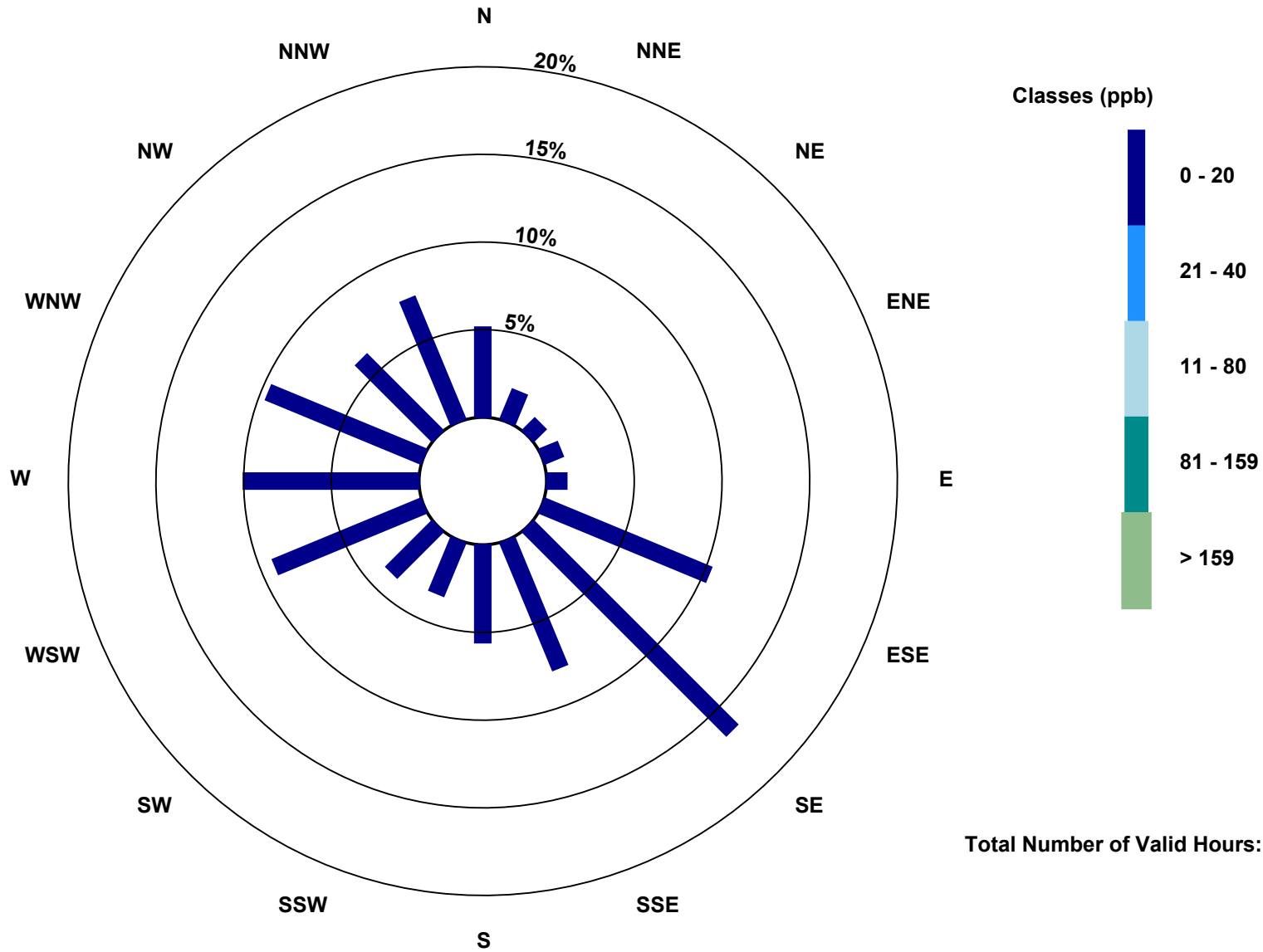
Total Number of Valid Hours: 699

Total Number of Hours: 744

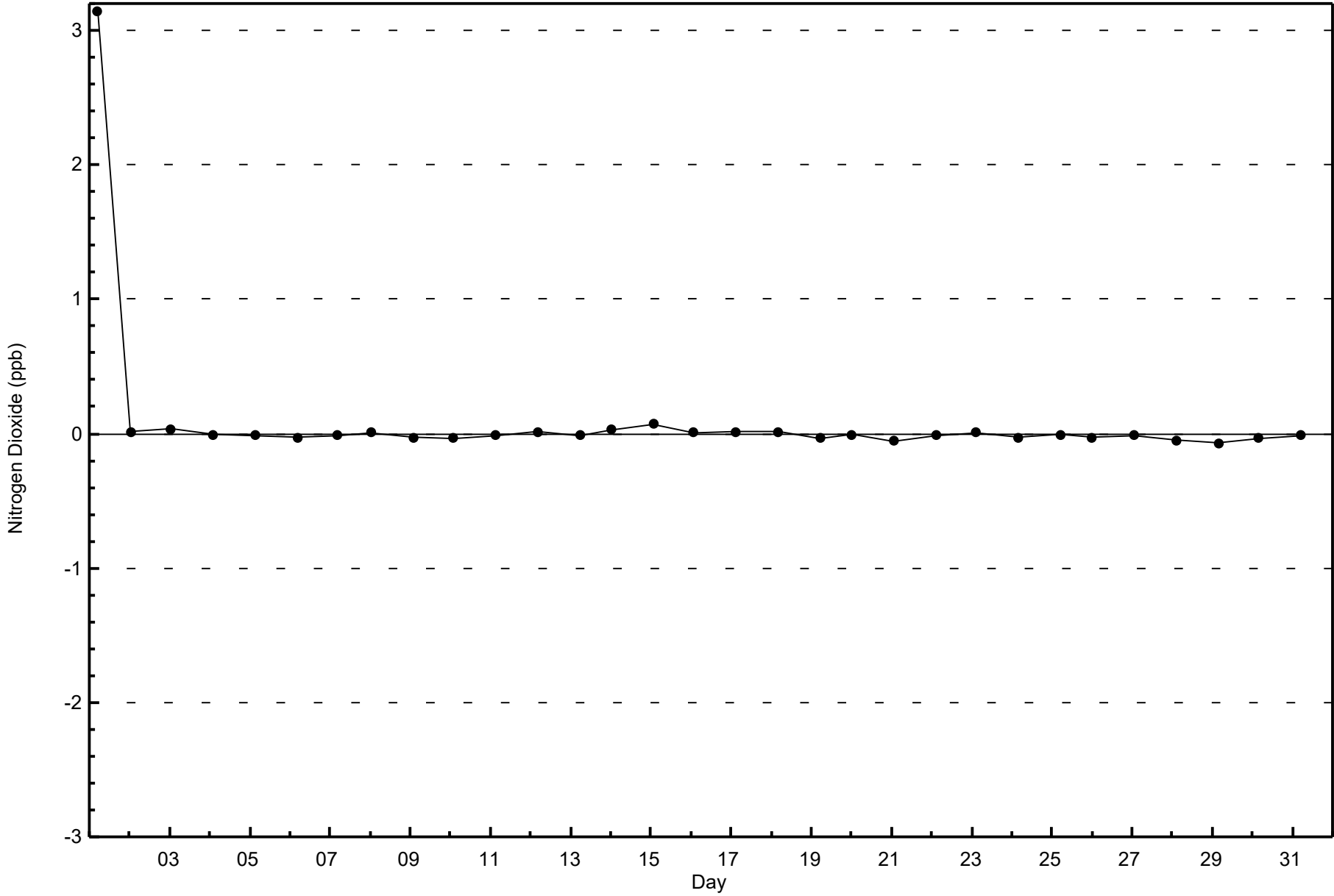


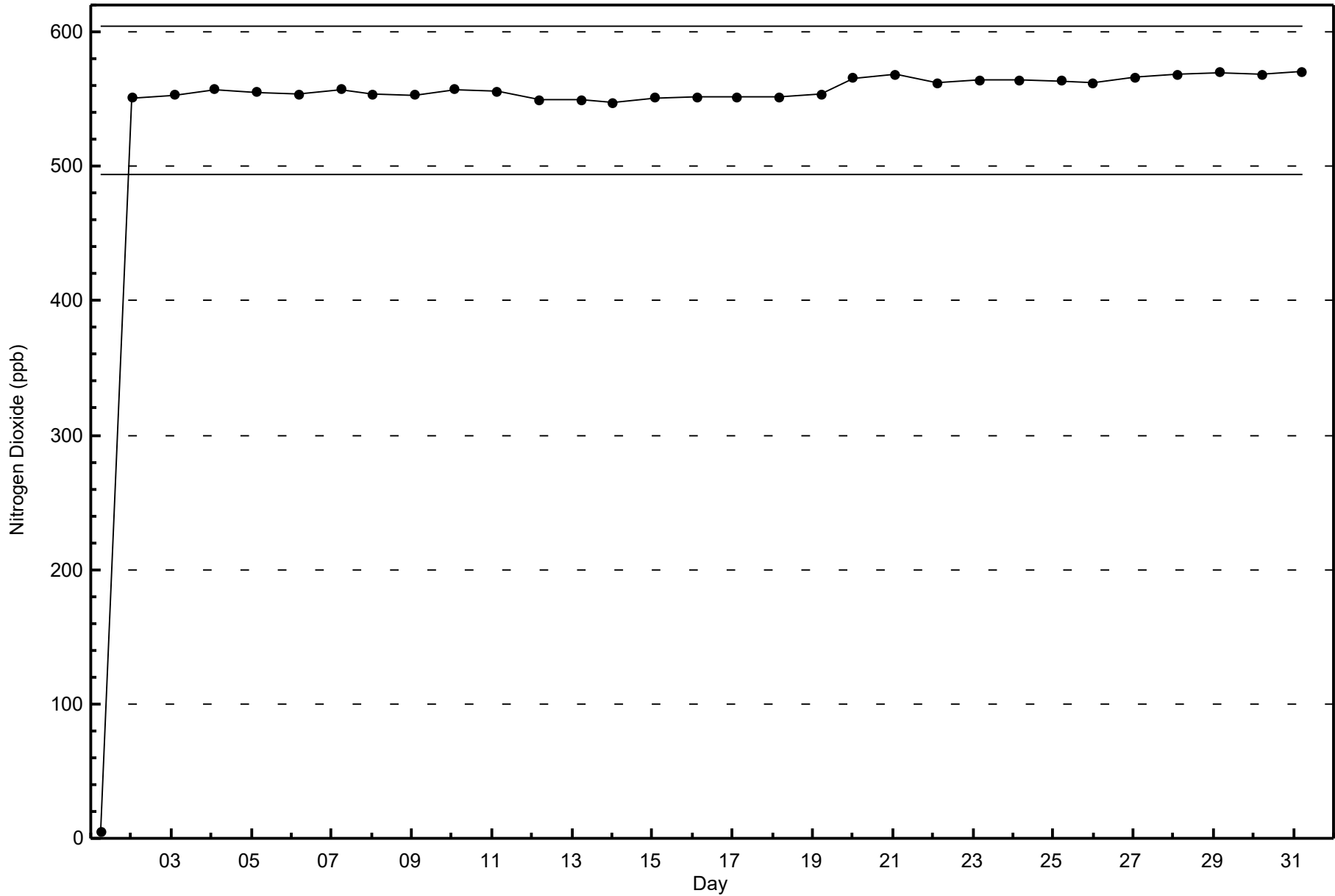
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Surmont 2



Total Number of Valid Hours: 699







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

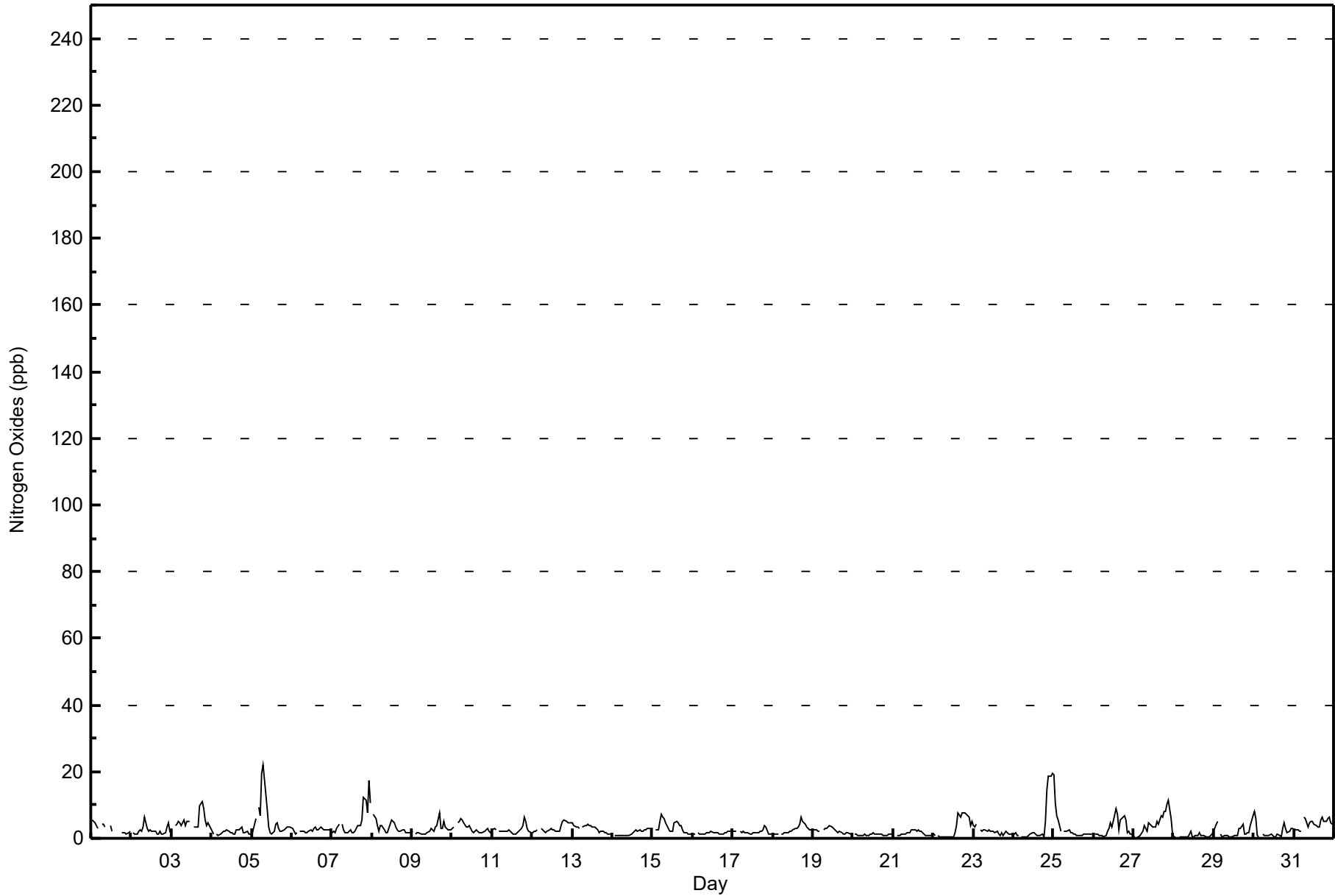
Surmont 2 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 21.9 ppb on Jan 5 08:00				Maximum Daily Average: 5.6 ppb on Jan 5		Hours of Data: 705														705						
Minimum Value: 0.3 ppb on Jan 28 06:00				Minimum Daily Average: 0.7 ppb on Jan 28		Hours of Missing Data: 39														39						
Maximum Diurnal Average: 3.6 ppb at hour 20				Minimum Diurnal Average: 2.0 ppb at hour 4		Hours of Calibration: 36														36						
Monthly Average: 2.81 ppb				Percentiles: P ₁ = 0.3 P ₁₀ = 0.8 Q ₁ = 1.4 Median = 2.1 Q ₃ = 3.4 P ₉₀ = 5.3 P ₉₉ = 14.2		Percent Operational Time: 99.6														99.6						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	5.6	4.9	4.5	3.8	2.8	Z	4.3	4.2	3.4	M	M	3.7	1.9	C	C	C	C	C	1.8	1.6	1.5	1.4	1.9	2.1	--	5.6
2-Jan	Z	1.6	1.4	1.4	2.0	2.5	2.0	3.6	6.4	2.8	2.1	2.3	2.2	2.3	2.3	1.4	1.1	2.1	1.3	1.1	1.5	3.3	4.7	2.0	2.3	6.4
3-Jan	2.5	Z	3.8	4.3	5.1	4.5	3.6	5.4	3.8	5.1	4.9	5.2	M	3.6	3.4	3.4	3.6	9.8	10.9	8.8	5.4	4.0	4.7	3.0	4.9	10.9
4-Jan	2.1	1.5	Z	1.2	1.0	1.3	1.6	2.2	2.2	2.3	2.0	1.8	1.6	1.4	1.5	2.4	2.7	3.1	3.2	1.5	1.5	2.2	1.4	1.2	1.9	3.2
5-Jan	1.0	2.5	5.8	Z	9.5	6.8	19.6	21.9	13.3	8.3	3.4	1.5	1.3	2.0	4.1	4.6	2.8	2.2	2.3	2.4	2.9	3.3	3.3	3.3	5.6	21.9
6-Jan	3.0	2.3	1.5	1.5	Z	2.2	2.2	2.0	1.9	1.8	2.1	2.3	2.3	2.9	3.5	2.5	2.6	3.3	3.2	2.8	2.5	2.6	2.5	1.9	2.4	3.5
7-Jan	1.7	1.9	1.6	2.9	4.1	Z	4.1	2.4	1.7	1.6	2.0	2.6	1.9	1.8	2.1	3.7	3.6	3.9	5.7	12.5	11.5	7.5	17.2	10.7	4.7	17.2
8-Jan	Z	7.3	6.0	3.9	2.3	3.6	3.9	2.7	1.8	1.9	2.8	4.2	5.5	4.5	3.3	2.7	2.0	2.2	2.4	2.4	1.9	1.7	1.7	1.9	3.2	7.3
9-Jan	2.2	Z	1.4	1.5	1.6	1.4	1.1	1.2	1.3	1.8	2.1	3.0	2.4	2.3	3.5	4.0	7.7	3.2	3.1	4.9	3.2	2.6	2.4	2.7	2.6	7.7
10-Jan	2.9	3.2	Z	4.5	5.2	5.9	5.4	4.7	3.5	3.3	3.8	2.9	2.0	1.9	2.4	1.9	1.7	1.7	1.5	2.1	2.6	3.1	2.0	1.8	3.0	5.9
11-Jan	2.4	3.1	2.6	Z	2.1	2.2	2.2	2.2	2.1	2.0	2.4	2.0	1.4	1.3	1.3	1.6	2.0	3.1	3.9	6.3	5.0	3.0	2.0	1.6	2.5	6.3
12-Jan	1.6	1.9	2.1	2.7	Z	3.1	2.4	2.1	1.8	2.2	2.7	2.8	2.7	2.6	2.1	1.9	2.2	3.8	4.9	5.3	5.0	4.5	4.8	4.5	3.0	5.3
13-Jan	4.9	4.0	3.4	3.6	2.9	Z	3.3	3.8	3.9	4.1	3.9	3.7	3.4	3.2	2.9	2.4	1.8	1.9	1.9	1.8	1.7	1.3	1.3	1.1	2.9	4.9
14-Jan	Z	0.9	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.9	1.4	1.8	2.0	2.5	2.3	2.5	2.2	2.3	2.5	2.6	2.8	3.0	3.0	1.7	3.0
15-Jan	2.9	Z	2.5	2.6	5.0	7.3	6.2	5.9	4.6	3.1	2.3	2.0	2.0	4.5	5.2	4.8	4.0	3.7	2.4	1.9	1.6	1.4	1.3	1.3	3.4	7.3
16-Jan	1.2	1.2	Z	1.7	1.1	1.2	1.2	1.1	1.7	1.6	1.8	1.9	1.6	1.6	1.7	1.6	1.4	1.2	1.2	1.6	1.9	2.1	2.1	2.1	1.6	2.1
17-Jan	2.1	2.1	2.1	Z	2.3	1.9	1.9	1.7	1.6	1.5	1.5	1.5	1.6	1.8	1.9	1.8	1.9	2.2	2.4	3.7	3.5	1.4	1.2	1.2	1.9	3.7
18-Jan	1.2	1.3	1.3	1.3	Z	1.4	1.3	1.5	1.6	1.7	2.1	2.3	2.5	2.9	3.0	3.2	4.2	6.3	5.2	4.1	3.3	2.8	2.7	2.6	2.6	6.3
19-Jan	2.5	2.5	2.4	2.3	2.1	Z	2.8	2.9	2.8	3.5	4.0	3.5	2.9	2.4	2.0	1.8	2.0	1.5	1.4	1.4	1.5	1.5	1.3	1.3	2.3	4.0
20-Jan	Z	1.3	1.1	1.0	0.9	0.9	1.0	1.2	1.0	1.0	1.3	1.3	1.5	1.4	1.4	1.2	1.1	1.4	1.0	1.0	1.1	1.4	1.1	1.1	1.2	1.5
21-Jan	1.1	Z	0.9	1.0	1.0	1.1	1.1	1.4	1.8	1.9	1.8	2.5	2.6	2.6	2.0	2.4	2.3	2.1	1.5	1.0	1.0	0.9	0.9	0.9	1.6	2.6
22-Jan	1.1	1.0	Z	0.7	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.3	0.6	1.7	4.0	7.6	6.2	7.8	7.8	7.8	7.4	6.4	4.0	5.0	3.1	7.8
23-Jan	4.0	3.5	4.1	Z	2.7	2.3	2.7	2.7	2.3	2.4	2.3	2.3	2.1	1.7	1.9	1.4	1.0	1.7	0.9	1.9	1.6	1.2	1.3	1.1	2.1	4.1
24-Jan	1.0	1.8	0.9	0.7	Z	0.5	0.5	0.5	0.6	0.7	1.2	1.9	1.7	1.3	0.9	0.7	0.7	1.2	0.6	4.9	14.2	18.6	18.6	19.4	4.1	19.4
25-Jan	18.9	10.8	6.7	5.6	2.1	Z	2.0	2.2	2.1	2.5	1.8	1.7	1.3	1.3	0.9	0.8	0.7	0.9	1.2	1.4	1.5	1.3	1.2	1.4	3.1	18.9
26-Jan	Z	1.3	1.1	0.8	0.8	0.7	0.6	0.8	2.0	2.9	4.5	3.3	5.3	8.8	7.3	2.4	5.5	6.1	6.6	5.6	1.7	1.9	1.3	1.1	3.1	8.8
27-Jan	0.3	Z	0.4	0.5	0.7	1.9	4.0	3.1	2.1	4.6	4.3	3.3	3.3	3.3	5.1	4.2	6.7	6.3	8.2	8.1	10.3	11.4	5.8	1.4	4.3	11.4
28-Jan	0.4	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.3	1.2	2.0	0.6	0.4	1.0	0.8	1.7	1.1	0.7	0.6	0.5	0.5	0.6	0.7	1.3	0.7	2.0
29-Jan	2.2	4.2	5.0	Z	1.2	0.5	0.8	0.9	0.8	0.6	0.5	0.5	0.8	0.8	1.0	3.2	3.0	4.2	1.5	1.4	1.8	1.8	4.0	6.7	2.1	6.7
30-Jan	8.2	6.1	0.9	0.4	Z	1.2	0.8	0.8	0.8	1.1	1.2	0.8	0.6	0.6	1.3	0.8	0.5	3.1	4.5	3.1	1.7	2.0	3.0	3.1	2.0	8.2
31-Jan	2.8	2.4	2.4	2.2	2.0	Z	6.5	5.9	3.5	4.5	5.0	5.2	4.4	3.7	3.4	3.2	5.3	6.4	4.9	5.3	5.8	6.3	4.8	4.2	4.4	6.5
																								Diurnal Average		
3.1 2.9 2.6 2.0 2.4 2.2 2.9 3.0 2.5 2.4 2.4 2.4 2.2 2.4 2.6 2.6 2.8 3.3 3.2 3.6 3.5 3.4 3.5 3.1																								Diurnal Maximum		
18.9 10.8 6.7 5.6 9.5 7.3 19.6 21.9 13.3 8.3 5.0 5.2 5.5 8.8 7.3 7.6 7.7 9.8 10.9 12.5 14.2 18.6 18.6 19.4																										
Z - zerospan		C - Calibration				M - Maintenance																				



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.86	99.86
21 - 40	1	0.14	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	36	13	7	8	8	72	115	55	39	23	26	63	70	67	43	53	698
21 - 40	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	36	13	7	8	8	72	115	55	39	23	26	64	70	67	43	53	699

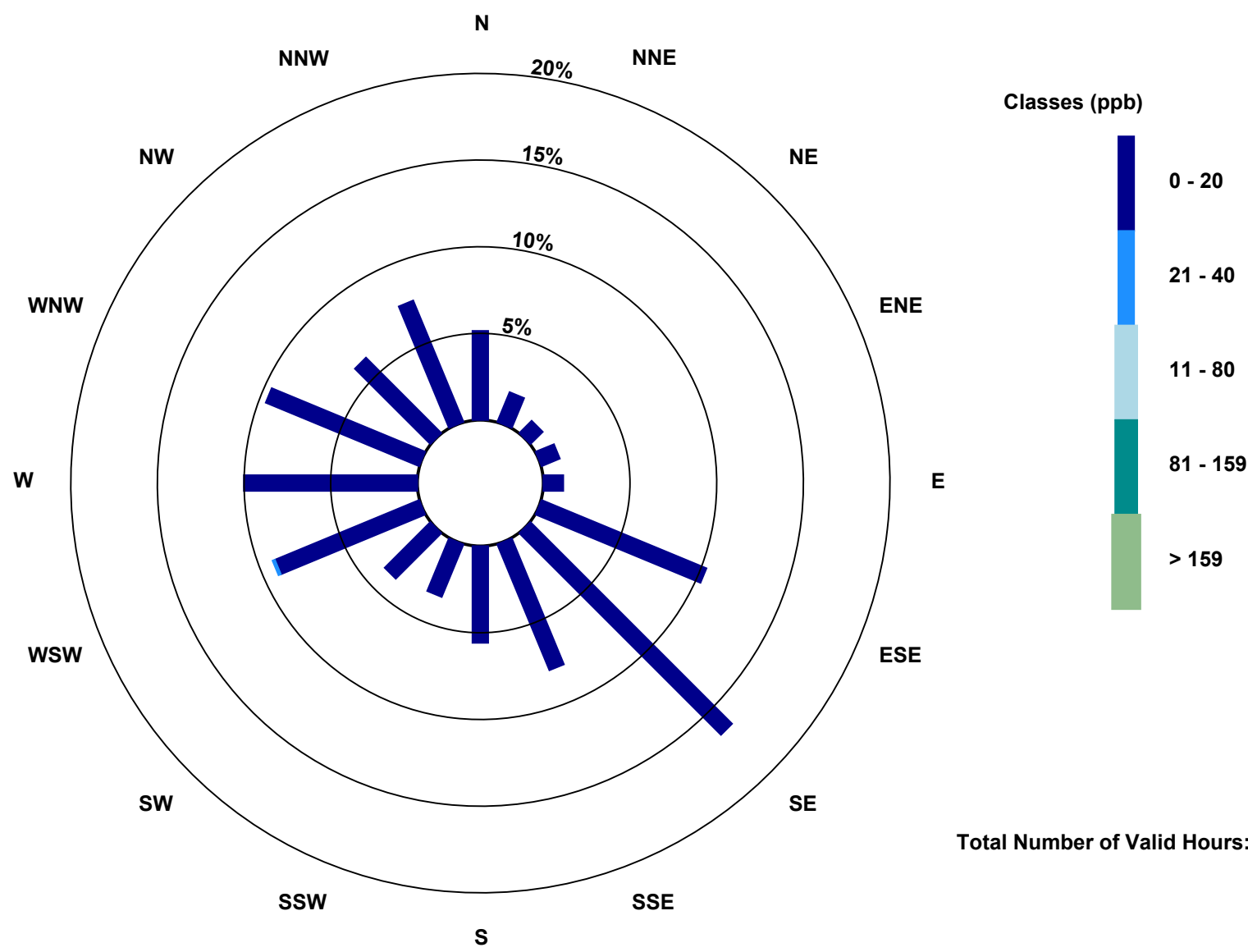
Total Number of Valid Hours: 699

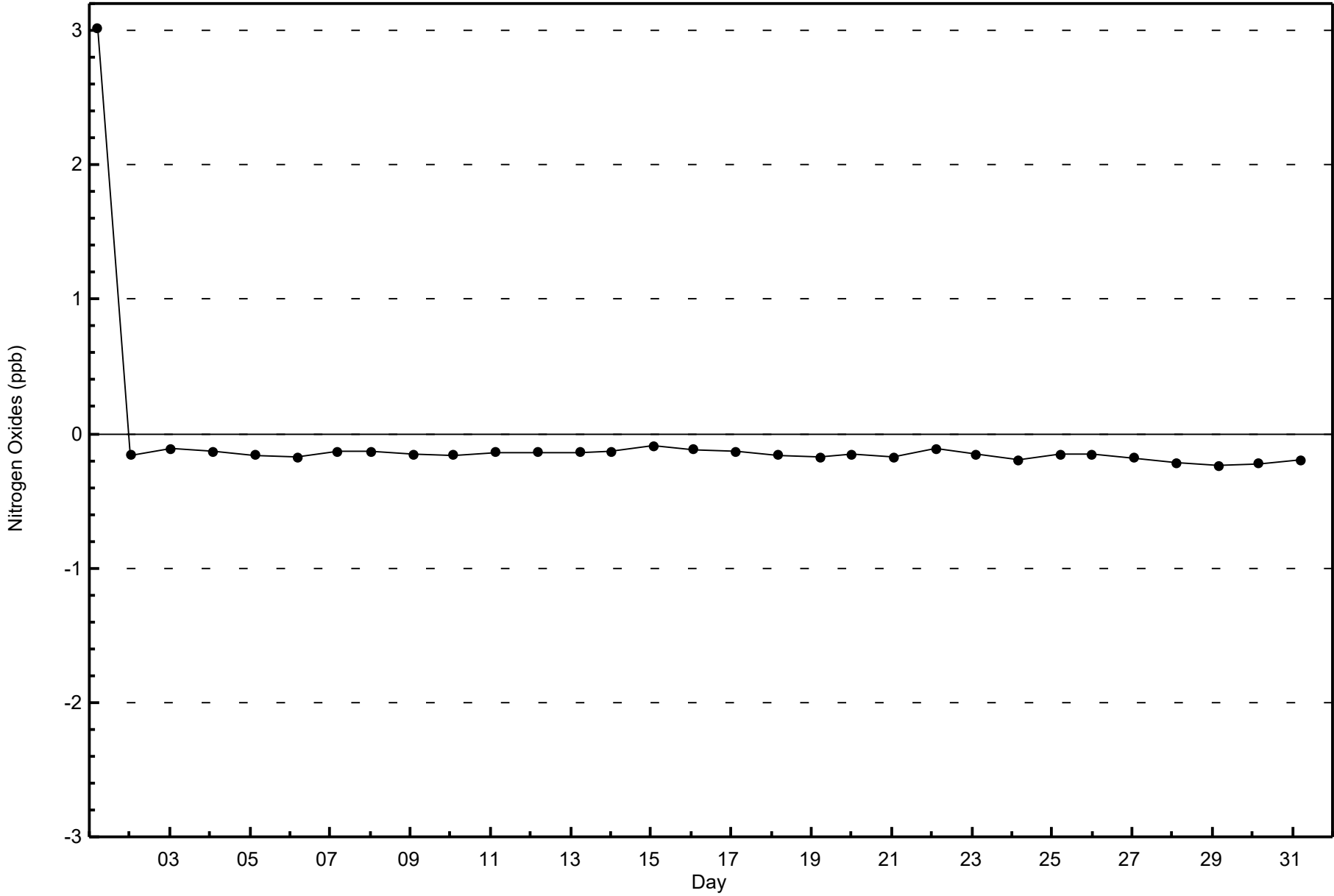
Total Number of Hours: 744

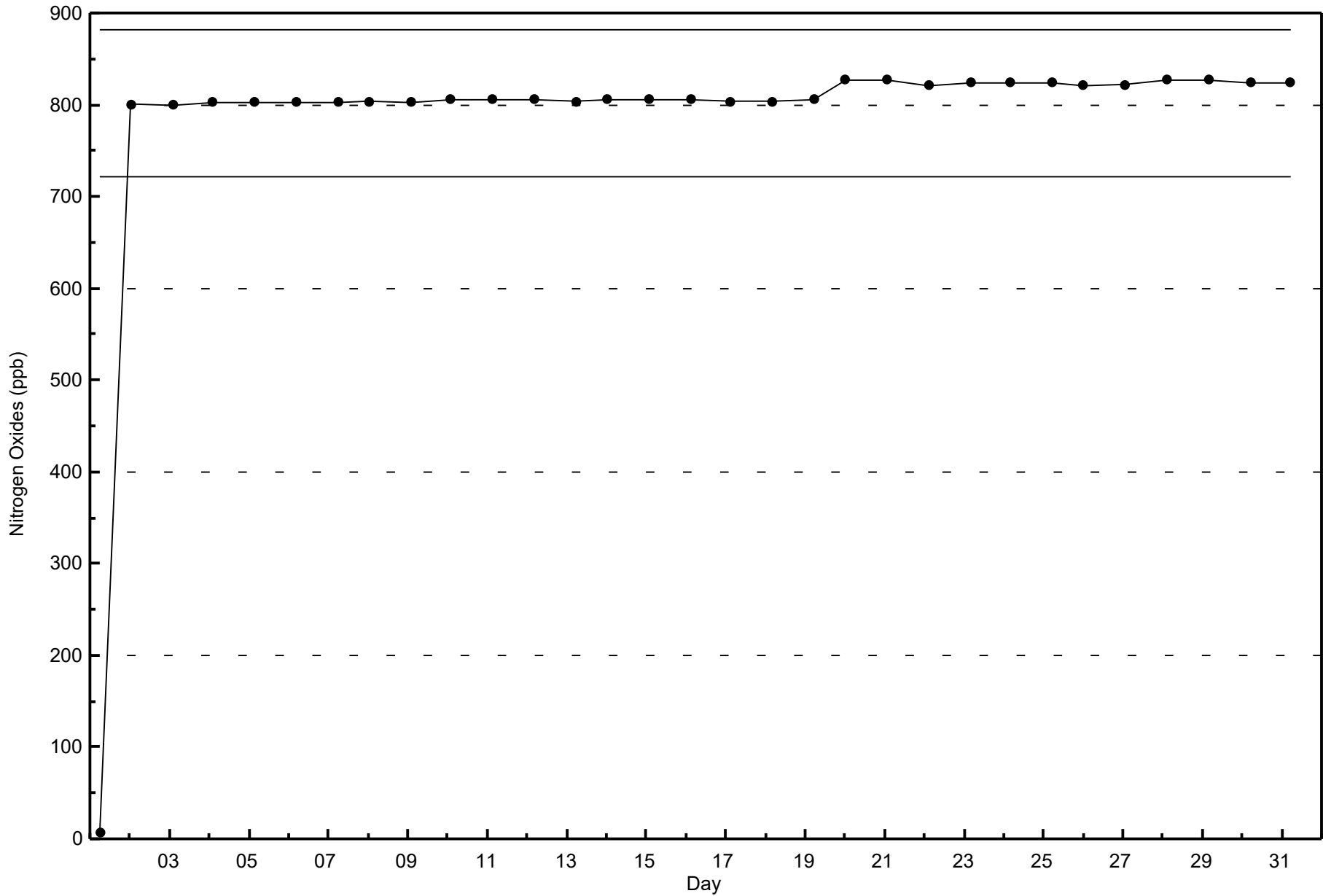


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Surmont 2

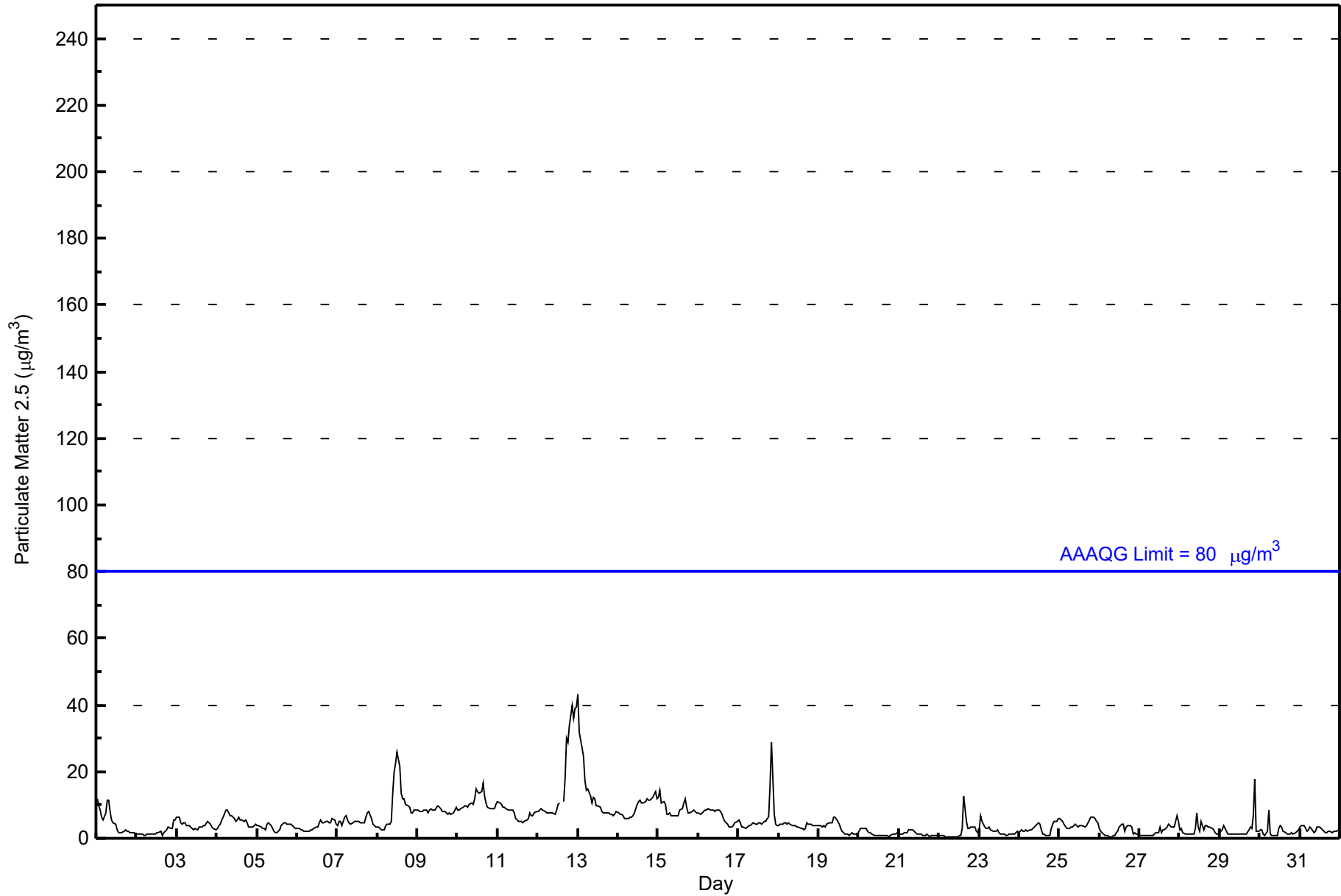








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744															744																												
Maximum Value: 43.3 µg/m ³ on Jan 13 01:00				Maximum Daily Average: 17.1 µg/m ³ on Jan 12		Hours of Data: 743															743																												
Minimum Value: 0.4 µg/m ³ on Jan 22 12:00				Minimum Daily Average: 1.4 µg/m ³ on Jan 21		Hours of Missing Data: 1															1																												
Maximum Diurnal Average: 6.3 µg/m ³ at hour 21				Minimum Diurnal Average: 4.4 µg/m ³ at hour 9		Hours of Calibration: 1															1																												
Monthly Average: 5.21 µg/m ³				Percentiles: P ₁ = 0.5 P ₁₀ = 1.1 Q ₁ = 2.1 Median = 3.8 Q ₃ = 7.3 P ₉₀ = 9.8 P ₉₉ = 29.7		Percent Operational Time: 100.0															100.0																												
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	11.8	9.6	8.3	6.4	5.6	7.6	11.5	11.6	8.1	5.6	4.9	4.4	2.6	1.8	1.8	1.7	2.3	2.6	2.3	2.1	1.8	1.7	1.6	1.4	5.0	11.8																							
2-Jan	1.3	1.4	1.3	1.2	1.0	0.9	1.1	1.3	1.1	1.1	1.2	1.1	1.6	1.8	2.1	1.0	1.8	2.0	2.3	3.2	2.9	3.2	5.3	5.3	1.9	5.3																							
3-Jan	6.4	6.2	4.7	4.2	4.6	4.6	4.0	3.9	3.2	2.8	2.7	3.0	2.6	3.6	3.2	3.5	3.8	3.8	5.0	4.5	4.2	3.4	3.1	2.7	3.9	6.4																							
4-Jan	3.0	3.8	4.1	5.5	6.4	8.5	8.6	7.8	6.9	6.7	6.0	5.3	5.3	6.2	5.7	5.4	5.3	5.4	4.5	3.6	3.2	3.3	3.7	4.2	5.4	8.6																							
5-Jan	4.0	3.6	3.5	3.1	2.8	2.6	4.0	4.5	3.9	2.9	2.1	1.6	1.8	2.6	4.0	4.2	4.8	4.5	4.2	4.1	4.1	3.8	3.3	3.1	3.5	4.8																							
6-Jan	3.0	2.9	2.6	2.4	2.1	1.9	2.0	2.1	2.4	2.7	3.2	3.4	3.5	4.5	5.4	4.8	4.7	5.1	4.9	4.7	4.8	5.8	5.7	4.1	3.7	5.8																							
7-Jan	3.9	5.1	4.9	4.0	6.5	6.7	5.4	4.5	4.2	4.5	4.9	4.9	5.0	4.9	4.7	4.6	4.7	6.4	7.8	8.1	6.1	4.4	3.7	3.3	5.1	8.1																							
8-Jan	3.3	3.2	2.6	2.7	2.5	3.9	4.4	4.4	4.9	13.4	19.9	22.7	25.9	21.7	13.7	12.0	11.9	10.3	9.6	9.1	7.7	7.5	8.4	8.3	9.7	25.9																							
9-Jan	8.5	8.1	8.0	8.2	8.6	8.5	7.8	8.6	8.8	8.4	8.3	9.3	9.9	9.4	8.8	8.1	8.0	7.7	7.2	7.5	7.3	7.6	8.6	9.1	8.3	9.9																							
10-Jan	8.4	8.7	8.9	9.3	9.5	9.6	9.4	10.1	10.4	10.2	12.0	14.8	13.8	13.5	14.0	16.4	12.7	10.6	9.3	9.1	8.8	9.1	8.9	10.3	10.7	16.4																							
11-Jan	11.0	10.4	10.0	9.4	9.1	8.7	8.4	8.6	8.6	8.3	7.8	5.9	5.3	4.9	4.9	4.8	5.1	5.7	6.0	7.7	7.0	6.8	7.5	8.0	7.5	11.0																							
12-Jan	8.0	8.7	8.9	8.5	7.9	7.8	7.6	7.7	7.6	7.6	7.2	8.7	10.3	10.7	C	10.9	18.2	30.2	29.0	34.1	40.0	36.0	38.8	39.6	17.1	40.0																							
13-Jan	43.3	32.0	27.1	24.5	17.4	14.5	14.7	12.8	10.8	12.1	11.7	9.9	9.7	9.4	8.1	7.6	7.6	7.8	7.8	7.4	7.1	6.8	7.3	8.0	13.6	43.3																							
14-Jan	7.7	7.3	7.3	6.6	5.9	5.7	6.0	6.5	6.5	6.8	7.8	10.0	11.1	11.6	10.8	10.6	11.0	11.8	11.4	11.2	11.8	12.2	14.0	11.8	9.3	14.0																							
15-Jan	12.5	14.5	10.5	10.9	10.3	7.0	7.3	7.8	7.0	6.6	6.8	6.7	7.0	8.6	8.9	10.7	11.7	9.2	7.5	7.4	8.0	8.3	7.9	7.7	8.8	14.5																							
16-Jan	7.8	7.4	7.5	7.8	8.3	8.6	9.0	8.6	8.4	8.5	8.1	8.6	8.5	8.2	7.2	5.9	5.1	4.4	3.5	3.3	3.4	3.8	4.6	5.3	6.7	9.0																							
17-Jan	5.4	4.8	3.6	3.4	3.2	3.5	3.8	3.8	4.1	4.5	4.4	4.4	4.5	4.8	4.4	5.0	5.3	5.8	6.2	15.6	28.6	7.3	4.2	3.8	6.0	28.6																							
18-Jan	3.9	4.1	4.2	4.6	4.5	4.4	4.5	4.4	4.0	3.8	3.8	3.4	3.2	3.0	2.9	2.7	3.1	4.7	4.4	4.1	3.9	3.6	3.9	3.6	3.9	4.7																							
19-Jan	3.7	3.6	3.6	3.6	3.6	4.1	4.6	4.7	4.8	6.4	6.4	5.2	4.3	3.0	2.2	1.5	1.4	1.1	1.0	1.4	1.5	1.4	1.1	1.1	3.1	6.4																							
20-Jan	2.1	2.8	2.9	3.1	2.9	2.1	1.7	1.6	1.2	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.8	1.1	1.1	1.3	1.6	1.4	3.1																							
21-Jan	1.4	1.3	1.4	1.6	1.6	1.7	2.5	2.7	2.4	2.1	1.7	1.5	1.3	1.3	1.0	1.0	1.0	1.3	0.6	0.7	0.8	0.7	1.0	1.0	1.4	2.7																							
22-Jan	1.0	0.9	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.8	0.6	3.2	12.8	5.3	2.9	3.2	3.3	3.3	3.5	2.3	1.8	2.1	12.8																							
23-Jan	2.3	6.6	5.0	3.4	2.8	3.0	3.3	2.4	2.1	2.2	2.3	2.4	1.9	1.4	1.2	1.1	1.0	1.0	1.1	1.2	1.2	1.3	1.5	2.0	2.2	6.6																							
24-Jan	1.8	2.5	2.1	2.0	2.5	2.2	2.5	2.7	3.2	3.4	3.8	4.8	4.3	2.6	1.2	1.1	0.9	1.0	0.8	2.9	4.0	4.9	5.2	5.7	2.8	5.7																							
25-Jan	6.0	5.4	4.9	4.4	3.2	3.0	3.1	3.2	3.3	4.1	3.8	3.5	3.8	3.8	3.6	3.5	3.7	4.4	5.5	6.5	6.3	5.8	5.1	4.5	4.4	6.5																							
26-Jan	3.2	2.1	1.3	0.8	0.9	0.7	0.5	0.5	1.0	1.0	1.8	2.3	3.2	4.4	4.3	2.1	3.5	3.9	3.9	3.3	1.4	1.6	1.3	1.2	2.1	4.4																							
27-Jan	0.9	0.9	0.7	0.7	0.7	0.7	0.6	0.9	0.9	1.5	1.5	1.5	3.3	1.7	2.3	2.7	3.6	4.3	4.0	3.4	3.3	3.3	6.6	5.2	2.3	6.6																							
28-Jan	2.5	3.1	1.6	1.2	1.3	1.1	1.2	1.2	1.1	2.8	7.8	3.3	2.2	5.2	2.6	3.9	4.0	3.2	3.3	2.9	2.5	1.8	1.3	1.4	2.6	7.8																							
29-Jan	1.7	2.6	3.8	3.1	2.1	1.3	1.2	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.2	1.3	2.7	3.4	3.1	6.8	18.0	2.1	2.2	2.8	18.0																							
30-Jan	2.7	2.7	1.2	0.8	2.0	8.5	1.5	0.9	0.9	0.9	1.0	3.0	3.9	3.4	2.2	1.7	1.2	1.2	1.4	1.6	1.2	1.5	1.9	2.6	2.1	8.5																							
31-Jan	3.5	3.8	3.9	3.1	2.0	2.6	3.2	3.0	1.6	2.3	3.2	3.3	3.2	2.5	1.9	1.8	1.9	2.1	2.0	1.8	2.0	2.2	1.9	2.6	2.6	3.9																							
																								6.0	5.8	5.2	4.9	4.6	4.7	4.7	4.4	4.7	5.1	5.2	5.4	5.3	4.6	5.0	5.0	5.4	5.3	5.8	6.3	5.9	5.6	5.6	Diurnal Average		
																								43.3	32.0	27.1	24.5	17.4	14.5	14.7	12.8	10.8	13.4	19.9	22.7	25.9	21.7	14.0	16.4	18.2	30.2	29.0	34.1	40.0	36.0	38.8	39.6	Diurnal Maximum	
C - Calibration																																																	
Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m ³ 24-hr 29 µg/m ³																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Surmont 2 - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	501	67.43	67.43
6 - 15	221	29.74	97.17
16 - 25	9	1.21	98.38
26 - 80	12	1.62	100.00
> 81.0	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Surmont 2 - January 2023

Concentration Ranges (μg/m ³)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	35	7	3	2	5	20	66	34	22	16	24	49	61	66	39	47	496
6 - 15	4	6	4	4	4	53	55	23	15	6	4	14	11	4	7	6	220
16 - 25	1	0	0	2	0	1	0	1	1	0	0	0	1	1	1	0	9
26 - 80	0	0	0	0	0	0	1	0	2	1	1	4	3	0	0	0	12
> 81.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	13	7	8	9	74	122	58	40	23	29	67	76	71	47	53	737

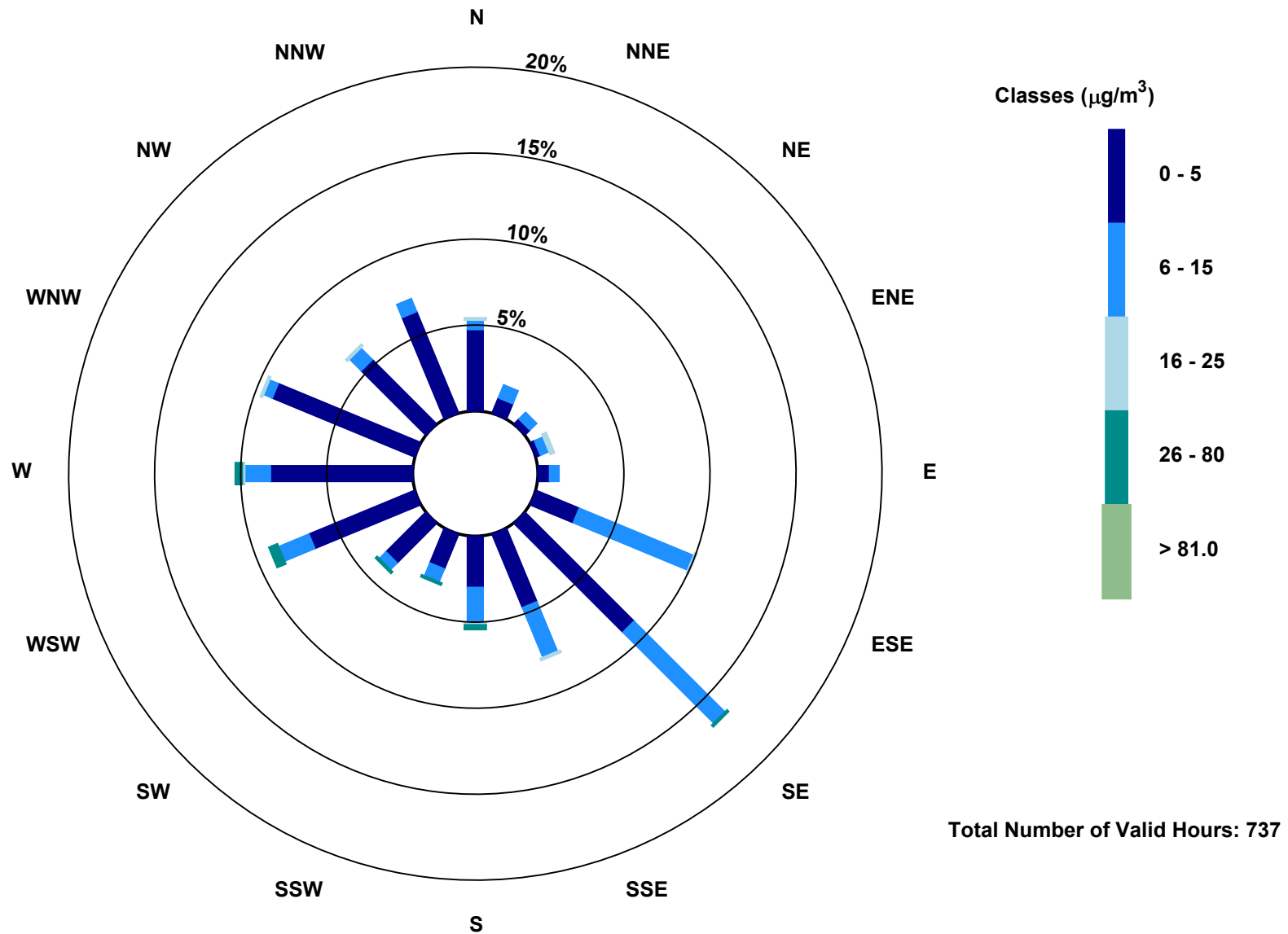
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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

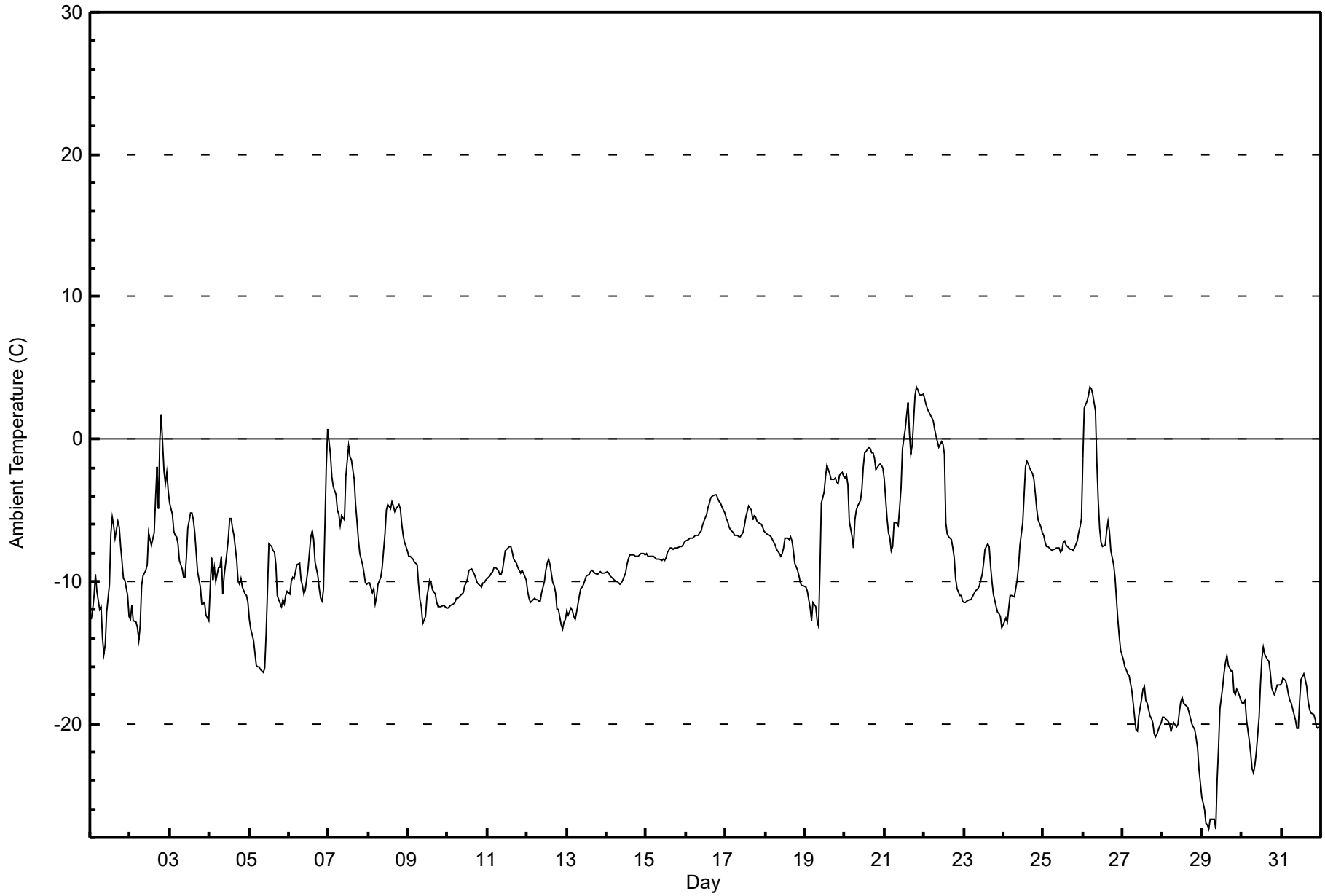




Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Surmont 2 - January 2023

Maximum Value: 3.6 C on Jan 21 20:00 Maximum Daily Average: -1.7 C on Jan 21		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -27.5 C on Jan 29 05:00 Minimum Daily Average: -21.1 C on Jan 29 Maximum Diurnal Average: -7.6 C at hour 15 Minimum Diurnal Average: -11.1 C at hour 9 Monthly Average: -9.59 C Percentiles: P ₁ = -25.7 P ₁₀ = -18.3 Q ₁ = -11.8 Median = -9.2 Q ₃ = -6.6 P ₉₀ = -2.7 P ₉₉ = 3.1																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-12.7	-12.0	-11.0	-9.5	-10.7	-12.0	-11.8	-14.0	-15.1	-14.4	-12.2	-10.2	-6.7	-5.5	-6.1	-7.0	-5.8	-6.2	-7.5	-8.7	-9.8	-9.9	-11.0	-12.4	-10.1	-5.5
2-Jan	-12.6	-11.6	-12.7	-12.8	-13.2	-14.1	-13.1	-10.3	-9.6	-9.2	-8.9	-6.5	-7.0	-7.5	-6.6	-4.2	-1.9	-4.9	-0.1	1.7	-2.3	-3.1	-2.4	-3.6	-7.4	1.7
3-Jan	-4.5	-5.3	-6.5	-6.8	-6.8	-7.3	-8.6	-9.2	-9.7	-9.7	-8.4	-6.3	-5.2	-5.2	-5.7	-6.6	-8.0	-9.3	-10.4	-11.5	-11.6	-11.5	-12.4	-12.8	-8.3	-4.5
4-Jan	-10.5	-8.3	-9.9	-9.0	-10.0	-9.1	-9.0	-8.3	-10.9	-9.6	-7.9	-7.0	-5.6	-5.6	-6.2	-6.8	-8.5	-10.0	-10.2	-9.8	-10.4	-10.9	-11.0	-11.4	-9.0	-5.6
5-Jan	-12.7	-13.4	-14.1	-15.0	-15.9	-16.0	-16.0	-16.2	-16.4	-16.1	-13.7	-10.6	-7.4	-7.5	-7.8	-7.9	-8.8	-11.0	-11.3	-11.8	-11.3	-11.5	-10.9	-10.7	-12.3	-7.4
6-Jan	-10.9	-10.0	-9.7	-9.8	-9.3	-8.9	-8.7	-9.9	-10.3	-10.9	-10.6	-9.1	-7.9	-6.9	-6.5	-7.1	-8.6	-9.7	-10.5	-11.2	-11.4	-10.6	-2.0	0.7	-8.7	0.7
7-Jan	-0.2	-1.1	-2.6	-3.3	-3.9	-5.0	-5.3	-6.0	-5.4	-5.7	-2.6	-1.6	-0.4	-1.3	-1.5	-2.8	-4.6	-5.7	-7.0	-8.1	-8.8	-9.4	-10.1	-10.2	-4.7	-0.2
8-Jan	-10.1	-10.1	-10.8	-10.5	-11.6	-11.1	-10.2	-9.7	-9.1	-7.9	-6.7	-5.0	-4.6	-4.9	-4.4	-4.7	-5.1	-4.9	-4.6	-4.9	-5.9	-6.8	-7.3	-7.8	-7.5	-4.4
9-Jan	-8.2	-8.2	-8.3	-8.4	-8.7	-8.9	-10.2	-11.3	-11.8	-13.0	-12.5	-11.1	-10.5	-9.9	-10.1	-10.6	-10.9	-11.4	-11.8	-11.8	-11.8	-11.7	-11.8	-11.9	-10.6	-8.2
10-Jan	-11.9	-11.8	-11.7	-11.6	-11.4	-11.2	-11.2	-11.1	-10.9	-10.8	-10.3	-10.1	-9.8	-9.2	-9.1	-9.4	-9.5	-9.8	-10.1	-10.3	-10.4	-10.1	-10.1	-9.9	-10.5	-9.1
11-Jan	-9.8	-9.6	-9.4	-9.3	-9.0	-9.0	-9.2	-9.5	-9.5	-9.2	-8.5	-7.8	-7.6	-7.5	-7.5	-8.0	-8.4	-8.7	-9.0	-9.3	-9.5	-9.3	-9.4	-9.9	-8.9	-7.5
12-Jan	-10.7	-11.2	-11.5	-11.4	-11.2	-11.3	-11.3	-11.4	-11.3	-10.8	-10.0	-9.3	-8.7	-8.4	-8.9	-10.1	-10.4	-10.8	-12.0	-12.0	-13.1	-13.3	-12.8	-12.7	-11.0	-8.4
13-Jan	-12.1	-12.3	-11.8	-12.1	-12.5	-12.7	-12.1	-11.0	-10.5	-10.4	-10.2	-9.9	-9.6	-9.5	-9.3	-9.3	-9.3	-9.4	-9.5	-9.4	-9.3	-9.4	-9.4	-9.4	-10.4	-9.3
14-Jan	-9.3	-9.4	-9.6	-9.8	-9.9	-10.0	-10.0	-10.1	-10.2	-10.2	-9.9	-9.4	-8.9	-8.4	-8.2	-8.1	-8.2	-8.2	-8.2	-8.3	-8.1	-8.1	-8.1	-8.2	-9.0	-8.1
15-Jan	-8.1	-8.2	-8.2	-8.3	-8.3	-8.4	-8.5	-8.4	-8.5	-8.5	-8.5	-8.5	-8.4	-8.0	-7.6	-7.7	-7.8	-7.7	-7.7	-7.6	-7.6	-7.5	-7.5	-7.3	-8.0	-7.3
16-Jan	-7.2	-7.1	-7.0	-7.0	-7.0	-6.8	-6.8	-6.7	-6.6	-6.5	-6.0	-5.7	-5.3	-4.8	-4.5	-4.1	-4.0	-3.9	-3.9	-4.2	-4.4	-4.5	-4.8	-5.2	-5.6	-3.9
17-Jan	-5.6	-5.8	-6.2	-6.4	-6.6	-6.8	-6.8	-6.8	-6.9	-6.8	-6.6	-6.0	-5.5	-5.1	-4.7	-5.0	-5.7	-5.4	-5.4	-5.8	-5.9	-6.0	-6.2	-6.4	-6.0	-4.7
18-Jan	-6.6	-6.7	-6.7	-6.8	-7.0	-7.2	-7.5	-7.7	-8.1	-8.2	-8.0	-7.6	-7.0	-7.0	-7.0	-6.9	-7.2	-7.8	-8.7	-9.2	-9.7	-10.1	-10.3	-10.3	-7.9	-6.6
19-Jan	-10.4	-10.7	-11.3	-11.8	-12.8	-11.5	-11.8	-12.8	-13.2	-9.2	-4.5	-3.7	-2.7	-1.9	-2.2	-2.4	-2.8	-2.8	-2.8	-3.0	-3.1	-2.6	-2.3	-2.7	-6.5	-1.9
20-Jan	-2.7	-2.6	-3.2	-5.8	-6.9	-7.7	-5.7	-5.0	-4.7	-4.3	-3.5	-2.0	-1.0	-0.9	-0.6	-0.6	-1.0	-1.0	-1.4	-2.1	-1.8	-1.7	-1.9	-2.0	-2.9	-0.6
21-Jan	-2.8	-5.6	-6.6	-6.9	-7.8	-7.6	-5.9	-5.8	-6.1	-4.8	-3.5	-0.7	0.7	1.7	2.5	0.4	-1.0	-0.4	3.0	3.6	3.5	3.2	3.1	3.1	-1.7	3.6
22-Jan	2.8	2.4	2.1	1.9	1.7	1.3	0.7	0.2	-0.2	-0.5	-0.2	-0.4	-1.1	-5.9	-6.7	-6.9	-7.0	-7.6	-8.3	-9.8	-10.5	-11.0	-11.0	-11.4	-3.6	2.8
23-Jan	-11.5	-11.4	-11.3	-11.3	-11.3	-11.1	-10.9	-10.7	-10.5	-10.3	-9.9	-9.5	-8.7	-7.8	-7.4	-7.5	-8.9	-10.0	-10.9	-11.8	-12.2	-12.3	-12.5	-13.3	-10.5	-7.4
24-Jan	-13.1	-12.5	-12.9	-11.9	-11.0	-11.0	-11.1	-10.5	-9.9	-9.0	-7.5	-5.9	-4.0	-1.9	-1.5	-1.7	-2.1	-2.4	-2.8	-3.8	-4.9	-5.7	-6.2	-6.5	-7.1	-1.5
25-Jan	-6.8	-7.2	-7.5	-7.6	-7.8	-7.8	-7.8	-7.8	-7.6	-7.6	-7.9	-7.8	-7.2	-7.1	-7.4	-7.6	-7.7	-7.7	-7.9	-7.6	-7.1	-6.6	-6.2	-5.6	-7.4	-5.6
26-Jan	-1.3	2.2	2.7	3.1	3.6	3.5	3.1	1.9	-1.7	-4.3	-6.3	-7.3	-7.5	-7.4	-6.5	-5.8	-6.5	-7.8	-8.9	-9.7	-11.2	-12.7	-13.9	-14.8	-4.7	3.6
27-Jan	-15.5	-16.0	-16.2	-16.5	-16.6	-17.7	-18.6	-19.5	-20.4	-20.5	-19.5	-18.3	-17.6	-17.4	-18.3	-18.6	-19.4	-19.6	-19.9	-20.7	-20.9	-20.8	-20.1	-19.9	-18.7	-15.5
28-Jan	-19.6	-19.5	-19.7	-19.8	-20.0	-20.5	-20.2	-19.9	-20.3	-20.0	-19.2	-18.4	-18.2	-18.6	-18.7	-18.9	-19.3	-19.7	-20.0	-20.4	-21.1	-21.7	-23.2	-24.2	-20.0	-18.2
29-Jan	-25.1	-26.0	-27.0	-27.2	-27.5	-26.7	-26.7	-26.7	-27.4	-24.0	-21.7	-18.9	-17.4	-16.4	-15.7	-15.2	-15.9	-16.3	-16.3	-17.8	-18.0	-17.6	-17.7	-18.3	-21.1	-15.2
30-Jan	-18.6	-18.6	-18.4	-19.8	-21.2	-22.1	-23.2	-23.5	-22.9	-22.0	-19.5	-17.1	-15.4	-14.6	-15.1	-15.5	-15.6	-16.4	-17.5	-17.7	-18.0	-17.3	-17.3	-17.3	-18.5	-14.6
31-Jan	-17.2	-16.8	-17.0	-17.4	-18.0	-18.4	-18.6	-19.0	-19.8	-20.3	-20.3	-18.4	-16.8	-16.5	-16.9	-17.4	-18.4	-19.0	-19.3	-19.3	-19.6	-20.2	-20.4	-20.2	-18.5	-16.5
	-9.9	-9.8	-10.1	-10.3	-10.6	-10.7	-10.7	-10.9	-11.1	-10.8	-9.8	-8.7	-7.8	-7.6	-7.6	-7.9	-8.3	-8.9	-9.1	-9.4	-9.9	-10.0	-9.9	-10.1		Diurnal Average
	2.8	2.4	2.7	3.1	3.6	3.5	3.1	1.9	-0.2	-0.5	-0.2	-0.4	0.7	1.7	2.5	0.4	-1.0	-0.4	3.0	3.6	3.5	3.2	3.1	3.1		Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Surmont 2 - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	38	5.11	5.11
-20 - 0	679	91.26	96.37
0 - 10	27	3.63	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

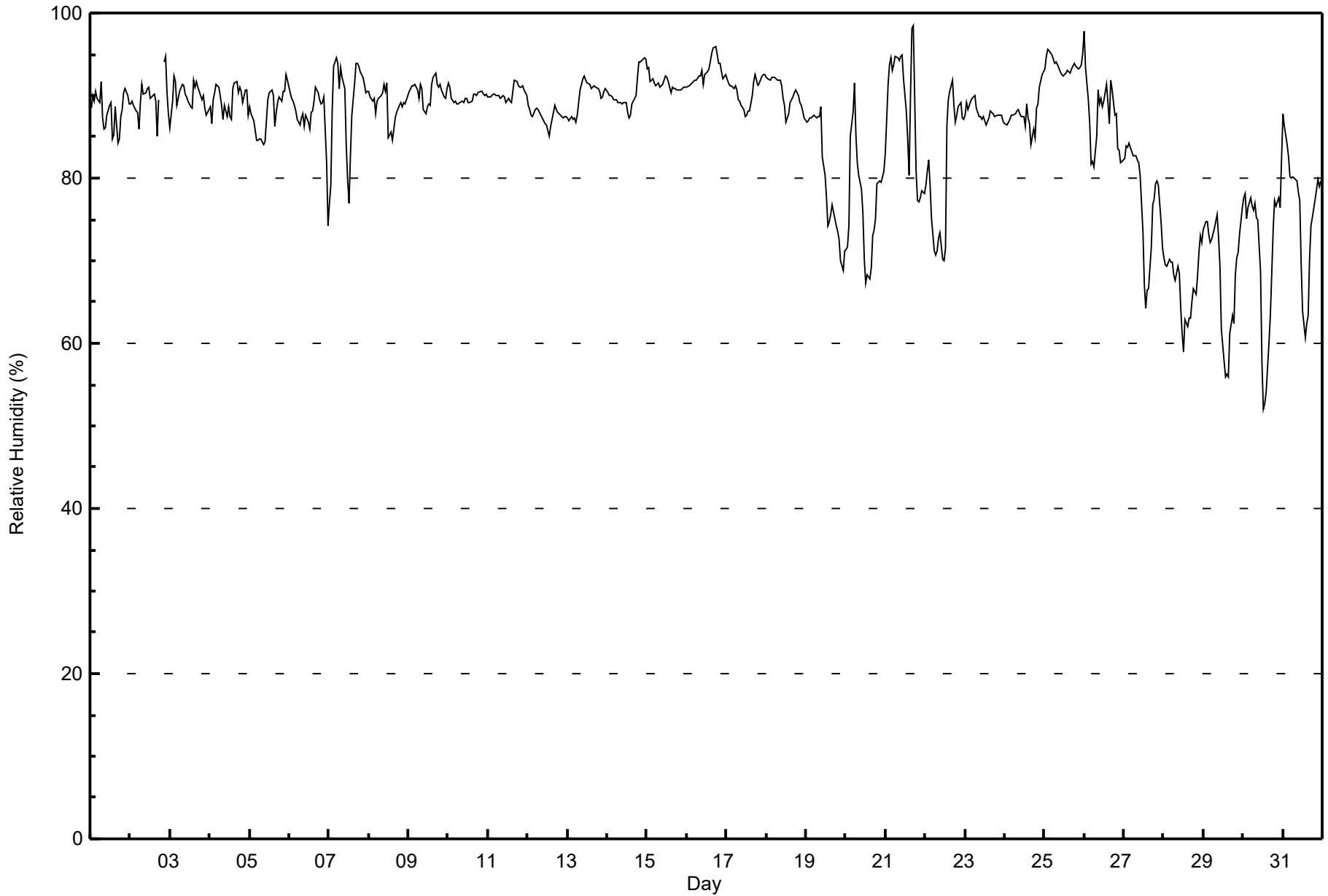
Relative Humidity (RH) - %
Surmont 2 - January 2023

Maximum Value: 98.5 % on Jan 21 18:00 Maximum Daily Average: 93.7 % on Jan 25																						Hours in Service: 744 Hours of Data: 742					
Minimum Value: 52.0 % on Jan 30 13:00 Minimum Daily Average: 67.1 % on Jan 28 Maximum Diurnal Average: 87.5 % at hour 4 Minimum Diurnal Average: 82.1 % at hour 13 Monthly Average: 85.72 % Percentiles: P ₁ = 58.3 P ₁₀ = 72.8 Q ₁ = 84.0 Median = 88.8 Q ₃ = 90.9 P ₉₀ = 92.4 P ₉₉ = 95.1																						Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	88.5	90.0	89.3	90.5	89.7	89.2	91.7	87.3	85.9	86.1	87.6	88.8	89.2	84.7	85.3	88.7	84.2	84.8	87.4	88.3	90.3	90.8	90.0	89.0	88.2	91.7	
2-Jan	89.0	89.4	88.8	88.1	87.9	86.0	89.1	91.3	90.2	90.3	90.9	91.1	89.7	89.9	90.2	89.3	85.1	89.5	UO	UO	94.0	94.7	90.3	87.7	89.7	94.7	
3-Jan	86.1	89.3	92.3	91.6	88.9	89.7	90.5	91.4	91.2	90.2	89.9	89.4	88.7	88.4	91.8	91.1	91.8	91.1	90.0	89.5	89.9	88.5	87.6	88.3	89.9	92.3	
4-Jan	88.6	86.6	89.5	90.3	91.3	91.0	90.0	88.8	87.2	88.8	87.4	88.7	87.5	87.1	90.8	91.5	91.8	90.4	91.0	90.5	89.2	90.6	90.7	87.7	89.5	91.8	
5-Jan	88.7	87.7	87.0	85.7	84.6	84.7	84.8	84.8	84.1	84.3	87.0	89.6	90.4	90.6	89.9	86.3	88.0	89.1	89.8	89.3	90.4	90.5	92.6	91.8	88.0	92.6	
6-Jan	90.4	89.7	89.4	88.8	88.1	87.1	86.5	87.3	87.8	86.3	87.7	86.8	86.0	88.0	88.1	89.3	91.0	90.4	89.5	89.0	89.2	89.9	81.8	74.2	87.6	91.0	
7-Jan	77.0	79.2	88.3	93.5	94.6	93.9	90.9	93.4	92.2	90.9	84.1	79.8	76.9	82.7	87.6	91.6	94.0	94.0	93.5	92.8	92.2	91.4	90.4	90.4	89.0	94.6	
8-Jan	90.4	89.9	89.3	89.7	87.8	89.4	89.7	90.0	90.3	91.4	90.6	91.5	84.9	85.6	84.6	86.0	87.4	88.0	88.8	89.2	88.6	89.2	89.0	90.0	88.8	91.5	
9-Jan	90.5	90.8	91.2	91.2	91.3	90.7	89.7	91.4	90.8	88.2	87.8	88.7	88.9	88.8	91.4	92.2	92.7	91.3	91.1	91.4	90.6	89.8	89.7	90.9	90.5	92.7	
10-Jan	91.6	91.0	89.7	89.1	89.3	89.0	89.0	89.2	89.3	89.2	89.6	89.6	89.2	89.1	89.4	90.2	90.1	90.1	90.3	90.6	90.5	90.1	90.0	90.2	89.8	91.6	
11-Jan	89.8	89.8	89.9	90.1	90.2	90.1	89.9	89.7	89.9	90.0	89.8	89.2	89.6	89.4	89.1	90.6	91.9	91.8	91.2	91.1	91.0	91.2	90.6	90.0	90.2	91.9	
12-Jan	88.9	88.3	87.7	87.5	88.3	88.5	88.3	88.0	87.6	87.3	86.6	86.4	85.7	85.0	86.3	88.0	88.8	88.3	88.0	87.7	87.5	87.2	87.4	87.4	87.5	88.9	
13-Jan	87.3	87.0	87.4	87.1	87.3	86.7	87.7	90.7	91.4	92.1	92.4	91.9	91.5	91.4	90.9	91.0	91.3	91.1	90.9	90.6	89.6	89.8	90.4	90.9	89.9	92.4	
14-Jan	90.4	89.9	90.1	89.8	89.5	89.5	89.2	89.1	89.1	89.0	89.2	89.1	88.0	87.2	87.7	89.0	89.6	90.0	92.2	94.1	94.0	94.2	94.6	94.5	90.4	94.6	
15-Jan	93.2	93.4	91.7	92.0	91.6	91.2	91.4	91.6	91.1	91.4	91.8	92.3	92.3	93.0	91.7	90.3	91.1	90.8	90.9	90.8	90.7	90.7	90.9	91.1	91.0	91.4	93.4
16-Jan	90.9	91.3	91.4	91.5	91.8	91.9	91.9	92.4	92.4	93.1	91.4	92.5	92.8	93.3	94.0	95.0	95.8	95.9	94.9	93.9	93.9	92.8	92.1	92.5	92.9	95.9	
17-Jan	92.1	91.5	91.2	91.2	90.8	91.2	90.8	89.5	89.4	88.8	88.3	87.4	87.6	88.1	88.2	90.0	91.8	92.5	91.9	91.2	91.6	92.4	92.6	92.5	90.5	92.6	
18-Jan	92.2	92.0	91.8	92.2	92.3	92.3	92.0	91.8	91.9	91.1	89.7	88.7	86.9	87.9	89.2	89.5	89.9	90.4	90.7	90.0	89.2	88.9	88.1	87.3	90.2	92.3	
19-Jan	86.9	86.9	87.3	87.2	87.4	87.7	87.3	87.4	87.5	88.7	82.5	80.3	77.7	74.2	74.8	75.6	76.8	75.1	74.2	73.6	72.5	70.0	68.8	71.2	80.1	88.7	
20-Jan	71.4	71.7	74.3	85.1	88.0	91.6	85.2	81.8	80.4	78.6	75.8	70.2	67.2	68.3	67.7	69.1	73.1	73.7	75.1	79.4	79.7	79.5	80.1	80.8	77.0	91.6	
21-Jan	83.0	91.4	93.8	94.5	93.1	93.7	94.7	94.6	94.2	94.8	94.9	92.0	88.1	84.7	80.3	90.0	98.1	98.5	80.8	77.3	77.1	77.6	78.5	78.1	88.5	98.5	
22-Jan	79.1	80.8	82.1	79.2	75.1	71.2	70.7	71.1	72.8	73.4	70.2	70.0	71.5	86.4	89.5	90.6	91.8	88.8	86.9	87.7	88.7	89.2	87.4	87.2	80.9	91.8	
23-Jan	87.7	89.1	88.4	89.3	89.7	89.8	90.0	88.4	87.5	87.4	87.1	87.5	87.0	86.4	87.3	88.2	88.0	87.9	87.5	87.6	87.7	87.6	87.6	87.0	88.0	90.0	
24-Jan	86.7	86.4	86.8	87.1	87.6	87.6	87.8	88.2	88.3	87.9	87.4	87.5	86.3	88.9	87.3	86.6	84.0	85.9	84.8	88.4	89.0	90.9	92.5	92.9	87.8	92.9	
25-Jan	93.3	94.7	95.5	95.4	94.9	94.3	94.0	94.1	93.7	92.8	92.5	92.5	92.5	92.7	93.0	92.8	93.2	93.5	93.9	93.5	93.2	93.3	93.7	95.1	93.7	95.5	
26-Jan	97.8	93.4	89.5	86.6	81.8	82.0	81.3	85.1	90.7	89.0	89.7	88.6	89.3	91.4	89.1	86.6	91.8	90.7	87.6	87.9	83.6	83.3	81.8	82.1	87.5	97.8	
27-Jan	82.4	83.9	83.7	84.3	83.8	82.7	82.7	82.7	82.3	81.8	80.3	73.5	67.1	64.2	66.4	66.6	71.7	76.8	77.5	79.4	79.7	79.2	74.5	71.5	77.4	84.3	
28-Jan	70.4	69.5	69.3	70.2	69.9	69.8	68.4	67.7	69.3	68.5	64.3	61.2	59.0	62.8	62.1	63.1	63.0	65.0	66.7	66.0	68.1	71.1	73.0	72.3	67.1	73.0	
29-Jan	73.7	74.8	74.8	73.2	72.3	72.6	74.0	74.7	75.6	72.8	69.4	61.7	57.8	55.9	56.2	56.0	61.3	63.4	62.3	68.2	70.4	71.1	73.3	76.5	68.4	76.5	
30-Jan	77.6	78.1	75.2	76.4	77.7	76.6	76.1	76.9	75.3	74.9	68.7	57.6	52.0	52.7	54.2	60.0	63.4	68.5	73.8	77.3	76.7	77.6	76.5	82.3	71.1	82.3	
31-Jan	87.7	86.2	84.1	82.6	80.1	79.9	80.1	80.1	79.7	78.3	77.3	69.6	64.0	60.6	62.4	63.4	70.1	74.3	75.3	77.5	78.6	79.9	79.0	79.7	76.3	87.7	
																						Diurnal Average					
																						Diurnal Maximum					
UO - Unstable Operation																											



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont 2 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Surmont 2 - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	10	1.35	1.35
60 - 80	140	18.87	20.22
80 - 100	592	79.78	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

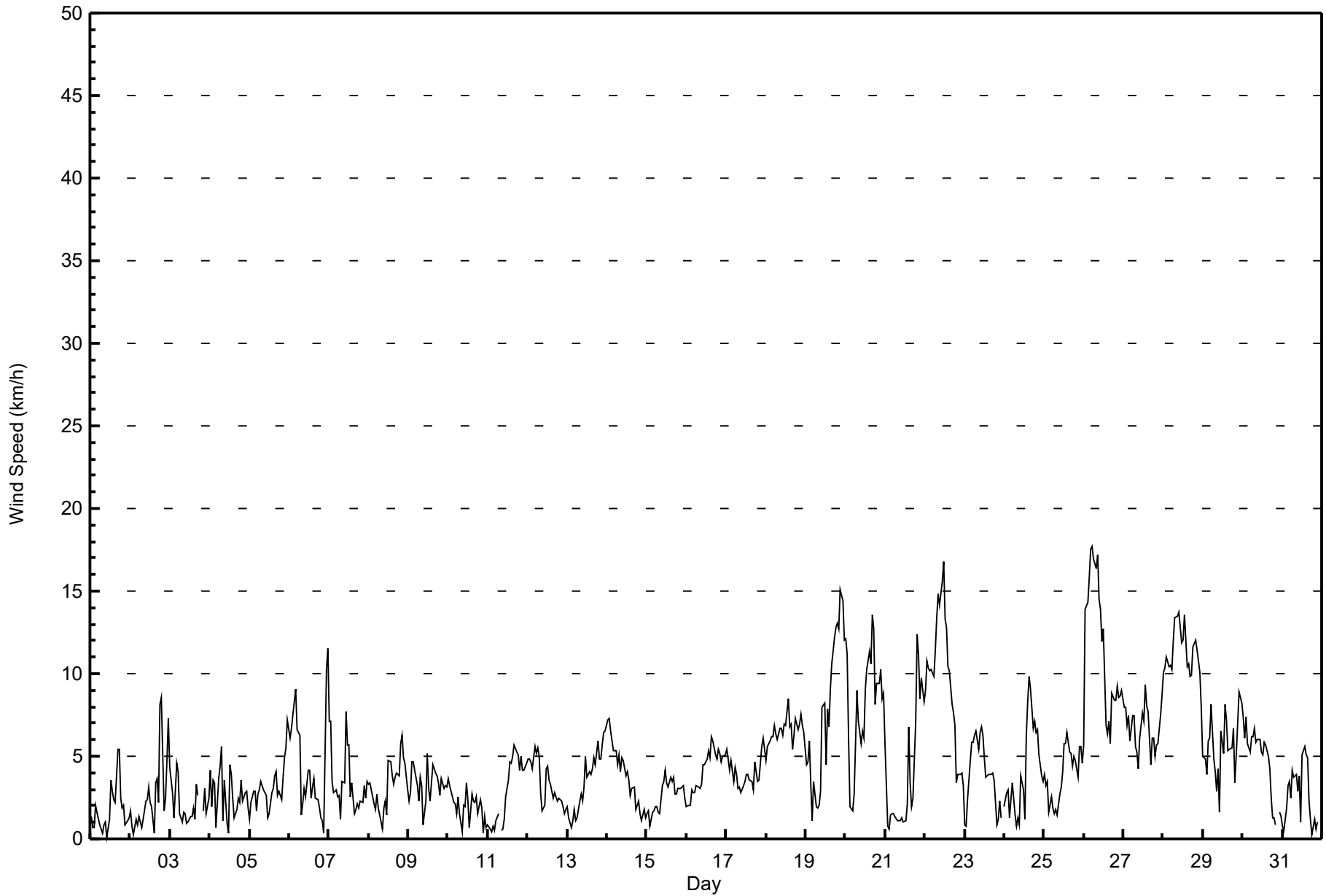
Wind Speed (WS) - km/h
Surmont 2 - January 2023

Maximum Speed: 18 km/h on Jan 26 06:00	Maximum Daily Speed Average: 10.9 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 1 11:00	Minimum Daily Speed Average: 1.0 km/h on Jan 2	Hours of Data: 738
Maximum Diurnal Speed Average: 1.4 km/h at hour 8	Minimum Diurnal Speed Average: 0.4 km/h at hour 13	Hours of Missing Data: 6
Monthly Average Velocity: 1.0 km/h 278.5 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 6 P ₉₀ = 9 P ₉₉ = 15	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	WSW1	W1	SSW1	W2	WSW2	NW1	NW1	SSW0	WSW1	SW1	E0	ESE1	W4	W3	NW2	W2	WNW5	WNW5	W2	ESE2	E2	WSW1	SW1	SSE1	W1.2	WNW5
2-Jan	SE2	WSW1	SW0	WSW1	WSW1	SE1	SSW1	S1	SSW1	SSE2	SSE2	SSE3	ESE2	SE2	SE0	W3	WNW4	WNW2	WNW8	WNW9	SW2	WSW2	S5	SE7	SW1.0	WNW9
3-Jan	ESE4	ESE3	S1	SW3	SSW5	SSW4	SW2	W1	WSW2	WSW1	SW1	SW1	SSE1	S1	SSW2	SW1	WSW3	WSW3	UO	UO	WSW2	WSW3	W2	WNW2	SW1.5	SSW5
4-Jan	W4	WSW2	NW4	NW3	NW1	W4	W4	W6	W1	W4	WSW1	N0	WSW5	WSW4	WSW2	WSW1	WSW2	W2	W2	W4	W2	WSW3	WSW3	W2	W2.5	W6
5-Jan	WSW1	WSW2	WSW3	SW3	SW2	WSW3	WSW3	WSW3	WSW3	WSW3	WSW3	SW1	S2	SE3	SE3	SSE4	SSE4	S3	SSW3	S2	SE4	ESE5	ESE6	ESE7	S1.9	ESE7
6-Jan	SE6	SE7	ESE8	ESE8	SE9	SE7	ESE6	E1	SE2	SE3	ESE3	SE4	SE4	S2	SSE3	SSE4	S2	SW2	WSW2	SW1	SSW1	WNW0	W10	W11	SSE2.7	W11
7-Jan	W7	W7	W3	SW3	SW3	WSW3	WSW3	WNW1	WSW3	W3	W8	WNW6	NW6	NW3	WNW3	WNW2	SW2	WSW2	WSW2	WSW2	WSW2	WSW3	WSW2	WSW3	W3.1	W8
8-Jan	WSW3	WSW3	WSW3	W2	WSW2	WSW3	WSW2	SSW1	S1	WSW2	ENE2	ENE1	SE5	ESE5	ESE4	SE3	SE4	SE4	ESE4	ESE6	ESE6	ESE5	ESE5	SE3	SE1.9	ESE6
9-Jan	SE2	SE3	ESE5	SE5	ESE4	ESE3	SE2	SE4	SE3	WSW1	SE2	ESE5	SE3	S2	ESE3	SE4	SSE4	SE4	ESE3	ESE3	ESE4	ESE3	SSE3	S3	SE3.1	ESE5
10-Jan	SSE4	SSE3	SSE3	SSE2	SE2	SE2	ESE3	SSE2	ESE0	ESE2	SE2	SE3	SE2	SE1	NE3	N2	NE2	NNE3	NW1	N2	NNW2	S0	SE1	S1	ESE1.0	SSE4
11-Jan	S1	SSW1	SE0	SW1	SE0	S1	ESE1	UO	SW1	SSW1	SE1	SE3	SE4	SE5	SSE5	SE5	SE6	SE5	SSE5	SSE4	SSE5	SSE4	S4	S5	SSE2.8	SE6
12-Jan	SSE5	SSE5	SSE5	SSE4	SE6	SE5	SSE5	S5	SSE3	SSW2	S2	S4	S4	SSE4	SSE3	SSW2	SSE3	S3	WSW2	SW2	W2	W2	WSW2	SSW2	S2.9	SE6
13-Jan	WSW2	W1	WSW1	WNW1	W2	W1	WNW1	NNW2	NE3	NNE2	ENE3	E5	ENE4	NE4	ENE4	E4	E5	ESE4	ESE6	ESE5	ESE5	ESE6	ESE6	ESE7	E2.4	ESE7
14-Jan	ESE7	ESE7	ESE7	ESE6	ESE5	SE5	ESE5	SE5	SE4	SE5	SE5	SSE4	ESE4	SE4	SE3	ESE3	SE3	SSE2	SE2	SSE2	S2	NNW1	NW2	WNW1	SE3.5	ESE7
15-Jan	NNE2	N2	WSW1	NNE2	N2	N2	NNW2	ENE2	E2	ESE3	ESE3	ESE4	SE3	SE3	ESE4	ESE4	ESE4	ESE3	ESE3	SE3	SE3	SE3	SE3	SE2	ESE1.9	ESE4
16-Jan	SE2	ESE2	SE2	SE3	ESE3	SE3	ESE3	ESE3	ESE3	SE3	SE4	SE4	SE5	SE5	ESE5	ESE6	ESE6	SE5	SE5	SE5	SE5	SSE5	SSE5	SSE5	SE4.0	ESE6
17-Jan	SSE5	SSE5	SSW4	S5	SSW3	SSW4	S4	S3	SSE3	SSE3	SSE3	SE4	SE4	SSE4	SE4	SE3	SSE3	SSE5	S4	S4	S4	S6	S6	S5	S3.9	S6
18-Jan	S5	S6	SSE6	SSE6	SSE6	SSE7	SSE6	SSE6	SSE7	S7	SSE6	SSE7	SE7	SE8	SE7	SE7	SE5	SE6	SE7	SE7	SE7	SE8	SE7	SSE6	SSE6.3	SE8
19-Jan	SE5	SE5	ESE6	SE3	SW1	SSE4	ESE2	SW2	SE2	W3	W8	W8	W4	W8	WNW7	W9	W11	W12	W13	W13	W13	W15	W14	W12	W5.6	W15
20-Jan	W12	W11	WNW6	W2	WNW2	W3	WNW6	W9	NW7	NW6	NW7	NW6	WNW9	WNW10	W11	W11	W14	WNW13	NW8	WNW9	WNW9	WNW10	WNW9	WNW9	WNW8.0	W14
21-Jan	WNW6	W1	E1	W1	S2	SSE1	SW1	SW1	SSW1	SSW1	WSW1	WNW1	S1	SW2	W7	WSW3	SW2	W2	WNW7	W12	WNW11	WNW8	W10	WNW8	W3.4	W12
22-Jan	WNW9	WNW11	WNW10	WNW10	WNW10	WNW10	WNW11	WNW13	WNW15	WNW14	WNW16	NW17	NNW13	N13	NNW10	NNW10	N8	N8	NNW7	NNW3	NNW4	NNW4	N4	N3	NW8.8	NW17
23-Jan	WNW1	ESE1	SE2	SE5	SE6	SE6	SE6	SE7	SE5	SE6	SE7	SE6	SE5	SE4	ESE4	ENE4	NE4	NNE4	N4	WNW1	NW1	NW2	N1	UO	ESE2.7	SE7
24-Jan	SE2	SE3	SSE3	SSW1	SE2	SSE3	S1	SSW1	SW1	S1	SE4	SE3	ESE1	WNW6	NW8	NW10	NW9	NW7	NNW7	N6	NNW7	N5	N4	NNE3	NNW1.8	NW10
25-Jan	NNE4	NNE3	NNE3	NE2	N3	N2	ESE2	ESE2	E1	ENE3	NE3	SE4	SE6	ESE6	ESE6	SE5	SE5	SE4	SE5	SSE5	SE4	SE6	SE6	SE5	ESE2.9	ESE6
26-Jan	WSW6	WNW14	WNW14	W16	WNW18	WNW18	NW17	NNW16	N17	NNW14	NNW14	NNW12	NNW13	NNW7	NNW6	NNW7	N6	NNW9	N8	N8	N9	N9	N9	N9	NNW9.9	WNW18
27-Jan	NNE8	N8	N7	N7	N6	N7	NNW7	NNW6	NNW5	NW4	NNW6	NNW8	NNW7	N9	NNW8	NNW8	NNW4	NNW6	NNW6	NNW5	NNW6	NNW6	NNW8	NW9	NNW6.5	N9
28-Jan	NW10	NW10	NW11	NW10	NW11	WNW10	NW12	NW13	WNW13	WNW14	NW13	NW12	NW12	NW14	NW10	NW11	NW10	NW10	NNW12	NNW12	NNW11	N11	N10	N8	NW10.9	WNW14
29-Jan	NNW5	NW5	WNW4	W6	W6	W8	WNW5	W4	WNW3	WNW4	WNW2	W6	WSW5	W8	W7	SSW5	WSW5	WSW6	WNW7	WNW3	NW5	NW7	NNW9	NNW8	WNW4.7	NNW9
30-Jan	NNW7	NNW6	NW7	NW6	WNW5	WNW6	W6	W7	W6	WNW6	WNW6	NW5	NNW5	NW6	WNW6	W5	W4	W2	WSW1	SW1	NW1	UO	NNW2	NNW1	WNW4.3	NW7
31-Jan	SW1	W1	NNW2	NNE3	N3	N2	NNW4	NNE4	N4	NNE3	N4	NNW1	N5	NNW6	WNW5	WNW5	WNW2	W1	WSW0	WSW1	WSW1	W1	UO	NNW1	NNW2.1	NNW6

