

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

REPORT HISTORY

Original report release data: September 29, 2023

Revised report release date: November 30, 2023

Revision 1 –Revision of PM2.5 data at Barge Landing and Fort Mckay South

Following the installation of the updated firmware, the PM2.5 data collected at Barge Landing (AMS 9) and Fort Mckay South (AMS 13) air monitoring stations in August 2023 was recalculated under the assumption that the alignment factor was automatically applied to the data. The WBEA discovered that the instrument's alignment factor setting was not activated, and that the recalculation initially made was not necessary. A revision was made to the PM2.5 data on November 30, 2023. In consideration of the revised data, the ground-level concentration exceedances summary, station summary, network summary, and cover letter for the monthly report were updated and resubmitted to the Electronic Transfer System (ETS) on November 30, 2023.



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Wood Buffalo Environmental Association

AUGUST 2023 MONTHLY REPORT

CONTINUOUS MONITORING

November 30, 2023

Revision 01

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





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November 30, 2023

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

Enclosed is the August 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	AMS505 - Sawbones Bay
AMS17 - Wapasu	AMS507 – Kirby South

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):



Industry Operators

Athabasca Oil Corporation
Canadian Natural

EPEA Approval No.

289664-00-00; 241311-00-00
149968-01-00; 153125-01-00;
20809-02-00; 224816-01-00; 228044-00-00;
237382-00-00

Cenovus Energy Inc.

48522-01-00

ChemTrade Logistics

404827-00-00

CNOOC International

137467-01-00; 236394-00-00

Connacher Oil and Gas Ltd.

240008-00-00

ConocoPhillips

48263-01-00

Fort Hills Energy Corporation

151469-01-00

Hammerstone Corporation

189942-00-00

Harvest Operations Corp.

246984-01-00

H.J. Baker Sulphur Canada ULC

426549-00-00

Husky Oil Operations Ltd.

206355-01-00

Imperial Oil Ltd.

00046586-00-00

Inter Pipeline Ltd.

73203-02-00

Keyera Energy Ltd.

187-03-00

MEG Energy Corp.

00216466-01-00

Parsons Creek Aggregates

231302-00

PetroChina Canada Ltd.

254465-00-00

Suncor Energy Inc.

094-02-00; 80105-01-00

Sunshine Oilsands Ltd.

305529-00-00

Surmont Energy

318401-00-00

Syncrude Canada Ltd.

026-02-00

Titan Tire Reclamation Corporation

364232-00-00

Government and Non-Government Organizations

Alberta Energy Regulator

Health Canada

Alberta Environment and Protected Areas

Keyano College

Alberta Health

Parks Canada

Alberta Health Services

Regional Municipality of Wood Buffalo

Environment and Climate Change Canada

Indigenous Communities

Athabasca Chipewyan First Nation

Fort McKay First Nation

Chard Métis Nation

Fort McMurray 468 First Nation

Chipewyan Prairie Dene First Nation

Fort McKay Métis

Christina River Dene Nation Council

Lakeland Métis

Conklin Resource Development Advisory
Council

McMurray Métis

Mikisew Cree First Nation

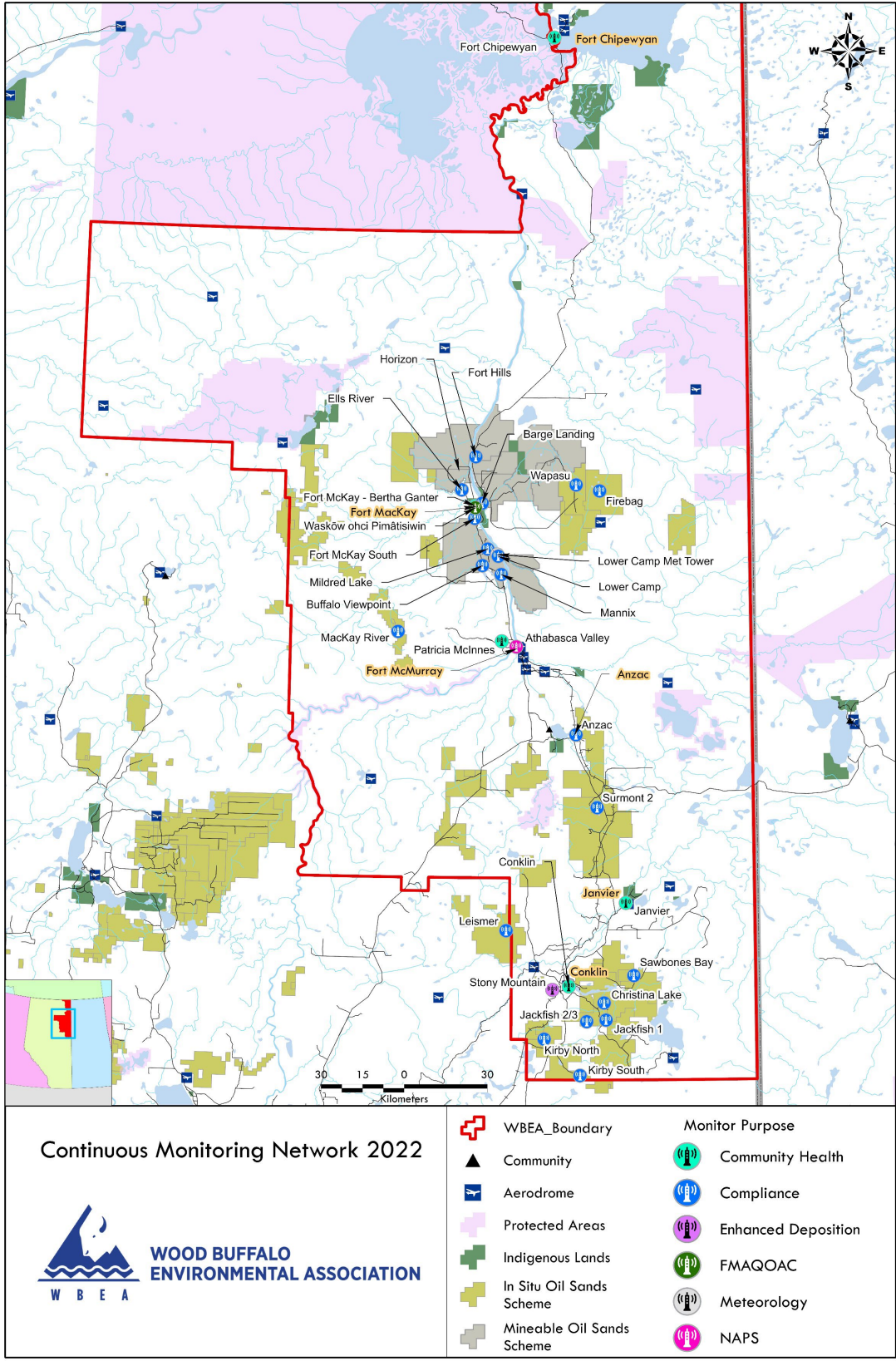


Figure 1: Map of WBEA Continuous Monitoring Network

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, TRS, and SO₂.

There were five ground-level concentrations in excess of the 1-hour H₂S objective reported to AEPA; following data validation and processing, four of these exceedances were confirmed.

There was one ground-level concentrations in excess of the 1-hour O₃ objective reported to AEPA; following data validation and processing, the one exceedance was confirmed.

There were one thousand six hundred seventeen ambient ground-level concentrations in excess of the 1-hour PM_{2.5} guideline reported to AEPA; following data validation and processing, seven exceedances were retracted, and one thousand six hundred ten were confirmed.

There were two hundred twenty-six ambient ground-level concentrations in excess of the 24-hour PM_{2.5} objective reported to AEPA; following data validation and processing, two hundred and twenty-six were confirmed.

There was one ground-level concentrations in excess of the 24-hour TSP objective reported to AEPA; following data validation and processing, the exceedance was confirmed.

There were one ground-level concentrations in excess of the 30-day dustfall guideline reported to AEPA; following data validation and processing, the exceedance was confirmed.

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

*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 are raw values. The final values are determined after processing data for reporting. For all parameters, except PM_{2.5}, the final 5-minute data values are 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 are then rounded to one decimal place greater than the reporting precision indicated in the Air Monitoring Directive (AMD). The final 1-hour data values are calculated from final 5-minute data values and then rounded to reporting precision. The final 24-hour data values are calculated from final 1-hour values.

After data processing and validation, NO₂ concentrations are re-calculated from baseline-corrected NO_x and NO concentrations. Specifically, the NO concentration is 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 August 2023, there were five instances that resulted in monitoring instruments operating less than 90% of the time.

1. The wind speed and wind direction sensor at Lower Camp AMS operated less than 90% of July and August 2023, which is a contravention of Clause DQ 4-C, of Chapter 6 of the Air Monitoring Directive (2016, as amended). This incident was reported to Alberta Environment and Protected Areas (AEPA) on August 17, 2023 (reference number 417947).

During the daily system check on August 16, the WBEA identified the wind direction was not comparing well with nearby sites and initiated a site visit that day. The WBEA determined that the sensor had been out of alignment since the previous calibration on July 21. The sensor was aligned and secured properly, and the issue was rectified. During the monthly data validation process, 246 hours and 369 hours of data were invalidated for the months of July and August, respectively, due to this incident.

2. The relative humidity (RH) sensor at the Sawbones Bay air monitoring station (AMS) operated less than 90% of August 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 September 7, 2023 (reference number 419001).

During routine daily system checks, it was identified that the RH measurements were over-ranging periodically, with the output signal of the sensor displaying values beyond 100%. The relative humidity sensor data was invalidated during periods of time when measurements were found to be inconsistent with other comparable RH sensors in the WBEA ambient network. Therefore, RH data at Sawbones Bay AMS has been invalidated for 104 hours in August. The relative humidity sensor was replaced on August 30, with normal operations resuming at 10:00 MST.

3. The NO₂ analyzer at Sawbones Bay AMS operated less than 90% of August 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 September 22, 2023 (reference number 419826).

On August 2, the daily QA check failed to meet the AMD operational criteria for the NO₂ analyzer. The WBEA determined it was due to a degrading sample pump and conducted maintenance to replace the sample pump the following day. After maintenance, the analyzer was left to stabilize overnight, and a multi-point calibration was conducted on August 4. Data was invalidated to the last acceptable span, on July 30, resulting in 81 hours of downtime.

4. The NH₃ analyzer at Patricia McInnes air monitoring station (AMS) operated less than 90% of August 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 September 28, 2023 (reference number 420096).

There were two issues associated with the operation of the NH₃ analyzer, contributing to 104 hours of downtime in August:

- The AMD specifies the range at which the daily spans and monthly calibration are conducted on the NH₃ analyzer. The NH₃ analyzer requires additional time to stabilize to ambient conditions following daily spans and routine monthly multipoint calibrations at the range required by the AMD. This additional stabilization time is necessary and expected for this type of analyzer after exposure to high concentrations of NH₃ gas. As a result, it may take multiple hours before the response returns to normal. In the month of August, the additional stabilization time after the spans resulted in a total of 87 hours of invalid data.
 - On August 2, the sample pump was replaced as a preventative maintenance measure for the NH₃ analyzer. After maintenance, the analyzer was left to stabilize overnight, and a multi-point calibration was conducted on August 3, which resulted in an additional 17 hours of invalid data.
5. The barometric pressure (BP) sensor at Athabasca Valley AMS operated less than 90% of August 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 September 22, 2023 (reference number 419808).

On August 28, following a station power outage, the BP sensor signal flatlined. The WBEA reset the sensor, verified its performance, and resolved the issue on September 1, 2023. The unstable operations due to flatlined signal in August resulted in 90 hours of invalid data.

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 2023 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, and this is an inherent behavior in the NH₃ analyzer operations due to the properties of the NH₃ gas. Data for 1 to 2 hours following the daily spans have been reported as invalid for a total of 33 hours this month.

Cleaning of the sample manifold on August 25 interrupted the normal operations of all gaseous analyzers, except for the NO₂ analyzer, which was being calibrated at the time, for 2 hours.

A flatline in the output signal of the NH₃ analyzer on August 3 and 4 resulted in 18 hours of invalid data. Subsequent maintenance to reboot the NH₃ analyzer on August 4 resulted in a further 1 hour of downtime.

A flatline in the output signal of the wind sensor on August 21, 28 and 30 resulted in 4 hours of invalid data.

The surface leaf wetness sensor operated out of range on August 3 and 6 resulting in 9 hours of invalid data.

Station 2, Mildred Lake

Cleaning of the sample manifold on August 30 interrupted the normal operations of the SO₂ and THC/NMHC/CH₄ analyzers for 2 hours.

A flatline in the output signal of the wind sensor on August 6 and 22 resulted in 2 hours of invalid data.

Station 3, Lower Camp – Meteorology

Failure to record data for all the meteorological sensors on August 2 and 9 resulted in 10 hours of invalid data.

A flatline in the output signal of the wind sensor, wind direction and vertical wind speed at 100-meter on August 10 resulted in 1 hour of invalid data.

Station 4, Buffalo Viewpoint

Failure to record data for the PM_{2.5} analyzer on August 31 resulted in 1 hour of invalid data.

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

Station 5, Mannix

No operational issues to report.

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 87 hours this month.

Maintenance to replace sample pump, and the stabilization period of the analyzer on August 2 and 3 interrupted the normal operations of the NH₃ analyzer resulting in 17 hours of downtime.

Cleaning of the sample manifold on August 24 interrupted the normal operations of all gaseous analyzers for 1 hour.

Maintenance to replace the support gas cylinder on August 24 interrupted the normal operations of the THC/NMHC/CH₄ analyzer resulting in 2 hours of downtime.

Maintenance to replace the SO₂ scrubber beads of the TRS analyzer on August 28 to improve the daily span response resulted in 5 hours of downtime.

The daily span checks for the TRS analyzer were outside the 10% AMD criteria on August 26 to 28 due to over saturation of the SO₂ scrubber beads.

Station 7, Athabasca Valley

A flatline in the output signal of the THC/NMHC/CH₄ analyzer on August 19 and 20 resulted in 23 hours of invalid data. Subsequent maintenance to reboot the THC/NMHC/CH₄ analyzer on August 20 resulted in a further 1 hour of downtime.

A flatline in the output signal of the CO₂ analyzer on August 21 and 22 resulted in 25 hours of invalid data. Subsequent maintenance to reboot the CO₂ analyzer on August 22 resulted in a further 1 hour of invalid data.

Station power failure on August 28 interrupted the normal operations of all air quality analyzers for 28 hours.

Cleaning of the sample manifold on August 28 interrupted the normal operations of all gaseous analyzers for 1 hour.

Unstable operations of the THC/NMHC/CH₄ analyzer due to depletion of the support gases on August 29 resulted in 7 hours of invalid data. Subsequent maintenance to replace the support gas of THC/NMHC/CH₄ analyzer on August 29 resulted in additional 2 hours of downtime.

A flatline in the output signal of the barometric pressure sensor on August 29 resulted in 90 hours of invalid data.

Unstable operations due to excessive baseline noise in the output signal of the O₃ analyzer on August 29 resulted in 2 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 August. Therefore, the calibrator zeros from the July, August and September multi-point calibrations were used to validate the analyzer baseline response.

Station 8, Fort Chipewyan

A flatline in the output signal of the SO₂ analyzer on August 3 and 4 resulted in 16 hours of invalid data. Subsequent maintenance to reboot the SO₂ analyzer on August 4 resulted in a further 1 hour of downtime.

A flatline in the output signal of the CO analyzer on August 5 and 30 resulted in 25 hours of invalid data.

Station power failure on August 12 interrupted the normal operations of all air quality analyzers for 1 hour.

Cleaning of the sample manifold on August 24 interrupted the normal operations of all gaseous analyzers, except for the TRS analyzer, for 1 hour.

Maintenance to replace sample pump, and the stabilization period of the analyzer on August 28 and 29 interrupted the normal operations of the NO₂ analyzer resulting in 23 hours of downtime.

Failure to record data for the CO₂ analyzer on August 30 resulted in 1 hour of invalid data.

The daily span checks of all gaseous analyzer were outside the 10% AMD criteria on August 31 due to an interruption in the station calibrator configuration.

Station 9, Barge Landing

Unstable operations on August 1 due to excessive baseline noise in the output signal of the THC/NMHC/CH₄ analyzer resulting in 9 hours of invalid data.

Failure to record data for the atmospheric temperature sensor throughout the month resulted in 3 hours of invalid data.

A flatline in the output signal of the wind sensor on August 2 resulted in 1 hour of invalid data.

The daily span checks for the TRS analyzer were outside the 10% AMD criteria for multiple days in the month of August due to high atmospheric humidity.

Station 11, Lower Camp

Station power failure on August 2 interrupted the normal operations of all air quality analyzers for 5 hours.

Cleaning of the sample manifold on August 29 interrupted the normal operations of the H₂S, and THC/NMHC/CH₄ analyzers for 1 hour.

The relative humidity sensor operated out of range throughout the month resulting in 28 hours of invalid data.

Unstable operations due to misalignment of the wind cross-arm from August 1 through 16 resulted in 369 hours of invalid data. Subsequent maintenance to re-align the wind cross-arm on August 16 resulted in an additional 4 hours of downtime.

A flatline in the output signal of the wind sensor on August 22 resulted in 1 hour of invalid data.

Station 13, Fort McKay South

A flatline in the output signal of the wind sensor on August 30 resulted in 1 hour of invalid data.

Station 14, Anzac

Note: The multi-point as founds on August 4 were not completed during the TRS routine calibration and calibration gas replacement due to an issue with the in-situ calibrator setup, which was replaced on August 3.

Maintenance to verify the daily QA check on August 4 interrupted the normal operations of the TRS analyzer for 1 hour.

Maintenance to verify the daily QA check on August 14 and 28 interrupted the normal operations of all gaseous analyzers for 2 to 3 hours.

Cleaning of the sample manifold on August 15 interrupted the normal operations of the O₃, SO₂, TRS, and THC/NMHC/CH₄ analyzers for 1 hour.

An internal audit on August 16 and 17 interrupted the normal operations of all air quality analyzers for 1 to 5 hours.

Station power failure on August 25 and 30 interrupted the normal operations of all air quality analyzers for 8 to 9 hours.

Maintenance to verify the daily QA check on August 27 interrupted the normal operations of the SO₂ analyzer for 1 hour.

Maintenance to verify the daily QA check on August 30 interrupted the normal operations of the TR_s analyzer for 1 hour.

The relative humidity sensor operated out of range throughout the month resulting in 21 hours of invalid data.

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

Maintenance to replace the wind speed sensor cable on August 21 and 22 resulted in 20 hours of downtime.

Sensor failure due to a non-operational wind speed analyzer on August 22 and 23 resulted in 19 hours of invalid data. A subsequent maintenance to replace the wind speed sensor on August 23 resulted in an additional 2 hours of downtime.

The daily span check of all gaseous analyzers was outside the 10% AMD criteria for multiple days throughout the month due to an interruption in the station calibrator configuration.

Station 17, Wapasu

Failure to record data for the PM_{2.5} analyzer on August 5 resulted in 1 hour of invalid data.

Analyzer failure of the O₃ analyzer due to a sample pump failure on August 30 and 31 resulted in 30 hours of invalid data. Subsequent maintenance to replace the sample pump on August 31 resulted in additional 3 hours of downtime.

A flatline in the output signal of the wind sensor on August 22 resulted in 1 hour of invalid data.

Station 18, Stony Mountain

Unstable operations due to excessive baseline drift in the output signal of the THC/NMHC/CH₄ analyzer on August 9 and 10 resulted in 34 hours of invalid data.

Maintenance to replace the support gas cylinder on August 23 interrupted the normal operations of the THC/NMHC/CH₄ analyzer resulting in 2 hours of downtime.

Maintenance to replace the actuator on August 26 interrupted the normal operations of the THC/NMHC/CH₄ analyzer for 4 hours.

Unstable operations of the NO₂ analyzer due to station temperature fluctuation on August 29 and 30 resulted in 23 hours of invalid data.

Unstable operation due to flatline signal of the CO₂ analyzer on August 30 and 31 resulted in 32 hours of invalid data. Subsequent maintenance to replace the CO₂ analyzer on August 31 resulted in an additional 5 hours of downtime.

The surface leaf wetness sensor operated out of range on August 11 resulting in 1 hour of invalid data.

Unstable operations due to inconsistent response of the wind sensor on August 25 and 26 resulted in 10 hours of invalid data.

The daily span check of THC/NMHC/CH₄ analyzer was outside the 10% AMD criteria on August 23 due to an interruption in the station calibrator configuration.

Station 19, Firebag

Cleaning of the sample manifold on August 16 interrupted the normal operations of H₂S, SO₂ and THC analyzers for 1 hour.

A flatline in the output signal of the THC on August 26 resulted in 53 hours of invalid data. Subsequent maintenance to reboot the analyzer on August 28 and to perform a multipoint verification check to address the THC baseline drifting on August 29 resulted further in 5 hours of downtime.

The relative humidity sensor operated out of range throughout the month resulting in 12 hours of invalid data.

Station 20, MacKay River

Maintenance to verify the daily QA check on August 8 interrupted the normal operations of the H₂S analyzer for 2 hours.

Cleaning of the sample manifold on August 8 interrupted the normal operations of NO₂ analyzer for 1 hour.

A flatline in the output signal of the wind sensor on August 6 and 7 resulted in 2 hours of invalid data.

Station 21, Conklin

Maintenance to verify the daily QA check on August 16 interrupted the normal operations of the O₃ analyzer for 1 hour.

Cleaning of the sample manifold on August 17 interrupted the normal operations of all gaseous analyzers for 1 hour.

Unstable operation due to inconsistent response of the PM_{2.5} analyzer on August 18 resulted in 9 hours of invalid data. Subsequent maintenance to replace the PM_{2.5} analyzer on August 18 resulted in an additional 1 hour of downtime.

A flatline in the output signal of the wind sensor on August 2, 22 and 29 resulted in 3 hours of invalid data.

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

The daily span check of NO₂ and O₃ analyzers was outside the 10% AMD criteria on August 16 and 17 due to an interruption in the station calibrator configuration.

Station 22, Janvier

The daily span checks for the TRS analyzer were outside the 10% AMD criteria for multiple days in the month of August due to high atmospheric humidity. QA checks were initiated for the days span was below the 10% AMD criteria to verify the performance of the analyzer which resulted in 7 hours of invalid data in August.

Unstable operation due to inconsistent response of the PM_{2.5} analyzer on August 10 and 11 resulted in 16 hours of invalid data. Subsequent maintenance to reboot the PM_{2.5} analyzer on August 11 resulted in an additional 1 hour of downtime.

Cleaning of the sample manifold on August 17 interrupted the normal operations of NO₂, O₃, and TRS analyzers for 1 hour.

Maintenance to replace the SO₂ scrubber beads of the TRS analyzer on August 29 to improve the daily span response resulted in 5 hours of downtime.

Maintenance to troubleshoot the TRS analyzer whilst replace the zero-air generator on August 31 to help improve the daily span response resulted in 7 hours of invalid data.

A flatline in the output signal of the wind sensor on August 22 and 30 resulted in 2 hours of invalid data.

Station 23, Fort Hills

Cleaning of the sample manifold on August 17 interrupted the normal operations of the NO₂, SO₂, and THC/NMHC/CH₄ for 1 hour.

Failure to record data for all parameters on August 26 resulted in 1 hour of invalid data.

Station power failure and the maintenance to reset the station modem on August 26 and 27 interrupted the normal operations of all air quality analyzers for 26 hours.

A flatline in the output signal of the wind sensor on August 12 resulted in 1 hour of invalid data.

Station 25, Waskōw ohci Pimâtisiwin

Intermittent flatlines in the output signal of the wind sensors throughout the month resulted in 11 hours of invalid data.

Station 26, Christina Lake

Failure to record data for all parameters on August 8 resulted in 2 hours of downtime.

Maintenance to reset the logger and the modem on August 9 interrupted the normal operation of all parameters for 1 hour.

Cleaning of the sample manifold on August 17 interrupted the normal operations of the H₂S and SO₂ analyzer for 1 hour.

Station 27, Jackfish 2/3

Cleaning of the sample manifold on August 2 interrupted the normal operations of the NO₂ and SO₂ analyzers for 1 hour.

A flatline in the output signal of the wind sensor on August 30 resulted in 1 hour of invalid data.

Station 29, Surmont 2

Cleaning of the sample manifold on August 8 interrupted the normal operations of the H₂S, and NO₂ analyzers for 2 hours.

The relative humidity sensor operated out of range on throughout the month resulting in 24 hours of downtime.

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

Station 30, Ells River

The daily span checks for the TRS analyzer were outside the 10% AMD criteria for multiple days in the month of August due to high atmospheric humidity.

Unstable operations due to excessive baseline drift in the output signal of the SO₂ analyzer from August 1 through August 3 resulted in 48 hours of invalid data.

Maintenance to reset the logger and the modem on August 4 interrupted the normal operation of all parameters for 1 hour.

Cleaning of the sample manifold on August 9 interrupted the normal operations of the SO₂, THC/NMHC/CH₄, and TRS for 1 hour.

Maintenance to replace the support gas cylinder on August 14 interrupted the normal operations of the THC/NMHC/CH₄ analyzer resulting in 3 hours of downtime.

Maintenance to verify the daily QA check on August 31 interrupted the normal operations of the TRS analyzer for 1 hour.

A flatline in the output signal of the wind sensor on August 2 resulted in 1 hour of invalid data.

Station 505, Sawbones Bay

Analyzer failure of the NO₂ analyzer due to a sample pump failure on August 1 to 3 resulted in 56 hours of invalid data. Subsequent maintenance and stabilization period to replace the sample pump on August 3 and 4 resulted in additional 24 hours of downtime.

Maintenance to remotely troubleshoot the NO₂ analyzer on August 2 resulted in 1 hour of invalid data.

The relative humidity sensor operated out of range on throughout the month resulting in 104 hours of invalid data.

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

Station 507, Kirby South

Unstable operations due to excessive baseline noise in the output signal of the SO₂ analyzer on August 21 and 22 resulted in 16 hours of invalid data. Subsequent maintenance to reboot and conduct a QA check on August 22 resulted in an additional 4 hours of downtime.

If additional information is required, please contact the Wood Buffalo Environmental Association at (780) 799-4420.

Yours sincerely,

Wood Buffalo Environmental Association

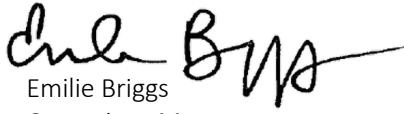
The representative of the Person Responsible for this monitoring program is Emilie Briggs, Operations Manager, WBEA.

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.

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

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

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe, and the specified analysis, summarization, and reporting requirements.



Emilie Briggs
Operations Manager
Wood Buffalo Environmental Association
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Fort McMurray AB T9K 0K4
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WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

August 2023

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Created: November 24 2023 10:19:00

APPROVAL NUMBERS	REPORT DATE						
	MONTH	YEAR					
289664-00-00	8	2023					
241311-00-00	CONTINUOUS AMBIENT MONITORING						
20809-02-00							
149968-01-00							
237382-00-00				ONE-HOUR AVERAGE		24-HOUR AVERAGE	
48522-01-00	PARAMETER	STN. NO.	% TIME OPERATIONAL	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION	MAXIMUM CONCENTRATION	NO. READINGS > REGULATION
240008-00-00	SO2(ppb)	1	100	16	0	4.4	0
48263-01-00	SO2(ppb)	2	100	45.1	0	7.7	0
224816-00-00	SO2(ppb)	4	100	12.3	0	2.7	0
151469-01-00	SO2(ppb)	5	100	68.3	0	13.3	0
189942-00-00	SO2(ppb)	6	100	13.5	0	3.2	0
206355-00-00	SO2(ppb)	7	99	11.5	0	2.0	0
46586-00-00	SO2(ppb)	8	97	4.9	0	1.7	0
73203-02-00	SO2(ppb)	9	100	13.6	0	3.0	0
216466-01-00	SO2(ppb)	11	99	83.3	0	7.2	0
137467-01-00	SO2(ppb)	13	100	24.6	0	5.5	0
236394-00-00	SO2(ppb)	14	98	5.9	0	1.1	0
254465-00-00	SO2(ppb)	17	100	28.0	0	5.3	0
094-03-00	SO2(ppb)	18	100	2.5	0	0.7	0
80105-01-00	SO2(ppb)	19	100	35.6	0	5.5	0
305529-00-00	SO2(ppb)	20	100	19.6	0	3.4	0
318401-00-00	SO2(ppb)	21	100	2.8	0	0.6	0
026-03-00	SO2(ppb)	22	100	0.9	0	0.3	0
364232-00-00	SO2(ppb)	23	96	20.3	0	3.3	0
228044-00-00	SO2(ppb)	25	100	16.3	0	3.6	0
247548-00-00	SO2(ppb)	26	99	30.7	0	4.9	0
231302-00-00	SO2(ppb)	27	100	5.3	0	1.5	0
153125-01-00	SO2(ppb)	29	100	7.9	0	0.7	0
	SO2(ppb)	30	93	43.7	0	6.3	0
	SO2(ppb)	505	100	11.1	0	2.8	0
	SO2(ppb)	507	97	9.7	0	2.3	0
	H2S(ppb)	1	100	2.4	0	0.9	0
	H2S(ppb)	2	100	5.1	0	1.4	0
	H2S(ppb)	4	100	2.8	0	1.3	0
	H2S(ppb)	5	100	14.3	2	2.9	0
	H2S(ppb)	11	99	16.4	2	2.9	0
	H2S(ppb)	17	100	3.7	0	0.5	0
	H2S(ppb)	19	100	4.2	0	0.5	0
	H2S(ppb)	20	100	2.8	0	0.7	0
	H2S(ppb)	25	100	2.3	0	0.9	0
	H2S(ppb)	26	99	2.7	0	0.8	0
	H2S(ppb)	27	100	0.8	0	0.5	0
	H2S(ppb)	29	100	1.0	0	0.5	0
	H2S(ppb)	505	100	1.7	0	0.5	0
	H2S(ppb)	507	100	1.0	0	0.4	0
	TRS(ppb)	1	100	2.5	0	1.2	0
	TRS(ppb)	6	99	3.2	0	1.2	0
	TRS(ppb)	7	99	4.7	0	1.7	0
	TRS(ppb)	8	100	3.5	0	1.2	0
	TRS(ppb)	9	100	2.5	0	1.1	0
	TRS(ppb)	13	100	3.7	0	1.1	0
	TRS(ppb)	14	98	1.4	0	0.6	0
	TRS(ppb)	18	100	1.2	0	0.5	0
	TRS(ppb)	21	100	1.3	0	0.8	0
	TRS(ppb)	22	97	0.6	0	0.3	0
	TRS(ppb)	23	96	1.9	0	0.7	0
	TRS(ppb)	30	100	2.6	0	0.8	0
	THC(ppm)	1	100	4.2	-	2.8	-
	THC(ppm)	2	100	4.3	-	2.7	-
	THC(ppm)	4	100	4.7	-	3.2	-
	THC(ppm)	5	100	5.6	-	3.6	-
	THC(ppm)	6	100	2.8	-	2.4	-
	THC(ppm)	7	95	3.9	-	3.0	-
	THC(ppm)	9	99	3.7	-	2.7	-
	THC(ppm)	11	99	3.5	-	2.7	-
	THC(ppm)	13	100	4.0	-	2.9	-
	THC(ppm)	14	98	2.9	-	2.6	-
	THC(ppm)	17	100	3.4	-	2.6	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

August 2023
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Created: November 24 2023 10:19:00

REPORT DATE							
MONTH	YEAR						
8	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)	18	95	2.3	0	2.2	-
241311-00-00	THC(ppm)	19	92	3.2	0	2.5	-
20809-02-00	THC(ppm)	20	100	3.3	0	2.8	-
149968-01-00	THC(ppm)	21	100	4.5	0	2.7	-
237382-00-00	THC(ppm)	22	100	2.5	0	2.2	-
48522-01-00	THC(ppm)	23	96	8.8	0	3.8	-
240008-00-00	THC(ppm)	29	100	3.0	0	2.6	-
48263-01-00	THC(ppm)	30	99	4.2	0	2.6	-
224816-00-00	THC(ppm)	507	100	3.9	0	2.7	-
151469-01-00	O3(ppb)	1	100	69.6	0	25.1	-
189942-00-00	O3(ppb)	4	100	55.9	0	33.3	-
206355-00-00	O3(ppb)	6	100	62.2	0	31.1	-
46586-00-00	O3(ppb)	7	99	60.4	0	31.3	-
73203-02-00	O3(ppb)	8	100	57.2	0	39.3	-
216466-01-00	O3(ppb)	13	100	68.2	0	24.0	-
137467-01-00	O3(ppb)	14	98	51.8	0	31.6	-
236394-00-00	O3(ppb)	17	96	77.2	1	36.2	-
254465-00-00	O3(ppb)	18	100	47.8	0	33.1	-
094-03-00	O3(ppb)	21	99	50.1	0	32.8	-
80105-01-00	O3(ppb)	22	100	39.8	0	30.4	-
305529-00-00	NO2(ppb)	1	100	26.2	0	9.2	-
318401-00-00	NO2(ppb)	4	100	26.5	0	14.1	-
026-03-00	NO2(ppb)	6	100	27.0	0	10.9	-
364232-00-00	NO2(ppb)	7	99	32.8	0	14.5	-
228044-00-00	NO2(ppb)	8	97	10.2	0	4.3	-
247548-00-00	NO2(ppb)	9	100	26.8	0	10.6	-
231302-00-00	NO2(ppb)	13	100	23.8	0	8.9	-
153125-01-00	NO2(ppb)	14	98	9.3	0	3.3	-
	NO2(ppb)	17	100	26.1	0	6.2	-
	NO2(ppb)	18	97	3.3	0	1.5	-
	NO2(ppb)	19	100	15.3	0	4.3	-
	NO2(ppb)	20	100	12.2	0	4.1	-
	NO2(ppb)	21	100	15.0	0	4.5	-
	NO2(ppb)	22	100	8.7	0	3.0	-
	NO2(ppb)	23	96	44.7	0	19.1	-
	NO2(ppb)	26	100	30.1	0	9.1	-
	NO2(ppb)	27	100	5.0	0	1.8	-
	NO2(ppb)	29	100	9.0	0	2.6	-
	NO2(ppb)	30	100	24.6	0	8.5	-
	NO2(ppb)	505	89	16.1	0	4.9	-
	NO2(ppb)	507	100	43.4	0	10.9	-
	CO(ppm)	1	100	3.4	0	1.1	-
	CO(ppm)	7	96	3.6	0	1.4	-
	CO(ppm)	8	96	5.6	0	1.7	-
	CO(ppm)	18	100	2.2	0	1.3	-
	CO2(ppm)	1	100	544.4	-	466.5	-
	CO2(ppm)	8	100	479.4	-	455.1	-
	CO2(ppm)	18	95	475.8	-	434.0	-
	NH3(ppb)	1	93	63.0	0	19.0	-
	NH3(ppb)	6	86	47.1	0	20.9	-
	PM2.5(ug/m3)	1	100	473.7	134	166.9	16
	PM2.5(ug/m3)	4	100	477.4	158	189.3	17
	PM2.5(ug/m3)	6	100	344.0	91	164.3	16
	PM2.5(ug/m3)	7	100	391.2	94	208.8	16
	PM2.5(ug/m3)	8	100	812.1	217	327.8	19
	PM2.5(ug/m3)	9	100	449.3	112	167.8	17
	PM2.5(ug/m3)	13	100	448.3	130	167.2	16
	PM2.5(ug/m3)	14	99	381.8	63	191.3	12
	PM2.5(ug/m3)	17	100	478.1	114	140.0	17
	PM2.5(ug/m3)	18	100	303.9	54	166.3	11
	PM2.5(ug/m3)	21	99	288.7	66	160.0	12
	PM2.5(ug/m3)	22	98	314.6	51	164.8	10
	PM2.5(ug/m3)	23	96	932.3	164	230.9	18
	PM2.5(ug/m3)	29	100	349.5	56	152.0	12

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION
MONTHLY AIR MONITORING SUMMARY

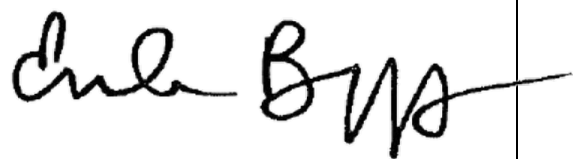
August 2023

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Created: November 24 2023 10:19:00

REPORT DATE	
MONTH	YEAR
8	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)	30	100	397.3	106	128.9	17
241311-00-00	WS(km/h)	1	99	-	-	-	-
20809-02-00	WS(km/h)	2	100	-	-	-	-
149968-01-00	WS(km/h)	4	100	-	-	-	-
237382-00-00	WS(km/h)	5	100	-	-	-	-
48522-01-00	WS(km/h)	6	100	-	-	-	-
240008-00-00	WS(km/h)	7	100	-	-	-	-
48263-01-00	WS(km/h)	8	100	-	-	-	-
224816-00-00	WS(km/h)	9	100	-	-	-	-
151469-01-00	WS(km/h)	11	50	-	-	-	-
189942-00-00	WS(km/h)	13	100	-	-	-	-
206355-00-00	WS(km/h)	14	94	-	-	-	-
46586-00-00	WS(km/h)	17	100	-	-	-	-
73203-02-00	WS(km/h)	18	99	-	-	-	-
216466-01-00	WS(km/h)	19	100	-	-	-	-
137467-01-00	WS(km/h)	20	100	-	-	-	-
236394-00-00	WS(km/h)	21	100	-	-	-	-
254465-00-00	WS(km/h)	22	100	-	-	-	-
094-03-00	WS(km/h)	23	100	-	-	-	-
80105-01-00	WS(km/h)	25	99	-	-	-	-
318401-00-00	WS(km/h)	26	100	-	-	-	-
026-03-00	WS(km/h)	27	100	-	-	-	-
364232-00-00	WS(km/h)	29	97	-	-	-	-
228044-00-00	WS(km/h)	30	100	-	-	-	-
247548-00-00	WS(km/h)	505	100	-	-	-	-
231302-00-00	WS(km/h)	507	100	-	-	-	-
153125-01-00							
							



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS01 BERTHA GANTER - FORT MCKAY AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY - BERTHA GANTER (AMS01)
AUGUST 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	16	0	4.4	0
H2S(ppb) Average	702	40	42	99.73	2.4	0	0.9	0
TRS(ppb) Average	704	38	40	99.73	2.5	0	1.2	0
THC(ppm) Average	706	36	38	99.73	4.2	-	2.8	-
NMHC(ppm) Average	706	36	38	99.73	0.657	-	0.26	-
CH4(ppm) Average	706	36	38	99.73	3.9	-	2.5	-
O3 (ppb) Average	706	36	38	99.73	69.6	0	25.1	-
NO2 (ppb) Average	707	37	37	100	26.2	0	9.2	-
NO (ppb) Average	707	37	37	100	116.7	-	23.3	-
NOX (ppb) Average	707	37	37	100	130	-	31.5	-
NH3 (ppb) Average	652	38	92	92.74	63	0	19	-
PM2.5 (ug/m3) Average	742	2	2	100	473.7	134	166.9	16
CO(ppm) Average	707	35	37	99.73	3.4	0	1.1	0
CO2(ppm) Average	706	36	38	99.73	544.4	0	466.5	0
Temperature 2 m (C) Average	744	0	0	100	30.7	-	21.7	-
Temperature 10 m (C) Average	744	0	0	100	30.2	-	22	-
Relative Humidity (%) Average	744	0	0	100	98.8	-	92.8	-
Wind Speed 10 m (km/h) Average	739	1	5	99.46	18	-	12	-
Wind Direction 10 m (deg) Average	739	1	5	99.46	-	-	-	-
Precipitation (mm) Total	744	0	0	100	13.3	-	15.3	-
Leaf Wetness (% of range) Average	735	0	9	98.79	94.2	-	32.8	-
Global Solar Radiation (W/m2) Average	744	0	0	100	776.3	-	278.7	-

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

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

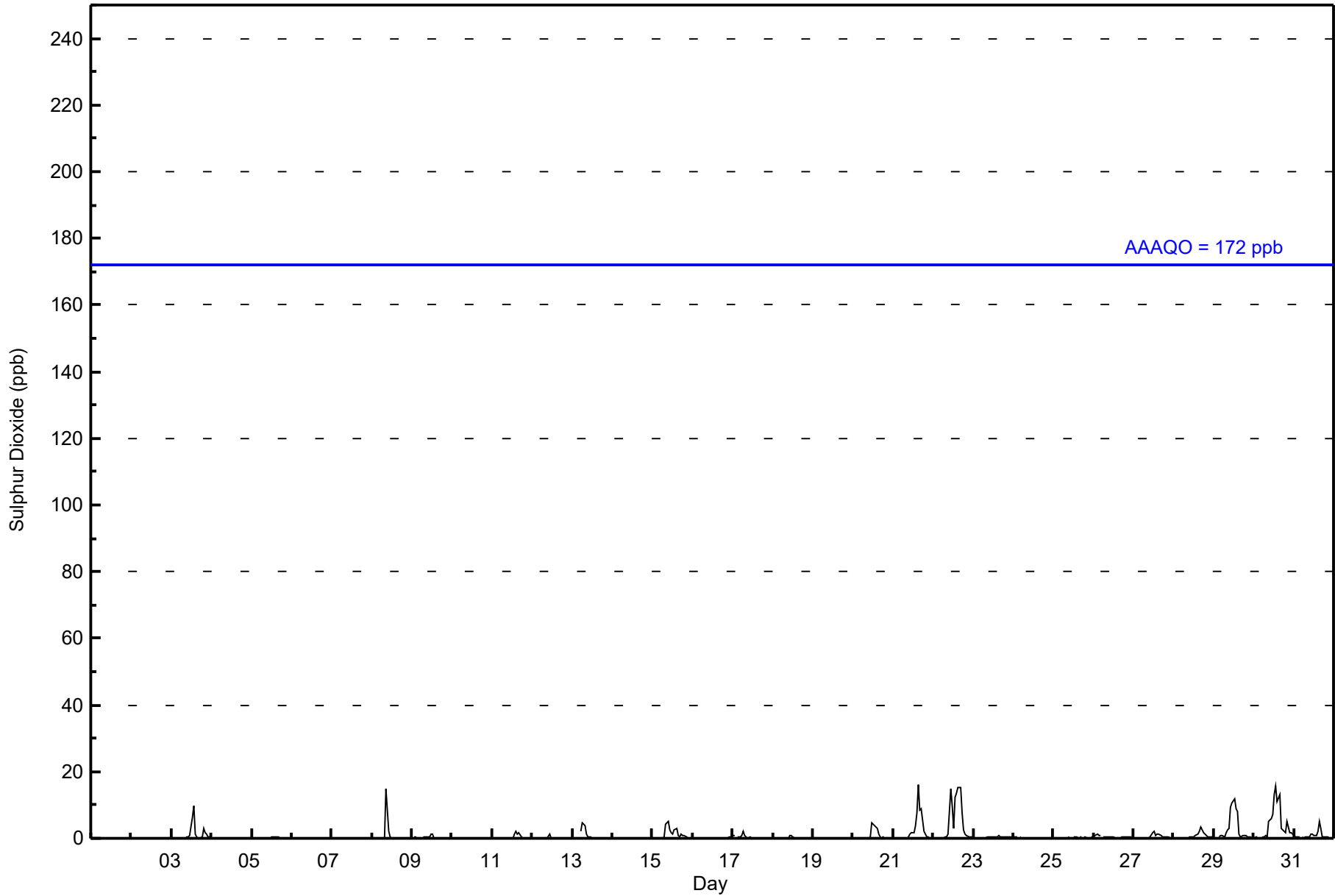
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	706	0.76	2.2	-	0	0	0	0.1	0.4	1.5	16
H2S (ppb) Average	702	0.34	0.3	-	0	0.1	0.1	0.2	0.4	0.8	2.4
TRS (ppb) Average	704	0.6	0.3	-	0.2	0.3	0.4	0.5	0.7	1	2.5
THC (ppm) Average	706	2.19	0.3	-	1.9	1.9	2	2.1	2.3	2.6	4.2
NMHC(ppm) Average	706	0.08	0.111	-	0	0	0	0	0.1	0.2	0.657
CH4(ppm) Average	706	2.11	0.2	-	1.9	1.9	2	2	2.2	2.3	
O3 (ppb) Average	706	16.79	11.5	-	0.1	2.9	7.9	15.6	23.9	30.7	69.6
NO2 (ppb) Average	707	4.65	4.5	-	0	0.3	0.9	3.4	7.1	11.3	26.2
NO (ppb) Average	707	2.13	8.5	-	0	0	0	0.1	1	3.9	116.7
NOX (ppb) Average	707	6.77	10.8	-	0	0.3	0.9	3.9	8.4	14.3	130
NH3 (ppb) Average	652	2.05	7.6	-	0	0	0	0	0	0	63
PM2.5 (ug/m3) Average	742	47.61	64.7	-	2.5	5.2	9.5	22.9	66.1	110.8	473.7
CO(ppm) Average	707	0.58	0.4	-	0.3	0.3	0.4	0.4	0.7	0.9	3.4
CO2(ppm) Average	706	434.03	30.7	-	396.6	403.4	410.1	425	450.4	476.9	544.4
Temperature 2 m (C) Average	744	17.08	4.8	-	6.4	11.7	13.5	16.2	20.5	23.7	30.7
Temperature 10 m (C) Average	744	17.13	4.4	-	7	12.3	13.8	16.4	20.2	23.2	30.2
Relative Humidity (%) Average	744	75.13	17.2	-	34.6	49	61	76.7	90.8	96.1	98.8
Wind Speed 10 m (km/h) Average	739	6	3	-	0	2	4	5	8	11	18
Wind Direction 10 m (deg) Average	739	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	55.34	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	735	13.6	19.7	-	0.4	0.8	1.2	2.1	19.7	44.7	94.2
Global Solar Radiation (W/m2) Average	744	171.17	216.4	-	0	0	0	59.4	308.8	526.5	776.3

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS (EXCEPT NO2)	25 Aug 2023 10:00	25 Aug 2023 12:00	1	Maintenance - sample manifold cleaned
NH3	03 Aug 2023 16:00	04 Aug 2023 09:00	18	Unstable Operation - flatline in analyzer output signal
NH3	04 Aug 2023 10:00	04 Aug 2023 10:00	1	Maintenance - analyzer rebooted
NH3	01 Aug 2023 03:00	31 Aug 2023 04:00	33	Stabilization after daily QA check
Wind Speed, Wind Direction	21 Aug 2023 23:00	22 Aug 2023 00:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Aug 2023 20:00	28 Aug 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Aug 2023 07:00	30 Aug 2023 07:00	1	Flat line in sensor output signal
Surface Leaf Wetness	03 Aug 2023 05:00	03 Aug 2023 07:00	3	Sensor operated out of range
Surface Leaf Wetness	13 Aug 2023 02:00	13 Aug 2023 07:00	6	Sensor operated out of range





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	693	98.16	98.16
11 - 20	13	1.84	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 - August 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	66	13	9	8	14	18	37	64	123	67	28	38	32	77	42	52	688
11 - 20	0	0	0	0	0	0	4	8	1	0	0	0	0	0	0	0	13
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	66	13	9	8	14	18	41	72	124	67	28	38	32	77	42	52	701

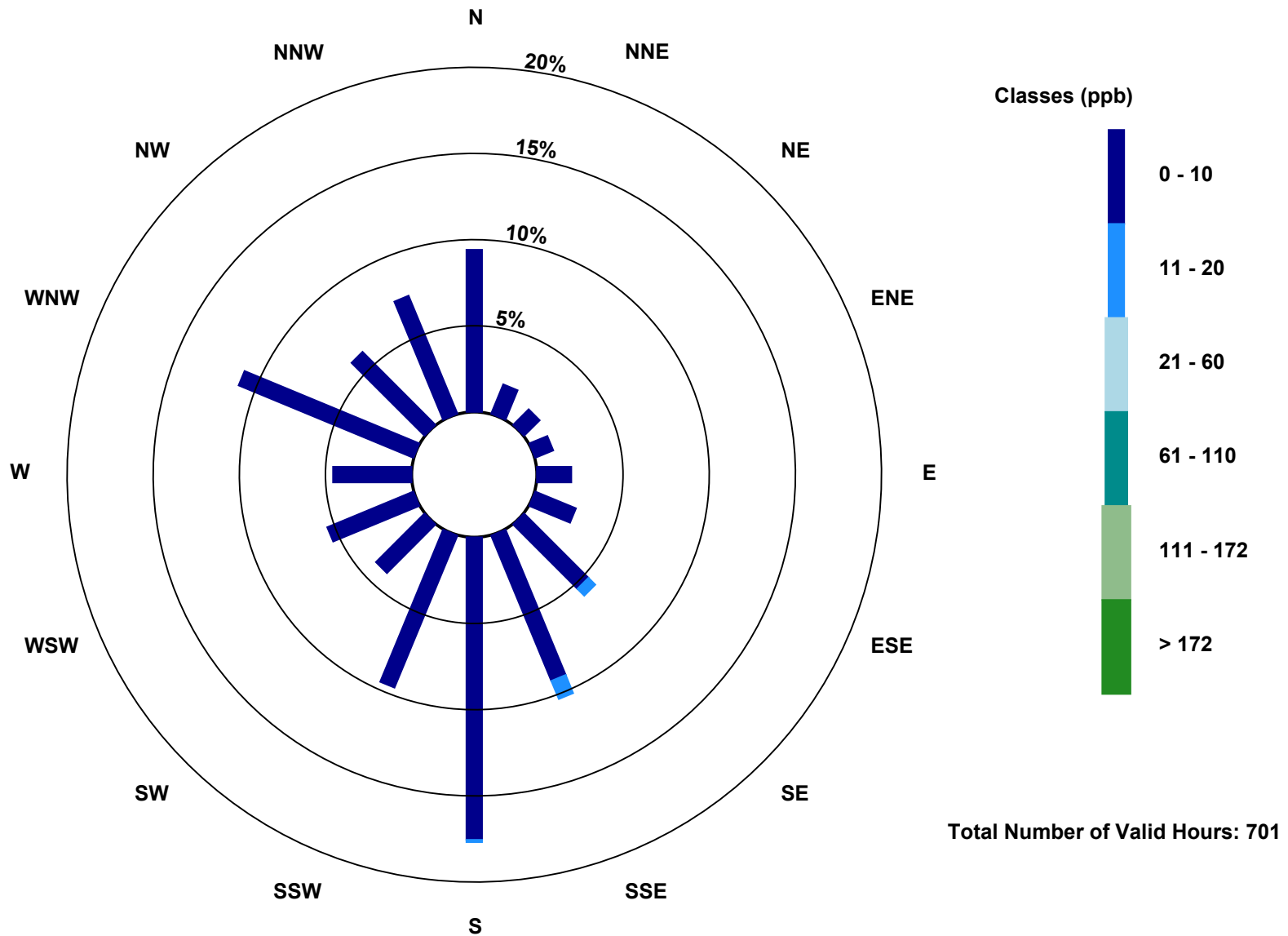
Total Number of Valid Hours: 701

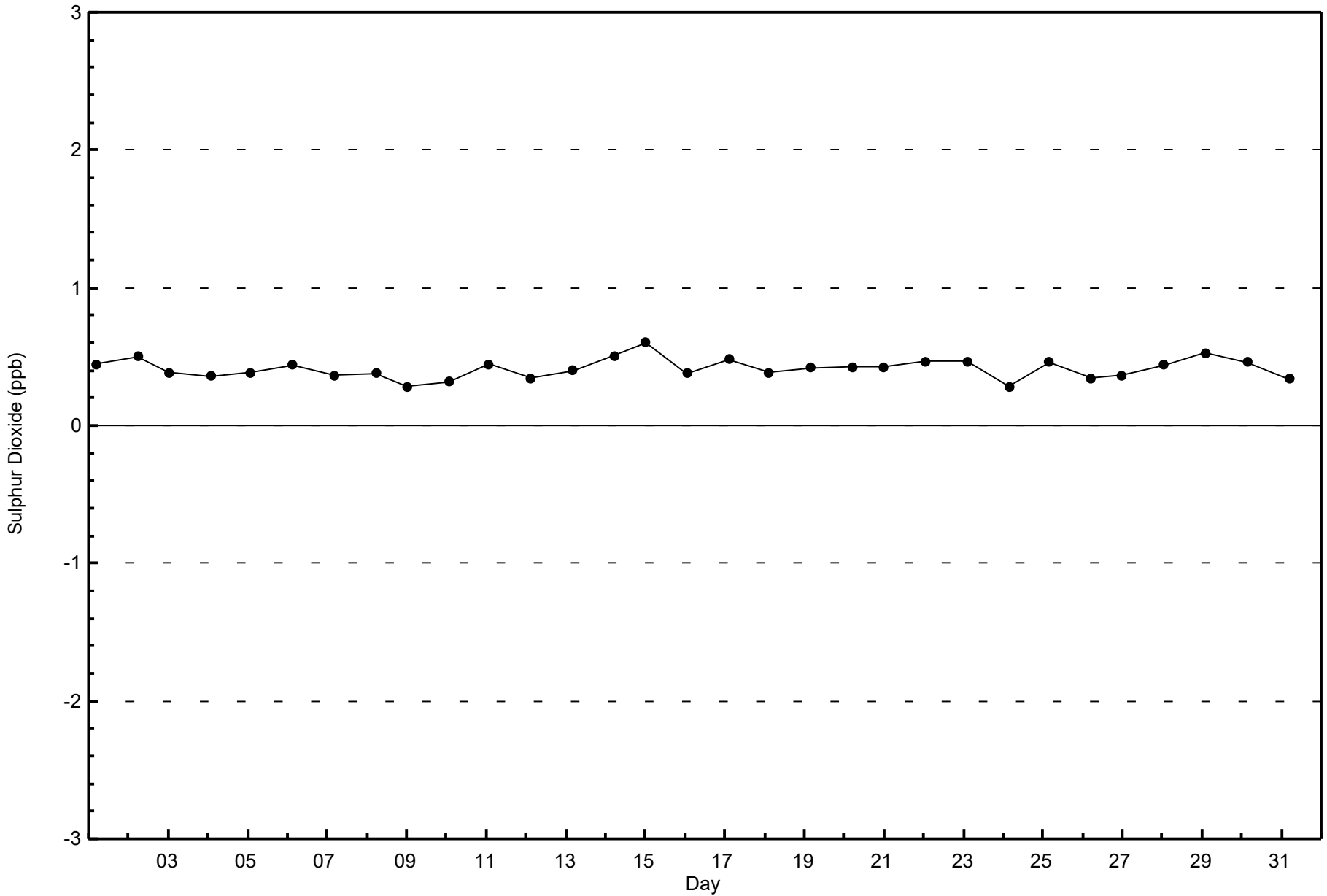
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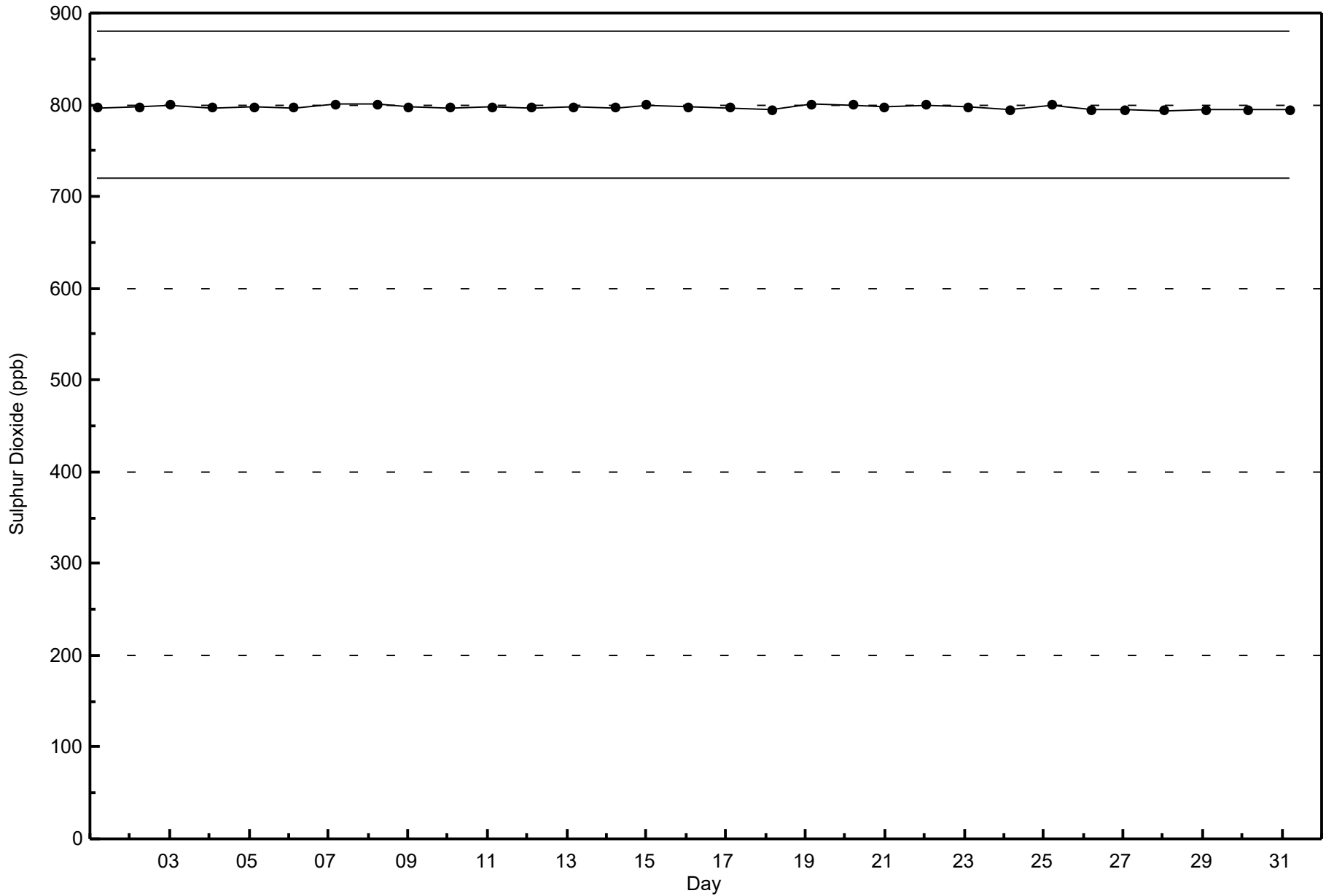


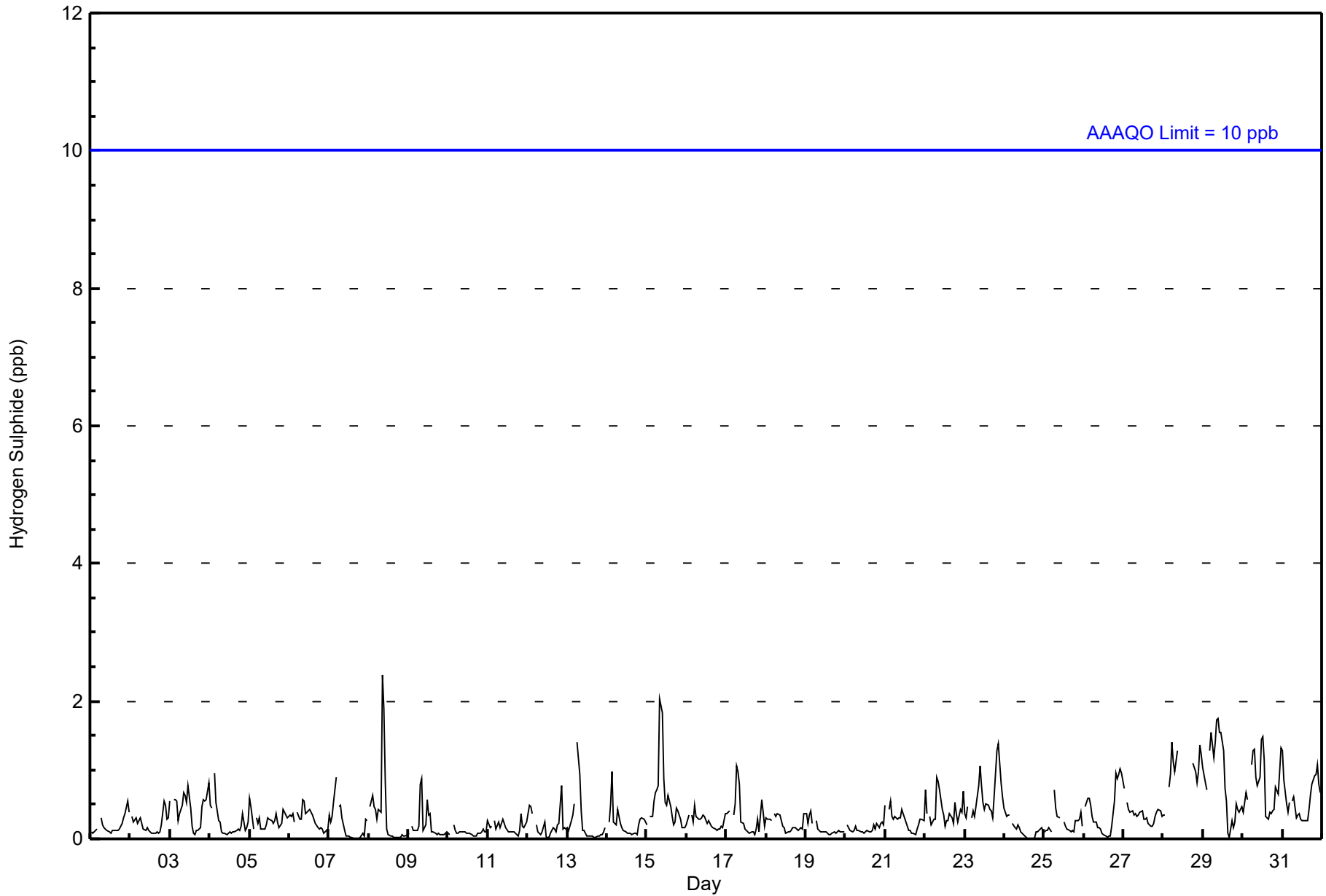
Wood Buffalo Environmental Association
Wind Rose Aug 2023

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











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	702	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: 702

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Fort McKay - Bertha Ganter - August 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	66	13	9	8	14	18	41	67	117	66	31	38	36	78	42	53	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	66	13	9	8	14	18	41	67	117	66	31	38	36	78	42	53	697

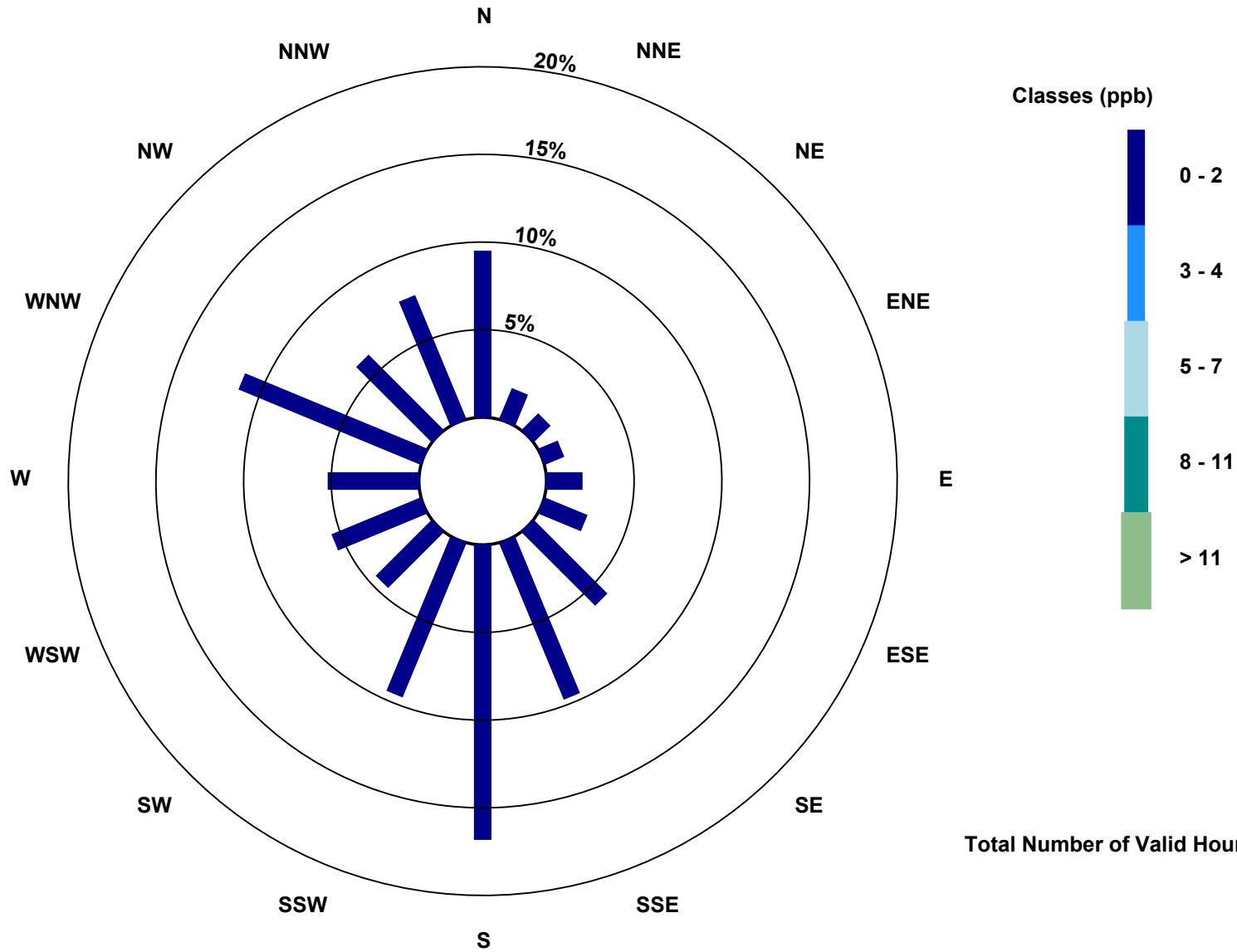
Total Number of Valid Hours: 697

Total Number of Hours: 744

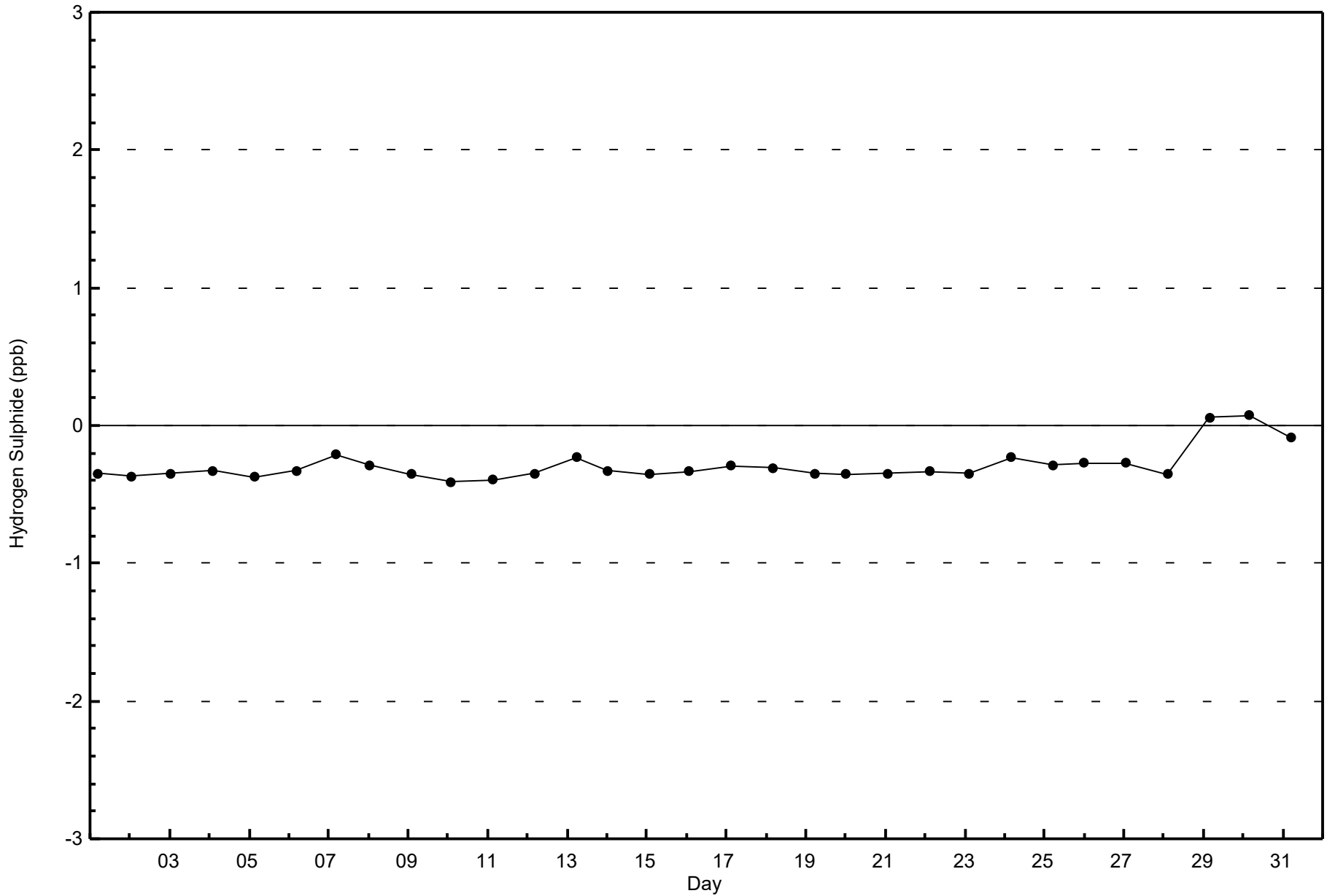


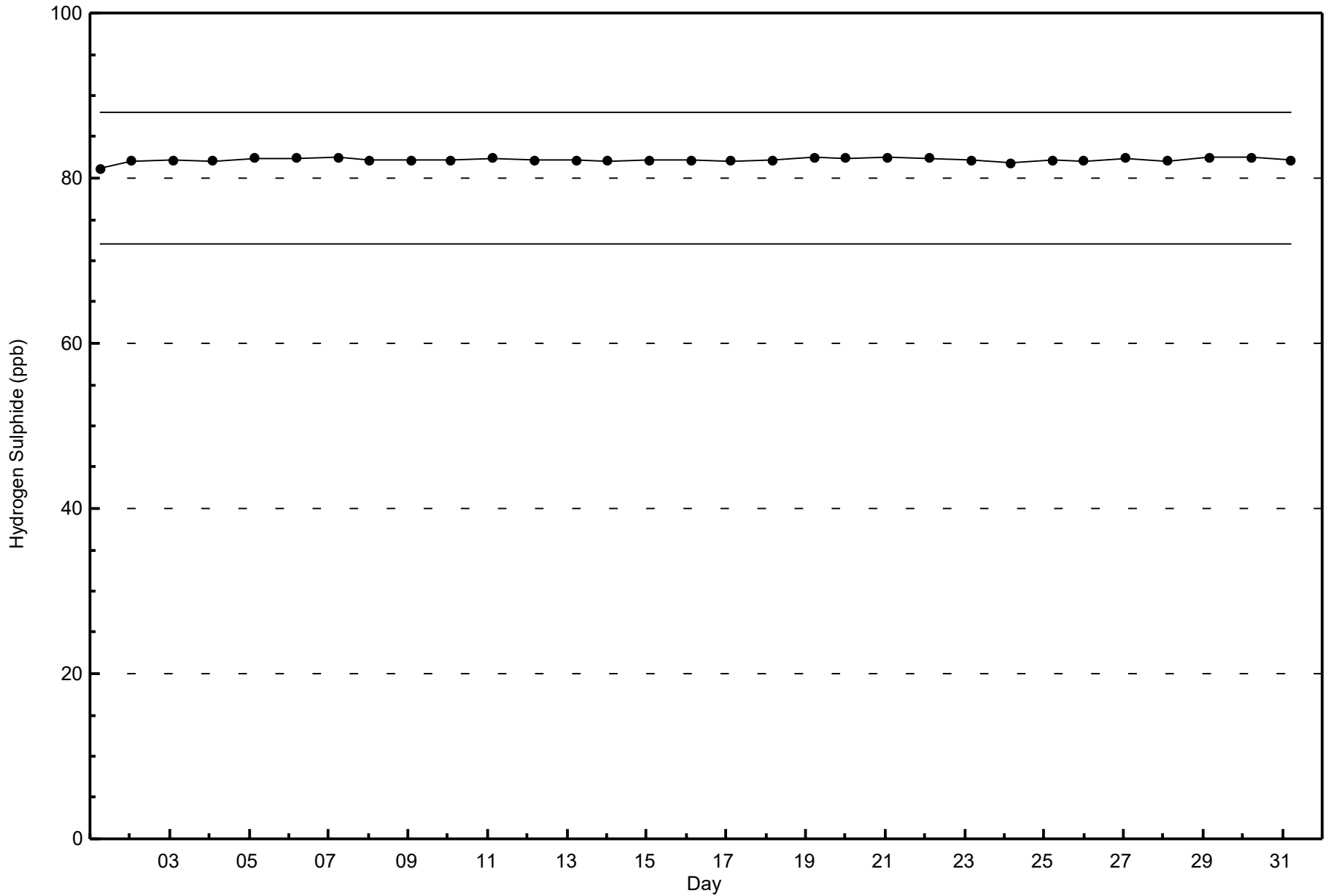
Wood Buffalo Environmental Association
Wind Rose Aug 2023

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



Total Number of Valid Hours: 697







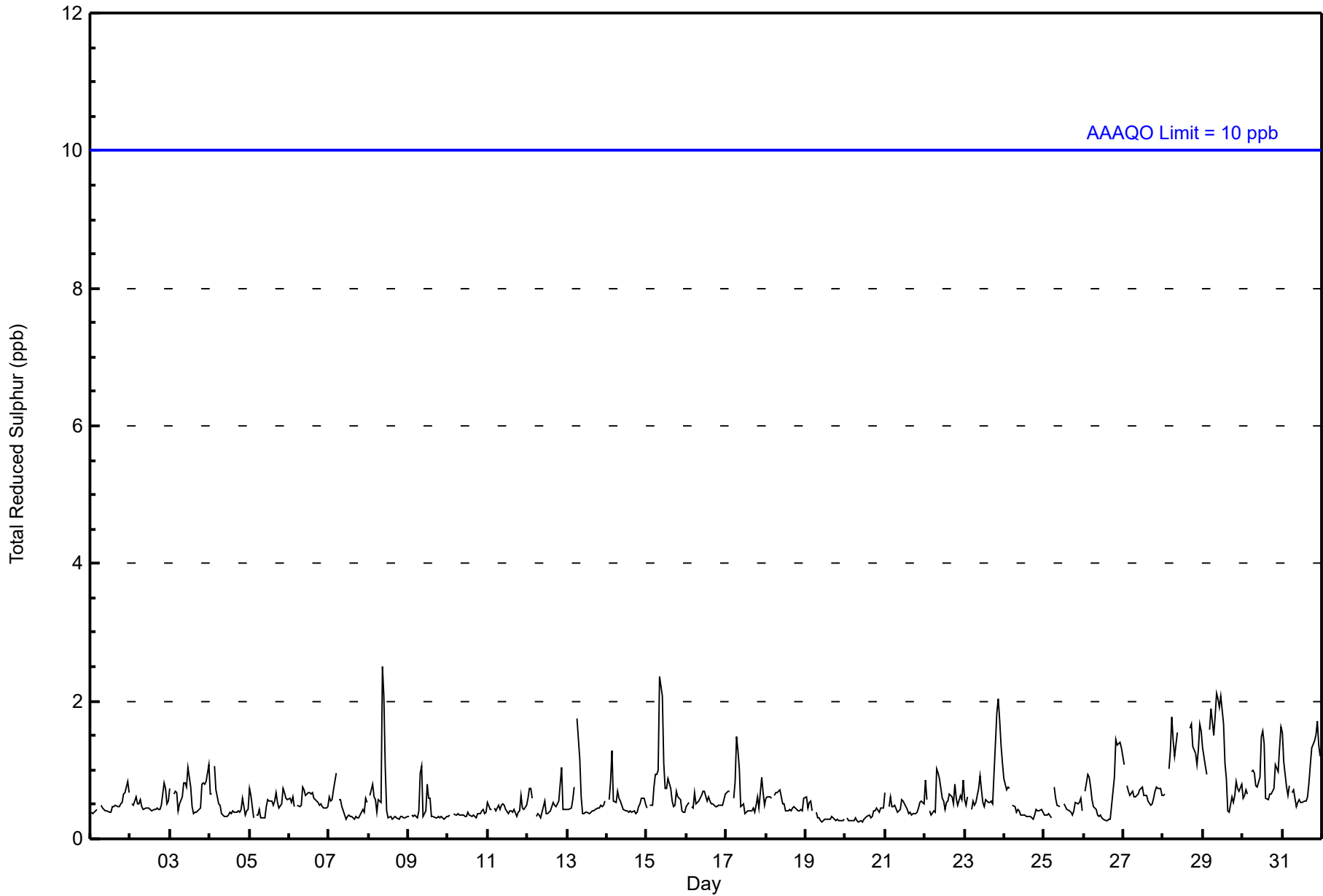
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum					
Maximum Value: 2.5 ppb on Aug 8 09:00		Maximum Daily Average: 1.2 ppb on Aug 29		Hours of Data: 704														Hours of Missing Data: 40		Hours of Calibration: 38							
Minimum Value: 0.2 ppb on Aug 20 09:00		Minimum Daily Average: 0.3 ppb on Aug 20		Hours of Calibration: 38														Percent Operational Time: 99.7									
Maximum Diurnal Average: 0.8 ppb at hour 9		Minimum Diurnal Average: 0.4 ppb at hour 16		Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 1.0 P ₉₉ = 2.0																							
Monthly Average: 0.60 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-Aug	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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.5	0.8	
2-Aug	Z	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.8	0.7	0.5	0.5	0.5	0.8	
3-Aug	0.7	Z	0.7	0.7	0.7	0.4	0.5	0.6	0.8	0.8	0.7	1.0	0.8	0.5	0.4	0.4	0.4	0.4	0.4	0.8	0.8	0.8	0.8	1.1	0.7	1.1	
4-Aug	0.6	0.7	Z	1.1	0.7	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.4	0.4	0.4	0.5	0.5	1.1	
5-Aug	0.7	0.6	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0.5	0.5	0.7	0.7	0.6	0.6	0.5	0.7	
6-Aug	0.6	0.5	0.6	0.5	Z	0.5	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	
7-Aug	0.6	0.5	0.6	0.7	1.0	Z	0.6	0.6	0.5	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	0.6	0.5	0.5	1.0	
8-Aug	Z	0.6	0.8	0.6	0.6	0.4	0.6	0.5	2.5	2.1	1.0	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	0.6	2.5	
9-Aug	0.3	Z	0.3	0.3	0.4	0.3	0.4	1.0	1.1	0.3	0.4	0.8	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	1.1	
10-Aug	0.3	0.3	Z	0.4	0.3	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
11-Aug	0.5	0.4	0.4	Z	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.6	0.4	0.4	0.5	0.4	0.6	
12-Aug	0.6	0.7	0.7	0.6	Z	0.3	0.4	0.3	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	1.0	0.4	0.4	0.4	0.5	1.0	
13-Aug	0.4	0.4	0.5	0.6	0.8	Z	1.7	1.2	0.6	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	0.6	0.5	1.7		
14-Aug	Z	0.6	0.8	1.3	0.6	0.5	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.5	1.3	
15-Aug	0.4	Z	0.5	0.5	0.7	0.9	0.9	1.0	2.4	2.1	1.1	0.7	0.7	0.9	0.7	0.6	0.5	0.5	0.7	0.6	0.6	0.4	0.4	0.4	0.8	2.4	
16-Aug	0.5	0.5	Z	0.5	0.5	0.7	0.5	0.5	0.6	0.6	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	0.7	0.5	0.7	
17-Aug	0.7	0.7	0.7	Z	0.6	0.8	1.5	1.3	1.0	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.4	0.9	0.7	0.5	0.6	1.5	
18-Aug	0.6	0.6	0.6	0.6	Z	0.6	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.5	0.7	
19-Aug	0.6	0.4	0.5	0.6	0.4	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	
20-Aug	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	
21-Aug	0.7	Z	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.7	
22-Aug	0.9	0.6	Z	0.4	0.3	0.4	0.4	1.0	0.9	0.9	0.6	0.6	0.4	0.5	0.5	0.7	0.6	0.5	0.8	0.6	0.5	0.6	0.6	0.9	0.6	1.0	
23-Aug	0.6	0.5	0.6	Z	0.4	0.6	0.5	0.5	0.7	0.9	0.7	0.5	0.5	0.6	0.5	0.5	0.5	0.5	1.0	1.8	2.0	1.7	1.4	1.1	0.8	2.0	
24-Aug	0.9	0.7	0.7	Z	0.5	0.5	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	0.4	0.4	0.4	0.4	0.4	0.4	0.9	
25-Aug	0.3	0.3	0.4	0.4	0.3	Z	0.7	0.6	0.5	0.5	M	M	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.4	0.5	0.7	
26-Aug	Z	0.7	0.9	0.9	0.8	0.6	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.9	1.4	1.4	1.4	1.4	1.3	0.7	1.4	
27-Aug	1.1	Z	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.7	0.6	0.7	1.1	
28-Aug	0.6	0.7	Z	1.0	1.3	1.8	1.4	1.2	1.5	C	C	C	C	C	C	C	1.6	1.7	1.3	1.2	1.1	1.3	1.7	1.6	--	1.8	
29-Aug	1.3	1.1	0.9	Z	1.6	1.9	1.5	1.8	2.1	2.0	1.9	2.1	1.7	1.1	0.9	0.4	0.4	0.6	0.5	0.6	0.8	0.7	0.7	0.8	1.2	2.1	
30-Aug	0.6	0.6	0.7	0.7	Z	1.0	1.0	1.0	0.8	0.8	0.9	1.5	1.6	1.4	0.6	0.6	0.7	0.7	0.7	0.7	1.1	1.0	1.3	1.6	0.9	1.6	
31-Aug	1.5	1.1	0.7	0.6	0.8	Z	0.7	0.7	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.8	1.1	1.3	1.4	1.5	1.7	1.4	1.2	0.9	1.7	
																								Diurnal Average		Diurnal Maximum	
																								0.7		1.5	
																								0.6		1.1	
																								0.6		0.9	
																								0.6		1.3	
																								0.6		1.6	
																								0.6		1.9	
																								0.7		1.7	
																								0.7		1.8	
																								0.8		2.5	
																								0.7		2.1	
																								0.6		1.9	
																								0.6		2.1	
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																								0.5		0.9	
																								0.4		0.7	
																								0.5		1.6	
																								0.5		1.7	
																								0.5		1.3	
																								0.6		1.8	
																								0.7		2.0	
																								0.7		1.7	
																								0.7		1.7	
																								0.7		1.6	
																								0.7		1.6	

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**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort McKay - Bertha Ganter - August 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	66	13	9	8	14	18	40	67	119	66	31	38	36	78	42	53	698
3 - 4	0	0	0	0	0	0	1	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	66	13	9	8	14	18	41	67	119	66	31	38	36	78	42	53	699

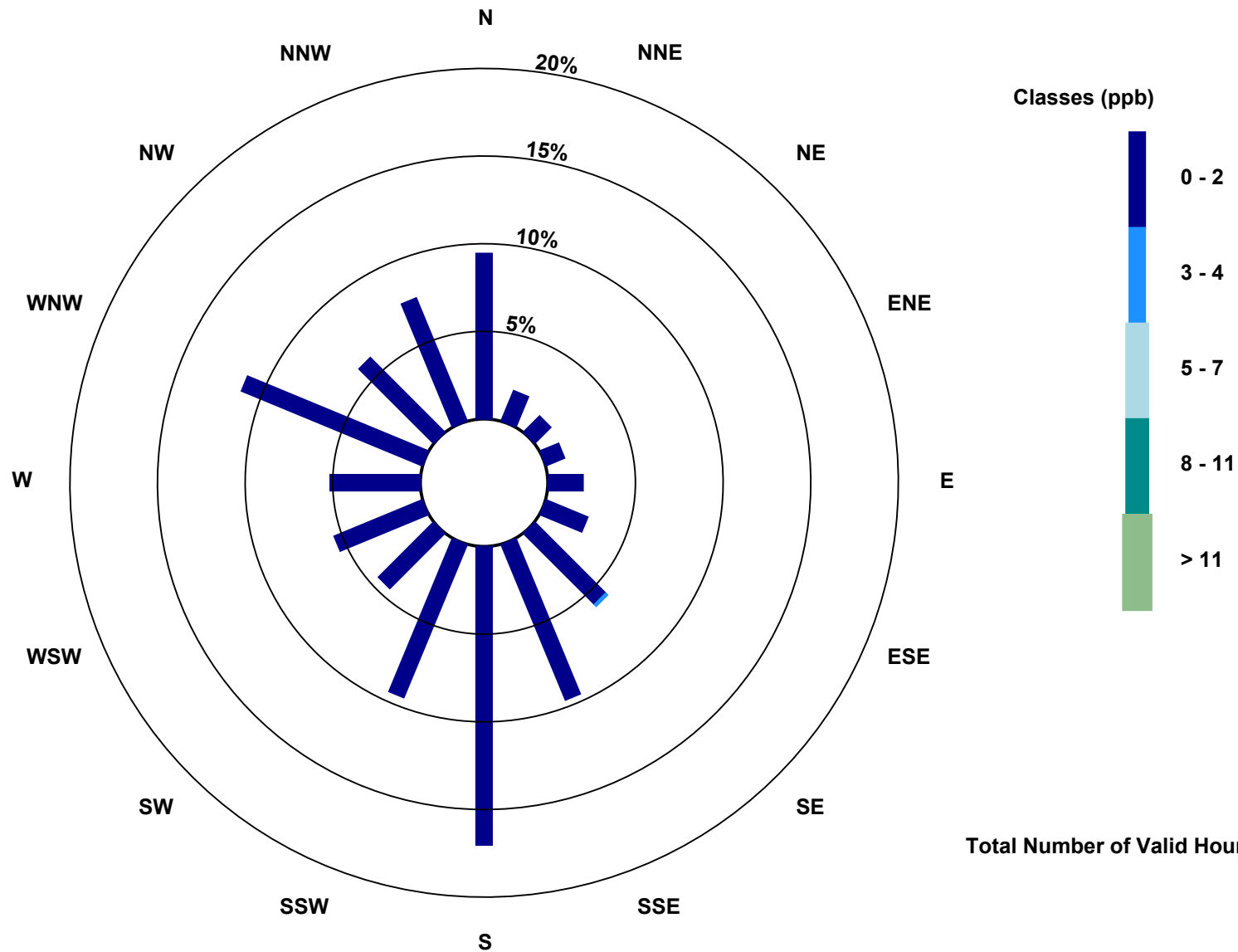
Total Number of Valid Hours: 699

Total Number of Hours: 744

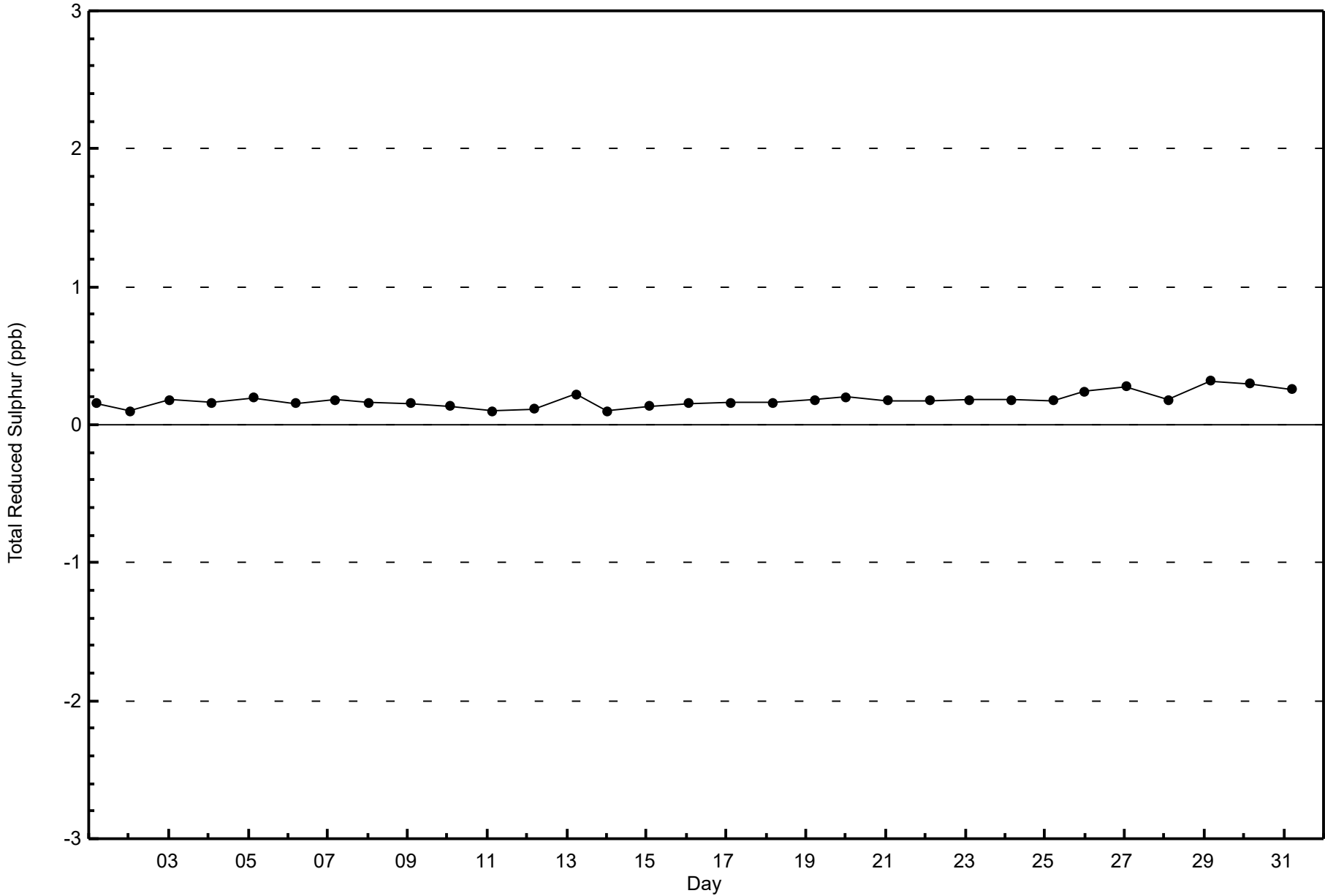


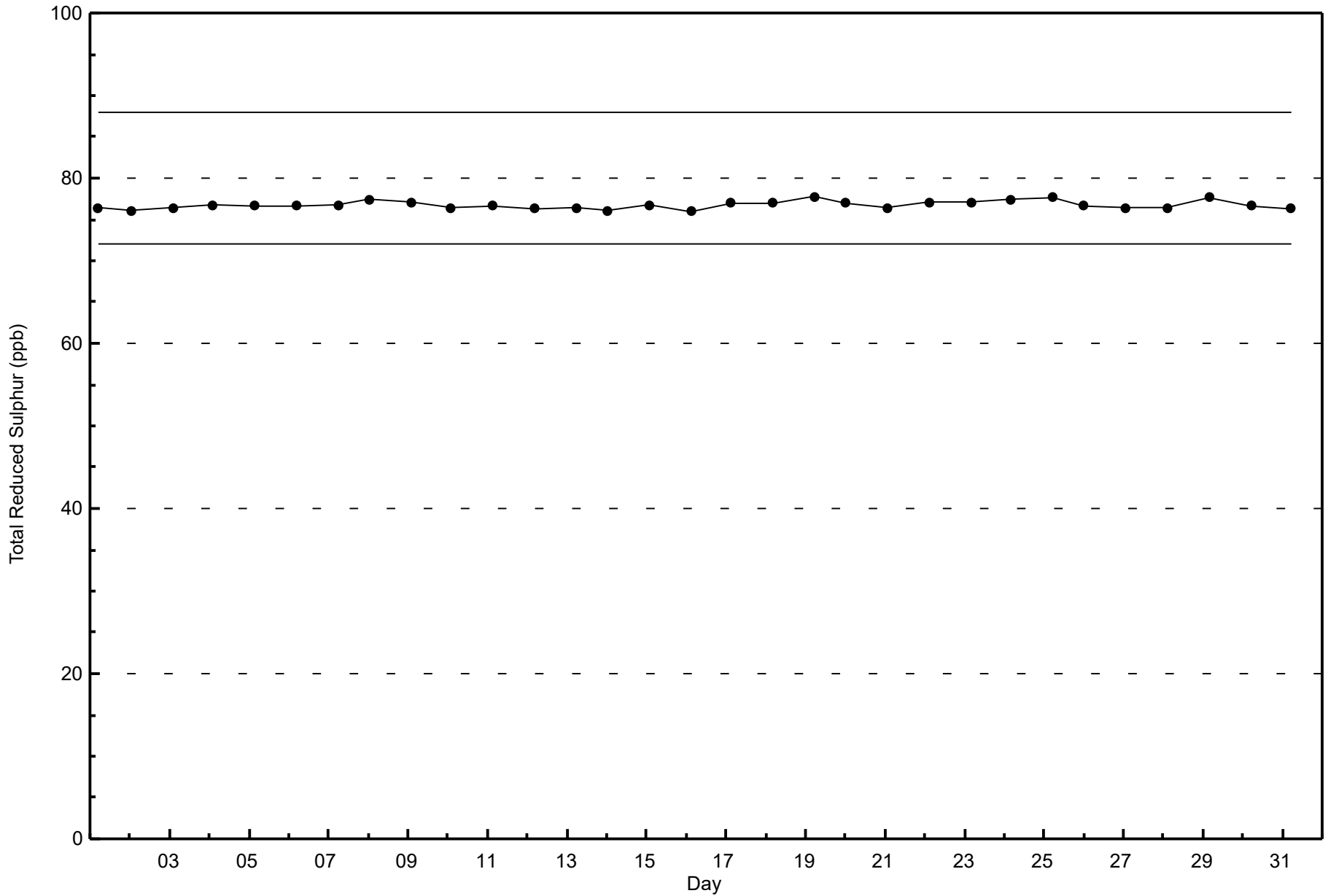
Wood Buffalo Environmental Association
Wind Rose Aug 2023

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



Total Number of Valid Hours: 699







Wood Buffalo Environmental Association
Summary of Hour Averages

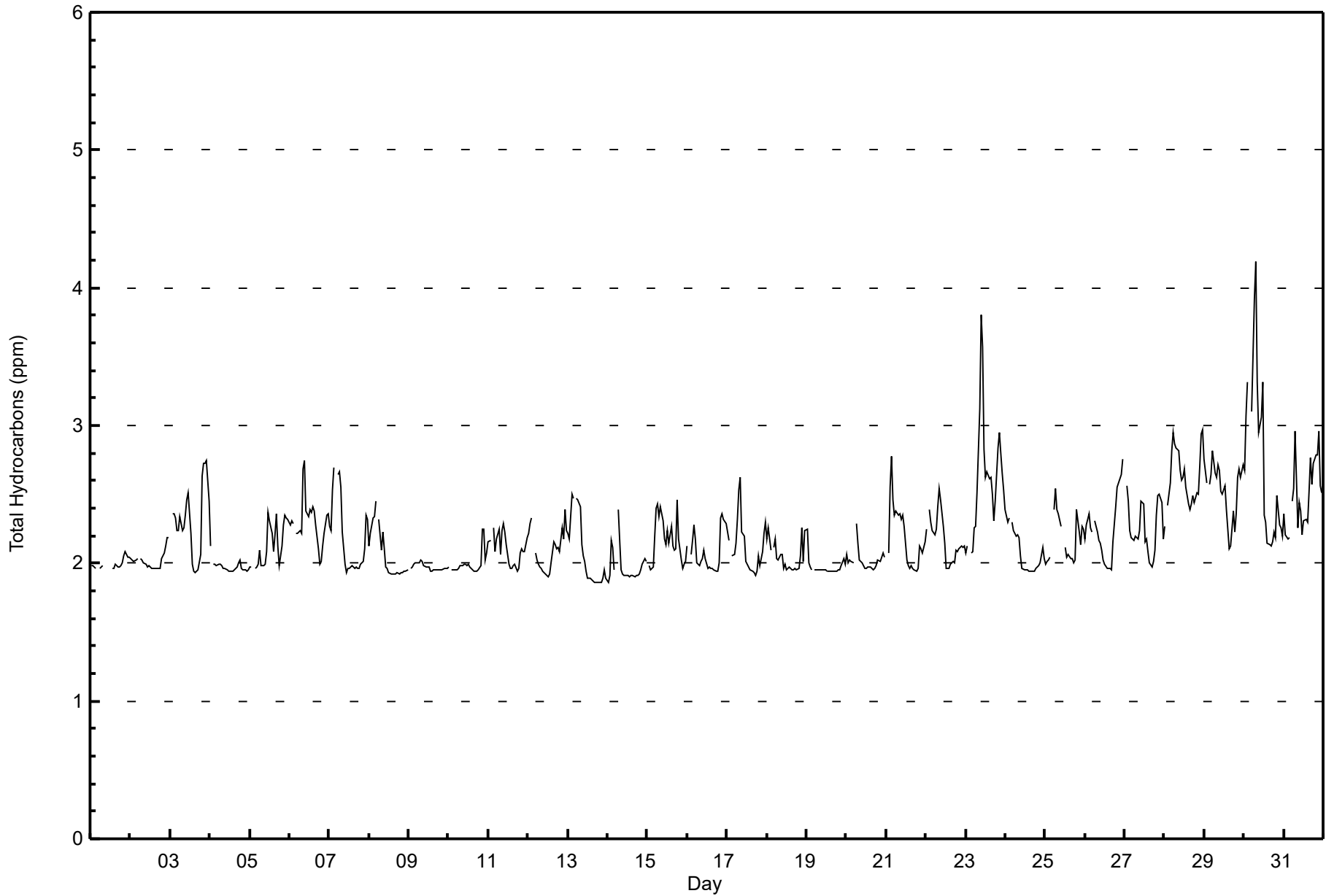
Total Hydrocarbons (THC) - ppm
Fort McKay - Bertha Ganter - August 2023

Maximum Value: 4.2 ppm on Aug 30 08:00																				Maximum Daily Average: 2.8 ppm on Aug 30					Hours in Service: 744		
Minimum Value: 1.9 ppm on Aug 13 20:00																				Minimum Daily Average: 2.0 ppm on Aug 9					Hours of Data: 706		
Maximum Diurnal Average: 2.3 ppm at hour 7																				Minimum Diurnal Average: 2.0 ppm at hour 18					Hours of Missing Data: 38		
Monthly Average: 2.19 ppm																				Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.3					Hours of Calibration: 36		
																									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-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1
2-Aug	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	2.2	2.2	2.0	2.0	2.2
3-Aug	Z	2.4	2.4	2.3	2.2	2.2	2.3	2.2	2.3	2.4	2.5	2.5	2.2	2.0	1.9	1.9	1.9	1.9	2.1	2.6	2.7	2.7	2.7	2.4	2.3	2.7	2.7
4-Aug	2.1	Z	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	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1
5-Aug	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.4	2.3	2.2	2.1	2.2	2.4	2.1	2.0	2.1	2.3	2.3	2.3	2.3	2.1	2.1	2.4
6-Aug	2.3	2.3	2.3	Z	2.2	2.2	2.2	2.2	2.7	2.7	2.4	2.3	2.4	2.4	2.4	2.3	2.1	2.0	2.0	2.1	2.2	2.3	2.4	2.3	2.3	2.7	2.7
7-Aug	2.3	2.2	2.5	2.7	Z	2.6	2.7	2.6	2.2	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.3	2.2	2.2	2.7	2.7
8-Aug	2.1	2.2	2.3	2.3	2.5	Z	2.3	2.1	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.5	2.5
9-Aug	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	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Aug	2.0	Z	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.3	2.0	2.1	2.0	2.0	2.3
11-Aug	2.2	2.2	Z	2.3	2.1	2.2	2.2	2.1	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.3
12-Aug	2.2	2.3	2.3	Z	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.1	2.1	2.1	2.1	2.3	2.2	2.4	2.2	2.1	2.1	2.4
13-Aug	2.2	2.2	2.5	2.5	Z	2.5	2.5	2.4	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.5	2.5
14-Aug	1.9	1.9	2.2	2.1	2.0	Z	2.4	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.4
15-Aug	Z	2.0	2.0	2.0	2.2	2.4	2.4	2.3	2.4	2.3	2.2	2.1	2.2	2.1	2.3	2.1	2.1	2.1	2.5	2.2	2.0	2.0	2.0	2.0	2.2	2.2	2.5
16-Aug	2.1	Z	2.1	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.3	2.4	2.3	2.3	2.1	2.1	2.4	2.4
17-Aug	2.2	2.2	Z	2.0	2.1	2.1	2.3	2.5	2.6	2.2	2.2	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.1	2.0	2.1	2.2	2.3	2.1	2.1	2.6
18-Aug	2.2	2.3	2.1	Z	2.1	2.2	2.0	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	2.3	2.0	2.2	2.1	2.1	2.3	2.3
19-Aug	2.2	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2
20-Aug	2.1	2.0	2.0	2.0	2.0	Z	2.3	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	2.0	2.0	2.0	2.0	2.3
21-Aug	Z	2.1	2.6	2.8	2.5	2.3	2.4	2.3	2.4	2.3	2.3	2.3	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.8	2.8
22-Aug	2.2	Z	2.4	2.3	2.2	2.2	2.3	2.4	2.5	2.5	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.5	2.5
23-Aug	2.1	2.1	Z	2.1	2.1	2.3	2.3	2.5	3.1	3.8	3.6	2.8	2.6	2.7	2.6	2.6	2.5	2.3	2.5	2.8	2.9	2.8	2.7	2.5	2.6	3.8	3.8
24-Aug	2.4	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.4
25-Aug	2.0	2.0	2.0	2.0	Z	2.4	2.5	2.4	2.4	2.3	M	M	2.1	2.0	2.1	2.0	2.0	2.0	2.4	2.2	2.1	2.3	2.3	2.2	2.2	2.5	2.5
26-Aug	2.2	2.3	2.4	2.3	2.2	Z	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.5	2.6	2.6	2.6	2.8	2.3	2.3	2.8	2.8
27-Aug	Z	2.6	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.4	2.5	2.5	2.4	2.2	2.2	2.6	2.6
28-Aug	2.3	Z	2.4	2.6	2.8	2.9	2.9	2.8	2.8	2.7	2.6	2.6	2.7	2.6	2.4	2.4	2.4	2.5	2.4	2.5	2.5	2.7	2.9	3.0	2.6	3.0	3.0
29-Aug	2.8	2.6	Z	2.6	2.6	2.8	2.7	2.6	2.7	2.7	2.5	2.5	2.6	2.4	2.2	2.1	2.1	2.4	2.2	2.4	2.6	2.7	2.6	2.7	2.5	2.8	2.8
30-Aug	2.7	3.1	3.3	Z	3.1	3.5	3.9	4.2	3.3	2.9	3.1	3.3	2.3	2.3	2.1	2.1	2.1	2.2	2.2	2.2	2.5	2.3	2.3	2.2	2.8	4.2	4.2
31-Aug	2.4	2.2	2.2	2.2	Z	2.5	2.5	3.0	2.3	2.4	2.4	2.2	2.3	2.3	2.3	2.5	2.8	2.6	2.7	2.8	2.8	3.0	2.6	2.5	2.5	3.0	3.0
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration M - Maintenance																											



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	322	45.61	45.61
2.1 - 3.0	372	52.69	98.30
3.1 - 10.0	12	1.70	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
Fort McKay - Bertha Ganter - August 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	17	6	6	5	10	15	27	24	28	37	17	22	20	44	17	27	322
2.1 - 3.0	49	7	3	3	4	3	13	47	96	26	10	15	12	31	24	25	368
3.1 - 10.0	0	0	0	0	0	0	1	1	0	4	1	1	0	2	1	0	11
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	66	13	9	8	14	18	41	72	124	67	28	38	32	77	42	52	701