W1.0	W1.1	W0.8	WSW1	WSW1	WSW1.2	W1.2	W1.4	WNW1	WNW1.2	WNW1.0	WNW0.5	NW0.4	NW0.8	WNW0.9	WNW0.7	WSW1.0	WNW1.1	WNW1.4	W1.3	WNW0.9	WNW0.9	W1.0	W0.9	Diurnal Average	
W12	WNW14	WNW14	W16	WNW18	WNW18	NW17	NNW16	N17	NNW14	NNW14	NNW12	NNW13	NW14	W11	W11	W14	WNW13	W13	W13	W13	W15	W14	W12	Diurnal Maximum	

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	506	68.56	68.56
6 - 11	192	26.02	94.58
12 - 19	40	5.42	100.00
20 - 28	0	0.00	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 738

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	19	12	7	8	9	54	95	49	36	23	29	65	39	28	16	17	506
6 - 11	19	1	0	0	0	20	27	10	4	0	0	2	26	32	23	28	192
12 - 19	2	0	0	0	0	0	0	0	0	0	0	0	11	11	8	8	40
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	40	13	7	8	9	74	122	59	40	23	29	67	76	71	47	53	738

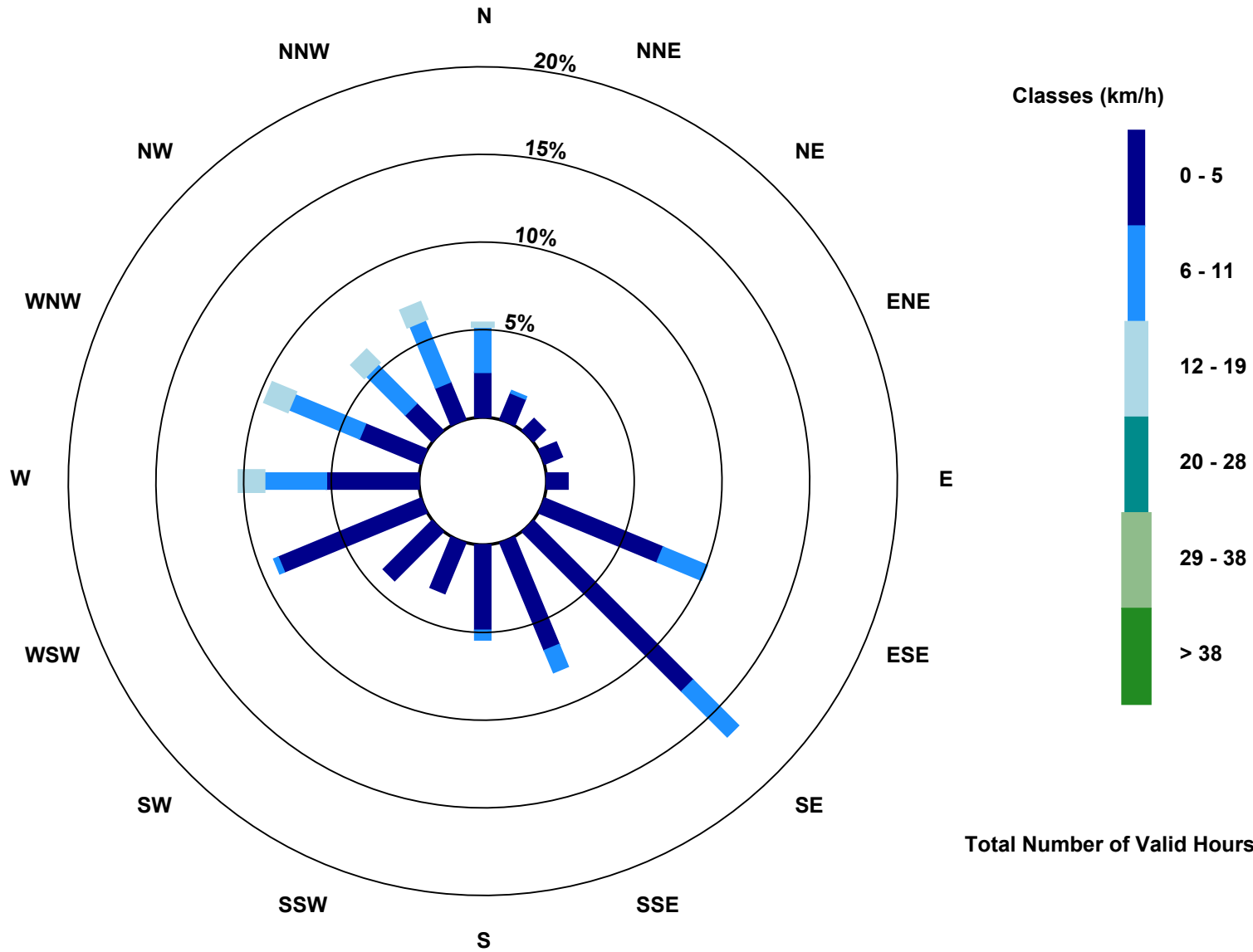
Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Surmont 2



Total Number of Valid Hours: 738



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont 2 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Jan 26 08:00 Minimum Value: 1 km/h on Jan 16 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 6																	Hours in Service: 744 Hours of Data: 738 Hours of Missing Data: 6 Hours of Calibration: 0 Percent Operational Time: 99.2									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	2	2	1	1	1	1	1	1	2
2-Jan	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	4	4	1	1	2	2	4	
3-Jan	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	2	1	UO	UO	1	2	1	1	2		
4-Jan	3	2	1	2	1	2	2	2	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2	1	3	
5-Jan	1	1	2	1	2	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	
6-Jan	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3	
7-Jan	2	2	2	1	1	1	2	1	2	2	2	3	2	2	2	1	1	2	1	1	1	1	2	1	3	
8-Jan	1	1	2	1	1	1	1	1	1	2	1	1	1	2	1	1	1	2	1	2	2	1	2	2	2	
9-Jan	1	1	1	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	
10-Jan	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
11-Jan	1	1	1	1	1	1	1	UO	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	
12-Jan	2	2	2	2	2	2	2	2	2	1	1	2	2	1	1	1	1	2	1	2	1	1	1	1	2	
13-Jan	1	1	1	1	1	2	1	1	1	1	2	2	1	1	1	1	2	1	1	1	1	2	2	2	2	
14-Jan	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16-Jan	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
17-Jan	2	2	2	2	2	2	2	1	1	1	1	2	2	1	1	1	2	2	2	2	2	3	3	2	3	
18-Jan	2	2	3	3	3	3	3	2	3	3	2	3	3	3	3	2	2	2	2	3	3	2	2	3	3	
19-Jan	2	1	2	2	1	2	1	1	1	3	3	3	2	3	3	3	3	4	4	4	4	4	4	3	4	
20-Jan	4	3	3	2	1	2	2	3	3	3	3	3	4	3	3	3	4	4	4	3	3	3	3	3	4	
21-Jan	2	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	1	3	3	4	3	3	3	3	4	
22-Jan	3	3	3	3	3	3	4	5	6	5	6	7	5	5	5	4	3	3	3	2	1	1	1	1	7	
23-Jan	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	
24-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	3	3	3	2	2	1	1	4	
25-Jan	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	1	1	2	1	2	
26-Jan	5	5	5	5	6	6	7	7	7	6	5	4	5	3	3	3	2	4	4	3	4	3	4	4	7	
27-Jan	3	3	3	3	3	3	3	2	2	2	3	3	3	4	3	3	2	3	3	2	2	3	3	4	4	
28-Jan	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	4	5	4	5	5	5	4	4	3	5	
29-Jan	2	2	1	1	1	2	2	2	2	3	1	3	2	3	3	2	2	3	2	2	2	3	3	3	3	
30-Jan	3	3	3	2	2	2	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	UO	1	1	3	
31-Jan	1	1	1	1	2	1	2	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	UO	1	2	
Diurnal Maximum																								5		
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Surmont 2 - January 2023

Direction of Maximum Speed: 301 deg on Jan 26 06:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 319.8 deg on Jan 28	Hours of Data: 738
Direction of Minimum Speed: 95 deg on Jan 1 11:00	Hours of Missing Data: 6
Direction of Minimum Daily Speed Average: 1.0 deg on Jan 2	Percent Operational Time: 99.2
Monthly Average Direction: 278.5 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	240	271	205	265	258	325	308	210	241	234	95	118	270	275	314	276	288	290	273	104	100	239	236	168	270.1
2-Jan	129	243	220	250	242	145	205	178	202	153	155	152	120	126	129	278	293	297	291	291	232	244	174	126	221.4
3-Jan	115	117	180	223	211	193	226	261	251	256	224	222	150	173	201	215	248	240	UO	UO	237	244	265	282	214.9
4-Jan	275	251	317	321	308	269	271	273	272	273	238	11	249	249	240	247	237	274	269	263	262	255	251	262	267.8
5-Jan	240	239	242	236	234	239	243	244	242	240	248	233	171	124	137	155	165	191	203	176	142	120	121	118	183.0
6-Jan	134	125	118	120	125	132	104	100	142	133	121	136	128	173	161	151	174	235	242	227	207	287	263	265	149.9
7-Jan	281	276	270	221	216	242	250	293	256	273	267	282	322	320	282	300	228	254	244	245	240	244	248	245	266.5
8-Jan	252	253	244	263	247	243	243	213	179	241	67	63	132	118	123	133	142	125	116	115	115	108	113	124	139.0
9-Jan	139	143	117	126	115	110	138	133	139	242	134	105	141	174	122	127	148	131	121	108	113	122	167	172	130.7
10-Jan	151	159	151	166	137	134	122	147	111	116	131	129	132	135	36	11	47	20	320	356	329	189	135	188	116.9
11-Jan	187	209	143	215	139	174	119	UO	214	204	139	135	142	145	152	142	143	140	154	162	166	147	186	170	154.3
12-Jan	165	167	151	168	140	143	156	170	168	194	180	184	190	158	161	203	157	184	245	220	268	268	237	211	174.6
13-Jan	256	278	245	300	266	265	296	339	35	33	58	98	77	56	73	91	97	102	111	108	116	111	111	115	92.8
14-Jan	118	114	112	117	121	125	122	126	125	130	128	150	123	144	129	114	130	152	139	148	173	337	322	290	125.5
15-Jan	25	8	257	24	356	4	331	61	96	108	116	112	133	130	122	123	118	120	119	124	129	135	132	124	109.8
16-Jan	124	102	126	130	123	128	120	123	110	127	124	131	132	129	123	117	119	124	129	146	136	162	162	159	130.9
17-Jan	158	166	192	185	200	195	180	188	161	160	152	145	144	147	135	137	156	165	174	181	188	179	181	184	170.1
18-Jan	173	175	167	166	168	155	162	150	157	171	166	154	133	140	137	135	144	134	133	138	140	126	140	147	149.4
19-Jan	132	133	120	125	233	166	119	232	142	272	266	272	270	281	286	265	264	263	267	274	277	272	265	260	261.4
20-Jan	263	265	286	281	292	264	297	279	306	314	306	307	294	289	276	274	269	284	307	286	292	283	293	300	285.9
21-Jan	288	261	101	267	186	164	228	234	199	207	237	286	176	225	266	255	229	266	294	275	283	290	280	293	272.5
22-Jan	288	285	293	293	297	300	294	292	291	288	299	313	328	352	346	346	350	353	347	332	328	330	355	354	312.9
23-Jan	295	112	130	130	136	143	131	134	135	132	143	127	132	134	120	65	41	18	6	298	310	324	9	UO	119.4
24-Jan	129	137	149	193	145	161	169	201	214	175	137	125	104	295	305	308	312	326	338	352	345	356	353	12	326.8
25-Jan	24	20	33	45	6	8	107	115	86	69	56	137	124	111	111	134	143	130	141	148	138	132	141	137	112.4
26-Jan	258	285	282	279	290	301	310	333	352	347	339	342	336	345	335	345	358	346	351	355	10	6	4	6	327.7
27-Jan	13	3	1	354	4	356	348	344	338	325	333	340	348	350	347	343	328	341	336	326	342	332	328	320	344.4
28-Jan	315	323	310	313	305	302	306	304	295	303	317	319	318	319	326	320	325	325	334	334	334	350	354	350	319.8
29-Jan	328	323	284	266	267	278	295	263	286	290	291	266	251	263	259	210	238	258	284	297	305	324	346	340	285.0
30-Jan	334	335	317	316	289	289	265	265	280	291	291	311	327	312	294	275	280	273	250	228	319	UO	346	344	298.6
31-Jan	232	272	334	20	4	3	346	17	7	12	354	339	8	347	288	300	292	274	240	254	257	259	UO	286	338.7

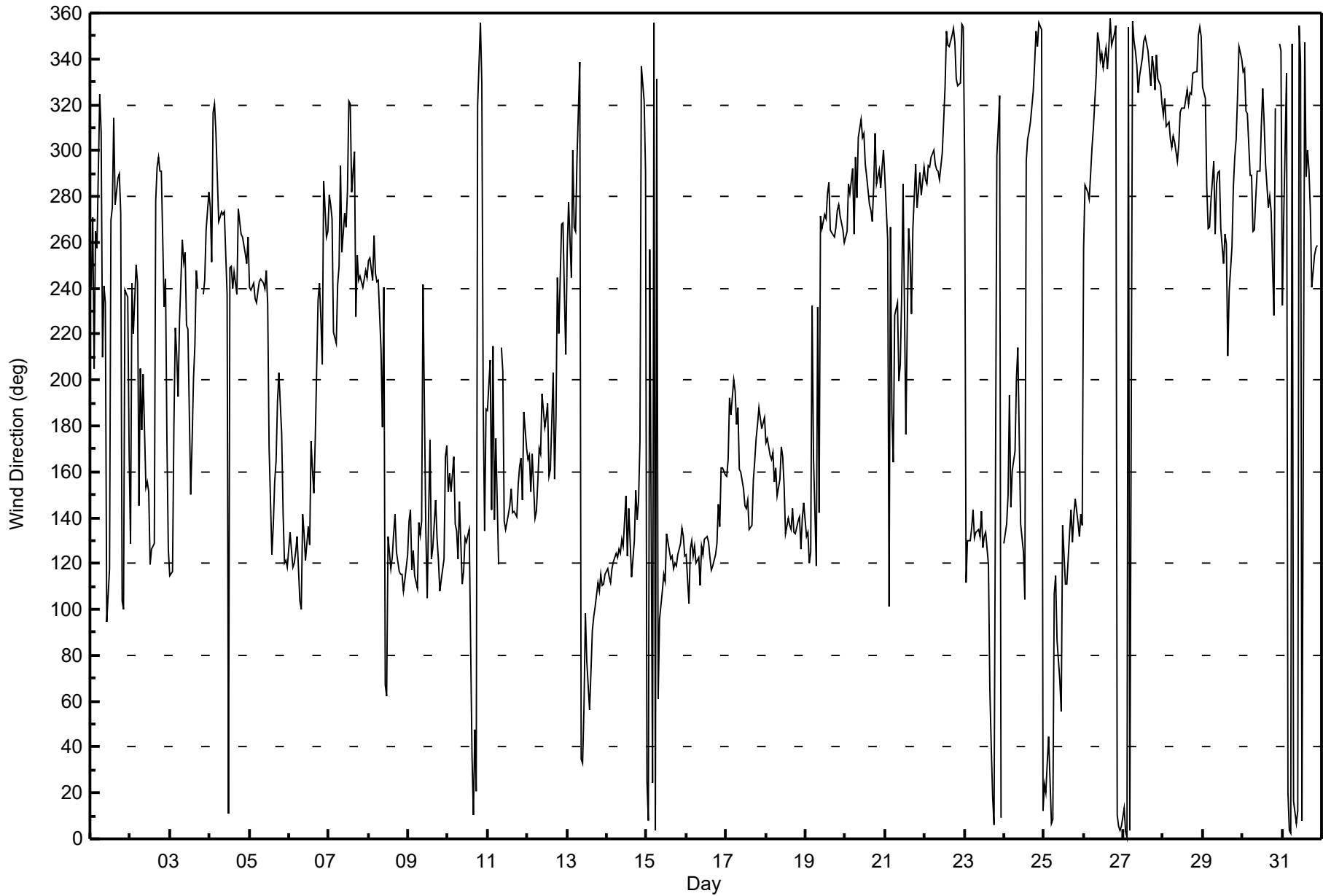
261.8 267.7 265.8 255.4 249.6 251.0 275.4 279.1 291.9 286.1 293.8 295.0 320.7 306.9 293.1 281.8 258.1 285.6 298.0 280.6 291.0 290.9 274.1 269.3
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Surmont 2 - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont 2 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 124 deg on Jan 2 15:00	Hours of Data: 738
Minimum Value: 7 deg on Jan 4 16:00	Hours of Missing Data: 6
Percentiles: P ₁ = 15 P ₁₀ = 25 Q ₁ = 32 Median = 40 Q ₃ = 55 P ₉₀ = 69 P ₉₉ = 97	Hours of Calibration: 0
	Percent Operational Time: 99.2

Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	31	51	76	55	25	64	79	66	41	70	108	88	61	39	64	86	40	40	93	87	85	73	67	62	108
2-Jan	75	52	72	55	46	84	74	100	74	37	51	45	72	52	124	56	55	93	31	38	57	54	36	16	124
3-Jan	55	80	101	63	32	24	60	16	25	42	60	58	84	72	32	64	13	30	UO	UO	37	15	51	31	101
4-Jan	79	82	43	37	86	30	39	19	101	64	59	88	18	15	18	7	41	57	55	24	47	27	32	41	101
5-Jan	48	17	12	19	62	18	23	15	17	13	18	43	67	37	41	38	53	57	62	66	47	35	41	26	67
6-Jan	45	37	33	37	38	51	36	88	68	45	54	39	27	42	45	30	37	36	24	59	44	83	23	21	88
7-Jan	26	22	21	31	39	46	75	89	28	48	20	26	38	66	35	52	30	38	39	44	11	12	32	14	89
8-Jan	24	20	19	33	26	18	62	50	75	46	59	56	34	37	39	38	46	49	39	25	21	18	25	59	75
9-Jan	44	57	24	39	38	33	44	38	51	62	55	25	60	53	41	34	41	42	33	59	21	35	49	50	62
10-Jan	52	54	50	54	52	69	38	56	89	39	40	40	59	82	52	60	47	44	63	49	40	85	52	64	89
11-Jan	50	71	99	46	95	55	60	UO	62	71	71	37	46	40	42	44	55	44	56	65	57	62	60	56	99
12-Jan	57	56	57	64	47	57	60	61	77	81	83	66	54	48	51	47	64	80	47	59	20	37	39	33	83
13-Jan	27	48	75	44	40	55	48	50	48	51	47	31	37	34	30	29	24	26	18	25	20	20	21	24	75
14-Jan	25	23	24	28	33	43	34	35	32	36	41	55	34	43	38	31	35	62	46	66	45	32	33	52	66
15-Jan	50	39	71	55	42	46	52	56	70	27	28	27	45	45	36	33	21	39	42	31	43	36	40	42	71
16-Jan	44	43	39	41	46	37	34	42	30	40	33	39	42	39	38	32	32	37	49	49	51	62	55	58	62
17-Jan	53	61	61	65	73	57	63	57	68	59	54	42	51	50	48	44	59	55	62	65	64	64	57	60	73
18-Jan	62	58	57	54	56	53	57	56	56	61	59	52	52	45	53	49	59	45	42	50	52	46	52	62	62
19-Jan	65	47	33	64	54	44	71	34	75	101	25	26	30	27	35	24	26	24	27	26	28	26	24	21	101
20-Jan	23	25	32	79	87	47	35	25	33	57	43	49	40	35	28	26	24	30	38	25	30	27	33	31	87
21-Jan	28	89	112	36	76	87	44	51	66	80	73	94	83	69	22	24	36	74	31	25	25	25	23	26	112
22-Jan	26	25	28	27	29	29	28	29	32	31	32	36	43	38	37	35	33	36	33	42	25	32	34	46	46
23-Jan	65	91	62	35	42	46	45	40	48	38	36	32	44	46	23	43	36	35	41	33	44	40	85	UO	91
24-Jan	66	53	44	49	45	44	78	59	51	60	30	52	85	31	30	32	36	38	35	34	32	38	34	35	85
25-Jan	30	37	42	88	52	64	79	73	80	49	41	56	32	29	24	40	42	48	42	52	42	22	33	35	88
26-Jan	78	29	30	26	29	34	35	38	34	37	40	35	34	34	37	34	34	34	35	29	38	35	40	36	78
27-Jan	36	35	37	38	42	37	36	33	38	45	36	36	36	32	35	33	34	35	39	34	32	32	32	38	45
28-Jan	36	36	34	36	32	33	33	34	29	30	36	36	40	37	38	36	39	39	39	38	37	38	37	32	40
29-Jan	37	36	30	18	17	25	29	30	39	69	89	35	40	30	33	55	57	46	32	41	39	33	34	35	89
30-Jan	43	35	35	36	27	26	17	16	21	27	29	39	47	39	30	26	25	20	59	30	52	UO	39	37	59
31-Jan	29	58	31	43	49	54	39	43	36	49	36	92	38	37	38	26	31	25	57	42	43	17	UO	21	92
	79	91	112	88	95	87	79	100	101	101	108	94	85	82	124	86	64	93	93	87	85	85	85	64	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS30 ELLS RIVER JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 JANUARY 2023

MONTHLY SUMMARY for
 AMD SECTION III.B.1(c)

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	7.5	0	1.4	0
TRS (ppb) Average	708	36	36	100	1.5	0	1.1	0
THC (ppm) Average	688	33	56	96.91	5.4	-	3.4	-
NMHC (ppm) Average	688	33	56	96.91	0.85	-	0.353	-
CH4 (ppm) Average	688	33	56	96.91	4.7	-	3.1	-
NO2 (ppb) Average	707	36	37	99.87	38.8	0	24.2	-
NO (ppb) Average	707	36	37	99.87	154.1	-	64.8	-
NOX (ppb) Average	707	36	37	99.87	189.3	-	88.2	-
PM2.5 (ug/m3) Average	743	1	1	100	87	1	35.2	1
Temperature 2 m (C) Average	744	0	0	100	3.3	-	-2.6	-
Relative Humidity (%) Average	744	0	0	100	94.6	-	91.2	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	31	-	18	-
Wind Direction 10 m (deg) Average	741	0	3	99.6	-	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100	276.8	-	57.7	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	0.37	0.7	-	0	0	0.1	0.2	0.4	0.7	7.5
TRS (ppb) Average	708	0.62	0.2	-	0.4	0.4	0.5	0.5	0.7	0.9	1.5
THC (ppm) Average	688	2.41	0.5	-	1.8	2	2.1	2.2	2.6	3.1	5.4
NMHC(ppm) Average	688	0.093	0.137	-	0	0	0	0	0.1	0.3	0.85
CH4(ppm) Average	688	2.32	0.4	-	1.8	2	2.1	2.2	2.4	2.9	4.7
NO2 (ppb) Average	707	13.52	9.9	-	0.1	0.7	3.7	14	22.1	26.2	38.8
NO (ppb) Average	707	12.71	23	-	0	0	0	1	15	44.6	154.1
NOX (ppb) Average	707	26.23	30.1	-	0.2	0.8	3.9	15.7	37.1	67.3	189.3
PM2.5 (ug/m3) Average	743	8.29	8.2	-	0.5	1.3	2.9	6.5	11.2	16.8	87
Temperature 2 m (C) Average	744	-10.5	5.9	-	-29.6	-19	-13.2	-9.1	-7.1	-4.5	3.3
Relative Humidity (%) Average	744	82.97	8.7	-	50.5	69.9	80.7	85.4	89.2	90.6	94.6
Wind Speed 10 m (km/h) Average	741	8	5	-	0	2	4	8	11	14	31
Wind Direction 10 m (deg) Average	741	257	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	744	24.09	53.3	-	0	0	0	0	17.9	92.5	276.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	01 Jan 2023 14:00	01 Jan 2023 18:00	5	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	01 Jan 2023 19:00	02 Jan 2023 10:00	16	Unstable Operation - excessive baseline drift
THC/NMHC/CH4	02 Jan 2023 11:00	02 Jan 2023 12:00	2	Maintenance - replaced sample pump
NO2	10 Jan 2023 11:00	10 Jan 2023 11:00	1	Unstable Operation - excessive baseline drift
Wind Speed, Wind Direction	09 Jan 2023 03:00	09 Jan 2023 03:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	15 Jan 2023 19:00	15 Jan 2023 19:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	31 Jan 2023 10:00	31 Jan 2023 10:00	1	Flat line in sensor output signal - Sensor frozen

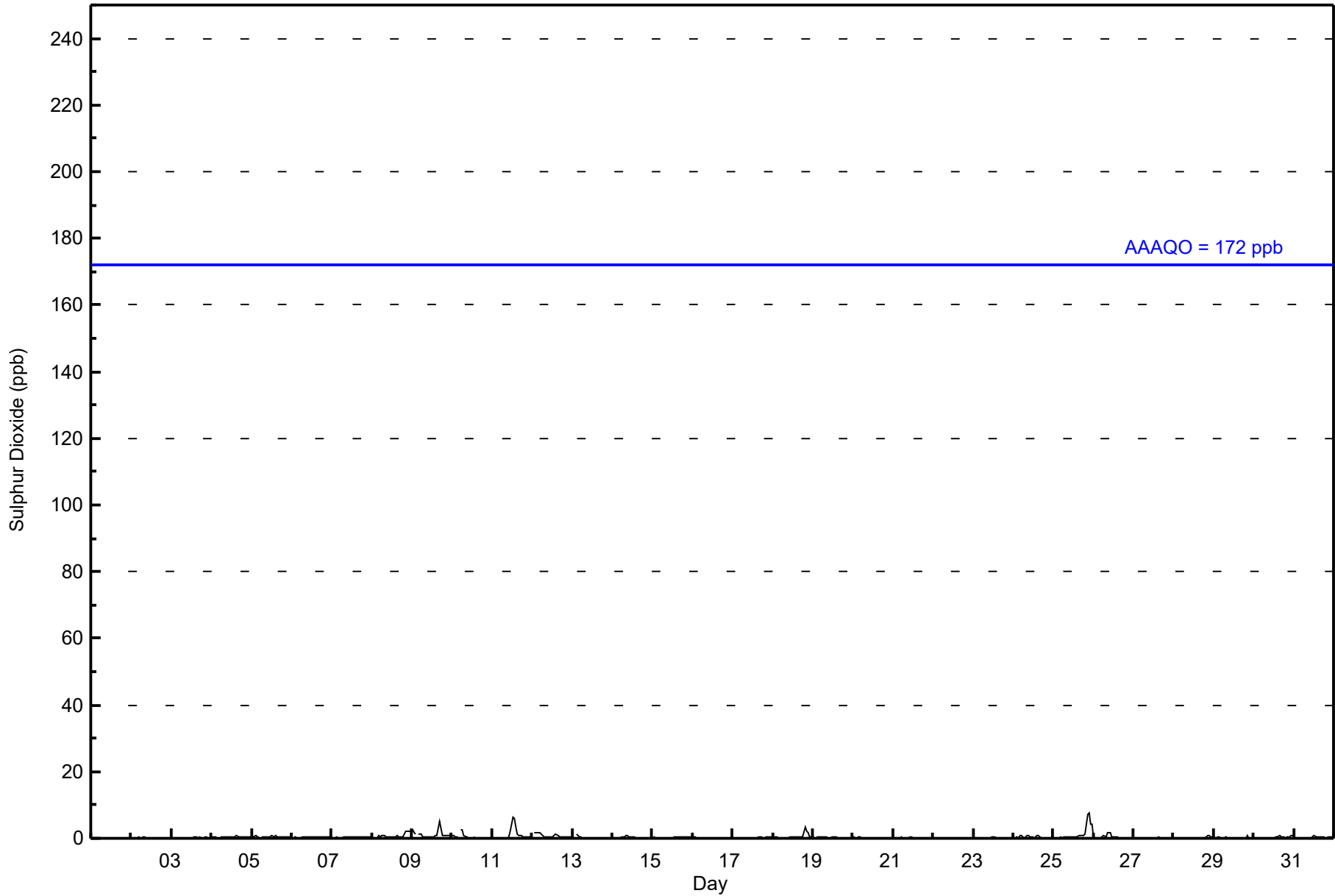


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744							
Maximum Value: 7.5 ppb on Jan 25 22:00		Maximum Daily Average: 1.4 ppb on Jan 25																	Hours of Data:	710									
Minimum Value: 0.0 ppb on Jan 1 22:00		Minimum Daily Average: 0.0 ppb on Jan 22																	Hours of Missing Data:	34									
Maximum Diurnal Average: 0.6 ppb at hour 21		Minimum Diurnal Average: 0.2 ppb at hour 19																	Hours of Calibration:	34									
Monthly Average: 0.37 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 3.3																	Percent Operational Time:	100.0									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	0.2	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2			
2-Jan	0.1	0.1	Z	0.2	0.2	0.1	0.2	0.3	0.3	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3			
3-Jan	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3				
4-Jan	0.3	0.3	0.5	0.5	Z	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7				
5-Jan	0.5	0.6	1.0	0.5	0.6	Z	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.5	1.0				
6-Jan	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.2	0.4	0.3	0.2	0.2	0.3	0.5			
7-Jan	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.4	0.2	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.5			
8-Jan	0.2	0.1	Z	0.3	0.8	0.6	0.7	0.8	0.6	0.5	0.4	0.4	0.4	0.4	0.9	0.5	0.5	0.6	1.1	2.2	1.9	2.2	2.3	0.8	2.3				
9-Jan	2.4	1.9	1.4	Z	1.3	1.3	0.6	0.6	0.5	0.4	0.5	0.5	0.5	0.5	0.8	0.8	5.2	3.1	1.0	1.0	0.8	0.7	0.7	0.8	1.2	5.2			
10-Jan	0.7	0.7	0.6	0.5	Z	2.4	2.4	0.9	0.3	0.3	C	C	C	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5	2.4				
11-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	2.2	6.2	5.8	3.3	1.4	1.0	0.7	0.6	0.5	0.4	0.3	0.5	0.5	1.0	6.2			
12-Jan	Z	1.5	1.8	1.6	1.6	1.1	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.7	1.1	0.6	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.7	1.8			
13-Jan	0.3	Z	1.3	1.0	0.5	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.2	1.3				
14-Jan	0.0	0.0	Z	0.1	0.0	0.4	0.5	0.5	0.7	1.0	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0			
15-Jan	0.1	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.5	0.4	0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.5	0.3	0.5			
16-Jan	0.6	0.2	0.1	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.6				
17-Jan	0.1	0.0	0.1	0.0	0.2	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.5	0.1	0.2	0.2	0.5	0.6	0.3	0.2	0.6			
18-Jan	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.5	3.3	2.1	1.6	0.5	0.5	0.6	3.3			
19-Jan	0.4	Z	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.4			
20-Jan	0.3	0.3	Z	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3			
21-Jan	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2			
22-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1			
23-Jan	0.1	0.1	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3			
24-Jan	Z	0.6	0.3	0.1	0.8	0.6	0.2	0.3	0.7	0.7	0.6	0.2	0.2	0.4	0.8	0.7	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.4	0.8			
25-Jan	0.2	Z	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.2	0.3	0.3	0.3	0.4	0.5	0.7	1.1	0.9	1.0	1.5	7.1	7.5	4.3	4.2	1.4	7.5			
26-Jan	0.5	0.3	Z	0.2	0.2	0.4	0.8	0.3	1.6	1.6	1.7	0.6	0.4	0.3	0.3	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.4	1.7			
27-Jan	0.1	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3			
28-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.7	0.2	0.3	0.1	0.7			
29-Jan	0.4	0.2	0.3	0.2	0.2	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	1.0	0.1	0.0	0.0	0.2	1.0			
30-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.6	0.8	0.3	0.3	0.2	0.2	0.2	0.6	0.7	0.8	0.2	0.8			
31-Jan	0.3	Z	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.8	0.4	0.4	0.3	0.5	0.5	0.3	0.1	0.2	0.4	0.3	0.3	0.3	0.8			
		0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.4	0.6	0.6	0.4	0.4	Diurnal Average			
		2.4	1.9	1.8	1.6	1.6	2.4	2.4	0.9	1.6	1.6	1.7	2.2	6.2	5.8	3.3	1.4	5.2	3.1	1.0	3.3	7.1	7.5	4.3	4.2	Diurnal Maximum			
Z - zerospan		C - Calibration																											
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr	172 ppb	24-hr	48 ppb																								



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Ells River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Ells River - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	710	100.00	100.00
11 - 20	0	0.00	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Ells River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	41	100	31	18	6	6	6	41	176	97	49	44	22	26	23	21	707
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	100	31	18	6	6	6	41	176	97	49	44	22	26	23	21	707

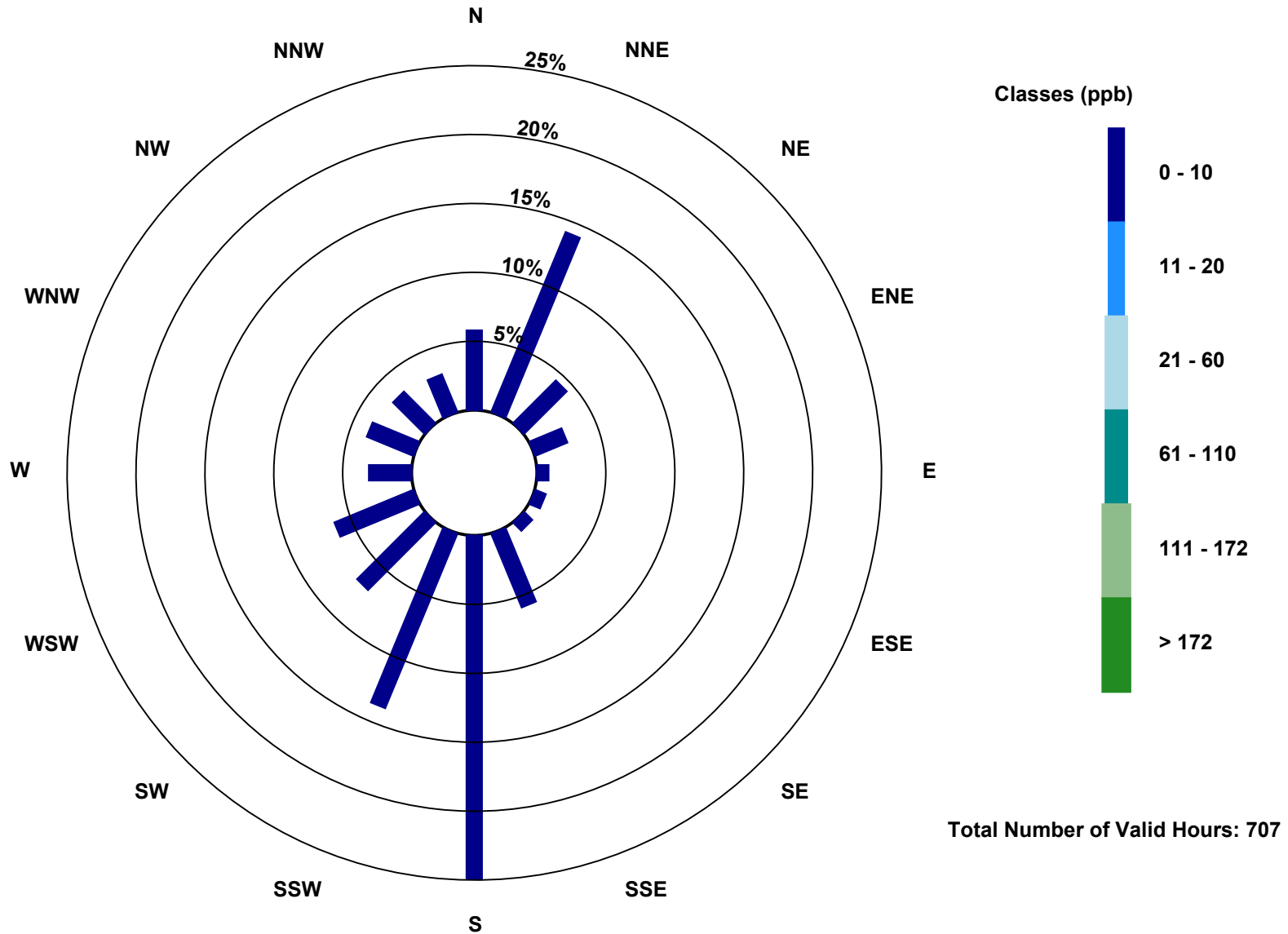
Total Number of Valid Hours: 707

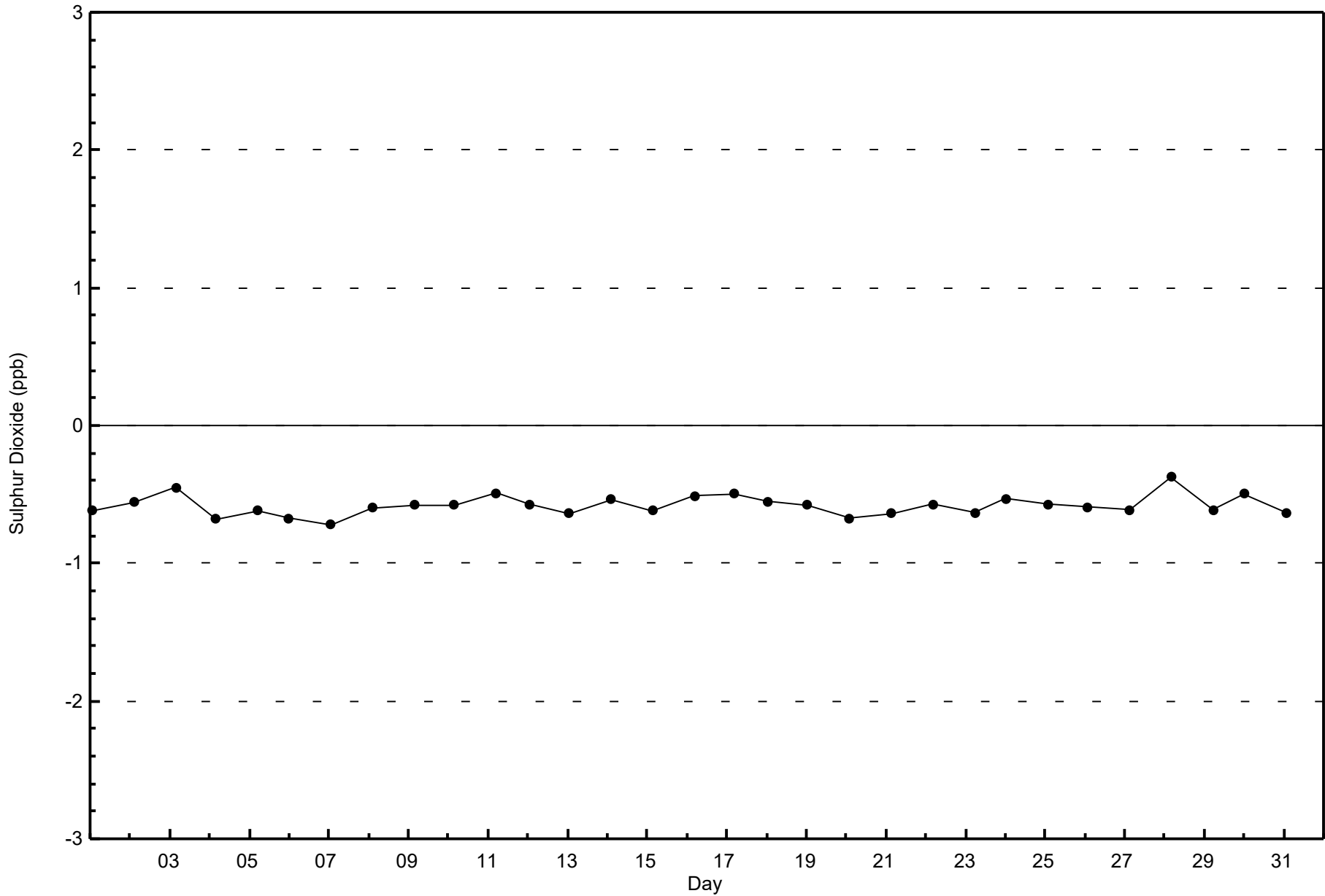
Total Number of Hours: 744

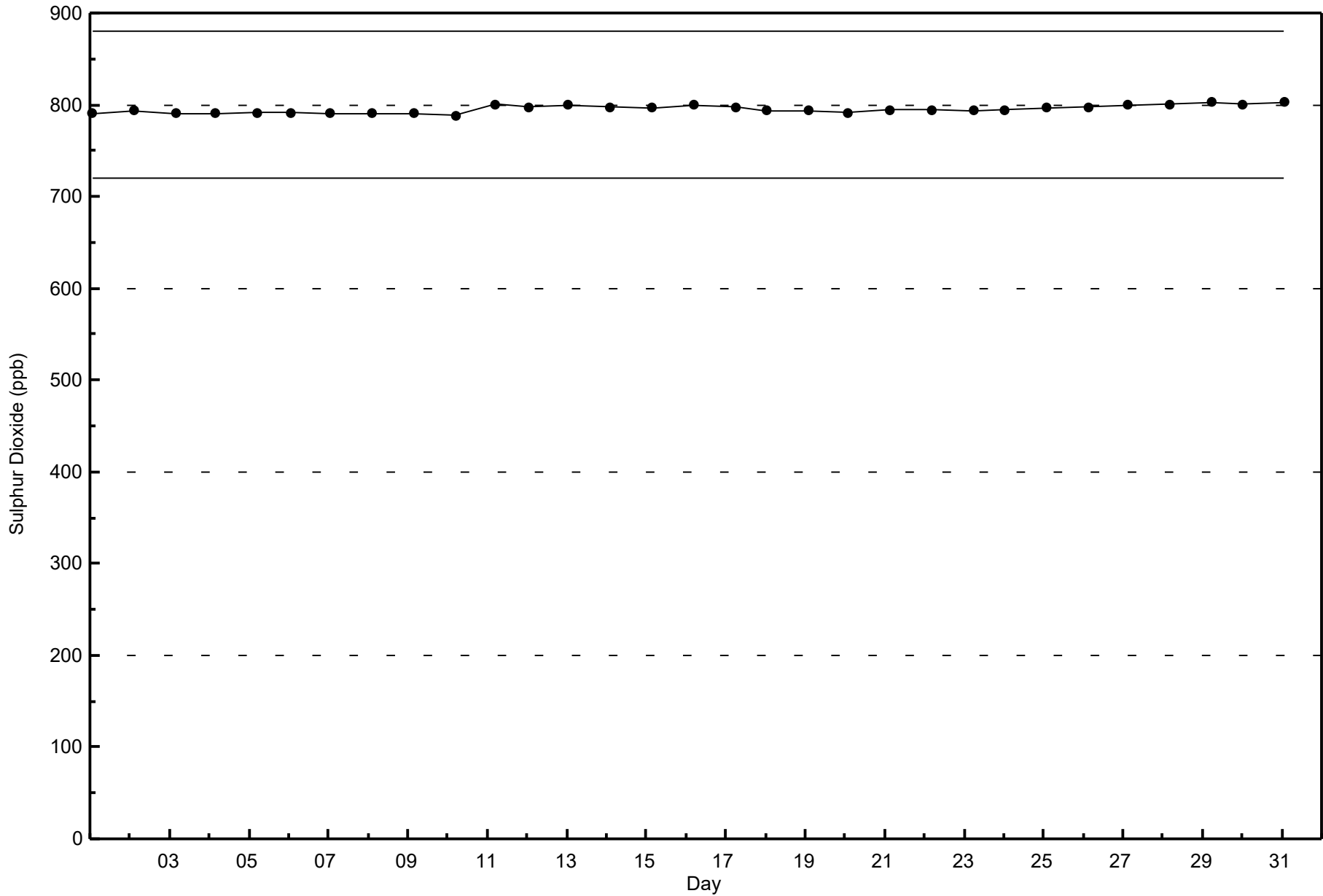


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Ells River









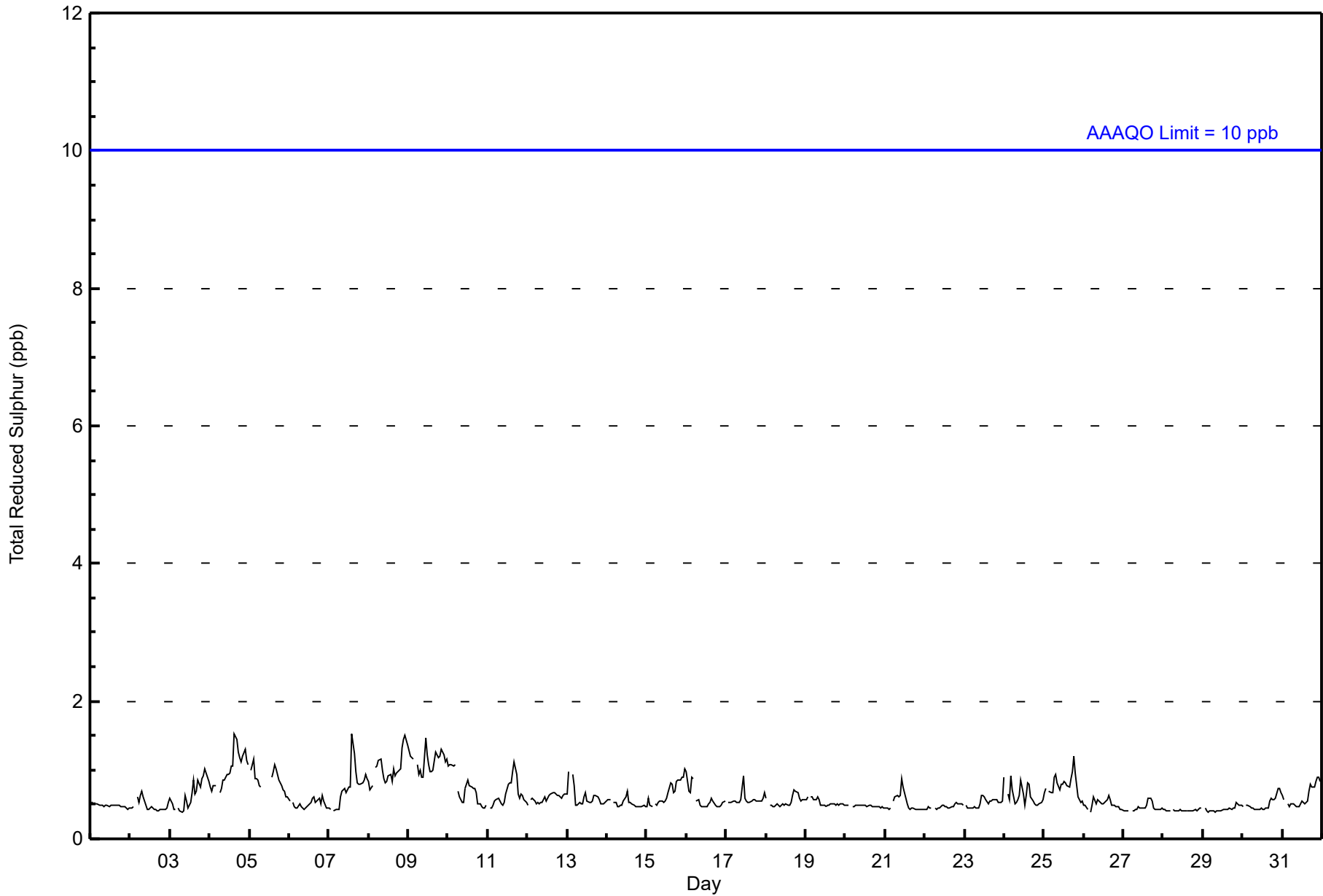
Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

Ells River - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 1.5 ppb on Jan 4 16:00		Maximum Daily Average: 1.1 ppb on Jan 9														Hours of Data:		708																															
Minimum Value: 0.4 ppb on Jan 29 04:00		Minimum Daily Average: 0.4 ppb on Jan 28														Hours of Missing Data:		36																															
Maximum Diurnal Average: 0.7 ppb at hour 17		Minimum Diurnal Average: 0.6 ppb at hour 9														Hours of Calibration:		36																															
Monthly Average: 0.62 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 0.4 Q ₁ = 0.5 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 0.9 P ₉₉ = 1.3														Percent Operational Time:		100.0																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5																								
2-Jan	0.4	0.5	0.5	Z	0.6	0.5	0.6	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.7																							
3-Jan	0.6	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.7	0.9	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.8	0.6	1.0																							
4-Jan	0.8	0.7	0.8	0.8	0.8	Z	0.7	0.7	0.9	0.8	0.9	0.9	1.0	1.1	1.1	1.5	1.4	1.3	1.2	1.1	1.2	1.3	1.1	1.1	1.0	1.5																							
5-Jan	Z	1.0	1.2	0.9	0.9	0.9	0.8	0.8	C	C	C	C	C	0.9	1.0	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.6	0.9	1.2																							
6-Jan	0.5	Z	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.4	0.5	0.5	0.6																							
7-Jan	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.6	0.7	0.7	0.7	0.7	0.8	1.5	1.2	1.0	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.7	1.5																							
8-Jan	0.8	0.7	0.8	Z	1.0	1.0	1.1	1.2	1.0	0.9	0.8	0.8	0.9	0.9	0.8	1.0	0.9	1.0	1.0	1.0	1.3	1.4	1.5	1.4	1.0	1.5																							
9-Jan	1.3	1.2	1.2	1.2	Z	1.1	0.9	1.0	0.9	0.9	1.5	1.2	1.1	1.0	1.0	1.0	1.3	1.2	1.2	1.2	1.3	1.2	1.1	1.2	1.1	1.5																							
10-Jan	1.1	1.1	1.1	1.1	1.1	Z	0.7	0.6	0.5	0.5	0.7	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0.4	0.5	0.5	0.7	1.1																							
11-Jan	Z	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.8	0.8	0.8	1.0	1.1	0.9	0.6	0.6	0.7	0.6	0.6	0.5	0.6	1.1																							
12-Jan	0.5	Z	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7																							
13-Jan	0.7	1.0	Z	0.9	0.8	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	1.0																							
14-Jan	0.6	0.6	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7																							
15-Jan	0.5	0.6	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	0.7	1.0																							
16-Jan	1.0	0.7	0.7	0.9	0.9	Z	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	1.0																							
17-Jan	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.9	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.9																							
18-Jan	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.7																							
19-Jan	0.6	0.6	Z	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6																							
20-Jan	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5																							
21-Jan	0.5	0.4	0.4	0.4	Z	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.9																							
22-Jan	0.4	0.4	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5																							
23-Jan	Z	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.6																							
24-Jan	0.9	Z	0.7	0.6	0.9	0.7	0.5	0.5	0.6	0.6	0.9	0.7	0.5	0.6	0.8	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.9																							
25-Jan	0.7	0.7	Z	0.7	0.7	0.7	0.9	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.2	0.9	0.6	0.6	0.5	0.6	0.8	1.2																							
26-Jan	0.5	0.5	0.4	Z	0.4	0.5	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.6																							
27-Jan	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6																							
28-Jan	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5																							
29-Jan	Z	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5																							
30-Jan	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.5	0.7																							
31-Jan	0.6	0.6	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.8	0.7	0.8	0.9	0.9	0.8	0.6	0.9																							
																								Diurnal Average		0.6		0.6		0.6		0.6		0.6		0.6		0.7		0.7		0.7		0.6		0.6		0.6	
																								Diurnal Maximum		1.3		1.2		1.2		1.2		1.1		1.1		1.5		1.5		1.4		1.3		1.4		1.5	
Z - zerospan C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Ells River - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Ells River - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	37	103	31	19	6	6	7	41	169	99	52	45	21	26	23	20	705
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	37	103	31	19	6	6	7	41	169	99	52	45	21	26	23	20	705

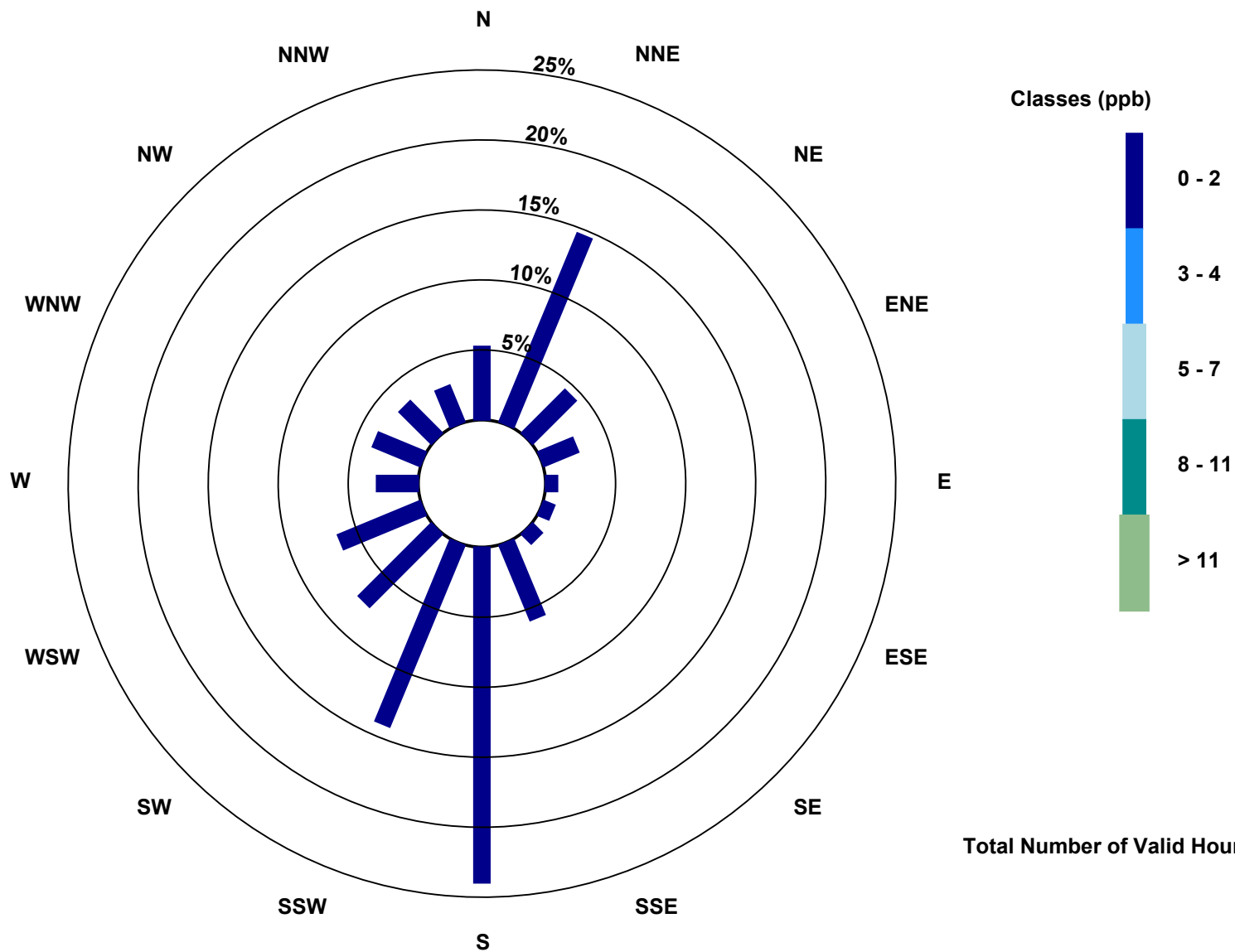
Total Number of Valid Hours: 705

Total Number of Hours: 744

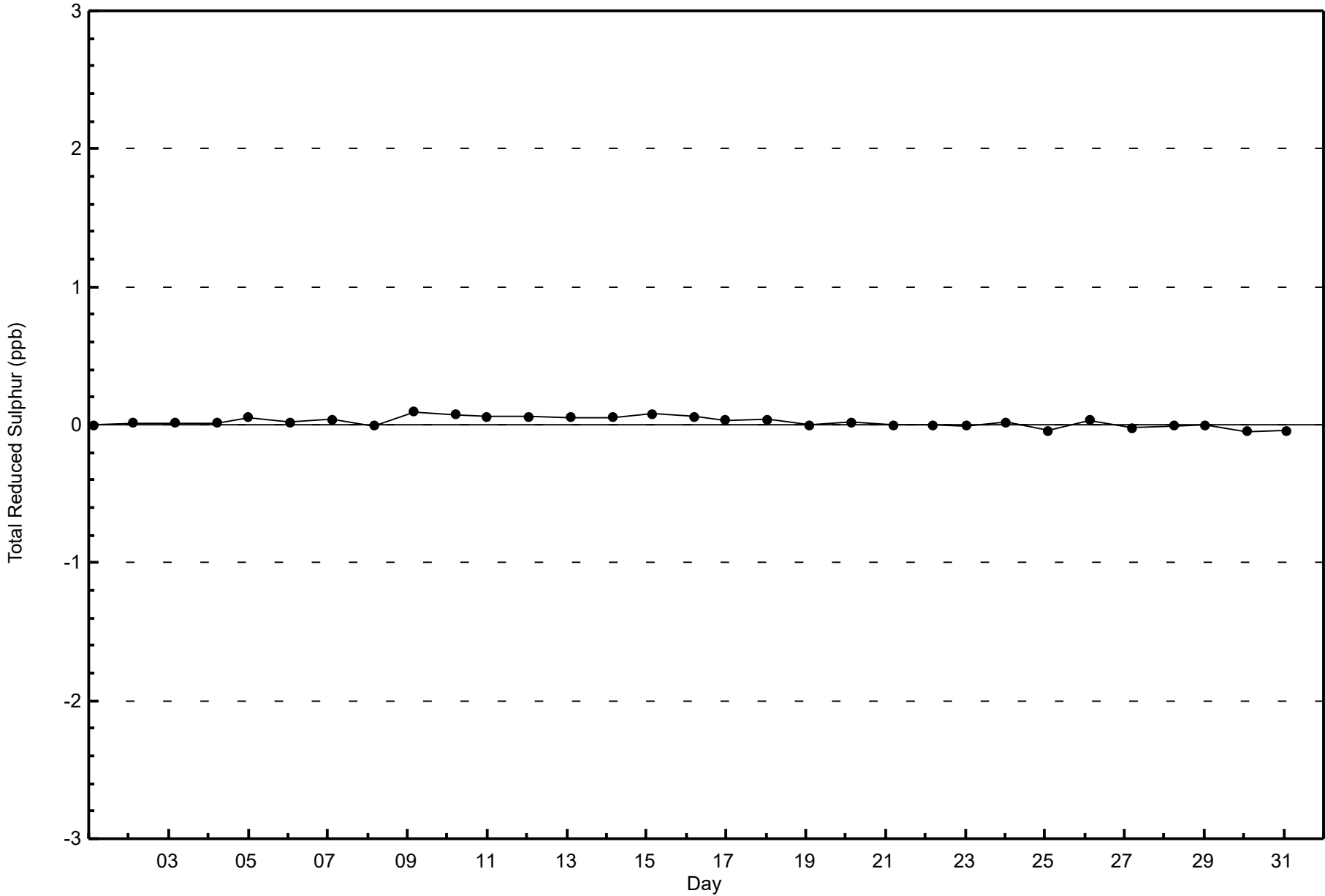


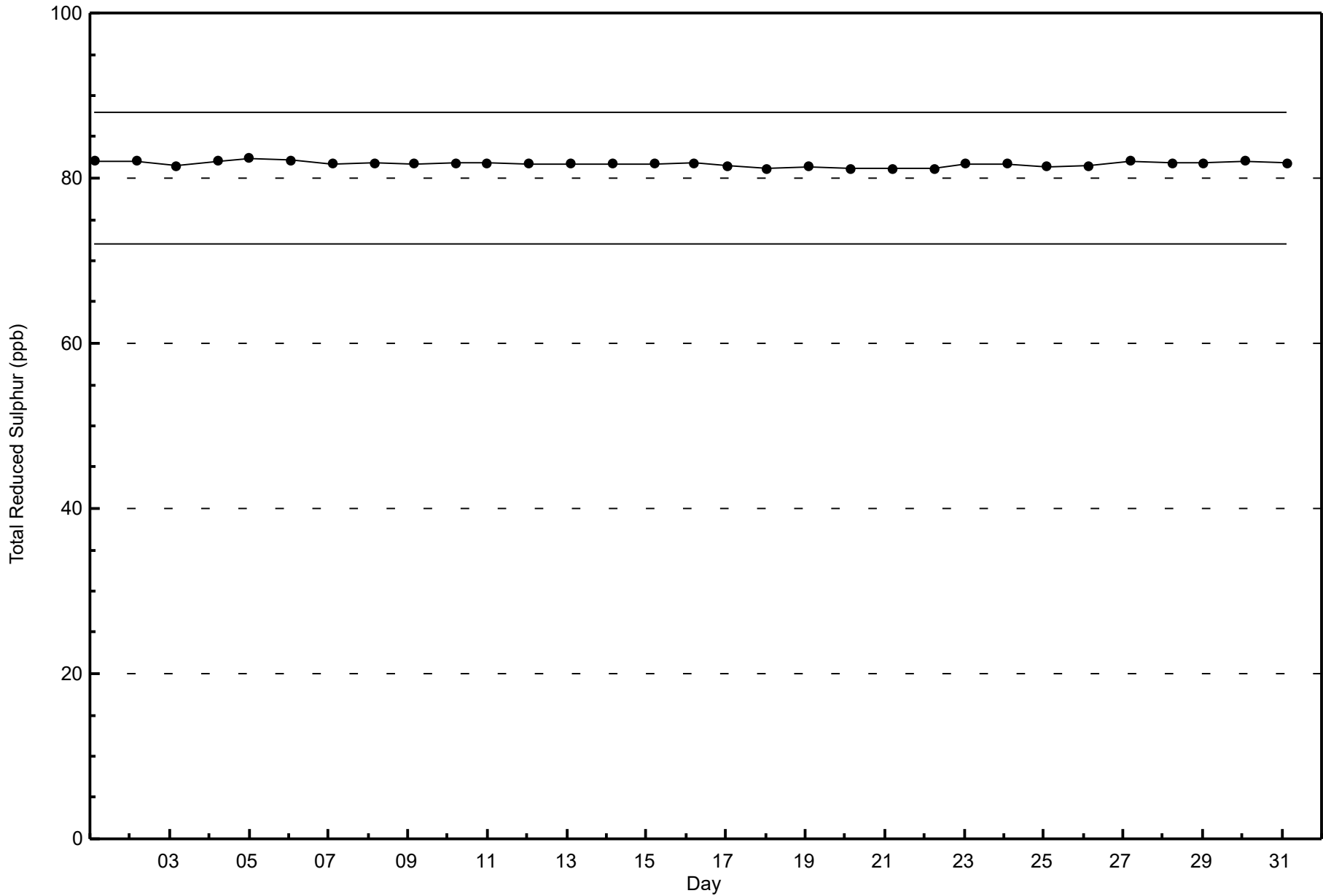
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Reduced Sulphur (TRS) - ppb
Ells River



Total Number of Valid Hours: 705







Wood Buffalo Environmental Association
Summary of Hour Averages

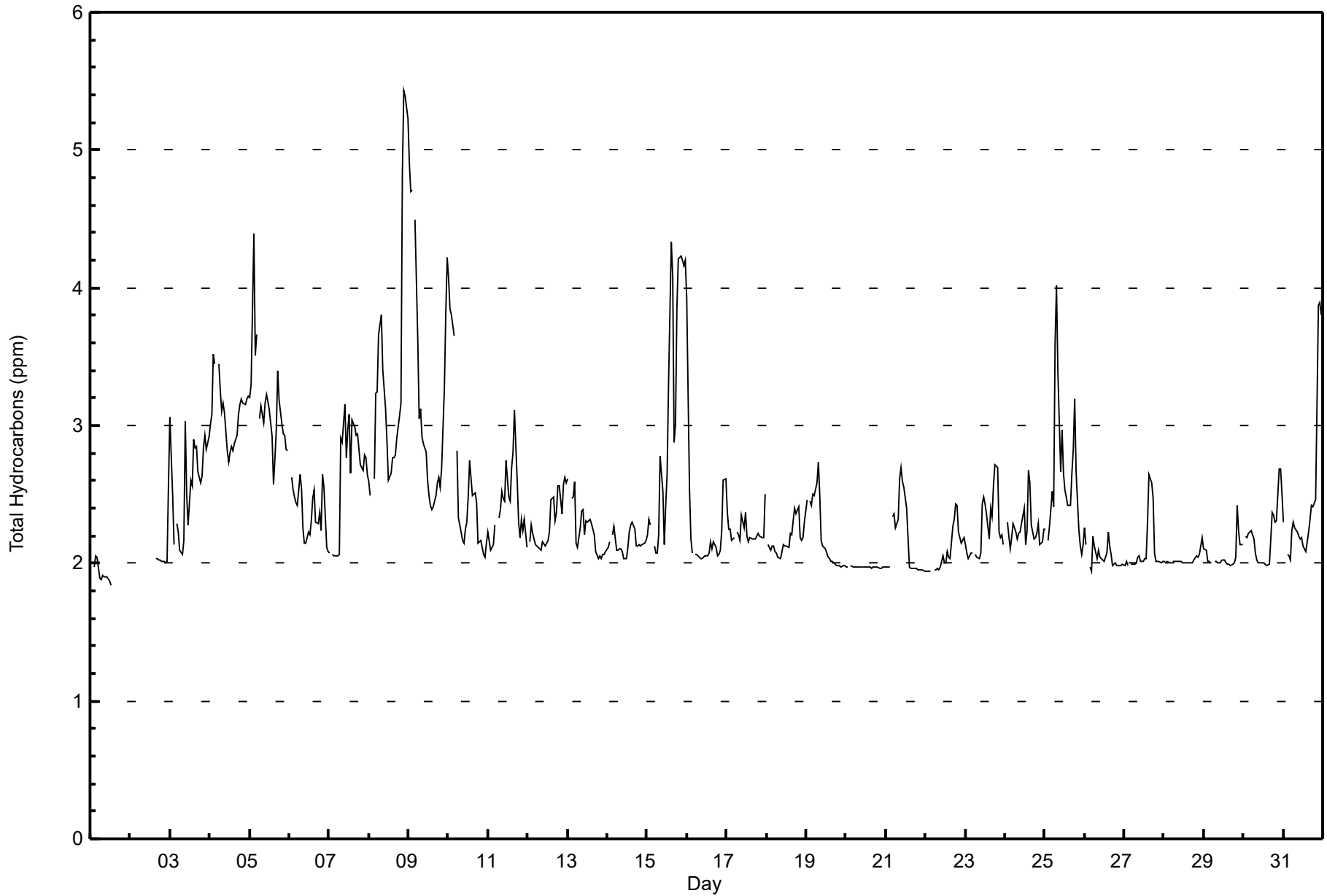
Total Hydrocarbons (THC) - ppm
Ells River - January 2023

Maximum Value: 5.4 ppm on Jan 8 22:00		Maximum Daily Average: 3.4 ppm on Jan 8		Hours in Service: 744																						
Minimum Value: 1.8 ppm on Jan 1 13:00		Minimum Daily Average: 2.0 ppm on Jan 20		Hours of Data: 688																						
Maximum Diurnal Average: 2.6 ppm at hour 24		Minimum Diurnal Average: 2.3 ppm at hour 13		Hours of Missing Data: 56																						
Monthly Average: 2.41 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.6 P ₉₀ = 3.1 P ₉₉ = 4.5		Hours of Calibration: 33																						
				Percent Operational Time: 96.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2.0	Z	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	M	M	M	M	M	UO	UO	UO	UO	UO	UO	--	2.1
2-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6	--	2.6
3-Jan	3.1	2.5	2.1	Z	2.3	2.2	2.1	2.1	2.2	3.0	2.5	2.3	2.6	2.6	2.9	2.8	2.8	2.7	2.6	2.6	2.8	2.9	2.8	2.9	2.6	3.1
4-Jan	3.0	3.1	3.5	3.4	Z	3.4	3.3	3.1	3.2	3.1	2.8	2.7	2.8	2.8	2.8	2.9	2.9	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.1	3.5
5-Jan	3.2	3.3	4.4	3.5	3.7	Z	3.0	3.1	3.0	3.2	3.2	3.2	3.1	2.9	2.6	2.8	3.0	3.4	3.2	3.0	2.9	2.9	2.8	2.8	3.1	4.4
6-Jan	Z	2.6	2.5	2.5	2.4	2.4	2.6	2.5	2.3	2.1	2.1	2.2	2.2	2.3	2.5	2.5	2.3	2.3	2.4	2.2	2.6	2.5	2.1	2.1	2.4	2.6
7-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.9	2.9	3.2	2.8	3.0	3.1	2.7	3.0	3.0	2.9	2.9	2.8	2.7	2.7	2.8	2.8	2.6	2.7	3.2
8-Jan	2.6	2.5	Z	2.6	3.2	3.2	3.7	3.8	3.4	3.3	3.1	2.9	2.6	2.7	2.8	2.8	2.8	2.9	3.1	3.2	4.8	5.4	5.4	5.2	3.4	5.4
9-Jan	4.9	4.7	4.7	Z	4.5	3.6	3.0	3.1	2.9	2.9	2.8	2.6	2.5	2.4	2.4	2.4	2.5	2.6	2.6	2.6	2.7	3.3	3.8	4.2	3.2	4.9
10-Jan	4.1	3.8	3.8	3.7	Z	2.8	2.3	2.3	2.2	2.1	2.2	2.3	2.5	2.7	2.5	2.5	2.5	2.4	2.1	2.2	2.1	2.1	2.0	2.1	2.6	4.1
11-Jan	2.2	2.1	2.1	2.1	2.3	Z	2.3	2.4	2.5	2.5	2.4	2.7	2.5	2.4	2.7	2.8	3.1	2.6	2.3	2.2	2.3	2.2	2.3	2.1	2.4	3.1
12-Jan	Z	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.5	2.5	2.3	2.4	2.6	2.6	2.4	2.6	2.6	2.6	2.3	2.6
13-Jan	2.6	Z	2.5	2.5	2.6	2.1	2.1	2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.6
14-Jan	2.1	2.2	Z	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3
15-Jan	2.2	2.3	2.3	Z	2.1	2.1	2.1	2.2	2.8	2.5	2.1	2.4	2.6	3.3	4.3	4.1	2.9	3.0	3.9	4.2	4.2	4.2	4.2	4.2	3.1	4.3
16-Jan	3.9	2.5	2.2	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.6	2.6	2.2	3.9
17-Jan	2.4	2.3	2.3	2.2	2.2	Z	2.2	2.2	2.2	2.4	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.2	2.5
18-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.4	2.2	2.2	2.2	2.3	2.2	2.4
19-Jan	2.5	Z	2.4	2.4	2.5	2.5	2.6	2.7	2.5	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.7
20-Jan	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
21-Jan	2.0	2.0	2.0	Z	2.3	2.4	2.3	2.3	2.6	2.7	2.6	2.6	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.2	2.7
22-Jan	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.3	2.3	2.4	2.4	2.2	2.1	2.2	2.2	2.1	2.4
23-Jan	2.1	2.1	2.0	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.4	2.5	2.4	2.4	2.2	2.4	2.3	2.6	2.7	2.7	2.2	2.2	2.2	2.1	2.3	2.7
24-Jan	Z	2.3	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.1	2.2	2.7	2.6	2.3	2.2	2.2	2.2	2.3	2.1	2.2	2.2	2.3	2.7
25-Jan	2.3	Z	2.2	2.3	2.5	2.4	3.6	4.0	3.4	2.7	3.0	2.7	2.5	2.5	2.4	2.4	2.7	2.8	3.2	2.7	2.2	2.1	2.1	2.1	2.6	4.0
26-Jan	2.3	2.1	Z	2.0	1.9	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.6	2.6	2.5	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.6
28-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.2	2.0	2.2
29-Jan	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.2	2.1	2.1	2.1	2.4
30-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.4	2.3	2.3	2.7	2.7	2.5	2.2	2.7
31-Jan	2.3	Z	2.1	2.1	2.0	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	3.2	3.9	3.9	3.8	2.5	3.9
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Ells River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	169	24.56	24.56
2.1 - 3.0	444	64.53	89.10
3.1 - 10.0	75	10.90	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Ells River - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	29	7	2	0	0	1	1	8	23	26	36	12	10	10	3	169
2.1 - 3.0	34	72	21	16	6	5	5	35	131	61	13	7	8	8	9	12	443
3.1 - 10.0	6	1	3	0	0	1	0	5	27	7	2	1	2	8	4	6	73
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	102	31	18	6	6	6	41	166	91	41	44	22	26	23	21	685

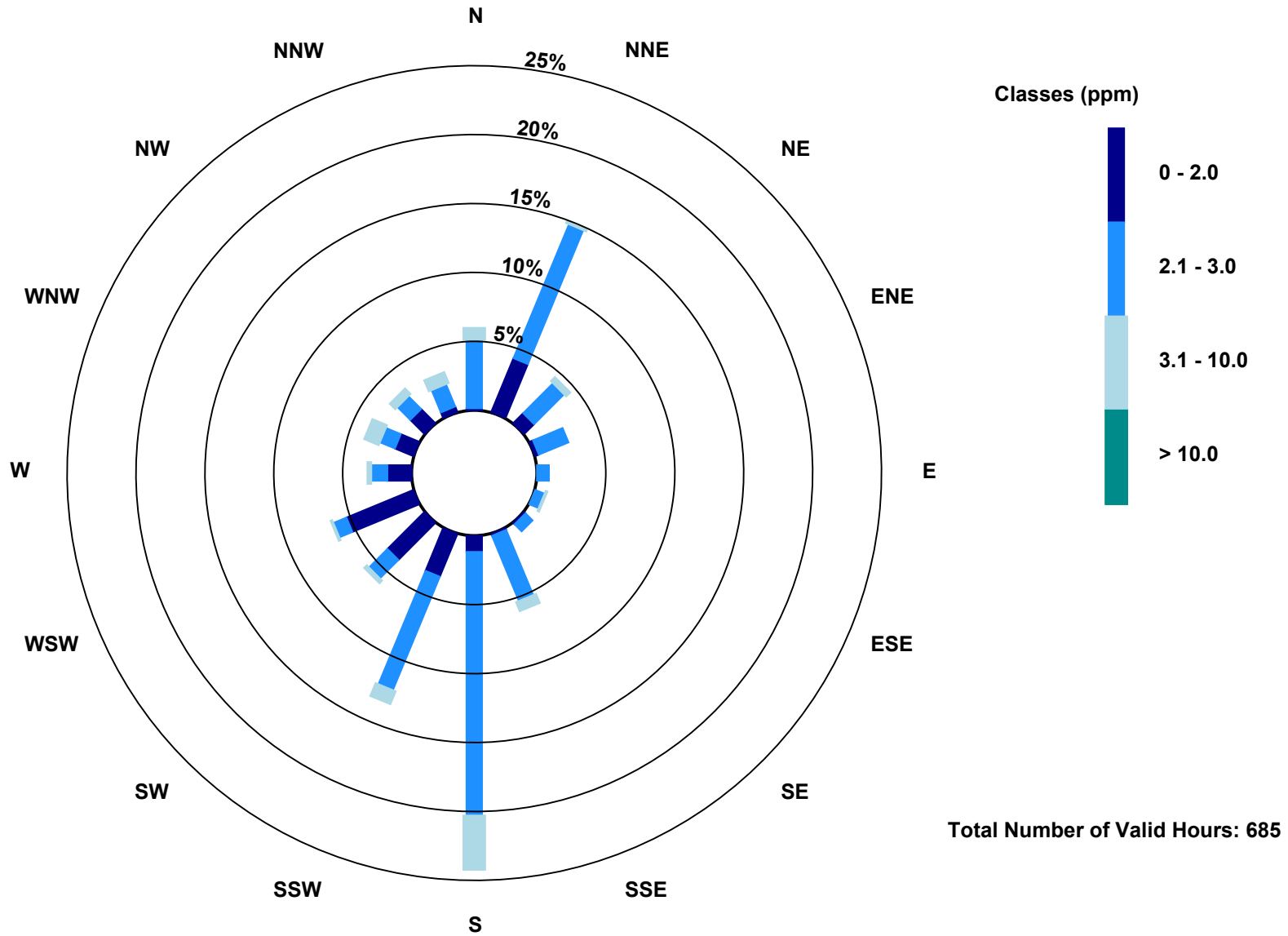
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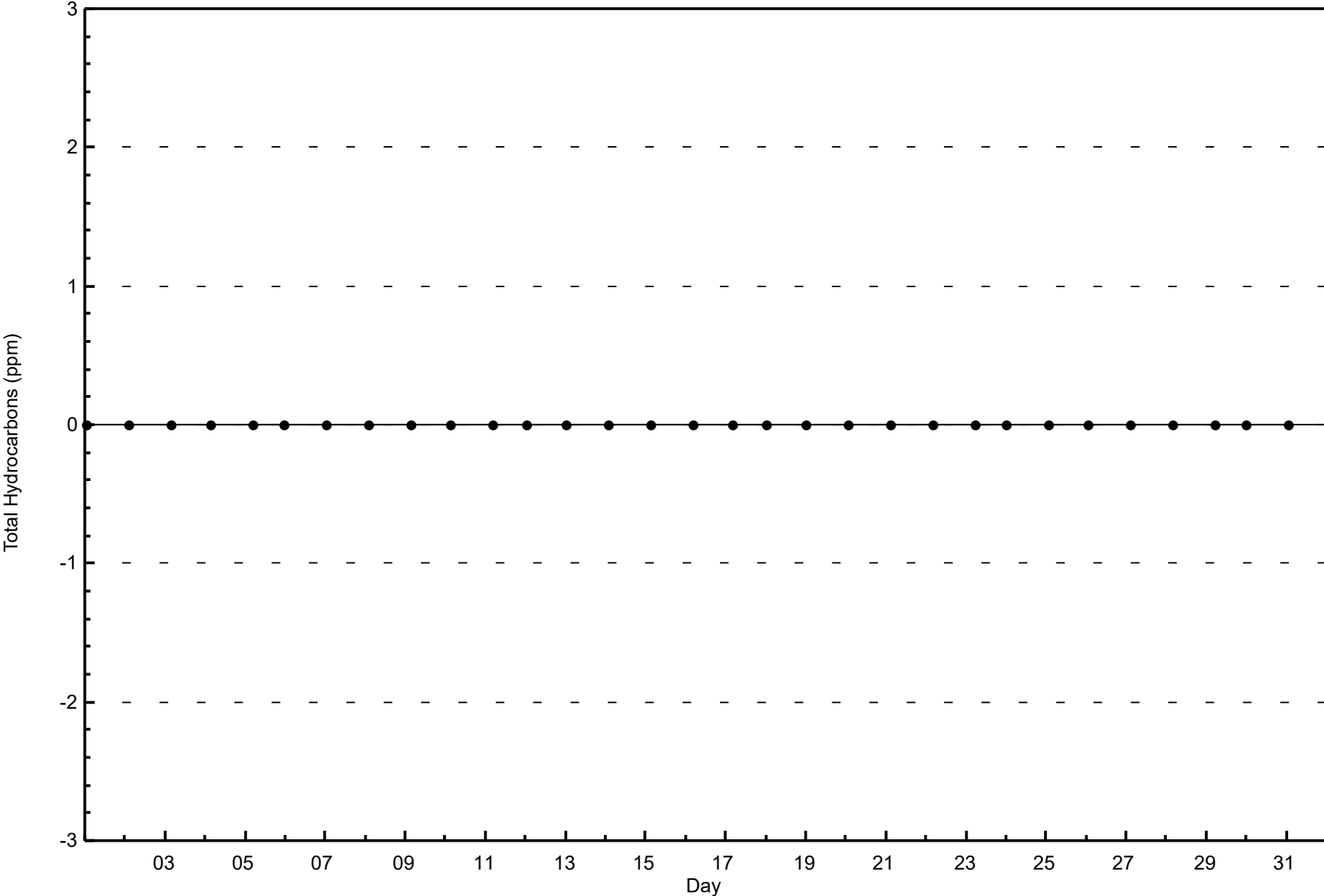
Total Number of Hours: 744

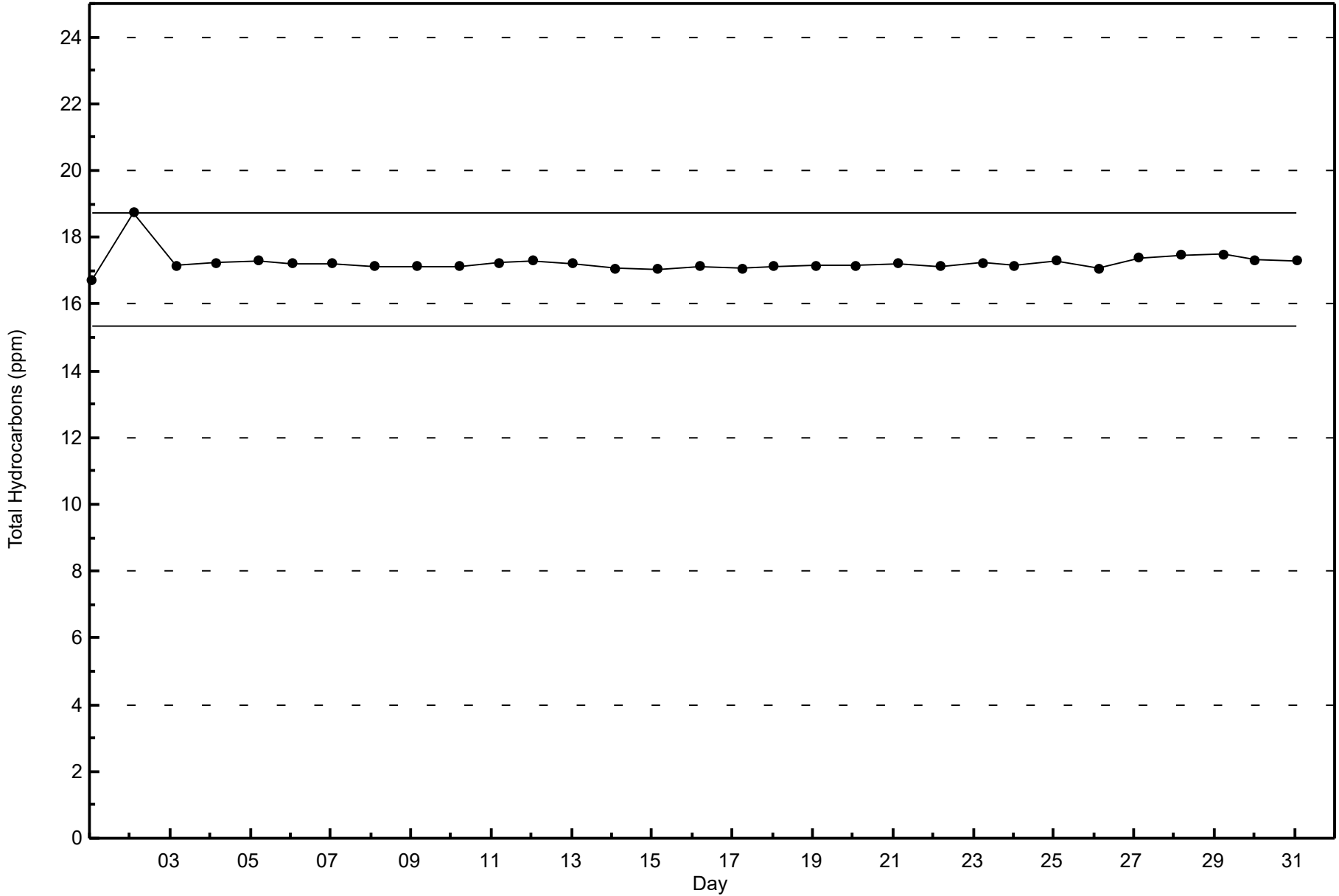


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Ells River





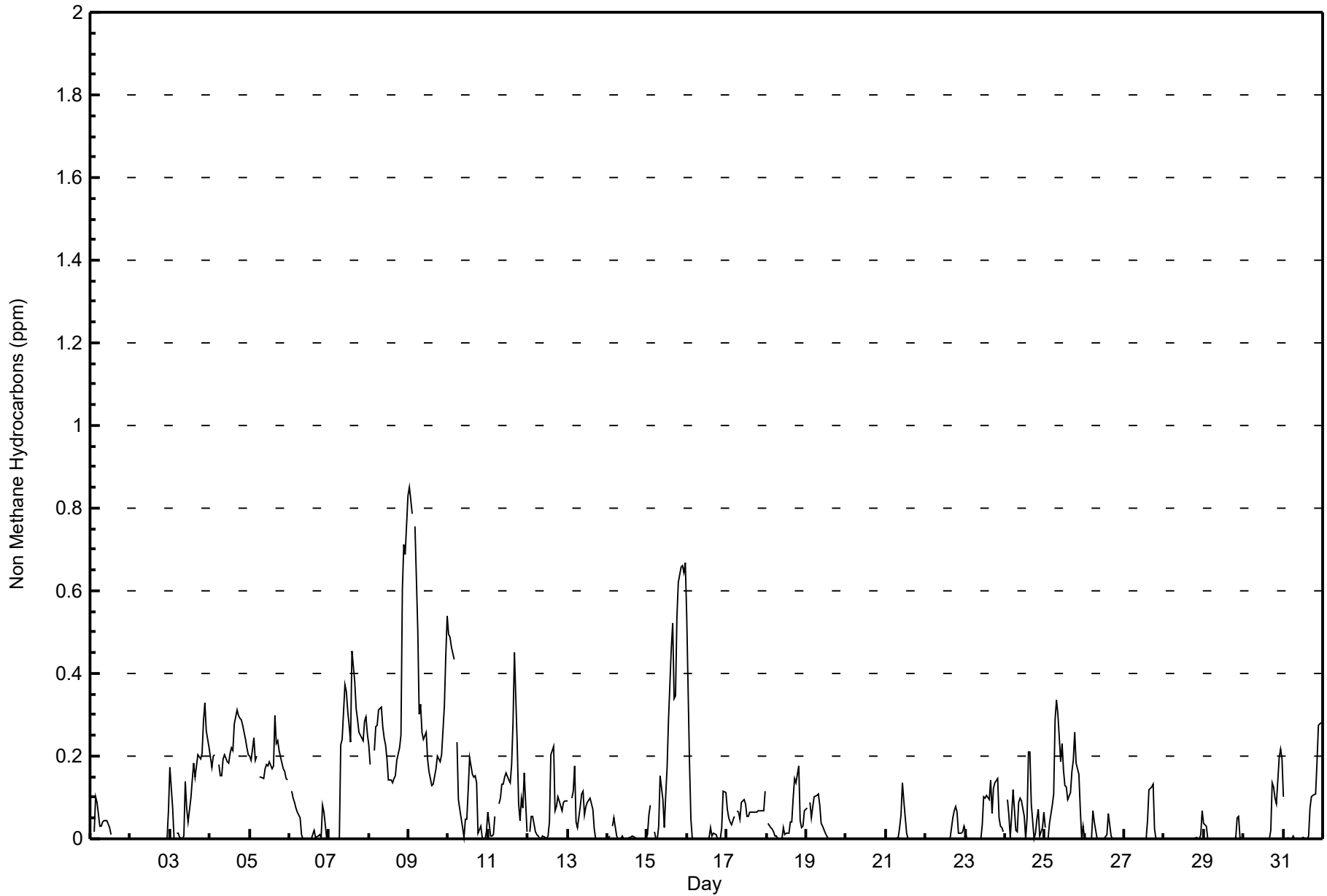




Summary of Hour Averages

Ells River - January 2023

Maximum Value: 0.850 ppm on Jan 9 01:00		Maximum Daily Average: 0.353 ppm on Jan 9		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Jan 2 16:00		Minimum Daily Average: 0.000 ppm on Jan 20		Hours of Data:	688																						
Maximum Diurnal Average: 0.134 ppm at hour 24		Minimum Diurnal Average: 0.058 ppm at hour 7		Hours of Missing Data:	56																						
Monthly Average: 0.093 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.3 P ₉₉ = 0.7		Hours of Calibration:	33																						
				Percent Operational Time:	96.9																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.020	Z	0.017	0.100	0.090	0.029	0.031	0.040	0.046	0.044	0.043	0.029	0.009	M	M	M	M	M	UO	UO	UO	UO	UO	UO	--	0.100	
2-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.069	--	0.069		
3-Jan	0.174	0.074	0.001	Z	0.013	0.014	0.003	0.000	0.006	0.140	0.074	0.041	0.099	0.142	0.183	0.150	0.177	0.205	0.194	0.207	0.284	0.328	0.263	0.221	0.130	0.328	
4-Jan	0.197	0.172	0.199	0.204	Z	0.180	0.153	0.152	0.193	0.204	0.187	0.183	0.208	0.220	0.212	0.278	0.312	0.299	0.292	0.287	0.274	0.242	0.219	0.204	0.221	0.312	
5-Jan	0.199	0.190	0.246	0.190	0.200	Z	0.150	0.151	0.146	0.169	0.179	0.176	0.168	0.151	0.146	0.299	0.229	0.239	0.212	0.184	0.171	0.163	0.147	0.143	0.188	0.299	
6-Jan	Z	0.115	0.098	0.087	0.075	0.064	0.049	0.010	0.000	0.000	0.000	0.000	0.000	0.012	0.022	0.003	0.008	0.009	0.005	0.080	0.063	0.001	0.001	0.030	0.115		
7-Jan	0.000	Z	0.000	0.001	0.000	0.000	0.000	0.228	0.240	0.372	0.355	0.307	0.276	0.233	0.454	0.381	0.317	0.288	0.257	0.250	0.237	0.285	0.294	0.254	0.219	0.454	
8-Jan	0.229	0.181	Z	0.214	0.270	0.276	0.311	0.318	0.271	0.244	0.227	0.193	0.143	0.143	0.137	0.146	0.154	0.190	0.221	0.251	0.605	0.712	0.688	0.830	0.302	0.830	
9-Jan	0.850	0.820	0.787	Z	0.756	0.505	0.303	0.327	0.258	0.239	0.256	0.193	0.162	0.144	0.128	0.131	0.170	0.201	0.192	0.187	0.204	0.322	0.445	0.540	0.353	0.850	
10-Jan	0.495	0.488	0.464	0.432	Z	0.232	0.095	0.072	0.028	0.002	0.047	0.047	0.120	0.195	0.155	0.150	0.154	0.137	0.013	0.029	0.005	0.000	0.000	0.017	0.147	0.495	
11-Jan	0.063	0.006	0.005	0.010	0.055	Z	0.084	0.097	0.132	0.131	0.148	0.160	0.141	0.136	0.180	0.280	0.451	0.227	0.084	0.043	0.098	0.076	0.161	0.015	0.121	0.451	
12-Jan	Z	0.017	0.056	0.055	0.017	0.009	0.006	0.000	0.001	0.005	0.004	0.002	0.006	0.041	0.203	0.223	0.068	0.077	0.100	0.091	0.067	0.089	0.091	0.090	0.057	0.223	
13-Jan	0.091	Z	0.099	0.115	0.175	0.040	0.028	0.079	0.110	0.114	0.058	0.078	0.088	0.097	0.083	0.071	0.024	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.059	0.175	
14-Jan	0.001	0.006	Z	0.032	0.049	0.006	0.000	0.000	0.001	0.006	0.001	0.000	0.000	0.004	0.002	0.006	0.003	0.001	0.000	0.002	0.002	0.000	0.002	0.005	0.006	0.049	
15-Jan	0.010	0.057	0.082	Z	0.017	0.000	0.000	0.031	0.152	0.096	0.026	0.107	0.173	0.287	0.461	0.521	0.339	0.345	0.535	0.620	0.657	0.661	0.645	0.668	0.282	0.668	
16-Jan	0.538	0.182	0.048	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.029	0.007	0.014	0.011	0.000	0.000	0.000	0.027	0.116	0.111	0.047	0.538	
17-Jan	0.073	0.052	0.042	0.033	0.053	Z	0.069	0.066	0.047	0.088	0.095	0.084	0.053	0.053	0.065	0.064	0.064	0.063	0.064	0.068	0.067	0.068	0.069	0.114	0.066	0.114	
18-Jan	Z	0.038	0.028	0.023	0.017	0.008	0.006	0.002	0.001	0.001	0.026	0.009	0.013	0.014	0.041	0.039	0.098	0.147	0.137	0.175	0.045	0.026	0.031	0.067	0.043	0.175	
19-Jan	0.076	Z	0.088	0.052	0.080	0.100	0.104	0.109	0.080	0.038	0.029	0.014	0.008	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.109	
20-Jan	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
21-Jan	0.000	0.000	0.000	Z	0.000	0.001	0.001	0.002	0.027	0.059	0.135	0.093	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.135	
22-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.066	0.079	0.065	0.015	0.012	0.016	0.029	0.015	0.079	
23-Jan	0.019	0.000	0.000	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.034	0.101	0.099	0.104	0.096	0.141	0.062	0.122	0.135	0.145	0.052	0.030	0.028	0.017	0.052	0.145	
24-Jan	Z	0.096	0.059	0.004	0.056	0.120	0.021	0.016	0.089	0.097	0.092	0.055	0.001	0.051	0.212	0.212	0.084	0.001	0.012	0.048	0.071	0.008	0.026	0.064	0.065	0.212	
25-Jan	0.028	Z	0.001	0.036	0.080	0.110	0.288	0.337	0.302	0.188	0.229	0.168	0.129	0.125	0.096	0.111	0.161	0.189	0.259	0.182	0.158	0.070	0.000	0.031	0.142	0.337	
26-Jan	0.003	0.000	Z	0.000	0.000	0.069	0.041	0.001	0.002	0.000	0.000	0.000	0.000	0.010	0.061	0.034	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.069	
27-Jan	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043	0.119	0.125	0.133	0.025	0.000	0.000	0.000	0.000	0.000	0.019	0.133	
28-Jan	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.010	0.069	0.004	0.069	
29-Jan	0.037	0.029	0.001	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.052	0.054	0.002	0.000	0.008	0.054	
30-Jan	Z	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.134	0.125	0.097	0.084	0.198	0.218	0.194	0.047	0.218	
31-Jan	0.101	Z	0.002	0.000	0.000	0.000	0.006	0.001	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.008	0.076	0.101	0.105	0.107	0.186	0.275	0.277	0.281	0.066	0.281	
		0.128	0.105	0.089	0.064	0.080	0.071	0.058	0.068	0.071	0.075	0.075	0.068	0.064	0.075	0.104	0.113	0.105	0.106	0.102	0.102	0.114	0.124	0.125	0.134	Diurnal Average	
		0.850	0.820	0.787	0.432	0.756	0.505	0.311	0.337	0.302	0.372	0.355	0.307	0.276	0.287	0.461	0.521	0.451	0.345	0.535	0.620	0.657	0.712	0.688	0.830	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				UO - Unstable Operation																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	264	38.37	38.37
0.006 - 0.05	118	17.15	55.52
0.06 - 0.1	143	20.78	76.31
> 0.1	163	23.69	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	11	50	11	5	2	1	3	8	31	35	26	37	13	13	13	4	263
0.006 - 0.05	8	19	3	9	1	1	0	4	36	19	11	0	2	0	0	5	118
0.06 - 0.1	5	21	12	2	3	2	2	12	47	19	2	3	4	3	2	4	143
> 0.1	17	12	5	2	0	2	1	17	52	18	2	4	3	10	8	8	161
Totals	41	102	31	18	6	6	6	41	166	91	41	44	22	26	23	21	685