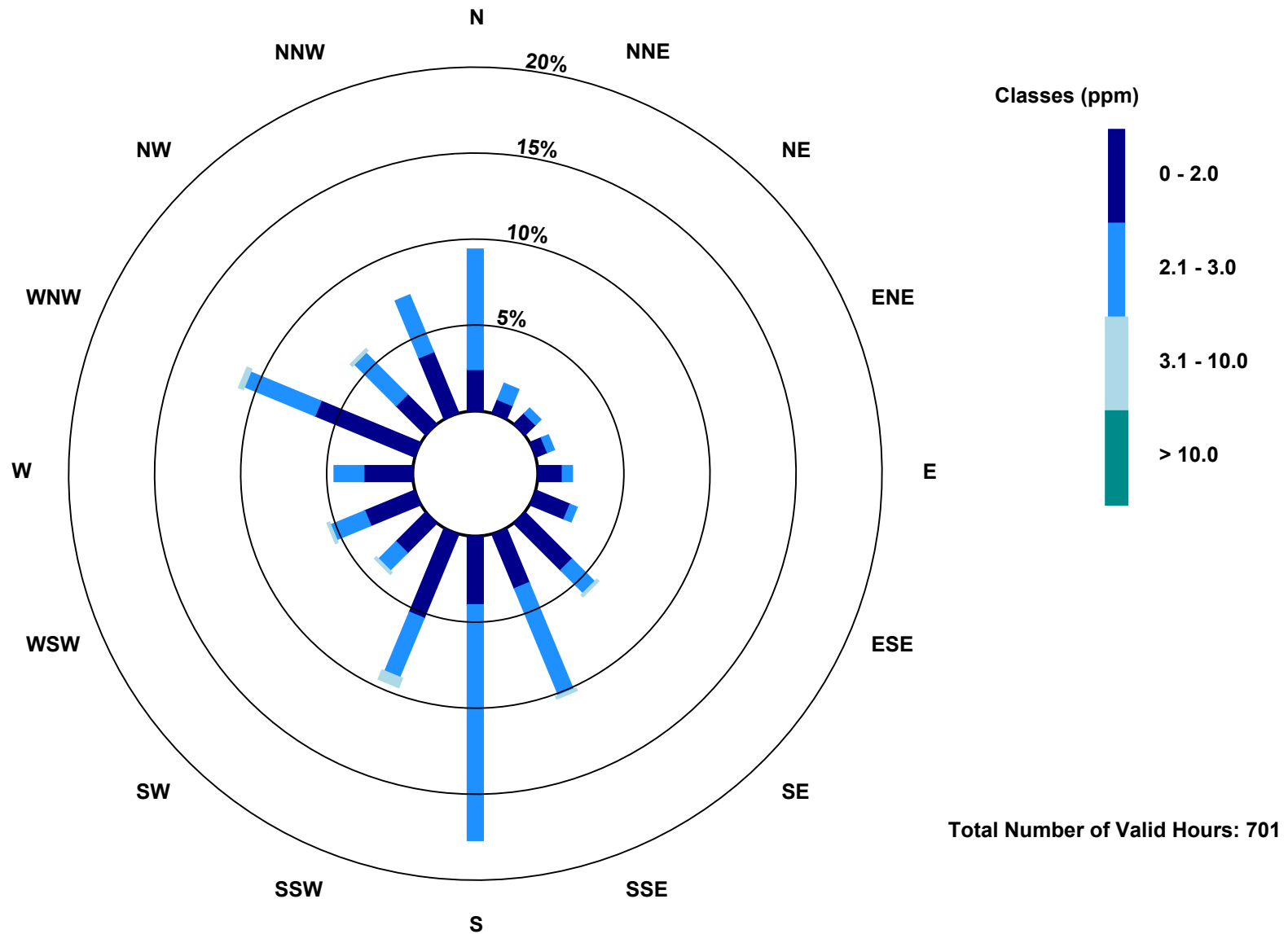
Total Number of Valid Hours: 701

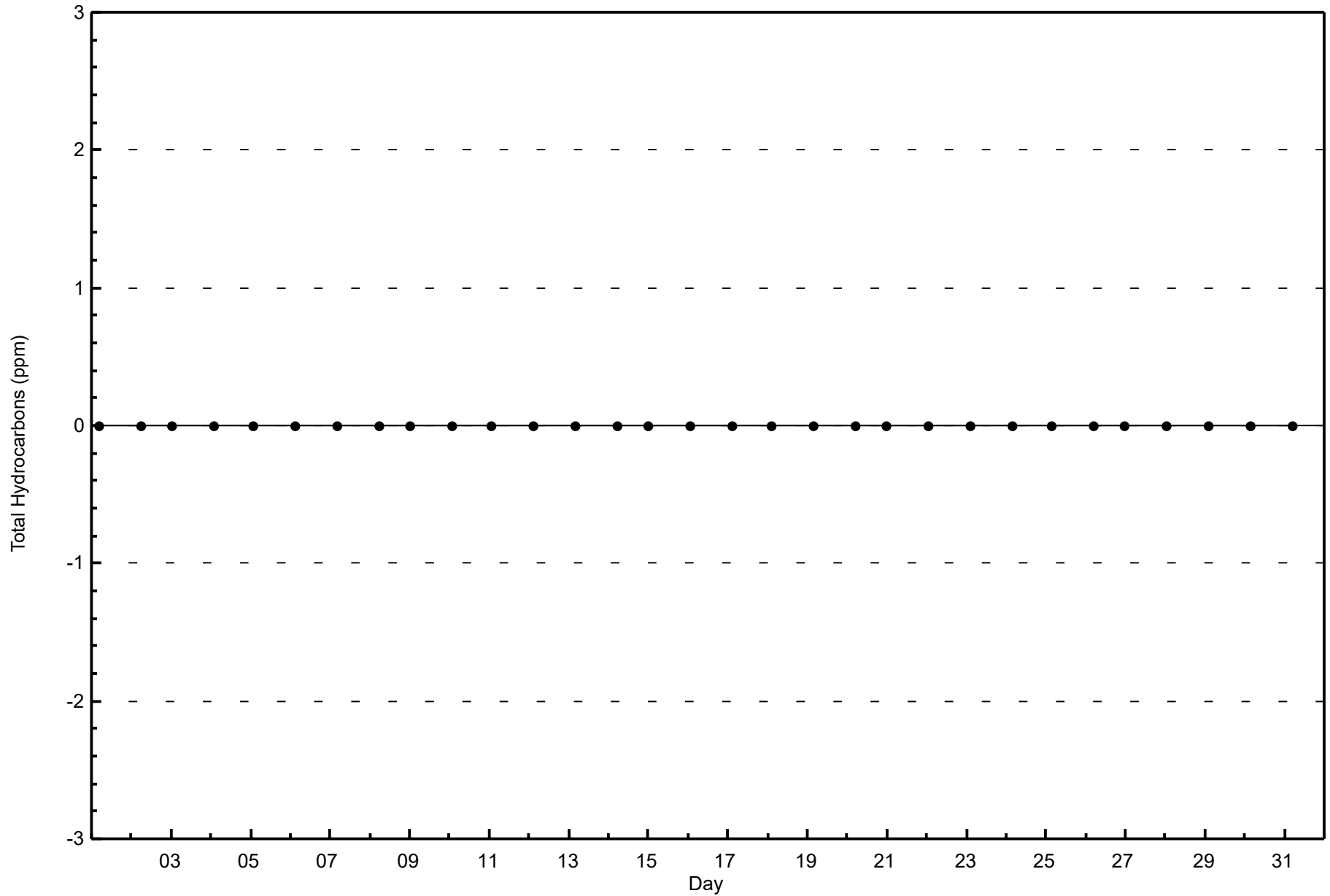
Total Number of Hours: 744

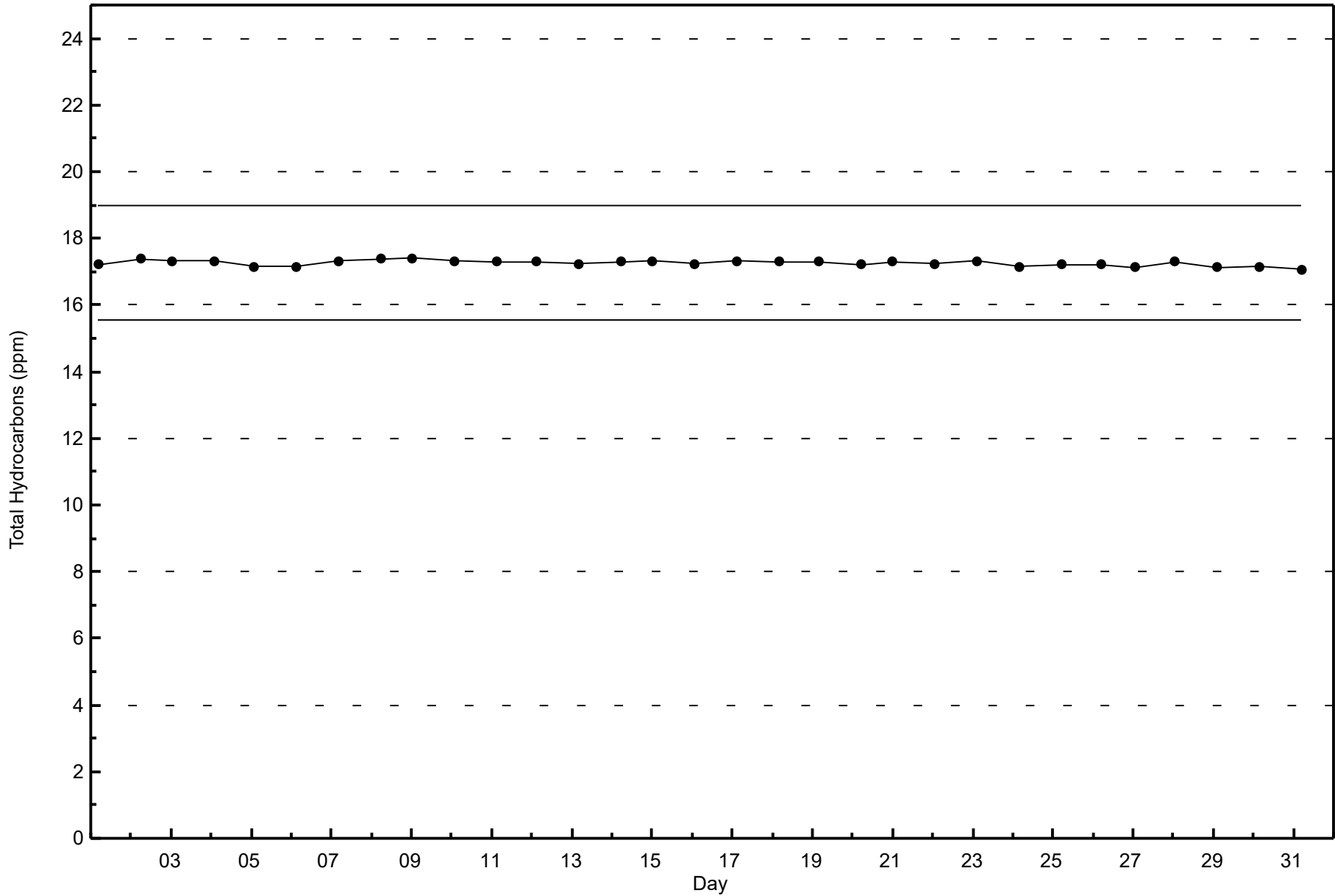


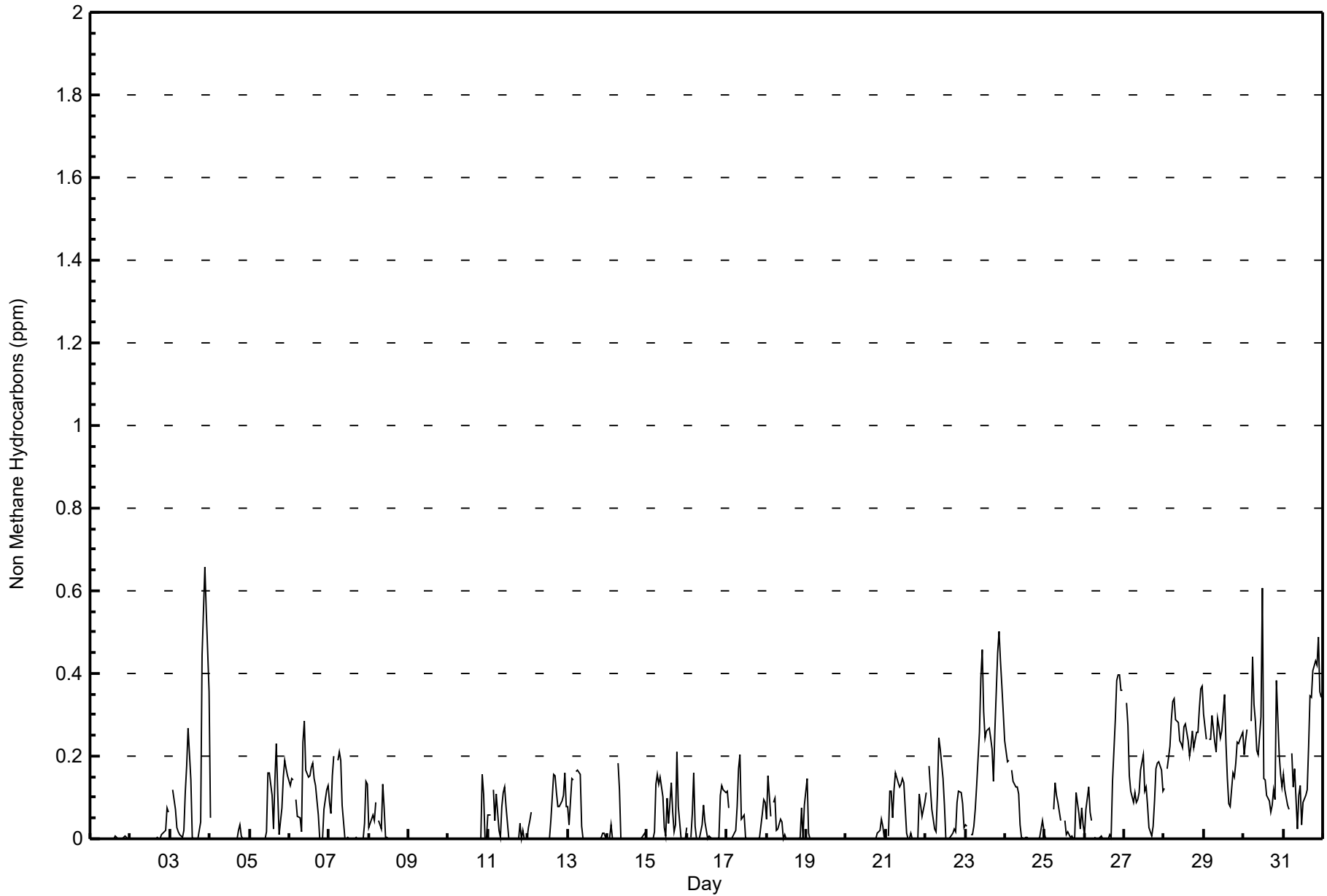
Wood Buffalo Environmental Association
Wind Rose Aug 2023

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











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	313	44.33	44.33
0.006 - 0.05	99	14.02	58.36
0.06 - 0.1	150	21.25	79.60
> 0.1	144	20.40	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - August 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	17	6	5	5	10	15	27	22	35	34	18	19	16	42	17	25	313
0.006 - 0.05	13	0	1	1	1	1	2	10	15	9	1	5	9	12	7	10	97
0.06 - 0.1	14	4	2	0	2	1	10	17	31	13	5	9	4	16	8	13	149
> 0.1	22	3	1	2	1	1	2	23	43	11	4	5	3	7	10	4	142
Totals	66	13	9	8	14	18	41	72	124	67	28	38	32	77	42	52	701

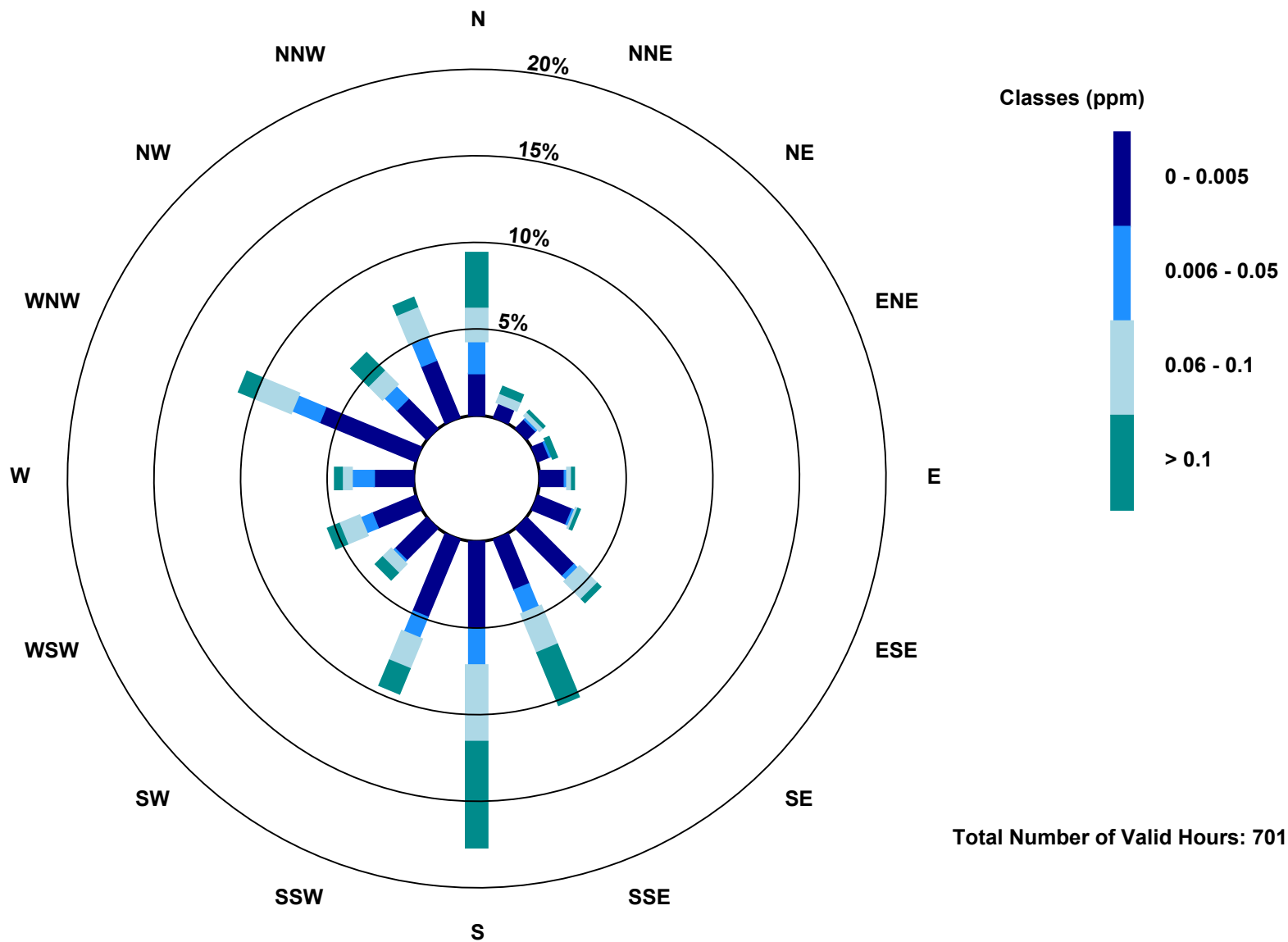
Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

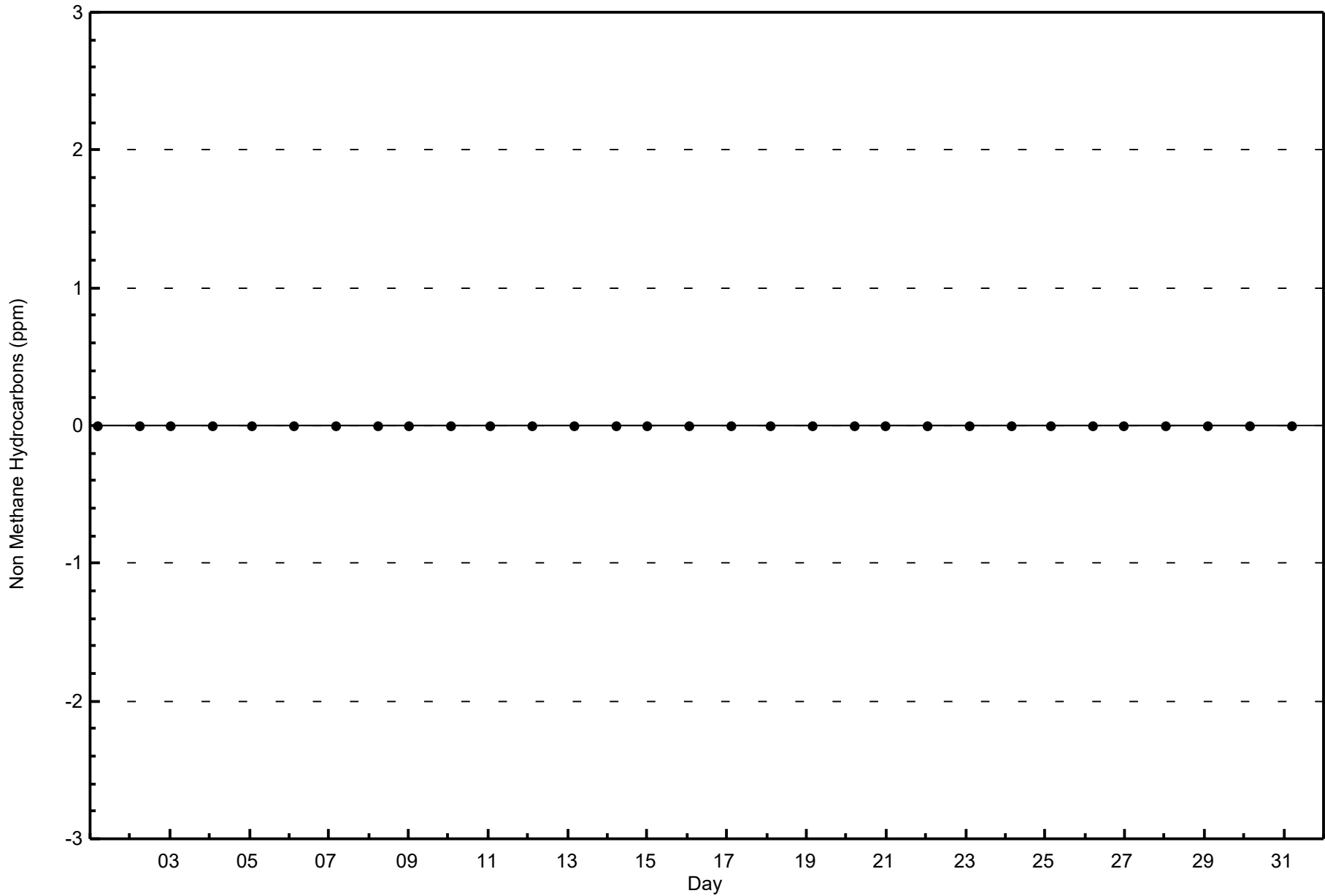
Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter

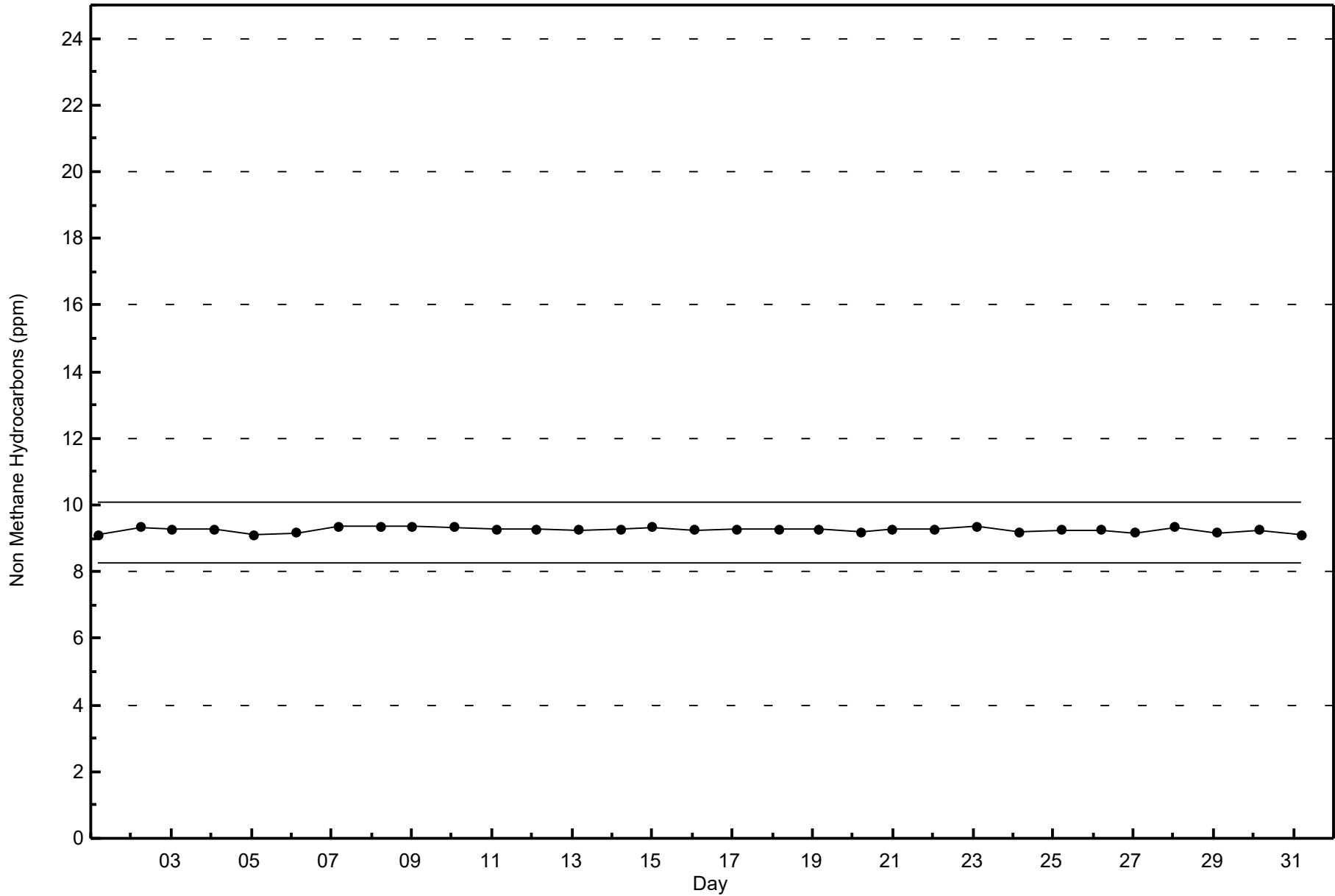




Wood Buffalo Environmental Association
Zero Responses

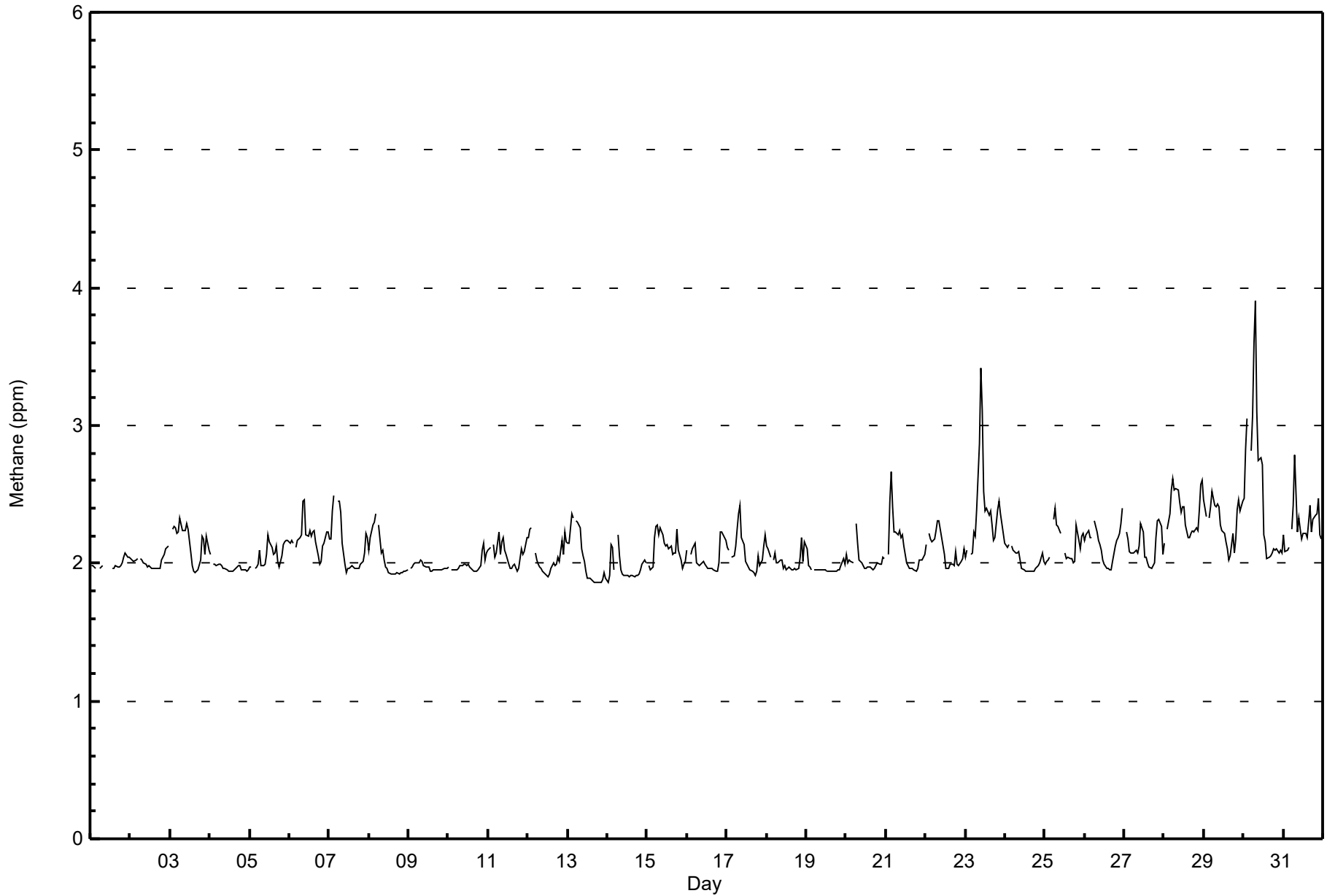
Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay - Bertha Ganter - August 2023







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																															
Maximum Value: 3.9 ppm on Aug 30 08:00		Maximum Daily Average: 2.5 ppm on Aug 30		Hours of Data:														706																																	
Minimum Value: 1.9 ppm on Aug 13 20:00		Minimum Daily Average: 2.0 ppm on Aug 14		Hours of Missing Data:														38																																	
Maximum Diurnal Average: 2.2 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Calibration:														36																																	
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.9		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-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	C	C	C	C	C	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	2.1																								
2-Aug	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1																							
3-Aug	Z	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.2	2.2	2.1	2.2	2.1	2.1	2.3																								
4-Aug	2.1	Z	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	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1																								
5-Aug	2.0	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.2																								
6-Aug	2.1	2.2	2.1	Z	2.1	2.2	2.2	2.2	2.5	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.5																								
7-Aug	2.2	2.2	2.4	2.5	Z	2.5	2.5	2.4	2.1	2.0	1.9	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	2.1	2.2	2.5																								
8-Aug	2.1	2.2	2.3	2.3	2.4	Z	2.3	2.1	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.4																								
9-Aug	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	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0																								
10-Aug	2.0	Z	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.1																								
11-Aug	2.1	2.1	Z	2.1	2.0	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2																								
12-Aug	2.2	2.2	2.3	Z	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.2	2.0	2.3	2.3																								
13-Aug	2.1	2.1	2.4	2.3	Z	2.3	2.3	2.3	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.4	2.4																								
14-Aug	1.9	1.9	2.1	2.1	2.0	Z	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.2	2.2																								
15-Aug	Z	2.0	2.0	2.0	2.2	2.3	2.3	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.1	2.3	2.3																								
16-Aug	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	1.9	1.9	2.0	2.2	2.2	2.2	2.2	2.0	2.2	2.2																								
17-Aug	2.1	2.1	Z	2.0	2.1	2.1	2.2	2.4	2.4	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.1	2.0	2.0	2.1	2.2	2.1	2.4	2.4																								
18-Aug	2.1	2.1	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.0	2.2	2.0	2.2	2.2	2.2																								
19-Aug	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1																								
20-Aug	2.1	2.0	2.0	2.0	2.0	Z	2.3	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	2.3																								
21-Aug	Z	2.1	2.4	2.7	2.4	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	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.7	2.7																								
22-Aug	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.3																								
23-Aug	2.0	2.1	Z	2.1	2.1	2.2	2.2	2.4	2.9	3.4	3.1	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.4	2.4	2.4	2.3	2.2	2.4	3.4	3.4																								
24-Aug	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	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	2.1	2.0	2.0	2.1	2.1																								
25-Aug	2.0	2.0	2.0	2.0	Z	2.3	2.4	2.3	2.3	2.2	M	M	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.2	2.1	2.2	2.2	2.1	2.4	2.4																								
26-Aug	2.2	2.2	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.3	2.4	2.1	2.4	2.4																								
27-Aug	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.3	2.3	2.3	2.1	2.1	2.3	2.3																								
28-Aug	2.2	Z	2.2	2.4	2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.4	2.6	2.6	2.4	2.6	2.6																								
29-Aug	2.5	2.3	Z	2.3	2.4	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.1	2.2	2.1	2.2	2.4	2.5	2.4	2.5	2.3	2.5	2.5																								
30-Aug	2.5	2.8	3.1	Z	2.8	3.1	3.6	3.9	3.1	2.7	2.8	2.7	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	3.9	3.9																								
31-Aug	2.2	2.1	2.1	2.1	Z	2.2	2.4	2.8	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.2	2.3	2.4	2.4	2.5	2.2	2.2	2.3	2.8	2.8																								
																								2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	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	2.1	2.1	2.1	2.1	2.1	Diurnal Average	
																								2.5	2.8	3.1	2.7	2.8	3.1	3.6	3.9	3.1	3.4	3.1	2.7	2.4	2.4	2.4	2.4	2.4	2.2	2.3	2.4	2.4	2.5	2.6	2.6	2.6	2.6	2.6	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	359	50.85	50.85
2.1 - 3.0	340	48.16	99.01
3.1 - 10.0	7	0.99	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
Fort McKay - Bertha Ganter - August 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	24	7	7	5	10	17	27	28	32	41	19	27	21	47	19	27	358
2.1 - 3.0	42	6	2	3	4	1	14	44	92	24	8	10	11	29	22	25	337
3.1 - 10.0	0	0	0	0	0	0	0	0	0	2	1	1	0	1	1	0	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	66	13	9	8	14	18	41	72	124	67	28	38	32	77	42	52	701

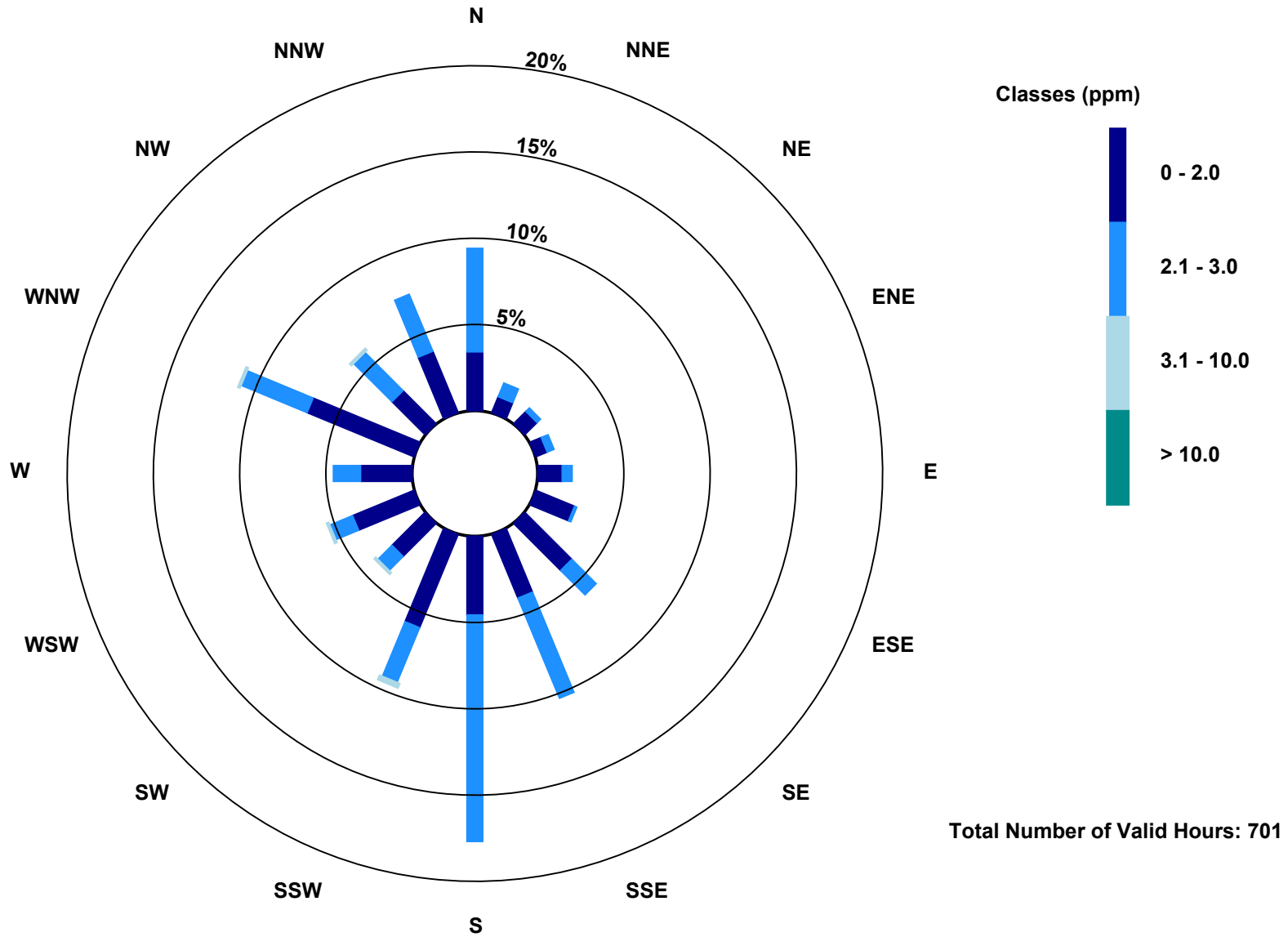
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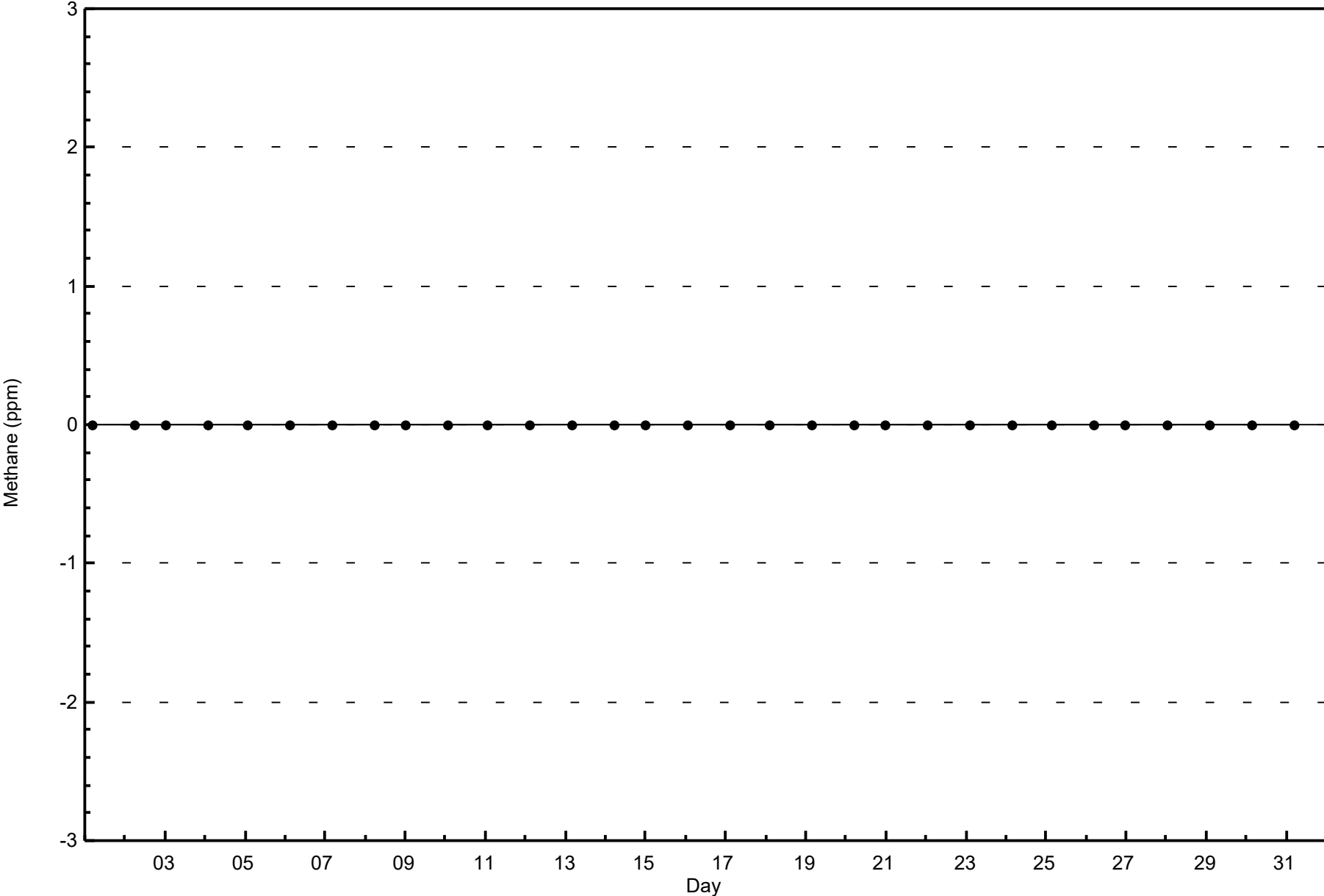
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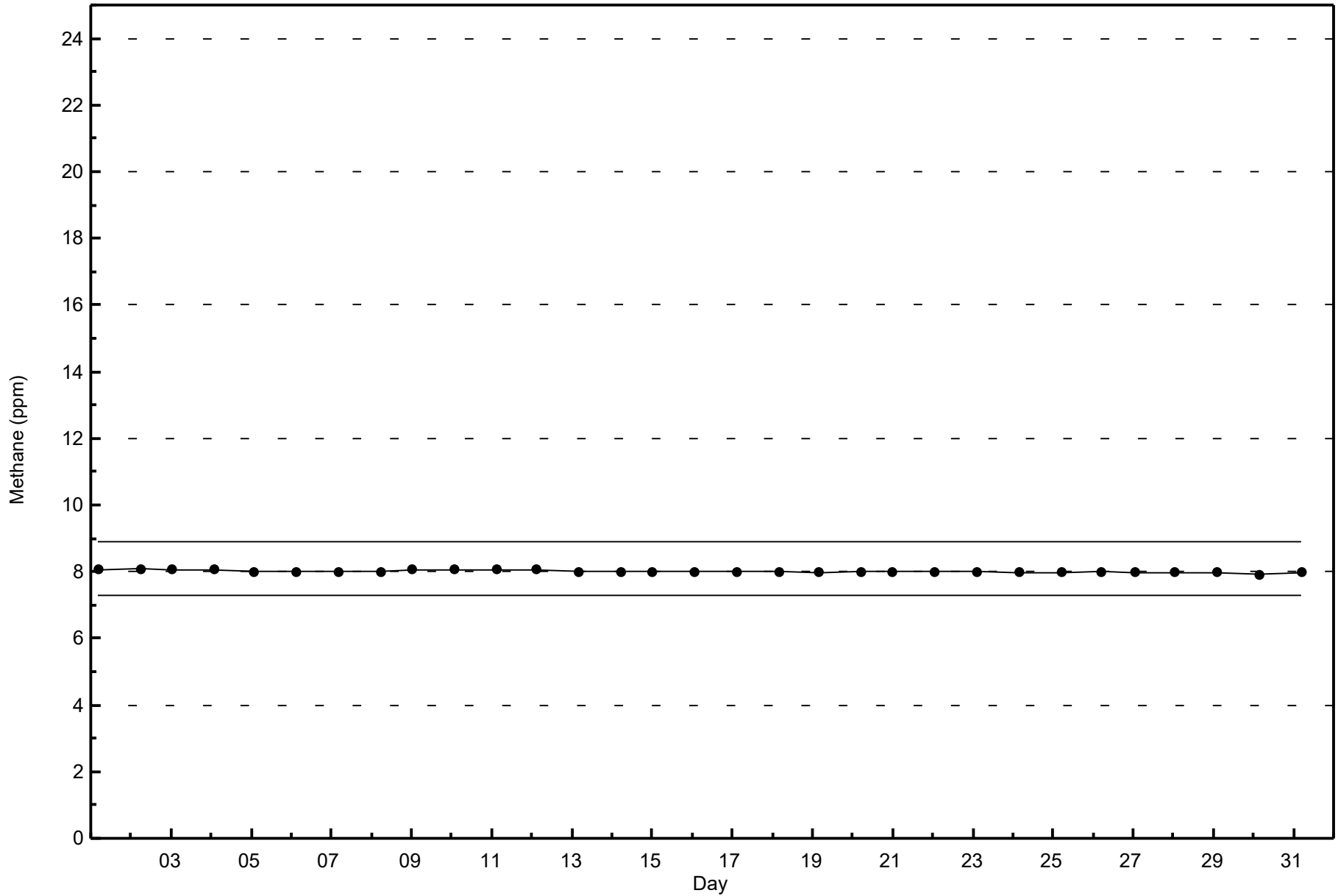


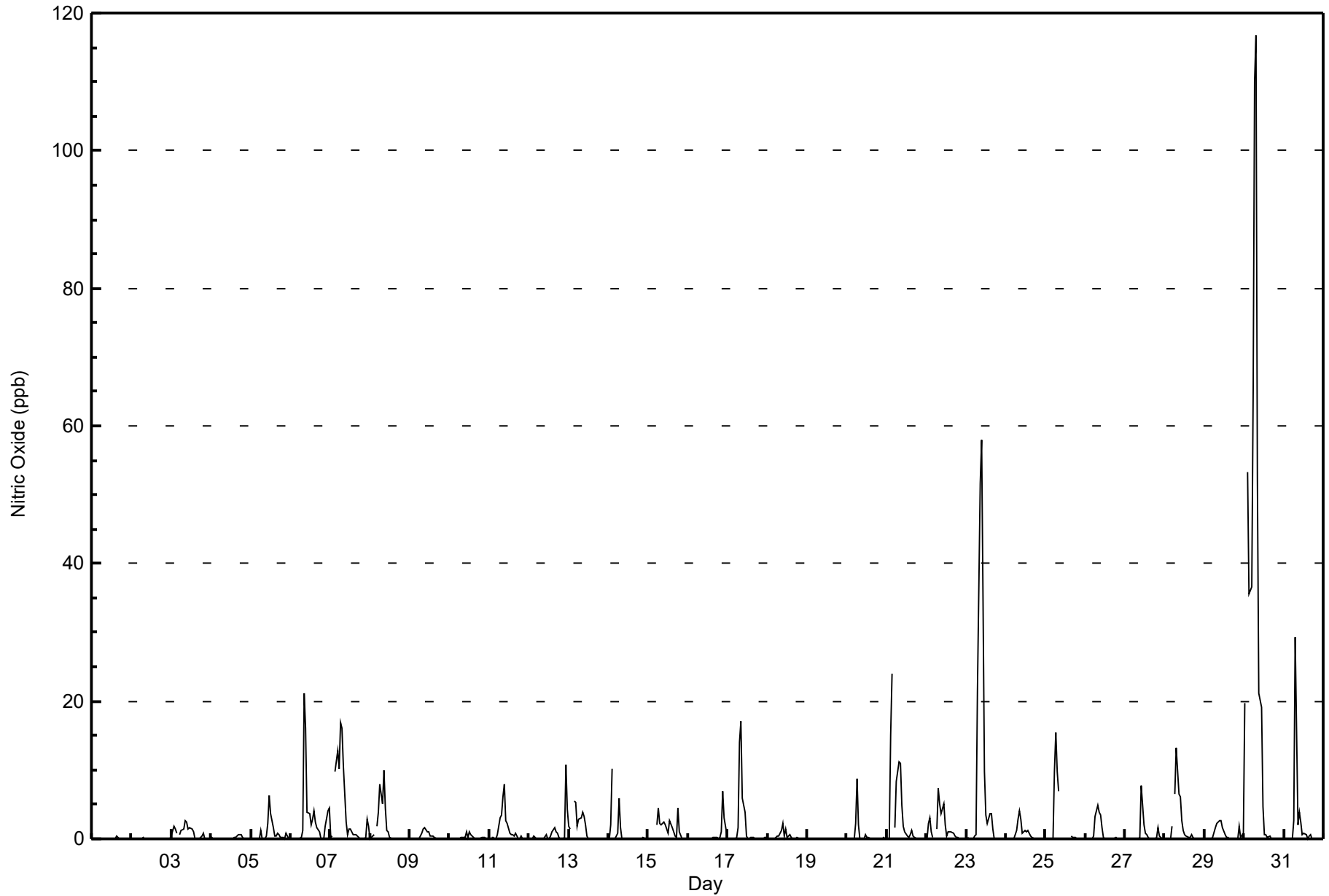
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Fort McKay - Bertha Ganter











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	692	97.88	97.88
21 - 40	8	1.13	99.01
41 - 80	5	0.71	99.72
81 - 159	2	0.28	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 - August 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	64	14	9	8	14	18	40	73	120	60	30	39	31	79	37	53	689
21 - 40	0	0	0	0	0	0	0	0	2	2	0	2	1	0	1	0	8
11 - 80	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	14	9	8	14	18	40	73	122	64	31	41	32	81	39	53	703

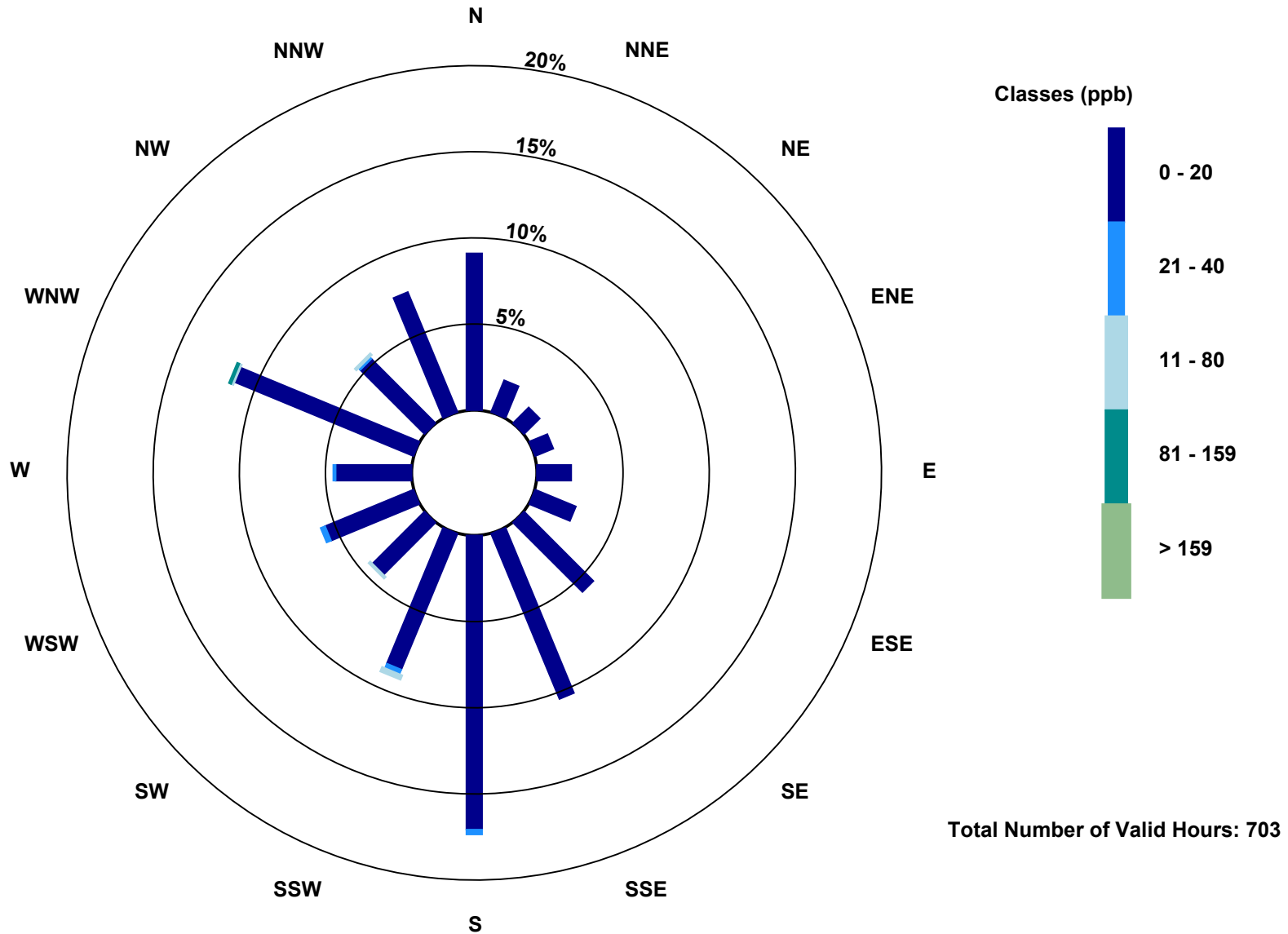
Total Number of Valid Hours: 703

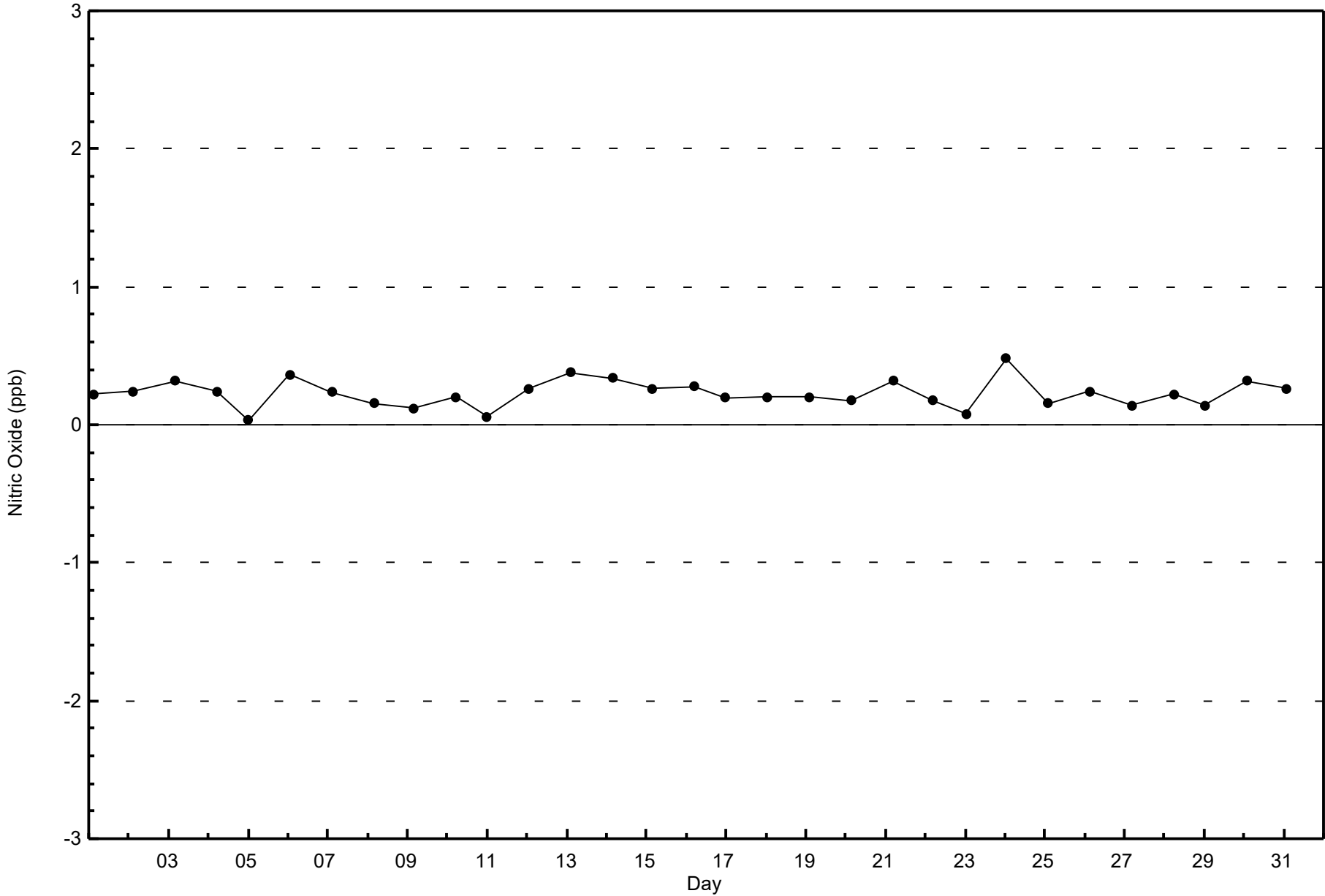
Total Number of Hours: 744

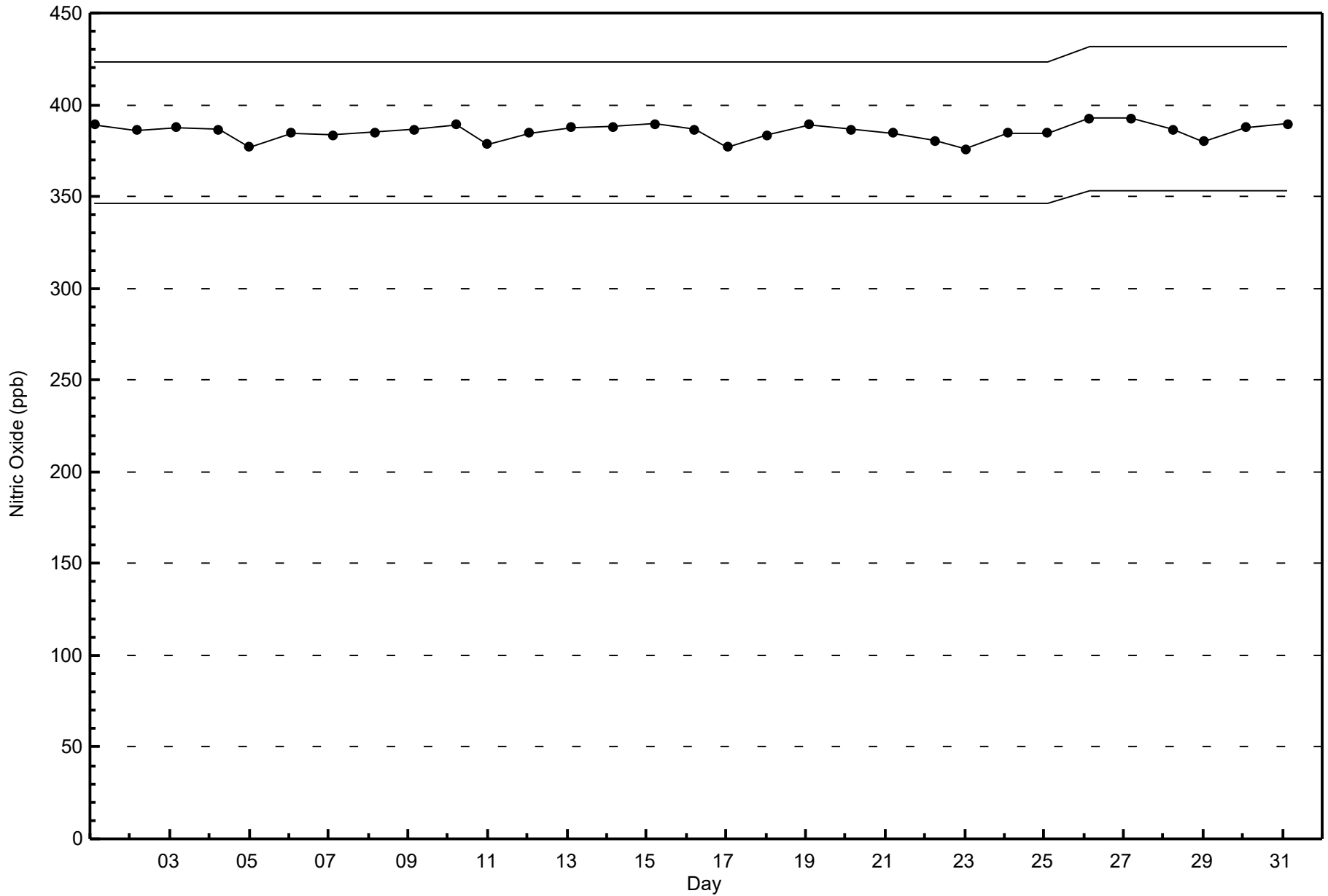


Wood Buffalo Environmental Association
Wind Rose Aug 2023

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









Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 26.2 ppb on Aug 27 21:00	Maximum Daily Average: 9.2 ppb on Aug 23		Hours of Data:	707
Minimum Value: 0.0 ppb on Aug 12 12:00	Minimum Daily Average: 1.0 ppb on Aug 4		Hours of Missing Data:	37
Maximum Diurnal Average: 7.2 ppb at hour 23	Minimum Diurnal Average: 2.4 ppb at hour 18		Hours of Calibration:	37
Monthly Average: 4.65 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.9 Median = 3.4 Q ₃ = 7.1 P ₉₀ = 11.3 P ₉₉ = 19.1		Percent Operational Time:	100.0

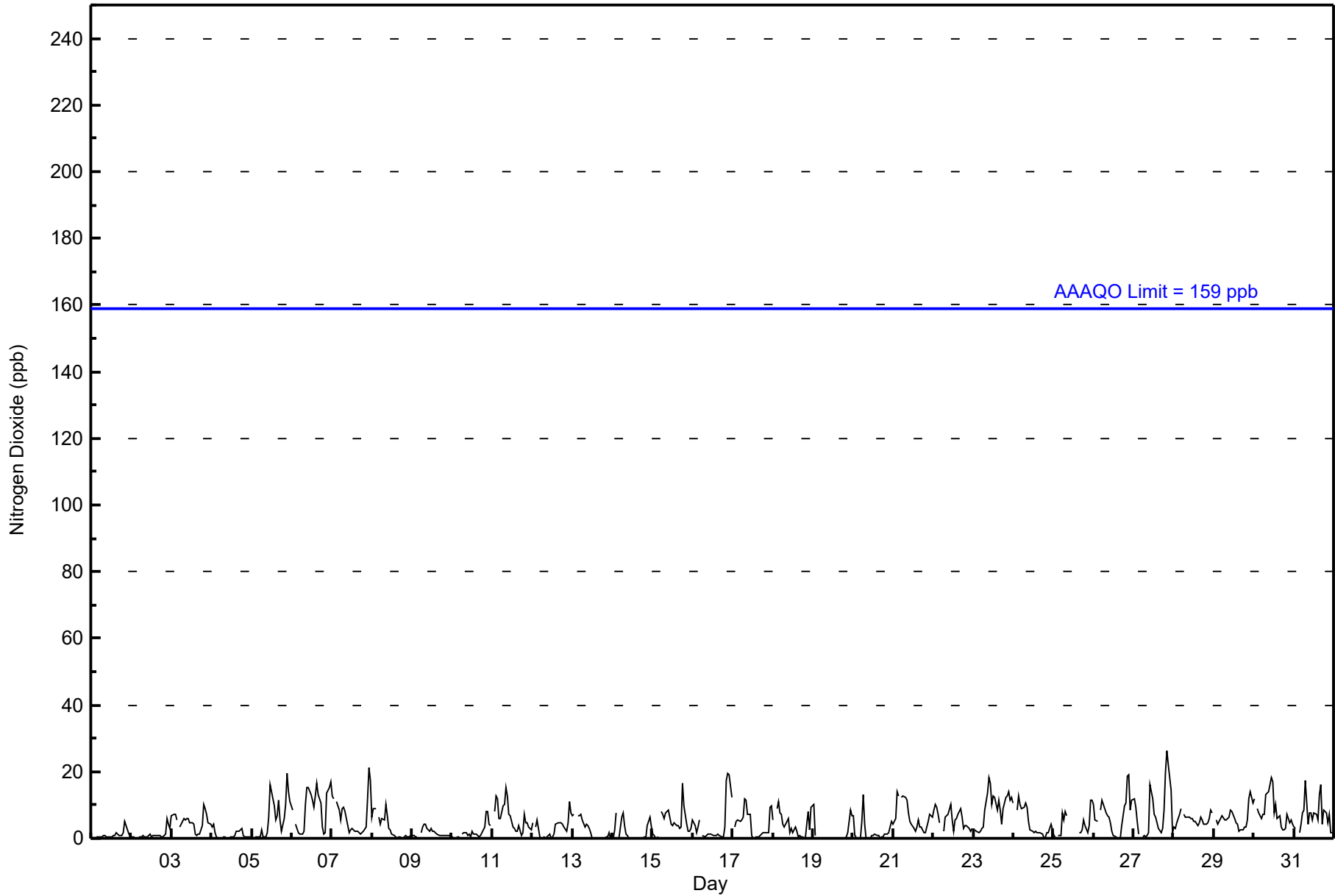
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	0.2	0.2	Z	0.3	0.6	0.5	0.6	0.8	0.7	0.5	0.4	0.4	0.3	0.7	0.8	1.6	0.9	0.8	0.8	1.9	5.1	4.0	1.1	0.8	1.0	5.1																							
2-Aug	0.4	0.3	0.3	Z	0.3	0.3	0.5	0.7	0.4	0.6	0.9	1.4	0.6	0.7	0.8	0.8	1.0	0.7	0.6	0.4	1.3	6.0	4.1	2.8	1.1	6.0																							
3-Aug	6.7	7.4	7.4	5.5	Z	3.5	4.2	5.9	5.3	5.8	5.9	4.8	4.8	4.3	1.1	1.0	1.2	1.3	4.0	10.2	8.7	7.1	4.8	4.2	5.0	10.2																							
4-Aug	3.2	4.1	1.5	0.3	0.1	Z	0.1	0.3	0.3	0.2	0.2	0.3	0.4	0.4	1.0	2.1	2.0	2.4	3.0	0.8	0.3	0.3	0.3	0.3	1.0	4.1																							
5-Aug	Z	0.2	0.3	0.4	0.3	0.5	2.6	0.4	0.3	1.5	6.4	15.9	13.9	9.9	5.5	6.7	11.3	5.7	2.2	6.1	10.2	19.5	13.8	10.9	6.3	19.5																							
6-Aug	8.3	Z	4.2	2.8	1.6	1.1	1.1	2.0	10.1	15.2	15.1	13.3	11.6	9.5	12.7	16.5	13.3	10.6	3.2	1.1	1.6	13.5	15.1	17.0	8.7	17.0																							
7-Aug	12.9	11.9	Z	10.9	8.4	5.5	9.0	9.3	7.9	3.7	1.9	2.7	2.9	2.6	2.3	2.2	1.8	1.2	1.6	2.0	3.5	11.8	21.3	17.5	6.7	21.3																							
8-Aug	6.3	9.1	9.1	Z	6.4	4.4	6.1	5.7	10.2	6.6	3.1	2.5	1.3	0.8	0.5	0.2	0.3	0.3	0.2	0.5	0.7	0.4	0.5	1.0	3.3	10.2																							
9-Aug	0.8	0.7	0.5	0.5	Z	1.6	3.4	4.1	4.1	3.1	2.2	2.8	2.2	2.2	1.5	1.3	0.7	1.0	0.9	0.7	0.8	0.9	1.0	0.3	1.6	4.1																							
10-Aug	0.3	0.2	0.2	0.4	0.5	Z	1.4	1.6	1.9	1.0	1.4	0.6	2.2	1.4	1.1	0.7	0.5	0.8	1.9	3.3	7.9	8.1	4.4	4.0	2.0	8.1																							
11-Aug	Z	7.9	12.6	11.9	6.0	5.8	9.8	10.3	15.1	12.5	7.3	6.7	3.3	2.8	2.2	2.3	4.0	0.8	1.8	7.3	4.7	4.7	3.5	2.6	6.3	15.1																							
12-Aug	4.5	Z	3.5	5.7	0.5	0.1	0.1	0.4	0.2	0.4	1.1	0.0	0.4	1.4	4.2	4.8	4.6	4.7	4.2	3.6	2.2	4.7	11.1	7.5	3.0	11.1																							
13-Aug	6.9	7.3	Z	6.9	6.6	7.3	5.4	3.6	4.3	3.7	3.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.6	1.5	0.2	2.6	7.3																							
14-Aug	0.0	2.5	7.6	Z	0.1	6.4	7.6	4.0	1.2	0.9	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.3	0.0	4.0	6.4	3.4	1.9	7.6																							
15-Aug	1.1	0.8	0.2	0.4	Z	8.0	7.2	6.0	7.7	8.6	6.2	4.2	3.8	4.7	3.7	3.8	2.9	3.4	16.5	9.8	4.4	2.0	2.2	3.0	4.8	16.5																							
16-Aug	5.4	3.9	1.5	3.2	5.7	Z	0.7	0.6	1.0	1.3	1.3	1.3	0.8	0.8	0.7	1.1	0.9	0.6	0.4	3.2	17.2	19.6	19.2	12.1	4.5	19.6																							
17-Aug	Z	3.2	4.9	5.6	5.0	5.5	6.5	11.8	11.5	7.1	7.2	0.7	0.2	0.2	0.4	0.5	1.0	1.2	1.7	1.6	1.7	1.9	9.5	9.7	4.3	11.8																							
18-Aug	5.6	Z	8.9	10.9	7.5	7.0	4.4	3.2	5.2	5.8	1.9	2.9	1.8	3.6	2.1	0.4	0.8	0.6	0.3	0.2	4.2	8.2	2.6	9.3	4.2	10.9																							
19-Aug	10.2	0.9	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	0.0	0.0	0.1	0.2	0.5	1.9	8.3	6.7	1.3	10.2																							
20-Aug	6.7	1.0	0.3	Z	0.1	4.9	13.2	4.3	0.2	0.1	0.1	0.8	0.8	1.1	0.9	0.7	0.2	0.6	0.6	1.1	1.3	1.8	3.2	5.1	2.1	13.2																							
21-Aug	4.4	5.8	14.0	12.7	Z	12.2	12.6	12.2	11.6	7.6	5.1	4.4	2.9	2.3	3.4	5.4	3.2	3.3	1.6	1.6	3.6	5.0	7.4	6.4	6.5	14.0																							
22-Aug	8.3	10.0	9.5	7.0	4.5	Z	2.3	6.3	6.8	7.0	10.2	5.7	2.3	5.3	5.8	7.2	8.7	6.3	3.1	3.9	3.9	3.0	2.3	3.0	5.8	10.2																							
23-Aug	Z	2.7	2.0	1.9	2.1	3.1	3.3	8.4	13.4	18.3	16.6	10.1	12.5	12.1	8.6	11.4	8.5	4.4	9.1	12.1	12.7	13.8	11.3	12.2	9.2	18.3																							
24-Aug	10.4	Z	8.3	12.9	10.0	8.8	9.4	10.5	9.3	5.1	2.5	2.3	1.9	2.1	1.6	1.6	1.5	1.1	0.1	0.6	1.5	1.9	4.3	2.4	4.8	12.9																							
25-Aug	0.9	0.5	Z	0.7	1.0	7.8	5.5	7.9	6.7	C	C	C	C	C	C	1.8	1.8	2.7	5.5	3.7	1.7	3.9	11.3	11.3	--	11.3																							
26-Aug	10.2	5.7	5.0	Z	8.3	11.3	10.2	7.5	6.7	6.5	4.8	2.3	0.9	0.4	0.2	0.2	0.1	3.7	9.7	10.6	18.6	19.1	8.5	11.4	7.0	19.1																							
27-Aug	11.8	9.4	5.2	1.2	Z	0.5	0.9	0.4	0.9	1.8	16.3	12.0	7.4	6.2	4.5	2.9	1.7	2.8	8.3	19.8	26.2	22.2	14.4	1.5	7.8	26.2																							
28-Aug	3.2	3.0	4.7	7.0	8.9	Z	7.3	6.4	6.5	6.5	5.8	5.8	4.9	5.2	3.9	4.8	6.5	5.5	4.1	4.4	4.8	6.0	8.6	7.8	5.7	8.9																							
29-Aug	Z	5.4	4.4	5.1	6.1	6.6	5.6	5.3	5.8	6.3	8.5	8.0	6.1	4.6	4.1	2.0	2.6	2.4	3.3	3.3	5.4	11.9	13.9	10.8	6.0	13.9																							
30-Aug	11.9	Z	8.7	7.5	6.0	7.3	7.4	13.3	13.7	14.1	18.2	17.1	7.6	10.1	6.0	6.8	3.6	2.5	2.5	2.8	7.4	4.5	5.4	4.1	8.2	18.2																							
31-Aug	3.6	3.1	Z	1.6	4.3	7.7	8.5	17.4	4.3	7.7	7.6	5.3	7.7	7.3	5.4	13.1	16.2	4.2	8.3	7.7	4.7	7.3	1.7	1.6	6.8	17.4																							
																								5.5	4.1	5.0	4.7	3.9	4.9	5.1	5.5	5.6	5.3	5.4	4.5	3.5	3.4	2.8	3.4	3.3	2.4	3.2	4.0	5.4	7.1	7.2	6.2	Diurnal Average	
																								12.9	11.9	14.0	12.9	10.0	12.2	13.2	17.4	15.1	18.3	18.2	17.1	13.9	12.1	12.7	16.5	16.2	10.6	16.5	19.8	26.2	22.2	21.3	17.5	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 - Bertha Ganter - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.58	99.58
21 - 40	3	0.42	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 - August 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	64	14	9	8	14	18	40	73	121	63	31	41	32	81	38	53	700
21 - 40	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	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	64	14	9	8	14	18	40	73	122	64	31	41	32	81	39	53	703

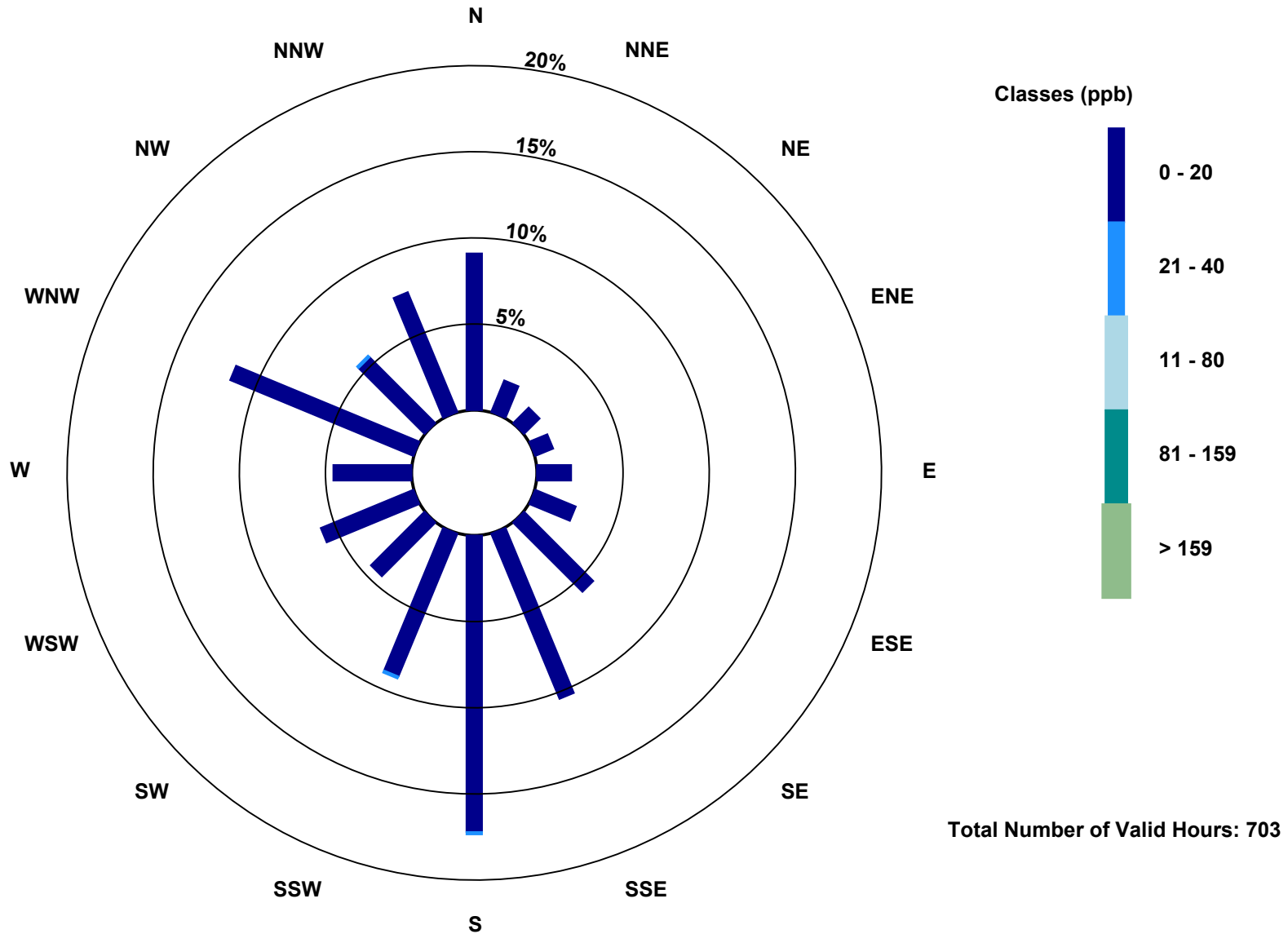
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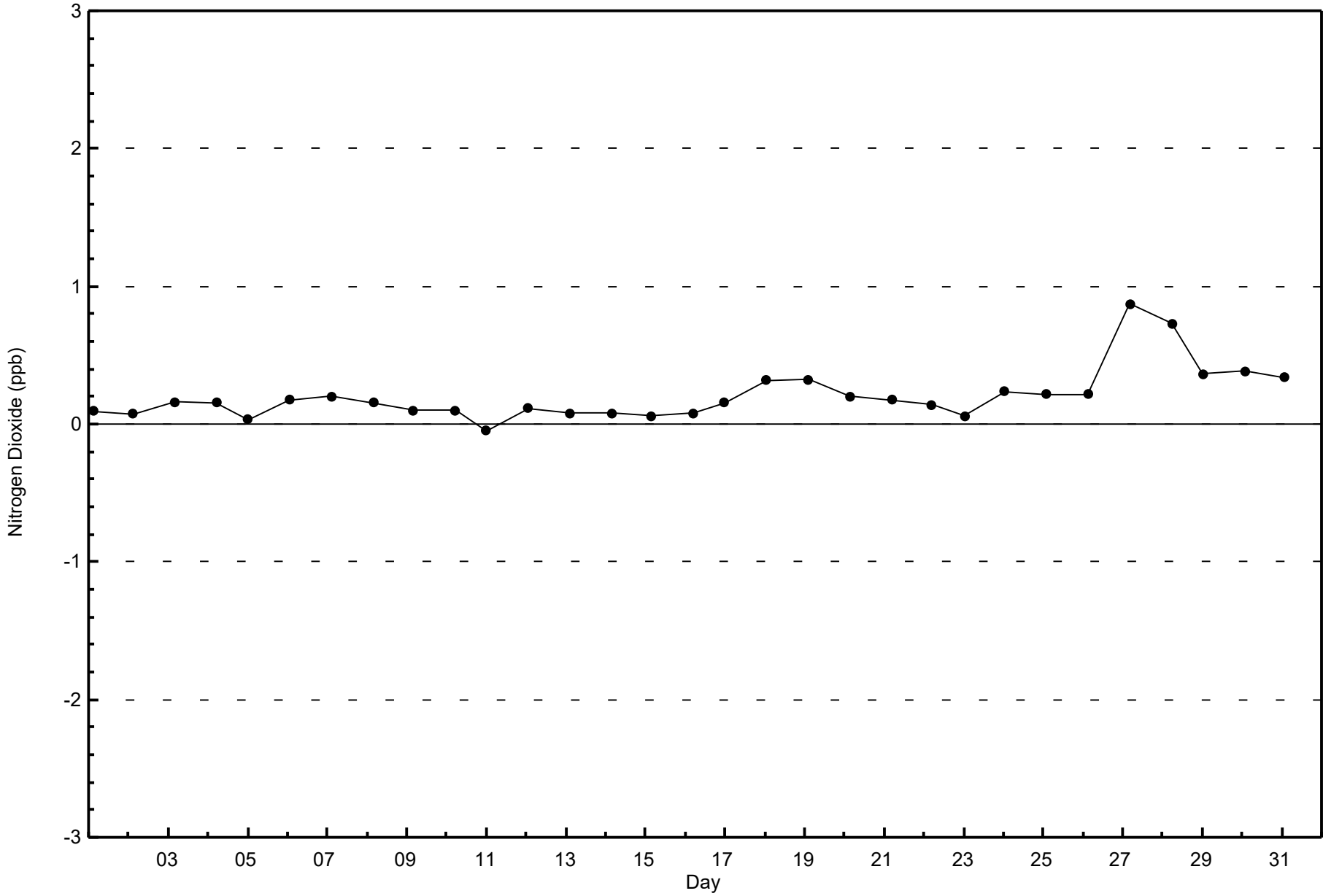
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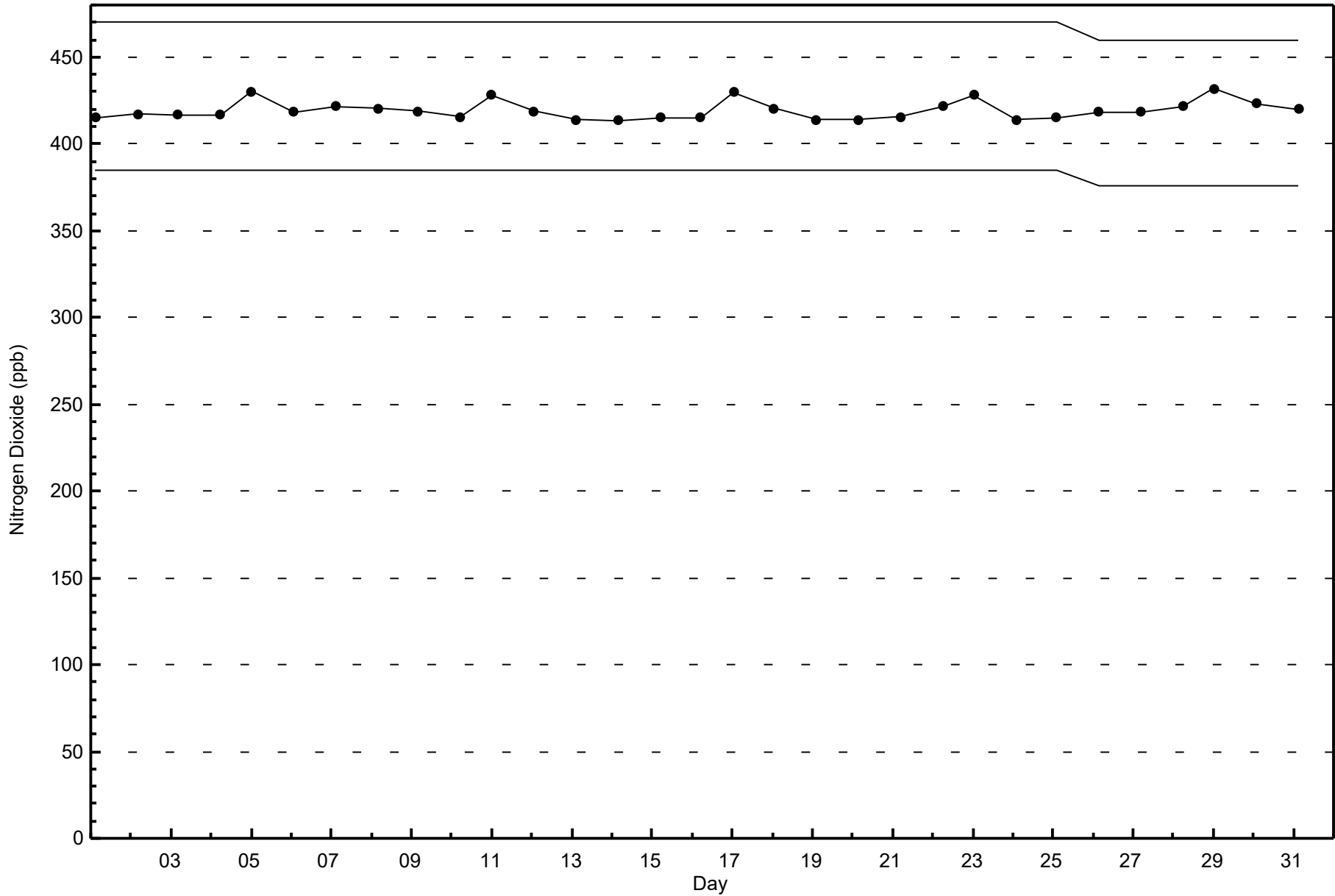


Wood Buffalo Environmental Association
Wind Rose Aug 2023

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









Wood Buffalo Environmental Association
Summary of Hour Averages

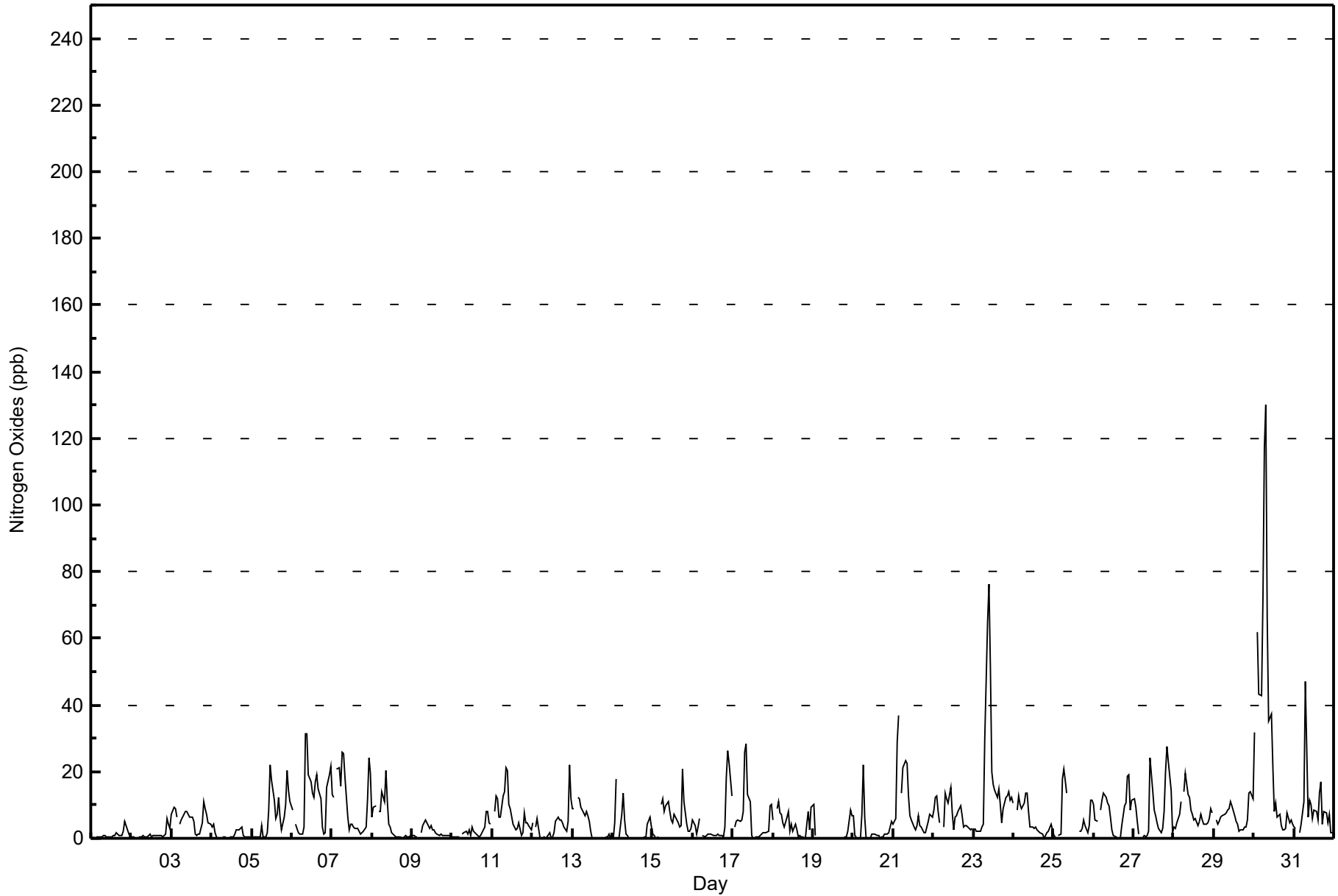
Nitrogen Oxides (NO_x) - ppb
Fort McKay - Bertha Ganter - August 2023

Maximum Value: 130.0 ppb on Aug 30 08:00		Maximum Daily Average: 31.5 ppb on Aug 30		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Aug 13 14:00		Minimum Daily Average: 1.1 ppb on Aug 1		Hours of Data: 707																							
Maximum Diurnal Average: 14.2 ppb at hour 8		Minimum Diurnal Average: 2.6 ppb at hour 18		Hours of Missing Data: 37																							
Monthly Average: 6.77 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.9 Median = 3.9 Q ₃ = 8.4 P ₉₀ = 14.3 P ₉₉ = 50.9		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-Aug	0.2	0.2	Z	0.3	0.6	0.5	0.6	0.8	0.7	0.5	0.4	0.4	0.3	0.7	0.8	1.9	1.0	0.8	0.8	1.9	5.1	4.0	1.1	0.8	1.1	5.1	
2-Aug	0.4	0.3	0.3	Z	0.3	0.3	0.5	0.8	0.4	0.6	0.9	1.4	0.6	0.7	0.8	0.8	1.0	0.7	0.6	0.4	1.3	6.0	4.1	2.8	1.1	6.0	
3-Aug	7.0	9.2	8.9	6.3	Z	4.2	5.4	7.4	7.9	8.3	7.4	6.5	6.2	5.3	1.1	1.0	1.2	1.3	4.5	11.1	8.8	7.1	4.8	4.2	5.9	11.1	
4-Aug	3.3	4.1	1.5	0.3	0.1	Z	0.1	0.3	0.3	0.2	0.2	0.3	0.4	0.4	1.3	2.4	2.6	2.9	3.5	0.9	0.4	0.3	0.3	0.4	1.1	4.1	
5-Aug	Z	0.3	0.3	0.4	0.3	0.5	3.8	0.5	0.4	1.9	8.6	22.2	17.6	11.4	5.8	7.1	12.1	6.3	2.3	6.3	10.2	20.4	14.2	10.9	7.1	22.2	
6-Aug	8.3	Z	4.2	2.8	1.6	1.1	1.3	3.2	31.2	31.3	19.0	17.0	13.6	12.3	16.7	19.0	15.0	11.7	3.3	1.1	1.6	15.3	19.2	21.5	11.8	31.3	
7-Aug	13.1	12.3	Z	20.6	21.3	15.7	25.8	25.4	18.4	6.2	2.5	4.1	4.3	3.5	3.0	2.9	2.3	1.3	1.7	2.0	3.5	11.9	24.2	19.4	10.7	25.8	
8-Aug	6.3	9.3	9.8	Z	8.1	8.2	14.1	10.8	20.2	11.0	4.3	3.5	1.5	0.9	0.5	0.2	0.3	0.3	0.2	0.5	0.7	0.4	0.5	1.0	4.9	20.2	
9-Aug	0.8	0.7	0.5	0.5	Z	1.6	3.9	4.8	5.5	4.8	3.1	3.8	2.6	2.7	1.8	1.4	0.7	1.1	1.0	0.7	0.8	0.9	1.0	0.3	1.9	5.5	
10-Aug	0.3	0.2	0.2	0.4	0.5	Z	1.4	1.8	2.2	1.3	2.4	0.9	3.3	2.0	1.3	0.7	0.5	0.8	1.9	3.4	8.0	8.2	4.5	4.1	2.2	8.2	
11-Aug	Z	8.0	12.8	12.0	6.1	6.3	12.8	13.8	21.2	20.4	10.0	9.0	4.1	3.4	2.7	2.8	4.9	0.8	1.8	7.7	4.7	4.7	3.6	2.6	7.7	21.2	
12-Aug	4.5	Z	3.5	6.0	0.5	0.1	0.1	0.4	0.2	0.4	1.7	0.0	0.4	1.8	5.3	6.4	5.6	5.4	4.5	3.6	2.2	4.9	22.0	11.8	4.0	22.0	
13-Aug	8.7	8.7	Z	12.5	11.9	9.1	8.3	6.7	8.2	6.9	5.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.6	1.5	0.2	4.0	12.5	
14-Aug	0.0	4.5	17.7	Z	0.1	7.2	13.5	5.7	1.2	0.9	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.3	0.0	4.2	6.4	3.4	2.8	17.7	
15-Aug	1.1	0.8	0.2	0.4	Z	10.1	11.7	8.2	9.6	11.1	8.2	5.7	4.7	7.3	5.3	4.8	3.3	3.7	21.0	10.8	4.4	2.0	2.2	3.0	6.1	21.0	
16-Aug	5.4	3.9	1.5	3.2	5.7	Z	0.7	0.6	1.0	1.3	1.3	1.3	0.8	0.8	0.7	1.2	1.0	0.7	0.4	3.3	18.3	26.5	22.3	12.7	5.0	26.5	
17-Aug	Z	3.2	4.9	5.6	5.0	5.7	8.1	25.9	28.5	13.1	11.1	1.0	0.2	0.2	0.6	0.6	1.0	1.3	1.7	1.6	1.7	1.9	9.7	10.0	6.2	28.5	
18-Aug	5.6	Z	8.9	10.9	7.5	7.1	4.8	3.5	6.3	8.1	2.3	4.4	2.1	4.2	2.3	0.4	0.8	0.6	0.5	0.2	4.2	8.2	2.6	9.3	4.6	10.9	
19-Aug	10.2	0.9	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	0.0	0.0	0.1	0.2	0.5	1.9	8.3	6.7	1.3	10.2	
20-Aug	6.7	1.0	0.3	Z	0.1	7.1	21.9	6.4	0.2	0.1	0.1	1.4	1.1	1.3	1.0	0.7	0.2	0.6	0.6	1.1	1.3	1.8	3.3	5.1	2.8	21.9	
21-Aug	4.4	5.9	29.0	36.8	Z	13.7	21.0	23.5	22.5	12.6	6.9	5.4	3.3	2.6	4.0	6.6	3.6	3.5	1.6	1.6	3.6	5.0	7.4	6.4	10.0	36.8	
22-Aug	8.4	12.2	12.5	7.9	4.7	Z	3.6	13.6	11.8	10.7	15.3	7.7	2.6	6.3	6.7	8.1	9.6	6.7	3.2	4.0	4.0	3.1	2.4	3.1	7.3	15.3	
23-Aug	Z	2.8	2.1	1.9	2.1	3.5	4.0	29.7	65.0	76.2	51.1	19.9	16.0	14.4	12.2	15.0	10.0	4.5	9.1	12.1	12.7	13.8	11.3	12.2	17.5	76.2	
24-Aug	10.4	Z	8.3	12.9	10.0	8.9	10.6	13.3	13.4	8.0	3.4	3.6	2.9	3.3	2.4	2.0	1.8	1.1	0.1	0.6	1.5	1.9	4.3	2.4	5.5	13.4	
25-Aug	0.9	0.5	Z	0.7	1.1	17.7	20.9	17.6	13.6	Z	Z	Z	Z	Z	Z	2.2	2.0	2.9	5.7	3.7	1.7	3.9	11.3	11.3	--	20.9	
26-Aug	10.2	5.7	5.0	Z	8.3	11.6	13.4	12.4	10.7	9.9	6.5	2.6	0.9	0.4	0.2	0.2	0.1	3.7	9.8	10.6	18.6	19.1	8.5	11.4	7.8	19.1	
27-Aug	11.8	9.4	5.2	1.2	Z	0.5	0.9	0.4	0.9	2.0	24.0	14.0	8.3	6.9	4.7	2.9	1.7	2.8	8.3	20.0	27.7	22.7	14.4	1.5	8.4	27.7	
28-Aug	3.2	3.0	4.7	7.0	10.8	Z	13.8	19.7	13.0	12.5	8.4	7.1	5.5	5.7	4.0	5.0	7.1	5.7	4.2	4.4	4.8	6.0	8.7	7.8	7.5	19.7	
29-Aug	Z	5.5	4.4	5.1	6.2	6.8	7.2	7.6	8.3	8.8	11.1	9.6	6.6	4.9	4.3	2.0	2.6	2.4	3.3	3.3	5.4	13.7	14.2	11.7	6.7	14.2	
30-Aug	31.7	Z	62.0	43.1	42.7	72.6	117.4	130.0	66.1	35.2	37.3	21.8	8.2	10.8	6.2	7.1	3.6	2.5	2.5	2.8	7.4	4.5	5.4	4.1	31.5	130.0	
31-Aug	3.6	3.1	Z	1.6	4.3	7.8	11.2	46.8	6.3	11.5	10.0	5.9	8.5	7.8	5.4	13.6	16.9	4.2	8.3	7.7	4.7	7.3	1.7	1.6	8.7	46.8	
		6.4	4.5	8.4	7.7	6.2	8.8	11.7	14.2	12.7	10.5	8.8	6.1	4.2	4.1	3.4	3.8	3.6	2.6	3.4	4.1	5.5	7.5	7.9	6.6	Diurnal Average	
		31.7	12.3	62.0	43.1	42.7	72.6	117.4	130.0	66.1	76.2	51.1	22.2	17.6	14.4	16.7	19.0	16.9	11.7	21.0	20.0	27.7	26.5	24.2	21.5	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	665	94.06	94.06
21 - 40	31	4.38	98.44
41 - 80	9	1.27	99.72
81 - 159	2	0.28	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 - August 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	59	12	9	8	14	18	39	71	111	55	30	39	31	77	36	53	662
21 - 40	5	2	0	0	0	0	1	2	10	5	0	1	1	2	2	0	31
11 - 80	0	0	0	0	0	0	0	0	1	4	1	1	0	1	1	0	9
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	14	9	8	14	18	40	73	122	64	31	41	32	81	39	53	703

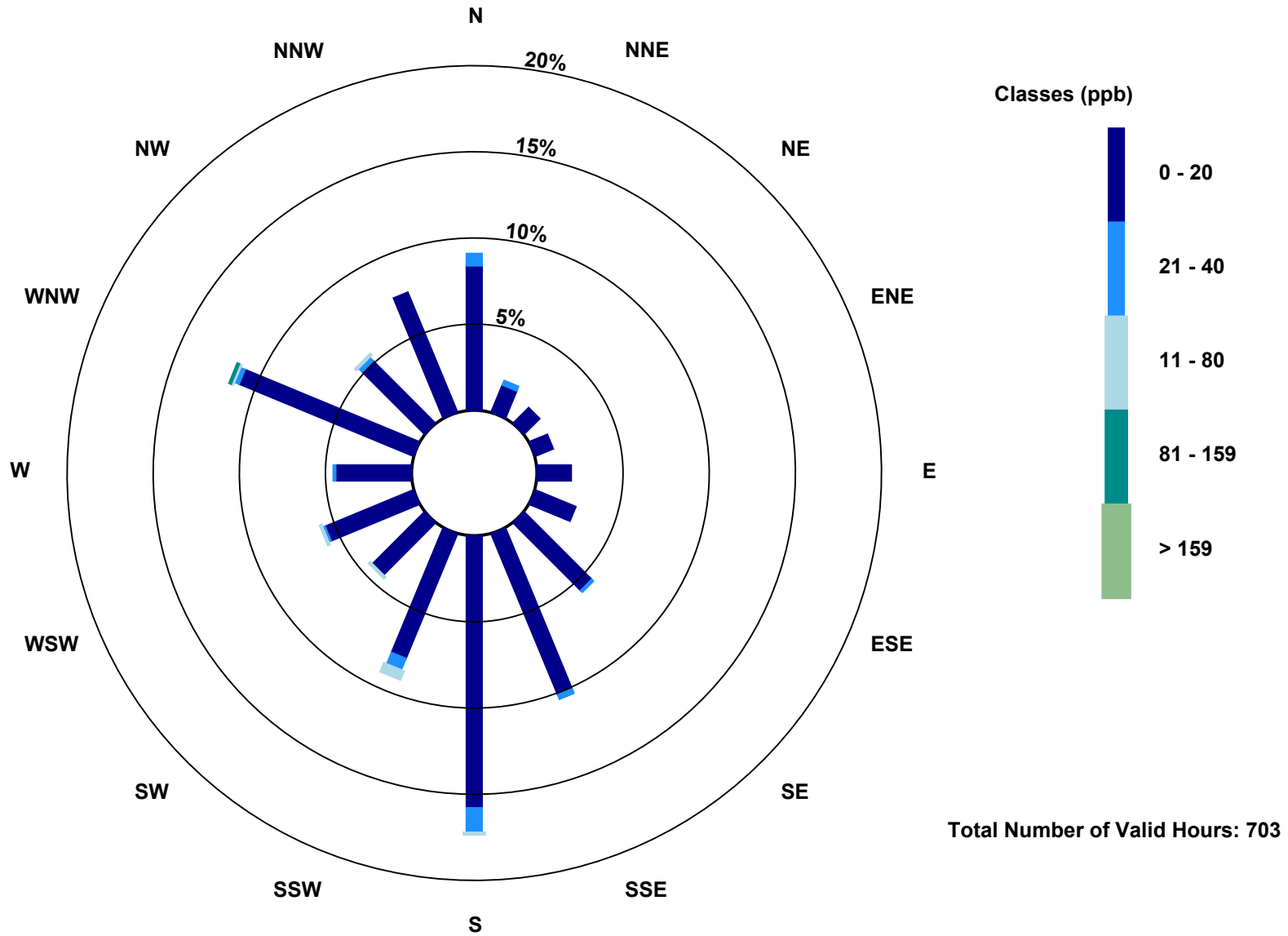
Total Number of Valid Hours: 703

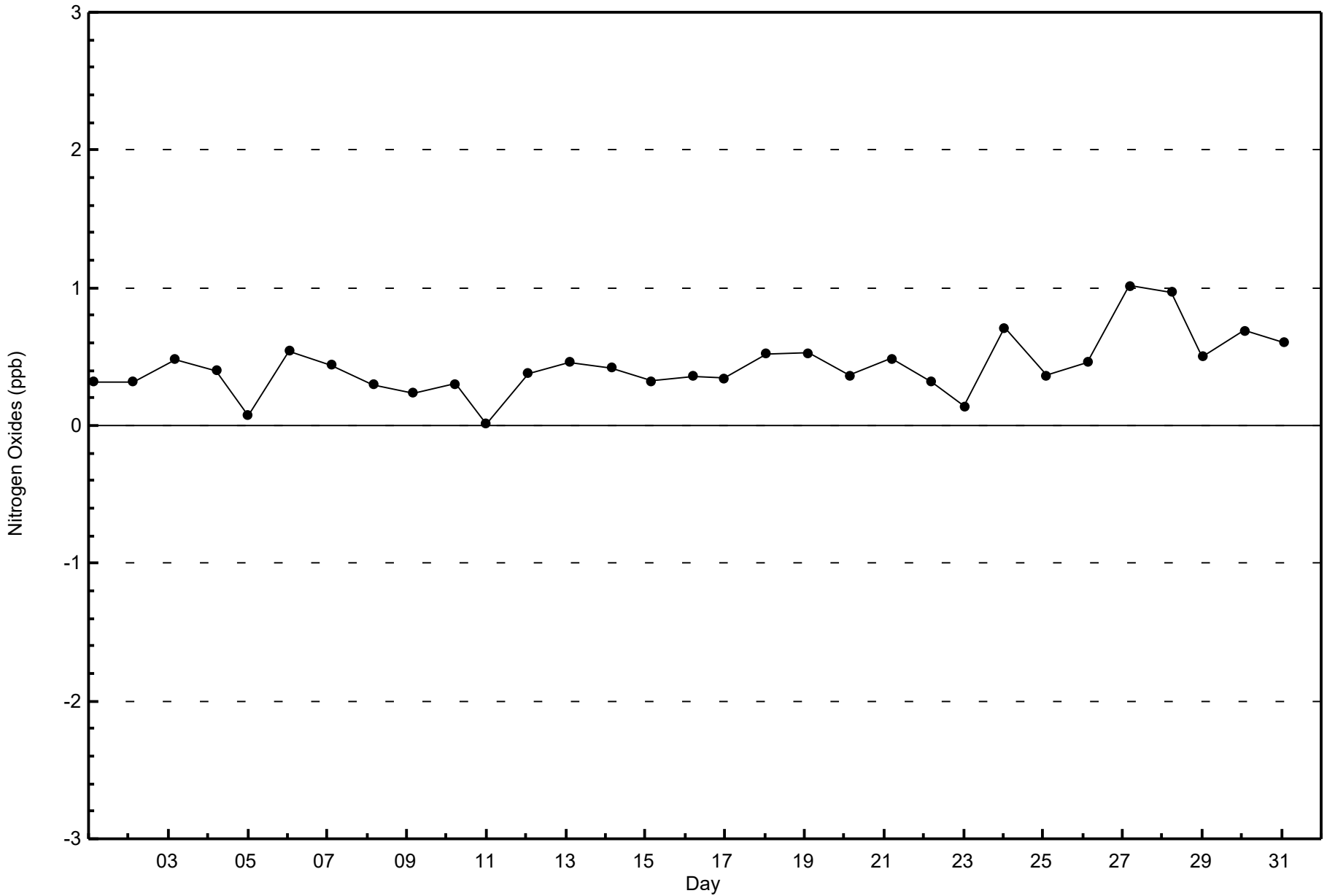
Total Number of Hours: 744

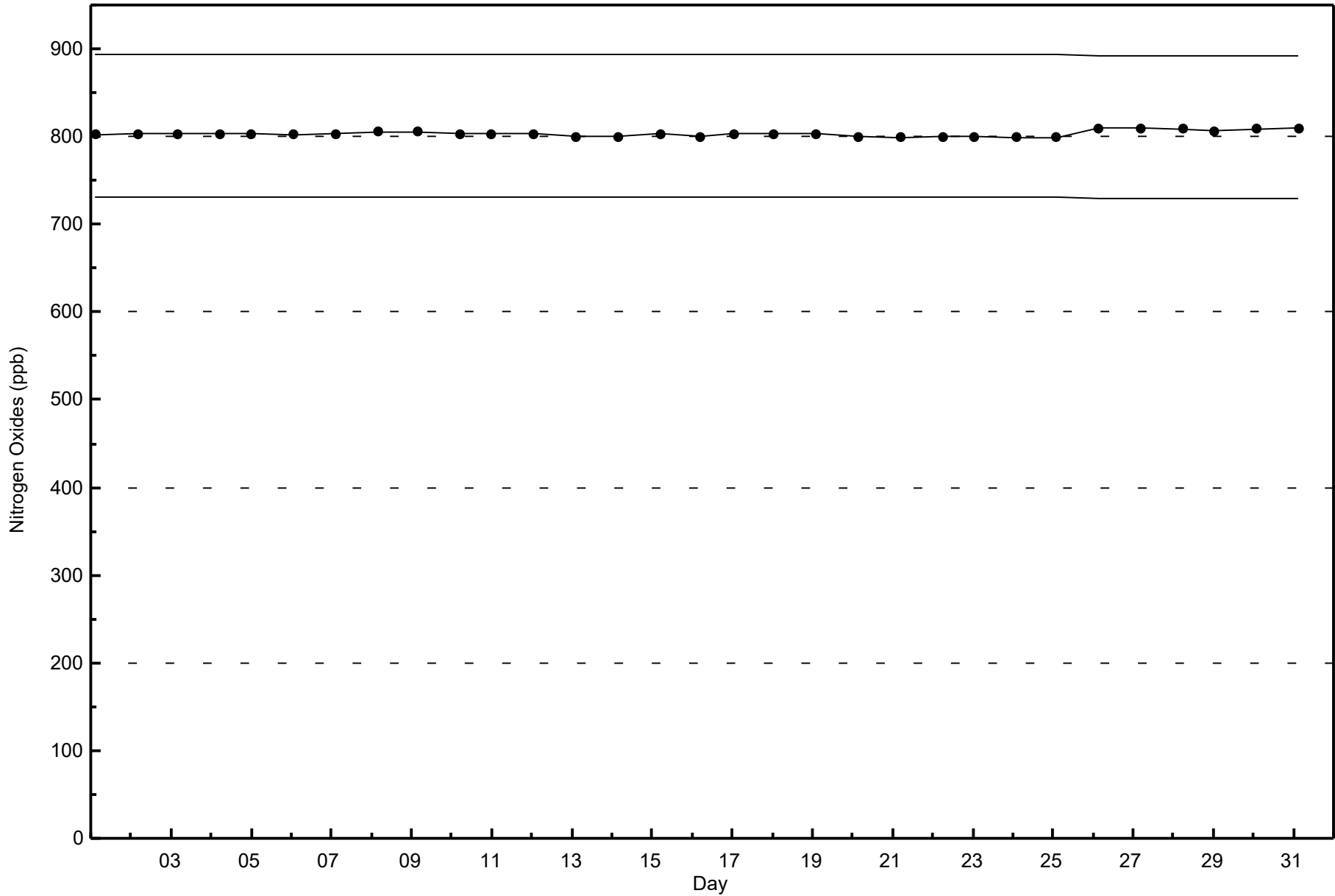


Wood Buffalo Environmental Association
Wind Rose Aug 2023

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









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort McKay - Bertha Ganter - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 69.6 ppb on Aug 31 16:00	Maximum Daily Average: 25.1 ppb on Aug 31		Hours of Data:	706
Minimum Value: 0.1 ppb on Aug 28 06:00	Minimum Daily Average: 5.8 ppb on Aug 28		Hours of Missing Data:	38
Maximum Diurnal Average: 30.4 ppb at hour 16	Minimum Diurnal Average: 7.0 ppb at hour 7		Hours of Calibration:	36
Monthly Average: 16.79 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 2.9 Q ₁ = 7.9 Median = 15.6 Q ₃ = 23.9 P ₉₀ = 30.7 P ₉₉ = 52.6		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-Aug	Z	17.4	16.4	19.8	22.3	22.2	18.9	16.0	15.6	15.3	15.0	16.5	18.2	31.9	34.7	35.1	35.5	34.6	30.4	25.7	12.5	9.2	11.5	9.9	21.1	35.5
2-Aug	9.0	Z	9.1	7.9	7.9	7.0	6.5	6.9	11.9	14.8	20.1	27.2	26.1	26.1	28.8	28.5	27.7	28.7	27.3	16.4	11.2	12.8	7.5	4.1	16.2	28.8
3-Aug	1.5	0.5	Z	0.9	1.5	2.1	2.3	3.6	5.0	8.0	9.1	19.0	32.4	40.1	40.0	37.2	27.8	25.1	21.4	17.5	11.4	10.8	6.5	6.6	14.4	40.1
4-Aug	6.5	7.9	9.5	Z	12.5	13.1	12.8	12.9	16.4	18.2	19.1	21.9	23.3	25.5	24.1	23.4	22.8	21.2	19.5	20.1	17.4	19.2	17.9	14.8	17.4	25.5
5-Aug	11.6	10.8	10.6	9.2	Z	9.9	5.8	12.5	13.1	18.4	28.1	25.4	35.7	48.6	57.1	60.1	53.2	30.8	28.2	21.2	14.2	3.2	2.9	3.8	22.4	60.1
6-Aug	3.0	1.6	4.2	4.1	3.2	Z	3.7	3.7	2.0	4.8	10.7	12.8	8.5	19.3	24.7	24.3	29.3	30.8	26.1	20.8	13.6	5.7	0.3	2.1	11.3	30.8
7-Aug	Z	2.7	0.3	0.1	0.1	0.7	2.6	3.8	8.1	17.0	20.5	22.1	23.0	24.1	27.6	28.9	28.9	29.5	29.9	29.1	22.2	9.5	1.1	2.1	14.5	29.9
8-Aug	5.6	Z	1.7	2.4	1.8	2.2	4.8	12.7	14.4	19.5	24.7	26.5	28.7	29.0	28.4	27.9	27.3	25.4	26.8	25.7	23.1	23.6	23.6	22.9	18.6	29.0
9-Aug	23.8	22.8	Z	19.9	18.0	17.9	15.3	14.8	14.5	15.9	18.3	20.6	20.8	19.9	17.6	17.6	17.2	18.8	17.9	16.3	15.6	15.3	16.3	17.6	17.9	23.8
10-Aug	18.0	20.5	22.9	Z	19.3	19.3	17.4	15.7	13.8	C	C	C	C	C	23.4	27.8	28.7	27.4	25.9	22.7	14.9	11.9	19.1	17.9	20.4	28.7
11-Aug	12.3	9.3	4.4	13.0	Z	19.3	8.4	12.3	9.1	12.4	21.5	24.1	28.3	26.6	30.2	31.1	31.0	31.0	26.7	17.4	13.7	7.1	5.2	5.1	17.4	31.1
12-Aug	4.2	3.5	2.1	1.9	5.1	Z	5.0	5.1	6.1	9.7	16.2	17.5	19.0	21.6	20.4	18.9	18.4	22.1	16.5	15.8	6.8	2.9	0.5	3.2	10.6	22.1
13-Aug	Z	2.6	0.3	0.4	0.4	2.8	6.0	9.1	11.3	13.9	15.8	18.8	17.9	17.0	16.9	17.2	17.0	16.2	15.0	14.0	12.2	11.6	9.7	10.7	11.2	18.8
14-Aug	9.0	Z	0.1	0.9	3.7	3.8	1.9	7.6	16.9	22.8	27.8	27.6	29.0	29.5	28.2	29.9	29.9	29.7	29.5	26.9	25.2	19.5	14.1	10.8	18.4	29.9
15-Aug	12.7	13.5	Z	15.2	4.6	2.5	5.9	10.8	9.2	7.1	9.7	11.1	11.9	14.6	20.9	22.8	23.4	22.0	10.5	13.3	17.4	19.5	17.5	15.5	13.5	23.4
16-Aug	8.1	7.0	8.7	Z	4.1	7.4	11.9	15.7	19.2	20.7	21.0	23.7	25.5	25.9	25.7	25.8	25.6	24.4	23.0	19.2	3.8	1.7	1.5	4.9	15.4	25.9
17-Aug	11.2	13.6	12.7	12.3	Z	10.1	8.0	3.0	4.9	11.7	13.5	16.0	16.9	19.2	21.0	20.0	19.9	27.0	23.0	14.3	21.4	15.5	6.8	12.1	14.5	27.0
18-Aug	16.0	12.4	16.6	15.3	19.2	Z	18.8	17.9	16.6	20.4	25.2	26.7	30.6	29.9	30.8	27.8	25.3	22.8	22.8	22.3	15.3	12.2	17.6	7.8	20.5	30.8
19-Aug	Z	12.1	12.8	13.3	11.6	11.3	10.9	12.4	13.6	13.2	15.0	17.9	20.4	23.1	26.4	27.8	23.9	23.0	21.3	20.1	18.6	16.2	11.8	14.1	17.0	27.8
20-Aug	14.1	Z	16.0	16.0	17.5	11.8	4.2	12.4	15.8	17.2	19.8	24.6	26.0	29.3	30.7	30.6	27.5	19.2	23.9	16.5	13.0	6.9	5.8	5.9	17.6	30.7
21-Aug	4.7	3.5	Z	0.3	5.2	5.9	5.3	7.6	11.0	18.3	28.9	38.1	40.0	42.5	40.0	37.9	39.8	41.5	41.5	36.9	24.4	17.4	15.1	9.0	22.4	42.5
22-Aug	4.9	1.4	0.6	Z	3.2	4.7	3.7	5.1	12.4	17.4	21.0	32.5	40.6	41.4	43.5	44.4	41.2	40.2	33.1	22.9	18.0	11.3	8.9	10.7	20.1	44.4
23-Aug	8.3	5.5	4.0	5.5	Z	3.7	3.9	2.0	1.0	1.0	1.5	5.6	11.5	8.4	6.8	11.1	10.4	16.8	15.2	10.9	7.8	5.8	6.9	6.4	7.0	16.8
24-Aug	8.1	9.4	9.5	5.3	7.9	Z	7.3	5.7	7.3	13.5	17.2	20.3	22.9	24.7	26.9	27.9	28.6	28.2	26.0	23.0	18.6	13.6	9.9	10.4	16.2	28.6
25-Aug	Z	8.7	8.5	6.3	6.3	1.6	1.4	3.7	6.5	8.9	M	M	25.2	31.2	30.9	30.8	30.1	29.1	24.9	23.3	23.4	20.6	15.6	18.9	16.9	31.2
26-Aug	19.8	Z	18.7	18.0	13.0	8.2	6.3	11.0	15.1	19.2	25.4	33.3	33.6	31.5	29.2	26.8	26.9	29.8	23.3	18.4	10.2	9.4	14.6	7.1	19.5	33.6
27-Aug	3.4	2.7	Z	10.9	11.4	11.2	8.4	8.6	9.4	13.1	16.4	32.4	36.7	35.9	40.2	39.3	37.8	33.7	28.2	12.8	2.3	2.9	6.4	17.8	18.3	40.2
28-Aug	11.7	8.0	6.3	Z	0.3	0.1	0.4	0.2	0.5	1.3	3.2	5.5	9.3	10.7	11.9	9.6	9.1	13.6	11.4	7.2	4.5	2.8	2.4	2.4	5.8	13.6
29-Aug	2.6	4.0	4.6	3.9	Z	2.2	3.4	5.2	8.1	12.7	19.5	28.4	37.8	36.8	31.8	30.1	29.3	27.9	24.3	20.6	13.1	3.7	2.9	1.7	15.4	37.8
30-Aug	0.2	0.2	0.3	0.1	0.4	Z	0.4	0.4	1.1	4.9	8.0	35.8	51.2	59.5	56.4	51.1	46.4	42.0	36.9	34.2	33.4	35.5	30.7	31.4	24.4	59.5
31-Aug	Z	23.1	20.2	18.2	10.0	6.4	5.5	2.8	14.9	14.8	26.7	39.5	47.0	52.7	64.2	69.6	47.8	27.0	20.6	16.6	13.1	9.3	14.8	11.4	25.1	69.6

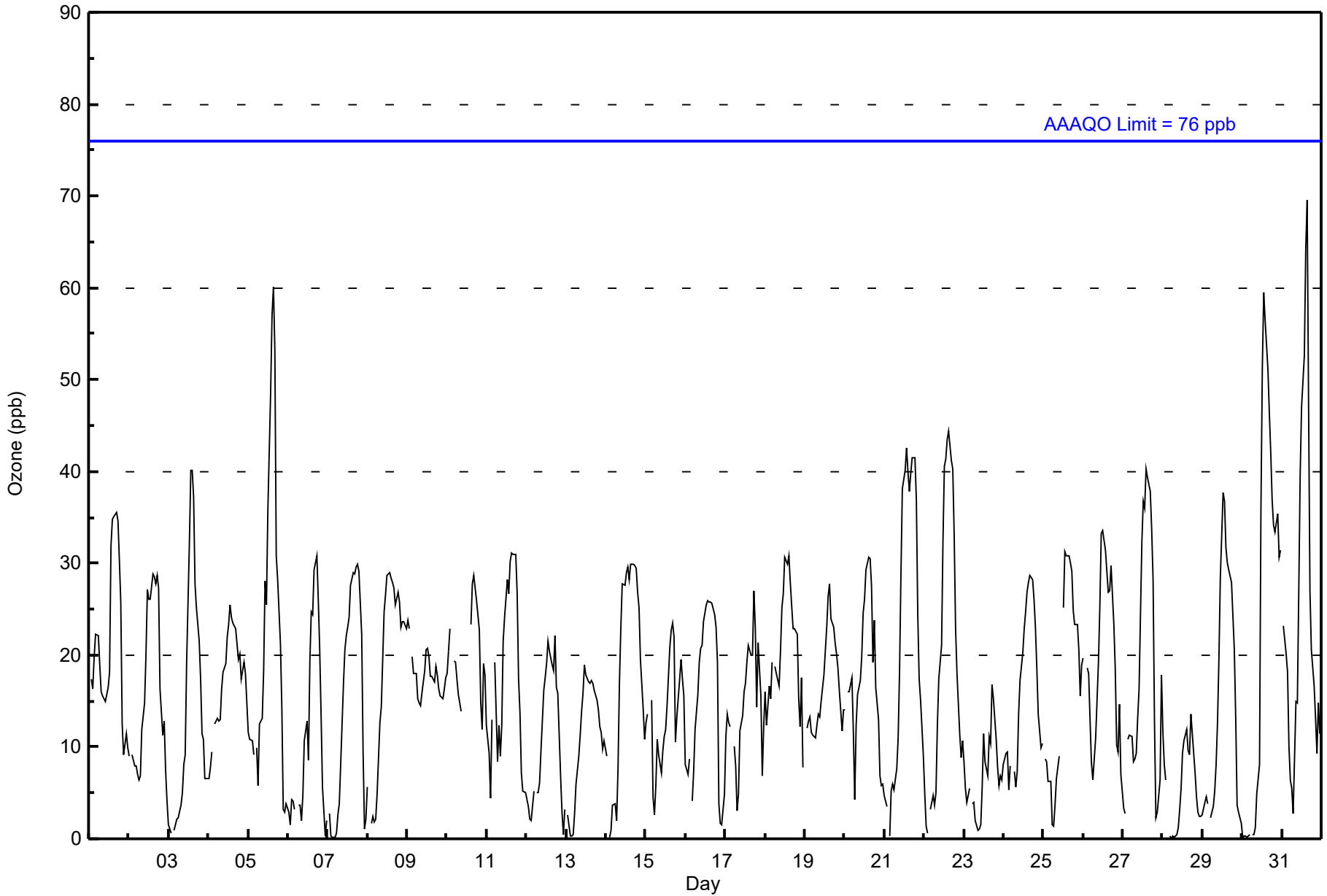
9.2	8.7	8.5	8.5	8.1	8.0	7.0	8.4	10.5	13.5	17.9	23.1	26.6	29.2	30.3	30.4	28.6	27.1	24.2	20.1	15.2	11.8	10.5	10.3	Diurnal Average	
23.8	23.1	22.9	19.9	22.3	22.2	18.9	17.9	19.2	22.8	28.9	39.5	51.2	59.5	64.2	69.6	53.2	42.0	41.5	36.9	33.4	35.5	30.7	31.4	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	471	66.71	66.71
21 - 50	225	31.87	98.58
51 - 82	10	1.42	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



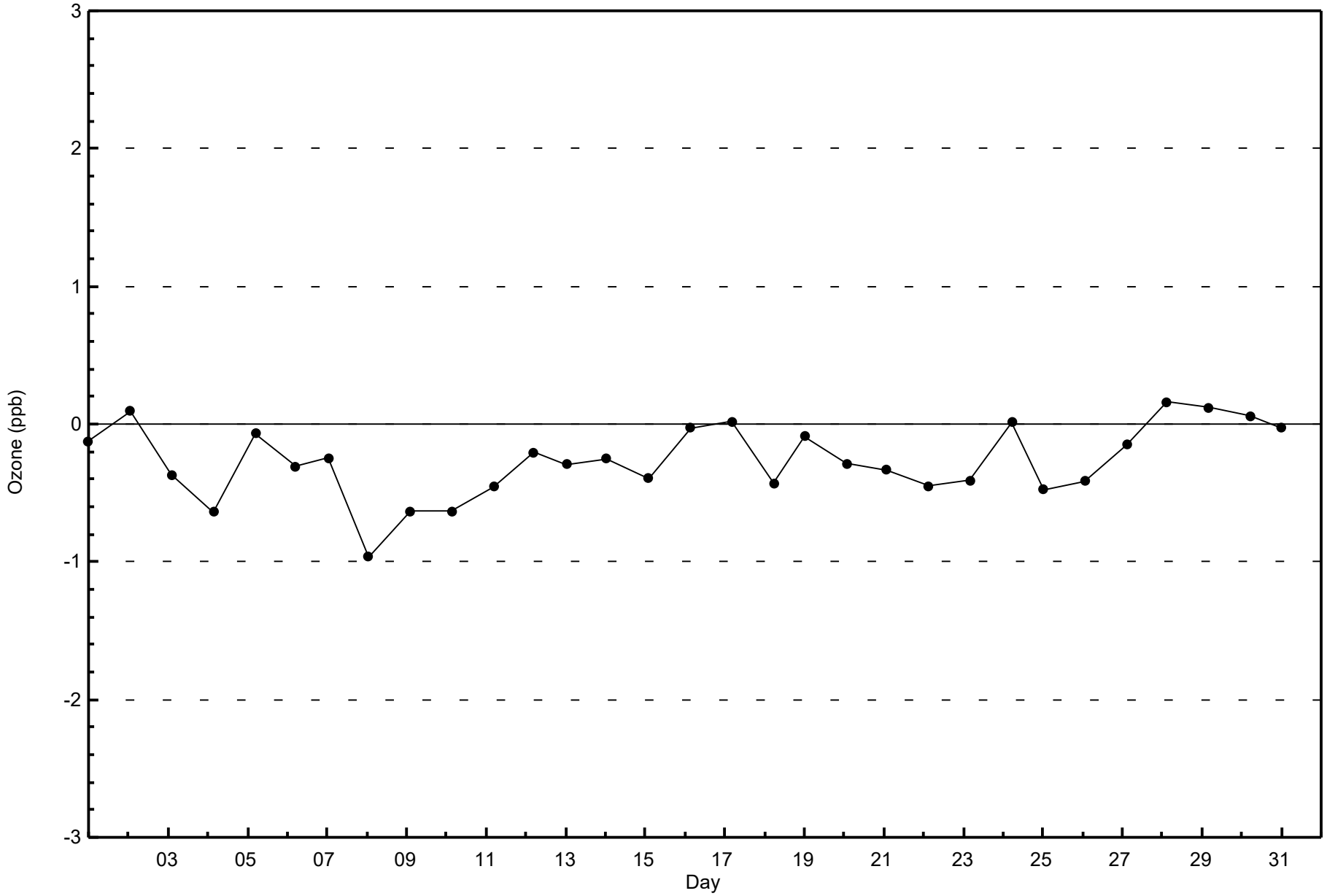
Wood Buffalo Environmental Association
Frequency Distribution

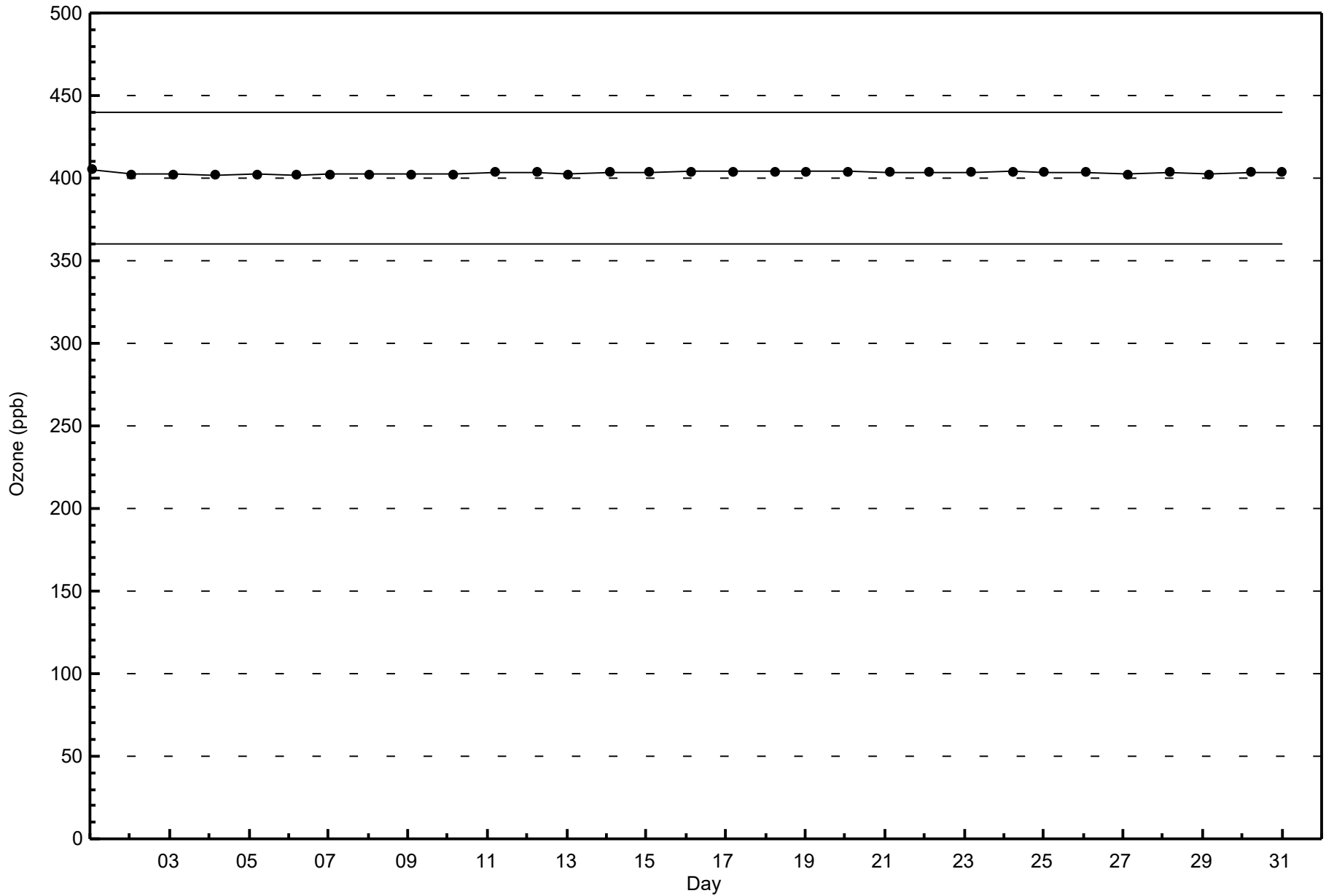
Ozone (O₃) - ppb
Fort McKay - Bertha Ganter - August 2023

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	4	2	2	2	7	26	41	84	45	23	32	28	64	32	30	467
21 - 50	20	9	6	4	4	10	16	29	35	22	7	8	8	17	7	22	224
51 - 82	0	0	1	1	4	0	0	3	1	0	0	0	0	0	0	0	10
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	13	9	7	10	17	42	73	120	67	30	40	36	81	39	52	701

Total Number of Valid Hours: 701

Total Number of Hours: 744







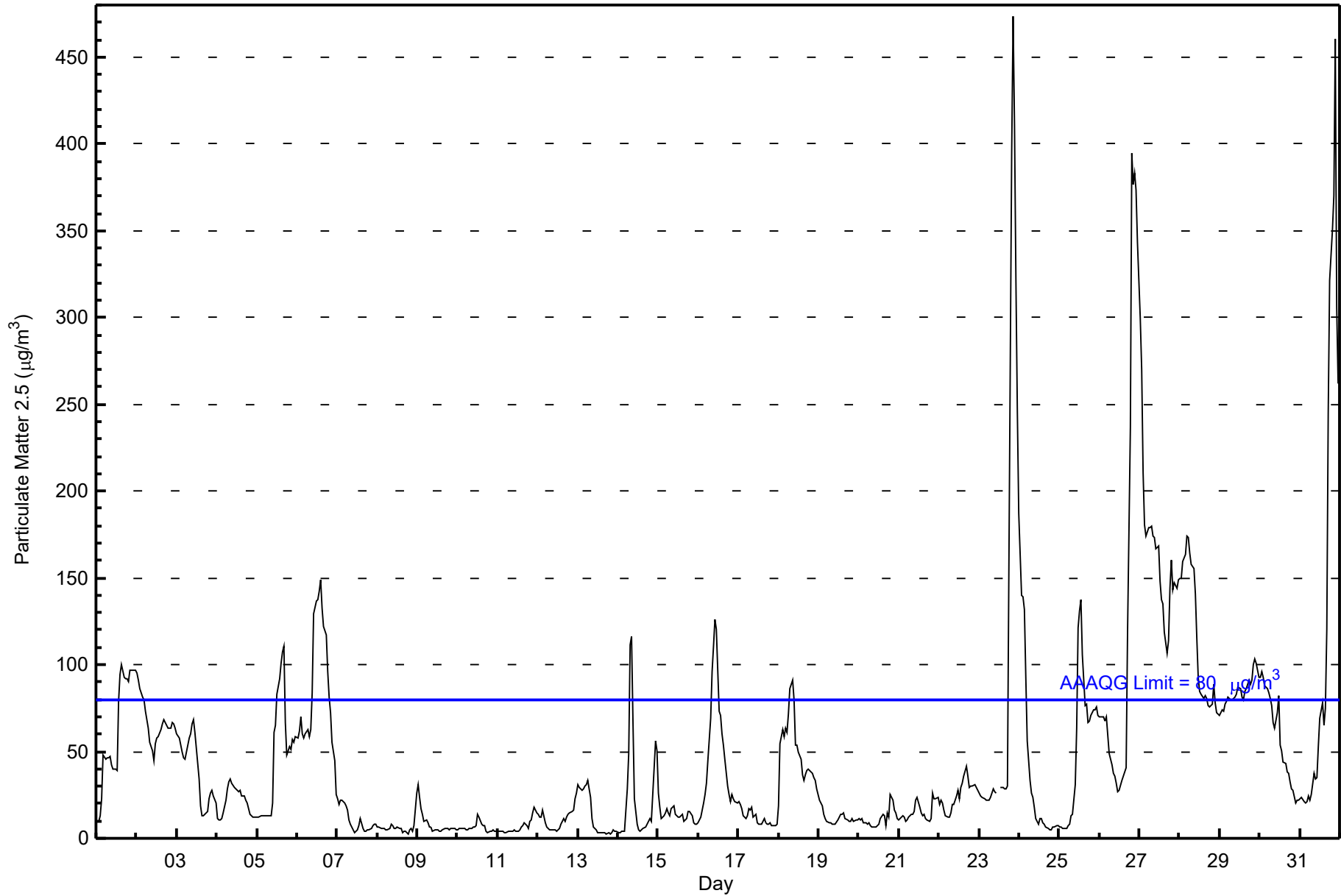
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort McKay - Bertha Ganter - August 2023

Number of Exceedences (AAAQO): 1-hr: 134 24-hr: 16																								Hours in Service:		
Maximum Value: 473.7 µg/m ³ on Aug 23 21:00																								744		
Minimum Value: 2.5 µg/m ³ on Aug 13 20:00																								Hours of Data:		
Maximum Diurnal Average: 72.1 µg/m ³ at hour 22																								742		
Monthly Average: 47.61 µg/m ³																								Hours of Missing Data:		
Percentiles: P ₁ = 3.3 P ₁₀ = 5.2 Q ₁ = 9.5 Median = 22.9 Q ₃ = 66.1 P ₉₀ = 110.8 P ₉₉ = 372.3																								2		
Minimum Daily Average: 6.1 µg/m ³ on Aug 10																								Hours of Calibration:		
Minimum Diurnal Average: 39.3 µg/m ³ at hour 6																								2		
Percentiles: P ₁ = 3.3 P ₁₀ = 5.2 Q ₁ = 9.5 Median = 22.9 Q ₃ = 66.1 P ₉₀ = 110.8 P ₉₉ = 372.3																								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-Aug	9.5	9.9	12.6	22.9	48.3	45.4	46.5	46.6	47.0	42.7	40.2	40.1	38.7	79.2	94.8	100.1	93.0	92.1	92.1	90.6	96.4	96.9	96.6	96.9	61.6	100.1
2-Aug	94.9	91.0	86.5	81.4	79.8	73.3	68.7	63.2	55.1	50.1	44.7	54.3	57.4	58.8	62.6	65.5	68.2	66.9	65.1	63.7	63.6	66.4	65.6	63.7	67.1	94.9
3-Aug	60.3	57.4	54.0	50.0	46.5	45.6	49.9	57.7	60.3	66.2	68.3	60.7	43.5	34.0	18.8	13.1	12.9	13.5	15.3	23.1	26.2	27.6	24.8	20.1	39.6	68.3
4-Aug	11.4	10.9	10.4	11.0	15.0	21.6	28.6	32.8	34.2	31.4	29.3	28.7	27.9	26.7	27.5	24.7	24.8	22.3	20.6	17.2	13.6	12.0	12.3	12.2	21.1	34.2
5-Aug	12.0	12.6	12.8	13.1	12.6	13.0	12.7	12.6	13.3	20.2	60.8	65.5	82.7	91.8	100.5	107.0	110.8	66.4	48.4	52.5	51.4	57.3	55.6	58.6	47.7	110.8
6-Aug	57.9	61.5	69.9	60.6	58.0	60.6	62.3	58.8	63.0	83.5	129.2	136.9	137.6	142.2	148.7	132.5	121.7	117.3	96.1	81.3	72.2	55.0	45.1	25.0	86.5	148.7
7-Aug	23.1	19.5	22.3	21.7	20.4	19.1	16.2	10.9	7.8	5.0	3.4	3.8	4.9	7.3	11.7	5.6	4.3	3.8	4.6	4.8	5.3	7.0	8.3	7.9	10.4	23.1
8-Aug	6.4	6.3	5.8	5.5	5.4	5.2	5.1	5.4	8.5	7.4	5.3	5.9	6.8	5.3	5.9	3.4	4.0	4.4	2.8	4.9	5.8	3.7	7.2	26.1	6.3	26.1
9-Aug	30.8	24.0	16.8	13.5	9.9	10.7	9.0	6.6	6.7	4.5	5.2	5.1	5.0	3.8	3.7	4.8	5.7	5.6	5.3	5.2	5.3	5.5	5.4	5.2	8.5	30.8
10-Aug	5.2	5.3	5.8	5.9	5.5	5.2	5.1	5.6	6.0	6.5	6.5	7.2	13.6	12.6	7.9	7.0	7.1	4.1	3.5	3.8	4.5	4.6	3.9	4.1	6.1	13.6
11-Aug	4.2	4.3	4.4	4.3	3.5	3.4	4.3	4.2	4.2	4.4	4.5	4.2	3.7	5.1	6.9	7.4	9.2	7.4	5.7	10.1	10.3	14.7	18.0	14.4	6.8	18.0
12-Aug	13.6	12.0	11.8	16.2	9.1	6.4	5.4	4.9	4.7	4.8	5.3	4.5	4.5	5.8	8.1	11.1	9.6	12.0	13.9	14.8	15.4	16.6	22.8	25.7	10.8	25.7
13-Aug	30.5	29.1	27.3	28.8	29.9	30.9	33.1	23.4	11.0	6.6	5.6	4.6	3.4	3.4	3.2	3.0	2.9	2.8	2.9	2.5	3.1	4.9	4.0	3.9	12.5	33.1
14-Aug	3.5	3.6	4.3	3.8	3.9	28.8	48.9	111.5	116.0	67.5	22.9	8.3	4.5	4.1	4.6	5.6	6.2	8.0	9.5	11.4	10.0	25.3	56.1	50.6	25.8	116.0
15-Aug	25.7	17.5	11.5	12.8	14.4	17.1	14.8	13.0	17.4	18.4	13.5	13.2	12.4	12.4	13.7	9.9	10.7	11.5	15.5	15.1	13.1	9.0	8.5	8.4	13.7	25.7
16-Aug	9.3	12.0	16.3	20.7	25.1	31.6	45.0	68.7	96.0	110.7	125.9	120.0	73.0	71.1	60.5	53.4	45.8	30.3	24.9	21.4	25.6	23.1	21.0	20.7	48.0	125.9
17-Aug	20.8	19.5	16.9	13.0	11.7	13.2	17.2	16.3	18.2	12.3	14.1	9.0	8.4	8.3	8.5	11.6	9.3	8.3	8.2	9.3	7.4	7.2	7.6	8.0	11.8	20.8
18-Aug	18.8	54.8	62.8	58.9	63.1	61.0	71.7	85.9	91.3	79.3	53.4	53.4	49.7	45.7	36.7	33.7	37.0	38.9	39.5	38.2	37.3	35.2	33.2	28.5	50.3	91.3
19-Aug	22.2	20.5	18.7	14.1	11.0	9.9	9.2	9.1	8.5	7.8	8.2	10.6	12.4	13.6	14.0	15.0	11.6	10.6	9.9	9.9	11.6	9.9	10.4	10.7	12.1	22.2
20-Aug	11.6	10.2	11.2	9.4	8.6	7.9	8.6	7.5	6.7	6.5	6.5	7.7	8.2	11.5	13.5	13.1	7.5	14.9	12.0	24.9	22.1	16.5	14.4	11.6	11.3	24.9
21-Aug	10.8	12.1	12.9	12.0	10.0	10.7	12.4	13.8	13.9	15.3	22.0	23.8	17.9	14.6	13.3	13.7	11.3	10.8	10.1	11.7	25.9	23.1	22.9	23.4	15.3	25.9
22-Aug	19.5	21.6	20.5	15.9	13.2	12.3	12.4	15.1	19.4	19.9	24.2	27.6	22.7	29.1	31.5	35.4	41.4	35.9	29.0	30.4	30.4	30.9	29.0	28.0	24.8	41.4
23-Aug	26.4	24.4	23.5	22.7	22.1	21.8	22.3	23.3	28.4	27.2	26.1	C	C	29.5	29.1	28.2	28.9	29.9	152.8	394.2	473.7	411.0	321.3	246.7	109.7	473.7
24-Aug	187.0	139.6	138.8	131.6	92.6	56.0	33.5	25.8	23.6	18.2	11.1	8.4	11.1	11.2	9.2	8.2	6.6	5.7	4.7	4.7	6.2	6.2	7.4	7.7	39.8	187.0
25-Aug	6.5	6.1	5.3	5.7	5.4	7.6	8.1	13.0	14.1	30.6	63.3	121.0	130.8	137.8	105.9	76.9	77.2	66.6	67.8	71.1	74.3	74.2	75.4	70.6	54.8	137.8
26-Aug	69.9	70.1	70.2	67.2	70.1	59.1	48.8	41.9	37.6	35.5	31.4	26.9	27.9	33.5	36.2	38.1	41.0	118.7	237.1	394.4	376.4	382.8	373.6	343.0	126.3	394.4
27-Aug	299.3	269.8	210.9	180.8	174.2	178.8	178.8	180.1	174.5	173.3	166.6	168.6	148.2	137.9	135.1	119.1	106.3	114.2	144.3	160.6	143.5	147.3	143.8	148.9	166.9	299.3
28-Aug	149.3	150.0	159.3	163.2	174.4	173.1	164.7	157.9	155.3	140.6	115.4	93.0	84.4	82.9	80.8	82.1	80.3	76.8	76.0	77.4	88.3	78.1	72.1	71.6	114.5	174.4
29-Aug	70.7	73.7	73.4	77.2	79.2	81.7	80.0	79.7	80.8	81.3	83.2	87.0	86.5	81.3	79.7	84.6	86.3	91.5	89.1	91.3	99.7	103.4	100.5	92.5	84.8	103.4
30-Aug	92.5	95.7	92.9	87.7	86.2	84.1	80.7	76.2	67.1	63.5	72.1	82.1	53.3	50.8	44.0	43.4	38.4	37.1	32.6	28.5	27.9	20.1	21.6	21.8	58.3	95.7
31-Aug	22.8	23.5	21.1	20.6	21.3	24.3	21.9	25.0	37.4	34.5	34.9	52.7	68.9	78.0	64.7	74.8	120.6	244.9	321.2	350.5	370.5	460.8	306.0	261.6	127.6	460.8
46.0 44.2 42.3 40.4 39.7 39.3 39.5 41.8 42.8 41.2 42.0 44.5 41.7 42.9 41.3 39.7 40.0 44.3 53.6 68.4 71.5 72.1 64.3 58.6																								Diurnal Average		
299.3 269.8 210.9 180.8 174.4 178.8 178.8 180.1 174.5 173.3 166.6 168.6 148.2 142.2 148.7 132.5 121.7 244.9 321.2 394.4 473.7 460.8 373.6 343.0																								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 - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	93	12.53	12.53
6 - 15	216	29.11	41.64
16 - 25	88	11.86	53.50
26 - 80	212	28.57	82.08
> 81.0	133	17.92	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 McKay - Bertha Ganter - August 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	12	6	2	1	0	6	17	3	2	6	6	6	6	7	3	10	93
6 - 15	12	2	3	4	9	12	11	20	42	20	12	11	14	22	11	11	216
16 - 25	6	0	0	0	0	0	5	13	17	9	2	7	4	15	5	3	86
26 - 80	18	3	3	1	4	0	6	24	44	17	8	14	12	27	10	20	211
> 81.0	20	3	1	2	1	0	3	16	24	17	3	4	1	14	13	9	131
Totals	68	14	9	8	14	18	42	76	129	69	31	42	37	85	42	53	737

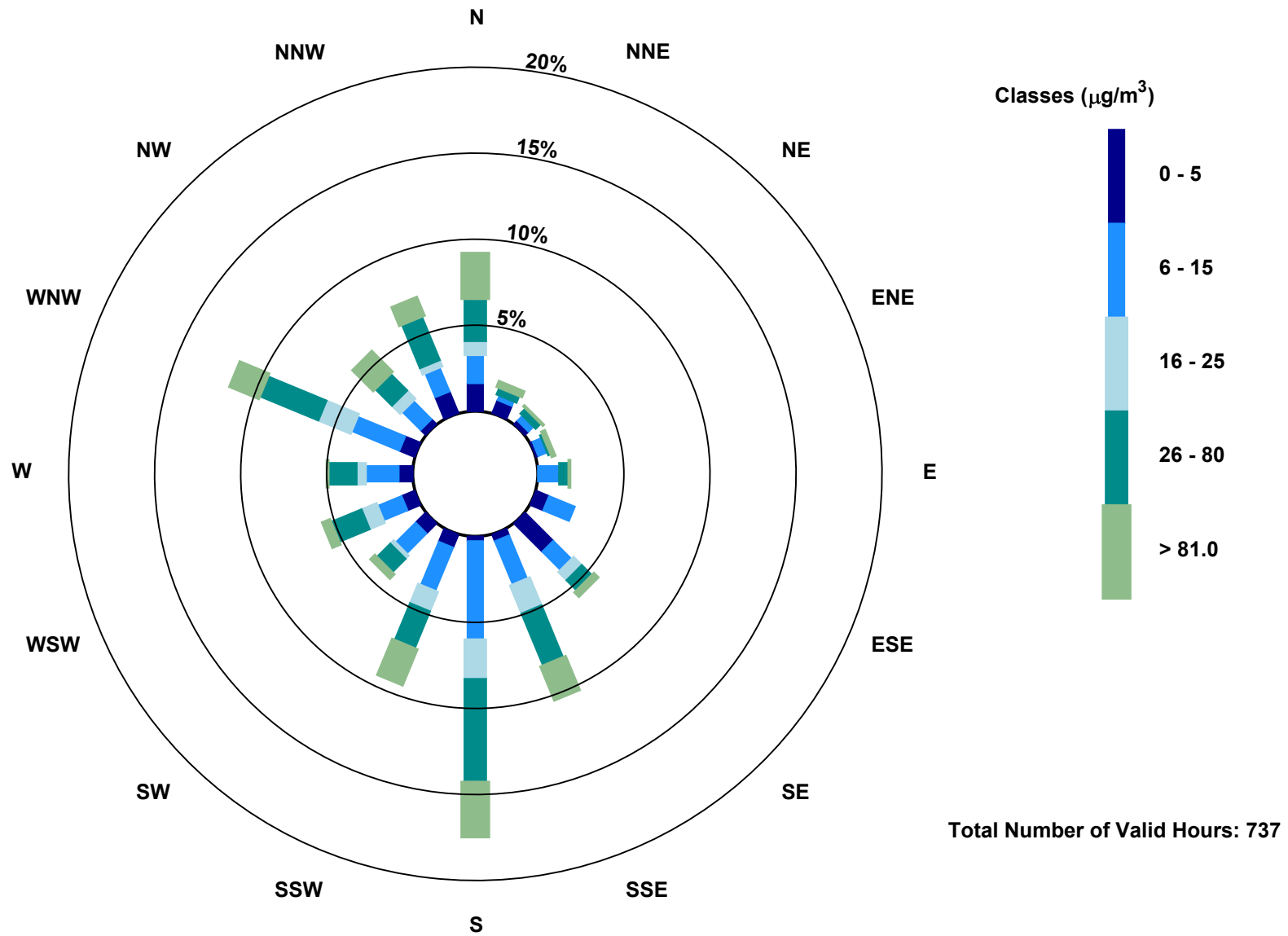
Total Number of Valid Hours: 737

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

Fort McKay - Bertha Ganter - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 3.4 ppm on Aug 23 21:00	Maximum Daily Average: 1.1 ppm on Aug 31		Hours of Data:	707
Minimum Value: 0.3 ppm on Aug 7 17:00	Minimum Daily Average: 0.3 ppm on Aug 7		Hours of Missing Data:	37
Maximum Diurnal Average: 0.8 ppm at hour 22	Minimum Diurnal Average: 0.5 ppm at hour 3		Hours of Calibration:	35
Monthly Average: 0.58 ppm	Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.7 P ₉₀ = 0.9 P ₉₉ = 2.4		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-Aug	0.4	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.7	0.9
2-Aug	0.8	0.8	0.8	0.7	Z	0.7	0.7	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.8
3-Aug	0.6	0.6	0.6	0.6	0.6	Z	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7
4-Aug	Z	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	0.4	0.4	0.4	0.4	0.4	0.5	0.5
5-Aug	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.8
6-Aug	0.6	0.7	Z	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.4	0.7	0.8
7-Aug	0.4	0.3	0.4	Z	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
8-Aug	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	0.3	0.3	0.3	0.4	0.4
9-Aug	0.4	0.4	0.4	0.3	0.3	Z	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	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10-Aug	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
11-Aug	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
12-Aug	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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
13-Aug	0.6	0.6	0.5	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.6
14-Aug	0.4	0.4	0.4	0.4	Z	0.5	0.5	0.8	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.4	0.8
15-Aug	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
16-Aug	Z	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.0	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.1
17-Aug	0.5	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	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5
18-Aug	0.4	0.7	Z	0.7	0.8	0.8	0.9	1.0	1.0	0.8	0.7	0.7	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	1.0
19-Aug	0.5	0.5	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
20-Aug	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	0.5	0.5	0.5	0.5	0.4	0.5
21-Aug	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	C	C	C	C	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5
22-Aug	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	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
23-Aug	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5	1.3	2.9	3.4	2.9	2.4	1.9	1.0	3.4
24-Aug	1.5	1.2	Z	1.1	0.9	0.6	0.5	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	0.3	0.4	0.4	0.5	1.5
25-Aug	0.4	0.3	0.3	Z	0.3	0.4	0.4	0.4	0.4	0.5	M	M	1.1	1.0	0.9	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.7	1.1
26-Aug	0.8	0.8	0.8	0.8	Z	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.9	1.6	2.4	2.3	2.3	2.3	2.1	1.0	2.4
27-Aug	1.8	1.6	1.3	1.2	1.1	Z	1.1	1.2	1.2	1.2	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.8
28-Aug	Z	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.9	1.2
29-Aug	0.7	Z	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
30-Aug	0.8	0.8	Z	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.6	0.8
31-Aug	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.6	0.7	0.7	0.6	0.5	0.9	2.0	2.4	2.6	2.8	3.4	2.5	2.3	1.1	3.4

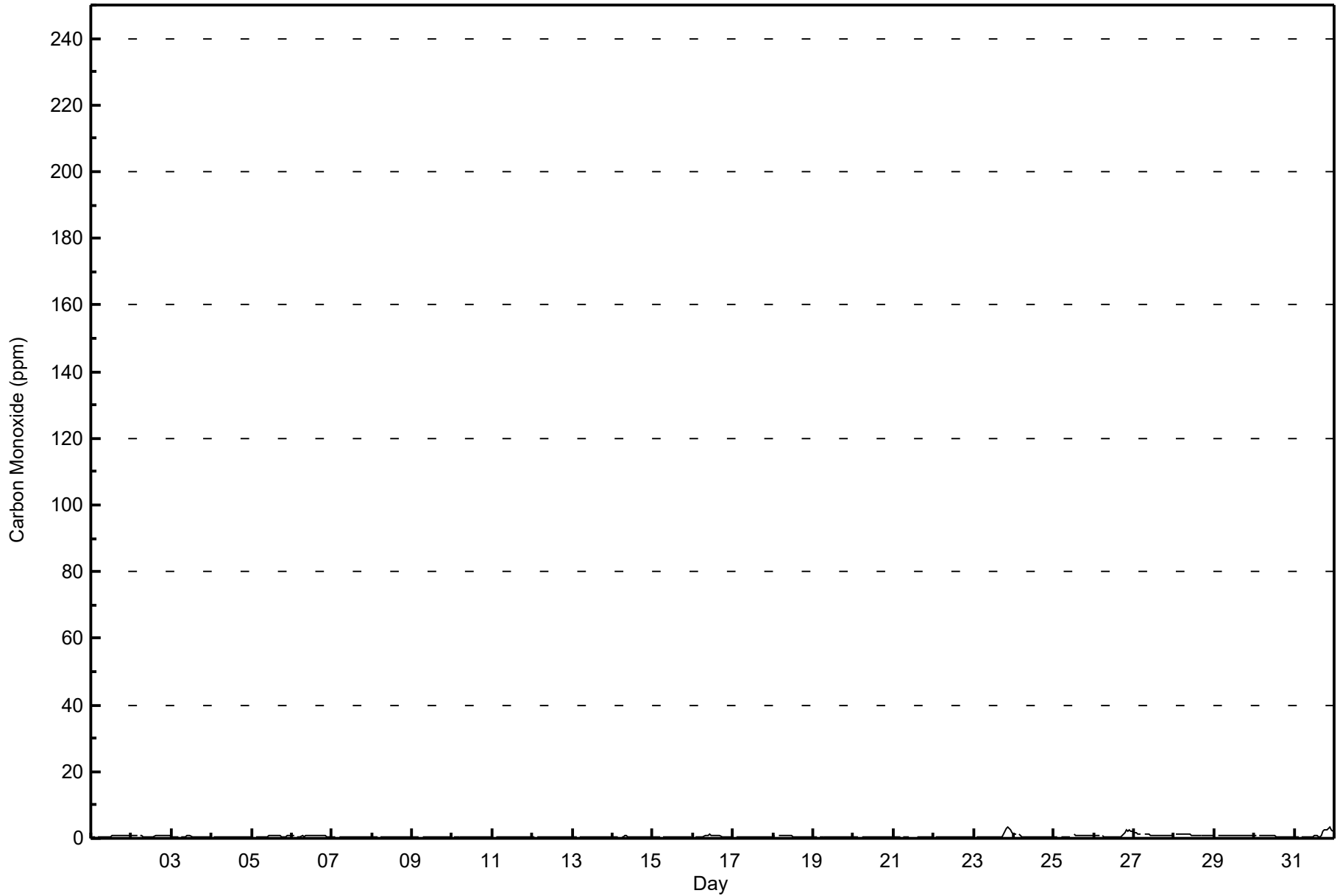
0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.7	0.7	Diurnal Average	
1.8	1.6	1.3	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.1	1.0	1.1	1.0	0.9	0.9	0.9	2.0	2.4	2.9	3.4	3.4	2.5	2.3	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	82	11.60	11.60
0.4 - 0.5	371	52.48	64.07
0.6 - 0.7	112	15.84	79.92
0.8 - 1.4	121	17.11	97.03
1.5 - 10	20	2.83	99.86
> 10	0	0.00	99.86

Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Monoxide (CO) - ppm
Fort McKay - Bertha Ganter - August 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	12	6	2	0	1	7	10	5	1	3	3	6	7	4	5	10	82
0.4 - 0.5	20	2	4	5	10	11	24	38	66	38	20	26	22	42	15	26	369
0.6 - 0.7	11	4	2	1	2	0	4	13	19	10	4	5	5	14	8	10	112
0.8 - 1.4	13	2	1	2	1	0	1	17	35	14	3	3	2	13	7	4	118
1.5 - 10	9	0	0	0	0	0	0	0	0	1	0	1	0	3	4	2	20
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	65	14	9	8	14	18	39	73	121	66	30	41	36	76	39	52	701

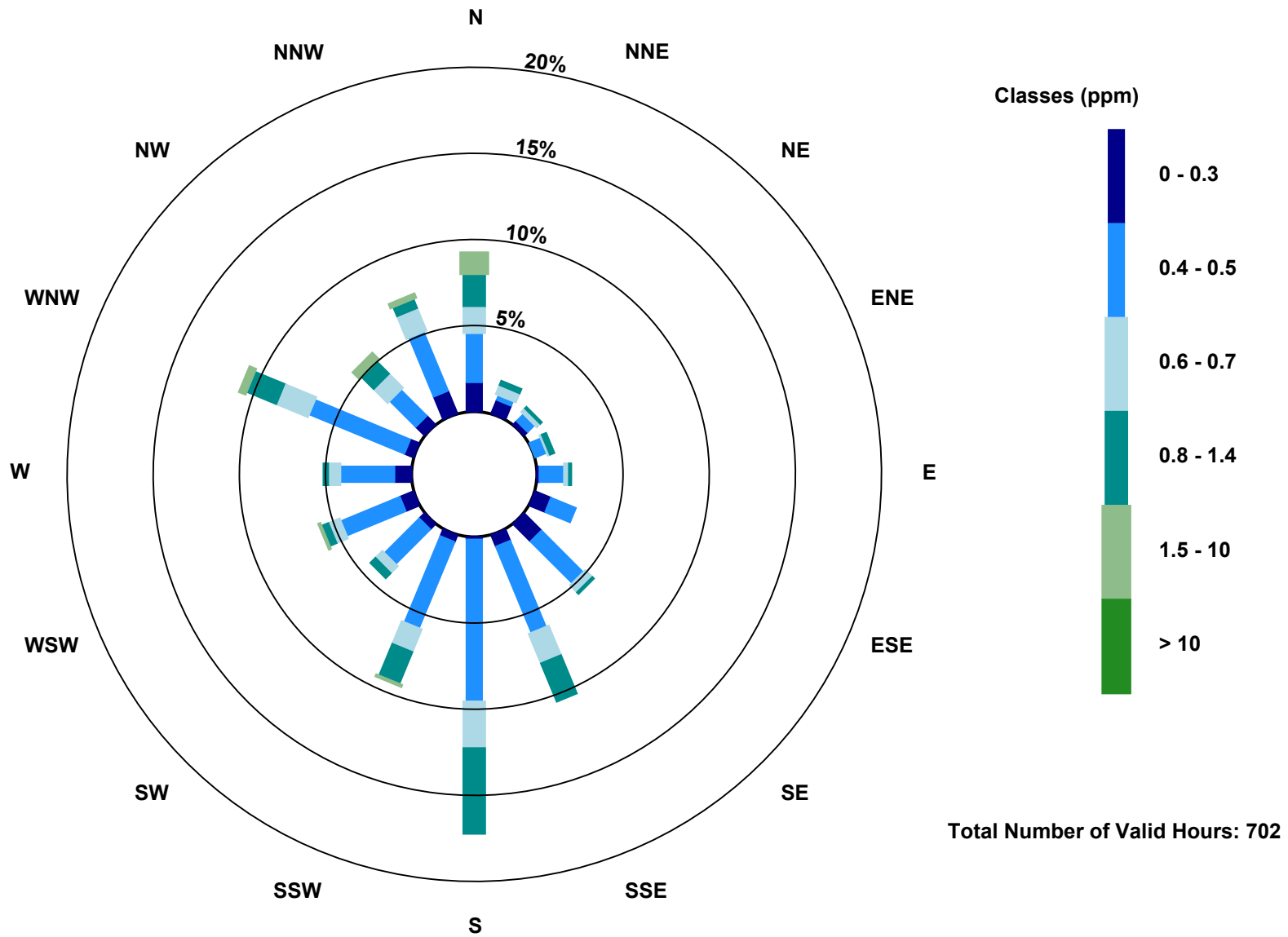
Total Number of Valid Hours: 702

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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



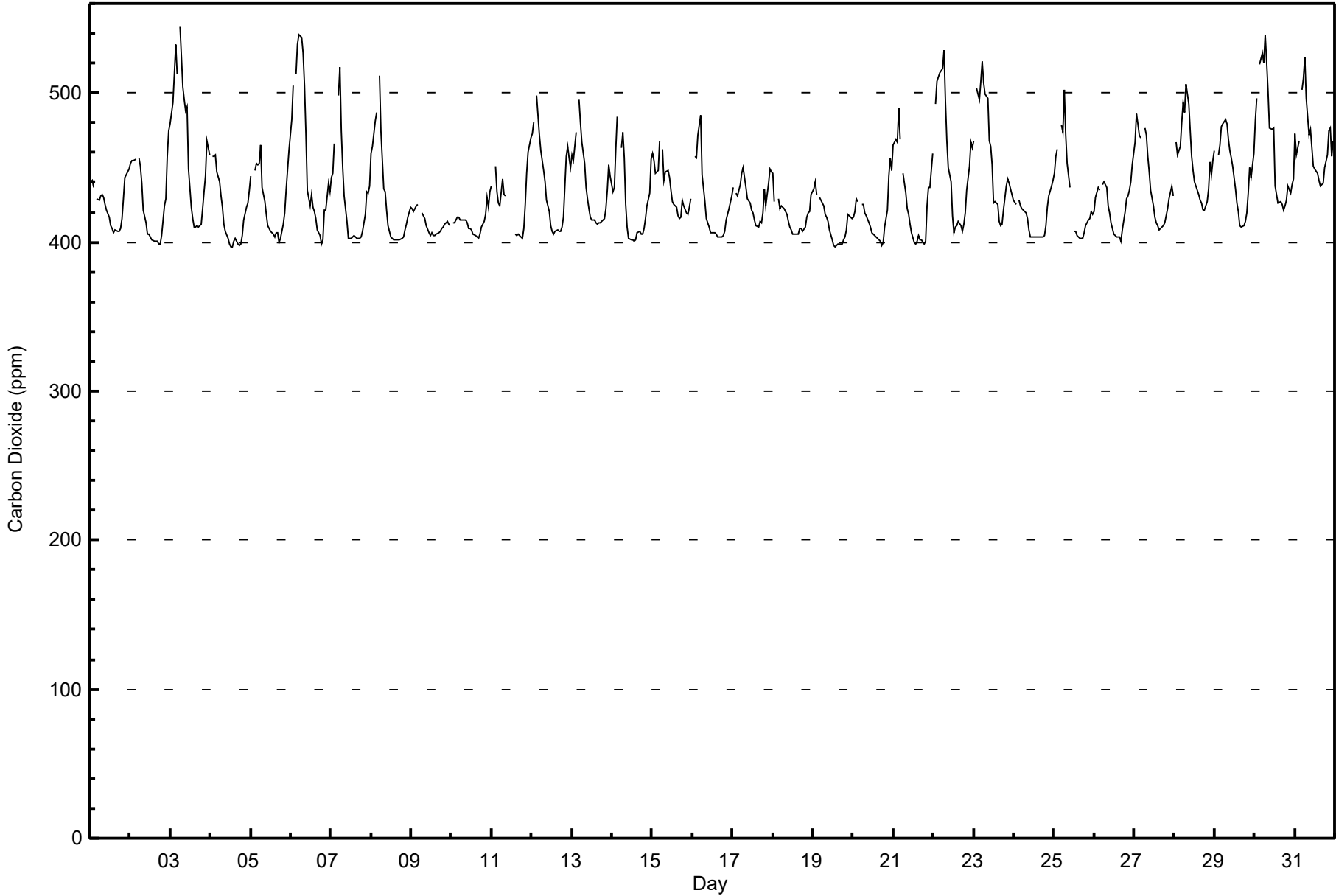


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:		744																					
Maximum Value: 544.4 ppm on Aug 3 07:00		Maximum Daily Average: 466.5 ppm on Aug 31		Hours of Data:		706																					
Minimum Value: 396.6 ppm on Aug 4 14:00		Minimum Daily Average: 412.6 ppm on Aug 9		Hours of Missing Data:		38																					
Maximum Diurnal Average: 469.0 ppm at hour 5		Minimum Diurnal Average: 407.7 ppm at hour 18		Hours of Calibration:		36																					
Monthly Average: 434.03 ppm		Percentiles: P ₁ = 398.2 P ₁₀ = 403.4 Q ₁ = 410.1 Median = 425.0 Q ₃ = 450.4 P ₉₀ = 476.9 P ₉₉ = 526.7		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-Aug	440.6	441.2	437.0	Z	429.3	428.4	431.0	431.5	430.4	425.5	421.0	416.8	411.1	409.0	406.5	408.2	407.2	407.5	408.9	415.5	429.5	443.5	447.5	448.5	425.0	448.5	
2-Aug	452.7	454.8	454.8	455.2	Z	456.2	450.4	439.8	421.5	412.8	404.9	405.5	403.6	401.5	400.9	400.7	400.5	398.2	398.8	404.0	423.9	429.2	457.0	474.5	426.2	474.5	
3-Aug	479.5	493.5	512.4	532.2	512.3	Z	544.4	503.6	495.4	487.6	490.3	449.3	423.1	416.1	410.4	410.1	411.0	410.2	411.5	421.9	433.4	443.9	467.8	458.5	461.7	544.4	
4-Aug	Z	457.8	457.5	458.2	447.4	440.3	431.3	423.0	412.3	407.4	402.6	398.6	397.2	396.6	400.1	402.2	398.7	397.4	399.1	404.4	414.6	423.4	426.0	434.6	418.7	458.2	
5-Aug	444.0	Z	447.8	452.6	452.2	452.3	465.1	436.6	427.0	418.3	411.1	409.3	407.5	405.7	403.6	405.8	406.3	399.3	402.1	412.4	419.5	435.2	448.4	461.0	427.1	465.1	
6-Aug	482.6	505.1	Z	512.2	532.6	539.2	537.1	526.7	505.0	472.8	435.1	424.0	432.0	423.3	420.5	415.3	408.5	404.3	398.7	401.7	421.3	421.3	439.6	433.8	456.2	539.2	
7-Aug	443.0	446.3	466.4	Z	498.1	517.1	474.1	449.8	431.3	414.1	402.5	402.2	402.3	403.4	404.2	402.4	402.4	402.2	403.1	406.7	418.3	433.5	432.9	437.9	430.2	517.1	
8-Aug	459.1	464.1	480.8	487.3	Z	511.7	475.0	435.9	434.0	421.7	411.3	407.6	403.7	401.6	402.0	401.5	401.6	401.9	402.3	403.8	408.1	412.0	416.4	423.6	429.0	511.7	
9-Aug	422.2	420.4	422.7	424.3	425.2	Z	419.9	417.5	415.4	410.8	406.3	404.5	406.1	404.4	404.7	405.2	406.5	407.2	409.0	410.0	412.1	413.4	412.0	411.2	412.6	425.2	
10-Aug	Z	412.7	413.3	416.3	416.5	414.8	414.6	414.7	414.6	413.0	409.0	408.6	407.9	405.1	404.2	403.6	402.4	405.7	409.6	414.2	418.7	429.7	422.9	433.4	413.3	433.4	
11-Aug	437.2	Z	450.5	434.2	426.0	423.9	442.3	431.5	430.7	C	C	C	C	C	405.7	403.9	405.3	403.8	402.7	409.3	425.0	445.6	460.3	469.5	428.2	469.5	
12-Aug	472.2	479.9	Z	498.4	471.7	461.5	454.3	448.1	440.9	428.1	420.4	411.1	406.7	405.6	406.9	408.3	407.2	407.2	410.2	416.5	457.4	464.0	456.2	449.6	438.4	498.4	
13-Aug	458.5	454.8	473.4	Z	495.6	480.4	466.5	452.3	436.6	428.9	422.3	416.2	414.5	415.0	413.1	412.1	412.6	412.9	414.6	415.7	422.6	435.0	451.8	443.9	436.9	495.6	
14-Aug	434.2	436.7	462.3	484.5	Z	463.4	473.5	457.0	425.6	410.4	402.8	401.9	401.7	400.4	401.7	405.8	407.4	405.2	405.6	409.5	415.8	424.5	433.2	455.3	426.9	484.5	
15-Aug	459.4	455.1	446.0	447.6	468.2	Z	461.9	441.6	446.8	447.8	443.0	434.7	427.2	425.3	422.9	417.8	416.0	416.5	428.0	424.5	419.6	418.4	423.1	429.2	435.7	468.2	
16-Aug	Z	457.6	456.7	471.3	478.7	485.0	445.1	426.7	415.4	412.4	410.1	406.7	405.9	406.5	404.9	403.7	403.4	403.2	404.3	407.6	414.7	418.3	422.2	430.5	425.7	485.0	
17-Aug	436.5	Z	432.5	431.1	438.4	445.7	449.5	442.8	437.1	428.9	426.5	421.3	419.9	415.0	411.2	410.0	413.5	412.8	419.3	435.6	424.3	439.1	448.9	447.2	429.9	449.5	
18-Aug	445.9	427.6	Z	429.2	422.2	424.6	423.8	422.1	418.4	413.9	410.1	408.3	404.9	405.6	405.3	405.4	408.7	409.4	407.6	410.2	416.6	419.5	420.5	432.1	417.0	445.9	
19-Aug	435.3	440.2	432.3	Z	429.6	428.0	424.6	418.5	416.9	414.0	408.2	401.3	397.7	397.2	397.9	398.7	398.4	398.9	401.3	403.4	408.0	418.8	416.8	415.5	413.1	440.2	
20-Aug	417.0	420.5	428.8	426.7	Z	425.3	425.3	419.9	417.4	412.7	409.9	406.7	405.2	404.7	402.9	401.1	400.7	398.1	399.8	409.8	421.8	443.9	456.7	448.1	417.5	456.7	
21-Aug	465.2	469.0	466.6	489.8	469.0	Z	445.8	433.1	422.0	418.1	411.8	405.9	399.6	398.5	401.0	404.8	401.3	401.5	399.0	401.0	424.5	436.2	436.2	459.6	428.7	489.8	
22-Aug	Z	492.6	508.0	511.1	513.8	516.8	528.5	494.5	467.9	449.5	440.7	417.8	406.2	410.4	410.8	413.4	410.8	407.3	411.8	419.6	434.3	450.9	467.2	463.6	454.2	528.5	
23-Aug	468.4	Z	503.0	495.6	507.8	521.5	506.8	499.5	496.5	468.0	464.6	451.6	426.0	427.0	425.0	413.6	411.2	411.5	421.1	437.8	442.0	439.8	436.1	431.6	456.8	521.5	
24-Aug	427.8	425.4	Z	427.7	424.7	422.0	420.6	419.8	415.6	407.7	403.5	403.0	403.0	403.4	403.4	403.2	403.4	403.4	404.4	411.1	423.0	430.9	437.5	441.1	415.9	441.1	
25-Aug	446.2	457.4	462.7	Z	477.9	473.9	502.3	472.0	452.4	436.3	M	M	407.6	406.7	404.4	402.1	402.1	402.4	405.8	411.0	414.5	415.9	420.9	418.8	433.0	502.3	
26-Aug	420.2	429.9	437.0	434.6	Z	438.0	440.7	436.3	423.8	419.3	413.1	408.8	405.7	403.0	403.0	403.1	400.7	408.4	420.7	429.1	431.4	435.2	440.4	451.6	423.2	451.6	
27-Aug	466.8	485.5	478.9	471.3	469.6	Z	476.9	471.7	457.7	447.0	434.5	423.8	416.8	413.1	410.9	408.5	410.0	410.6	412.9	417.4	422.8	429.3	437.3	431.0	439.3	485.5	
28-Aug	Z	466.8	458.1	464.1	480.3	493.4	486.6	505.5	492.9	474.8	458.0	447.9	440.1	437.2	432.1	428.4	426.2	421.7	421.6	426.8	436.0	454.2	445.3	454.2	454.4	505.5	
29-Aug	461.1	Z	458.6	464.7	477.9	478.9	481.7	479.5	469.3	461.7	456.8	450.6	435.4	425.8	420.1	411.2	410.4	410.6	414.1	419.4	432.5	449.9	443.6	459.6	446.7	481.7	
30-Aug	481.4	496.2	Z	519.1	526.5	520.2	539.4	521.1	500.9	476.8	475.6	476.2	437.9	432.3	426.0	427.4	424.7	421.3	424.0	428.3	437.5	432.8	438.9	442.4	465.5	539.4	
31-Aug	473.0	458.8	467.7	Z	501.9	510.1	523.5	496.7	471.5	475.8	463.1	450.4	449.1	446.5	441.1	437.3	438.6	439.0	450.0	458.9	474.2	476.3	457.8	468.2	466.5	523.5	
		451.2	455.8	458.3	465.6	469.0	468.2	466.5	453.8	443.3	433.9	426.5	419.7	413.5	411.5	409.9	408.9	408.3	407.7	410.4	416.0	425.7	434.3	439.4	443.9	Diurnal Average	
		482.6	505.1	512.4	532.2	532.6	539.2	544.4	526.7	505.0	487.6	490.3	476.2	449.1	446.5	441.1	437.3	438.6	439.0	450.0	458.9	474.2	476.3	467.8	474.5	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	279	39.52	39.52
420 - 440	176	24.93	64.45
440 - 460	102	14.45	78.90
460 - 480	68	9.63	88.53
480 - 500	26	3.68	92.21
> 500	34	4.82	97.03

Total Number of Valid Hours: 706
Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort McKay - Bertha Ganter - August 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	23	7	7	6	10	17	30	21	30	34	14	13	10	19	8	29	278
420 - 440	33	4	0	0	1	0	4	27	34	8	3	9	12	13	13	13	174
440 - 460	4	0	0	1	2	0	3	14	23	8	3	3	7	21	8	4	101
460 - 480	3	1	1	0	0	0	3	6	22	3	5	4	2	8	6	4	68
480 - 500	0	0	0	0	0	0	0	2	7	3	1	2	2	7	1	1	26
> 500	2	0	0	1	0	0	0	2	1	8	0	6	3	8	2	0	33
Totals	65	12	8	8	13	17	40	72	117	64	26	37	36	76	38	51	680

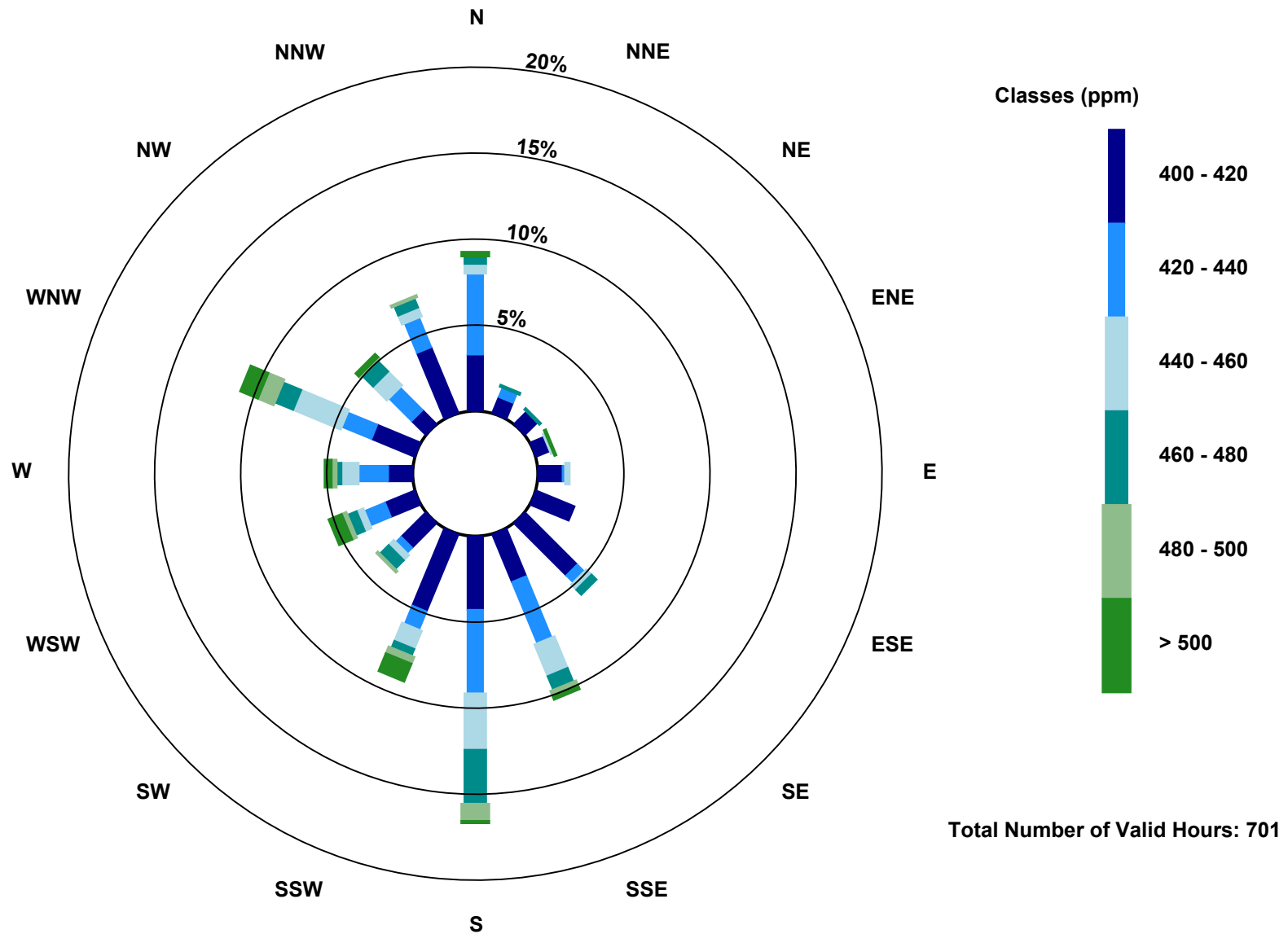
Total Number of Valid Hours: 701

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Number of Exceedences (AAAQO): 1-hr: 0	Maximum Value: 63.0 ppb on Aug 26 22:00	Maximum Daily Average: 19.0 ppb on Aug 27	Hours in Service: 744
Minimum Value: 0.0 ppb on Aug 1 01:00	Maximum Diurnal Average: 5.3 ppb at hour 22	Minimum Daily Average: 0.0 ppb on Aug 1	Hours of Data: 652
Monthly Average: 2.05 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 = 42.4	Minimum Diurnal Average: 0.4 ppb at hour 10	Hours of Missing Data: 92
			Hours of Calibration: 38
			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-Aug	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	
2-Aug	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	
3-Aug	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	
4-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	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	
6-Aug	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	
7-Aug	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	
8-Aug	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	
9-Aug	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	
10-Aug	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	
11-Aug	0.0	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	
12-Aug	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	
13-Aug	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	
14-Aug	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	
15-Aug	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	
16-Aug	0.0	0.0	0.0	0.0	Z	RE	0.0	0.0	0.0	0.0	11.6	12.5	11.1	12.8	13.1	12.1	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	13.1
17-Aug	0.0	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	
18-Aug	Z	RE	0.0	0.0	0.0	0.0	0.0	10.2	10.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	10.9
19-Aug	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
20-Aug	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
21-Aug	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
22-Aug	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
23-Aug	0.0	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
24-Aug	Z	RE	18.9	16.7	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	18.9
25-Aug	0.0	Z	RE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	M	M	10.2	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	10.5
26-Aug	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	13.9	63.0
27-Aug	36.7	27.9	21.6	Z	RE	15.9	14.2	13.1	12.8	13.0	16.7	21.4	25.0	24.1	23.4	22.2	19.3	17.7	16.7	15.9	15.2	15.3	15.3	15.6	0.0	0.0	19.0	36.7
28-Aug	14.2	13.1	12.9	12.4	Z	RE	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	14.2
29-Aug	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
30-Aug	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
31-Aug	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	8.0	31.4

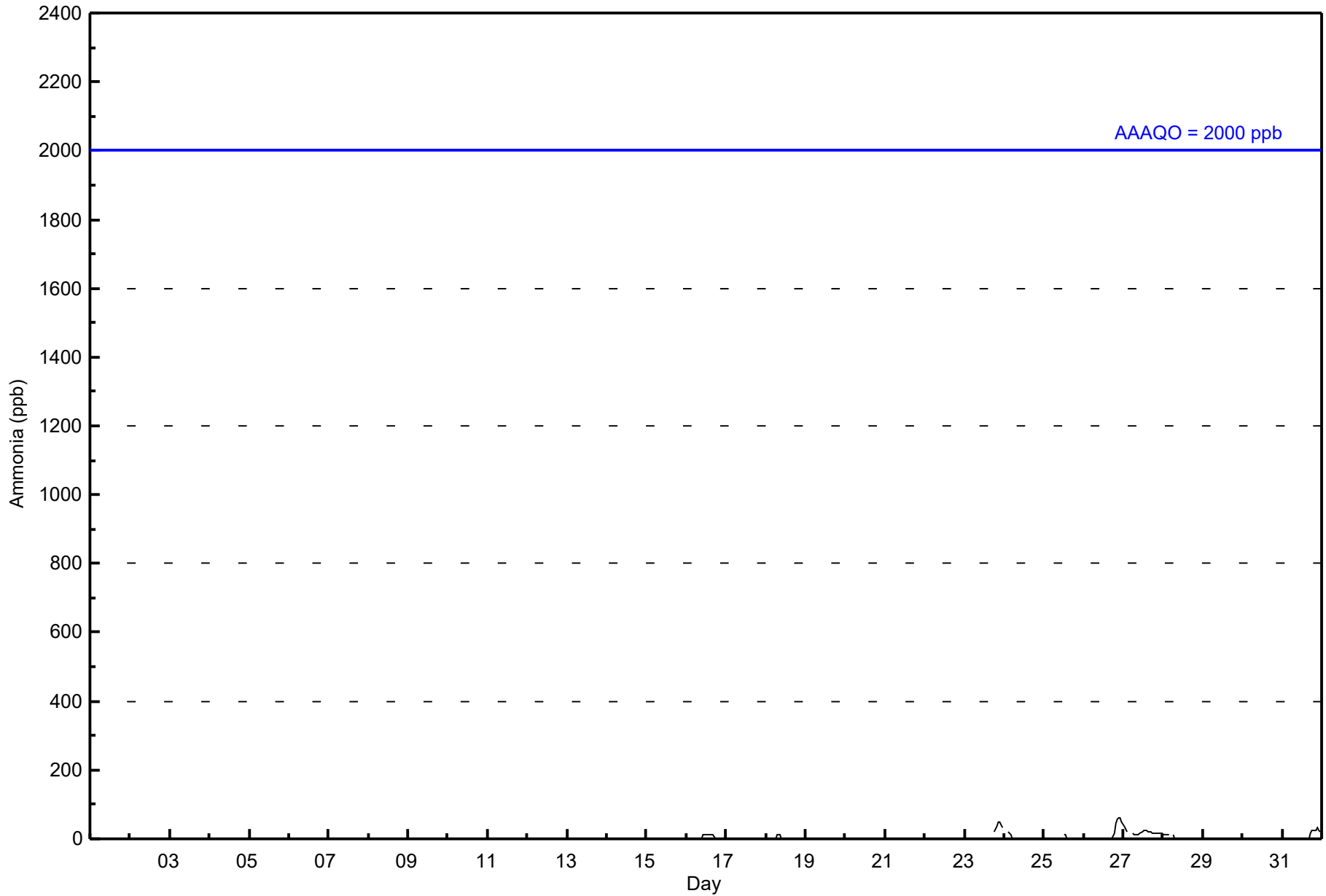
2.0	2.2	2.8	1.5	0.6	0.8	1.0	0.8	0.8	0.4	1.0	1.2	1.5	1.6	1.2	1.2	1.1	1.2	2.6	4.0	4.9	5.3	4.7	4.0					Diurnal Average
36.7	27.9	21.6	16.7	12.5	15.9	14.2	13.1	12.8	13.0	16.7	21.4	25.0	24.1	23.4	22.2	19.3	17.7	22.7	44.1	58.2	63.0	59.8	48.8					Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	592	90.80	90.80
6 - 10	3	0.46	91.26
11 - 15	21	3.22	94.48
16 - 20	12	1.84	96.32
21 - 25	11	1.69	98.01
> 26	13	1.99	100.00

Total Number of Valid Hours: 652

Total Number of Hours: 744



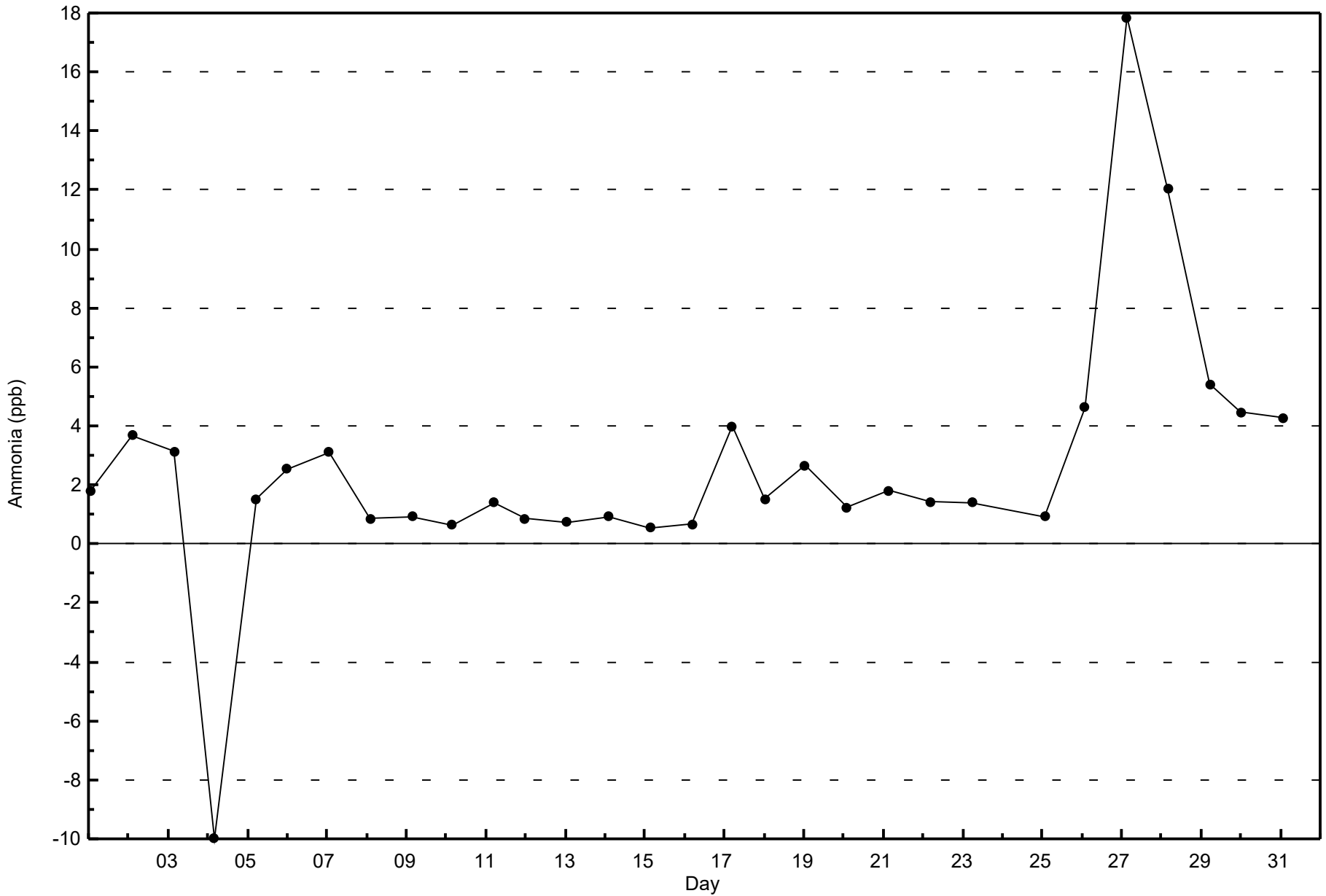
Wood Buffalo Environmental Association
Frequency Distribution

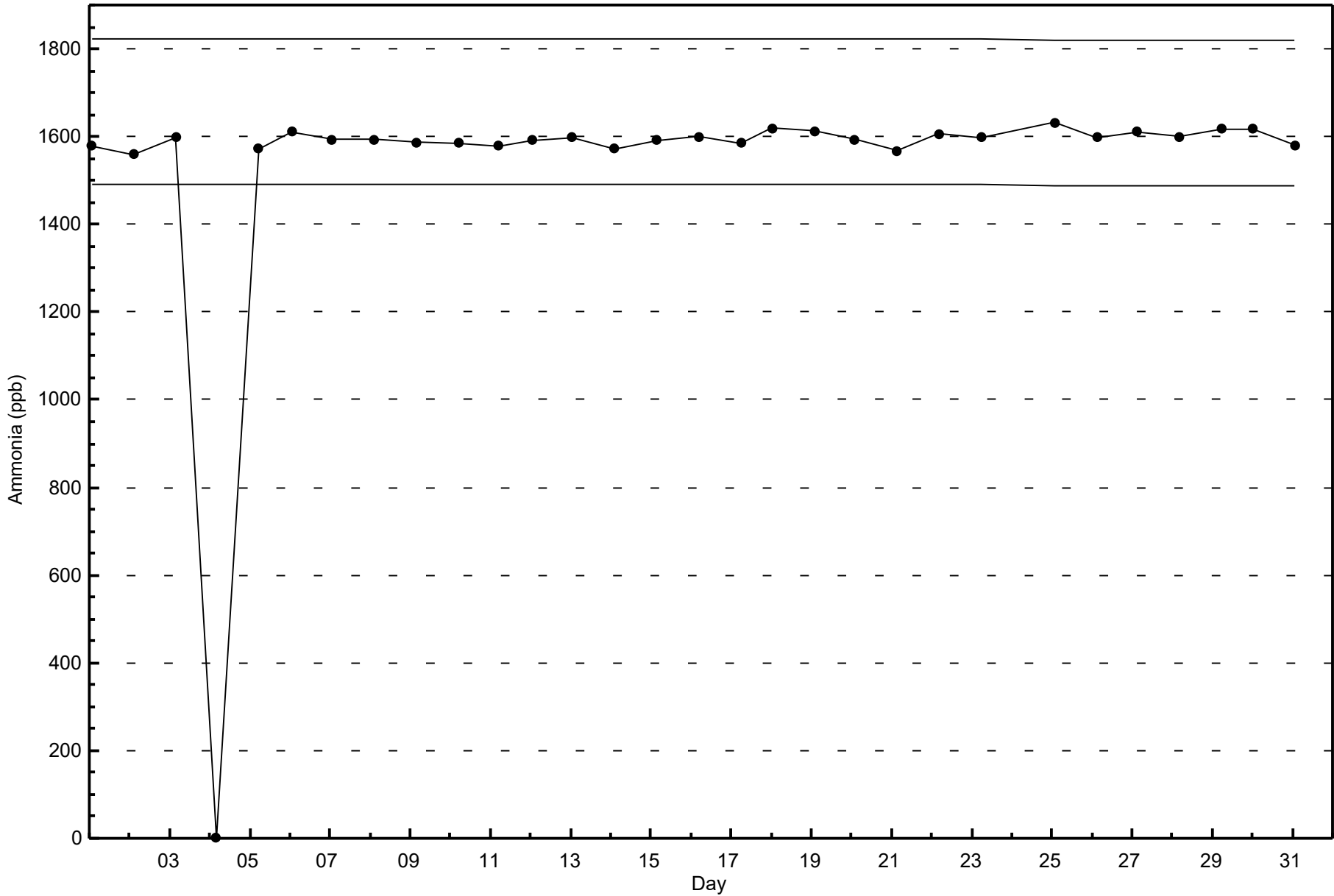
Ammonia (NH₃) - ppb
Fort McKay - Bertha Ganter - August 2023

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 5	50	12	9	8	14	18	38	67	95	49	29	33	28	62	31	45	588
6 - 10	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
11 - 15	1	1	0	0	0	0	1	2	7	2	1	1	1	4	0	0	21
16 - 20	4	1	0	0	0	0	0	1	1	4	0	0	0	1	0	0	12
21 - 25	1	0	0	0	0	0	0	1	2	2	1	1	0	1	2	0	11
> 26	6	0	0	0	0	0	0	0	0	1	0	0	0	2	2	2	13
Totals	62	14	9	8	14	18	39	71	105	59	31	35	29	70	35	48	647

Total Number of Valid Hours: 647

Total Number of Hours: 744



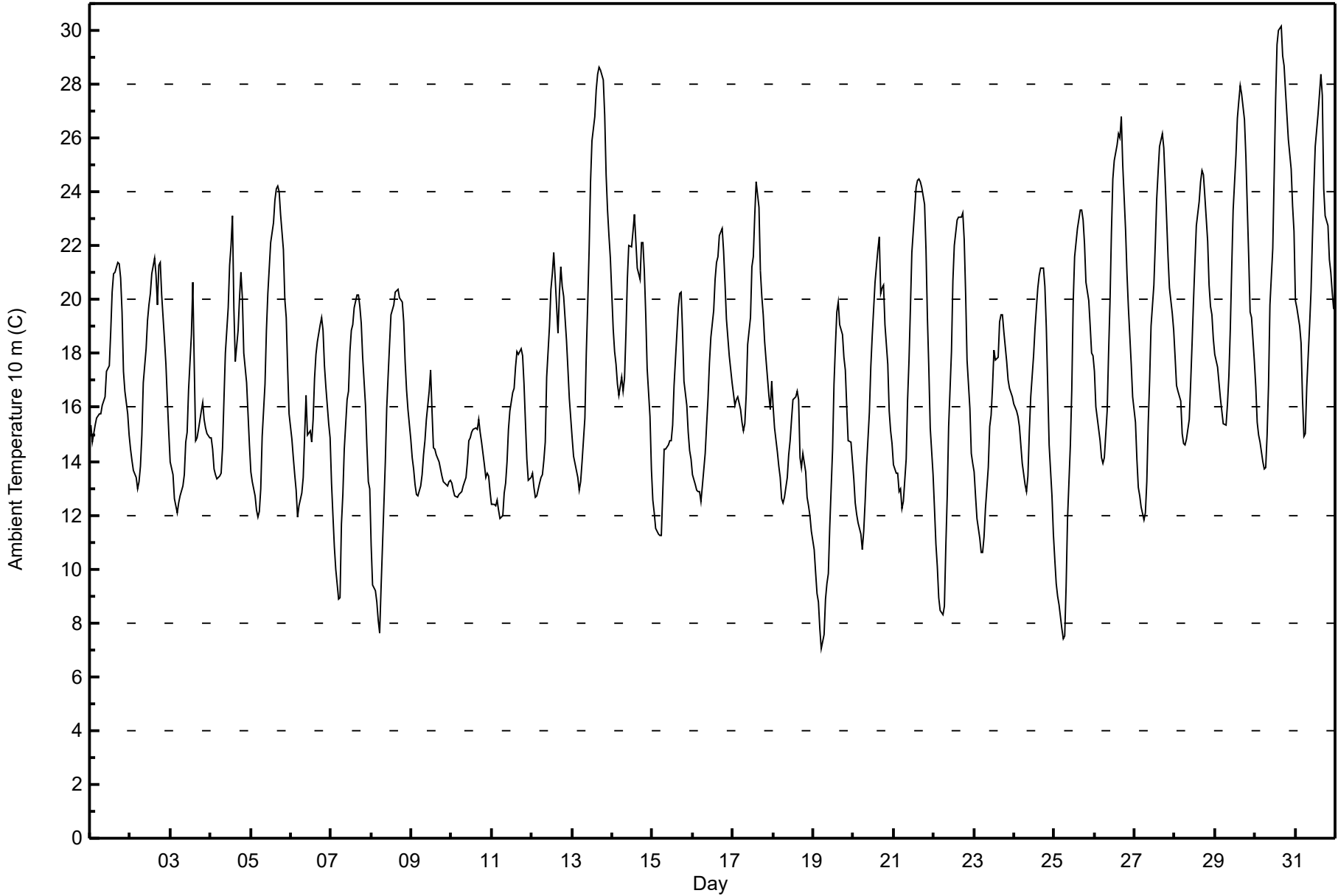




Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 30.2 C on Aug 30 16:00		Maximum Daily Average: 22.0 C on Aug 30		Hours in Service: 744																							
Minimum Value: 7.0 C on Aug 19 06:00		Minimum Daily Average: 13.4 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 21.6 C at hour 16		Minimum Diurnal Average: 12.4 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 17.13 C		Percentiles: P ₁ = 8.2 P ₁₀ = 12.3 Q ₁ = 13.8 Median = 16.4 Q ₃ = 20.2 P ₉₀ = 23.2 P ₉₉ = 28.4		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-Aug	15.3	14.7	15.0	15.3	15.6	15.7	15.8	16.1	16.2	16.4	17.3	17.6	18.8	20.3	21.0	21.0	21.4	21.4	20.8	19.5	17.3	16.6	15.8	15.0	17.5	21.4	
2-Aug	14.4	14.0	13.6	13.4	13.0	13.3	13.8	15.0	16.9	18.2	19.2	19.8	20.2	21.0	21.5	20.9	19.8	21.3	21.4	20.2	18.5	17.6	16.3	15.1	17.4	21.5	
3-Aug	14.0	13.5	12.6	12.4	12.1	12.5	12.7	13.1	13.5	14.7	15.1	16.7	18.7	20.6	17.6	14.7	14.9	15.2	15.9	16.2	15.5	15.2	15.0	14.8	14.9	20.6	
4-Aug	14.9	14.4	13.7	13.5	13.3	13.4	13.6	14.5	16.3	18.0	19.7	21.3	22.0	23.1	19.7	17.7	18.9	20.1	21.0	20.1	18.0	16.9	15.8	14.6	17.3	23.1	
5-Aug	13.6	13.3	12.7	12.2	11.9	12.1	13.0	14.9	16.8	18.9	20.2	21.2	22.1	22.8	23.7	24.1	24.2	24.0	23.2	21.9	20.0	19.3	17.4	15.8	18.3	24.2	
6-Aug	14.8	14.1	13.5	12.9	12.0	12.3	12.8	13.4	15.0	16.4	15.0	15.2	14.7	15.5	17.1	17.9	18.5	19.1	19.3	18.9	17.5	16.7	15.4	14.9	15.5	19.3	
7-Aug	13.2	12.0	10.8	10.0	8.9	8.9	11.7	12.8	14.4	16.3	16.6	18.1	18.9	19.1	19.7	20.2	20.2	19.8	19.1	17.9	16.1	14.6	13.2	13.0	15.2	20.2	
8-Aug	10.9	9.4	9.2	8.8	8.1	7.6	9.3	12.4	14.0	16.0	17.2	18.3	19.4	19.8	20.3	20.3	20.4	20.1	19.9	19.2	17.7	16.7	15.9	14.8	15.2	20.4	
9-Aug	14.1	13.7	13.2	12.8	12.7	13.1	13.5	14.2	14.8	15.5	16.6	17.4	15.9	14.5	14.4	14.2	14.0	13.7	13.4	13.2	13.2	13.1	13.2	13.3	14.1	17.4	
10-Aug	13.2	12.9	12.7	12.6	12.8	12.8	12.9	13.1	13.4	14.0	14.8	14.9	15.1	15.2	15.2	15.2	15.6	15.1	14.7	13.9	13.4	13.6	13.4	12.9	13.9	15.6	
11-Aug	12.4	12.4	12.3	12.5	12.2	11.9	12.0	12.8	13.2	14.0	15.2	15.9	16.5	16.7	17.5	18.1	18.0	18.2	17.9	16.9	15.5	14.1	13.3	13.4	14.7	18.2	
12-Aug	13.6	13.0	12.7	12.7	13.2	13.4	13.5	14.0	14.7	17.1	19.0	20.4	20.9	21.7	20.8	18.8	20.2	21.2	20.5	20.1	18.5	17.4	16.4	15.6	17.1	21.7	
13-Aug	14.9	14.2	13.7	13.4	12.9	13.2	14.0	15.6	18.0	19.8	21.9	24.4	25.9	26.8	27.8	28.3	28.6	28.5	28.2	26.9	24.6	23.3	22.4	21.6	21.2	28.6	
14-Aug	18.9	18.1	17.6	16.8	16.4	17.1	16.6	17.1	18.8	20.8	22.0	22.0	22.6	23.2	22.2	21.2	20.8	22.1	21.0	21.0	19.4	17.4	15.7	13.7	19.3	23.2	
15-Aug	12.6	12.1	11.5	11.3	11.3	11.2	12.8	14.5	14.4	14.6	14.8	14.8	15.3	16.8	18.8	19.7	20.2	20.3	18.8	17.0	16.1	15.1	14.4	14.1	15.1	20.3	
16-Aug	13.5	13.1	12.9	12.9	12.9	12.5	13.1	14.3	15.3	16.3	17.6	18.6	19.6	20.7	21.4	21.6	22.4	22.6	21.8	20.6	19.3	18.6	17.9	16.9	17.4	22.6	
17-Aug	16.5	16.1	16.3	16.4	15.9	15.4	15.1	15.4	16.5	18.4	19.3	21.2	21.6	23.1	24.4	23.5	21.1	20.1	19.5	18.4	17.8	16.4	15.9	17.0	18.4	24.4	
18-Aug	16.0	15.2	14.4	13.8	13.4	12.6	12.5	12.7	13.4	14.2	14.8	15.6	16.3	16.4	16.6	16.3	14.1	13.8	14.3	13.6	12.7	12.3	12.0	11.4	14.1	16.6	
19-Aug	10.7	9.9	9.1	8.8	7.8	7.0	7.6	8.9	9.4	9.8	11.6	14.4	16.9	18.3	19.5	19.9	19.1	18.7	17.9	17.4	16.0	14.7	14.7	14.0	13.4	19.9	
20-Aug	13.3	12.5	12.0	11.7	11.3	10.7	11.4	12.5	13.8	15.8	17.5	18.7	19.6	20.7	21.9	22.3	20.2	20.4	20.6	19.1	17.6	15.9	15.2	14.6	16.2	22.3	
21-Aug	13.9	13.6	13.6	12.9	13.0	12.2	12.5	14.1	16.3	17.8	19.7	21.7	23.3	24.1	24.4	24.5	24.4	24.2	23.5	21.9	19.4	17.4	15.2	13.5	18.2	24.5	
22-Aug	12.2	10.9	10.1	8.9	8.5	8.3	8.6	10.8	12.7	15.3	18.1	20.7	22.0	22.5	23.0	23.1	23.1	23.2	22.2	20.2	17.7	16.0	14.3	13.9	16.1	23.2	
23-Aug	13.6	12.7	11.9	11.1	10.6	10.6	11.2	12.3	13.8	15.3	15.7	16.8	18.1	17.8	17.9	19.2	19.5	19.4	18.8	17.7	17.0	16.7	16.6	16.4	15.4	19.5	
24-Aug	16.1	15.9	15.7	15.3	14.6	13.9	13.1	12.9	13.5	15.1	16.4	17.9	18.9	19.7	20.4	20.9	21.2	21.2	20.5	18.9	16.8	14.6	12.7	11.3	16.6	21.2	
25-Aug	10.4	9.4	9.0	8.7	7.8	7.4	7.5	9.4	11.8	14.6	16.6	19.9	21.6	22.1	22.6	23.3	23.3	23.0	22.1	20.6	20.0	19.0	18.0	17.9	16.1	23.3	
26-Aug	17.4	16.1	15.2	14.8	14.1	13.9	14.2	15.9	18.0	19.9	22.5	24.5	25.1	25.7	26.2	26.0	26.8	25.0	22.6	21.0	19.7	18.7	17.6	16.4	19.9	26.8	
27-Aug	15.4	14.1	13.0	12.7	12.3	11.8	12.1	13.2	15.4	17.0	19.0	20.5	22.1	23.7	24.7	25.7	26.2	25.7	24.4	23.0	21.6	20.4	19.5	18.9	18.8	26.2	
28-Aug	17.9	16.8	16.6	16.2	15.1	14.7	14.6	14.8	15.5	16.9	18.4	20.0	21.4	22.8	23.7	24.4	24.8	24.6	23.8	22.2	20.6	19.8	19.5	18.5	19.3	24.8	
29-Aug	18.0	17.5	16.9	16.3	15.9	15.4	15.4	16.1	17.2	18.9	21.2	23.3	25.4	26.7	27.4	28.0	27.6	26.7	25.3	23.4	21.6	19.5	19.3	17.7	20.9	28.0	
30-Aug	16.8	15.5	15.0	14.7	14.0	13.7	13.7	15.0	16.8	19.8	21.9	24.7	27.4	29.5	30.0	30.2	29.0	28.7	27.8	26.8	25.9	24.9	23.5	22.5	22.0	30.2	
31-Aug	20.0	19.7	19.0	18.4	16.4	14.9	15.1	16.8	19.0	20.3	22.3	24.1	25.7	26.9	27.7	28.4	27.6	24.1	23.1	22.8	21.5	21.0	20.3	19.6	21.4	28.4	
		14.6	13.9	13.4	13.0	12.6	12.4	12.8	13.8	15.1	16.6	18.0	19.4	20.4	21.2	21.6	21.6	21.5	21.3	20.8	19.7	18.3	17.2	16.3	15.6	Diurnal Average	
		20.0	19.7	19.0	18.4	16.4	17.1	16.6	17.1	19.0	20.8	22.5	24.7	27.4	29.5	30.0	30.2	29.0	28.7	28.2	26.9	25.9	24.9	23.5	22.5	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	29	3.90	3.90
10 - 20	523	70.30	74.19
> 20	192	25.81	100.00

Total Number of Valid Hours: 744

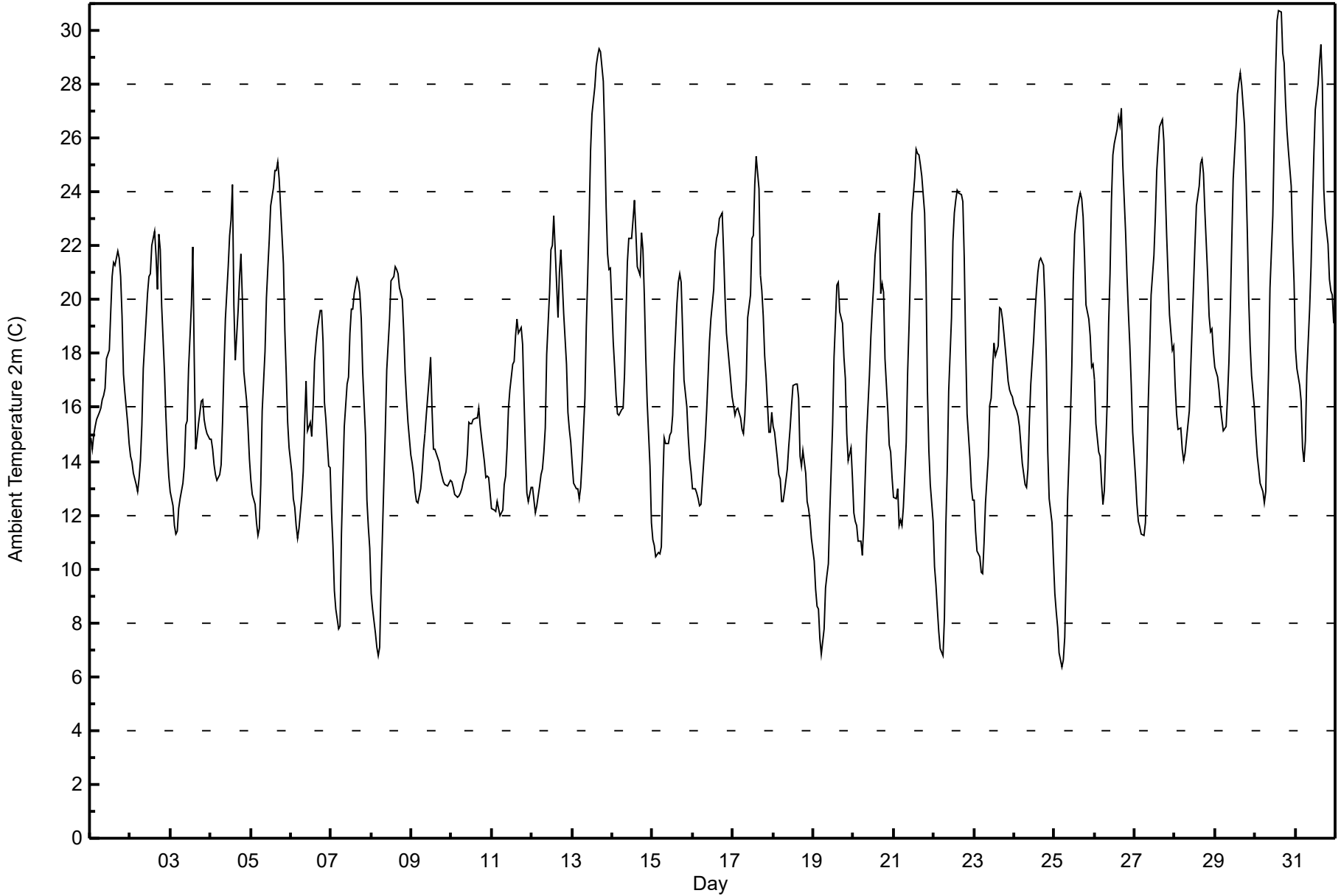
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 30.7 C on Aug 30 15:00 Maximum Daily Average: 21.7 C on Aug 30		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																																														
Minimum Value: 6.4 C on Aug 25 05:00 Maximum Diurnal Average: 22.3 C at hour 15 Monthly Average: 17.08 C		Minimum Daily Average: 13.5 C on Aug 19 Minimum Diurnal Average: 11.9 C at hour 6 Percentiles: P ₁ = 7.1 P ₁₀ = 11.7 Q ₁ = 13.5 Median = 16.2 Q ₃ = 20.5 P ₉₀ = 23.7 P ₉₉ = 29.0																																														
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-Aug	14.9	14.5	15.0	15.3	15.6	15.8	16.0	16.3	16.4	16.7	17.8	18.1	19.5	20.8	21.4	21.3	21.8	21.6	20.9	19.4	17.2	16.6	15.4	14.6	17.6	21.8																						
2-Aug	14.2	14.0	13.6	13.1	12.9	13.4	14.0	15.3	17.4	19.3	20.2	20.9	21.0	22.0	22.6	21.6	20.4	22.4	21.9	19.8	17.3	15.7	14.4	13.4	17.5	22.6																						
3-Aug	12.9	12.4	11.6	11.3	11.4	12.2	12.6	13.2	13.8	15.3	15.5	17.5	19.8	22.0	17.8	14.5	14.9	15.4	16.3	16.3	15.5	15.2	15.1	14.8	14.9	22.0																						
4-Aug	14.8	14.5	13.9	13.5	13.3	13.5	13.8	15.4	17.5	19.3	21.2	22.4	23.0	24.3	19.8	17.8	19.6	20.8	21.7	20.0	17.3	16.2	15.3	14.1	17.6	24.3																						
5-Aug	13.3	12.7	12.4	11.7	11.2	11.5	13.1	15.8	18.1	20.1	21.2	22.2	23.5	24.2	24.8	24.8	25.1	24.5	23.4	21.3	18.9	17.3	15.4	14.5	18.4	25.1																						
6-Aug	13.6	12.6	12.3	11.6	11.1	11.5	12.7	13.6	15.5	16.9	15.1	15.4	14.9	16.1	17.7	18.4	18.9	19.6	19.6	18.5	16.2	15.6	13.8	13.8	15.2	19.6																						
7-Aug	12.1	10.9	9.2	8.5	7.8	7.9	11.3	13.3	15.3	16.9	17.1	18.7	19.6	19.6	20.2	20.8	20.7	20.2	19.3	17.4	15.0	12.6	11.6	10.8	14.9	20.8																						
8-Aug	9.1	8.5	7.6	7.1	6.8	7.1	9.5	13.3	15.2	17.4	18.3	19.3	20.7	20.9	21.2	21.1	20.9	20.4	20.0	18.8	17.3	16.3	15.4	14.2	15.3	21.2																						
9-Aug	13.9	13.5	12.9	12.5	12.5	13.0	13.6	14.5	15.0	15.8	17.1	17.9	15.9	14.4	14.4	14.3	14.0	13.7	13.4	13.3	13.2	13.1	13.2	13.3	14.1	17.9																						
10-Aug	13.2	13.0	12.7	12.7	12.7	12.8	13.0	13.2	13.6	14.3	15.4	15.4	15.4	15.6	15.6	15.6	16.0	15.3	14.9	14.0	13.4	13.5	13.4	12.8	14.1	16.0																						
11-Aug	12.2	12.2	12.2	12.5	12.3	12.0	12.2	13.1	13.5	14.5	16.0	16.6	17.6	17.7	18.7	19.3	18.8	19.0	18.3	16.3	14.4	12.8	12.5	13.0	14.9	19.3																						
12-Aug	13.0	12.5	12.1	12.3	13.1	13.5	13.7	14.3	15.2	18.0	20.2	21.9	22.0	23.1	21.8	19.3	21.0	21.9	20.7	19.5	17.6	15.8	15.2	14.7	17.2	23.1																						
13-Aug	13.9	13.2	13.0	13.0	12.6	13.0	14.0	16.3	19.0	20.9	23.0	25.5	26.9	27.9	28.7	29.1	29.3	29.2	28.1	26.1	23.5	21.7	21.1	21.2	21.3	29.3																						
14-Aug	18.4	17.5	16.4	15.8	15.7	15.9	16.0	17.2	19.4	21.4	22.3	22.9	23.7	22.5	21.2	20.9	22.5	21.9	20.2	17.9	16.2	13.8	11.7	11.7	18.9	23.7																						
15-Aug	11.1	10.9	10.5	10.6	10.5	10.8	13.1	14.9	14.6	14.7	15.0	15.1	15.7	17.5	19.8	20.7	20.9	20.7	18.9	17.0	16.0	14.9	14.1	13.6	15.1	20.9																						
16-Aug	13.0	13.0	12.8	12.6	12.3	12.4	13.3	14.8	15.9	17.2	18.5	19.3	20.4	21.8	22.3	22.5	23.0	23.2	21.7	20.1	18.7	18.2	17.6	16.4	17.5	23.2																						
17-Aug	16.1	15.7	15.9	16.0	15.6	15.2	15.0	15.7	17.0	19.3	20.2	22.3	22.4	24.3	25.3	24.1	20.9	20.3	19.4	17.9	17.1	15.1	15.1	15.8	18.4	25.3																						
18-Aug	15.3	15.1	14.1	13.5	13.3	12.5	12.5	12.9	13.7	14.6	15.3	16.1	16.8	16.9	16.9	16.3	14.2	13.8	14.4	13.6	12.5	12.2	11.8	11.2	14.1	16.9																						
19-Aug	10.3	9.3	8.6	8.5	7.4	6.8	7.8	9.3	9.8	10.2	12.1	15.4	17.9	19.2	20.5	20.6	19.6	19.1	17.9	17.1	15.0	14.0	14.5	13.4	13.5	20.6																						
20-Aug	12.1	11.8	11.6	11.0	11.1	10.5	11.6	13.3	15.0	17.2	18.6	19.7	20.5	21.6	22.7	23.2	20.2	20.6	20.3	17.8	15.8	14.6	14.3	13.4	16.2	23.2																						
21-Aug	12.7	12.6	13.0	11.6	11.8	11.6	12.3	14.7	17.3	19.0	21.1	23.1	24.5	25.6	25.4	25.4	25.0	24.6	23.2	20.8	16.6	14.4	13.1	11.8	18.0	25.6																						
22-Aug	10.1	9.4	8.5	7.7	7.1	6.8	8.2	11.6	13.7	16.6	19.3	22.2	23.2	23.7	24.1	24.0	23.9	23.7	21.5	18.3	15.8	14.1	13.0	12.6	15.8	24.1																						
23-Aug	12.5	11.4	10.7	10.5	9.9	9.8	11.0	12.5	14.2	16.1	16.3	17.4	18.4	17.9	18.3	19.7	19.7	19.3	18.7	17.6	17.0	16.6	16.5	16.4	15.3	19.7																						
24-Aug	16.1	15.9	15.7	15.3	14.6	13.9	13.2	13.0	13.7	15.5	16.9	18.5	19.6	20.4	21.0	21.4	21.6	21.3	20.0	17.7	14.3	12.6	11.7	10.4	16.4	21.6																						
25-Aug	9.1	8.4	7.8	6.9	6.4	6.6	7.4	9.9	12.6	15.6	17.6	20.7	22.4	23.0	23.4	24.0	23.8	23.1	21.6	19.8	19.3	18.7	17.5	17.6	16.0	24.0																						
26-Aug	17.0	15.4	14.3	14.2	13.2	12.4	12.9	16.2	19.1	21.0	23.7	25.4	25.8	26.3	26.8	26.5	27.1	25.0	22.5	20.9	19.5	18.3	16.8	15.1	19.8	27.1																						
27-Aug	13.4	12.4	11.8	11.5	11.3	11.2	11.7	13.8	16.2	18.0	20.2	21.6	23.0	24.8	25.6	26.4	26.7	25.9	24.1	22.4	20.9	19.4	18.1	18.3	18.7	26.7																						
28-Aug	16.8	15.8	15.2	15.3	14.4	14.1	14.3	14.8	15.8	17.4	19.0	20.6	22.1	23.5	24.2	25.0	25.2	24.7	23.3	20.9	19.4	18.8	18.9	18.1	19.1	25.2																						
29-Aug	17.5	17.1	16.6	16.0	15.5	15.1	15.3	16.4	17.7	19.7	22.2	24.5	26.4	27.7	28.1	28.4	27.9	26.5	24.6	22.5	20.0	18.3	17.2	16.0	20.7	28.4																						
30-Aug	15.0	14.2	13.7	13.2	12.9	12.5	12.9	15.2	17.4	20.4	23.1	26.0	28.5	30.4	30.7	30.7	29.2	28.8	27.3	26.3	25.5	24.2	22.2	20.6	21.7	30.7																						
31-Aug	18.2	17.4	16.8	16.2	14.5	14.0	14.8	17.3	19.7	21.2	23.5	25.4	27.0	28.0	28.9	29.5	28.0	24.1	23.0	22.1	20.7	20.4	20.2	19.1	21.3	29.5																						
																								13.7	13.2	12.7	12.3	12.0	11.9	12.7	14.2	15.8	17.4	18.8	20.2	21.2	22.1	22.3	22.2	21.9	21.6	20.7	19.1	17.4	16.2	15.4	14.7	Diurnal Average
																								18.4	17.5	16.8	16.2	15.7	15.9	16.0	17.3	19.7	21.4	23.7	26.0	28.5	30.4	30.7	30.7	29.3	29.2	28.1	26.3	25.5	24.2	22.2	21.2	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	35	4.70	4.70
10 - 20	502	67.47	72.18
> 20	207	27.82	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