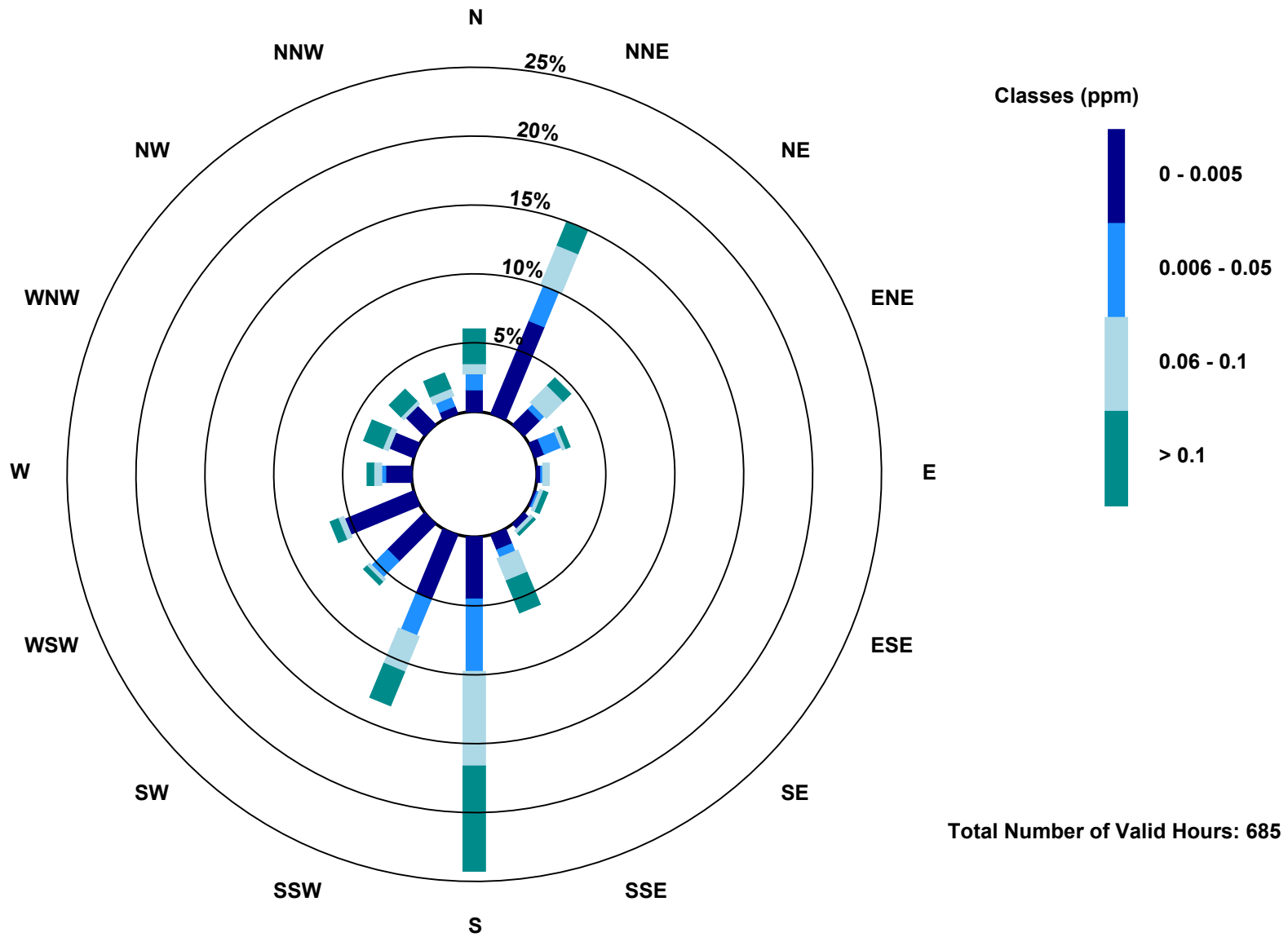
Total Number of Valid Hours: 685

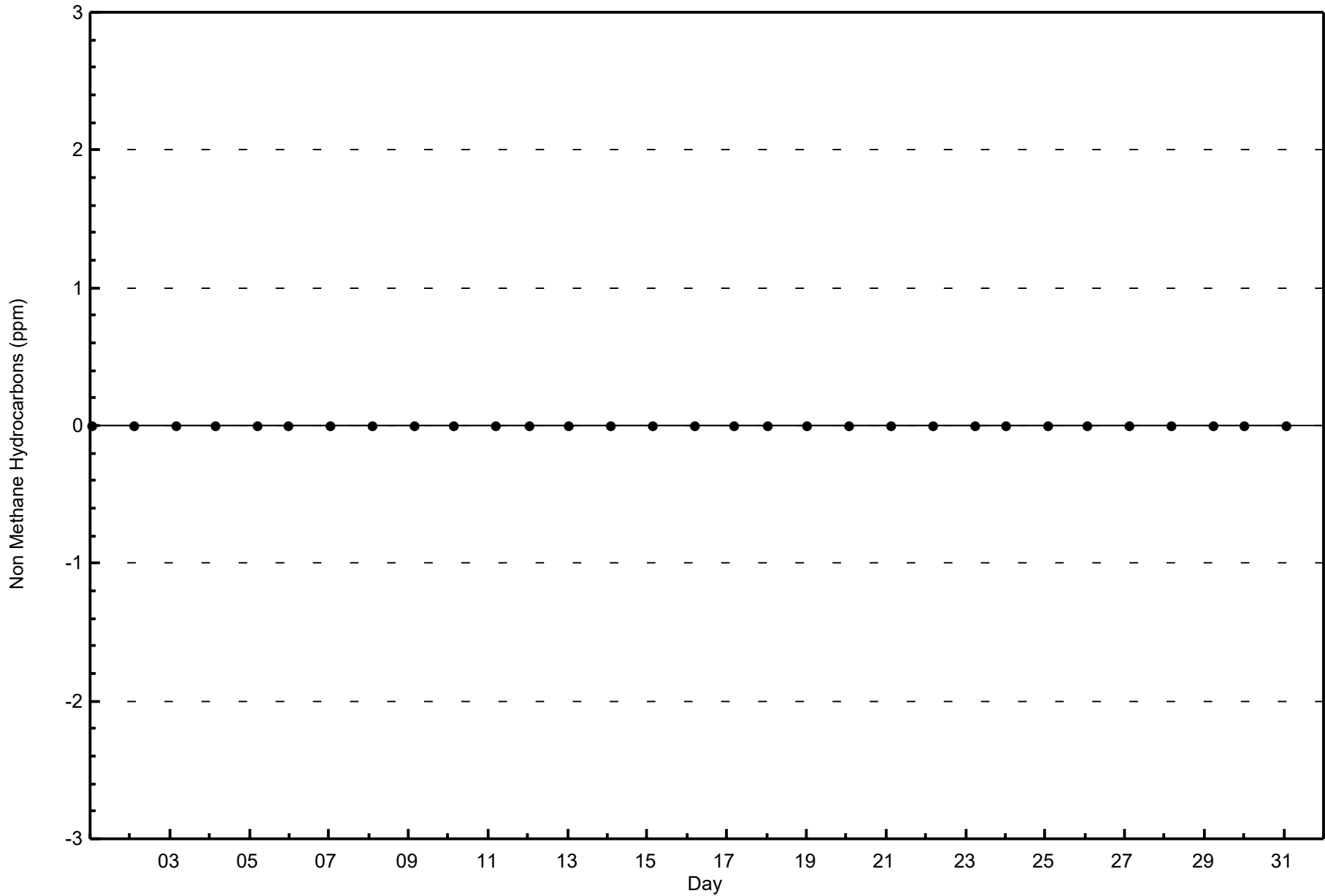
Total Number of Hours: 744

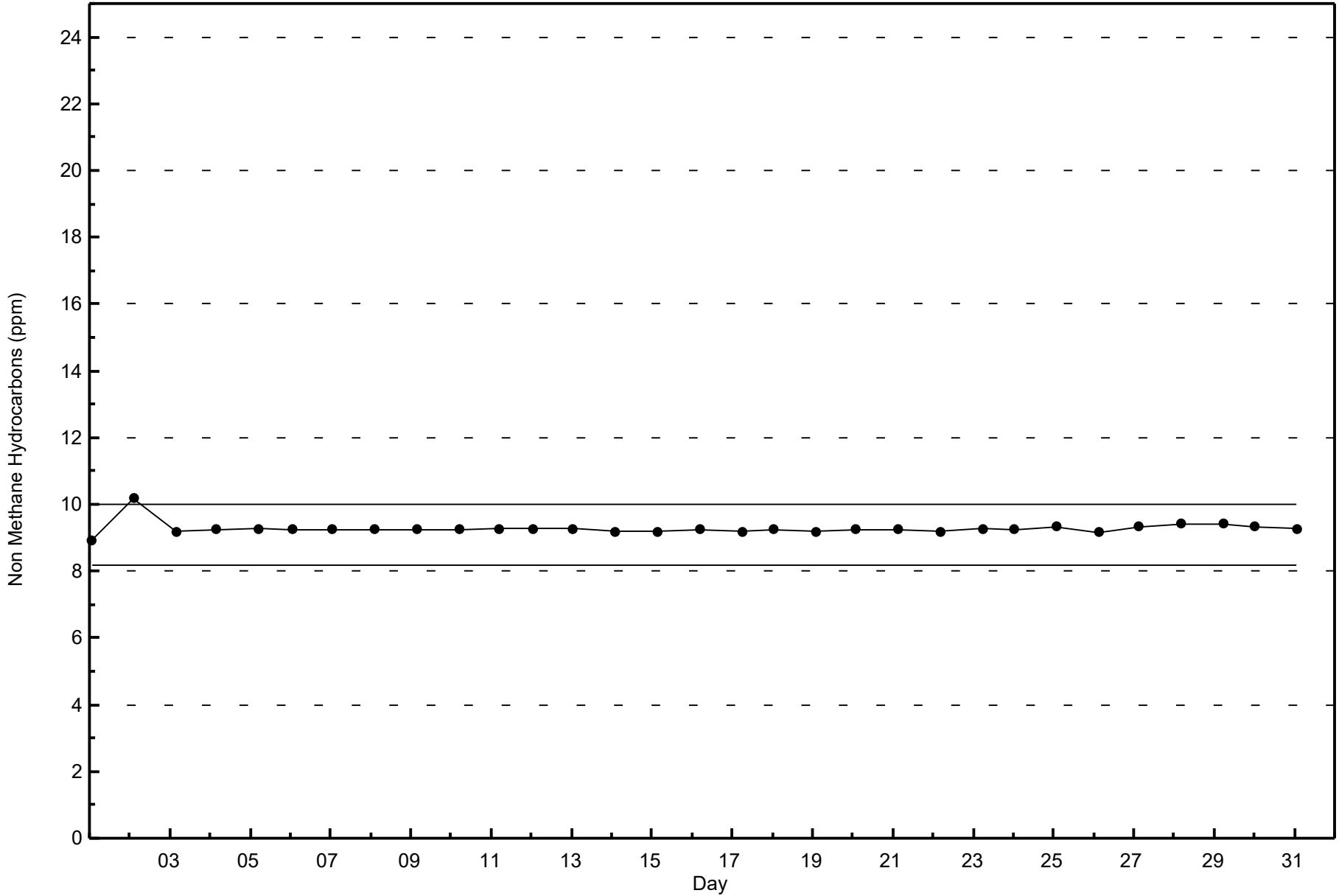


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Non Methane Hydrocarbons (NMHC) - ppm
Ells River

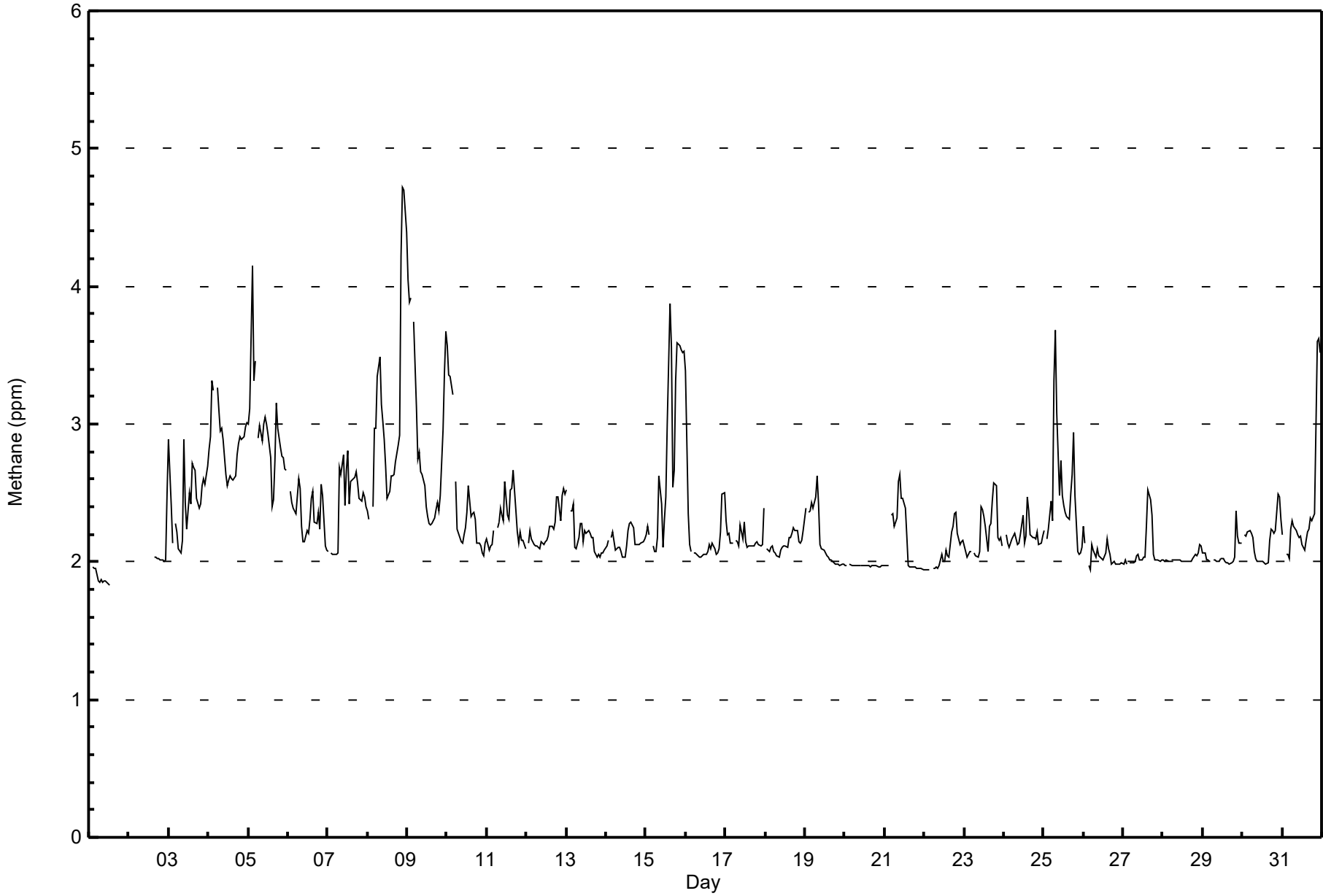








Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 4.7 ppm on Jan 8 22:00		Maximum Daily Average: 3.1 ppm on Jan 8		Hours of Data: 688														Hours of Missing Data: 56		Hours of Calibration: 33							
Minimum Value: 1.8 ppm on Jan 1 13:00		Minimum Daily Average: 2.0 ppm on Jan 20		Hours of Calibration: 33														Percent Operational Time: 96.9									
Maximum Diurnal Average: 2.5 ppm at hour 24		Minimum Diurnal Average: 2.2 ppm at hour 13		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.4 P ₉₀ = 2.9 P ₉₉ = 3.9																							
Monthly Average: 2.32 ppm																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	M	M	M	M	M	UO	UO	UO	UO	UO	UO	--	2.0	
2-Jan	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	--	2.5	
3-Jan	2.9	2.4	2.1	Z	2.3	2.2	2.1	2.1	2.2	2.9	2.4	2.2	2.5	2.4	2.7	2.7	2.7	2.5	2.4	2.4	2.5	2.6	2.6	2.7	2.5	2.9	
4-Jan	2.8	2.9	3.3	3.2	Z	3.3	3.1	3.0	3.0	2.9	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.8	2.9	2.9	2.9	2.9	3.0	3.0	2.9	3.3	
5-Jan	3.0	3.1	4.1	3.3	3.5	Z	2.9	3.0	2.9	3.0	3.0	3.0	2.9	2.8	2.4	2.5	2.7	3.2	3.0	2.8	2.8	2.8	2.7	2.7	3.0	4.1	
6-Jan	Z	2.5	2.4	2.4	2.4	2.4	2.6	2.5	2.3	2.1	2.1	2.2	2.2	2.3	2.5	2.5	2.3	2.3	2.4	2.2	2.6	2.5	2.1	2.1	2.3	2.6	
7-Jan	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.7	2.6	2.8	2.4	2.7	2.8	2.4	2.6	2.6	2.6	2.7	2.6	2.5	2.4	2.5	2.5	2.4	2.4	2.8	
8-Jan	2.4	2.3	Z	2.4	3.0	3.0	3.3	3.5	3.1	3.0	2.9	2.7	2.5	2.5	2.6	2.6	2.6	2.7	2.8	2.9	4.2	4.7	4.7	4.4	3.1	4.7	
9-Jan	4.0	3.9	3.9	Z	3.7	3.1	2.7	2.8	2.7	2.6	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	3.0	3.4	3.7	2.9	4.0	
10-Jan	3.6	3.4	3.3	3.2	Z	2.6	2.2	2.2	2.1	2.1	2.2	2.3	2.4	2.6	2.3	2.4	2.4	2.3	2.1	2.1	2.1	2.1	2.0	2.1	2.4	3.6	
11-Jan	2.2	2.1	2.1	2.1	2.2	Z	2.2	2.3	2.4	2.3	2.3	2.6	2.3	2.3	2.5	2.5	2.7	2.4	2.2	2.1	2.2	2.2	2.2	2.1	2.3	2.7	
12-Jan	Z	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.3	2.5	2.5	2.3	2.5	2.5	2.5	2.2	2.5	
13-Jan	2.5	Z	2.4	2.4	2.4	2.1	2.1	2.2	2.3	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.5	
14-Jan	2.1	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3	
15-Jan	2.2	2.3	2.2	Z	2.1	2.1	2.1	2.2	2.6	2.4	2.1	2.3	2.5	3.0	3.9	3.6	2.5	2.7	3.3	3.6	3.6	3.5	3.5	3.5	2.8	3.9	
16-Jan	3.4	2.4	2.1	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.5	2.2	3.4	
17-Jan	2.3	2.2	2.2	2.1	2.1	Z	2.2	2.1	2.1	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.2	2.4	
18-Jan	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2	
19-Jan	2.4	Z	2.4	2.4	2.4	2.4	2.5	2.6	2.4	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.6	
20-Jan	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
21-Jan	2.0	2.0	2.0	Z	2.3	2.4	2.3	2.3	2.6	2.6	2.5	2.5	2.4	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.2	2.6	
22-Jan	1.9	1.9	1.9	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.2	2.3	2.3	2.4	2.2	2.1	2.1	2.2	2.1	2.4	
23-Jan	2.1	2.1	2.0	2.1	2.1	Z	2.1	2.0	2.0	2.1	2.4	2.4	2.3	2.3	2.1	2.3	2.3	2.4	2.6	2.5	2.2	2.2	2.2	2.1	2.2	2.6	
24-Jan	Z	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.1	2.2	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.5	
25-Jan	2.2	Z	2.2	2.2	2.4	2.3	3.3	3.7	3.1	2.5	2.7	2.5	2.4	2.4	2.3	2.3	2.5	2.6	2.9	2.5	2.1	2.1	2.1	2.1	2.5	3.7	
26-Jan	2.3	2.1	Z	2.0	1.9	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	
27-Jan	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.5	2.5	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.5	
28-Jan	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.1	
29-Jan	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	2.2	2.1	2.1	2.0	2.4	
30-Jan	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.3	2.2	2.5	
31-Jan	2.2	Z	2.1	2.1	2.0	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.4	3.0	3.6	3.6	3.5	2.4	3.6	
																								Diurnal Average		Diurnal Maximum	
2.4 2.3 2.4 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.2 2.3 2.2 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.4 2.4 2.4 2.5																								2.4		2.5	
4.0 3.9 4.1 3.3 3.7 3.3 3.3 3.7 3.1 3.0 3.0 3.0 2.9 3.0 3.9 3.6 2.7 3.2 3.3 3.6 4.2 4.7 4.7 4.4																								4.0		4.4	
Z - zerospan				C - Calibration				M - Maintenance				UO - Unstable Operation															





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Ells River - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	170	24.71	24.71
2.1 - 3.0	476	69.19	93.90
3.1 - 10.0	42	6.10	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 688

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Ells River - January 2023**

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	1	29	7	2	0	0	1	1	8	23	26	37	12	10	10	3	170
2.1 - 3.0	37	72	21	16	6	5	5	37	150	64	14	6	8	11	9	14	475
3.1 - 10.0	3	1	3	0	0	1	0	3	8	4	1	1	2	5	4	4	40
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	102	31	18	6	6	6	41	166	91	41	44	22	26	23	21	685

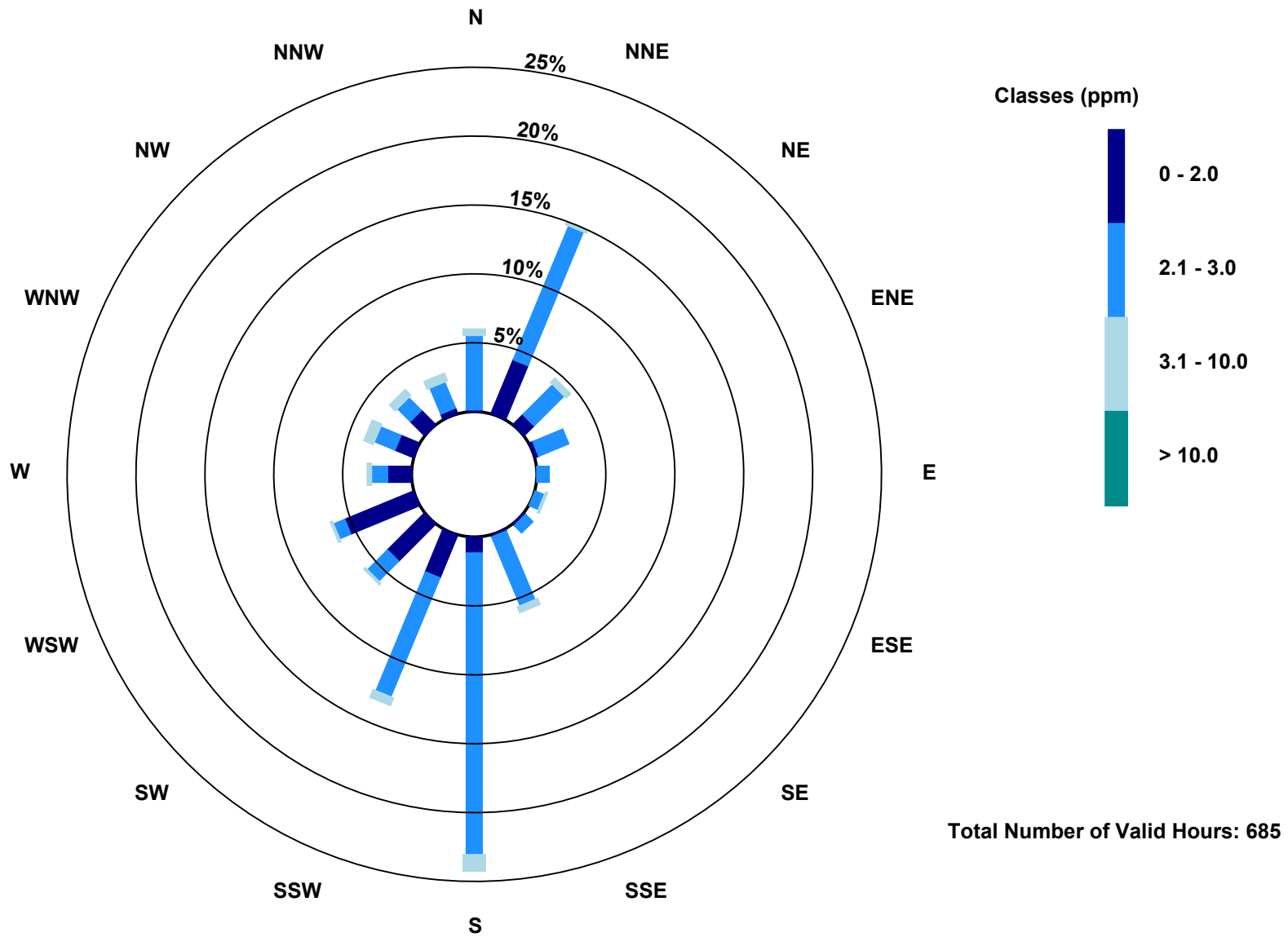
Total Number of Valid Hours: 685

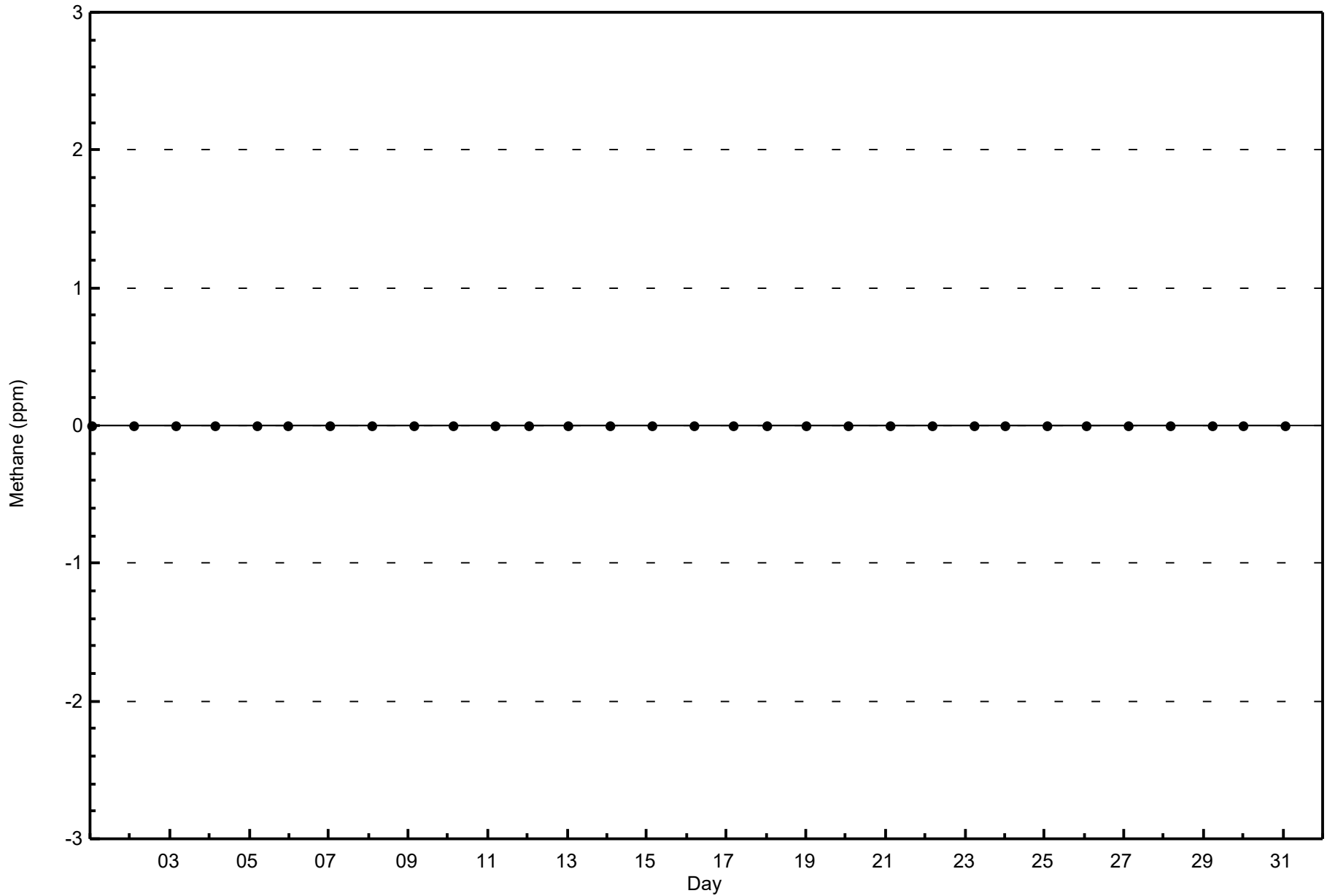
Total Number of Hours: 744

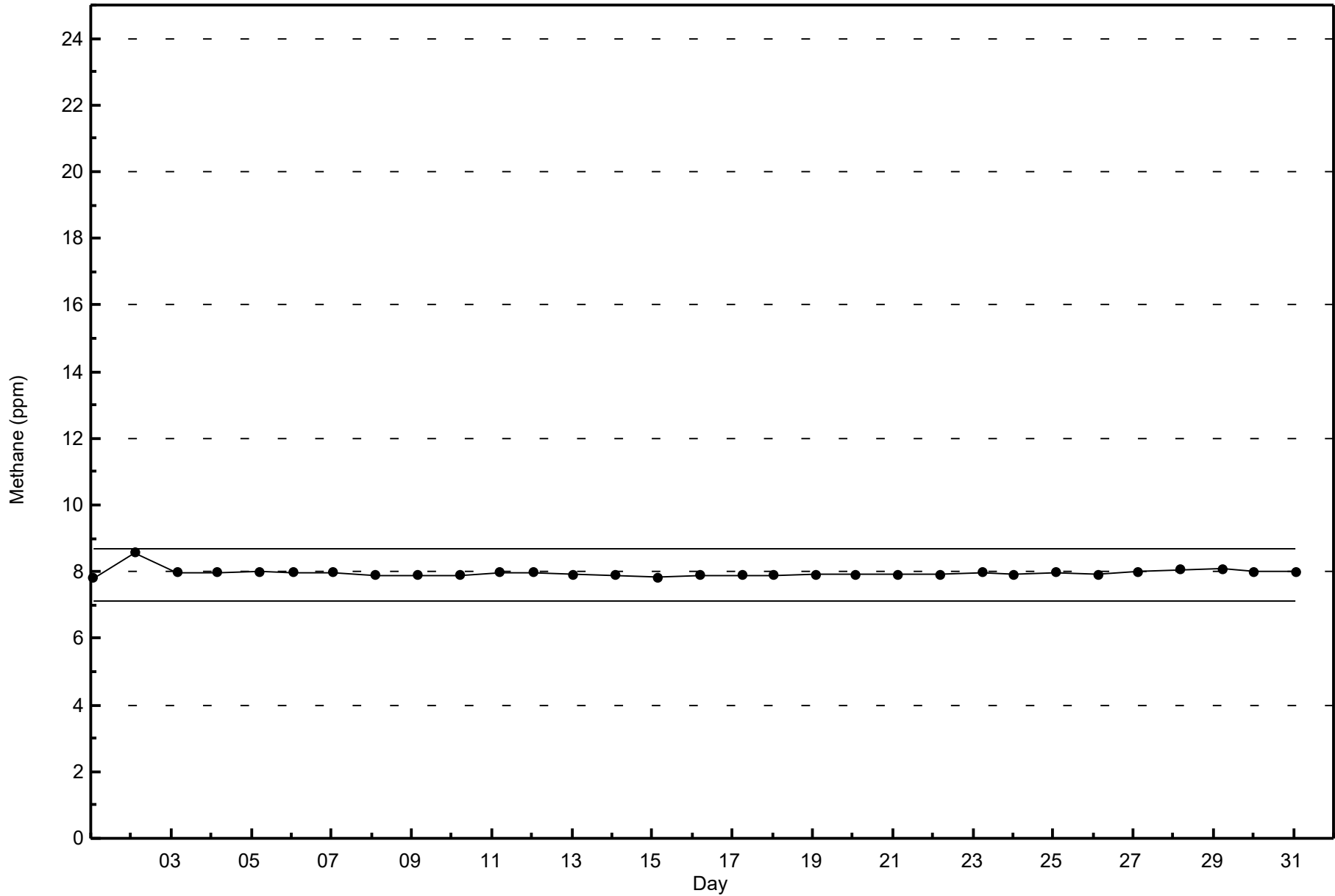


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Methane (CH₄) - ppm
Ells River









Wood Buffalo Environmental Association
Summary of Hour Averages

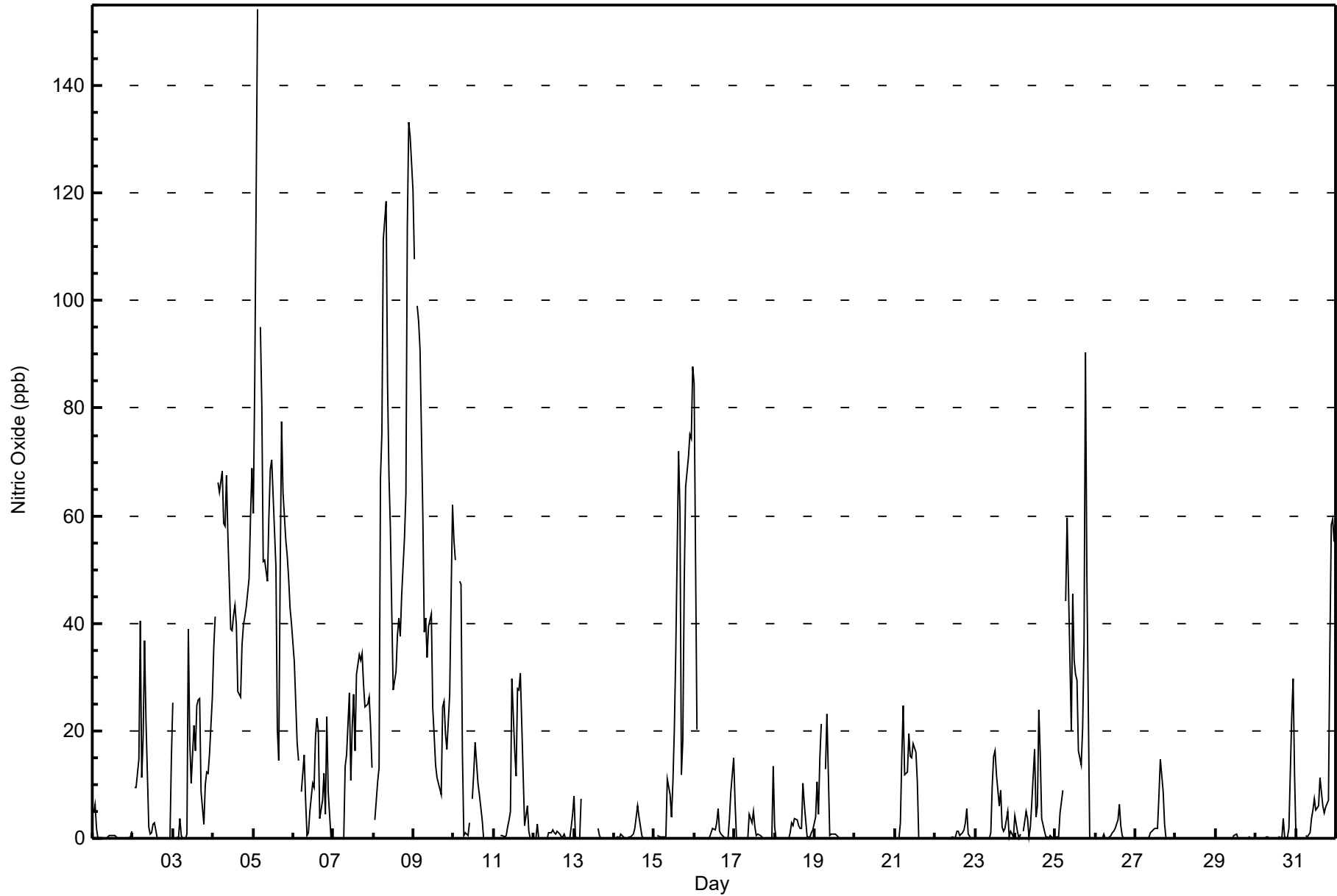
Nitric Oxide (NO) - ppb
Ells River - January 2023

Maximum Value: 154.1 ppb on Jan 5 03:00 Maximum Daily Average: 64.8 ppb on Jan 8																				Hours in Service: 744 Hours of Data: 707									
Minimum Value: 0.0 ppb on Jan 1 18:00 Minimum Daily Average: 0.0 ppb on Jan 20 Maximum Diurnal Average: 17.8 ppb at hour 5 Minimum Diurnal Average: 9.1 ppb at hour 17 Monthly Average: 12.71 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 1.0 Q ₃ = 15.0 P ₉₀ = 44.6 P ₉₉ = 107.1																				Hours of Missing Data: 37 Hours of Calibration: 36 Percent Operational Time: 99.9									
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1-Jan	4.6	6.2	1.7	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.4	0.6	0.6	0.5	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.3	1.4	0.8	6.2			
2-Jan	Z	9.4	9.5	14.7	40.4	11.3	18.7	36.8	22.1	2.2	0.9	1.0	2.7	2.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	8.2	40.4			
3-Jan	25.2	Z	0.1	0.0	3.8	0.6	0.0	0.0	0.7	38.8	18.1	10.4	21.1	16.2	24.8	25.7	25.9	8.7	2.6	10.1	12.2	12.0	15.8	26.3	13.0	38.8			
4-Jan	35.6	41.2	Z	66.1	64.3	68.4	58.5	58.2	67.5	56.3	38.8	38.7	41.5	43.4	39.7	27.3	26.2	35.9	39.6	41.2	43.0	48.3	59.6	68.9	48.2	68.9			
5-Jan	60.5	85.0	154.1	Z	95.0	80.7	51.5	51.7	47.7	59.5	68.5	70.4	63.9	50.5	20.1	14.4	49.3	77.4	64.5	55.3	52.5	48.4	42.8	40.1	61.0	154.1			
6-Jan	32.9	25.4	17.9	14.5	Z	8.8	15.5	7.2	0.5	1.0	5.0	10.3	9.5	19.0	22.5	19.9	3.6	7.2	12.2	4.5	22.7	8.7	0.0	0.1	11.7	32.9			
7-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.1	13.3	15.5	27.1	10.7	20.7	26.8	16.3	30.5	34.3	33.1	34.3	28.6	24.4	25.1	26.2	20.7	13.3	17.4	34.3			
8-Jan	Z	3.3	10.6	13.1	67.0	75.5	111.5	118.4	84.5	67.5	57.7	41.9	27.5	31.1	38.0	40.9	37.7	45.3	56.0	64.0	113.7	133.1	130.6	120.6	64.8	133.1			
9-Jan	107.6	Z	99.0	96.2	91.0	59.5	38.4	41.1	33.6	39.5	41.8	24.3	19.1	13.7	11.3	10.1	8.2	24.4	25.6	19.5	16.5	26.9	45.2	61.9	41.5	107.6			
10-Jan	55.4	51.8	Z	47.8	47.4	15.9	0.5	1.0	0.6	2.9	UO	7.4	12.1	17.8	10.4	8.2	5.8	3.5	0.1	0.0	0.0	0.0	0.0	0.1	13.1	55.4			
11-Jan	0.0	0.0	0.0	Z	0.6	0.4	0.4	0.5	2.1	3.3	4.9	29.7	16.2	11.6	27.8	27.7	30.7	11.8	2.3	4.2	5.9	1.3	0.0	0.0	7.9	30.7			
12-Jan	0.1	0.0	2.6	0.1	Z	0.0	0.0	0.0	0.1	1.0	1.1	1.5	1.0	0.8	1.3	0.9	0.2	0.3	0.9	0.1	0.0	0.1	2.2	4.4	0.8	4.4			
13-Jan	7.9	0.3	0.0	0.1	7.4	Z	0.0	0.1	0.1	C	C	C	C	C	1.8	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	1.0	7.9			
14-Jan	Z	0.3	0.3	0.1	0.7	0.2	0.0	0.0	0.0	0.3	0.3	0.7	1.9	3.9	6.1	3.9	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.8	6.1			
15-Jan	0.1	Z	0.6	0.4	0.4	0.1	0.3	0.2	10.9	8.2	3.8	10.5	20.3	34.3	71.9	60.8	11.8	18.2	47.5	65.5	71.0	75.2	74.4	87.8	29.3	87.8			
16-Jan	84.7	20.2	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.1	2.0	1.6	3.0	5.6	1.2	0.7	0.4	0.0	0.0	0.0	3.6	8.6	15.0	6.4	84.7			
17-Jan	6.5	0.0	0.0	Z	0.0	0.1	0.0	0.0	0.1	4.5	2.9	5.0	2.0	0.6	0.7	0.4	0.1	0.0	0.0	0.1	0.0	0.0	0.0	13.5	1.6	13.5			
18-Jan	2.1	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.1	2.8	2.3	3.7	3.5	2.5	2.0	1.9	10.1	6.3	0.1	0.2	0.3	1.0	1.5	1.8	10.1			
19-Jan	3.8	10.5	4.5	15.0	21.2	Z	13.0	23.1	12.0	0.6	0.8	0.8	0.7	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	23.1			
20-Jan	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		
21-Jan	0.0	Z	0.0	2.9	15.3	24.6	11.8	12.3	19.5	15.3	14.9	17.7	16.1	10.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	24.6			
22-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	1.3	1.4	0.6	1.0	1.5	2.8	5.4	0.7	0.0	0.0	0.0	0.7	5.4			
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	1.0	9.6	15.4	16.3	11.9	6.0	8.9	2.1	1.2	1.9	4.9	0.2	1.4	0.8	0.3	3.6	16.3			
24-Jan	4.2	1.1	0.1	0.9	Z	1.3	4.9	3.6	0.3	2.0	6.4	16.6	3.9	6.0	24.0	15.4	3.6	1.2	0.1	0.2	0.1	0.5	0.1	0.1	4.2	24.0			
25-Jan	0.2	0.3	0.3	4.8	8.9	Z	44.2	59.6	46.5	20.1	45.4	33.2	30.4	29.4	16.2	13.7	20.5	36.4	90.5	48.8	0.1	0.1	0.1	0.0	23.9	90.5			
26-Jan	Z	0.0	0.0	0.0	0.1	0.8	0.1	0.0	0.3	0.5	1.1	1.2	1.8	3.3	6.3	2.4	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.8	6.3			
27-Jan	0.0	Z	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.0	1.3	1.7	1.9	1.9	7.8	14.6	8.6	2.5	0.0	0.0	0.0	0.0	0.0	0.1	1.8	14.6			
28-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1		
29-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.8			
30-Jan	0.0	0.0	0.0	0.1	Z	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	3.6	0.3	0.1	0.3	1.9	22.7	29.6	11.8	3.1	29.6			
31-Jan	0.2	0.1	0.1	0.0	0.0	Z	0.5	0.4	0.9	3.8	5.2	7.2	5.3	6.2	11.2	8.6	6.0	4.8	5.9	7.2	35.4	58.4	59.2	55.3	12.3	59.2			
16.6 9.8 11.6 10.7 17.8 13.9 11.9 13.8 11.8 11.9 11.9 12.4 11.6 11.3 12.5 11.1 9.1 10.5 12.5 11.5 13.0 15.1 15.8 17.3																								Diurnal Average					
107.6 85.0 154.1 96.2 95.0 80.7 111.5 118.4 84.5 67.5 68.5 70.4 63.9 50.5 71.9 60.8 49.3 77.4 90.5 65.5 113.7 133.1 130.6 120.6																								Diurnal Maximum					
Z - zerospan				C - Calibration				UO - Unstable Operation																					



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Ells River - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	562	79.49	79.49
21 - 40	63	8.91	88.40
41 - 80	64	9.05	97.45
81 - 159	17	2.40	99.86
> 159	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	30	90	26	17	7	6	4	25	124	81	48	40	19	16	15	13	561
21 - 40	5	7	1	1	0	0	0	8	22	6	1	1	0	8	2	1	63
41 - 80	4	1	3	0	0	0	1	7	24	7	1	1	2	4	3	5	63
81 - 159	2	0	0	0	0	1	1	0	4	3	0	1	1	1	1	1	16
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	98	30	18	7	7	6	40	174	97	50	43	22	29	21	20	703

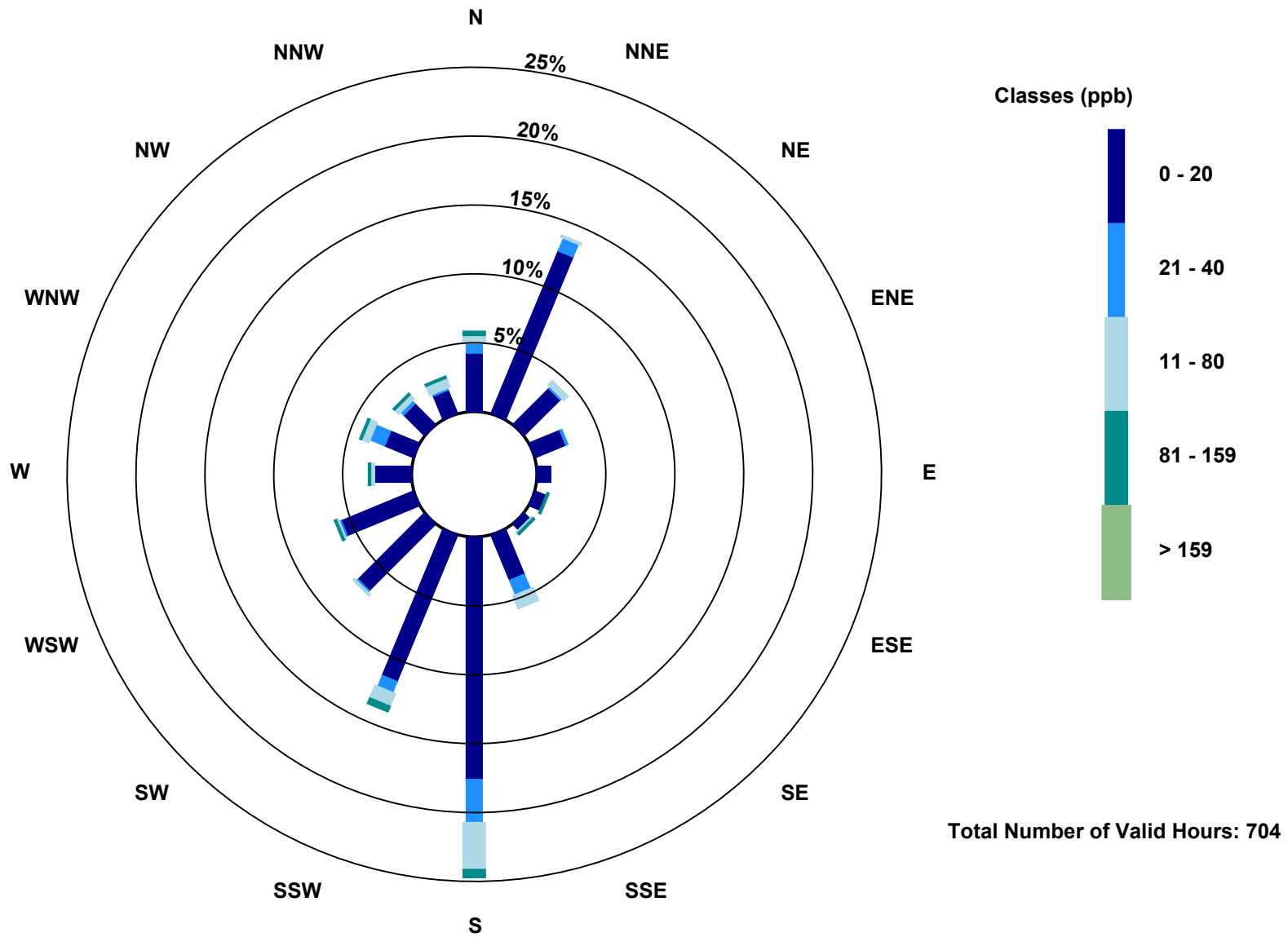
Total Number of Valid Hours: 704

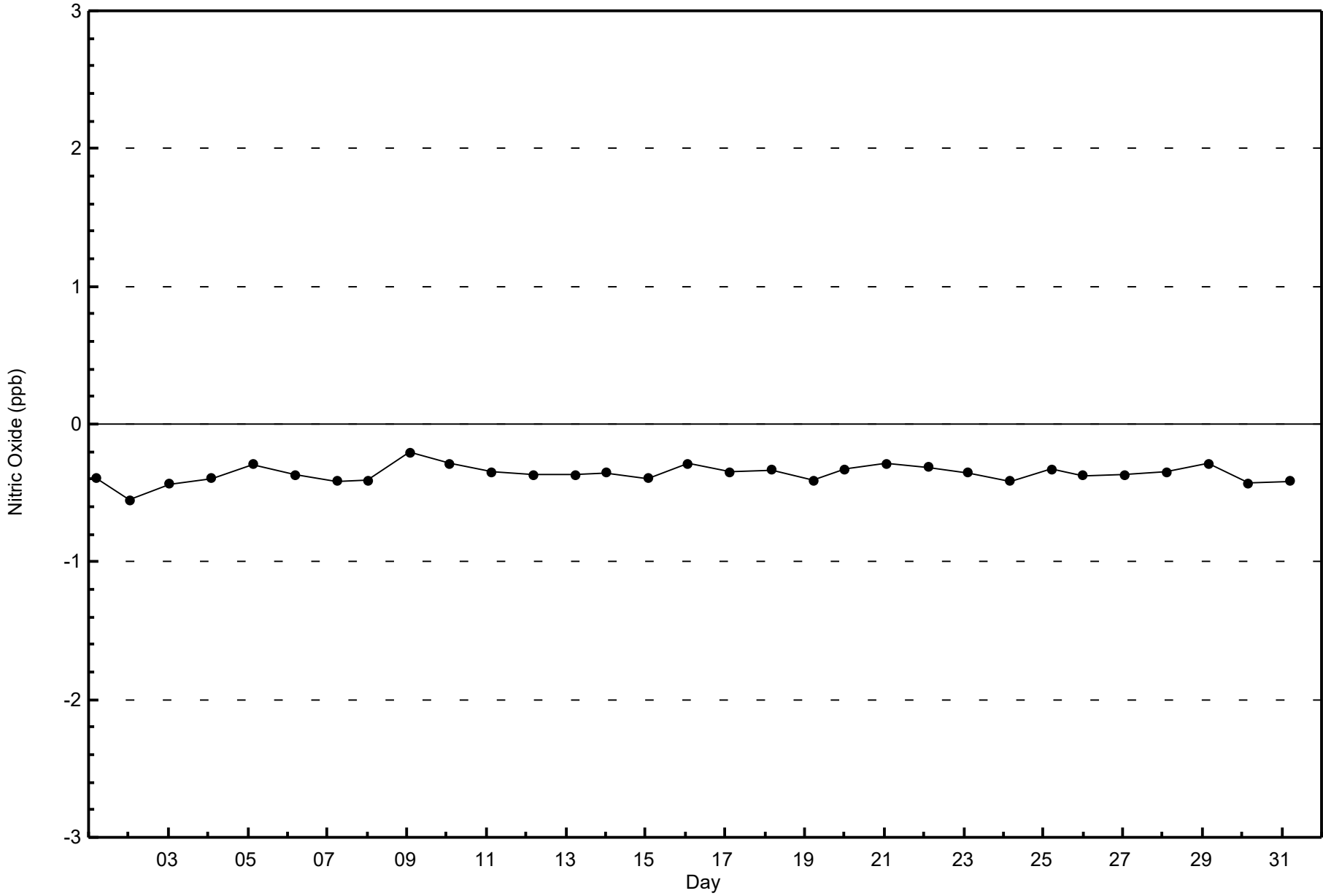
Total Number of Hours: 744

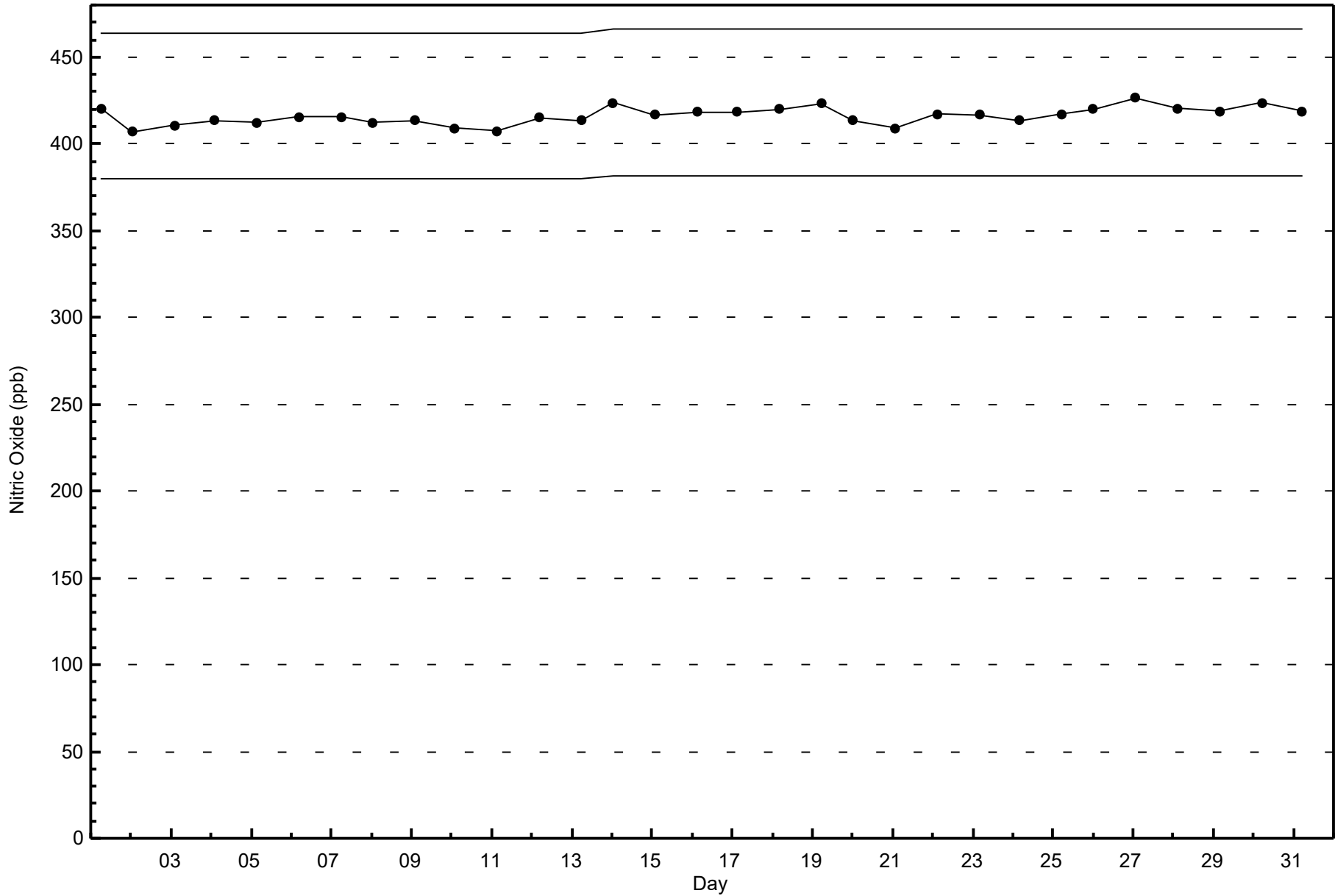


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Ells River









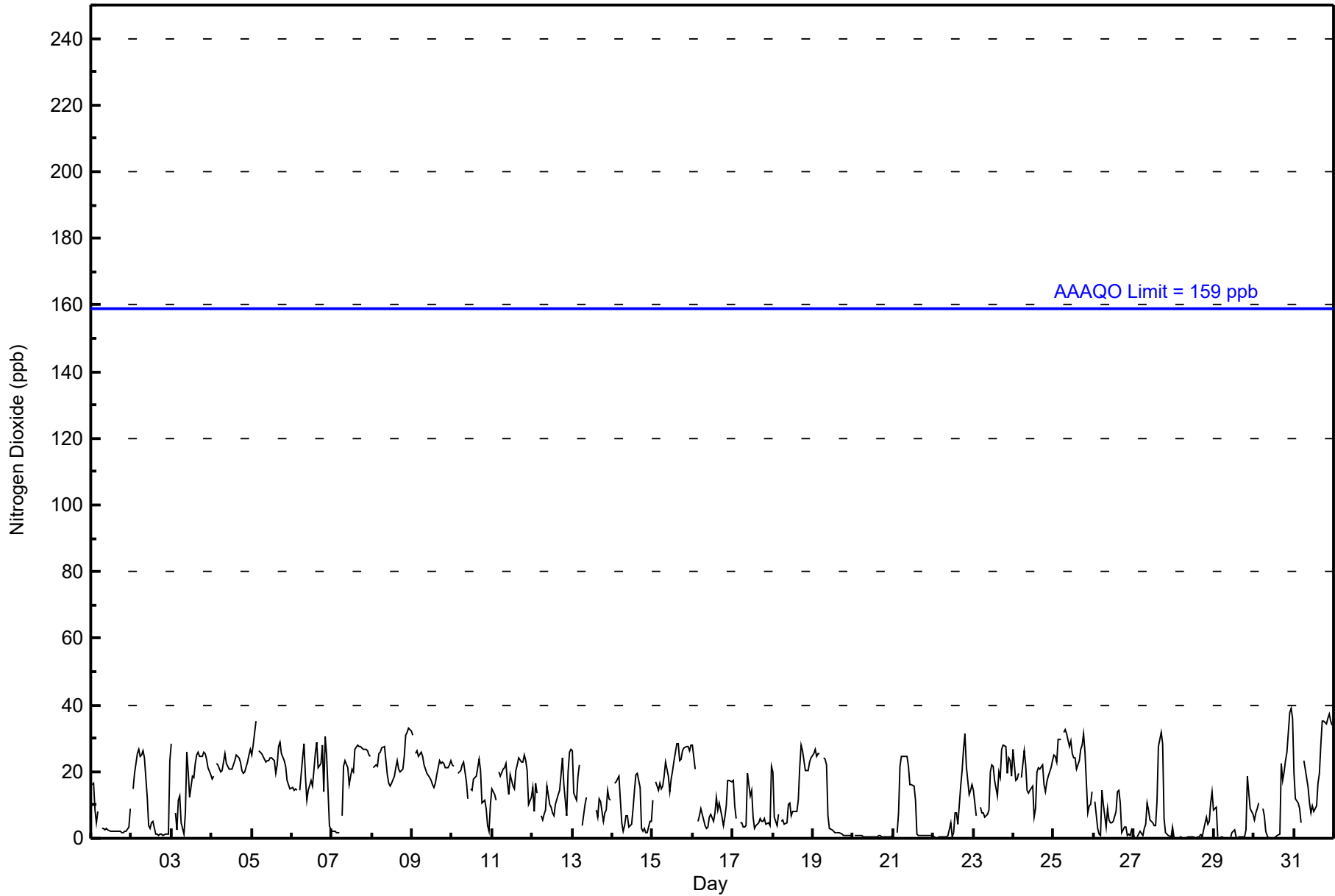
Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Ells River - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																										
Maximum Value: 38.8 ppb on Jan 30 23:00		Maximum Daily Average: 24.2 ppb on Jan 25		Hours of Data: 707																	Hours of Missing Data: 37		Hours of Calibration: 36		Percent Operational Time: 99.9																								
Minimum Value: 0.1 ppb on Jan 30 12:00		Minimum Daily Average: 0.6 ppb on Jan 20		Hours of Calibration: 36																	Hours of Missing Data: 37		Hours of Calibration: 36		Percent Operational Time: 99.9																								
Maximum Diurnal Average: 16.2 ppb at hour 17		Minimum Diurnal Average: 10.6 ppb at hour 13		Hours of Calibration: 36																	Hours of Missing Data: 37		Hours of Calibration: 36		Percent Operational Time: 99.9																								
Monthly Average: 13.52 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 3.7 Median = 14.0 Q ₃ = 22.1 P ₉₀ = 26.2 P ₉₉ = 35.1		Hours of Calibration: 36																	Hours of Missing Data: 37		Hours of Calibration: 36		Percent Operational Time: 99.9																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	15.9	16.4	8.6	4.6	7.9	Z	2.8	2.8	2.5	3.1	2.5	2.2	2.0	2.0	2.2	2.2	2.3	2.0	1.8	1.7	2.3	2.0	3.6	9.1	4.5	16.4																							
2-Jan	Z	14.8	19.4	25.3	26.5	24.6	24.8	26.2	24.2	12.3	3.9	3.1	4.7	4.9	1.1	1.1	1.0	1.1	1.2	1.0	1.1	1.1	1.2	23.4	10.8	26.5																							
3-Jan	28.2	Z	7.7	2.4	11.5	12.7	4.6	1.4	7.8	25.7	20.0	12.3	18.6	18.3	22.3	24.9	25.8	24.7	24.5	25.8	25.3	23.7	21.0	18.9	17.7	28.2																							
4-Jan	17.9	18.6	Z	22.5	21.9	20.1	20.5	22.9	25.6	22.6	20.6	20.9	20.9	22.2	23.3	25.1	24.1	22.9	20.4	19.5	19.9	23.0	24.8	26.6	22.0	26.6																							
5-Jan	24.8	27.9	35.2	Z	26.4	25.8	25.6	24.7	22.7	23.3	23.3	24.1	24.3	23.2	19.6	22.0	27.7	28.8	25.5	23.2	21.8	17.2	16.1	14.9	23.8	35.2																							
6-Jan	15.3	14.6	15.0	14.2	Z	14.2	24.1	28.6	18.6	11.5	14.6	17.5	15.5	20.4	25.5	28.9	21.1	22.5	27.9	13.8	30.5	25.1	3.8	2.5	18.5	30.5																							
7-Jan	2.3	2.2	2.0	1.9	1.9	Z	6.7	21.5	23.1	21.1	16.2	18.6	20.8	19.8	26.8	28.0	27.7	27.6	27.0	26.8	26.8	26.2	25.0	24.5	18.5	28.0																							
8-Jan	Z	21.0	22.0	21.6	25.5	25.7	27.1	27.6	23.1	19.2	16.7	15.7	16.7	18.5	21.2	23.3	20.8	19.9	20.9	24.4	31.0	31.8	33.0	32.0	23.4	33.0																							
9-Jan	30.8	Z	25.4	26.3	24.4	25.9	24.6	22.0	20.7	19.3	18.2	17.2	16.0	15.2	16.6	19.1	23.5	22.4	22.7	22.6	21.3	21.2	22.0	23.1	21.8	30.8																							
10-Jan	22.1	21.4	Z	19.6	19.9	20.2	22.1	23.0	16.9	11.7	UO	14.7	14.3	17.8	18.8	21.3	23.6	20.2	10.4	11.3	8.9	3.7	2.2	10.2	16.1	23.6																							
11-Jan	14.8	13.0	11.4	Z	19.8	18.8	20.7	21.1	22.3	17.1	13.0	18.9	15.7	15.0	20.2	21.9	24.1	22.9	22.8	24.9	23.4	20.3	10.3	12.3	18.5	24.9																							
12-Jan	15.2	8.1	16.4	13.4	Z	6.9	5.3	7.1	8.3	15.6	10.3	9.2	7.5	6.9	10.1	13.0	14.4	19.2	24.3	15.9	6.6	19.9	26.0	26.6	13.3	26.6																							
13-Jan	26.3	13.6	11.3	18.7	22.0	Z	3.9	10.3	12.1	C	C	C	C	C	8.5	6.3	11.9	11.1	4.9	7.8	8.5	14.2	11.8	11.3	11.9	26.3																							
14-Jan	Z	16.6	16.9	17.9	18.8	4.7	2.0	3.7	6.6	6.6	3.6	4.1	8.9	14.4	19.1	19.4	15.1	3.0	2.1	3.0	1.5	1.6	5.0	5.2	8.7	19.4																							
15-Jan	11.3	Z	16.9	14.5	16.4	14.9	15.5	18.8	22.8	18.8	13.8	18.0	20.3	23.5	28.6	28.4	23.5	23.7	26.1	27.2	27.6	27.5	26.3	27.8	21.4	28.6																							
16-Jan	27.9	20.9	Z	5.2	6.8	8.7	7.1	3.7	3.0	3.2	6.3	7.1	5.0	7.6	12.4	8.3	10.7	6.4	3.9	6.3	9.6	17.5	17.4	17.0	9.7	27.9																							
17-Jan	17.5	9.6	6.1	Z	4.5	4.8	3.6	3.2	3.9	19.6	12.8	14.3	6.5	3.0	3.8	4.8	5.8	5.1	5.0	6.0	4.3	4.5	3.7	21.5	7.6	21.5																							
18-Jan	19.9	6.3	3.8	7.0	Z	4.9	5.7	4.4	4.8	10.3	10.5	6.9	7.9	7.9	7.9	11.3	21.0	27.9	26.2	20.3	20.3	20.4	22.9	24.3	13.2	27.9																							
19-Jan	25.4	26.6	24.6	25.3	25.5	Z	24.1	23.7	22.0	6.6	2.9	2.4	2.0	1.9	1.8	1.8	1.7	1.2	1.0	0.9	0.8	0.8	0.8	0.8	9.8	26.6																							
20-Jan	Z	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9																							
21-Jan	1.5	Z	1.9	7.6	21.7	24.6	24.7	24.4	24.4	21.8	16.1	16.0	15.8	11.6	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	9.6	24.7																							
22-Jan	0.6	0.5	Z	0.5	0.4	0.4	0.4	0.3	0.3	1.0	4.5	0.6	1.6	7.8	7.7	4.4	15.5	20.4	26.8	31.2	21.7	13.2	14.3	16.0	8.3	31.2																							
23-Jan	14.5	10.5	6.8	Z	9.2	7.7	7.6	6.5	7.1	8.6	20.0	22.1	21.8	17.5	12.6	19.8	18.3	26.6	28.1	27.4	19.7	24.0	23.3	18.7	16.5	28.1																							
24-Jan	26.6	17.2	17.7	19.3	Z	18.3	26.3	22.0	14.6	13.4	14.2	15.5	6.2	8.7	19.8	21.1	20.9	22.2	15.9	14.0	17.0	18.6	21.1	23.4	18.0	26.6																							
25-Jan	24.9	24.5	22.8	29.7	29.5	Z	31.9	32.8	31.3	27.6	29.2	25.4	24.0	24.3	20.6	23.1	26.8	28.0	31.3	25.9	7.8	9.9	10.3	13.9	24.2	32.8																							
26-Jan	Z	11.1	3.1	1.2	0.7	14.6	10.1	3.3	8.8	5.4	4.7	4.5	5.0	8.1	13.9	14.4	10.6	1.6	3.2	3.4	1.0	1.1	0.8	2.7	5.8	14.6																							
27-Jan	0.3	Z	0.4	1.1	2.2	0.8	3.0	4.4	10.7	8.5	5.6	4.8	3.8	3.9	11.2	27.6	31.6	28.2	6.0	1.7	1.3	0.7	0.6	3.6	7.0	31.6																							
28-Jan	0.4	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	1.2	0.3	2.6	6.3	4.1	5.1	10.7	14.1	2.1	14.1																							
29-Jan	8.4	9.4	0.6	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	1.8	2.4	0.3	0.2	0.3	0.3	0.4	0.4	2.7	18.8	13.5	9.1	7.2	3.4	18.8																							
30-Jan	5.7	7.6	8.7	10.6	Z	8.9	6.7	2.0	0.7	0.2	0.2	0.1	0.2	0.5	0.7	1.3	22.6	17.2	20.0	23.5	25.7	37.6	38.8	36.0	12.0	38.8																							
31-Jan	19.7	11.8	10.5	9.1	4.8	Z	23.1	20.6	15.2	10.4	7.8	9.7	7.9	9.6	16.4	19.6	27.9	35.1	35.0	34.3	35.9	37.3	35.3	34.1	20.5	37.3																							
																								16.1	13.3	12.2	12.3	13.4	12.4	13.1	13.4	13.1	12.2	10.8	11.0	10.6	11.2	12.7	14.3	16.2	15.9	15.1	14.7	14.4	15.0	14.3	16.2	Diurnal Average	
																								30.8	27.9	35.2	29.7	29.5	25.9	31.9	32.8	31.3	27.6	29.2	25.4	24.3	24.3	28.6	28.9	31.6	35.1	35.0	34.3	35.9	37.6	38.8	36.0	Diurnal Maximum	
Z - zerospan																								C - Calibration						UO - Unstable Operation																			
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	487	68.88	68.88
21 - 40	220	31.12	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Ells River - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	28	81	20	11	2	6	2	17	98	71	49	39	18	20	14	10	486
21 - 40	13	17	10	7	5	1	4	23	77	26	1	4	4	9	7	10	218
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	98	30	18	7	7	6	40	175	97	50	43	22	29	21	20	704

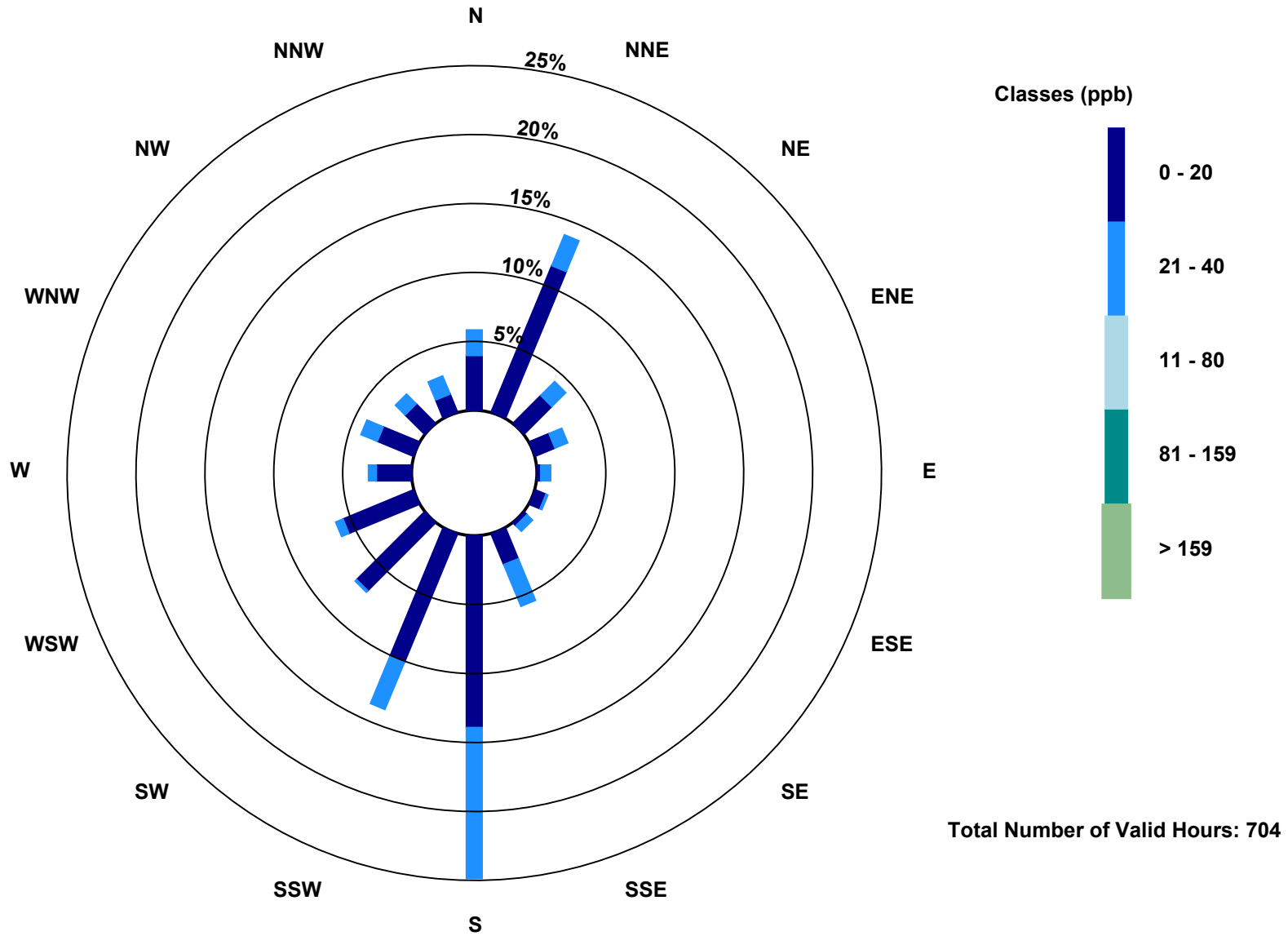
Total Number of Valid Hours: 704

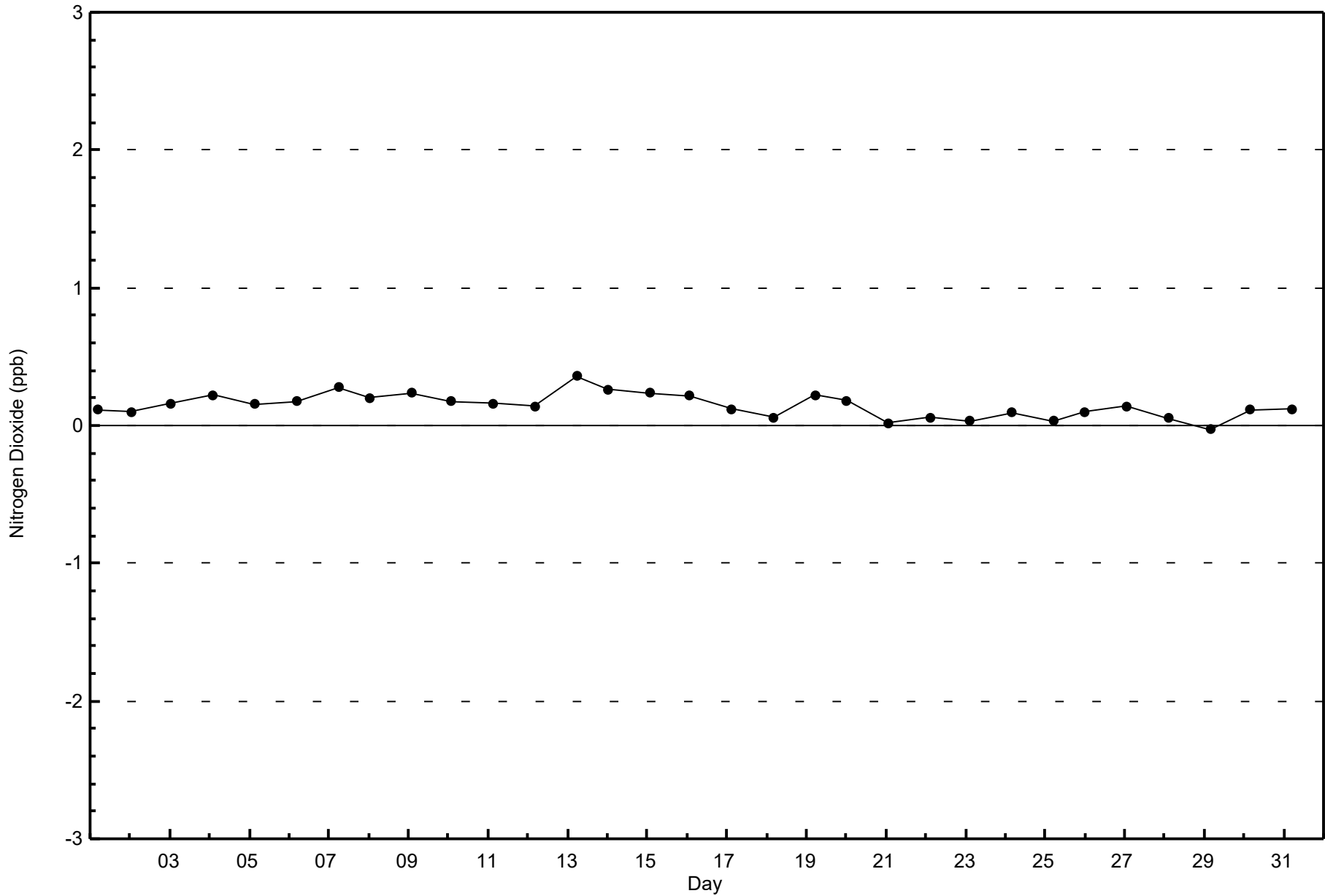
Total Number of Hours: 744

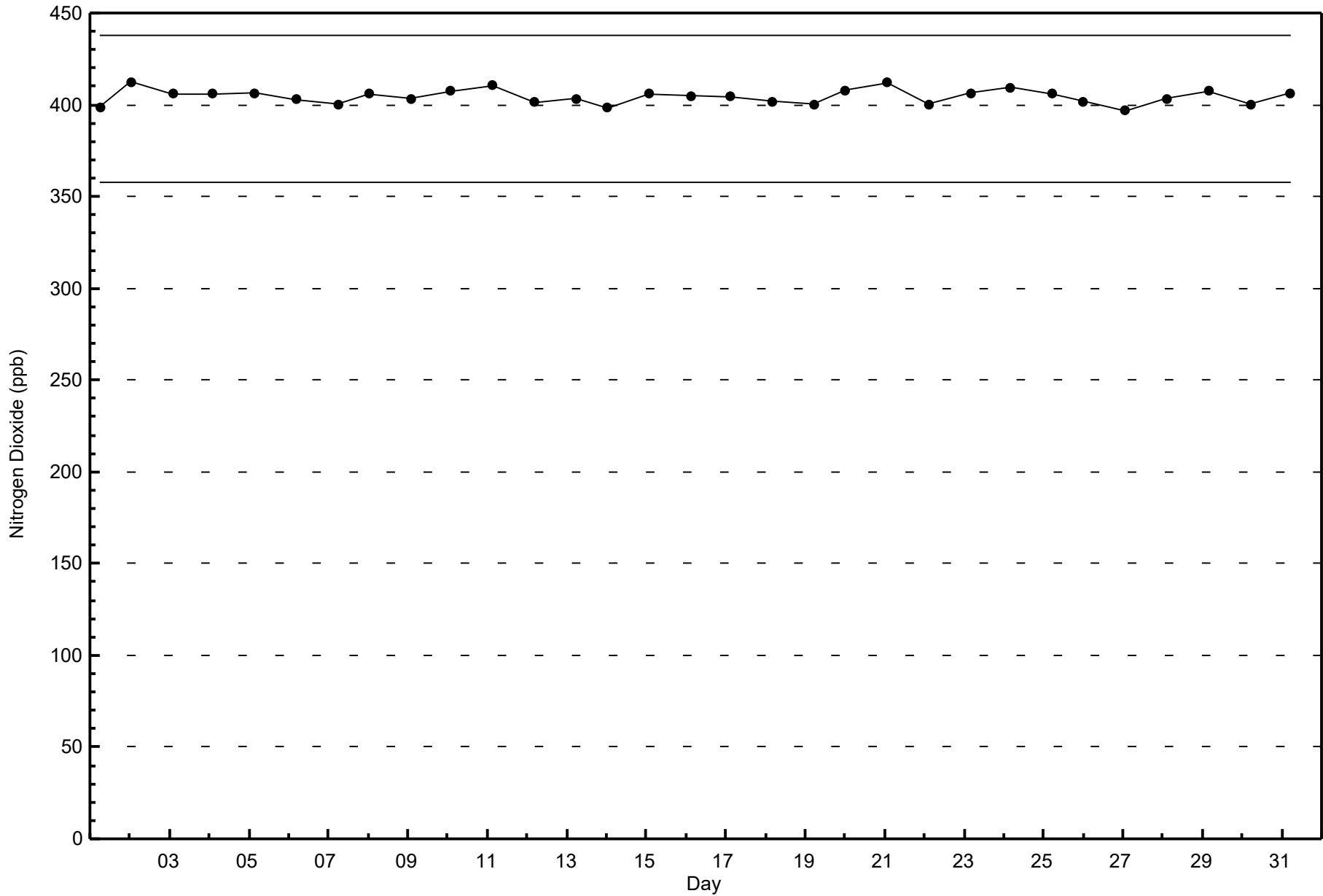


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Ells River





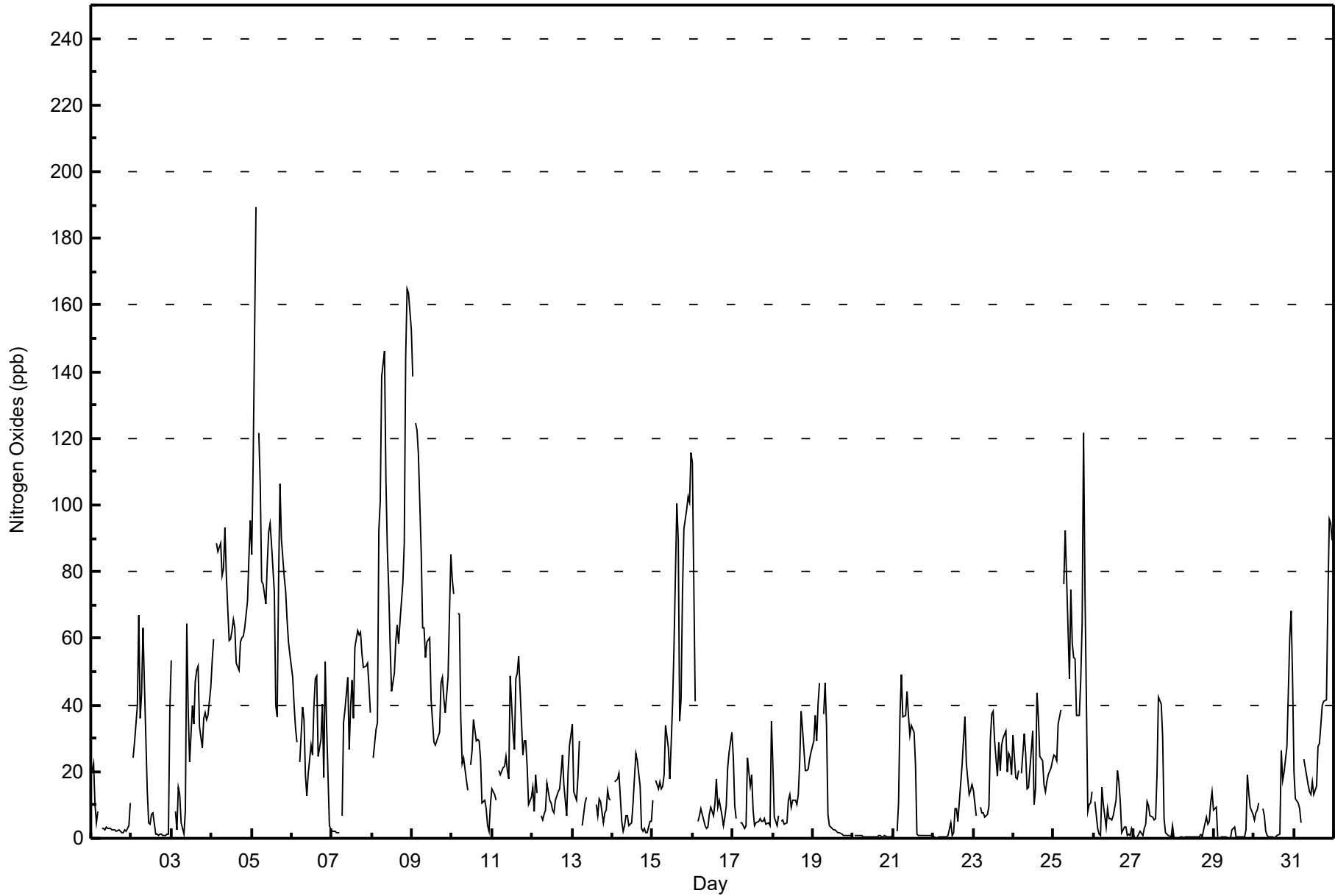




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Ells River - January 2023

Maximum Value: 189.3 ppb on Jan 5 03:00 Maximum Daily Average: 88.2 ppb on Jan 8 Minimum Value: 0.2 ppb on Jan 28 02:00 Minimum Daily Average: 0.6 ppb on Jan 20 Maximum Diurnal Average: 33.6 ppb at hour 24 Minimum Diurnal Average: 22.2 ppb at hour 13 Monthly Average: 26.23 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.8 Q ₁ = 3.9 Median = 15.7 Q ₃ = 37.1 P ₉₀ = 67.3 P ₉₉ = 137.6																						Hours in Service:	744				
																						Hours of Data:	707				
																						Hours of Missing Data:	37				
																						Hours of Calibration:	36				
																						Percent Operational Time:	99.9				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	20.5	22.6	10.3	4.6	7.9	Z	2.8	2.8	2.5	3.3	2.9	2.8	2.6	2.5	2.5	2.3	2.4	2.0	1.8	1.7	2.4	2.0	3.9	10.5	5.2	22.6	
2-Jan	Z	24.2	28.9	40.0	66.9	35.9	43.5	63.0	46.3	14.5	4.8	4.1	7.4	7.7	1.2	1.1	1.0	1.1	1.2	1.0	1.1	1.1	1.2	38.5	18.9	66.9	
3-Jan	53.4	Z	7.8	2.4	15.3	13.3	4.6	1.4	8.5	64.5	38.1	22.7	39.7	34.5	47.1	50.6	51.7	33.4	27.1	35.9	37.5	35.7	36.8	45.2	30.8	64.5	
4-Jan	53.5	59.8	Z	88.6	86.2	88.5	79.0	81.1	93.1	78.9	59.4	59.6	62.4	65.6	63.0	52.4	50.3	58.8	60.0	60.7	62.9	71.3	84.4	95.5	70.2	95.5	
5-Jan	85.3	112.9	189.3	Z	121.4	106.5	77.1	76.4	70.4	82.8	91.8	94.5	88.2	73.7	39.7	36.4	77.0	106.2	90.0	78.5	74.3	65.6	58.9	55.0	84.9	189.3	
6-Jan	48.2	40.0	32.9	28.7	Z	23.0	39.6	35.8	19.1	12.5	19.6	27.8	25.0	39.4	48.0	48.8	24.7	29.7	40.1	18.3	53.2	33.8	3.8	2.6	30.2	53.2	
7-Jan	2.3	2.2	2.0	1.9	1.9	Z	6.8	34.8	38.6	48.2	26.9	39.3	47.6	36.1	57.3	62.3	60.8	61.9	55.6	51.2	51.9	52.4	45.7	37.8	35.9	62.3	
8-Jan	Z	24.3	32.6	34.7	92.5	101.2	138.6	146.0	107.6	86.7	74.4	57.6	44.2	49.6	59.2	64.2	58.5	65.2	76.9	88.4	144.7	164.9	163.6	152.6	88.2	164.9	
9-Jan	138.4	Z	124.4	122.5	115.4	85.4	63.0	63.1	54.3	58.8	60.0	41.5	35.1	28.9	27.9	29.2	31.7	46.8	48.3	42.1	37.8	48.1	67.2	85.0	63.3	138.4	
10-Jan	77.5	73.2	Z	67.4	67.3	36.1	22.6	24.0	17.5	14.6	UO	22.1	26.4	35.6	29.2	29.5	29.4	23.7	10.5	11.3	8.9	3.7	2.2	10.3	29.2	77.5	
11-Jan	14.8	13.0	11.4	Z	20.4	19.2	21.1	21.6	24.4	20.4	17.9	48.6	31.9	26.6	48.0	49.6	54.8	34.7	25.1	29.1	29.3	21.6	10.3	12.3	26.4	54.8	
12-Jan	15.3	8.1	19.0	13.5	Z	6.9	5.3	7.1	8.4	16.6	11.4	10.7	8.5	7.7	11.4	13.9	14.6	19.5	25.2	16.0	6.6	20.0	28.2	31.0	14.1	31.0	
13-Jan	34.2	13.9	11.3	18.8	29.4	Z	3.9	10.4	12.2	C	C	C	C	C	10.3	6.7	12.0	11.1	4.9	7.8	8.5	14.3	11.8	11.4	12.9	34.2	
14-Jan	Z	16.9	17.2	18.0	19.5	4.9	2.0	3.7	6.6	6.9	3.9	4.8	10.8	18.3	25.2	23.3	15.7	3.0	2.1	3.1	1.5	1.6	5.0	5.2	9.5	25.2	
15-Jan	11.4	Z	17.5	14.9	16.8	15.0	15.8	19.0	33.7	27.0	17.6	28.5	40.6	57.8	100.5	89.2	35.3	41.9	73.6	92.7	98.6	102.7	100.7	115.6	50.7	115.6	
16-Jan	112.6	41.1	Z	5.2	6.8	8.8	7.1	3.7	3.0	3.4	7.4	9.1	6.6	10.6	18.0	9.5	11.4	6.8	3.9	6.3	9.6	21.1	26.0	32.0	16.1	112.6	
17-Jan	24.0	9.6	6.1	Z	4.5	4.9	3.6	3.2	4.0	24.1	15.7	19.3	8.5	3.6	4.5	5.2	5.9	5.1	5.0	6.1	4.3	4.5	3.7	35.0	9.2	35.0	
18-Jan	22.0	6.3	3.8	7.0	Z	4.9	5.7	4.4	4.8	11.4	13.3	9.2	11.6	11.4	10.4	13.3	22.9	38.0	32.5	20.4	20.5	20.7	23.9	25.8	15.0	38.0	
19-Jan	29.2	37.1	29.1	40.3	46.7	Z	37.1	46.8	34.0	7.2	3.7	3.2	2.7	2.4	2.1	1.9	1.7	1.2	1.0	0.9	0.8	0.8	0.8	0.8	14.4	46.8	
20-Jan	Z	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.9
21-Jan	1.5	Z	1.9	10.5	37.0	49.2	36.5	36.7	43.9	37.1	31.0	33.7	31.9	22.2	1.2	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	16.6	49.2	
22-Jan	0.6	0.5	Z	0.5	0.4	0.4	0.4	0.3	0.3	1.0	4.7	0.6	1.8	9.1	9.1	5.0	16.5	21.9	29.6	36.6	22.4	13.2	14.3	16.0	8.9	36.6	
23-Jan	14.5	10.5	6.8	Z	9.2	7.7	7.6	6.5	7.1	9.6	29.6	37.5	38.1	29.4	18.6	28.7	20.4	27.8	30.0	32.3	19.9	25.4	24.1	19.0	20.0	38.1	
24-Jan	30.8	18.3	17.8	20.2	Z	19.6	31.2	25.6	14.9	15.4	20.6	32.1	10.1	14.7	43.8	36.5	24.5	23.4	16.0	14.2	17.1	19.1	21.2	23.5	22.2	43.8	
25-Jan	25.1	24.8	23.1	34.5	38.4	Z	76.1	92.4	77.8	47.7	74.6	58.6	54.4	53.7	36.8	36.8	47.3	64.4	121.8	74.7	7.9	10.0	10.4	13.9	48.1	121.8	
26-Jan	Z	11.1	3.1	1.2	0.8	15.4	10.2	3.3	9.1	5.9	5.8	5.7	6.8	11.4	20.2	16.8	11.1	1.6	3.2	3.4	1.0	1.2	0.8	2.8	6.6	20.2	
27-Jan	0.3	Z	0.5	1.2	2.3	0.8	3.0	4.4	11.0	9.5	6.9	6.5	5.7	5.8	19.0	42.2	40.2	30.7	6.0	1.7	1.3	0.7	0.6	3.7	8.9	42.2	
28-Jan	0.4	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	1.3	0.4	2.6	6.3	4.1	5.1	10.7	14.1	2.1	14.1	
29-Jan	8.4	9.4	0.6	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	2.4	3.2	0.3	0.2	0.3	0.3	0.4	0.4	2.7	19.0	13.6	9.2	7.3	3.5	19.0
30-Jan	5.7	7.6	8.7	10.7	Z	9.0	6.9	2.2	0.8	0.3	0.3	0.2	0.2	0.6	0.8	1.4	26.2	17.5	20.1	23.8	27.6	60.3	68.4	47.8	15.1	68.4	
31-Jan	19.9	11.9	10.6	9.1	4.8	Z	23.6	21.0	16.1	14.2	13.0	16.9	13.2	15.8	27.6	28.2	33.9	39.9	40.9	41.5	71.3	95.7	94.5	89.4	32.7	95.7	
																								Diurnal Average	33.6		
																								Diurnal Maximum	189.3		
Z - zerospan C - Calibration UO - Unstable Operation																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Ells River - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	405	57.28	57.28
21 - 40	148	20.93	78.22
41 - 80	106	14.99	93.21
81 - 159	44	6.22	99.43
> 159	3	0.42	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Ells River - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	22	71	19	11	2	4	2	9	71	58	46	38	15	15	12	9	404
21 - 40	6	17	5	5	5	2	2	16	52	22	2	1	4	2	4	3	148
11 - 80	10	9	5	2	0	0	1	11	34	12	2	3	1	9	1	5	105
81 - 159	3	1	1	0	0	1	1	4	17	4	0	1	1	2	4	3	43
> 159	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
Totals	41	98	30	18	7	7	6	40	174	97	50	43	22	29	21	20	703