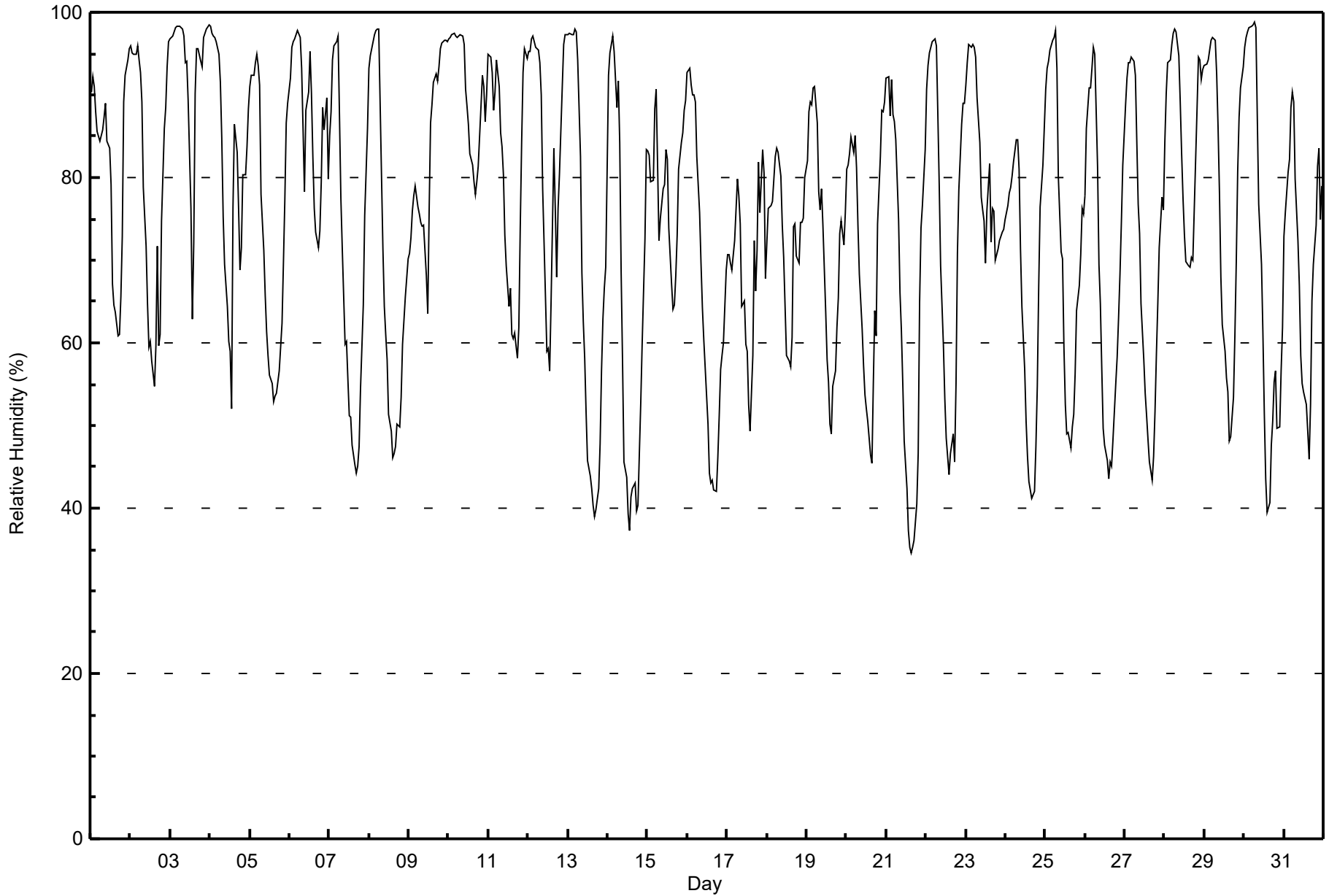
Fort McKay - Bertha Ganter - August 2023

Maximum Value: 98.8 % on Aug 30 07:00																						Maximum Daily Average: 92.8 % on Aug 3																						Hours in Service: 744			
Minimum Value: 34.6 % on Aug 21 16:00																						Minimum Daily Average: 64.0 % on Aug 21																						Hours of Data: 744			
Maximum Diurnal Average: 92.0 % at hour 6																						Minimum Diurnal Average: 56.4 % at hour 15																						Hours of Missing Data: 0			
Monthly Average: 75.13 %																						Percentiles: P ₁ = 39.4 P ₁₀ = 49.0 Q ₁ = 61.0 Median = 76.7 Q ₃ = 90.8 P ₉₀ = 96.1 P ₉₉ = 98.2																						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-Aug	90.3	92.2	91.1	88.0	85.7	84.4	85.1	85.7	87.3	89.0	84.4	83.5	79.2	67.1	64.5	63.8	60.8	61.0	65.5	72.9	89.2	92.4	94.3	95.6	81.4	95.6																					
2-Aug	95.9	95.1	95.0	95.0	96.0	94.2	92.7	89.2	78.9	71.8	64.7	59.4	60.2	57.8	54.7	59.6	71.7	59.7	61.0	74.8	85.9	88.4	93.4	96.4	78.8	96.4																					
3-Aug	96.8	97.2	97.7	98.1	98.3	98.3	98.3	97.9	97.2	93.9	94.0	89.3	76.3	62.9	72.0	90.2	95.6	95.6	94.0	93.5	97.0	97.5	98.0	98.4	92.8	98.4																					
4-Aug	98.4	97.5	97.1	96.9	96.5	95.0	91.5	84.8	75.3	69.5	64.4	60.2	59.0	52.0	76.4	86.5	83.0	76.2	68.9	71.6	80.4	80.3	83.8	88.2	80.6	98.4																					
5-Aug	91.0	92.4	92.4	94.0	94.9	93.6	91.1	77.9	71.1	65.8	61.3	58.6	56.1	55.0	53.0	53.6	53.8	55.2	58.5	62.4	69.7	77.3	86.6	89.0	73.0	94.9																					
6-Aug	92.1	95.7	96.4	96.9	97.3	97.8	97.0	93.3	85.9	78.3	88.2	90.3	95.2	90.2	82.5	76.3	73.3	71.5	73.6	79.5	88.5	85.7	89.7	79.9	87.3	97.8																					
7-Aug	85.0	87.9	94.2	96.0	96.5	97.1	87.5	77.4	71.3	59.8	60.1	55.5	51.3	51.0	47.7	45.2	44.2	45.1	47.5	54.4	64.5	75.4	80.7	85.9	69.2	97.1																					
8-Aug	93.2	94.8	96.4	97.2	97.8	98.0	98.0	80.1	71.3	64.5	60.9	58.0	51.4	49.3	46.1	46.6	47.4	50.2	49.8	53.4	59.9	62.7	65.6	70.2	69.3	98.0																					
9-Aug	70.9	72.7	76.0	77.8	79.0	76.4	75.6	74.6	74.1	74.2	68.1	63.6	76.1	86.5	88.7	91.6	92.6	91.8	93.4	95.6	96.2	96.6	96.7	96.5	82.7	96.7																					
10-Aug	96.7	96.9	97.3	97.4	97.1	96.9	97.1	97.3	97.1	96.0	90.7	88.6	86.5	83.0	81.5	79.5	78.0	79.6	81.3	88.6	92.4	91.1	86.7	90.0	90.3	97.4																					
11-Aug	94.9	94.6	92.7	88.1	90.3	94.2	91.0	85.4	83.8	80.4	73.0	69.3	64.3	66.6	61.0	60.5	61.2	58.2	61.9	73.9	84.3	92.8	95.6	94.4	79.7	95.6																					
12-Aug	95.2	95.3	96.8	97.1	95.8	95.5	95.5	94.0	89.9	78.6	65.6	59.0	59.4	56.5	64.9	83.6	76.2	67.9	76.3	80.5	91.1	96.1	97.3	97.4	83.6	97.4																					
13-Aug	97.3	97.4	97.3	97.2	98.0	97.7	94.3	82.6	68.5	62.6	58.1	51.4	45.7	43.9	42.4	40.3	39.0	39.9	42.4	47.7	56.7	62.9	66.5	69.1	66.6	98.0																					
14-Aug	92.4	95.1	96.1	97.2	95.3	88.5	91.7	84.3	68.7	57.7	45.6	43.8	39.3	37.3	41.3	42.3	43.0	39.6	40.3	46.7	52.7	59.9	72.6	83.4	64.8	97.2																					
15-Aug	83.3	82.8	79.4	79.6	88.2	90.7	81.7	72.4	75.0	78.6	79.2	83.4	82.2	73.9	67.1	64.1	64.6	68.1	73.0	81.0	84.2	85.4	88.1	89.3	79.0	90.7																					
16-Aug	92.8	93.1	91.1	90.0	89.9	89.1	82.6	75.8	69.7	64.3	60.3	56.9	50.2	44.2	43.0	43.4	42.2	42.1	46.0	51.1	56.8	58.5	60.0	68.8	65.1	93.1																					
17-Aug	70.7	70.7	69.7	68.8	72.3	76.2	79.7	77.8	74.4	64.4	65.1	59.9	59.1	52.6	49.4	58.4	72.3	66.2	71.3	81.9	75.8	83.4	80.6	67.7	69.5	83.4																					
18-Aug	72.2	76.2	76.6	77.0	79.8	82.6	83.6	83.0	80.2	74.2	70.3	64.3	58.4	57.8	57.2	60.8	74.1	74.3	70.4	69.6	74.6	74.6	75.1	80.0	72.8	83.6																					
19-Aug	82.0	88.0	89.2	88.9	90.8	91.0	86.7	78.3	76.1	78.6	74.3	63.7	58.0	55.2	50.2	48.9	54.7	56.6	61.9	65.5	73.2	74.8	71.8	75.8	72.3	91.0																					
20-Aug	81.0	81.6	82.9	84.8	83.1	85.0	81.1	74.2	68.2	61.7	57.4	53.8	52.0	50.5	46.5	45.5	55.2	63.9	60.9	74.4	82.5	88.1	88.0	89.1	70.5	89.1																					
21-Aug	92.1	92.3	87.4	91.8	87.7	86.8	84.5	74.9	66.2	61.6	55.1	48.1	42.3	37.3	35.2	34.6	35.2	36.1	40.5	46.6	64.9	73.8	76.6	83.4	64.0	92.3																					
22-Aug	90.8	93.5	95.0	95.8	96.5	96.8	95.9	87.8	79.2	69.2	59.7	53.3	48.5	46.2	44.0	46.6	48.9	45.6	55.1	70.9	78.5	86.5	89.0	88.9	73.4	96.8																					
23-Aug	91.2	93.9	96.1	95.8	96.1	95.8	94.5	89.7	84.2	77.6	76.0	74.7	69.6	76.0	81.7	72.1	76.2	75.9	69.9	71.3	72.4	72.8	73.4	73.7	81.3	96.1																					
24-Aug	74.9	76.6	78.1	78.9	80.2	81.9	84.5	84.7	80.9	71.4	64.4	56.8	50.5	46.3	43.3	42.2	41.1	42.0	47.4	54.7	66.7	76.5	81.5	86.1	66.3	86.1																					
25-Aug	90.8	93.2	94.0	95.4	96.6	97.0	97.8	93.2	80.2	71.0	70.2	59.6	52.5	48.9	49.2	47.3	49.8	51.3	56.2	63.9	66.9	70.7	76.4	75.7	72.8	97.8																					
26-Aug	77.9	85.9	90.8	90.8	93.2	95.7	95.0	81.3	69.5	64.8	57.0	49.7	47.6	45.7	43.6	45.6	45.0	48.3	55.1	58.3	63.1	68.3	74.5	81.5	67.8	95.7																					
27-Aug	88.8	92.1	93.9	94.0	94.6	94.1	92.5	84.4	76.9	73.1	64.8	58.0	53.9	51.3	48.3	45.5	43.4	46.2	51.7	58.6	64.8	71.6	77.6	76.1	70.7	94.6																					
28-Aug	84.2	90.1	94.0	94.2	96.0	97.5	98.0	97.6	94.7	89.2	83.0	77.5	73.0	69.9	69.2	69.1	70.3	70.0	76.2	88.3	94.5	94.3	91.9	93.1	85.7	98.0																					
29-Aug	93.6	93.8	94.3	95.4	96.6	96.9	96.6	92.6	86.1	78.2	68.0	62.2	58.9	55.8	54.1	48.2	48.6	53.3	60.9	69.9	80.7	87.3	90.8	93.4	77.3	96.9																					
30-Aug	95.7	96.9	97.7	98.1	98.3	98.5	98.8	98.2	87.3	76.8	69.5	61.2	51.5	43.5	39.6	40.7	47.7	50.4	55.3	56.6	49.7	49.8	56.6	61.9	70.0	98.8																					
31-Aug	73.0	75.8	80.7	82.2	88.5	90.4	89.1	79.8	72.3	67.0	58.4	55.1	54.1	52.6	49.4	45.9	52.5	65.1	69.5	74.3	81.3	83.6	74.9	79.0	70.6	90.4																					
																						87.9	89.7	90.6	90.9	91.8	92.0	90.6	84.8	78.8	73.0	68.1	63.5	60.1	57.0	56.4	57.4	59.4	59.6	62.4	68.8	75.5	79.3	81.7	83.8	Diurnal Average	
																						98.4	97.5	97.7	98.1	98.3	98.5	98.8	98.2	97.2	96.0	94.0	90.3	95.2	90.2	88.7	91.6	95.6	95.6	94.0	95.6	97.0	97.5	98.0	98.4	Diurnal Maximum	



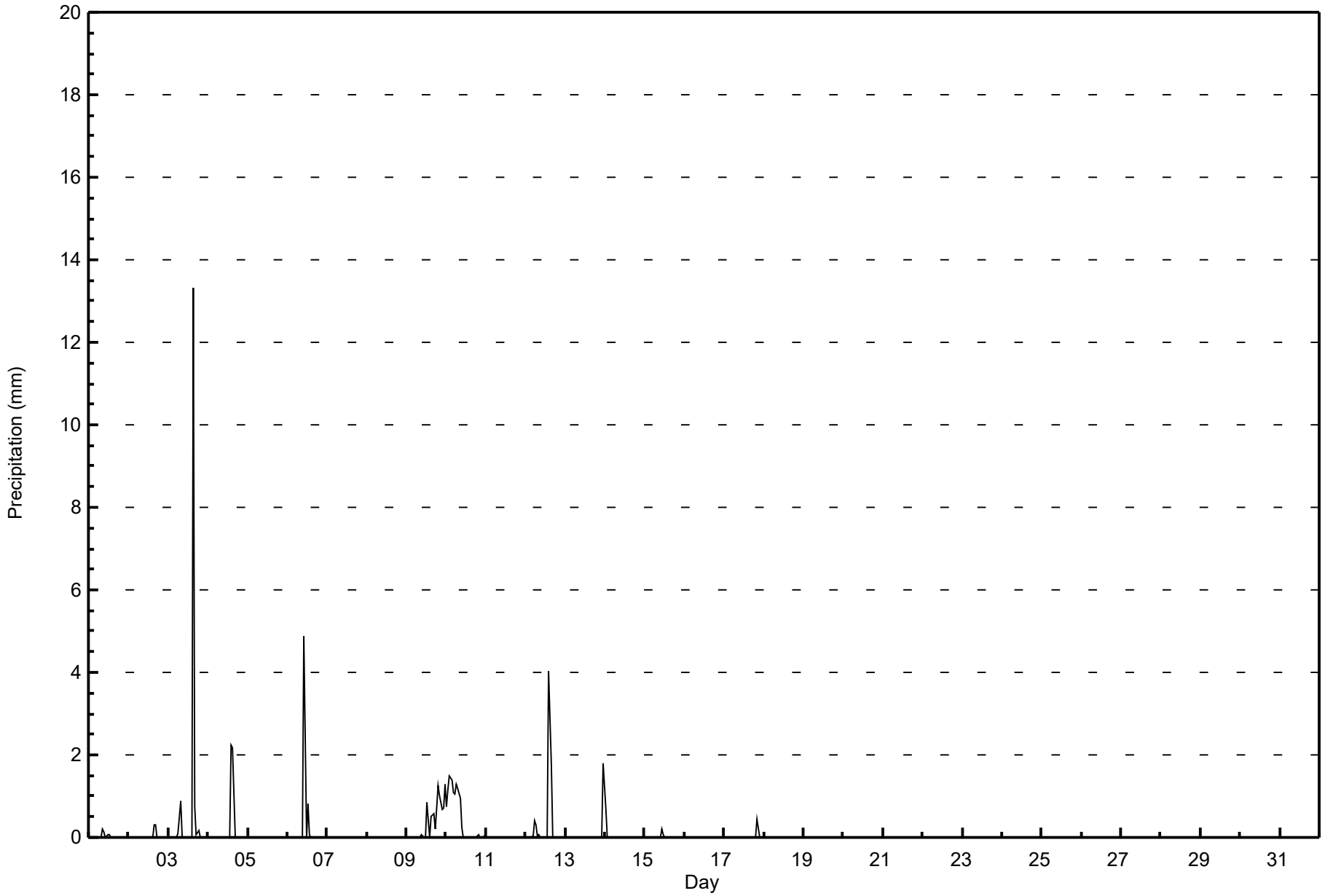
Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort McKay - Bertha Ganter - August 2023





Maximum Value: 13.3 mm on Aug 3 16:00		Maximum Daily Total: 15.3 mm on Aug 3		Hours in Service: 744																							
Minimum Value: 0.0 mm on Aug 1 01:00		Minimum Daily Total: 0.0 mm on Aug 5		Hours of Data: 744																							
Maximum Diurnal Total: 18.1 mm at hour 16		Minimum Diurnal Total: 0.2 mm at hour 12		Hours of Missing Data: 0																							
Monthly Total: 55.34 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 = 1.5		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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	
2-Aug	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	
3-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	15.3	13.3	
4-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	2.2	
5-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	4.9	
7-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.4	0.0	0.5	0.6	0.2	0.7	1.3	1.0	0.7	0.7	1.3	8.3	1.3	
10-Aug	0.7	1.2	1.5	1.4	1.1	1.1	1.3	1.2	1.0	0.2	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	10.7	1.5		
11-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.1	0.1	0.0	0.0	0.0	0.0	4.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	4.0		
13-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.8	1.8		
14-Aug	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	
15-Aug	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	0.3	0.3	0.2	
16-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.4	0.4	
18-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		1.4	1.2	1.5	1.4	1.1	1.5	1.7	2.1	1.2	0.4	5.1	0.2	1.7	0.5	6.3	18.1	1.6	0.3	0.9	1.3	1.4	0.7	0.7	3.1	Diurnal Average	
		0.7	1.2	1.5	1.4	1.1	1.1	1.3	1.2	1.0	0.2	4.9	0.1	0.8	0.4	4.0	13.3	0.7	0.2	0.7	1.3	1.0	0.7	0.7	1.8	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

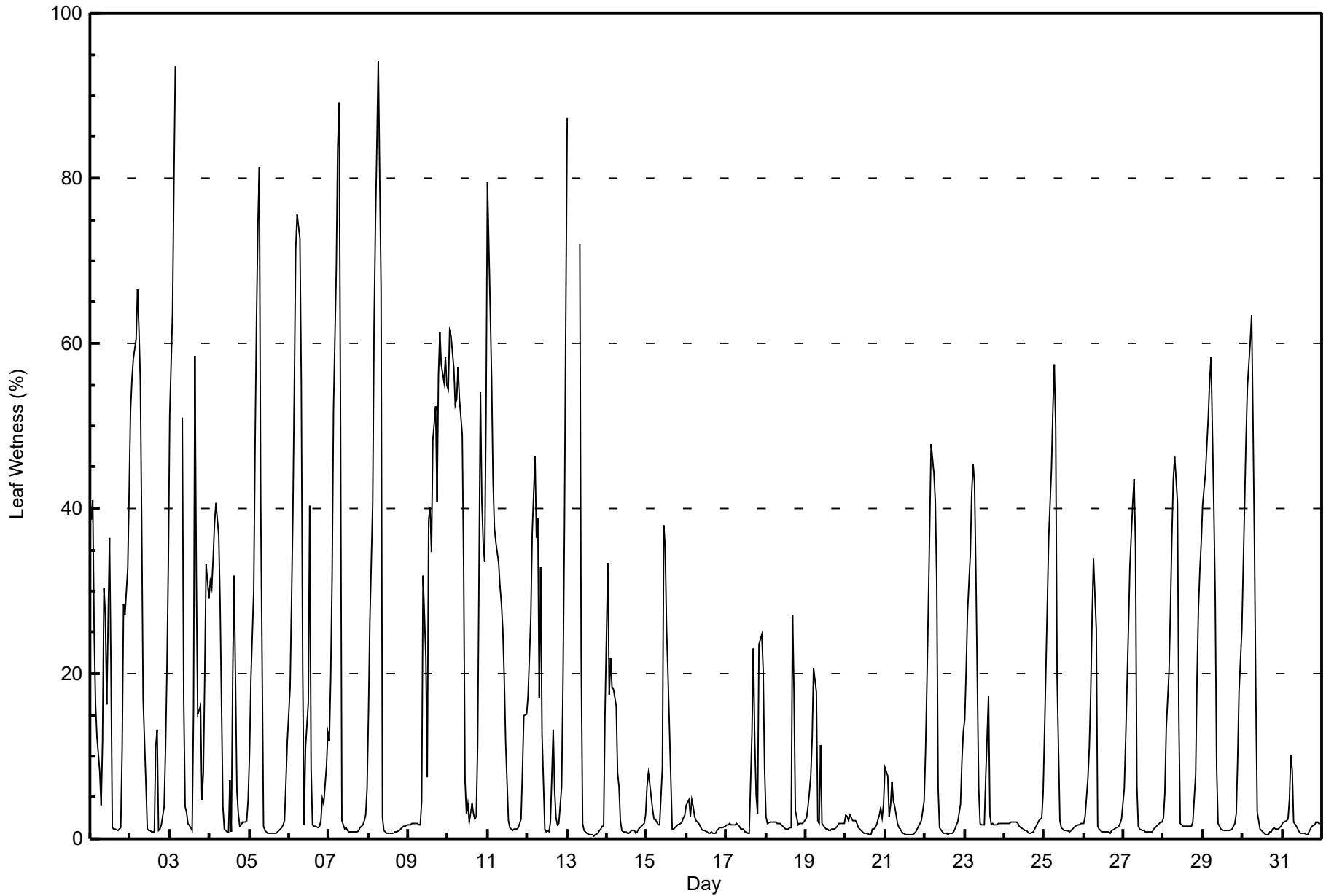
Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	712	95.70	95.70
0.4 - 0.5	4	0.54	96.24
0.6 - 0.7	7	0.94	97.18
0.8 - 1.4	13	1.75	98.92
1.5 - 10	7	0.94	99.87
> 10	1	0.13	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 94.2 % on Aug 8 07:00																				Maximum Daily Average: 32.8 % on Aug 10					Hours in Service: 744																							
Minimum Value: 0.4 % on Aug 13 17:00																				Minimum Daily Average: 1.7 % on Aug 24					Hours of Data: 735																							
Maximum Diurnal Average: 33.9 % at hour 6																				Minimum Diurnal Average: 3.2 % at hour 14					Hours of Missing Data: 9																							
Monthly Average: 13.60 %																				Percentiles: P ₁ = 0.5 P ₁₀ = 0.8 Q ₁ = 1.2 Median = 2.1 Q ₃ = 19.7 P ₉₀ = 44.7 P ₉₉ = 79.5					Hours of Calibration: 0																							
																									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-Aug	38.6	41.0	25.2	16.3	12.3	8.1	4.1	11.7	30.3	27.1	16.3	36.5	21.1	1.3	1.1	1.2	1.1	1.3	10.8	28.5	27.1	32.8	42.0	18.2	42.0																							
2-Aug	51.8	55.7	58.2	60.5	66.7	61.8	55.4	37.5	16.9	6.6	1.1	1.0	1.0	0.9	0.9	11.2	13.2	1.1	1.2	1.6	3.9	10.9	20.3	33.2	23.8	66.7																						
3-Aug	51.4	63.8	79.4	93.5	OR	OR	OR	51.0	16.8	3.9	3.2	1.8	1.3	1.0	15.6	58.4	32.0	15.1	16.0	4.7	8.0	19.4	33.3	29.2	28.5	93.5																						
4-Aug	31.2	30.3	33.8	38.2	40.6	36.8	28.4	16.3	3.9	1.2	0.9	0.8	7.2	0.8	19.8	31.9	5.7	3.0	1.5	1.7	2.0	2.0	2.2	4.7	14.4	40.6																						
5-Aug	10.1	19.4	30.0	47.9	62.9	74.2	81.3	41.1	1.5	1.1	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.8	1.1	1.3	1.7	2.2	6.7	11.9	16.7	81.3																						
6-Aug	18.2	28.4	39.5	54.6	71.3	75.5	72.7	55.2	20.7	1.7	11.1	16.4	40.3	8.6	1.7	1.6	1.5	1.4	1.6	2.3	5.0	4.3	8.8	12.9	23.1	75.5																						
7-Aug	11.9	19.5	31.7	52.0	69.0	83.5	89.1	52.2	2.3	1.2	1.3	0.9	0.8	0.9	0.8	0.8	0.8	0.8	1.1	1.3	1.6	2.2	2.8	6.1	18.1	89.1																						
8-Aug	15.2	26.5	40.6	62.3	74.7	84.1	94.2	66.6	2.6	1.1	0.9	0.8	0.6	0.7	0.7	0.8	0.8	0.9	1.1	1.3	1.4	1.5	1.6	1.7	20.1	94.2																						
9-Aug	1.7	1.7	1.8	1.8	1.9	1.8	1.7	1.7	4.5	31.9	22.1	7.5	38.6	40.1	34.7	48.3	52.4	40.9	56.1	61.3	57.4	55.2	58.3	55.0	28.3	61.3																						
10-Aug	54.3	61.5	60.8	56.9	52.5	53.3	57.1	53.3	49.0	32.9	6.9	3.1	4.2	2.0	4.2	3.1	2.4	2.6	11.2	54.1	40.9	35.7	33.5	51.7	32.8	61.5																						
11-Aug	79.6	64.1	55.6	43.4	37.6	36.0	33.4	30.5	28.5	25.2	19.5	11.6	2.2	1.4	1.2	1.1	1.2	1.3	1.4	1.8	2.4	8.1	14.9	15.1	21.5	79.6																						
12-Aug	17.2	22.1	27.0	37.1	46.2	36.5	38.8	17.1	32.8	12.7	1.2	0.9	1.0	0.9	2.0	13.3	5.7	2.5	1.6	1.9	6.2	19.3	37.4	63.6	18.5	63.6																						
13-Aug	87.3	OR	OR	OR	OR	OR	OR	72.1	21.7	1.9	1.0	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.8	1.0	1.3	1.4	1.5	15.3	11.6	87.3																						
14-Aug	33.4	17.4	21.9	18.4	18.2	16.1	7.9	6.2	2.2	1.1	0.9	0.9	0.7	0.6	0.8	1.0	1.0	0.7	0.9	1.1	1.4	1.5	1.8	2.9	6.6	33.4																						
15-Aug	6.2	7.9	6.6	3.6	2.4	2.3	2.0	1.7	1.7	8.7	38.0	35.3	25.4	19.9	7.5	1.1	1.2	1.3	1.6	1.8	1.9	2.0	2.5	2.9	7.7	38.0																						
16-Aug	4.0	4.7	2.7	4.8	3.9	2.6	2.2	1.9	1.5	1.2	1.0	1.0	0.9	0.7	0.7	0.8	0.7	0.7	1.0	1.2	1.4	1.4	1.4	1.6	1.8	4.8																						
17-Aug	1.7	1.7	1.9	1.7	1.7	1.8	1.8	1.7	1.5	1.2	1.2	0.8	0.9	0.7	0.6	12.8	23.0	11.7	5.3	3.0	23.6	24.8	20.5	8.4	6.4	24.8																						
18-Aug	2.7	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.5	1.3	1.2	1.2	1.3	1.4	27.1	18.2	3.4	1.7	1.8	1.8	1.8	2.0	3.6	27.1																						
19-Aug	2.5	3.8	5.6	7.7	12.3	20.7	17.7	2.3	1.9	11.4	1.8	1.4	1.1	1.1	1.0	1.0	1.2	1.2	1.4	1.6	1.9	1.9	1.8	1.9	4.4	20.7																						
20-Aug	2.8	2.8	2.3	2.8	2.2	2.2	2.1	1.9	1.4	1.1	0.8	0.7	0.7	0.7	0.6	0.6	1.1	1.2	1.4	1.8	2.9	3.8	2.6	4.3	1.9	4.3																						
21-Aug	8.7	7.7	2.8	4.1	7.0	4.5	4.0	1.9	1.4	1.1	0.8	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.9	1.2	1.6	1.9	2.3	4.5	2.5	8.7																						
22-Aug	10.6	19.0	28.1	38.0	47.8	44.2	40.8	31.1	6.1	1.3	0.9	0.8	0.7	0.6	0.5	0.6	0.7	0.8	1.2	1.7	2.1	4.2	9.5	13.0	12.7	47.8																						
23-Aug	14.4	20.4	27.4	34.4	41.9	45.5	43.0	32.0	6.1	1.8	1.7	1.7	1.7	7.4	17.3	2.9	1.7	1.8	1.7	1.8	1.8	1.8	1.8	1.8	13.1	45.5																						
24-Aug	1.8	1.9	1.9	1.9	2.0	2.0	2.1	2.1	1.9	1.6	1.4	1.2	1.0	0.9	0.8	0.8	0.7	0.8	1.2	1.5	1.8	2.2	2.5	5.4	1.7	5.4																						
25-Aug	12.8	20.5	28.4	36.4	45.0	52.0	57.4	49.9	19.4	2.2	1.4	1.2	1.1	1.0	0.9	0.9	1.0	1.1	1.3	1.6	1.7	1.7	1.9	1.9	14.3	57.4																						
26-Aug	1.9	2.7	7.3	11.0	17.5	26.9	33.8	25.5	1.5	1.2	1.0	0.9	0.9	0.9	0.8	0.9	0.7	1.0	1.2	1.3	1.4	1.6	1.8	2.4	6.1	33.8																						
27-Aug	6.1	12.0	18.9	25.6	33.1	40.4	43.5	35.7	6.4	1.4	1.2	1.0	1.0	0.9	0.8	0.8	0.8	0.9	1.2	1.3	1.5	1.7	2.1	2.0	10.0	43.5																						
28-Aug	2.5	5.6	13.4	20.3	27.9	36.4	43.4	46.2	40.8	14.5	1.9	1.7	1.5	1.4	1.4	1.5	1.5	1.6	2.0	7.8	19.7	28.0	32.6	35.9	16.2	46.2																						
29-Aug	40.5	44.2	47.6	51.1	55.4	58.4	39.9	29.0	8.6	1.8	1.5	1.2	1.0	1.0	1.0	0.9	1.0	1.2	1.5	1.8	3.1	9.5	17.8	25.3	18.5	58.4																						
30-Aug	32.9	40.7	48.5	54.7	60.2	63.4	50.4	36.0	17.5	3.2	1.2	0.9	0.8	0.7	0.6	0.6	0.9	0.9	1.2	1.3	1.2	1.2	1.4	1.6	17.6	63.4																						
31-Aug	1.8	2.0	2.2	2.3	4.8	10.2	8.3	2.0	1.5	1.2	0.9	0.7	0.6	0.6	0.5	0.5	0.8	1.3	1.5	1.6	2.0	2.1	1.9	1.9	2.2	10.2																						
																								21.2	21.7	25.1	29.5	31.8	33.9	33.1	26.3	11.4	6.7	4.7	4.4	5.2	3.2	3.9	6.5	5.9	3.8	4.1	5.8	7.5	9.1	11.7	14.9	Diurnal Average
																								87.3	64.1	79.4	93.5	74.7	84.1	94.2	72.1	49.0	32.9	38.0	36.5	40.3	40.1	34.7	58.4	52.4	40.9	56.1	61.3	57.4	55.2	58.3	63.6	Diurnal Maximum
OR - Out of Range																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

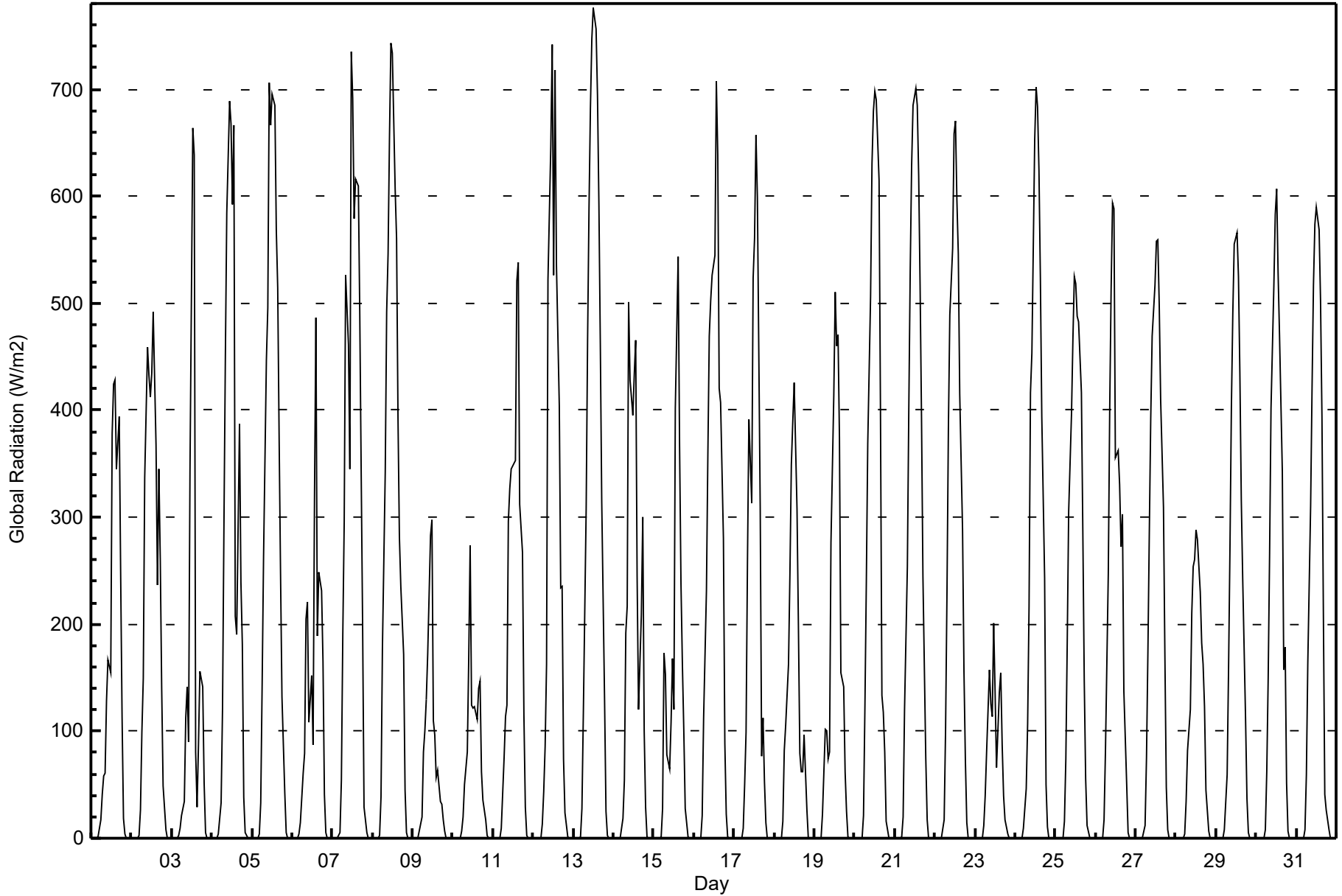
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	0	0.00	0.00
0.4 - 0.5	12	1.63	1.63
0.6 - 0.7	39	5.31	6.94
0.8 - 1.4	178	24.22	31.16
1.5 - 10	248	33.74	64.90
> 10	247	33.61	98.50

Total Number of Valid Hours: 735

Total Number of Hours: 744



Maximum Value: 776.3 W/m2 on Aug 13 13:00 Maximum Daily Average: 278.7 W/m2 on Aug 13																							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 W/m2 on Aug 1 01:00 Minimum Daily Average: 57.1 W/m2 on Aug 23 Maximum Diurnal Average: 499.5 W/m2 at hour 14 Minimum Diurnal Average: 0.0 W/m2 at hour 3 Monthly Average: 171.17 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 59.4 Q ₃ = 308.8 P ₉₀ = 526.5 P ₉₉ = 713.4																										
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-Aug	0.0	0.0	0.0	0.0	1.4	16.9	40.7	58.4	60.9	127.6	166.1	155.1	377.5	424.0	428.5	344.8	394.4	247.1	113.7	18.5	3.4	0.0	0.0	0.0	124.1	428.5
2-Aug	0.0	0.0	0.0	0.0	3.0	26.0	99.0	149.6	337.1	459.2	431.7	411.9	434.7	491.6	367.7	237.1	345.5	260.7	139.5	49.5	7.7	0.0	0.0	0.0	177.1	491.6
3-Aug	0.0	0.0	0.0	0.0	2.4	9.4	21.3	34.1	112.3	141.6	89.7	343.1	663.4	638.0	80.6	29.4	87.9	156.3	141.7	52.2	4.8	0.0	0.0	0.0	108.7	663.4
4-Aug	0.0	0.0	0.0	0.0	3.8	33.1	121.2	292.0	449.5	584.2	688.5	667.1	592.6	666.9	207.2	190.1	387.6	238.8	180.9	38.0	5.8	0.0	0.0	0.0	222.8	688.5
5-Aug	0.0	0.0	0.0	0.0	3.9	32.6	143.6	263.1	447.3	495.5	706.5	665.7	695.2	684.4	569.0	514.5	374.3	247.3	132.7	41.8	5.3	0.0	0.0	0.0	250.9	706.5
6-Aug	0.0	0.0	0.0	0.0	3.8	15.2	60.9	79.5	204.6	220.7	108.2	152.2	86.8	318.9	486.7	189.1	248.4	231.1	165.6	41.6	5.6	0.0	0.0	0.0	109.1	486.7
7-Aug	0.0	0.0	0.0	0.0	4.8	54.2	189.9	296.2	526.1	461.7	345.7	734.9	690.8	579.0	615.8	609.3	489.2	341.1	199.2	29.6	5.5	0.0	0.0	0.0	257.2	734.9
8-Aug	0.0	0.0	0.0	0.0	3.3	38.6	177.1	342.8	491.2	546.6	655.5	743.4	733.5	606.3	561.2	394.6	281.4	234.9	171.5	44.5	5.5	0.0	0.0	0.0	251.3	743.4
9-Aug	0.0	0.0	0.0	0.0	6.0	20.2	81.3	101.0	129.6	171.6	283.0	297.3	109.9	96.4	56.6	63.1	34.8	32.2	17.7	6.5	0.3	0.0	0.0	0.0	62.8	297.3
10-Aug	0.0	0.0	0.0	0.0	0.2	7.2	20.0	50.5	80.6	168.2	274.3	123.7	122.3	123.6	110.5	140.2	147.2	62.4	35.9	16.6	2.0	0.0	0.0	0.0	61.9	274.3
11-Aug	0.0	0.0	0.0	0.0	0.6	9.1	75.7	113.7	123.9	296.2	326.8	345.4	350.9	352.4	520.8	538.1	311.7	267.3	115.0	29.6	2.6	0.0	0.0	0.0	157.5	538.1
12-Aug	0.0	0.0	0.0	0.0	0.2	13.2	43.1	85.8	162.3	522.0	646.0	741.9	525.7	717.7	535.4	404.3	234.4	234.9	74.7	24.3	1.6	0.0	0.0	0.0	207.0	741.9
13-Aug	0.0	0.0	0.0	0.0	0.7	27.4	116.8	308.6	464.7	587.8	682.6	746.8	776.3	756.2	694.4	592.5	461.7	315.1	129.3	25.4	2.0	0.0	0.0	0.0	278.7	776.3
14-Aug	0.0	0.0	0.0	0.0	0.3	18.4	54.0	191.1	216.9	501.5	428.4	395.9	433.0	465.4	244.8	120.4	209.4	299.6	100.5	29.7	1.1	0.0	0.0	0.0	154.6	501.5
15-Aug	0.0	0.0	0.0	0.0	1.5	27.9	173.5	153.0	77.4	64.8	107.8	167.4	120.7	402.1	543.5	367.7	237.9	163.0	100.6	27.5	1.5	0.0	0.0	0.0	114.1	543.5
16-Aug	0.0	0.0	0.0	0.0	0.0	21.2	112.3	231.6	357.7	469.5	502.0	526.7	544.2	707.7	638.4	420.4	407.8	280.1	88.1	22.5	0.8	0.0	0.0	0.0	222.1	707.7
17-Aug	0.0	0.0	0.0	0.0	0.3	9.2	50.9	98.6	259.0	390.9	313.5	523.3	560.9	656.9	598.3	309.4	77.0	111.8	52.7	14.6	0.3	0.0	0.0	0.0	167.8	656.9
18-Aug	0.0	0.0	0.0	0.0	0.2	15.6	82.6	105.4	162.1	247.1	349.3	389.0	425.7	307.5	198.9	79.6	61.9	62.8	96.3	26.3	0.2	0.0	0.0	0.0	108.8	425.7
19-Aug	0.0	0.0	0.0	0.0	0.0	22.0	102.4	99.8	73.4	80.3	275.9	413.6	510.0	460.1	470.9	374.5	154.1	141.3	62.3	24.6	0.8	0.0	0.0	0.0	136.1	510.0
20-Aug	0.0	0.0	0.0	0.0	0.6	20.6	122.3	238.9	368.8	506.2	630.2	679.2	697.9	690.2	614.7	397.0	132.9	118.1	80.7	15.3	0.0	0.0	0.0	0.0	221.4	697.9
21-Aug	0.0	0.0	0.0	0.0	0.8	20.5	120.9	253.6	398.9	528.8	627.6	685.2	700.7	684.7	618.9	515.0	393.0	245.2	75.8	17.0	0.0	0.0	0.0	0.0	245.3	700.7
22-Aug	0.0	0.0	0.0	0.0	0.0	17.6	101.5	229.9	383.7	489.5	551.1	657.9	670.7	596.6	546.1	414.8	288.1	156.4	72.9	15.0	0.0	0.0	0.0	0.0	216.3	670.7
23-Aug	0.0	0.0	0.0	0.0	0.0	12.3	39.8	81.0	157.1	126.1	113.6	201.3	136.0	66.0	135.8	154.7	87.1	39.6	17.2	3.8	0.0	0.0	0.0	0.0	57.1	201.3
24-Aug	0.0	0.0	0.0	0.0	0.0	9.7	45.6	106.5	217.2	415.8	453.4	653.4	701.5	683.2	624.3	523.0	394.1	243.7	50.4	11.0	0.0	0.0	0.0	0.0	213.9	701.5
25-Aug	0.0	0.0	0.0	0.0	0.0	16.4	74.2	185.5	304.9	396.6	466.2	525.1	518.1	487.4	482.1	416.7	287.0	148.3	56.1	11.6	0.1	0.0	0.0	0.0	182.4	525.1
26-Aug	0.0	0.0	0.0	0.0	0.1	16.8	81.8	247.4	401.1	512.3	593.1	588.1	355.1	362.0	330.8	272.2	303.0	137.2	50.0	5.7	0.0	0.0	0.0	0.0	177.4	593.1
27-Aug	0.0	0.0	0.0	0.0	0.0	12.5	75.1	175.1	287.3	392.9	470.0	517.6	557.9	559.3	498.2	409.6	309.3	171.1	47.0	7.8	0.0	0.0	0.0	0.0	187.1	559.3
28-Aug	0.0	0.1	0.0	0.0	0.0	4.4	34.3	81.9	120.5	210.3	253.8	260.3	288.2	279.4	230.0	182.6	162.3	123.2	45.1	6.9	0.0	0.0	0.0	0.0	95.1	288.2
29-Aug	0.0	0.0	0.0	0.0	0.0	7.4	59.9	158.4	271.8	402.9	489.9	554.7	565.2	525.3	433.7	315.5	241.6	111.9	36.4	5.6	0.0	0.0	0.0	0.0	174.2	565.2
30-Aug	0.0	0.0	0.0	0.0	0.0	7.4	61.9	149.9	265.2	402.0	515.3	582.8	606.5	528.5	470.4	342.1	158.0	177.9	52.0	6.1	0.0	0.0	0.0	0.0	180.2	606.5
31-Aug	0.0	0.0	0.0	0.0	0.0	8.3	58.9	164.0	311.2	420.6	517.5	574.0	590.0	568.1	502.4	394.0	211.3	40.5	27.1	7.4	0.0	0.0	0.0	0.0	183.1	590.0
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	319	42.88	42.88
21 - 100	96	12.90	55.78
101 - 300	139	18.68	74.46
301 - 600	145	19.49	93.95
601 - 900	45	6.05	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 18 km/h on Aug 24 12:00	Maximum Daily Speed Average: 11.8 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 29 22:00	Minimum Daily Speed Average: 0.5 km/h on Aug 15	Hours of Data: 739
Maximum Diurnal Speed Average: 2.8 km/h at hour 14	Minimum Diurnal Speed Average: 0.3 km/h at hour 18	Hours of Missing Data: 5
Monthly Average Velocity: 1.0 km/h 223.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 5 Q ₃ = 8 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-Aug	WNW5	WNW6	W7	WNW6	W7	WNW7	W5	W5	SW5	WSW6	WSW5	W5	W6WNW11	NW12	NNW16	NW11	NW11	WNW8	NNW10	NW3	WNW4	WNW4	WNW4	WNW6.3	NNW16		
2-Aug	WNW3	WNW3	WNW4	NW3	WNW2	WNW3	NW4	WNW5	N4	SE5	W3	WNW2	NW4	S5	SW3	SSW6	SSE4	SE2	NE1	N2	NNW3	NNW3	WNW2	WNW3	WNW1.6	SSW6	
3-Aug	NW3	WNW3	WNW3	WNW3	N3	NW1	ENE1	W1	NNW2	SW0	SSE4	SSE7	SSE9	SSE10	NW8	SSE3	WNW1	S6	S6	S3	S2	SSE1	S1	SSW2	S1.3	SSE10	
4-Aug	NW6	WNW7	WNW5	NW4	WNW6	WNW5	WNW6	W7	WSW6	WSW5	SSW6	S4	S4	SSW8	E1	S9	SSE6	S4	WSW4	WNW5	WNW5	WNW4	SW2	NW3	WSW3.1	S9	
5-Aug	NW4	NW2	SW2	SSW2	S4	S4	S2	WSW2	S2	SE4	N5	NNE3	SE6	SE8	E4	NE6	ENE5	NNE5	NE5	N5	NNW4	NW3	W4	WNW2	NE0.7	SE8	
6-Aug	WNW3	W3	WNW3	WSW3	SSW3	SSW2	SSE1	N5	S6	NNE3	N7	N7	NW3	N4	N4	NNW5	NNW3	NNW4	NW4	NNW4	NNW8	NNW8	NNW8	N5	NNW3.0	NNW8	
7-Aug	NW6	NW4	W4	WNW5	WNW4	WNW2	N0	N2	NNE5	N6	NNW5	N7	NNE8	N8	N9	NNE10	NNE11	NNE10	NNE10	N8	NNW7	NNW6	NW4	NW3	N5.1	NNE11	
8-Aug	W4	NW4	WNW4	NW3	WNW3	WNW3	NNW2	SE3	SE7	SSE5	NE2	NE5	E6	ESE7	ESE9	ESE9	ESE8	ESE10	ESE13	SE10	ESE8	SE8	SE6	SSE6	ESE3.8	ESE13	
9-Aug	SSE7	SSE8	SSE7	SSE7	SE6	SSE8	SE9	SSE10	SE9	SE9	SSE12	SSE14	SSE14	SE12	SE12	SE9	ESE8	SE8	SE6	SE7	SE7	SE7	SE8	SE8	SE8.6	SSE14	
10-Aug	SE9	SE9	SE7	ESE5	SE5	SE6	ESE4	ESE4	ESE4	E4	E5	ENE6	E7	E7	ESE6	E6	E6	ENE6	NE5	NNE6	NNW7	N5	N4	N4	E4.1	SE9	
11-Aug	NW4	NW5	N4	N6	N5	NNW6	NNW6	N7	N7	NNW5	N2	NNE3	SSW4	WSW6	SSW5	SSW5	S8	SSW6	SSW5	S4	SSE1	S2	S3	SE2	WNW1.1	S8	
12-Aug	S3	N1	SW2	S3	WSW3	WNW5	WNW5	WNW4	WNW5	WNW5	W3	SW4	SSW4	S10	S2	NE5	ESE1	SSW1	ESE0	WSW2	W1	SSW4	S2	S4	SW1.8	S10	
13-Aug	S5	S4	S5	S4	S4	S7	SSE8	SSE9	S10	S12	S13	SSW12	SW10	SW10	SW10	WSW11	WSW10	SW8	WSW6	SSW5	SSW5	W4	W3WNW11	SSW6.4	S13		
14-Aug	WSW2	SSW4	S2	W1	NNW5	NNW8	SW2	WSW3	WSW4	WNW8	WNW11	WNW9	W10	W10	W8	W7	W7	WNW7	WNW7	WNW6	NNW7	WSW3	SSW3	WNW5.0	WNW11		
15-Aug	SSW2	SSE4	S4	S3	S5	S4	S5	SSE8	SSE6	SE4	S4	SSE7	SSE3	SSE7	SE8	SE7	ESE4	N3	N14	N17	NNW16	NNW10	NW7	NW6	ESE0.5	N17	
16-Aug	W3	W4	NW2	NNW4	S1	WNW3	WNW5	WNW7	NW8	NW6	WNW5	WNW4	WNW7	W7	WSW7	S8	SSW10	SSW8	SSW8	SSW6	SSW6	SSW7	SSW7	SSE5	WSW3.7	SSW10	
17-Aug	SSE7	S7	SSE9	S6	S7	S6	S5	S3	S8	S7	S5	W5	WNW6	W3	SSE5	E4	SSW5	SSE4	SE1	WNW4	NNW12	WNW4	NNW5	NNW5	SSW2.6	NNW12	
18-Aug	N11	N11	N9	N11	N13	N11	N12	NNW11	N11	N12	N12	NNW10	N12	N9	NNW9	NNW10	NNW15	NNW11	NNW9	NNW11	NNW8	NNW9	NW8	WNW6	NNW10.2	NNW15	
19-Aug	NW6	WNW4	WNW6	WNW6	W5	W3	WSW4	WSW5	SW3	SSW5	SSW6	SW7	SW7	SW6	SW7	WSW8	WSW6	SW6	SW5	SSW5	SSW4	SSW5	SSW6	S5	WSW4.5	WSW8	
20-Aug	S4	S5	NNW3	SSW6	SSW6	S5	S4	SW5	SW5	S2	ESE3	NE4	ENE5	ENE6	ENE3	WNW3	NW6	E1	ESE1	SW2	W2	W1	W2	S2	SSW1.2	SSW6	
21-Aug	WNW3	S5	S4	W2	SSW5	S5	S4	S8	S8	SSE10	SE10	SE10	SSE9	S8	SSE10	SSE10	SSE10	S8	S6	S5	WSW2	SW1	UO	UO	S5.9	SSE10	
22-Aug	WNW3	WSW1	WSW3	WSW2	WSW3	WSW4	SSW2	SSE5	SSE8	SSE7	SE6	SSE9	SSE12	SSE9	SSE6	SE6	SE5	WSW0	WNW3	SW3	WSW2	WSW3	NW2	WNW4	S2.8	SSE12	
23-Aug	WNW4	WNW3	WNW4	WNW4	W3	NW3	WNW3	WSW1	WNW2	SW2	WSW2	SSW2	NW4	W2	SSW1	NNW2	NW4	NNW6	N13	N16	N15	NNW13	N14	N15	NNW4.7	N16	
24-Aug	N17	N14	N15	NNE15	NNE16	NNE14	N16	N15	N16	N17	N16	N18	N16	N16	NNW14	NNW12	N11	NNW11	NNW8	NNW7	NNW4	W4	WNW6	W1	N11.8	N18	
25-Aug	WSW1	SSW2	S3	SSW3	SW4	S5	SSW5	S6	S9	SSE9	SSE12	S12	C	SSW10	SSW10	SSW10	S11	S9	S7	S7	S9	S10	S8	SSW8	S7.1	SSE12	
26-Aug	S8	SSE6	S6	S6	SSW5	SSW5	SW2	S6	S7	S11	S11	SSW12	SSW9	SW7	WSW6	WSW4	WNW7	N15	N16	N16	N14	N10	NW8	WNW3	WSW1.8	N16	
27-Aug	WNW3	SSW1	SW3	WSW2	W1	WNW3	SW2	WNW2	SSE2	SE6	SE7	SSE10	S10	SSW9	S9	SSW8	SSW8	SSW7	SSW7	SSW7	S7	SSW5	S5	S2	SSW5	S4.4	SSE10
28-Aug	S4	SSE5	S5	S5	S3	S4	S5	SSE4	S6	S7	SSE8	SSE7	SSE6	SSE5	SSE5	SSE3	S4	S7	S3	UO	S4	S5	S7	S6	S5.1	SSE8	
29-Aug	S8	S7	S7	S7	S7	S7	S8	SSE10	S11	SSE12	S11	SSE10	SSE10	SSE11	SSE11	S10	S8	S7	S6	S4	S3	ENE0	SW1	SSW0	S7.2	SSE12	
30-Aug	SSW2	SSW3	SSW2	SSW3	SSW2	SSW2	UO	WNW2	NW1	NW2	SE5	SE7	SSE10	S11	SSE8	S10	S7	SSE8	S6	S8	S9	S6	S5	S5	S4.8	S11	
31-Aug	N4	SSW2	SSW4	WSW4	WNW2	WSW1	SSW5	S5	NNW4	NE2	SE4	SSE5	SSE5	E2	E4	E5	N12	N14	N8	WNW3	NW6	NW6	NW8	WSW2	NNW1.4	N14	

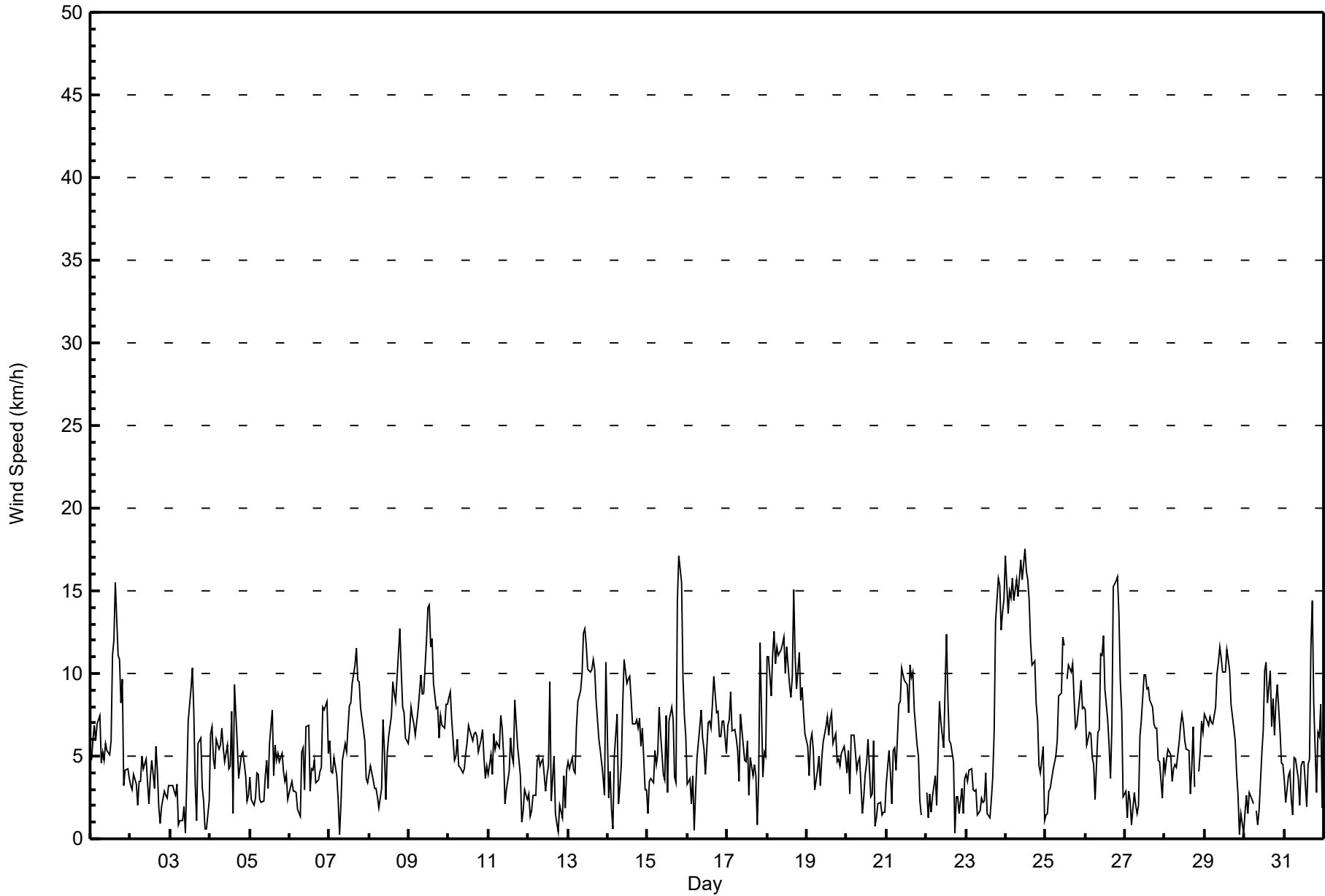
W1.5WSW1.3WSW1.4WSW1.3WSW1.2WSW1.4	SW1.2SSW1.5	S1.7	SSE1.8	SSE1.9	S2.2	S2.3	S2.8	S1.7	S1.5	SSW0.9	WSW0.3	NNW0.9	NW1.6	NW2.1	WNW1.7	WNW1.5	W1.2	Diurnal Average							
N17	N14	N15	NNE15	NNE16	NNE14	N16	N15	N16	N17	N16	N18	N16	N16	NNW14	NNW16	NNW15	N15	N16	N17	NNW16	NNW13	N14	N15	Diurnal Maximum	

C - Calibration 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 McKay - Bertha Ganter - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	385	52.10	52.10
6 - 11	300	40.60	92.69
12 - 19	54	7.31	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: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Fort McKay - Bertha Ganter - August 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	20	5	8	5	9	9	11	24	63	43	21	32	26	62	27	20	385
6 - 11	20	6	1	3	5	8	29	46	63	25	10	10	11	23	15	25	300
12 - 19	28	3	0	0	0	1	2	6	3	2	0	0	0	0	1	8	54
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	68	14	9	8	14	18	42	76	129	70	31	42	37	85	43	53	739

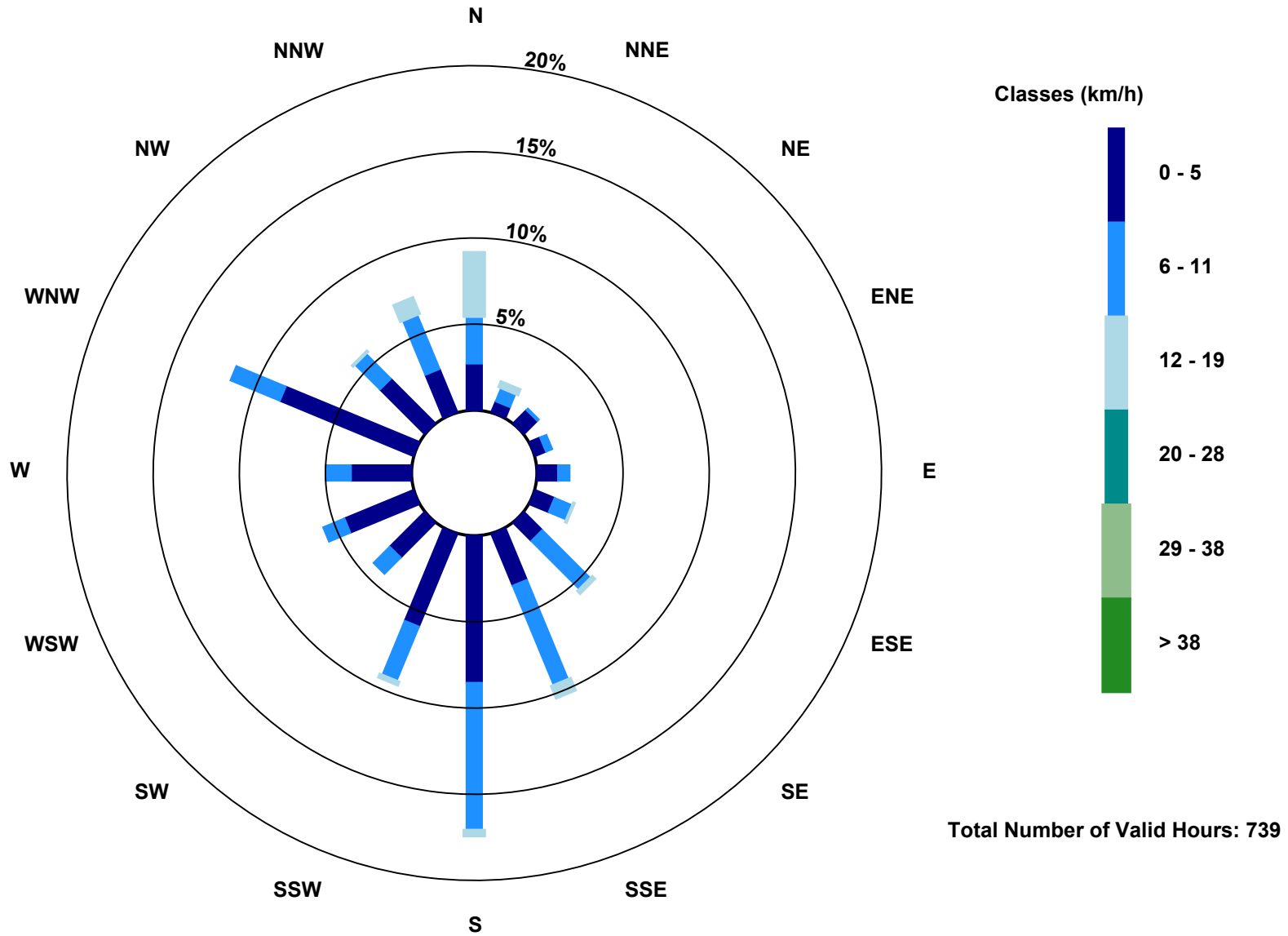
Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

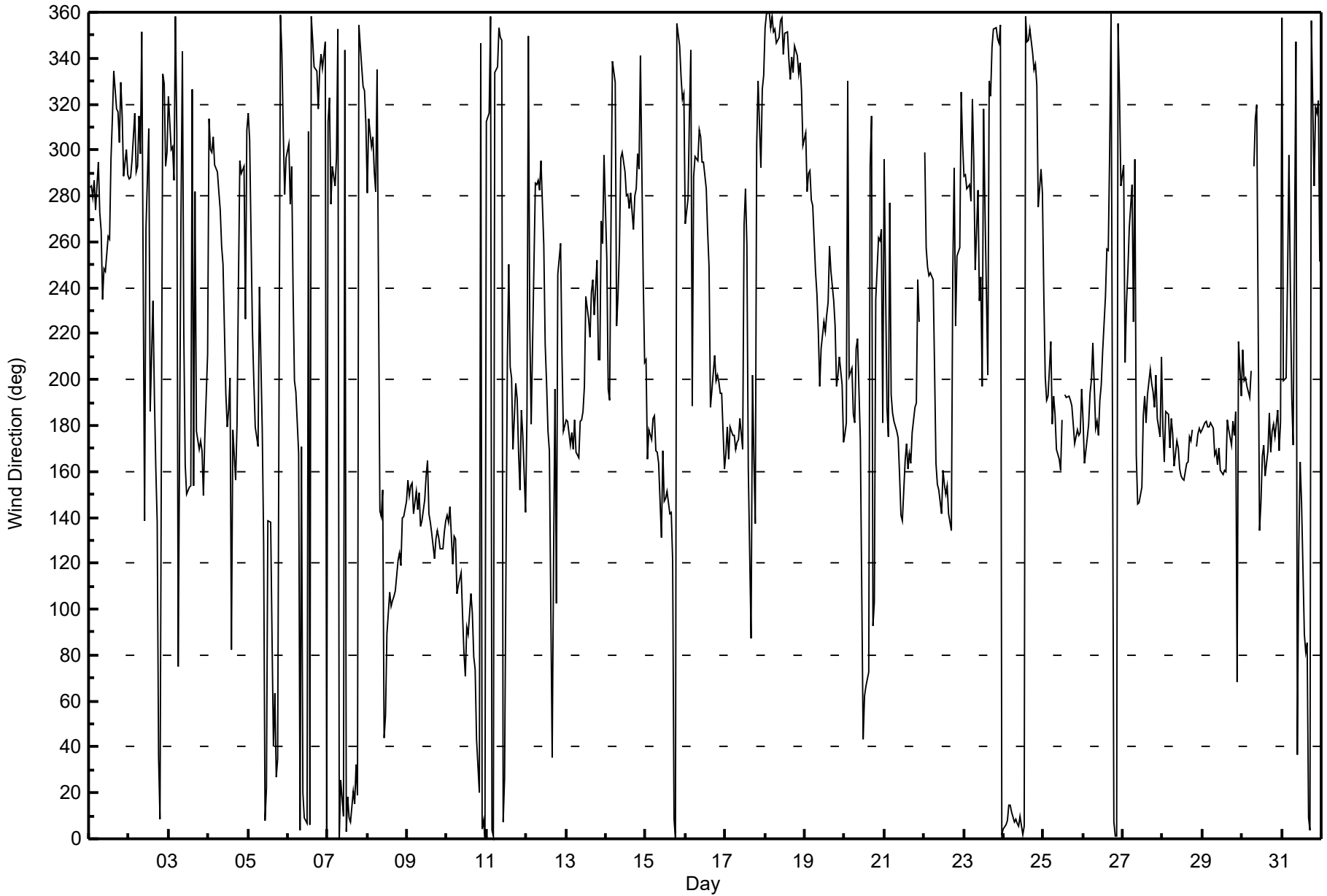
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Aug 3 15:00 Minimum Value: 0 km/h on Aug 2 20:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 4 P ₉₉ = 5														Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 1 Percent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



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 2 deg on Aug 24 12:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 359.7 deg on Aug 24																						Hours of Data: 739			
Direction of Minimum Speed: 68 deg on Aug 29 22:00											Direction of Minimum Daily Speed Average: 0.5 deg on Aug 15											Hours of Missing Data: 5			
Monthly Average Direction: 223.6 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-Aug	284	284	280	287	274	295	273	265	235	248	247	263	261	296	314	334	318	317	303	330	315	289	300	289	294.9
2-Aug	288	288	295	316	291	293	315	298	351	138	266	288	310	186	234	193	162	138	35	9	333	329	293	299	283.3
3-Aug	323	300	301	287	358	307	75	272	343	220	163	150	153	154	326	154	282	178	169	173	169	150	175	211	181.1
4-Aug	314	300	299	306	293	290	282	274	258	250	194	179	186	200	82	178	156	181	241	295	290	293	226	309	254.2
5-Aug	316	304	221	199	179	175	171	240	178	129	8	22	139	138	87	40	64	27	35	359	342	308	281	296	53.0
6-Aug	303	276	293	239	200	194	168	3	171	20	9	7	308	6	358	348	336	335	318	335	342	335	347	2	339.0
7-Aug	312	323	276	293	284	296	353	1	26	10	344	3	18	9	7	21	15	32	19	355	336	328	326	311	355.1
8-Aug	281	314	301	305	290	282	335	143	140	152	44	54	89	107	102	104	105	108	121	125	119	140	140	147	115.9
9-Aug	156	150	154	155	142	151	143	151	136	139	148	158	165	142	138	133	122	131	134	131	126	126	133	139	142.9
10-Aug	141	138	144	120	132	130	107	110	116	98	81	71	92	89	107	98	80	74	43	20	346	5	8	0	91.3
11-Aug	312	316	358	4	1	334	336	353	349	348	7	26	209	250	205	201	170	198	192	169	152	187	176	142	298.7
12-Aug	184	350	223	181	251	286	285	287	283	295	259	216	198	178	169	35	123	196	103	246	259	210	178	180	230.8
13-Aug	183	182	172	177	170	182	168	166	182	186	197	236	226	218	238	243	228	252	209	208	269	259	298	208.7	
14-Aug	252	196	191	268	339	329	223	237	257	296	299	290	280	275	281	265	280	283	298	292	341	244	208	283.6	
15-Aug	209	165	178	174	183	184	169	168	163	131	169	147	148	151	141	142	121	8	0	355	345	332	322	324	116.1
16-Aug	268	279	316	343	189	288	297	296	309	306	295	295	283	264	249	188	195	211	199	202	199	194	194	161	243.2
17-Aug	168	179	165	179	176	176	169	173	174	183	170	267	283	259	162	87	202	165	137	302	330	292	327	332	197.0
18-Aug	353	359	360	353	358	352	352	347	349	356	358	342	351	351	339	331	340	333	345	341	333	338	326	302	346.1
19-Aug	308	282	290	291	278	276	247	237	221	197	213	225	221	228	234	258	247	234	223	197	202	210	198	173	236.5
20-Aug	176	181	330	201	205	185	181	214	218	174	109	43	62	66	73	293	315	93	103	235	262	261	266	182	193.6
21-Aug	296	188	175	277	193	186	182	178	174	158	141	139	165	172	161	168	164	177	188	190	244	225	UO	UO	172.2
22-Aug	299	258	249	245	247	243	204	163	154	152	141	161	155	150	154	141	134	246	292	223	254	257	325	303	174.3
23-Aug	288	289	283	285	277	322	295	247	282	234	244	197	318	274	202	330	323	345	353	353	349	347	354	2	333.5
24-Aug	4	6	8	14	15	12	7	9	7	6	10	2	6	358	347	348	353	342	335	337	328	275	292	281	359.7
25-Aug	237	201	191	193	217	180	193	185	170	166	160	183	C	193	192	193	191	189	181	172	178	176	177	196	183.4
26-Aug	183	164	174	181	194	200	216	179	182	176	191	197	212	236	257	256	299	359	8	1	1	355	326	284	245.5
27-Aug	293	208	233	247	266	285	225	296	167	146	146	153	184	193	181	194	204	198	195	188	202	183	175	210	190.3
28-Aug	179	164	186	185	170	183	176	162	173	170	161	158	157	156	164	164	175	173	178	UO	171	176	179	177	170.9
29-Aug	178	181	182	179	179	181	178	167	169	163	170	160	159	160	160	182	178	171	182	176	186	68	217	193	171.9
30-Aug	213	199	201	197	192	204	UO	293	314	320	134	146	166	171	158	169	186	168	178	181	175	187	169	182	174.5
31-Aug	357	200	200	245	298	240	193	171	347	37	126	164	147	89	81	85	9	4	356	285	319	316	321	252	348.5
278.2 239.4 237.8 251.7 245.5 245.3 221.2 211.6 187.7 168.6 165.8 170.0 186.1 184.9 181.4 179.0 208.7 251.1 328.2 324.5 316.4 293.8 283.5 263.0																									
Diurnal Average																									
C - Calibration 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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Aug 22 18:00 Minimum Value: 5 deg on Aug 24 20:00 Percentiles: P ₁ = 9 P ₁₀ = 14 Q ₁ = 17 Median = 27 Q ₃ = 49 P ₉₀ = 70 P ₉₉ = 93																			Hours in Service: 744 Hours of Data: 739 Hours of Missing Data: 5 Hours of Calibration: 1 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-Aug	39	37	37	38	50	35	53	51	54	57	63	56	57	31	19	18	24	16	19	26	58	25	36	28	63
2-Aug	44	57	64	34	74	46	38	43	39	59	79	88	65	74	80	28	38	38	28	18	10	20	38	17	88
3-Aug	33	35	29	40	14	88	34	70	60	96	28	20	20	19	88	84	98	30	22	64	71	80	95	54	98
4-Aug	18	23	27	23	21	34	43	41	45	53	53	89	77	58	93	20	30	44	52	40	26	46	69	58	93
5-Aug	33	81	77	60	10	14	71	80	88	61	48	72	51	21	55	31	38	30	35	17	11	19	13	27	88
6-Aug	14	27	21	28	21	56	70	56	20	82	62	19	74	39	37	26	31	26	17	12	9	7	9	28	82
7-Aug	20	15	19	14	21	46	86	28	28	26	31	46	42	34	30	27	24	39	26	15	12	9	33	16	86
8-Aug	22	23	20	30	31	35	52	61	21	49	86	55	54	42	39	29	27	28	16	14	14	16	18	17	86
9-Aug	15	13	15	14	15	15	15	15	15	15	17	18	19	14	14	21	17	17	18	14	14	15	17	15	21
10-Aug	14	15	18	22	20	16	23	20	20	29	33	35	40	28	32	29	34	34	41	27	11	22	32	24	41
11-Aug	18	13	17	16	24	15	22	14	15	27	75	61	70	50	63	64	25	45	27	20	52	47	18	22	75
12-Aug	42	31	73	36	85	40	29	39	43	52	80	77	70	28	94	37	62	96	77	46	66	24	55	17	96
13-Aug	13	14	11	12	17	16	13	19	27	22	25	35	53	49	50	50	46	56	27	18	53	68	20	68	
14-Aug	77	47	80	91	35	14	73	71	49	34	24	31	40	40	46	45	50	47	42	19	15	32	65	54	91
15-Aug	68	22	27	55	15	17	18	15	42	77	49	17	74	20	25	21	35	78	14	16	13	18	15	14	78
16-Aug	25	34	58	33	89	49	26	23	22	53	54	69	48	51	57	36	36	41	24	16	17	18	21	15	89
17-Aug	13	21	12	14	14	15	17	29	26	33	38	64	52	89	86	62	82	50	79	53	28	25	24	18	89
18-Aug	20	15	15	14	15	16	14	15	18	17	19	29	17	22	19	13	15	12	15	11	10	9	18	17	29
19-Aug	19	28	21	22	35	61	55	53	73	40	43	47	54	54	53	54	66	45	41	20	11	23	22	18	73
20-Aug	22	17	70	44	42	30	29	49	50	100	76	59	56	38	70	101	26	73	59	75	55	52	88	50	101
21-Aug	46	28	50	62	25	14	25	17	19	13	14	14	28	41	27	23	18	18	13	11	38	33	UO	UO	62
22-Aug	67	45	39	56	25	19	45	20	14	47	31	21	17	24	39	30	26	102	28	49	46	51	82	49	102
23-Aug	19	22	22	14	36	36	32	74	82	52	52	77	22	44	75	39	29	12	13	15	12	12	16	15	82
24-Aug	15	17	17	18	18	19	17	18	18	20	21	18	20	19	20	22	19	17	8	5	13	15	14	72	72
25-Aug	56	45	28	48	19	18	15	22	14	23	13	25	C	27	30	27	22	18	12	8	14	12	16	23	56
26-Aug	17	11	10	11	12	12	31	66	30	19	29	27	36	49	51	47	36	28	15	16	15	14	11	47	66
27-Aug	20	68	38	33	79	31	54	64	80	15	18	16	30	32	28	30	29	23	17	13	20	13	53	22	80
28-Aug	16	17	13	20	24	19	14	17	13	17	13	12	14	15	16	20	13	14	26	UO	13	11	12	12	26
29-Aug	12	12	13	14	12	11	13	13	14	13	15	16	15	13	13	20	17	11	11	20	45	75	63	92	92
30-Aug	45	26	71	23	50	31	UO	44	83	78	34	19	18	18	12	15	18	14	13	13	19	32	38	27	83
31-Aug	43	77	46	37	36	74	40	17	68	68	43	60	53	87	41	33	38	15	18	39	17	40	25	81	87
Diurnal Maximum																									
77 81 80 91 89 88 86 80 88 100 86 89 77 89 94 101 98 102 79 75 71 80 95 92																									
C - Calibration UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS02 MILDRED LAKE AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
AUGUST 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	707	35	37	99.73	45.1	0	7.7	0
H2S (ppb) Average	704	40	40	100	5.1	0	1.4	0
THC (ppm) Average	707	35	37	99.73	4.3	-	2.7	-
NMHC(ppm) Average	707	35	37	99.73	0.685	-	0.233	-
CH4(ppm) Average	707	35	37	99.73	3.8	-	2.5	-
Temperature (C) Average	744	0	0	100	30.2	-	22.7	-
Relative Humidity (%) Average	744	0	0	100	99.7	-	93.3	-
Wind Speed 10 m (km/h) Average	740	2	4	99.73	19	-	13	-
Wind Direction 10 m (deg) Average	740	2	4	99.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MILDRED LAKE (AMS02)
AUGUST 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	1.63	4.3	-	0	0	0.1	0.3	0.9	4.1	45.1
H2S (ppb) Average	704	0.47	0.6	-	0	0.1	0.1	0.3	0.5	1.1	5.1
THC (ppm) Average	707	2.26	0.3	-	1.9	2	2.1	2.2	2.4	2.7	4.3
NMHC(ppm) Average	707	0.087	0.092	-	0	0	0	0.1	0.1	0.2	0.685
CH4(ppm) Average	707	2.18	0.2	-	1.9	2	2	2.1	2.2	2.5	3.8
Temperature 2 m (C) Average	744	17.26	4.4	-	7.7	12.4	14	16.4	20.3	23.5	30.2
Relative Humidity (%) Average	744	73.49	16.7	-	34.4	48.2	61	76.4	87.6	94.4	99.7
Wind Speed 10 m (km/h) Average	740	7.5	4	-	0	3	5	7	10	13	19
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2, THC/NMHC/CH4	30 Aug 2023 11:00	30 Aug 2023 12:00	2	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	06 Aug 2023 01:00	06 Aug 2023 01:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Aug 2023 02:00	22 Aug 2023 02:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

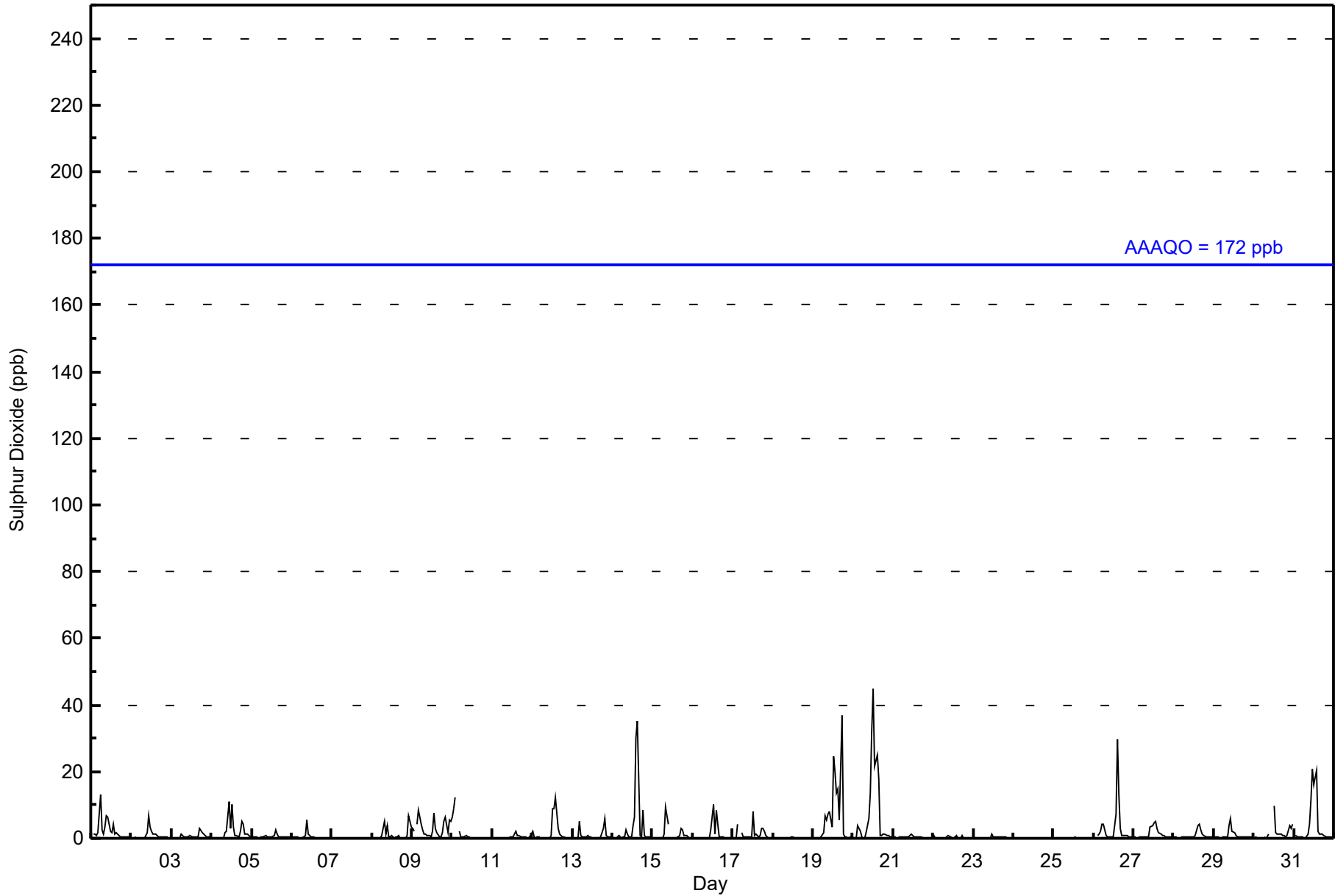
Mildred Lake - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																					
Maximum Value: 45.1 ppb on Aug 20 13:00		Maximum Daily Average: 7.7 ppb on Aug 20		Hours of Data: 707																							
Minimum Value: 0.0 ppb on Aug 3 05:00		Minimum Daily Average: 0.0 ppb on Aug 24		Hours of Missing Data: 37																							
Maximum Diurnal Average: 5.2 ppb at hour 13		Minimum Diurnal Average: 0.5 ppb at hour 22		Hours of Calibration: 35																							
Monthly Average: 1.63 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.9 P ₉₀ = 4.1 P ₉₉ = 24.4		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-Aug	Z	1.5	1.3	0.8	1.9	13.2	2.6	1.2	3.2	6.8	6.4	2.1	1.8	4.2	1.4	1.6	0.8	0.4	0.3	0.5	0.4	0.2	0.3	0.3	2.3	13.2	
2-Aug	0.1	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	1.5	6.8	3.3	2.1	1.4	1.1	0.7	0.5	0.3	0.4	0.2	0.3	0.3	0.2	0.1	0.9	6.8	
3-Aug	0.0	0.1	Z	0.0	0.0	0.1	1.3	0.4	0.2	0.4	0.3	0.7	0.5	0.3	0.3	0.5	0.4	3.1	1.7	1.2	1.0	0.5	0.4	0.3	0.6	3.1	
4-Aug	0.2	0.2	0.1	Z	0.1	0.2	0.1	0.2	1.5	2.0	10.9	3.1	10.2	3.5	0.9	1.0	0.5	2.3	4.9	4.2	1.4	1.2	0.9	0.5	2.2	10.9	
5-Aug	0.5	0.4	0.3	0.4	Z	0.2	0.3	0.6	0.6	0.5	0.4	0.4	0.4	0.8	2.7	1.2	0.5	0.5	0.5	0.3	0.3	0.4	0.3	0.3	0.6	2.7	
6-Aug	0.3	0.4	0.4	0.2	0.2	Z	0.3	0.3	0.7	5.4	1.3	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.5	5.4	
7-Aug	Z	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.1	0.1
8-Aug	0.0	Z	0.0	0.0	0.0	0.1	0.8	5.1	1.1	3.6	0.6	0.2	0.7	0.1	0.3	0.3	0.6	0.1	0.1	0.1	0.2	0.9	7.0	3.4	1.1	7.0	
9-Aug	3.1	2.2	Z	4.4	8.4	4.2	2.7	1.2	1.4	0.8	0.9	0.3	2.1	7.6	2.9	1.5	0.5	0.3	1.6	4.9	6.3	1.9	5.6	5.1	3.0	8.4	
10-Aug	6.2	8.9	12.4	Z	2.1	0.5	0.4	0.5	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.4	12.4	
11-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.1	0.3	0.6	1.5	2.2	0.9	0.7	0.3	0.4	0.3	0.2	0.1	0.1	1.3	0.4	2.2	
12-Aug	2.0	0.3	0.2	0.3	0.3	Z	0.1	0.1	0.1	0.1	0.2	0.9	8.9	9.1	12.2	2.9	1.2	0.7	0.4	0.3	0.1	0.1	0.2	0.1	1.8	12.2	
13-Aug	Z	0.1	0.1	0.1	4.9	0.7	0.4	0.2	0.4	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.5	3.1	6.0	0.9	0.3	0.4	0.3	0.9	6.0		
14-Aug	0.1	Z	0.1	0.3	0.7	0.2	0.3	0.3	2.6	1.3	0.4	0.3	3.9	6.3	30.0	35.3	0.8	0.5	8.5	0.7	0.5	0.4	0.3	0.3	4.1	35.3	
15-Aug	0.2	0.2	Z	0.0	0.1	0.1	0.2	1.5	9.3	4.2	C	C	C	C	0.6	0.5	1.0	3.0	2.4	0.9	0.6	0.2	0.1	0.0	1.3	9.3	
16-Aug	0.1	0.0	0.1	Z	0.0	0.1	0.2	0.2	0.1	0.1	0.2	2.7	10.1	1.2	8.5	4.1	0.3	0.3	0.2	0.2	0.2	0.0	0.0	0.0	1.3	10.1	
17-Aug	0.1	0.0	0.1	4.3	Z	1.7	0.6	0.3	0.3	0.3	0.2	0.3	7.9	0.9	1.3	0.5	0.8	3.0	2.8	2.0	0.9	0.2	0.2	0.0	1.3	7.9	
18-Aug	0.1	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.4	
19-Aug	Z	0.1	0.1	0.1	0.1	0.4	1.6	6.7	5.3	7.3	7.9	3.4	24.5	20.0	13.4	14.7	5.5	36.7	1.3	0.4	0.3	0.1	0.4	0.3	6.6	36.7	
20-Aug	0.3	Z	0.1	3.8	2.3	0.3	0.1	0.2	1.8	6.1	13.4	32.0	45.1	21.5	24.9	17.7	0.9	1.0	1.1	1.2	0.9	0.7	0.6	0.4	7.7	45.1	
21-Aug	0.4	0.4	Z	0.4	0.3	0.4	0.2	0.2	0.4	0.5	1.0	1.1	0.4	0.3	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.3	1.1	
22-Aug	0.8	0.1	0.2	Z	0.1	0.2	0.0	0.1	0.2	0.7	0.3	0.2	0.2	0.4	0.9	0.1	0.1	0.7	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.9	
23-Aug	0.1	0.1	0.1	0.1	Z	0.2	0.1	0.0	0.0	0.0	0.2	1.2	0.6	0.3	0.3	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.1	0.2	1.2	
24-Aug	0.0	0.0	0.1	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	0.1	
25-Aug	Z	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.3	
26-Aug	0.1	Z	0.7	1.1	2.2	4.3	4.4	0.8	0.6	0.5	0.4	0.4	0.5	7.4	29.7	13.1	2.9	0.8	0.8	0.6	0.7	0.5	0.4	0.4	3.2	29.7	
27-Aug	0.4	0.4	Z	0.4	0.4	0.5	0.4	0.6	0.5	0.6	3.3	3.8	4.7	5.1	3.2	1.8	1.2	0.9	0.7	0.6	0.4	0.4	0.3	0.4	1.3	5.1	
28-Aug	0.4	0.3	0.3	Z	0.2	0.4	0.4	0.3	0.3	0.2	0.3	0.4	0.4	0.8	3.7	4.2	2.6	1.4	0.9	0.6	0.4	0.5	0.5	0.4	0.9	4.2	
29-Aug	0.4	0.4	0.3	0.3	Z	0.3	0.4	0.3	0.4	3.6	5.9	2.2	1.7	1.0	0.6	0.6	0.5	0.4	0.4	0.2	0.3	0.3	0.3	0.2	0.9	5.9	
30-Aug	0.2	0.2	0.2	0.2	0.0	Z	0.2	0.2	0.2	1.5	M	M	9.8	1.5	1.3	1.4	1.2	0.9	0.7	0.5	0.7	3.7	2.9	4.3	1.5	9.8	
31-Aug	Z	0.7	0.4	0.4	0.5	0.2	0.2	0.2	1.2	4.4	11.3	21.0	16.3	20.3	2.3	1.4	1.1	1.2	0.9	0.6	0.5	0.4	0.4	0.3	3.7	21.0	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.6 0.7 0.7 0.7 1.0 1.1 0.6 0.7 1.1 1.7 2.5 2.8 5.2 3.9 4.7 3.5 0.8 2.0 1.1 0.9 0.6 0.5 0.7 0.6			
																								6.2 8.9 12.4 4.4 8.4 13.2 4.4 6.7 9.3 7.3 13.4 32.0 45.1 21.5 30.0 35.3 5.5 36.7 8.5 6.0 6.3 3.7 7.0 5.1			
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
Mildred Lake - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mildred Lake - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	684	96.75	96.75
11 - 20	13	1.84	98.59
21 - 60	10	1.41	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
Mildred Lake - August 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	79	25	12	16	13	28	46	77	89	52	40	30	36	31	34	73	681
11 - 20	0	0	0	0	0	1	0	0	1	0	1	4	2	1	2	1	13
21 - 60	1	2	0	0	0	0	0	0	1	0	0	3	2	0	1	0	10
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	80	27	12	16	13	29	46	77	91	52	41	37	40	32	37	74	704

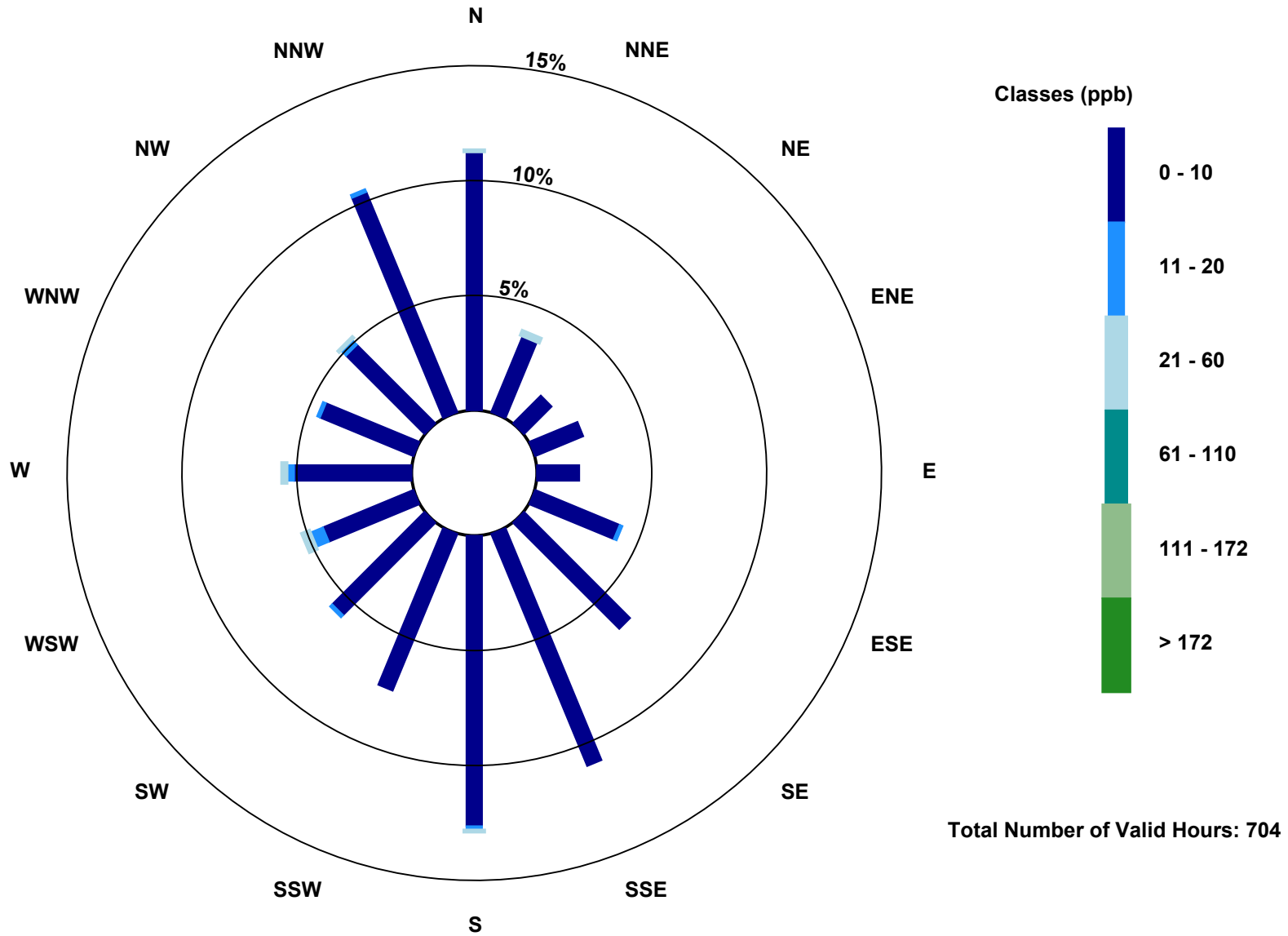
Total Number of Valid Hours: 704

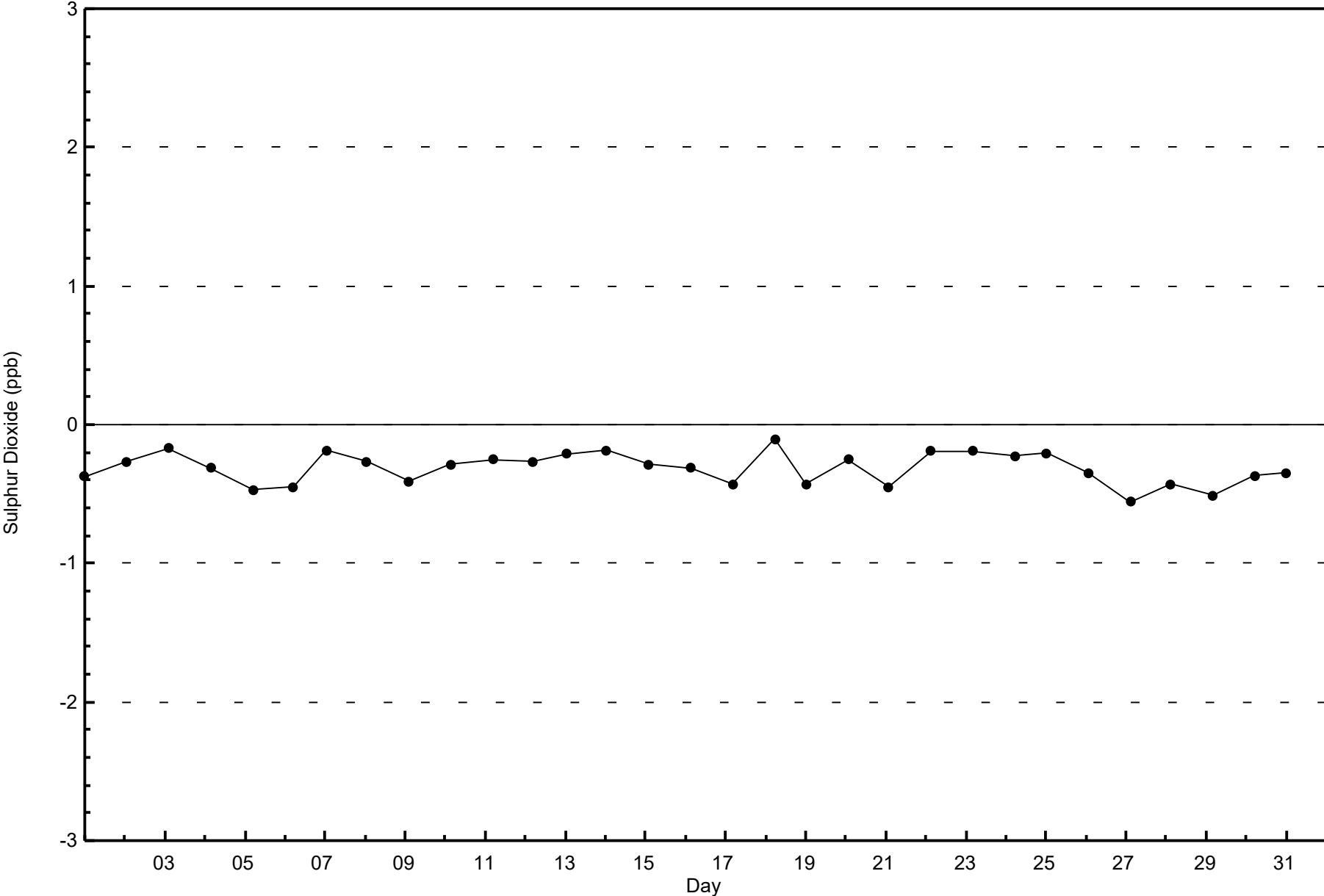
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Mildred Lake