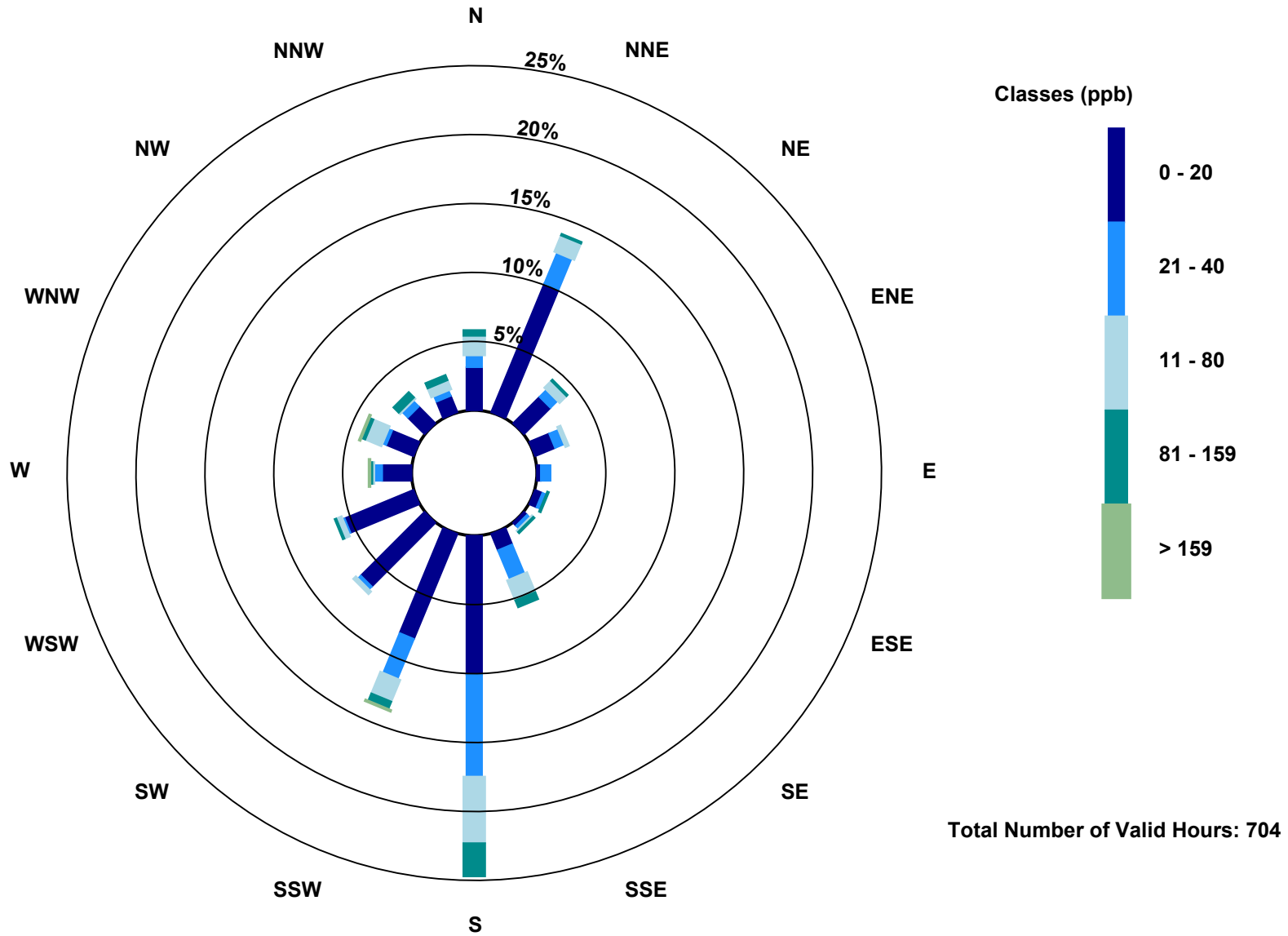
Total Number of Valid Hours: 704

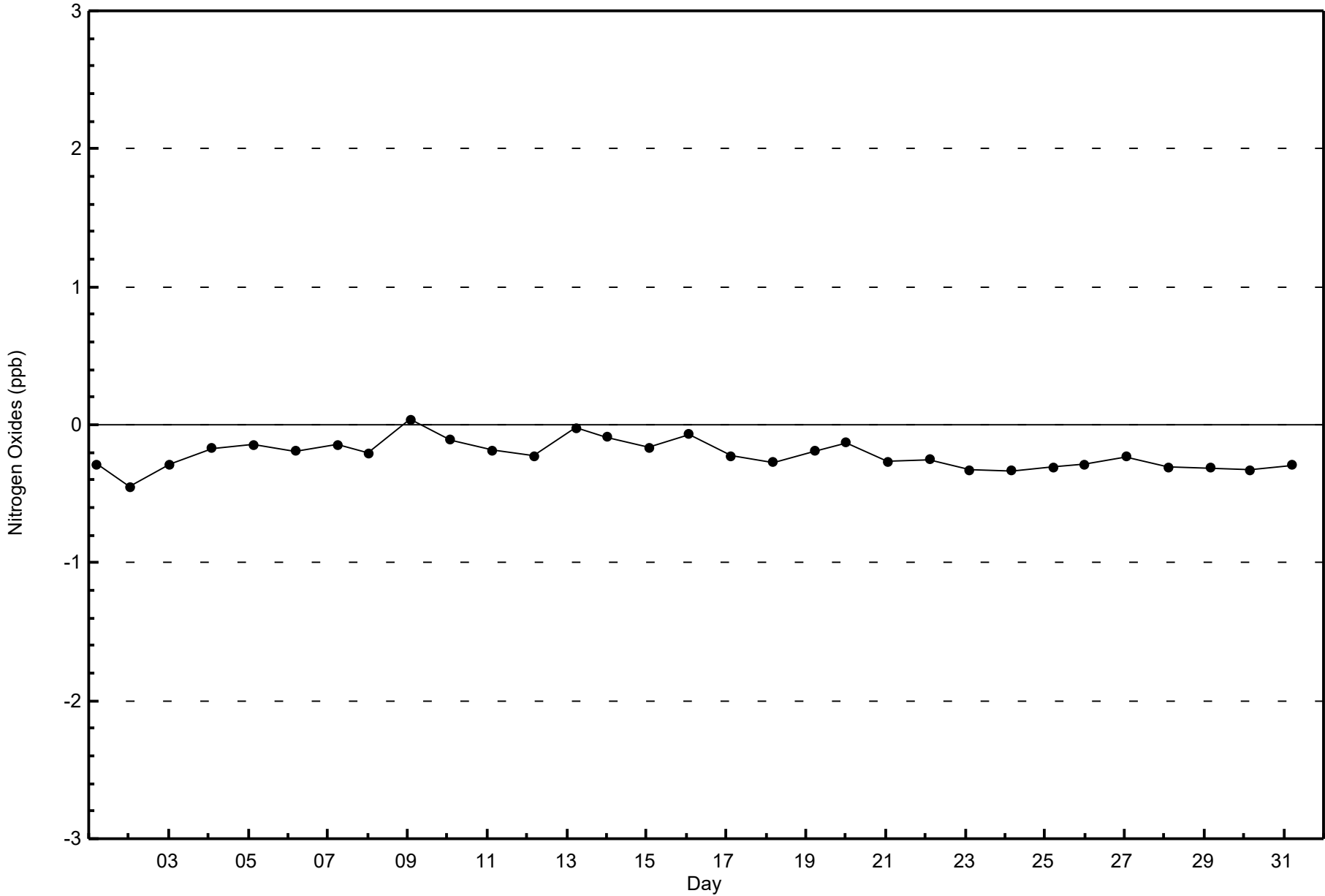
Total Number of Hours: 744

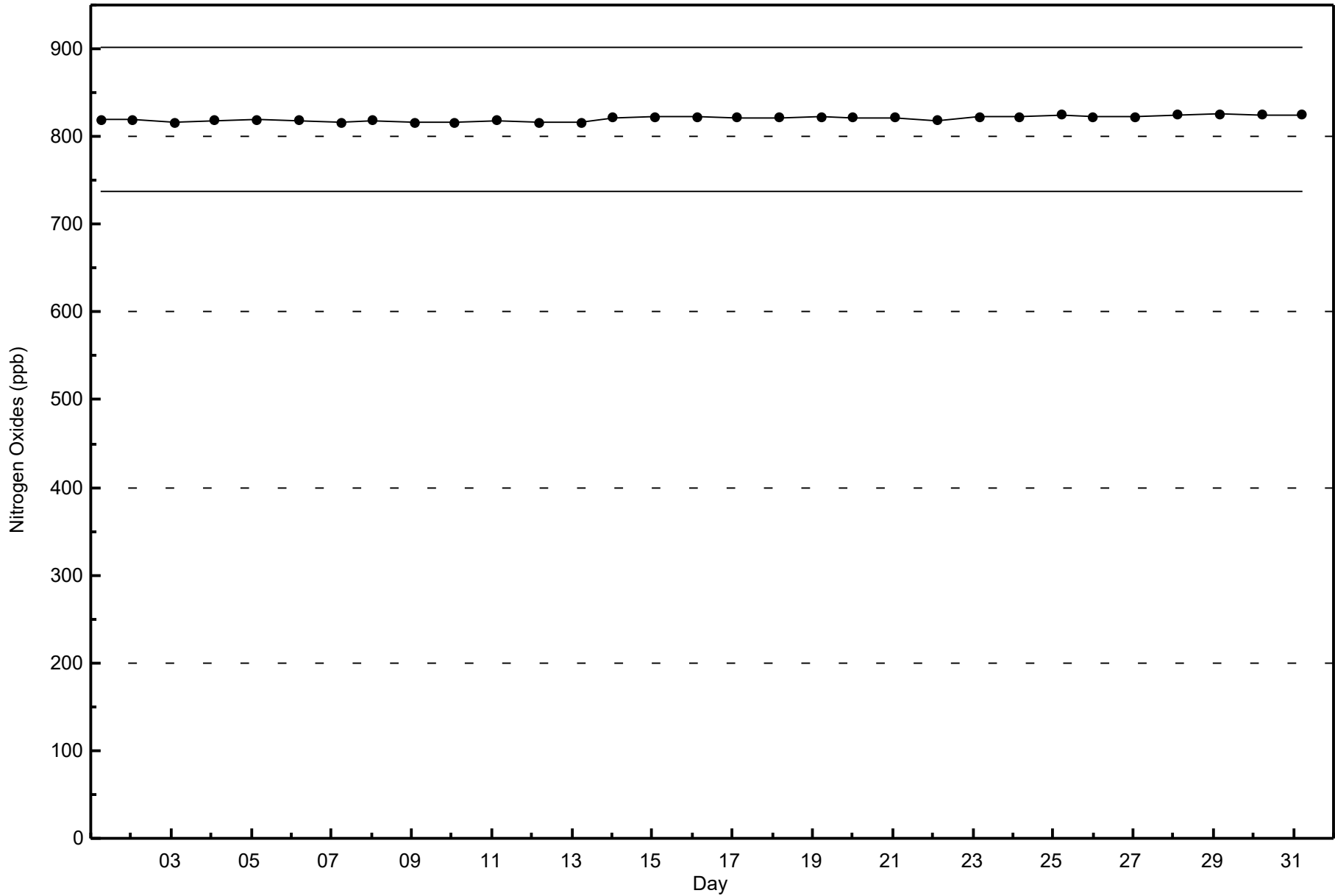


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Ells River







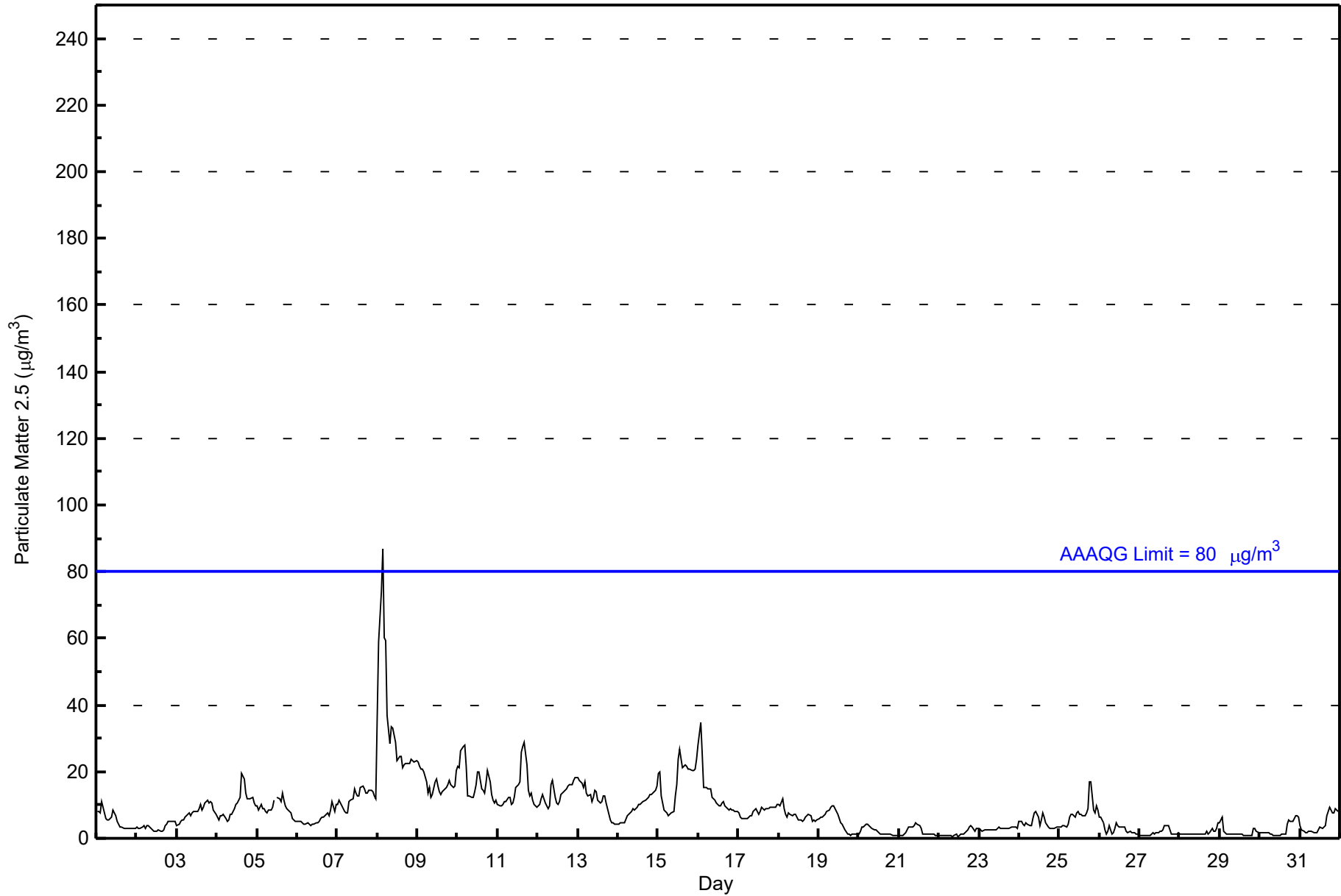


Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 1	Hours in Service:	744
Maximum Value: 87.0 µg/m ³ on Jan 8 04:00	Maximum Daily Average: 35.2 µg/m ³ on Jan 8		Hours of Data:	743
Minimum Value: 0.5 µg/m ³ on Jan 22 12:00	Minimum Daily Average: 1.6 µg/m ³ on Jan 22		Hours of Missing Data:	1
Maximum Diurnal Average: 9.8 µg/m ³ at hour 3	Minimum Diurnal Average: 7.1 µg/m ³ at hour 8		Hours of Calibration:	1
Monthly Average: 8.29 µg/m ³	Percentiles: P ₁ = 0.8 P ₁₀ = 1.3 Q ₁ = 2.9 Median = 6.5 Q ₃ = 11.2 P ₉₀ = 16.8 P ₉₉ = 34.1		Percent Operational Time:	100.0

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	8.1	8.0	7.5	11.2	9.3	5.9	5.7	5.7	5.9	6.2	8.3	7.0	4.9	4.1	3.5	3.2	3.1	3.0	2.9	2.9	2.9	2.9	2.9	3.1	5.3	11.2
2-Jan	3.2	3.0	3.0	3.4	3.7	3.1	3.7	3.6	3.3	2.7	2.2	2.0	2.3	2.5	2.2	2.3	2.7	3.7	4.4	5.1	5.1	5.1	5.2	4.9	3.4	5.2
3-Jan	4.0	4.2	5.0	5.6	5.7	6.4	6.8	7.6	6.8	7.5	8.0	8.2	8.1	8.9	10.0	8.7	9.2	10.7	11.4	10.5	11.1	10.4	8.7	7.1	7.9	11.4
4-Jan	6.4	5.7	6.6	6.8	7.2	6.0	5.3	5.7	7.2	7.1	8.7	10.0	10.5	11.4	12.4	19.5	18.0	13.5	12.0	11.9	11.7	12.3	10.6	9.6	9.8	19.5
5-Jan	9.6	8.3	10.0	8.8	8.7	7.9	7.8	8.3	8.3	9.5	11.3	C	12.2	11.7	11.1	13.6	11.5	9.9	8.7	8.0	7.7	5.9	5.5	5.1	9.1	13.6
6-Jan	5.2	5.0	5.2	4.7	4.2	4.1	4.5	4.0	4.0	4.1	4.3	4.6	4.9	5.8	6.4	6.3	7.1	7.4	6.7	8.4	11.2	8.1	10.2	5.9	11.2	
7-Jan	10.1	11.4	10.7	9.8	8.3	7.7	7.7	11.0	11.5	12.0	14.9	13.8	12.8	12.6	15.1	15.7	14.7	13.4	13.6	14.3	14.5	13.8	12.6	11.9	12.2	15.7
8-Jan	36.1	58.8	74.2	87.0	60.2	59.3	37.1	28.6	33.4	33.0	30.9	28.8	23.4	24.4	24.7	21.4	22.1	22.4	22.7	22.5	23.6	23.5	23.1	23.3	35.2	87.0
9-Jan	22.9	21.7	20.6	20.9	19.9	16.9	13.5	15.3	12.4	13.1	17.1	17.9	15.8	14.2	13.3	13.8	14.8	15.5	16.2	17.4	16.1	15.1	15.6	20.4	16.7	22.9
10-Jan	21.8	21.2	26.4	27.5	28.2	21.6	12.5	12.6	12.4	12.5	14.0	16.0	20.0	19.9	15.0	14.5	13.6	16.4	20.3	17.0	13.3	11.4	10.6	11.4	17.1	28.2
11-Jan	10.3	9.8	9.7	10.0	10.8	11.0	12.3	12.1	10.3	10.6	12.1	15.4	16.0	16.8	26.0	27.7	28.8	21.9	14.5	12.6	13.4	11.6	10.0	9.2	14.3	28.8
12-Jan	9.6	10.2	11.7	13.0	10.5	9.8	8.7	9.7	16.0	17.4	12.1	10.5	10.3	11.1	13.3	13.8	14.4	14.8	15.8	16.3	16.2	17.5	18.3	18.2	13.3	18.3
13-Jan	18.1	17.3	16.4	15.2	17.1	13.7	12.7	13.0	11.2	12.5	14.3	14.0	11.7	10.7	11.0	12.6	12.6	10.4	7.3	5.6	4.7	4.6	4.4	4.3	11.5	18.1
14-Jan	4.4	4.7	4.8	4.8	4.8	6.6	7.2	7.4	8.1	9.1	8.4	9.1	10.3	10.0	10.7	10.9	11.6	12.1	12.2	13.3	13.0	13.5	14.2	15.6	9.4	15.6
15-Jan	19.3	20.1	12.9	8.7	8.2	7.6	6.9	7.3	7.7	7.8	12.8	16.3	23.7	26.9	21.0	21.5	21.9	21.5	20.7	20.6	20.5	20.5	20.7	23.7	16.6	26.9
16-Jan	27.9	34.7	25.3	15.3	15.4	15.4	14.7	14.7	12.2	11.8	11.6	10.6	9.6	9.7	10.7	10.9	9.9	8.7	8.7	8.8	8.5	8.5	8.2	8.2	13.3	34.7
17-Jan	7.5	6.2	6.1	5.9	5.9	5.8	6.2	6.8	7.0	8.1	8.9	8.1	7.3	8.2	9.4	8.7	9.1	8.8	9.0	9.5	9.4	9.2	9.1	10.2	7.9	10.2
18-Jan	10.3	9.7	11.7	8.7	7.2	6.5	7.5	7.1	6.9	7.3	7.2	6.4	5.7	5.3	5.3	5.6	6.5	6.8	7.0	6.6	5.1	5.3	5.3	5.7	6.9	11.7
19-Jan	5.9	6.2	6.3	6.7	7.3	7.9	8.5	9.4	9.7	9.9	8.7	7.2	5.9	4.8	4.1	3.3	2.4	1.4	1.1	1.0	1.1	1.2	1.2	1.2	5.1	9.9
20-Jan	1.4	2.2	3.2	3.5	4.1	4.1	3.9	3.5	3.1	2.7	2.3	2.0	1.6	1.3	1.2	1.1	1.2	1.2	1.2	1.1	1.0	1.0	0.9	1.0	2.1	4.1
21-Jan	0.9	1.0	1.0	1.2	1.9	2.7	3.5	3.5	3.5	3.7	4.8	4.4	3.7	3.0	1.4	1.3	1.3	1.2	1.2	1.2	1.3	1.1	0.9	0.8	2.1	4.8
22-Jan	0.8	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.5	1.0	1.2	0.5	0.7	1.1	1.3	1.3	1.9	2.5	3.4	3.9	3.2	2.3	2.8	2.9	1.6	3.9
23-Jan	2.8	2.4	2.2	2.6	2.5	2.4	2.4	2.6	2.5	2.3	2.7	3.1	3.2	3.1	2.9	3.1	3.0	3.1	3.1	3.3	3.2	3.4	3.4	3.2	2.9	3.4
24-Jan	5.0	5.0	4.4	3.9	4.6	4.4	3.6	3.8	6.1	7.5	8.0	6.4	3.8	5.4	7.7	6.5	4.7	3.3	3.2	3.1	2.8	3.0	3.3	3.4	4.7	8.0
25-Jan	3.3	3.4	3.6	3.8	3.6	4.4	6.5	7.3	7.1	6.4	7.7	7.9	7.3	7.3	6.6	6.6	7.4	9.0	17.0	16.8	8.3	7.5	9.6	8.6	7.4	17.0
26-Jan	6.4	6.3	4.8	2.6	1.1	2.3	3.8	1.3	1.6	3.2	4.7	3.6	3.4	3.4	3.6	3.2	2.2	1.6	2.0	1.8	1.7	1.6	1.2	1.1	2.9	6.4
27-Jan	0.7	0.8	0.8	0.7	0.9	0.8	1.0	1.2	1.6	1.4	1.6	1.7	2.2	2.0	2.4	3.7	3.8	3.6	2.4	1.5	1.4	1.4	1.2	1.6	1.7	3.8
28-Jan	1.2	1.2	1.4	1.4	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.1	2.3	1.2	1.6	2.9	2.1	2.2	3.0	4.7	1.7	4.7
29-Jan	4.7	6.6	2.1	1.5	1.3	1.2	1.3	1.4	1.3	1.3	1.2	1.3	1.4	1.1	1.0	1.0	1.0	0.9	0.9	1.1	3.0	3.1	2.1	1.8	1.8	6.6
30-Jan	1.6	1.7	1.7	1.8	1.8	1.7	1.4	1.4	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.3	4.2	5.4	5.3	5.3	5.2	7.0	6.6	6.4	2.8	7.0
31-Jan	3.8	2.6	2.2	1.9	1.5	2.0	2.3	2.2	1.8	1.8	1.8	2.6	3.3	2.9	3.3	3.9	6.7	8.2	9.4	7.7	7.4	8.9	8.3	7.8	4.4	9.4
	8.8	9.7	9.8	9.7	8.6	8.1	7.1	7.1	7.3	7.6	8.2	8.0	8.0	8.1	8.3	8.6	8.8	8.5	8.6	8.4	8.0	7.9	7.7	8.0	Diurnal Average	
	36.1	58.8	74.2	87.0	60.2	59.3	37.1	28.6	33.4	33.0	30.9	28.8	23.7	26.9	26.0	27.7	28.8	22.4	22.7	22.5	23.6	23.5	23.1	23.7	Diurnal Maximum	

C - Calibration

Alberta Ambient Air Quality Guideline/Objectives: 1-hr 80 µg/m³ 24-hr 29 µg/m³





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Ells River - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	331	44.55	44.55
6 - 15	320	43.07	87.62
16 - 25	71	9.56	97.17
26 - 80	20	2.69	99.87
> 81.0	1	0.13	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Ells River - January 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	10	52	18	15	6	3	3	12	34	40	37	39	19	17	13	12	330
6 - 15	18	42	12	2	0	2	3	21	126	55	13	4	2	8	7	5	320
16 - 25	10	12	2	2	1	2	1	8	12	3	1	2	2	3	3	5	69
26 - 80	3	0	0	0	0	0	0	1	8	6	1	0	0	1	0	0	20
> 81.0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Totals	41	106	32	19	7	7	7	42	181	104	52	45	23	29	23	22	740

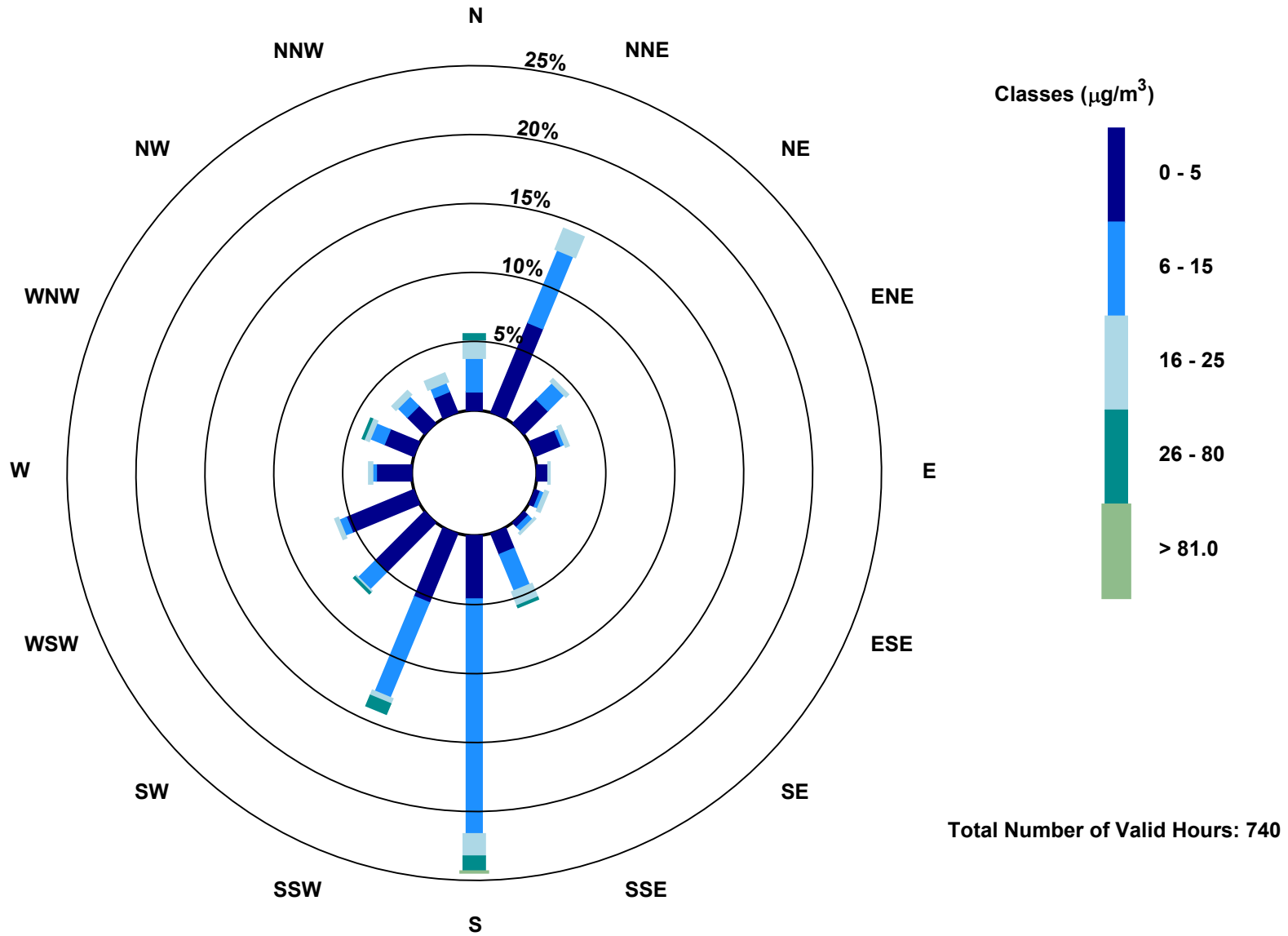
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

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



Total Number of Valid Hours: 740

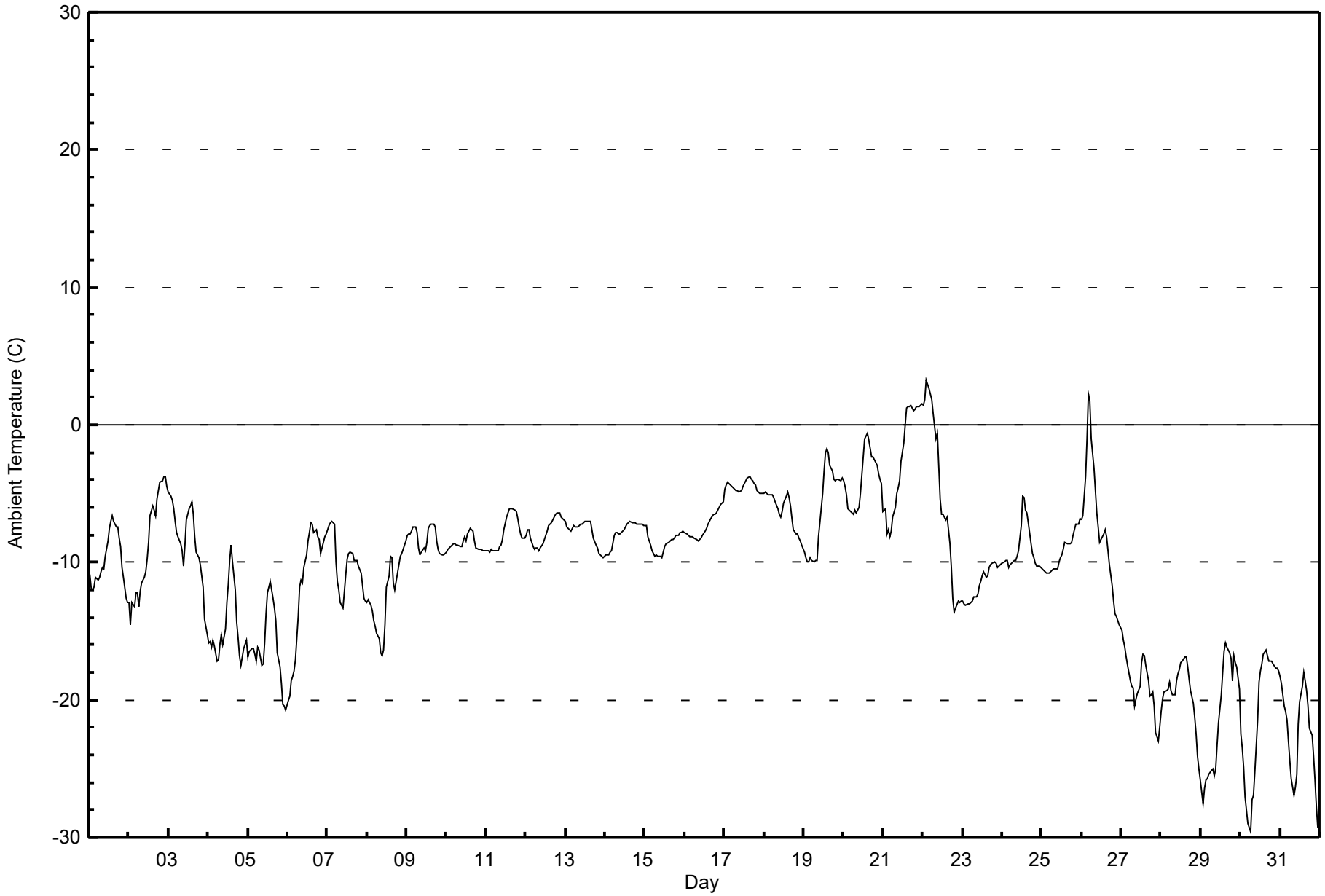


Maximum Value: 3.3 C on Jan 22 03:00 Maximum Daily Average: -2.6 C on Jan 21																						Hours in Service: 744 Hours of Data: 744					
Minimum Value: -29.6 C on Jan 30 07:00 Minimum Daily Average: -22.5 C on Jan 31																						Hours of Missing Data: 0 Hours of Calibration: 0					
Maximum Diurnal Average: -8.3 C at hour 15 Minimum Diurnal Average: -11.7 C at hour 9																						Percent Operational Time: 100.0					
Monthly Average: -10.50 C Percentiles: P ₁ = -27.0 P ₁₀ = -19.0 Q ₁ = -13.2 Median = -9.1 Q ₃ = -7.1 P ₉₀ = -4.5 P ₉₉ = 1.5																											
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	-10.8	-11.9	-12.0	-11.8	-11.0	-11.3	-11.1	-10.7	-10.3	-10.5	-9.6	-8.5	-7.5	-7.0	-6.6	-7.0	-7.4	-7.4	-8.2	-8.8	-10.3	-11.1	-12.6	-12.9	-9.9	-6.6	
2-Jan	-12.9	-14.5	-12.9	-13.2	-12.2	-12.2	-13.2	-12.1	-11.5	-11.1	-10.7	-9.8	-8.5	-6.6	-5.9	-6.2	-6.6	-5.4	-4.7	-4.2	-4.0	-3.8	-3.8	-4.4	-8.8	-3.8	
3-Jan	-4.9	-5.2	-5.5	-6.1	-7.0	-7.8	-8.1	-8.6	-9.2	-10.3	-8.7	-6.9	-6.1	-5.9	-5.6	-6.5	-8.1	-9.3	-9.7	-10.2	-11.0	-11.8	-14.2	-15.3	-8.4	-4.9	
4-Jan	-15.9	-15.7	-16.1	-15.7	-16.1	-17.2	-17.1	-16.0	-15.3	-16.0	-14.8	-12.9	-11.5	-9.9	-8.8	-10.0	-12.0	-14.4	-15.5	-16.8	-17.5	-16.2	-16.0	-15.7	-14.7	-8.8	
5-Jan	-16.9	-16.4	-16.3	-16.2	-16.7	-17.2	-16.2	-16.3	-17.5	-17.3	-15.8	-13.7	-12.2	-11.3	-12.0	-12.6	-13.3	-14.2	-16.6	-17.6	-18.8	-20.4	-20.4	-20.7	-16.1	-11.3	
6-Jan	-20.0	-19.8	-18.6	-18.4	-17.9	-17.1	-13.9	-11.8	-11.3	-11.5	-10.4	-9.4	-8.5	-7.9	-7.1	-7.2	-7.9	-7.7	-8.2	-8.3	-9.3	-9.0	-8.1	-7.9	-11.5	-7.1	
7-Jan	-7.7	-7.3	-7.1	-7.0	-7.3	-10.0	-11.4	-12.0	-13.0	-13.3	-12.1	-10.8	-9.8	-9.4	-9.3	-9.4	-9.8	-9.8	-9.8	-10.3	-10.8	-11.7	-12.7	-12.8	-10.2	-7.0	
8-Jan	-12.9	-12.8	-13.1	-13.6	-14.2	-14.6	-15.1	-15.5	-16.6	-16.8	-16.4	-14.6	-11.8	-11.0	-9.6	-9.7	-11.5	-12.0	-10.8	-10.2	-9.6	-9.4	-9.0	-8.5	-12.5	-8.5	
9-Jan	-8.1	-7.9	-8.0	-7.8	-7.4	-7.4	-7.8	-9.0	-9.4	-9.3	-8.9	-9.1	-8.5	-7.5	-7.3	-7.2	-7.2	-7.4	-8.4	-9.1	-9.4	-9.5	-9.5	-9.4	-8.4	-7.2	
10-Jan	-9.3	-9.1	-9.0	-8.7	-8.7	-8.7	-8.7	-8.8	-8.8	-8.8	-8.4	-8.1	-8.5	-7.9	-7.5	-7.7	-7.7	-8.5	-8.9	-9.1	-9.1	-9.1	-9.2	-9.2	-8.6	-7.5	
11-Jan	-9.1	-9.2	-9.2	-9.1	-9.2	-9.1	-9.2	-9.1	-8.9	-8.8	-8.4	-7.6	-6.7	-6.4	-6.1	-6.1	-6.1	-6.2	-6.3	-6.8	-7.4	-8.0	-8.2	-8.2	-7.9	-6.1	
12-Jan	-8.1	-7.6	-7.6	-8.3	-8.9	-9.0	-9.0	-9.0	-9.2	-9.0	-8.6	-8.3	-8.0	-7.7	-7.4	-7.1	-6.9	-6.8	-6.6	-6.4	-6.4	-6.7	-6.8	-6.9	-7.8	-6.4	
13-Jan	-7.1	-7.4	-7.6	-7.7	-7.6	-7.3	-7.4	-7.4	-7.4	-7.3	-7.2	-7.1	-7.1	-7.0	-7.0	-7.0	-7.6	-8.3	-8.7	-9.0	-9.3	-9.5	-9.6	-9.6	-7.8	-7.0	
14-Jan	-9.5	-9.5	-9.5	-9.2	-9.2	-8.1	-7.8	-7.9	-7.9	-8.0	-7.8	-7.7	-7.4	-7.2	-7.1	-7.0	-7.1	-7.1	-7.1	-7.2	-7.2	-7.2	-7.2	-7.3	-7.8	-7.0	
15-Jan	-7.3	-7.3	-8.2	-8.8	-9.2	-9.4	-9.6	-9.5	-9.5	-9.6	-9.6	-9.3	-8.8	-8.7	-8.5	-8.4	-8.3	-8.3	-8.2	-8.1	-8.0	-7.9	-7.9	-7.7	-8.6	-7.3	
16-Jan	-7.8	-7.9	-8.1	-8.1	-8.1	-8.2	-8.2	-8.3	-8.4	-8.3	-8.2	-8.0	-7.8	-7.5	-7.2	-7.0	-6.8	-6.6	-6.5	-6.4	-6.2	-6.0	-5.8	-5.6	-7.4	-5.6	
17-Jan	-4.7	-4.3	-4.2	-4.3	-4.4	-4.6	-4.7	-4.8	-4.8	-4.9	-4.8	-4.5	-4.2	-4.1	-3.9	-3.8	-3.9	-4.1	-4.2	-4.4	-4.8	-5.0	-5.0	-5.0	-4.5	-3.8	
18-Jan	-5.0	-4.9	-5.1	-5.1	-5.1	-5.1	-5.3	-5.6	-6.1	-6.5	-6.7	-6.3	-5.7	-5.2	-4.9	-5.3	-5.9	-6.8	-7.6	-8.0	-8.0	-8.2	-8.4	-8.8	-6.2	-4.9	
19-Jan	-9.2	-9.6	-9.9	-9.9	-9.7	-9.9	-10.0	-9.9	-9.8	-8.1	-7.1	-5.0	-3.3	-2.0	-1.8	-2.0	-3.0	-3.4	-3.9	-4.1	-4.0	-4.0	-4.1	-3.9	-6.2	-1.8	
20-Jan	-4.0	-4.5	-5.1	-6.1	-6.3	-6.4	-6.5	-6.2	-6.4	-6.0	-5.0	-3.7	-2.3	-1.1	-0.6	-1.1	-1.8	-2.4	-2.3	-2.5	-3.0	-3.5	-4.0	-4.3	-4.0	-0.6	
21-Jan	-6.3	-6.1	-7.9	-7.6	-8.1	-7.8	-6.7	-6.0	-5.0	-4.5	-4.0	-2.7	-1.4	0.0	1.2	1.3	1.4	1.5	1.0	1.1	1.4	1.4	1.3	1.5	-2.6	1.5	
22-Jan	1.4	1.8	3.3	3.0	2.6	1.8	0.8	-0.1	-1.0	-0.6	-5.4	-6.5	-6.5	-6.7	-6.9	-6.7	-8.6	-10.4	-12.6	-13.6	-13.3	-12.8	-12.9	-12.8	-5.1	3.3	
23-Jan	-12.8	-13.0	-13.2	-13.0	-13.0	-12.9	-12.8	-12.5	-12.5	-12.3	-11.7	-11.4	-11.0	-10.7	-11.1	-11.0	-10.4	-10.1	-10.0	-10.0	-10.1	-10.4	-10.3	-10.2	-11.5	-10.0	
24-Jan	-10.1	-10.0	-9.9	-9.9	-10.3	-10.2	-10.0	-9.9	-9.8	-9.6	-9.2	-7.4	-5.2	-5.3	-6.2	-6.4	-7.2	-8.6	-9.3	-9.7	-10.0	-10.2	-10.3	-10.4	-9.0	-5.2	
25-Jan	-10.5	-10.6	-10.7	-10.8	-10.8	-10.7	-10.6	-10.5	-10.5	-10.4	-9.9	-9.6	-9.4	-9.0	-8.6	-8.6	-8.6	-8.6	-8.6	-8.6	-8.1	-7.2	-7.3	-7.2	-6.8	-9.3	-6.8
26-Jan	-6.9	-6.6	-3.8	-1.0	2.2	1.8	-1.0	-3.1	-4.7	-6.4	-7.4	-8.5	-8.3	-8.0	-7.6	-8.1	-9.2	-10.1	-11.7	-12.8	-13.7	-13.9	-14.2	-14.5	-7.4	2.2	
27-Jan	-15.0	-15.6	-16.2	-16.9	-17.5	-18.6	-19.0	-19.1	-20.5	-19.9	-19.6	-19.0	-17.3	-16.6	-16.8	-17.5	-18.6	-19.8	-19.6	-19.4	-20.5	-22.4	-23.0	-22.0	-18.8	-15.0	
28-Jan	-20.8	-19.9	-19.5	-19.3	-19.3	-18.7	-19.4	-19.6	-19.6	-18.6	-18.1	-17.8	-17.3	-17.2	-16.9	-16.8	-17.6	-18.6	-19.3	-20.3	-21.3	-22.5	-24.1	-25.0	-19.5	-16.8	
29-Jan	-25.8	-27.5	-26.4	-25.9	-25.7	-25.5	-25.1	-25.0	-25.5	-25.1	-23.3	-21.7	-19.6	-18.0	-16.5	-15.9	-16.2	-16.5	-17.0	-18.6	-16.8	-17.2	-17.6	-19.2	-21.3	-15.9	
30-Jan	-22.5	-23.5	-24.9	-27.0	-28.9	-29.3	-29.6	-27.2	-27.0	-25.2	-21.4	-18.7	-17.9	-17.4	-16.7	-16.3	-16.8	-17.2	-17.2	-17.2	-17.4	-17.7	-17.7	-17.9	-21.4	-16.3	
31-Jan	-18.3	-18.8	-20.4	-20.9	-21.4	-23.0	-24.4	-25.7	-26.9	-26.3	-25.4	-21.7	-20.1	-19.0	-18.0	-18.6	-19.4	-20.5	-22.1	-22.6	-24.1	-25.8	-27.7	-29.3	-22.5	-18.0	
	-10.9	-11.1	-11.1	-11.1	-11.2	-11.4	-11.6	-11.5	-11.7	-11.6	-11.1	-10.2	-9.3	-8.7	-8.3	-8.5	-9.0	-9.5	-10.0	-10.3	-10.6	-10.9	-11.2	-11.3	Diurnal Average		
	1.4	1.8	3.3	3.0	2.6	1.8	0.8	-0.1	-1.0	-0.6	-4.0	-2.7	-1.4	0.0	1.2	1.3	1.4	1.5	1.0	1.1	1.4	1.4	1.3	1.5	Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Ells River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Ells River - January 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	56	7.53	7.53
-20 - 0	669	89.92	97.45
0 - 10	19	2.55	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

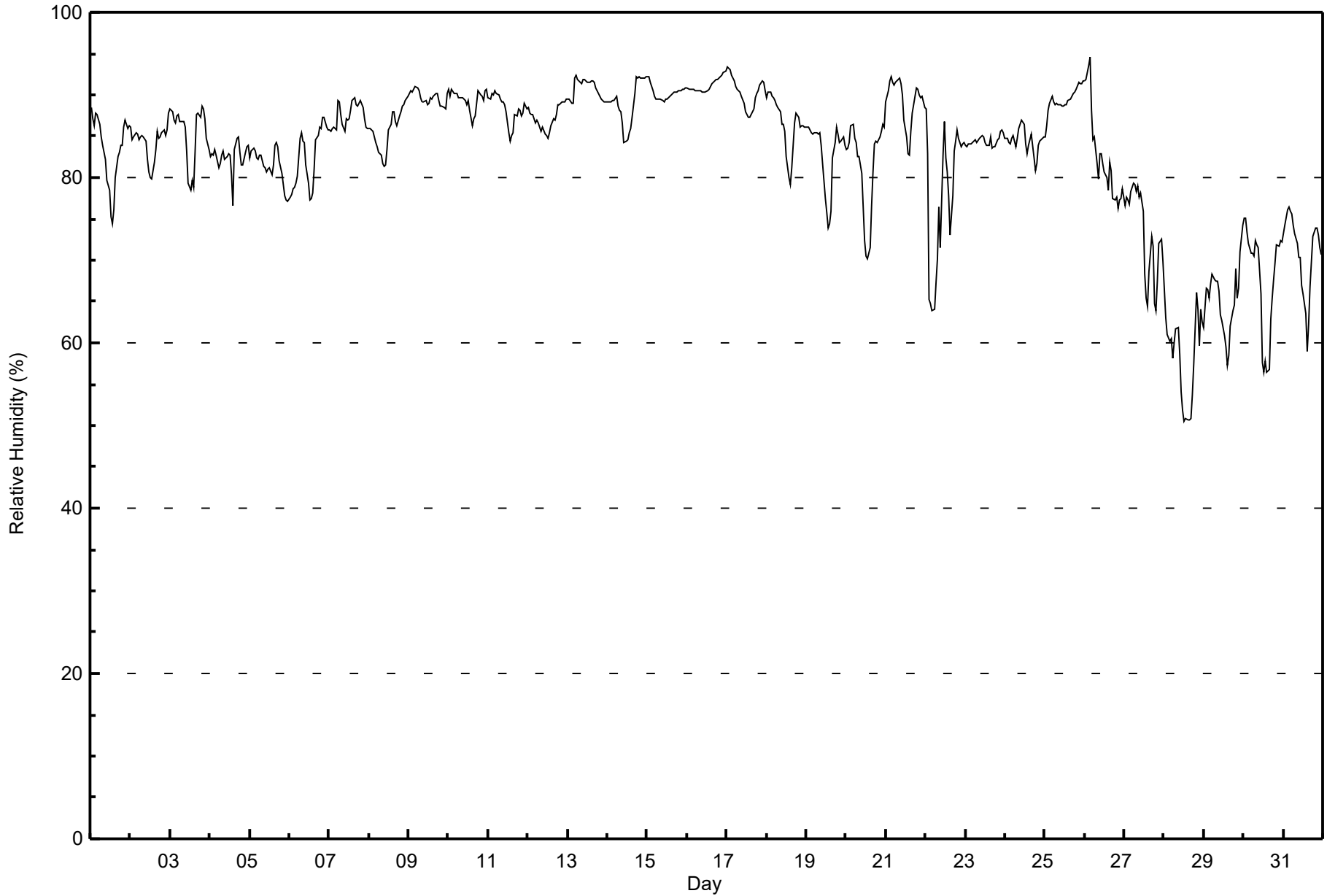
Relative Humidity (RH) - %
Ells River - January 2023

Maximum Value: 94.6 % on Jan 26 04:00 Maximum Daily Average: 91.2 % on Jan 16																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 50.5 % on Jan 28 13:00 Minimum Daily Average: 58.3 % on Jan 28 Maximum Diurnal Average: 84.7 % at hour 1 Minimum Diurnal Average: 79.1 % at hour 15 Monthly Average: 82.97 % Percentiles: P ₁ = 55.1 P ₁₀ = 69.9 Q ₁ = 80.7 Median = 85.4 Q ₃ = 89.2 P ₉₀ = 90.6 P ₉₉ = 92.4																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	88.4	87.1	86.4	87.8	87.6	86.4	84.9	84.0	83.0	82.3	79.6	78.5	75.3	74.4	76.2	80.0	82.6	83.1	83.9	83.9	86.1	87.0	85.9	86.2	83.4	88.4
2-Jan	86.1	84.5	84.9	85.4	85.3	84.6	85.0	85.1	84.9	84.4	82.2	80.7	80.0	79.9	81.8	83.3	85.7	84.8	84.8	85.4	85.8	85.0	85.7	87.8	84.3	87.8
3-Jan	88.3	87.9	87.0	86.6	87.5	87.6	86.8	86.8	86.8	86.2	83.2	79.4	78.4	79.6	78.8	83.1	87.7	87.7	87.3	88.7	88.4	87.1	84.7	83.4	85.4	88.7
4-Jan	82.5	82.9	82.8	83.3	82.7	81.2	81.8	82.7	83.2	82.3	82.6	82.9	82.8	80.3	76.5	83.3	84.7	84.9	83.0	81.5	81.6	83.0	83.7	83.8	82.5	84.9
5-Jan	82.4	83.2	83.6	83.3	82.4	82.2	82.7	82.6	81.4	81.1	80.7	81.0	81.2	80.3	81.6	83.8	84.2	83.7	82.0	80.5	79.2	77.8	77.3	77.1	81.5	84.2
6-Jan	77.7	77.9	78.7	78.8	79.3	80.2	84.8	85.4	84.4	84.2	81.5	79.3	77.3	77.5	78.1	81.0	84.6	85.1	86.2	85.9	87.3	87.3	86.2	85.8	82.3	87.3
7-Jan	85.8	85.6	86.0	86.1	85.8	89.3	89.2	87.7	86.4	85.6	87.1	87.0	87.2	88.1	89.2	89.6	88.7	88.6	89.0	89.3	88.4	87.1	86.0	85.9	87.4	89.6
8-Jan	85.9	86.0	85.5	84.9	84.2	83.8	83.1	82.8	81.6	81.4	81.5	83.3	85.8	86.5	87.9	88.0	86.7	86.4	87.4	88.0	88.6	88.8	89.3	89.8	85.7	89.8
9-Jan	90.2	90.4	90.4	90.6	91.0	90.9	90.5	89.7	89.1	89.2	89.3	88.8	89.0	89.6	89.6	89.8	90.2	90.2	89.3	88.7	88.6	88.5	88.2	90.2	89.7	91.0
10-Jan	90.7	89.8	90.7	90.3	90.2	90.2	89.7	89.7	89.7	89.4	89.3	88.8	89.3	88.2	86.3	87.1	87.5	89.0	90.6	90.1	89.8	89.3	90.4	90.7	89.5	90.7
11-Jan	89.6	89.6	90.2	90.1	90.5	90.1	90.0	89.5	89.2	89.2	88.8	88.0	85.4	84.4	85.1	85.4	87.6	87.5	88.3	88.2	87.4	87.9	89.0	88.3	88.3	90.5
12-Jan	88.5	87.8	87.6	87.6	86.6	86.9	86.6	86.2	85.6	86.0	85.3	85.0	84.8	85.4	86.2	87.1	87.0	87.6	88.9	88.8	89.2	89.1	89.1	89.4	87.2	89.4
13-Jan	89.5	89.5	89.0	89.1	92.1	92.3	91.8	91.4	91.4	91.9	91.8	91.7	91.5	91.6	91.6	91.7	91.5	90.9	90.3	89.8	89.5	89.3	89.1	89.1	90.7	92.3
14-Jan	89.2	89.2	89.2	89.4	89.4	89.9	88.6	88.1	87.9	86.6	84.3	84.4	84.5	85.3	86.0	87.3	90.2	92.2	92.0	92.1	92.0	92.0	92.1	92.2	88.9	92.2
15-Jan	92.1	92.2	91.5	90.5	89.9	89.6	89.5	89.5	89.4	89.3	89.2	89.4	89.5	89.7	89.9	90.2	90.3	90.3	90.4	90.5	90.6	90.7	90.7	90.9	90.2	92.2
16-Jan	90.8	90.7	90.7	90.6	90.6	90.6	90.6	90.5	90.4	90.4	90.4	90.4	90.5	90.8	91.0	91.3	91.5	91.8	91.9	92.0	92.2	92.4	92.8	92.9	91.2	92.9
17-Jan	93.3	93.3	93.1	92.4	91.8	91.0	90.7	90.5	90.3	89.9	89.0	88.0	87.7	87.3	87.2	88.0	88.3	89.6	90.2	90.5	91.2	91.7	91.5	90.5	90.3	93.3
18-Jan	89.7	90.4	90.3	89.8	89.7	89.3	88.8	88.6	87.9	86.5	86.5	85.6	82.6	79.9	79.2	81.2	83.9	86.6	87.8	87.2	86.1	86.3	86.3	86.1	86.5	90.4
19-Jan	86.1	86.1	85.8	85.4	85.3	85.5	85.5	85.2	85.5	83.9	81.6	77.4	75.7	73.9	74.5	75.9	82.4	84.3	86.1	85.3	84.3	84.4	84.9	83.9	82.9	86.1
20-Jan	83.4	83.6	84.2	86.3	86.4	84.7	84.2	82.6	82.5	80.5	76.4	72.3	70.5	70.2	71.4	76.5	80.7	84.0	84.5	84.3	84.9	85.6	86.4	86.1	81.3	86.4
21-Jan	89.2	90.6	91.6	92.2	91.5	91.2	91.5	91.9	92.0	91.4	90.0	87.0	84.9	82.8	82.7	85.5	87.7	88.8	90.9	90.6	90.0	89.7	89.8	88.5	89.3	92.2
22-Jan	88.3	83.0	65.2	64.8	63.9	64.1	67.3	70.1	76.4	71.6	82.7	86.8	82.3	80.7	77.7	73.0	77.8	83.2	84.4	85.8	84.7	83.8	84.0	84.2	77.7	88.3
23-Jan	83.9	83.8	84.1	84.1	84.2	84.4	84.6	84.3	84.7	85.0	84.9	84.2	84.0	83.9	84.9	83.6	83.7	83.7	84.7	84.8	85.6	85.7	85.4	84.5	85.7	85.7
24-Jan	84.7	84.7	84.2	84.0	84.8	85.0	83.8	84.8	85.9	86.4	86.9	86.5	84.1	82.9	83.9	84.5	85.2	82.3	80.9	81.7	83.9	84.3	84.7	84.9	84.4	86.9
25-Jan	84.9	86.2	88.1	89.1	89.8	89.2	88.8	89.0	88.8	88.8	88.6	86.6	88.8	88.9	89.3	89.5	89.9	90.1	90.3	90.7	91.5	91.4	91.3	91.7	89.3	91.7
26-Jan	91.7	91.9	93.6	94.6	88.2	84.6	85.0	81.7	79.8	82.9	82.9	81.8	80.6	79.9	78.4	81.8	80.8	77.4	77.3	77.7	76.3	77.3	77.5	78.7	82.6	94.6
27-Jan	76.7	77.7	77.3	76.8	78.3	79.3	79.1	78.4	79.0	77.7	78.1	76.0	68.3	65.4	64.4	68.7	72.8	71.7	64.7	63.9	67.5	72.0	72.5	69.9	73.2	79.3
28-Jan	66.4	63.1	60.9	60.2	60.5	58.2	60.1	61.7	61.8	58.6	54.0	51.8	50.5	50.9	50.7	50.7	50.8	53.8	57.4	66.1	64.1	59.7	64.1	62.5	58.3	66.4
29-Jan	61.9	66.7	66.5	65.4	67.1	68.3	67.6	67.4	67.4	66.2	63.4	62.7	60.8	59.5	57.4	58.5	62.0	63.9	64.6	68.9	65.4	66.5	70.9	74.2	65.1	74.2
30-Jan	75.1	75.1	73.5	72.0	70.8	70.8	70.5	72.4	71.8	71.6	65.9	57.7	56.5	57.8	56.5	56.9	63.0	65.4	67.6	69.6	71.9	71.8	72.3	72.3	67.9	75.1
31-Jan	73.2	74.3	76.1	76.4	75.9	75.7	74.3	73.2	72.1	70.4	70.3	67.0	65.9	63.5	59.1	62.2	66.7	69.9	72.9	73.9	73.9	73.0	71.6	70.6	70.9	76.4
84.7 84.7 84.2 84.1 84.0 83.8 83.8 83.7 83.6 82.9 82.2 81.1 79.9 79.3 79.1 80.6 82.5 83.2 83.5 84.0 84.0 84.0 84.3 84.3																								Diurnal Average		
93.3 93.3 93.6 94.6 92.1 92.3 91.8 91.9 92.0 91.9 91.8 91.7 91.5 91.6 91.6 91.7 91.5 92.2 92.0 92.1 92.2 92.4 92.8 92.9																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Ells River - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Ells River - January 2023

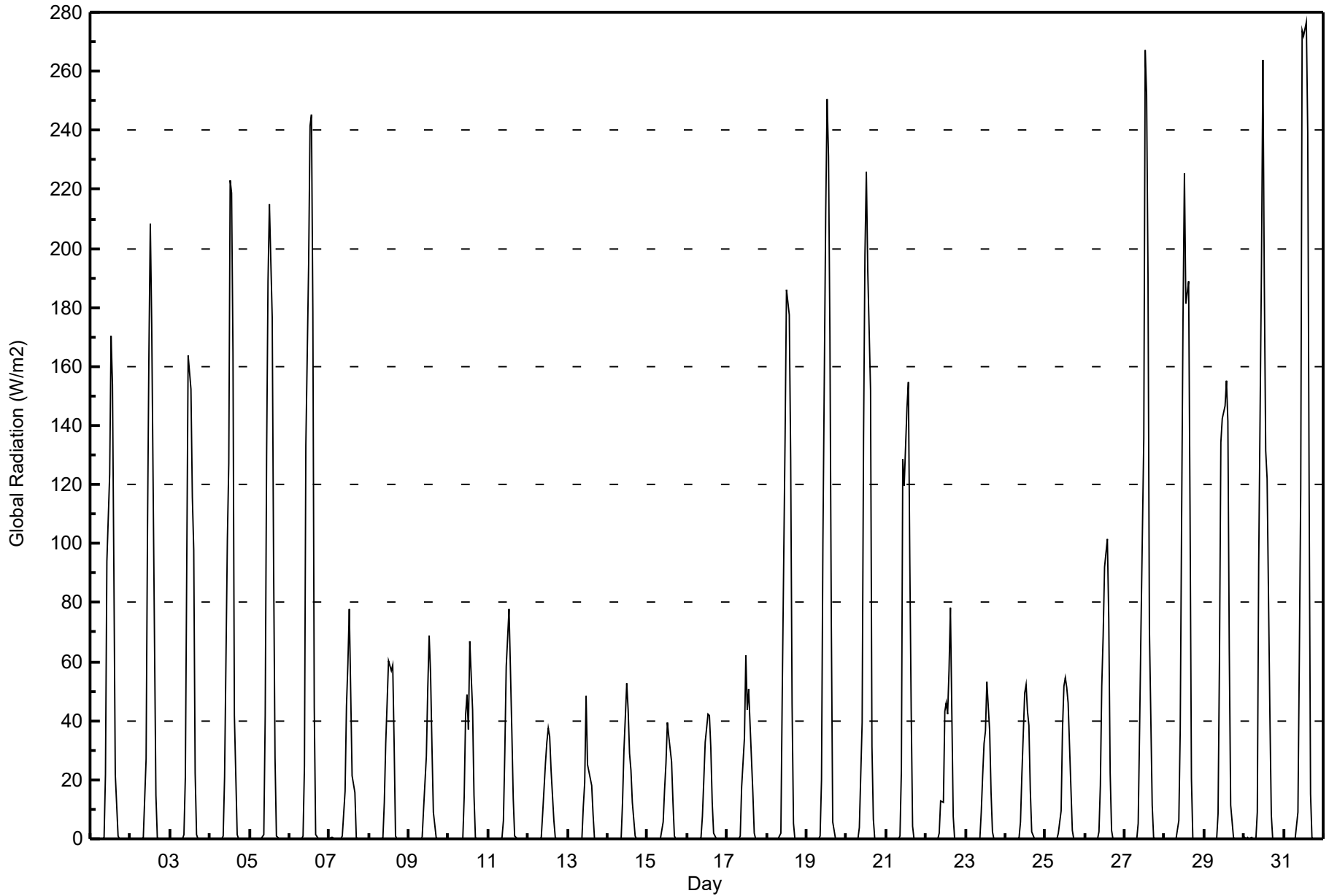
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	21	2.82	2.82
60 - 80	158	21.24	24.06
80 - 100	565	75.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 276.8 W/m2 on Jan 31 14:00 Maximum Daily Average: 57.7 W/m2 on Jan 31																						Hours in Service: 744				
Minimum Value: 0.0 W/m2 on Jan 1 01:00 Minimum Daily Average: 6.3 W/m2 on Jan 13																						Hours of Data: 744				
Maximum Diurnal Average: 127.5 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 8																						Hours of Missing Data: 0				
Monthly Average: 24.09 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 17.9 P ₉₀ = 92.5 P ₉₉ = 243.7																						Hours of Calibration: 0				
																						Percent Operational Time: 100.0				
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	21.7	94.0	123.4	170.5	153.7	90.5	21.6	0.8	0.2	0.2	0.1	0.2	0.2	0.1	0.1	28.2	170.5
2-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	26.9	105.0	163.6	208.2	174.0	67.0	14.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.7	208.2
3-Jan	0.0	0.2	0.1	0.2	0.1	0.0	0.0	0.1	1.5	20.8	92.1	163.6	152.2	115.6	97.6	22.4	1.4	0.0	0.0	0.1	0.1	0.1	0.1	0.0	27.8	163.6
4-Jan	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.9	20.7	101.6	127.2	223.0	219.0	164.6	41.6	1.6	0.1	0.2	0.1	0.0	0.1	0.1	0.0	37.5	223.0
5-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	41.7	130.2	189.0	215.2	176.4	92.7	27.5	1.2	0.3	0.2	0.2	0.2	0.0	0.0	0.0	36.5	215.2
6-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	24.8	133.6	195.3	241.6	245.3	178.5	44.6	1.6	0.0	0.0	0.0	0.0	0.0	0.1	0.2	44.4	245.3
7-Jan	0.1	0.3	0.2	0.1	0.0	0.2	0.0	0.0	0.8	16.2	45.3	59.5	77.9	50.1	21.2	15.7	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	12.0	77.9
8-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	12.5	32.2	45.9	60.1	56.9	59.0	32.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	60.1
9-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	10.0	27.9	50.7	68.9	56.1	31.3	8.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	68.9
10-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	14.4	41.5	48.9	37.1	67.0	43.6	14.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	67.0
11-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	6.3	29.7	58.3	78.0	57.4	36.6	13.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	78.0
12-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	8.5	25.6	32.8	37.3	34.5	23.4	6.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	37.3
13-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	11.0	19.2	48.2	25.1	20.5	18.1	8.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	48.2
14-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	12.3	30.0	52.6	43.7	29.1	23.0	12.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	52.6
15-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	5.5	16.7	25.7	39.6	34.7	26.2	12.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	39.6
16-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	7.5	20.1	32.9	42.4	41.6	30.9	12.3	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	42.4
17-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	17.7	34.2	62.1	43.6	50.6	38.9	15.8	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	62.1
18-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	50.3	92.8	135.8	185.8	177.7	128.6	45.5	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.3	185.8
19-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	19.7	100.4	212.1	250.5	231.2	170.6	73.5	5.8	0.2	0.2	0.1	0.0	0.0	0.0	0.0	44.4	250.5
20-Jan	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.0	3.6	39.4	135.8	198.1	226.1	192.5	151.8	31.3	6.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	41.1	226.1
21-Jan	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	23.1	128.7	119.5	146.4	154.7	95.0	43.8	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.9	154.7
22-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.0	12.6	12.5	43.4	45.8	42.3	56.8	78.2	7.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	12.6	78.2
23-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	9.2	21.6	32.1	36.5	53.0	36.4	15.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	53.0
24-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	5.7	21.7	49.4	52.3	43.1	38.5	16.5	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	52.3
25-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	9.6	37.5	51.9	54.8	51.2	46.0	17.1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	54.8
26-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	17.9	51.9	68.6	92.1	101.4	74.5	22.2	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	101.4
27-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	37.2	71.7	135.9	267.2	251.9	191.3	71.3	11.3	0.3	0.1	0.0	0.1	0.2	0.0	0.0	43.5	267.2
28-Jan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	36.8	109.3	176.8	225.5	181.1	188.7	110.8	20.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	44.0	225.5
29-Jan	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	8.6	60.1	134.5	142.2	146.6	155.2	141.3	64.2	11.6	0.3	0.0	0.0	0.0	0.0	0.0	0.2	36.1	155.2
30-Jan	0.4	0.0	0.2	0.2	0.3	0.0	0.1	0.0	9.2	92.9	195.3	263.8	188.6	131.5	121.7	41.6	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	263.8
31-Jan	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	9.2	61.5	118.8	273.7	271.9	276.8	239.3	117.0	15.2	0.3	0.0	0.0	0.0	0.1	0.1	0.1	57.7	276.8
																								Diurnal Average		
																								Diurnal Maximum		





Wood Buffalo Environmental Association
Summary of Hour Averages

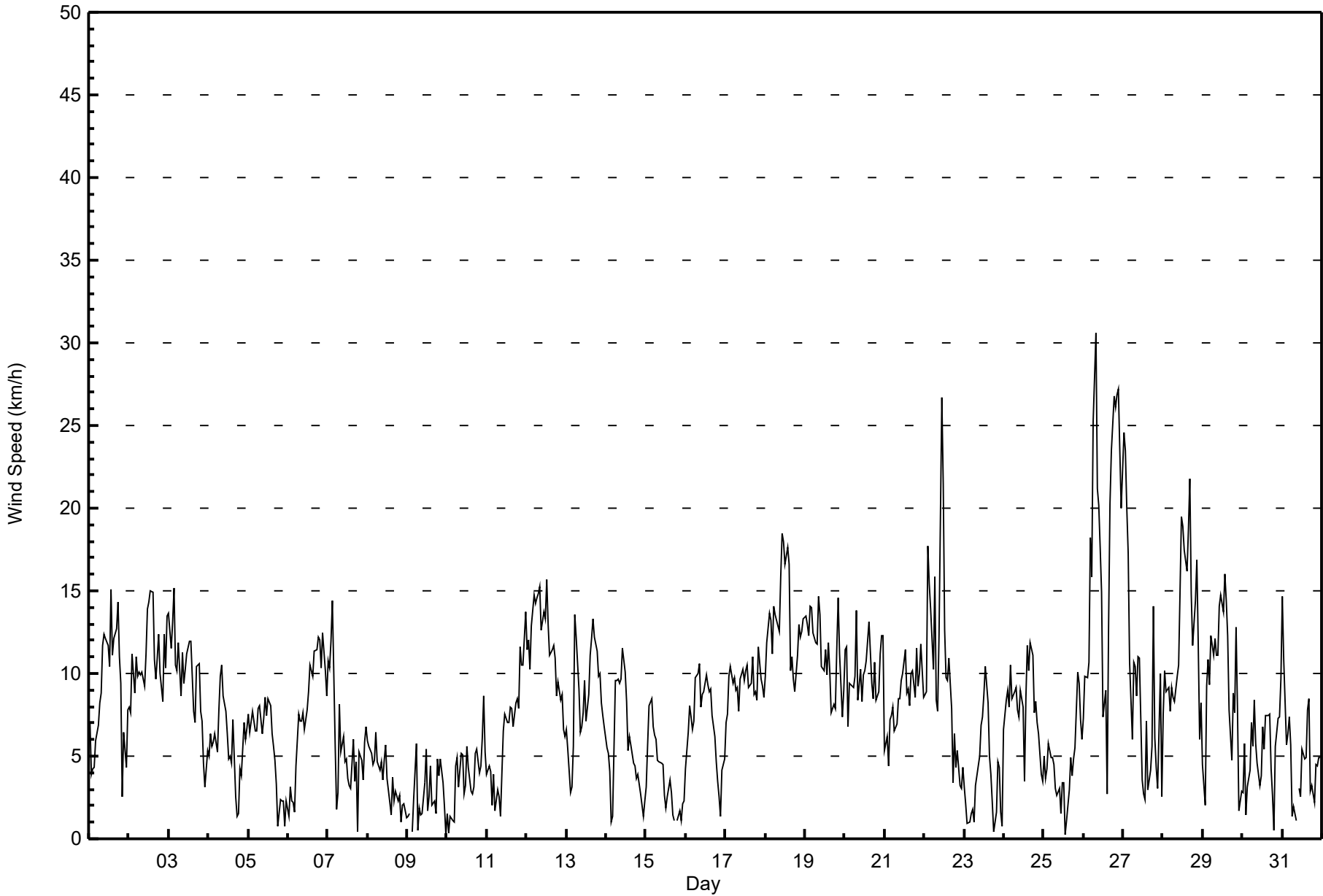
Wind Speed (WS) - km/h
Ells River - January 2023

Maximum Speed: 31 km/h on Jan 26 08:00	Maximum Daily Speed Average: 14.2 km/h on Jan 26	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 10 00:00	Minimum Daily Speed Average: 0.9 km/h on Jan 25	Hours of Data: 741
Maximum Diurnal Speed Average: 3.3 km/h at hour 9	Minimum Diurnal Speed Average: 0.8 km/h at hour 21	Hours of Missing Data: 3
Monthly Average Velocity: 2.2 km/h 203.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 8 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 24	Percent Operational Time: 99.6

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	S7	SSW4	W4	WSW4	WSW6	SSW7	SSW8	SSW9	SSW12	SSW12	SSW12	SW12	SW10	SW15	SW11	SW12	SW13	SW14	SW11	SW9	SW3	SSW6	SSW4	SSW8	SW8.5	SW15
2-Jan	SSW8	S8	S11	S9	SSW11	S10	S10	S10	S10	S9	S11	S14	S14	SSW15	SSW15	SSW11	SSW10	SW11	SW12	SSW10	SSW8	SSW12	SSW10	S13	SSW10.6	SSW15
3-Jan	S14	SSW12	SSW13	SSW15	S10	S10	SSW12	S9	S11	S9	S10	S11	S12	S12	S10	S8	SSE7	SSE10	S11	SSE8	S7	SSW5	S3	SSW5	S9.6	SSW15
4-Jan	S5	S6	S6	S6	S6	S5	S8	S10	S11	S9	S8	SSE6	SSE5	SE5	SSE5	SSE7	SSW3	WNW1	SW2	SSW4	S4	S7	SSE6	SSE7	S5.6	S11
5-Jan	S8	S6	SSW8	S7	S7	S7	S8	S8	S6	S7	S9	S7	S8	SSE8	SSE6	SSE6	SSW5	SSW3	S1	SSW2	SSW2	W2	WSW1	WNW2	S5.3	S9
6-Jan	WNW1	WNW3	W2	W2	SW2	SSW4	SSW8	SSW7	SSW7	SSW8	SSW7	SSW8	SSW9	S11	S10	SSW10	SSW11	S11	S12	S12	S10	S12	SSW10	SSW9	SSW7.3	S12
7-Jan	SSW11	SSW10	SSW12	SW14	WNW6	NW2	N3	NNW8	NW5	WNW6	WNW5	NW5	N4	ESE3	ENE3	NNE6	NW3	NNW5	WSW0	S5	SSW5	SSW4	S6	SSW7	WSW2.5	SW14
8-Jan	S6	SSW6	SSW5	S5	S5	SSW6	S5	SSW4	SSW5	S4	SSW5	S6	SSW4	SSE2	SSE1	SSE4	WNW2	N3	NNW2	NNW3	NW1	WNW2	W2	WSW1	SSW2.6	SSW6
9-Jan	N1	SW2	UO	SE0	ESE2	SSE6	N1	S2	S1	SSE2	N3	N5	NNE2	NNE3	NNE4	NE2	SSW2	NE1	NNE5	NE4	NNE5	N3	NE2	SSE0	NE1.3	SSE6
10-Jan	NNW1	WNW0	SSE1	WNW1	SW1	SSE4	SSE5	S3	SSE5	SSE5	SSW3	NNE3	NNE6	N4	NW3	WSW3	N3	NNE5	NNE5	N4	N4	NNE6	NNE9	NNE5	NNE1.3	NNE9
11-Jan	N4	N4	N4	NNW2	NNE4	ENE2	SSW3	SW3	SSW1	SSE4	S7	S8	SSW7	S7	S8	S8	S7	S8	S8	S8	S12	S11	S10	S14	S4.7	S14
12-Jan	S11	SSW12	S10	S13	S15	S14	S15	S15	S15	S13	S14	S13	S16	S13	S11	S11	S12	S11	S9	S10	S8	S9	S7	S6	S11.7	S16
13-Jan	SSE7	ESE5	E3	NE3	N6	NNE14	NNE12	NE9	NE6	NNE7	NNE8	NNE10	NE7	NE9	NE11	NE12	NE13	NNE12	NNE11	NNE10	NNE10	NNE8	NNE7	NNE7	NNE7.8	NNE14
14-Jan	NNE6	NNE5	NNE4	N1	W1	S10	S10	S10	S9	S10	S12	S10	S8	S5	S6	S6	S5	S4	S4	SSE4	SSW3	SSE3	ESE1	NNE2	S4.2	S12
15-Jan	ENE3	NNE6	NNE8	NNE8	NNE7	NNE6	NNE6	N5	N5	NNE5	NNE5	N3	N2	N3	N4	NNE3	ENE1	WSW1	UO	NW1	NW2	W1	NNW2	NNW2	NNE3.5	NNE8
16-Jan	N4	N6	NNE8	N7	NNE7	N7	NNE10	NNE10	NNE11	NNE8	NNE9	NNE9	NNE10	NNE9	NNE9	NNE9	N7	NNE6	N5	N3	NW3	SW1	SSW4	S5	NNE6.1	NNE11
17-Jan	SSW7	SSW8	SSW10	SSW10	S9	SSW10	S9	S9	SSW8	S10	S10	SSW10	SW10	SW11	SSW9	SSW9	S11	SSW9	S9	SSW8	SSW12	SSW10	SSW9	SSW9	SSW9.2	SSW12
18-Jan	S10	SSW12	SSW14	S13	S11	SSW14	S14	S13	S13	S16	S18	S18	S17	S18	S17	S10	S11	S10	S9	S11	S13	S12	S13	S13	S13.2	S18
19-Jan	S13	S13	S12	S14	S14	S12	S12	S12	SSW15	SW14	SW10	SW10	SW11	SW10	SSW12	SSW10	SSW8	SW8	SW8	WSW11	WSW15	WSW11	SW7	WSW9	SSW10.4	SSW15
20-Jan	WSW11	WSW12	SW7	SSW9	SW9	SW9	SW10	WSW14	WSW8	WSW10	SW8	WSW10	WSW10	WSW11	WSW13	SW11	SSW9	SW8	WSW11	W8	W9	WSW11	WSW12	WSW12	WSW9.8	WSW14
21-Jan	SE5	SSW6	SSE4	SSW7	S7	SSE8	S7	S7	S8	S9	SSE10	S10	S11	SSW9	SW9	SSW8	SW10	SW10	SW9	WSW12	WSW9	WSW10	WSW12	WSW9	SSW7.2	WSW12
22-Jan	WSW9	W9	NW18	WNW15	WNW14	WNW10	W16	WSW8	WSW8	NNW12	NNE27	NNE21	NNE13	NE10	NE10	NNE11	ENE8	ESE3	E6	NE4	ENE5	ENE3	NNE3	N4	NNW5.3	NNE27
23-Jan	N3	NNE2	SW1	SE1	E1	NNW2	ENE1	NE3	N4	NNE5	NNE7	NNE7	NNE9	NNE10	N8	NNW5	N4	W2	W0	SSE2	N5	ENE4	NNE2	ESE1	NNE3.1	NNE10
24-Jan	SSE7	S8	S9	SSE8	SSE10	S8	S9	SSE9	S8	SSE7	SSE9	SSW8	WSW3	NNE9	NNE12	NNE10	NE12	ENE11	NE8	ENE8	ENE7	ENE6	E4	NE3	ESE3.7	NE12
25-Jan	ENE5	E4	NE4	NNE6	NNE5	NNW5	NNW4	NE3	NE3	NNE3	N2	NNE3	NNE3	WNW0	N1	SE3	S5	S4	S5	S5	S10	S9	S7	SW6	SE0.9	S10
26-Jan	S7	S10	SW10	W11	NW18	NNE16	NNE25	NNE31	NNE21	NNE20	NNE18	NNE15	NE7	ENE9	NNE3	NE13	NNE20	NNE23	NNE27	NNE26	NNE27	NNE27	NNE24	NNE20	NNE14.2	NNE31
27-Jan	NNE25	NNE23	NNE20	NNE17	NNE11	NNE6	NNE11	NNE10	NE9	NE11	NE11	NE4	ENE3	ENE2	NE7	ENE3	NNW4	NW6	NNW14	WNW6	W4	WSW3	WNW10	WNW3	NNE7.5	NNE25
28-Jan	WSW8	WNW10	W9	W9	W8	WNW9	WNW9	W8	WNW10	NW10	NW15	NW20	NW19	NW17	NW16	NW19	NNW22	NW15	NNW12	NNE14	NNE17	N12	NNW6	NW8	NW10.9	NNW22
29-Jan	NNW5	SW2	SW9	WSW11	WSW9	WSW12	WSW11	WSW12	SW11	SW11	SSW14	SSW15	SSW14	SSW16	SW14	SW12	SW8	WSW5	W9	NW8	NNW13	N8	NW2	WNW3	WSW7.4	SSW16
30-Jan	WNW3	NNW6	WNW1	SSW3	SSW4	SSW7	SW6	WSW8	WSW6	SW5	WSW3	W4	WSW7	S5	S7	S7	SSE8	ESE4	NNE3	E1	NNE6	NNE7	NNE7	NNE10	SW1.4	NNE10
31-Jan	NNE15	NE11	NNE6	NE6	NE7	ENE6	E1	SSW2	W1	UO	W3	N3	SE5	SSE5	SSE5	SSE8	SSE9	SE3	NE3	NNW2	WNW5	NW4	WNW5	WNW5	NE1.6	NNE15

SSW2.2SSW2.3 SW2.8SSW3.2 SW2.8SSW2.9SSW2.8SSW2.8SSW3.3SSW3.0 S2.5SSW2.4SSW3.0SSW2.9SSW2.5 S2.3 S1.9SSW1.6 SW0.9 SW1.2WSW0.8 SW1.2 SW1.6 SW2.0	Diurnal Average
NNE25 NNE23 NNE20 NNE17WNW18 NNE16 NNE25 NNE31 NNE21 NNE20 NNE27 NNE21 NW19 S18 S17 NW19NNW22 NNE23 NNE27 NNE26 NNE27 NNE27 NNE24 NNE20	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	248	33.47	33.47
6 - 11	354	47.77	81.24
12 - 19	120	16.19	97.44
20 - 28	18	2.43	99.87
29 - 38	1	0.13	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Ells River - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	33	26	13	12	6	7	7	19	23	27	10	10	13	17	11	14	248
6 - 11	7	50	16	7	1	0	0	23	113	55	32	25	9	9	4	3	354
12 - 19	1	13	3	0	0	0	0	0	46	22	10	10	1	3	7	4	120
20 - 28	0	16	0	0	0	0	0	0	0	0	0	0	0	0	1	1	18
29 - 38	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	41	106	32	19	7	7	7	42	182	104	52	45	23	29	23	22	741

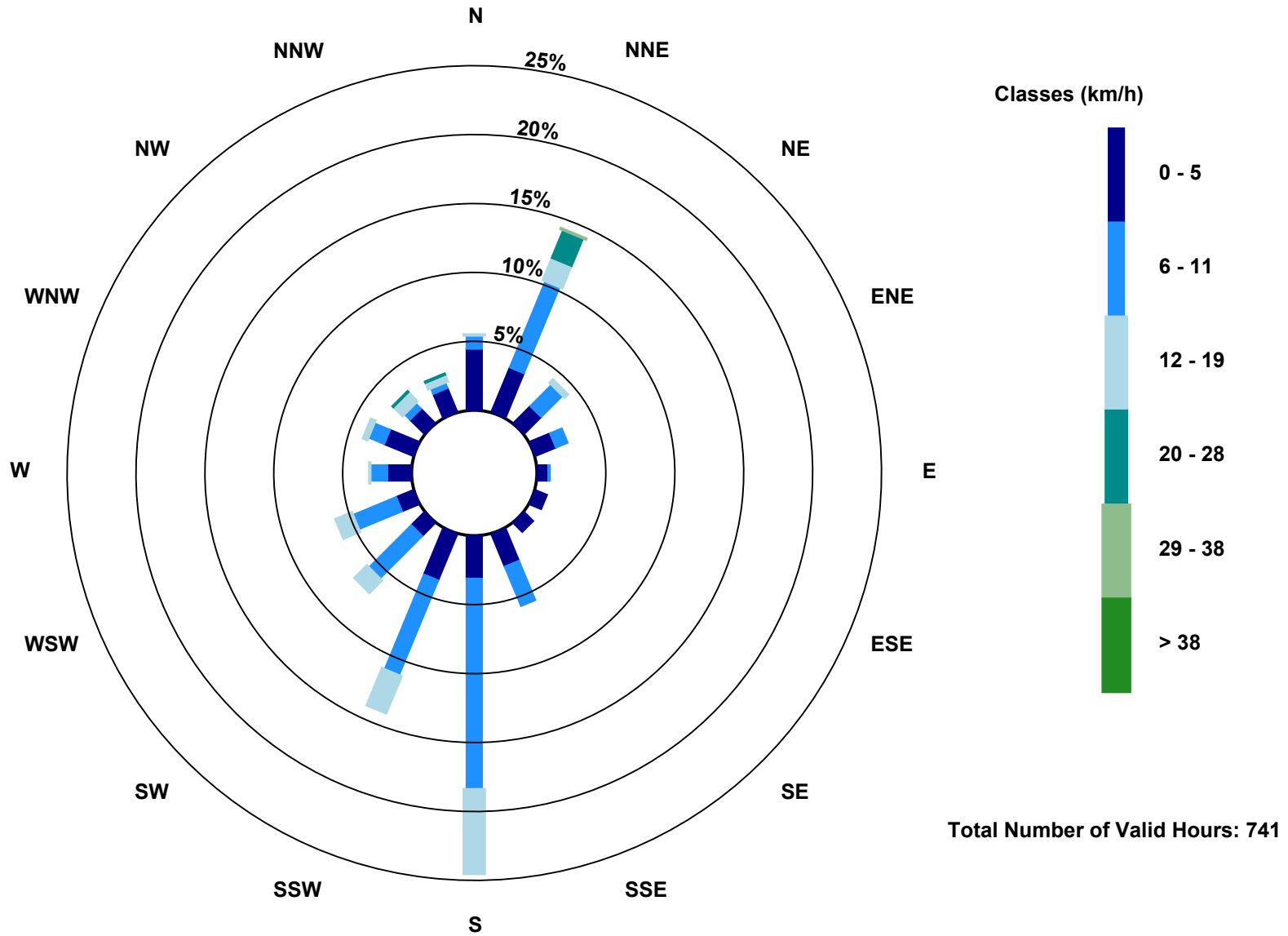
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Ells River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Ells River - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Jan 26 07:00 Minimum Value: 0 km/h on Jan 14 22:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6																														
Day	Hourly Period Ending At (MST)																								Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																							
1-Jan	2	2	2	2	1	1	2	2	2	2	3	2	3	4	3	3	3	3	4	4	2	2	1	2	4																						
2-Jan	2	2	2	2	2	2	2	2	2	1	2	2	2	3	3	2	2	2	2	3	3	3	2	3	3																						
3-Jan	2	2	2	3	2	2	2	1	1	1	2	2	2	2	2	1	2	2	1	2	2	2	2	1	3																						
4-Jan	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	1	1	1	2																						
5-Jan	1	1	1	2	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	2	2																						
6-Jan	1	1	1	1	1	2	1	1	1	1	1	2	1	2	2	1	2	2	2	2	2	1	2	2	2																						
7-Jan	2	2	2	3	3	1	2	2	1	1	2	1	1	2	1	2	1	1	1	1	1	1	2	1	3																						
8-Jan	1	1	1	1	1	1	1	2	3	1	1	1	2	1	1	1	1	0	1	1	1	0	1	1	3																						
9-Jan	1	1	UO	1	1	2	1	2	1	1	1	1	2	1	1	1	1	2	1	2	1	0	1	1	2																						
10-Jan	1	1	1	1	1	1	1	1	1	1	1	2	0	1	1	1	1	2	2	1	1	1	1	1	2																						
11-Jan	1	0	1	1	1	1	1	1	2	0	1	1	2	1	1	1	1	2	1	2	2	2	2	2	2																						
12-Jan	2	2	2	3	2	2	3	3	3	2	3	3	3	2	2	2	2	2	2	1	2	1	2	1	3																						
13-Jan	1	1	1	1	3	2	2	2	1	1	2	2	1	1	2	2	2	2	2	1	1	1	1	1	3																						
14-Jan	1	1	1	1	1	3	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	0	1	1	3																						
15-Jan	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	UO	1	1	1	1	1	3																						
16-Jan	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	1	1	1	0	1	1	1	1	2																						
17-Jan	1	1	2	2	2	2	2	2	1	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	3																						
18-Jan	2	2	3	3	3	3	3	2	2	3	4	4	4	3	3	2	1	1	1	2	2	2	2	2	4																						
19-Jan	2	2	2	2	2	2	2	2	2	3	3	3	4	2	3	2	2	2	2	4	4	4	3	3	4																						
20-Jan	3	3	4	2	1	2	3	4	3	4	3	3	3	3	3	3	2	2	3	3	2	3	3	3	4																						
21-Jan	2	2	1	2	1	1	2	2	3	1	1	2	2	2	2	1	2	2	2	3	3	3	3	3	3																						
22-Jan	2	2	5	5	5	4	4	4	4	2	7	4	4	2	2	3	2	1	1	1	1	2	1	1	7																						
23-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	2																						
24-Jan	1	1	1	2	1	2	1	2	1	2	2	2	3	2	2	3	2	1	1	1	1	1	1	2	3																						
25-Jan	1	1	1	1	1	1	1	1	1	2	1	2	2	1	1	1	1	1	1	3	2	2	2	2	3																						
26-Jan	3	1	3	3	5	4	8	6	4	5	3	4	2	3	1	4	4	3	4	4	4	4	4	5	8																						
27-Jan	4	3	3	4	2	2	5	3	2	2	2	3	1	1	2	2	2	2	2	2	1	1	3	2	5																						
28-Jan	2	3	2	3	3	3	2	2	3	2	5	5	4	4	3	4	7	4	3	5	5	8	2	1	8																						
29-Jan	2	2	2	2	2	3	2	3	3	2	3	4	3	4	4	4	2	2	2	2	3	3	1	1	4																						
30-Jan	1	1	2	2	2	2	3	2	2	1	2	2	2	2	2	2	2	1	1	1	2	1	2	3	3																						
31-Jan	2	2	3	2	1	2	1	1	1	UO	2	1	2	2	2	2	2	2	1	1	1	1	1	1	3																						
Diurnal Maximum																								4	3	5	5	5	4	8	6	4	7	5	5	4	4	4	4	7	4	4	5	5	8	4	5
UO - Unstable Operation																																															



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Ells River - January 2023

Direction of Maximum Speed: 24 deg on Jan 26 08:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 23.8 deg on Jan 26	Hours of Data: 741
Direction of Minimum Speed: 149 deg on Jan 10 00:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 0.9 deg on Jan 25	Percent Operational Time: 99.6
Monthly Average Direction: 203.3 deg	

Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	187	203	272	255	254	209	194	197	208	203	210	215	226	235	225	228	226	226	218	235	216	201	204	194	217.9
2-Jan	198	171	183	172	192	172	174	185	185	188	179	182	184	200	210	208	206	222	217	210	206	208	194	184	193.5
3-Jan	187	206	197	193	185	187	192	188	180	173	186	183	181	178	179	171	160	164	170	167	170	193	191	206	183.2
4-Jan	189	187	182	181	186	178	176	186	181	173	171	162	153	145	150	155	201	295	231	198	185	184	164	160	175.8
5-Jan	184	189	195	184	180	177	182	185	179	184	180	170	175	162	159	167	203	209	184	196	202	273	245	287	183.1
6-Jan	302	284	273	270	222	201	194	205	213	199	202	202	197	179	183	192	198	184	181	185	184	189	199	199	195.5
7-Jan	209	207	209	215	289	326	4	336	325	283	300	306	357	113	63	27	305	342	244	189	198	209	189	196	243.8
8-Jan	187	202	196	190	176	193	185	195	192	188	200	191	206	147	150	160	295	357	347	329	313	286	261	239	198.8
9-Jan	355	219	UO	136	118	147	10	175	188	167	9	11	12	18	16	37	198	37	23	35	18	354	38	149	34.9
10-Jan	339	292	152	286	215	168	165	174	162	167	200	15	14	354	325	249	353	24	18	349	2	17	25	15	18.3
11-Jan	352	2	351	344	20	66	198	220	192	160	176	188	198	182	180	179	172	179	173	180	174	171	176	178	178.3
12-Jan	171	192	184	172	180	175	178	178	178	174	178	178	178	176	171	175	172	175	178	181	178	171	178	169	176.8
13-Jan	158	102	91	51	5	21	26	40	53	29	19	30	44	39	38	46	34	24	27	23	24	18	22	22	33.7
14-Jan	27	13	16	350	269	170	171	171	169	173	176	176	181	179	178	179	184	174	160	192	165	111	20	20	170.3
15-Jan	58	27	21	15	13	13	22	352	354	28	26	4	3	10	5	24	78	250	UO	321	325	271	334	344	12.2
16-Jan	6	11	17	9	14	10	13	13	15	18	19	15	20	25	14	17	360	16	7	9	311	234	202	181	13.1
17-Jan	199	206	201	194	191	193	191	190	193	177	179	193	216	215	208	194	191	198	184	204	194	200	193	194	195.8
18-Jan	190	196	198	188	189	192	181	179	184	187	186	187	187	184	187	182	174	172	182	182	179	182	184	183	185.1
19-Jan	190	189	183	182	184	185	191	183	194	219	220	227	230	220	213	209	202	220	225	240	248	249	235	254	210.1
20-Jan	242	244	222	195	218	219	226	253	242	244	228	242	248	254	240	225	208	218	239	261	264	253	252	249	238.2
21-Jan	142	203	164	194	183	160	175	172	180	173	163	181	187	200	222	210	218	223	234	250	251	253	242	257	205.4
22-Jan	247	267	307	291	288	290	278	255	258	328	33	26	29	40	42	27	64	110	81	44	67	62	24	357	346.1
23-Jan	354	22	225	133	81	334	73	54	7	26	17	18	15	21	11	347	357	269	268	161	9	61	23	106	17.0
24-Jan	163	170	178	166	163	176	184	166	171	155	162	192	245	22	28	29	56	63	55	65	64	57	86	47	119.1
25-Jan	66	90	40	33	16	337	329	55	39	14	3	24	26	283	4	136	190	183	188	181	181	173	176	215	129.5
26-Jan	190	175	227	267	304	13	19	24	12	28	30	29	44	59	28	44	31	26	32	32	28	28	22	32	23.8
27-Jan	21	12	16	29	26	15	14	28	43	39	45	38	75	78	48	76	327	316	330	296	278	244	302	291	12.9
28-Jan	258	286	273	268	259	282	288	277	303	306	316	314	315	312	310	321	334	315	336	15	12	10	343	326	315.7
29-Jan	342	233	229	246	244	244	242	238	233	224	206	206	201	206	222	228	230	239	281	317	345	359	318	284	238.3
30-Jan	293	348	285	211	203	195	232	249	239	218	238	265	249	180	184	174	149	116	20	96	12	18	17	12	231.0
31-Jan	25	36	28	43	54	63	94	196	279	UO	275	2	136	163	147	162	160	142	34	336	303	315	299	292	49.0

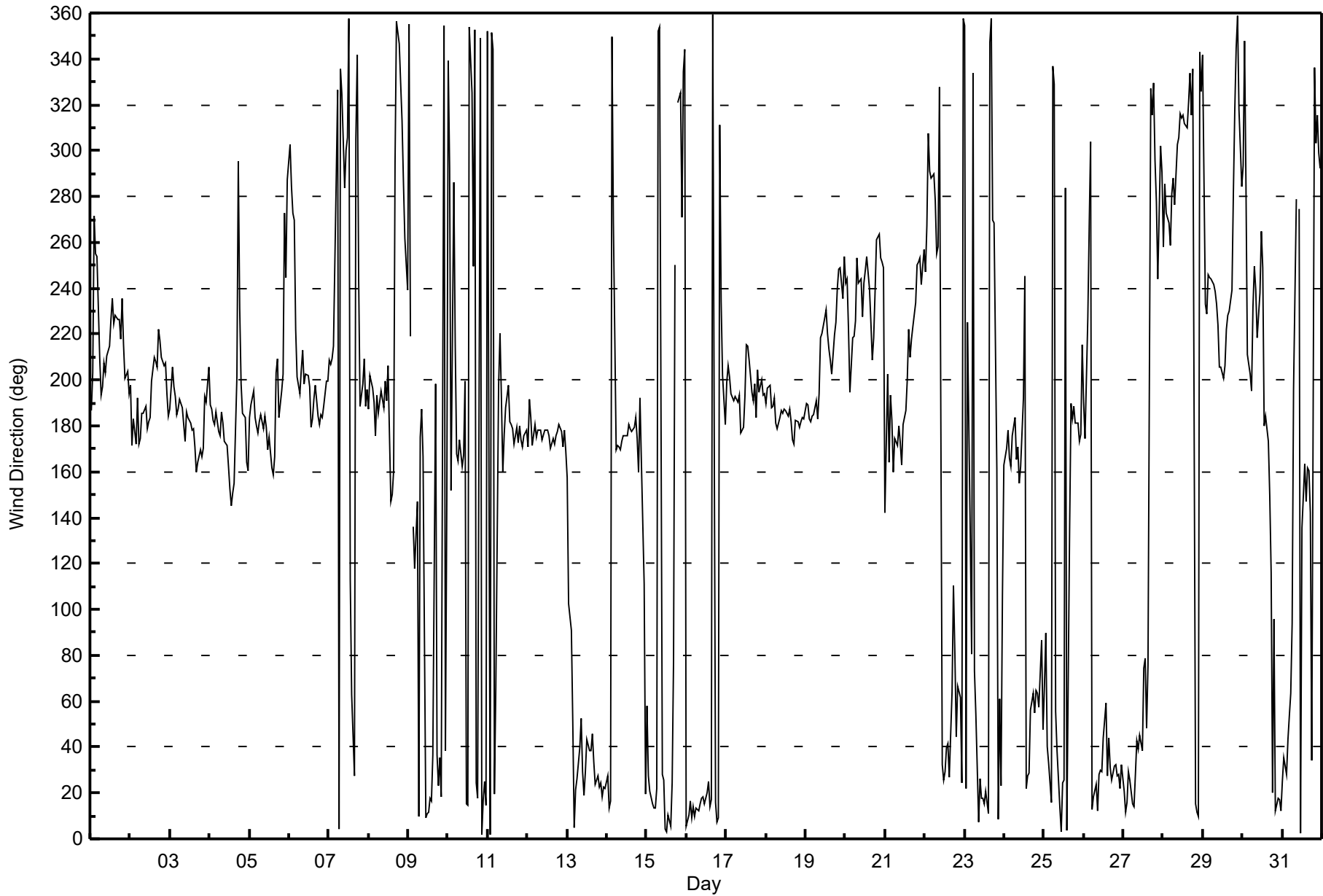
194.6 210.5 217.6 209.2 216.2 194.6 201.2 200.2 199.9 193.8 182.6 201.6 201.7 192.3 200.1 187.1 190.9 206.1 225.0 222.3 241.7 216.2 221.5 218.6
 Diurnal Average

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Ells River - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Ells River - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0											Hours in Service: 744														
Maximum Value: 94 deg on Jan 7 19:00											Hours of Data: 741														
Minimum Value: 5 deg on Jan 5 02:00											Hours of Missing Data: 3														
Percentiles: P ₁ = 6 P ₁₀ = 8 Q ₁ = 10 Median = 14 Q ₃ = 22 P ₉₀ = 41 P ₉₉ = 84											Hours of Calibration: 0														
											Percent Operational Time: 99.6														
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	8	22	33	25	18	24	18	13	12	12	15	14	18	14	17	17	16	13	20	18	84	22	32	12	84
2-Jan	13	11	8	11	13	16	10	15	12	17	12	10	10	13	14	15	13	16	13	14	17	11	15	7	17
3-Jan	7	10	11	10	8	8	10	11	6	9	10	13	10	10	10	13	15	10	6	8	10	40	62	15	62
4-Jan	30	21	15	12	18	26	12	10	9	10	9	9	15	9	6	8	57	52	39	23	43	12	9	7	57
5-Jan	11	5	7	6	9	8	5	5	8	6	6	9	10	12	6	6	15	13	76	22	26	56	60	44	76
6-Jan	67	31	39	40	30	15	7	11	10	9	10	14	12	13	14	14	10	11	9	9	7	7	13	13	67
7-Jan	12	13	11	13	33	75	72	20	19	12	30	21	31	57	47	19	34	28	94	19	13	22	12	8	94
8-Jan	13	16	18	11	17	8	17	20	51	16	10	6	16	11	8	10	32	31	41	42	66	39	31	34	66
9-Jan	88	24	UO	66	62	8	85	65	84	61	11	6	55	21	7	25	47	81	10	21	12	24	42	85	88
10-Jan	24	78	21	37	61	12	9	15	8	10	34	46	12	20	34	28	17	8	12	11	8	8	6	19	78
11-Jan	17	9	18	31	12	44	23	15	49	9	9	13	22	21	15	13	10	13	10	14	10	10	13	10	49
12-Jan	12	12	12	10	10	11	11	11	10	10	11	11	10	10	12	11	9	9	9	11	13	12	12	11	13
13-Jan	17	24	26	34	23	7	8	9	13	8	9	10	11	8	7	10	8	8	6	6	6	8	6	13	34
14-Jan	15	14	20	47	66	12	10	9	9	10	10	11	10	13	11	11	13	10	10	8	12	13	39	22	66
15-Jan	30	8	7	7	8	9	10	16	15	7	6	21	33	23	18	10	35	68	UO	49	35	30	26	15	68
16-Jan	12	6	6	7	6	8	6	6	8	7	8	7	6	10	10	12	9	8	8	17	14	61	17	9	61
17-Jan	13	12	12	12	11	11	11	10	14	11	9	13	19	18	13	12	13	15	13	15	13	14	16	17	19
18-Jan	15	12	14	12	12	12	13	10	11	12	11	12	12	11	10	14	9	6	9	8	8	8	9	9	15
19-Jan	9	9	9	10	9	9	11	9	10	18	19	20	17	18	14	15	10	14	16	18	18	24	28	23	28
20-Jan	20	18	63	17	14	17	22	19	27	30	28	18	21	23	17	16	13	19	19	30	15	14	15	17	63
21-Jan	42	30	25	18	13	12	8	14	16	18	12	10	11	16	14	13	17	14	18	20	21	19	18	20	42
22-Jan	16	29	15	19	20	25	18	36	27	36	10	10	8	10	10	11	11	24	13	20	13	32	18	17	36
23-Jan	23	49	85	68	35	47	73	19	12	13	9	8	7	5	7	19	34	38	88	83	17	29	50	75	88
24-Jan	11	10	11	17	12	12	10	10	14	11	15	60	39	9	8	12	10	17	12	15	13	19	31	60	
25-Jan	19	15	19	14	15	28	14	45	44	48	53	39	43	84	74	38	16	20	19	20	12	19	29	24	84
26-Jan	34	11	21	22	17	29	12	14	18	8	7	7	23	16	27	9	6	6	8	8	7	7	9	8	34
27-Jan	9	8	8	12	13	17	13	10	12	10	9	61	27	67	13	46	30	29	9	27	25	38	12	77	77
28-Jan	14	19	17	16	33	26	16	22	24	17	15	13	14	16	15	12	15	13	18	16	14	23	23	11	33
29-Jan	37	88	17	15	14	14	14	14	15	15	13	19	16	14	17	17	20	26	18	17	15	34	55	25	88
30-Jan	34	18	61	35	25	16	29	12	32	23	46	27	30	31	21	12	10	21	26	77	49	13	10	12	77
31-Jan	11	10	12	12	7	12	39	56	65	UO	15	31	37	42	41	14	7	68	24	40	15	12	9	6	68
											88 88 85 68 66 75 85 65 84 61 53 61 60 84 74 46 57 81 94 83 84 61 62 85														
Diurnal Maximum																									
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS506
JACKFISH 1
JANUARY 2023

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	710	34	34	100	52.9	0	14.5	0
H2S (ppb) Average	703	36	41	99.33	1.3	0	0.4	0
NO2 (ppb) Average	708	36	36	100	20.6	0	7	-
NO (ppb) Average	708	36	36	100	14.8	-	3.9	-
NOX (ppb) Average	708	36	36	100	32.5	-	9.8	-
Temperature 2 m (C) Average	744	0	0	100	3.2	-	-1.1	-
Relative Humidity (%) Average	744	0	0	100	96.3	-	93.3	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	23	-	13	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	1.5	4.9	-	0	0.1	0.2	0.4	0.7	2.1	52.9
H2S (ppb) Average	703	0.17	0.1	-	0	0.1	0.1	0.1	0.2	0.3	1.3
NO2 (ppb) Average	708	3.62	2.6	-	0.1	1.3	2.1	3	4.3	6.1	20.6
NO (ppb) Average	708	0.73	1.5	-	0	0	0	0.2	0.8	1.7	14.8
NOX (ppb) Average	708	4.35	3.7	-	0.1	1.4	2.4	3.4	5.1	7.6	32.5
Temperature 2 m (C) Average	744	-9.2	5.6	-	-27.8	-18.1	-11.7	-8.5	-5.5	-2.8	3.2
Relative Humidity (%) Average	744	85.71	7.1	-	55.1	75.5	82.4	88.5	90.4	92.1	96.3
Wind Speed 10 m (km/h) Average	742	5	4	-	0	1	2	5	6	9	23
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 1 (AMS506)
JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	20 Jan 2023 11:00	20 Jan 2023 15:00	5	Maintenance - SO2 scrubber hydrator re-filled
Wind Speed, Wind Direction	11 Jan 2023 04:00	11 Jan 2023 04:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	13 Jan 2023 07:00	13 Jan 2023 07:00	1	Flat line in sensor output signal - Sensor frozen



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

Jackfish 1 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 52.9 ppb on Jan 26 08:00		Maximum Daily Average: 14.5 ppb on Jan 28		Hours of Data: 710														0.4		1.2							
Minimum Value: 0.0 ppb on Jan 7 22:00		Minimum Daily Average: 0.1 ppb on Jan 14		Hours of Missing Data: 34														0.3		1.3							
Maximum Diurnal Average: 3.4 ppb at hour 13		Minimum Diurnal Average: 0.5 ppb at hour 1		Hours of Calibration: 34														0.3		1.0							
Monthly Average: 1.50 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.4 Q ₃ = 0.7 P ₉₀ = 2.1 P ₉₉ = 28.1		Percent Operational Time: 100.0														0.5		0.9							
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	0.2	Z	0.3	0.4	0.3	0.4	1.2	0.7	0.3	0.3	1.1	0.7	0.4	0.4	0.4	0.4	0.2	0.1	0.0	0.1	0.1	0.3	0.3	0.1	0.4	1.2	
2-Jan	0.1	0.2	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.9	0.8	1.3	0.3	1.3	
3-Jan	1.0	0.8	1.0	Z	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.4	0.3	1.0	
4-Jan	0.2	0.4	0.9	0.4	Z	0.3	0.4	0.4	0.4	0.3	0.7	0.9	0.7	0.9	0.5	0.6	0.4	0.5	0.7	0.4	0.3	0.2	0.2	0.5	0.9	0.9	
5-Jan	0.1	0.3	0.6	0.3	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.5	0.6	0.4	0.4	0.5	0.9	0.8	0.6	0.8	0.6	0.4	0.9	
6-Jan	Z	0.5	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	1.0	1.2	0.8	1.2	1.3	0.7	0.7	0.7	0.5	0.4	0.3	0.4	0.6	0.7	1.3	
7-Jan	0.5	Z	0.4	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.6	0.7	0.9	0.7	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.9	
8-Jan	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.6	0.7	0.6	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.7	
9-Jan	0.2	0.1	0.2	Z	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.9	1.3	2.1	2.2	3.0	4.2	4.6	4.0	4.0	3.0	2.2	1.5	4.6	
10-Jan	1.8	1.5	0.9	0.7	Z	0.4	0.4	0.4	0.5	0.4	0.4	0.7	1.4	3.9	7.1	8.4	8.1	6.7	6.7	1.3	0.6	0.5	0.4	0.3	2.3	8.4	
11-Jan	0.2	0.2	0.2	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.4	0.5	0.6	0.3	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.6	
12-Jan	Z	0.1	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.5	1.0	1.1	0.9	0.7	0.7	0.6	0.6	1.3	1.1	1.3	1.5	0.7	0.4	0.6	0.6	1.5	
13-Jan	0.3	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.3	
14-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.2	0.1	0.1	0.0	0.2	0.3	0.3	0.3	0.2	0.4	0.1	0.4	
15-Jan	0.3	0.4	0.3	Z	0.4	0.4	0.3	0.3	1.6	2.8	2.4	1.8	1.5	1.0	0.8	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.2	0.3	0.8	2.8	
16-Jan	0.4	0.3	0.3	0.6	Z	1.0	0.7	0.5	0.2	0.2	0.2	0.0	0.3	0.3	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.3	1.0	
17-Jan	0.0	0.1	0.2	0.2	0.1	Z	0.2	0.2	0.4	0.2	0.1	0.2	0.8	0.9	0.4	0.4	0.6	0.2	0.2	0.4	0.1	0.0	0.0	0.0	0.3	0.9	
18-Jan	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.8	0.3	0.8	
19-Jan	0.4	Z	0.4	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.2	1.3	1.8	1.5	0.9	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.8	
20-Jan	0.2	0.2	Z	0.1	0.1	0.1	0.3	0.5	0.8	0.7	1.1	1.4	1.4	1.0	1.1	0.7	0.4	0.3	0.4	0.3	0.6	0.7	0.6	0.6	0.6	1.4	
21-Jan	0.7	0.9	0.8	Z	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.5	0.7	0.3	0.9	
22-Jan	1.0	1.0	0.7	0.5	Z	0.9	0.9	3.7	9.5	39.6	7.4	12.4	43.7	42.0	10.2	6.8	1.8	0.8	0.7	1.1	0.9	5.6	1.6	1.8	8.5	43.7	
23-Jan	0.6	0.3	0.2	0.3	0.3	Z	0.3	0.2	0.1	0.3	0.2	0.3	0.5	0.7	0.7	0.4	0.4	0.4	0.5	0.5	0.6	0.4	0.3	0.2	0.4	0.7	
24-Jan	Z	0.1	0.0	0.4	0.6	0.2	0.2	0.1	0.1	0.3	C	C	C	0.6	0.7	24.8	7.9	4.3	2.2	2.2	0.6	0.2	1.0	0.6	2.4	24.8	
25-Jan	0.2	Z	0.5	0.3	0.3	0.9	0.4	0.6	0.9	0.9	1.8	1.8	0.8	0.6	1.6	1.4	0.6	0.3	0.2	0.2	0.2	0.1	0.0	0.6	0.7	1.8	
26-Jan	0.3	0.4	Z	0.4	0.5	2.1	19.1	52.9	7.1	1.2	0.7	0.6	1.1	0.8	0.7	1.1	1.2	5.6	1.1	0.3	0.6	1.1	0.4	0.2	4.3	52.9	
27-Jan	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.0	0.1	0.4	1.8	0.7	0.3	0.6	3.1	1.8	2.8	2.0	1.3	2.6	2.8	3.6	1.1	3.6	
28-Jan	4.0	5.0	20.5	26.8	Z	33.0	27.3	28.2	25.7	29.6	19.9	24.5	34.3	22.8	12.6	5.1	1.5	6.4	4.9	0.2	0.0	0.1	0.3	0.1	14.5	34.3	
29-Jan	0.1	2.5	2.2	4.5	4.4	Z	0.9	1.4	2.9	2.0	2.8	2.4	1.3	0.7	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.3	12.9	1.0	1.9	12.9	
30-Jan	Z	0.9	0.9	0.5	3.8	5.9	1.1	0.6	0.3	0.6	1.3	0.3	1.1	1.1	1.3	0.5	0.3	0.5	0.5	0.8	0.5	0.4	0.4	0.7	1.1	5.9	
31-Jan	0.4	Z	0.4	0.5	0.5	0.6	0.4	0.4	0.5	0.9	1.2	2.0	2.4	3.8	3.1	1.2	0.7	0.4	0.5	0.5	0.4	0.3	0.3	0.6	1.0	3.8	
																								Diurnal Average		Diurnal Maximum	
																								0.5		4.0	
																								0.7		5.0	
																								1.3		20.5	
																								1.5		26.8	
																								0.6		4.4	
																								1.9		33.0	
																								1.8		27.3	
																								3.0		52.9	
																								1.7		25.7	
																								2.7		39.6	
																								1.5		19.9	
																								1.8		24.5	
																								3.4		43.7	
																								2.9		42.0	
																								1.6		12.6	
																								2.0		24.8	
																								1.1		8.1	
																								1.2		6.7	
																								1.0		6.7	
																								0.7		4.6	
																								0.5		4.0	
																								0.7		5.6	
																								1.0		12.9	
																								0.6		3.6	

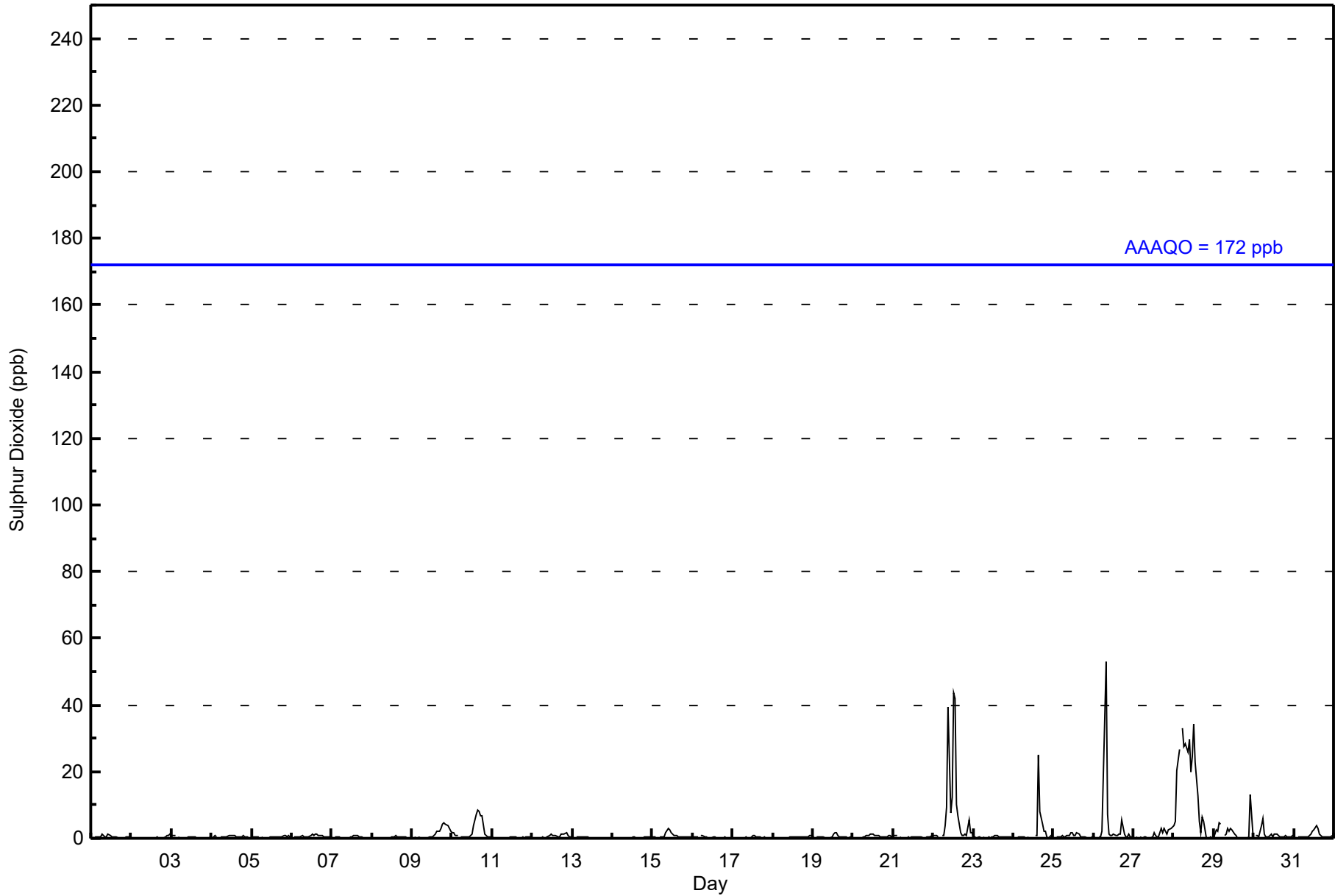
Z - zerospan C - Calibration

Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Jackfish 1 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 1 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	690	97.18	97.18
11 - 20	5	0.70	97.89
21 - 60	15	2.11	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 1 - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	26	14	8	3	6	8	12	38	159	146	99	24	15	38	46	46	688
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	5
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	14	8	3	6	8	12	38	159	146	99	24	15	40	64	46	708

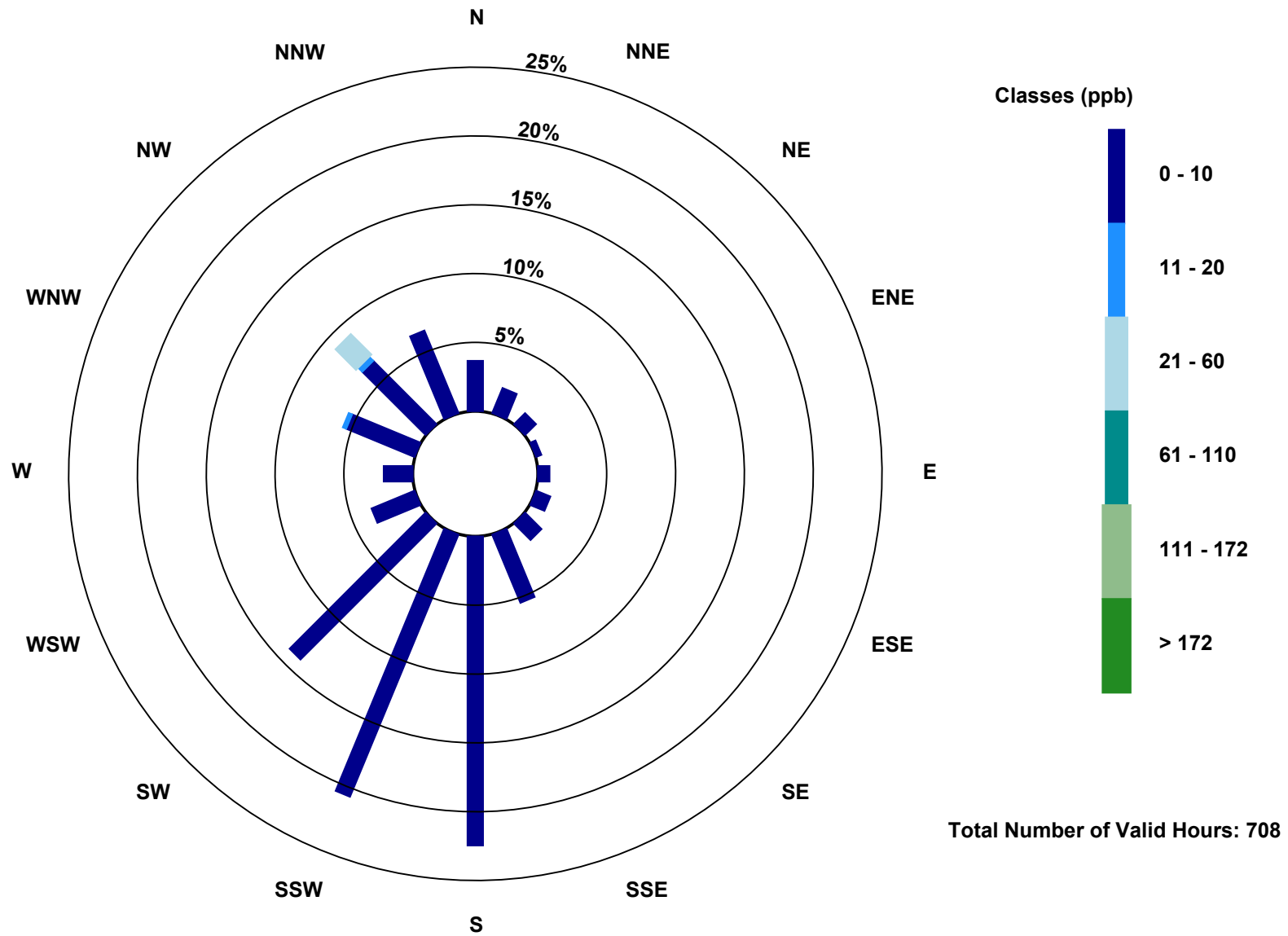
Total Number of Valid Hours: 708

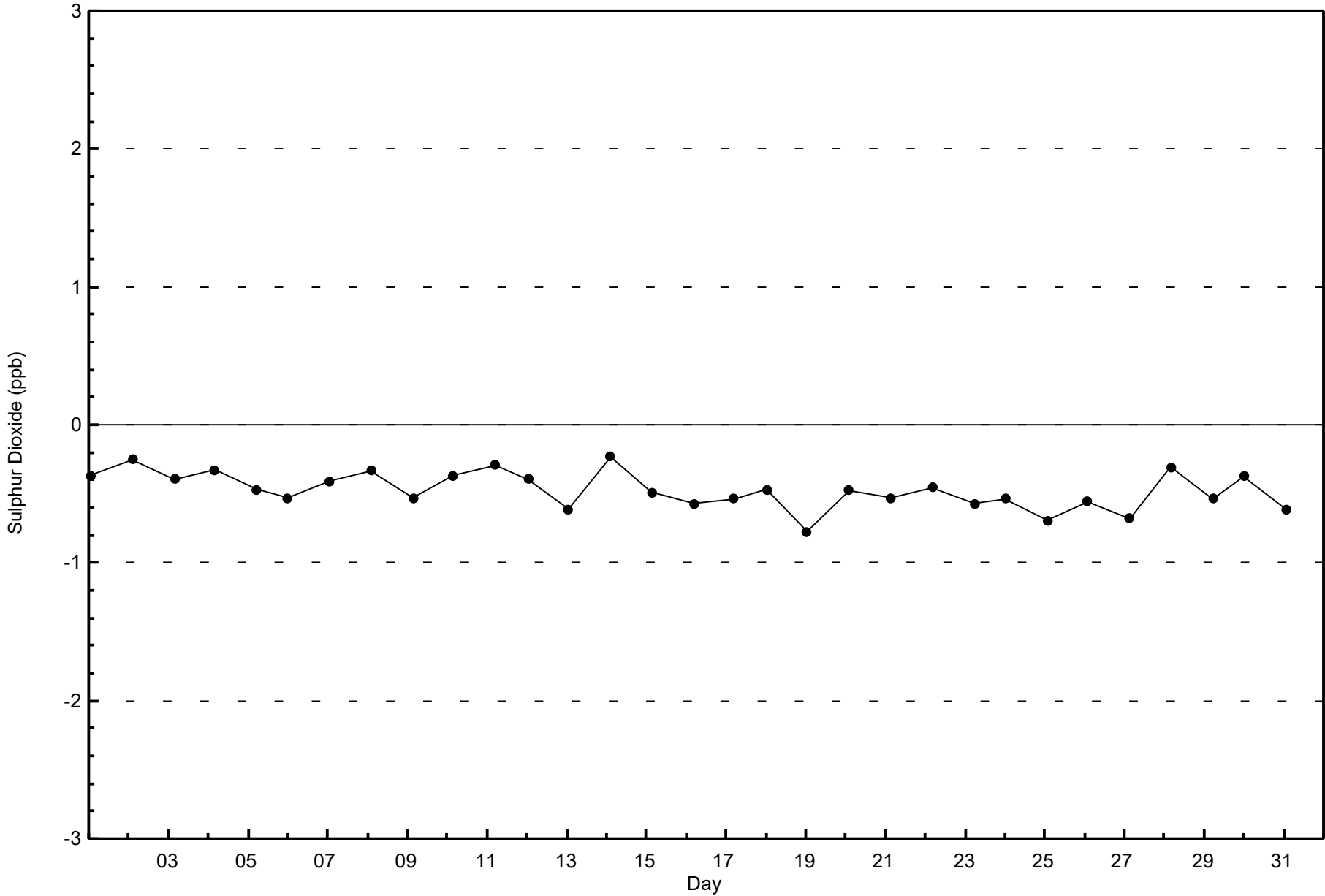
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Jackfish 1

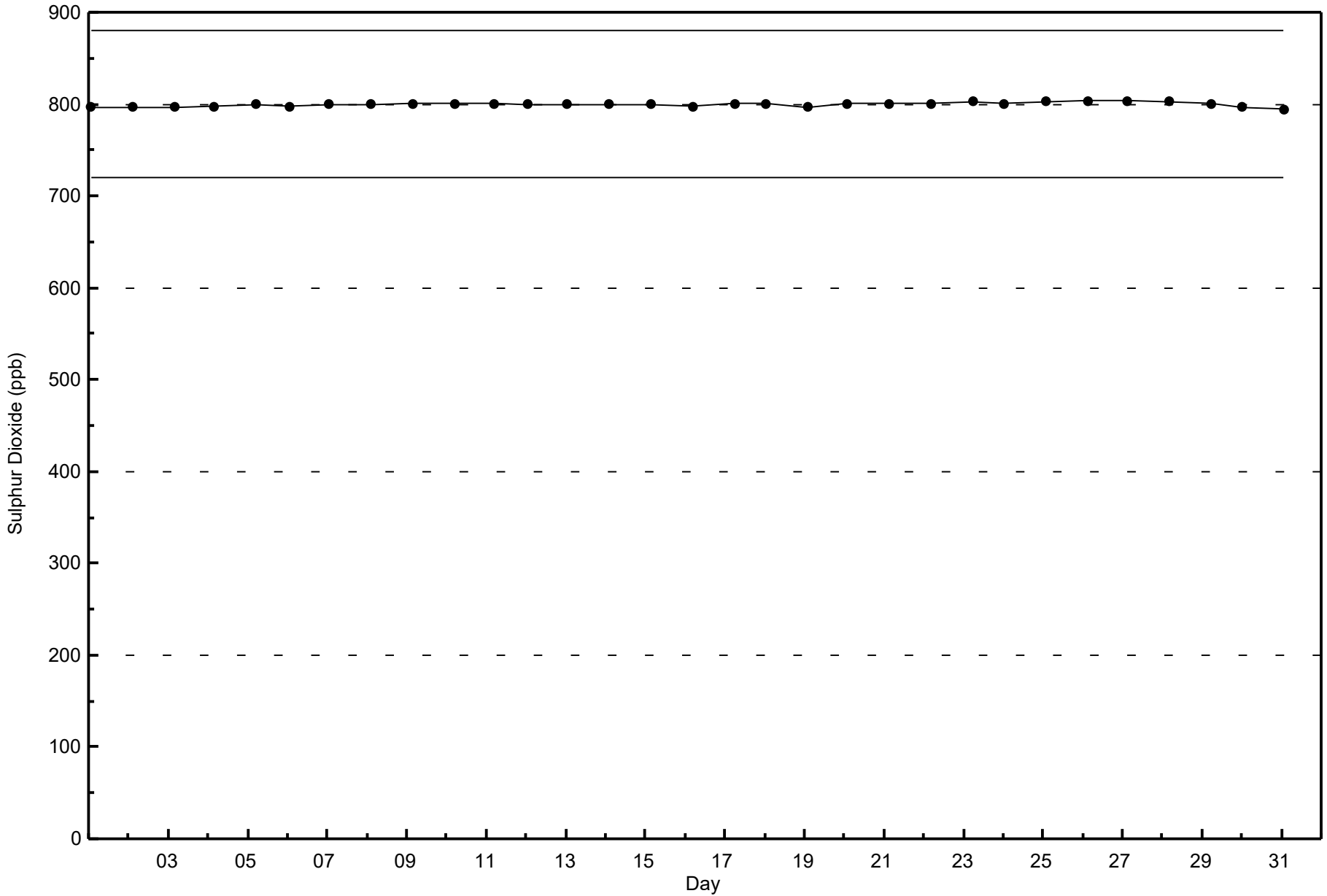


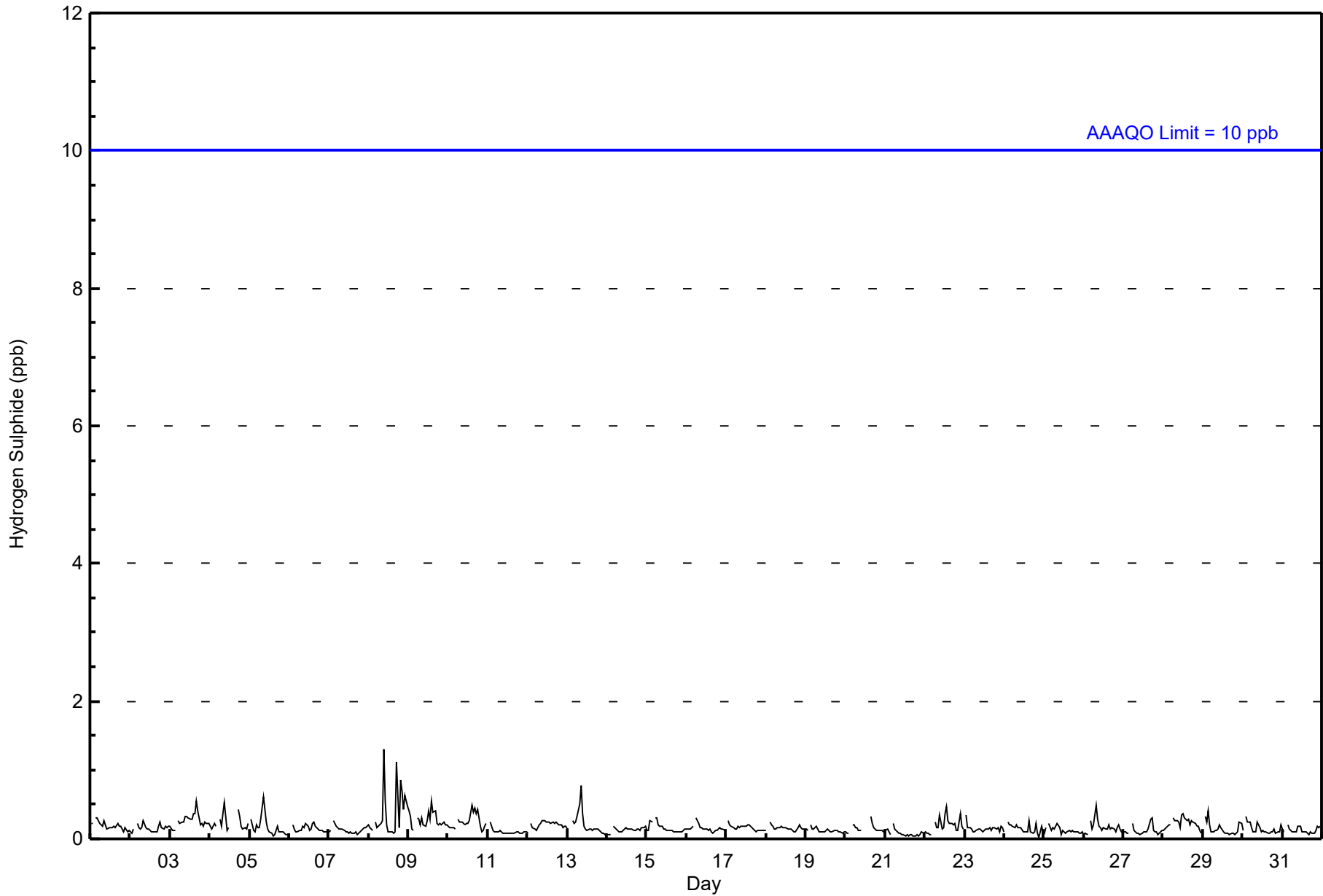




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Jackfish 1 - January 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 1 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 1 - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	26	13	8	5	6	6	12	39	160	145	97	22	15	39	63	45	701
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	26	13	8	5	6	6	12	39	160	145	97	22	15	39	63	45	701

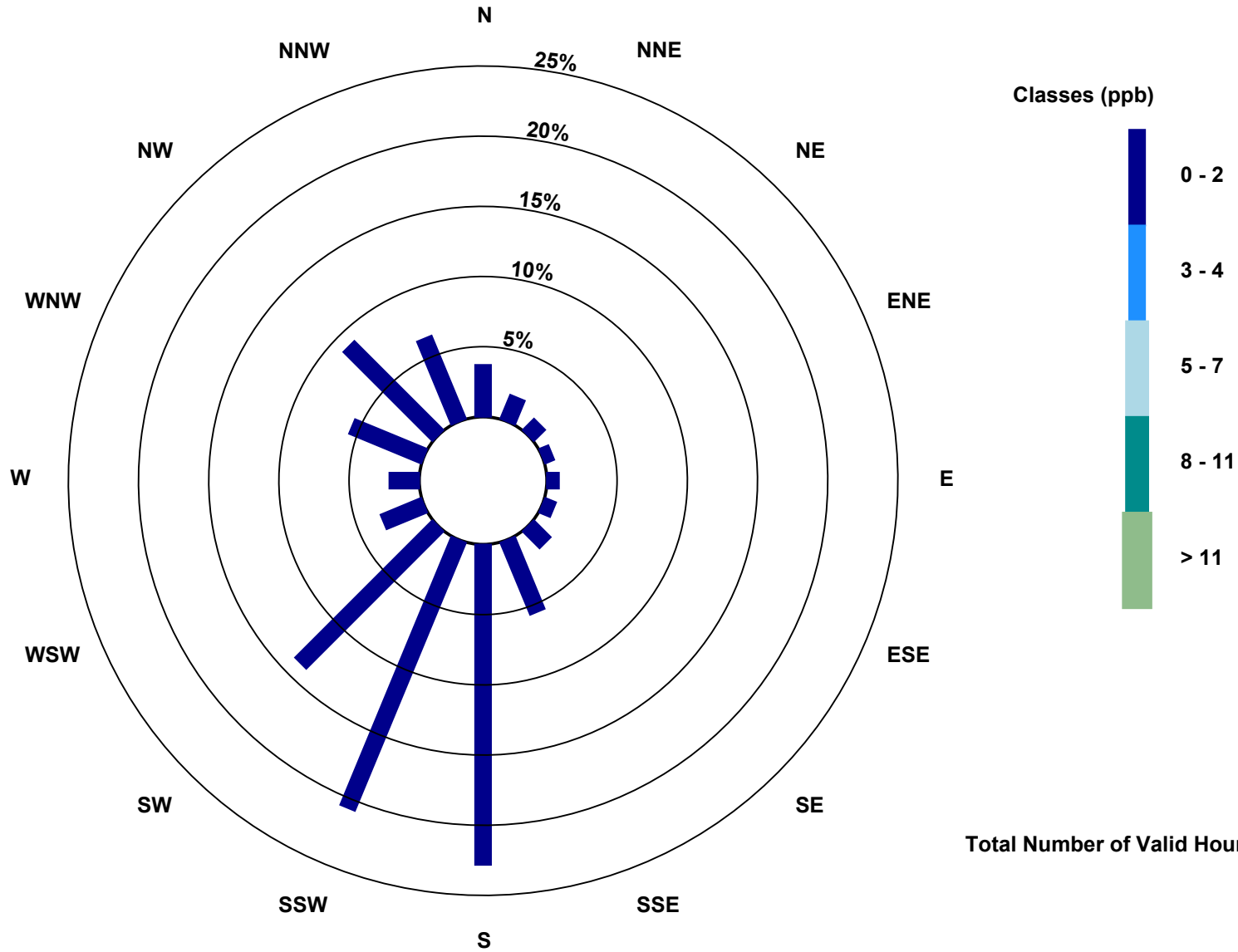
Total Number of Valid Hours: 701

Total Number of Hours: 744

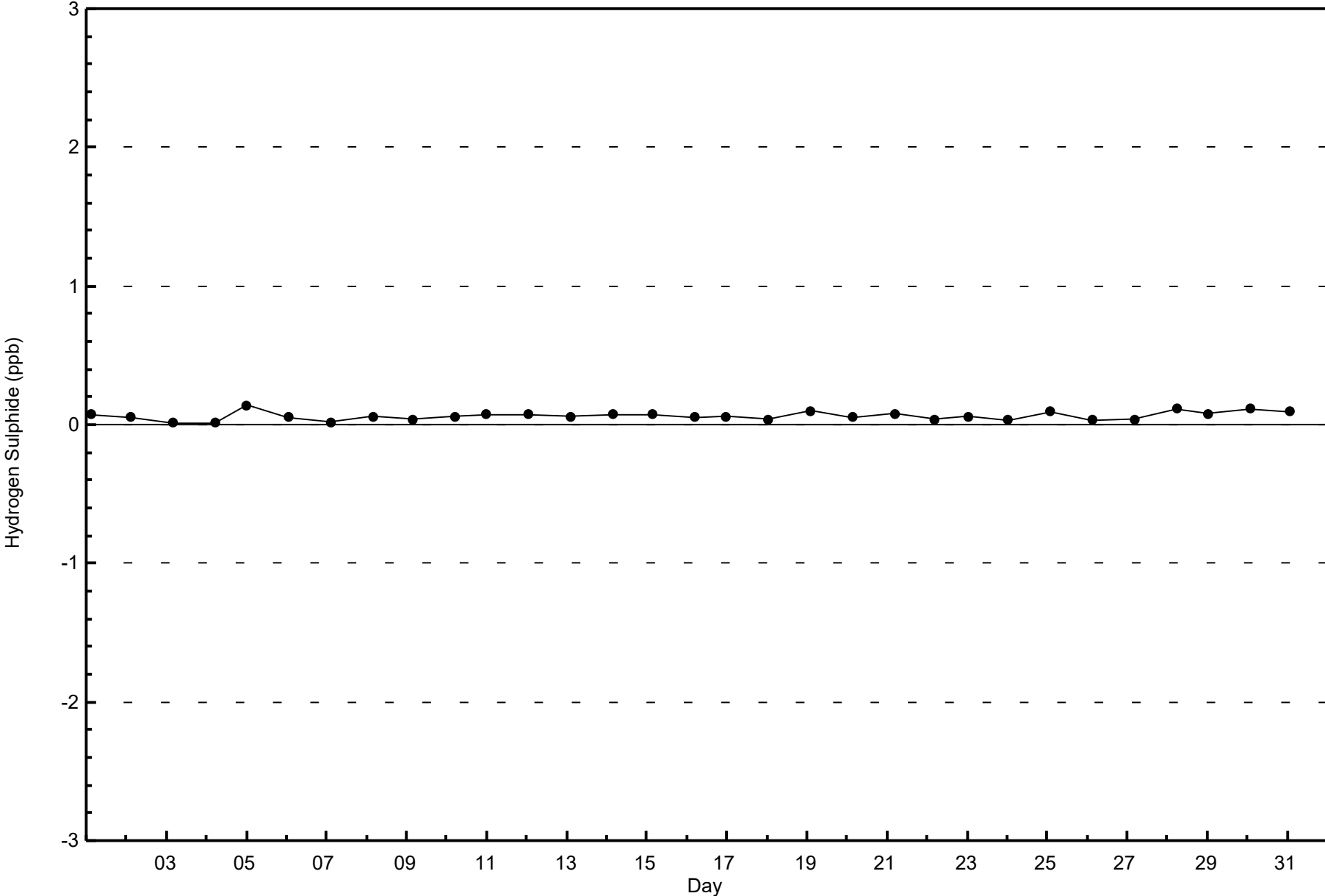


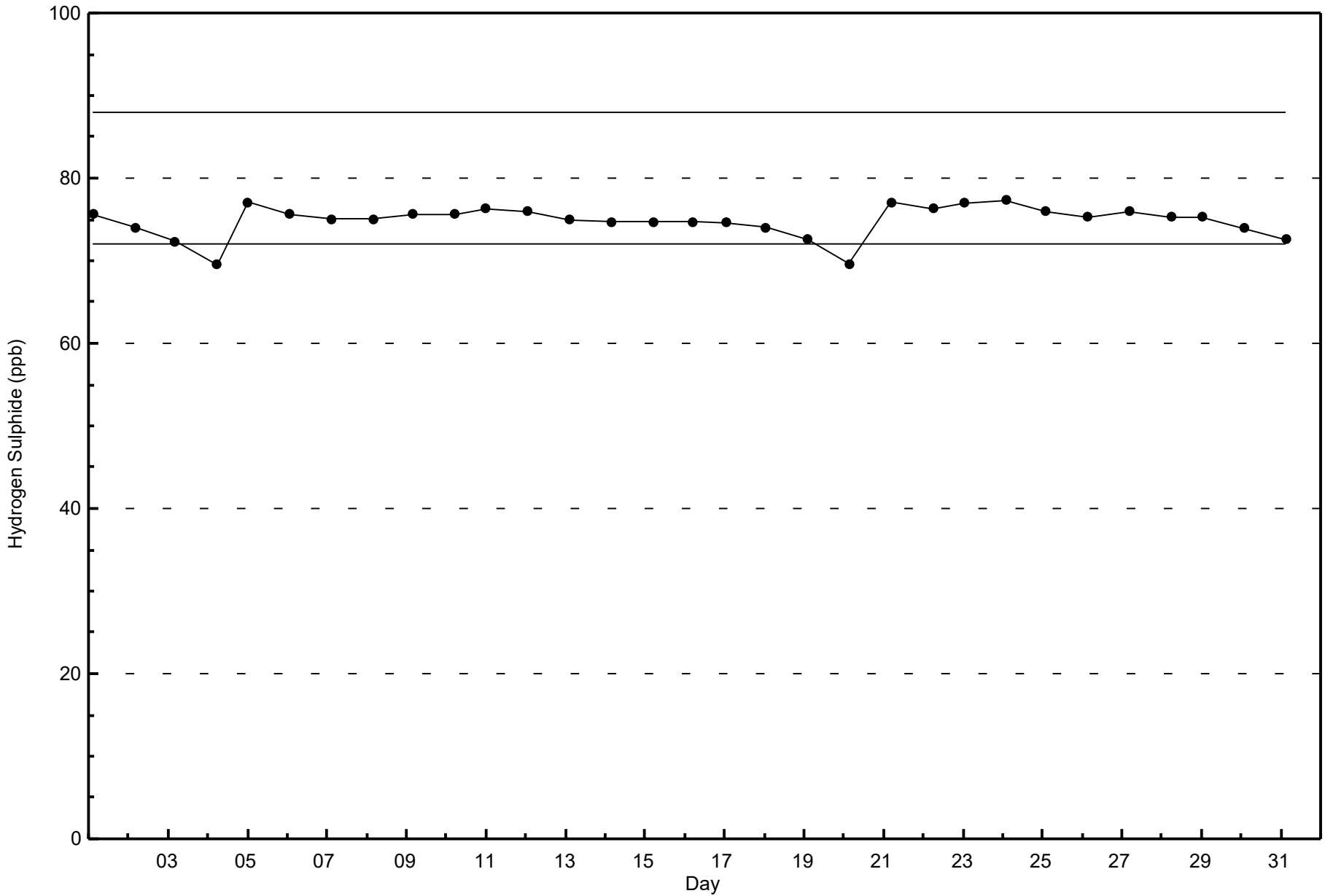
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 1



Total Number of Valid Hours: 701







Wood Buffalo Environmental Association
Summary of Hour Averages

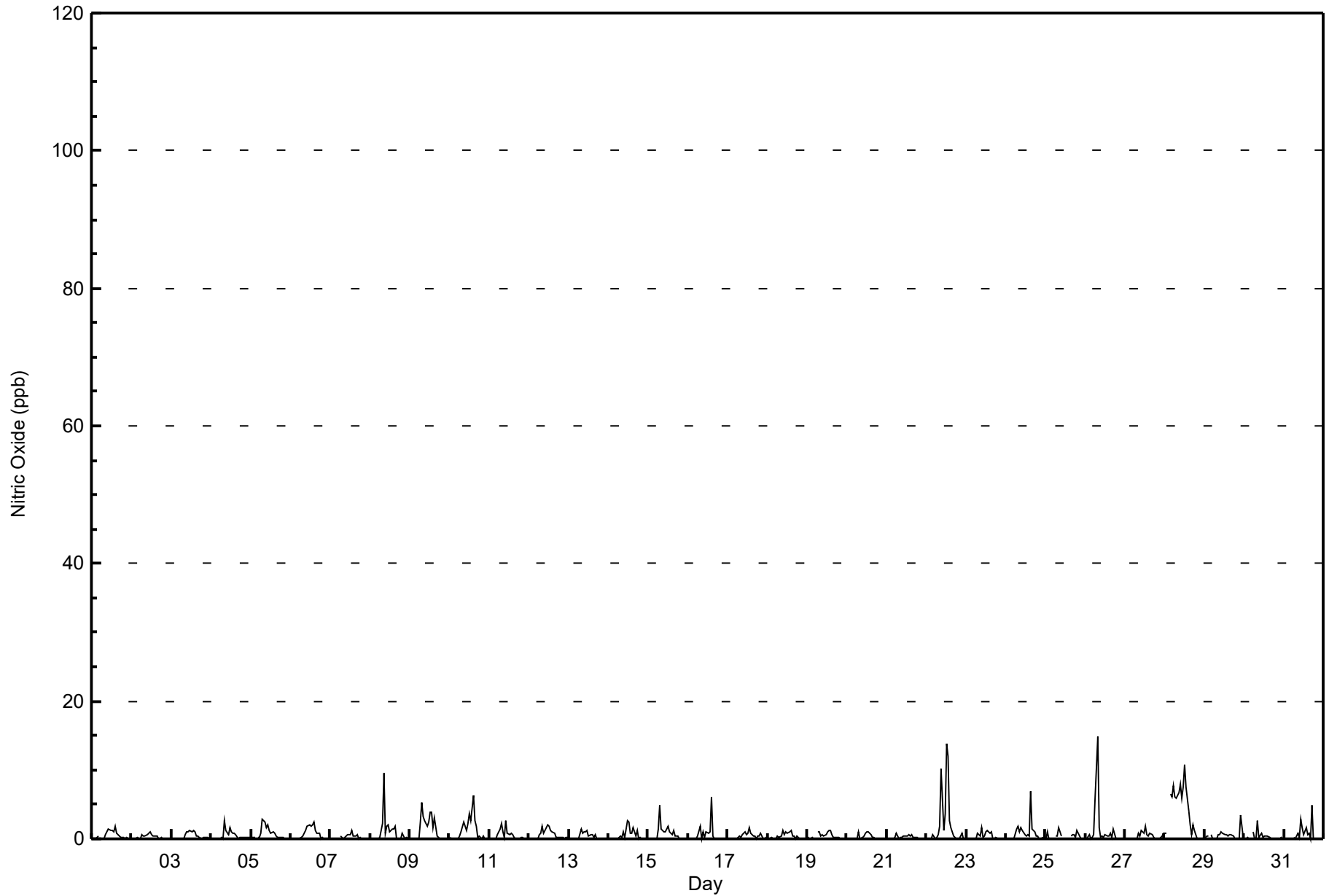
Nitric Oxide (NO) - ppb
Jackfish 1 - January 2023

Maximum Value: 14.8 ppb on Jan 26 08:00 Maximum Daily Average: 3.9 ppb on Jan 28																				Hours in Service: 744 Hours of Data: 708 Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0						
Minimum Value: 0.0 ppb on Jan 1 21:00 Minimum Daily Average: 0.2 ppb on Jan 21 Maximum Diurnal Average: 1.9 ppb at hour 13 Minimum Diurnal Average: 0.1 ppb at hour 24 Monthly Average: 0.73 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.8 P ₉₀ = 1.7 P ₉₉ = 7.8																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.1	0.1	0.1	0.1	0.4	Z	0.0	0.1	0.6	1.0	1.3	1.3	1.2	1.1	1.8	0.7	0.4	0.3	0.2	0.1	0.0	0.3	0.0	0.0	0.5	1.8
2-Jan	Z	0.0	0.1	0.1	0.0	0.0	0.5	0.4	0.4	0.6	0.7	1.0	0.6	0.3	0.4	0.4	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.3	1.0
3-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	1.0	1.1	1.0	1.1	1.1	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.4	1.1
4-Jan	0.1	0.0	Z	0.1	0.1	0.1	0.2	0.0	2.6	1.2	0.6	1.6	1.1	0.7	0.7	0.1	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	2.6
5-Jan	0.2	0.1	0.1	Z	0.2	0.1	0.8	2.8	2.4	1.6	2.0	1.2	0.7	1.0	0.7	0.4	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.7	2.8
6-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.4	0.8	1.2	1.9	2.0	1.8	2.1	2.4	1.3	0.7	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.7	2.4
7-Jan	0.0	0.0	0.0	0.1	0.0	Z	0.5	0.2	0.0	0.4	0.6	0.6	0.6	1.3	0.4	0.4	0.5	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.3	1.3
8-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.2	2.2	9.6	0.8	1.9	2.1	1.0	1.4	1.5	1.7	0.0	0.0	0.0	0.9	0.4	0.0	0.1	0.1	1.0	9.6
9-Jan	0.1	Z	0.0	0.0	0.0	0.0	2.4	5.3	3.3	2.6	1.7	2.3	3.8	3.9	1.7	3.0	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0	1.3	5.3
10-Jan	0.0	0.2	Z	0.0	0.1	0.1	0.4	1.0	2.4	1.8	1.2	2.2	3.7	2.6	6.4	2.6	1.9	0.3	0.3	0.0	0.4	0.0	0.0	0.0	1.2	6.4
11-Jan	0.0	0.0	0.0	Z	0.0	0.7	1.5	2.3	1.0	0.3	2.7	0.9	0.6	0.9	0.5	0.3	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.5	2.7
12-Jan	0.1	0.1	0.1	0.1	Z	0.0	0.5	0.8	1.8	0.8	1.6	1.9	1.8	1.3	1.1	0.8	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.6	1.9
13-Jan	0.1	0.0	0.1	0.0	0.0	Z	0.0	1.3	0.7	0.9	1.0	1.2	0.4	0.6	0.6	0.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.2	1.0	0.3	2.7	2.4	0.8	0.9	1.6	0.5	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.5	2.7
15-Jan	0.0	Z	0.0	0.0	0.0	0.0	1.4	4.8	1.3	1.0	1.1	1.4	1.8	1.1	0.7	1.2	0.4	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.7	4.8
16-Jan	0.0	0.0	Z	0.0	0.0	0.0	0.5	1.7	0.1	0.9	0.2	1.1	0.9	1.0	6.2	0.4	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.6	6.2
17-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.2	0.5	1.1	0.5	0.8	1.5	0.8	0.4	0.4	0.1	0.4	0.3	0.8	0.1	0.0	0.1	0.4	1.5
18-Jan	0.2	0.1	0.1	0.0	Z	0.0	0.5	0.3	0.5	1.2	0.6	1.1	0.9	1.0	1.2	0.5	0.4	0.0	0.4	0.0	0.1	0.1	0.0	0.0	0.4	1.2
19-Jan	0.2	0.1	0.1	0.1	0.1	Z	1.1	1.0	0.4	0.7	0.5	0.6	1.0	1.2	1.2	0.6	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.4	1.2
20-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.1	0.5	0.8	1.0	1.0	0.6	0.2	0.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	1.0
21-Jan	0.0	Z	0.0	0.1	0.0	0.3	0.7	0.0	0.3	0.1	0.4	0.4	0.4	0.5	0.3	0.5	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7
22-Jan	0.0	0.0	Z	0.1	0.6	0.1	0.2	0.7	1.9	10.1	1.3	3.6	13.8	12.0	2.7	1.7	0.4	0.2	0.1	0.0	0.0	0.8	0.0	0.0	2.2	13.8
23-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.7	0.4	1.6	0.2	0.5	0.9	1.2	0.8	1.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	1.6
24-Jan	0.0	0.0	0.0	0.0	Z	0.0	1.5	1.7	1.0	1.7	1.1	0.6	0.4	0.5	0.4	6.8	1.4	1.0	0.3	0.4	0.0	0.0	0.2	0.1	0.8	6.8
25-Jan	0.0	1.1	0.0	0.0	0.0	Z	0.4	0.3	1.6	0.3	C	C	C	C	C	0.5	0.6	0.7	0.2	1.2	0.3	0.0	0.0	0.0	0.4	1.6
26-Jan	Z	0.1	0.6	0.1	0.1	0.7	5.8	14.8	1.6	0.2	0.4	0.2	0.7	0.4	0.3	0.8	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.2	14.8
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5	1.1	0.9	1.9	0.6	0.4	0.9	0.7	0.3	0.0	0.0	0.0	0.0	0.4	0.7	0.4	1.9
28-Jan	0.9	0.9	Z	6.5	6.0	7.8	6.1	5.9	6.6	7.8	5.9	7.5	10.8	7.6	4.0	2.0	0.7	2.1	1.3	0.0	0.0	0.0	0.0	0.0	3.9	10.8
29-Jan	0.0	0.5	0.4	Z	0.6	0.0	0.0	0.0	0.6	0.5	1.1	0.9	0.6	0.6	0.4	0.6	0.7	0.3	0.0	0.0	0.1	0.1	3.5	0.1	0.5	3.5
30-Jan	0.0	0.0	0.1	0.0	Z	1.0	0.0	0.0	2.7	0.3	0.7	0.3	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	2.7
31-Jan	0.2	0.1	0.0	0.0	0.0	Z	0.1	0.0	0.9	0.2	2.8	1.6	0.6	1.6	0.5	0.9	0.1	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	4.8
																								Diurnal Average		
																								Diurnal Maximum		
0.1 0.1 0.1 0.3 0.3 0.4 0.8 1.6 1.5 1.4 1.3 1.5 1.9 1.7 1.4 1.1 0.4 0.5 0.2 0.2 0.1 0.1 0.2 0.1 0.9 1.1 0.6 6.5 6.0 7.8 6.1 14.8 9.6 10.1 5.9 7.5 13.8 12.0 6.4 6.8 1.9 4.8 1.3 1.2 0.8 0.8 3.5 0.7																										
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 1 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 1 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	708	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 1 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	14	7	5	6	8	10	42	156	147	101	23	15	40	60	48	707
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	14	7	5	6	8	10	42	156	147	101	23	15	40	60	48	707

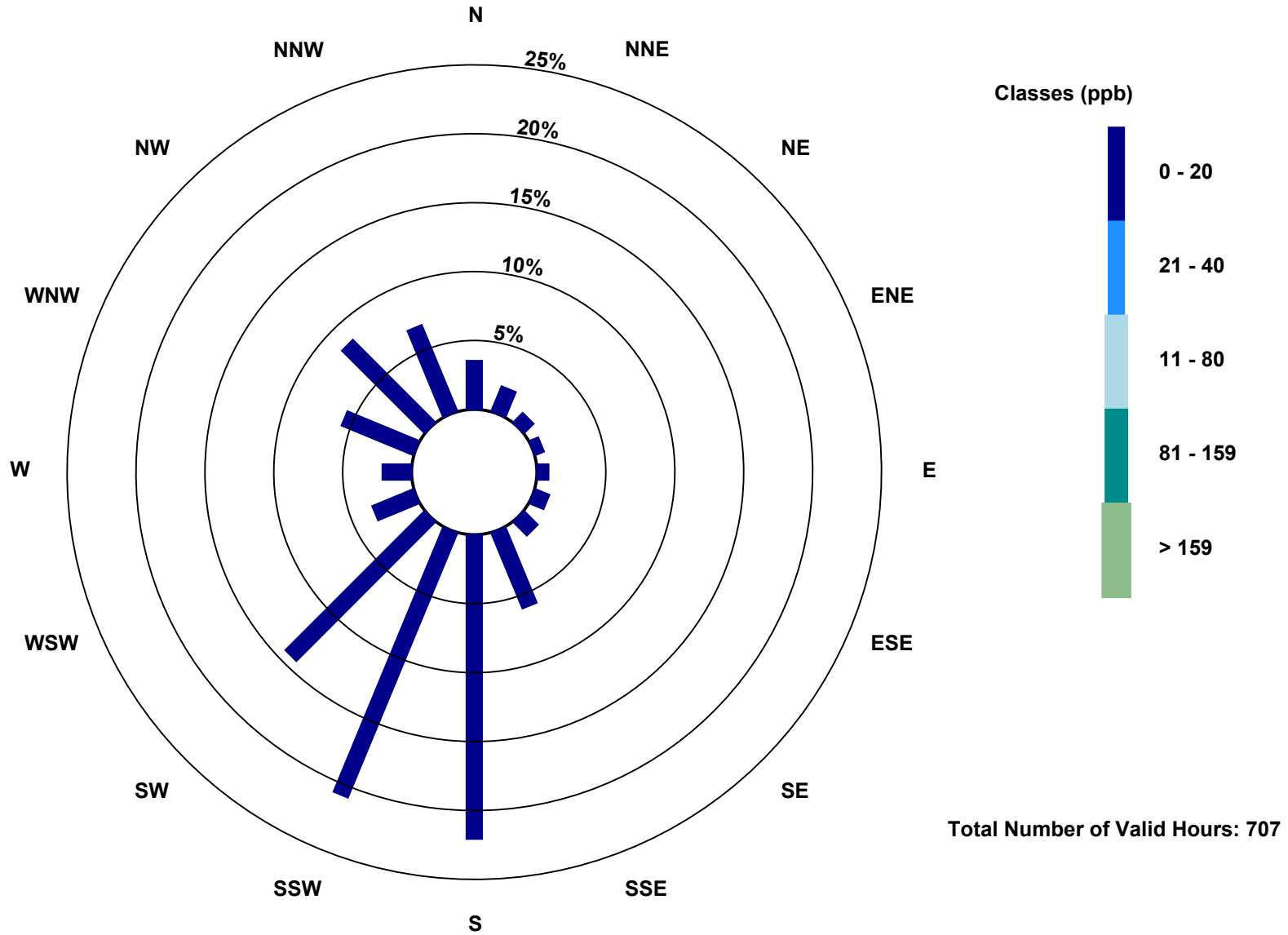
Total Number of Valid Hours: 707

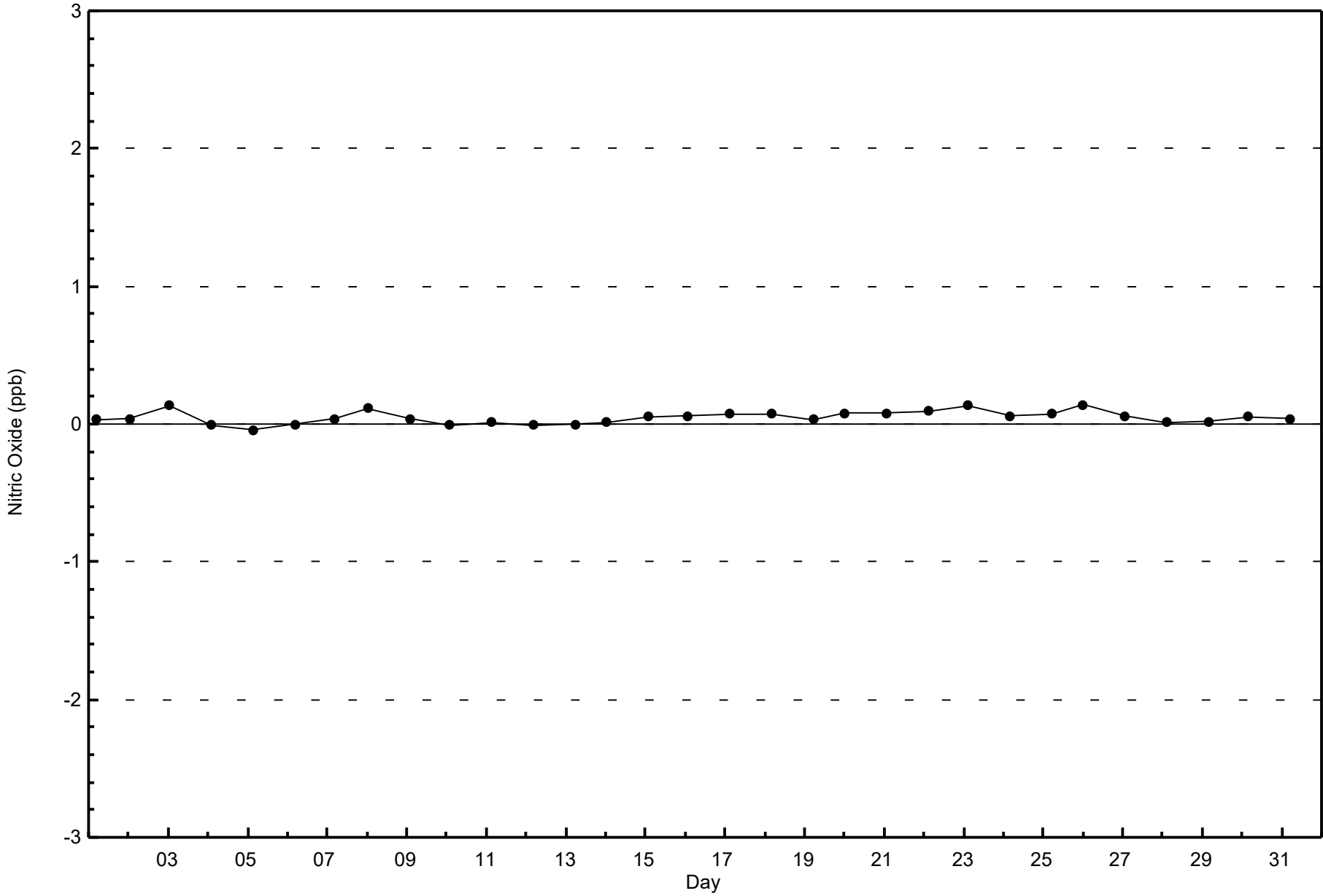
Total Number of Hours: 744

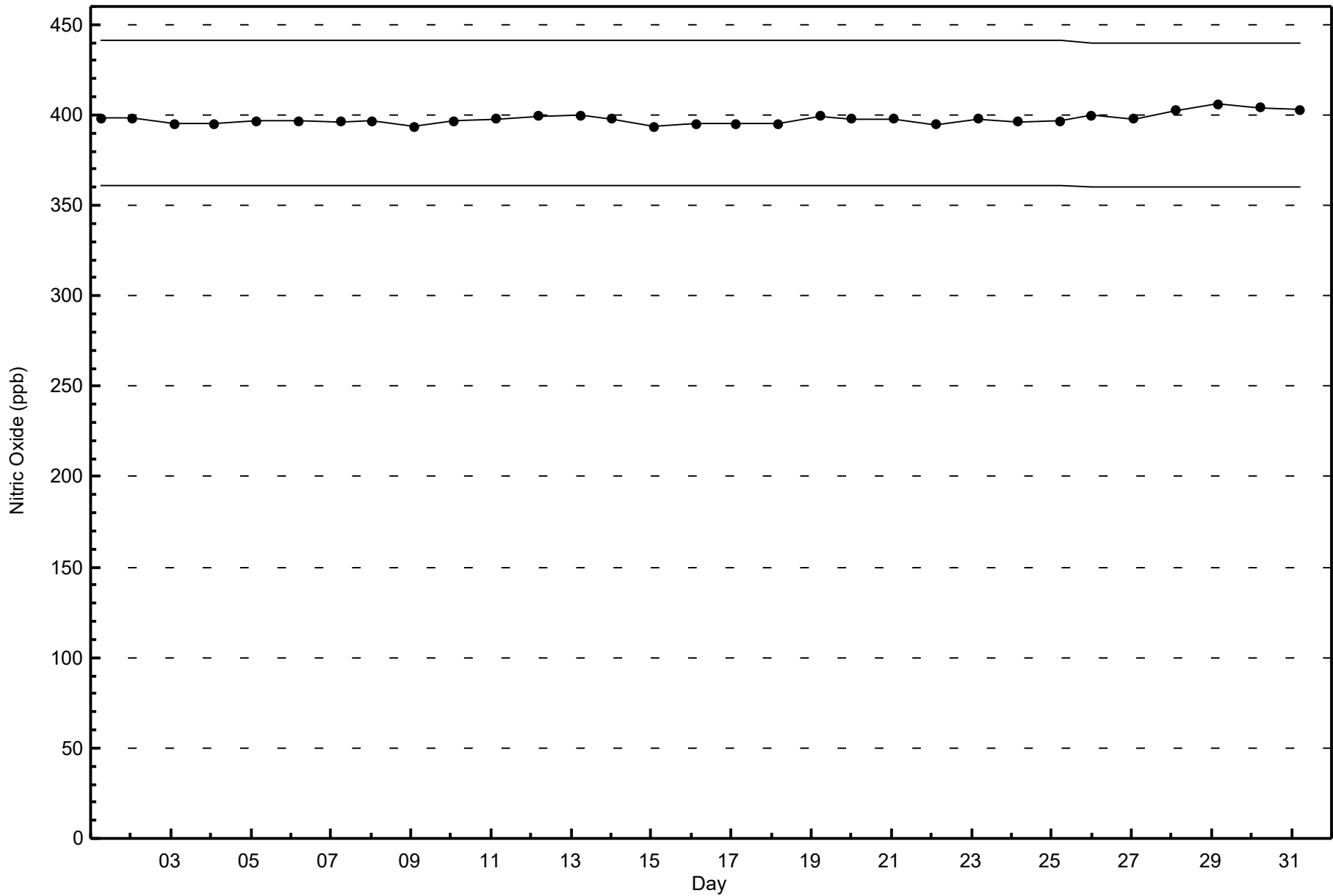


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Jackfish 1









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

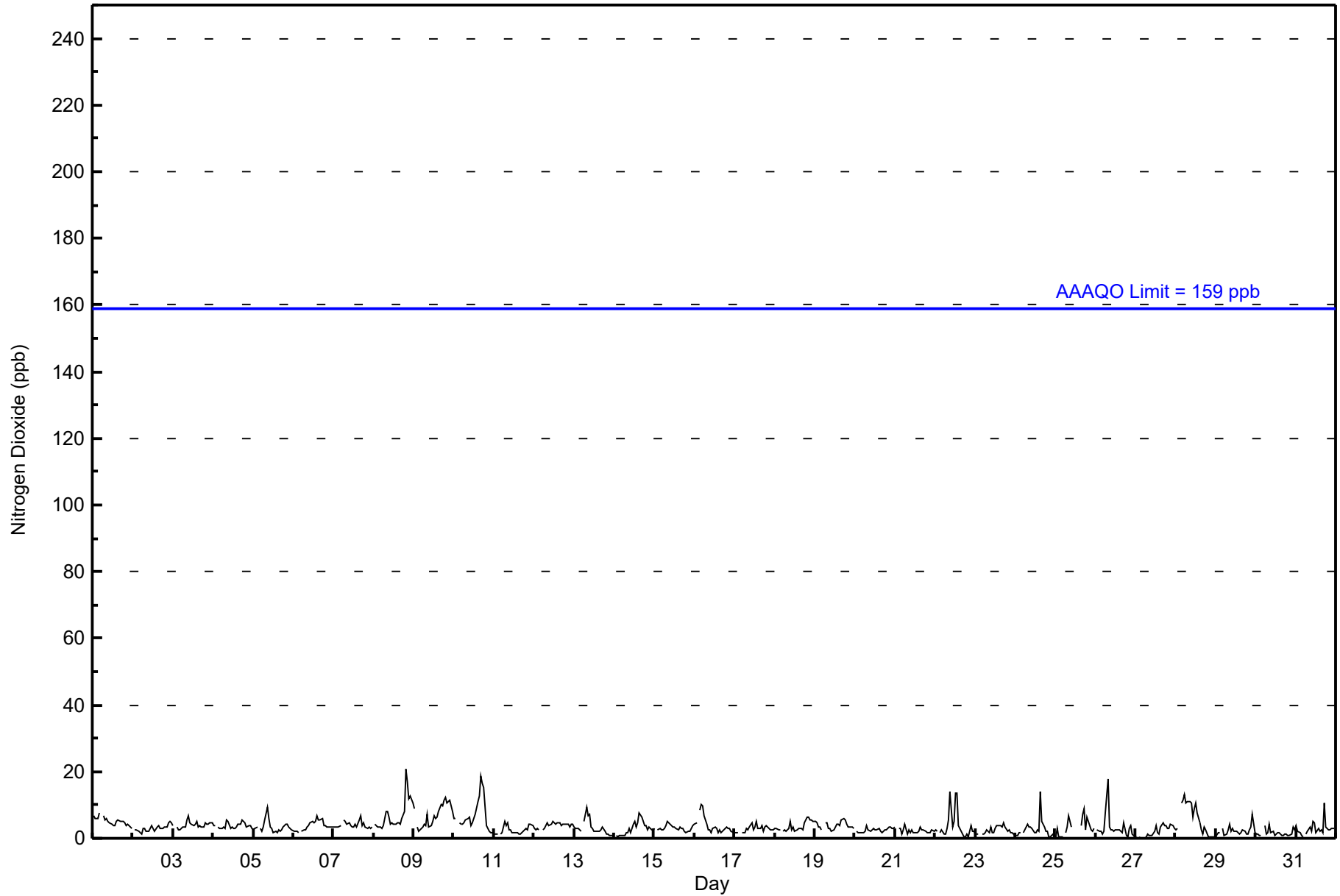
Jackfish 1 - January 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 20.6 ppb on Jan 8 20:00		Maximum Daily Average: 7.0 ppb on Jan 8		Minimum Value: 0.1 ppb on Jan 27 04:00		Minimum Daily Average: 1.6 ppb on Jan 30		Hours of Data: 708																																									
Maximum Diurnal Average: 4.5 ppb at hour 9		Minimum Diurnal Average: 2.3 ppb at hour 3		Hours of Missing Data: 36		Hours of Calibration: 36		Percent Operational Time: 100.0																																									
Monthly Average: 3.62 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 1.3 Q ₁ = 2.1 Median = 3.0 Q ₃ = 4.3 P ₉₀ = 6.1 P ₉₉ = 13.9																																															
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	6.6	6.1	5.9	5.9	7.7	Z	6.8	5.4	6.0	5.2	4.5	4.1	4.0	3.8	5.2	5.4	5.0	4.9	4.9	4.5	3.9	4.2	3.4	3.0	5.1	7.7																							
2-Jan	Z	2.7	2.4	2.2	1.9	1.4	2.8	2.9	2.3	2.3	3.1	3.7	2.9	2.3	3.2	4.0	3.0	2.9	3.0	3.5	3.5	4.8	5.0	4.5	3.1	5.0																							
3-Jan	3.8	Z	3.4	2.7	2.4	2.9	3.3	3.5	5.3	6.6	4.6	4.2	3.7	4.4	5.2	3.4	3.9	3.4	3.6	4.7	4.4	4.2	4.5	4.6	4.0	6.6																							
4-Jan	3.7	4.0	Z	3.5	3.1	3.0	3.6	2.9	5.6	5.1	2.9	3.5	2.9	2.9	3.5	4.2	4.3	5.6	4.9	4.7	3.2	3.8	3.7	3.0	3.8	5.6																							
5-Jan	2.7	3.0	3.2	Z	2.8	2.3	3.6	5.4	9.3	5.9	3.6	2.9	1.8	2.2	1.8	2.5	2.3	2.5	3.5	4.2	4.3	3.3	3.0	2.4	3.4	9.3																							
6-Jan	2.2	2.2	2.2	1.9	Z	2.1	2.5	2.4	3.2	3.9	4.5	4.9	4.7	5.2	6.8	5.5	5.3	5.9	4.0	3.9	3.5	3.5	3.3	3.4	3.8	6.8																							
7-Jan	3.3	3.6	3.3	3.3	3.9	Z	5.3	4.9	4.3	4.6	4.0	3.6	3.4	4.2	3.5	5.3	6.6	3.7	4.6	3.5	3.1	3.3	3.0	3.3	4.0	6.6																							
8-Jan	Z	4.3	3.5	3.6	3.3	3.1	3.8	8.2	8.1	6.5	4.4	4.5	4.3	4.1	4.5	4.5	4.4	5.9	8.0	20.6	16.8	11.9	12.6	10.5	7.0	20.6																							
9-Jan	8.9	Z	3.4	2.3	2.4	3.2	4.3	4.0	7.3	3.6	3.8	5.2	6.9	5.9	6.4	8.2	10.3	9.9	11.5	12.3	10.5	11.4	9.6	8.0	6.9	12.3																							
10-Jan	5.9	5.9	Z	4.6	4.3	4.3	4.5	5.3	6.1	6.2	3.8	4.5	5.9	7.4	10.9	12.7	18.8	16.5	15.1	3.8	3.0	2.0	1.8	1.8	6.7	18.8																							
11-Jan	1.4	1.2	1.2	Z	1.3	1.9	4.9	4.0	4.7	2.5	2.7	1.8	1.9	1.9	1.8	1.2	1.3	2.0	2.4	2.8	2.6	4.2	4.1	3.7	2.5	4.9																							
12-Jan	3.0	2.7	3.1	2.7	Z	2.5	3.0	3.7	4.6	4.0	4.4	4.9	4.5	4.1	4.7	4.5	4.0	4.3	4.3	4.4	4.4	3.4	4.4	4.2	3.9	4.9																							
13-Jan	3.3	2.9	3.0	2.4	2.3	Z	5.0	9.5	6.6	7.0	3.3	2.9	2.1	2.3	2.2	2.0	2.7	3.5	2.2	1.4	1.1	0.9	0.8	0.7	3.0	9.5																							
14-Jan	Z	0.8	0.6	0.7	0.9	0.7	1.0	1.6	1.6	2.9	1.7	4.3	5.2	3.2	4.7	7.7	6.4	4.9	3.8	3.9	2.7	3.2	2.6	2.4	2.9	7.7																							
15-Jan	3.0	Z	2.6	3.1	2.7	2.7	3.0	3.9	5.0	4.2	3.8	3.6	3.4	3.0	2.7	3.5	2.8	2.9	2.2	1.9	2.0	2.3	3.1	3.7	3.1	5.0																							
16-Jan	4.3	4.5	Z	8.5	10.3	9.6	6.9	4.4	2.4	2.5	1.7	2.9	3.2	2.8	1.6	2.4	1.9	2.5	3.0	3.3	3.1	2.8	2.2	1.9	3.9	10.3																							
17-Jan	1.8	1.9	1.8	Z	1.8	1.6	1.9	2.9	2.7	3.4	4.6	2.5	3.5	4.9	3.0	3.0	3.7	2.2	3.5	3.8	3.3	2.6	2.6	2.6	2.9	4.9																							
18-Jan	2.9	2.8	2.6	2.7	Z	2.0	2.7	2.3	2.8	5.1	2.4	3.3	2.1	2.6	2.8	2.8	2.9	2.4	4.7	6.2	6.3	5.4	5.5	5.0	3.5	6.3																							
19-Jan	5.1	4.5	3.2	3.2	2.6	Z	4.5	4.7	3.1	3.1	2.3	2.5	3.3	4.1	4.1	4.0	5.5	5.9	5.5	4.4	3.5	3.5	3.2	2.8	3.9	5.9																							
20-Jan	Z	2.1	1.9	1.7	1.6	1.6	2.0	3.7	2.6	2.3	2.7	2.9	2.6	2.7	3.0	2.1	1.7	2.0	2.4	2.5	3.2	3.2	2.9	3.1	2.5	3.7																							
21-Jan	3.2	Z	3.0	2.8	1.2	2.5	4.2	1.4	2.5	1.8	2.4	1.9	1.8	1.9	2.1	3.6	2.6	2.6	2.1	1.9	1.9	1.8	2.4	2.1	2.3	4.2																							
22-Jan	2.5	2.3	Z	1.9	2.7	1.1	1.2	3.0	5.5	14.0	3.3	4.9	13.7	13.6	3.8	3.1	1.4	0.6	0.6	1.3	0.6	3.8	2.1	2.1	3.9	14.0																							
23-Jan	1.1	1.3	1.1	Z	1.4	1.2	1.5	2.5	1.6	3.2	1.7	1.7	2.9	3.9	4.0	4.0	3.5	4.7	3.2	2.1	2.5	1.5	1.6	1.2	2.3	4.7																							
24-Jan	0.9	0.9	1.8	1.7	Z	1.9	3.6	4.2	3.3	3.4	3.1	1.9	1.8	2.5	2.1	13.9	5.2	3.2	2.0	2.2	0.6	0.4	1.4	0.6	2.7	13.9																							
25-Jan	0.5	3.0	0.5	0.5	0.3	Z	1.9	3.5	6.7	3.3	C	C	C	C	C	3.9	7.4	8.8	2.5	6.2	3.7	2.5	2.1	2.8	3.3	8.8																							
26-Jan	Z	2.6	2.1	2.3	1.4	2.0	7.7	17.7	3.2	2.4	2.5	2.1	2.7	2.7	2.7	2.3	1.5	4.5	0.9	0.4	3.0	3.8	1.3	0.7	3.2	17.7																							
27-Jan	0.4	Z	0.3	0.1	0.1	0.1	0.5	1.1	0.7	0.7	1.0	2.1	3.7	1.9	1.4	3.3	4.7	3.9	3.8	3.1	3.0	4.1	3.9	2.8	2.0	4.7																							
28-Jan	2.5	3.0	Z	10.8	11.6	13.0	10.7	11.2	11.1	10.6	6.5	9.0	10.6	7.6	4.6	2.7	1.2	3.4	2.4	0.6	0.5	0.4	0.4	0.3	5.9	13.0																							
29-Jan	0.5	1.9	1.6	Z	2.9	0.9	1.1	2.6	4.1	2.3	2.8	2.0	2.0	1.7	1.3	1.9	2.5	2.3	1.3	1.3	2.7	3.6	7.4	1.5	2.3	7.4																							
30-Jan	1.4	1.4	0.9	0.8	Z	3.9	1.2	1.6	4.2	1.9	2.3	0.8	1.3	1.6	1.7	1.0	0.7	1.2	1.1	1.0	0.8	1.1	3.3	2.7	1.6	4.2																							
31-Jan	3.7	2.3	1.5	0.8	0.5	Z	1.1	2.3	3.3	2.2	5.0	4.7	1.9	3.1	2.0	2.5	1.8	10.6	3.6	2.5	2.5	2.8	2.9	2.9	2.9	10.6																							
																								3.0	2.8	2.3	3.0	3.0	2.9	3.6	4.4	4.5	4.3	3.3	3.5	3.8	3.8	3.6	4.2	4.2	4.5	3.9	4.0	3.6	3.5	3.6	3.0	Diurnal Average	
																								8.9	6.1	5.9	10.8	11.6	13.0	10.7	17.7	11.1	14.0	6.5	9.0	13.7	13.6	10.9	13.9	18.8	16.5	15.1	20.6	16.8	11.9	12.6	10.5	Diurnal Maximum	
Z - zerospan																								C - Calibration																									
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Jackfish 1 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Jackfish 1 - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	99.86	99.86
21 - 40	1	0.14	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 1 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	14	7	5	6	8	10	42	156	147	101	23	15	40	60	47	706
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	14	7	5	6	8	10	42	156	147	101	23	15	40	60	48	707

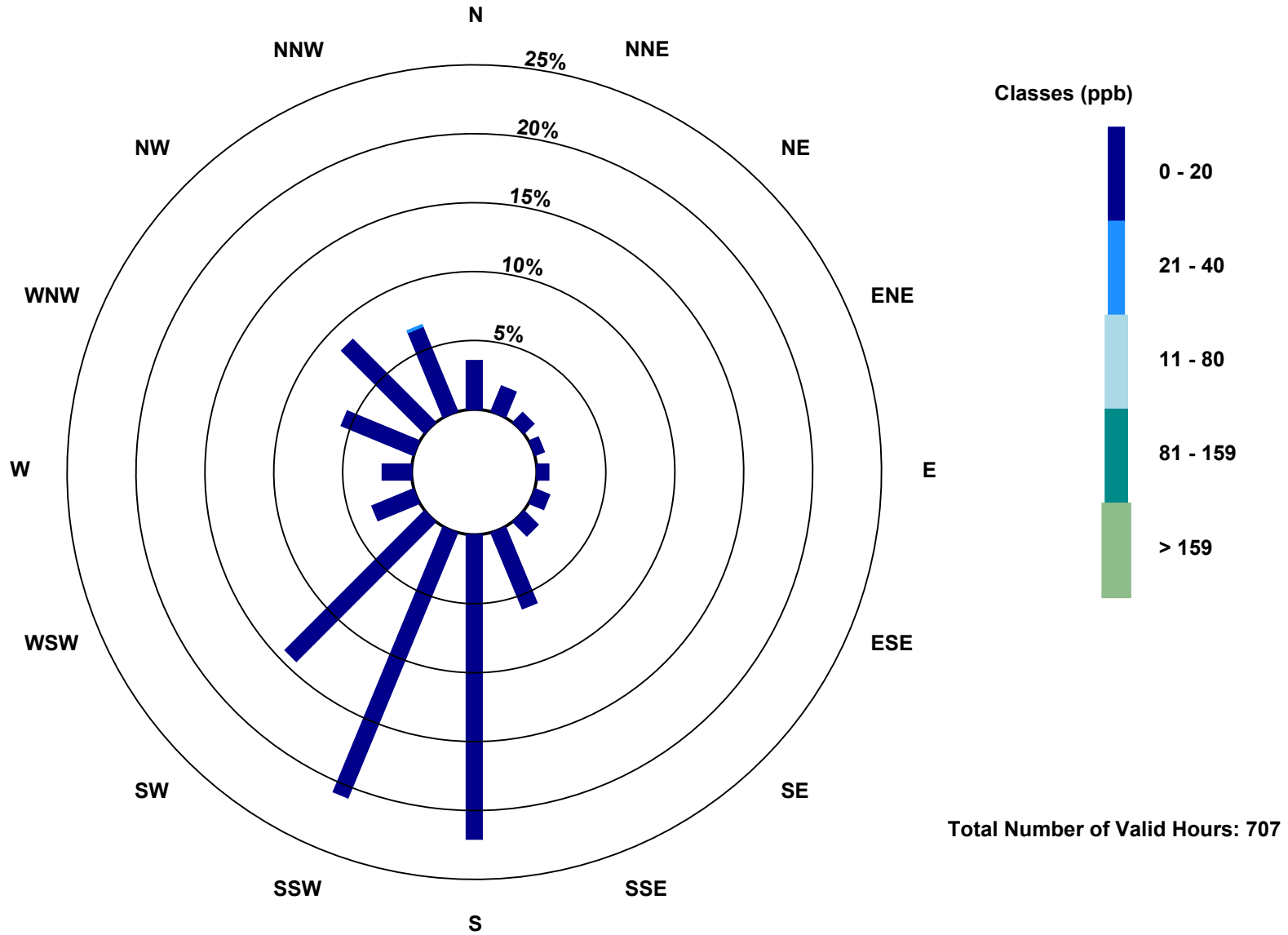
Total Number of Valid Hours: 707

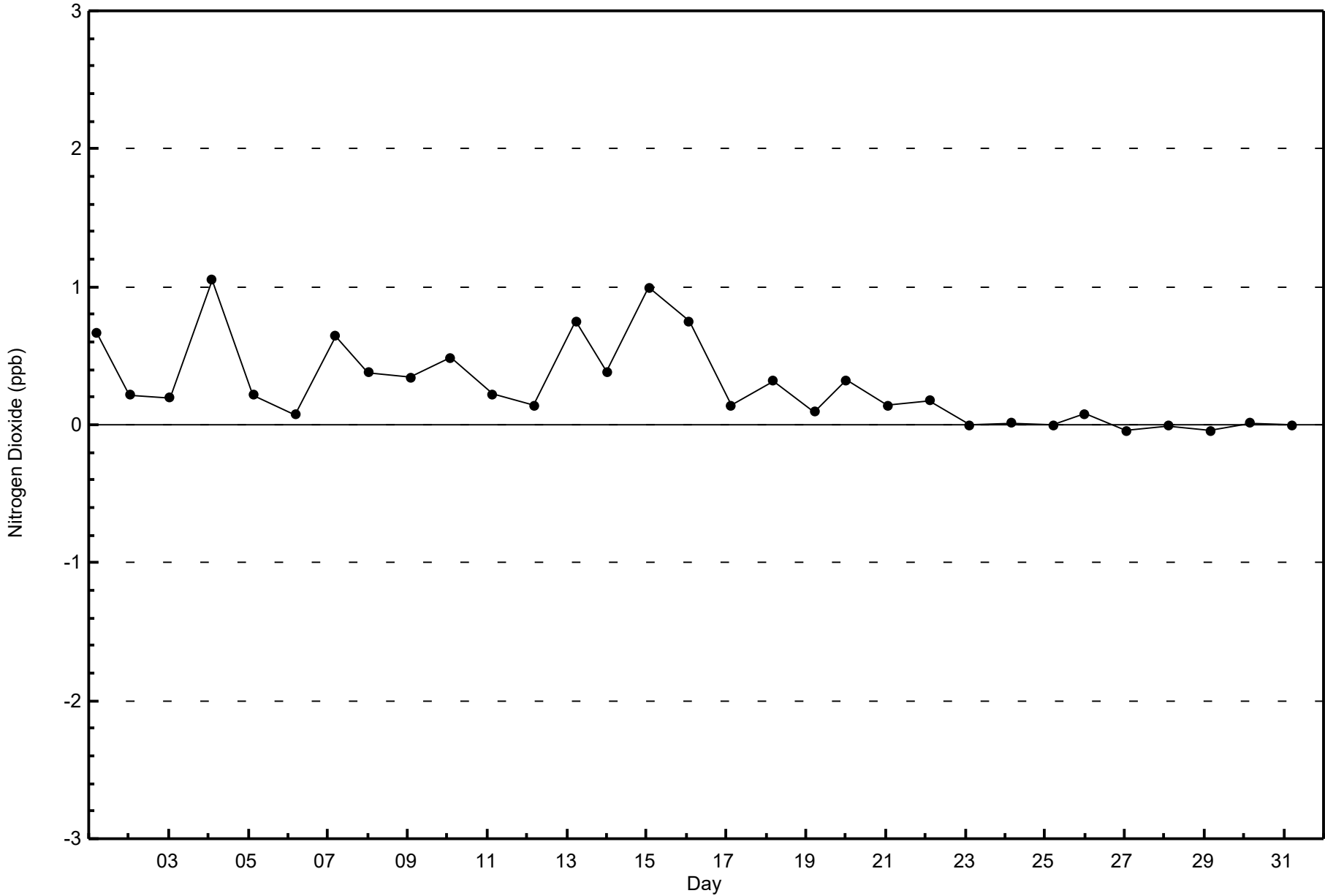
Total Number of Hours: 744

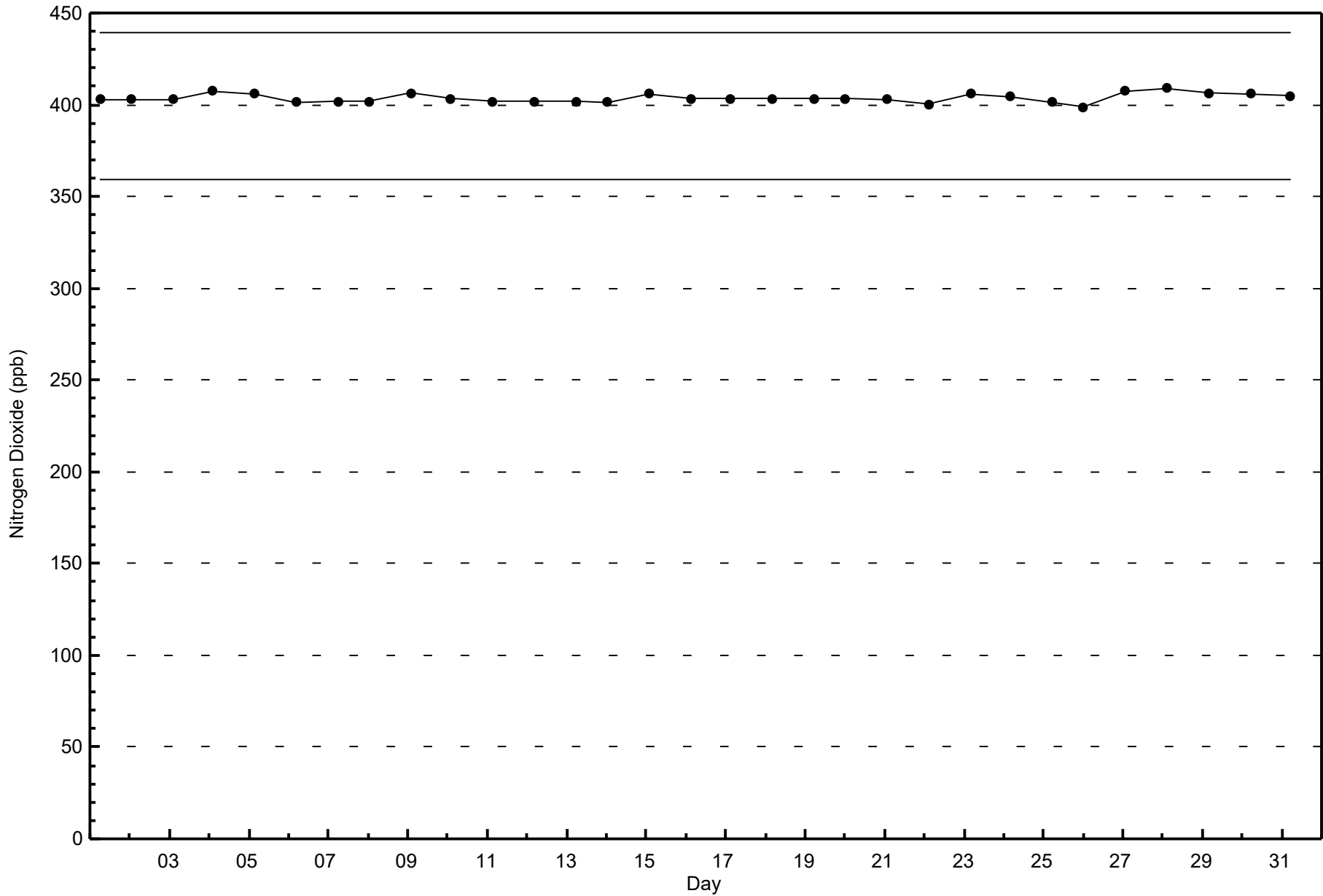


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 1









Wood Buffalo Environmental Association
Summary of Hour Averages

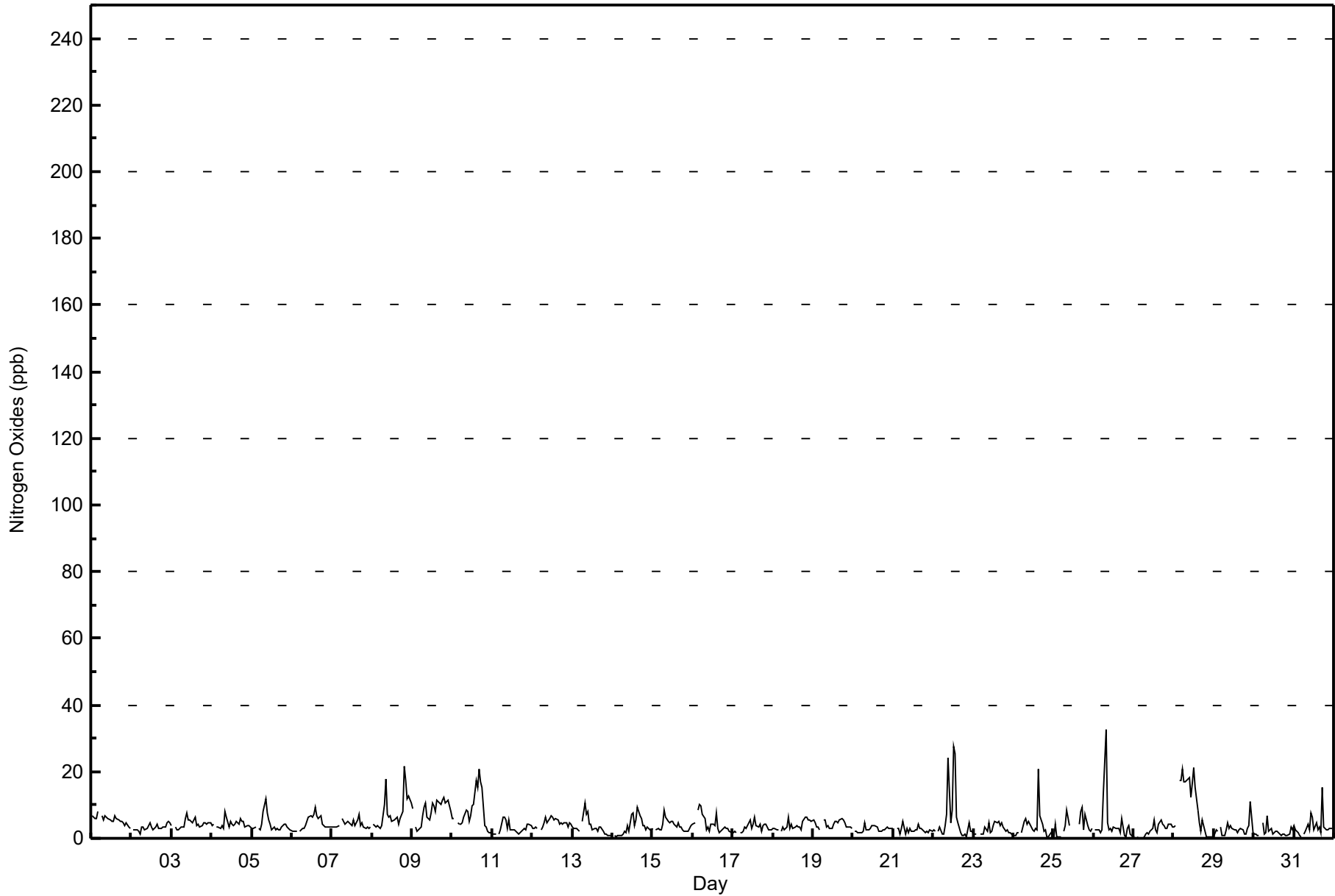
Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - January 2023