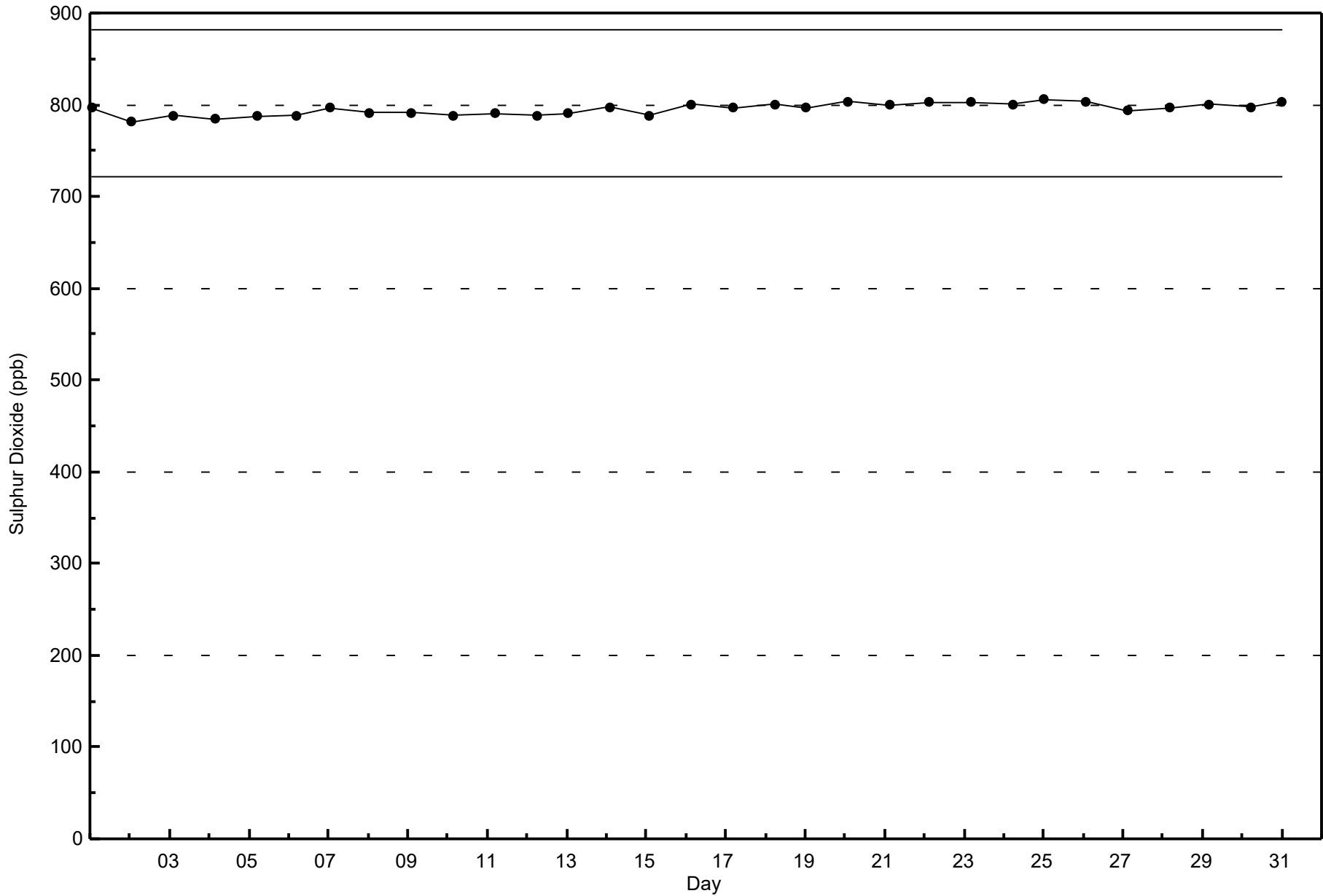






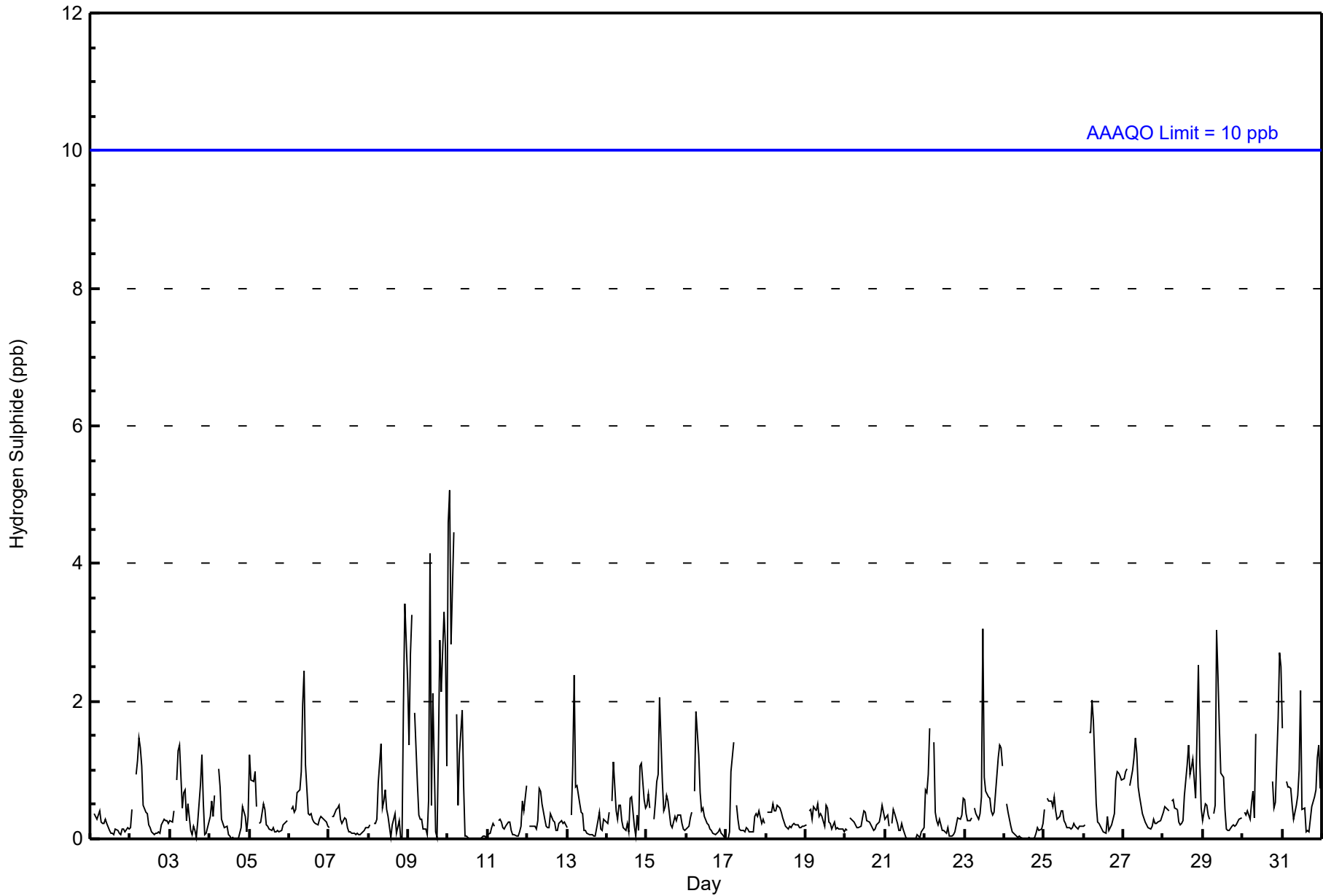
Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Mildred Lake - August 2023





Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744					
Maximum Value: 5.1 ppb on Aug 10 02:00		Maximum Daily Average: 1.4 ppb on Aug 9																	Hours of Data:	704							
Minimum Value: 0.0 ppb on Aug 4 14:00		Minimum Daily Average: 0.1 ppb on Aug 24																	Hours of Missing Data:	40							
Maximum Diurnal Average: 0.7 ppb at hour 6		Minimum Diurnal Average: 0.2 ppb at hour 17																	Hours of Calibration:	40							
Monthly Average: 0.47 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.5 P ₉₀ = 1.1 P ₉₉ = 3.0																	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-Aug	0.2	Z	0.4	0.3	0.3	0.4	0.2	0.2	0.2	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	0.2	0.1	0.2	0.4	0.4
2-Aug	0.2	0.4	Z	0.9	1.1	1.5	1.3	1.0	0.5	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.4	1.5
3-Aug	0.3	0.2	0.4	Z	0.8	1.3	1.4	0.5	0.7	0.7	0.3	0.5	0.1	0.1	0.2	0.1	0.0	0.2	0.8	1.2	0.5	0.1	0.1	0.2	0.5	1.4	
4-Aug	0.3	0.6	0.3	0.6	Z	1.0	0.8	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.3	0.1	0.3	0.3	1.0		
5-Aug	1.2	0.8	0.8	1.0	0.5	Z	0.2	0.3	0.5	0.4	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	1.2	
6-Aug	Z	0.4	0.5	0.4	0.4	0.7	0.7	1.0	2.0	2.4	1.1	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.6	2.4	
7-Aug	0.2	Z	0.3	0.3	0.4	0.4	0.5	0.3	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	0.1	0.2	0.2	0.2	0.5	
8-Aug	0.2	0.2	Z	0.2	0.2	0.3	0.8	1.4	0.5	0.6	0.7	0.4	0.3	0.0	0.2	0.3	0.4	0.1	0.3	0.0	0.0	1.9	3.4	2.3	0.6	3.4	
9-Aug	1.4	2.7	3.3	Z	1.8	0.8	0.3	0.3	0.3	0.1	0.1	0.1	0.6	4.2	0.5	2.1	0.1	0.0	1.3	2.9	2.1	3.3	2.8	1.1	1.4	4.2	
10-Aug	4.6	5.1	2.8	4.5	Z	1.8	0.5	1.3	1.9	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	0.0	1.0	5.1	
11-Aug	0.1	0.1	0.2	0.2	0.2	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.5	0.4	0.8	0.2	0.8	
12-Aug	Z	0.2	0.2	0.2	0.2	0.1	0.3	0.7	0.7	0.5	0.3	0.2	0.2	0.2	0.4	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.7	
13-Aug	0.2	Z	0.3	1.1	2.4	0.8	0.8	0.5	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.4	0.1	0.1	0.3	0.3	0.4	2.4		
14-Aug	0.2	0.4	Z	0.6	1.1	0.4	0.3	0.5	0.5	0.3	0.2	0.1	0.2	0.1	0.6	0.6	0.2	0.0	0.3	0.1	1.1	1.1	0.6	0.5	0.4	1.1	
15-Aug	0.5	0.7	0.4	Z	0.3	0.5	0.8	0.9	2.0	0.8	0.4	0.5	0.6	0.6	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.5	2.0	
16-Aug	0.1	0.2	0.3	0.4	Z	0.7	1.8	1.2	0.7	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.3	1.8	
17-Aug	0.0	0.0	0.1	1.0	1.4	Z	0.5	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.4	0.2	0.3	0.2	0.3	1.4	
18-Aug	Z	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.3	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	0.3	0.5	
19-Aug	0.2	Z	0.4	0.4	0.3	0.5	0.4	0.5	0.3	0.4	0.3	0.2	0.5	0.4	0.3	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.5	
20-Aug	0.1	0.1	Z	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4	0.5	0.4	0.2	0.5	
21-Aug	0.3	0.3	0.2	Z	0.2	0.4	0.4	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.4	
22-Aug	0.7	0.7	0.9	1.6	Z	1.4	0.4	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.6	0.4	1.6	
23-Aug	0.6	0.4	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.4	0.6	3.0	0.9	0.7	0.6	0.6	0.4	0.3	0.4	0.9	1.2	1.4	1.3	1.1	0.7	3.0	
24-Aug	Z	0.5	0.4	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	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.5	
25-Aug	0.4	Z	0.6	0.6	0.5	0.5	0.6	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	
26-Aug	0.2	0.2	Z	1.5	1.5	2.0	1.7	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.1	0.2	0.2	0.4	0.9	1.0	1.0	0.9	0.9	0.6	2.0	
27-Aug	0.9	1.0	1.0	Z	0.8	1.0	1.2	1.5	1.3	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.6	1.5	
28-Aug	0.4	0.5	0.5	0.4	Z	0.6	0.6	0.4	0.4	0.2	0.2	0.2	0.3	0.6	1.1	1.4	0.9	1.0	1.2	0.6	1.5	2.5	1.1	0.4	0.7	2.5	
29-Aug	0.3	0.5	0.5	0.3	0.3	Z	0.4	0.5	3.0	2.4	1.6	1.0	0.9	0.4	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.6	3.0	
30-Aug	Z	0.4	0.3	0.4	0.3	0.5	0.7	0.3	1.5	C	C	C	C	C	C	C	C	C	C	0.8	0.5	0.5	1.8	2.7	2.5	2.7	
31-Aug	1.6	Z	0.8	0.7	0.7	0.7	0.5	0.3	0.5	0.6	1.0	2.2	0.4	0.5	0.1	0.1	0.1	0.3	0.5	0.6	0.7	1.2	1.4	0.7	0.7	2.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.6 4.6			
																								0.7 5.1			
																								0.6 3.3			
																								0.7 4.5			
																								0.7 2.4			
																								0.7 2.0			
																								0.6 1.8			
																								0.5 1.5			
																								0.7 3.0			
																								0.5 2.4			
																								0.4 1.6			
																								0.4 3.0			
																								0.3 0.9			
																								0.3 4.2			
																								0.2 1.1			
																								0.3 2.1			
																								0.2 0.9			
																								0.2 1.0			
																								0.2 1.3			
																								0.3 2.9			
																								0.4 2.1			
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																								0.6 3.4			
																								0.6 2.5			
																								0.5 0.5			
																								0.5 1.8			
																								0.5 2.7			
																								0.5 2.5			
																								0.7 0.7			
																								0.7 2.2			
																								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
Mildred Lake - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	688	97.73	97.73
3 - 4	14	1.99	99.72
5 - 7	2	0.28	100.00
8 - 11	0	0.00	100.00
> 11	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mildred Lake - August 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	81	27	10	16	13	23	42	72	90	53	40	39	40	29	38	74	687
3 - 4	0	0	0	0	0	6	4	3	0	0	0	0	0	1	0	0	14
5 - 7	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
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	81	27	10	16	13	31	46	75	90	53	40	39	40	30	38	74	703

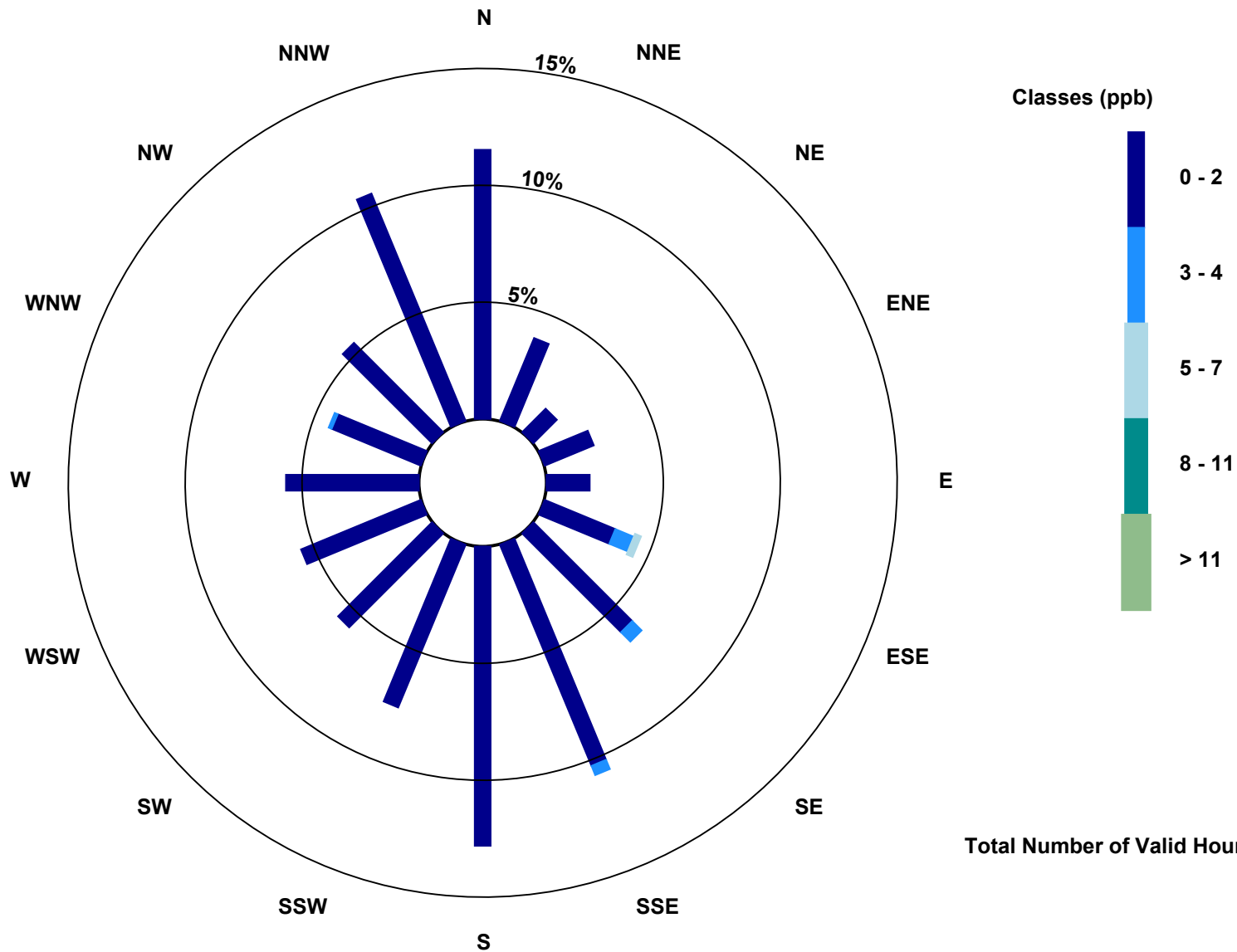
Total Number of Valid Hours: 703

Total Number of Hours: 744

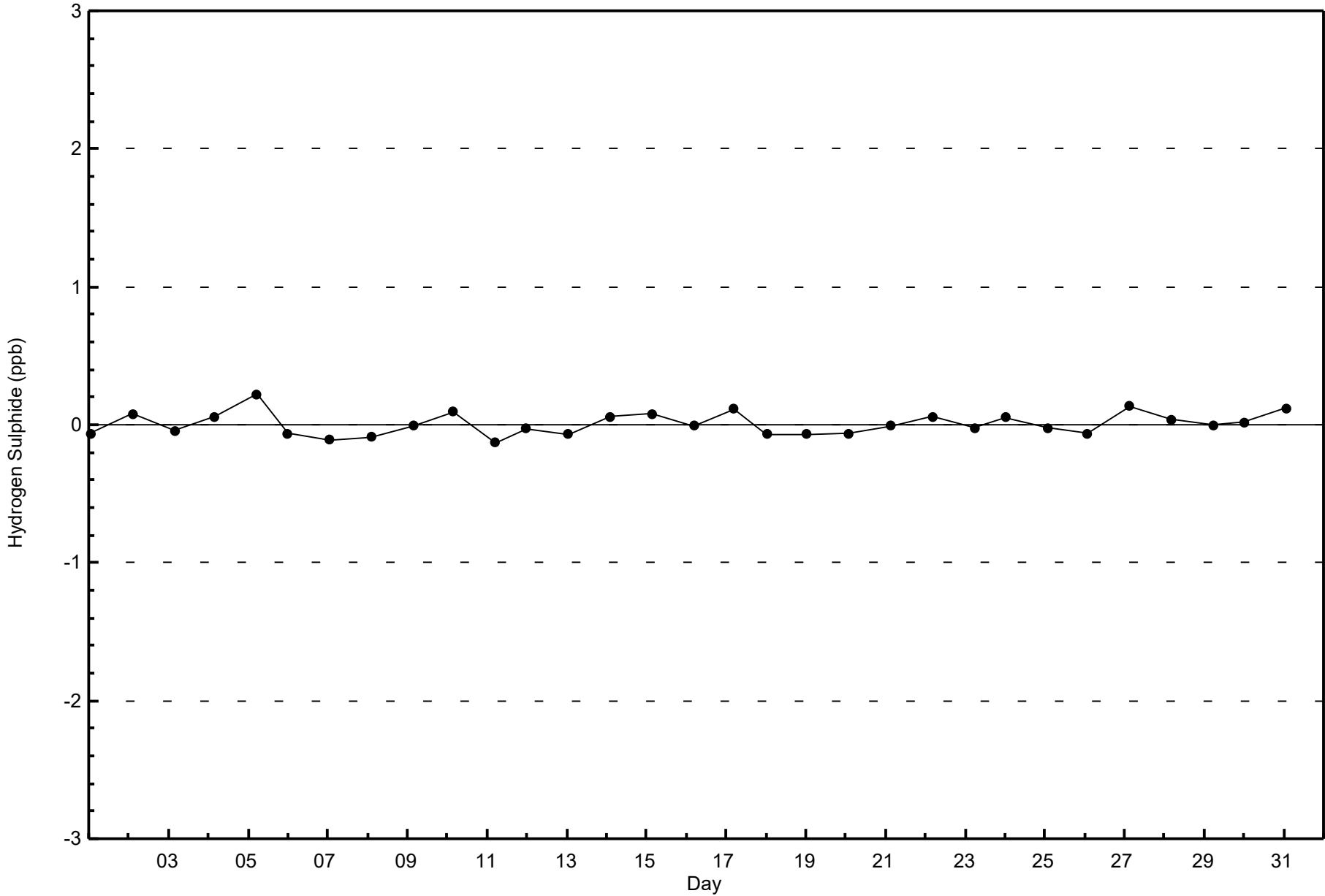


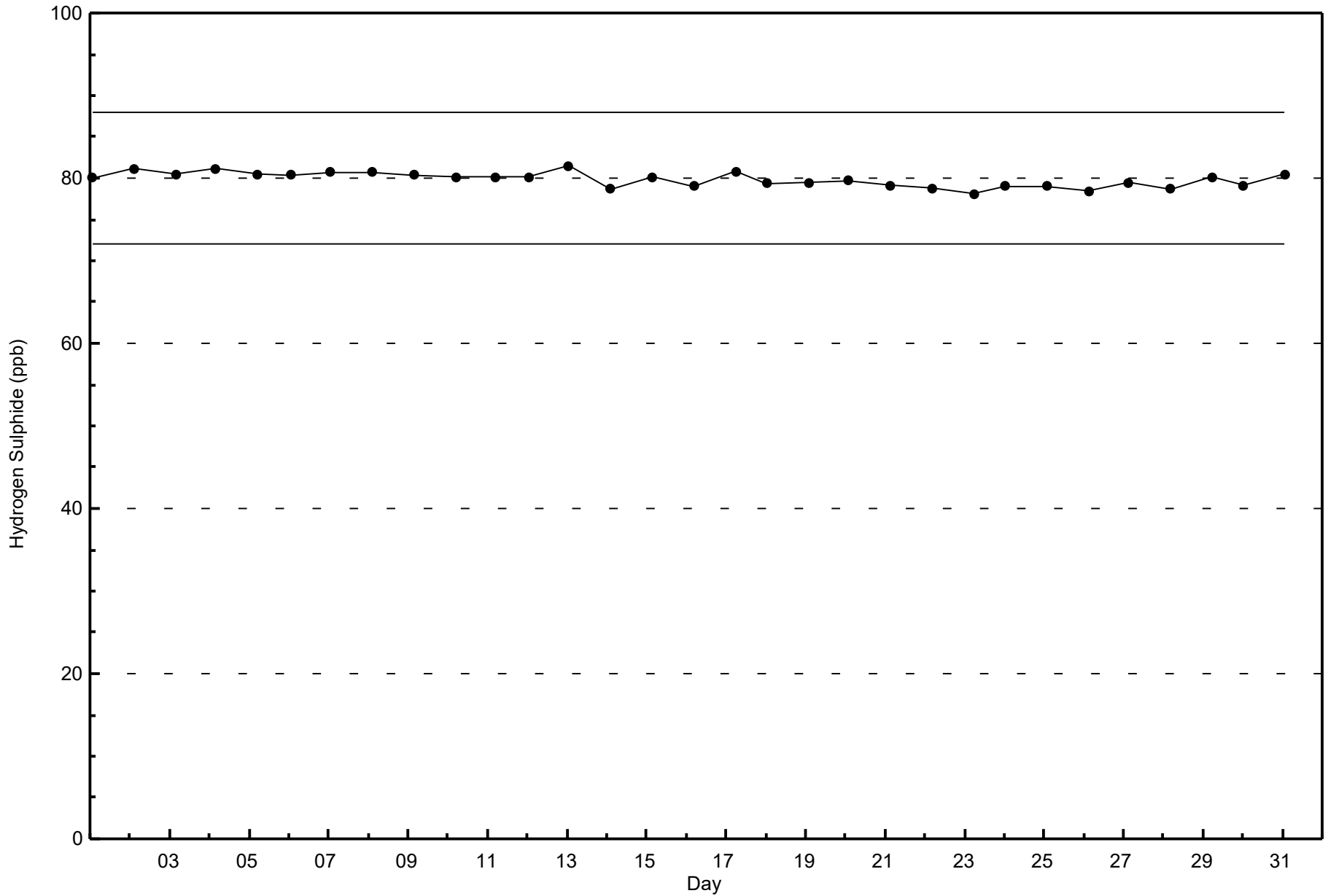
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Mildred Lake



Total Number of Valid Hours: 703







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

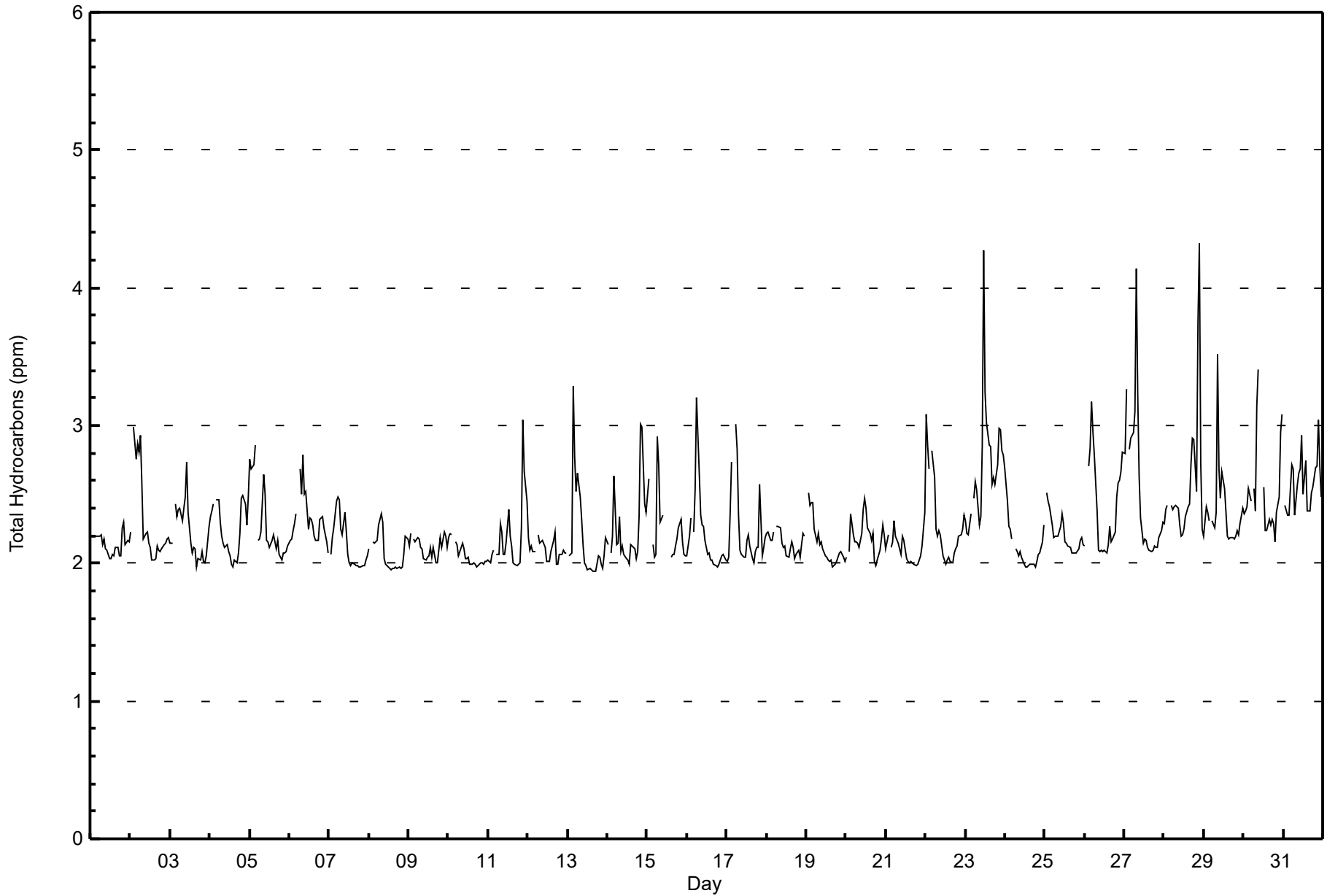
Mildred Lake - August 2023

Maximum Value: 4.3 ppm on Aug 28 22:00		Maximum Daily Average: 2.7 ppm on Aug 23		Hours in Service: 744																						
Minimum Value: 1.9 ppm on Aug 13 17:00		Minimum Daily Average: 2.1 ppm on Aug 10		Hours of Data: 707																						
Maximum Diurnal Average: 2.4 ppm at hour 7		Minimum Diurnal Average: 2.1 ppm at hour 17		Hours of Missing Data: 37																						
Monthly Average: 2.26 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 = 3.3		Hours of Calibration: 35																						
				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-Aug	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.2	2.2	2.1	2.3
2-Aug	2.2	Z	3.0	2.8	2.9	2.8	2.9	2.6	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	3.0
3-Aug	2.1	2.1	Z	2.4	2.3	2.4	2.4	2.3	2.4	2.5	2.7	2.4	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.3	2.2	2.7
4-Aug	2.3	2.4	2.4	Z	2.5	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.5	2.4	2.3	2.5	2.2	2.5	
5-Aug	2.8	2.7	2.7	2.9	Z	2.2	2.2	2.2	2.6	2.5	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.3	2.9
6-Aug	2.2	2.2	2.2	2.3	2.4	Z	2.7	2.5	2.8	2.5	2.5	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.1	2.3	2.8
7-Aug	Z	2.1	2.2	2.3	2.4	2.5	2.5	2.2	2.2	2.4	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	2.1	2.1	2.5
8-Aug	2.1	Z	2.2	2.1	2.2	2.2	2.3	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.4
9-Aug	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.2
10-Aug	2.2	2.2	2.2	Z	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	2.0	2.0	2.0	2.1	2.2
11-Aug	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.3	2.2	2.1	2.1	2.1	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.3	3.0	2.7	2.5	2.2	3.0
12-Aug	2.2	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
13-Aug	Z	2.1	2.1	3.3	2.8	2.5	2.6	2.5	2.3	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	2.1	2.0	2.0	2.0	2.1	2.2	2.2	3.3
14-Aug	2.1	Z	2.1	2.2	2.6	2.1	2.2	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.3	3.0	3.0	2.4	2.4	2.2	3.0
15-Aug	2.5	2.6	Z	2.1	2.0	2.1	2.9	2.7	2.3	2.4	C	C	C	C	2.0	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.3	2.9
16-Aug	2.1	2.2	2.3	Z	2.2	2.5	3.2	2.6	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	3.2
17-Aug	2.0	2.0	2.4	2.7	Z	3.0	2.8	2.3	2.1	2.1	2.0	2.0	2.2	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.6	2.1	2.1	2.2	3.0
18-Aug	2.2	2.2	2.2	2.2	2.2	Z	2.3	2.3	2.3	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.0	2.1	2.1	2.0	2.1	2.2	2.2	2.2	2.3
19-Aug	Z	2.5	2.4	2.4	2.4	2.2	2.2	2.2	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	2.1	2.0	2.0	2.1	2.5
20-Aug	2.0	Z	2.1	2.4	2.2	2.2	2.2	2.1	2.1	2.2	2.4	2.5	2.4	2.3	2.2	2.2	2.2	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.2	2.5
21-Aug	2.1	2.2	Z	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.1	2.4
22-Aug	3.1	2.9	2.7	Z	2.8	2.6	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.3	3.1
23-Aug	2.3	2.2	2.2	2.4	Z	2.5	2.6	2.5	2.3	2.3	2.8	4.3	3.2	3.0	2.9	2.8	2.6	2.6	2.6	2.7	3.0	3.0	2.8	2.8	2.7	4.3
24-Aug	2.7	2.4	2.3	2.2	2.2	Z	2.1	2.1	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	2.1	2.2	2.3	2.1	2.7
25-Aug	Z	2.5	2.5	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.5
26-Aug	2.1	Z	2.7	2.8	3.2	3.0	2.8	2.4	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.2	2.2	2.5	2.6	2.6	2.7	2.8	2.4	3.2
27-Aug	2.8	3.3	Z	2.8	2.9	3.0	3.1	4.1	3.2	2.6	2.3	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.5	4.1
28-Aug	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.4	2.4	2.7	2.9	2.9	2.5	3.7	4.3	2.7	2.3	4.3
29-Aug	2.2	2.4	2.4	2.3	Z	2.3	2.3	2.4	3.5	2.7	2.5	2.7	2.5	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	3.5
30-Aug	2.4	2.4	2.4	2.5	2.4	Z	2.5	2.4	3.1	3.4	M	M	2.6	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.4	2.5	2.9	3.1	2.5	3.4
31-Aug	Z	2.4	2.3	2.3	2.5	2.7	2.7	2.4	2.6	2.7	2.7	2.9	2.5	2.7	2.4	2.4	2.4	2.5	2.6	2.7	2.7	3.0	2.7	2.5	2.6	3.0
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mildred Lake - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mildred Lake - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	145	20.51	20.51
2.1 - 3.0	546	77.23	97.74
3.1 - 10.0	16	2.26	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Mildred Lake - August 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	19	7	3	7	9	7	5	11	15	15	16	12	4	2	1	12	145
2.1 - 3.0	61	20	9	9	4	21	39	62	74	36	25	25	35	28	35	61	544
3.1 - 10.0	0	0	0	0	0	1	2	4	2	1	0	0	1	2	1	1	15
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	80	27	12	16	13	29	46	77	91	52	41	37	40	32	37	74	704

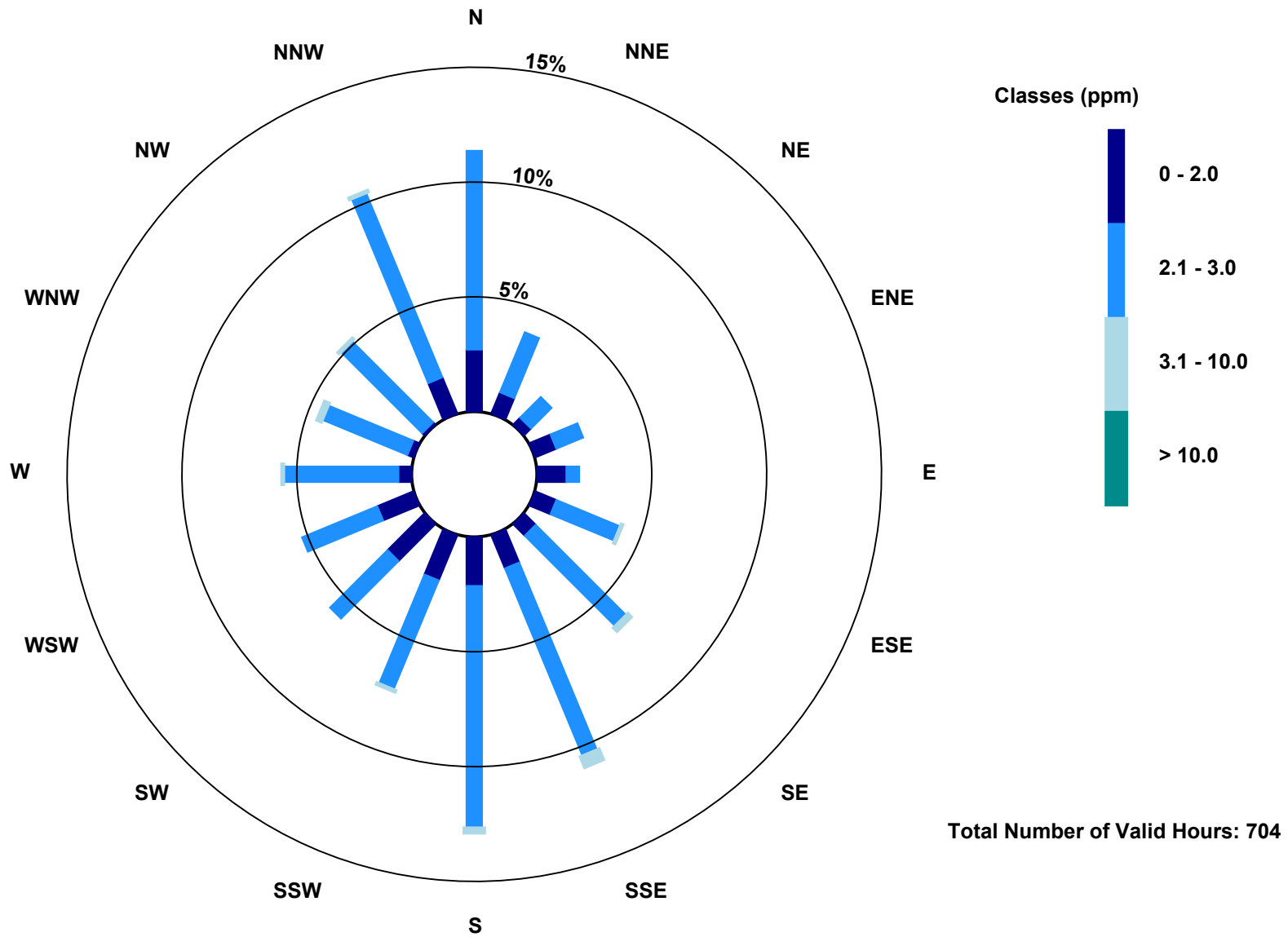
Total Number of Valid Hours: 704

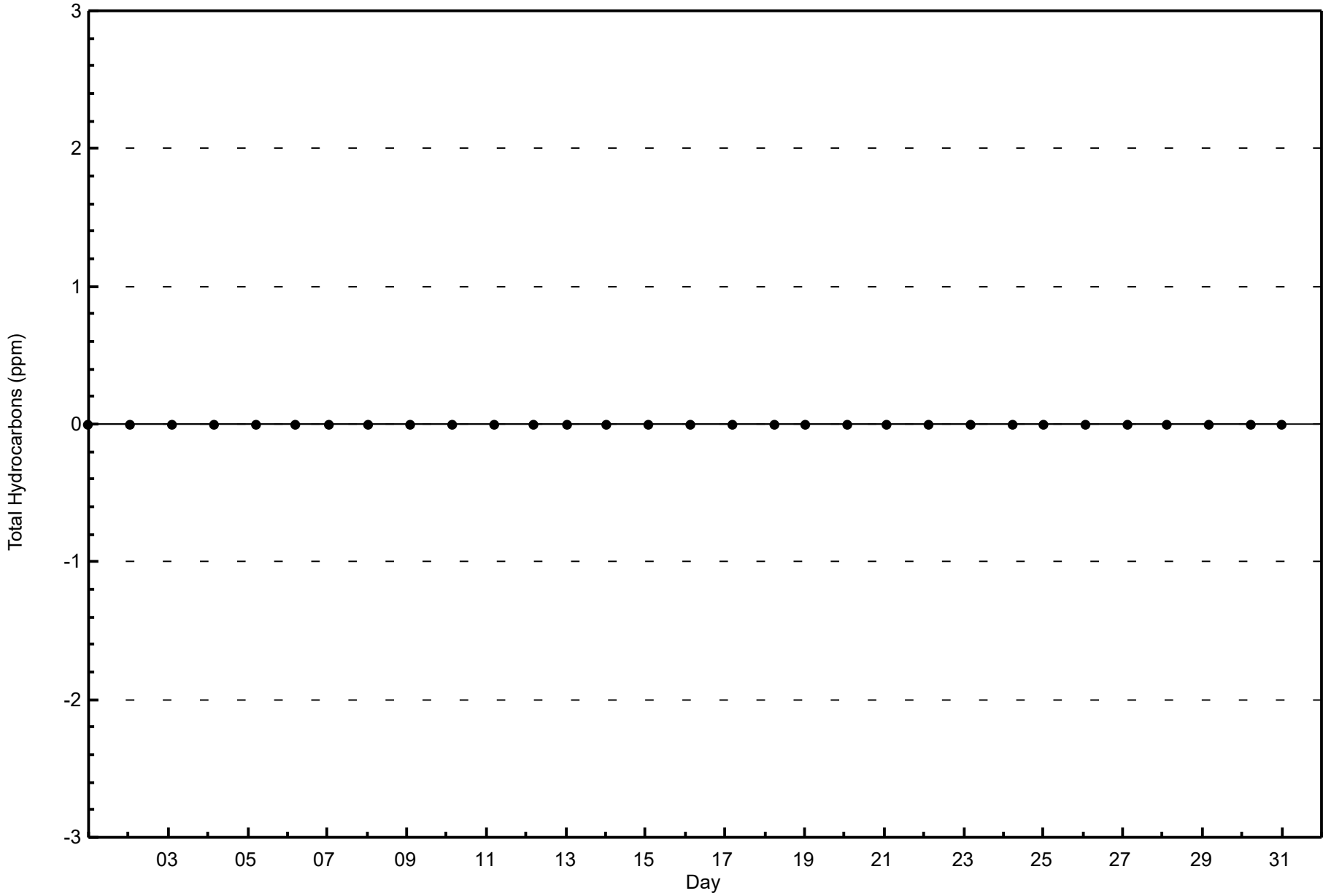
Total Number of Hours: 744

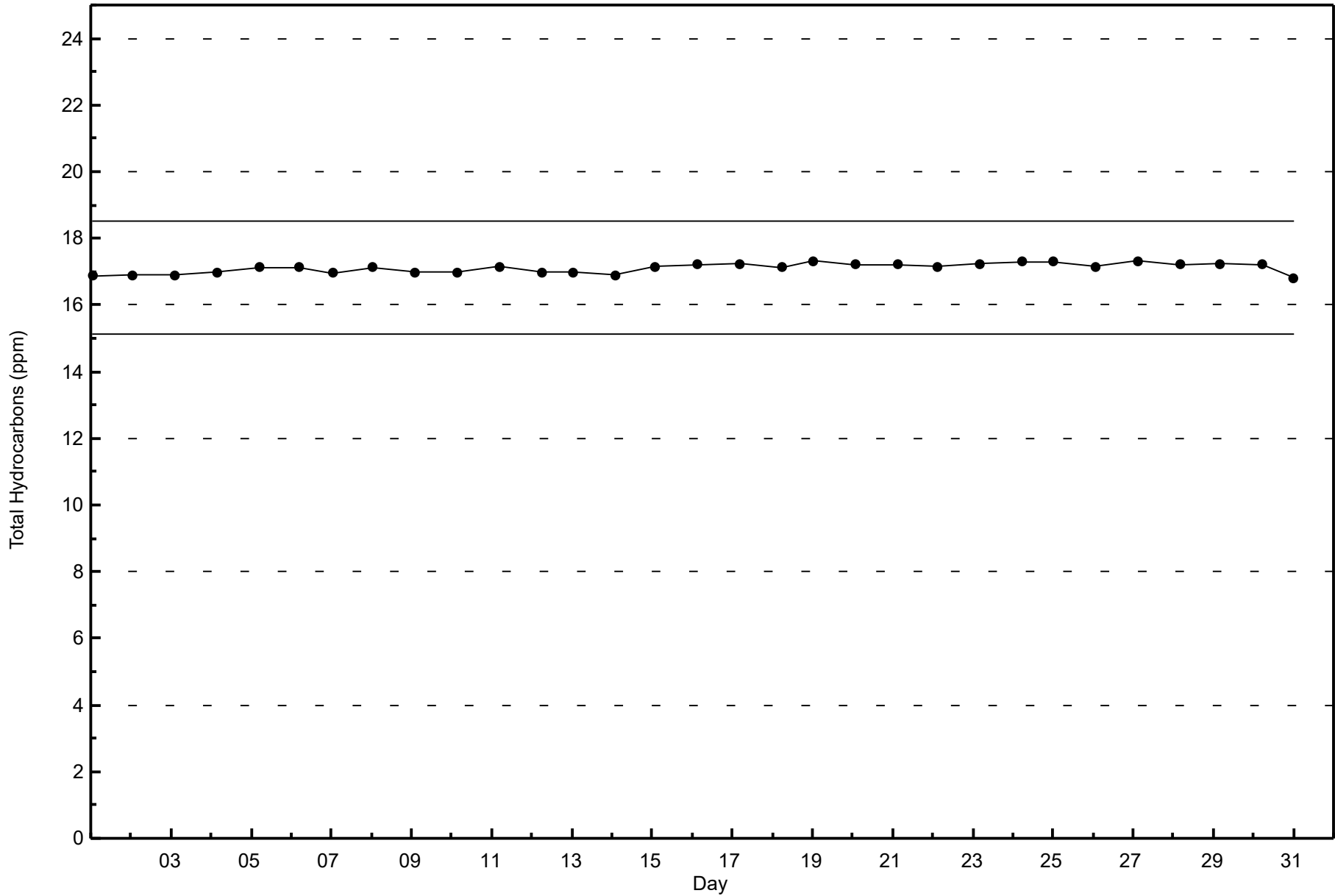


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Mildred Lake

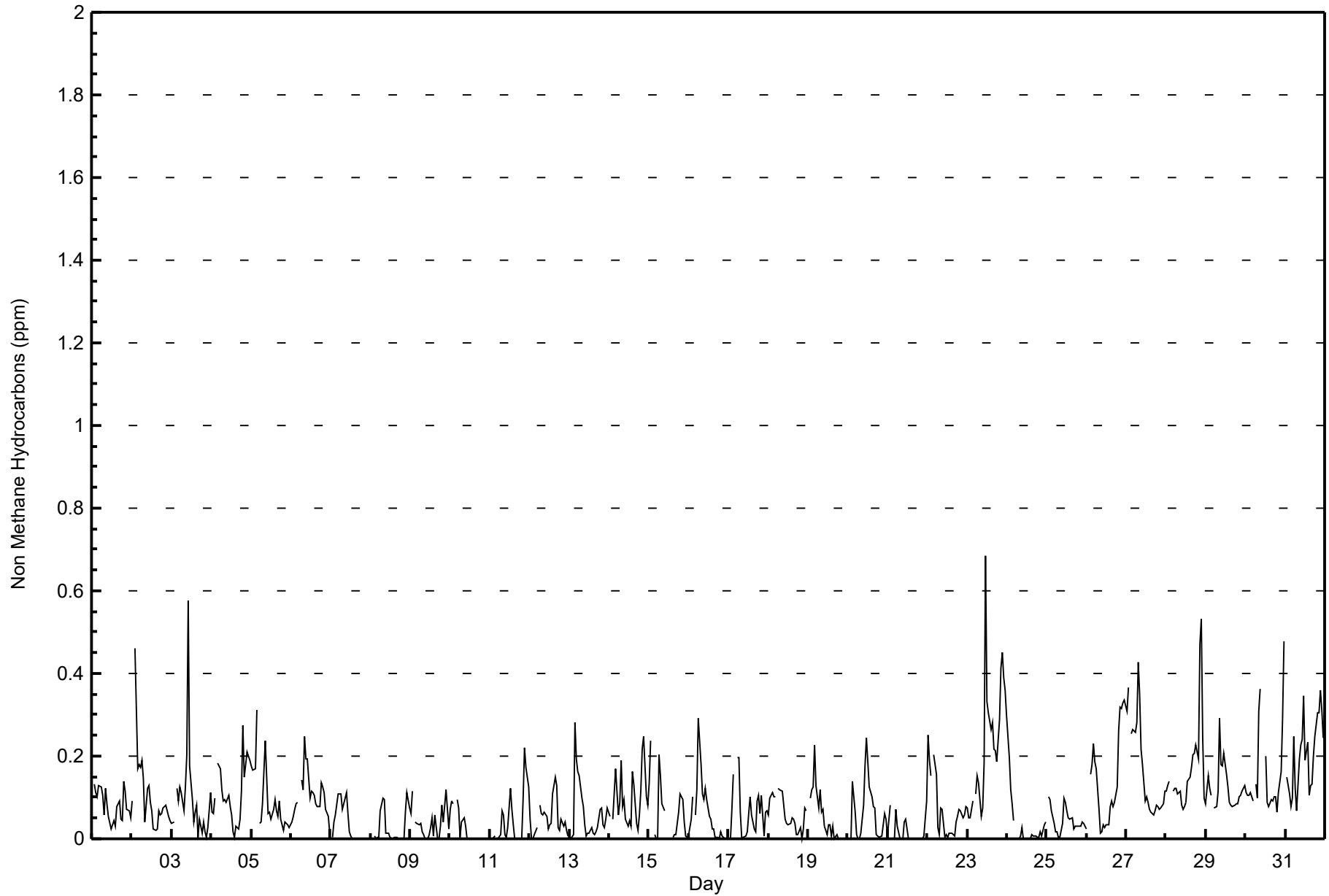








Maximum Value: 0.685 ppm on Aug 23 12:00		Maximum Daily Average: 0.233 ppm on Aug 23		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Aug 7 14:00		Minimum Daily Average: 0.017 ppm on Aug 21		Hours of Data:	707																						
Maximum Diurnal Average: 0.109 ppm at hour 5		Minimum Diurnal Average: 0.050 ppm at hour 17		Hours of Missing Data:	37																						
Monthly Average: 0.087 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 = 0.4		Hours of Calibration:	35																						
				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-Aug	Z	0.131	0.111	0.102	0.127	0.126	0.106	0.059	0.122	0.085	0.055	0.024	0.033	0.044	0.031	0.077	0.090	0.048	0.044	0.138	0.116	0.070	0.069	0.050	0.081	0.138	
2-Aug	0.093	Z	0.461	0.168	0.181	0.173	0.188	0.144	0.040	0.123	0.129	0.087	0.069	0.024	0.020	0.024	0.068	0.056	0.060	0.074	0.080	0.067	0.053	0.045	0.106	0.461	
3-Aug	0.038	0.042	Z	0.121	0.091	0.124	0.111	0.067	0.125	0.204	0.576	0.175	0.094	0.040	0.064	0.081	0.002	0.048	0.015	0.042	0.018	0.003	0.028	0.113	0.096	0.576	
4-Aug	0.064	0.062	0.097	Z	0.184	0.169	0.119	0.091	0.097	0.088	0.104	0.077	0.058	0.016	0.005	0.032	0.023	0.047	0.115	0.275	0.148	0.211	0.201	0.189	0.107	0.275	
5-Aug	0.175	0.165	0.169	0.311	Z	0.036	0.042	0.086	0.238	0.149	0.062	0.063	0.048	0.073	0.094	0.069	0.053	0.090	0.049	0.020	0.041	0.036	0.036	0.027	0.093	0.311	
6-Aug	0.042	0.054	0.072	0.084	0.089	Z	0.142	0.117	0.248	0.194	0.194	0.098	0.115	0.113	0.107	0.083	0.078	0.079	0.134	0.125	0.111	0.070	0.053	0.014	0.105	0.248	
7-Aug	Z	0.002	0.042	0.056	0.107	0.108	0.107	0.072	0.083	0.113	0.063	0.018	0.005	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.113	
8-Aug	0.001	Z	0.006	0.001	0.002	0.003	0.067	0.098	0.095	0.012	0.014	0.013	0.004	0.000	0.003	0.003	0.004	0.000	0.000	0.000	0.000	0.064	0.112	0.073	0.025	0.112	
9-Aug	0.060	0.114	Z	0.041	0.037	0.034	0.036	0.016	0.010	0.001	0.000	0.009	0.026	0.052	0.006	0.059	0.001	0.000	0.030	0.080	0.041	0.119	0.072	0.022	0.038	0.119	
10-Aug	0.072	0.091	0.085	Z	0.095	0.074	0.004	0.040	0.051	0.029	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	0.024	0.095	
11-Aug	0.000	0.000	0.004	0.007	Z	0.001	0.009	0.068	0.058	0.010	0.004	0.028	0.122	0.070	0.035	0.001	0.000	0.000	0.000	0.000	0.095	0.219	0.172	0.127	0.045	0.219	
12-Aug	0.047	0.000	0.001	0.011	0.026	Z	0.081	0.061	0.056	0.063	0.055	0.023	0.032	0.037	0.109	0.149	0.130	0.028	0.021	0.048	0.032	0.039	0.021	0.008	0.047	0.149	
13-Aug	Z	0.001	0.009	0.281	0.192	0.163	0.152	0.100	0.078	0.034	0.007	0.013	0.014	0.027	0.015	0.012	0.017	0.027	0.072	0.074	0.034	0.027	0.049	0.073	0.064	0.281	
14-Aug	0.053	Z	0.047	0.107	0.169	0.058	0.089	0.190	0.079	0.094	0.048	0.032	0.043	0.032	0.163	0.133	0.037	0.022	0.058	0.114	0.218	0.248	0.103	0.082	0.096	0.248	
15-Aug	0.134	0.238	Z	0.012	0.001	0.000	0.203	0.152	0.084	0.068	C	C	C	C	0.004	0.011	0.010	0.036	0.066	0.109	0.096	0.039	0.005	0.002	0.067	0.238	
16-Aug	0.007	0.047	0.101	Z	0.056	0.120	0.290	0.181	0.108	0.097	0.122	0.097	0.054	0.048	0.025	0.022	0.005	0.003	0.001	0.015	0.005	0.003	0.000	0.000	0.061	0.290	
17-Aug	0.000	0.000	0.071	0.157	Z	0.197	0.197	0.065	0.003	0.004	0.008	0.017	0.062	0.103	0.058	0.025	0.017	0.090	0.105	0.060	0.104	0.007	0.063	0.068	0.064	0.197	
18-Aug	0.059	0.098	0.113	0.103	0.102	Z	0.123	0.119	0.114	0.080	0.048	0.039	0.035	0.036	0.050	0.047	0.036	0.011	0.011	0.026	0.000	0.025	0.073	0.069	0.062	0.123	
19-Aug	Z	0.099	0.117	0.124	0.227	0.131	0.074	0.120	0.065	0.072	0.030	0.009	0.034	0.034	0.008	0.031	0.001	0.010	0.000	0.001	0.000	0.000	0.000	0.000	0.052	0.227	
20-Aug	0.001	Z	0.000	0.138	0.063	0.011	0.000	0.000	0.012	0.083	0.177	0.242	0.186	0.126	0.101	0.079	0.074	0.010	0.005	0.004	0.006	0.033	0.061	0.047	0.063	0.242	
21-Aug	0.008	0.081	Z	0.000	0.000	0.071	0.032	0.000	0.000	0.001	0.039	0.047	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.090	0.017	0.090	
22-Aug	0.250	0.190	0.153	Z	0.204	0.156	0.027	0.012	0.073	0.070	0.005	0.009	0.004	0.012	0.012	0.015	0.007	0.040	0.053	0.070	0.067	0.050	0.058	0.079	0.070	0.250	
23-Aug	0.073	0.052	0.051	0.093	Z	0.110	0.153	0.135	0.054	0.073	0.184	0.685	0.333	0.307	0.263	0.282	0.216	0.213	0.186	0.287	0.414	0.450	0.391	0.358	0.233	0.685	
24-Aug	0.299	0.195	0.118	0.085	0.046	Z	0.001	0.001	0.008	0.027	0.000	0.000	0.000	0.001	0.010	0.008	0.008	0.004	0.004	0.017	0.006	0.035	0.042	0.040	0.040	0.299	
25-Aug	Z	0.102	0.096	0.069	0.038	0.018	0.016	0.002	0.002	0.037	0.099	0.088	0.069	0.052	0.047	0.051	0.025	0.032	0.031	0.030	0.029	0.042	0.037	0.030	0.045	0.102	
26-Aug	0.023	Z	0.155	0.179	0.232	0.186	0.169	0.073	0.013	0.019	0.032	0.026	0.033	0.035	0.079	0.090	0.079	0.087	0.126	0.261	0.320	0.315	0.328	0.334	0.139	0.334	
27-Aug	0.310	0.366	Z	0.256	0.263	0.259	0.281	0.426	0.350	0.217	0.180	0.091	0.101	0.087	0.071	0.063	0.058	0.068	0.082	0.077	0.070	0.075	0.086	0.116	0.172	0.426	
28-Aug	0.115	0.130	0.138	Z	0.115	0.124	0.123	0.110	0.114	0.082	0.071	0.078	0.090	0.139	0.150	0.172	0.202	0.208	0.228	0.192	0.470	0.532	0.243	0.098	0.170	0.532	
29-Aug	0.084	0.152	0.124	0.106	Z	0.076	0.077	0.115	0.291	0.181	0.175	0.206	0.155	0.126	0.088	0.081	0.077	0.082	0.085	0.086	0.100	0.104	0.115	0.128	0.122	0.291	
30-Aug	0.113	0.107	0.104	0.112	0.092	Z	0.133	0.097	0.308	0.364	M	M	0.201	0.088	0.079	0.095	0.092	0.102	0.100	0.065	0.112	0.163	0.293	0.479	0.157	0.479	
31-Aug	Z	0.148	0.108	0.077	0.097	0.248	0.120	0.068	0.194	0.226	0.239	0.345	0.190	0.235	0.104	0.130	0.132	0.201	0.249	0.304	0.307	0.359	0.313	0.243	0.202	0.359	
		0.085	0.103	0.098	0.108	0.109	0.107	0.106	0.093	0.102	0.094	0.091	0.074	0.065	0.058	0.062	0.050	0.053	0.062	0.083	0.098	0.109	0.099	0.097	Diurnal Average		
		0.310	0.366	0.461	0.311	0.263	0.259	0.290	0.426	0.350	0.364	0.576	0.685	0.333	0.307	0.263	0.282	0.216	0.213	0.249	0.304	0.470	0.532	0.391	0.479	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	119	16.83	16.83
0.006 - 0.05	193	27.30	44.13
0.06 - 0.1	274	38.76	82.89
> 0.1	121	17.11	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake - August 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	8	5	5	9	6	2	14	23	11	4	2	0	0	1	7	119
0.006 - 0.05	18	8	1	4	1	6	14	12	25	19	25	16	7	6	8	22	192
0.06 - 0.1	24	10	6	4	1	14	13	31	36	20	9	12	27	17	18	32	274
> 0.1	16	1	0	3	2	3	17	20	7	2	3	7	6	9	10	13	119
Totals	80	27	12	16	13	29	46	77	91	52	41	37	40	32	37	74	704

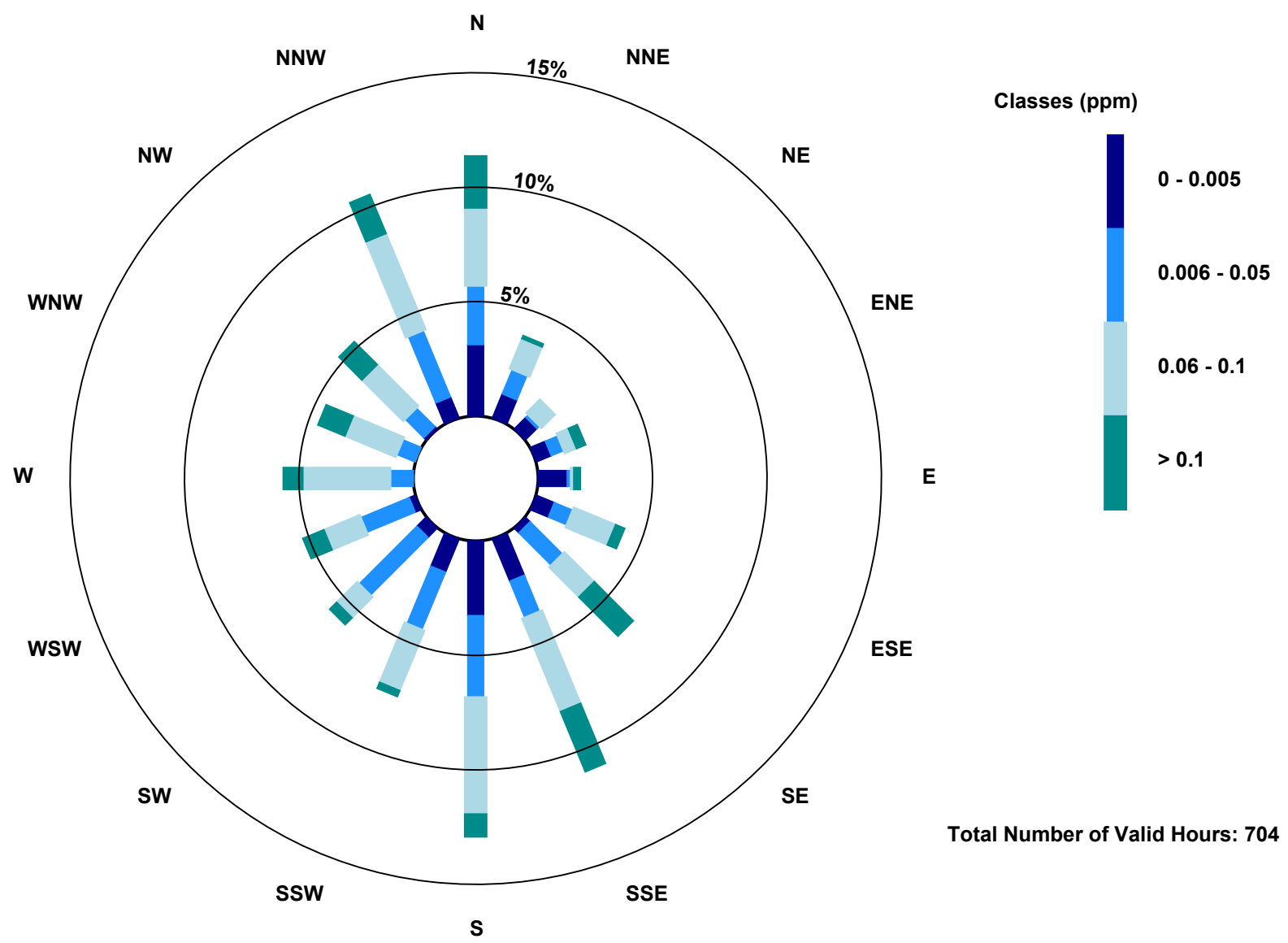
Total Number of Valid Hours: 704

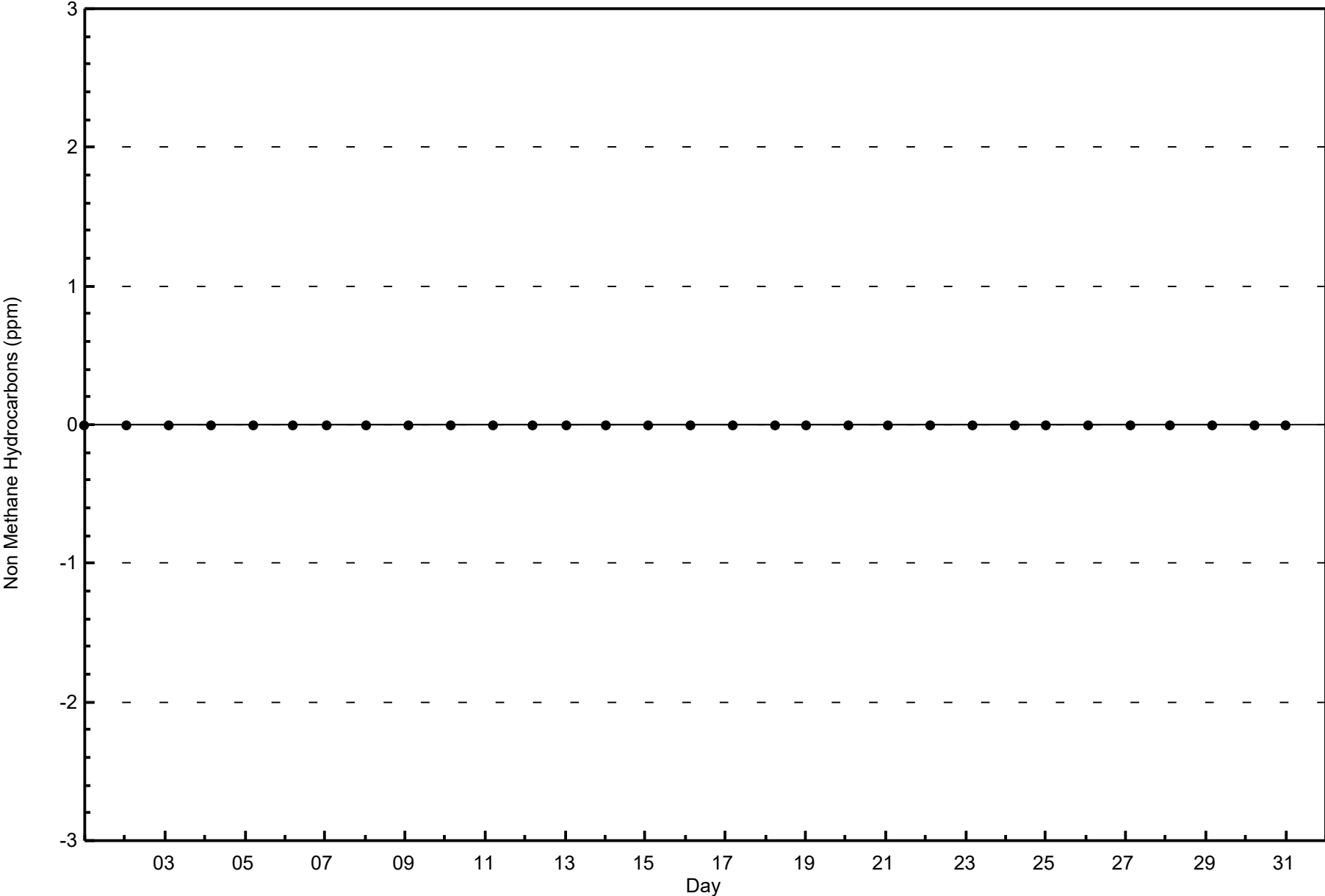
Total Number of Hours: 744

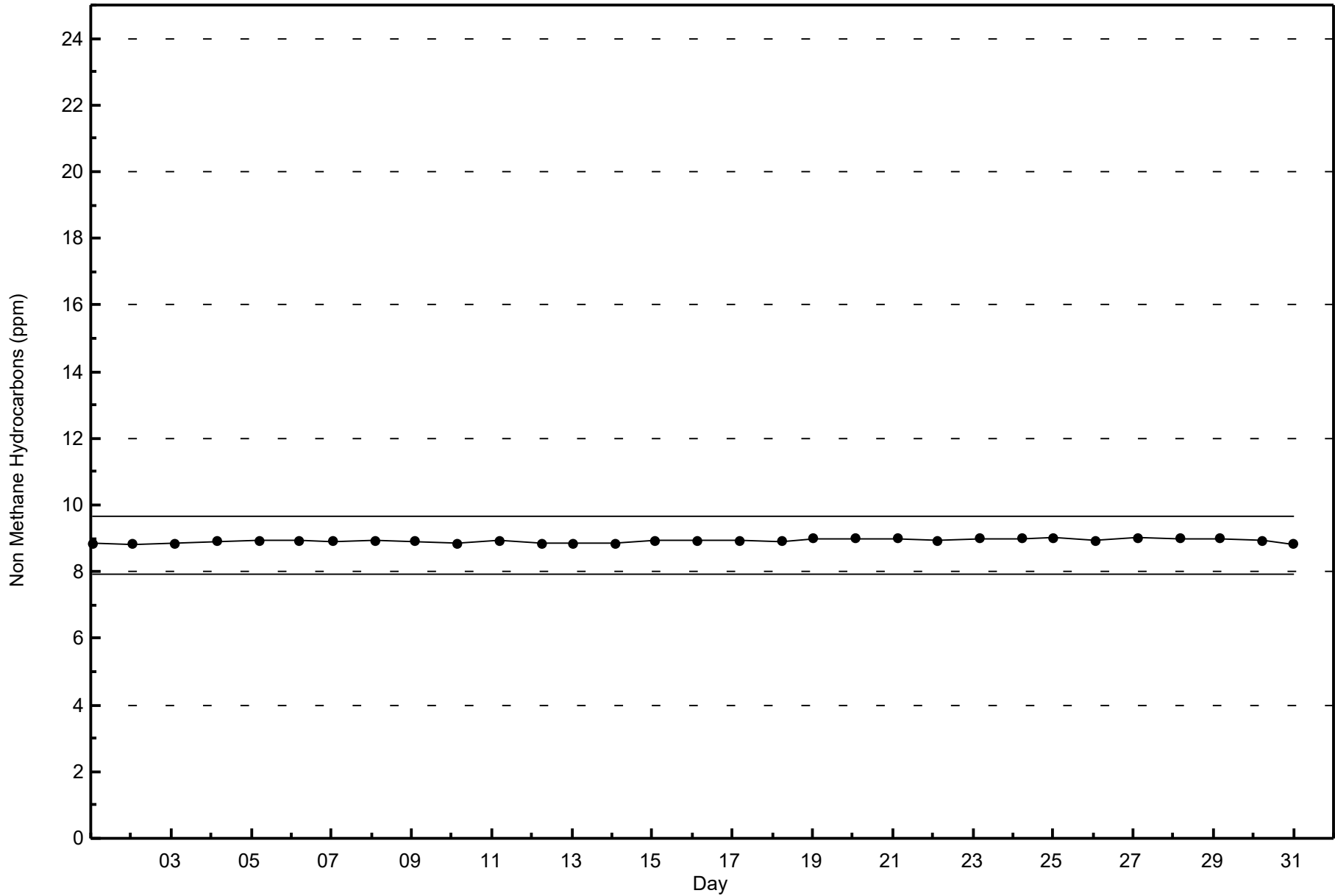


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mildred Lake









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

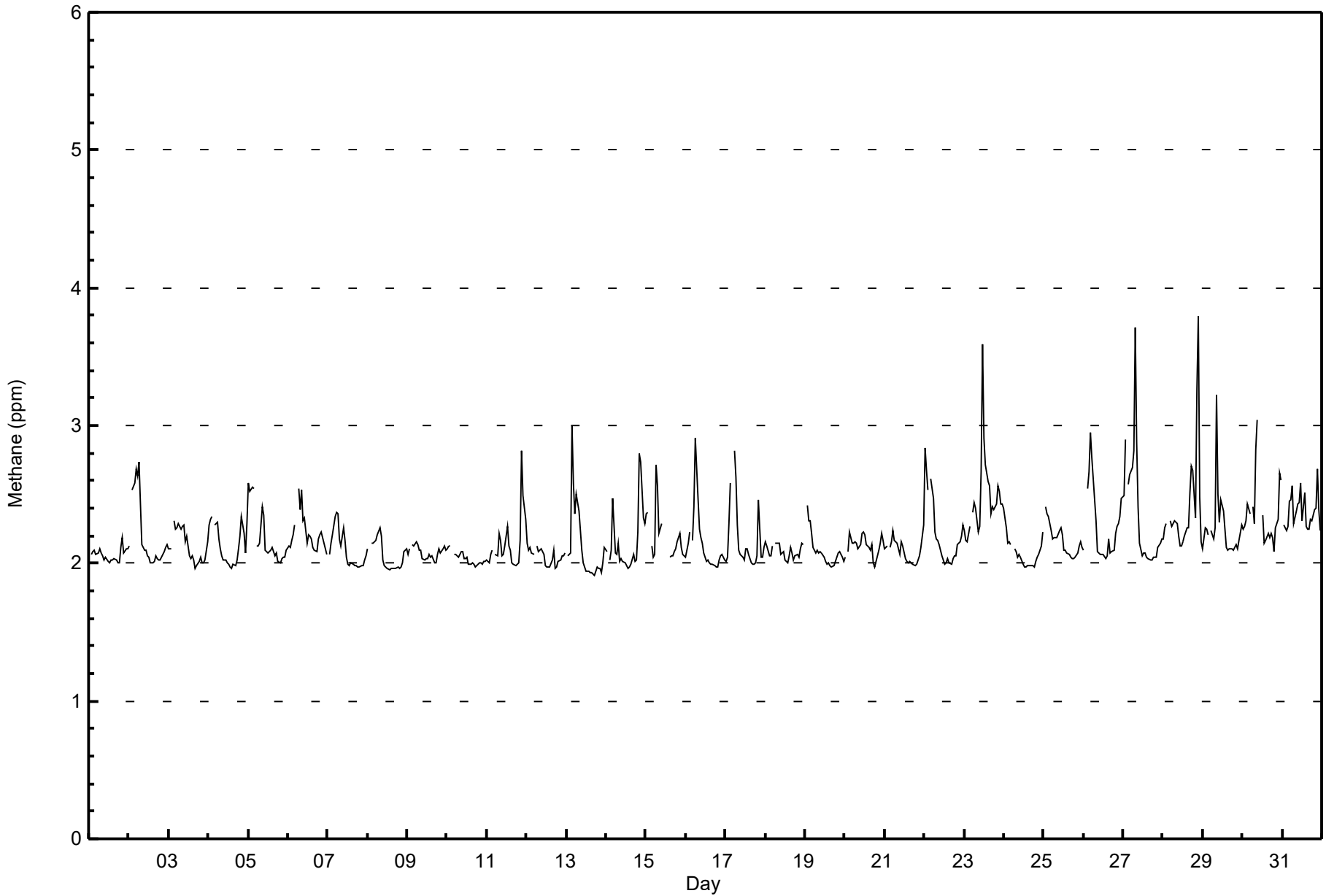
Mildred Lake - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																																	
Maximum Value: 3.8 ppm on Aug 28 22:00		Maximum Daily Average: 2.5 ppm on Aug 23		Hours of Data:														707																																			
Minimum Value: 1.9 ppm on Aug 13 18:00		Minimum Daily Average: 2.0 ppm on Aug 10		Hours of Missing Data:														37																																			
Maximum Diurnal Average: 2.3 ppm at hour 7		Minimum Diurnal Average: 2.1 ppm at hour 17		Hours of Calibration:														35																																			
Monthly Average: 2.18 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.5 P ₉₉ = 2.9		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-Aug	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	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2																									
2-Aug	2.1	Z	2.5	2.6	2.7	2.6	2.7	2.4	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.7																								
3-Aug	2.1	2.1	Z	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.1	2.3	2.1	2.3																							
4-Aug	2.3	2.3	2.3	Z	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.1	2.3	2.1	2.2	2.1	2.3	2.1	2.3																							
5-Aug	2.6	2.5	2.6	2.5	Z	2.1	2.1	2.1	2.1	2.4	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.2	2.6	2.6																							
6-Aug	2.1	2.1	2.2	2.2	2.3	Z	2.5	2.4	2.5	2.3	2.3	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.5																							
7-Aug	Z	2.1	2.1	2.2	2.3	2.4	2.4	2.2	2.1	2.3	2.2	2.0	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	2.4																							
8-Aug	2.1	Z	2.1	2.1	2.2	2.2	2.2	2.3	2.2	2.0	2.0	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	2.3																							
9-Aug	2.1	2.1	Z	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	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	2.2																							
10-Aug	2.1	2.1	2.1	Z	2.1	2.1	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	2.1																							
11-Aug	2.0	2.0	2.1	2.1	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.8	2.5	2.3	2.1	2.1	2.1	2.1	2.8																							
12-Aug	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1																							
13-Aug	Z	2.1	2.1	3.0	2.6	2.4	2.5	2.4	2.2	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0	2.1	2.1	2.1	2.1	3.0																								
14-Aug	2.1	Z	2.0	2.0	2.1	2.5	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.2	2.8	2.7	2.3	2.3	2.1	2.1	2.1	2.1	2.8																							
15-Aug	2.4	2.4	Z	2.1	2.0	2.1	2.7	2.6	2.2	2.3	C	C	C	C	2.0	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	2.7																							
16-Aug	2.0	2.1	2.2	Z	2.2	2.4	2.9	2.5	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.9																							
17-Aug	2.0	2.0	2.3	2.6	Z	2.8	2.6	2.3	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.5	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.8																							
18-Aug	2.2	2.1	2.1	2.1	2.1	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	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																							
19-Aug	Z	2.4	2.3	2.3	2.2	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	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.4																							
20-Aug	2.0	Z	2.1	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2																							
21-Aug	2.1	2.1	Z	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.3																							
22-Aug	2.8	2.7	2.5	Z	2.6	2.5	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.2	2.8																							
23-Aug	2.2	2.2	2.2	2.3	Z	2.4	2.4	2.4	2.2	2.3	2.7	3.6	2.9	2.7	2.6	2.6	2.4	2.4	2.4	2.4	2.6	2.5	2.4	2.4	2.5	2.4	2.4	2.4	2.5	3.6																							
24-Aug	2.4	2.3	2.1	2.2	2.1	Z	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																							
25-Aug	Z	2.4	2.4	2.3	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.4																							
26-Aug	2.1	Z	2.5	2.7	2.9	2.8	2.6	2.3	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.3	2.3	2.3	2.5	2.3	2.3	2.3	2.3	2.9																							
27-Aug	2.5	2.9	Z	2.6	2.6	2.7	2.8	3.7	2.9	2.4	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	2.4	2.4	2.4	2.4	3.7																							
28-Aug	2.2	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.5	2.7	2.7	2.7	2.3	3.3	3.8	2.5	2.2	2.4	2.4	2.4	2.4	3.8																							
29-Aug	2.1	2.3	2.2	2.2	Z	2.2	2.2	2.3	3.2	2.5	2.3	2.5	2.4	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	3.2																							
30-Aug	2.2	2.3	2.3	2.4	2.4	Z	2.4	2.3	2.8	3.0	M	M	2.4	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.3	2.7	2.6	2.4	2.4	2.4	2.4	3.0																							
31-Aug	Z	2.3	2.2	2.3	2.4	2.5	2.6	2.3	2.4	2.4	2.4	2.6	2.3	2.5	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.7	2.4	2.2	2.4	2.4	2.4	2.4	2.7																							
																								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	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	Diurnal Average
																								2.8	2.9	2.6	3.0	2.9	2.8	2.9	3.7	3.2	3.0	2.7	3.6	2.9	2.7	2.6	2.6	2.5	2.7	2.7	2.4	3.3	3.8	2.7	2.6	2.4	2.4	2.4	2.4	2.4	Diurnal Maximum
Z - zerospan																								C - Calibration				M - Maintenance																									



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mildred Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Mildred Lake - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	214	30.27	30.27
2.1 - 3.0	488	69.02	99.29
3.1 - 10.0	5	0.71	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



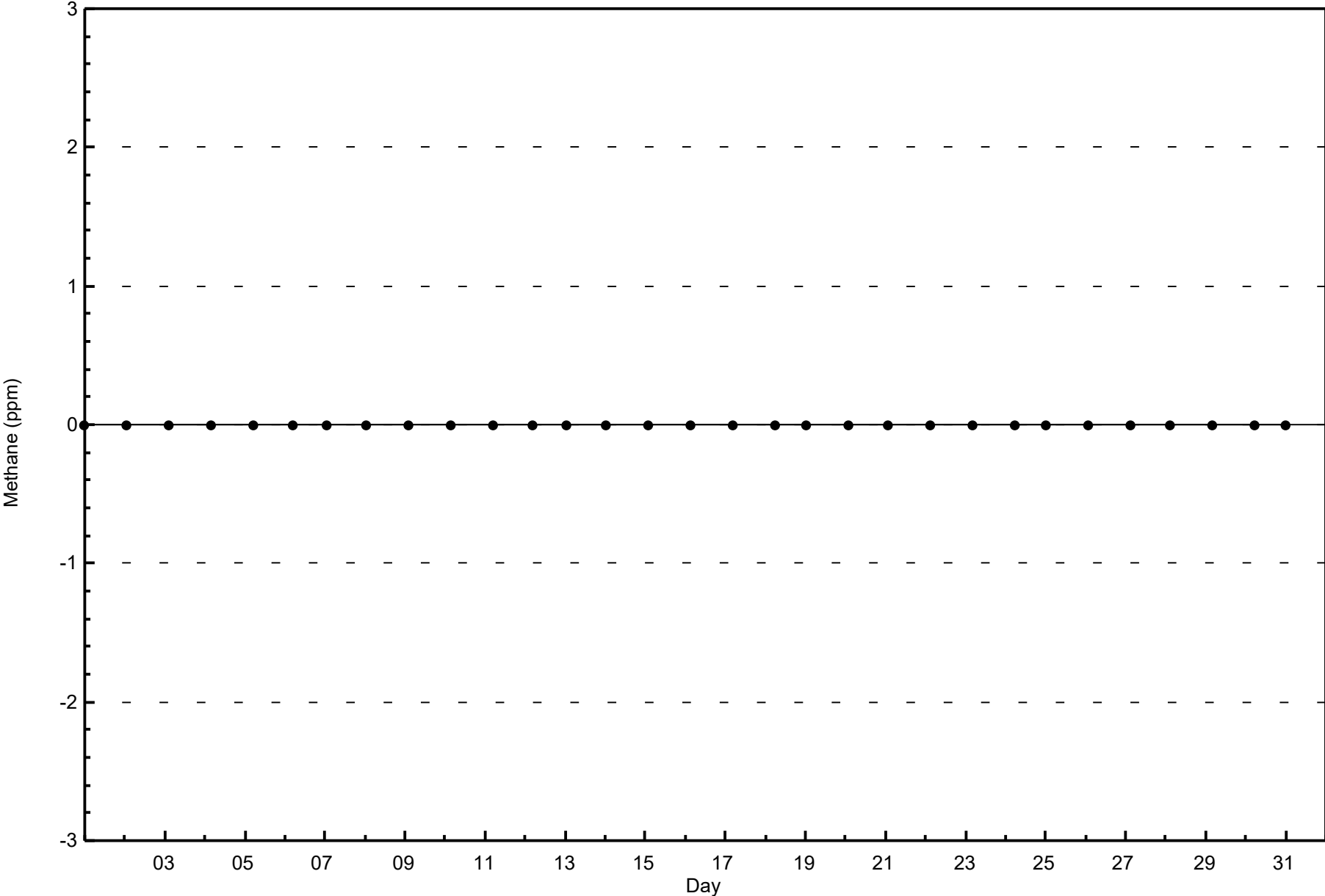
**Wood Buffalo Environmental Association
Frequency Distribution**

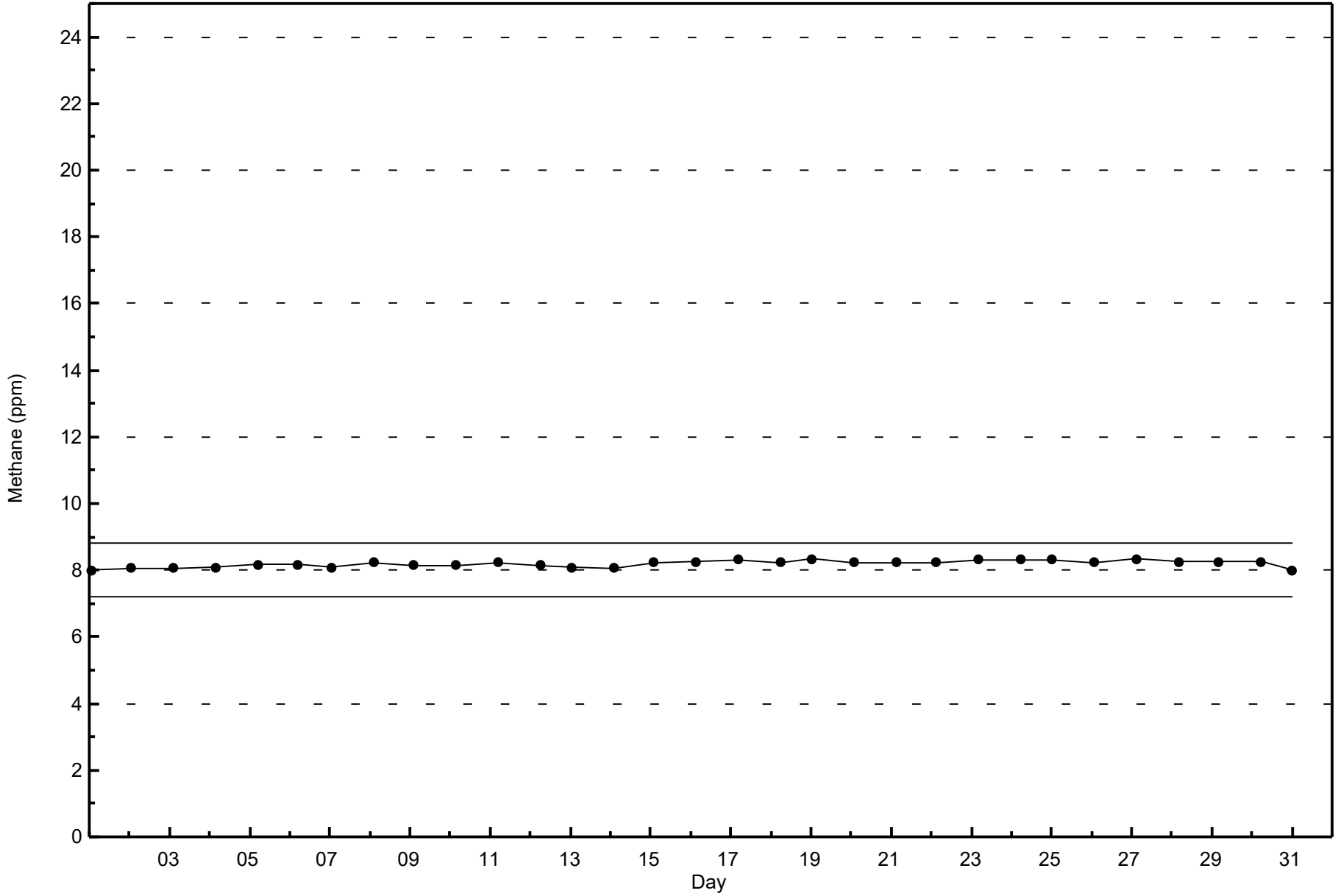
**Methane (CH₄) - ppm
Mildred Lake - August 2023**

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	21	13	4	8	9	9	6	14	25	22	23	17	15	7	4	17	214
2.1 - 3.0	59	14	8	8	4	20	39	60	66	30	18	20	25	24	33	57	485
3.1 - 10.0	0	0	0	0	0	0	1	3	0	0	0	0	0	1	0	0	5
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	80	27	12	16	13	29	46	77	91	52	41	37	40	32	37	74	704

Total Number of Valid Hours: 704

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

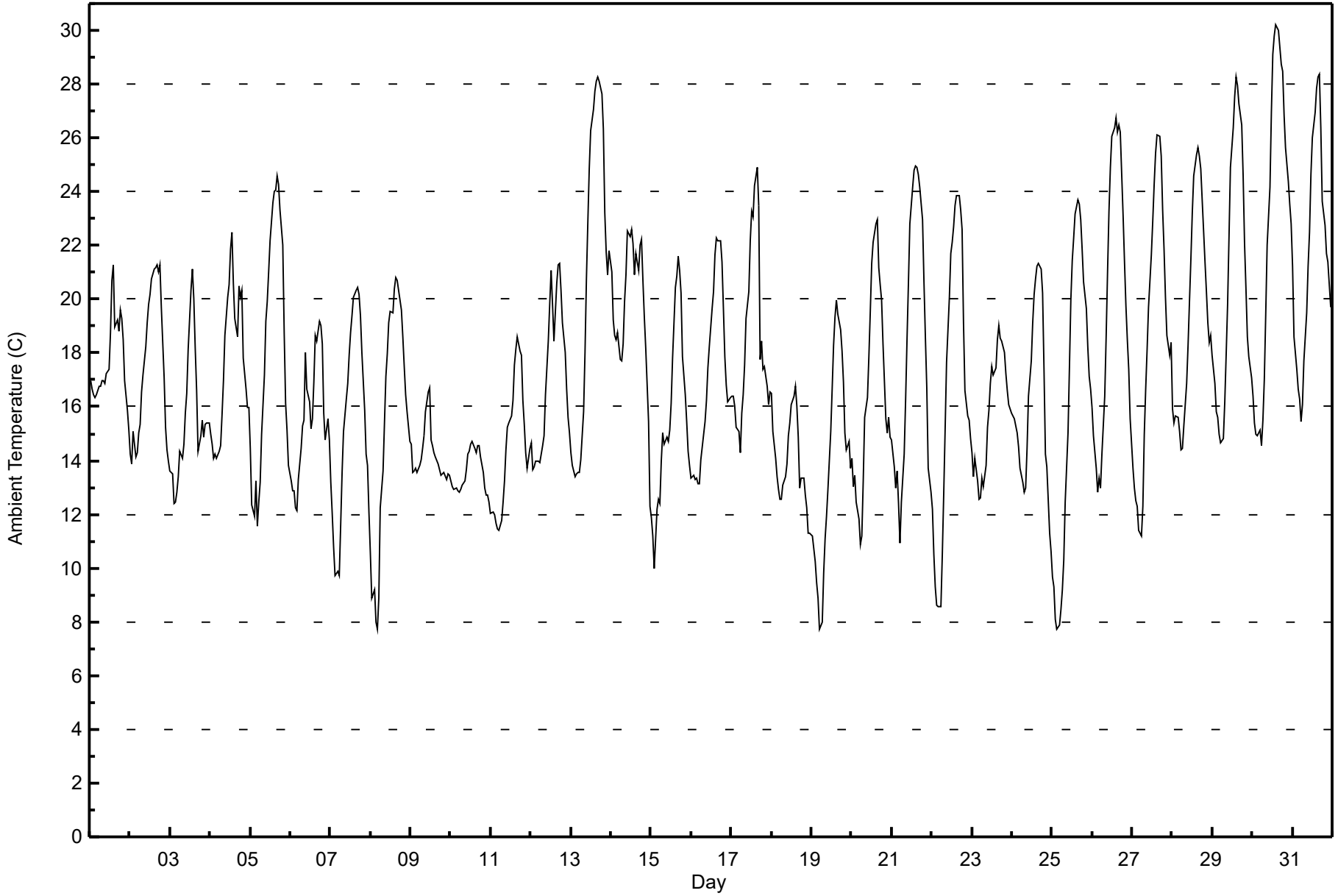
Mildred Lake - August 2023

Maximum Value: 30.2 C on Aug 30 15:00		Maximum Daily Average: 22.7 C on Aug 30		Hours in Service: 744																							
Minimum Value: 7.7 C on Aug 8 05:00		Minimum Daily Average: 13.5 C on Aug 10		Hours of Data: 744																							
Maximum Diurnal Average: 22.0 C at hour 16		Minimum Diurnal Average: 12.8 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 17.26 C		Percentiles: P ₁ = 8.5 P ₁₀ = 12.4 Q ₁ = 14.0 Median = 16.4 Q ₃ = 20.3 P ₉₀ = 23.5 P ₉₉ = 28.3		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-Aug	17.0	16.6	16.4	16.3	16.4	16.7	16.8	17.0	16.9	16.9	17.2	17.4	18.7	20.7	21.3	19.0	19.2	18.8	19.6	19.3	18.5	17.0	15.9	15.2	17.7	21.3	
2-Aug	14.2	13.9	15.1	14.1	14.3	15.0	15.3	16.5	17.2	18.2	19.1	19.8	20.2	20.8	21.1	21.2	21.3	21.0	21.3	19.7	17.1	15.2	14.4	14.0	17.5	21.3	
3-Aug	13.6	13.5	12.4	12.4	12.8	13.4	14.3	14.1	14.6	15.8	16.5	18.2	20.3	21.1	20.0	18.2	16.6	14.4	14.9	15.5	14.9	15.3	15.4	15.4	15.6	21.1	
4-Aug	15.0	14.6	14.1	14.3	14.1	14.3	14.5	15.7	17.0	18.7	20.1	20.6	21.8	22.5	20.6	19.3	18.6	20.5	20.1	20.3	17.8	16.7	16.0	16.0	17.6	22.5	
5-Aug	14.4	12.3	11.9	13.2	11.6	12.4	13.2	15.0	17.2	19.2	19.9	21.0	22.2	23.6	24.0	24.1	24.6	24.3	23.3	22.0	18.8	16.1	15.1	13.8	18.1	24.6	
6-Aug	13.3	12.9	12.9	12.2	12.1	13.3	14.4	15.3	15.5	18.0	16.7	16.2	15.2	15.5	16.9	18.6	18.5	19.2	19.0	18.4	15.8	14.7	15.5	14.8	15.6	19.2	
7-Aug	13.2	12.0	10.8	9.7	9.9	9.7	11.6	13.6	15.1	16.3	16.9	17.9	18.8	19.4	20.1	20.3	20.4	20.2	19.4	18.0	15.9	14.2	13.8	12.1	15.4	20.4	
8-Aug	10.5	8.9	9.2	8.0	7.7	8.9	12.3	13.6	15.4	17.1	18.0	19.1	19.5	19.5	20.4	20.8	20.7	20.3	19.6	18.6	17.5	16.5	15.8	14.7	15.5	20.8	
9-Aug	14.6	13.5	13.6	13.7	13.6	13.8	14.0	14.5	14.9	15.8	16.6	16.7	14.8	14.6	14.3	14.1	13.9	13.7	13.5	13.5	13.5	13.3	13.5	13.4	14.2	16.7	
10-Aug	13.3	13.0	12.9	13.0	12.9	12.8	12.9	13.1	13.2	13.7	14.2	14.3	14.6	14.7	14.5	14.3	14.6	14.6	14.1	13.6	13.0	12.7	12.7	12.4	13.5	14.7	
11-Aug	12.0	12.1	12.0	11.7	11.5	11.4	11.7	12.5	13.2	14.4	15.2	15.4	15.7	16.2	17.5	18.1	18.6	18.1	17.9	16.2	15.4	14.3	13.7	14.5	14.6	18.6	
12-Aug	14.6	13.6	13.7	14.0	14.0	13.9	14.2	14.5	14.9	16.4	18.4	19.8	21.1	19.8	18.4	20.6	21.3	21.3	20.3	19.1	18.0	16.6	15.6	15.0	17.1	21.3	
13-Aug	14.3	13.8	13.4	13.5	13.6	13.6	14.0	15.8	18.0	20.8	22.8	24.9	26.3	27.0	27.8	28.1	28.3	28.1	27.6	26.3	23.2	21.8	20.9	21.8	21.1	28.3	
14-Aug	21.0	19.3	18.7	18.5	18.8	17.8	17.7	18.3	19.9	20.9	22.5	22.4	22.6	22.1	20.9	21.7	21.1	22.0	22.2	20.7	19.3	18.2	15.5	12.3	19.8	22.6	
15-Aug	11.9	11.2	10.0	12.2	12.6	12.4	14.0	15.0	14.6	14.9	14.7	15.1	16.2	17.8	20.4	20.8	21.6	21.0	20.2	17.9	16.4	15.4	14.3	13.8	15.6	21.6	
16-Aug	13.4	13.4	13.3	13.4	13.1	13.1	14.1	15.0	15.5	16.2	17.4	18.2	19.7	20.3	21.7	22.3	22.2	22.2	21.4	19.6	17.8	16.8	16.2	16.3	17.2	22.3	
17-Aug	16.4	16.4	16.0	15.2	15.1	14.3	15.7	16.4	17.5	19.3	20.3	22.2	23.3	23.1	24.2	24.9	23.5	17.7	18.4	17.4	17.5	16.7	16.1	16.5	18.5	24.9	
18-Aug	16.5	15.1	14.1	13.4	12.9	12.6	12.5	13.1	13.4	13.9	14.9	15.4	16.1	16.4	16.7	16.0	14.9	13.0	13.3	13.3	12.7	12.2	11.3	11.3	14.0	16.7	
19-Aug	11.2	10.7	10.3	9.5	8.9	7.7	8.0	9.8	11.1	11.9	12.9	15.1	16.7	18.3	19.3	20.0	19.5	18.9	18.1	16.9	15.0	14.4	14.7	13.7	13.9	20.0	
20-Aug	14.1	13.0	13.5	12.4	11.8	10.9	11.2	13.2	15.6	16.3	17.8	19.6	21.3	22.1	22.8	23.0	21.2	20.5	20.0	18.4	15.6	15.0	15.6	14.8	16.7	23.0	
21-Aug	14.8	13.8	13.0	13.6	12.4	10.9	12.4	14.2	16.3	18.5	20.6	22.8	24.2	24.8	25.0	24.9	24.6	24.2	23.0	20.6	18.6	16.7	13.7	12.8	18.2	25.0	
22-Aug	12.2	10.5	9.3	8.6	8.6	8.6	10.5	12.7	15.2	17.7	20.1	21.7	22.1	22.7	23.5	23.9	23.9	23.4	22.6	19.1	16.6	15.6	15.5	14.8	16.6	23.9	
23-Aug	14.3	13.4	14.1	13.2	12.6	12.6	13.4	13.0	13.8	15.2	15.9	16.9	17.5	17.2	17.4	18.5	19.0	18.6	18.5	18.0	17.2	16.6	16.1	15.9	15.8	19.0	
24-Aug	15.8	15.6	15.3	15.0	14.5	13.7	13.2	12.8	13.0	14.4	16.4	17.7	19.1	20.2	20.8	21.2	21.3	21.1	20.3	17.4	14.3	13.8	11.3	10.6	16.2	21.3	
25-Aug	9.7	9.3	8.1	7.7	7.9	8.5	9.2	10.3	12.5	15.0	17.4	20.0	21.5	22.3	23.2	23.7	23.5	23.0	21.8	20.7	19.7	18.2	17.1	16.6	16.1	23.7	
26-Aug	16.0	14.9	13.7	12.8	13.3	13.0	14.3	16.4	18.6	21.0	23.3	24.9	26.1	26.4	26.8	26.2	26.5	26.2	23.1	21.4	19.8	18.5	17.4	15.6	19.8	26.8	
27-Aug	13.7	13.0	12.5	12.3	11.4	11.2	12.3	15.0	16.7	18.1	19.7	21.6	22.9	24.2	25.4	26.1	26.0	25.3	23.3	21.8	20.1	18.6	17.9	18.4	18.7	26.1	
28-Aug	15.9	15.4	15.7	15.6	15.1	14.4	14.5	15.3	16.9	18.3	19.9	21.5	23.2	24.6	25.4	25.6	25.3	24.9	23.7	21.4	20.3	19.2	18.4	18.6	19.5	25.6	
29-Aug	17.9	16.9	15.8	15.6	15.0	14.7	14.8	16.2	18.0	19.8	22.3	24.9	26.4	27.5	28.3	28.0	27.3	26.5	24.6	22.0	20.4	18.6	17.9	17.1	20.7	28.3	
30-Aug	16.4	15.4	15.0	14.9	15.1	14.5	15.5	17.0	19.5	22.0	24.2	27.0	29.1	29.8	30.2	30.0	29.4	28.8	28.5	26.8	25.6	24.4	23.5	22.8	22.7	30.2	
31-Aug	21.2	18.6	17.4	16.6	16.3	15.4	16.1	17.7	19.5	21.2	22.5	24.6	26.0	26.9	27.8	28.2	28.4	26.4	23.6	22.8	21.7	21.4	20.6	19.7	21.7	28.4	
		14.6	13.8	13.4	13.1	12.9	12.8	13.5	14.6	15.8	17.3	18.5	19.8	20.7	21.4	21.8	22.0	21.8	21.2	20.6	19.3	17.7	16.6	15.9	15.3	Diurnal Average	
		21.2	19.3	18.7	18.5	18.8	17.8	17.7	18.3	19.9	22.0	24.2	27.0	29.1	29.8	30.2	30.0	29.4	28.8	28.5	26.8	25.6	24.4	23.5	22.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Mildred Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mildred Lake - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	25	3.36	3.36
10 - 20	521	70.03	73.39
> 20	198	26.61	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

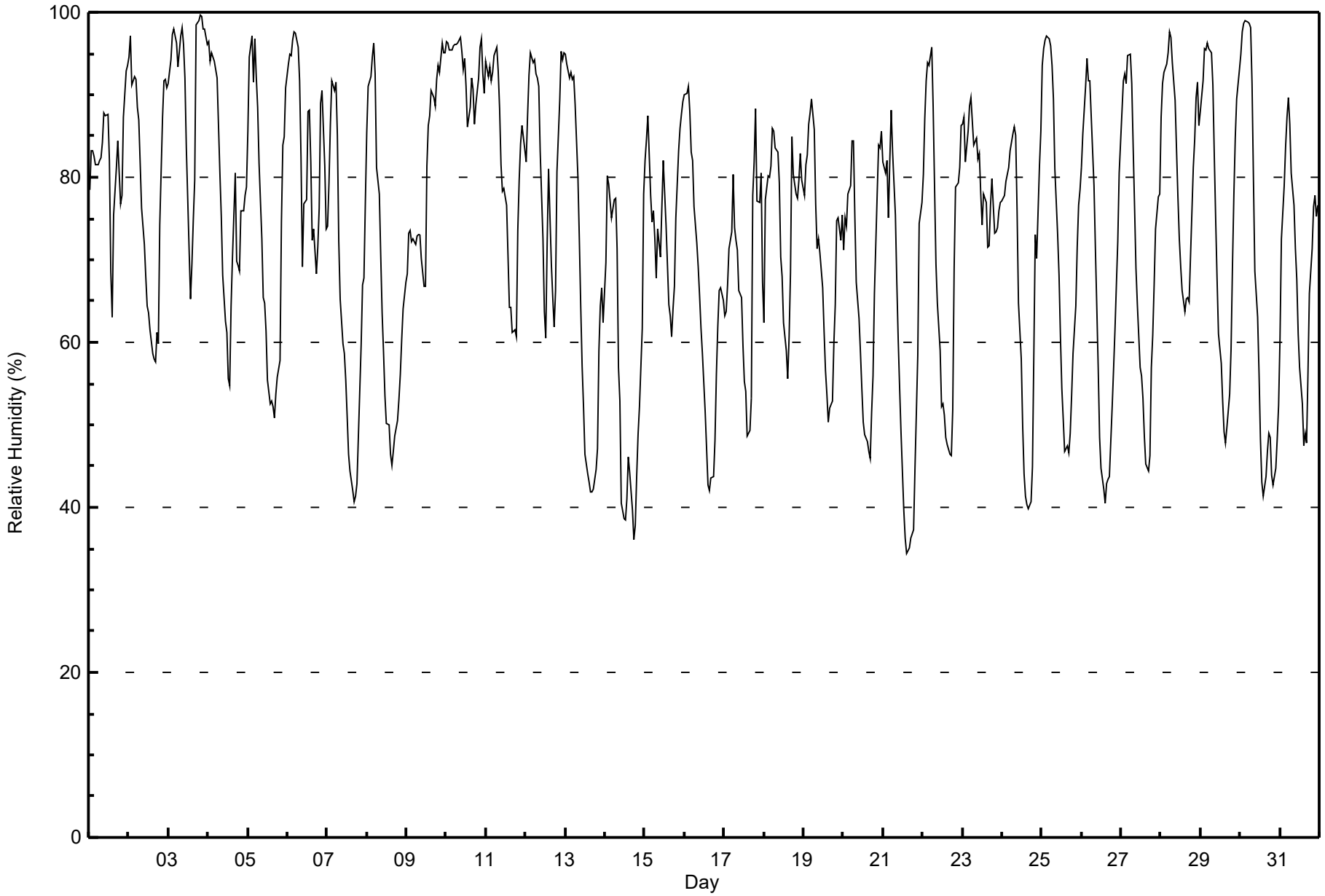
Relative Humidity (RH) - %
Mildred Lake - August 2023

Maximum Value: 99.7 % on Aug 3 20:00 Maximum Daily Average: 93.3 % on Aug 10																						Hours in Service:	744																								
Minimum Value: 34.4 % on Aug 21 15:00 Minimum Daily Average: 56.9 % on Aug 14																						Hours of Data:	744																								
Maximum Diurnal Average: 89.6 % at hour 6 Minimum Diurnal Average: 56.1 % at hour 16																						Hours of Missing Data:	0																								
Monthly Average: 73.49 % Percentiles: P ₁ = 38.1 P ₁₀ = 48.2 Q ₁ = 61.0 Median = 76.4 Q ₃ = 87.6 P ₉₀ = 94.4 P ₉₉ = 98.3																						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-Aug	78.5	83.2	83.2	82.5	81.5	81.5	82.1	82.4	84.3	87.9	87.5	87.6	82.0	68.4	63.0	75.4	81.3	84.4	80.5	76.8	77.8	87.3	92.9	93.6	81.9	93.6																					
2-Aug	94.6	97.1	91.2	92.2	91.8	88.4	87.0	81.6	76.2	71.9	68.0	64.3	63.5	61.6	58.6	57.9	57.6	61.1	59.9	74.2	87.3	91.6	91.8	90.9	77.5	97.1																					
3-Aug	91.3	94.3	97.2	97.9	97.2	96.3	93.3	97.2	98.2	96.1	92.0	83.5	71.2	65.3	69.4	74.9	79.7	98.5	99.0	99.7	99.6	98.0	98.0	96.1	91.0	99.7																					
4-Aug	96.4	94.1	95.1	94.5	94.0	92.1	86.2	80.5	75.3	68.2	62.6	61.2	55.5	54.7	64.3	70.3	80.6	69.9	69.4	68.6	75.9	75.9	77.8	78.9	76.7	96.4																					
5-Aug	85.6	94.5	97.2	91.5	96.8	92.2	88.5	81.7	72.6	65.4	64.8	61.4	55.5	52.5	52.9	52.1	50.8	53.6	55.8	57.8	74.6	83.9	85.0	90.9	73.2	97.2																					
6-Aug	93.8	94.9	94.7	96.5	97.6	97.5	95.7	91.7	82.4	69.2	76.8	77.2	87.9	88.2	81.9	72.3	73.8	68.3	71.5	76.3	88.9	90.5	81.4	73.7	84.3	97.6																					
7-Aug	74.1	79.4	86.5	91.7	90.6	91.5	85.2	72.2	65.3	59.8	58.7	55.5	51.0	46.5	44.5	42.0	40.7	41.3	42.8	48.5	59.6	66.9	67.8	76.9	64.1	91.7																					
8-Aug	85.4	91.0	92.2	94.6	96.3	92.5	81.2	77.9	70.6	63.6	58.7	53.6	50.2	50.0	46.4	45.1	46.8	48.7	50.5	53.1	56.1	60.3	64.0	67.3	66.5	96.3																					
9-Aug	68.2	73.3	73.5	72.3	72.6	71.9	72.9	73.1	73.0	70.2	66.8	66.8	81.4	86.3	87.4	90.6	89.7	88.7	91.9	93.5	92.8	96.2	95.1	95.1	81.0	96.2																					
10-Aug	96.4	96.3	95.4	95.5	96.0	96.2	96.1	96.3	97.0	95.3	93.0	94.4	91.1	86.1	88.4	92.1	90.7	86.4	88.8	92.1	95.8	96.8	92.6	90.2	93.3	97.0																					
11-Aug	94.0	92.3	93.3	91.6	92.7	94.8	95.8	92.9	88.4	81.5	78.3	78.6	76.7	70.5	64.3	64.2	61.2	61.5	60.7	73.5	79.6	84.0	86.2	83.4	80.8	95.8																					
12-Aug	81.8	87.5	92.4	95.0	94.0	94.3	92.5	92.0	91.0	83.3	72.5	63.7	60.4	72.0	81.1	69.4	65.4	61.8	66.3	80.7	89.3	95.3	94.2	95.1	82.1	95.3																					
13-Aug	95.0	93.7	92.1	92.7	91.8	92.2	88.9	80.0	72.5	64.5	57.2	52.2	46.4	44.1	43.1	41.9	41.8	42.2	44.5	47.1	59.1	64.4	66.7	62.4	65.7	95.0																					
14-Aug	69.7	80.2	79.2	77.1	75.1	77.3	77.4	71.4	57.0	52.9	40.6	38.7	38.4	41.0	46.1	44.3	39.7	36.2	37.8	43.8	48.8	52.3	61.7	78.0	56.9	80.2																					
15-Aug	82.1	84.5	87.5	77.8	74.6	75.9	72.6	67.8	73.7	70.3	76.3	82.1	78.2	74.3	64.6	63.2	60.7	64.1	66.7	75.1	83.2	86.0	87.6	89.1	75.7	89.1																					
16-Aug	90.0	90.1	91.0	88.0	83.0	82.1	76.5	72.0	69.1	65.7	61.7	58.7	51.5	47.2	42.7	42.0	43.6	43.7	48.1	56.2	61.9	66.3	66.6	65.0	65.1	91.0																					
17-Aug	63.2	63.7	66.9	71.3	73.4	80.4	73.9	72.4	71.1	66.3	65.4	59.6	55.3	54.0	48.7	49.3	53.3	77.8	81.9	88.4	77.0	76.9	80.5	67.4	68.3	88.4																					
18-Aug	62.4	77.3	80.1	79.9	81.3	85.9	85.7	83.6	83.1	79.4	70.4	67.9	62.4	59.0	55.6	60.6	68.5	84.9	80.3	77.9	77.5	79.6	82.9	79.6	75.2	85.9																					
19-Aug	77.7	81.6	82.8	86.4	87.7	89.5	85.8	76.9	71.4	72.6	70.8	66.6	61.3	56.7	53.8	50.4	52.0	52.9	59.8	64.6	74.7	75.1	72.3	75.4	70.8	89.5																					
20-Aug	71.2	75.1	74.1	77.9	79.0	84.3	84.5	75.2	67.3	63.0	58.7	54.4	50.3	48.9	47.9	46.8	45.9	51.5	55.9	65.9	78.1	83.9	83.5	85.6	67.0	85.6																					
21-Aug	81.9	80.4	82.0	75.1	82.0	88.1	83.1	75.4	67.3	60.3	54.6	49.2	39.6	36.2	34.4	34.8	35.2	36.3	37.3	44.7	51.5	58.4	74.4	76.9	60.0	88.1																					
22-Aug	80.3	87.2	91.6	94.0	93.6	95.8	88.5	78.9	69.6	64.7	59.0	52.3	52.5	51.2	48.5	47.6	46.4	46.3	51.8	68.9	78.8	79.3	81.2	86.2	70.6	95.8																					
23-Aug	86.5	87.3	81.8	85.6	88.6	89.6	86.7	84.0	84.8	82.3	82.8	78.1	74.3	77.9	76.9	71.5	71.6	76.6	79.8	73.2	73.3	73.8	76.0	77.0	80.0	89.6																					
24-Aug	77.2	77.8	79.5	80.3	81.2	83.2	85.2	86.1	85.1	75.9	64.7	57.9	49.9	44.1	41.3	40.3	39.8	40.7	44.9	58.7	73.0	70.2	81.3	85.6	66.8	86.1																					
25-Aug	93.5	95.6	96.6	97.1	96.7	96.0	93.6	89.5	81.0	73.0	68.1	60.7	54.4	50.7	46.7	47.5	46.6	49.0	53.6	58.6	64.4	71.5	76.7	78.5	72.5	97.1																					
26-Aug	81.2	85.2	91.0	94.4	91.6	91.6	87.5	78.9	71.4	64.2	56.9	48.6	44.8	42.2	40.6	42.9	43.5	43.7	52.3	56.8	61.6	66.9	72.1	80.5	66.3	94.4																					
27-Aug	88.0	91.7	92.5	91.3	94.8	94.9	91.4	83.7	76.5	69.0	64.5	57.0	55.9	53.2	48.6	45.3	44.4	46.3	57.0	60.8	67.0	73.7	77.6	78.0	71.0	94.9																					
28-Aug	87.2	91.4	92.7	93.7	95.0	97.6	96.9	93.9	89.4	83.4	77.7	72.6	69.1	66.2	63.8	65.2	65.3	65.0	70.3	81.2	84.5	89.6	91.5	86.3	82.1	97.6																					
29-Aug	88.0	91.6	95.6	95.5	96.2	95.6	95.1	91.1	82.7	75.0	67.6	61.0	57.5	52.9	49.2	47.7	49.7	53.8	59.2	69.2	77.8	84.7	89.6	93.0	75.8	96.2																					
30-Aug	95.0	97.6	98.6	99.0	98.8	98.7	98.1	91.4	79.9	68.7	63.1	56.4	48.4	43.0	41.3	43.8	46.8	49.1	48.5	43.9	42.8	44.8	48.3	52.3	66.6	99.0																					
31-Aug	60.5	72.6	79.0	83.8	87.3	89.7	86.5	80.5	76.6	71.3	67.6	60.9	56.9	52.6	47.4	49.0	47.7	56.3	65.9	71.3	76.5	77.8	75.2	76.6	69.6	89.7																					
																						82.9	86.5	88.0	88.3	88.8	89.6	86.9	82.3	77.5	72.1	68.0	64.0	60.4	58.0	56.2	56.1	56.8	59.4	62.3	67.8	73.8	77.5	79.8	80.8	Diurnal Average	
																						96.4	97.6	98.6	99.0	98.8	98.7	98.1	97.2	98.2	96.1	93.0	94.4	91.1	88.2	88.4	92.1	90.7	98.5	99.0	99.7	99.6	98.0	98.0	96.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mildred Lake - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Mildred Lake - August 2023