Maximum Value: 32.5 ppb on Jan 26 08:00 Maximum Daily Average: 9.8 ppb on Jan 28 Minimum Value: 0.1 ppb on Jan 27 05:00 Minimum Daily Average: 1.9 ppb on Jan 30 Maximum Diurnal Average: 6.0 ppb at hour 9 Minimum Diurnal Average: 2.4 ppb at hour 3 Monthly Average: 4.35 ppb Percentiles: P ₁ = 0.4 P ₁₀ = 1.4 Q ₁ = 2.4 Median = 3.4 Q ₃ = 5.1 P ₉₀ = 7.6 P ₉₉ = 20.7																				Hours in Service: 744 Hours of Data: 708 Hours of Missing Data: 36 Hours of Calibration: 36 Percent Operational Time: 100.0						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	6.7	6.2	6.0	6.0	8.1	Z	6.8	5.5	6.6	6.2	5.8	5.4	5.2	4.9	7.0	6.1	5.4	5.2	5.1	4.6	3.9	4.5	3.4	3.0	5.5	8.1
2-Jan	Z	2.7	2.5	2.3	1.9	1.4	3.3	3.3	2.7	2.9	3.8	4.7	3.5	2.6	3.6	4.4	3.1	2.9	3.1	3.6	3.5	4.8	5.1	4.5	3.3	5.1
3-Jan	3.8	Z	3.4	2.7	2.4	2.9	3.3	3.5	5.9	7.6	5.6	5.3	4.7	5.5	6.3	3.7	4.3	3.6	3.7	4.9	4.6	4.4	4.7	4.7	4.4	7.6
4-Jan	3.8	4.0	Z	3.6	3.2	3.1	3.8	2.9	8.2	6.3	3.5	5.1	4.0	3.6	4.2	4.9	4.4	5.9	5.2	4.9	3.3	4.0	3.8	3.2	4.3	8.2
5-Jan	2.9	3.1	3.3	Z	3.0	2.4	4.4	8.2	11.7	7.5	5.6	4.1	2.5	3.2	2.5	2.9	2.4	2.7	3.6	4.3	4.4	3.4	3.0	2.4	4.1	11.7
6-Jan	2.2	2.2	2.2	1.9	Z	2.1	2.8	2.8	4.0	5.1	6.4	6.9	6.5	7.3	9.2	6.8	6.0	6.8	4.1	4.0	3.5	3.5	3.3	3.4	4.5	9.2
7-Jan	3.3	3.6	3.3	3.4	3.9	Z	5.8	5.1	4.3	5.0	4.6	4.2	4.0	5.5	3.9	5.7	7.1	3.8	4.8	3.6	3.1	3.3	3.0	3.3	4.2	7.1
8-Jan	Z	4.3	3.5	3.6	3.3	3.1	4.0	10.4	17.7	7.3	6.3	6.6	5.3	5.5	6.0	6.2	4.4	5.9	8.0	21.5	17.2	11.9	12.7	10.6	8.1	21.5
9-Jan	9.0	Z	3.4	2.3	2.4	3.2	6.7	9.3	10.6	6.2	5.5	7.5	10.7	9.8	8.1	11.2	10.7	10.0	11.5	12.3	10.5	11.5	9.6	8.0	8.3	12.3
10-Jan	5.9	6.1	Z	4.6	4.4	4.4	4.9	6.3	8.5	8.0	5.0	6.7	9.6	10.0	17.3	15.3	20.7	16.8	15.4	3.8	3.4	2.0	1.8	1.8	7.9	20.7
11-Jan	1.4	1.2	1.2	Z	1.3	2.6	6.4	6.3	5.7	2.8	5.4	2.7	2.5	2.8	2.3	1.5	1.3	2.0	2.5	3.0	2.7	4.3	4.2	3.8	3.0	6.4
12-Jan	3.1	2.8	3.2	2.8	Z	2.5	3.5	4.5	6.4	4.8	6.0	6.8	6.3	5.4	5.8	5.3	4.3	4.5	4.4	4.6	4.5	3.5	4.6	4.4	4.5	6.8
13-Jan	3.4	2.9	3.1	2.4	2.3	Z	5.0	10.8	7.3	7.9	4.3	4.1	2.5	2.9	2.8	2.2	3.2	3.6	2.2	1.4	1.1	0.9	0.8	0.7	3.4	10.8
14-Jan	Z	0.8	0.6	0.7	0.9	0.7	1.1	2.0	1.8	3.9	2.0	7.0	7.6	4.0	5.6	9.3	6.9	6.1	3.9	4.0	2.7	3.2	2.6	2.4	3.5	9.3
15-Jan	3.0	Z	2.6	3.1	2.7	2.7	4.4	8.7	6.3	5.2	4.9	5.0	5.2	4.1	3.4	4.7	3.2	3.4	2.6	1.9	2.0	2.3	3.1	3.7	3.8	8.7
16-Jan	4.3	4.5	Z	8.5	10.3	9.6	7.4	6.1	2.5	3.4	1.9	4.0	4.1	3.8	7.8	2.8	1.9	2.5	3.1	3.4	3.1	2.8	2.2	1.9	4.4	10.3
17-Jan	1.8	1.9	1.8	Z	1.8	1.6	2.0	3.2	2.9	3.9	5.7	3.0	4.3	6.4	3.8	3.4	4.1	2.3	3.9	4.1	4.1	2.7	2.6	2.7	3.2	6.4
18-Jan	3.1	2.9	2.7	2.7	Z	2.0	3.2	2.6	3.3	6.3	3.0	4.4	3.0	3.6	4.0	3.3	3.3	2.4	5.1	6.2	6.4	5.5	5.5	5.0	3.9	6.4
19-Jan	5.3	4.6	3.3	3.3	2.7	Z	5.6	5.7	3.5	3.8	2.8	3.1	4.3	5.3	5.3	4.6	5.7	6.0	5.7	4.6	3.5	3.5	3.2	2.9	4.3	6.0
20-Jan	Z	2.1	1.9	1.7	1.6	1.6	2.0	4.7	2.6	2.4	3.2	3.7	3.6	3.7	3.6	2.3	2.0	2.0	2.5	2.6	3.2	3.2	2.9	3.1	2.7	4.7
21-Jan	3.2	Z	3.0	2.9	1.2	2.8	4.9	1.4	2.8	1.9	2.8	2.3	2.2	2.4	2.4	4.1	2.8	2.8	2.2	1.9	1.9	1.8	2.4	2.1	2.5	4.9
22-Jan	2.5	2.3	Z	2.0	3.3	1.2	1.4	3.7	7.4	24.1	4.6	8.5	27.5	25.6	6.5	4.8	1.8	0.8	0.7	1.3	0.6	4.6	2.1	2.1	6.1	27.5
23-Jan	1.1	1.3	1.1	Z	1.4	1.2	1.5	3.2	2.0	4.8	1.9	2.2	3.8	5.1	4.8	5.0	3.6	4.7	3.5	2.1	2.5	1.5	1.6	1.2	2.7	5.1
24-Jan	0.9	0.9	1.8	1.7	Z	1.9	5.1	5.9	4.3	5.1	4.2	2.5	2.2	3.0	2.5	20.7	6.6	4.2	2.3	2.6	0.6	0.4	1.6	0.7	3.6	20.7
25-Jan	0.5	4.1	0.5	0.5	0.3	Z	2.3	3.8	8.3	3.6	C	C	C	C	C	4.4	8.0	9.5	2.7	7.4	4.0	2.5	2.1	2.8	3.8	9.5
26-Jan	Z	2.7	2.7	2.4	1.5	2.7	13.5	32.5	4.8	2.6	2.9	2.3	3.4	3.1	3.0	3.1	1.8	6.0	0.9	0.4	3.0	3.8	1.3	0.7	4.4	32.5
27-Jan	0.4	Z	0.3	0.1	0.1	0.1	0.5	1.1	1.5	1.2	2.1	3.0	5.6	2.5	1.8	4.2	5.4	4.2	3.8	3.1	3.0	4.1	4.3	3.5	2.4	5.6
28-Jan	3.4	3.9	Z	17.3	17.6	20.8	16.8	17.1	17.7	18.4	12.4	16.5	21.4	15.2	8.6	4.7	1.9	5.5	3.7	0.6	0.5	0.4	0.4	0.3	9.8	21.4
29-Jan	0.5	2.4	2.0	Z	3.5	0.9	1.1	2.6	4.7	2.8	3.9	2.9	2.6	2.3	1.7	2.5	3.2	2.6	1.3	1.3	2.8	3.7	10.9	1.6	2.8	10.9
30-Jan	1.4	1.4	1.0	0.8	Z	4.9	1.2	1.6	6.9	2.2	3.0	1.1	1.7	2.0	2.0	1.2	0.7	1.2	1.1	1.0	0.8	1.1	3.6	2.7	1.9	6.9
31-Jan	3.9	2.4	1.5	0.8	0.5	Z	1.2	2.3	4.2	2.4	7.8	6.3	2.5	4.7	2.5	3.4	1.9	15.4	3.6	2.5	2.5	2.8	2.9	2.9	3.5	15.4
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	98.73	98.73
21 - 40	9	1.27	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	25	13	7	5	6	8	10	42	156	147	101	23	15	40	53	47	698
21 - 40	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7	1	9
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	25	14	7	5	6	8	10	42	156	147	101	23	15	40	60	48	707

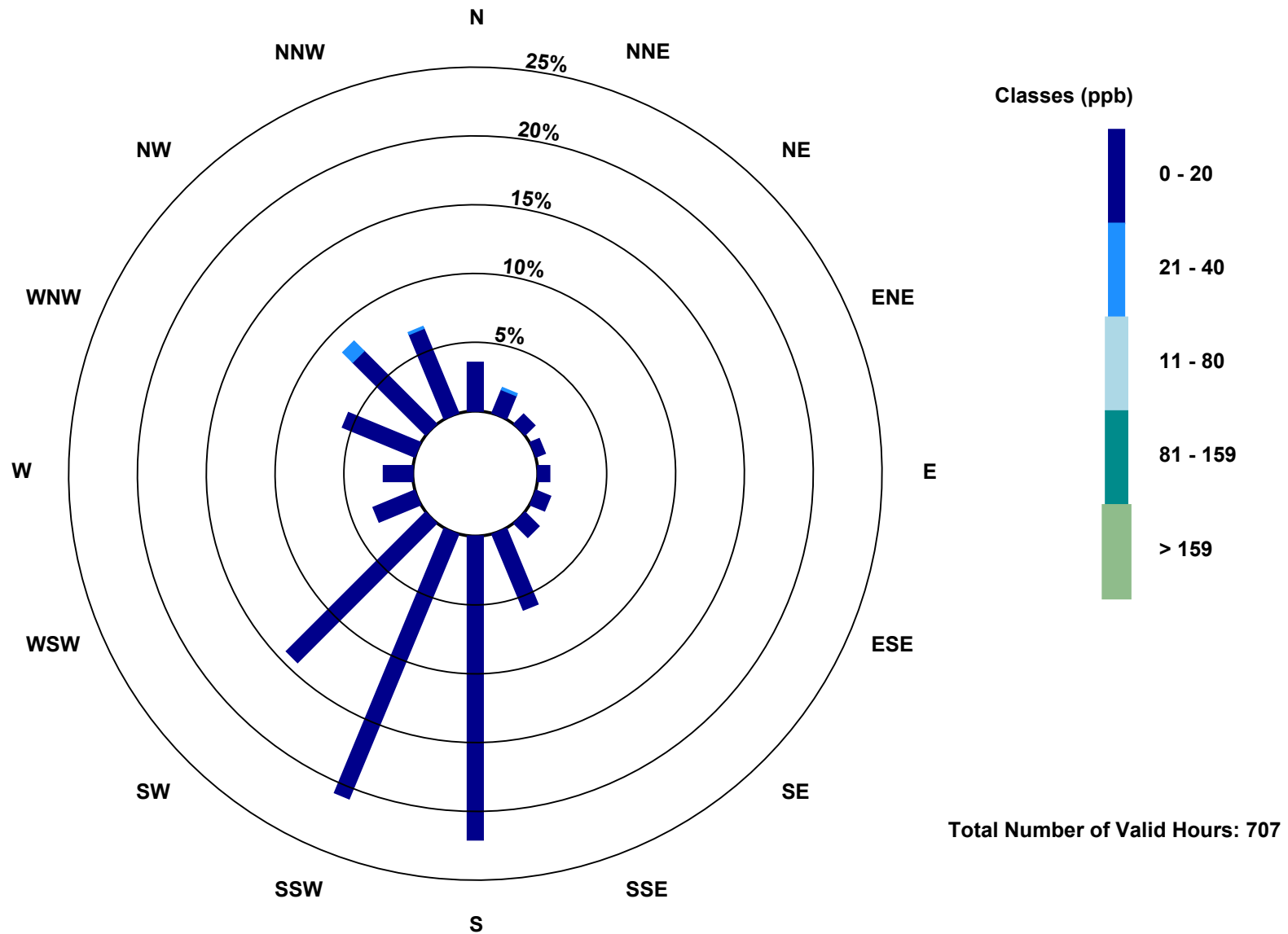
Total Number of Valid Hours: 707

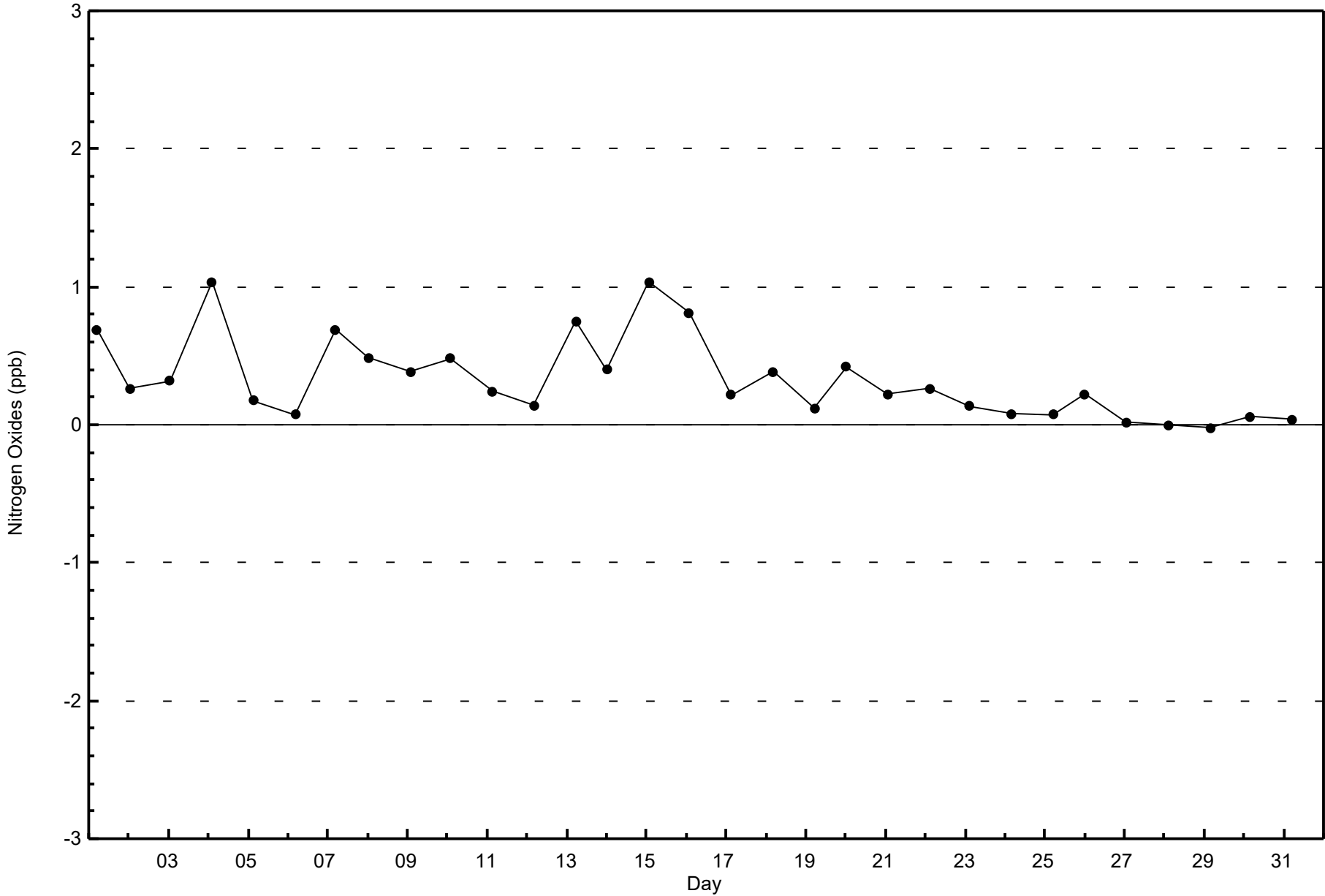
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 1

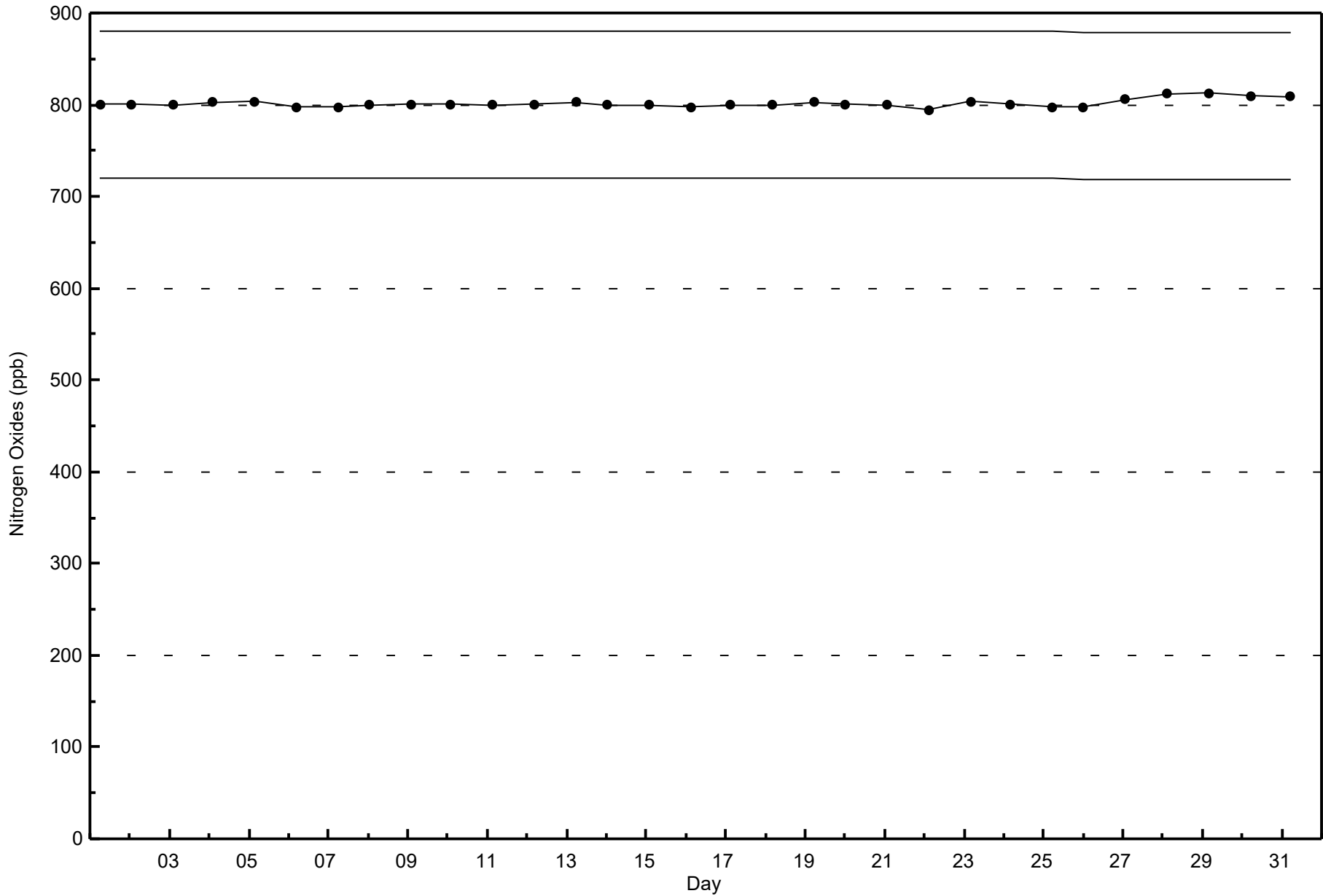






Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Jackfish 1 - January 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

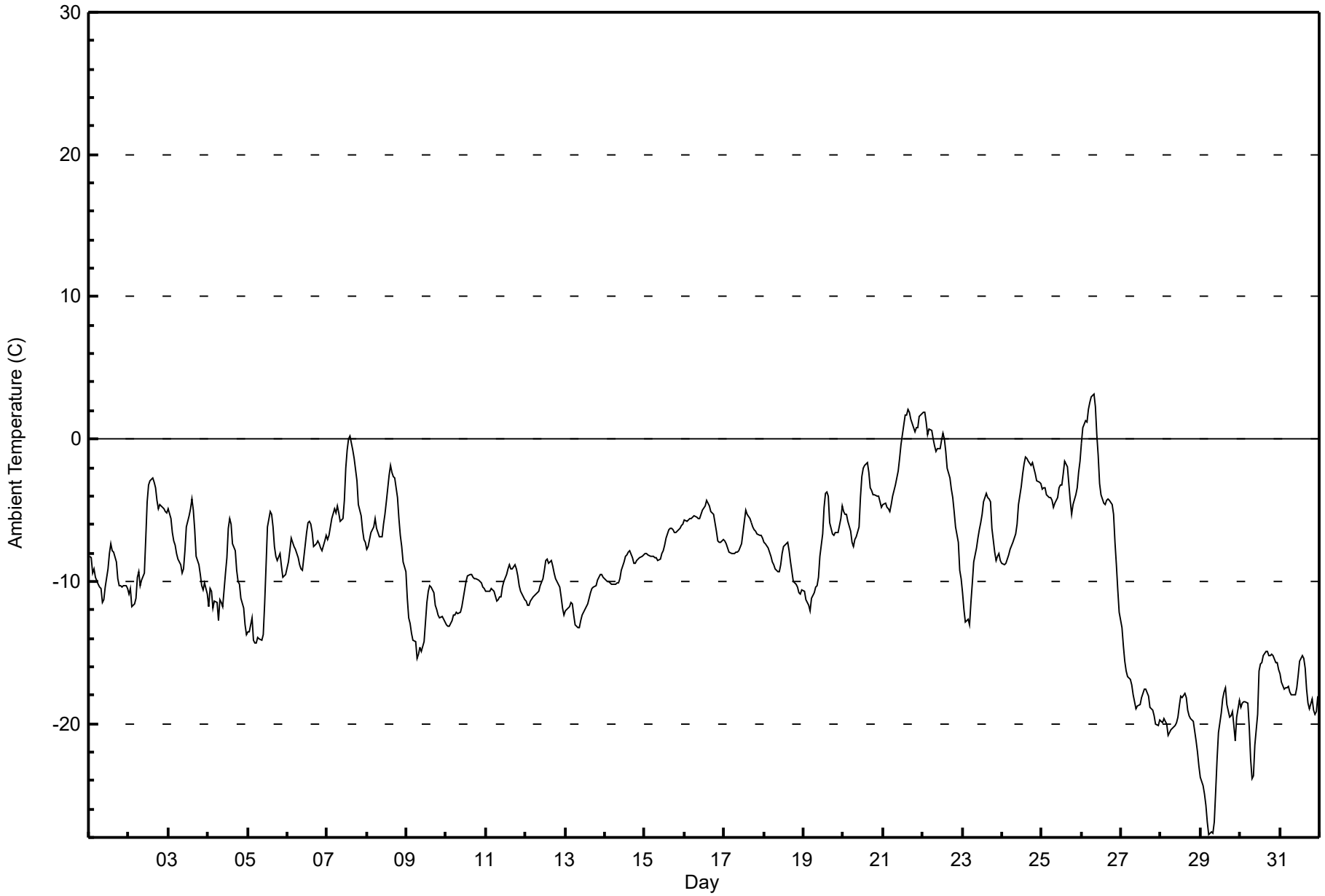
Ambient Temperature (AT) - C
Jackfish 1 - January 2023

Maximum Value: 3.2 C on Jan 26 08:00 Maximum Daily Average: -1.1 C on Jan 21 Minimum Value: -27.8 C on Jan 29 06:00 Minimum Daily Average: -22.2 C on Jan 29 Maximum Diurnal Average: -6.9 C at hour 15 Minimum Diurnal Average: -10.5 C at hour 9 Monthly Average: -9.20 C Percentiles: P ₁ = -24.6 P ₁₀ = -18.1 Q ₁ = -11.7 Median = -8.5 Q ₃ = -5.5 P ₉₀ = -2.8 P ₉₉ = 1.8																						Hours in Service: 744	Hours of Data: 744	Hours of Missing Data: 0	Hours of Calibration: 0	Percent Operational Time: 100.0
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-8.2	-8.4	-9.4	-9.2	-9.8	-10.2	-10.5	-10.5	-11.5	-11.2	-10.4	-9.1	-8.1	-7.4	-7.8	-7.9	-8.6	-9.8	-10.3	-10.3	-10.4	-10.3	-10.3	-10.5	-9.6	-7.4
2-Jan	-10.9	-10.5	-11.7	-11.6	-11.2	-9.8	-9.3	-10.3	-9.9	-9.4	-7.0	-4.4	-3.2	-2.9	-2.7	-3.0	-3.4	-4.3	-4.9	-4.6	-4.8	-4.9	-5.1	-5.2	-6.9	-2.7
3-Jan	-4.9	-5.6	-6.5	-7.1	-7.5	-8.1	-8.4	-8.8	-9.4	-9.1	-7.9	-6.2	-5.4	-4.9	-4.2	-5.0	-6.4	-8.2	-8.8	-9.6	-10.3	-10.6	-10.1	-10.9	-7.7	-4.2
4-Jan	-11.8	-10.5	-10.7	-11.9	-11.4	-11.5	-12.8	-11.3	-11.5	-11.8	-9.4	-8.3	-6.2	-5.6	-6.0	-7.3	-7.9	-9.2	-10.0	-10.2	-11.2	-11.8	-13.1	-13.7	-10.2	-5.6
5-Jan	-13.6	-13.5	-12.5	-14.1	-14.4	-14.3	-13.9	-14.0	-14.1	-13.8	-11.5	-8.9	-6.2	-5.1	-5.3	-6.1	-7.5	-8.2	-8.5	-8.1	-8.9	-9.7	-9.6	-9.6	-10.5	-5.1
6-Jan	-8.6	-7.9	-7.0	-7.2	-7.6	-7.8	-8.4	-8.8	-9.1	-9.2	-8.3	-6.6	-5.9	-5.7	-6.0	-6.6	-7.5	-7.3	-7.1	-7.3	-7.7	-7.8	-7.2	-6.8	-7.5	-5.7
7-Jan	-7.1	-6.7	-6.2	-5.6	-4.9	-5.2	-4.7	-5.2	-5.8	-5.6	-4.3	-2.1	-0.7	0.1	0.2	-0.8	-1.4	-2.1	-2.9	-4.6	-5.4	-6.3	-7.1	-7.2	-4.2	0.2
8-Jan	-7.7	-7.6	-6.5	-6.4	-6.2	-5.6	-6.3	-6.9	-6.9	-6.8	-6.0	-5.3	-4.4	-2.6	-1.9	-2.3	-2.6	-2.7	-4.1	-5.6	-6.7	-7.6	-8.6	-9.3	-5.7	-1.9
9-Jan	-11.2	-12.6	-13.0	-13.7	-14.1	-14.2	-15.4	-15.1	-14.7	-14.9	-14.3	-12.9	-11.5	-10.7	-10.3	-10.4	-10.8	-11.7	-12.0	-12.3	-12.6	-12.5	-12.6	-12.9	-12.8	-10.3
10-Jan	-13.1	-13.2	-13.2	-12.8	-12.4	-12.4	-12.2	-12.3	-12.1	-11.8	-11.2	-10.6	-10.0	-9.6	-9.5	-9.5	-9.7	-9.8	-9.8	-9.9	-10.0	-10.2	-10.4	-10.5	-11.1	-9.5
11-Jan	-10.7	-10.7	-10.7	-10.5	-10.6	-10.7	-11.4	-11.3	-11.1	-11.1	-10.4	-10.0	-9.5	-9.2	-8.8	-9.1	-9.1	-8.8	-9.1	-9.6	-10.3	-10.7	-10.9	-11.3	-10.2	-8.8
12-Jan	-11.4	-11.7	-11.7	-11.4	-11.1	-11.0	-10.9	-10.8	-10.7	-10.4	-9.8	-9.2	-8.6	-8.5	-8.7	-8.6	-8.9	-9.4	-9.8	-10.0	-10.4	-11.1	-11.9	-12.3	-10.3	-8.5
13-Jan	-12.1	-12.0	-11.8	-11.5	-11.5	-12.4	-13.0	-13.2	-13.2	-12.8	-12.3	-12.1	-12.0	-11.6	-11.2	-10.8	-10.5	-10.4	-10.3	-10.0	-9.7	-9.5	-9.5	-9.7	-11.4	-9.5
14-Jan	-9.9	-10.0	-10.0	-10.1	-10.2	-10.2	-10.2	-10.1	-10.1	-9.8	-9.2	-8.7	-8.3	-8.1	-7.9	-7.9	-8.3	-8.7	-8.7	-8.6	-8.4	-8.3	-8.2	-8.2	-9.1	-7.9
15-Jan	-8.1	-8.1	-8.2	-8.2	-8.3	-8.2	-8.3	-8.4	-8.5	-8.4	-8.0	-7.8	-7.5	-7.0	-6.4	-6.2	-6.3	-6.4	-6.6	-6.5	-6.4	-6.3	-6.1	-5.9	-7.3	-5.9
16-Jan	-5.7	-5.8	-5.7	-5.6	-5.6	-5.5	-5.4	-5.5	-5.6	-5.5	-5.3	-5.0	-4.7	-4.3	-4.5	-4.7	-5.1	-5.3	-5.9	-6.5	-7.1	-7.3	-7.2	-7.1	-5.7	-4.3
17-Jan	-7.2	-7.4	-7.6	-8.0	-8.0	-8.1	-8.0	-8.0	-7.9	-7.8	-7.3	-6.6	-5.8	-5.0	-5.3	-5.6	-5.9	-6.2	-6.3	-6.5	-6.7	-6.7	-6.8	-7.0	-6.9	-5.0
18-Jan	-7.3	-7.4	-7.6	-8.0	-8.2	-8.6	-8.8	-9.1	-9.4	-9.3	-8.8	-8.1	-7.6	-7.3	-7.3	-7.8	-8.6	-9.3	-10.0	-10.2	-10.5	-10.8	-10.9	-10.6	-8.8	-7.3
19-Jan	-10.7	-11.3	-11.5	-11.7	-12.0	-11.2	-10.8	-10.4	-10.3	-9.7	-8.3	-6.7	-4.8	-3.8	-3.8	-4.0	-5.9	-6.7	-6.8	-6.6	-6.6	-6.6	-5.6	-4.7	-7.9	-3.8
20-Jan	-5.1	-5.2	-5.3	-5.8	-6.5	-7.3	-7.5	-7.0	-6.9	-6.1	-4.1	-2.7	-2.0	-1.8	-1.7	-2.3	-3.4	-3.6	-3.9	-4.0	-4.0	-4.0	-4.4	-4.8	-4.6	-1.7
21-Jan	-4.6	-4.5	-4.8	-4.9	-5.1	-4.6	-4.1	-3.2	-2.8	-2.2	-1.4	-0.4	1.0	1.7	1.7	2.1	1.9	1.4	0.8	0.5	0.8	0.8	1.6	1.8	-1.1	2.1
22-Jan	1.9	1.8	1.2	0.3	0.7	0.6	0.0	-0.5	-0.9	-0.7	-0.6	-0.1	0.4	0.0	-0.8	-2.1	-2.8	-3.5	-4.1	-5.1	-6.2	-7.2	-9.3	-9.8	-2.0	1.9
23-Jan	-10.8	-12.0	-12.9	-12.7	-13.1	-11.4	-10.1	-8.6	-7.6	-7.0	-6.4	-5.9	-5.2	-4.4	-3.9	-4.1	-4.2	-4.4	-6.3	-7.9	-8.5	-8.2	-8.1	-8.5	-8.0	-3.9
24-Jan	-8.7	-8.8	-8.7	-8.4	-8.1	-7.7	-7.3	-7.0	-6.7	-6.0	-4.6	-3.3	-2.4	-1.7	-1.3	-1.4	-1.5	-1.9	-1.7	-2.1	-2.4	-2.9	-3.0	-3.2	-4.6	-1.3
25-Jan	-3.5	-3.4	-3.5	-4.0	-4.1	-4.1	-4.3	-4.8	-4.5	-4.1	-3.5	-3.2	-3.2	-2.4	-1.5	-2.0	-3.1	-4.3	-5.3	-4.7	-4.0	-3.4	-2.4	-1.6	-3.5	-1.5
26-Jan	-0.3	0.8	1.3	1.2	2.0	2.5	3.0	3.2	2.2	0.3	-1.2	-3.1	-3.9	-4.5	-4.6	-4.3	-4.2	-4.3	-4.6	-5.3	-7.3	-8.8	-10.6	-12.2	-2.6	3.2
27-Jan	-13.2	-14.5	-15.6	-16.3	-16.6	-16.9	-17.2	-17.9	-18.4	-19.0	-18.8	-18.7	-18.1	-17.9	-17.6	-17.6	-18.0	-18.9	-19.0	-19.1	-19.4	-20.0	-20.1	-19.8	-17.9	-13.2
28-Jan	-19.9	-20.0	-19.7	-20.1	-20.9	-20.6	-20.5	-20.3	-20.2	-19.9	-19.5	-18.7	-18.1	-18.2	-17.9	-18.2	-19.0	-19.4	-19.7	-19.8	-20.6	-21.2	-22.0	-23.0	-19.9	-17.9
29-Jan	-23.7	-24.4	-25.0	-25.7	-26.9	-27.8	-27.6	-27.7	-26.9	-24.7	-22.5	-20.6	-19.2	-18.3	-17.8	-17.5	-18.7	-19.6	-19.5	-19.2	-20.1	-21.2	-19.6	-18.4	-22.2	-17.5
30-Jan	-18.9	-18.5	-18.5	-18.5	-18.6	-20.2	-22.5	-23.9	-23.6	-21.5	-19.3	-16.3	-15.8	-15.7	-15.2	-14.9	-14.9	-15.2	-15.3	-15.1	-15.2	-15.7	-15.7	-16.2	-17.7	-14.9
31-Jan	-16.5	-17.0	-17.6	-17.5	-17.5	-17.4	-17.8	-17.9	-18.0	-18.0	-17.5	-16.6	-15.6	-15.2	-15.4	-16.1	-17.6	-18.6	-18.9	-18.3	-19.0	-19.4	-19.2	-18.1	-17.5	-15.2
	-9.8	-9.9	-10.0	-10.2	-10.3	-10.3	-10.5	-10.5	-10.5	-10.2	-9.3	-8.3	-7.5	-7.0	-6.9	-7.2	-7.7	-8.3	-8.7	-8.9	-9.4	-9.7	-9.8	-9.9		Diurnal Average
	1.9	1.8	1.3	1.2	2.0	2.5	3.0	3.2	2.2	0.3	-0.6	-0.1	1.0	1.7	1.7	2.1	1.9	1.4	0.8	0.5	0.8	0.8	1.6	1.8		Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 1 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Jackfish 1 - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	31	4.17	4.17
-20 - 0	682	91.67	95.83
0 - 10	31	4.17	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

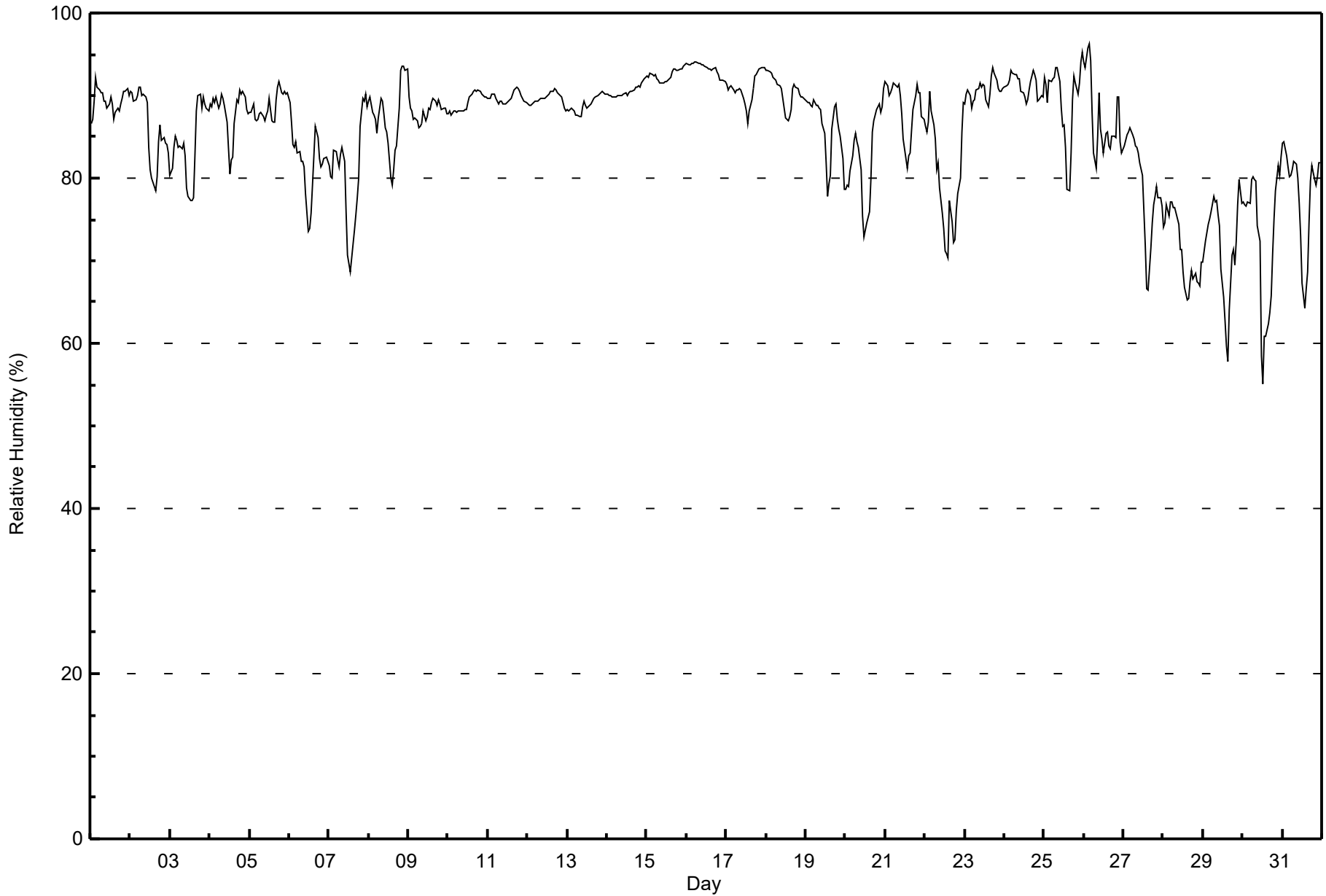
Relative Humidity (RH) - %
Jackfish 1 - January 2023

Maximum Value: 96.3 % on Jan 26 04:00 Maximum Daily Average: 93.3 % on Jan 16 Minimum Value: 55.1 % on Jan 30 13:00 Minimum Daily Average: 71.3 % on Jan 28 Maximum Diurnal Average: 87.6 % at hour 4 Minimum Diurnal Average: 81.0 % at hour 15 Monthly Average: 85.71 % Percentiles: P ₁ = 63.1 P ₁₀ = 75.5 Q ₁ = 82.4 Median = 88.5 Q ₃ = 90.4 P ₉₀ = 92.1 P ₉₉ = 94.0																						Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0					
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Jan	86.5	87.1	89.3	92.2	91.1	90.7	90.3	90.3	89.4	89.3	88.6	89.0	89.8	88.9	87.2	87.9	88.5	88.2	89.0	89.6	90.4	90.6	90.8	89.9	89.4	92.2	
2-Jan	90.5	90.4	89.3	89.6	90.0	91.0	91.1	90.0	90.2	89.9	89.2	83.7	81.1	80.1	79.0	78.6	80.3	84.4	86.5	84.5	84.9	84.2	84.1	83.1	86.1	91.1	
3-Jan	80.3	81.1	83.7	85.0	84.6	83.8	83.9	83.5	84.3	82.8	78.8	77.7	77.3	77.3	77.7	82.7	88.1	89.9	90.2	88.4	89.8	89.0	88.4	88.1	84.0	90.2	
4-Jan	89.0	88.6	89.6	89.1	89.8	88.5	89.1	90.2	89.7	88.7	86.8	83.5	80.4	82.2	82.6	86.6	89.5	89.1	90.7	90.1	90.4	89.9	88.4	87.9	87.9	90.7	
5-Jan	88.0	88.0	89.0	87.1	87.0	87.1	87.8	87.9	87.4	86.9	87.6	88.2	89.7	87.0	86.8	86.8	89.5	91.0	91.7	90.4	90.2	90.5	90.3	90.3	88.6	91.7	
6-Jan	89.1	86.8	84.1	83.8	84.4	83.1	83.2	82.1	82.0	81.3	78.1	73.5	73.9	75.7	79.1	82.7	86.3	84.9	82.3	81.4	81.7	82.4	82.5	82.1	81.9	89.1	
7-Jan	81.6	80.1	80.0	83.4	83.3	82.1	81.4	82.9	83.7	82.1	75.9	70.6	69.7	68.6	70.3	73.7	75.5	77.6	80.0	86.2	89.6	89.3	90.2	88.7	80.3	90.2	
8-Jan	89.4	89.8	87.9	87.7	87.1	85.4	87.4	89.7	89.4	87.8	86.0	85.6	84.2	79.9	79.2	81.0	83.4	84.0	88.4	93.0	93.6	93.6	93.0	93.2	87.5	93.6	
9-Jan	89.8	88.4	88.1	87.2	87.3	86.9	86.1	86.3	86.6	88.1	87.0	87.5	88.4	88.4	89.2	89.6	89.4	88.8	89.4	89.0	88.2	88.5	88.4	87.9	88.1	89.8	
10-Jan	87.7	88.2	87.6	88.2	88.2	88.0	88.2	88.1	88.1	88.1	88.3	88.4	89.2	89.8	90.1	90.5	90.7	90.6	90.7	90.6	90.2	90.0	89.8	89.8	89.1	90.7	
11-Jan	89.7	89.6	90.2	90.2	90.2	89.7	88.9	89.3	89.3	89.0	89.0	88.9	89.3	89.4	89.7	90.2	90.7	91.0	90.8	90.5	90.0	89.7	89.4	89.1	89.7	91.0	
12-Jan	89.0	88.8	88.8	89.0	89.3	89.3	89.4	89.5	89.6	89.7	89.7	89.8	90.0	90.1	90.4	90.5	90.8	90.6	90.4	90.1	89.8	89.1	88.5	88.2	89.6	90.8	
13-Jan	88.3	88.1	88.5	88.4	88.1	87.6	87.7	87.5	87.5	88.6	89.3	88.8	88.4	88.8	89.0	89.3	89.6	89.8	90.0	90.2	90.3	90.5	90.4	90.2	88.9	90.5	
14-Jan	90.1	90.1	90.0	89.9	89.9	89.9	89.9	90.0	90.0	90.1	90.2	90.3	90.0	90.4	90.5	90.5	90.7	91.0	91.0	91.1	91.0	91.6	92.1	92.1	90.5	92.1	
15-Jan	92.3	92.2	92.8	92.5	92.4	92.5	92.1	91.9	91.6	91.5	91.6	91.6	91.7	91.9	92.2	92.8	93.2	93.2	93.0	93.1	93.2	93.3	93.5	93.7	92.5	93.7	
16-Jan	93.9	93.8	93.8	93.9	93.9	94.1	94.1	94.0	93.8	93.7	93.7	93.6	93.5	93.2	93.2	93.1	93.3	93.4	92.9	92.5	91.9	91.8	91.9	91.7	93.3	94.1	
17-Jan	91.3	90.8	91.0	91.1	90.6	90.3	90.7	90.8	90.8	90.7	89.7	89.0	88.1	86.5	88.1	89.5	90.8	92.4	92.5	92.9	93.2	93.4	93.4	93.4	90.9	93.4	
18-Jan	93.1	93.1	92.9	92.7	92.2	92.0	91.9	91.4	91.2	90.8	89.7	88.6	87.2	86.9	87.4	88.3	90.8	91.3	91.0	90.8	90.2	89.8	89.8	89.7	90.5	93.1	
19-Jan	89.3	89.1	89.1	88.9	88.6	89.5	88.9	88.8	88.5	88.2	86.7	85.4	81.8	77.9	79.3	80.4	86.0	88.7	89.0	87.1	86.0	85.1	82.5	78.6	86.0	89.5	
20-Jan	78.7	79.2	79.0	80.8	82.8	84.5	85.5	84.4	83.8	80.9	75.4	72.9	73.7	74.6	75.9	80.0	85.6	87.0	87.6	88.3	89.1	87.9	88.7	90.8	82.4	90.8	
21-Jan	91.7	91.2	90.0	90.3	90.8	91.4	91.4	91.0	91.4	90.0	87.8	84.8	82.4	81.1	82.8	83.1	85.7	88.3	89.9	91.4	90.3	90.3	87.5	87.2	88.4	91.7	
22-Jan	86.3	85.6	86.8	90.5	88.2	86.4	84.8	81.1	81.9	78.9	75.7	73.9	71.2	70.9	70.4	77.4	74.7	72.2	72.6	76.1	78.2	79.9	85.6	89.2	79.9	90.5	
23-Jan	89.0	90.2	90.7	90.0	88.5	89.3	89.6	90.7	90.9	91.4	91.0	91.3	91.2	89.5	88.6	90.2	92.4	93.4	92.8	91.9	90.8	90.6	90.5	90.9	90.6	93.4	
24-Jan	91.0	91.2	91.3	91.8	93.0	92.8	92.6	92.5	92.1	92.1	90.5	90.3	89.9	89.0	89.6	90.6	91.7	93.0	92.5	91.9	89.4	89.6	90.0	89.9	91.2	93.0	
25-Jan	92.1	91.4	89.2	91.8	91.7	92.0	92.2	93.4	93.5	91.7	88.5	86.3	86.4	83.8	78.7	78.5	83.0	89.5	92.4	91.6	90.1	91.6	94.1	95.2	89.5	95.2	
26-Jan	94.1	93.4	95.7	96.3	94.3	88.0	83.1	81.1	85.1	90.3	85.9	84.7	83.0	81.9	80.3	76.1	71.9	66.7	66.4	71.6	74.6	76.8	77.8	79.1	77.6	77.6	96.3
27-Jan	83.9	84.6	85.3	85.7	86.2	85.3	84.7	83.9	83.7	83.0	81.9	80.3	76.1	71.9	66.7	66.4	71.6	74.6	76.8	77.8	79.1	77.6	77.6	76.6	79.2	86.2	
28-Jan	74.1	74.5	76.7	75.4	77.1	77.0	76.4	76.4	75.1	74.5	71.4	71.4	68.6	66.7	65.3	65.5	67.5	68.9	67.8	68.4	67.4	67.3	66.9	69.9	71.3	77.1	
29-Jan	69.9	72.4	73.4	74.5	75.1	76.0	77.7	77.1	77.3	75.6	74.2	69.1	65.6	62.7	59.7	57.8	64.1	70.7	71.4	69.5	72.4	76.8	79.8	76.9	71.7	79.8	
30-Jan	77.1	76.8	76.7	77.1	77.0	79.8	80.2	79.8	79.7	74.2	72.4	58.5	55.1	60.8	60.8	62.3	63.8	65.8	70.8	75.1	78.4	81.6	80.4	82.5	72.8	82.5	
31-Jan	84.3	84.4	82.8	81.3	80.2	80.4	81.1	82.0	81.7	80.0	76.9	73.1	67.2	64.2	66.6	68.7	74.6	79.7	81.6	79.9	79.2	80.1	81.9	81.9	78.1	84.4	
87.1 87.1 87.2 87.6 87.5 87.2 87.1 87.0 87.1 86.5 84.8 82.9 81.7 81.1 81.0 82.2 84.4 85.7 86.5 86.7 87.1 87.3 87.2 87.1																								Diurnal Average			
94.1 93.8 95.7 96.3 94.3 94.1 94.1 94.0 93.8 93.7 93.7 93.6 93.5 93.2 93.2 93.1 93.3 93.4 93.0 93.1 93.6 93.6 94.1 95.2																								Diurnal Maximum			



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 1 - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Jackfish 1 - January 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	4	0.54	0.54
60 - 80	137	18.41	18.95
80 - 100	603	81.05	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Jackfish 1 - January 2023

Maximum Speed: 23 km/h on Jan 26 10:00	Maximum Daily Speed Average: 11.9 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 11 05:00	Minimum Daily Speed Average: 0.3 km/h on Jan 10	Hours of Data: 742
Maximum Diurnal Speed Average: 2.6 km/h at hour 6	Minimum Diurnal Speed Average: 1.7 km/h at hour 22	Hours of Missing Data: 2
Monthly Average Velocity: 2.1 km/h 239.7 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 5 Q ₃ = 6 P ₉₀ = 9 P ₉₉ = 18	Percent Operational Time: 99.7

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24				
1-Jan	SW4	SW6	SW5	SW4	SSW5	WSW3	NW2	SSW3	SSW2	SSW3	S2	S2	SSW2	SSW3	SSW3	SSW4	SSW5	SSW7	SSW6	SW6	SW5	SSW5	SW5	SSW5	SW4.0	SSW7		
2-Jan	SW5	SW4	SSW4	SSW5	SSW5	SW6	SSW5	SSW5	SSW5	S5	SSW4	SSW4	SW6	SW6	SSW7	SW7	SW6	SSW5	SSW6	SSW3	S4	S3	SSW4	S7	SSW5.0	SW7		
3-Jan	S8	S9	S8	S7	S7	S7	S8	S9	S9	S8	S9	S7	S5	SSW4	S3	S3	SSW4	SSW4	SW3	SSW4	SSW5	SSW4	SSW5	SSW4	S5.9	S9		
4-Jan	SSW5	SW4	SSW3	SSW4	SW3	SSW5	SSW2	SW1	SSW2	SW3	SW4	SSW3	WSW3	WSW2	SW3	SW2	SW3	SSW4	SSW4	SSW3	S4	SSW3	S4	SSW4	SSW3.1	SSW5		
5-Jan	S6	SSW4	SSW3	S3	SSW3	S6	SSW5	SSW4	SSW4	S4	S5	S5	S5	S5	S4	S5	S5	S6	S6	S7	S6	S6	S7	SSE8	S5.1	SSE8		
6-Jan	SSE7	S8	S8	S6	S8	S8	S8	S9	S11	S8	SSW6	SSW6	SSW6	SSW5	S6	S6	SSW5	SSW8	SW9	SW9	SW10	SW8	SW7	SW7	SSW7.2	S11		
7-Jan	SW9	SW9	SW9	SSW6	SW8	SW10	SW9	SW9	SW9	SW8	SW8	SW5	SW6	SW5	SW3	SW4	SW6	SW5	SSW5	S5	SSW5	S6	S6	S5	SSW6.5	SW10		
8-Jan	S7	S9	S9	S6	S4	S2	S1	S2	NNW1	S1	SSW1	SSE4	ESE3	SE4	E3	ESE3	SW1	NNE2	NW1	NNW1	W1	WSW1	S0	SSW1	S2.0	S9		
9-Jan	NNW1	WSW1	SW1	W1	S2	SW2	SSW2	SW1	SSW1	S3	S2	S1	SSE1	SSE1	N0	ESE0	NNE1	ESE2	ESE2	SSE1	S1	SSE1	SSE1	S1	S0.8	S3		
10-Jan	S1	SSW1	SE1	S2	S1	SW0	SSE1	SW1	S0	S0	SW0	NNW1	NNW0	NW0	NNW1	E1	NNE2	N2	N2	NNE2	NE1	NE1	NNW1	N2	NNE0.3	N2		
11-Jan	NNE2	N1	NE1	UO	W0	SSE1	S0	SSW0	SW1	SSW0	S1	SSE1	S1	SSE2	S1	S1	S1	SSW1	SSW2	SSW2	SSW2	SSW2	SSW2	SSW2	S0.9	SSW2		
12-Jan	SSW2	SSW2	SSW2	SSW2	S2	S2	S3	SSW3	SSW3	S3	SSW3	SSW2	SSW3	SSW3	SSW4	SSW3	SSW3	SSW4	SSW4	SSW3	SSW3	SSW3	SSW3	SSW2	SSW2.8	SSW4		
13-Jan	SW1	SW1	SSW1	SSW1	NW0	NW3	UO	NNW1	NNW4	NNE4	ENE4	NE4	ENE3	NNE3	E3	ESE3	NE2	ENE2	E4	SE5	SE4	SE5	SE6	SE6	E1.7	SE6		
14-Jan	SE4	SE5	SSE5	SSE4	SSE4	S3	S3	S2	S3	S2	SSW2	SSW2	SSW2	SSW2	SSW1	SSW1	SW1	SW0	SW1	SSW1	WSW0	WSW1	WSW1	WSW1	S1.9	SE5		
15-Jan	WSW1	W2	N3	NNW2	NW2	NNW1	E1	E1	SSE2	S2	S1	SSE3	SSE3	SSE3	S2	S2	S1	SE1	SSE2	SSE2	S2	S2	S1	SSE3	S1.0	SSE3		
16-Jan	SSE3	S2	S1	S3	SSE4	SSE4	SSE4	SSE5	SSE5	SSE4	SSE5	SSE5	S4	SSE6	SSE9	SSE8	SSE6	S5	S7	S6	S5	S5	S6	S6	SSE4.8	SSE9		
17-Jan	S6	S6	S5	S5	S5	S5	S5	SSW4	S5	S5	S5	S6	SSW6	SSW5	S6	SSW5	SSW6	SSW7	SSW7	SSW7	SSW8	S6	S6	SSW6	SSW5.8	SSW8		
18-Jan	SSW6	SSW5	SSW6	SSW5	S5	S5	S5	S5	S6	S5	S5	S5	S6	S6	S5	S5	S6	S6	S6	S5	S6	S6	S7	S7	S5.5	S7		
19-Jan	SSW7	S7	S6	SSW3	SW3	SSW6	SSW6	SSW6	SSW5	SSW5	SW6	WSW4	WSW5	NNW4	WSW3	SW5	SW6	SW6	SSW6	SSW6	SW6	SW6	SW7	SSW6	SW5.1	S7		
20-Jan	SW4	SW5	SW6	SW5	SW6	SW6	SW5	SSW5	SW5	SW5	SW5	NNW4	NW4	W4	W4	SW5	SW5	SW5	SSW5	SSW5	SSW5	SW5	WSW5	WSW4	SW4.5	SW6		
21-Jan	WSW4	SW4	SW5	SW6	SW6	SW6	SW7	SW7	SW7	SW6	SW6	SW6	SW7	SW6	SW7	SSW5	SSW5	SW7	SW7	SW5	SW5	SW3	NNW3	NNW5	SW5.4	SW7		
22-Jan	NW3	NNW3	NNW3	NNW5	NNW7	NNW6	NNW7	NNW7	NNW7	NW10	NNW8	NNW10	NW14	NW15	NW18	NW18	NW17	NW18	NNW14	NNW13	NNW11	NW6	NW3	WSW2	NNW9.1	NW18		
23-Jan	NNW1	SSE3	S5	S4	S4	S5	S4	S6	S6	S6	S5	SSE6	S6	S5	S4	S2	SSW1	NNW4	NNW10	NNW9	NNW4	NNW2	N3	N3	SSW1.7	NNW10		
24-Jan	ENE1	ESE2	S1	SSE2	S2	S4	S4	S5	S3	S3	SSW3	WSW4	SW4	W3	NW5	NW7	NNW4	NNW5	NNW10	NW8	NNW11	NNW9	NW6	NNW9	NNW2.5	NNW11		
25-Jan	NNW6	NW7	NNW9	N5	NNW7	NW6	N5	N1	NW2	NNW3	NW4	N3	NNW1	SW4	NNW1	W2	SSW2	SSW3	SSW6	SSW6	SSW4	S5	S7	S7	NNW1.7	NNW9		
26-Jan	SSW7	W5	NNW7	NNW6	NNW9	NNW11	NNW12	NW15	NW19	NNW23	NNW20	NNW22	NNW15	NNW16	NNW15	NW11	NW12	NW8	NNW12	NNW11	NNE11	NNE11	NNE12	N11	NNW11.2	NNW23		
27-Jan	N10	N10	NNE11	N10	N10	N10	N9	N9	NNE9	N8	N8	N7	N6	NNW7	NW7	NW8	NW8	NNW11	NNW13	NNW11	NNW11	NNW11	NNW9	NW11	NNW8.9	NNW13		
28-Jan	NW10	NW9	NW8	NW10	NW8	NW9	NW8	NW8	NW9	NW10	NW9	NW11	NW12	NW13	NW14	NW13	NW14	NW13	NW14	NW13	NW13	NW17	NNW19	NNW18	NNW16	NNW15	NW11.9	NNW19
29-Jan	NNW13	NW9	NW9	NW8	NW5	NNW3	W3	W3	NNW2	NNW3	NNW4	NNW3	WSW3	SW5	SSW6	SSW5	SSW5	SSW6	SSW8	SW7	SSW3	WSW2	NW8	NNW12	W3.7	NNW13		
30-Jan	NNW13	NNW13	NW12	NNW11	NW9	NW6	NNW3	W2	NW1	W2	NNW3	NNW3	NNW4	W4	NNW4	NNW3	W2	WSW1	WSW1	WSW1	NW1	NNW1	NNW4	SSE1	NW4.0	NNW13		
31-Jan	NE2	ENE3	ESE4	SE4	SE3	NE1	NE2	NNE3	N2	N2	NNE2	N2	NW3	NW4	NNW3	WSW2	SW1	NNW0	NW1	W1	S2	S2	SW1	W2	N0.3	SE4		

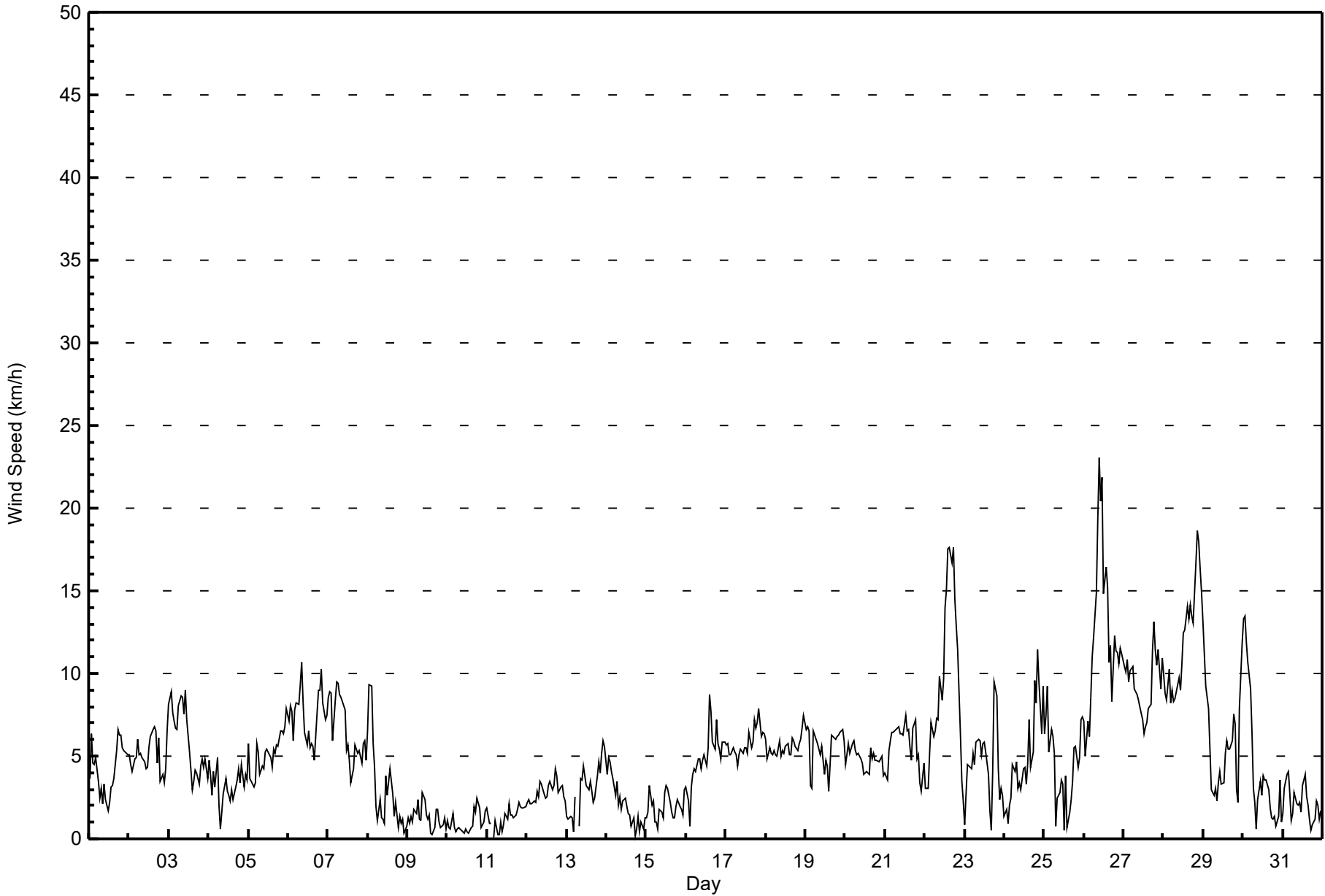
WSW1.9	SW2.1	SW2.0	SW2.1	SW2.2	SW2.6	SW2.3	SW2.4	SW2.2	SSW2.1	SSW2.1	SSW1.8	SSW2.2	SSW2.2	SSW1.9	SSW2.1	SSW2.3	SSW2.3	SSW2.4	SSW2.2	SSW1.8	SSW1.7	SSW1.7	SSW1.8	Diurnal Average
NNW13	NNW13	NW12	NNW11	N10	NNW11	NNW12	NW15	NW19	NNW23	NNW20	NNW22	NNW15	NNW16	NW18	NW18	NW17	NW18	NNW14	NNW13	NNW11	NNW11	NNW11	NNW15	Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Jackfish 1 - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 1 - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	473	63.75	63.75
6 - 11	231	31.13	94.88
12 - 19	35	4.72	99.60
20 - 28	3	0.40	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 742

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 1 - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	15	9	8	5	6	8	10	34	102	118	57	25	16	31	17	12	473
6 - 11	12	4	0	0	0	0	2	8	64	32	49	0	0	11	31	18	231
12 - 19	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18	15	35
20 - 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	14	8	5	6	8	12	42	166	150	106	25	16	43	66	48	742

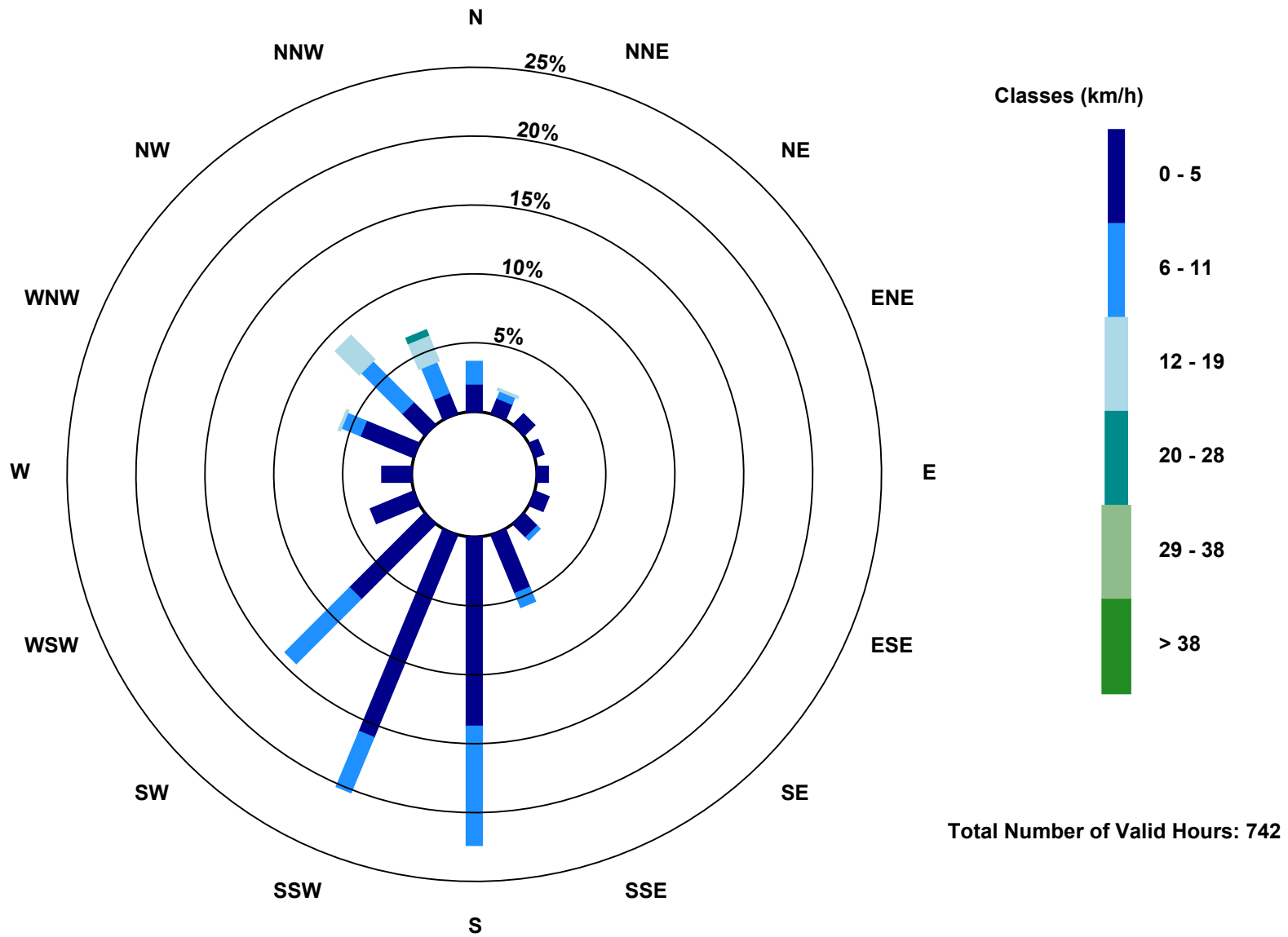
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Jackfish 1





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Jackfish 1 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Jan 26 10:00 Minimum Value: 0 km/h on Jan 11 05:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 4																	Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7									
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	2	
2-Jan	1	1	1	1	1	2	2	1	1	1	2	2	2	2	2	2	2	2	1	2	1	1	1	1	2	
3-Jan	2	2	2	2	2	2	2	2	2	2	3	2	2	1	1	1	2	2	2	2	1	1	1	1	3	
4-Jan	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	2	
5-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	2	
6-Jan	2	3	3	2	3	3	3	3	3	3	2	2	2	2	2	2	1	3	3	3	3	2	2	2	3	
7-Jan	2	2	2	2	3	3	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	2	1	3	
8-Jan	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	
9-Jan	1	1	1	1	1	2	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
10-Jan	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
11-Jan	1	1	1	UO	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
12-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	
13-Jan	1	1	1	1	1	1	UO	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	
14-Jan	1	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	2	
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16-Jan	1	1	1	1	1	1	1	2	2	1	1	2	2	2	3	2	2	2	3	2	2	2	2	2	3	
17-Jan	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	3	
18-Jan	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	
19-Jan	2	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	3	3	3	3	
20-Jan	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	
21-Jan	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	
22-Jan	2	2	1	2	1	2	2	2	2	2	2	3	4	3	4	5	4	4	4	3	3	2	2	1	5	
23-Jan	1	2	1	1	1	2	1	2	2	2	1	2	1	2	1	1	1	3	2	1	2	1	2	1	3	
24-Jan	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	
25-Jan	2	3	4	1	1	1	2	1	2	2	1	1	1	2	1	1	1	1	1	2	1	1	2	3	4	
26-Jan	3	2	3	2	3	3	3	3	4	6	5	6	4	4	3	3	4	2	3	3	3	3	4	3	6	
27-Jan	3	3	4	3	3	3	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	2	3	4	4	
28-Jan	2	2	2	3	1	2	2	2	2	2	3	3	3	3	4	3	4	3	3	4	4	4	4	3	4	
29-Jan	3	2	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	2	1	2	4	4	
30-Jan	3	3	3	3	2	2	1	1	1	1	2	1	2	2	2	1	1	1	1	1	1	1	2	1	3	
31-Jan	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
																	Diurnal Maximum									
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

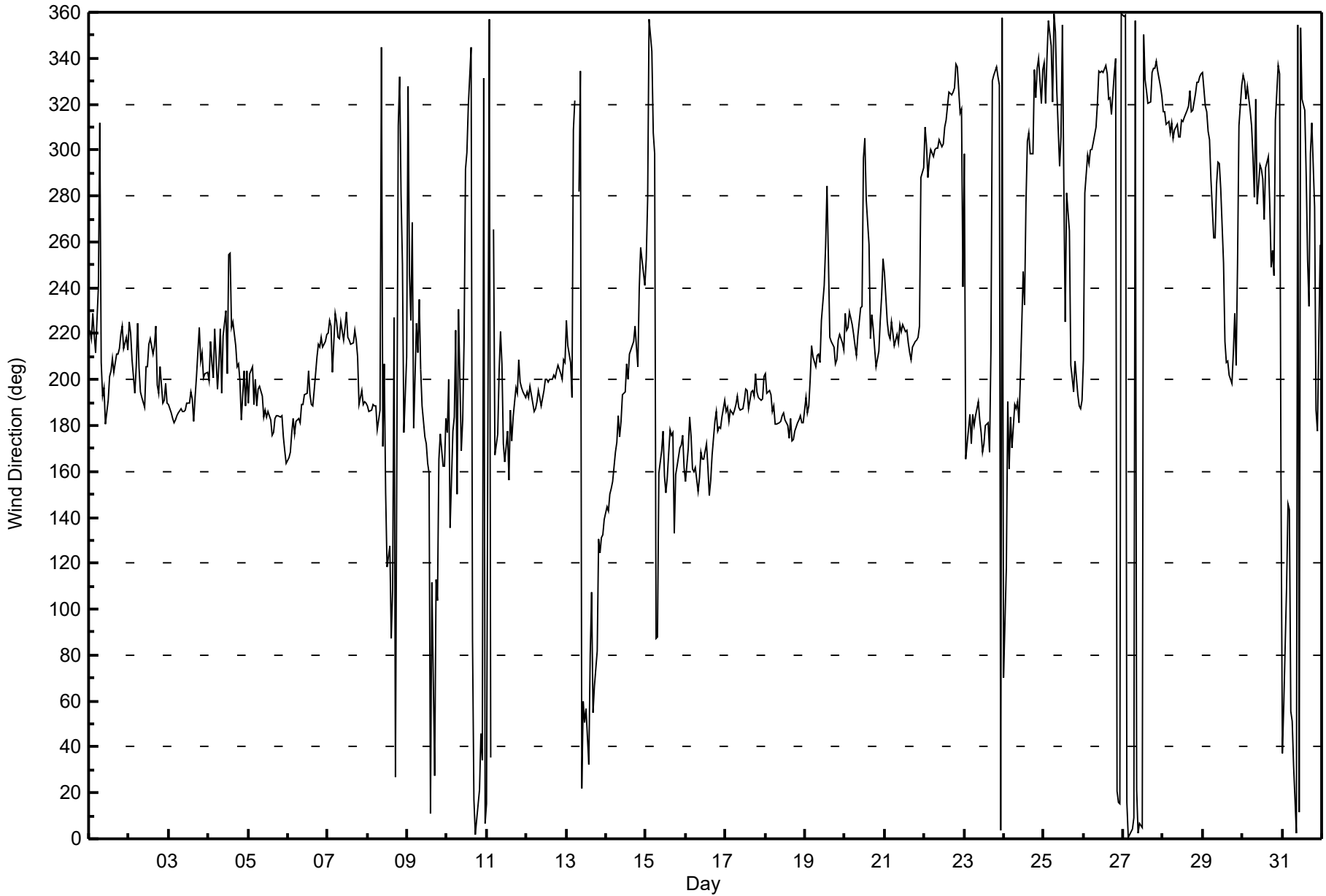
Wind Direction (WD) - deg
Jackfish 1 - January 2023

Direction of Maximum Speed: 334 deg on Jan 26 10:00 Direction of Maximum Daily Speed Average: 318.5 deg on Jan 28																							Hours in Service: 744		
Direction of Minimum Speed: 265 deg on Jan 11 05:00 Direction of Minimum Daily Speed Average: 0.3 deg on Jan 10																							Hours of Data: 742		
Monthly Average Direction: 239.7 deg																							Hours of Missing Data: 2		
																							Percent Operational Time: 99.7		
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	222	218	229	219	211	240	312	207	193	197	181	191	201	204	209	203	211	211	213	220	223	213	219	213	214.8
2-Jan	225	220	209	194	206	225	205	195	192	188	205	206	216	218	211	215	223	197	194	206	190	191	198	190	205.7
3-Jan	189	186	183	181	183	184	185	187	186	186	187	190	189	195	191	182	192	201	223	208	212	201	202	203	190.6
4-Jan	199	217	207	201	222	196	206	222	194	219	230	202	255	255	223	225	215	206	207	200	183	204	189	204	209.0
5-Jan	189	202	205	189	200	188	196	197	193	184	187	184	186	182	176	177	183	184	185	184	185	175	169	163	184.3
6-Jan	166	169	177	183	176	182	183	181	189	189	193	194	204	193	189	189	195	210	216	214	218	214	217	220	194.7
7-Jan	220	226	223	203	229	225	218	218	225	217	222	230	218	217	215	216	221	217	210	189	195	189	190	190	215.6
8-Jan	188	186	187	189	189	189	178	187	345	171	207	151	119	127	87	108	227	27	311	332	281	250	177	210	174.8
9-Jan	328	246	225	269	179	225	212	235	205	188	175	172	164	159	11	112	27	113	103	165	176	162	162	183	184.5
10-Jan	177	200	135	178	184	222	150	231	169	183	218	292	299	319	345	87	17	2	9	21	46	34	332	6	12.0
11-Jan	15	357	35	UO	265	167	176	204	221	207	172	164	178	156	187	173	183	197	194	209	199	196	195	192	186.3
12-Jan	194	192	197	193	186	187	191	195	192	189	195	200	200	199	200	200	202	201	204	206	202	200	209	207	197.9
13-Jan	226	215	208	192	309	322	UO	282	334	22	60	51	57	33	80	108	55	67	82	131	124	131	133	139	91.3
14-Jan	145	143	150	153	156	169	173	184	175	182	193	195	207	200	211	213	217	223	214	206	240	258	246	241	175.7
15-Jan	253	279	357	343	308	298	87	88	159	169	178	158	151	157	178	175	177	133	159	162	170	171	176	162	169.6
16-Jan	156	170	184	175	161	160	161	151	157	168	165	165	172	162	149	156	167	182	186	178	179	179	184	191	168.6
17-Jan	186	188	182	187	185	187	189	193	188	187	187	191	196	195	187	195	195	193	203	195	192	191	191	201	191.3
18-Jan	203	194	195	193	186	189	181	180	181	182	184	185	182	180	174	183	173	174	178	181	183	184	181	181	183.6
19-Jan	192	185	189	200	215	210	206	211	211	208	226	241	258	284	253	218	217	214	207	209	217	220	216	213	214.4
20-Jan	229	222	223	229	224	220	215	211	219	231	232	297	305	278	259	218	228	222	213	206	213	226	237	253	230.1
21-Jan	247	225	220	218	225	221	215	220	216	224	221	224	221	221	216	212	208	214	216	217	218	223	288	292	222.7
22-Jan	310	302	288	296	300	297	300	301	301	305	302	303	310	313	319	325	324	325	327	338	336	316	318	240	314.9
23-Jan	299	166	172	185	172	185	180	184	191	183	177	168	172	180	181	169	213	330	333	336	332	328	4	357	197.5
24-Jan	70	118	190	161	184	170	189	187	190	181	201	247	232	277	304	308	298	299	335	323	335	340	321	335	297.6
25-Jan	338	320	341	356	345	321	359	351	326	293	305	355	286	225	282	265	206	201	195	208	193	188	187	191	283.8
26-Jan	209	281	298	294	300	300	303	310	320	334	334	335	334	337	333	322	323	315	333	340	21	16	15	360	329.0
27-Jan	358	359	16	1	2	5	9	356	21	2	7	5	350	331	326	320	321	333	336	335	339	334	328	323	348.1
28-Jan	317	317	311	312	307	312	305	309	311	306	306	313	312	314	317	319	326	317	317	325	329	330	332	333	318.5
29-Jan	334	319	317	308	304	287	262	262	285	295	294	283	251	216	207	208	202	198	212	229	206	251	311	328	277.9
30-Jan	333	330	322	328	317	310	297	279	322	276	294	292	287	270	292	297	276	249	256	245	313	337	333	157	312.1
31-Jan	37	58	110	146	143	56	51	32	3	354	12	354	322	318	289	252	232	299	312	275	187	177	218	259	1.1
240.1 234.0 234.0 230.6 234.2 232.5 224.0 224.5 229.8 237.3 238.1 246.6 248.2 248.9 250.5 243.1 245.9 244.2 251.7 250.1 244.3 239.0 239.6 243.7 Diurnal Average																									
UO - Unstable Operation All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Jackfish 1 - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 1 - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 106 deg on Jan 15 08:00 Minimum Value: 6 deg on Jan 14 17:00 Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 17 Median = 24 Q ₃ = 38 P ₉₀ = 61 P ₉₉ = 89																			Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7						
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	68	21	36	32	32	61	78	53	35	39	66	73	66	39	44	33	22	19	20	17	17	19	21	19	78
2-Jan	20	20	18	16	19	24	23	17	18	16	28	32	32	25	27	30	26	35	15	56	25	18	20	15	56
3-Jan	15	13	11	11	13	13	13	14	14	13	19	26	26	39	27	12	13	37	32	16	16	19	25	29	39
4-Jan	25	27	34	19	21	21	31	30	36	31	24	33	48	49	40	37	24	20	24	36	22	28	20	18	49
5-Jan	10	20	39	19	13	8	11	12	14	13	13	12	14	13	12	12	9	11	11	14	11	12	12	12	39
6-Jan	16	17	23	19	19	20	21	18	21	21	23	25	31	29	24	19	19	24	21	19	17	22	25	23	31
7-Jan	16	21	17	23	27	19	17	17	19	16	18	22	23	25	26	13	13	12	14	14	11	11	11	9	27
8-Jan	11	11	11	13	15	55	77	35	57	72	70	16	33	19	24	27	61	34	73	22	82	40	81	55	82
9-Jan	66	21	44	36	23	26	39	19	49	11	15	28	23	23	80	69	60	32	37	32	54	50	15	76	80
10-Jan	14	53	74	27	59	77	73	74	45	62	69	55	69	91	95	75	47	52	33	44	80	80	54	44	95
11-Jan	45	77	89	UO	53	16	67	45	15	21	28	24	24	26	26	23	19	22	22	23	25	23	23	24	89
12-Jan	26	28	23	21	27	25	25	28	25	25	29	31	27	26	26	26	26	29	30	22	23	20	19	21	31
13-Jan	37	31	19	53	55	38	UO	55	20	45	46	52	55	59	45	50	71	61	46	24	31	21	18	19	71
14-Jan	21	19	21	17	26	25	19	14	13	17	19	21	17	18	14	8	6	44	41	14	47	22	18	23	47
15-Jan	27	45	45	65	43	68	95	106	30	21	22	24	28	28	19	17	12	38	30	20	16	18	14	17	106
16-Jan	17	20	13	12	16	15	19	22	22	22	18	22	22	20	17	16	18	23	27	27	30	25	27	29	30
17-Jan	25	27	25	25	22	25	24	27	26	24	27	24	27	27	22	26	28	26	32	27	25	26	26	31	32
18-Jan	29	32	30	28	28	28	32	29	29	33	30	32	31	24	22	22	19	19	17	20	18	17	15	16	33
19-Jan	21	15	21	31	53	27	26	26	23	28	31	48	66	71	67	37	26	31	27	35	31	46	43	49	71
20-Jan	72	44	50	53	41	22	27	32	36	36	60	84	72	72	72	39	48	40	44	35	38	38	35	39	84
21-Jan	31	28	23	19	14	14	18	19	19	23	19	24	25	27	24	26	37	22	21	26	29	62	85	43	85
22-Jan	67	74	57	29	15	22	21	18	22	18	29	24	18	14	12	15	14	13	14	14	15	24	36	30	74
23-Jan	81	56	10	9	11	18	12	15	20	17	17	14	16	22	20	77	23	10	11	32	49	38	35	81	
24-Jan	73	38	53	18	15	13	21	23	26	21	52	54	51	70	43	18	27	27	16	16	12	12	14	15	73
25-Jan	19	18	19	19	19	17	30	84	71	59	31	53	99	51	105	44	22	15	17	24	21	19	18	23	105
26-Jan	38	61	32	46	32	25	20	14	13	16	13	15	15	15	13	14	14	13	15	16	24	26	27	24	61
27-Jan	23	24	24	25	23	24	25	22	25	25	24	24	26	16	15	14	15	11	12	12	12	12	18	15	26
28-Jan	12	13	13	12	13	14	16	15	15	16	20	14	14	13	15	14	14	12	13	13	12	12	12	12	20
29-Jan	12	12	12	11	14	28	49	49	75	68	56	71	65	43	32	26	21	27	28	52	74	52	15	13	75
30-Jan	12	13	15	16	15	11	35	36	100	55	53	55	58	63	70	62	72	43	52	47	83	71	41	40	100
31-Jan	53	23	20	20	71	48	61	43	51	63	57	80	48	35	59	50	69	86	89	57	37	45	55	19	89
	81	77	89	65	71	77	95	106	100	72	70	84	99	91	105	75	77	86	89	57	83	80	85	76	
	Diurnal Maximum																								
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS508
KIRBY NORTH
JANUARY 2023**

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

February 28, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS 508)
 JANUARY 2023

MONTHLY SUMMARY

Parameter	Hours of Data	Hours of Calibration	Hours without Data	Operational Time	Maximum 1-Hour Value	1-Hour Exceedances	Maximum 24-Hour Value	24-Hour Exceedances
SO2 (ppb) Average	706	38	38	100	11.7	0	2.8	0
H2S (ppb) Average	708	36	36	100	0.4	0	0.2	0
THC (ppm) Average	706	38	38	100	2.8	-	2.6	-
NO2 (ppb) Average	701	36	43	99.06	14.4	0	9.5	-
NO (ppb) Average	701	36	43	99.06	4.7	-	0.7	-
NOX (ppb) Average	701	36	43	99.06	15.6	-	10.2	-
Temperature 2 m (C) Average	744	0	0	100	3.7	-	-2.1	-
Relative Humidity (%) Average	744	0	0	100	97.2	-	93.8	-
Wind Speed 10 m (km/h) Average	725	0	19	97.45	29	-	20	-
Wind Direction 10 m (deg) Average	725	0	19	97.45	-	-	-	-

Note : Operational time includes periods of data collection and instrument calibration

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)
 JANUARY 2023

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	706	0.5	1	-	0	0	0.1	0.2	0.5	1.1	11.7
H2S (ppb) Average	708	0.13	0.1	-	0.1	0.1	0.1	0.1	0.2	0.2	0.4
THC (ppm) Average	706	2.45	0.1	-	2.1	2.3	2.4	2.4	2.5	2.6	2.8
NO2 (ppb) Average	701	3.15	2.2	-	0.1	0.7	1.7	2.7	4.2	5.8	14.4
NO (ppb) Average	701	0.33	0.5	-	0	0	0	0.1	0.4	0.8	4.7
NOX (ppb) Average	701	3.48	2.4	-	0.1	0.9	2	3	4.4	6.5	15.6
Temperature 2 m (C) Average	744	-9.7	5.7	-	-28.5	-18.4	-12.2	-9.2	-6	-2.9	3.7
Relative Humidity (%) Average	744	86.34	7.3	-	58.2	74.5	84.2	88.4	91.3	93.8	97.2
Wind Speed 10 m (km/h) Average	725	8.5	5	-	0	2	5	8	11	16	29
Wind Direction 10 m (deg) Average	725	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY NORTH (AMS508)
 JANUARY 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2	21 Jan 2023 10:00	21 Jan 2023 10:00	1	Maintenance - reinitiated daily QA check
NO2	22 Jan 2023 12:00	22 Jan 2023 17:00	6	Maintenance - sample pump replaced
Wind Speed, Wind Direction	09 Jan 2023 15:00	09 Jan 2023 16:00	2	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	09 Jan 2023 19:00	10 Jan 2023 03:00	9	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	10 Jan 2023 13:00	10 Jan 2023 13:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	11 Jan 2023 07:00	11 Jan 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	13 Jan 2023 07:00	13 Jan 2023 07:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	16 Jan 2023 01:00	16 Jan 2023 01:00	1	Flat line in sensor output signal - Sensor frozen
Wind Speed, Wind Direction	30 Jan 2023 22:00	31 Jan 2023 01:00	4	Flat line in sensor output signal - Sensor frozen