Maximum Speed: 19 km/h on Aug 9 12:00	Maximum Daily Speed Average: 12.4 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 4 17:00	Minimum Daily Speed Average: 1.2 km/h on Aug 11	Hours of Data: 740
Maximum Diurnal Speed Average: 2.6 km/h at hour 15	Minimum Diurnal Speed Average: 0.2 km/h at hour 23	Hours of Missing Data: 4
Monthly Average Velocity: 1.0 km/h 226.1 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 16	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-Aug	WSW9	W13	W14	W13	W13	W11	W13	W11	W10	WSW10	WSW9	WSW9	WSW6	WNW11	NW12	W6	S1	S8	SSW7	NW7	NNW8	NNW3	NNW3	NNW5	W7.6	W14
2-Aug	NNW3	W3	NNW2	NNW5	WNW7	WNW6	NNW5	NW8	NNW7	W4	WSW5	WSW6	SSW3	SW5	SW4	ENE3	N4	NNE5	NNE4	NE3	NE2	NE3	ENE5	NE3	NW2.2	NW8
3-Aug	NNE3	N5	SSE2	SSE1	NE4	SE3	SE8	S6	ESE3	SSE5	SSE8	SE10	SSE9	SSE11	SSE15	NNE3	N8	SSE5	SSW6	SSE3	S6	S4	SW1	NNW4	SSE3.4	SSE15
4-Aug	WNW6	WNW10	NW9	NW7	WNW9	W10	W10	W11	W8	W7	W5	WNW7	WNW5	SSW4	SW11	ENE8	SE0	W3	WSW5	W4	NNE3	SW5	WSW8	W7	W5.4	SW11
5-Aug	NW2	ENE2	WSW3	WSW5	SSW4	SW6	SW6	SW5	WNW4	WNW3	NNW8	NW7	SSW0	SE5	ENE5	NNE7	N8	NNE7	NNE5	NNE4	NNE4	N3	NNW3	NNW2.1	NNW8	
6-Aug	UO	NW1	NW1	NNW1	S2	SSE2	SSW4	NNE3	ENE6	ESE6	NNE11	NE11	NNW3	NNW4	N8	NNE7	N7	N7	NNW6	NNW3	NW4	NNW6	N8	N8	N3.7	NE11
7-Aug	N6	N7	N6	N6	N4	NNW1	N5	NNW4	NNW5	NW7	NNW9	NNW11	N10	N11	N13	NNE12	N11	NNE12	NNE9	N8	N6	NNW7	N7	NE6	N7.3	N13
8-Aug	NNE3	N4	N6	N4	NNE4	NE2	SE2	SSE4	SSE7	SE9	ESE10	ESE10	ESE10	E11	E10	E13	ESE13	E14	ESE14	ESE15	ESE14	ESE11	SE9	ESE7	ESE7.1	ESE15
9-Aug	SE9	ESE8	ESE8	SE10	SE9	SE12	SE14	SE14	SE13	SE16	SE16	SSE19	SE15	SE14	SE17	ESE13	E16	E13	ESE10	ESE10	ESE12	ESE10	SE14	SE14	SE12.3	SSE19
10-Aug	ESE15	ESE12	ESE10	ESE11	ESE12	ESE13	ESE12	ESE10	ESE9	E9	E10	ENE8	ENE12	E12	ENE10	NE8	ENE7	ENE9	NE7	NNE7	N6	N7	NNE7	NNE6	E8.0	ESE15
11-Aug	N9	N7	N7	N7	N7	N7	NNW8	N9	N8	NNE6	NW2	SW5	W5	WNW4	WSW4	SSW8	SSW8	SSW8	S7	SSE6	SSE7	SE5	SSE3	SE6	NW1.2	N9
12-Aug	S8	SSE2	WSW4	WSW5	WSW5	WSW7	W9	W8	W7	W7	WNW9	WNW8	S2	NNW1	SW5	SW5	WNW3	NW4	NNW5	SW2	SSW2	SSW4	SW4	SSW4	WSW3.8	W9
13-Aug	SSW5	S4	SSE5	SSE7	SE8	SSE7	SSE10	SSE10	SE10	S7	SSW13	SSW13	SW14	SW15	SW15	SW16	SW14	SW13	WSW9	WSW8	SW5	WSW5	SW5	W7	SSW7.6	SW16
14-Aug	N4	S7	SSW5	WSW6	WNW10	NNW11	NNW2	W6	W9	W13	W14	W14	WSW16	WSW16	W14	WNW15	WNW13	W11	WNW9	WNW9	WNW7	NNW3	WSW0	W8.1	WSW16	
15-Aug	SW3	SW4	SSW4	SSW6	S6	SSE8	SSE7	SE7	ESE6	SE10	S8	SE9	SE11	SSW10	S7	SSE8	SE3	ENE3	NNW10	N14	NNW14	NNW10	NNW8	NNW8	SSE1.7	NNW14
16-Aug	NNW5	NW5	NNW1	NNW7	NW6	NW5	WNW8	NW10	NW12	NW12	NW10	WNW7	W7	WNW9	W10	SW11	SSW13	SSW12	SSW8	S8	S9	S8	S9	S9	W4.8	SSW13
17-Aug	SSE10	SSE12	SE6	SE6	E2	SSE2	SSE9	S8	SSW8	SSW9	SSW9	SW9	WNW10	WNW11	WNW7	SSW6	NNW6	WNW5	ENE4	NW1	NNW11	N6	NNW7	NNW11	SW2.1	SSE12
18-Aug	NNW12	N11	N11	N10	N9	N11	N13	N15	N9	N10	N13	NNW14	NW12	N8	NNW11	NW8	NNW13	NNW9	NNW9	NNW7	NNW9	NNW7	NNW7	NW8	NNW9.9	N15
19-Aug	NW8	WNW8	WNW10	WNW8	W12	WSW7	SW6	SW7	SW6	WSW7	WSW8	WSW9	W11	WSW10	WSW11	WSW14	WSW14	WSW12	SW8	SSW7	S5	SSW6	SW6	SSW6	WSW7.5	WSW14
20-Aug	SW10	SSW9	S7	W3	SW8	SSW8	S9	S7	SW4	NW6	NW5	N3	NW2	NNE4	NNE5	NNW5	NW10	N4	NE3	E3	WSW1	S4	S2	S3	SW1.7	SW10
21-Aug	SSW6	SSW1	SSE4	S8	SSE3	SSE3	S8	S9	S8	SSE8	SSE8	SE7	S9	S8	SSE7	SSE10	SSE9	S10	S9	SSE6	SSE7	SSE5	SSE4	SSE3	S6.5	S10
22-Aug	S3	UO	ENE1	ESE3	E1	S2	SSE6	S8	SSE9	SSE9	SSE9	SSE11	S7	WSW2	S5	SSW6	SW6	NW3	N3	NNE2	NE1	SSE2	S2	ENE2	S3.3	SSE11
23-Aug	NNW4	N4	N5	N4	NNW3	NE2	NNW4	N8	N2	NNW3	S1	WNW3	NNW5	NNW4	NNW5	NNW7	N7	N8	NNW9	N14	N14	N15	N14	N14	N6.4	N15
24-Aug	N17	N19	N15	N15	N15	N15	N16	N16	N16	N16	N16	NNW19	N16	N14	NNW15	NNW12	NNW11	NNW8	NNW6	NNW6	N5	SW1	SW2	N12.4	NNW19	
25-Aug	SSW4	SSW3	SSE2	S3	S5	S8	S6	S10	S9	SSE9	SSE10	S11	SSW12	SW10	SSW10	SSW10	S12	S9	S9	S12	S14	S12	S10	S9	S8.4	S14
26-Aug	S9	SSE4	SE5	E4	ESE5	SE4	SE6	SSE8	S9	S10	SSW12	SSW12	SW13	SW14	WSW11	WNW11	W12	NW10	N14	N14	N11	N10	N6	NNW4	WSW2.3	N14
27-Aug	NW3	W1	NW2	NW2	SSW3	WSW1	NW2	SSE1	SSW4	SSE5	S7	S7	SSW8	SSW8	S8	SSW8	SSW9	SW8	SSW7	S7	S6	S5	S6	SW2	SSW4.2	SSW9
28-Aug	ESE3	S3	SSE4	S5	S5	SSE4	S7	SSE5	SSE4	S6	S8	SSE7	SSE7	SE4	SE6	SE5	SSE7	SE10	SSE5	SE6	SE6	SSE5	SSE6	S8	SSE5.4	SE10
29-Aug	S7	SSE6	S6	S7	S7	S7	S7	S6	SSE9	ESE8	SE8	SE9	SE9	SSE10	S10	S11	S9	S7	SSE6	SSE5	S6	S4	S5	SSW4	SSE6.9	S11
30-Aug	SSW4	SSW3	S5	SSW5	SSW6	SSE4	S8	S7	S5	C	C	SE7	SSE8	SSE9	SSE8	SSE10	SSE12	SSE9	SSE10	SSE10	SSE8	SSE6	SSE7	SE6	SSE6.8	SSE12
31-Aug	S4	NE3	E4	SSW2	S3	SW2	SSW6	SSW8	WSW5	SE4	S5	S6	WSW3	NW7	NW8	NW9	NW7	N13	N11	NNW6	NNW6	NW6	NNW9	NW5	NW2.2	N13

WSW0.7	WNW0.7	WNW0.4	W0.7	WSW1.0	SSW1.1	S1.9	SSW2.0	SSW1.5	S1.8	SSW1.6	SSW2.4	SW2.5	SW2.0	SW2.6	SW1.7	WSW1.3	W0.8	NNW0.4	NNE0.4	NNE0.5	NNW0.2	WSW0.2	NW0.3	Diurnal Average
N17	N19	N15	N15	N15	N15	N16	N16	N16	N16	SE16	SSE19	NNW19	N16	SE17	SW16	E16	E14	N14	ESE15	ESE14	N15	N14	SE14	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

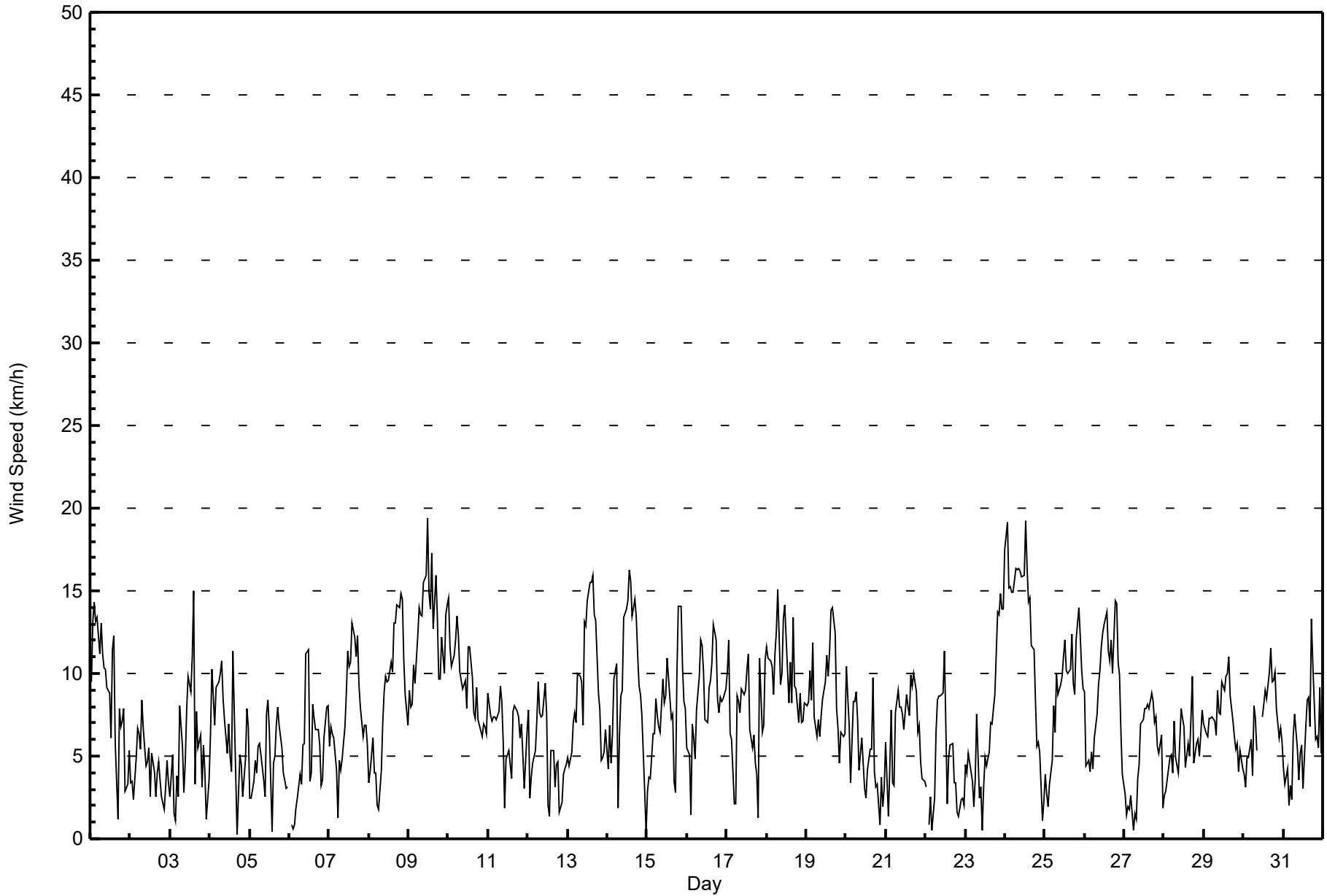
Wind Speed (WS) - km/h
Mildred Lake - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 12 km/h on Aug 17 17:00																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 2 Percent Operational Time: 99.7								
Minimum Value: 0 km/h on Aug 30 03:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 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-Aug	3	5	4	4	5	5	4	4	4	3	3	3	4	4	3	3	2	3	2	1	3	1	1	1	5
2-Aug	2	1	2	1	2	2	1	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	3
3-Aug	1	2	2	2	1	1	3	3	1	2	2	2	3	4	4	4	4	3	3	2	2	2	2	2	4
4-Aug	2	3	2	2	3	3	3	4	3	3	3	2	3	3	4	3	2	1	2	2	1	1	3	3	4
5-Aug	1	2	2	2	1	1	1	1	2	2	2	3	3	2	2	2	2	2	2	1	1	1	1	1	3
6-Aug	UO	1	1	1	1	2	2	4	2	2	5	4	2	2	2	2	1	1	1	1	1	1	2	2	5
7-Aug	1	1	1	1	3	1	1	1	2	2	3	4	4	3	4	4	3	3	3	2	1	1	1	1	4
8-Aug	1	1	2	1	1	1	1	2	2	2	3	3	3	3	3	3	3	3	4	4	4	3	3	2	4
9-Aug	3	2	2	4	3	3	3	4	3	4	4	5	5	5	5	3	3	3	3	4	4	2	5	4	5
10-Aug	4	3	4	3	3	3	3	3	2	2	2	2	3	3	3	2	2	3	2	2	1	1	2	1	4
11-Aug	2	2	1	1	1	1	2	2	2	2	2	1	2	2	3	2	2	2	2	1	1	1	1	2	3
12-Aug	2	2	1	2	2	2	3	2	2	2	3	2	2	3	2	2	2	2	1	1	2	1	1	1	3
13-Aug	1	1	1	1	2	2	3	2	2	2	4	4	5	5	5	5	5	4	3	3	2	2	1	3	5
14-Aug	5	1	2	3	3	3	3	3	3	3	4	4	5	5	5	5	5	4	2	2	2	3	1	1	5
15-Aug	2	1	2	2	1	2	1	2	2	4	3	3	2	2	2	2	3	2	5	4	3	3	1	1	5
16-Aug	2	1	1	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	2	1	1	2	2	2	4
17-Aug	2	3	2	2	1	3	2	2	3	3	2	3	4	3	3	2	12	3	2	2	5	4	2	2	12
18-Aug	3	3	3	3	2	3	3	3	2	3	3	4	3	3	3	2	4	2	2	2	2	1	1	2	4
19-Aug	2	3	3	3	3	3	2	2	3	3	3	3	4	4	4	5	4	4	3	2	2	2	2	2	5
20-Aug	3	3	3	2	3	2	1	1	2	2	2	2	2	2	2	5	3	3	1	2	1	2	1	2	5
21-Aug	2	2	1	2	2	2	3	2	2	2	2	3	3	3	3	3	3	3	2	1	1	1	1	3	3
22-Aug	2	UO	1	2	1	1	2	2	2	2	2	3	2	2	3	2	2	2	1	1	1	1	1	1	3
23-Aug	1	1	1	2	1	1	2	2	2	2	1	2	2	1	2	1	1	1	2	3	3	3	3	3	3
24-Aug	4	4	3	4	4	4	4	4	4	4	4	4	5	5	4	4	3	2	2	1	1	2	1	1	5
25-Aug	1	1	2	1	2	2	2	2	2	2	2	3	4	3	3	3	3	2	2	2	3	2	2	2	4
26-Aug	2	2	1	1	1	1	2	1	2	3	4	4	4	4	4	3	4	5	4	4	3	2	1	1	5
27-Aug	1	1	2	1	1	1	1	1	1	2	2	2	3	2	3	3	2	3	1	1	2	2	2	2	3
28-Aug	1	2	1	1	1	1	1	2	1	2	2	1	2	1	1	1	2	2	2	1	1	1	1	1	2
29-Aug	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	2	1	1	1	1	1	1	1	3
30-Aug	1	1	0	1	1	1	2	3	1	C	C	2	2	2	2	2	2	3	2	3	2	3	2	3	3
31-Aug	2	1	2	1	2	2	2	2	3	2	2	2	2	3	2	3	2	5	3	2	2	3	2	1	5
																	Diurnal Maximum								
																	C - Calibration UO - Unstable Operation								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Mildred Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Mildred Lake - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	243	32.84	32.84
6 - 11	388	52.43	85.27
12 - 19	109	14.73	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: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mildred Lake - August 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	15	8	9	5	4	11	30	26	22	18	16	8	7	16	33	243
6 - 11	43	10	4	6	4	17	27	49	66	28	15	18	22	23	20	36	388
12 - 19	27	2	0	1	5	11	11	4	4	7	8	5	11	2	4	7	109
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	85	27	12	16	14	32	49	83	96	57	41	39	41	32	40	76	740

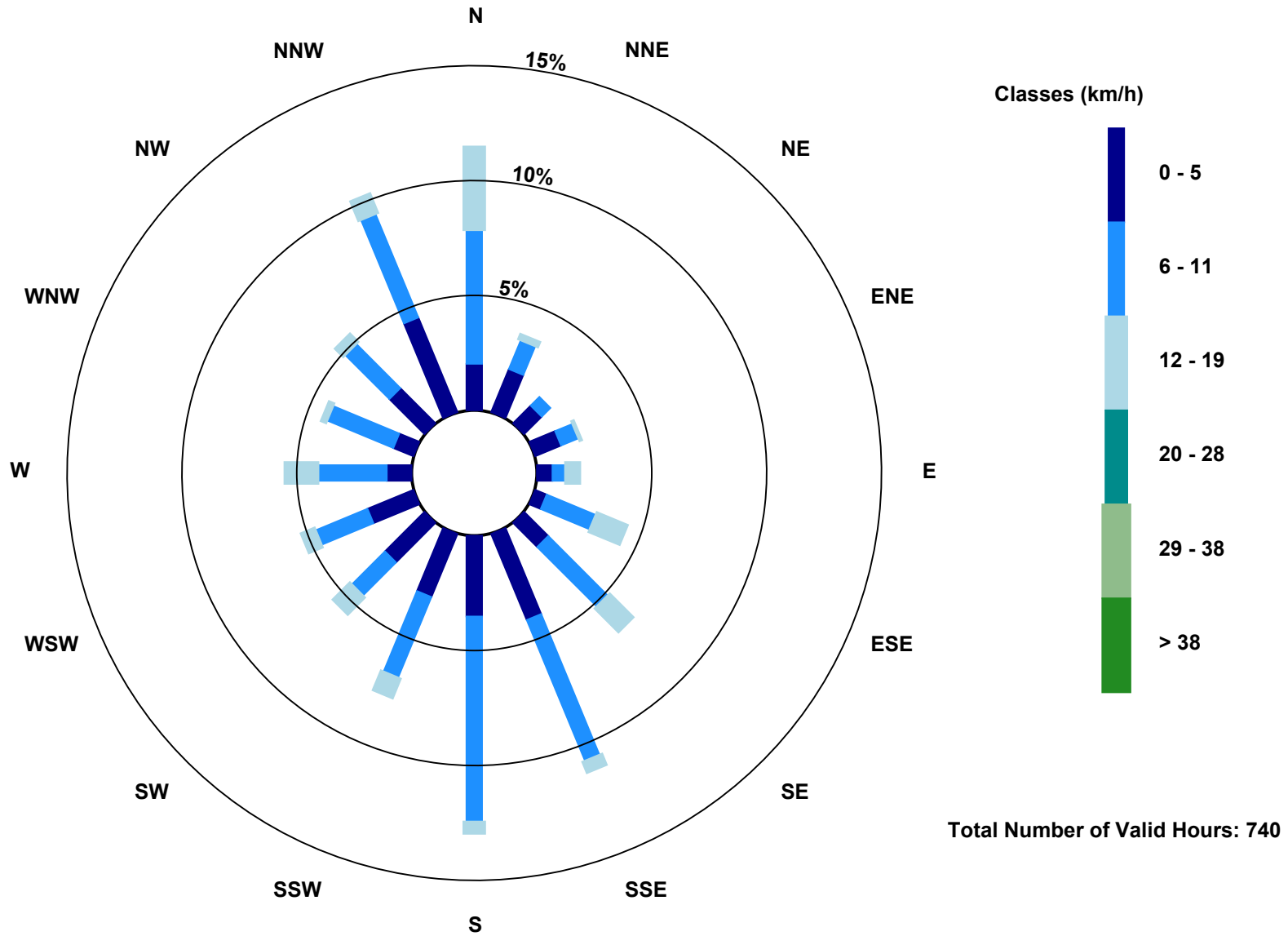
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Mildred Lake





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mildred Lake - August 2023

Direction of Maximum Speed: 147 deg on Aug 9 12:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 353.8 deg on Aug 24	Hours of Data: 740
Direction of Minimum Speed: 146 deg on Aug 4 17:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 1.2 deg on Aug 11	Percent Operational Time: 99.7
Monthly Average Direction: 226.1 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-Aug	242	275	279	275	276	268	278	277	268	246	246	246	248	297	315	278	181	191	207	309	342	346	333	327	273.7
2-Aug	328	259	329	333	301	297	332	310	344	261	245	245	193	219	224	60	10	14	19	50	51	33	71	50	319.3
3-Aug	31	0	165	160	41	141	143	182	110	161	153	145	158	154	149	31	10	154	193	163	175	172	236	329	147.7
4-Aug	292	301	313	306	287	281	277	277	269	266	272	291	292	203	225	59	146	262	240	276	12	224	246	265	275.7
5-Aug	309	73	253	258	211	224	227	230	299	293	338	331	322	194	139	63	18	8	12	14	16	32	7	344	334.1
6-Aug	UO	325	319	337	184	166	192	21	66	116	13	36	344	348	10	20	352	349	344	333	326	327	3	11	8.7
7-Aug	2	354	355	3	358	337	355	347	334	321	334	332	353	7	356	12	10	15	23	2	354	347	10	48	358.5
8-Aug	15	9	357	11	17	37	132	162	162	133	102	119	102	82	93	101	109	100	106	105	110	114	126	117	102.7
9-Aug	124	109	120	137	128	138	142	140	138	141	139	147	140	126	137	106	100	96	111	120	123	105	128	128	127.6
10-Aug	116	117	118	118	109	105	106	109	103	97	83	61	78	85	76	51	59	70	55	33	4	355	26	20	84.4
11-Aug	355	360	350	2	358	355	346	350	354	30	320	230	270	296	241	207	208	199	188	165	153	129	157	134	321.5
12-Aug	176	168	238	240	246	245	277	274	278	279	291	296	171	345	228	236	301	325	342	222	194	204	223	208	256.9
13-Aug	202	183	165	153	139	163	150	153	141	180	198	213	225	231	228	231	228	226	254	251	215	239	233	273	208.0
14-Aug	349	178	211	246	300	338	333	264	270	273	281	279	273	249	256	265	285	283	275	289	287	290	339	251	275.7
15-Aug	232	222	199	203	181	167	152	141	113	138	169	145	143	149	181	160	127	64	343	354	341	344	335	329	151.0
16-Aug	338	322	335	334	325	310	302	305	310	316	307	291	269	289	265	229	209	207	205	191	186	187	181	179	261.5
17-Aug	166	165	143	130	90	148	157	172	193	199	194	222	288	293	282	203	341	287	70	319	333	359	329	327	227.2
18-Aug	335	358	8	3	3	4	2	356	349	350	359	332	326	359	334	306	336	337	339	343	336	339	329	321	345.3
19-Aug	326	297	294	288	271	247	227	229	227	243	255	237	266	254	239	239	243	252	221	206	178	194	217	193	247.1
20-Aug	218	195	184	274	220	210	172	172	220	316	326	356	310	32	16	342	310	355	40	93	251	181	191	183	232.5
21-Aug	193	200	161	176	157	166	179	182	183	162	148	144	176	187	168	165	164	179	173	166	156	147	161	149	169.0
22-Aug	185	UO	71	114	83	185	164	174	168	164	153	163	188	248	176	193	217	306	4	30	56	159	186	62	170.8
23-Aug	341	357	349	354	339	45	341	349	349	339	183	282	344	336	327	346	354	353	348	351	353	355	359	360	349.9
24-Aug	357	357	3	4	5	3	3	1	358	1	6	360	346	354	352	330	338	327	331	339	345	352	225	227	353.8
25-Aug	203	200	165	178	187	179	178	179	170	157	151	169	201	218	211	202	186	186	169	173	175	179	183	180	182.3
26-Aug	169	152	129	90	120	129	145	162	189	187	192	213	219	228	251	293	277	305	5	0	2	353	353	335	240.9
27-Aug	309	268	307	313	196	245	325	157	192	162	184	181	193	198	191	207	203	217	196	175	179	176	171	214	195.2
28-Aug	111	176	168	187	182	160	178	166	154	174	179	158	155	130	140	135	147	144	157	143	144	158	164	173	158.5
29-Aug	172	161	180	179	182	173	178	177	148	120	130	144	146	151	175	181	179	171	168	163	175	183	183	198	165.9
30-Aug	209	199	174	195	193	166	181	177	171	C	C	145	164	163	154	150	149	149	154	168	161	168	147	131	163.1
31-Aug	174	38	92	195	170	220	196	194	243	128	174	174	254	307	318	305	324	1	360	328	333	315	331	323	308.2

247.0 303.4 300.9 271.6 256.1 212.3 190.3 208.4 206.3 188.6 202.1 206.4 226.9 233.1 225.8 228.7 256.6 262.4 341.9 11.8 23.4 335.7 238.1 315.3
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

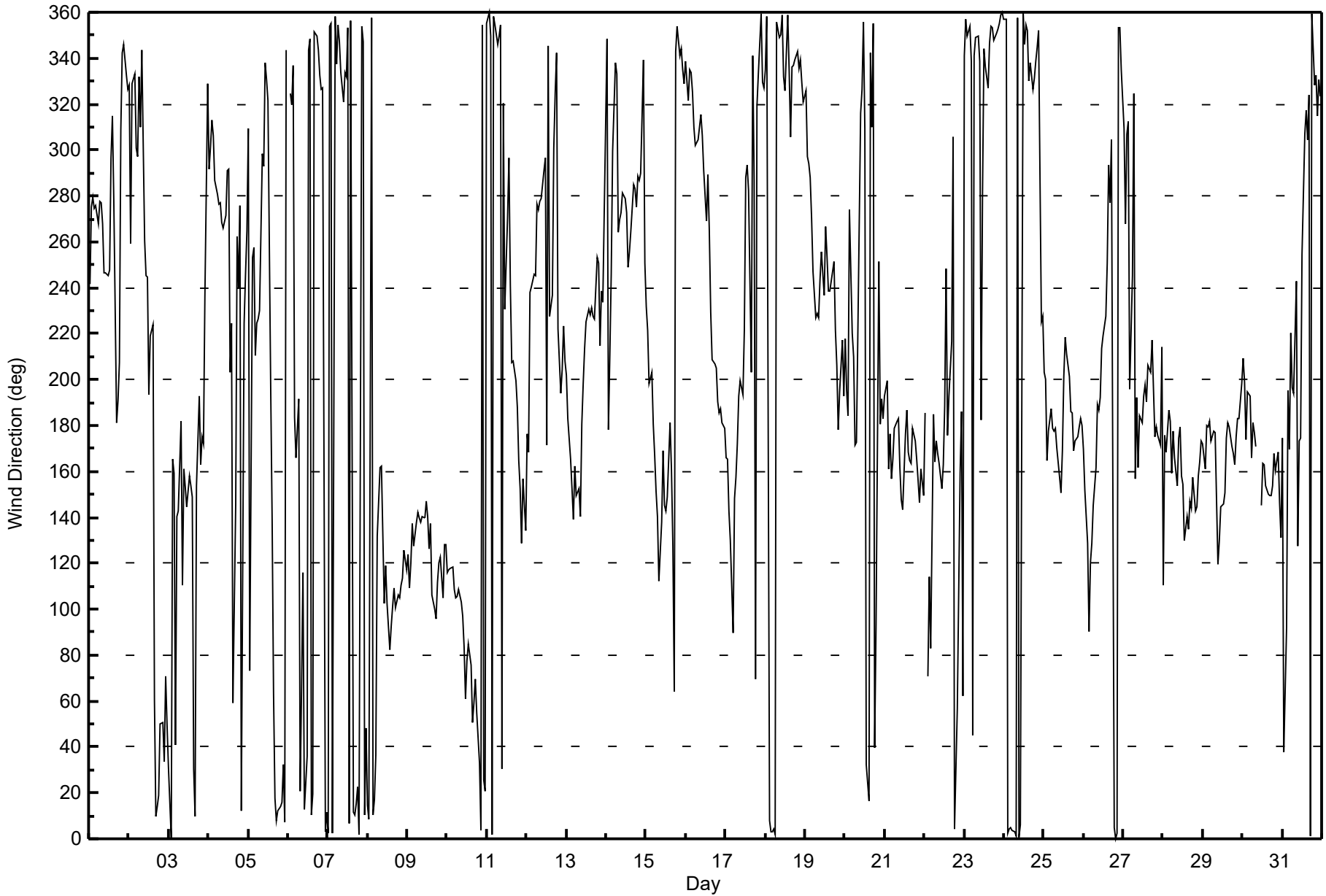
Wind Direction (WD) - deg
Mildred Lake - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Aug 20 13:00 Minimum Value: 7 deg on Aug 7 22:00 Percentiles: P ₁ = 9 P ₁₀ = 13 Q ₁ = 17 Median = 22 Q ₃ = 33 P ₉₀ = 58 P ₉₉ = 89																			Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 2 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-Aug	29	24	22	24	25	30	22	23	28	23	25	27	47	27	23	51	89	21	30	17	27	32	16	16	89
2-Aug	22	28	66	24	16	19	32	22	22	52	53	43	87	49	62	33	49	18	18	11	20	22	19	16	87
3-Aug	44	20	73	81	48	53	32	38	59	34	18	21	31	23	15	80	55	42	34	50	20	36	81	42	81
4-Aug	20	17	13	16	17	18	20	21	28	37	56	30	42	68	28	34	99	38	26	32	74	32	23	24	99
5-Aug	61	48	36	39	13	16	20	22	67	67	23	24	58	99	62	53	29	19	18	17	17	11	18	14	99
6-Aug	UO	67	73	61	33	35	38	79	46	37	28	23	58	71	29	27	19	24	17	19	11	13	14	20	79
7-Aug	20	12	9	11	71	51	14	27	28	27	23	25	30	33	28	26	27	23	21	17	11	7	19	23	71
8-Aug	26	21	12	18	22	51	49	44	27	34	28	28	29	19	24	20	20	15	16	16	17	17	19	20	51
9-Aug	19	18	18	17	19	17	15	15	17	16	17	16	22	21	18	16	13	14	17	21	22	16	23	20	23
10-Aug	20	21	21	19	17	15	15	16	14	17	15	16	16	15	22	19	27	19	23	24	17	14	19	23	27
11-Aug	15	15	11	15	13	13	13	15	14	34	85	32	35	48	72	31	27	24	17	15	9	13	13	17	85
12-Aug	22	58	30	26	27	26	22	22	24	26	30	33	86	90	34	45	62	29	15	54	53	17	19	20	90
13-Aug	17	24	18	10	16	14	12	16	20	44	22	27	28	27	26	27	26	25	34	30	27	27	21	35	44
14-Aug	76	21	42	44	24	16	86	34	29	25	23	24	22	28	25	26	21	23	22	16	17	29	72	87	87
15-Aug	44	41	46	18	20	13	15	19	21	32	28	15	13	15	31	23	85	66	57	16	14	14	13	9	85
16-Aug	17	12	68	15	10	14	17	19	20	16	25	39	42	29	37	28	23	22	23	15	13	13	13	13	68
17-Aug	14	13	35	33	53	88	14	17	22	25	21	29	33	21	34	38	87	66	67	95	31	19	12	8	95
18-Aug	13	15	18	16	19	16	16	16	20	19	21	22	19	25	22	15	17	12	12	17	11	12	12	12	25
19-Aug	12	17	19	20	22	30	35	31	39	30	30	31	29	34	33	28	27	29	34	30	53	19	26	17	53
20-Aug	26	27	59	64	25	23	14	18	54	30	39	68	100	61	50	59	21	35	42	38	59	38	66	57	100
21-Aug	34	88	29	18	67	41	20	15	18	24	25	36	30	35	42	29	23	22	13	13	10	21	18	59	88
22-Aug	17	UO	65	22	67	16	16	17	18	19	20	22	35	89	58	44	27	43	17	59	81	25	16	40	89
23-Aug	15	16	14	20	34	59	70	14	66	36	90	43	22	18	23	12	12	12	11	14	13	15	16	14	90
24-Aug	14	15	16	18	18	18	18	17	17	19	21	18	23	23	18	17	16	11	8	9	8	72	39	72	72
25-Aug	12	28	71	28	26	10	19	12	17	18	15	26	23	26	26	26	17	16	12	13	13	13	13	14	71
26-Aug	15	37	33	32	16	16	18	18	20	21	24	25	27	25	27	23	22	35	20	18	17	13	12	21	37
27-Aug	20	42	64	65	52	78	84	60	30	48	27	26	25	25	26	25	22	25	14	14	20	19	42	62	84
28-Aug	44	35	36	14	16	27	13	29	19	19	15	18	19	32	22	17	18	12	18	11	11	16	9	10	44
29-Aug	10	9	8	8	10	9	9	15	13	20	23	18	19	18	18	17	14	13	13	11	12	19	11	19	23
30-Aug	19	22	8	14	13	29	14	18	21	C	C	34	24	24	21	16	13	12	13	18	21	44	33	33	44
31-Aug	30	44	33	72	52	91	29	20	52	57	33	38	71	27	24	24	34	19	28	28	14	22	14	25	91
Diurnal Maximum																									
C - Calibration UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Mildred Lake - August 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS03 LOWER CAMP METEOROLOGY AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
AUGUST 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	734	0	10	98.66	30.2	-	23.1	-
Temperature 45 m (C) Average	734	0	10	98.66	30.1	-	23.3	-
Temperature 100 m (C) Average	734	0	10	98.66	29.6	-	23.7	-
Temperature 163 m (C) Average	735	0	9	98.79	29.3	-	24.2	-
Relative Humidity 20 m (%) Average	734	0	10	98.66	99.4	-	89.0	-
Relative Humidity 45 m (%) Average	734	0	10	98.66	99	-	88.6	-
Relative Humidity 100 m (%) Average	734	0	10	98.66	94	-	85.9	-
Relative Humidity 163 m (%) Average	734	0	10	98.66	96.4	-	88.7	-
Wind Speed 20 m (km/h) Average	734	0	10	98.66	24	-	13.0	-
Wind Speed 45 m (km/h) Average	734	0	10	98.66	30	-	20.0	-
Wind Speed 100 m (km/h) Average	733	0	11	98.52	38	-	26.0	-
Wind Speed 163 m (km/h) Average	734	0	10	98.66	44	-	32.0	-
Wind Direction 20 m (deg) Average	734	0	10	98.66	-	-	-	-
Wind Direction 45 m (deg) Average	734	0	10	98.66	-	-	-	-
Wind Direction 100 m (deg) Average	733	0	11	98.52	-	-	-	-
Wind Direction 163 m (deg) Average	734	0	10	98.66	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	734	0	10	98.66	0.4	-	-0.1	-
Vertical Wind Speed 45 m (km/h) Average	734	0	10	98.66	1.6	-	0.5	-
Vertical Wind Speed 100 m (km/h) Average	733	0	11	98.52	2.1	-	0.4	-
Vertical Wind Speed 163 m (km/h) Average	734	0	10	98.66	5.1	-	1.5	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP MET TOWER (AMS03)
AUGUST 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	734	17.79	4.2	-	8.5	13.1	14.7	17.1	20.5	23.8	30.2
Temperature 45 m (C) Average	734	17.88	4.2	-	8.4	13.3	14.8	17.2	20.6	23.7	30.1
Temperature 100 m (C) Average	734	17.89	4.1	-	8	13.3	14.8	17.2	20.5	23.5	29.6
Temperature 163 m (C) Average	735	17.79	4	-	7.5	13.2	14.8	17.3	20.4	23.2	29.3
Relative Humidity 20 m (%) Average	734	72.76	17.2	-	31.6	45.5	59.8	76.3	86.9	93.3	99.4
Relative Humidity 45 m (%) Average	734	71.17	16.6	-	31.6	45.9	59.2	73.5	84.9	91.7	99
Relative Humidity 100 m (%) Average	734	66.53	15.2	-	29.2	43.6	55.6	68.3	79.2	85.5	94
Relative Humidity 163 m (%) Average	734	67.13	14.8	-	29.1	46.2	56	68.5	78.7	86.3	96.4
Wind Speed 20 m (km/h) Average	734	7.5	5	-	0	2	4	7	11	14	24
Wind Speed 45 m (km/h) Average	734	10.8	6	-	0	3	6	10	15	20	30
Wind Speed 100 m (km/h) Average	733	13.7	7	-	1	5	8	13	19	25	38
Wind Speed 163 m (km/h) Average	734	16.1	8	-	1	6	10	15	21	29	44
Wind Direction 20 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-
Wind Direction 100 m (deg) Average	733	-	-	-	-	-	-	-	-	-	-
Wind Direction 163 m (deg) Average	734	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	734	-0.29	0.3	-	-1.4	-0.7	-0.5	-0.2	0	0	0.4
Vertical Wind Speed 45 m (km/h) Average	734	0.04	0.3	-	-1.1	-0.4	-0.2	0	0.3	0.5	1.6
Vertical Wind Speed 100 m (km/h) Average	733	0.03	0.4	-	-1.5	-0.5	-0.2	0	0.3	0.5	2.1
Vertical Wind Speed 163 m (km/h) Average	734	0.35	0.7	-	-1.7	-0.3	0	0.2	0.6	1.1	5.1

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	02 Aug 2023 08:00	02 Aug 2023 16:00	9	DAS Failure - data not recorded
ALL PARAMETERS	09 Aug 2023 14:00	09 Aug 2023 14:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction, Vertical Wind Speed 100 m	10 Aug 2023 10:00	10 Aug 2023 10:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Summary of Hour Averages

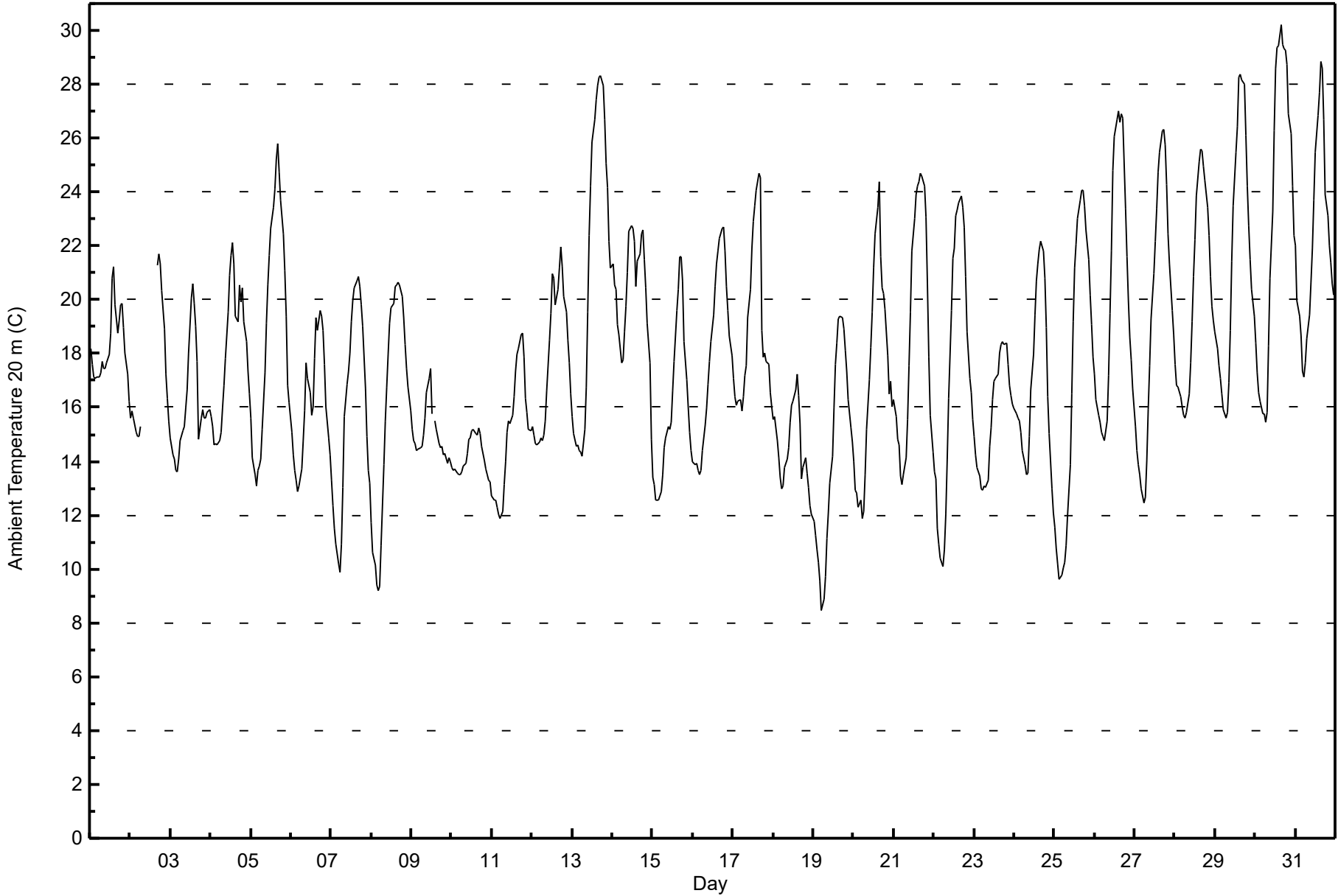
Ambient Temperature 20 m (AT20m) - C
Lower Camp Met Tower - August 2023

Maximum Value: 30.2 C on Aug 30 16:00		Maximum Daily Average: 23.1 C on Aug 30		Hours in Service:	744																						
Minimum Value: 8.5 C on Aug 19 06:00		Minimum Daily Average: 14.2 C on Aug 10		Hours of Data:	734																						
Maximum Diurnal Average: 22.2 C at hour 16		Minimum Diurnal Average: 13.6 C at hour 6		Hours of Missing Data:	10																						
Monthly Average: 17.79 C		Percentiles: P ₁ = 9.7 P ₁₀ = 13.1 Q ₁ = 14.7 Median = 17.1 Q ₃ = 20.5 P ₉₀ = 23.8 P ₉₉ = 28.7		Hours of Calibration:	0																						
				Percent Operational Time:	98.7																						
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-Aug	18.2	17.6	17.2	17.1	17.1	17.1	17.3	17.7	17.5	17.5	17.7	18.0	18.7	20.8	21.2	19.8	18.7	19.2	19.8	19.9	19.0	18.0	17.2	16.2	18.3	21.2	
2-Aug	15.6	15.9	15.6	15.1	14.9	14.9	15.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	21.3	21.7	21.3	20.4	18.9	17.2	16.4	15.5	--	21.7	
3-Aug	14.9	14.3	14.1	13.7	13.6	14.1	14.8	15.1	15.3	16.0	16.7	18.0	20.1	20.6	19.8	19.0	17.7	14.8	15.6	15.9	15.6	15.8	15.9	16.1	20.6	20.6	
4-Aug	15.7	15.3	14.6	14.7	14.6	14.8	15.1	16.0	16.8	17.8	19.6	20.9	21.7	22.1	21.3	19.4	19.2	20.6	19.9	20.5	19.2	18.4	17.3	16.5	18.0	22.1	
5-Aug	15.6	14.1	13.5	13.1	13.7	13.8	14.1	15.2	17.3	19.1	20.5	21.6	22.6	23.4	24.1	25.2	25.8	24.8	23.7	22.4	21.1	19.4	16.8	16.2	19.0	25.8	
6-Aug	15.1	14.2	13.7	13.3	12.9	13.1	13.7	14.8	15.9	17.6	17.1	16.6	15.7	16.0	17.8	19.3	18.9	19.6	19.4	18.9	17.6	16.0	14.9	14.2	16.1	19.6	
7-Aug	13.3	12.3	11.5	10.9	10.2	9.9	10.9	13.0	15.6	16.9	17.3	18.0	19.2	20.0	20.4	20.7	20.8	20.5	19.8	19.0	16.7	14.9	13.7	13.2	15.8	20.8	
8-Aug	11.7	10.6	10.1	9.4	9.2	9.4	10.9	13.9	15.5	16.7	18.0	19.1	19.7	19.9	20.5	20.6	20.7	20.5	20.1	19.3	18.4	17.5	16.7	15.9	16.0	20.7	
9-Aug	15.2	14.8	14.7	14.4	14.5	14.5	14.6	15.0	15.6	16.5	17.1	17.4	15.7	DF	15.5	15.2	14.7	14.5	14.6	14.2	14.3	13.9	14.1	14.0	15.0	17.4	
10-Aug	13.8	13.7	13.7	13.5	13.5	13.5	13.6	13.8	13.9	14.3	14.8	14.9	15.2	15.2	15.0	15.0	15.2	15.0	14.5	14.0	13.7	13.5	13.3	13.2	14.2	15.2	
11-Aug	12.7	12.5	12.6	12.3	12.0	11.9	12.2	13.1	14.0	15.1	15.5	15.4	15.7	16.4	17.4	18.0	18.2	18.7	18.8	17.8	16.3	15.8	15.2	15.1	15.1	18.8	
12-Aug	15.3	15.0	14.7	14.6	14.7	14.9	14.8	15.0	15.5	16.6	18.5	19.5	21.0	20.8	19.8	20.4	21.2	21.9	21.2	20.1	19.5	18.5	17.7	16.5	17.8	21.9	
13-Aug	15.7	15.0	14.6	14.6	14.4	14.3	14.2	15.2	16.8	19.5	22.4	24.2	25.9	26.7	27.4	27.9	28.3	28.3	28.0	26.7	25.1	24.2	22.2	21.2	21.4	28.3	
14-Aug	21.4	20.5	20.4	19.1	18.7	17.7	17.8	18.8	19.8	21.0	22.5	22.7	22.7	22.2	20.5	21.4	21.7	22.5	22.6	21.5	20.4	19.1	17.6	14.8	20.3	22.7	
15-Aug	13.4	13.2	12.6	12.6	12.7	12.9	13.5	14.5	14.9	15.3	15.2	15.4	16.6	17.7	19.6	20.4	21.6	21.6	20.7	18.4	17.0	16.0	15.1	14.4	16.0	21.6	
16-Aug	14.0	13.8	13.9	13.6	13.5	13.6	14.4	15.3	16.0	16.9	17.7	18.4	19.4	20.5	21.3	21.8	22.3	22.6	22.7	21.8	20.5	19.6	18.6	17.9	17.9	22.7	
17-Aug	17.1	16.4	16.1	16.3	16.3	15.9	16.4	17.2	17.6	19.3	20.4	21.9	22.9	23.5	24.1	24.7	24.5	18.9	17.9	18.0	17.7	17.6	16.6	16.0	18.9	24.7	
18-Aug	15.6	15.6	14.7	14.1	13.4	13.0	13.1	13.8	14.1	14.5	15.4	16.1	16.2	16.7	17.2	16.4	15.4	13.4	13.8	14.1	13.6	13.0	12.3	12.0	14.5	17.2	
19-Aug	11.8	11.2	10.7	10.3	9.6	8.5	8.9	9.7	11.1	12.1	13.2	14.2	16.0	17.6	18.4	19.3	19.4	19.3	18.9	18.1	17.3	16.3	15.2	14.7	14.2	19.4	
20-Aug	14.0	12.9	12.8	12.3	12.6	11.9	12.1	13.5	15.2	17.0	18.2	19.5	21.2	22.4	23.5	24.4	21.6	20.4	20.2	19.6	17.9	16.5	17.0	16.0	17.2	24.4	
21-Aug	16.3	15.7	14.8	14.6	13.5	13.1	13.5	14.1	15.6	17.5	19.6	21.8	23.0	23.9	24.2	24.4	24.7	24.6	24.2	23.1	20.6	17.8	15.7	14.4	18.8	24.7	
22-Aug	13.6	13.3	11.5	10.9	10.4	10.1	10.7	12.0	14.1	16.4	19.6	21.5	21.9	23.1	23.3	23.6	23.9	23.4	22.7	20.8	18.8	17.1	16.5	15.5	17.3	23.9	
23-Aug	14.9	14.3	13.8	13.5	13.0	12.9	13.1	13.0	13.3	14.5	15.3	16.3	17.0	17.1	17.2	18.0	18.3	18.4	18.3	18.4	17.6	16.8	16.4	16.1	15.7	18.4	
24-Aug	16.0	15.7	15.6	15.5	15.1	14.4	13.9	13.5	13.6	14.9	16.7	18.0	19.4	20.7	21.3	21.8	22.2	21.8	20.8	19.0	16.4	15.0	13.0	12.1	16.9	22.2	
25-Aug	11.6	10.8	10.2	9.6	9.8	10.0	10.2	10.9	12.0	13.9	16.5	19.2	21.2	22.1	23.0	23.7	24.0	24.1	23.5	22.6	21.5	20.2	19.1	17.9	17.0	24.1	
26-Aug	17.2	16.3	15.7	15.4	15.1	14.9	14.8	15.5	17.2	19.5	21.8	24.8	26.1	26.7	27.0	26.6	26.9	26.8	23.4	21.6	19.9	18.6	17.8	16.7	20.3	27.0	
27-Aug	15.3	14.4	13.9	13.5	13.0	12.5	12.7	14.0	15.9	17.5	19.3	21.0	22.2	23.4	24.8	25.5	26.3	26.3	25.7	24.3	22.4	21.4	19.6	18.7	19.3	26.3	
28-Aug	17.6	16.8	16.8	16.4	16.0	15.7	15.6	15.8	16.5	17.7	19.2	20.9	22.2	23.8	25.1	25.6	25.6	25.0	24.4	23.4	22.4	20.8	19.7	19.3	20.1	25.6	
29-Aug	18.8	18.2	17.5	17.1	16.5	15.9	15.6	15.8	16.9	18.9	21.4	23.5	25.5	26.4	28.2	28.4	28.2	28.0	26.1	24.2	22.7	21.5	20.4	19.4	21.5	28.4	
30-Aug	18.4	17.3	16.5	16.2	15.8	15.7	15.5	15.8	18.3	20.8	23.3	26.3	28.6	29.4	29.4	30.2	29.5	29.3	29.3	28.8	26.9	26.1	24.2	22.4	23.1	30.2	
31-Aug	22.0	19.9	19.4	18.7	17.3	17.1	17.7	18.6	19.4	20.6	21.9	23.7	25.5	26.9	27.7	28.8	28.6	26.7	23.9	23.1	22.0	21.4	20.6	20.2	22.2	28.8	
		15.5	14.9	14.4	14.1	13.8	13.6	13.9	14.7	15.7	17.1	18.4	19.6	20.6	21.6	21.9	22.2	22.1	21.7	21.2	20.3	19.1	18.0	17.0	16.2	Diurnal Average	
		22.0	20.5	20.4	19.1	18.7	17.7	17.8	18.8	19.8	21.0	23.3	26.3	28.6	29.4	29.4	30.2	29.5	29.3	29.3	28.8	26.9	26.1	24.2	22.4	Diurnal Maximum	
DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

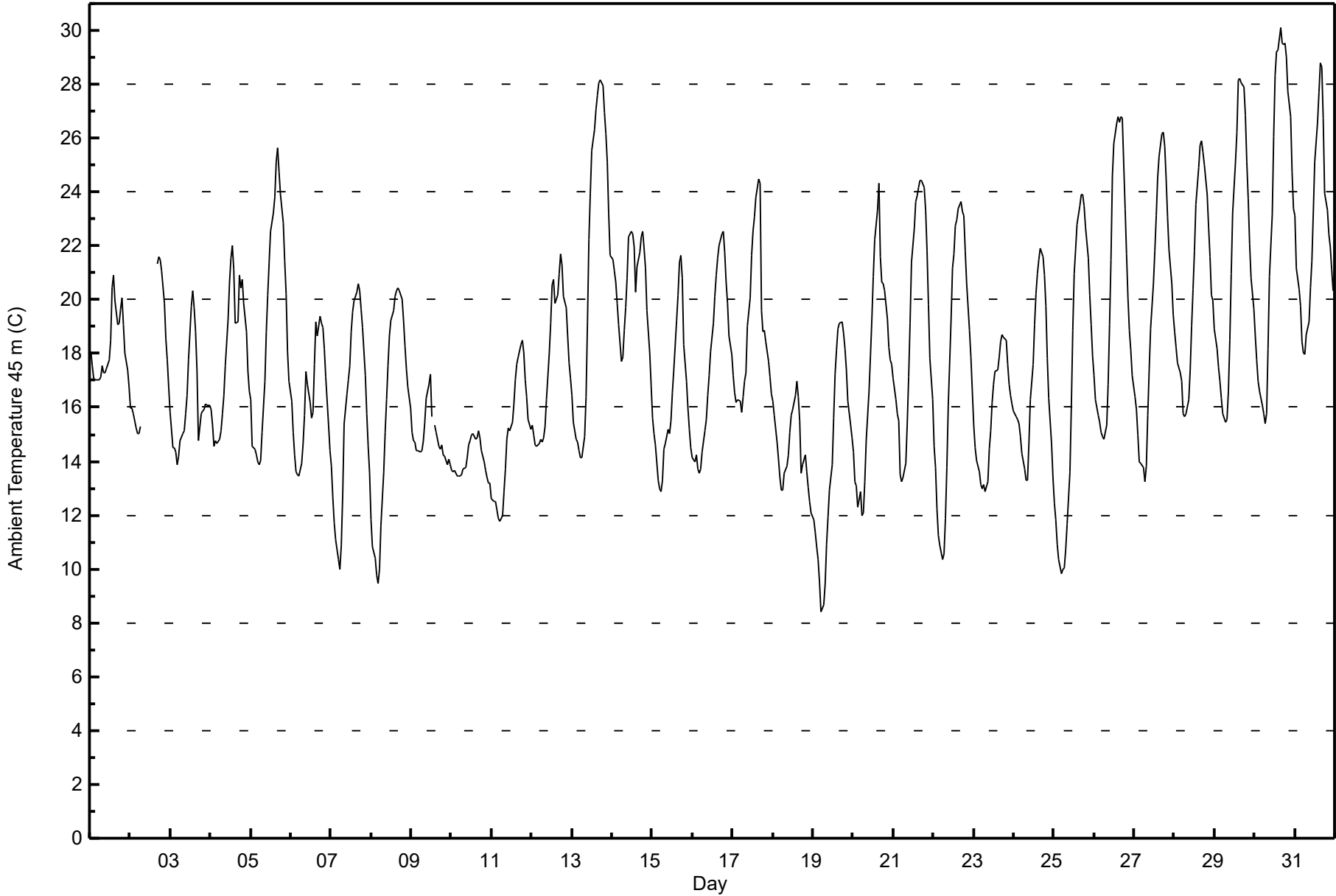
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	10	1.36	1.36
10 - 20	517	70.44	71.80
> 20	207	28.20	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



Maximum Value: 30.1 C on Aug 30 16:00		Maximum Daily Average: 23.3 C on Aug 30		Hours in Service: 744																							
Minimum Value: 8.4 C on Aug 19 06:00		Minimum Daily Average: 14.1 C on Aug 10		Hours of Data: 734																							
Maximum Diurnal Average: 22.0 C at hour 16		Minimum Diurnal Average: 13.7 C at hour 6		Hours of Missing Data: 10																							
Monthly Average: 17.88 C		Percentiles: P ₁ = 10.0 P ₁₀ = 13.3 Q ₁ = 14.8 Median = 17.2 Q ₃ = 20.6 P ₉₀ = 23.7 P ₉₉ = 28.7		Hours of Calibration: 0																							
				Percent Operational Time: 98.7																							
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-Aug	18.1	17.5	17.1	17.0	17.0	17.0	17.2	17.5	17.3	17.3	17.5	17.8	18.5	20.4	20.9	20.0	19.1	19.1	19.7	20.1	19.1	18.0	17.4	16.8	18.2	20.9	
2-Aug	16.0	16.0	15.8	15.2	15.0	15.0	15.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	21.3	21.6	21.5	21.1	19.9	18.6	17.7	16.8	--	21.6	
3-Aug	15.8	14.5	14.5	14.4	13.8	14.2	14.8	15.0	15.1	15.8	16.4	17.8	19.7	20.4	19.7	18.8	17.4	14.8	15.8	15.9	15.9	16.1	16.1	16.1	16.2	20.4	
4-Aug	15.9	15.3	14.6	14.7	14.6	14.8	15.1	15.8	16.5	17.6	19.3	20.6	21.5	22.0	21.1	19.2	19.2	20.9	20.4	20.8	19.9	18.8	17.3	16.6	18.0	22.0	
5-Aug	16.3	14.5	14.4	14.2	14.0	13.9	14.0	15.1	17.0	18.8	20.2	21.4	22.5	23.2	23.8	25.1	25.7	24.7	23.9	22.8	21.5	20.2	18.1	17.0	19.3	25.7	
6-Aug	16.2	15.1	14.2	13.6	13.5	13.4	13.9	14.7	15.7	17.4	16.9	16.2	15.6	15.8	17.6	19.2	18.6	19.4	19.1	19.0	18.2	17.1	15.4	14.4	16.3	19.4	
7-Aug	13.8	12.7	11.7	11.1	10.4	10.0	10.9	12.8	15.4	16.5	17.0	17.6	18.8	19.5	20.0	20.3	20.6	20.3	19.7	19.0	17.2	15.7	14.6	13.5	15.8	20.6	
8-Aug	11.8	10.8	10.4	9.8	9.4	10.0	11.6	13.6	15.1	16.3	17.5	18.6	19.2	19.6	20.1	20.3	20.4	20.3	20.0	19.3	18.3	17.4	16.8	16.0	15.9	20.4	
9-Aug	15.1	14.8	14.7	14.4	14.4	14.3	14.4	14.8	15.4	16.3	16.8	17.2	15.6	DF	15.4	15.1	14.6	14.4	14.6	14.2	14.2	13.9	14.1	13.9	14.9	17.2	
10-Aug	13.7	13.6	13.7	13.5	13.4	13.5	13.5	13.7	13.8	14.2	14.6	14.8	15.0	15.1	14.8	14.9	15.1	14.9	14.4	14.0	13.6	13.4	13.2	13.2	14.1	15.1	
11-Aug	12.6	12.5	12.5	12.2	11.9	11.8	12.0	12.9	13.7	14.8	15.3	15.1	15.5	16.1	17.0	17.6	17.9	18.3	18.5	18.0	17.0	16.4	15.6	15.2	15.0	18.5	
12-Aug	15.4	15.0	14.6	14.6	14.7	14.8	14.7	14.9	15.3	16.3	18.0	19.1	20.5	20.7	19.9	20.2	21.0	21.7	21.3	20.1	19.7	18.7	17.7	17.1	17.7	21.7	
13-Aug	16.5	15.4	14.8	14.7	14.4	14.2	14.1	14.9	16.4	19.2	22.2	24.0	25.6	26.3	27.1	27.6	28.0	28.2	27.9	27.0	26.2	25.1	23.2	21.6	21.4	28.2	
14-Aug	21.5	21.1	20.6	19.9	19.1	17.7	17.8	18.9	19.7	20.8	22.3	22.6	22.4	22.0	20.3	21.2	21.7	22.3	22.5	21.9	21.2	19.6	18.0	16.8	20.5	22.6	
15-Aug	15.6	15.0	14.6	13.3	13.0	12.9	13.3	14.4	14.6	15.2	15.0	15.5	16.5	17.4	19.3	20.2	21.4	21.7	20.8	18.4	17.0	16.0	15.2	14.5	16.3	21.7	
16-Aug	14.2	14.0	14.2	13.7	13.6	13.7	14.4	15.1	15.6	16.4	17.2	18.1	19.1	20.1	20.9	21.5	22.0	22.5	22.6	21.8	20.7	19.9	18.6	17.9	17.8	22.6	
17-Aug	17.2	16.6	16.2	16.3	16.2	15.8	16.4	17.0	17.3	19.0	20.1	21.6	22.5	23.1	23.8	24.5	24.3	19.6	18.8	18.8	18.4	17.7	17.1	16.5	19.0	24.5	
18-Aug	16.2	15.7	14.7	14.1	13.4	12.9	12.9	13.5	13.8	14.2	15.1	15.7	15.9	16.5	17.0	16.4	15.5	13.6	13.9	14.2	13.6	13.0	12.5	12.1	14.4	17.0	
19-Aug	11.8	11.4	10.8	10.4	9.5	8.4	8.7	9.4	10.9	11.9	12.9	13.9	15.6	17.2	18.1	18.9	19.1	19.2	18.8	18.2	17.4	16.2	15.4	14.9	14.1	19.2	
20-Aug	14.3	13.3	13.1	12.3	12.9	12.0	12.1	13.3	14.8	16.6	17.9	19.3	20.9	22.2	23.3	24.3	21.6	20.7	20.6	20.3	19.3	18.2	17.8	17.6	17.4	24.3	
21-Aug	17.1	16.3	15.7	15.5	13.5	13.2	13.4	13.9	15.4	17.1	19.1	21.4	22.6	23.6	23.9	24.2	24.4	24.5	24.2	23.3	21.8	19.8	17.8	16.3	19.1	24.5	
22-Aug	14.6	13.7	12.3	11.3	10.9	10.4	10.6	11.9	13.8	16.1	19.3	21.2	21.7	22.7	22.9	23.4	23.6	23.3	23.1	21.8	20.6	18.8	17.8	16.6	17.6	23.6	
23-Aug	15.4	14.5	14.0	13.6	13.1	13.0	13.2	12.9	13.2	14.4	15.1	16.2	16.9	17.4	17.8	18.4	18.7	18.6	18.5	17.6	16.9	16.4	16.1	15.8	18.7	18.7	
24-Aug	15.9	15.7	15.5	15.4	14.9	14.3	13.7	13.3	13.3	14.6	16.3	17.6	19.1	20.2	20.9	21.5	21.9	21.6	20.9	19.8	17.8	16.3	14.6	13.4	17.0	21.9	
25-Aug	12.5	11.8	10.9	10.3	9.8	10.0	10.0	10.7	11.7	13.6	16.1	18.8	21.0	21.9	22.8	23.5	23.9	23.9	23.5	22.7	21.6	20.2	19.1	17.9	17.0	23.9	
26-Aug	17.2	16.3	15.7	15.4	15.1	14.9	14.8	15.3	16.9	19.1	21.5	24.6	25.8	26.5	26.8	26.6	26.8	26.7	23.4	21.7	20.1	18.9	18.1	17.2	20.2	26.8	
27-Aug	16.4	15.9	15.0	14.0	13.9	13.8	13.2	13.8	15.7	17.4	18.9	20.6	21.8	23.1	24.5	25.3	26.2	26.2	25.7	24.5	23.0	21.8	20.6	19.5	19.6	26.2	
28-Aug	18.8	18.3	17.7	17.3	17.0	15.7	15.6	15.8	16.3	17.4	19.0	20.4	21.8	23.5	24.9	25.7	25.9	25.5	25.0	23.9	22.7	21.6	20.2	20.0	20.4	25.9	
29-Aug	18.9	18.2	17.5	17.0	16.4	15.8	15.4	15.5	16.6	18.5	21.0	23.2	25.1	26.2	28.2	28.2	28.1	27.9	26.8	25.1	23.7	22.1	20.8	19.6	21.5	28.2	
30-Aug	18.7	17.8	17.0	16.6	16.1	15.8	15.4	15.8	18.2	20.9	23.2	26.1	28.3	29.2	29.3	30.1	29.5	29.5	29.5	29.0	27.7	26.8	24.8	23.4	23.3	30.1	
31-Aug	23.1	21.2	20.4	19.8	18.4	18.0	18.0	18.7	19.2	20.5	21.5	23.2	25.1	26.6	27.7	28.8	28.7	26.8	24.0	23.3	22.5	22.0	21.1	20.3	22.4	28.8	
		16.0	15.3	14.8	14.4	14.0	13.7	13.9	14.5	15.4	16.8	18.1	19.3	20.3	21.3	21.6	22.0	21.7	21.3	20.6	19.6	18.6	17.5	16.7	Diurnal Average		
		23.1	21.2	20.6	19.9	19.1	18.0	18.0	18.9	19.7	20.9	23.2	26.1	28.3	29.2	29.3	30.1	29.5	29.5	29.5	29.0	27.7	26.8	24.8	23.4	Diurnal Maximum	
DF - DAS Failure																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

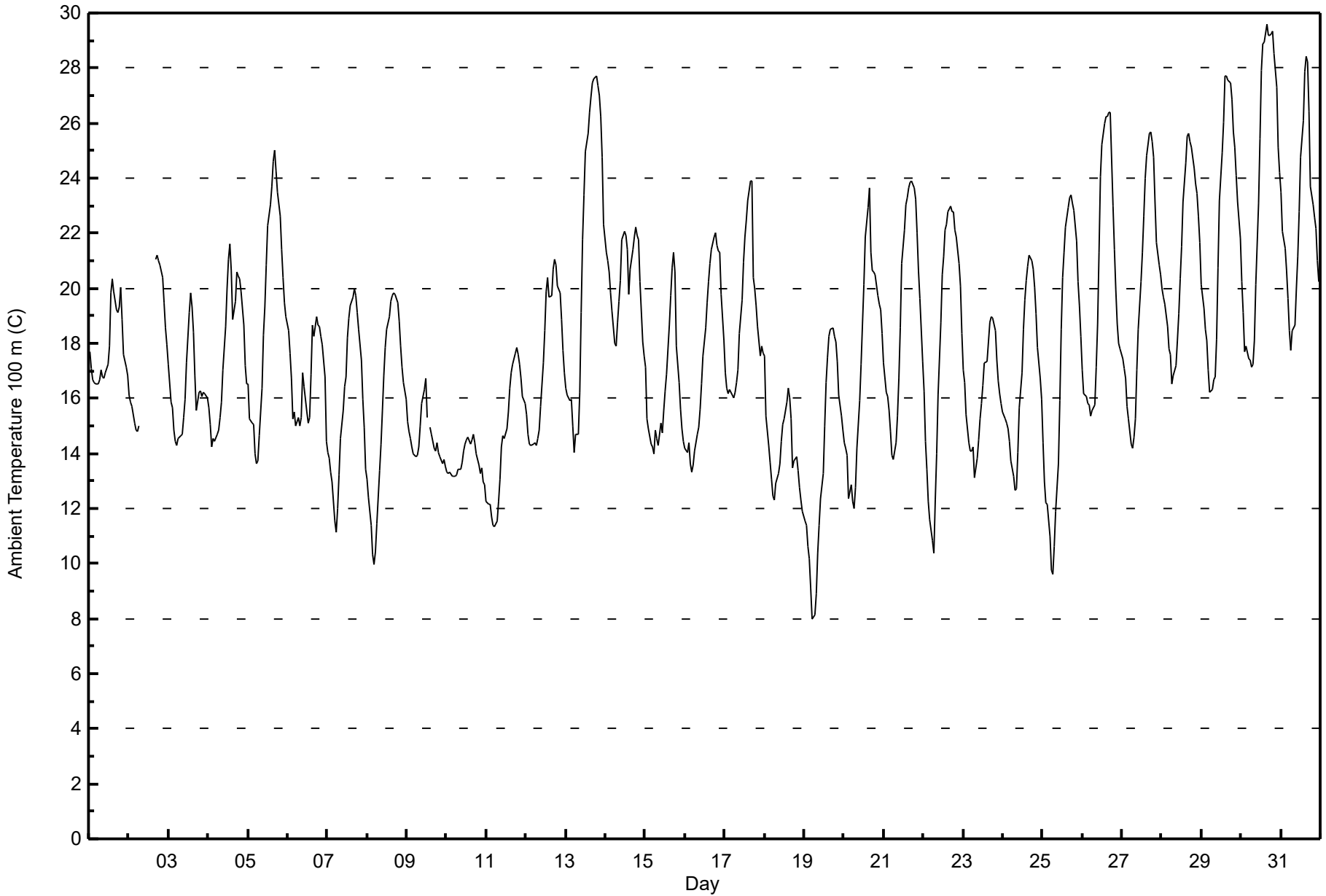
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	10	1.36	1.36
10 - 20	509	69.35	70.71
> 20	215	29.29	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



Maximum Value: 29.6 C on Aug 30 16:00																						Hours in Service: 744					
Maximum Daily Average: 23.7 C on Aug 30																						Hours of Data: 734					
Minimum Value: 8.0 C on Aug 19 06:00																						Hours of Missing Data: 10					
Maximum Diurnal Average: 21.6 C at hour 17																						Hours of Calibration: 0					
Minimum Daily Average: 13.7 C on Aug 10																						Percent Operational Time: 98.7					
Minimum Diurnal Average: 14.0 C at hour 6																											
Monthly Average: 17.89 C																											
Percentiles: P ₁ = 10.2 P ₁₀ = 13.3 Q ₁ = 14.8 Median = 17.2 Q ₃ = 20.5 P ₉₀ = 23.5 P ₉₉ = 28.5																											
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-Aug	17.7	17.1	16.7	16.6	16.5	16.5	16.7	17.0	16.8	16.7	16.9	17.2	17.9	19.8	20.3	19.9	19.2	19.1	19.3	20.1	18.9	17.6	17.2	16.9	17.9	20.3	
2-Aug	16.1	15.9	15.7	15.1	14.8	14.8	15.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	21.0	21.2	21.0	20.9	20.4	19.5	18.5	18.0	--	21.2	
3-Aug	17.2	15.9	15.6	14.9	14.4	14.3	14.5	14.7	14.7	15.3	16.0	17.3	19.1	19.8	19.3	18.4	16.8	15.6	16.2	16.3	16.1	16.2	16.2	16.0	16.3	19.8	
4-Aug	15.7	15.1	14.3	14.5	14.5	14.7	14.9	15.3	15.9	17.0	18.6	20.0	21.0	21.6	20.7	18.9	19.5	20.6	20.5	20.3	19.9	18.7	17.2	16.5	17.7	21.6	
5-Aug	16.5	15.3	15.1	15.0	14.0	13.6	13.7	14.7	16.4	18.3	19.3	20.8	22.3	23.0	23.7	24.6	25.0	24.3	23.5	22.6	21.4	20.4	19.5	19.0	19.2	25.0	
6-Aug	18.5	17.6	16.7	15.3	15.5	15.0	15.3	15.0	15.3	16.9	16.4	15.5	15.1	15.3	16.9	18.6	18.2	18.9	18.7	18.6	18.3	18.0	16.8	14.5	16.7	18.9	
7-Aug	14.0	13.8	13.3	13.0	11.5	11.1	12.0	13.2	14.6	15.5	16.4	16.8	18.2	18.9	19.4	19.7	20.0	19.7	19.1	18.5	17.4	16.0	15.0	13.4	15.9	20.0	
8-Aug	13.1	12.4	11.4	10.3	10.0	10.4	11.5	13.4	14.3	15.6	16.8	17.9	18.5	19.0	19.5	19.7	19.8	19.8	19.5	18.8	17.9	17.1	16.6	15.9	15.8	19.8	
9-Aug	15.2	14.8	14.5	14.2	14.0	13.9	14.0	14.2	15.0	15.8	16.3	16.7	15.3	DF	14.9	14.7	14.2	14.1	14.4	14.1	13.9	13.6	13.8	13.5	14.6	16.7	
10-Aug	13.3	13.3	13.3	13.2	13.2	13.2	13.2	13.4	13.4	13.7	14.1	14.3	14.5	14.6	14.3	14.5	14.7	14.4	14.0	13.6	13.3	13.5	13.0	12.8	13.7	14.7	
11-Aug	12.3	12.2	12.2	11.7	11.4	11.3	11.6	12.3	13.1	14.2	14.7	14.5	14.9	15.5	16.4	16.9	17.2	17.6	17.8	17.6	17.2	16.7	16.1	15.8	14.6	17.8	
12-Aug	15.4	14.7	14.3	14.3	14.3	14.4	14.3	14.5	14.8	15.7	17.3	18.5	19.9	20.4	19.7	19.7	20.7	21.1	20.9	20.1	19.8	18.9	17.8	17.0	17.4	21.1	
13-Aug	16.4	16.1	15.9	15.9	15.0	14.0	14.7	14.7	16.2	19.1	21.8	23.4	24.9	25.6	26.4	27.0	27.4	27.6	27.7	27.4	27.0	26.2	24.8	22.3	21.6	27.7	
14-Aug	21.3	21.0	20.6	19.8	19.2	18.0	17.9	18.8	19.5	20.3	21.8	22.1	21.9	21.4	19.8	20.7	21.4	21.8	22.2	21.9	21.7	20.2	18.0	17.5	20.4	22.2	
15-Aug	17.2	15.3	14.9	14.4	14.2	14.0	14.8	14.6	14.3	15.1	14.7	15.6	16.3	16.9	18.7	19.7	20.7	21.3	20.6	17.9	16.6	15.6	14.9	14.4	16.4	21.3	
16-Aug	14.2	14.0	14.4	13.6	13.3	13.6	14.1	14.7	14.9	15.6	16.5	17.5	18.6	19.5	20.3	20.9	21.4	21.9	22.0	21.5	21.3	21.3	19.8	18.1	17.6	22.0	
17-Aug	16.9	16.4	16.2	16.3	16.1	16.0	16.2	16.6	17.0	18.4	19.6	21.0	21.9	22.5	23.2	23.9	23.9	20.4	20.0	19.4	18.6	17.5	17.9	17.6	18.9	23.9	
18-Aug	17.6	15.3	14.3	13.7	13.1	12.5	12.3	12.9	13.3	13.6	14.4	15.0	15.3	15.9	16.4	16.0	15.3	13.5	13.7	13.9	13.4	12.8	12.3	11.9	14.1	17.6	
19-Aug	11.5	11.4	10.6	10.2	9.1	8.0	8.1	8.9	10.4	11.4	12.4	13.2	15.0	16.6	17.5	18.3	18.5	18.6	18.3	18.1	17.3	16.1	15.3	14.8	13.7	18.6	
20-Aug	14.4	14.2	13.9	12.3	12.9	12.3	12.0	12.8	14.2	15.9	17.3	18.7	20.1	21.9	22.9	23.7	21.3	20.6	20.6	20.5	19.8	19.4	19.2	18.4	17.5	23.7	
21-Aug	17.3	16.2	16.0	15.6	14.8	13.9	13.8	14.4	15.4	16.8	18.6	20.9	22.1	23.0	23.3	23.6	23.8	23.9	23.6	23.3	22.0	20.7	19.6	17.4	19.2	23.9	
22-Aug	16.3	14.5	13.4	12.2	11.6	10.8	10.4	12.3	14.0	16.1	18.8	20.5	21.2	22.1	22.3	22.8	23.0	22.8	22.8	22.1	21.9	20.9	20.1	18.4	18.0	23.0	
23-Aug	17.0	16.6	15.4	14.4	14.1	14.1	14.2	13.1	13.8	14.5	15.3	15.8	16.5	17.3	17.4	18.1	18.8	19.0	18.9	18.5	17.4	16.6	16.2	15.8	16.2	19.0	
24-Aug	15.5	15.2	15.1	14.9	14.4	13.7	13.2	12.7	12.7	14.0	15.7	16.9	18.5	19.6	20.3	20.8	21.2	21.0	20.7	20.0	19.1	17.9	16.7	16.0	16.9	21.2	
25-Aug	14.4	13.0	12.2	12.2	11.0	9.8	9.6	10.6	11.9	13.6	15.9	18.5	20.4	21.3	22.2	22.9	23.3	23.4	23.1	22.8	21.7	20.2	19.4	18.3	17.2	23.4	
26-Aug	17.0	16.2	16.1	15.8	15.8	15.4	15.6	15.8	17.1	18.7	21.3	24.0	25.2	26.0	26.3	26.2	26.4	26.4	23.0	21.4	19.9	18.7	18.0	17.8	20.2	26.4	
27-Aug	17.4	17.1	16.7	15.7	15.3	14.4	14.2	14.6	15.2	17.0	18.5	20.2	21.3	22.6	24.0	24.8	25.6	25.7	25.3	24.8	23.1	21.6	20.9	20.5	19.9	25.7	
28-Aug	20.0	19.7	19.4	18.6	17.8	17.6	16.5	16.8	17.2	18.1	19.1	20.3	21.5	23.1	24.5	25.5	25.6	25.3	25.1	24.3	23.8	23.4	22.6	21.7	21.2	25.6	
29-Aug	20.1	19.3	18.5	18.1	17.0	16.2	16.3	16.7	16.8	18.2	20.7	23.2	24.9	26.0	27.7	27.7	27.6	27.5	26.9	25.7	25.1	24.1	23.2	21.8	22.1	27.7	
30-Aug	20.2	19.1	17.7	17.9	17.4	17.4	17.2	17.2	18.1	20.2	23.1	25.4	27.9	28.9	29.0	29.6	29.2	29.2	29.2	29.2	29.3	28.5	27.3	25.1	24.2	23.7	29.6
31-Aug	23.5	22.1	21.4	20.6	19.6	18.5	17.8	18.5	18.7	20.0	21.1	22.8	24.8	26.1	27.9	28.4	28.2	26.4	23.7	23.0	22.6	22.2	21.0	20.2	22.5	28.4	
16.6 15.8 15.4 14.8 14.4 14.0 14.0 14.5 15.2 16.4 17.6 18.8 19.8 20.8 21.2 21.5 21.6 21.4 21.0 20.6 19.8 19.0 18.1 17.3																						Diurnal Average					
23.5 22.1 21.4 20.6 19.6 18.5 17.9 18.8 19.5 20.3 23.1 25.4 27.9 28.9 29.0 29.6 29.2 29.2 29.2 29.2 29.3 28.5 27.3 25.1 24.2																						Diurnal Maximum					
DF - DAS Failure																											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	7	0.95	0.95
10 - 20	519	70.71	71.66
> 20	208	28.34	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



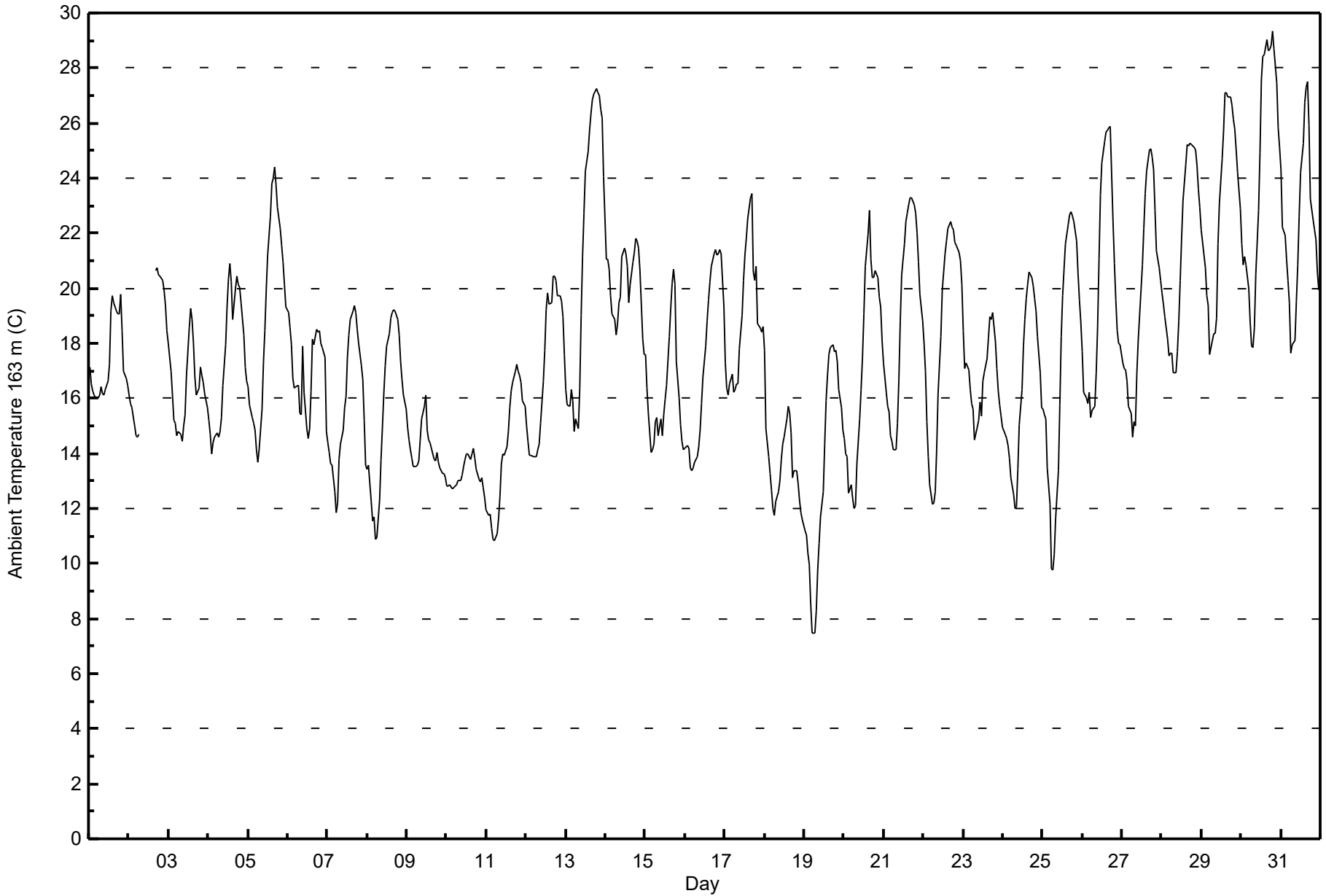
Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature 163 m (AT163m) - C

Lower Camp Met Tower - August 2023

Maximum Value: 29.3 C on Aug 30 20:00 Maximum Daily Average: 24.2 C on Aug 30																						Hours in Service: 744 Hours of Data: 735																									
Minimum Value: 7.5 C on Aug 19 06:00 Minimum Daily Average: 13.2 C on Aug 10 Maximum Diurnal Average: 21.1 C at hour 17 Minimum Diurnal Average: 14.2 C at hour 7 Monthly Average: 17.79 C Percentiles: P ₁ = 10.1 P ₁₀ = 13.2 Q ₁ = 14.8 Median = 17.3 Q ₃ = 20.4 P ₉₀ = 23.2 P ₉₉ = 28.1																						Hours of Missing Data: 9 Hours of Calibration: 0 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-Aug	17.1	16.5	16.3	16.1	16.0	16.0	16.1	16.4	16.2	16.1	16.3	16.6	17.2	19.2	19.7	19.5	19.2	19.1	19.0	19.8	18.5	17.0	16.7	16.5	17.4	19.8																					
2-Aug	16.1	15.8	15.7	15.0	14.6	14.6	14.7	DF	DF	DF	DF	DF	DF	DF	DF	DF	20.6	20.8	20.5	20.5	20.3	19.9	19.4	18.5	--	20.8																					
3-Aug	18.0	17.0	16.1	15.2	15.1	14.7	14.8	14.7	14.4	15.0	15.4	16.8	18.6	19.3	18.8	18.0	16.8	16.1	16.4	17.1	16.8	16.6	16.1	15.7	16.4	19.3																					
4-Aug	15.2	14.7	14.0	14.4	14.6	14.7	14.6	14.8	15.3	16.5	18.0	19.3	20.3	20.9	20.2	18.9	20.0	20.5	20.2	20.0	19.5	18.3	17.1	16.6	17.4	20.9																					
5-Aug	16.4	15.8	15.3	15.1	14.9	14.1	13.7	14.2	15.6	17.3	18.5	19.9	21.2	22.6	23.8	24.0	24.4	23.7	23.0	22.2	21.6	21.0	20.1	19.3	19.1	24.4																					
6-Aug	19.1	18.5	18.0	16.7	16.4	16.4	16.5	15.5	15.4	17.9	16.2	14.9	14.5	14.9	16.3	18.2	18.0	18.5	18.4	18.5	18.0	17.8	17.5	14.8	17.0	19.1																					
7-Aug	14.4	14.0	13.6	13.6	12.6	11.9	12.2	13.8	14.4	14.8	15.7	16.0	17.5	18.3	18.9	19.2	19.4	19.1	18.5	18.0	17.2	16.7	15.2	13.6	15.8	19.4																					
8-Aug	13.4	13.6	12.2	11.5	11.7	10.9	10.9	12.3	13.8	14.9	16.2	17.2	17.9	18.4	18.9	19.1	19.2	19.2	18.9	18.3	17.4	16.7	16.1	15.6	15.6	19.2																					
9-Aug	14.9	14.5	14.1	13.8	13.5	13.5	13.6	13.7	14.5	15.2	15.7	16.1	14.8	14.5	14.4	14.2	13.8	13.8	14.0	13.7	13.5	13.3	13.3	13.1	14.2	16.1																					
10-Aug	12.8	12.8	12.9	12.7	12.8	12.8	12.9	13.0	13.0	13.2	13.5	13.8	14.0	14.0	13.8	14.0	14.2	13.8	13.4	13.1	13.0	13.1	12.8	12.4	13.2	14.2																					
11-Aug	12.0	11.7	11.8	11.3	10.9	10.8	11.1	11.6	12.5	13.6	14.0	13.9	14.2	14.8	15.7	16.2	16.6	17.0	17.2	17.0	16.8	16.6	15.9	15.7	14.1	17.2																					
12-Aug	15.0	14.4	13.9	13.9	13.9	13.9	13.9	14.2	14.4	15.1	16.6	17.8	19.2	19.8	19.4	19.5	20.4	20.5	20.3	19.7	19.7	19.5	19.0	17.6	17.1	20.5																					
13-Aug	16.3	15.8	15.7	16.3	15.9	14.8	15.3	14.9	16.4	19.0	21.2	22.7	24.3	25.0	25.7	26.3	26.8	27.1	27.3	27.1	27.0	26.5	26.2	24.1	21.6	27.3																					
14-Aug	21.1	21.1	20.7	19.7	19.1	18.9	18.3	18.7	19.5	19.7	21.2	21.5	21.3	20.8	19.5	20.2	20.9	21.3	21.8	21.7	21.5	20.6	18.2	17.6	20.2	21.8																					
15-Aug	17.6	16.4	15.4	14.0	14.1	14.4	15.1	15.3	14.7	15.3	14.6	15.4	16.0	16.5	18.3	19.3	20.2	20.7	20.1	17.3	16.0	15.0	14.5	14.1	16.3	20.7																					
16-Aug	14.2	14.3	14.2	13.5	13.4	13.5	13.7	13.9	14.3	14.9	15.8	16.8	17.9	18.8	19.6	20.3	20.8	21.3	21.4	21.2	21.3	21.4	21.2	19.3	17.4	21.4																					
17-Aug	17.3	16.4	16.1	16.5	16.9	16.2	16.3	16.5	16.5	17.8	19.0	20.3	21.2	21.8	22.5	23.3	23.4	20.6	20.3	20.8	18.7	18.6	18.4	18.6	18.9	23.4																					
18-Aug	17.7	14.9	13.9	13.3	12.6	12.0	11.8	12.2	12.6	13.0	13.8	14.4	14.6	15.2	15.7	15.5	14.8	13.1	13.4	13.4	12.9	12.3	11.8	11.6	13.6	17.7																					
19-Aug	11.2	11.0	10.4	10.0	8.6	7.5	7.5	8.3	9.8	10.8	11.7	12.6	14.3	15.9	16.8	17.6	17.9	18.0	17.7	17.8	17.3	16.3	15.7	14.9	13.3	18.0																					
20-Aug	14.6	14.0	13.9	12.5	12.9	12.4	12.0	12.1	13.6	15.2	16.3	17.5	19.1	20.8	22.0	22.8	21.1	20.4	20.4	20.7	20.4	19.7	19.3	18.1	17.2	22.8																					
21-Aug	17.3	16.2	15.7	15.5	14.7	14.4	14.1	14.1	15.1	16.7	18.8	20.5	21.6	22.4	22.7	23.0	23.3	23.3	23.0	22.7	22.0	21.0	19.8	18.8	19.0	23.3																					
22-Aug	18.0	17.0	15.2	13.9	12.9	12.2	12.2	12.6	14.2	16.2	18.3	19.9	20.6	21.3	21.7	22.2	22.4	22.2	22.1	21.7	21.5	21.3	21.0	20.2	18.4	22.4																					
23-Aug	18.5	17.1	17.3	17.0	16.3	15.8	15.6	14.5	15.0	15.2	15.9	15.4	16.6	17.0	17.4	18.2	19.0	18.9	19.1	18.1	17.1	16.3	15.8	15.4	16.8	19.1																					
24-Aug	14.9	14.7	14.5	14.3	13.8	13.1	12.5	12.0	12.1	13.4	15.0	16.3	17.9	18.9	19.6	20.1	20.6	20.4	20.1	19.6	19.2	18.3	17.0	15.7	16.4	20.6																					
25-Aug	15.6	15.4	15.3	13.5	12.1	9.8	9.7	10.3	11.6	13.4	15.8	18.3	19.7	20.7	21.6	22.3	22.7	22.8	22.6	22.4	21.7	20.5	19.6	18.8	17.3	22.8																					
26-Aug	17.7	16.2	16.0	15.8	16.2	15.3	15.6	15.7	16.9	18.6	21.1	23.4	24.6	25.3	25.7	25.7	25.9	25.9	22.4	20.9	19.6	18.5	18.0	17.9	19.9	25.9																					
27-Aug	17.3	17.1	17.0	16.6	15.7	15.5	14.6	15.1	15.0	16.9	18.1	19.9	20.9	22.2	23.5	24.3	25.0	25.1	24.8	24.3	22.8	21.4	20.7	20.3	19.8	25.1																					
28-Aug	19.8	19.4	19.0	18.1	17.5	17.6	17.6	17.0	16.9	17.7	18.8	20.3	21.8	23.2	24.5	25.2	25.2	25.3	25.2	25.1	25.0	24.4	23.6	22.9	21.3	25.3																					
29-Aug	22.1	21.2	20.7	19.7	19.4	17.6	18.1	18.4	18.4	18.9	21.6	23.1	24.7	25.7	27.1	27.1	27.0	26.9	26.7	26.1	25.8	25.0	24.2	22.9	22.8	27.1																					
30-Aug	21.6	20.8	21.2	20.8	20.0	18.8	17.9	17.8	18.5	20.5	22.8	24.9	27.6	28.4	28.5	29.0	28.6	28.7	28.8	29.3	28.7	27.5	25.8	25.1	24.2	29.3																					
31-Aug	24.3	22.2	21.9	21.0	20.3	19.5	17.7	18.0	18.1	19.5	20.9	22.7	24.2	25.3	26.7	27.3	27.5	25.9	23.2	22.5	22.1	21.8	20.6	19.9	22.2	27.5																					
																						16.8	16.1	15.7	15.2	14.8	14.3	14.2	14.4	15.0	16.1	17.2	18.3	19.3	20.1	20.6	21.0	21.1	21.0	20.7	20.3	19.8	19.1	18.4	17.6	Diurnal Average	
																						24.3	22.2	21.9	21.0	20.3	19.5	18.3	18.7	19.5	20.5	22.8	24.9	27.6	28.4	28.5	29.0	28.6	28.7	28.8	29.3	28.7	27.5	26.2	25.1	Diurnal Maximum	
DF - DAS Failure																																															





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	8	1.09	1.09
10 - 20	519	70.61	71.70
> 20	208	28.30	100.00

Total Number of Valid Hours: 735

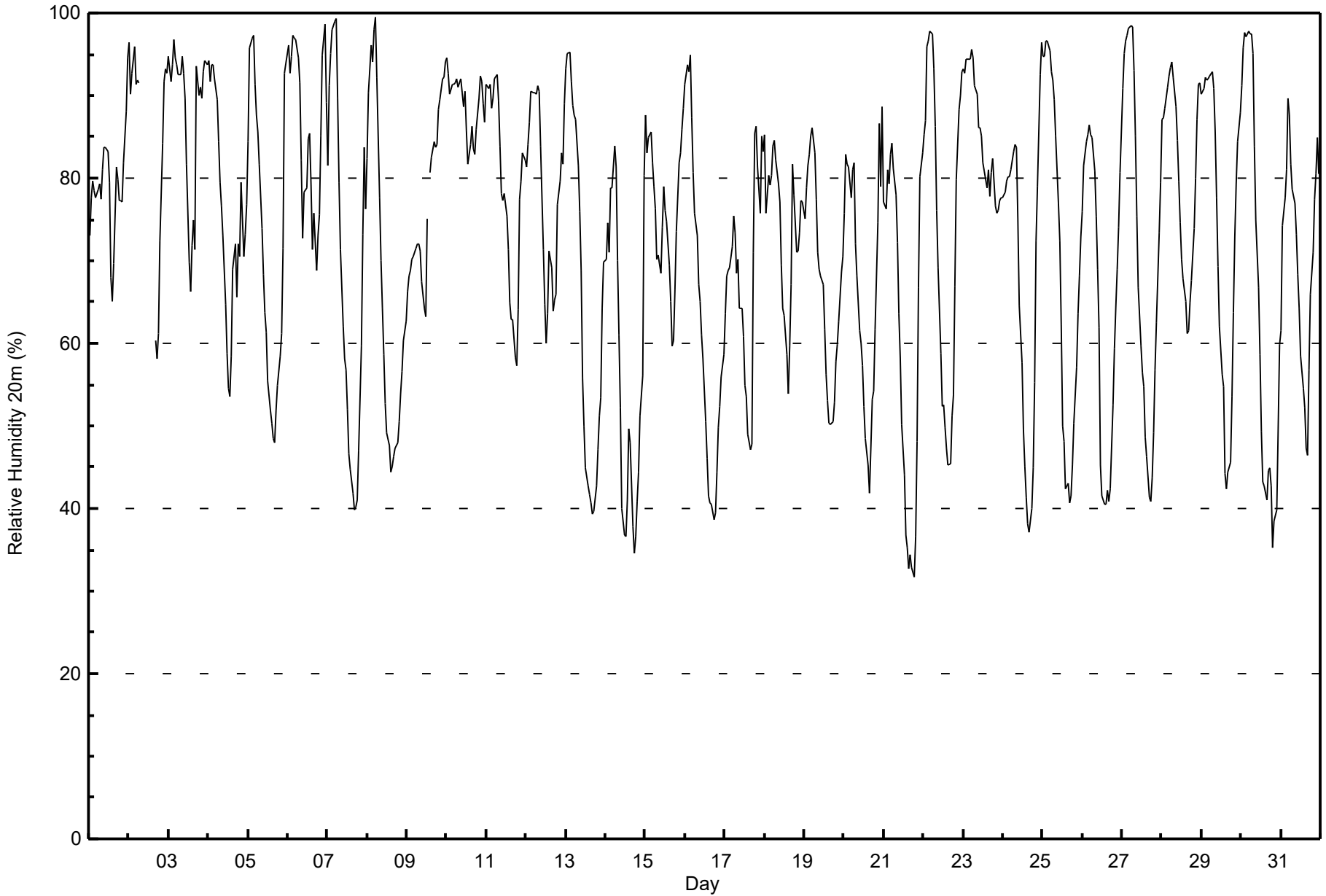
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 99.4 % on Aug 8 06:00 Maximum Daily Average: 89.0 % on Aug 10																						Hours in Service:	744			
Minimum Value: 31.6 % on Aug 21 19:00 Minimum Daily Average: 56.5 % on Aug 14																						Hours of Data:	734			
Maximum Diurnal Average: 88.6 % at hour 4 Minimum Diurnal Average: 54.5 % at hour 16																						Hours of Missing Data:	10			
Monthly Average: 72.76 % Percentiles: P ₁ = 36.5 P ₁₀ = 45.5 Q ₁ = 59.8 Median = 76.3 Q ₃ = 86.9 P ₉₀ = 93.3 P ₉₉ = 97.9																						Hours of Calibration:	0			
																						Percent Operational Time:	98.7			
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-Aug	73.0	77.7	79.6	78.5	77.7	78.6	79.3	77.5	81.0	83.8	83.8	83.2	79.5	67.9	65.1	69.7	81.4	79.8	77.2	77.2	77.1	81.9	88.2	94.6	78.9	94.6
2-Aug	96.5	90.2	92.7	96.0	91.3	91.9	91.6	DF	DF	DF	DF	DF	DF	DF	DF	DF	60.4	58.2	61.1	72.4	84.2	91.8	93.3	92.7	--	96.5
3-Aug	94.8	91.7	93.8	96.8	94.7	93.8	92.5	92.6	94.8	92.8	89.6	81.8	69.8	66.3	71.8	75.0	71.3	93.6	90.0	91.0	89.7	92.9	94.2	93.7	87.9	96.8
4-Aug	94.3	91.7	93.7	93.8	92.0	89.5	84.5	79.4	76.6	73.0	64.8	58.8	54.6	53.5	58.6	69.1	72.0	65.6	72.0	70.5	79.5	70.5	73.2	76.8	75.3	94.3
5-Aug	84.4	95.8	97.0	97.3	91.4	87.6	85.6	81.8	74.0	68.3	63.6	61.4	55.5	51.9	50.4	48.5	47.9	51.9	54.8	58.4	61.2	71.5	92.6	93.9	71.9	97.3
6-Aug	96.2	92.8	94.8	97.3	97.0	96.8	94.7	91.6	82.1	72.7	78.4	78.9	84.8	85.4	79.1	71.4	75.7	68.9	73.0	75.5	85.0	94.8	98.6	89.2	85.6	98.6
7-Aug	81.6	91.3	95.1	97.9	98.9	99.4	89.7	79.5	71.3	62.0	58.1	56.7	52.0	46.6	44.8	41.9	39.9	40.2	41.1	46.9	59.7	73.3	83.7	76.3	67.8	99.4
8-Aug	82.4	90.3	96.0	94.0	97.9	99.4	92.3	77.7	70.0	64.3	58.6	52.7	49.2	47.6	44.4	45.0	46.3	47.3	48.0	50.5	53.8	56.7	60.3	62.8	66.1	99.4
9-Aug	66.3	68.1	68.9	70.2	70.6	71.5	72.0	72.0	71.1	67.4	64.3	63.2	75.1	DF	80.8	82.5	84.5	83.7	84.1	88.4	89.5	92.1	92.2	94.0	77.1	94.0
10-Aug	94.7	92.6	90.1	91.3	91.3	91.5	92.0	90.9	92.1	90.3	88.6	90.5	85.7	81.7	84.1	86.3	83.6	82.9	85.9	89.7	92.4	91.7	88.9	86.8	89.0	94.7
11-Aug	91.3	90.8	91.3	88.4	89.7	92.0	92.5	89.4	83.9	78.1	77.3	78.1	75.5	71.3	64.9	62.9	62.8	58.4	57.3	64.1	77.4	79.7	83.1	82.2	78.4	92.5
12-Aug	81.4	84.0	86.8	90.6	90.3	90.4	90.2	91.2	90.4	83.9	71.4	64.8	60.0	63.5	71.3	69.1	63.8	65.2	65.9	76.8	79.7	83.0	81.6	89.0	78.5	91.2
13-Aug	93.2	95.1	95.3	91.7	88.9	87.6	87.2	81.5	76.0	68.9	55.8	50.0	44.9	42.6	41.7	40.6	39.3	39.7	42.7	47.1	51.1	53.4	64.3	69.8	64.5	95.3
14-Aug	70.2	74.6	71.1	78.9	78.9	83.9	81.3	70.0	61.0	52.2	39.9	36.9	36.6	41.0	49.7	47.9	37.9	34.5	36.5	40.8	44.4	51.2	56.1	80.3	56.5	83.9
15-Aug	87.6	83.0	84.9	85.6	81.9	79.0	76.3	70.2	70.6	68.5	74.0	79.0	76.1	74.8	69.5	65.0	59.7	60.3	66.4	73.6	81.9	83.1	85.9	88.5	76.1	88.5
16-Aug	91.3	93.8	92.8	94.8	87.3	80.7	75.8	73.0	67.2	65.1	60.9	58.1	50.5	46.1	41.5	40.7	40.5	38.7	39.5	44.4	49.8	52.4	56.0	58.7	62.5	94.8
17-Aug	63.5	68.1	68.8	69.2	71.6	75.5	73.4	68.5	70.2	64.2	64.2	60.8	54.9	53.6	49.0	47.1	47.8	71.0	85.5	86.2	81.4	75.8	85.2	83.2	68.3	86.2
18-Aug	85.3	75.8	80.3	79.2	80.3	84.0	84.6	82.2	79.3	77.0	69.5	64.2	63.5	58.6	53.8	59.7	67.1	81.6	78.0	71.0	71.2	73.5	77.4	77.2	73.9	85.3
19-Aug	75.1	78.8	81.5	82.9	85.2	86.1	83.1	77.4	71.0	68.9	68.2	67.1	61.8	56.3	53.1	50.3	50.2	50.5	53.0	57.8	59.8	62.8	68.6	70.5	67.5	86.1
20-Aug	75.7	82.9	81.7	81.3	77.6	81.1	81.8	72.0	68.1	61.6	60.0	57.2	52.3	48.5	45.2	41.9	47.5	53.2	54.3	61.7	74.7	86.6	79.1	88.7	67.3	88.7
21-Aug	77.1	76.2	81.1	79.2	82.8	84.3	81.2	77.9	72.2	63.6	58.1	50.1	44.0	36.8	35.3	32.6	34.4	32.8	31.6	36.5	48.1	66.8	80.2	83.0	60.3	84.3
22-Aug	85.3	86.9	95.9	96.7	97.8	97.5	93.3	86.2	76.1	69.1	58.7	52.4	52.6	49.9	47.2	45.3	45.5	51.2	53.7	67.0	79.8	88.4	90.0	92.9	73.3	97.8
23-Aug	93.3	92.8	94.4	94.4	94.5	95.6	94.6	91.3	90.2	86.1	86.0	85.1	81.9	80.9	78.8	81.0	77.8	80.7	82.3	76.6	75.8	76.0	77.2	77.6	85.2	95.6
24-Aug	77.6	78.3	79.6	80.1	80.2	81.0	83.2	84.0	83.7	75.1	64.5	57.6	49.6	45.0	41.3	38.1	37.1	40.0	44.8	55.3	72.3	79.0	92.6	96.4	67.4	96.4
25-Aug	94.8	94.8	96.6	96.6	95.4	92.8	91.9	89.5	85.1	76.9	72.4	62.3	50.0	48.1	42.5	43.0	40.7	41.6	45.3	50.4	57.1	63.6	68.2	72.8	69.7	96.6
26-Aug	76.0	81.6	84.4	85.3	86.4	85.2	84.9	80.9	75.4	69.0	61.9	45.3	41.6	40.5	40.5	42.3	40.9	42.3	52.5	59.3	64.5	69.0	74.0	80.6	65.2	86.4
27-Aug	90.9	95.2	96.6	97.3	98.1	98.4	98.4	93.1	85.1	75.4	66.9	59.6	56.4	54.8	48.7	46.2	41.4	40.9	43.8	49.1	56.8	62.5	73.5	79.4	71.2	98.4
28-Aug	87.1	87.4	88.4	91.0	92.4	93.4	94.1	92.2	88.7	84.6	79.6	74.6	70.3	67.8	65.1	61.2	61.6	64.8	67.6	73.9	80.0	87.2	91.4	91.5	80.7	94.1
29-Aug	90.2	90.9	92.1	91.9	92.0	92.4	92.9	90.9	85.6	77.7	69.2	62.1	56.3	54.7	44.3	42.5	44.4	45.6	53.5	63.7	72.9	79.4	84.4	88.0	73.2	92.9
30-Aug	91.2	95.8	97.7	97.1	97.9	97.5	97.4	95.1	83.9	74.8	66.7	58.6	49.2	43.3	42.8	41.0	44.5	45.0	42.7	35.3	38.5	39.9	49.7	59.9	66.1	97.9
31-Aug	61.5	74.2	77.6	81.0	89.7	87.7	81.7	78.7	77.0	73.3	68.4	64.2	58.6	54.5	52.1	47.3	46.5	56.8	65.9	70.9	77.5	80.5	85.0	80.5	70.5	89.7
84.0 85.9 87.8 88.6 88.4 88.6 86.9 82.6 78.5 73.0 68.1 63.8 59.8 56.3 55.2 54.5 54.7 57.0 59.7 63.9 69.9 74.5 79.6 82.3																						Diurnal Average				
96.5 95.8 97.7 97.9 98.9 99.4 98.4 95.1 94.8 92.8 89.6 90.5 85.7 85.4 84.1 86.3 84.5 93.6 90.0 91.0 92.4 94.8 98.6 96.4																						Diurnal Maximum				
DF - DAS Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	24	3.27	3.27
40 - 60	162	22.07	25.34
60 - 80	246	33.51	58.86
80 - 100	302	41.14	100.00

Total Number of Valid Hours: 734

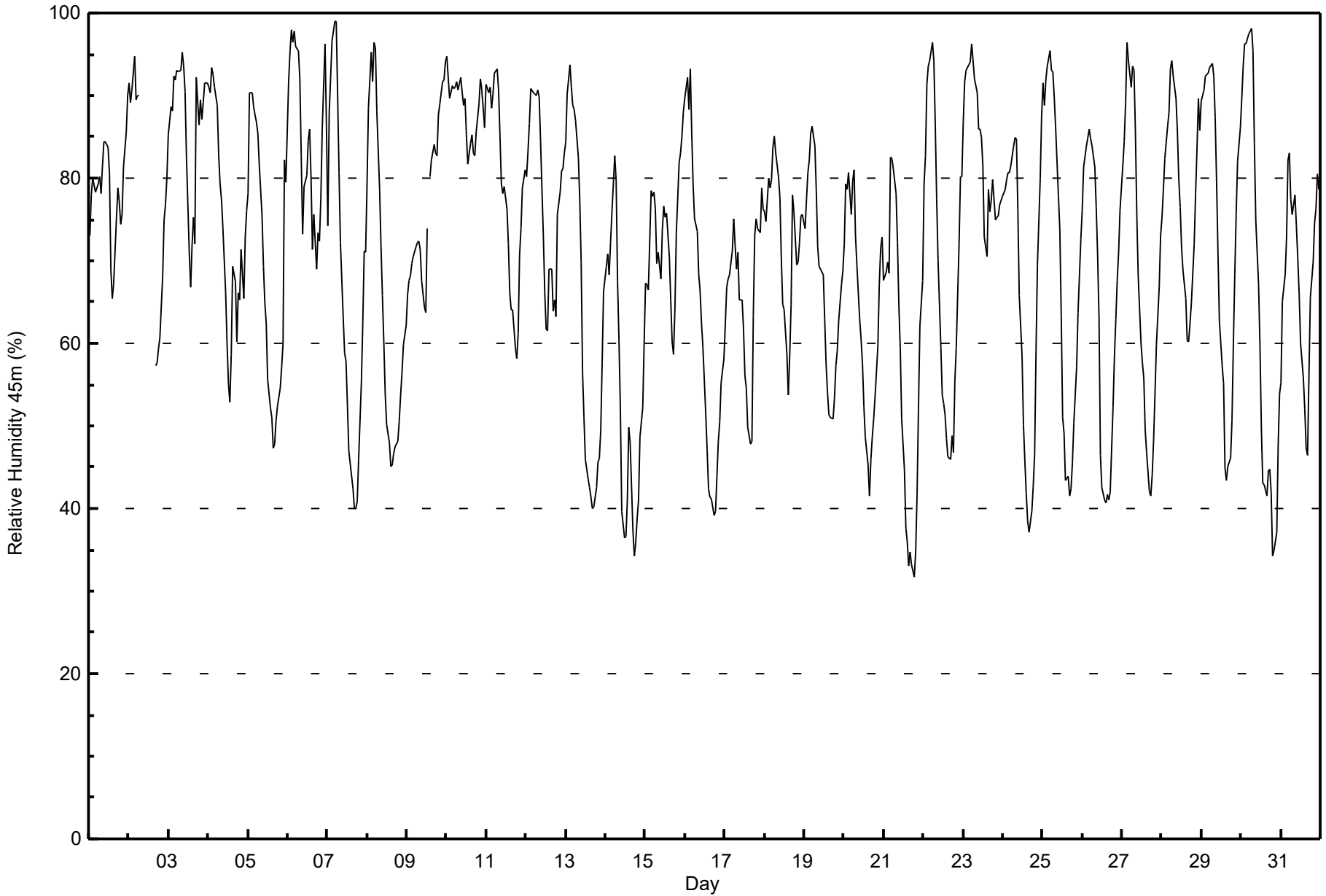
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 99.0 % on Aug 7 06:00																						Maximum Daily Average: 88.6 % on Aug 10																						Hours in Service: 744			
Minimum Value: 31.6 % on Aug 21 19:00																						Minimum Daily Average: 54.1 % on Aug 14																						Hours of Data: 734			
Maximum Diurnal Average: 87.8 % at hour 6																						Minimum Diurnal Average: 54.2 % at hour 17																						Hours of Missing Data: 10			
Monthly Average: 71.17 %																						Percentiles: P ₁ = 35.3 P ₁₀ = 45.9 Q ₁ = 59.2 Median = 73.5 Q ₃ = 84.9 P ₉₀ = 91.7 P ₉₉ = 96.6																						Hours of Calibration: 0			
																																												Percent Operational Time: 98.7			
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-Aug	73.1	78.0	80.0	79.1	78.3	79.3	80.2	78.2	81.5	84.5	84.5	83.7	80.5	68.8	65.4	67.3	75.3	78.9	77.1	74.4	75.6	81.3	85.7	90.0	78.4	90.0																					
2-Aug	91.6	89.1	90.6	94.7	89.5	90.0	90.1	DF	DF	DF	DF	DF	DF	DF	DF	DF	57.3	57.7	59.4	60.8	68.1	74.9	76.9	80.0	--	94.7																					
3-Aug	85.2	88.6	88.2	92.3	91.9	93.1	92.9	93.0	95.3	93.6	90.6	82.6	71.0	66.8	71.8	75.2	72.1	92.1	86.5	89.5	87.1	89.2	91.6	91.4	86.3	95.3																					
4-Aug	91.0	90.3	93.4	92.6	91.1	88.9	82.9	79.3	77.4	74.1	66.0	60.1	55.2	52.8	58.7	69.3	67.5	60.1	66.1	65.2	71.3	65.5	72.9	76.1	73.7	93.4																					
5-Aug	78.1	90.4	90.4	88.6	87.7	86.7	85.5	81.8	75.4	69.4	64.9	62.4	55.7	52.1	51.0	47.3	47.8	50.7	52.4	54.6	57.2	59.9	82.2	79.4	68.8	90.4																					
6-Aug	91.7	95.4	98.0	96.4	97.8	95.9	95.5	92.0	82.7	73.3	79.0	80.3	84.7	85.9	80.0	71.4	75.6	69.0	73.5	72.3	77.4	85.9	96.3	86.4	84.8	98.0																					
7-Aug	74.3	88.0	92.2	96.7	99.0	99.0	90.1	80.6	72.2	63.0	58.8	57.9	52.6	47.0	45.4	42.4	39.9	40.0	40.8	45.9	55.4	62.7	71.2	71.0	66.1	99.0																					
8-Aug	79.1	88.5	95.2	91.7	96.5	95.8	88.2	78.6	71.7	65.8	60.1	54.0	50.1	47.9	45.1	45.2	46.6	47.5	48.1	50.5	53.8	56.4	59.8	62.1	65.8	96.5																					
9-Aug	66.0	67.6	68.1	69.6	70.4	71.7	72.2	72.5	71.4	67.7	64.5	63.7	74.0	DF	80.1	82.2	84.2	83.0	82.8	87.7	89.1	91.8	91.8	94.0	76.8	94.0																					
10-Aug	94.7	92.3	89.6	91.2	90.9	91.0	91.7	90.7	92.2	90.3	88.7	89.7	85.3	81.7	84.3	85.3	83.0	82.6	85.5	89.0	92.1	90.7	88.6	86.1	88.6	94.7																					
11-Aug	91.3	90.3	90.9	88.5	90.2	92.8	93.3	90.7	85.1	79.3	78.1	79.0	76.3	72.1	66.1	64.1	64.0	59.5	58.1	61.2	70.7	73.9	78.9	81.1	78.1	93.3																					
12-Aug	80.2	83.2	86.7	90.9	90.4	90.2	90.0	90.7	89.8	84.3	72.8	66.1	61.7	61.5	69.1	68.9	63.9	65.3	63.2	75.6	78.3	80.9	81.3	83.1	77.8	90.9																					
13-Aug	84.4	90.1	93.7	91.0	88.8	88.3	86.9	82.5	77.2	69.8	56.5	51.1	45.9	43.6	42.5	41.3	40.0	40.2	42.5	45.6	46.2	49.5	57.7	66.2	63.4	93.7																					
14-Aug	69.3	70.9	68.3	72.3	75.9	82.8	79.7	67.4	60.4	52.1	39.6	36.5	36.6	41.0	49.8	48.0	37.3	34.3	36.0	38.7	41.0	48.6	52.3	60.0	54.1	82.8																					
15-Aug	67.2	67.1	66.5	78.4	77.7	78.3	76.3	69.6	71.0	67.8	73.7	76.6	75.2	75.8	70.6	65.2	60.2	58.7	64.3	73.4	81.8	83.1	85.1	87.9	73.0	87.9																					
16-Aug	89.7	92.3	88.3	93.2	85.4	79.2	75.1	73.6	68.3	66.3	62.4	59.5	51.6	47.1	42.4	41.4	41.2	39.2	39.7	43.9	48.2	50.5	55.3	58.1	62.2	93.2																					
17-Aug	62.4	66.7	67.8	68.3	71.1	75.1	71.9	69.0	71.0	65.2	65.3	61.7	56.1	54.6	49.8	47.8	48.2	63.4	73.0	75.1	74.0	73.4	78.7	76.2	66.1	78.7																					
18-Aug	75.9	74.7	80.0	78.9	79.9	83.7	85.0	83.0	80.1	77.7	70.4	64.7	64.1	58.7	53.7	58.5	64.8	77.9	76.0	69.5	69.8	72.3	75.4	75.6	72.9	85.0																					
19-Aug	73.9	77.5	80.6	82.2	85.4	86.3	84.0	78.5	71.7	69.3	69.0	68.2	62.9	57.5	54.2	51.3	51.0	50.9	53.4	57.2	59.2	62.7	67.1	68.9	67.6	86.3																					
20-Aug	72.1	79.3	78.6	80.7	75.6	79.6	81.1	73.0	69.5	62.8	60.6	57.4	52.4	48.7	45.2	41.4	45.9	48.7	50.8	53.6	59.7	67.2	71.6	73.0	63.7	81.1																					
21-Aug	67.6	68.6	69.9	68.5	82.6	82.4	81.1	78.1	72.2	64.6	59.3	50.9	44.5	37.6	35.9	33.1	34.8	33.2	31.6	34.7	41.6	52.1	62.1	67.6	56.4	82.6																					
22-Aug	79.3	82.7	91.3	93.6	94.2	96.4	94.3	86.5	77.4	70.0	59.5	53.6	52.8	51.3	48.5	46.2	45.9	48.8	46.8	55.4	59.5	72.0	80.2	80.2	69.4	96.4																					
23-Aug	86.8	91.7	93.0	93.7	94.1	96.2	94.3	92.1	90.3	86.0	85.9	84.8	81.5	72.9	70.5	78.7	75.9	77.3	79.8	74.9	75.2	75.4	76.9	77.3	83.5	96.2																					
24-Aug	77.8	78.6	79.9	80.6	80.7	81.5	83.9	85.0	84.8	76.3	65.7	58.5	50.2	45.8	41.8	38.5	37.1	39.7	42.8	46.6	59.2	69.4	79.9	87.6	65.5	87.6																					
25-Aug	91.5	88.8	91.9	93.5	95.4	93.1	92.9	89.8	86.0	77.7	73.8	63.4	51.1	49.2	43.4	43.8	41.5	42.3	45.6	50.3	57.2	63.7	68.1	72.6	69.4	95.4																					
26-Aug	76.1	81.3	84.0	84.9	86.0	84.8	84.0	81.3	76.5	70.6	63.0	46.4	42.5	41.1	40.7	41.8	41.1	42.0	52.2	58.3	62.8	67.7	71.0	76.1	64.8	86.0																					
27-Aug	81.6	84.4	89.1	96.4	94.2	91.0	93.6	93.0	85.6	75.4	68.2	60.0	57.5	55.8	49.5	46.8	42.1	41.5	44.1	48.4	54.0	59.8	66.9	73.0	68.8	96.4																					
28-Aug	75.3	78.6	82.3	86.2	88.0	93.3	94.2	92.3	89.7	85.7	79.9	76.5	71.5	68.8	65.5	60.3	60.2	62.3	64.9	72.1	78.2	83.5	89.7	85.7	78.5	94.2																					
29-Aug	89.3	90.7	92.4	92.6	92.7	93.3	93.9	92.3	87.3	79.5	70.8	62.7	57.3	55.0	45.0	43.4	45.1	46.1	50.7	60.0	68.3	75.8	82.0	86.2	73.0	93.9																					
30-Aug	89.7	93.6	96.3	96.2	97.5	97.8	98.1	95.4	84.3	74.9	67.1	59.7	49.6	43.1	42.9	41.5	44.5	44.7	41.9	34.2	35.0	37.2	47.6	53.9	65.3	98.1																					
31-Aug	55.3	65.1	68.3	72.9	82.2	83.0	77.5	75.7	77.9	74.2	70.3	65.9	59.9	55.7	52.0	47.2	46.4	56.2	65.6	69.8	74.6	76.3	80.5	78.7	68.0	83.0																					
																						79.4	82.7	84.7	86.3	87.1	87.8	86.5	82.9	79.2	73.7	69.0	64.6	60.3	56.5	55.4	54.5	54.2	55.9	57.9	60.9	65.2	69.5	75.0	77.0	Diurnal Average	
																						94.7	95.4	98.0	96.7	99.0	99.0	98.1	95.4	95.3	93.6	90.6	89.7	85.3	85.9	84.3	85.3	84.2	92.1	86.5	89.5	92.1	91.8	96.3	94.0	Diurnal Maximum	
DF - DAS Failure																																															





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	24	3.27	3.27
40 - 60	174	23.71	26.98
60 - 80	278	37.87	64.85
80 - 100	258	35.15	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

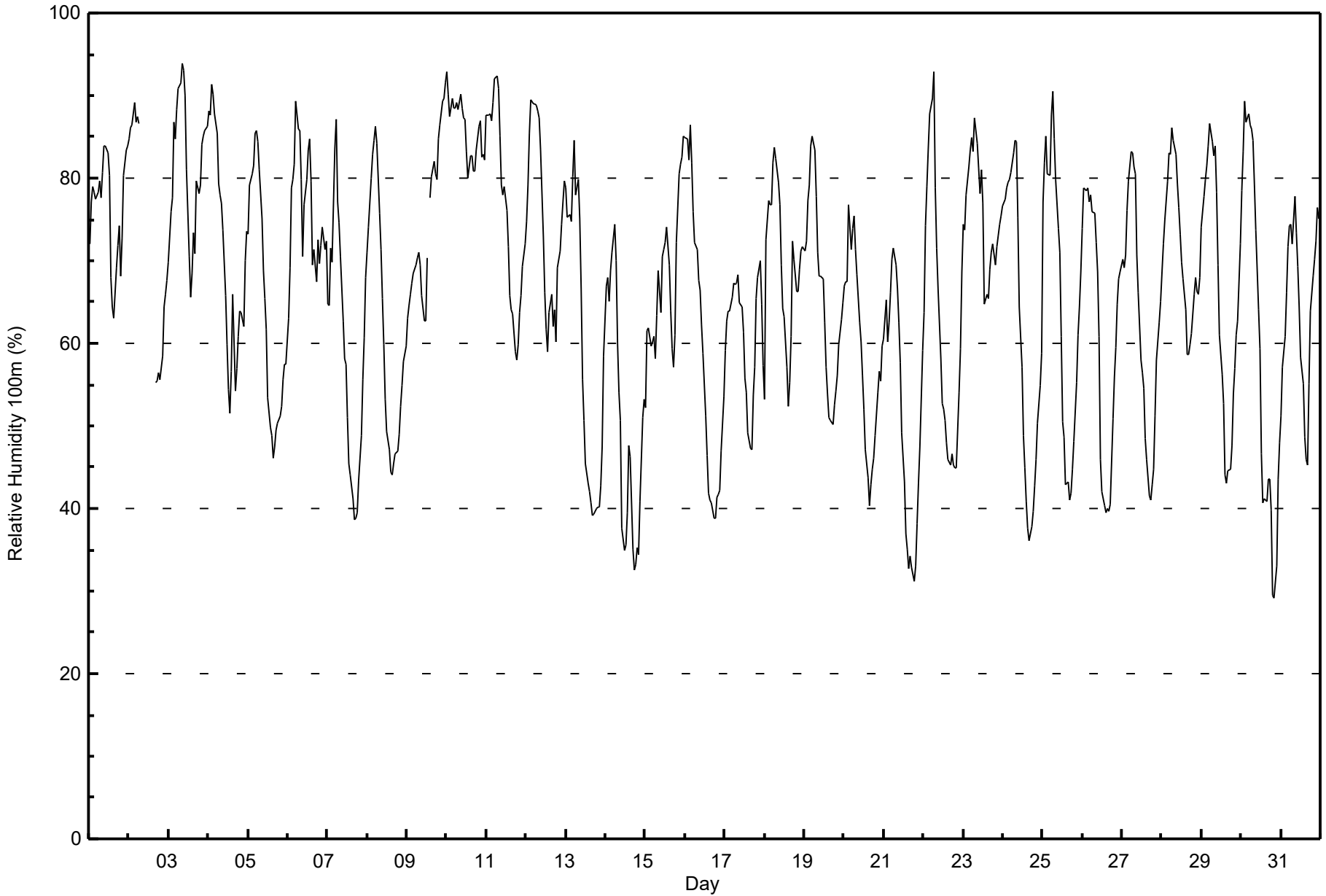
Relative Humidity 100m (RH100m) - %
Lower Camp Met Tower - August 2023

Maximum Value: 94.0 % on Aug 3 09:00																						Maximum Daily Average: 85.9 % on Aug 10																						Hours in Service: 744			
Minimum Value: 29.2 % on Aug 30 21:00																						Minimum Daily Average: 50.3 % on Aug 14																						Hours of Data: 734			
Maximum Diurnal Average: 81.8 % at hour 6																						Minimum Diurnal Average: 52.1 % at hour 17																						Hours of Missing Data: 10			
Monthly Average: 66.53 %																						Percentiles: P ₁ = 33.1 P ₁₀ = 43.6 Q ₁ = 55.6 Median = 68.3 Q ₃ = 79.2 P ₉₀ = 85.5 P ₉₉ = 91.5																						Hours of Calibration: 0			
																																												Percent Operational Time: 98.7			
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-Aug	72.0	77.1	79.0	78.3	77.4	78.2	79.6	77.6	80.7	84.0	84.0	83.1	80.3	67.9	64.4	63.0	69.1	71.9	74.2	68.2	72.8	80.3	83.5	83.9	76.3	84.0																					
2-Aug	84.7	86.1	86.5	89.2	86.9	87.5	86.6	DF	DF	DF	DF	DF	DF	DF	DF	DF	55.2	55.4	56.5	55.6	58.5	64.3	66.0	67.7	--	89.2																					
3-Aug	69.8	76.0	77.6	86.8	84.8	88.3	90.8	91.6	94.0	93.1	90.1	80.9	70.5	65.6	68.5	73.3	70.8	79.6	78.2	79.2	84.1	85.0	85.8	86.3	81.3	94.0																					
4-Aug	88.1	87.7	91.4	90.3	87.9	85.4	79.3	78.0	77.0	73.7	65.8	59.9	54.4	51.5	56.7	65.9	54.3	57.0	60.9	64.0	63.7	62.1	70.0	73.6	70.8	91.4																					
5-Aug	73.2	79.2	80.6	81.5	85.5	85.7	84.5	81.1	75.0	68.8	65.5	61.6	53.4	49.8	48.8	46.1	47.5	49.4	50.3	51.2	52.3	55.6	57.5	57.5	64.2	85.7																					
6-Aug	63.0	69.2	78.7	79.9	81.6	89.2	86.0	85.7	79.8	70.5	76.9	79.8	83.3	84.7	79.7	69.5	71.4	67.5	72.5	69.7	71.8	74.0	71.4	72.4	76.2	89.2																					
7-Aug	64.7	64.6	71.5	69.9	83.5	87.1	77.1	74.6	70.5	62.7	58.1	57.5	51.0	45.4	44.0	41.2	38.7	38.8	39.5	43.4	48.8	55.6	60.6	67.9	59.0	87.1																					
8-Aug	71.0	74.1	80.1	82.8	84.6	86.3	84.2	75.8	71.4	65.4	59.8	53.3	49.3	47.1	44.4	44.1	45.4	46.6	47.0	49.0	52.4	54.9	57.8	59.7	61.9	86.3																					
9-Aug	63.1	64.7	66.0	67.3	68.4	69.5	70.3	70.9	69.6	65.8	62.8	62.7	70.3	DF	77.6	80.2	82.0	80.5	79.8	84.8	86.5	89.3	89.7	91.5	74.5	91.5																					
10-Aug	92.8	90.3	87.5	89.7	88.6	88.4	89.1	88.3	90.2	88.5	87.2	87.2	83.2	80.0	82.7	82.8	80.9	80.9	83.4	86.3	86.9	82.5	82.9	82.2	85.9	92.8																					
11-Aug	87.7	87.6	87.8	87.0	89.2	92.0	92.4	90.9	85.1	79.1	78.0	78.9	76.0	71.7	65.7	64.0	63.6	59.0	58.0	59.9	63.7	65.7	69.4	72.1	76.0	92.4																					
12-Aug	74.8	79.1	85.5	89.5	89.1	88.9	88.8	88.2	87.3	83.5	73.0	66.0	61.7	59.0	63.7	66.0	62.0	64.0	60.1	69.1	71.2	74.4	77.1	79.7	75.1	89.5																					
13-Aug	78.9	75.2	75.6	74.8	80.2	84.6	77.9	79.8	75.1	66.6	55.6	50.7	45.4	43.1	42.0	40.6	39.2	39.3	40.0	40.1	40.1	42.6	47.4	58.5	58.1	84.6																					
14-Aug	67.0	68.0	65.0	68.9	71.1	74.3	70.1	60.0	54.0	50.6	37.7	35.0	35.6	39.5	47.6	46.2	35.1	32.5	33.1	35.3	34.4	40.8	51.0	53.1	50.3	74.3																					
15-Aug	52.1	61.6	61.8	59.7	60.1	60.9	58.2	63.4	68.8	63.8	70.5	71.4	72.2	74.1	69.4	63.9	59.3	57.1	61.0	72.2	80.5	81.6	82.6	85.0	67.1	85.0																					
16-Aug	84.8	84.8	82.2	86.4	81.9	75.9	72.2	71.3	67.7	66.5	62.1	58.8	51.1	46.5	41.9	41.0	40.8	38.8	38.8	41.3	41.7	42.1	46.9	53.5	59.1	86.4																					
17-Aug	59.1	62.7	63.9	63.9	65.6	67.3	67.1	67.4	68.4	64.9	64.3	61.4	55.8	54.1	49.2	47.3	47.0	53.7	57.1	65.3	68.0	70.0	64.7	57.4	61.1	70.0																					
18-Aug	53.2	72.5	77.3	76.7	76.8	81.9	83.7	82.3	79.5	76.8	69.5	64.3	63.2	57.1	52.3	55.3	60.8	72.4	70.2	66.2	66.2	69.0	71.2	71.8	69.6	83.7																					
19-Aug	71.2	72.3	77.2	79.2	83.9	85.1	83.3	77.9	70.9	68.1	68.2	67.8	62.5	57.2	53.9	51.1	50.7	50.1	52.5	54.3	56.1	59.9	62.9	64.8	65.9	85.1																					
20-Aug	66.9	67.4	67.5	76.8	71.4	73.9	75.5	71.3	68.3	62.6	60.1	56.0	52.0	47.0	43.7	40.3	42.9	44.7	46.2	48.8	54.1	56.5	55.5	59.6	58.7	76.8																					
21-Aug	60.6	65.3	60.2	62.5	66.2	70.2	71.5	69.4	66.7	62.5	57.6	49.1	43.2	37.0	35.0	32.7	34.2	32.9	31.1	33.0	38.1	43.1	47.5	59.1	51.2	71.5																					
22-Aug	63.8	74.2	79.0	83.6	87.8	89.7	93.0	78.8	71.5	66.5	58.1	52.8	52.1	50.7	47.9	45.9	45.3	46.6	45.3	44.9	45.0	54.1	59.3	68.7	62.7	93.0																					
23-Aug	74.5	73.8	78.0	81.3	83.3	84.8	83.2	87.3	84.3	81.2	78.2	81.0	77.0	64.7	66.0	65.4	69.0	71.0	72.1	69.5	71.6	73.1	74.4	75.4	75.8	87.3																					
24-Aug	76.7	77.5	78.7	79.5	79.8	80.7	83.1	84.5	84.4	75.3	64.5	57.2	48.9	44.9	40.9	37.6	36.1	37.8	39.6	42.7	46.0	50.3	54.9	58.9	60.8	84.5																					
25-Aug	77.1	81.9	85.1	80.6	80.4	87.6	90.5	84.7	79.8	74.0	71.0	60.8	50.5	48.6	42.8	43.3	41.0	41.8	44.7	48.2	55.2	61.0	64.3	68.6	65.1	90.5																					
26-Aug	73.9	78.8	78.5	78.8	77.1	77.9	75.9	75.7	72.2	68.7	60.8	45.8	42.0	40.3	39.5	40.0	39.7	40.4	50.9	56.0	59.5	64.8	67.7	68.7	61.4	78.8																					
27-Aug	70.2	69.2	70.6	76.1	79.6	83.2	83.1	81.4	80.5	70.6	66.0	58.0	56.5	54.6	48.5	45.9	41.5	41.1	42.9	44.8	51.3	57.9	62.5	65.1	62.6	83.2																					
28-Aug	68.6	72.0	75.0	79.7	83.1	82.8	86.1	84.5	82.9	79.4	76.4	73.2	69.8	67.8	64.1	58.7	58.7	59.9	61.1	65.9	68.0	66.2	65.9	67.9	71.6	86.1																					
29-Aug	74.1	77.7	79.9	81.5	83.9	86.6	84.5	82.7	83.9	78.3	69.4	61.0	56.2	52.7	44.1	43.0	44.6	44.7	47.6	53.9	56.9	61.1	62.7	72.1	66.0	86.6																					
30-Aug	78.5	83.2	89.3	86.8	87.7	86.4	86.0	84.5	79.3	73.8	64.1	59.4	46.6	40.8	41.2	40.8	43.6	43.5	39.8	29.5	29.2	33.1	43.6	48.0	59.9	89.3																					
31-Aug	51.2	57.0	60.9	66.1	71.7	74.2	74.4	72.1	77.8	73.4	69.3	64.5	58.3	55.1	48.7	45.8	45.2	55.1	63.9	68.1	70.1	72.3	76.5	75.0	64.4	77.8																					
																						71.2	74.5	76.7	78.5	80.0	81.8	80.9	78.7	76.5	72.0	67.5	63.3	59.1	55.1	53.8	52.7	52.1	53.4	54.8	56.8	59.5	62.7	65.6	68.6	Diurnal Average	
																						92.8	90.3	91.4	90.3	89.2	92.0	93.0	91.6	94.0	93.1	90.1	87.2	83.3	84.7	82.7	82.8	82.0	80.9	83.4	86.3	86.9	89.3	89.7	91.5	Diurnal Maximum	
DF - DAS Failure																																															



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	35	4.77	4.77
40 - 60	204	27.79	32.56
60 - 80	331	45.10	77.66
80 - 100	164	22.34	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

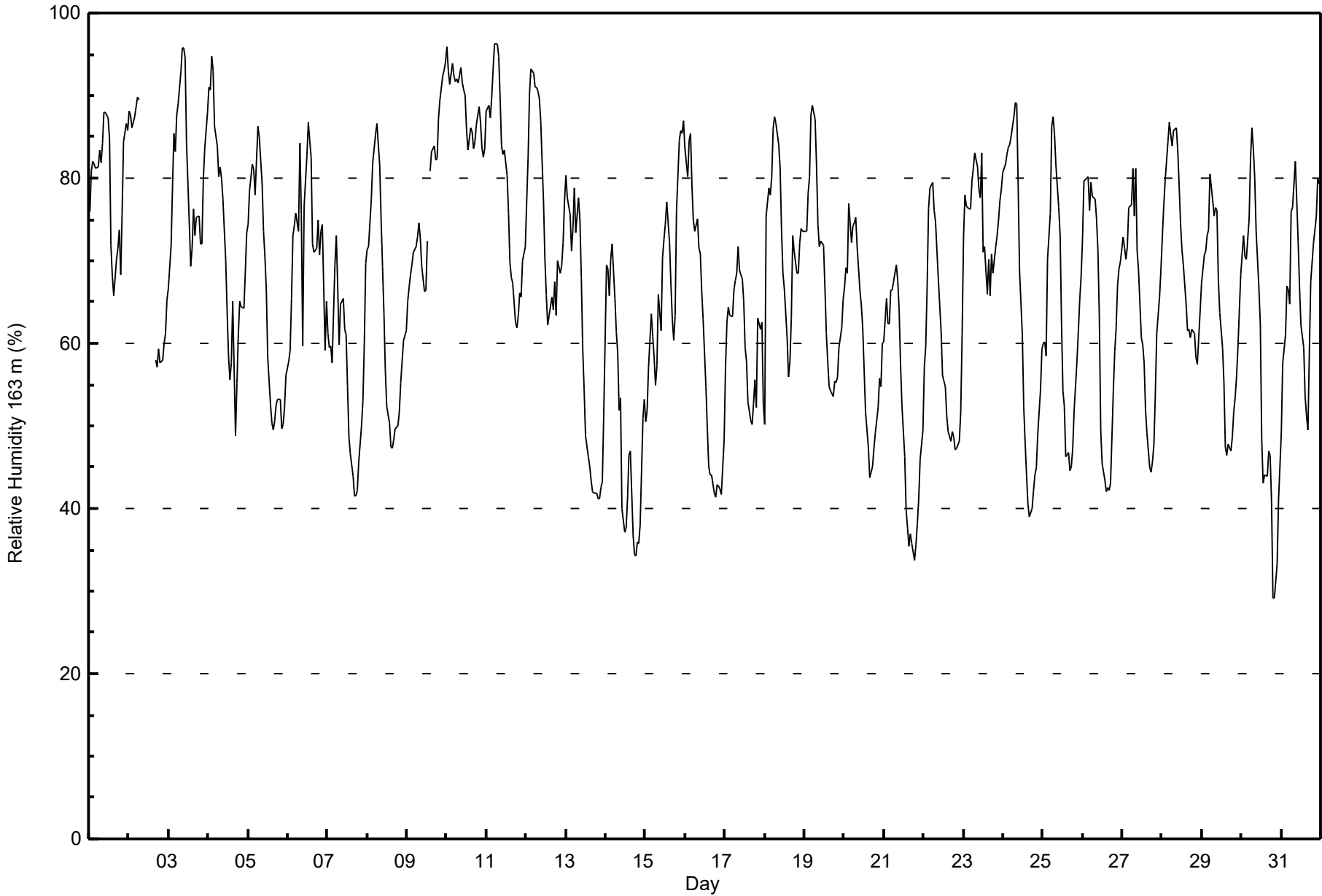
Relative Humidity 163 m (RH163m) - %
Lower Camp Met Tower - August 2023

Maximum Value: 96.4 % on Aug 11 06:00		Maximum Daily Average: 88.7 % on Aug 10		Hours in Service: 744																						
Minimum Value: 29.1 % on Aug 30 21:00		Minimum Daily Average: 50.2 % on Aug 14		Hours of Data: 734																						
Maximum Diurnal Average: 79.7 % at hour 7		Minimum Diurnal Average: 54.4 % at hour 17		Hours of Missing Data: 10																						
Monthly Average: 67.13 %		Percentiles: P ₁ = 35.7 P ₁₀ = 46.2 Q ₁ = 56.0 Median = 68.5 Q ₃ = 78.7 P ₉₀ = 86.3 P ₉₉ = 94.4		Hours of Calibration: 0																						
				Percent Operational Time: 98.7																						
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-Aug	76.0	80.8	82.0	81.7	81.2	81.4	83.5	81.8	84.3	87.9	88.0	87.3	84.7	71.8	68.1	65.8	70.2	71.4	73.7	68.3	75.7	84.5	86.6	85.8	79.3	88.0
2-Aug	88.1	87.7	86.0	87.4	88.7	89.8	89.4	DF	DF	DF	DF	DF	DF	DF	DF	DF	58.0	57.2	59.3	57.7	57.9	60.0	61.1	65.2	--	89.8
3-Aug	66.6	71.9	78.9	85.4	83.3	87.6	89.1	92.9	95.7	95.7	94.6	84.2	74.4	69.3	71.5	76.2	73.0	75.2	75.5	72.0	72.1	79.9	83.5	88.0	80.7	95.7
4-Aug	90.9	90.7	94.8	93.0	86.3	83.8	80.1	81.3	80.0	77.5	70.0	64.0	58.4	55.7	57.6	65.0	48.8	55.0	61.0	65.0	64.5	64.3	68.7	73.4	72.1	94.8
5-Aug	74.4	78.5	81.7	81.1	77.9	82.3	86.3	84.9	79.2	73.5	70.4	66.5	58.3	52.6	50.4	49.5	50.7	52.6	53.3	53.3	49.7	50.2	52.1	56.1	65.2	86.3
6-Aug	57.8	59.2	65.5	73.1	74.2	75.7	73.6	84.2	75.5	59.6	76.6	82.8	86.7	84.6	82.6	72.0	71.0	71.5	74.9	70.6	73.5	74.3	59.1	65.0	72.7	86.7
7-Aug	61.2	59.5	59.6	57.7	69.5	73.0	66.8	59.8	64.7	65.5	61.8	61.1	54.7	48.6	46.6	43.9	41.5	41.6	42.2	45.6	50.1	53.1	60.0	69.6	56.6	73.0
8-Aug	71.4	71.7	77.5	81.9	83.5	85.3	86.6	81.5	74.8	69.3	63.8	56.8	52.4	50.3	47.5	47.2	48.3	49.6	50.0	51.7	55.3	57.8	60.3	61.6	64.0	86.6
9-Aug	65.1	66.7	68.3	69.5	71.0	71.6	72.8	74.7	72.7	69.3	66.2	66.4	72.4	DF	80.9	83.3	84.0	82.2	82.4	87.4	89.4	92.4	93.0	94.0	77.2	94.0
10-Aug	96.0	93.1	91.4	93.9	92.4	91.7	92.1	91.5	93.4	91.5	90.7	89.9	86.0	83.4	86.1	85.6	83.6	84.4	86.4	88.7	86.9	83.7	82.6	83.5	88.7	96.0
11-Aug	88.2	88.9	87.3	89.8	93.3	96.4	96.3	94.7	89.7	83.8	82.9	83.4	80.3	75.8	69.8	68.0	67.4	62.5	61.9	63.4	66.1	65.7	70.1	71.7	79.1	96.4
12-Aug	77.3	82.6	90.4	93.2	92.7	91.0	91.1	90.5	89.7	86.9	77.2	70.3	65.8	62.1	63.4	65.6	64.1	67.5	63.4	69.9	68.5	69.5	72.2	77.2	76.7	93.2
13-Aug	80.3	77.7	75.6	71.2	73.8	78.8	73.4	77.7	75.0	68.0	59.3	54.5	48.8	46.3	45.0	43.3	42.0	41.8	41.1	41.1	42.6	43.3	51.4	58.1	80.3	
14-Aug	69.5	69.0	65.7	70.2	72.0	65.4	61.4	58.8	51.9	53.5	40.0	37.0	37.6	41.2	46.4	47.0	36.7	34.4	34.3	35.9	35.7	38.1	50.8	53.2	50.2	72.0
15-Aug	50.5	51.9	57.1	63.6	60.9	58.3	54.9	57.2	66.0	61.5	70.4	72.6	74.4	77.2	72.1	67.1	63.0	60.4	63.4	76.1	84.6	85.7	85.4	87.0	67.5	87.0
16-Aug	83.5	80.1	84.6	85.5	79.1	74.9	73.6	75.1	71.6	70.8	66.2	62.9	54.7	49.7	45.1	44.0	44.0	41.9	41.4	42.9	42.7	42.3	41.7	48.3	60.3	85.5
17-Aug	57.2	62.6	64.4	63.4	63.2	66.5	67.6	68.5	71.7	68.8	67.9	65.0	59.6	57.8	52.8	50.8	50.2	52.6	55.5	52.2	63.1	61.7	62.6	52.5	60.8	71.7
18-Aug	50.1	75.3	78.7	78.0	80.2	86.0	87.4	86.6	84.0	81.1	73.8	68.5	66.6	60.6	56.0	57.8	63.1	73.0	71.2	68.5	68.5	72.2	73.9	73.5	72.3	87.4
19-Aug	73.6	73.6	78.2	80.2	87.6	88.8	87.1	81.5	74.3	71.6	72.3	71.9	66.7	61.2	57.8	54.7	54.2	53.5	55.4	55.3	55.9	59.6	61.9	65.2	68.4	88.8
20-Aug	66.8	69.1	68.4	76.9	72.3	74.3	74.6	75.3	71.6	66.5	64.5	61.9	56.8	51.8	47.5	43.7	44.4	45.2	47.3	49.1	52.2	55.8	54.7	60.0	60.4	76.9
21-Aug	60.2	65.4	62.4	62.4	66.5	66.5	67.5	69.5	67.7	64.1	57.4	52.6	46.2	39.9	37.6	35.5	36.9	35.8	33.8	35.7	38.1	41.2	45.9	49.5	51.6	69.5
22-Aug	57.2	59.7	66.7	76.2	78.8	79.5	76.1	74.7	71.2	67.8	61.3	56.1	55.5	54.8	51.2	49.4	48.2	49.4	48.6	47.1	47.4	48.1	51.7	60.9	59.9	79.5
23-Aug	72.9	78.0	76.6	76.2	76.2	79.7	81.2	83.0	81.4	78.7	77.7	83.0	71.0	71.6	66.0	70.1	65.8	70.8	68.4	71.7	73.1	74.9	77.3	78.7	75.2	83.0
24-Aug	80.8	81.6	82.9	83.7	84.1	85.1	87.5	89.1	89.0	79.3	68.8	61.0	52.3	48.0	44.1	40.5	39.0	39.9	42.2	44.1	44.9	49.1	54.5	59.4	63.8	89.1
25-Aug	59.9	60.1	58.5	70.2	75.7	86.3	87.5	85.2	81.6	76.4	73.0	62.4	54.2	52.3	46.3	46.7	44.5	45.2	47.4	51.9	57.7	61.3	65.3	68.1	63.2	87.5
26-Aug	72.8	79.7	80.0	80.1	76.1	79.4	77.8	77.4	75.1	71.1	63.2	49.5	45.5	43.3	42.0	42.5	42.2	43.1	54.2	59.0	61.9	67.0	69.0	69.9	63.4	80.1
27-Aug	72.9	71.6	70.1	71.7	76.5	76.8	81.3	75.5	81.2	71.2	68.8	60.6	59.8	57.6	51.9	49.1	44.8	44.5	45.8	47.9	53.9	61.1	65.7	68.9	63.7	81.3
28-Aug	72.9	76.5	79.7	84.4	86.7	85.2	83.8	85.8	86.2	83.4	79.2	74.6	71.3	69.5	64.8	61.6	61.8	60.7	61.6	61.1	58.2	57.4	60.8	63.9	72.1	86.7
29-Aug	67.2	70.7	71.1	73.1	73.7	80.5	77.2	75.4	76.5	76.1	67.7	63.8	59.5	55.2	47.5	46.5	47.8	47.0	48.6	51.8	53.4	56.0	59.6	68.3	63.1	80.5
30-Aug	70.7	73.1	70.5	70.1	75.1	82.3	86.1	83.6	80.0	73.6	66.7	62.3	48.3	43.1	44.1	43.9	47.0	46.4	40.9	29.2	29.1	33.2	41.1	45.0	57.7	86.1
31-Aug	49.4	57.7	61.1	66.9	66.4	64.7	75.9	76.4	82.0	77.2	72.3	66.7	62.1	59.5	53.5	51.2	49.4	58.8	67.5	72.2	73.7	75.4	79.9	79.4	66.6	82.0
70.4 73.1 74.7 77.1 78.0 79.6 79.7 79.1 77.9 74.0 70.4 66.7 62.2 58.4 56.6 55.6 54.4 55.3 56.6 57.6 59.5 61.9 64.3 67.6																								Diurnal Average		
96.0 93.1 94.8 93.9 93.3 96.4 96.3 94.7 95.7 95.7 94.6 89.9 86.7 84.6 86.1 85.6 84.0 84.4 86.4 88.7 89.4 92.4 93.0 94.0																								Diurnal Maximum		
DF - DAS Failure																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	21	2.86	2.86
40 - 60	213	29.02	31.88
60 - 80	334	45.50	77.38
80 - 100	166	22.62	100.00

Total Number of Valid Hours: 734

Total Number of Hours: 744



Maximum Speed: 24 km/h on Aug 9 12:00	Maximum Daily Speed Average: 12.8 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 22 23:00	Minimum Daily Speed Average: 1.1 km/h on Aug 20	Hours of Data: 734
Maximum Diurnal Speed Average: 3.7 km/h at hour 15	Minimum Diurnal Speed Average: 0.7 km/h at hour 21	Hours of Missing Data: 10
Monthly Average Velocity: 1.5 km/h 180.5 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 21	Percent Operational Time: 98.7

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-Aug	WSW16	W16	W13	W12	W15	W16	W13WNW13	W13WSW15	WSW14	WSW15	WSW12	WNW9	NNW8	WNW6	S2	SSW11	SW7	W5	NNW6	N2	NNW1	NW3			W8.7	W16
2-Aug	WNW1	WSW2	NNW2	WNW3	NW4	N1	N2	DF	DF	DF	DF	DF	DF	DF	DF	NNE4	N2	N1	S0	NNW1	NNW2	N2	N2	---	NNE4	
3-Aug	NNW2	NNW4	WSW0	N3	N3	NW1	E2	SSE3	ESE1	ESE3	SE9	SE9	SSE9	SSE9	SSE14	SE3	N8	WSW2	SSE6	SE5	ESE5	SE4	SW1	W2	SE2.5	SSE14
4-Aug	NW4	NW6	NNW5	NW4	N6	NW5	WNW6	W10	W10	SW11	WSW8	WSW8	WSW2	S3	SW16	NNE6	SW1	N4	ENE1	S1	NW2	SW4	WNW1	WNW5	W3.7	SW16
5-Aug	NW2	WSW0	SE3	SE4	SSE6	S6	S5	SSE5	WNW0	NNE2	NNW5	N4	NNE5	NNE5	NE3	N4	NNW4	N8	N7	NNE4	N2	NE1	N1	NW2	NNE1.3	N8
6-Aug	N1	NNE1	NNW1	NNW0	ESE2	ESE2	SE3	NNE3	ESE2	ESE5	N10	NNE6	NNW3	NNW5	NNW6	NNW5	NNW6	NNW4	NW3	NW1	N2	NNW3	NNW5	N2.6	N10	
7-Aug	N3	NNW2	WNW1	N1	N1	NNW1	NNW2	NW3	N4	NNW4	NNW8	NW8	N10	NNW10	N11	N11	N12	NNE13	NNE10	N8	NNW4	NNW2	N2	ENE3	N5.2	NNE13
8-Aug	N3	N2	NNW3	NNE2	NNW1	NW3	WNW3	SE2	ESE7	SE11	SE8	SE8	ESE8	E9	SE13	SE11	SE13	ESE14	ESE15	ESE14	SE13	ESE13	ESE10	ESE10	ESE6.8	ESE15
9-Aug	ESE9	ESE11	ESE12	ESE12	SE13	SE14	SE15	SE14	SE14	SE15	SE19	SSE24	SE19	DF	SE18	ESE14	ESE12	ESE7	ESE9	ESE8	SE11	ESE10	ESE11	SE11	SE12.8	SSE24
10-Aug	ESE13	SE12	ESE12	ESE12	ESE14	ESE14	ESE12	ESE10	ESE6	E6	E5	ENE6	E9	E8	E7	ENE5	E7	ENE7	NE5	NNE6	N7	N7	N6	N6	E6.6	ESE14
11-Aug	NNW6	NNW4	NNW5	NNW7	NNW5	NNW4	NNW5	NNW6	N5	N5	NW3	W6	W6	NW3	W4	WSW7	W7	W7	WSW5	S5	ESE4	ESE4	SE3	SE8	WNW2.3	SE8
12-Aug	SSE6	SE7	S3	SW4	SW5	WSW12	W8	NW3	WNW3	NW4	WNW8	WSW8	W4	W3	WSW8	WSW8	W4	N2	W2	WSW6	SW1	SSW4	SSW4	SE5	WSW3.5	WSW12
13-Aug	SE7	SE6	ESE7	SE12	SE13	SSE12	SE20	SE14	SE13	SE11	S17	SW19	WSW18	WSW18	WSW20	WSW20	WSW21	WSW18	WSW12	SW10	SW5	WSW9	WSW11	SSE4	SSW8.9	WSW21
14-Aug	N2	SE7	SSE5	SSE4	NNW6	NNW8	WNW2	W7	WSW12	W10	WNW14	WNW14	W16	WSW23	WSW22	WSW17	WNW17	WNW14	W10	WNW9	WNW9	W8	WNW2	SE1	W8.0	WSW23
15-Aug	SE0	ESE3	SE7	SE8	SE10	SE9	SE11	SE10	SE9	SE8	SE4	SE12	SSE12	SE8	SE6	E4	ESE4	ENE1	NNW8	NNW13	NNW11	NNW9	NNW7	NNW4	ESE3.3	NNW13
16-Aug	N2	SSW0	NNW1	NNW4	WNW4	NW3	NNW4	NNW4	NW8	NNW7	NW9	W5	WSW13	WSW11	WSW11	WSW13	SW16	SW17	SW14	S13	S16	S18	S15	SSE9	SW5.7	S18
17-Aug	ESE4	E5	ESE7	SE10	SE10	SE6	SE8	SSE11	SSE7	SSW6	SSE3	W2	WSW13	W9	WSW10	SW7	NW8	NNW2	NE1	NW3	NNW8	NNE2	NNW3	NW4	S1.8	WSW13
18-Aug	NNW4	NNW11	NNW8	N9	N6	N9	N13	N14	N13	NNW10	N13	NNW11	NW9	N9	NNW10	NW7	NW10	NNW7	NNW7	NNW5	NNW8	NNW7	NW6	NW6	NNW8.6	N14
19-Aug	NW8	NW6	NW6	WNW4	WNW5	WNW6	W7	WSW12	WSW14	W11	WSW12	WSW14	WSW15	WSW17	SW20	WSW22	WSW23	WSW20	SW15	SW11	SW10	SSW9	SE5	SE8	WSW9.9	WSW23
20-Aug	SE11	SE10	SE12	E2	SSW11	SSW7	SE8	SSE8	SE5	WSW5	NW4	N7	N7	N7	N6	N5	NW9	NNW4	ENE1	SE3	NNW2	SE1	NE1	WNW1	ESE1.1	SE12
21-Aug	SE5	SSE4	SE8	SE11	SE8	SE8	SE9	SE9	SE9	SE8	SE8	SE9	SE12	SSE11	SSE10	S13	SSE9	S16	S15	S10	SE8	ESE2	N1	SE2	SSE7.9	S16
22-Aug	W0	SE1	N2	S0	ESE0	E2	ESE3	SE6	SE7	SE8	SE7	SSE7	ENE3	E3	SSE7	SSW7	WNW4	NW5	NNW3	NNE1	NW1	WSW0	WSW0	NNW3	SE1.5	SE8
23-Aug	NNW5	NW3	NW3	NNW4	NW4	NNW2	NW4	NNW6	NW3	NNW4	NNW3	N4	NW3	NW3	NW2	N3	NNW5	NNW3	NW4	NNW8	NNW7	NNW7	NNW8	NNW8	NNW4.3	NNW8
24-Aug	NNW11	NNW11	NNW10	N10	N11	N12	N13	N14	N13	N15	N17	N17	N16	NNW15	NNW14	NNW10	NNW8	NW8	NW7	NNW3	NW2	NW1	NNW0	E0	NNW9.8	N17
25-Aug	SE2	SE3	SE3	ESE5	SE5	SSE7	SE8	SE12	SE12	SE13	SE11	S12	SSW18	SSW14	SSW16	SSW17	SSW18	SSW16	SSE11	SSE16	S21	SSE21	S17	SSE11	S10.8	SSE21
26-Aug	SE9	E7	ESE11	SE11	SE13	SE13	SE16	SE14	SE11	SE9	SSE12	SW18	SW17	WSW16	WSW10	W8	W12	NW10	N15	N11	NNW8	NNW3	NNW2	WSW1	S3.1	SW18
27-Aug	SE0	N2	NNE1	W1	ESE1	NE1	N1	NNE1	ESE1	SE4	SE5	E4	SE7	SSE9	S9	S11	SSW12	SSW15	SSW13	S11	SE4	SE6	SE9	SE6	SSE4.1	SSW15
28-Aug	SSE2	SE5	SE8	SE8	SE8	SE7	SE8	ESE9	SE8	SE7	SE9	SE7	SE7	SE5	SE5	SE8	SE11	SE11	SE6	SE5	SE7	SE8	SE7	SE10	SE7.3	SE11
29-Aug	SE7	SE8	SE10	SE10	SE10	SE8	SE11	SE11	SE12	SE9	SE9	SE10	SE10	SE12	S15	S17	S15	S13	SE6	ESE4	SE5	SE9	SE8	SE6	SSE9.1	S17
30-Aug	SE2	SW0	SSE0	SE2	E1	SE5	SE7	SE6	ESE2	NE1	E4	SSE3	SSE6	SSE9	SE10	SSE14	SSE14	SSE12	SSE16	SSE17	SE13	SE12	SE5	ESE4	SE6.6	SSE17
31-Aug	SE1	NNW4	SSE2	W1	NE1	SSW3	SSE6	SSE5	SW10	S1	SE7	ESE6	SW2	WNW3	NNE4	NNE4	N5	NNW8	NNW9	NW7	NNW6	NW3	NNW6	NW5	NW1.2	SW10

ESE0.9 ESE1.0 ESE1.9 ESE1.9 SE1.9 SSE1.7 SE2.7 SE2.6 SSE2.1 SSE1.8 S1.4 SSW2.7 SSW3.1 SW2.7 SSW3.7 SW3.6 WSW3.1 WSW2.8 SSW1.3 SSW1.3 SSE0.7 SSE1.9 SE1.1 ESE1.3	Diurnal Average
WSW16 W16 W13 SE12 W15 W16 SE20 SE14 SE14 SE15 SE19 SSE24 SE19 WSW23 WSW22 WSW22 WSW23 WSW20 SSE16 SSE17 SSE21 SSE21 S17 SSE11	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

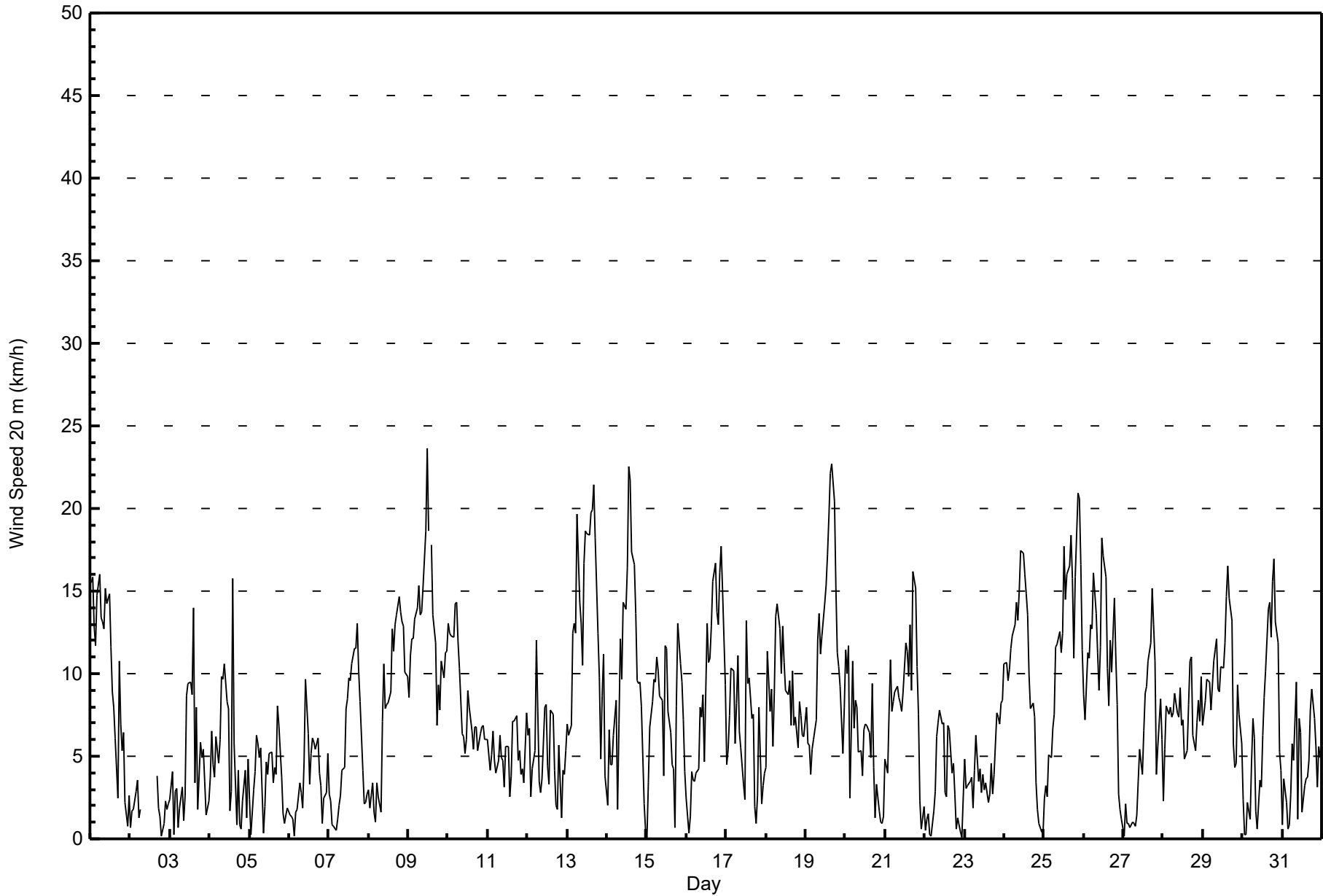
Wind Speed 20 m (WS20m) - km/h
Lower Camp Met Tower - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Aug 3 18:00 Minimum Value: 0 km/h on Aug 22 01:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																		Hours in Service: 744 Hours of Data: 734 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.7							
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-Aug	4	5	5	5	5	5	5	5	4	5	3	3	4	6	4	6	3	4	4	3	4	1	1	1	6
2-Aug	1	1	1	1	2	1	1	DF	DF	DF	DF	DF	DF	DF	DF	DF	3	1	1	1	1	1	1	1	3
3-Aug	2	2	1	1	1	2	2	3	2	1	3	2	4	4	7	4	5	10	3	3	2	1	2	2	10
4-Aug	2	3	3	2	2	3	4	4	4	3	3	3	3	4	6	4	2	2	1	1	1	2	2	2	6
5-Aug	2	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1	1	1	2
6-Aug	1	1	1	1	1	1	2	4	2	3	6	4	2	3	3	2	2	3	2	1	1	1	2	2	6
7-Aug	1	1	1	1	1	1	2	1	2	2	3	3	4	4	5	5	5	5	5	4	1	1	1	1	5
8-Aug	1	1	2	1	1	2	1	3	3	4	3	4	4	4	4	5	5	5	5	5	4	4	4	3	5
9-Aug	3	4	4	4	4	5	5	5	5	6	7	5	7	DF	6	5	5	4	4	4	4	4	3	4	7
10-Aug	5	5	5	4	5	5	4	4	3	3	2	3	4	4	4	2	4	4	2	3	2	2	2	2	5
11-Aug	3	2	2	3	3	2	2	3	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	4	4
12-Aug	4	2	2	2	3	4	4	2	2	3	4	3	3	3	3	3	2	1	2	2	1	2	2	2	4
13-Aug	2	2	2	4	3	3	3	4	3	3	4	4	6	6	6	6	5	5	3	2	2	3	3	3	6
14-Aug	3	3	3	3	3	4	2	4	5	4	6	6	6	8	7	6	6	5	4	3	2	3	2	1	8
15-Aug	1	2	3	3	2	3	4	4	4	4	3	5	3	4	3	1	2	1	6	5	4	4	3	2	6
16-Aug	2	1	1	2	1	1	1	3	4	3	4	4	4	5	4	5	4	4	3	2	2	2	3	5	5
17-Aug	4	3	3	3	4	2	3	3	3	3	2	4	5	4	4	3	9	5	2	2	4	2	2	1	9
18-Aug	3	4	4	3	3	3	5	5	4	4	5	5	4	3	5	2	4	3	3	3	3	3	2	2	5
19-Aug	2	2	3	3	3	4	4	5	4	4	4	4	5	5	4	6	6	6	3	2	2	2	2	3	6
20-Aug	2	4	4	2	3	3	2	2	2	3	2	2	2	2	2	3	5	2	1	1	1	1	1	1	5
21-Aug	2	2	3	3	2	2	3	2	2	3	2	3	4	5	3	4	4	3	3	3	2	3	1	2	5
22-Aug	0	1	1	1	1	1	1	2	3	3	2	4	2	2	3	3	2	2	1	1	1	1	1	1	4
23-Aug	2	1	1	1	1	1	1	3	2	3	1	1	1	1	2	2	1	1	1	3	3	3	3	3	3
24-Aug	4	4	4	4	4	4	5	5	5	5	6	5	5	6	5	4	3	3	2	2	1	1	1	1	6
25-Aug	1	1	1	2	2	2	2	2	3	3	3	5	4	4	4	4	3	3	2	3	3	3	3	2	5
26-Aug	3	3	3	3	3	3	4	3	3	3	4	4	5	4	4	4	4	7	6	4	3	2	1	1	7
27-Aug	1	1	1	1	1	1	1	1	1	1	3	2	3	4	4	5	3	3	2	2	2	2	2	3	5
28-Aug	1	2	2	2	3	2	2	2	2	2	3	2	2	2	2	2	2	2	3	2	1	2	2	3	3
29-Aug	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	4	2	2	2	1	2	2	4
30-Aug	2	1	1	2	1	2	2	2	2	1	2	2	3	3	4	4	3	3	4	5	3	4	3	2	5
31-Aug	2	2	1	2	1	1	2	3	3	2	2	2	3	2	1	2	2	6	4	2	2	1	2	2	6
Diurnal Maximum																								5	
DF - DAS Failure																									



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	296	40.33	40.33
6 - 11	285	38.83	79.16
12 - 19	140	19.07	98.23
20 - 28	13	1.77	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

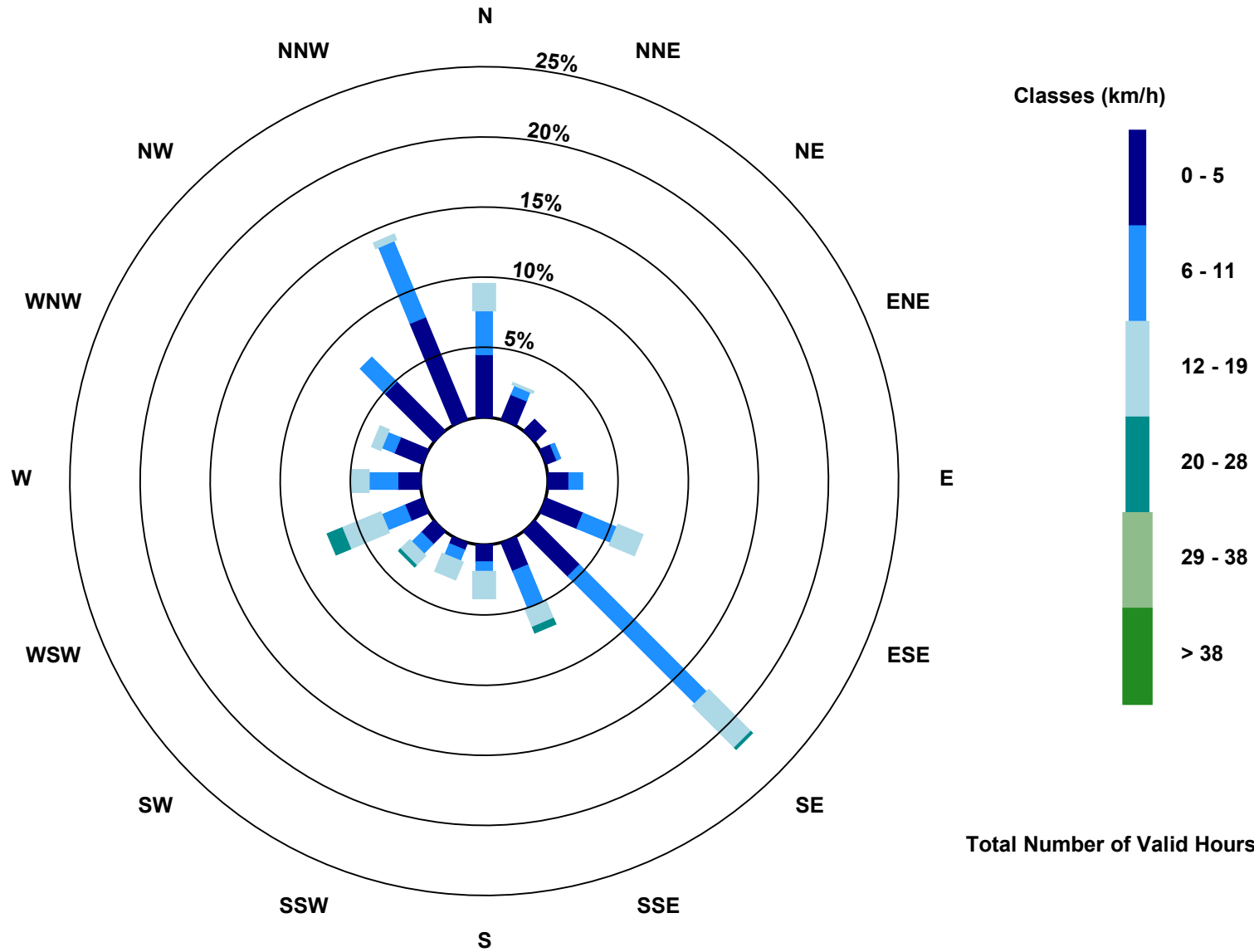
Total Number of Valid Hours: 734

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Maximum Speed: 30 km/h on Aug 14 14:00	Maximum Daily Speed Average: 19.9 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 20 21:00	Minimum Daily Speed Average: 1.4 km/h on Aug 20	Hours of Data: 734
Maximum Diurnal Speed Average: 4.0 km/h at hour 15	Minimum Diurnal Speed Average: 0.6 km/h at hour 21	Hours of Missing Data: 10
Monthly Average Velocity: 1.7 km/h 177.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 10 Q ₃ = 15 P ₉₀ = 20 P ₉₉ = 26	Percent Operational Time: 98.7

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-Aug	WSW21WSW24	W20	W18	W22WSW23	W20WNW20WSW19WSW20WSW18WSW18WSW15WNW13	NNW12WNW10	SW5	SSW13	SW10WNW10	NNW11	N3	NNW1	NW5	W12.6	WSW24											
2-Aug	NNW4	WSW3	NW3	NW2	NW5	W2	NNW3	DF	DF	DF	DF	DF	DF	DF	DF	NNE6	N3	NNE2	ENE3	NE1	NNE3	E1	ENE2	---	NNE6	
3-Aug	E1	N5	WSW1	NNE2	NNE4	SW2	SE5	SSE6	ESE2	ESE4	SE12	SE12	SSE11	SE11	SE19	ESE5	N12	WNW2	SSE7	SE7	SE7	SSE5	SW4	W4	SE3.8	SE19
4-Aug	WNW6WNW11	NW8	NW7	NNW9	WNW8WNW11	W15	W13WSW12	WSW9	WSW9	W2	S3	SW19	NE9	SW1	N5	SW1	WSW3	NW4	SW7	WSW4	WNW8	W5.8	SW19			
5-Aug	WNW3	E1	SSE5	S4	S7	SSW7	SSW6	S6	W1	N1	NNW6	NNW5	N6	NNE5	NE4	N6	NNW5	N12	NNE13	NNE9	NNE4	NE3	NNW4	N2	N2.0	NNE13
6-Aug	NW2	WNW1	NW3	W1	SSE1	SE3	SE6	NE4	E3	SE7	N14	NNE9	NNW5	NNW6	NNW8	NNW8	NNW8	NNW8	NW7	NW6	NNW3	NNW4	N8	NNW9	N3.7	N14
7-Aug	N5	NNW6	N2	N2	NW1	NNW1	NNW3	NW3	N5	NW5	NNW10	NW11	N14	N13	N15	N17	N16	NNE19	NNE18	NNE14	N8	NNW7	N6	ENE4	N8.0	NNE19
8-Aug	NNE3	N4	N6	N3	N3	NNW3	NNW1	SE2	ESE9	SE13	SE9	SE11	ESE11	E14	SE17	ESE17	SE19	ESE20	ESE23	ESE22	ESE20	ESE21	ESE18	ESE18	ESE10.4	ESE23
9-Aug	ESE15	ESE20	ESE21	ESE20	SE20	SE21	SE23	SE21	SE21	SE23	SE27	SSE27	SE27	DF	SE27	ESE20	ESE18	ESE12	ESE16	ESE14	ESE17	ESE16	ESE18	SE18	SE19.9	SSE27
10-Aug	ESE20	SE20	ESE20	ESE19	ESE22	ESE22	ESE19	ESE17	ESE12	ESE11	E9	E10	E15	E13	E11	ENE9	E11	ENE11	N8	NNE11	N10	N11	N9	N9	E11.0	ESE22
11-Aug	NNW11	NNW8	NNW10	NNW11	NNW8	NNW7	NNW8	NNW9	N7	N6	NW4	W7	W8	NW3	W5	WSW8	W9	W10	WSW6	S9	SSE9	SE7	SE7	SE11	NW3.0	SE11
12-Aug	SSE10	SE9	SSW5	SW7	SW9WSW18	W13	WNW7	WNW6	WNW6WNW10	W10	W6	W5	SW11	WSW9	W5	N3	NW2	WSW9	SW4	SW7	SSW6	S6	WSW5.7	WSW18		
13-Aug	SSE8	SE9	SE11	SE16	SE17	SE17	SE23	SE19	SE18	SE14	S18	SW21WSW22WSW23WSW25WSW26WSW26	SW22WSW17WSW13	SW12	SW15WSW16	SSW3	SSW11.5	WSW26								
14-Aug	N5	SSE10	S6	S6	NNW10	NNW14	NW4	W11WSW17	W14WNW21WNW21	W24WSW30WSW29WSW24WNW24WNW20	W15WNW16WNW18	W14	NNW4	SW3	W12.3	WSW30										
15-Aug	SW5	S2	SSE7	SE10	SE14	SE13	SE16	SE14	SE15	SE15	SE17	SE15	SE11	SE8	ESE5	ESE5	E1	N12	NNW20	NNW19	NNW17	NNW14	NNW9	ESE3.7	NNW20	
16-Aug	NNW6	SW2	NW2	NNW6	NW7	NW6	NW6	NNW7	NW12	NNW10	NW12	W6WSW15	W13WSW14WSW15	SW18	SW18	SW16	SSW16	S21	S23	S19	S14	WSW7.2	S23			
17-Aug	SE9	ESE9	ESE11	SE15	SE15	SE10	SE13	SSE13	SSE8	SSW6	SE4	W4WSW16	W12WSW12	SW9	NNW11	NNW5	NE4	NNW3	NNW12	NNE4	NNW5	NNW9	S2.3	WSW16		
18-Aug	NNW10	NNW19	N13	N14	N11	N15	N20	N21	N19	NNW14	N19	NNW16	NW13	N13	NNW14	NW11	NNW17	NNW14	NNW15	N11	NNW16	NNW15	NNW13	NW11	NNW14.3	N21
19-Aug	NW13	NW11	WNW12	WNW9	W9	W10WSW12WSW15WSW17WSW16WSW16WSW17WSW18WSW20	SW22WSW26WSW27WSW26	SW18	SW15	SW15	SSW13	SSE6	SSE8	WSW13.7	WSW27											
20-Aug	SE13	SE14	SE14	E4	SW13	S9	SSE10	SSE9	SSE6	WSW7	NW4	N7	N7	N7	N7	NNW6	NW15	NNW8	NE3	SE6	ENE0	SSE1	SSE2	SSE4	SE1.4	NW15
21-Aug	S6	S5	SSE11	SE13	SE11	SE11	SE13	SE12	SE9	SE10	SE10	ESE12	SE16	SSE12	SSE11	S14	SSE11	S17	S17	S14	SSE12	SE8	SSW1	SE4	SSE10.2	S17
22-Aug	SE4	SE4	NNE2	NNE0	SE3	ESE3	SE5	SE8	SE9	SE10	SE9	SSE8	E3	E4	SSE8	SSW7	W5	NW7	NNW6	NNE1	W1	SE1	SSW1	N2	SE2.4	SE10
23-Aug	NNW8	N5	NNW5	NNW6	NNW6	N3	NNW6	NNW11	NW4	NNW5	NW3	NNW4	NNW4	NW7	NW5	NNW5	NNW8	NNW7	NNW9	N14	NNW14	NNW13	NNW14	NNW15	NNW7.6	NNW15
24-Aug	NNW18	NNW17	N15	N15	N17	N18	N19	N21	N19	N21	N26	N25	N23	NNW21	NNW19	NNW15	NNW12	NW12	NW15	NNW9	NNW5	NW2	NW2	NW1	NNW15.0	N26
25-Aug	SE5	SE9	SE7	SE10	SE9	SE9	SE11	SE14	SE16	SE15	SE16	SSE15	SSW19	SSW15	SSW17	SSW18	SSW20	SSW17	S13	S20	S25	S24	S21	SSE15	S13.4	S25
26-Aug	SSE13	ESE10	ESE17	SE16	SE19	SE17	SE20	SE19	SE15	SE13	SE15	SW20	SW20WSW20WSW15	W13	W18	NW16	N22	N18	N15	NNW7	N6	NW2	SSE3.4	N22		
27-Aug	WNW0	WNW3	NW1	W1	SSW1	W4	NW1	NNE0	S2	SE3	SE6	ESE5	SE8	SSE10	S10	S12	SSW13	SSW17	SSW16	S15	S8	SSE8	SE12	SE10	S5.4	SSW17
28-Aug	SE5	SE11	SE13	SE10	SE9	SE11	SE10	SE13	SE11	SE11	SE12	SE9	ESE11	ESE6	ESE7	SE11	SE13	SE16	SE11	SE9	SE11	SE14	SE14	SE16	SE10.9	SE16
29-Aug	SE12	SE14	SE14	SE15	SE14	SE13	SE15	SE17	SE15	SE13	SE13	SE14	SE16	SE18	S16	S18	S15	S15	SSE9	SE9	SE11	SE13	SE11	SE9	SE12.9	SE18
30-Aug	SE6	SE4	SE4	SE7	SE5	SE8	SE10	SE8	ESE2	ENE1	ESE5	SSE4	SE8	SSE11	SE14	SSE16	SSE18	SSE14	SSE18	SSE22	SE19	SE17	SE9	SE9	SE9.7	SSE22
31-Aug	S4	N4	ESE5	S2	ESE2	SSW4	S8	S7	SW11	S1	SE8	ESE8	SW2	WNW4	NNE4	N5	NNW7	NNW15	NNW15	NW12	NNW11	NNW7	NNW11	NW9	NW2.2	NNW15

SE1.1 ESE1.6 ESE2.5 SE2.6 SE2.5 SSE2.5 SE3.5 SE3.2 SSE2.6 SSE2.4 SSE1.5 SSW2.7 SSW3.4 WSW3.1 SW4.0 SW3.9 WSW3.0 WSW3.1 WSW0.8 SSW0.9 S0.6 SSE2.0 SE1.3 SE1.7	Diurnal Average
WSW21WSW24 ESE21 ESE20 ESE22WSW23 SE23 N21 SE21 SE23 SE27 SSE27 SE27WSW30WSW29WSW26WSW27WSW26 ESE23 ESE22 S25 S24 S21 ESE18	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 45 m (WS45m) - km/h
Lower Camp Met Tower - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 14 km/h on Aug 17 17:00	Hours of Data: 734
Minimum Value: 1 km/h on Aug 27 04:00	Hours of Missing Data: 10
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7	Hours of Calibration: 0
	Percent Operational Time: 98.7

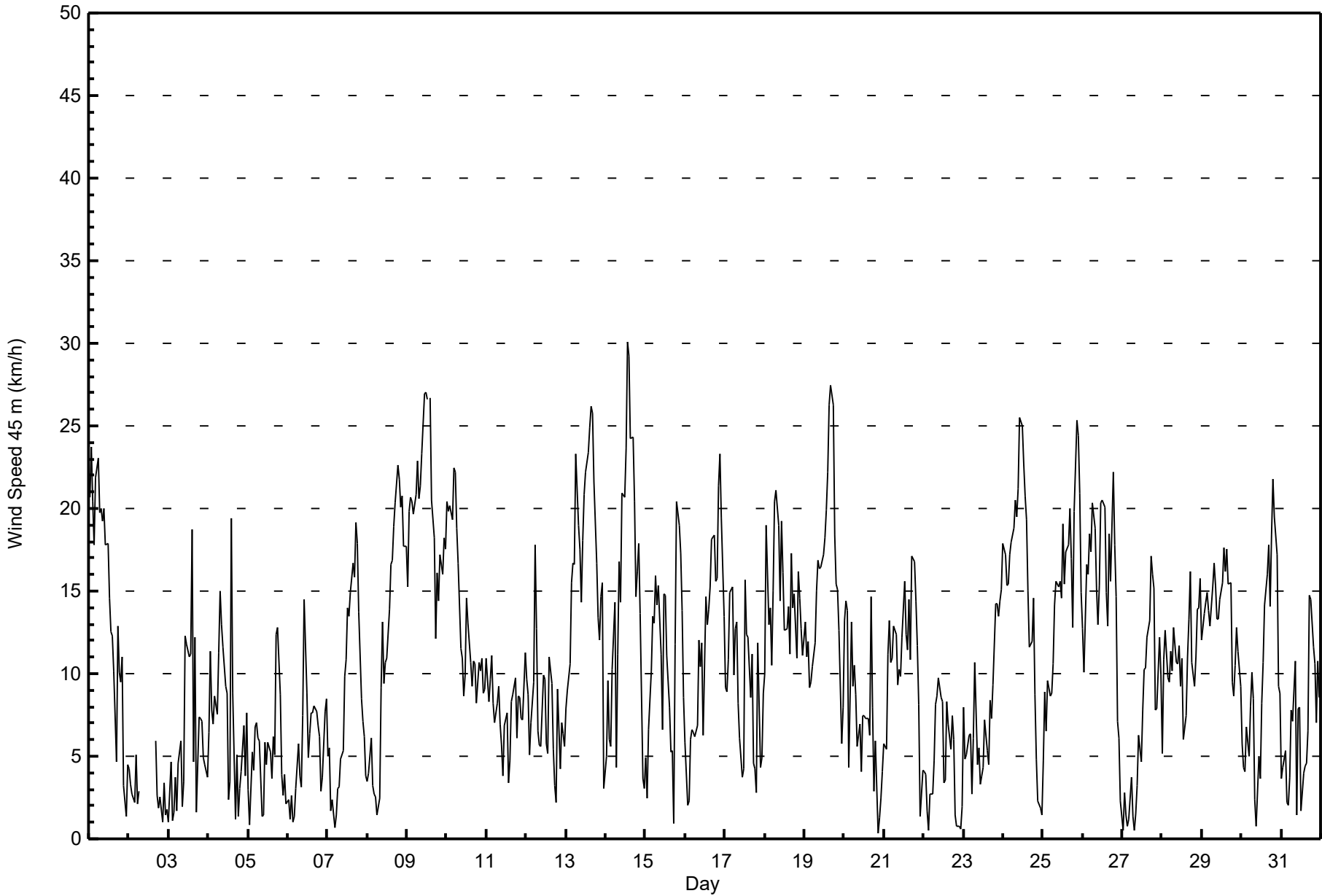
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	3	5	5	4	4	4	4	5	4	4	3	3	5	6	4	7	4	4	4	2	6	2	1	2	7
2-Aug	2	1	2	1	3	2	1	DF	DF	DF	DF	DF	DF	DF	DF	DF	3	1	1	1	1	2	1	1	3
3-Aug	2	2	1	1	1	2	3	3	3	2	3	2	4	4	7	5	7	13	4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

DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	181	24.66	24.66
6 - 11	243	33.11	57.77
12 - 19	235	32.02	89.78
20 - 28	73	9.95	99.73
29 - 38	2	0.27	100.00
> 38	0	0.00	100.00

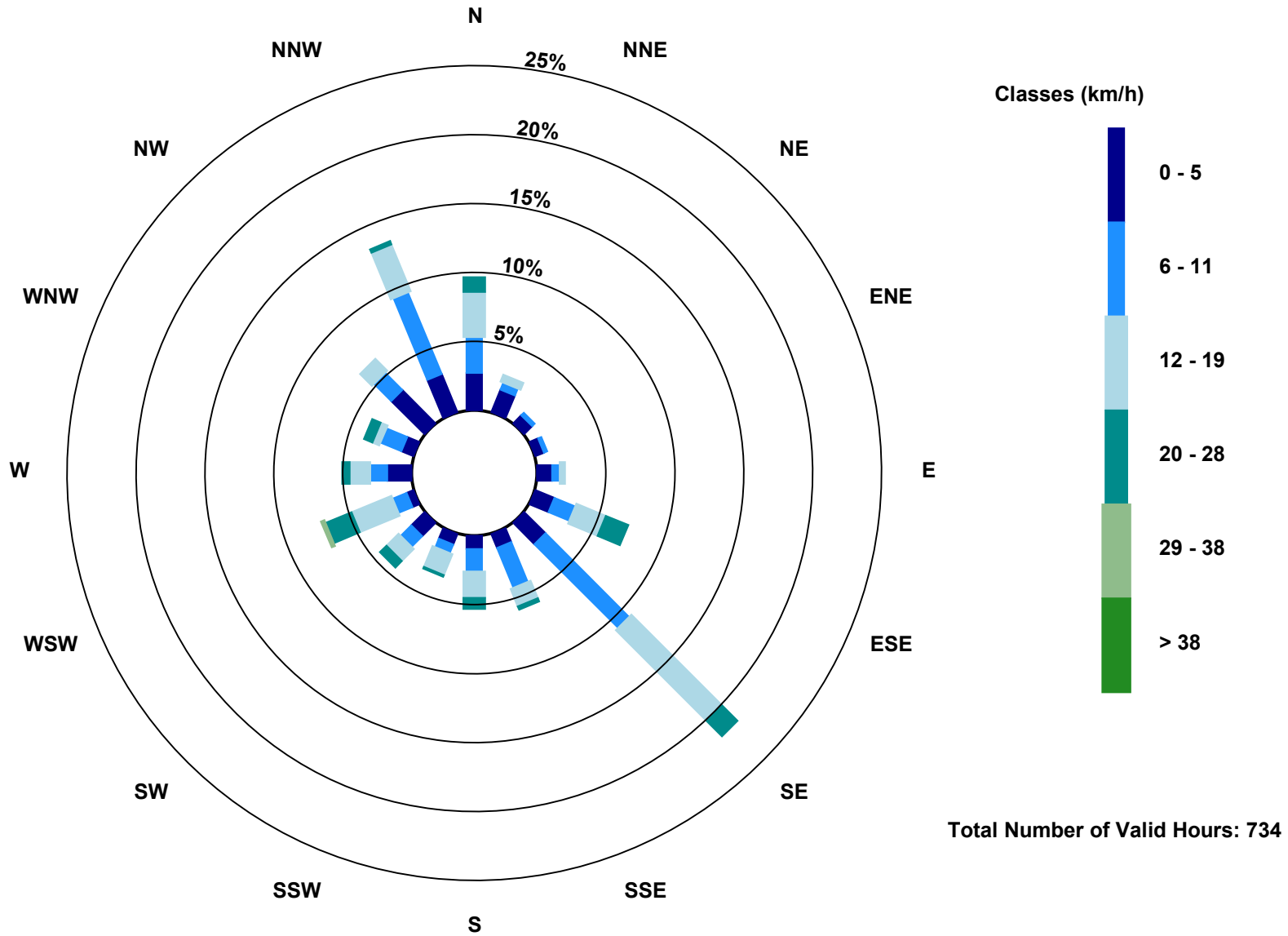
Total Number of Valid Hours: 734

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

Maximum Speed: 38 km/h on Aug 25 21:00		Maximum Daily Speed Average: 26.2 km/h on Aug 9		Hours in Service: 744																																											
Minimum Speed Value: 1 km/h on Aug 17 20:00		Minimum Daily Speed Average: 2.0 km/h on Aug 15		Hours of Data: 733																																											
Maximum Diurnal Speed Average: 4.8 km/h at hour 15		Minimum Diurnal Speed Average: 1.2 km/h at hour 21		Hours of Missing Data: 11																																											
Monthly Average Velocity: 2.6 km/h 209.7 deg		Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 8 Median = 13 Q ₃ = 19 P ₉₀ = 25 P ₉₉ = 34		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-Aug	WSW25	WSW30	W27	W23	W27	W28	W25	NNW24	WSW23	WSW23	WSW20	WSW20	WSW17	W15	NNW15	NNW14	W4	SW15	SW14	NNW15	NNW15	N5	NNW4	NNW9	W15.8	WSW30																					
2-Aug	NNW11	W6	W6	NW5	WNW7	W6	WNW4	DF	DF	DF	DF	DF	DF	DF	DF	N6	N4	NE2	E5	ESE6	E4	ESE9	ESE9	---	NNW11																						
3-Aug	SE12	E2	SSE6	ESE4	E6	SSE7	SE11	SSE9	ESE4	SSE5	SE13	SE14	SSE12	SE14	SE24	ESE6	N14	NW4	S8	SSE8	S7	SSW10	SW9	W9	SSE6.2	SE24																					
4-Aug	WNW12	WNW17	NW13	NW12	WNW14	WNW14	W18	W17	W15	WSW12	WSW10	W9	W3	SSW5	SW23	NE11	NW3	WNW5	SW9	WSW8	NW8	WSW9	WSW13	W10	W9.3	SW23																					
5-Aug	NW7	NNE2	S4	WSW10	SW9	SW12	SW12	SW10	W4	NW2	NW6	NNW6	NNW7	NNE3	NNE3	N8	NNW5	N14	NNE16	NNE15	NE11	ENE5	NE2	NNE3	NNW3.0	NNE16																					
6-Aug	NW2	NW2	WNW2	NNW2	WSW2	SSE4	SW6	NNE3	ENE6	SE10	N18	NNE11	NNW5	NNW6	N9	N8	N10	NNW9	NNW8	NNW8	NNW5	NNW8	NNE15	N10	N5.0	N18																					
7-Aug	NNE6	NNW10	N10	N9	N8	N4	N4	NNW4	NNW5	NW5	NNW10	NW12	N16	N16	N18	N19	N18	NNE21	NNE21	NNE18	N16	N12	NNE9	E6	N10.8	NNE21																					
8-Aug	SE4	NE3	NE3	NE3	ENE4	ESE3	SE3	SE5	SE10	SE15	SE10	SE12	ESE12	E15	SE19	ESE20	SE22	ESE24	ESE28	ESE28	ESE26	SE29	SE25	SE24	ESE14.0	SE29																					
9-Aug	SE22	SE26	SE27	SE27	SE25	SE28	SE29	SE27	SE28	SE30	SE32	SSE31	SE35	DF	SE34	ESE27	ESE23	ESE14	SE21	SE21	SE25	SE24	SE24	SE25	SE26.2	SE35																					
10-Aug	SE27	SE27	SE26	SE23	ESE30	ESE30	ESE27	ESE25	SE17	UO	E13	E13	E19	E17	E14	E12	E14	ENE12	ENE10	NE14	NNE13	NNE17	NE13	NNE12	E15.3	ESE30																					
11-Aug	N15	N11	N12	N14	N11	N9	NNW10	NNW11	N9	N6	NW4	W7	W8	WNW4	W6	WSW9	W9	WSW11	SW7	S10	SSE16	SSE13	SSE14	SE17	NW2.5	SE17																					
12-Aug	SSE14	S9	SW10	WSW13	WSW14	WSW23	W17	W11	WNW9	WNW8	WNW11	W10	W6	W7	WSW13	WSW12	WNW5	NNW4	NNW4	WSW10	WSW9	WSW12	WSW12	SW9	WSW8.8	WSW23																					
13-Aug	SSW8	S10	S10	SSE14	SE18	SE18	SSE19	SE19	SE17	SSE15	S19	SSW22	SW25	WSW27	WSW28	WSW30	WSW30	SW25	WSW22	WSW19	WSW19	WSW23	WSW25	W9	SW14.7	WSW30																					
14-Aug	NNW10	SSE11	SSW9	SW6	NW16	NNW20	N8	W14	W21	W17	WNW26	NNW26	W28	WSW36	WSW35	WSW29	NNW31	NNW26	W21	NNW23	NNW29	NNW21	N6	WSW3	W16.5	WSW36																					
15-Aug	WSW10	WSW8	SW7	SW11	S12	SE16	SSE14	SE15	SE20	SE14	SE10	SSE17	SE18	SE13	SE8	SE4	ESE6	ESE1	NNW14	N26	NNW27	NNW23	NNW20	NNW15	SE2.0	NNW27																					
16-Aug	NNW12	NW5	WNW5	NNW11	NNW11	NW10	NW10	NW9	NW14	NW12	NW13	WNW7	WSW15	W15	WSW16	WSW16	SW20	SW20	SSW19	SSW21	SSW30	SSW36	SSW35	S25	WSW10.7	SSW36																					
17-Aug	SSE14	SE13	SE14	SSE19	SSE17	SSE13	SSE17	SSE14	S9	SSW7	SSE3	WSW7	WSW17	W13	WSW14	WSW10	NW13	NW9	ENE6	ESE1	NW15	NNE9	NNW11	NNW18	SSW3.5	SSE19																					
18-Aug	NNW23	N25	N19	N20	N19	N22	N27	N26	N22	N17	N23	NNW19	NNW15	N16	NNW17	NW15	NNW23	NNW20	NNW22	N17	NNW24	NNW20	NNW18	NNW17	NNW19.8	N27																					
19-Aug	NW17	NW18	WNW21	W17	W16	W16	WSW16	WSW16	WSW18	WSW20	WSW19	WSW18	WSW20	WSW21	SW23	WSW28	WSW29	WSW29	SW22	WSW22	SW21	SW20	SW14	SSW12	WSW18.0	WSW29																					
20-Aug	S10	S9	S9	ESE4	WSW17	SSW14	S11	S9	S5	WSW8	NW5	NNW7	NNW7	N7	N7	NNW7	NW19	NNW11	N6	E6	E4	SSE7	SSE8	S7	SW2.4	NW19																					
21-Aug	SW11	SW7	S12	S13	SSE9	SSE12	S12	S10	SSE8	SE10	SE11	SE13	SE17	S13	SSE13	S15	SSE12	S18	S19	S21	S20	SSE14	SSE10	SSE10	SSE12.0	S21																					
22-Aug	SE11	SE9	ESE4	SE7	SE6	SE6	SSE8	SSE11	SSE9	SSE11	SSE11	SSE10	ESE4	SE4	SSE9	S7	W6	WNW8	NNW7	N5	NNE2	ESE4	SE8	ESE7	SSE4.8	SSE11																					
23-Aug	NE1	NNW5	N6	NNW7	NW3	SW2	NW4	NNW11	N6	NW5	WNW4	W6	NNW6	NW10	NNW10	NNW11	N12	N12	N16	N22	N21	N19	N21	N21	NNW9.5	N22																					
24-Aug	N23	N23	N21	N21	N22	N23	N24	N25	N24	N26	N30	N29	N26	NNW25	NNW22	NNW17	NNW14	NW15	NNW20	NNW15	NNW14	NNW10	NNW7	WNW5	N19.7	N30																					
25-Aug	WSW6	WSW5	SSW1	SSE7	SSE12	SSE11	SSE12	S11	SSE12	SSE13	SE16	S17	SSW21	SSW16	SSW19	SSW19	SSW22	SSW18	S17	S30	S38	S35	SSW33	S24	S16.3	S38																					
26-Aug	S16	SE12	SSE17	SSE16	SSE17	SSE15	SSE17	SSE17	SSE13	SE16	SSE17	SW22	SW22	WSW23	WSW19	W17	W23	NW20	N28	N23	N21	N13	N11	NNW10	SSW4.2	N28																					
27-Aug	NW6	NW6	WNW7	NW2	WSW8	W10	WSW6	W2	WSW5	SSE2	SSE7	SE4	SSE9	SSE12	S12	S14	SSW15	SSW18	SW20	SSW23	SSW15	SSW11	S9	S6	SSW7.3	SSW23																					
28-Aug	S2	SSW7	SSW8	SSW10	SSW10	S7	S10	S10	SSE7	S7	SSE10	SSE9	SE12	ESE8	ESE9	SE11	SSE14	SE17	SSE16	SSE14	SSE14	SSE16	S15	S17	SSE9.9	S17																					
29-Aug	SSE15	SSE16	SSE16	SSE13	SSE14	SSE14	SSE14	SSE13	SE12	SE14	SE15	SE14	SE15	SE18	S17	S19	S16	S19	S17	SSE13	SSE15	SSE17	SSE14	SSE15	SSE14.6	S19																					
30-Aug	SSE10	SSE10	SE9	SSE11	SSE9	SSE10	SSE11	SSE8	SE5	SE3	SSE7	SE6	SE12	SSE12	SE15	SSE17	SSE20	SSE15	SSE22	SSE30	SE27	SE24	SE14	SE15	SSE13.1	SSE30																					
31-Aug	SSE9	NE3	ESE11	SSE7	S6	WSW6	SSW11	SSW11	SW11	SSW3	ESE6	SE8	WSW3	WNW5	N4	NNW4	NNW8	NNW20	NNW17	NNW13	NNW15	NNW13	NNW15	NNW13	NW2.8	NNW20																					
SSW1.4																								SSW1.4	S2.1	S1.9	SSW3.1	SSW3.8	S4.1	S3.4	S2.8	S2.8	S1.8	SSW3.6	SSW4.2	WSW3.9	SW4.8	SW4.6	W4.3	W3.9	WSW1.6	SW1.4	WSW1.2	S2.5	S2.5	S2.0	Diurnal Average
SE27																								WSW30	W27	SE27	ESE30	ESE30	SE29	SE27	SE28	SE30	SE32	SSE31	SE35	WSW36	WSW35	WSW30	NNW31	WSW29	ESE28	SSE30	S38	SSW36	SSW35	SE25	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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 17 km/h on Aug 17 17:00	Hours in Service: 744 Hours of Data: 733 Hours of Missing Data: 11 Hours of Calibration: 0 Percent Operational Time: 98.5
Minimum Value: 1 km/h on Aug 6 05:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8	

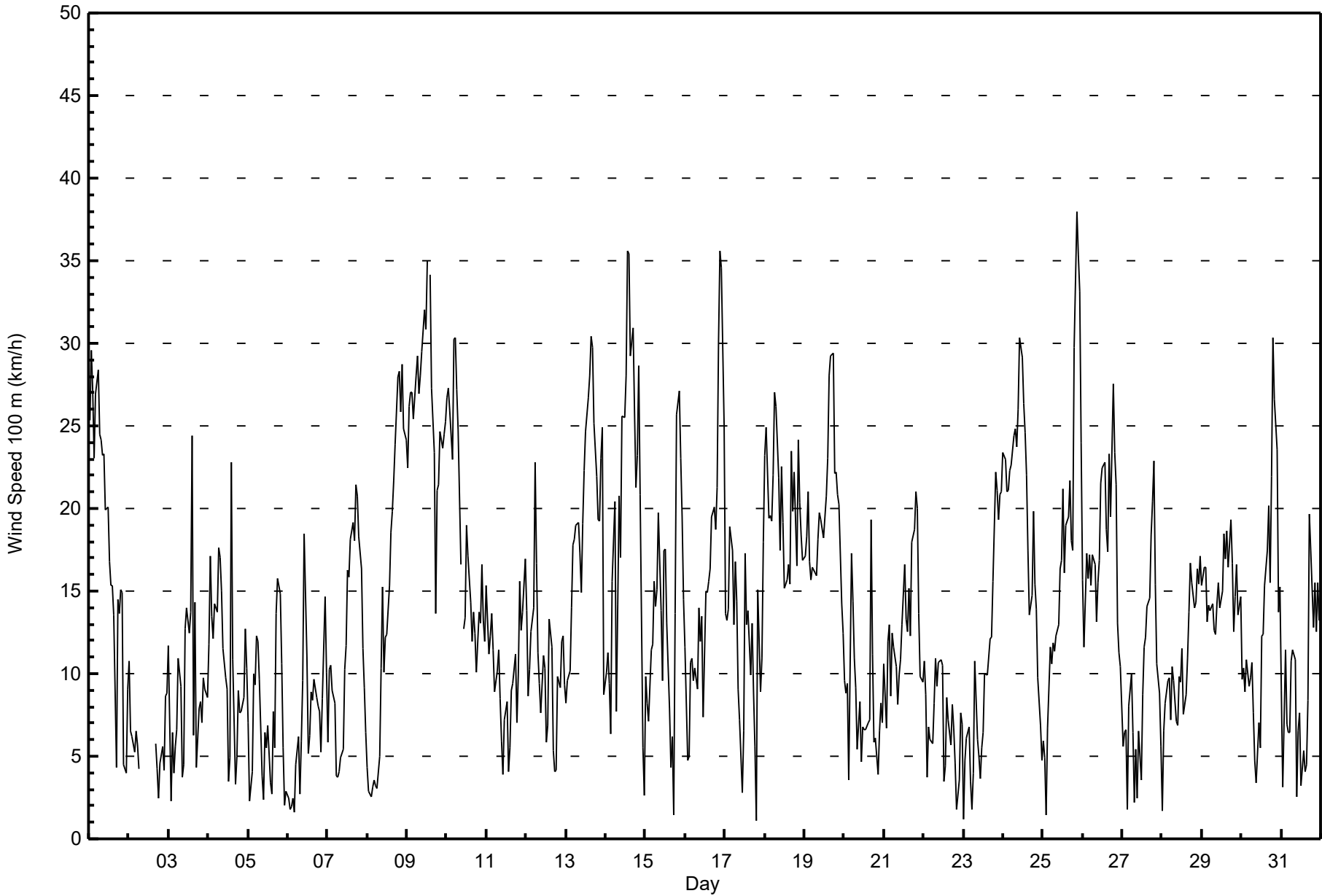
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	3	4	5	4	3	3	4	5	3	3	2	3	4	5	4	6	2	3	3	3	7	2	1	2	7
2-Aug	2	2	3	1	2	2	1	DF	DF	DF	DF	DF	DF	DF	DF	DF	3	1	1	2	3	3	2	2	3
3-Aug	5	1	3	2	2	3	5	4	3	3	2	2	4	3	6	6	7	14	5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

DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	96	13.10	13.10
6 - 11	228	31.11	44.20
12 - 19	247	33.70	77.90
20 - 28	133	18.14	96.04
29 - 38	29	3.96	100.00
> 38	0	0.00	100.00

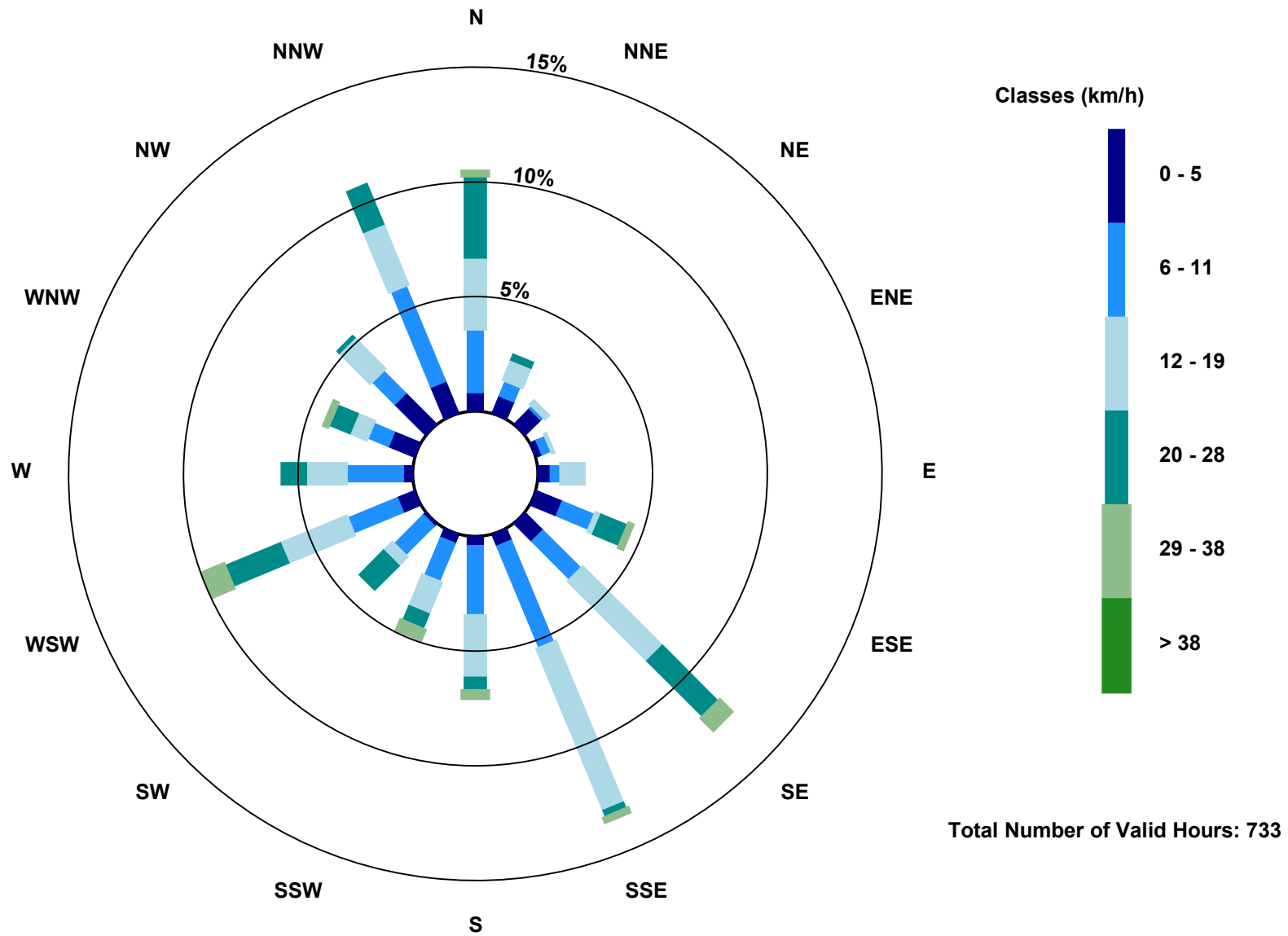
Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Maximum Speed: 44 km/h on Aug 25 22:00	Maximum Daily Speed Average: 31.5 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 23 11:00	Minimum Daily Speed Average: 1.9 km/h on Aug 11	Hours of Data: 734
Maximum Diurnal Speed Average: 5.6 km/h at hour 15	Minimum Diurnal Speed Average: 1.4 km/h at hour 21	Hours of Missing Data: 10
Monthly Average Velocity: 3.3 km/h 225.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 10 Median = 15 Q ₃ = 21 P ₉₀ = 29 P ₉₉ = 38	Percent Operational Time: 98.7