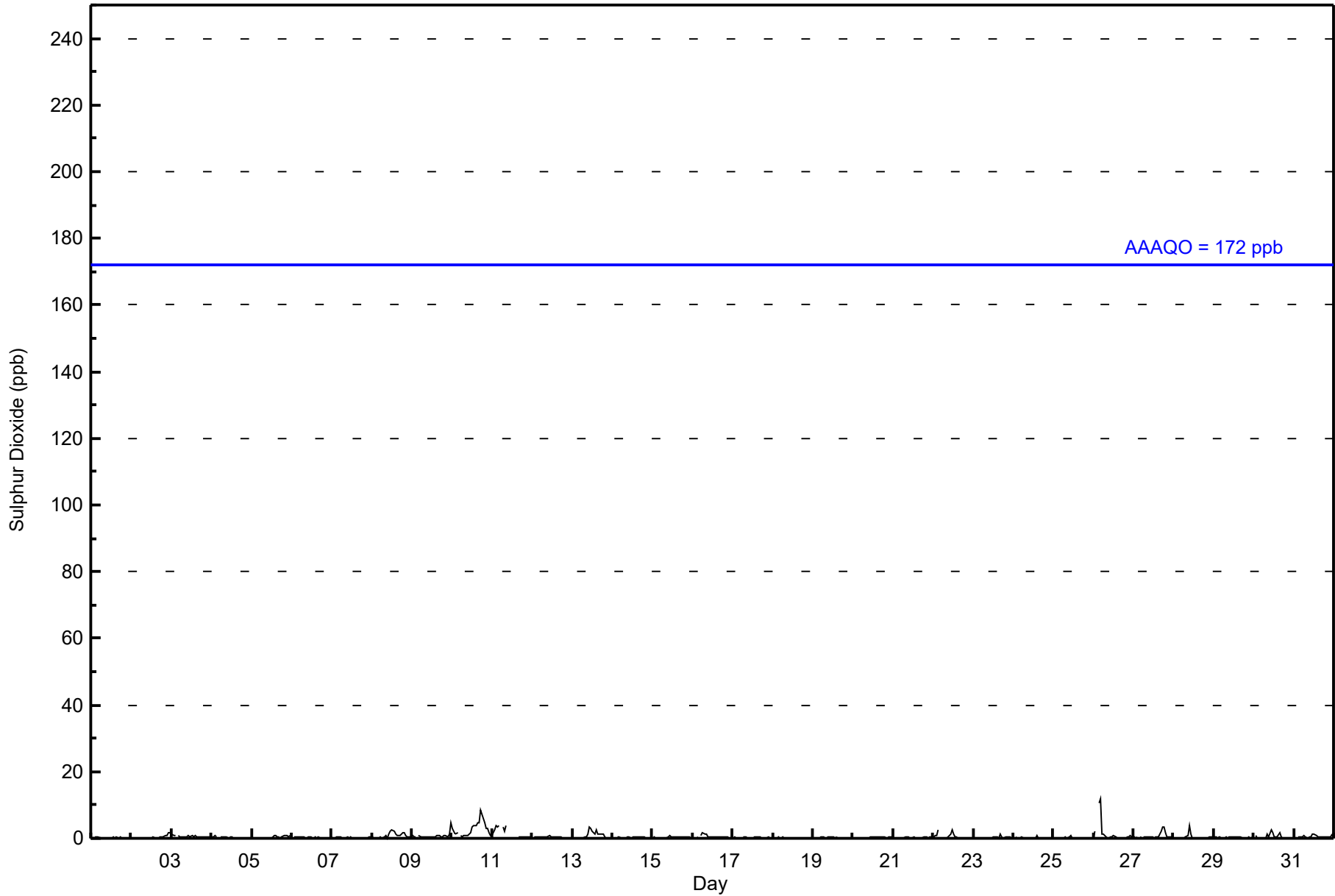


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																										
Maximum Value: 11.7 ppb on Jan 26 05:00		Maximum Daily Average: 2.8 ppb on Jan 10																			Hours of Data:	706																										
Minimum Value: 0.0 ppb on Jan 1 20:00		Minimum Daily Average: 0.1 ppb on Jan 18																			Hours of Missing Data:	38																										
Maximum Diurnal Average: 0.9 ppb at hour 4		Minimum Diurnal Average: 0.3 ppb at hour 6																			Hours of Calibration:	38																										
Monthly Average: 0.50 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 4.5																			Percent Operational Time:	100.0																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Jan	0.6	Z	0.6	0.6	0.4	0.2	0.0	0.2	0.1	0.1	0.0	0.1	0.1	0.3	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.6																						
2-Jan	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.3	0.3	1.0	0.9	1.7	1.6	0.3	1.7																						
3-Jan	1.2	0.9	1.0	Z	0.8	0.5	0.5	0.5	0.6	0.5	0.7	0.6	0.8	0.6	0.7	0.5	0.4	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.6	1.2																						
4-Jan	0.2	0.4	0.7	0.3	Z	0.5	0.5	0.4	0.3	0.3	0.1	0.3	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7																						
5-Jan	0.0	0.0	0.1	0.0	0.1	Z	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.7	0.7	0.4	0.3	0.1	0.4	0.7	0.8	0.9	0.5	0.7	0.3	0.9																						
6-Jan	Z	0.3	0.3	0.4	0.5	0.4	0.4	0.3	0.1	0.2	0.2	0.3	0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.5																						
7-Jan	0.3	Z	0.2	0.5	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.3	0.4	0.2	0.5																						
8-Jan	0.4	0.2	Z	0.2	0.2	0.2	0.2	0.4	1.1	0.2	1.4	2.1	2.5	2.2	1.1	1.0	0.7	0.7	1.6	1.7	0.7	0.4	0.5	0.5	0.9	2.5																						
9-Jan	0.8	0.6	0.5	Z	0.7	0.4	0.5	0.5	0.5	0.6	0.4	0.3	0.4	0.4	0.4	0.8	1.0	0.3	0.4	0.7	0.8	0.6	1.4	4.5	0.8	4.5																						
10-Jan	2.9	2.0	1.2	1.6	Z	0.8	0.5	0.8	0.8	1.0	1.1	1.6	3.2	3.9	3.9	4.8	4.9	8.7	7.1	4.8	2.8	3.0	1.7	0.8	2.8	8.7																						
11-Jan	0.7	2.7	3.9	3.6	4.0	Z	3.5	2.3	3.7	C	C	C	C	C	C	C	0.4	0.4	0.4	0.6	0.6	0.6	0.5	0.2	--	4.0																						
12-Jan	Z	0.2	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.7	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.7																						
13-Jan	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.3	1.2	3.3	3.1	2.3	1.5	2.5	1.3	1.3	1.3	1.1	0.3	0.2	0.1	0.1	0.1	0.9	3.3																						
14-Jan	0.0	0.0	Z	0.4	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.3	0.2	0.1	0.1	0.3	0.2	0.4																						
15-Jan	0.2	0.4	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.6	0.7	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.3	0.3	0.2	0.2	0.1	0.3	0.7																						
16-Jan	0.1	0.1	0.2	0.4	Z	0.6	1.7	1.3	1.2	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.4	0.5	0.3	0.2	0.2	0.1	0.5	1.7																						
17-Jan	0.1	0.2	0.1	0.1	0.1	Z	0.3	0.3	0.4	0.2	0.0	0.1	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.4																						
18-Jan	Z	0.1	0.2	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.1	0.3																						
19-Jan	0.0	Z	0.1	0.1	0.2	0.3	0.3	0.1	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3																						
20-Jan	0.2	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3																						
21-Jan	0.2	0.2	0.1	Z	0.0	0.1	0.2	0.3	0.4	0.3	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.4	0.6	0.5	0.2	0.6	0.5	0.3	0.6																						
22-Jan	0.4	0.8	0.9	2.7	Z	0.2	0.2	0.1	0.2	0.6	1.4	2.6	1.1	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	2.7																						
23-Jan	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.2	1.1	0.2	0.2	0.3	0.2	0.3	0.2	0.2	1.1	1.1																						
24-Jan	Z	0.3	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.8	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8																						
25-Jan	0.1	Z	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.3	0.9	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.9																						
26-Jan	0.1	2.0	Z	10.5	11.7	1.2	1.1	0.2	0.1	0.1	0.2	0.5	0.7	0.6	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.4	0.9	0.3	1.4	11.7																						
27-Jan	0.4	0.2	0.2	Z	0.2	0.2	0.3	0.4	0.3	0.2	0.5	0.2	0.1	0.2	0.3	0.6	2.2	3.3	3.2	1.7	0.6	0.3	0.3	0.2	0.7	3.3																						
28-Jan	0.1	0.0	0.0	0.0	Z	0.0	0.1	0.5	0.8	3.8	1.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.2	0.3	3.8																						
29-Jan	0.3	0.2	0.2	0.3	0.3	Z	0.2	0.2	0.2	0.3	0.2	0.4	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.5	0.1	0.2	0.2	0.5																						
30-Jan	Z	0.7	0.1	0.0	0.1	0.1	0.1	0.1	1.3	0.2	2.6	1.8	0.4	0.4	0.2	1.8	0.6	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.5	2.6																						
31-Jan	0.1	Z	0.3	0.3	0.4	0.5	0.7	0.4	0.2	0.3	0.6	1.3	1.2	1.0	0.6	0.4	0.3	0.6	0.5	0.6	0.5	0.6	0.4	1.1	0.6	1.3																						
																								0.4	0.5	0.4	0.9	0.8	0.3	0.4	0.4	0.5	0.4	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4	Diurnal Average
																								2.9	2.7	3.9	10.5	11.7	1.2	3.5	2.3	3.7	3.8	3.3	3.1	3.2	3.9	3.9	4.8	4.9	8.7	7.1	4.8	2.8	3.0	1.7	4.5	Diurnal Maximum
Z - zerospan C - Calibration																																																
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 172 ppb 24-hr 48 ppb																																																



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Kirby North - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby North - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.86	99.86
11 - 20	1	0.14	100.00
21 - 60	0	0.00	100.00
61 - 110	0	0.00	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby North - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	11	21	29	17	7	9	11	34	133	220	58	22	9	22	40	43	686
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111 - 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	21	29	17	7	9	11	34	133	220	58	22	9	23	40	43	687

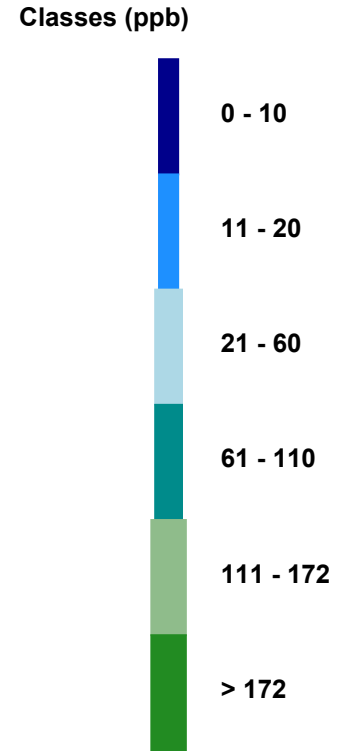
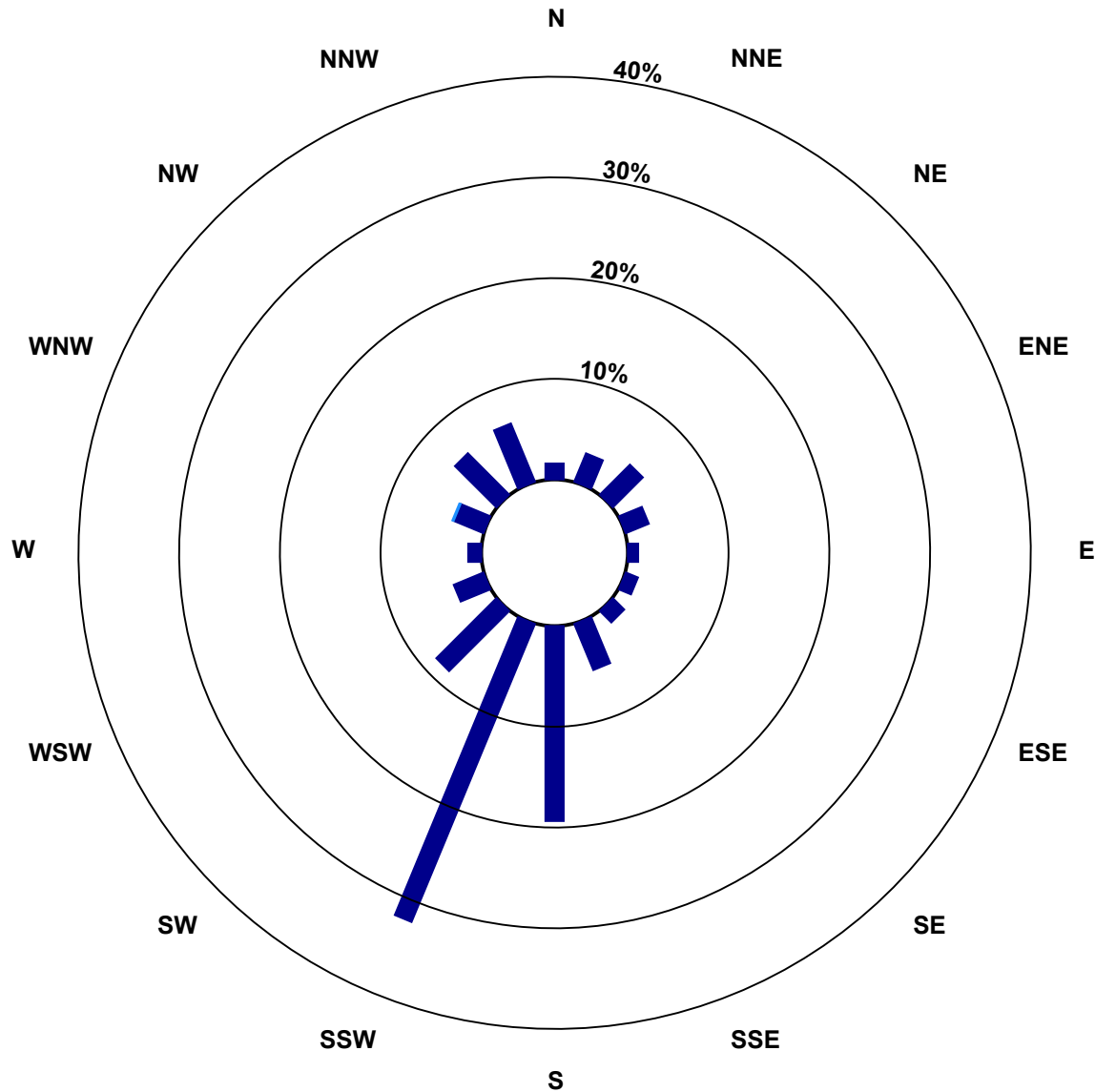
Total Number of Valid Hours: 687

Total Number of Hours: 744

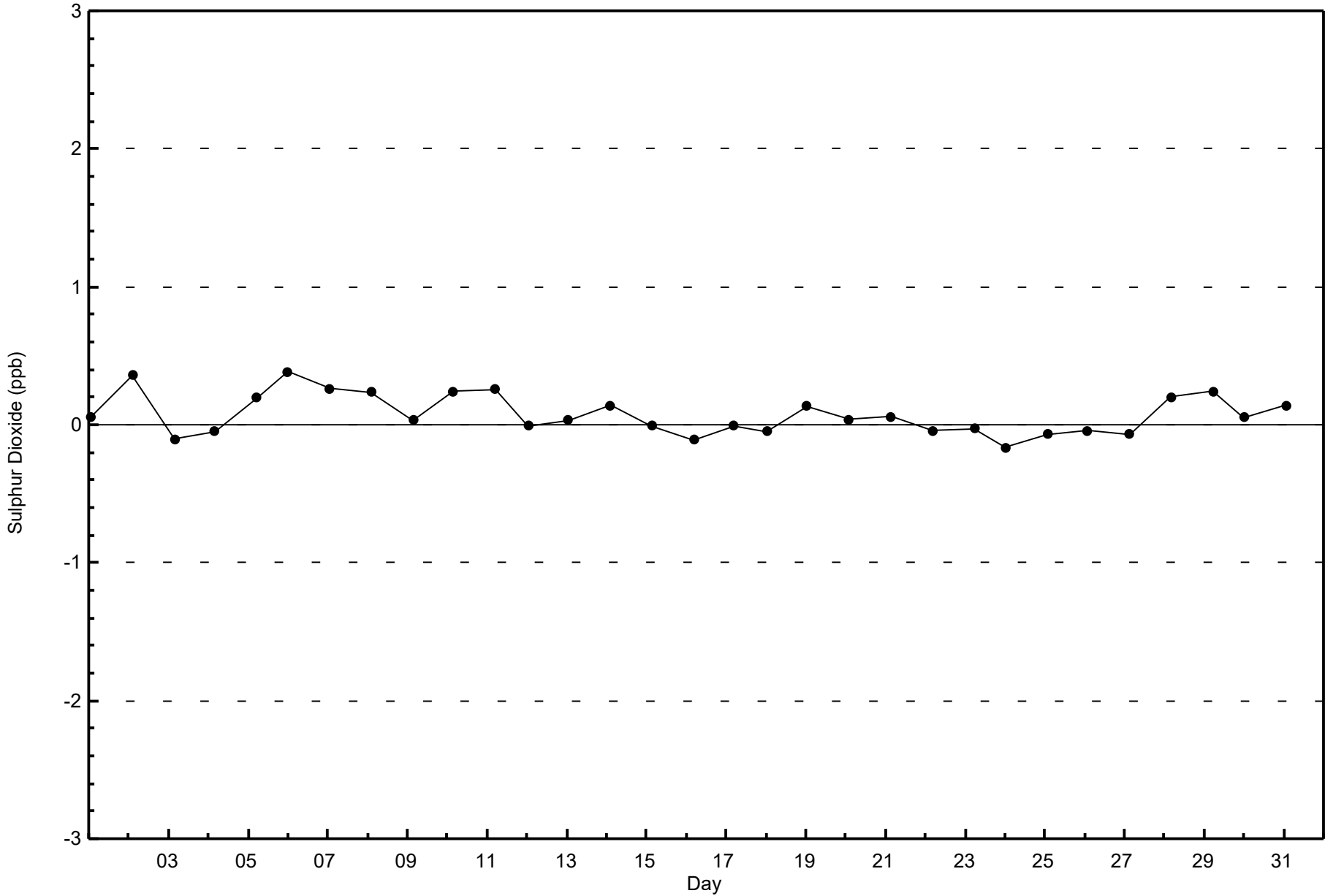


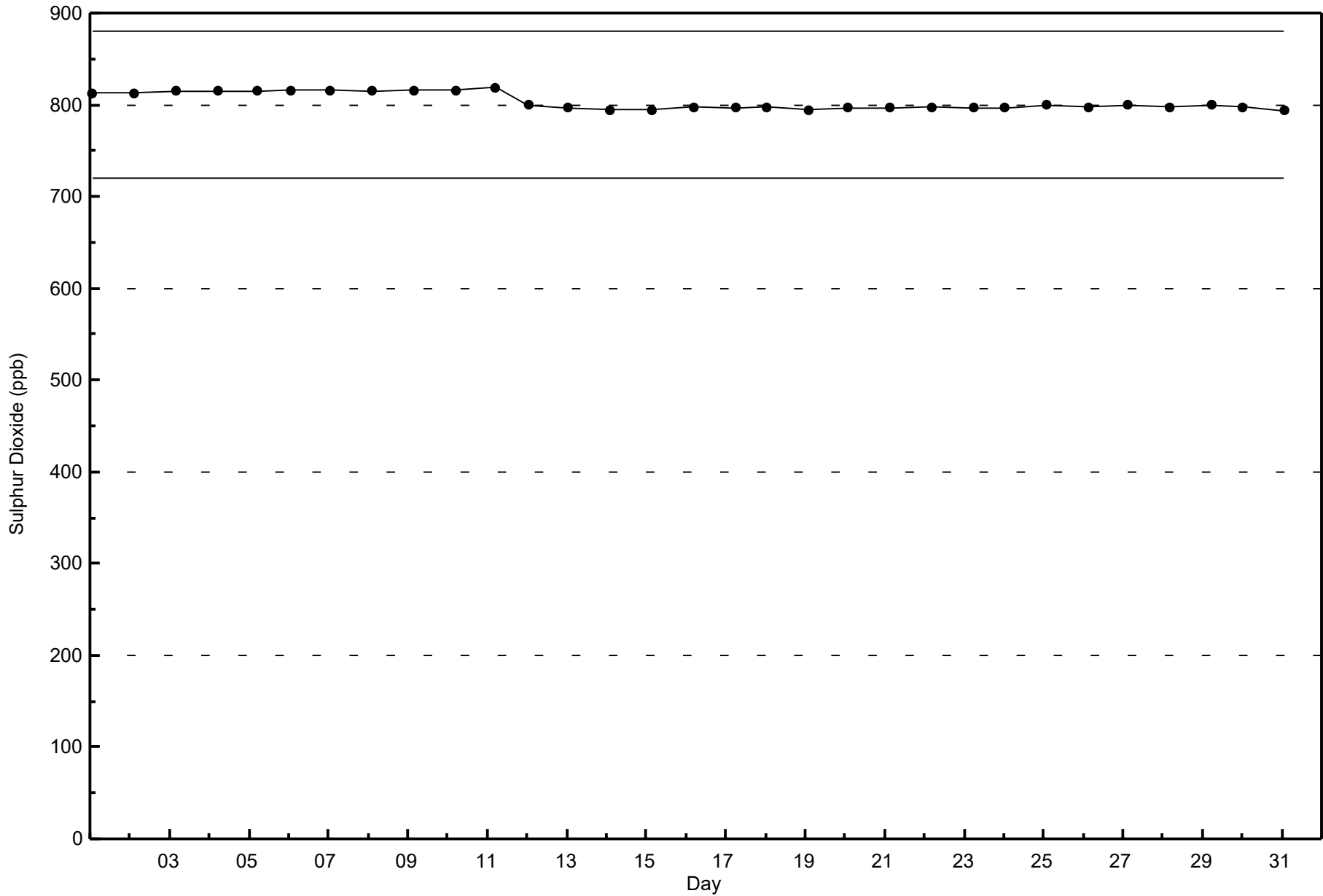
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Sulphur Dioxide (SO₂) - ppb
Kirby North



Total Number of Valid Hours: 687







Wood Buffalo Environmental Association
Summary of Hour Averages

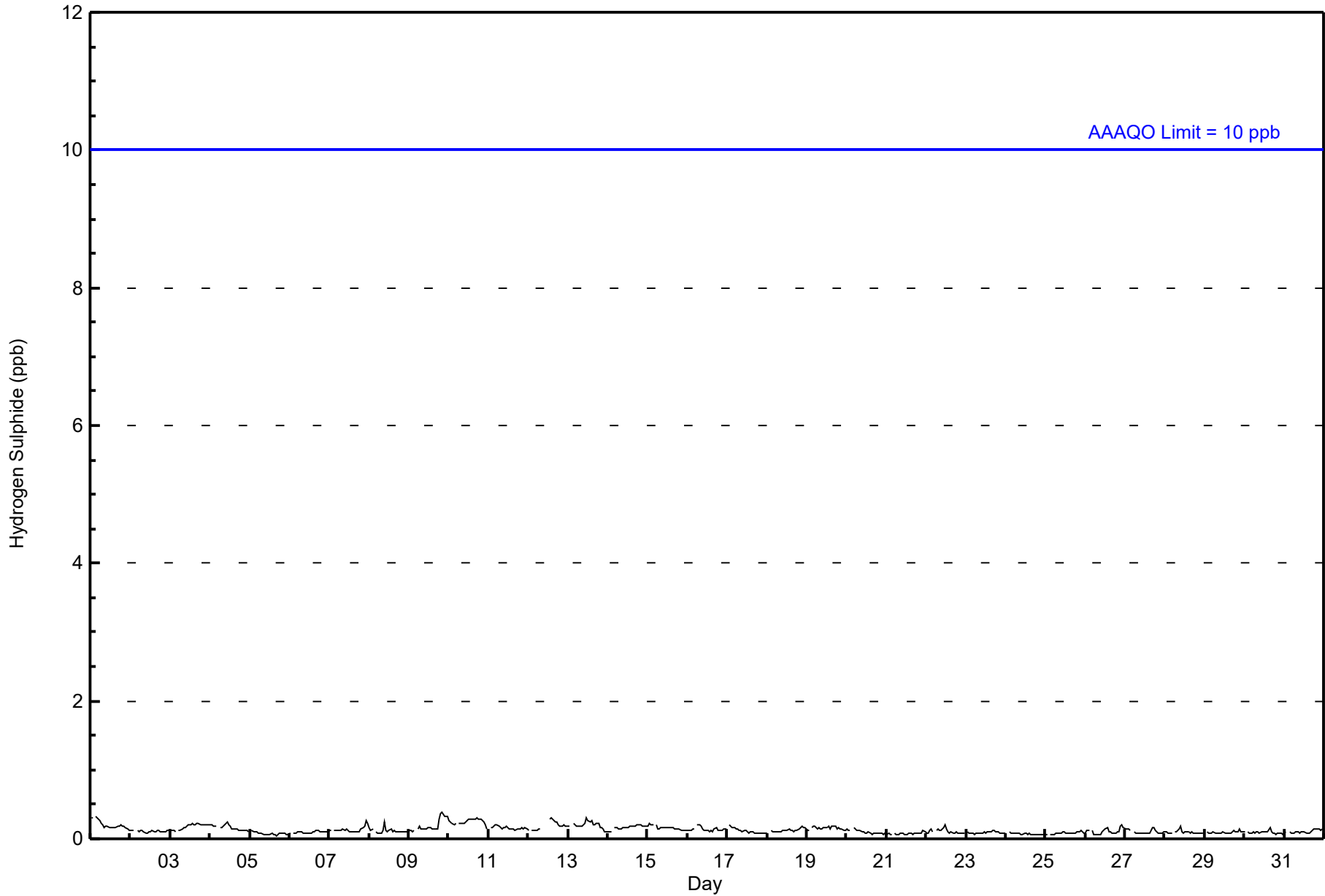
Hydrogen Sulphide (H₂S) - ppb
Kirby North - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 0.4 ppb on Jan 9 21:00 Maximum Daily Average: 0.2 ppb on Jan 10		Hours in Service: 744 Hours of Data: 708																								
Minimum Value: 0.1 ppb on Jan 5 17:00 Maximum Diurnal Average: 0.1 ppb at hour 2 Monthly Average: 0.13 ppb		Minimum Daily Average: 0.1 ppb on Jan 24 Minimum Diurnal Average: 0.1 ppb at hour 9 Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.2 P ₉₉ = 0.3																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.3	0.3	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	
2-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
3-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
4-Jan	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
5-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
6-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
7-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.3	
8-Jan	0.2	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
9-Jan	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.3	0.3	0.3	0.4	
10-Jan	0.3	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.3	
11-Jan	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	
12-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	C	C	C	C	C	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
13-Jan	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	
14-Jan	0.1	0.1	0.1	Z	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
15-Jan	0.2	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
16-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
17-Jan	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
18-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	
19-Jan	0.1	0.1	Z	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	
20-Jan	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
21-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
22-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
23-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
24-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
25-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
26-Jan	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	
27-Jan	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
28-Jan	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
29-Jan	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
30-Jan	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
31-Jan	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	
0.1																								Diurnal Average		
0.3																								Diurnal Maximum		
Z - zerospan C - Calibration																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Kirby North - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	100.00	100.00
3 - 4	0	0.00	100.00
5 - 7	0	0.00	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2	11	23	27	16	7	10	12	33	136	216	60	23	8	25	40	42	689
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 - 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	23	27	16	7	10	12	33	136	216	60	23	8	25	40	42	689

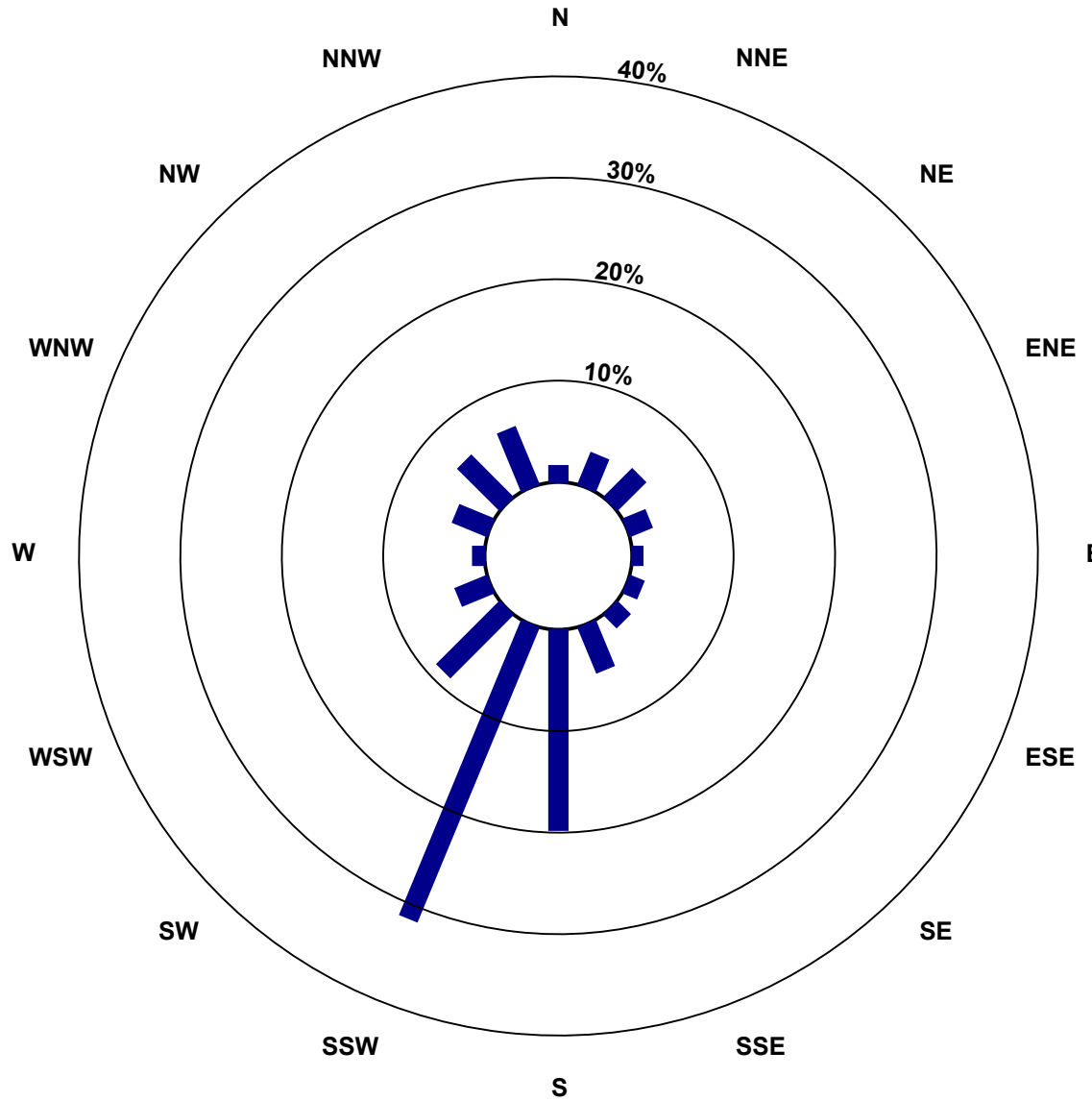
Total Number of Valid Hours: 689

Total Number of Hours: 744

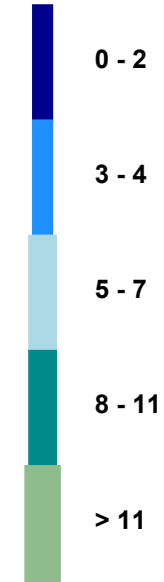


Wood Buffalo Environmental Association
Wind Rose Jan 2023

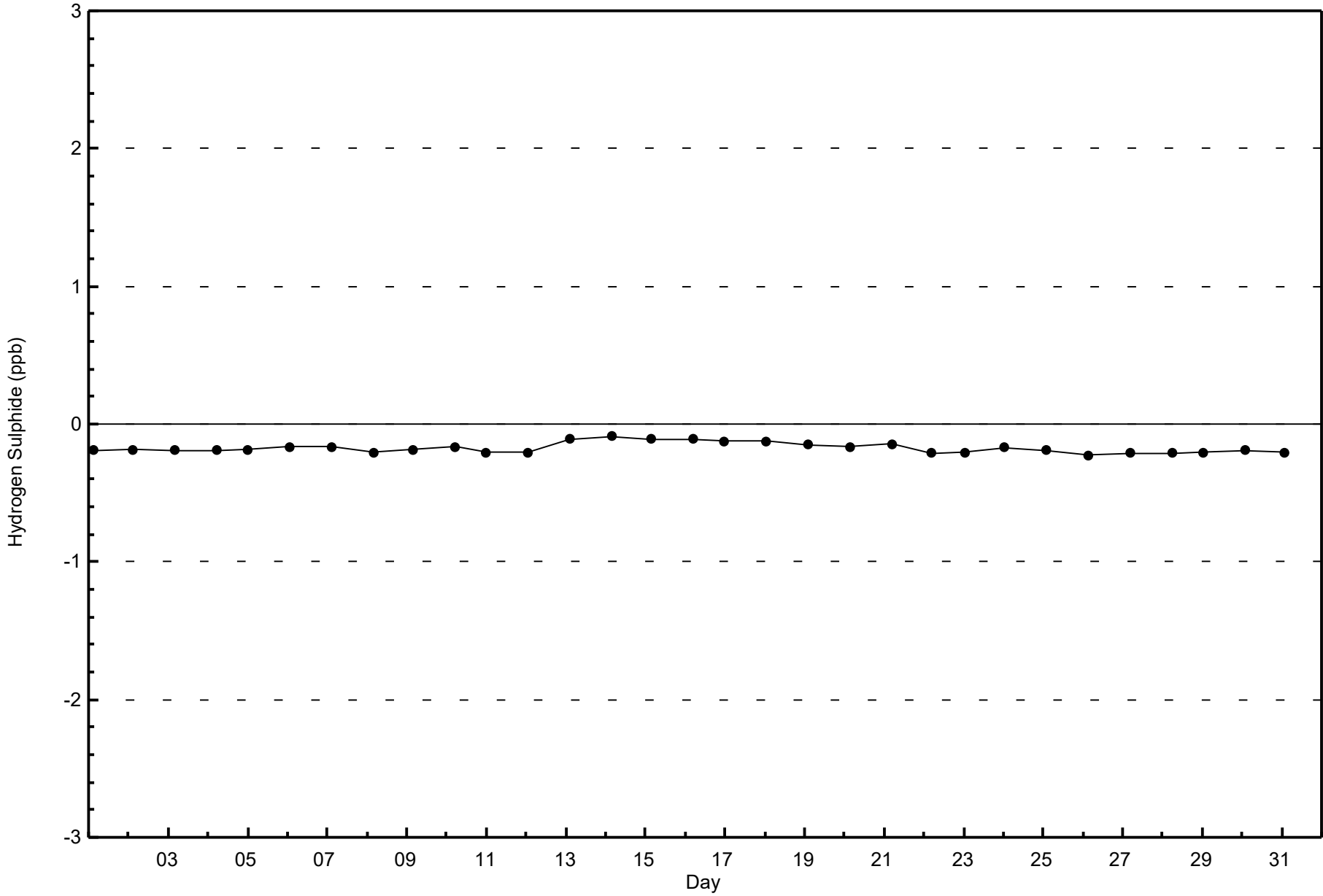
Hydrogen Sulphide (H₂S) - ppb
Kirby North

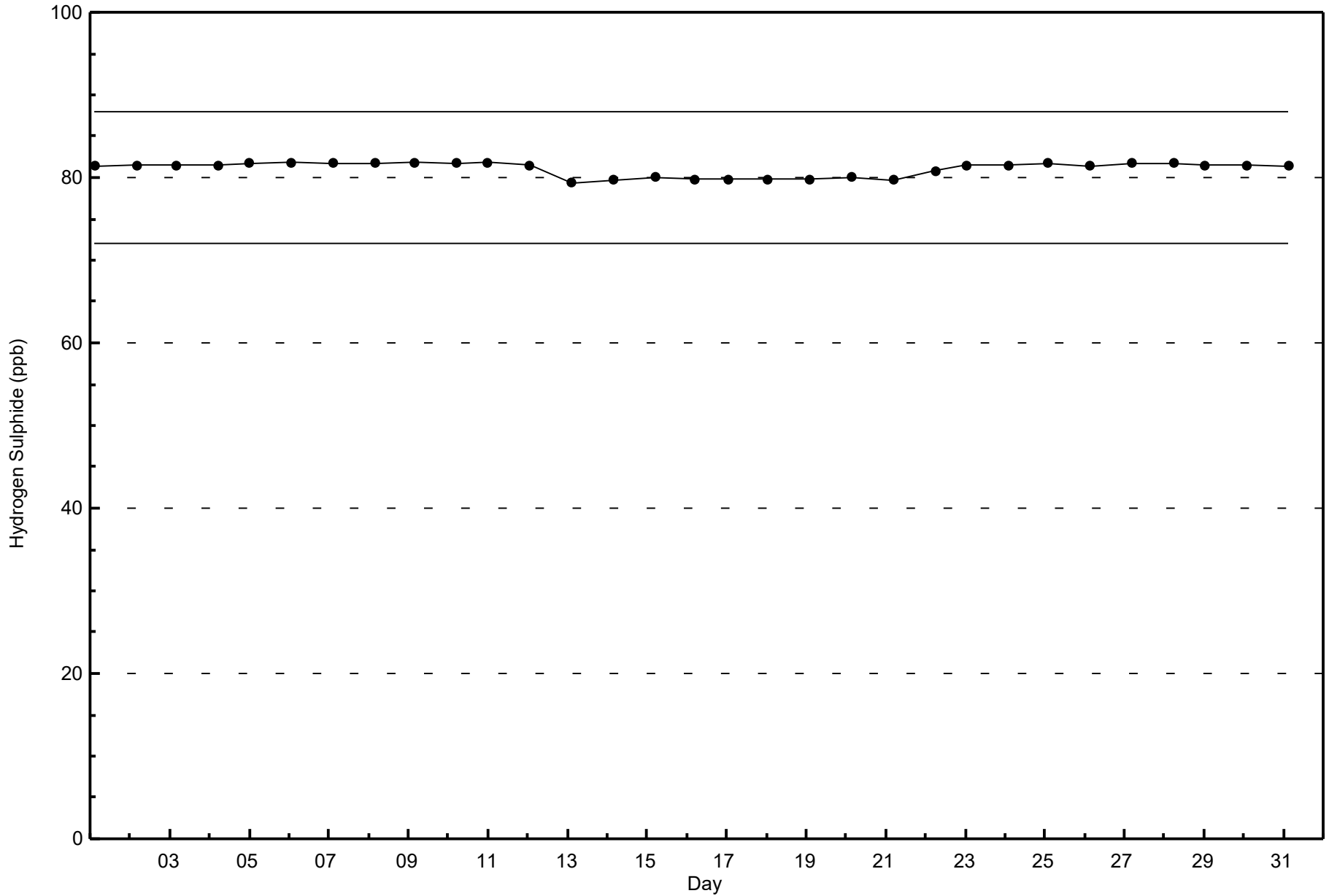


Classes (ppb)



Total Number of Valid Hours: 689

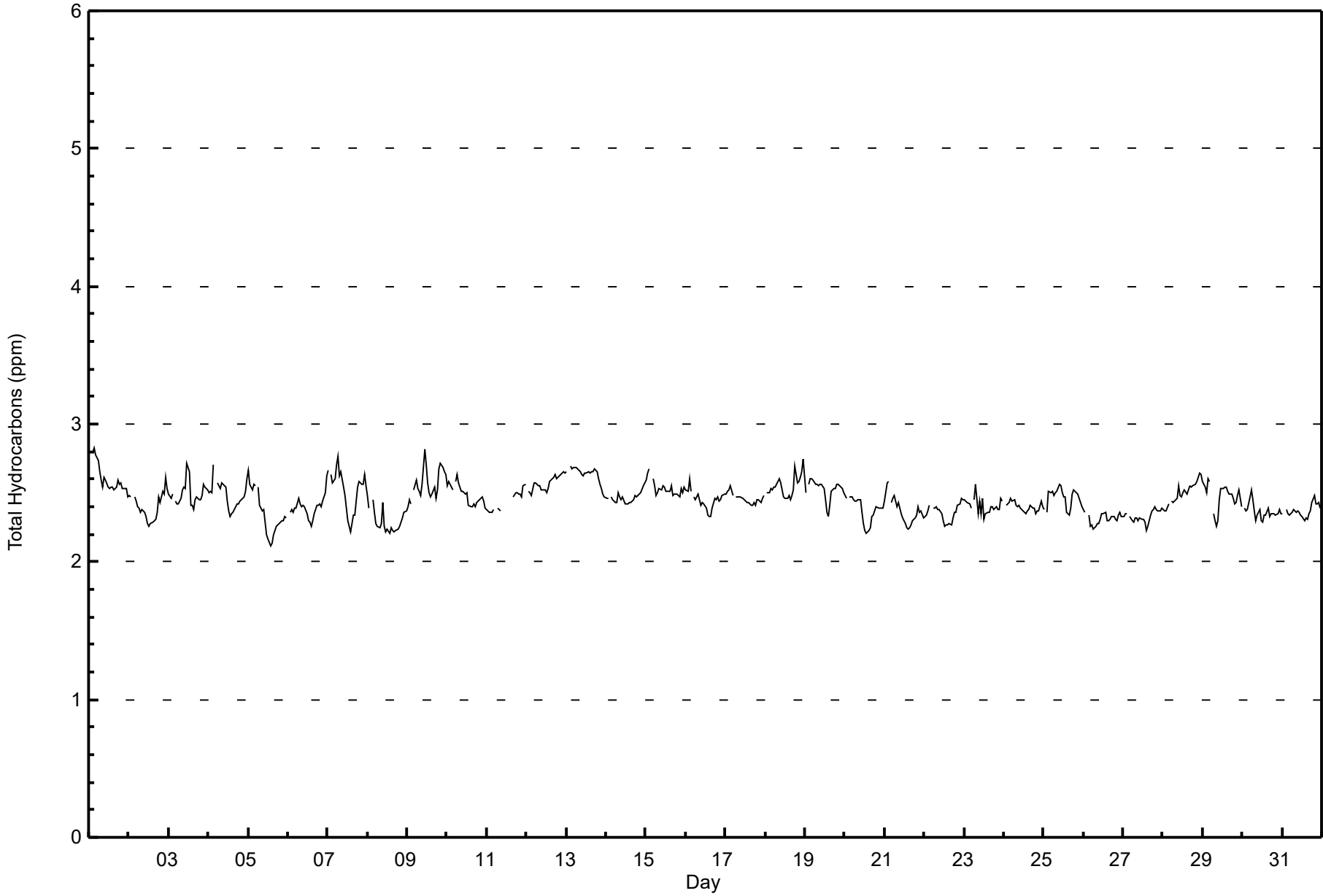






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Kirby North - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby North - January 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	706	100.00	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby North - January 2023

Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1 - 3.0	11	21	29	17	7	9	11	34	133	220	58	22	9	23	40	43	687
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	21	29	17	7	9	11	34	133	220	58	22	9	23	40	43	687

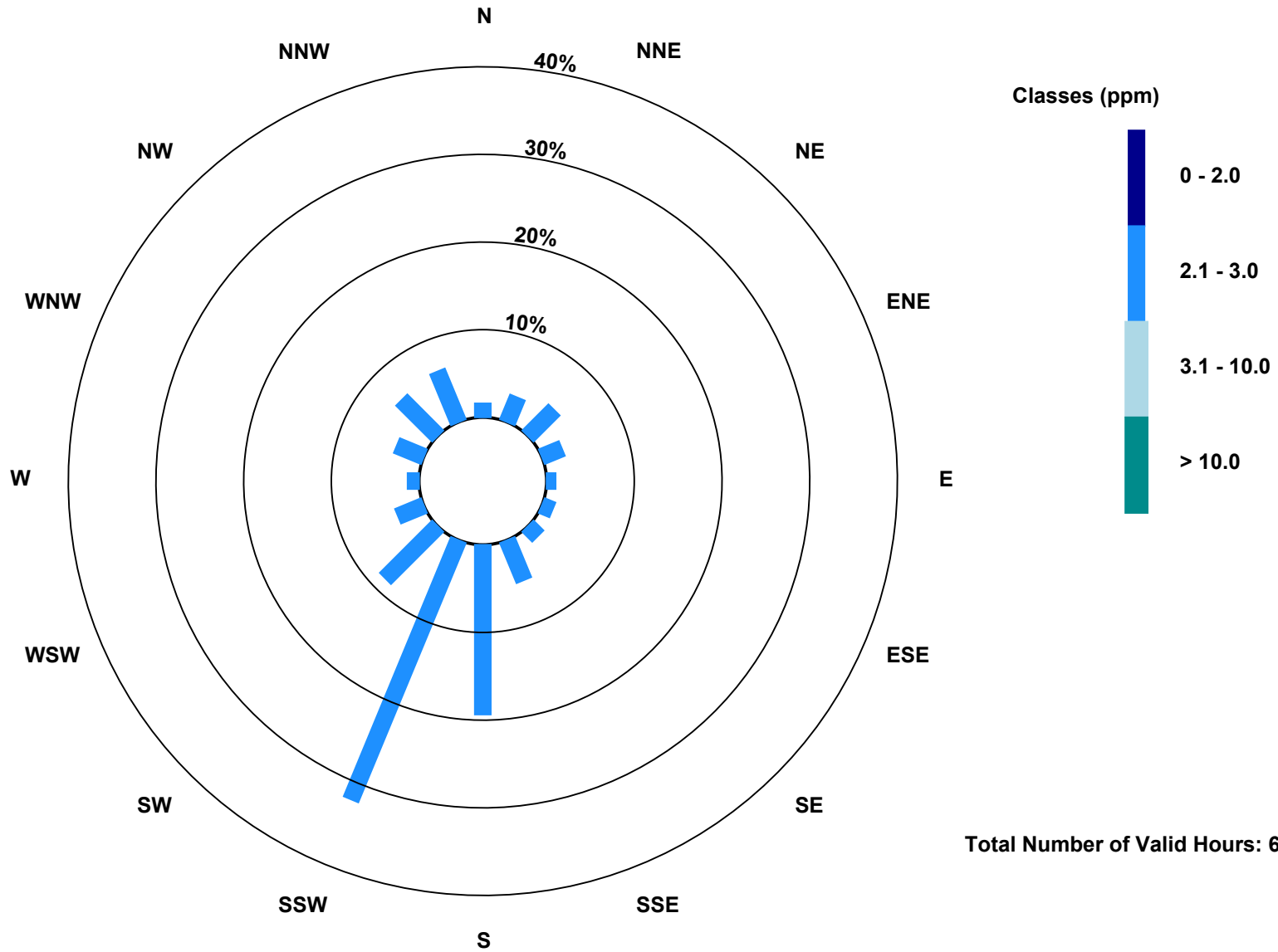
Total Number of Valid Hours: 687

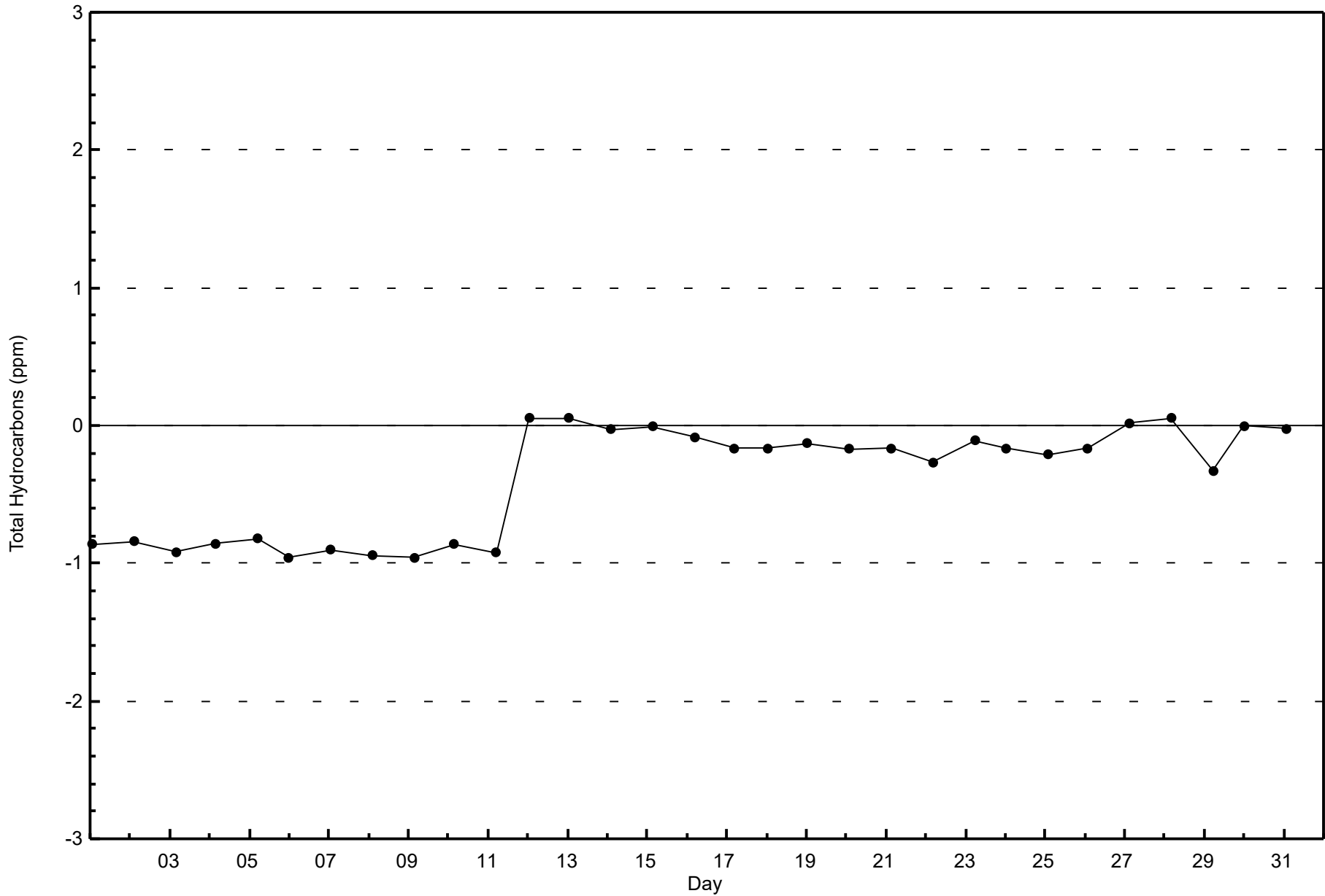
Total Number of Hours: 744

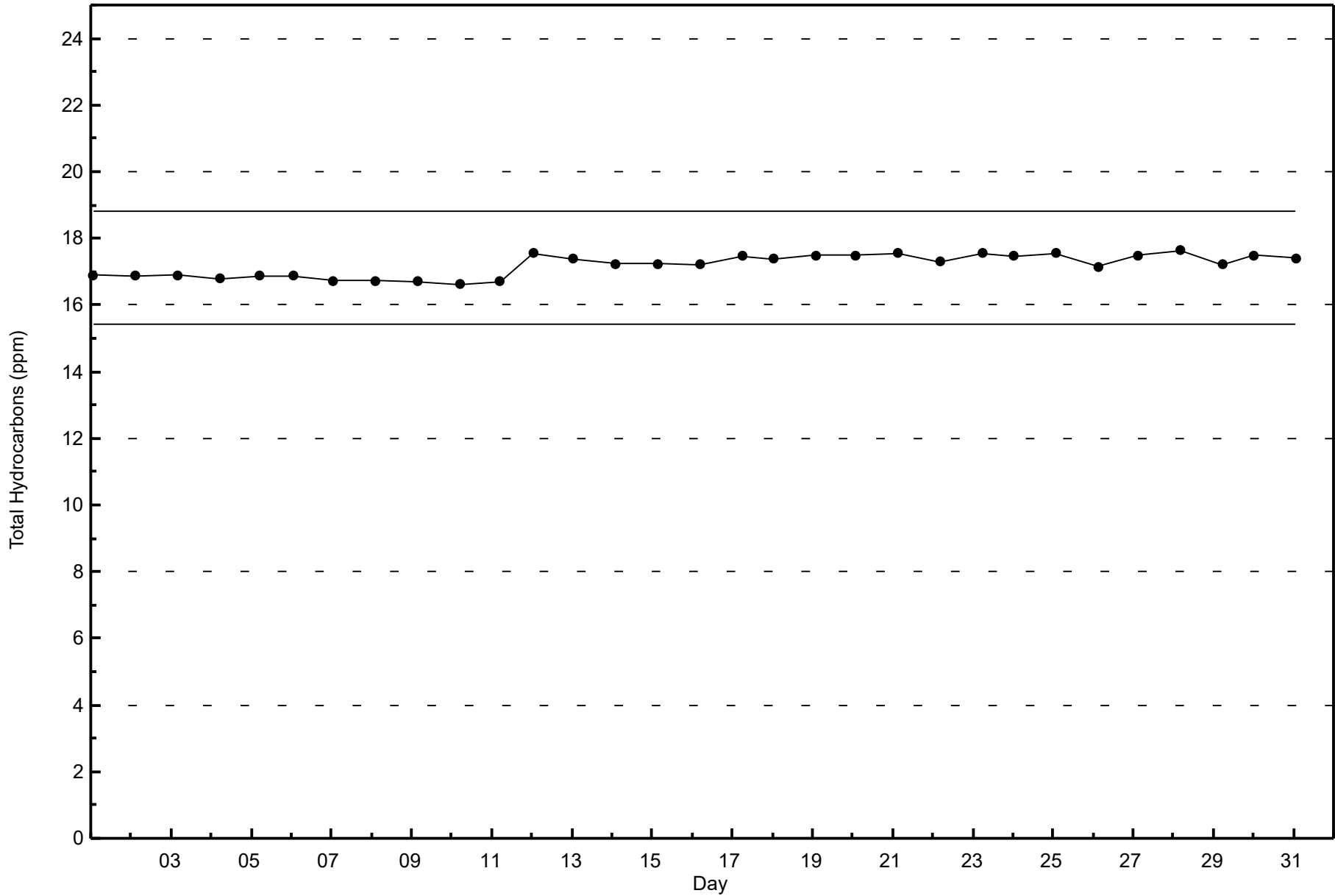


Wood Buffalo Environmental Association
Wind Rose Jan 2023

Total Hydrocarbons (THC) - ppm
Kirby North









Wood Buffalo Environmental Association
Summary of Hour Averages

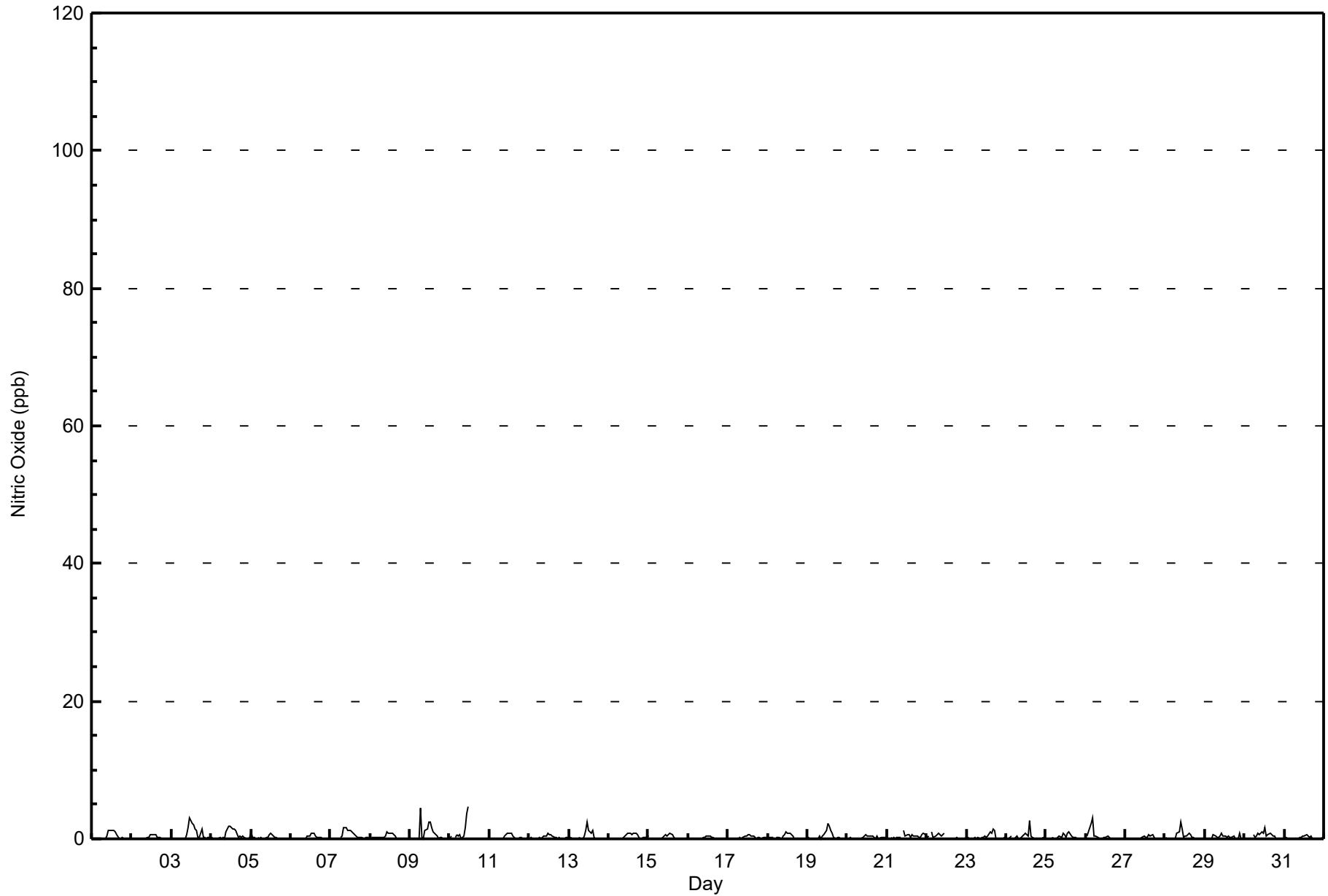
Nitric Oxide (NO) - ppb
Kirby North - January 2023

Maximum Value: 4.7 ppb on Jan 10 12:00		Maximum Daily Average: 0.7 ppb on Jan 9		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Jan 1 01:00		Minimum Daily Average: 0.1 ppb on Jan 16		Hours of Data: 701																						
Maximum Diurnal Average: 1.0 ppb at hour 12		Minimum Diurnal Average: 0.1 ppb at hour 21		Hours of Missing Data: 43																						
Monthly Average: 0.33 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.8 P ₉₉ = 2.4		Hours of Calibration: 36																						
				Percent Operational Time: 99.1																						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	1.2	1.3	1.2	1.3	1.1	0.6	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	1.3
2-Jan	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.5	0.7	0.7	0.6	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7
3-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.7	1.5	3.1	2.3	1.9	1.4	1.2	0.2	0.1	1.5	0.3	0.1	0.0	0.1	0.2	0.6	3.1
4-Jan	0.2	0.1	Z	0.1	0.1	0.2	0.1	0.2	0.1	0.9	1.8	1.9	1.6	1.4	1.4	1.2	0.2	0.4	0.2	0.4	0.1	0.1	0.1	0.2	0.6	1.9
5-Jan	1.0	0.1	0.1	Z	0.3	0.1	0.1	0.0	0.1	0.3	0.2	0.5	0.8	0.4	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	1.0
6-Jan	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.7	0.8	0.8	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.8
7-Jan	0.0	0.1	0.0	0.0	0.0	Z	0.2	0.4	1.6	1.6	1.2	1.3	1.3	1.0	0.8	0.5	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.5	1.6
8-Jan	Z	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.4	0.9	0.7	0.9	0.8	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9
9-Jan	0.0	Z	0.0	0.0	0.0	0.0	4.4	0.3	0.0	1.3	1.4	2.5	2.3	1.6	1.0	0.8	0.5	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.7	4.4
10-Jan	0.1	0.4	Z	0.1	0.7	0.4	0.6	0.1	0.4	1.7	3.6	4.7	C	C	C	C	C	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.7	4.7
11-Jan	0.0	0.0	0.1	Z	0.0	0.0	0.1	0.0	0.1	0.4	0.6	0.8	0.8	0.7	0.4	0.2	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.2	0.8
12-Jan	0.0	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.4	0.5	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.7
13-Jan	0.0	0.2	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.4	1.2	2.4	1.2	0.9	1.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4
14-Jan	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.9	0.8	0.9	0.6	0.8	0.8	0.7	0.3	0.0	0.0	0.3	0.2	0.3	0.3	0.9
15-Jan	0.4	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.4	0.6	0.7	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.7
16-Jan	0.0	0.1	Z	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.5	0.5	0.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
17-Jan	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.2	0.0	0.2	0.3	0.4	0.6	0.5	0.4	0.4	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.6
18-Jan	0.1	0.1	0.2	0.1	Z	0.1	0.2	0.1	0.1	0.3	0.6	1.0	0.9	0.8	0.7	0.4	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.3	1.0
19-Jan	0.1	0.0	0.0	0.1	0.0	Z	0.1	0.4	0.0	0.5	0.7	1.3	2.2	1.9	1.3	0.8	0.2	0.1	0.2	0.2	0.0	0.1	0.0	0.0	0.4	2.2
20-Jan	Z	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.4	0.7	0.5	0.4	0.3	0.4	0.2	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.7
21-Jan	0.1	Z	0.2	0.1	0.3	0.1	0.3	0.1	0.2	M	1.3	0.4	0.6	0.6	0.3	0.7	0.4	0.4	0.4	0.3	0.3	0.5	0.8	0.7	0.4	1.3
22-Jan	0.3	0.5	Z	1.0	0.2	0.4	0.5	0.9	0.7	0.5	0.9	M	M	M	M	M	M	0.1	0.1	0.1	0.0	0.0	0.0	0.1	--	1.0
23-Jan	0.1	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.1	0.2	0.2	0.5	0.3	0.5	1.0	0.7	1.5	1.2	0.0	0.0	0.0	0.0	0.1	0.1	0.3	1.5
24-Jan	0.0	0.0	0.1	0.3	Z	0.0	0.4	0.1	0.1	0.2	0.4	0.8	0.6	0.5	2.7	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.3	2.7
25-Jan	0.0	0.0	0.1	0.0	0.1	Z	0.0	0.2	0.4	0.2	0.8	0.5	0.3	0.9	1.0	0.4	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.2	1.0
26-Jan	Z	0.5	1.6	2.3	3.0	0.3	0.4	0.1	0.0	0.0	0.1	0.1	0.3	0.4	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.0
27-Jan	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.1	0.2	0.6	0.4	0.6	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.6
28-Jan	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.8	1.0	2.4	1.3	0.2	0.3	0.4	0.8	0.6	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.4	2.4
29-Jan	0.0	0.0	0.0	Z	0.0	0.7	0.4	0.2	0.3	0.4	0.8	0.4	0.5	0.3	0.3	0.2	0.2	0.4	0.0	0.0	0.0	0.8	0.0	0.1	0.3	0.8
30-Jan	0.1	0.0	0.1	0.0	Z	0.6	0.2	0.4	0.8	0.7	1.1	0.8	1.7	0.4	0.7	0.7	0.7	0.3	0.3	0.0	0.1	0.0	0.0	0.0	0.4	1.7
31-Jan	0.1	0.1	0.1	0.1	0.0	Z	0.1	0.1	0.0	0.2	0.3	0.4	0.4	0.6	0.5	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Kirby North - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Kirby North - January 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684

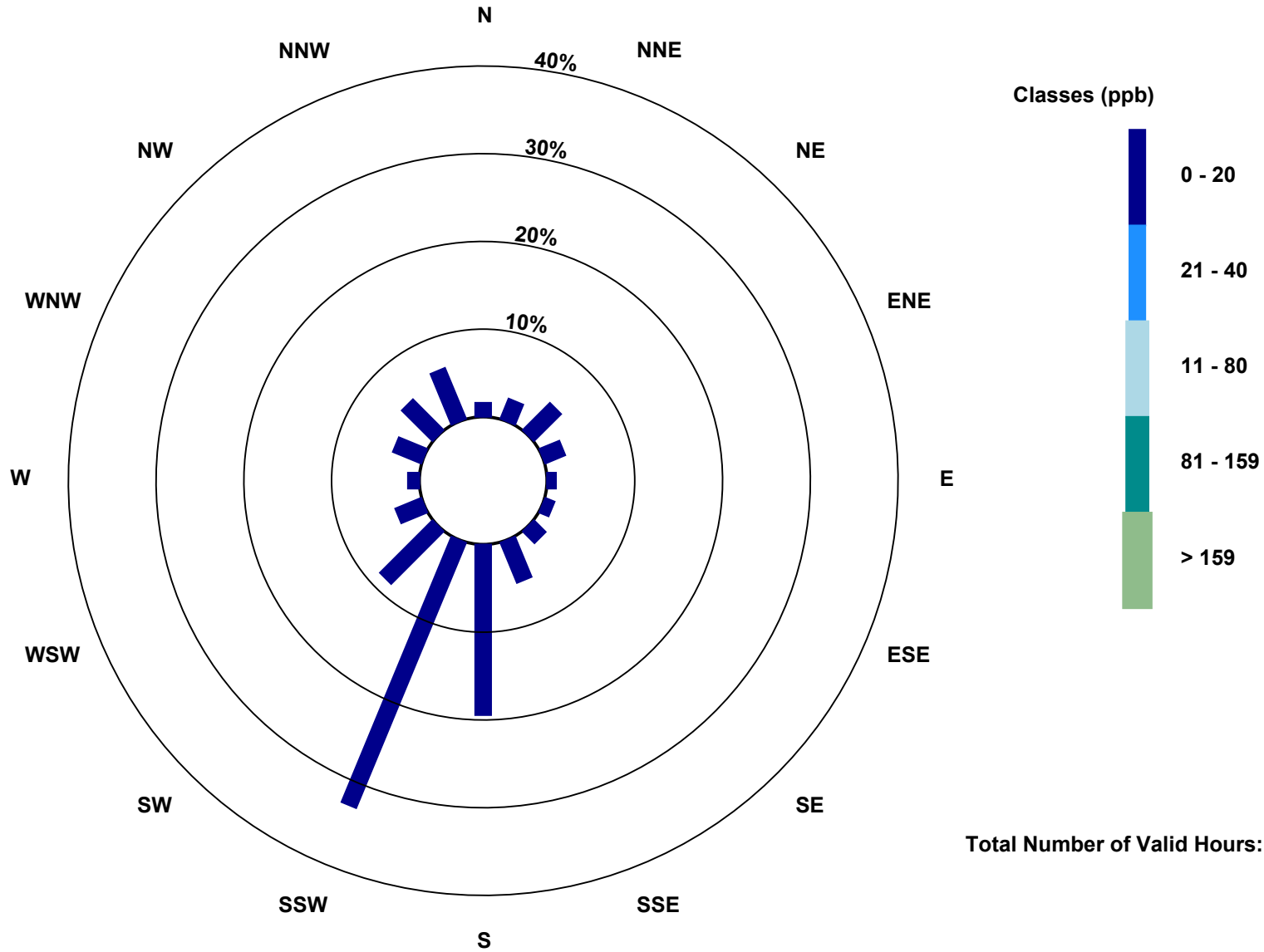
Total Number of Valid Hours: 684

Total Number of Hours: 744

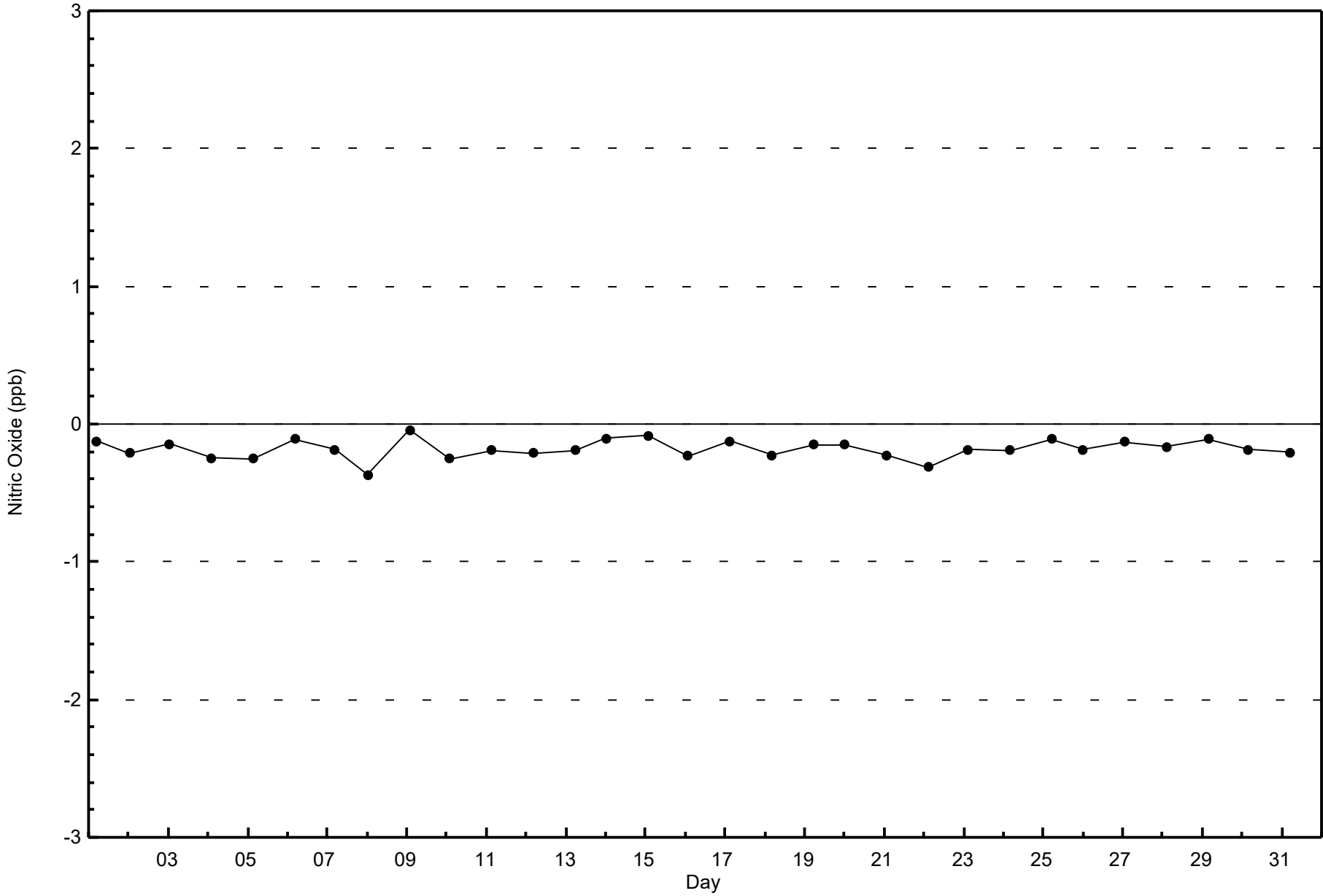


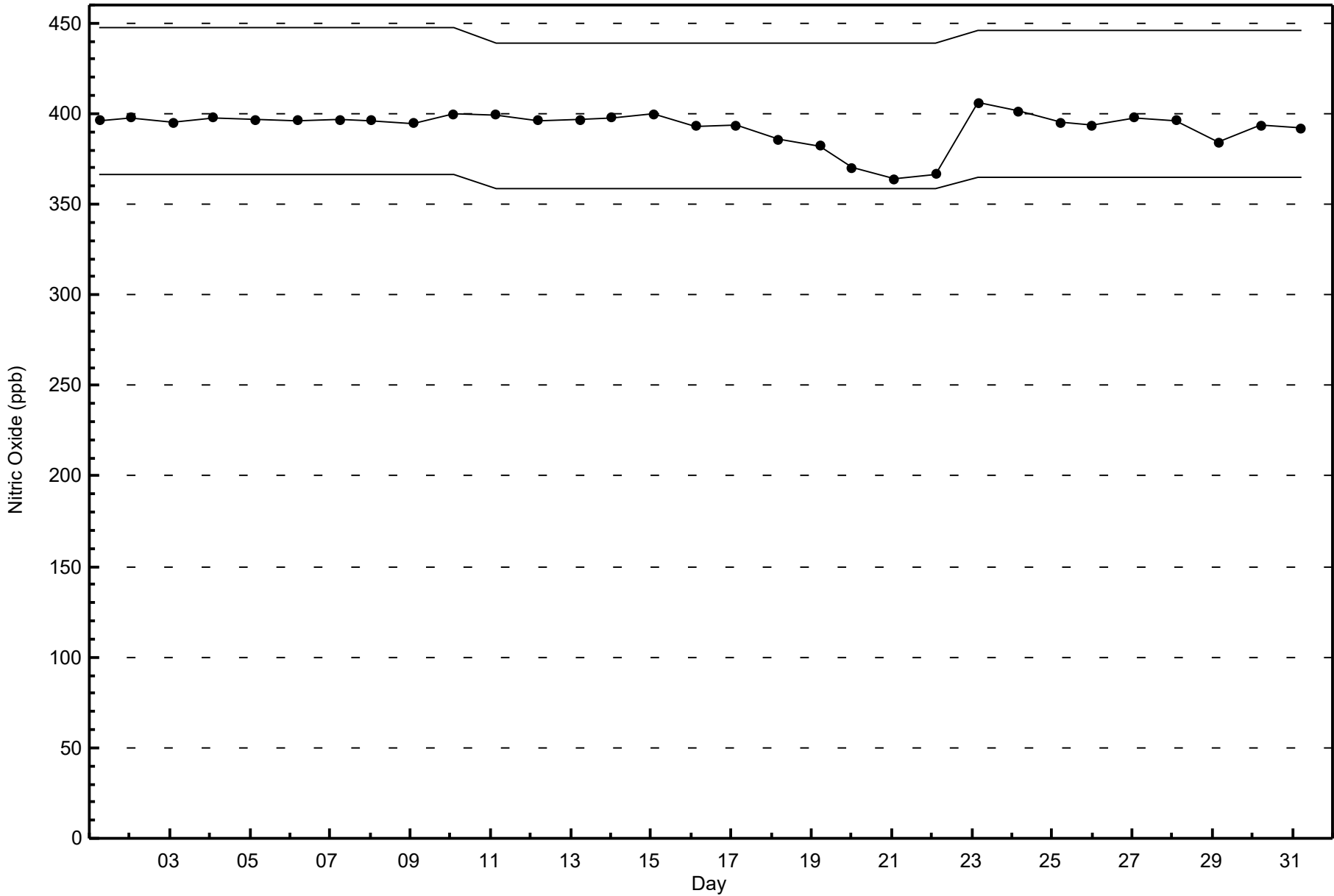
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitric Oxide (NO) - ppb
Kirby North



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

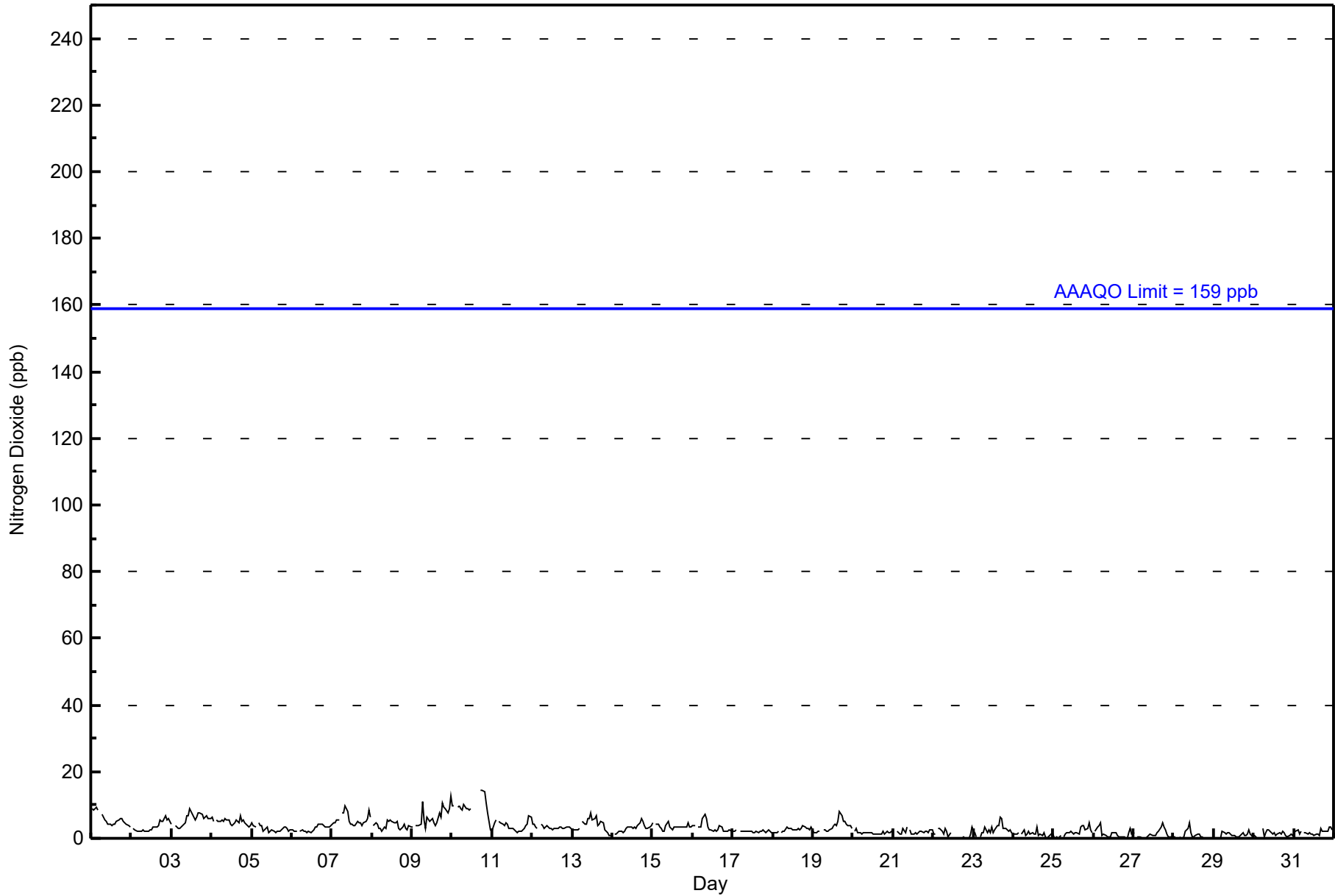
Kirby North - January 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 14.4 ppb on Jan 10 18:00		Maximum Daily Average: 9.5 ppb on Jan 10																	Hours of Data:	701																													
Minimum Value: 0.1 ppb on Jan 22 20:00		Minimum Daily Average: 0.8 ppb on Jan 28																	Hours of Missing Data:	43																													
Maximum Diurnal Average: 3.9 ppb at hour 18		Minimum Diurnal Average: 2.7 ppb at hour 13																	Hours of Calibration:	36																													
Monthly Average: 3.15 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 1.7 Median = 2.7 Q ₃ = 4.2 P ₉₀ = 5.8 P ₉₉ = 10.1																	Percent Operational Time:	99.1																													
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Jan	9.0	8.6	9.0	9.2	8.4	Z	7.1	6.5	5.5	5.1	4.4	4.3	4.0	4.1	4.4	4.9	5.6	5.8	5.8	5.1	4.7	4.2	3.9	3.5	5.8	9.2																							
2-Jan	Z	2.9	2.6	2.3	2.3	2.1	2.0	2.4	2.1	2.3	2.1	2.5	2.7	3.3	3.6	3.2	3.7	5.7	4.9	4.9	6.6	5.7	6.1	5.0	3.5	6.6																							
3-Jan	4.2	Z	4.0	3.3	2.9	2.9	3.4	4.2	4.8	6.7	6.7	8.7	7.2	6.3	5.6	6.3	7.7	7.5	7.1	5.9	6.3	6.9	5.8	6.0	5.7	8.7																							
4-Jan	6.3	5.1	Z	5.5	4.9	5.2	5.3	5.2	5.8	5.6	5.3	4.1	3.9	4.2	4.7	5.4	4.8	6.7	5.2	5.7	4.8	4.0	3.6	3.9	5.0	6.7																							
5-Jan	4.6	4.0	3.6	Z	4.7	4.0	3.7	2.1	3.1	3.3	1.7	2.0	2.6	2.0	1.6	2.0	2.1	2.0	2.6	3.3	3.6	2.9	2.2	2.6	2.9	4.7																							
6-Jan	2.6	2.3	2.2	2.2	Z	2.3	2.7	2.2	2.2	1.9	2.0	1.9	2.2	2.7	3.4	3.6	4.1	4.2	4.2	4.0	3.2	3.4	3.2	3.9	2.9	4.2																							
7-Jan	4.3	4.5	4.8	5.4	5.6	Z	7.6	7.8	9.7	8.0	5.0	4.4	4.3	3.7	3.8	5.2	4.7	4.6	3.8	4.8	5.0	5.8	8.4	6.2	5.5	9.7																							
8-Jan	Z	3.7	4.6	4.2	3.1	2.9	2.3	3.2	2.8	5.5	5.1	5.5	5.0	4.7	4.6	5.2	2.9	2.6	3.4	4.2	3.0	2.7	3.7	3.2	3.8	5.5																							
9-Jan	3.3	Z	3.9	3.8	3.8	4.4	11.2	5.6	3.0	6.3	4.9	5.5	5.8	4.8	3.8	4.5	7.5	6.3	10.4	9.4	9.1	7.7	8.8	12.8	6.4	12.8																							
10-Jan	9.9	9.9	Z	9.3	9.8	8.9	8.6	10.1	9.0	9.0	8.5	8.7	C	C	C	C	C	14.4	14.4	14.0	10.4	7.5	5.1	2.7	9.5	14.4																							
11-Jan	2.1	4.6	5.4	Z	5.0	4.5	4.2	3.8	4.6	4.2	2.9	2.8	2.8	2.6	2.2	1.9	2.3	2.3	2.4	3.1	3.9	4.4	6.8	6.2	3.7	6.8																							
12-Jan	4.2	4.2	3.6	3.1	Z	4.1	3.9	2.8	3.3	3.7	2.8	2.8	2.7	2.9	3.0	3.0	3.6	3.4	3.1	3.0	3.3	3.2	3.2	3.0	3.3	4.2																							
13-Jan	2.5	2.6	2.5	2.6	2.8	Z	4.9	4.3	4.3	6.1	6.1	7.5	5.7	5.8	6.8	3.9	4.3	5.1	4.7	2.4	2.3	1.5	1.0	0.9	3.9	7.5																							
14-Jan	Z	1.2	1.3	1.8	2.1	2.0	1.7	2.0	3.0	3.3	3.3	3.5	2.9	3.2	3.0	3.8	4.5	5.8	4.9	3.7	3.0	2.9	3.5	3.9	3.1	5.8																							
15-Jan	4.7	Z	4.4	4.2	3.2	2.8	2.2	2.2	3.8	5.0	3.5	2.8	2.7	3.2	3.6	3.5	3.3	3.3	3.2	3.6	3.6	4.5	3.5	3.5	3.5	5.0																							
16-Jan	3.8	3.8	Z	3.6	3.4	3.5	6.0	7.0	6.1	3.3	2.6	2.4	2.3	2.4	2.2	2.5	3.8	3.3	2.2	2.1	2.1	2.0	2.4	2.3	3.3	7.0																							
17-Jan	2.2	2.3	2.4	Z	2.1	2.1	2.2	2.3	2.2	2.3	2.3	2.0	1.7	1.9	2.0	1.8	2.0	2.0	2.4	2.0	1.9	2.4	2.0	1.9	2.1	2.4																							
18-Jan	1.8	1.9	1.9	2.0	Z	1.9	2.1	2.2	3.4	3.0	2.8	2.8	2.5	2.4	2.6	3.1	2.5	2.9	3.8	3.2	2.9	3.0	2.7	3.2	2.6	3.8																							
19-Jan	1.7	1.7	1.9	2.3	2.3	Z	2.5	2.4	2.2	2.3	2.5	3.0	4.0	4.3	3.8	5.1	7.9	6.9	5.0	5.1	4.2	4.0	3.9	3.0	3.6	7.9																							
20-Jan	Z	2.3	3.0	1.9	1.9	1.4	1.7	1.5	1.8	1.7	1.5	1.6	1.2	1.3	1.3	1.4	1.4	1.3	2.1	1.4	2.1	1.5	1.6	2.3	1.7	3.0																							
21-Jan	2.2	Z	2.2	1.9	1.4	1.4	3.0	1.8	3.4	M	2.7	1.2	1.4	1.5	1.4	1.9	2.0	2.1	1.9	2.0	2.3	1.9	2.4	2.4	2.0	3.4																							
22-Jan	1.4	1.2	Z	2.8	3.1	2.3	1.4	2.9	2.2	0.6	1.6	M	M	M	M	M	M	0.2	0.5	0.1	0.2	0.2	1.1	3.3	--	3.3																							
23-Jan	2.2	1.6	0.3	Z	0.4	1.6	1.5	3.3	1.8	2.7	1.7	3.2	1.7	2.5	3.9	4.0	6.5	5.8	3.0	2.9	2.6	2.1	2.4	1.8	2.6	6.5																							
24-Jan	1.1	1.2	1.3	1.6	Z	1.2	2.4	0.9	1.1	2.0	1.1	1.6	1.4	1.2	3.5	0.9	1.3	1.0	1.8	0.4	0.2	0.3	1.4	1.5	1.3	3.5																							
25-Jan	0.6	0.2	0.5	0.2	0.7	Z	0.5	1.2	1.7	1.6	2.1	1.8	1.2	1.9	1.8	1.4	3.4	3.9	3.9	2.5	3.0	4.6	2.6	1.8	1.9	4.6																							
26-Jan	Z	2.0	3.3	3.9	4.5	1.0	1.2	0.8	0.3	0.3	0.6	1.6	1.9	1.8	0.9	0.5	0.4	0.4	0.5	0.2	0.2	1.5	3.0	1.3	1.4	4.5																							
27-Jan	1.5	Z	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.7	1.1	1.0	0.7	0.7	1.7	2.0	3.5	4.7	3.3	2.4	1.4	0.6	0.5	0.3	1.2	4.7																							
28-Jan	0.3	0.3	Z	0.4	0.2	0.2	0.4	2.0	2.8	4.6	1.9	0.5	0.6	0.7	1.1	1.3	0.5	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.8	4.6																						
29-Jan	0.2	0.2	0.2	Z	0.1	2.2	1.9	1.1	1.9	1.7	1.2	0.8	0.7	0.6	0.5	0.6	0.7	1.5	1.0	1.0	1.2	2.6	1.1	0.6	1.0	2.6																							
30-Jan	1.0	0.5	0.2	0.2	Z	2.8	0.6	1.8	2.5	2.4	1.8	1.3	1.6	0.7	1.1	1.6	1.4	2.1	1.8	0.8	0.5	0.8	1.1	0.9	1.3	2.8																							
31-Jan	1.6	2.0	2.6	1.1	2.0	Z	1.8	1.6	1.4	1.7	1.4	1.3	1.0	1.4	1.2	0.8	2.8	2.0	2.0	2.0	2.2	3.4	3.3	2.6	1.9	3.4																							
																								3.1	2.9	2.8	3.0	3.1	2.7	3.2	3.1	3.3	3.6	3.0	3.1	2.7	2.7	2.9	2.9	3.5	3.9	3.7	3.4	3.2	3.2	3.2	3.1	Diurnal Average	
																								9.9	9.9	9.0	9.3	9.8	8.9	11.2	10.1	9.7	9.0	8.5	8.7	7.2	6.3	6.8	6.3	7.9	14.4	14.4	14.0	10.4	7.7	8.8	12.8	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Kirby North - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684

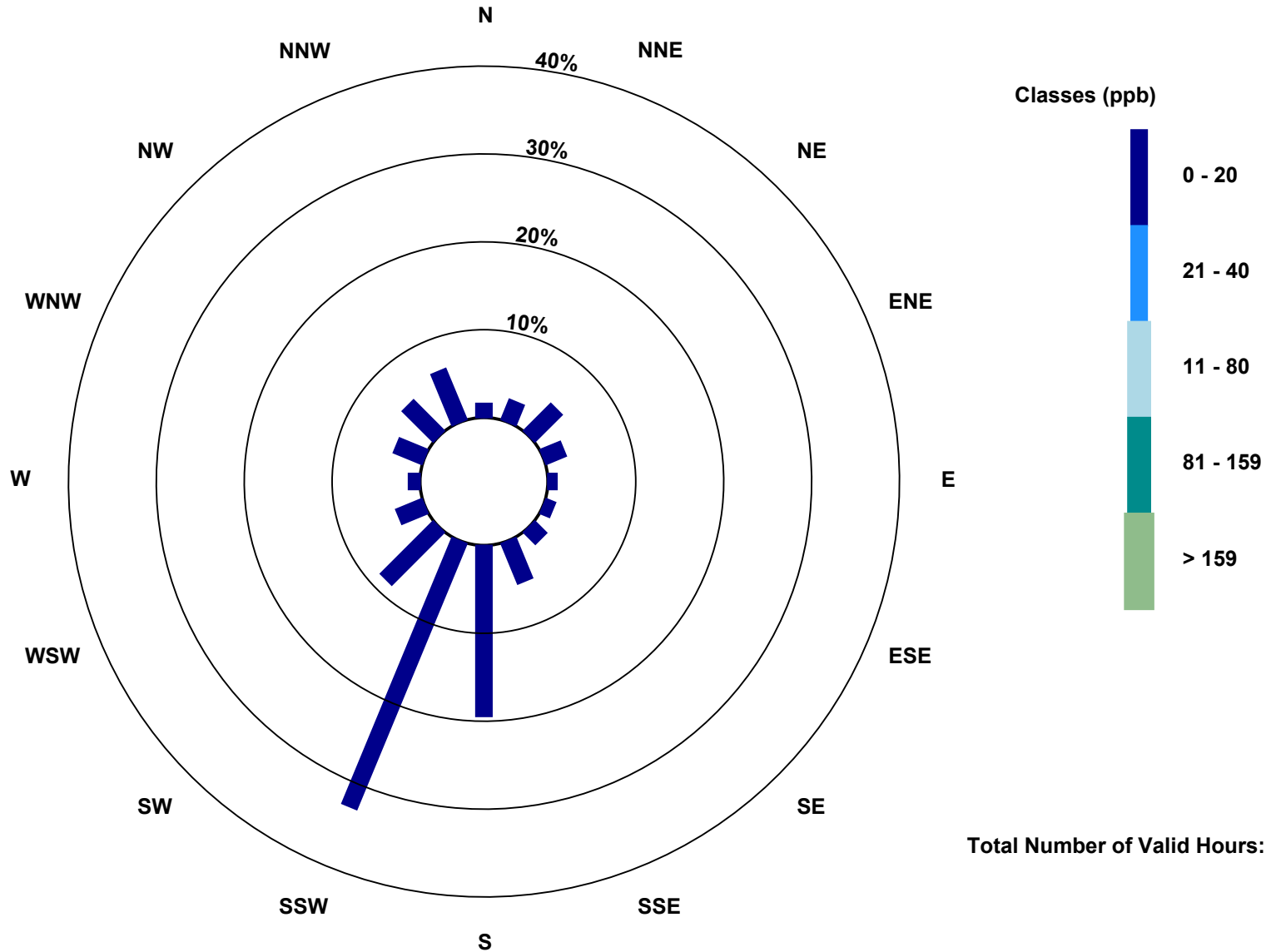
Total Number of Valid Hours: 684

Total Number of Hours: 744

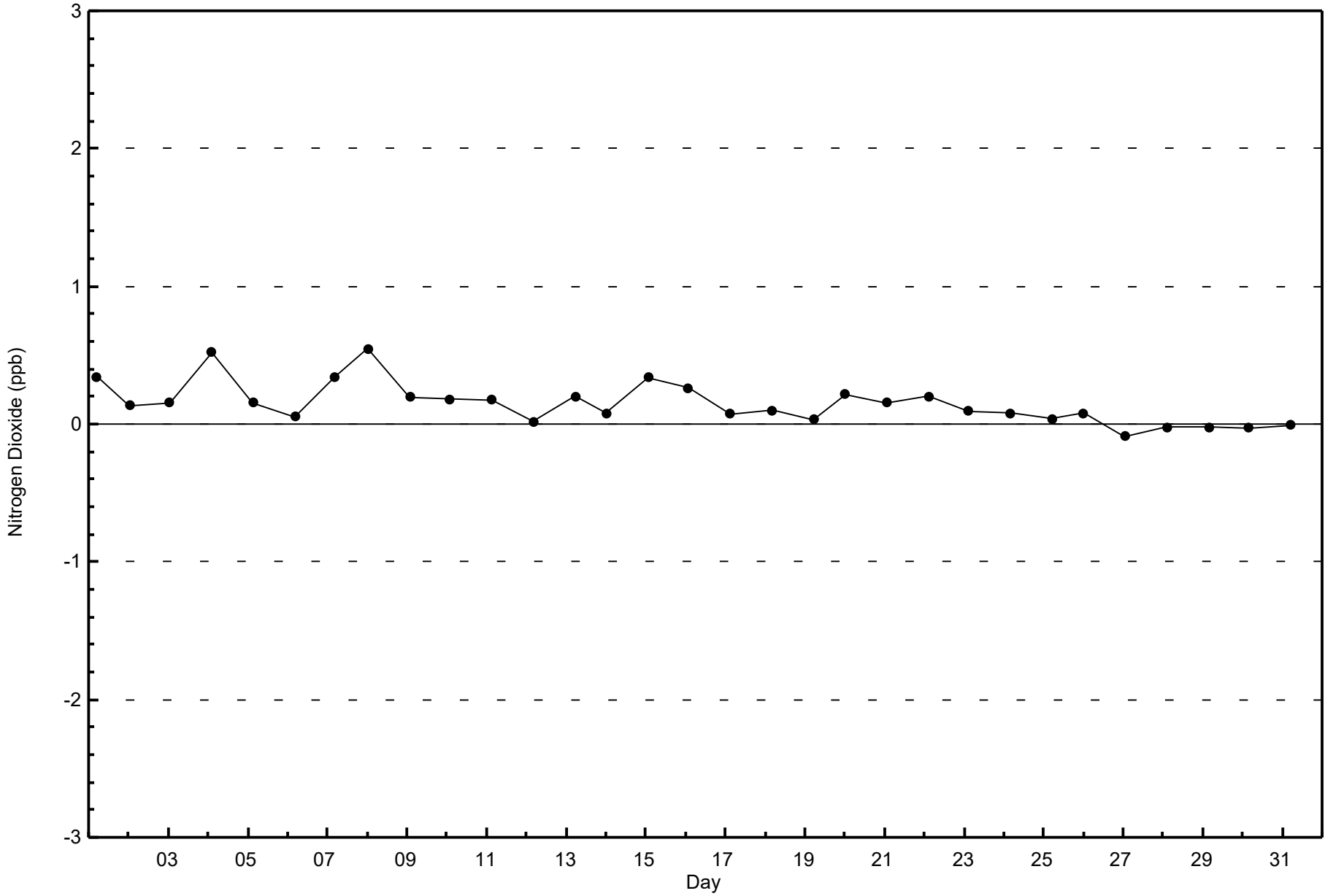


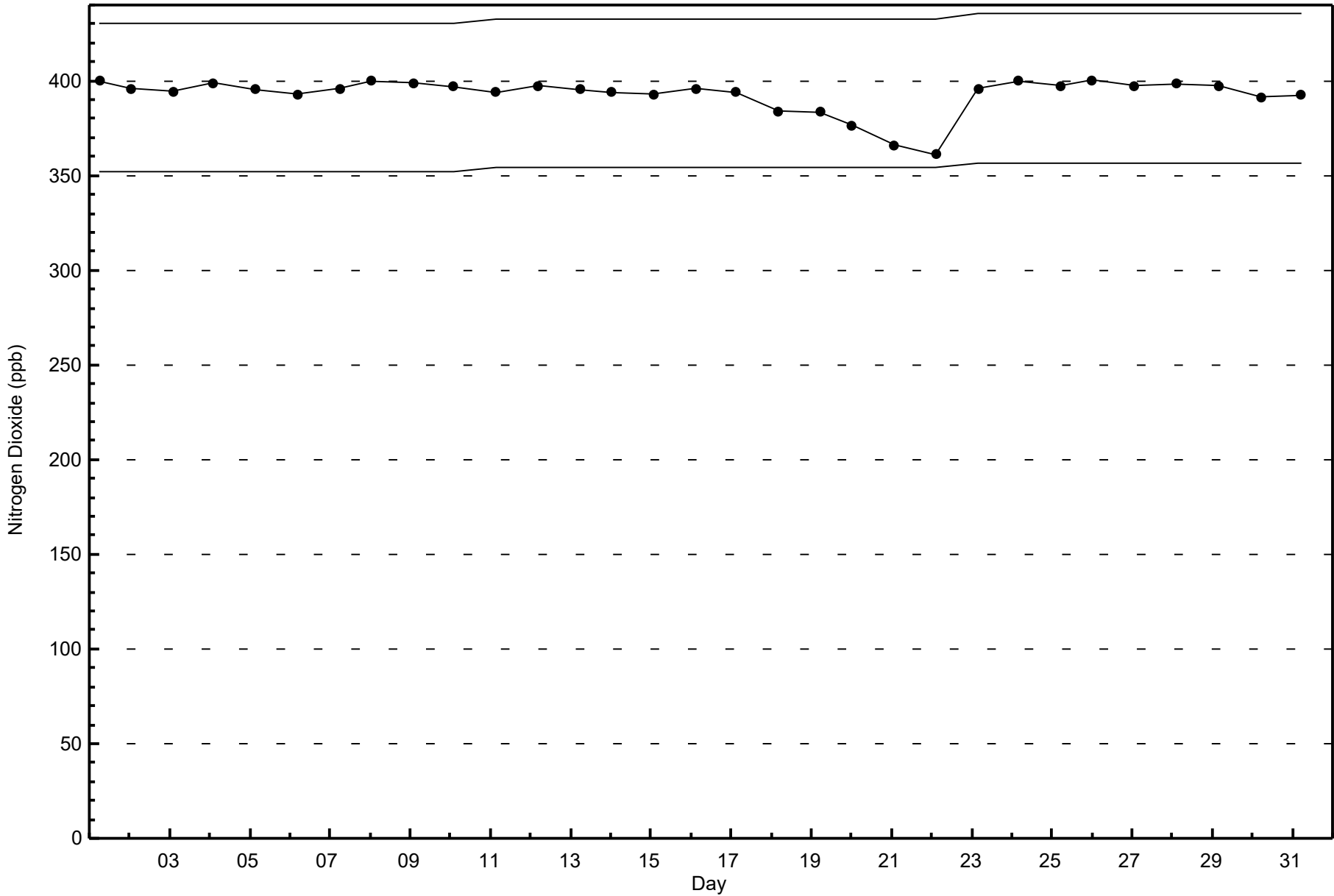
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Dioxide (NO₂) - ppb
Kirby North



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

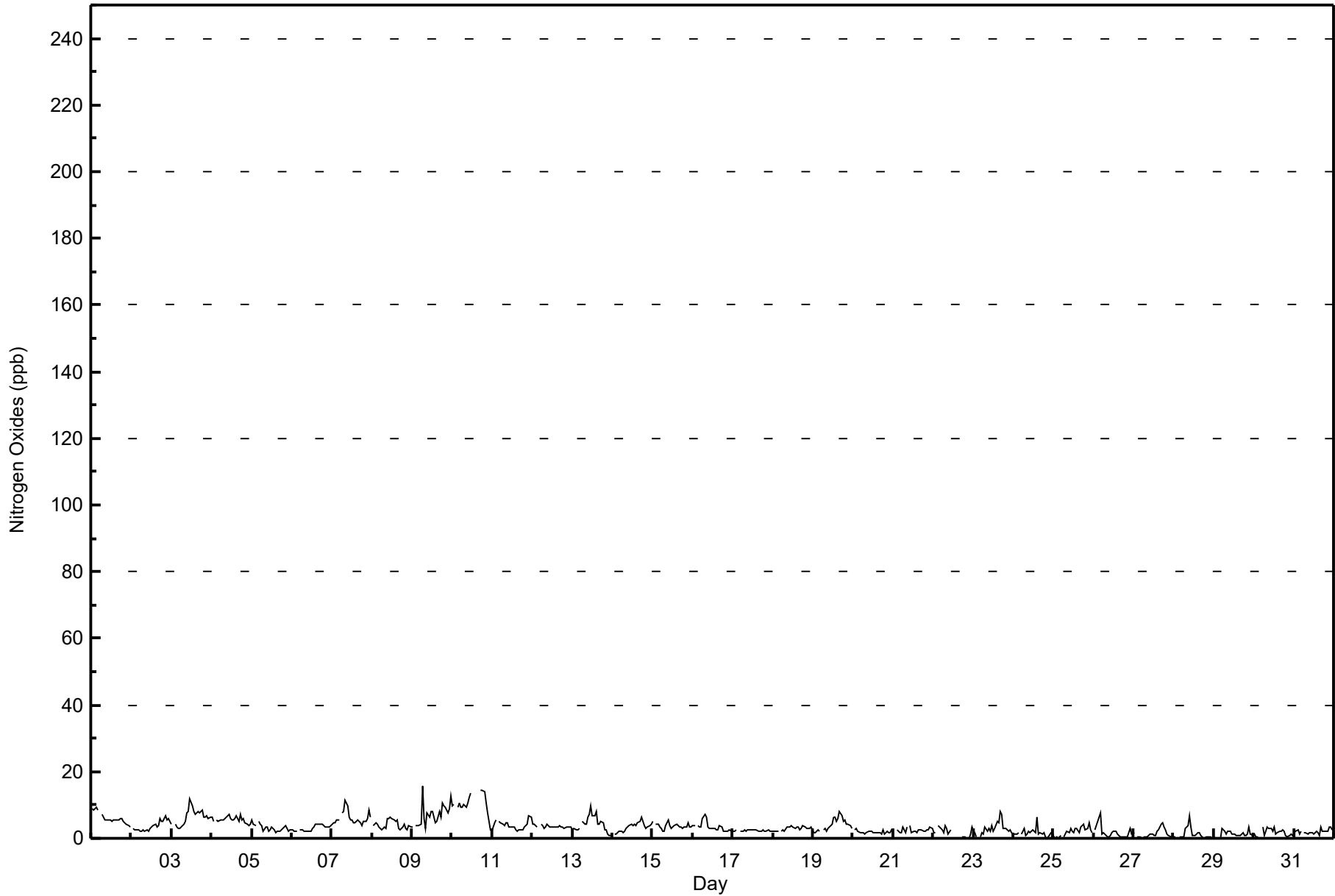
Nitrogen Oxides (NO_x) - ppb
Kirby North - January 2023

Maximum Value: 15.6 ppb on Jan 9 07:00 Maximum Daily Average: 10.2 ppb on Jan 10																				Hours in Service: 744 Hours of Data: 701						
Minimum Value: 0.1 ppb on Jan 28 19:00 Minimum Daily Average: 1.2 ppb on Jan 28 Maximum Diurnal Average: 4.1 ppb at hour 12 Minimum Diurnal Average: 2.9 ppb at hour 6 Monthly Average: 3.48 ppb Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 2.0 Median = 3.0 Q ₃ = 4.4 P ₉₀ = 6.5 P ₉₉ = 11.8																				Hours of Missing Data: 43 Hours of Calibration: 36 Percent Operational Time: 99.1						
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	9.0	8.6	9.0	9.2	8.4	Z	7.1	6.5	5.5	5.6	5.6	5.6	5.2	5.4	5.5	5.5	5.7	5.8	5.9	5.1	4.7	4.2	4.0	3.5	6.1	9.2
2-Jan	Z	3.0	2.6	2.4	2.3	2.1	2.1	2.4	2.1	2.5	2.3	3.0	3.4	4.0	4.2	3.5	3.9	5.9	5.0	4.9	6.6	5.7	6.1	5.0	3.7	6.6
3-Jan	4.2	Z	4.0	3.3	2.9	2.9	3.5	4.2	4.9	7.4	8.2	11.8	9.5	8.2	7.0	7.5	7.9	7.6	8.6	6.2	6.4	6.9	5.9	6.2	6.3	11.8
4-Jan	6.5	5.2	Z	5.6	5.0	5.4	5.4	5.4	5.9	6.5	7.1	6.0	5.5	5.6	6.1	6.6	5.0	7.1	5.4	6.1	4.9	4.1	3.7	4.1	5.6	7.1
5-Jan	5.6	4.1	3.7	Z	5.0	4.1	3.8	2.1	3.2	3.6	1.9	2.5	3.4	2.4	1.8	2.1	2.1	2.0	2.7	3.3	3.6	2.9	2.2	2.6	3.1	5.6
6-Jan	2.6	2.3	2.2	2.2	Z	2.3	2.7	2.2	2.2	2.0	2.3	2.3	2.9	3.5	4.2	4.0	4.3	4.4	4.3	4.0	3.2	3.4	3.2	3.9	3.1	4.4
7-Jan	4.3	4.6	4.8	5.4	5.6	Z	7.8	8.2	11.3	9.6	6.2	5.7	5.6	4.7	4.6	5.7	4.9	4.7	3.9	5.0	5.1	6.0	8.5	6.4	6.0	11.3
8-Jan	Z	3.8	4.8	4.3	3.3	3.0	2.4	3.3	2.9	5.9	6.0	6.2	5.9	5.5	5.2	5.5	2.9	2.6	3.4	4.2	3.0	2.7	3.7	3.2	4.1	6.2
9-Jan	3.3	Z	3.9	3.8	3.8	4.4	15.6	5.9	3.0	7.6	6.3	8.0	8.1	6.4	4.8	5.3	8.0	6.4	10.6	9.6	9.2	7.8	8.9	12.9	7.1	15.6
10-Jan	10.0	10.3	Z	9.4	10.5	9.3	9.2	10.2	9.4	10.7	12.1	13.4	C	C	C	C	C	14.4	14.4	14.1	10.5	7.5	5.1	2.7	10.2	14.4
11-Jan	2.1	4.6	5.5	Z	5.0	4.5	4.3	3.8	4.7	4.6	3.5	3.6	3.6	3.3	2.6	2.1	2.3	2.3	2.5	3.2	3.9	4.4	6.9	6.4	3.9	6.9
12-Jan	4.2	4.3	3.7	3.2	Z	4.2	4.0	2.9	3.4	4.1	3.3	3.5	3.3	3.4	3.4	3.3	3.8	3.5	3.3	3.1	3.4	3.3	3.4	3.3	3.5	4.3
13-Jan	2.5	2.8	2.6	2.7	2.9	Z	5.0	4.3	4.3	6.5	7.3	9.9	6.9	6.7	8.0	4.2	4.4	5.1	4.7	2.4	2.3	1.5	1.0	0.9	4.3	9.9
14-Jan	Z	1.2	1.3	1.8	2.1	2.0	1.7	2.0	3.0	3.5	3.7	4.4	3.7	4.1	3.6	4.6	5.3	6.5	5.2	3.7	3.0	3.2	3.7	4.2	3.4	6.5
15-Jan	5.1	Z	4.4	4.2	3.2	2.8	2.2	2.2	3.8	5.4	4.0	3.2	3.3	3.9	4.3	3.8	3.3	3.3	3.2	3.6	3.6	4.6	3.6	3.6	3.7	5.4
16-Jan	3.8	3.9	Z	3.7	3.4	3.6	6.0	7.0	6.2	3.4	2.9	2.9	2.8	2.9	2.5	2.7	3.8	3.3	2.2	2.1	2.1	2.0	2.4	2.3	3.4	7.0
17-Jan	2.2	2.3	2.4	Z	2.1	2.1	2.2	2.5	2.2	2.5	2.6	2.4	2.3	2.4	2.4	2.2	2.2	2.1	2.6	2.1	2.0	2.6	2.1	2.1	2.3	2.6
18-Jan	1.9	2.0	2.1	2.1	Z	2.0	2.3	2.3	3.5	3.3	3.4	3.8	3.4	3.2	3.3	3.5	2.6	2.9	3.8	3.3	2.9	3.1	2.8	3.2	2.9	3.8
19-Jan	1.8	1.7	1.9	2.4	2.3	Z	2.6	2.8	2.2	2.8	3.2	4.3	6.2	6.2	5.1	5.9	8.1	7.0	5.2	5.3	4.2	4.1	3.9	3.0	4.0	8.1
20-Jan	Z	2.4	3.2	1.9	1.9	1.5	1.8	1.5	1.9	1.9	1.9	2.3	1.7	1.7	1.6	1.8	1.6	1.4	2.5	1.5	2.2	1.6	1.7	2.4	1.9	3.2
21-Jan	2.3	Z	2.4	2.0	1.7	1.5	3.3	1.9	3.6	M	4.0	1.6	2.0	2.1	1.7	2.6	2.4	2.5	2.3	2.3	2.6	2.4	3.2	3.1	2.4	4.0
22-Jan	1.7	1.7	Z	3.8	3.3	2.7	1.9	3.8	2.9	1.1	2.5	M	M	M	M	M	M	0.3	0.6	0.2	0.2	0.2	1.1	3.4	--	3.8
23-Jan	2.3	1.7	0.4	Z	0.4	1.7	1.5	3.4	1.9	2.9	1.9	3.7	2.0	3.0	4.9	4.7	8.0	7.0	3.0	2.9	2.6	2.1	2.5	1.9	2.9	8.0
24-Jan	1.1	1.2	1.4	1.9	Z	1.2	2.8	1.0	1.2	2.2	1.5	2.4	2.0	1.7	6.2	1.2	1.5	1.1	1.8	0.4	0.2	0.3	1.5	1.5	1.6	6.2
25-Jan	0.6	0.2	0.6	0.2	0.8	Z	0.5	1.4	2.1	1.8	2.9	2.3	1.5	2.8	2.8	1.8	3.5	4.0	4.0	2.5	3.1	4.7	2.6	1.8	2.1	4.7
26-Jan	Z	2.5	4.9	6.2	7.5	1.3	1.6	0.9	0.3	0.3	0.7	1.7	2.2	2.2	1.1	0.6	0.4	0.5	0.5	0.2	0.2	1.5	3.0	1.3	1.8	7.5
27-Jan	1.5	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.7	1.3	1.3	0.8	0.9	2.3	2.4	4.1	4.8	3.3	2.5	1.4	0.7	0.5	0.4	1.3	4.8
28-Jan	0.3	0.4	Z	0.5	0.3	0.3	0.5	2.8	3.8	7.0	3.2	0.7	0.9	1.1	1.9	1.9	0.7	0.5	0.1	0.2	0.2	0.3	0.2	0.2	1.2	7.0
29-Jan	0.2	0.2	0.2	Z	0.1	2.9	2.3	1.3	2.2	2.1	2.0	1.2	1.2	0.9	0.8	0.8	0.9	1.9	1.0	1.0	1.2	3.4	1.1	0.7	1.3	3.4
30-Jan	1.1	0.5	0.3	0.2	Z	3.4	0.8	2.2	3.3	3.1	2.9	2.1	3.3	1.1	1.8	2.3	2.1	2.4	2.1	0.8	0.6	0.8	1.1	0.9	1.7	3.4
31-Jan	1.7	2.1	2.7	1.2	2.0	Z	1.9	1.7	1.4	1.9	1.7	1.7	1.4	2.0	1.7	1.0	3.3	2.0	2.0	2.0	2.2	3.4	3.3	2.7	2.0	3.4
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby North - January 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Kirby North - January 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	701	100.00	100.00
21 - 40	0	0.00	100.00
41 - 80	0	0.00	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby North - January 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	17	30	17	7	8	13	34	133	224	58	22	9	24	34	43	684

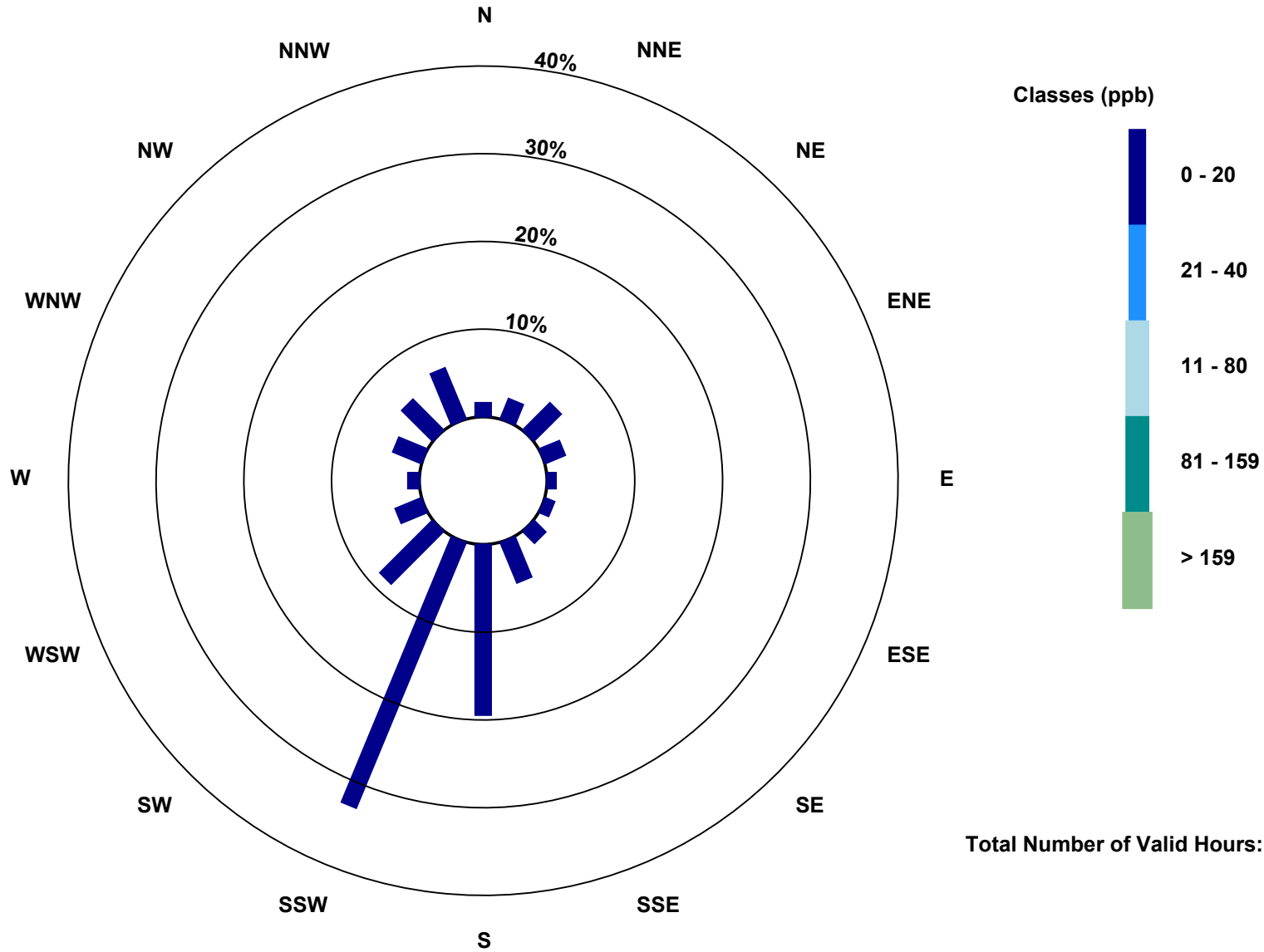
Total Number of Valid Hours: 684

Total Number of Hours: 744

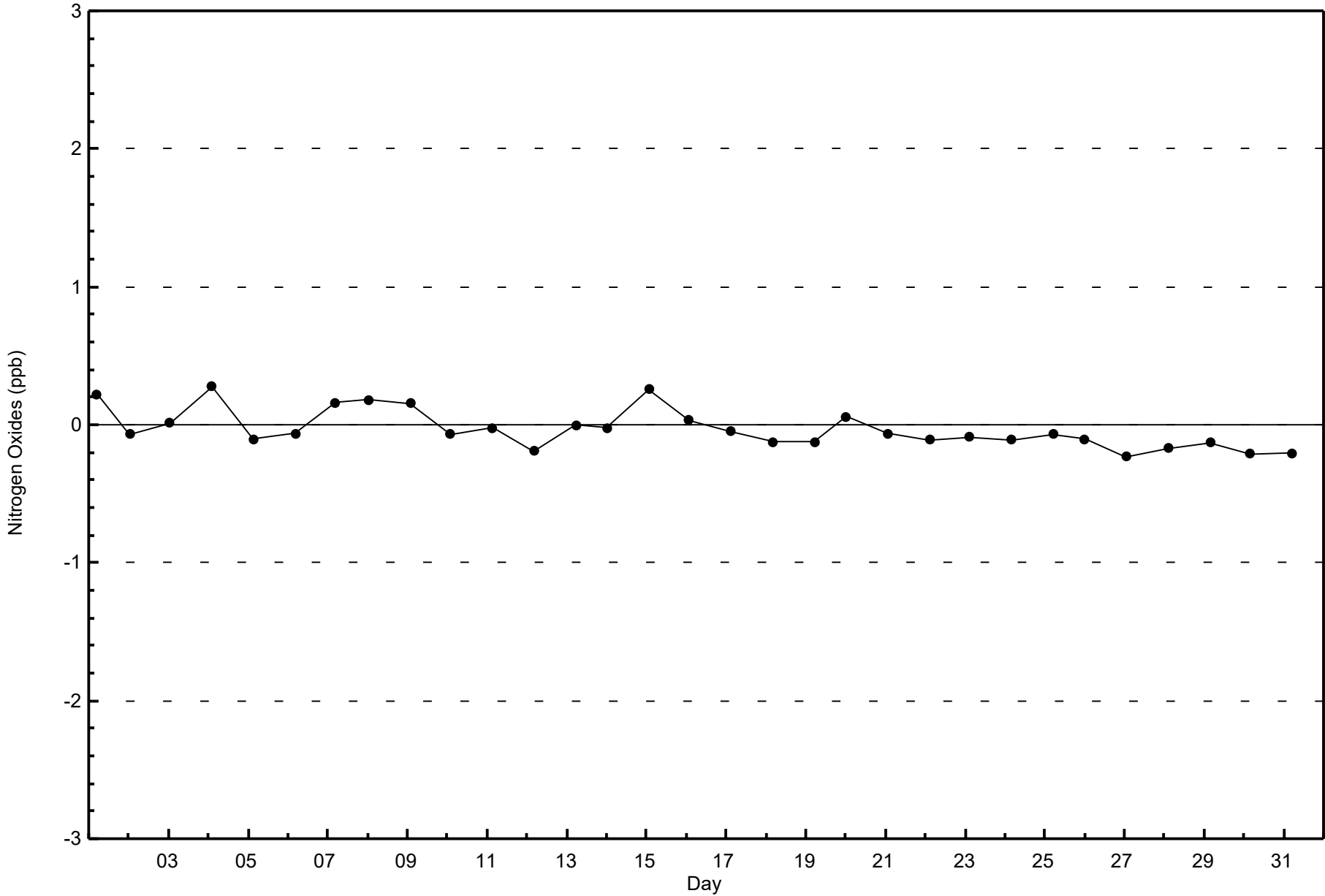


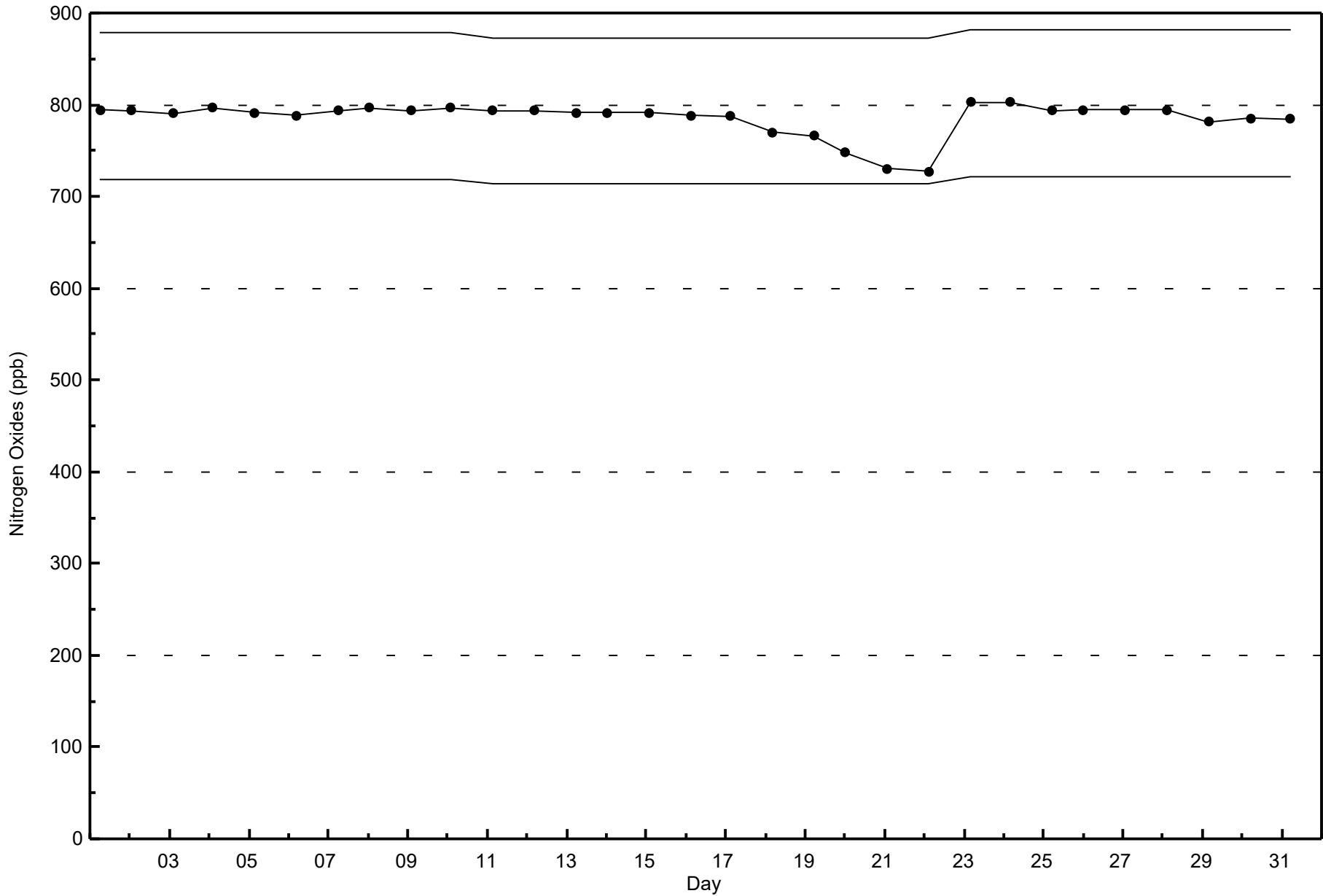
Wood Buffalo Environmental Association
Wind Rose Jan 2023

Nitrogen Oxides (NO_x) - ppb
Kirby North



Total Number of Valid Hours: 684







Wood Buffalo Environmental Association
Summary of Hour Averages

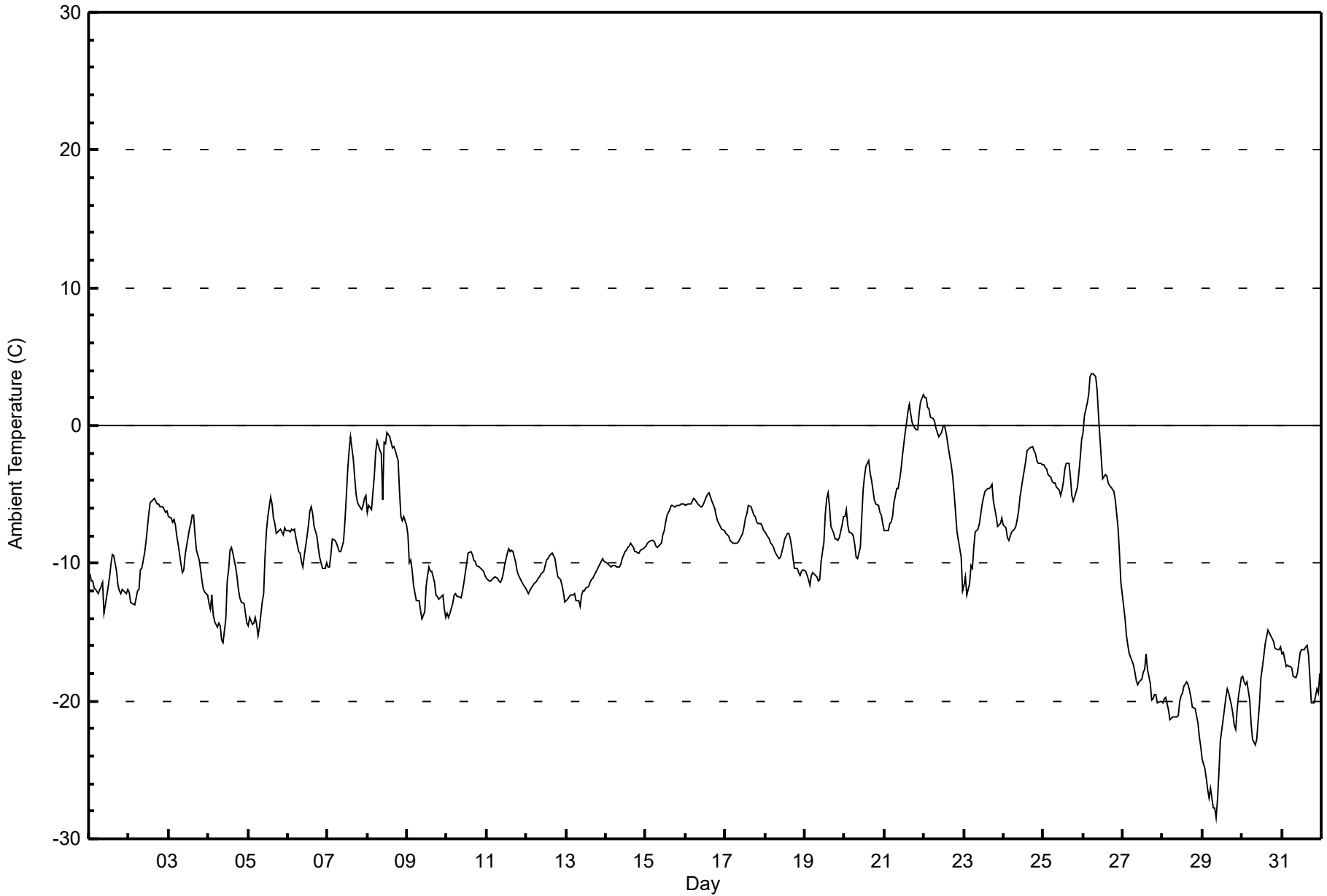
Ambient Temperature (AT) - C
Kirby North - January 2023

Maximum Value: 3.7 C on Jan 26 06:00 Maximum Daily Average: -2.1 C on Jan 26		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Minimum Value: -28.5 C on Jan 29 09:00 Minimum Daily Average: -23.2 C on Jan 29 Maximum Diurnal Average: -7.5 C at hour 15 Minimum Diurnal Average: -10.9 C at hour 9 Monthly Average: -9.70 C Percentiles: P ₁ = -25.4 P ₁₀ = -18.4 Q ₁ = -12.2 Median = -9.2 Q ₃ = -6.0 P ₉₀ = -2.9 P ₉₉ = 2.1																										
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	-10.8	-11.3	-11.3	-11.8	-11.9	-12.2	-11.9	-11.7	-11.4	-13.6	-13.0	-11.7	-10.9	-10.1	-9.3	-9.5	-10.6	-11.6	-12.0	-12.2	-11.9	-12.0	-12.2	-11.9	-11.5	-9.3
2-Jan	-12.1	-12.8	-12.9	-13.0	-12.5	-12.0	-11.9	-10.4	-10.3	-9.3	-8.5	-7.4	-6.4	-5.6	-5.4	-5.3	-5.4	-5.7	-5.7	-5.9	-5.9	-6.1	-6.3	-6.2	-8.5	-5.3
3-Jan	-6.6	-6.7	-7.1	-6.8	-7.2	-8.1	-8.7	-10.1	-10.6	-10.4	-9.3	-8.7	-7.5	-7.1	-6.5	-6.5	-7.9	-9.1	-9.8	-10.5	-11.3	-11.9	-12.1	-12.3	-8.9	-6.5
4-Jan	-13.0	-13.3	-12.3	-13.7	-14.2	-14.6	-14.3	-14.6	-15.6	-15.7	-14.1	-11.3	-10.4	-9.1	-8.8	-9.2	-10.3	-11.0	-11.9	-12.6	-12.8	-12.9	-13.7	-14.3	-12.7	-8.8
5-Jan	-14.6	-14.0	-14.4	-14.4	-13.9	-14.4	-15.3	-14.7	-12.8	-12.2	-9.5	-7.6	-6.6	-5.2	-5.7	-6.7	-7.1	-7.8	-7.8	-7.5	-7.8	-7.9	-7.4	-7.6	-10.1	-5.2
6-Jan	-7.7	-7.7	-7.5	-7.6	-7.5	-8.2	-9.2	-9.3	-9.9	-10.3	-9.4	-8.0	-7.2	-6.2	-5.9	-6.4	-7.4	-8.1	-8.9	-9.6	-10.0	-10.3	-10.3	-10.0	-8.4	-5.9
7-Jan	-10.3	-10.3	-9.3	-8.2	-8.4	-8.6	-8.9	-9.1	-9.2	-8.4	-7.0	-5.2	-3.3	-1.8	-0.9	-2.4	-3.8	-5.0	-5.6	-5.8	-6.1	-5.8	-5.3	-5.1	-6.4	-0.9
8-Jan	-6.3	-5.8	-6.1	-4.9	-3.7	-1.9	-1.2	-1.8	-2.0	-5.4	-1.2	-1.3	-0.5	-0.8	-1.3	-1.6	-1.5	-1.8	-2.5	-4.8	-6.7	-6.9	-6.6	-7.2	-3.5	-0.5
9-Jan	-8.0	-9.9	-9.8	-10.4	-11.6	-12.7	-12.7	-12.7	-13.4	-14.0	-13.6	-11.7	-10.8	-10.3	-10.6	-10.6	-11.4	-12.3	-12.4	-12.6	-12.5	-12.3	-13.3	-13.9	-11.8	-8.0
10-Jan	-13.6	-14.0	-13.6	-12.9	-12.3	-12.2	-12.4	-12.4	-12.5	-12.0	-11.4	-10.7	-10.0	-9.3	-9.1	-9.3	-9.7	-9.9	-10.2	-10.3	-10.4	-10.5	-10.6	-10.9	-11.2	-9.1
11-Jan	-11.1	-11.3	-11.3	-11.2	-11.1	-11.0	-11.1	-11.3	-11.4	-11.1	-10.8	-10.2	-9.2	-9.0	-9.2	-9.0	-9.2	-9.9	-10.6	-10.8	-11.1	-11.3	-11.5	-11.8	-10.6	-9.0
12-Jan	-12.0	-12.2	-12.0	-11.8	-11.5	-11.3	-11.3	-11.1	-11.0	-10.8	-10.6	-10.1	-9.8	-9.6	-9.4	-9.3	-9.5	-9.6	-10.3	-10.9	-11.2	-11.6	-12.1	-12.8	-10.9	-9.3
13-Jan	-12.7	-12.6	-12.3	-12.3	-12.3	-12.2	-12.7	-12.8	-13.1	-12.3	-12.0	-12.0	-11.8	-11.7	-11.4	-11.2	-11.1	-10.9	-10.5	-10.3	-10.1	-9.8	-9.7	-9.8	-11.6	-9.7
14-Jan	-10.0	-10.1	-10.2	-10.3	-10.2	-10.2	-10.3	-10.3	-10.3	-10.1	-9.7	-9.2	-9.0	-8.8	-8.7	-8.6	-8.8	-9.2	-9.2	-9.2	-9.3	-9.1	-9.0	-8.8	-9.5	-8.6
15-Jan	-8.7	-8.5	-8.5	-8.4	-8.3	-8.5	-8.7	-8.8	-8.8	-8.5	-7.9	-7.7	-7.1	-6.5	-6.1	-5.8	-5.8	-5.9	-5.9	-5.8	-5.8	-5.7	-5.7	-5.7	-7.2	-5.7
16-Jan	-5.7	-5.7	-5.7	-5.7	-5.5	-5.3	-5.3	-5.6	-5.8	-5.9	-5.9	-5.7	-5.2	-5.0	-4.9	-5.1	-5.5	-6.0	-6.5	-6.9	-7.2	-7.4	-7.5	-7.7	-6.0	-4.9
17-Jan	-7.9	-8.0	-8.1	-8.4	-8.5	-8.5	-8.5	-8.5	-8.4	-8.3	-7.9	-7.4	-6.8	-6.4	-5.8	-5.9	-6.2	-6.5	-6.6	-7.0	-7.1	-7.1	-7.3	-7.6	-7.4	-5.8
18-Jan	-7.8	-7.9	-8.2	-8.5	-8.6	-8.8	-9.2	-9.4	-9.6	-9.6	-9.1	-8.7	-8.2	-7.8	-7.8	-8.3	-8.8	-9.6	-10.4	-10.4	-10.6	-10.8	-10.6	-10.5	-9.1	-7.8
19-Jan	-10.6	-10.9	-11.2	-11.6	-10.9	-10.7	-10.9	-11.0	-11.3	-11.1	-9.9	-8.5	-6.4	-5.3	-4.8	-5.9	-7.3	-7.9	-8.2	-8.2	-8.4	-8.1	-7.3	-6.6	-8.9	-4.8
20-Jan	-6.6	-6.1	-7.2	-7.7	-7.8	-8.1	-8.6	-9.6	-9.7	-8.9	-6.7	-4.7	-3.6	-2.9	-2.6	-3.5	-4.0	-4.7	-5.4	-5.7	-5.8	-6.3	-6.5	-7.1	-6.2	-2.6
21-Jan	-7.7	-7.7	-7.7	-7.1	-7.0	-6.6	-5.6	-4.6	-4.6	-4.0	-3.3	-2.2	-0.5	0.2	1.0	1.5	0.9	0.2	-0.2	-0.3	-0.3	0.9	1.7	2.2	-2.5	2.2
22-Jan	2.1	2.1	1.3	1.2	0.6	0.5	0.3	-0.2	-0.5	-0.8	-0.6	-0.1	0.0	-0.4	-1.0	-1.8	-2.9	-3.8	-4.9	-6.3	-7.7	-8.9	-9.5	-12.0	-2.2	2.1
23-Jan	-11.5	-11.0	-12.3	-11.5	-10.2	-10.4	-8.8	-7.8	-7.5	-7.1	-6.4	-5.7	-5.2	-4.7	-4.6	-4.6	-4.5	-4.3	-5.5	-6.7	-7.4	-7.2	-7.1	-6.7	-7.4	-4.3
24-Jan	-7.2	-7.4	-8.1	-8.3	-8.0	-7.7	-7.5	-7.3	-6.8	-6.2	-5.2	-3.8	-3.3	-2.7	-1.8	-1.7	-1.6	-1.5	-1.8	-2.0	-2.5	-2.7	-2.8	-2.8	-4.6	-1.5
25-Jan	-2.9	-3.0	-3.2	-3.5	-3.8	-4.0	-4.2	-4.2	-4.5	-4.7	-5.1	-4.7	-4.1	-3.2	-2.7	-2.7	-3.8	-5.1	-5.5	-5.2	-4.5	-3.4	-2.4	-1.0	-3.8	-1.0
26-Jan	-0.5	0.7	1.6	2.2	3.6	3.7	3.7	3.5	2.6	0.8	-0.8	-2.4	-3.8	-3.5	-3.6	-4.2	-4.4	-4.5	-4.8	-5.4	-6.4	-7.5	-9.2	-11.4	-2.1	3.7
27-Jan	-13.1	-14.0	-15.3	-16.0	-16.6	-17.1	-17.4	-17.9	-18.5	-18.8	-18.6	-18.4	-17.9	-17.7	-16.5	-17.7	-18.7	-20.0	-19.9	-19.5	-19.6	-20.1	-20.0	-20.0	-17.9	-13.1
28-Jan	-20.2	-19.8	-19.8	-20.6	-21.4	-21.3	-21.2	-21.2	-21.2	-21.1	-20.1	-19.6	-19.4	-19.0	-18.6	-18.8	-19.2	-19.7	-20.4	-20.5	-21.0	-21.6	-22.5	-23.3	-20.5	-18.6
29-Jan	-24.2	-24.9	-25.6	-26.5	-27.0	-26.4	-27.8	-27.8	-28.5	-27.1	-25.2	-22.9	-21.3	-20.5	-19.7	-19.1	-19.4	-20.3	-21.0	-21.7	-22.0	-20.6	-19.6	-18.3	-23.2	-18.3
30-Jan	-18.2	-18.6	-18.8	-18.6	-19.9	-21.7	-22.8	-23.0	-23.2	-22.8	-20.1	-18.3	-17.6	-16.8	-15.8	-14.9	-15.1	-15.2	-15.5	-15.7	-16.2	-16.3	-16.2	-16.1	-18.2	-14.9
31-Jan	-16.6	-16.4	-17.5	-17.3	-17.4	-17.5	-17.6	-18.2	-18.3	-18.0	-17.3	-16.5	-16.3	-16.2	-16.1	-16.0	-16.6	-18.4	-20.1	-20.2	-19.7	-19.2	-19.4	-18.0	-17.7	-16.0
	-10.2	-10.3	-10.5	-10.5	-10.5	-10.6	-10.7	-10.8	-10.9	-10.9	-10.0	-9.1	-8.4	-7.8	-7.5	-7.7	-8.3	-8.9	-9.3	-9.7	-10.0	-10.0	-10.1	-10.2	Diurnal Average	
	2.1	2.1	1.6	2.2	3.6	3.7	3.7	3.5	2.6	0.8	-0.6	-0.1	0.0	0.2	1.0	1.5	0.9	0.2	-0.2	-0.3	-0.3	0.9	1.7	2.2	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Kirby North - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Kirby North - January 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	45	6.05	6.05
-20 - 0	674	90.59	96.64
0 - 10	25	3.36	100.00
10 - 20	0	0.00	100.00
> 20	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

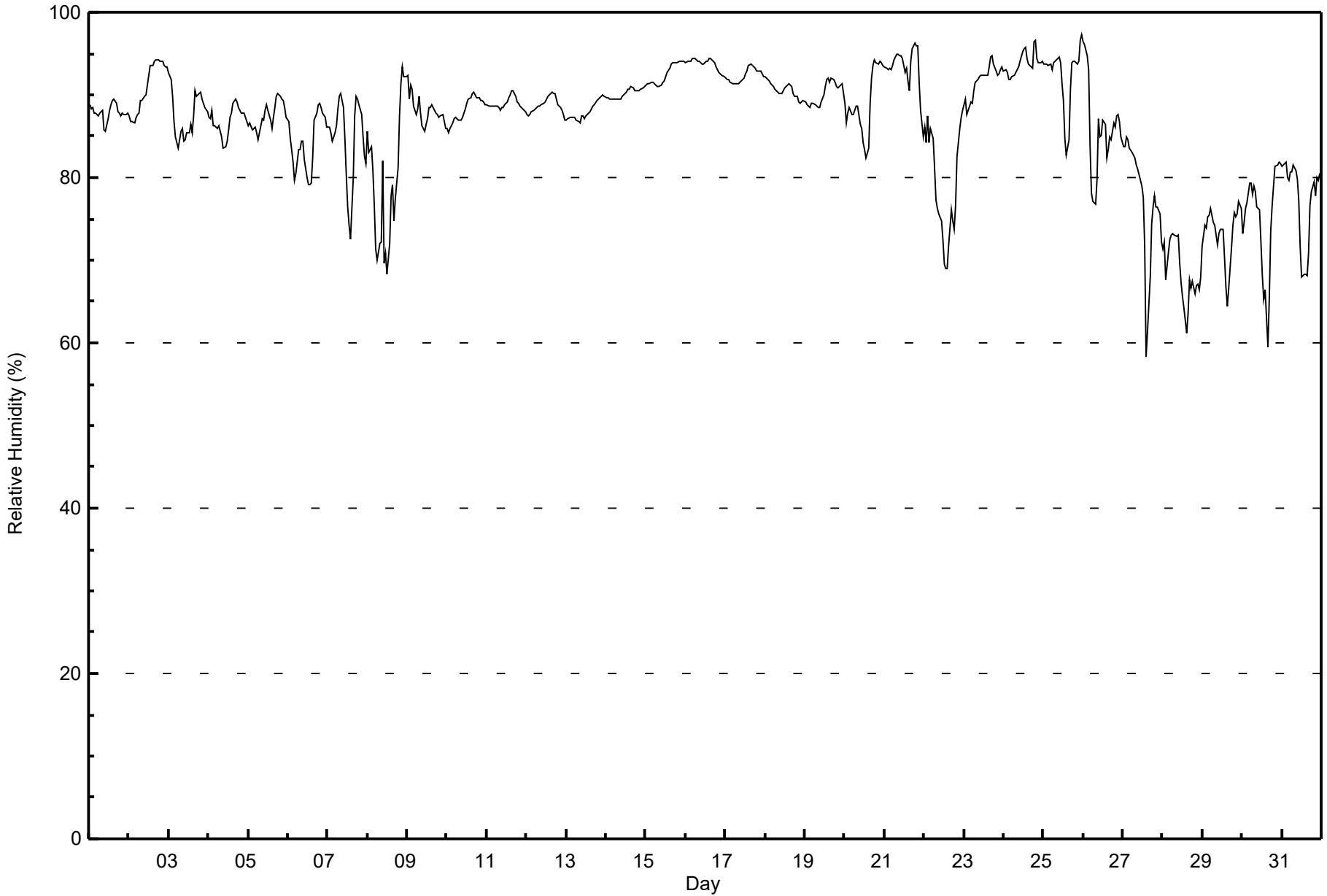
Relative Humidity (RH) - %
Kirby North - January 2023

Maximum Value: 97.2 % on Jan 26 00:00 Maximum Daily Average: 93.8 % on Jan 24																						Hours in Service: 744 Hours of Data: 744																								
Minimum Value: 58.2 % on Jan 27 15:00 Minimum Daily Average: 68.6 % on Jan 28 Maximum Diurnal Average: 88.0 % at hour 21 Minimum Diurnal Average: 83.6 % at hour 15 Monthly Average: 86.34 % Percentiles: P ₁ = 65.4 P ₁₀ = 74.5 Q ₁ = 84.2 Median = 88.4 Q ₃ = 91.3 P ₉₀ = 93.8 P ₉₉ = 95.9																						Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																								
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																						
1-Jan	88.9	88.3	88.4	87.8	87.8	87.5	87.9	88.0	88.1	85.7	85.6	87.2	88.1	88.9	89.4	89.4	89.0	88.0	87.8	87.5	87.9	87.7	87.6	87.8	87.9	89.4																				
2-Jan	87.5	86.8	86.7	86.6	87.2	87.6	87.7	89.3	89.2	89.9	89.9	91.1	92.4	93.6	93.6	94.0	94.3	94.2	94.2	94.0	94.0	93.6	93.4	93.4	91.0	94.3																				
3-Jan	92.7	91.8	89.8	86.7	85.0	84.2	83.6	85.5	85.9	84.4	84.6	85.5	86.4	85.5	87.5	90.5	89.8	90.2	90.4	89.6	89.0	88.5	87.9	87.5	87.5	92.7																				
4-Jan	87.3	87.1	88.1	86.2	86.3	85.9	86.3	85.6	84.8	83.6	83.7	84.3	85.7	87.3	87.8	89.0	89.5	89.2	88.5	88.1	87.8	87.8	87.3	86.8	86.8	89.5																				
5-Jan	86.3	86.6	85.8	85.9	86.1	85.4	84.6	85.4	87.2	86.9	88.1	88.8	88.1	86.9	85.9	87.3	88.5	89.8	90.2	89.8	89.5	89.3	88.4	87.2	87.4	90.2																				
6-Jan	86.7	84.8	83.4	81.9	79.6	80.6	83.4	83.3	84.4	84.4	82.2	80.0	79.2	79.1	79.4	82.4	87.0	87.8	88.8	89.0	88.5	87.9	87.2	86.0	84.0	89.0																				
7-Jan	86.2	86.1	85.5	84.4	85.5	86.4	88.3	89.9	90.1	88.4	84.7	80.3	76.4	74.3	72.6	80.0	87.5	89.8	89.5	88.8	87.6	84.9	82.5	81.6	84.6	90.1																				
8-Jan	85.6	83.0	83.8	80.8	76.6	71.3	70.0	72.0	72.2	82.0	69.7	70.9	68.4	72.0	77.8	79.2	74.8	77.5	81.2	87.5	91.4	93.4	92.1	92.2	79.4	93.4																				
9-Jan	92.4	89.5	91.1	90.6	88.6	87.7	88.4	89.8	87.8	86.3	85.5	86.4	87.2	88.5	88.5	88.8	88.2	87.8	87.7	87.3	87.5	87.6	86.8	85.9	88.2	92.4																				
10-Jan	85.9	85.5	85.9	86.6	87.1	87.3	87.1	87.0	86.9	87.3	87.8	88.2	89.0	89.5	89.7	90.2	90.3	90.0	89.7	89.6	89.4	89.4	89.1	88.9	88.2	90.3																				
11-Jan	88.8	88.7	88.6	88.6	88.7	88.7	88.6	88.4	88.2	88.4	88.4	88.8	89.2	89.6	90.0	90.5	90.5	89.8	89.2	88.9	88.7	88.4	88.2	87.9	88.9	90.5																				
12-Jan	87.7	87.5	87.7	87.9	88.2	88.4	88.5	88.6	88.7	88.8	88.9	89.2	89.6	89.9	90.0	90.3	90.3	90.1	89.4	88.8	88.5	88.1	87.6	86.9	88.7	90.3																				
13-Jan	87.0	87.1	87.3	87.2	87.3	87.2	86.9	86.8	86.6	87.5	87.5	87.1	87.5	87.8	88.0	88.3	88.6	88.9	89.3	89.4	89.6	89.9	90.0	89.9	88.0	90.0																				
14-Jan	89.7	89.6	89.5	89.4	89.5	89.5	89.5	89.4	89.4	89.6	89.9	90.3	90.3	90.6	90.8	90.9	90.8	90.6	90.6	90.5	90.5	90.7	90.9	91.0	90.1	91.0																				
15-Jan	91.1	91.3	91.4	91.5	91.5	91.3	91.1	91.1	91.1	91.2	91.6	91.8	92.1	92.8	93.3	93.7	93.8	93.8	93.9	94.0	94.0	94.1	94.0	94.0	92.5	94.1																				
16-Jan	94.0	94.0	94.0	94.1	94.3	94.5	94.4	94.2	94.0	93.9	93.8	93.8	94.0	94.1	94.4	94.4	94.3	93.9	93.4	93.0	92.7	92.5	92.4	92.2	93.8	94.5																				
17-Jan	92.0	91.9	91.8	91.5	91.3	91.3	91.4	91.4	91.4	91.5	91.8	92.1	92.5	92.9	93.5	93.7	93.6	93.4	93.3	92.9	92.8	92.8	92.6	92.3	92.3	93.7																				
18-Jan	92.1	92.0	91.7	91.4	91.2	91.0	90.7	90.5	90.2	90.1	90.2	90.5	90.9	91.2	91.3	91.2	90.9	90.1	89.8	89.9	89.2	89.0	89.2	89.3	90.6	92.1																				
19-Jan	89.1	88.8	88.6	88.4	88.9	89.0	88.8	88.7	88.4	88.4	89.1	89.9	91.0	91.8	92.0	91.6	92.0	91.9	91.6	91.1	90.9	91.1	91.3	90.3	90.1	92.0																				
20-Jan	89.0	86.5	87.9	88.5	87.6	87.6	88.1	88.7	88.7	86.4	86.0	84.2	83.4	82.4	83.5	89.0	92.0	93.6	94.2	93.9	93.7	94.0	94.0	93.5	89.0	94.2																				
21-Jan	93.4	93.3	93.0	93.2	93.1	93.5	94.2	94.9	94.8	94.7	94.8	94.5	92.8	93.3	91.7	90.5	94.0	95.5	96.3	95.9	95.9	91.5	88.1	85.0	93.2	96.3																				
22-Jan	86.1	84.2	87.5	84.3	86.0	84.8	81.2	77.3	76.2	75.6	74.7	72.3	69.5	69.0	69.0	71.6	76.1	74.7	73.8	76.6	82.6	86.0	87.3	88.1	78.9	88.1																				
23-Jan	88.8	89.5	87.6	88.6	89.2	89.1	90.5	91.6	91.9	92.2	92.4	92.4	92.3	92.4	92.4	93.4	94.5	94.7	93.7	92.9	92.3	92.6	93.1	93.4	91.7	94.7																				
24-Jan	92.9	93.0	92.7	91.9	91.9	92.2	92.4	92.6	93.1	93.4	94.1	95.3	95.6	95.7	94.4	93.7	93.6	93.2	96.4	96.7	94.3	93.9	93.9	94.0	93.8	96.7																				
25-Jan	93.7	93.8	93.8	93.6	93.7	93.1	93.9	94.1	94.2	94.6	94.0	91.3	89.3	84.7	82.7	84.6	90.7	94.0	94.1	94.1	93.7	94.1	96.5	97.2	92.5	97.2																				
26-Jan	96.5	96.1	94.8	93.1	83.9	78.2	77.1	76.7	79.9	87.2	85.0	85.1	86.9	86.5	82.3	83.4	84.9	84.6	86.6	86.1	87.5	87.7	86.8	84.9	85.9	96.5																				
27-Jan	83.8	83.8	85.0	84.5	83.6	83.1	82.8	82.3	81.5	81.0	80.4	79.0	77.6	71.8	58.2	61.4	68.0	74.4	76.4	77.7	76.5	76.4	75.6	72.2	77.4	85.0																				
28-Jan	71.3	72.3	67.6	71.1	72.5	73.1	73.2	73.0	73.0	73.0	69.6	67.2	65.6	64.2	61.1	63.5	67.6	66.6	67.4	65.9	66.9	67.1	66.4	67.9	68.6	73.2																				
29-Jan	71.7	74.3	73.9	75.3	75.3	76.3	74.6	74.2	73.1	71.9	73.2	73.7	73.7	70.4	66.7	64.3	66.5	71.6	74.2	75.8	75.3	75.6	77.2	76.4	73.1	77.2																				
30-Jan	73.3	74.7	76.3	77.0	79.3	79.3	78.0	79.0	78.3	76.5	76.1	72.2	68.2	65.3	66.4	59.5	65.6	73.6	76.5	79.0	81.3	81.6	81.9	81.6	75.0	81.9																				
31-Jan	81.4	81.6	81.8	80.0	79.7	80.7	80.7	81.5	80.9	79.7	77.2	71.6	67.9	68.3	68.3	68.1	70.8	76.6	78.3	79.5	77.8	80.0	79.7	80.5	77.2	81.8																				
																						87.5	87.2	87.1	86.7	86.3	86.0	85.9	86.1	86.1	86.3	85.5	85.0	84.5	84.2	83.6	84.4	86.1	87.1	87.6	87.9	88.0	88.0	87.7	87.3	Diurnal Average
																						96.5	96.1	94.8	94.1	94.3	94.5	94.4	94.9	94.8	94.7	94.8	95.3	95.6	95.7	94.4	94.4	94.5	95.5	96.4	96.7	95.9	94.1	96.5	97.2	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Kirby North - January 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Kirby North - January 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	0	0.00	0.00
40 - 60	2	0.27	0.27
60 - 80	132	17.74	18.01
80 - 100	610	81.99	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

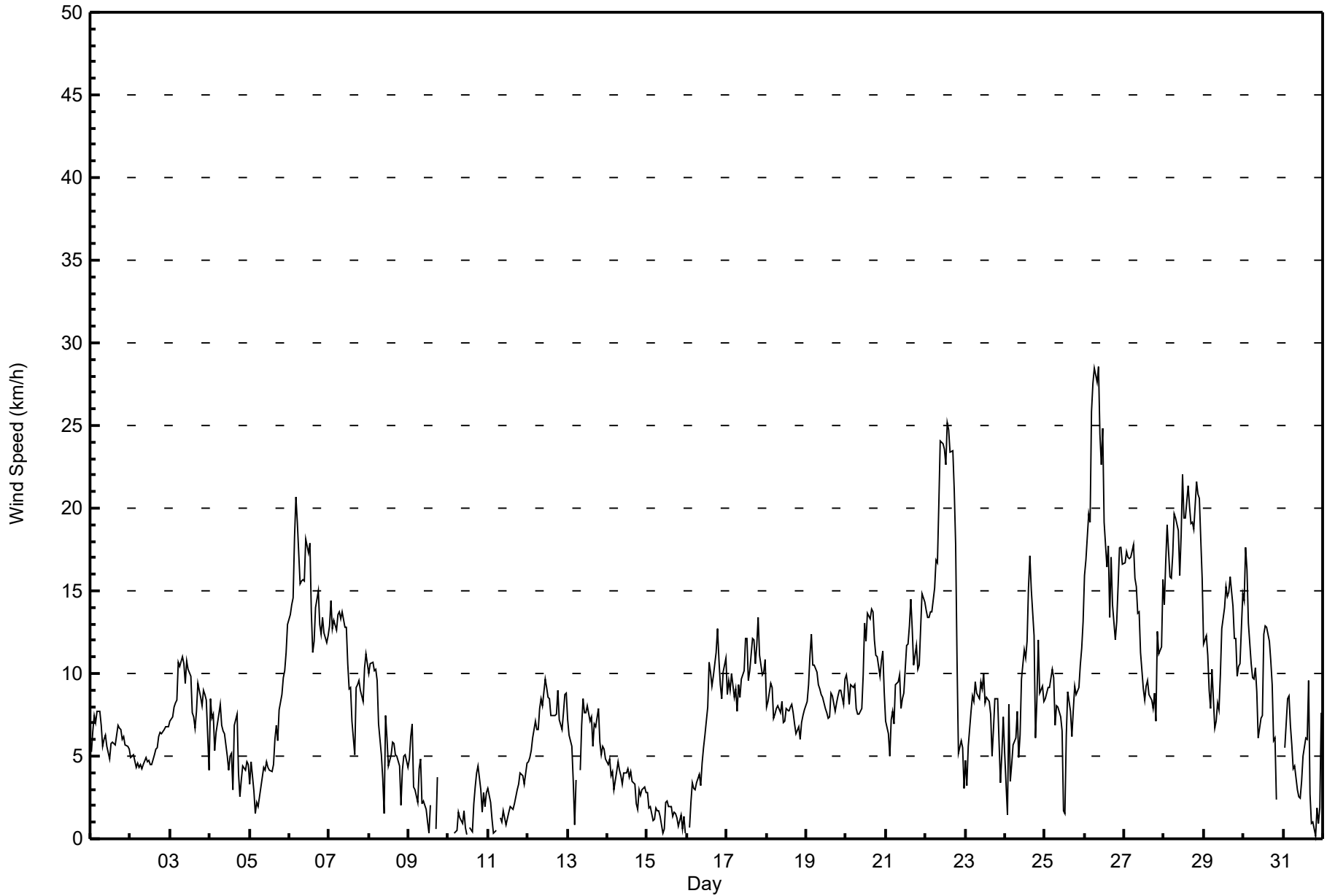
Wind Speed (WS) - km/h
Kirby North - January 2023

Maximum Speed: 29 km/h on Jan 26 09:00	Maximum Daily Speed Average: 18.0 km/h on Jan 28	Hours in Service: 744
Minimum Speed Value: 0 km/h on Jan 31 20:00	Minimum Daily Speed Average: 0.5 km/h on Jan 15	Hours of Data: 725
Maximum Diurnal Speed Average: 4.8 km/h at hour 14	Minimum Diurnal Speed Average: 3.0 km/h at hour 21	Hours of Missing Data: 19
Monthly Average Velocity: 3.7 km/h 226.8 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 5 Median = 8 Q ₃ = 11 P ₉₀ = 16 P ₉₉ = 25	Percent Operational Time: 97.5

Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	SSW5	SSW6	SSW7	SSW7	SSW8	SW8	SW7	SW6	SW6	SSW6	SSW6	SSW5	SSW6	SSW6	SSW6	SSW6	SSW7	SSW7	SSW7	SSW6	SSW6	SSW6	SSW6	SSW5	SSW6.1	SSW8
2-Jan	SSW5	SSW5	SSW5	S4	S5	SSW4	S4	SSW4	SSW4	SSW5	SSW5	SSW5	SSW5	SSW5	SSW5	SSW6	SSW6	S6	S6	S7	S7	S7	S7	SSW5.2	S7	
3-Jan	S7	S7	S8	S8	S8	S11	S10	S11	S11	S9	S11	S10	S10	SSW8	SSW7	SSW7	SSW8	SSW9	SSW9	SSW8	SSW9	S9	SSW8	SSW4	S8.5	S11
4-Jan	SSW8	SSW7	SW8	SSW5	SSW6	SSW8	SW8	SW7	SW7	SSW6	SSW5	S4	SSW5	SW5	SSW3	SSW7	SSW8	SSW4	SSW3	SSW4	SSW4	SSW4	SSW5	SSW4	SSW5.5	SSW8
5-Jan	S3	SSW5	S3	SSW2	SSW2	S2	S3	S3	S4	S4	S5	S4	S4	SSE4	SSE6	SSE7	S6	S8	S9	S10	S10	S11	S13	S5.4	S13	
6-Jan	S14	S14	S15	S18	S21	S19	S15	S16	SSW16	SSW16	SSW18	SSW17	SSW18	SSW14	SSW11	SSW12	SSW14	SSW15	SSW13	SSW12	SSW13	S12	S12	S12	SSW14.6	S21
7-Jan	S13	S14	S13	SSW13	S13	S14	S14	S13	S14	SSW13	SSW13	SSW11	SSW9	SSW9	S7	S5	SSW9	S9	S10	S9	S8	S10	S11	S11	S10.9	S14
8-Jan	S10	S11	S11	S10	SSE10	SSE10	SSE7	S5	SE4	NE1	SSE7	SE6	SE4	E5	ENE6	ENE6	ESE5	ESE5	ESE4	E2	SSE4	SE5	SSE5	SSE4	SSE5.2	S11
9-Jan	S5	S6	S7	SSE3	SSE3	S2	S4	SSW5	SSW2	SSW2	SSW2	SSW1	S0	SSW2	UO	UO	NE1	NE4	UO	UO	UO	UO	UO	UO	---	S7
10-Jan	UO	UO	UO	ENE0	WSW0	SSE1	SSW2	NE1	NE1	NE2	NNE1	SSW0	UO	NNE1	NNE0	NNE2	NNE3	NE4	NE4	NE3	NE2	NE3	NNE2	NNE3	NE1.4	NE4
11-Jan	NE3	ENE2	ENE1	ESE0	ENE0	ESE1	UO	SSW1	SSW1	SSW2	SW1	S1	SSE2	S2	SW2	S2	S2	SSW3	SSW3	S4	SSW4	SSW4	S3	SSW5	S1.5	SSW5
12-Jan	SSW5	SSW5	SSW5	SSW6	S7	S7	SSW7	SSW8	SSW8	SSW8	SSW10	SSW9	SSW9	SSW8	SSW7	SSW7	SSW7	SSW8	SW9	SSW7	SSW7	SSW8	SW9	SW9	SSW7.4	SSW10
13-Jan	SW7	SW6	SSW6	SSW3	NNW1	NNE4	UO	NE4	NE7	NE8	ENE8	ENE8	NE8	NE7	ENE7	E6	NE7	ENE7	ENE8	E6	E5	E6	ESE5	ESE5	ENE3.9	NE8
14-Jan	ESE4	ESE5	SE4	SE4	SSE3	SSE4	S5	S4	S4	SSW3	S4	SSW4	SW4	SW4	SW4	SSW3	SW3	SW2	SSW2	SSW3	SW3	WSW3	WSW3	WSW3	S2.8	ESE5
15-Jan	WSW3	NW2	N2	NE1	NE1	NNE2	NE2	NE2	ENE1	S0	SSE1	SSE2	SSE2	SSE2	S2	S1	SSE2	S2	SSE1	S1	S1	S1	S1	SSE0	SE0.5	WSW3
16-Jan	UO	ESE1	S2	SSE3	SE3	SE3	SE3	SE4	SSE3	SSE5	SSE6	SSE6	SSE8	SSE11	SSE10	SSE9	S10	S11	S13	S11	SSW9	SSW8	SSW10	SSW11	S6.5	S13
17-Jan	SSW9	SSW10	SSW9	S10	SSW9	SSW9	SSW8	SSW9	SSW9	SSW10	SSW10	SSW12	SW12	SSW10	SSW10	SSW12	SSW12	SSW11	SSW12	SSW13	SSW11	SSW10	SSW10	SSW11	SSW10.2	SSW13
18-Jan	SSW8	SSW8	SSW9	S9	SSW7	S8	S8	S8	S8	S8	S7	SSW7	S8	S8	S8	S8	S8	S7	S6	SSW7	SSW6	S7	S7	SSW8	S7.6	SSW9
19-Jan	SSW8	SSW9	SSW11	SSW12	SW10	SW10	SSW10	SSW9	SSW9	SW9	SW9	SW8	SW8	SW7	SW7	SSW9	SSW9	SSW8	SSW8	SSW9	SSW9	SSW9	SSW8	SSW10	SSW9.0	SSW12
20-Jan	SSW10	SSW9	SSW8	SSW9	SSW9	SSW9	SSW8	S8	SSW8	SSW8	SW10	WSW13	SW12	WSW14	SW13	SW14	SW14	SW12	SSW11	SSW11	SSW10	SSW11	SSW11	SSW9	SW10.2	SW14
21-Jan	SSW7	S6	S5	S7	S8	S7	S9	SSW10	S10	S8	SSW8	SSW9	SSW12	SSW12	SW13	SW15	SSW13	SSW11	SSW12	SSW10	SSW11	SW13	WSW15	WSW14	SSW9.5	WSW15
22-Jan	WSW14	WSW13	WSW13	WSW14	WSW14	WSW15	WSW17	WSW17	WSW20	NW24	WSW24	WSW24	WSW23	NW25	NW25	NNW23	NNW23	NNW21	NNW18	NNW11	NNW5	NNW6	NNW6	SW3	NW15.0	NW25
23-Jan	SW5	S3	SSE6	SSE8	S9	S8	S9	S9	S9	S9	S9	S10	S8	S9	SSW8	SSW8	WSW5	NW7	N8	N8	NNE6	N3	NNW5	NNW7	SSW3.5	S10
24-Jan	NNE5	ENE1	WSW8	SSW4	SSE5	S6	SSW6	SSW8	S5	SSW6	SW10	SW11	SW11	WSW12	NNW15	NW17	WSW15	NNW12	NW6	NNW8	NNW12	NNW9	NNW9	NW8	W5.3	NW17
25-Jan	NNW8	NNW9	NNW9	NW9	NW10	NW10	NNW7	NW8	NW8	NNW7	NNW7	NNW2	SW2	SW6	SW9	SW8	SSW6	S8	SSW9	SSW9	SSW9	SSW11	SSW11	SSW13	WSW4.0	SSW13
26-Jan	SSW16	WSW17	NNW20	W19	NNW26	NNW28	NNW28	NW28	NW29	NNW24	NNW23	N25	N19	NNW16	NNW18	NNW13	NNW17	NW14	NNW12	N13	NNE15	NNE18	NE18	NE17	NW14.9	NW29
27-Jan	NE17	NNE17	NNE17	NNE17	NE17	NE18	NE16	NNE15	NNE14	NNE14	NNE11	N9	N8	N9	NNW10	NNW9	NW8	NW8	N9	NNW7	NNW13	NNW11	NNW12	NNW16	N11.3	NE18
28-Jan	NNW14	NW17	NW19	NW16	NW16	NW17	NW20	NNW19	NNW19	NNW16	NNW18	NW22	NW19	NW19	NW21	NW20	NW19	NW19	NNW19	NNW22	NNW21	NNW21	NNW18	NNW16	NW18.0	NW22
29-Jan	NNW12	NNW12	NW11	NW9	NW8	NNW10	SW7	SW7	SSW8	SSW8	SW10	SW13	SW14	SW15	SSW15	SSW15	SSW16	SSW14	SSW12	SSW12	SW10	W10	NW11	NNW15	WSW7.5	SSW16
30-Jan	NNW14	NNW18	NNW16	NW13	NW11	NW10	NW10	NNW10	W9	SW6	W7	W7	WSW12	WSW13	WSW13	W12	WSW11	WSW9	SW6	SW6	SE2	UO	UO	UO	WNW7.9	NNW18
31-Jan	UO	ENE6	ENE8	E9	E7	ENE6	NE4	NNE4	NNE3	NE3	NE2	NW3	W5	WSW6	W6	WSW10	NW3	SE1	E1	SSW0	SW2	SW1	SE2	W8	NNE0.7	WSW10

SW3.5 SW3.1 SW3.3 SW3.5 SW3.3 SW3.3 SW4.1 SW3.9 SW3.5 SW3.4 SW4.1 SW4.1 SW4.8 SW4.8	WSW4.8	WSW4.7	SW4.5 SW3.7 SW3.3 SW3.2 SW3.0 SW3.1 SW3.3 SW3.4	Diurnal Average
NE17 NNW18 WNW20 W19 NNW26 NNW28 NNW28 NW28 NW29 NNW24 WNW24 N25 WNW23 NW25 NNW23 NNW23 NNW21 NNW19 NNW22 NNW21 NNW21 NNW18 NE17				Diurnal Maximum

UO - Unstable Operation
 All monthly, daily, and diurnal averages have been calculated using vector methods





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby North - January 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	216	29.79	29.79
6 - 11	343	47.31	77.10
12 - 19	139	19.17	96.28
20 - 28	26	3.59	99.86
29 - 38	1	0.14	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 725

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby North - January 2023**

Wind Speed Ranges (km/h)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	2	13	19	7	3	10	12	22	42	58	14	6	1	1	3	3	216
6 - 11	6	2	5	11	4	0	1	14	80	138	35	5	6	4	18	14	343
12 - 19	2	8	6	0	0	0	0	0	20	33	12	12	2	12	12	20	139
20 - 28	1	0	0	0	0	0	0	0	1	0	0	0	0	9	7	8	26
29 - 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	11	23	30	18	7	10	13	36	143	229	61	23	9	26	41	45	725

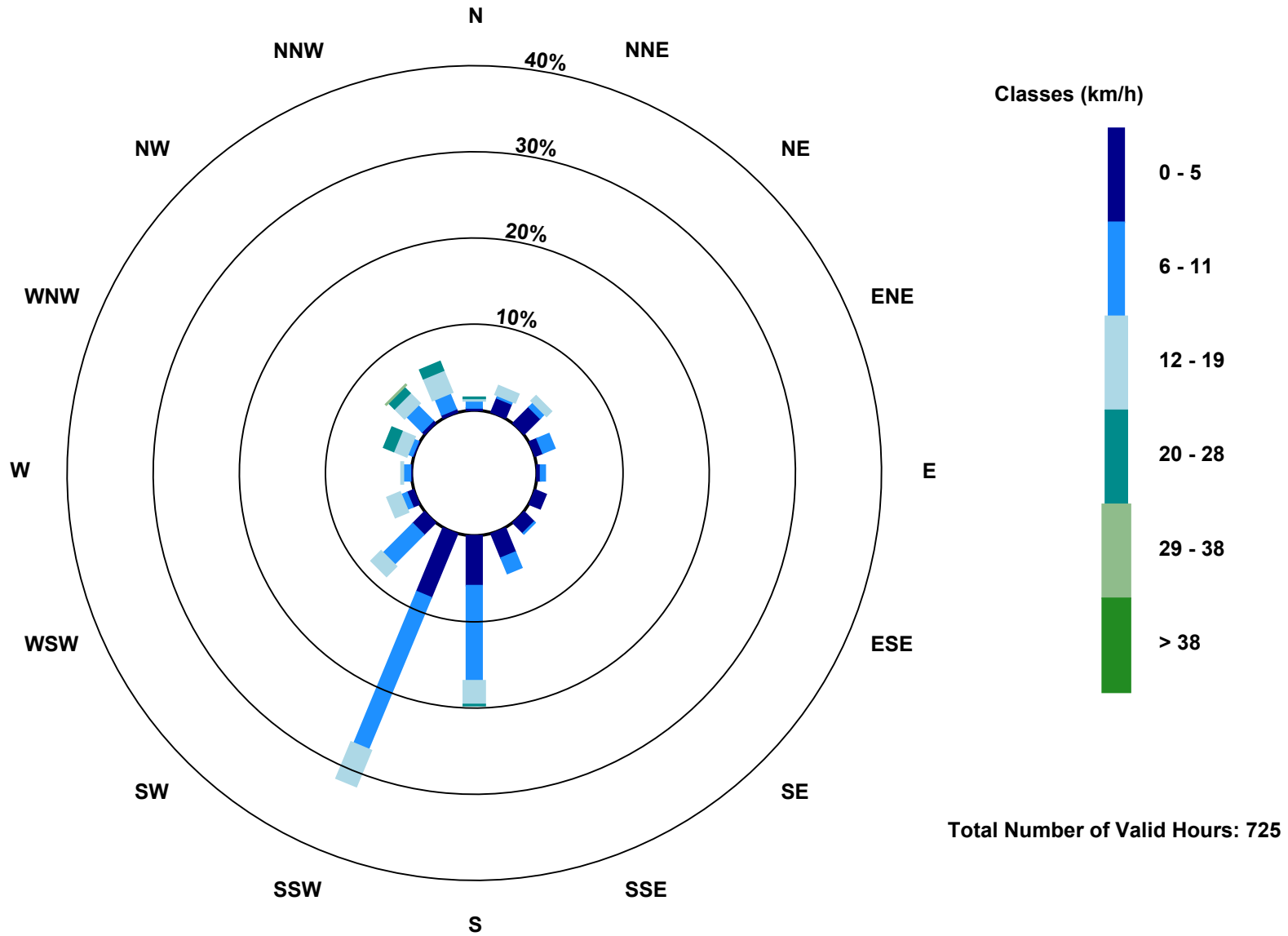
Total Number of Valid Hours: 725

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Jan 2023

Wind Speed (WS) - km/h
Kirby North





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Kirby North - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Jan 26 09:00 Minimum Value: 0 km/h on Jan 9 18:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6																		Hours in Service: 744 Hours of Data: 725 Hours of Missing Data: 19 Hours of Calibration: 0 Percent Operational Time: 97.5								
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3-Jan	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4-Jan	2	2	2	2	2	1	2	1	2	1	2	1	1	2	1	2	1	2	2	1	1	2	2	2	1	2
5-Jan	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	2	1	1	2	2	2	2	3	3	3	
6-Jan	3	3	4	5	5	5	4	4	4	4	4	4	5	4	4	3	4	4	3	3	3	2	3	3	5	
7-Jan	3	2	2	3	3	2	2	2	2	2	3	3	2	2	2	2	1	2	2	3	2	2	2	1	3	
8-Jan	1	2	1	2	2	2	2	3	1	2	2	3	2	1	1	2	2	1	1	2	2	1	1	1	3	
9-Jan	1	2	1	2	2	2	1	2	1	1	1	1	1	1	UO	UO	1	0	UO	UO	UO	UO	UO	UO	2	
10-Jan	UO	UO	UO	1	1	1	1	1	1	1	1	1	UO	1	1	1	0	1	1	1	1	0	1	1	1	
11-Jan	1	1	1	1	1	1	UO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
12-Jan	1	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	
13-Jan	2	2	1	1	1	1	UO	2	1	2	2	2	2	2	2	1	1	2	2	2	1	1	1	2	2	
14-Jan	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
15-Jan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16-Jan	UO	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	4	3	3	3	3	3	4	
17-Jan	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	4	3	3	2	3	4	
18-Jan	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2	3	
19-Jan	2	2	3	2	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	3	
20-Jan	2	2	2	2	2	2	2	1	1	2	2	3	3	3	3	3	2	2	2	2	2	2	2	1	3	
21-Jan	2	2	2	2	3	2	2	2	2	2	3	2	2	2	3	3	2	2	2	2	2	3	3	3	3	
22-Jan	3	3	3	3	3	3	4	4	6	6	6	6	6	7	7	7	6	6	5	4	2	1	2	3	7	
23-Jan	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	1	2	2	3	
24-Jan	1	2	2	2	2	1	1	2	1	2	2	3	2	2	4	4	3	3	2	3	3	2	2	3	4	
25-Jan	2	3	2	2	2	2	2	2	3	2	2	2	2	2	2	1	1	1	2	2	2	2	3	4	4	
26-Jan	4	4	5	4	6	7	7	7	9	7	6	6	5	5	5	4	5	3	3	3	3	4	3	3	9	
27-Jan	3	4	4	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	1	4	3	3	4	4	
28-Jan	3	6	5	5	4	4	5	5	4	4	5	6	5	6	5	5	5	6	5	5	6	6	5	4	6	
29-Jan	3	2	2	3	2	3	2	2	2	2	2	3	3	3	3	4	4	4	3	2	3	3	2	4	4	
30-Jan	4	5	5	3	4	2	3	3	4	2	2	2	3	3	3	3	2	3	2	2	1	UO	UO	UO	5	
31-Jan	UO	2	2	2	2	2	1	1	1	2	2	3	2	2	2	3	2	1	1	1	2	1	1	4	4	
Diurnal Maximum																										
4 6 5 5 6 7 7 7 9 7 6 6 6 7 7 7 6 6 5 5 6 6 5 4																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

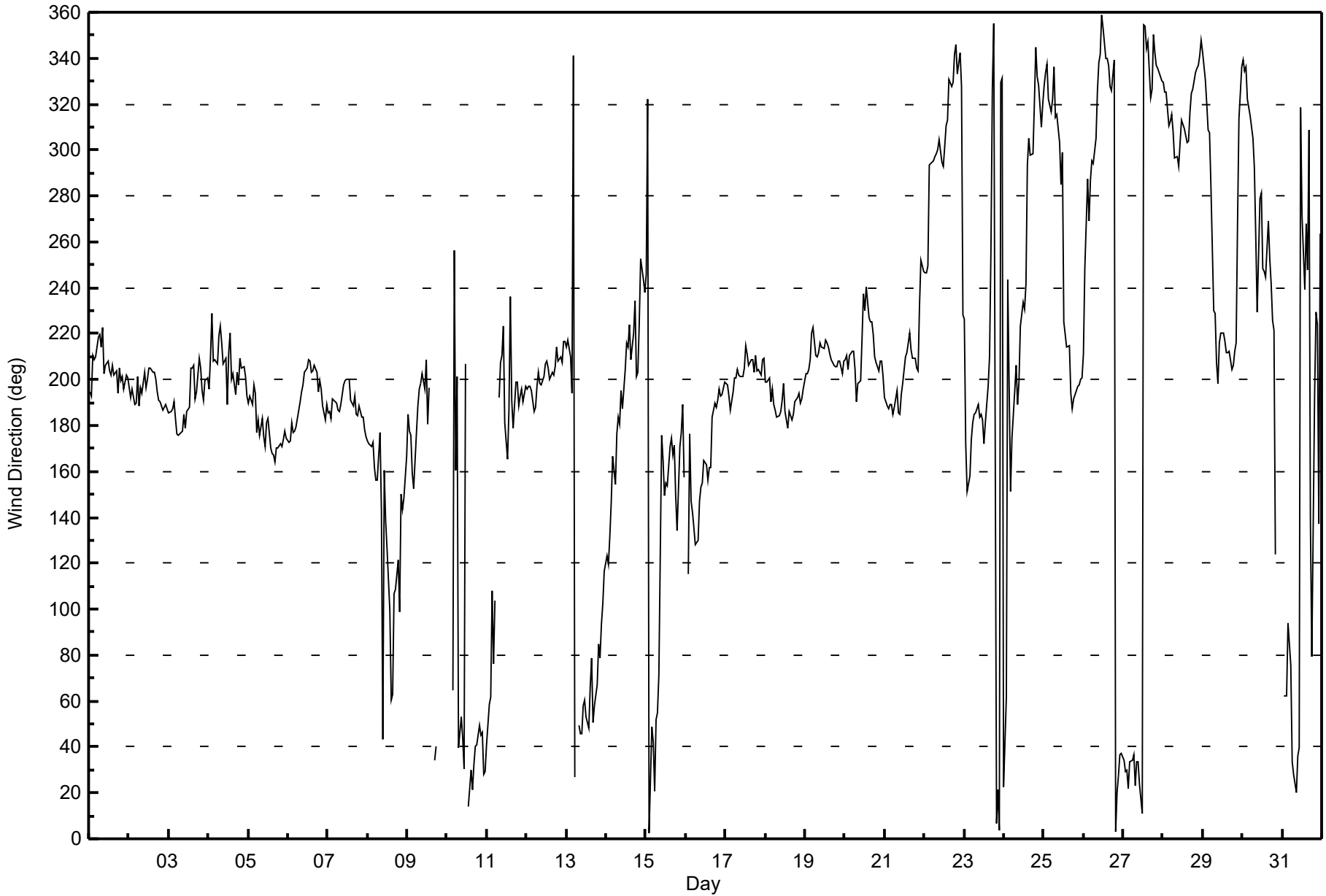
Kirby North - January 2023

Direction of Maximum Speed: 326 deg on Jan 26 09:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 317.4 deg on Jan 28																						Hours of Data: 725			
Direction of Minimum Speed: 193 deg on Jan 31 20:00											Direction of Minimum Daily Speed Average: 0.5 deg on Jan 15											Hours of Missing Data: 19			
Monthly Average Direction: 226.8 deg																						Percent Operational Time: 97.5			
Day	Hourly Period Ending At (MST)																								Daily Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Jan	195	193	210	208	210	219	220	214	223	203	206	208	204	202	206	202	204	194	205	200	201	196	202	201	205.5
2-Jan	196	192	196	189	190	201	189	196	194	203	197	200	205	205	203	203	200	195	191	190	187	188	189	187	194.8
3-Jan	185	186	187	191	183	177	176	177	178	185	179	186	188	205	205	206	192	194	210	205	195	191	199	201	189.6
4-Jan	196	210	229	208	209	207	219	223	216	207	209	189	212	220	200	203	194	203	197	209	205	206	202	193	207.8
5-Jan	190	193	189	198	194	177	183	175	183	175	171	181	183	170	168	167	164	170	170	172	171	174	178	175	175.4
6-Jan	172	173	181	177	178	179	187	191	194	198	203	205	209	208	203	204	206	203	195	200	196	189	183	189	192.3
7-Jan	186	186	183	192	190	190	187	186	189	198	199	200	200	200	191	188	193	185	184	189	184	183	178	175	188.9
8-Jan	174	172	171	173	162	156	156	177	143	44	161	138	126	99	60	63	107	109	122	99	150	144	148	167	146.8
9-Jan	185	178	176	160	153	177	188	196	198	203	196	209	181	196	UO	UO	34	41	UO	UO	UO	UO	UO	UO	-
10-Jan	UO	UO	UO	65	256	161	201	40	53	44	30	207	UO	14	30	21	32	40	41	50	45	46	28	29	39.5
11-Jan	41	59	62	108	76	104	UO	192	208	211	224	181	166	187	236	191	179	199	199	189	193	196	190	197	187.4
12-Jan	196	197	197	195	186	188	197	203	198	198	201	207	208	205	200	203	202	205	214	208	210	207	216	216	203.3
13-Jan	214	217	210	194	341	27	UO	50	46	46	58	60	53	48	66	79	51	58	67	85	79	94	103	116	71.5
14-Jan	123	119	132	146	167	155	176	183	181	195	187	204	216	214	224	209	220	234	201	203	225	253	244	238	190.2
15-Jan	246	322	3	49	42	21	52	55	72	176	164	150	155	154	171	174	167	171	150	134	171	177	189	157	141.3
16-Jan	UO	115	176	147	142	135	128	130	147	153	155	165	163	156	162	162	183	190	188	191	196	193	193	199	173.8
17-Jan	198	197	193	187	194	201	201	205	202	201	201	205	214	211	206	209	209	203	210	204	204	202	209	209	203.6
18-Jan	199	199	201	190	196	189	187	184	185	186	191	198	186	179	186	184	183	185	191	192	194	190	191	196	190.0
19-Jan	203	202	204	209	220	222	211	210	212	216	214	214	217	216	214	211	209	206	205	206	208	208	203	208	210.4
20-Jan	209	211	204	211	212	213	204	191	198	199	218	237	230	240	227	225	225	219	210	207	204	208	208	201	215.0
21-Jan	192	189	188	189	189	185	188	195	185	185	194	198	210	212	216	220	213	210	210	205	204	232	252	247	208.4
22-Jan	247	247	250	293	294	295	297	298	300	304	295	293	301	310	313	331	328	329	342	346	333	342	328	228	304.6
23-Jan	227	172	151	158	174	181	185	185	189	183	185	183	172	181	197	210	256	326	355	6	22	4	329	331	193.1
24-Jan	23	62	243	197	151	175	196	206	189	199	223	234	231	241	294	305	298	299	320	345	332	328	310	321	274.9
25-Jan	328	333	337	322	317	322	336	314	316	303	285	299	225	220	214	215	194	187	192	194	197	197	200	201	256.5
26-Jan	211	248	288	269	287	295	294	305	326	338	342	359	353	340	340	337	328	326	339	3	20	27	37	37	326.1
27-Jan	34	29	30	22	34	34	37	23	33	33	24	11	355	354	344	347	323	326	350	342	337	336	332	330	9.9
28-Jan	330	325	325	311	313	315	308	297	297	293	303	313	311	310	304	304	316	325	327	333	336	337	341	348	317.4
29-Jan	343	331	320	309	308	285	230	229	207	199	216	220	221	216	212	212	212	205	207	212	216	269	314	336	243.3
30-Jan	339	335	336	322	315	310	305	292	263	230	279	281	249	247	245	269	252	242	226	221	124	UO	UO	UO	284.9
31-Jan	UO	62	62	94	85	76	34	28	20	36	40	319	272	239	268	248	309	139	80	193	229	224	137	264	20.7
214.7 220.0 228.3 218.1 222.7 227.5 225.9 230.0 228.6 225.4 226.4 231.9 230.2 232.5 239.4 238.4 235.7 230.2 220.3 216.5 213.9 217.8 221.0 225.3																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Kirby North - January 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Kirby North - January 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0														Hours in Service: 744												
Maximum Value: 104 deg on Jan 10 05:00														Hours of Data: 725												
Minimum Value: 8 deg on Jan 8 00:00														Hours of Missing Data: 19												
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 15 Median = 17 Q ₃ = 21 P ₉₀ = 28 P ₉₉ = 79														Hours of Calibration: 0												
														Percent Operational Time: 97.5												
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Jan	22	18	15	17	15	13	14	17	20	14	21	24	16	17	20	17	17	13	13	14	14	13	13	15	24	
2-Jan	16	15	15	14	17	18	16	19	18	17	18	17	15	15	17	16	16	15	15	14	14	14	15	16	19	
3-Jan	15	16	15	14	14	14	13	13	13	14	14	16	16	19	18	16	17	15	16	14	12	15	16	28		
4-Jan	21	20	24	28	30	13	14	21	16	13	17	26	17	22	58	16	20	30	35	33	27	34	27	14	58	
5-Jan	15	15	17	12	18	50	16	13	9	8	12	16	16	16	15	16	16	17	16	19	16	17	18	18	50	
6-Jan	18	17	19	18	17	17	20	20	19	21	18	18	18	18	21	20	17	17	16	16	15	15	18	19	21	
7-Jan	15	14	14	15	15	13	12	12	12	14	16	17	21	18	20	27	12	12	12	14	15	10	9	8	27	
8-Jan	13	11	11	12	11	12	22	53	57	59	19	24	27	20	16	19	20	18	26	49	17	13	13	23	59	
9-Jan	11	10	10	34	44	52	15	23	22	24	20	61	73	25	UO	UO	83	10	UO	UO	UO	UO	UO	UO	83	
10-Jan	UO	UO	UO	93	104	101	69	18	36	36	66	58	UO	40	50	20	14	12	UO	11	16	15	16	13	13	104
11-Jan	13	20	42	40	40	43	UO	52	45	16	16	57	29	31	16	26	21	23	23	22	23	24	22	22	57	
12-Jan	22	23	22	22	19	19	21	21	21	21	20	20	18	19	22	19	21	20	17	18	18	18	16	16	23	
13-Jan	16	18	17	22	95	21	UO	11	10	14	14	16	16	15	16	20	14	15	18	19	17	19	19	18	95	
14-Jan	18	17	20	17	26	18	19	16	18	22	19	19	19	16	17	16	23	18	19	22	16	18	17	17	26	
15-Jan	22	45	23	29	17	20	24	17	53	54	63	20	22	33	21	20	18	19	22	44	19	65	20	50	65	
16-Jan	UO	55	19	15	18	20	17	21	27	17	19	19	18	17	20	20	20	21	20	20	22	22	21	22	55	
17-Jan	24	21	24	21	24	23	25	19	21	21	21	19	17	21	20	19	19	20	18	19	18	21	19	19	25	
18-Jan	22	22	21	20	23	22	20	19	20	19	22	22	22	19	19	18	18	17	19	18	16	19	18	19	23	
19-Jan	19	17	16	15	16	15	16	15	14	14	17	18	16	17	15	14	15	15	16	15	14	15	18	15	19	
20-Jan	15	16	16	15	15	14	16	14	17	16	18	13	17	12	14	12	12	12	14	14	14	13	12	13	18	
21-Jan	21	25	34	21	34	20	16	16	15	19	26	18	15	15	14	13	14	14	14	14	18	13	13	11	34	
22-Jan	11	14	15	15	14	13	15	15	15	15	14	15	16	15	16	17	16	16	17	19	21	16	26	49	49	
23-Jan	18	44	25	13	18	15	16	16	20	18	19	18	16	19	19	16	39	23	16	16	16	22	36	21	44	
24-Jan	21	74	13	53	27	19	18	16	18	18	17	13	14	14	23	15	14	14	20	20	15	16	16	16	74	
25-Jan	16	17	16	15	17	20	17	21	17	22	23	75	83	25	16	16	17	13	15	18	16	17	17	20	83	
26-Jan	15	19	16	16	15	16	15	17	17	21	18	19	19	19	18	22	15	15	18	18	12	14	13	11	22	
27-Jan	11	11	13	13	11	12	14	16	15	14	15	19	22	19	20	15	14	15	19	18	16	15	16	14	22	
28-Jan	14	16	16	17	15	15	14	14	14	15	17	16	16	16	17	17	16	17	15	16	18	17	18	18	18	
29-Jan	16	12	13	15	15	23	21	21	16	18	16	13	13	14	14	15	15	16	15	14	18	25	16	16	25	
30-Jan	18	17	16	17	16	14	15	16	25	27	25	29	15	12	12	19	18	15	20	22	45	UO	UO	UO	45	
31-Jan	UO	14	17	16	17	20	31	16	33	49	32	43	47	27	33	14	72	60	49	96	55	80	55	23	96	
Diurnal Maximum																										
UO - Unstable Operation																										



End of Report