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-Aug	WSW29	W34	W32	W28	W30	W33	W28WNW27	W26WSW26WSW22WSW22WSW19	W18	NW17WNW15	NNW8	SW11WSW15	NW19	N17	NNE6	NNW6	NNW9	W18.0	W34							
2-Aug	NNW9	WNW7	WNW9	NW12WNW10	WNW9	WNW8	DF	DF	DF	DF	DF	DF	DF	DF	DF	N6	NNE5	ENE3	E5	E6	E8	ESE13	ESE17	---	ESE17	
3-Aug	SE17	ESE12	S9	SSE5	ESE9	SSE15	SSE18	S14	SE8	S8	SSE11	SSE13	SSE13	SSE15	SE26	ESE7	N14	NW4	S9	SSE5	S11	SSW16WSW12WNW12	SSE8.2	SE26		
4-Aug	WNW15	NW22	NW19	NW17WNW23WNW19WNW18	W17	W16	W11WSW10	W9	W4	SW6WSW27	NNE12	NW7	W8WSW13	W12	NW10	W10	W18WNW17	WNW12.1	WSW27							
5-Aug	NW13	WNW6	W6	W8	W14	W17WSW17WSW12	W5	WNW4	NW6	NNW6	NNW7	N2	NNE2	N8	N6	NNE13	NNE17	NE19	NE20	ENE13	ENE6	NNE4	NNW4.9	NE20		
6-Aug	NNW2	NNE2	WNW2	NW5	W4	WSW4	WSW6	NNW5	ENE11	ESE14	NNE20	NE14	N5	N4	NNE9	NNE8	N9	N9	N8	NNW8	NNW9	N12	NE22	NE17	NNE6.2	NE22
7-Aug	ENE11	NE10	NNE9	NE10	NNE11	NNE7	NE8	NNE8	NNW5	NW6	NNW10	NNW12	N16	N16	N19	N20	NNE18	NNE22	NNE23	NNE20	NNE20	NNE22	NE16	E12	NNE12.4	NNE23
8-Aug	ESE14	ESE12	ESE10	SE5	ESE11	SE12	SE7	SE10	SE11	SE16	SE10	SE12	ESE11	E14	SE18	ESE21	SE22	ESE25	ESE30	ESE33	ESE31	SE33	SE28	SE30	SE17.6	ESE33
9-Aug	SE27	SE30	SE32	SE33	SE30	SE33	SE32	SE29	SE31	SE32	SE33	SSE32	SE40	DF	SE38	SE34	ESE34	ESE28	SE30	SE27	SE30	SE30	SE31	SE32	SE31.5	SE40
10-Aug	SE32	SE33	SE28	SE26	SE34	SE36	SE34	SE30	SE23	ESE22	ESE16	E14	E21	E20	ESE16	E12	E15	E12	ENE11	ENE14	NE14	NE16	ENE11	NE14	ESE18.5	SE36
11-Aug	NNE19	NNE16	NNE16	NNE15	N14	NNE11	N12	N13	N9	NNE6	NNW4	W7	W8	W5	W6	WSW9WSW10WSW12	SW8	S10	S16	SSE17	SSE19	SSE20	NNW1.9	SSE20		
12-Aug	SSE16	SW12WSW13WSW17WSW17WSW26	W20WNW15WNW12	WNW9WNW12	W10	W5	W7WSW15	W13	NW5	NNW4	NNW4	W6WSW10	WSW8	W10WSW11	W10.1	WSW26										
13-Aug	WSW12	SW10	SSW10	S12	S17	S18	S16	S18	SSE16	S16	SSW19	SW23WSW26WSW29WSW30WSW34WSW32WSW28WSW25	W24WSW25	W28	W29	W21	SW18.2	WSW34								
14-Aug	NNW15	S12WSW15WSW15WNW22	N30	NNE14	W11	W22	W18WNW28WNW29	W31WSW38WSW40	W33WNW35WNW31	W26WNW29	NW34WNW29	N7	W2	WNW19.8	WSW40											
15-Aug	WNW5	W18WSW14	SW13	SW13	SSW13	S10	S13	SSE20	SSE19	SSE16	S18	SSE18	SSE13	SSE6	SSE4	SE6	S2	NNW15	N28	NNW30	N25	NNW22	NNW19	SW2.1	NNW30	
16-Aug	N15	NNW9	WNW7	NNW13	NNW15	NNW12	NW14	NW13	NW15	NW13	NW14	WNW8WSW15	W16	W17WSW17	SW20	SW21	SW22	SW26	SW30	SW36	SSW42	SSW39	WSW12.4	SSW42		
17-Aug	S22	S19	S19	S20	S14	S15	S17	S12	SSW10	SSW8	S4	WSW8WSW18	W14WSW14WSW10	NW13	NNW12	ENE4	NE3	NNW19	NNE20	N12	NNW26	SW4.7	NNW26			
18-Aug	NNW31	N30	N28	N27	N25	N27	N32	N29	N22	N18	N23	NNW20	NNW17	N16	N17	NW17	NNW26	N22	N25	N21	NNW28	N23	N21	NNW20	N23.1	N32
19-Aug	NNW21	NW18WNW26WNW22	W19	W20WSW19WSW17WSW20	W22WSW21WSW19WSW20WSW22WSW24WSW29WSW30WSW31WSW25WSW27WSW26WSW27	SW27	SW23	WSW21.0	WSW31	WSW21	WSW19	WSW20	WSW22	WSW24	WSW29	WSW30	WSW31	WSW25	WSW27	WSW26	WSW27	SW27	SW23	WSW21.0	WSW31	
20-Aug	SW16	SW13	SW11	WNW4WSW18	SSW17	SSW18	SSW10	SW7	WSW9	W7	WNW8	NW6	NNW5	NNW7	NW7	NW21	NNW12	N9	ENE7	E6	SSE12	S15	SSW9	WSW5.4	NW21	
21-Aug	WSW18WSW14	SSW11	SSW15	SSW8	SSW10	SSW11	SSW11	SSW8	SSE9	SSE10	SE12	SSE16	S14	SSE12	S16	S13	S18	S20	S22	S26	S21	SSE12	SSE14	S12.8	S26	
22-Aug	SSE13	SSE13	SSE6	SE9	SSE7	SSE9	SSE17	S18	S12	S13	S13	S11	SE4	SE7	SSE9	S7	W6	WNW8	NNW6	N5	NE2	ESE4	ESE9	SE8	SSE6.7	S18
23-Aug	SSE6	NW1	N5	NE3	SE6	SSE4	S2	NW6	NNW6	NNW6	NNW1	WNW8	N9	NNW9	NNW10	N11	N16	N18	NNE26	NNE28	NNE26	NNE24	NNE26	N25	N9.7	NNE28
24-Aug	N25	N26	N25	N24	N25	N26	N28	N27	N25	N27	N29	N29	N27	N26	NNW22	NNW18	NNW14	NNW15	NNW20	NNW18	N21	N19	NNE14	N5	N21.9	N29
25-Aug	WNW2	W7	W6	SSW5	SSE12	S12	S10	SSW12	S12	S13	SSE15	S18	SSW21	SSW17	SSW19	SSW21	SSW22	SSW19	SSW22	SSW33	SSW43	SSW44	SSW42	SSW34	SSW18.3	SSW44
26-Aug	SSW26	S16	S19	SSW19	SSW21	SSW19	SSW19	S19	S13	SSE14	S18	SW22	SW23WSW25WSW23	W21	W27	NW22	NNE32	N27	N28	N19	N19	N15	WSW7.3	NNE32		
27-Aug	NNW6	NNW8	NNW11	N11	W3	NW7	NW5	NW8	WSW6	SSE3	S7	S4	S9	S12	S13	SSW14	SSW15	SW19	SW21	SW25	SW21	SW17	SW12	SW6	SW7.1	SW25
28-Aug	WSW8	SW14	SW11	SW12	SW15	SW9	SW14	SW14	SSW8	SSW7	S10	S11	S10	SSE6	SSE7	SSE9	SSE14	SSE21	SSE22	S19	S18	S14	S13	S15	SSW11.2	SSE22
29-Aug	SSW16	SSW13	SSW12	S13	SSW12	S14	SSW11	S11	SSE12	SE11	SSE15	SSE12	SSE12	SSE17	S17	S19	S17	S20	S21	S21	S21	S22	SSE23	SSE23	S15.5	SSE23
30-Aug	SSE20	SSE18	SSE20	SSE24	SSE19	SSE13	SSE13	SSE13	SSE7	SSE5	S9	SE12	SE15	SSE14	SSE14	SSE18	SSE20	S17	SSE25	SSE34	SE29	SE27	SSE18	SSE21	SSE17.3	SSE34
31-Aug	SSE16	ESE2	SE11	SSE10	SSW14WSW13	SW15	SSW15WSW11	SSW3	SE6	S7	WSW5	WNW6	NNW4	NW5	NNW9	N20	N19	N13	N17	NNW14	NNW19	NNW16	WNW3.1	N20		

SSW2.6	SW3.0	WSW3.3	SW2.9	SW4.2	SW4.0	SW4.6	SW4.5	SSW3.8	SSW3.8	SSW3.0	SW4.6	SW4.9	WSW5.1	SW5.6	WSW5.0	W4.4	W3.9	WSW1.8	WSW1.6	W1.4	S1.9	SSW2.4	S2.5	Diurnal Average
SE32	W34	SE32	SE33	SE34	SE36	SE34	SE30	SE31	SE32	SE33	SSE32	SE40	WSW38	WSW40	SE34	WNW35	WSW31	NNE32	SSE34	SSW43	SSW44	SSW42	SSW39	Diurnal Maximum

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



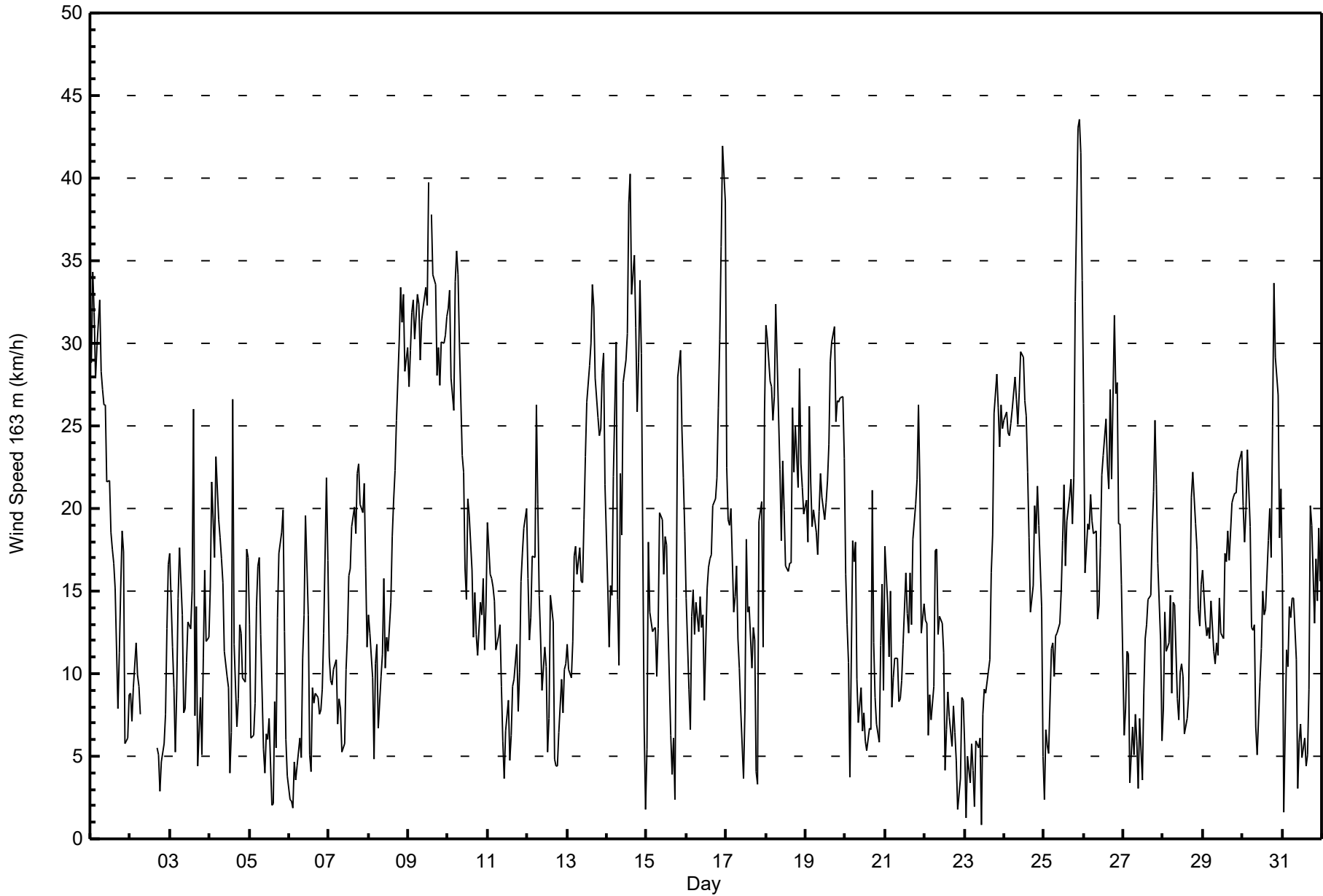
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 16 km/h on Aug 17 17:00	Hours of Data: 734
Minimum Value: 0 km/h on Aug 25 01:00	Hours of Missing Data: 10
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8	Hours of Calibration: 0
	Percent Operational Time: 98.7

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-Aug	4	3	3	3	3	2	4	4	3	3	3	3	4	5	3	5	2	3	3	2	6	2	1	1	6
2-Aug	2	1	2	2	3	2	1	DF	DF	DF	DF	DF	DF	DF	DF	DF	2	2	1	2	2	2	4	2	4
3-Aug	3	1	3	3	4	4	4	5	3	3	2	2	4	4	5	6	7	14	6	3	3	2	3	3	14
4-Aug	3	2	2	2	3	4	3	2	3	2	3	4	3	5	8	5	4	1	2	2	3	3	2	3	8
5-Aug	2	3	2	2	1	2	1	3	3	2	2	3	2	2	2	1	2	3	3	2	2	2	2	1	3
6-Aug	1	1	1	1	2	1	1	7	4	5	11	5	2	3	3	2	1	1	1	1	1	2	3	8	11
7-Aug	4	2	1	1	1	2	2	1	1	2	2	2	4	4	4	5	5	3	4	3	2	1	4	4	5
8-Aug	3	2	3	2	5	4	3	4	4	3	3	4	4	5	4	5	4	4	3	3	4	2	4	3	5
9-Aug	3	3	2	3	4	3	2	3	3	4	5	7	5	DF	5	4	4	5	4	6	5	3	4	4	7
10-Aug	4	5	5	4	4	3	3	3	3	3	4	5	6	6	6	4	6	4	3	3	2	2	2	3	6
11-Aug	3	3	2	3	3	2	3	3	2	2	2	2	1	2	3	2	3	2	2	3	1	3	3	3	3
12-Aug	4	1	2	2	3	1	3	3	3	3	3	3	3	4	3	7	2	1	1	2	2	2	2	2	7
13-Aug	2	1	1	1	3	3	3	3	2	3	4	4	5	3	3	4	4	4	2	2	2	2	2	6	6
14-Aug	9	5	3	5	5	6	4	7	3	3	5	5	4	6	3	6	5	5	4	4	2	7	5	2	9
15-Aug	2	2	4	2	2	2	1	3	3	5	8	4	2	3	4	2	2	2	8	4	3	5	2	1	8
16-Aug	3	1	1	3	2	2	3	4	3	3	4	4	4	4	4	5	4	3	3	2	3	2	1	5	5
17-Aug	6	5	5	3	2	2	2	2	2	3	2	4	3	4	3	4	16	10	5	3	10	4	3	4	16
18-Aug	2	4	3	4	3	3	3	4	3	3	3	4	3	2	5	2	5	3	3	4	4	4	4	2	5
19-Aug	1	2	3	4	4	4	2	3	2	4	3	4	3	4	4	4	3	2	2	2	2	2	4	3	4
20-Aug	4	3	3	4	3	5	3	2	2	3	3	2	2	2	3	6	5	2	2	1	2	4	3	4	6
21-Aug	3	5	2	2	2	1	1	2	2	1	2	3	4	4	4	3	4	3	2	1	2	4	2	2	5
22-Aug	2	2	2	2	1	2	2	2	4	3	3	4	3	4	4	3	3	1	1	1	1	2	2	1	4
23-Aug	3	1	1	2	1	1	2	2	1	3	2	1	2	2	1	2	3	1	2	3	3	3	3	3	3
24-Aug	3	4	4	4	4	4	4	4	3	5	4	4	4	5	4	3	2	3	1	1	1	2	2	3	5
25-Aug	0	1	1	1	3	3	2	2	2	1	2	5	4	3	4	4	3	3	4	3	2	1	4	2	5
26-Aug	4	4	2	2	1	2	2	2	3	4	4	4	4	3	3	5	4	7	7	5	3	3	3	4	7
27-Aug	1	1	2	3	2	1	2	1	1	2	3	2	4	4	4	4	3	2	4	1	3	2	3	2	4
28-Aug	4	2	1	2	2	1	2	2	1	1	1	1	1	2	2	1	3	2	3	1	2	2	1	2	4
29-Aug	1	1	1	2	2	1	1	1	2	1	1	2	3	2	3	3	3	1	1	2	1	1	2	2	3
30-Aug	2	2	3	3	2	3	2	2	2	1	2	3	4	3	4	3	2	4	7	6	4	5	4	4	7
31-Aug	4	2	4	4	3	2	2	3	3	2	2	2	4	2	2	2	3	10	6	3	2	2	3	4	10
Diurnal Maximum																									
9 5 5 5 5 6 4 7 4 5 11 7 6 6 8 7 16 14 8 6 10 7 5 8																									

DF - DAS Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	61	8.31	8.31
6 - 11	179	24.39	32.70
12 - 19	268	36.51	69.21
20 - 28	152	20.71	89.92
29 - 38	67	9.13	99.05
> 38	7	0.95	100.00

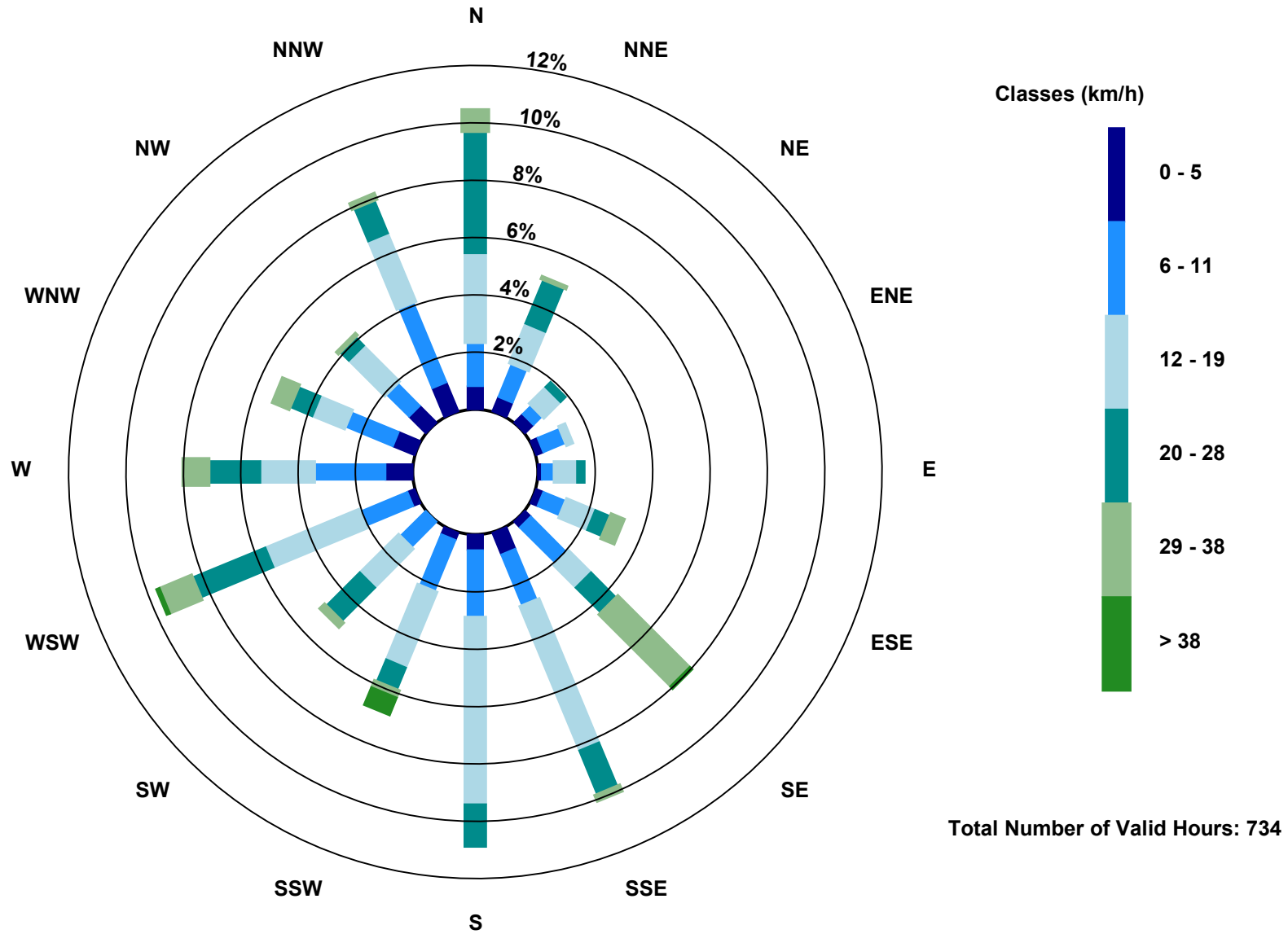
Total Number of Valid Hours: 734

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

Direction of Maximum Speed: 158 deg on Aug 9 12:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 128.8 deg on Aug 9	Hours of Data: 734
Direction of Minimum Speed: 256 deg on Aug 22 23:00	Hours of Missing Data: 10
Direction of Minimum Daily Speed Average: 1.1 deg on Aug 20	Percent Operational Time: 98.7
Monthly Average Direction: 180.5 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-Aug	238	260	267	277	261	260	268	289	260	248	239	238	242	285	340	284	187	210	222	274	347	7	327	325	260.6
2-Aug	295	240	327	297	321	0	349	DF	DF	DF	DF	DF	DF	DF	DF	DF	12	2	3	177	342	341	349	354	--
3-Aug	348	339	249	353	360	314	100	156	107	116	142	146	154	153	149	125	352	244	158	131	120	132	235	272	138.8
4-Aug	304	304	329	318	349	318	290	264	260	235	242	257	239	183	235	32	214	356	69	186	317	229	288	300	274.3
5-Aug	310	240	133	125	152	173	172	162	295	30	333	349	19	26	37	358	348	357	11	17	10	46	355	310	25.2
6-Aug	352	17	342	344	109	110	124	33	102	118	351	22	327	341	344	343	342	346	329	320	322	355	346	327	356.0
7-Aug	356	340	292	353	1	342	329	308	357	330	334	324	358	348	3	7	2	15	27	10	344	337	11	57	357.4
8-Aug	6	352	348	33	339	316	298	141	122	135	142	131	120	93	134	127	131	116	116	114	124	122	123	110	119.3
9-Aug	120	118	114	118	125	127	127	135	129	133	139	158	143	DF	136	118	121	120	115	119	124	118	122	124	128.8
10-Aug	123	126	121	120	118	118	115	118	107	100	94	76	88	88	92	60	80	75	45	27	0	5	3	352	94.0
11-Aug	336	330	339	341	333	329	327	345	349	353	311	263	269	305	270	251	263	259	240	185	114	108	126	138	299.4
12-Aug	150	141	190	222	231	251	263	305	303	315	291	258	263	274	238	250	276	354	273	244	235	206	202	141	244.4
13-Aug	131	133	122	142	136	149	145	139	139	137	184	214	239	249	246	246	241	237	243	236	231	240	246	154	201.7
14-Aug	1	146	159	158	338	341	302	262	252	276	290	287	267	247	250	254	296	298	263	292	290	270	301	163	271.9
15-Aug	133	121	132	128	124	136	136	133	128	141	131	141	147	135	126	98	109	70	346	344	331	331	330	327	116.3
16-Aug	351	205	342	341	301	309	335	341	313	330	316	278	237	256	253	242	229	221	214	188	183	185	172	168	230.6
17-Aug	122	98	108	135	139	126	136	160	160	199	149	269	249	275	250	230	304	337	35	305	343	22	333	323	188.2
18-Aug	340	343	347	352	5	10	1	356	360	346	352	340	326	350	347	305	323	329	327	343	330	327	321	320	343.0
19-Aug	317	318	311	298	293	287	262	242	241	259	257	241	242	237	236	242	240	245	229	230	219	200	127	125	243.8
20-Aug	139	129	132	81	208	192	142	165	146	241	326	8	7	11	9	358	325	329	60	128	343	144	35	302	119.0
21-Aug	146	154	142	136	126	135	134	133	137	135	126	126	136	167	156	176	167	188	180	174	133	113	350	131	150.6
22-Aug	277	128	360	188	121	93	121	126	132	131	139	151	75	85	159	192	289	322	339	14	315	248	256	334	136.8
23-Aug	345	322	320	327	316	339	324	335	304	348	330	0	317	310	311	351	344	332	324	345	341	336	342	341	334.5
24-Aug	341	341	345	351	350	354	353	350	351	353	352	351	352	346	344	334	336	321	322	336	305	311	328	83	346.0
25-Aug	144	131	128	123	131	147	137	142	139	141	138	172	203	192	207	208	199	197	166	168	169	166	172	155	170.8
26-Aug	140	98	122	127	133	138	137	136	135	140	150	220	236	242	251	278	266	313	3	350	348	337	345	249	174.7
27-Aug	143	349	28	263	121	37	349	32	121	126	132	94	128	162	169	182	200	213	210	182	135	141	130	136	168.7
28-Aug	150	129	130	126	125	129	133	122	124	127	136	134	127	132	129	134	139	140	125	126	139	133	124	132	130.9
29-Aug	129	131	132	136	141	136	138	135	138	130	133	138	133	134	174	184	186	185	126	120	135	140	144	142	146.5
30-Aug	143	226	156	129	96	132	137	134	111	37	97	162	148	148	137	160	152	149	153	167	143	138	126	117	145.3
31-Aug	146	331	147	270	41	199	163	166	235	190	140	122	230	283	29	13	359	331	329	310	342	325	346	305	313.4

123.3	104.6	115.8	118.6	133.2	146.7	138.5	145.7	159.3	156.3	173.7	201.5	213.1	233.9	213.2	222.5	240.8	237.6	210.1	196.4	152.4	162.4	144.2	123.0
Diurnal Average																							

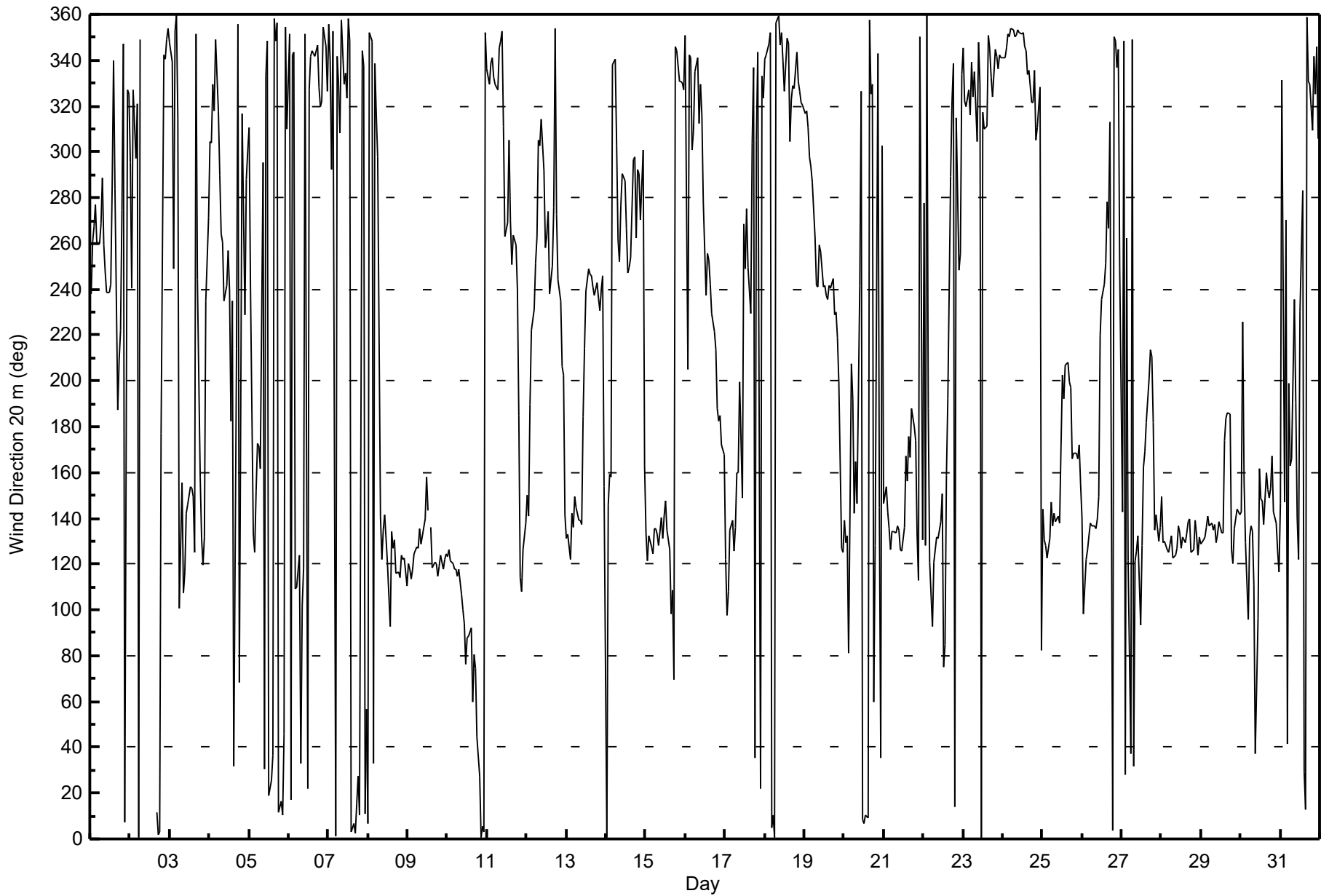
DF - DAS Failure
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 106 deg on Aug 8 08:00		Hours in Service: 744 Hours of Data: 734 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.7																								
Minimum Value: 6 deg on Aug 25 20:00																										
Percentiles: P ₁ = 8 P ₁₀ = 13 Q ₁ = 17 Median = 23 Q ₃ = 39 P ₉₀ = 71 P ₉₉ = 97																										
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-Aug	14	17	21	21	18	18	20	23	19	15	12	13	20	47	25	68	78	14	70	34	29	41	85	35	85	
2-Aug	88	71	61	28	40	50	45	DF	DF	DF	DF	DF	DF	DF	DF	DF	66	40	49	97	78	30	61	49	97	
3-Aug	69	13	83	31	45	80	72	82	98	64	18	17	31	25	18	81	43	81	58	50	16	26	88	74	98	
4-Aug	28	24	22	22	19	29	37	24	31	16	23	37	95	67	21	48	95	51	87	92	40	41	95	34	95	
5-Aug	59	84	28	21	17	24	26	26	94	78	40	49	29	21	34	25	15	23	17	63	65	59	32	94		
6-Aug	51	65	72	88	35	41	28	72	71	43	39	40	63	64	26	19	22	18	19	15	84	54	55	21	88	
7-Aug	46	42	75	68	74	62	62	43	32	34	20	24	27	27	29	30	22	23	29	21	11	33	33	30	75	
8-Aug	40	61	42	54	57	33	31	106	25	21	29	35	38	31	23	26	21	20	19	18	17	19	18	18	106	
9-Aug	23	20	17	17	15	17	16	19	18	19	17	14	20	DF	18	20	20	29	22	26	20	20	19	19	29	
10-Aug	18	20	19	18	17	17	19	21	29	27	28	25	26	29	36	34	34	29	34	27	15	18	16	16	36	
11-Aug	20	23	19	22	30	30	23	24	22	28	51	27	29	52	56	26	29	23	38	27	29	22	24	15	56	
12-Aug	36	16	68	26	25	16	30	42	47	75	35	35	58	77	19	24	54	46	56	25	69	30	43	22	77	
13-Aug	11	12	16	13	14	15	9	13	13	21	19	14	18	17	15	16	12	11	12	10	21	12	22	64	64	
14-Aug	73	19	40	68	34	19	77	25	19	24	22	23	20	16	14	21	20	21	25	15	13	28	59	84	84	
15-Aug	105	32	24	12	12	16	19	17	29	36	62	19	10	31	30	16	37	87	55	16	20	19	18	20	105	
16-Aug	73	84	71	24	26	26	37	40	29	27	38	62	21	38	29	22	18	14	15	9	6	6	10	57	84	
17-Aug	68	32	39	15	19	18	18	15	39	46	50	99	24	30	23	27	45	96	98	56	20	62	28	24	99	
18-Aug	22	19	24	21	46	20	20	19	21	21	21	26	26	21	25	19	17	19	18	31	21	17	19	17	46	
19-Aug	12	22	35	59	48	46	41	24	16	21	21	15	17	14	14	13	11	14	11	10	11	20	29	15	59	
20-Aug	10	23	14	72	33	23	17	17	28	53	63	21	19	23	26	32	27	31	77	18	68	84	57	75	84	
21-Aug	30	61	14	16	15	15	14	13	14	18	20	21	20	27	27	24	22	12	9	18	19	82	88	36	88	
22-Aug	73	59	66	90	99	49	22	17	19	17	24	35	71	67	39	40	66	25	12	87	55	84	97	15	99	
23-Aug	19	36	16	24	23	32	28	25	24	25	34	20	38	18	25	29	24	26	15	17	17	20	20	19	38	
24-Aug	20	20	19	20	20	20	20	19	19	19	19	16	20	18	20	21	22	16	13	13	28	89	83	86	89	
25-Aug	18	19	19	15	20	16	18	11	14	11	14	35	15	14	17	15	14	14	9	6	7	7	10	9	35	
26-Aug	21	24	13	13	13	11	10	12	14	21	31	18	19	13	19	36	20	30	19	16	16	68	48	54	68	
27-Aug	92	28	72	74	75	69	72	74	70	32	39	23	34	30	33	28	21	12	8	17	33	23	10	13	92	
28-Aug	24	16	9	9	18	13	16	14	15	16	13	18	20	21	17	13	10	9	19	14	8	12	12	13	24	
29-Aug	12	14	13	14	14	18	13	14	11	21	21	13	17	17	18	13	12	10	24	30	15	6	7	16	30	
30-Aug	58	98	99	74	55	17	14	16	69	89	28	49	25	22	21	16	15	14	10	21	11	15	65	73	99	
31-Aug	96	38	65	76	95	53	29	34	21	86	17	23	93	68	24	26	20	30	35	32	19	38	25	27	96	
		105	98	99	90	99	80	77	106	98	89	63	99	95	77	56	81	95	96	98	97	84	89	97	86	
		Diurnal Maximum																								
DF - DAS Failure																										





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 246 deg on Aug 14 14:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 125.4 deg on Aug 9	Hours of Data: 734
Direction of Minimum Speed: 64 deg on Aug 20 21:00	Hours of Missing Data: 10
Direction of Minimum Daily Speed Average: 1.4 deg on Aug 20	Percent Operational Time: 98.7
Monthly Average Direction: 177.5 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-Aug	238	258	267	275	261	258	268	287	257	247	239	239	241	284	335	284	217	210	222	282	346	7	342	326	262.3
2-Aug	327	257	318	307	312	269	336	DF	DF	DF	DF	DF	DF	DF	DF	DF	16	0	16	68	50	32	100	62	--
3-Aug	88	353	246	19	32	224	132	153	102	120	135	138	151	146	140	104	357	295	164	131	133	167	225	277	137.2
4-Aug	300	296	326	314	333	303	282	263	263	238	249	258	262	187	234	37	235	349	222	237	304	234	249	286	274.7
5-Aug	301	88	149	189	185	196	196	189	274	351	329	343	7	24	40	356	347	1	18	26	23	37	339	357	3.2
6-Aug	323	292	309	277	157	143	141	53	90	124	353	23	332	343	348	345	341	344	326	321	330	327	353	343	351.8
7-Aug	351	344	352	4	309	344	332	313	351	326	332	322	357	352	4	8	3	16	30	16	355	340	356	69	359.2
8-Aug	27	351	350	11	357	344	335	142	119	131	136	127	115	94	129	121	125	114	115	113	120	122	123	115	115.1
9-Aug	114	116	116	120	126	128	127	128	126	129	134	151	136	DF	131	116	115	116	116	119	123	118	123	124	125.4
10-Aug	122	125	121	119	117	117	115	118	111	102	96	82	90	91	93	69	82	75	50	32	2	9	9	358	95.2
11-Aug	343	340	345	344	346	341	333	347	350	354	313	265	269	308	276	255	265	261	243	183	150	128	135	135	308.2
12-Aug	147	145	197	231	235	248	261	288	289	300	291	262	269	272	236	253	281	350	311	241	229	219	213	178	245.6
13-Aug	157	143	135	140	133	138	140	135	133	132	185	214	238	248	246	245	240	236	241	237	222	228	241	197	201.1
14-Aug	350	150	175	172	327	341	323	259	251	272	289	287	265	246	248	252	294	295	263	289	291	275	340	236	273.1
15-Aug	234	182	163	145	135	136	135	131	124	134	125	139	143	132	126	104	116	80	350	347	334	334	333	338	112.7
16-Aug	342	226	324	344	321	314	317	338	312	328	310	281	240	260	256	243	230	220	214	192	188	191	179	174	237.7
17-Aug	141	123	118	136	136	130	137	160	157	201	139	263	249	274	251	234	307	332	55	318	335	16	329	337	181.4
18-Aug	338	346	354	355	6	6	0	359	1	348	355	340	325	353	346	305	327	332	333	352	336	332	332	324	344.9
19-Aug	318	307	299	285	271	272	256	241	242	257	256	240	243	239	235	241	240	243	228	229	217	206	168	149	245.4
20-Aug	141	134	136	98	221	190	149	167	150	248	324	4	360	7	4	348	320	335	35	124	64	151	148	164	139.7
21-Aug	178	169	149	146	132	137	135	134	128	127	124	123	137	165	153	175	167	187	179	177	156	130	211	129	151.3
22-Aug	132	130	14	19	130	123	130	134	125	132	144	152	88	100	156	192	281	305	348	15	278	125	197	356	136.5
23-Aug	344	349	347	343	338	2	341	337	305	345	317	341	329	311	320	343	343	337	332	352	347	342	348	344	340.1
24-Aug	342	344	351	356	355	358	357	355	355	359	357	354	355	344	344	334	338	322	325	331	338	318	306	319	348.0
25-Aug	143	136	140	134	136	145	133	143	136	137	133	167	203	193	208	206	200	199	173	174	173	171	179	165	169.3
26-Aug	147	107	122	128	133	137	137	136	131	129	145	219	235	241	249	280	266	312	7	355	351	344	351	313	168.3
27-Aug	303	286	309	267	198	262	310	17	171	127	132	105	133	158	170	183	201	212	211	190	172	156	134	139	176.6
28-Aug	130	134	132	139	139	131	137	129	128	127	131	127	123	119	118	132	139	135	130	127	135	132	129	137	131.5
29-Aug	131	131	132	135	136	136	135	133	134	127	128	134	130	133	173	184	185	185	154	124	132	131	134	134	142.0
30-Aug	137	143	138	135	140	133	134	131	118	74	120	152	138	148	134	160	154	154	158	165	137	131	125	129	143.3
31-Aug	179	10	119	175	107	204	179	185	236	190	130	121	236	289	20	10	347	336	334	317	338	327	339	317	322.4

131.0 120.7 122.3 126.0 139.5 152.2 141.5 145.7 151.4 147.3 153.8 198.3 209.9 236.5 213.9 228.3 253.7 256.6 239.4 200.1 174.9 162.6 144.4 124.7
 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 45 m (WD45m) - deg
Lower Camp Met Tower - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 98 deg on Aug 8 08:00	Hours of Data: 734
Minimum Value: 4 deg on Aug 29 23:00	Hours of Missing Data: 10
Percentiles: P ₁ = 5 P ₁₀ = 8 Q ₁ = 10 Median = 16 Q ₃ = 28 P ₉₀ = 52 P ₉₉ = 92	Hours of Calibration: 0
	Percent Operational Time: 98.7

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-Aug	9	10	13	13	12	11	13	14	11	10	8	9	16	41	19	49	46	9	24	30	28	37	74	20	74
2-Aug	42	28	59	51	38	60	35	DF	DF	DF	DF	DF	DF	DF	DF	DF	55	33	33	32	61	41	60	72	72
3-Aug	70	17	59	78	50	87	57	44	92	69	11	12	28	21	14	76	33	85	51	27	18	24	49	47	92
4-Aug	17	14	12	12	17	22	27	14	26	14	21	31	90	66	17	43	94	36	82	57	28	29	52	21	94
5-Aug	46	78	11	18	16	23	23	28	84	88	33	46	26	20	32	17	22	11	12	9	19	27	15	30	88
6-Aug	14	44	26	75	39	36	14	55	61	38	37	36	43	64	17	12	15	14	10	6	30	34	9	17	75
7-Aug	20	13	59	29	72	60	36	33	24	24	15	17	20	20	25	17	16	14	12	12	11	18	27	72	
8-Aug	42	21	17	28	35	36	48	98	18	15	20	27	32	20	18	19	14	13	10	9	10	9	9	8	98
9-Aug	11	8	6	8	8	10	9	11	10	11	10	15	17	DF	12	10	12	16	13	15	12	10	9	11	17
10-Aug	10	13	10	8	9	9	10	11	15	15	15	13	13	16	23	18	22	15	28	19	10	12	14	12	28
11-Aug	12	14	10	12	18	19	15	15	16	26	41	21	18	44	48	22	23	18	31	17	19	14	13	9	48
12-Aug	22	11	35	17	11	9	17	26	26	65	24	28	48	69	14	21	50	35	44	8	20	15	22	28	69
13-Aug	17	6	9	8	7	10	6	7	6	16	17	13	15	11	10	11	9	8	7	7	9	8	8	82	82
14-Aug	63	18	26	35	29	11	67	18	13	15	14	16	13	10	9	16	12	15	19	10	5	27	44	27	67
15-Aug	21	51	24	11	10	9	10	10	13	23	43	16	10	17	22	18	27	79	57	10	10	9	10	9	79
16-Aug	24	42	52	16	15	13	30	30	17	19	29	54	17	30	22	17	14	11	13	9	6	5	8	13	54
17-Aug	23	24	31	11	9	9	10	14	39	44	60	88	17	20	15	21	41	92	70	77	25	39	19	10	92
18-Aug	10	10	13	13	18	10	11	12	12	13	14	15	19	13	16	16	14	9	9	19	9	9	9	12	19
19-Aug	5	12	18	24	30	29	21	13	11	13	13	11	12	11	11	9	8	9	9	7	8	15	38	29	38
20-Aug	9	9	12	57	33	22	16	16	31	37	63	16	19	21	23	26	20	19	48	13	84	88	30	52	88
21-Aug	23	38	7	14	8	9	8	8	10	11	12	11	17	28	24	21	20	11	8	9	20	20	51	44	51
22-Aug	13	14	79	77	22	19	16	12	12	16	21	31	54	66	37	39	69	16	7	44	94	77	93	36	94
23-Aug	8	20	16	8	11	24	23	11	29	21	36	24	28	13	12	16	16	8	7	9	8	10	11	9	36
24-Aug	10	10	12	14	13	12	13	12	12	14	11	10	14	13	12	14	16	10	6	6	9	27	36	30	36
25-Aug	35	9	8	7	9	11	11	9	9	6	8	35	13	14	16	14	13	13	8	5	7	6	9	7	35
26-Aug	14	20	5	7	6	6	4	5	7	13	32	17	16	8	12	31	13	27	12	10	7	16	9	36	36
27-Aug	82	25	55	54	80	34	46	95	59	36	34	20	31	30	30	29	18	9	6	14	22	22	5	7	95
28-Aug	11	8	6	10	18	7	9	7	7	8	8	11	9	13	7	9	7	6	9	8	5	4	4	7	18
29-Aug	5	7	7	7	7	9	7	7	6	11	12	6	9	9	16	12	10	6	23	12	7	4	4	10	23
30-Aug	12	11	12	12	16	9	9	8	63	95	22	45	20	20	15	13	13	12	8	17	10	13	52	69	95
31-Aug	57	39	22	61	60	50	25	23	18	85	11	15	97	62	18	18	17	16	31	28	15	11	16	18	97
	82	78	79	78	80	87	67	98	92	95	63	88	97	69	48	76	94	92	82	77	94	88	93	82	

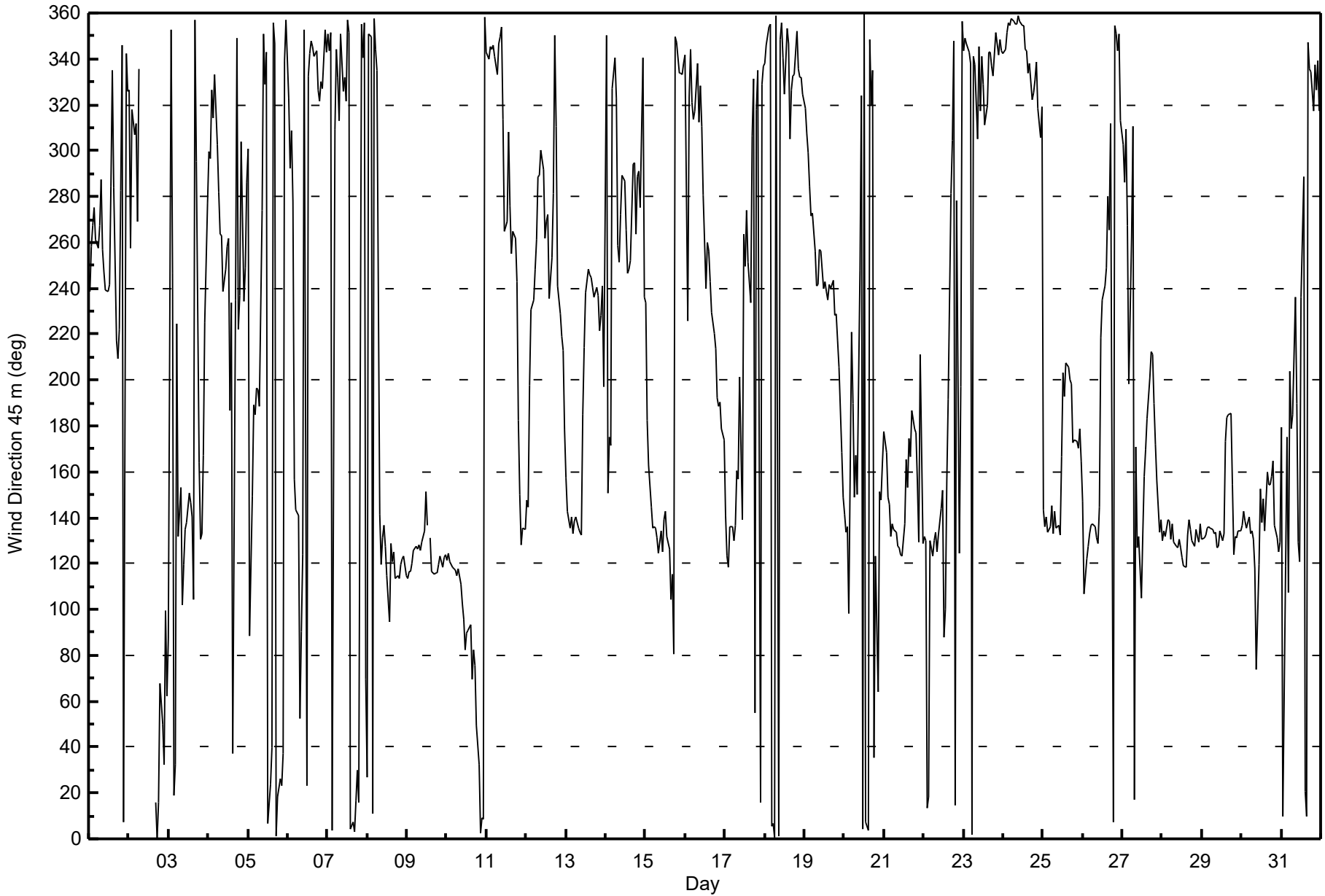
Diurnal Maximum

DF - DAS Failure



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 184 deg on Aug 25 21:00																				Hours in Service: 744							
Direction of Maximum Daily Speed Average: 129.9 deg on Aug 9																				Hours of Data: 733							
Direction of Minimum Speed: 105 deg on Aug 17 20:00										Direction of Minimum Daily Speed Average: 2.0 deg on Aug 15										Hours of Missing Data: 11							
Monthly Average Direction: 209.7 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-Aug	243	257	267	275	262	259	268	285	257	247	243	241	242	281	327	286	272	214	226	297	344	11	344	334	265.9		
2-Aug	327	262	275	326	284	263	292	DF	DF	DF	DF	DF	DF	DF	DF	DF	5	6	48	91	103	97	112	121	--		
3-Aug	126	92	151	116	100	157	136	162	116	150	139	139	157	145	141	115	0	315	188	148	176	196	230	281	148.8		
4-Aug	294	297	319	313	298	290	275	266	265	246	250	260	259	207	235	38	318	301	234	251	308	249	246	278	274.5		
5-Aug	308	26	190	250	229	231	233	227	278	312	321	338	345	16	31	354	345	5	22	31	34	65	41	27	333.2		
6-Aug	310	323	295	339	253	161	214	20	73	124	1	33	347	341	358	358	349	342	332	328	333	334	12	8	356.9		
7-Aug	30	348	353	11	358	349	356	343	329	308	332	322	357	353	4	7	5	18	28	17	10	6	16	92	3.7		
8-Aug	130	47	43	38	78	123	146	124	128	130	133	126	113	96	128	121	125	114	116	115	118	125	132	127	120.0		
9-Aug	125	128	127	130	131	131	130	132	131	132	135	149	137	DF	134	119	112	114	129	129	129	125	130	130	129.9		
10-Aug	129	131	128	127	122	121	118	121	127	UO	100	89	95	94	98	79	86	78	57	43	19	28	34	13	101.1		
11-Aug	358	359	354	356	355	357	347	348	352	358	317	265	273	296	274	252	260	258	234	182	165	151	150	143	311.9		
12-Aug	153	183	228	247	244	248	261	279	282	293	293	264	272	266	239	255	292	332	329	252	238	240	239	220	251.2		
13-Aug	197	186	174	157	142	144	152	145	140	149	188	213	236	246	244	244	240	236	245	255	242	244	251	259	215.3		
14-Aug	344	167	213	214	307	346	349	264	260	270	290	285	264	247	250	252	293	292	264	287	299	292	353	249	276.8		
15-Aug	258	244	221	196	183	162	157	141	132	146	140	152	146	136	137	126	122	121	345	352	339	342	338	335	144.1		
16-Aug	334	311	283	332	330	317	304	325	315	323	309	282	243	259	256	242	228	218	213	204	205	209	198	189	242.6		
17-Aug	157	145	146	150	147	147	153	168	183	209	154	252	251	276	252	238	308	322	69	105	324	21	331	327	202.7		
18-Aug	333	354	359	359	358	3	359	358	1	350	355	340	327	354	347	310	332	340	343	359	342	343	346	331	347.7		
19-Aug	325	306	293	280	263	260	251	244	245	255	255	238	243	240	236	241	240	243	230	237	229	222	214	208	248.3		
20-Aug	184	177	179	121	242	197	185	178	184	248	304	333	335	352	354	334	310	340	9	97	97	158	160	177	227.4		
21-Aug	218	223	182	178	168	165	170	173	154	133	129	131	144	169	155	175	168	187	180	176	176	158	154	148	167.3		
22-Aug	140	143	123	126	141	142	152	168	154	153	160	162	116	125	155	191	276	295	340	355	32	122	137	116	149.3		
23-Aug	39	343	355	348	315	235	318	341	2	317	298	277	338	325	332	339	350	350	358	2	358	356	1	356	347.6		
24-Aug	351	352	357	359	359	359	359	356	356	1	358	356	355	345	344	336	338	326	330	338	345	347	344	294	350.4		
25-Aug	252	243	202	167	165	158	150	170	161	149	145	175	205	196	209	204	200	200	185	186	184	185	196	189	185.7		
26-Aug	171	140	149	154	161	164	166	157	150	134	156	217	233	240	247	277	266	307	11	358	358	353	356	346	212.8		
27-Aug	322	319	292	314	244	261	258	272	238	148	157	131	153	166	177	186	204	213	214	206	196	192	177	177	205.6		
28-Aug	171	203	206	208	207	177	184	180	167	170	151	155	129	109	118	139	149	146	155	154	154	162	169	170	161.9		
29-Aug	166	157	156	158	159	157	159	152	137	129	135	142	138	143	177	185	184	186	177	153	150	155	162	156	158.3		
30-Aug	159	147	144	149	161	163	165	162	128	134	162	127	134	154	140	162	159	165	162	164	139	131	139	143	150.9		
31-Aug	159	53	118	149	180	237	200	203	235	206	121	131	256	289	357	341	337	344	347	332	337	335	335	330	317.7		
207.1 206.4 190.0 180.8 201.9 192.9 187.7 188.3 185.0 181.6 181.0 204.7 210.3 237.3 216.8 233.0 262.0 265.6 243.8 221.7 241.6 189.4 189.7 174.6																											
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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 92 deg on Aug 17 18:00	Hours of Data: 733
Minimum Value: 2 deg on Aug 16 21:00	Hours of Missing Data: 11
Percentiles: P ₁ = 4 P ₁₀ = 6 Q ₁ = 8 Median = 12 Q ₃ = 22 P ₉₀ = 37 P ₉₉ = 78	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-Aug	7	6	9	10	8	9	10	11	7	7	6	8	11	37	16	36	43	9	12	26	29	34	21	11	43
2-Aug	6	24	25	17	31	17	25	DF	DF	DF	DF	DF	DF	DF	DF	DF	51	17	29	19	20	34	13	8	51
3-Aug	10	40	15	25	24	35	21	29	64	53	9	11	24	17	10	78	28	79	38	26	12	10	25	23	79
4-Aug	9	7	10	8	11	13	14	13	20	15	20	31	68	63	15	40	71	35	20	19	21	18	13	25	71
5-Aug	15	63	32	10	13	9	11	18	57	64	25	33	24	39	62	16	23	11	10	6	9	16	30	10	64
6-Aug	26	28	37	27	39	32	9	86	48	36	25	31	38	61	16	13	9	7	7	6	7	12	8	27	86
7-Aug	35	12	7	10	7	22	12	25	24	22	12	12	16	14	15	20	13	12	11	9	4	11	23	20	35
8-Aug	33	64	36	38	15	32	56	75	13	11	16	22	28	18	16	14	12	9	6	6	7	5	6	6	75
9-Aug	5	4	4	5	4	5	4	5	6	6	5	13	12	DF	8	8	10	18	9	9	7	6	6	7	18
10-Aug	7	7	7	6	5	5	6	6	16	UO	10	9	9	10	16	14	16	11	23	14	6	8	9	14	23
11-Aug	9	12	9	9	11	12	9	9	12	19	39	15	13	33	41	16	18	12	27	15	4	10	11	7	41
12-Aug	14	22	13	10	8	6	13	12	14	26	19	23	48	38	12	27	46	27	21	8	10	8	12	19	48
13-Aug	13	11	14	10	10	7	10	9	8	25	14	12	13	8	7	9	7	8	9	5	6	8	5	43	43
14-Aug	47	24	27	71	23	10	55	18	11	11	10	13	11	7	5	12	9	13	14	12	3	22	27	28	71
15-Aug	10	13	31	9	15	9	9	15	6	18	44	12	10	11	25	33	17	87	55	8	5	6	7	4	87
16-Aug	6	31	22	15	5	10	23	21	13	15	22	58	15	23	17	12	13	9	10	5	2	3	4	8	58
17-Aug	17	16	24	11	8	7	9	12	26	34	65	49	15	22	12	16	39	92	40	91	43	26	18	5	92
18-Aug	5	7	8	7	6	4	6	6	8	8	9	13	17	9	13	13	12	6	6	11	5	6	7	13	17
19-Aug	4	10	7	13	14	15	12	9	8	9	8	12	10	10	10	7	6	6	7	4	5	7	14	16	16
20-Aug	20	28	32	64	20	20	14	14	44	20	72	28	23	21	19	23	15	9	30	17	45	25	9	28	72
21-Aug	12	34	9	13	14	10	10	12	17	10	8	13	16	22	21	16	18	9	6	3	6	11	7	11	34
22-Aug	10	12	26	7	17	7	10	8	15	24	19	23	52	86	35	36	67	15	9	13	47	53	8	9	86
23-Aug	77	11	12	7	33	40	67	9	16	38	43	23	20	11	4	5	8	3	6	6	5	6	6	7	77
24-Aug	5	7	7	9	8	8	8	7	7	8	6	7	11	11	10	11	14	8	3	5	4	8	13	17	17
25-Aug	12	15	42	9	5	9	10	14	13	9	9	31	10	13	14	12	11	10	7	3	4	4	5	6	42
26-Aug	14	17	9	11	11	10	8	10	12	8	31	13	15	6	8	27	10	27	8	7	5	6	9	7	31
27-Aug	8	4	18	44	16	7	10	19	9	48	32	39	27	26	27	25	15	8	4	8	10	17	10	17	48
28-Aug	71	17	11	8	14	7	8	10	10	9	13	17	8	11	10	9	8	8	8	7	5	6	5	4	71
29-Aug	4	6	4	7	7	6	6	10	8	6	8	6	10	12	12	10	8	4	14	12	6	4	4	6	14
30-Aug	10	10	12	10	11	5	10	13	27	38	15	32	13	20	17	10	10	12	7	11	9	14	27	29	38
31-Aug	46	63	12	46	23	18	25	12	17	65	10	20	88	51	23	24	16	9	30	27	7	8	13	12	88
	77	64	42	71	39	40	67	86	64	65	72	58	88	86	62	78	71	92	55	91	47	53	30	43	

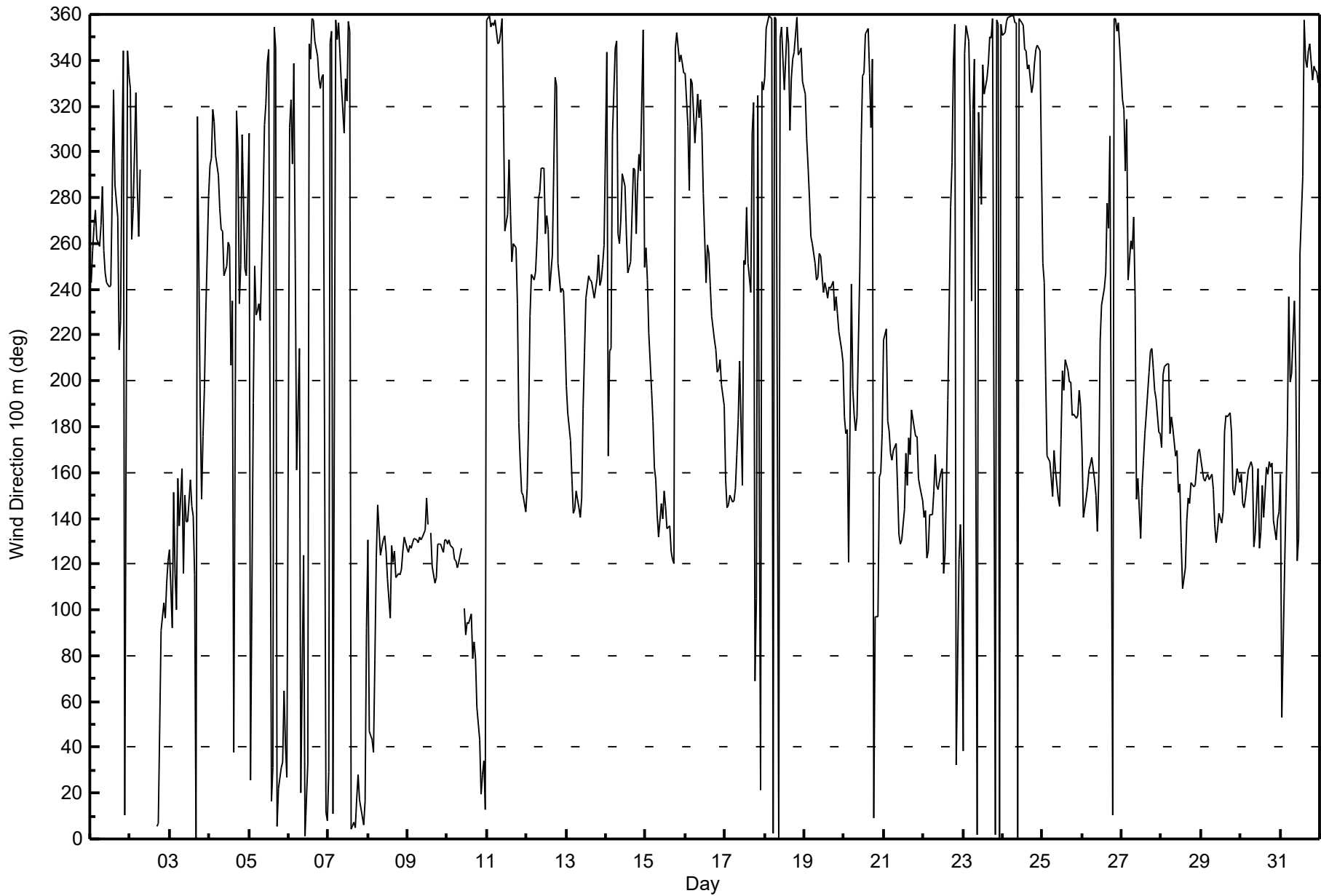
Diurnal Maximum

DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 201 deg on Aug 25 22:00																				Hours in Service: 744					
Direction of Maximum Daily Speed Average: 133.8 deg on Aug 9																				Hours of Data: 734					
Direction of Minimum Speed: 294 deg on Aug 23 11:00										Direction of Minimum Daily Speed Average: 1.9 deg on Aug 11										Hours of Missing Data: 10					
Monthly Average Direction: 225.4 deg																				Percent Operational Time: 98.7					
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-Aug	251	262	274	281	270	267	275	286	264	254	251	248	247	278	326	294	332	232	240	305	351	23	340	348	274.2
2-Aug	335	289	293	317	292	289	290	DF	DF	DF	DF	DF	DF	DF	DF	DF	356	23	70	89	97	100	102	113	--
3-Aug	129	122	174	164	116	154	149	183	138	174	148	147	165	150	145	121	3	316	185	161	189	211	239	284	160.6
4-Aug	298	308	324	324	301	299	284	276	276	261	254	268	264	223	242	30	321	259	241	263	307	262	262	285	283.9
5-Aug	306	295	268	273	268	260	256	248	272	293	320	334	336	3	24	358	353	12	28	36	43	66	61	23	332.5
6-Aug	343	15	295	320	269	248	246	332	63	110	19	42	10	360	21	14	1	355	349	341	338	352	45	52	16.8
7-Aug	66	35	29	36	24	33	41	25	329	304	336	328	1	356	7	10	12	24	33	23	23	29	47	98	20.5
8-Aug	121	122	117	124	115	128	133	132	137	131	127	126	117	99	127	122	127	116	119	119	119	131	137	134	124.3
9-Aug	135	135	132	133	135	136	136	139	136	135	137	151	138	DF	136	124	118	119	131	135	133	132	134	134	133.8
10-Aug	133	134	133	134	128	127	124	128	130	120	106	95	99	100	102	86	91	81	67	61	47	48	58	34	110.0
11-Aug	20	23	13	15	11	14	359	352	360	14	335	269	278	277	267	253	254	257	231	183	169	163	161	152	340.9
12-Aug	164	221	249	258	254	256	273	282	284	292	297	271	266	267	248	260	306	330	335	265	251	244	273	258	261.9
13-Aug	237	224	210	190	170	178	184	170	168	177	192	216	239	248	245	247	243	242	251	262	257	261	273	270	232.0
14-Aug	335	188	239	248	300	0	13	278	275	276	293	286	269	253	258	260	292	293	269	291	306	302	11	259	284.5
15-Aug	287	269	258	227	221	202	188	174	153	164	161	172	153	153	163	159	134	187	343	359	347	351	348	345	230.5
16-Aug	350	344	297	333	347	330	309	319	319	323	310	285	249	261	259	245	231	221	220	216	217	218	213	207	251.9
17-Aug	188	178	177	181	182	171	172	176	205	211	190	244	255	278	257	245	309	337	60	45	331	33	354	341	227.4
18-Aug	346	3	8	5	3	7	4	2	5	355	357	344	333	358	349	318	340	349	353	2	348	352	352	339	354.4
19-Aug	336	315	299	292	269	267	255	254	254	259	258	244	248	244	241	246	245	247	241	247	248	241	229	225	255.5
20-Aug	235	231	226	286	245	211	212	197	216	247	280	299	308	333	334	326	306	335	11	69	86	149	183	196	245.0
21-Aug	239	252	212	213	212	203	208	204	194	163	166	144	153	171	158	176	173	187	181	175	176	176	166	164	184.4
22-Aug	158	159	159	141	154	151	168	174	175	178	171	171	131	135	157	189	275	292	332	356	48	109	117	136	163.1
23-Aug	162	312	350	47	128	148	185	315	341	337	294	282	349	335	342	352	358	2	14	14	12	12	14	10	4.0
24-Aug	4	2	5	7	6	7	6	3	2	7	5	2	360	350	347	339	339	332	335	343	353	9	18	357	358.8
25-Aug	299	262	259	195	162	170	184	200	188	172	167	190	208	200	213	205	202	204	196	193	195	201	211	210	199.0
26-Aug	202	183	188	192	198	196	198	187	177	156	178	219	234	244	251	278	270	306	17	5	7	8	10	7	238.4
27-Aug	337	334	341	352	279	309	315	319	256	162	189	186	177	181	183	192	209	218	219	216	215	220	221	235	224.7
28-Aug	254	234	224	227	231	219	217	218	207	199	186	186	175	154	154	160	158	159	168	183	182	185	190	187	192.4
29-Aug	194	200	199	191	196	187	195	175	156	145	155	154	157	157	181	188	186	190	191	185	178	170	166	158	177.3
30-Aug	161	161	165	163	162	150	148	151	158	162	177	134	137	164	149	166	163	171	168	165	140	133	153	154	156.4
31-Aug	159	120	126	164	202	257	222	213	239	194	143	173	256	291	330	322	333	354	3	349	351	347	340	344	302.9
213.0 229.6 236.4 234.4 227.9 219.6 215.6 215.3 211.4 191.4 204.2 217.1 218.8 238.3 226.0 238.1 266.3 266.6 243.2 245.5 280.2 190.9 193.3 188.8																									
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

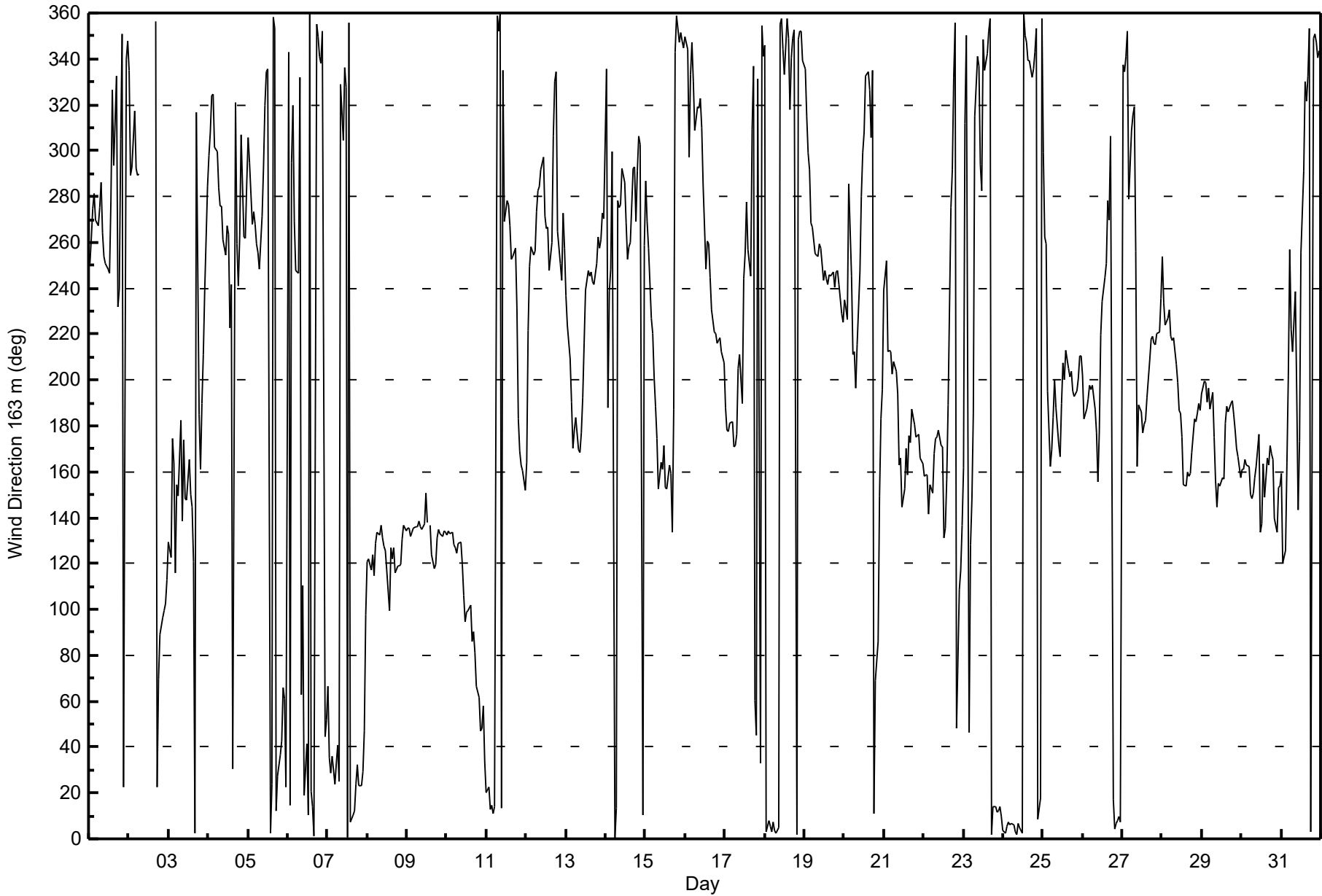
Wind Direction 163 m (WD163m) - deg
Lower Camp Met Tower - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Aug 17 19:00 Minimum Value: 2 deg on Aug 21 20:00 Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 17 P ₉₀ = 29 P ₉₉ = 79																		Hours in Service: 744 Hours of Data: 734 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.7							
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-Aug	5	5	7	6	6	7	8	10	6	5	6	7	10	32	15	28	39	11	12	21	31	30	16	12	39
2-Aug	8	27	15	7	27	12	15	DF	DF	DF	DF	DF	DF	DF	DF	DF	48	14	11	13	7	10	9	9	48
3-Aug	6	6	32	33	20	14	8	22	26	27	10	13	23	16	10	77	29	74	40	23	8	8	25	22	77
4-Aug	10	8	11	6	7	12	12	11	15	16	17	29	39	54	14	43	47	19	5	7	18	13	6	15	54
5-Aug	10	22	15	12	4	5	4	10	25	36	23	29	24	81	80	16	22	13	9	5	11	3	7	24	81
6-Aug	21	40	39	21	28	17	15	45	32	15	24	20	39	76	18	16	7	8	6	6	3	15	9	17	76
7-Aug	20	14	10	13	4	5	8	6	30	19	8	9	18	15	14	19	15	12	8	6	6	4	17	14	30
8-Aug	12	8	8	23	12	14	19	24	13	10	17	19	26	17	16	12	10	8	5	4	6	4	5	5	26
9-Aug	4	4	3	3	4	4	4	6	5	5	5	12	9	DF	7	6	6	7	6	7	5	5	5	5	12
10-Aug	5	5	5	6	4	4	4	4	7	7	8	10	8	9	14	11	13	10	17	12	7	7	7	11	17
11-Aug	11	11	8	9	10	11	10	10	11	19	45	15	11	25	24	15	17	10	24	13	4	8	9	9	45
12-Aug	16	11	9	5	6	4	10	7	13	19	16	19	46	34	13	37	37	21	20	12	10	14	9	16	46
13-Aug	10	9	10	7	13	13	12	9	11	23	13	13	12	6	6	6	5	6	9	4	3	6	4	25	25
14-Aug	36	28	14	21	19	13	15	39	12	9	9	12	9	6	5	9	7	10	10	11	2	17	35	67	67
15-Aug	23	6	22	11	10	9	9	11	11	13	24	9	8	13	38	44	21	71	54	8	5	6	6	4	71
16-Aug	7	9	21	14	4	10	13	13	9	14	18	30	14	17	15	11	11	9	9	4	2	3	2	3	30
17-Aug	12	12	18	12	13	8	8	10	14	26	52	37	13	23	12	17	40	45	96	67	43	17	25	6	96
18-Aug	4	6	6	6	5	3	5	6	8	8	9	11	15	8	13	11	11	5	5	9	4	6	7	10	15
19-Aug	4	11	6	12	8	8	7	8	6	7	7	9	9	10	9	7	5	4	5	2	3	5	6	5	12
20-Aug	12	22	29	87	14	18	10	15	25	16	35	30	31	32	23	38	12	9	23	11	9	27	5	18	87
21-Aug	7	10	11	9	18	10	9	13	18	13	15	17	16	20	19	14	18	10	5	2	3	5	5	6	20
22-Aug	7	6	21	7	16	9	6	5	8	11	14	21	45	40	31	29	67	17	6	15	79	49	6	9	79
23-Aug	41	92	9	40	11	15	90	16	15	27	84	14	13	6	4	6	3	3	4	4	4	6	5	6	92
24-Aug	6	7	8	8	7	8	8	7	7	8	7	7	10	10	10	9	12	7	4	3	3	8	6	18	18
25-Aug	25	11	12	27	8	8	17	8	13	8	9	21	10	13	11	11	10	9	5	3	2	2	3	2	27
26-Aug	8	11	6	7	8	5	5	8	12	14	24	12	13	5	7	22	7	28	6	6	5	4	6	5	28
27-Aug	11	6	8	22	29	11	11	5	20	24	25	43	32	24	24	22	15	7	3	4	7	9	9	21	43
28-Aug	27	11	8	6	5	8	8	6	6	10	10	8	12	17	18	15	7	5	7	5	3	7	6	6	27
29-Aug	7	7	7	9	8	9	7	12	9	9	5	8	12	13	11	9	8	4	6	5	6	5	3	4	13
30-Aug	4	4	5	4	4	8	10	14	8	13	13	14	12	17	18	8	7	12	6	10	10	13	18	10	18
31-Aug	8	77	10	16	26	4	18	11	19	49	22	25	70	41	26	25	15	11	31	31	8	10	10	10	77
Diurnal Maximum																									
DF - DAS Failure																									



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Value: 0.4 km/h on Aug 28 03:00		Maximum Daily Average: -0.1 km/h on Aug 28		Hours in Service: 744																						
Minimum Value: -1.4 km/h on Aug 9 12:00		Minimum Daily Average: -0.6 km/h on Aug 13		Hours of Data: 734																						
Maximum Diurnal Average: -0.1 km/h at hour 23		Minimum Diurnal Average: -0.5 km/h at hour 15		Hours of Missing Data: 10																						
Monthly Average: -0.29 km/h		Percentiles: $P_1 = -1.1$ $P_{10} = -0.7$ $Q_1 = -0.5$ Median = -0.2 $Q_3 = 0.0$ $P_{90} = 0.0$ $P_{99} = 0.2$		Hours of Calibration: 0																						
				Percent Operational Time: 98.7																						
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-Aug	-0.5	-0.9	-0.6	-0.6	-0.8	-1.0	-0.7	-0.6	-0.6	-0.8	-0.6	-0.7	-0.6	-0.3	-0.2	-0.3	-0.1	-0.3	-0.1	-0.3	-0.1	-0.1	0.0	-0.1	-0.5	0.0
2-Aug	0.0	-0.1	-0.1	-0.2	-0.2	0.0	0.0	DF	DF	DF	DF	DF	DF	DF	DF	DF	-0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	--	0.1
3-Aug	0.1	-0.1	0.0	0.1	-0.1	0.0	-0.1	-0.2	-0.1	0.0	-0.5	-0.7	-0.3	-0.3	-0.7	-0.4	-0.4	-0.4	-0.2	-0.2	0.0	0.0	-0.1	-0.2	-0.2	0.1
4-Aug	-0.2	-0.3	-0.2	-0.1	-0.1	-0.4	-0.1	-0.4	-0.5	-0.7	-0.6	-0.6	-0.3	-0.2	-0.6	-0.3	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.2	-0.3	0.0
5-Aug	-0.1	0.0	0.0	0.1	-0.1	-0.1	-0.2	-0.3	-0.1	0.2	-0.3	-0.2	-0.4	-0.5	0.0	0.1	-0.2	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.2
6-Aug	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	-0.1	-0.2	-0.2	-0.4	-0.3	-0.1	-0.5	-0.3	-0.4	-0.2	-0.4	-0.1	-0.1	0.0	0.0	0.0	-0.4	-0.2	0.1
7-Aug	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.3	0.0	-0.3	-0.5	-0.6	-0.4	-0.4	-0.6	-0.6	-0.7	-0.7	-0.4	-0.2	0.0	0.0	0.0	0.0	-0.2	0.0
8-Aug	0.1	0.1	0.0	0.1	0.0	-0.2	-0.2	0.1	-0.3	-0.7	-0.5	-0.4	-0.6	-0.6	-0.8	-0.5	-0.8	-0.8	-0.7	-0.7	-0.6	-0.6	-0.4	-0.4	-0.4	0.1
9-Aug	-0.5	-0.5	-0.7	-0.6	-0.6	-0.6	-0.8	-0.4	-0.5	-0.5	-1.0	-1.4	-0.7	DF	-0.9	-0.7	-0.6	-0.3	-0.4	-0.4	-0.5	-0.4	-0.6	-0.6	-0.6	-0.3
10-Aug	-0.7	-0.4	-0.6	-0.6	-0.7	-0.7	-0.6	-0.4	-0.4	-0.3	-0.2	-0.3	-0.5	-0.3	-0.3	-0.4	-0.5	-0.6	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.4	-0.1
11-Aug	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3	-0.1	-0.3	-0.1	-0.2	-0.2	-0.4	-0.4	-0.1	0.0	-0.3	-0.5	-0.4	-0.2	0.0	0.2	0.0	0.1	-0.3	-0.2	0.2
12-Aug	-0.3	-0.1	0.0	0.0	0.0	-0.6	-0.3	-0.1	0.2	-0.1	-0.4	-0.4	-0.1	-0.2	0.0	-0.2	-0.3	0.0	0.0	-0.1	-0.1	-0.1	-0.2	0.0	-0.2	0.2
13-Aug	0.1	0.1	-0.1	-0.5	-0.8	-1.0	-1.2	-1.1	-0.7	-0.5	-0.7	-0.8	-0.9	-1.1	-1.2	-1.0	-1.3	-0.8	-0.6	-0.4	-0.1	-0.2	-0.7	0.0	-0.6	0.1
14-Aug	-0.1	-0.1	0.0	-0.2	-0.2	-0.4	-0.2	-0.3	-0.6	-0.5	-0.5	-0.7	-1.0	-0.7	-1.0	-0.9	-1.0	-0.6	-0.5	-0.4	-0.5	-0.2	0.0	0.0	-0.4	0.0
15-Aug	0.0	0.2	0.0	0.2	0.0	-0.3	-0.4	-0.5	-0.4	-0.5	-0.1	-0.6	-0.4	-0.4	0.0	-0.4	-0.3	-0.1	-0.2	-0.4	-0.3	-0.1	-0.2	-0.2	-0.2	0.2
16-Aug	-0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.4	-0.2	-0.2	-0.1	-0.3	-0.6	-0.8	-0.7	-0.6	-0.7	-0.6	-0.7	-0.4	-0.6	-0.8	-0.8	-0.5	-0.1	-0.4	0.0
17-Aug	0.0	-0.1	-0.6	-0.4	-0.5	-0.3	-0.3	-0.3	-0.4	-0.2	0.2	-0.1	-0.7	-0.6	-0.6	-0.1	-0.4	-0.1	-0.2	-0.2	-0.3	0.0	-0.1	-0.2	-0.3	0.2
18-Aug	0.0	-0.3	0.0	-0.3	-0.2	-0.3	-0.6	-0.8	-0.4	-0.4	-0.6	-0.3	-0.5	-0.4	-0.5	-0.3	-0.4	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.3	-0.3	0.0
19-Aug	-0.4	-0.2	-0.1	-0.2	-0.2	-0.3	-0.3	-0.6	-0.6	-0.6	-0.8	-0.8	-0.7	-0.9	-1.1	-1.2	-1.0	-1.0	-0.6	-0.3	-0.2	-0.2	0.2	0.1	-0.5	0.2
20-Aug	-0.3	0.2	-0.4	0.0	-0.4	-0.2	-0.3	-0.5	-0.1	0.0	-0.2	0.0	0.1	-0.2	-0.3	-0.2	-0.3	-0.3	0.0	0.1	0.0	0.0	0.0	0.0	-0.1	0.2
21-Aug	0.0	0.0	0.1	0.1	-0.1	-0.2	-0.4	-0.5	-0.2	-0.1	-0.1	-0.2	-0.6	-0.5	-0.4	-0.7	-0.2	-0.8	-0.8	-0.2	0.4	0.1	0.0	0.0	-0.2	0.4
22-Aug	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.3	-0.1	0.0	-0.3	-0.1	-0.2	-0.1	-0.3	-0.5	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.1	-0.1	0.1
23-Aug	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.3	-0.2	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.3	-0.2	0.0
24-Aug	-0.3	-0.3	-0.4	-0.3	-0.4	-0.5	-0.7	-0.6	-0.6	-0.9	-0.9	-0.9	-0.9	-0.8	-0.6	-0.3	-0.3	-0.5	-0.2	-0.1	0.0	0.0	0.0	0.0	-0.4	0.0
25-Aug	0.0	-0.1	-0.1	0.2	0.1	0.0	-0.3	-0.7	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7	-0.9	-0.7	-0.8	-0.7	-0.4	-0.9	-1.2	-1.0	-0.7	-0.1	-0.5	0.2
26-Aug	0.0	-0.8	-0.7	-0.5	-0.5	-0.6	-0.9	-0.9	-0.8	-0.3	-0.5	-0.7	-0.9	-0.7	-0.6	-0.4	-0.7	-0.6	-0.5	-0.4	-0.3	-0.1	0.0	0.0	-0.5	0.0
27-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.0	-0.1	-0.4	-0.2	-0.3	-0.2	-0.4	-0.6	-0.5	-0.3	0.1	0.0	0.3	0.0	-0.1	0.3
28-Aug	0.0	0.0	0.4	0.2	0.3	0.0	-0.2	0.0	-0.4	-0.2	-0.3	0.1	-0.2	0.0	-0.1	-0.3	-0.4	-0.7	0.0	0.0	0.0	0.1	0.2	-0.2	-0.1	0.4
29-Aug	-0.1	-0.2	-0.2	-0.3	-0.5	-0.5	-0.4	-0.7	-0.8	-0.7	-0.2	-0.4	-0.3	-0.4	-0.7	-0.8	-0.7	-0.6	0.1	0.1	0.0	0.0	0.0	0.0	-0.4	0.1
30-Aug	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	-0.1	0.2	-0.2	-0.1	-0.1	-0.2	-0.4	-0.6	-0.3	-0.4	-0.5	-1.0	-0.5	-0.5	-0.3	-0.1	-0.2	0.2
31-Aug	0.1	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.5	-0.1	-0.2	0.0	-0.1	-0.2	0.2	-0.2	-0.1	0.0	-0.4	-0.4	-0.1	-0.1	-0.2	-0.2	-0.1	0.2
																								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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.5 km/h on Aug 9 15:00 Minimum Value: 0.1 km/h on Aug 22 20:00 Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.7 Median = 1.4 Q ₃ = 1.9 P ₉₀ = 2.4 P ₉₉ = 3.2		Hours in Service: 744 Hours of Data: 734 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.7																							
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-Aug	2.1	2.9	2.7	2.4	2.7	2.7	2.6	2.7	2.4	2.2	1.9	1.9	1.9	2.5	1.8	1.6	0.6	1.4	1.2	0.9	1.5	0.4	0.2	0.4	2.9
2-Aug	0.3	0.4	0.5	0.3	0.6	0.4	0.5	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.9	0.4	0.1	0.1	0.2	0.2	0.2	0.4	0.9
3-Aug	0.3	0.4	0.2	0.4	0.4	0.4	0.9	1.1	0.8	0.8	1.7	1.6	2.0	1.6	2.3	2.0	2.1	2.3	1.1	0.8	0.6	0.5	0.6	0.7	2.3
4-Aug	0.6	1.3	0.9	0.7	1.0	1.1	1.7	2.0	2.0	1.5	1.7	1.9	1.2	1.0	2.1	1.9	0.9	0.7	0.5	0.5	0.3	0.5	0.9	0.9	2.1
5-Aug	0.4	0.3	0.3	0.4	0.8	1.1	1.0	1.2	1.1	1.2	1.4	1.5	1.3	1.3	1.2	1.3	0.9	1.3	1.4	0.8	0.3	0.2	0.1	0.1	1.5
6-Aug	0.1	0.2	0.2	0.1	0.2	0.2	0.5	1.0	1.0	1.4	2.4	1.8	0.7	1.3	1.6	1.3	1.1	1.1	0.9	0.4	0.1	0.3	0.5	1.0	2.4
7-Aug	0.5	0.4	0.2	0.1	0.2	0.3	0.8	1.0	1.4	1.3	1.6	2.1	2.2	2.2	2.5	2.6	2.3	2.9	2.6	1.8	0.5	0.4	0.4	0.6	2.9
8-Aug	0.5	0.4	0.5	0.3	0.2	0.5	0.5	1.2	1.8	2.0	1.8	2.0	2.0	2.3	2.4	2.5	2.6	3.0	3.2	2.9	2.6	2.6	2.2	2.2	3.2
9-Aug	2.1	2.6	2.3	2.4	2.4	2.9	3.1	2.9	2.9	3.2	3.5	2.9	3.4	DF	3.5	2.9	2.7	1.8	2.3	2.0	2.2	2.1	2.4	2.3	3.5
10-Aug	2.7	2.7	2.7	2.5	3.0	2.9	2.5	2.5	1.7	1.7	1.4	1.6	2.3	2.2	2.0	1.5	1.8	1.7	1.4	1.6	1.3	1.3	1.1	1.0	3.0
11-Aug	1.3	0.9	1.1	1.5	1.1	0.9	1.1	1.6	1.3	1.3	1.1	1.1	1.2	1.0	1.6	1.8	1.6	1.7	1.1	0.7	0.6	0.7	0.6	1.2	1.8
12-Aug	1.1	0.9	0.8	0.7	1.1	2.1	1.7	1.1	1.0	1.2	2.0	2.0	2.0	1.1	1.0	1.7	1.1	0.7	0.3	0.7	0.4	0.7	1.1	0.9	2.1
13-Aug	0.7	0.7	0.9	1.7	1.9	2.0	2.3	2.3	2.4	2.2	2.1	2.3	2.6	2.9	2.9	3.1	2.4	2.1	1.5	0.7	0.7	0.9	1.1	0.8	3.1
14-Aug	1.0	0.7	0.7	0.6	1.1	1.5	0.6	1.4	1.9	2.1	2.8	2.8	3.2	3.4	3.3	2.9	3.0	2.9	1.7	1.6	1.3	1.4	0.3	0.2	3.4
15-Aug	0.2	0.6	0.7	0.9	1.4	1.5	2.2	1.9	2.3	1.5	1.2	1.6	1.5	1.7	1.8	0.9	1.2	0.4	1.8	2.4	2.3	2.1	1.4	0.7	2.4
16-Aug	0.5	0.2	0.4	0.6	0.5	0.4	0.7	1.3	1.9	1.9	2.3	1.7	1.9	2.1	2.3	2.0	2.1	1.9	1.6	1.1	1.2	1.3	1.5	1.5	2.3
17-Aug	1.3	1.5	1.6	1.7	1.8	1.2	1.5	1.4	1.6	1.5	1.2	1.7	2.1	2.1	1.8	1.5	2.1	1.8	0.8	0.5	1.6	0.6	0.4	0.6	2.1
18-Aug	0.8	2.2	1.7	1.8	1.5	1.9	2.6	2.9	2.7	2.1	2.7	2.6	2.0	1.8	2.0	1.3	2.0	1.3	1.5	1.3	1.9	1.5	1.2	1.0	2.9
19-Aug	1.1	1.0	1.7	1.3	1.8	1.9	2.1	1.8	1.9	2.4	2.2	2.1	2.2	2.1	2.1	2.7	2.6	2.7	1.8	1.2	1.2	1.3	1.1	1.1	2.7
20-Aug	1.3	1.8	1.7	0.9	1.2	0.9	1.3	1.3	1.5	1.8	1.7	1.7	1.8	1.6	1.4	1.4	1.9	0.7	0.2	0.2	0.2	0.3	0.2	0.2	1.9
21-Aug	0.6	0.6	0.8	1.2	1.0	1.1	1.6	1.7	1.5	1.9	2.0	2.1	2.4	1.9	1.9	1.7	1.5	1.5	1.3	0.9	0.7	0.4	0.2	0.2	2.4
22-Aug	0.1	0.3	0.2	0.2	0.2	0.3	0.6	1.2	1.6	1.8	1.7	1.7	1.1	1.4	1.7	1.5	1.3	0.8	0.3	0.1	0.2	0.1	0.1	0.2	1.8
23-Aug	0.7	0.3	0.3	0.4	0.4	0.3	0.6	1.4	0.6	0.8	0.6	0.8	0.7	0.4	0.3	0.7	0.8	0.4	0.6	1.5	1.5	1.6	1.6	1.7	1.7
24-Aug	2.2	2.2	2.0	2.1	2.3	2.5	2.6	2.8	2.6	2.9	3.5	3.2	2.8	2.8	2.6	2.2	1.7	1.6	1.2	0.5	0.1	0.2	0.2	0.1	3.5
25-Aug	0.2	0.4	0.3	0.6	0.8	0.9	1.4	1.7	2.1	2.0	2.3	2.2	2.1	1.6	2.0	2.0	1.9	1.6	0.9	1.1	1.7	1.7	1.6	1.2	2.3
26-Aug	1.4	1.5	1.8	1.7	2.0	1.9	2.2	2.1	2.0	2.1	2.6	2.3	2.4	2.1	1.9	1.9	2.4	2.4	3.0	1.9	1.5	0.6	0.4	0.2	3.0
27-Aug	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.7	1.3	1.6	1.3	1.6	1.8	1.7	1.8	1.5	1.6	1.3	0.9	0.8	1.1	0.8	0.7	1.8
28-Aug	0.2	0.6	0.8	0.7	0.8	1.0	1.0	1.4	1.4	1.5	1.7	1.7	1.7	1.3	1.0	1.1	1.2	1.2	0.7	0.5	0.6	0.8	0.9	1.5	1.7
29-Aug	0.9	1.3	1.6	1.8	1.5	1.7	1.9	2.2	1.8	2.1	2.2	1.9	2.3	2.4	1.7	1.4	1.4	1.3	0.8	0.5	0.5	0.7	0.5	0.8	2.4
30-Aug	0.5	0.2	0.3	0.4	0.3	0.8	1.2	1.0	0.8	0.9	1.0	1.4	1.5	1.6	1.9	1.7	1.9	1.4	1.4	1.6	1.3	1.6	1.0	0.8	1.9
31-Aug	0.6	0.5	0.3	0.3	0.3	0.3	0.8	1.0	1.5	1.2	1.6	1.7	1.5	1.5	1.2	0.9	0.6	1.9	1.8	1.1	0.7	0.4	0.8	0.6	1.9
	2.7	2.9	2.7	2.5	3.0	2.9	3.1	2.9	2.9	3.2	3.5	3.2	3.4	3.4	3.5	3.1	3.0	3.0	3.2	2.9	2.6	2.6	2.4	2.3	
	Diurnal Maximum																								
DF - DAS Failure																									



Maximum Value: 1.6 km/h on Aug 28 03:00																						Maximum Daily Average: 0.5 km/h on Aug 28																						Hours in Service: 744	
Minimum Value: -1.1 km/h on Aug 24 13:00																						Minimum Daily Average: -0.4 km/h on Aug 24																						Hours of Data: 734	
Maximum Diurnal Average: 0.2 km/h at hour 4																						Minimum Diurnal Average: -0.1 km/h at hour 17																						Hours of Missing Data: 10	
Monthly Average: 0.04 km/h																						Percentiles: P ₁ = -0.8 P ₁₀ = -0.4 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 0.9																						Hours of Calibration: 0	
																																												Percent Operational Time: 98.7	
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-Aug	0.4	-0.3	-0.1	-0.4	-0.3	-0.4	-0.4	-0.6	-0.1	0.2	0.5	0.1	0.1	-0.1	-0.4	-0.2	-0.1	0.7	0.6	-0.1	-0.2	0.0	0.0	-0.1	-0.1	0.7	0.7																		
2-Aug	0.0	-0.1	-0.1	0.0	-0.3	0.0	-0.1	DF	DF	DF	DF	DF	DF	DF	DF	DF	-0.3	-0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1																	
3-Aug	0.1	-0.1	0.1	0.1	0.0	0.1	0.4	0.1	-0.1	0.1	0.2	0.1	0.2	0.2	0.6	0.1	-0.5	-0.1	0.2	0.2	0.1	0.1	0.1	0.1	-0.2	0.1	0.6																		
4-Aug	-0.3	-0.5	-0.4	-0.2	-0.2	-0.3	0.2	0.0	0.1	-0.1	-0.1	0.0	0.0	0.1	0.4	-0.3	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.1	0.0	-0.3	-0.1	0.4																		
5-Aug	0.1	0.0	0.2	0.1	-0.1	0.0	0.0	-0.1	0.3	0.5	-0.4	-0.2	-0.5	-0.4	-0.2	-0.2	-0.3	-0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5																		
6-Aug	0.0	0.1	0.0	0.1	0.1	0.2	0.3	0.1	0.0	0.1	-0.5	-0.3	-0.1	-0.3	-0.4	-0.7	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	-0.4	-0.1	0.3																		
7-Aug	0.0	-0.1	0.1	0.0	0.0	-0.1	0.0	-0.2	0.1	-0.1	-0.7	-0.4	-0.3	-0.5	-0.6	-0.7	-0.7	-0.5	-0.7	-0.1	-0.1	-0.1	0.0	-0.1	-0.2	-0.2	0.1																		
8-Aug	0.0	0.1	0.0	0.2	0.1	0.0	-0.1	0.4	0.3	0.0	-0.2	0.3	-0.1	-0.3	0.1	0.2	0.3	0.1	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.4																		
9-Aug	0.5	0.3	0.1	0.1	0.0	0.3	0.1	0.5	0.4	0.5	0.5	0.7	0.5	DF	0.5	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.7																		
10-Aug	0.4	0.5	0.4	0.2	0.3	0.3	0.4	0.4	0.1	0.1	0.0	-0.3	-0.2	-0.2	0.0	-0.3	-0.4	-0.4	-0.3	-0.3	-0.2	0.0	-0.2	-0.2	0.0	0.5																			
11-Aug	-0.2	-0.1	-0.1	-0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.1	0.4	0.0	-0.3	0.0	-0.1	0.4	0.8	0.3	0.6	0.3	0.0	0.0	0.8																		
12-Aug	0.5	0.5	0.3	0.3	0.7	0.3	0.1	0.1	0.2	-0.1	-0.3	-0.1	0.1	0.0	0.5	0.3	-0.2	-0.1	0.2	0.2	0.1	0.1	-0.1	0.2	0.2	0.2	0.7																		
13-Aug	0.4	0.6	0.4	0.7	0.0	0.1	0.5	-0.1	0.0	0.0	0.5	0.4	0.0	-0.4	-0.3	0.0	-0.2	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.2	0.2	0.7																		
14-Aug	-0.2	0.5	0.3	0.1	-0.1	-0.5	-0.2	0.1	0.1	-0.2	-0.7	-0.5	0.2	0.0	0.1	-1.0	-0.9	-0.1	-0.6	-0.7	0.1	0.0	0.1	-0.2	0.0	0.1	0.5																		
15-Aug	0.0	0.0	0.2	0.7	0.7	0.7	0.8	0.2	0.1	-0.1	0.1	0.2	0.4	-0.1	0.3	-0.3	0.1	0.1	-0.2	-0.5	-0.7	-0.6	-0.4	-0.2	0.1	0.8																			
16-Aug	-0.1	0.0	0.0	-0.2	-0.2	-0.3	-0.6	-0.2	-0.3	-0.2	-0.6	-0.8	-0.2	-0.2	-0.2	0.0	0.0	0.3	0.7	0.2	0.4	0.6	0.6	0.8	0.0	0.8																			
17-Aug	0.7	0.3	-0.5	0.3	0.3	-0.1	0.1	0.4	0.1	0.1	0.6	0.3	-0.1	-0.5	0.0	0.4	-0.5	0.0	-0.2	-0.1	-0.4	-0.1	-0.1	-0.2	0.0	0.7																			
18-Aug	-0.1	-0.6	0.0	-0.1	0.0	-0.4	-0.6	-0.5	-0.6	-0.7	-0.6	-0.5	-0.5	-0.3	-0.6	-0.4	-0.6	-0.4	-0.4	0.0	-0.4	-0.2	-0.1	-0.5	-0.4	0.0																			
19-Aug	-0.5	-0.5	0.0	0.4	0.5	0.4	0.4	0.3	0.1	-0.1	-0.1	0.0	0.1	-0.1	-0.4	-0.2	0.1	0.2	0.2	0.2	0.4	0.5	0.4	0.4	0.1	0.5																			
20-Aug	0.4	1.2	0.4	0.1	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.0	-0.1	-0.3	-0.2	-0.5	-0.6	-0.3	0.1	0.4	0.1	0.1	0.1	0.2	0.1	1.2																			
21-Aug	0.0	0.2	0.9	0.8	0.6	0.4	0.4	0.1	0.1	0.1	0.2	0.3	0.3	0.0	0.0	-0.3	0.5	0.0	0.1	0.5	0.9	0.7	0.0	0.2	0.3	0.9																			
22-Aug	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.1	0.4	-0.1	0.4	0.0	0.3	0.5	-0.3	0.0	-0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.5																			
23-Aug	-0.3	0.0	-0.1	-0.1	-0.2	0.0	-0.2	-0.3	-0.2	-0.2	-0.3	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	0.0																			
24-Aug	-0.4	-0.4	-0.3	-0.2	-0.3	-0.5	-0.3	-0.6	-0.6	-0.5	-0.7	-0.8	-1.1	-0.8	-1.0	-0.3	-0.5	-0.8	-0.5	-0.1	0.0	0.0	0.0	0.0	-0.4	0.0																			
25-Aug	0.3	0.4	0.3	0.8	0.7	0.4	0.4	0.0	-0.2	0.0	-0.1	0.1	0.5	0.2	0.3	0.5	0.3	0.2	0.0	-0.3	-0.3	-0.2	0.2	0.4	0.2	0.8																			
26-Aug	0.9	-0.8	-0.1	0.0	0.1	0.4	0.4	0.0	-0.2	0.1	0.3	0.4	0.1	0.1	-0.2	-0.3	-0.4	-0.7	-0.5	-0.3	-0.2	-0.2	0.0	0.0	0.0	0.9																			
27-Aug	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.3	0.3	-0.1	0.0	0.3	0.6	0.7	0.6	0.1	0.3	0.4	0.2	0.3	1.2	0.4	0.3	1.2																			
28-Aug	0.2	0.9	1.6	0.9	0.8	0.8	0.4	0.4	0.1	0.0	0.0	0.2	0.1	0.3	0.1	0.3	0.3	0.3	0.7	0.2	0.5	1.1	1.0	0.8	0.5	1.6																			
29-Aug	0.3	0.4	0.6	0.4	0.2	-0.2	0.4	-0.2	-0.3	-0.3	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.0	0.6	0.6	0.4	0.5	0.5	0.3	0.3	0.6																			
30-Aug	0.3	0.2	0.1	0.4	0.4	0.5	0.6	0.4	0.2	0.4	0.1	-0.2	0.3	0.4	0.3	0.0	0.5	0.4	0.2	0.0	0.7	0.3	0.1	0.7	0.3	0.7																			
31-Aug	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.4	0.0	0.1	0.1	-0.2	-0.1	-0.4	-0.4	-0.5	-0.1	-0.2	-0.2	-0.2	0.0	0.4																			
																						Diurnal Average																							
																						Diurnal Maximum																							
DF - DAS Failure																																													



Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

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

Lower Camp Met Tower - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.3 km/h on Aug 9 15:00 Minimum Value: 0.1 km/h on Aug 22 21:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.8 Median = 1.3 Q ₃ = 1.9 P ₉₀ = 2.3 P ₉₉ = 2.9																				Hours in Service: 744 Hours of Data: 734 Hours of Missing Data: 10 Hours of Calibration: 0 Percent Operational Time: 98.7					
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-Aug	1.8	2.7	2.8	2.6	2.5	2.5	2.6	2.6	2.3	2.2	1.7	1.7	2.0	2.6	1.9	1.5	0.6	1.4	1.4	0.9	1.3	0.6	0.3	0.3	2.8
2-Aug	0.5	0.6	0.6	0.4	0.6	0.6	0.5	DF	DF	DF	DF	DF	DF	DF	DF	0.6	0.5	0.2	0.2	0.3	0.3	0.4	0.5	0.6	
3-Aug	0.5	0.4	0.2	0.4	0.4	0.6	1.2	1.4	0.7	0.8	1.5	1.4	2.3	1.7	2.3	2.2	1.7	2.2	1.3	0.7	0.6	0.7	0.7	0.8	2.3
4-Aug	0.9	1.2	1.1	0.8	1.3	1.4	1.8	1.9	2.1	1.6	2.0	2.2	1.4	1.3	2.1	1.8	0.9	0.7	0.8	0.8	0.7	0.6	1.3	1.0	2.2
5-Aug	0.5	0.4	0.3	0.5	0.9	1.5	1.4	1.5	1.3	1.2	1.7	1.6	1.4	1.1	1.0	0.9	0.9	1.0	1.2	0.8	0.5	0.3	0.2	0.2	1.7
6-Aug	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.8	1.0	1.2	2.1	1.8	0.8	1.2	1.6	1.0	0.9	0.9	0.8	0.3	0.2	0.3	0.6	1.2	2.1
7-Aug	1.0	0.4	0.3	0.2	0.2	0.4	0.7	1.1	1.4	1.4	1.7	2.3	2.0	2.1	2.4	2.5	2.2	2.3	2.3	1.7	0.6	0.8	0.8	0.8	2.5
8-Aug	0.5	0.5	0.6	0.4	0.3	0.4	0.4	1.3	1.8	1.8	1.7	2.0	2.0	2.1	2.3	2.2	2.2	2.4	2.8	2.4	2.2	2.2	1.8	1.6	2.8
9-Aug	1.9	1.9	1.6	1.6	1.9	2.4	2.4	2.8	2.5	2.8	2.9	3.1	3.1	DF	3.3	2.6	2.6	2.0	2.2	2.0	2.1	2.0	2.0	2.0	3.3
10-Aug	2.3	2.5	2.2	2.0	2.3	2.3	2.2	2.2	1.8	1.9	1.5	1.6	2.2	2.2	2.1	1.5	1.8	1.8	1.3	1.3	1.2	1.0	1.2	1.0	2.5
11-Aug	1.3	1.0	0.9	1.4	1.2	1.0	1.1	1.5	1.4	1.4	1.2	1.2	1.3	1.0	1.9	2.0	1.8	1.7	1.2	0.8	0.8	1.0	1.1	1.1	2.0
12-Aug	1.1	1.0	1.1	1.0	1.1	1.8	1.6	1.2	1.1	1.3	2.2	2.3	2.3	1.5	1.0	1.6	0.9	0.7	0.3	0.6	0.6	0.9	1.4	1.1	2.3
13-Aug	0.9	0.8	1.0	1.2	1.4	2.0	1.4	1.9	1.7	2.0	2.6	2.9	2.6	2.6	2.8	2.3	2.0	1.4	0.6	0.9	1.0	0.7	1.1	2.9	
14-Aug	1.2	0.9	1.0	0.8	1.4	1.3	0.6	1.3	1.8	2.3	2.9	2.9	3.1	2.8	3.1	2.7	2.8	2.8	1.7	1.5	0.9	1.2	0.5	0.2	3.1
15-Aug	0.4	0.8	0.8	1.1	1.2	1.3	1.8	1.5	2.1	1.5	1.2	1.2	1.3	1.6	1.8	0.8	1.4	0.5	1.8	1.8	2.3	1.9	1.1	0.6	2.3
16-Aug	0.4	0.3	0.4	0.6	0.6	0.3	0.9	1.3	2.0	2.0	2.3	1.9	2.1	2.4	2.5	2.2	2.4	2.3	2.0	1.3	1.3	1.5	1.7	1.7	2.5
17-Aug	1.6	1.9	1.6	1.6	1.5	1.1	1.4	1.5	1.7	1.6	1.4	1.9	2.3	2.1	2.0	1.7	1.6	1.8	0.9	0.5	1.5	0.9	0.4	0.5	2.3
18-Aug	0.9	1.9	1.7	1.6	1.7	1.6	2.4	2.6	2.4	1.8	2.3	2.4	2.0	1.6	1.7	1.2	1.7	1.1	1.5	1.5	1.8	1.5	1.3	1.0	2.6
19-Aug	0.7	1.2	2.0	1.7	2.1	2.3	2.1	1.8	1.8	2.3	2.3	2.0	2.2	2.2	2.3	2.4	2.1	2.3	1.7	1.1	1.3	1.7	1.5	1.6	2.4
20-Aug	1.3	1.7	1.8	1.0	1.4	1.0	1.3	1.6	1.4	2.0	1.7	1.7	1.6	1.4	1.4	1.2	1.8	0.5	0.2	0.3	0.2	0.5	0.4	0.5	2.0
21-Aug	0.9	0.9	0.8	0.9	0.8	0.9	1.3	1.2	1.2	1.6	1.6	1.8	2.2	2.3	2.1	2.2	1.8	1.8	1.5	1.1	1.1	0.8	0.4	0.4	2.3
22-Aug	0.4	0.5	0.3	0.2	0.3	0.4	0.8	1.0	1.4	1.5	1.8	1.9	1.2	1.5	2.0	2.0	1.3	0.8	0.2	0.1	0.1	0.2	0.2	0.2	2.0
23-Aug	0.5	0.3	0.3	0.3	0.3	0.3	0.6	1.0	0.6	0.7	0.5	0.7	0.7	0.3	0.2	0.6	0.5	0.4	0.6	1.4	1.3	1.5	1.6	1.6	1.6
24-Aug	2.0	2.0	1.8	2.3	2.4	2.2	2.6	2.5	2.5	2.8	2.9	2.6	2.3	2.7	2.3	2.1	1.7	1.3	1.0	0.3	0.2	0.3	0.3	0.2	2.9
25-Aug	0.4	0.5	0.3	0.4	0.8	1.1	1.5	1.5	1.7	1.3	1.8	2.4	2.7	2.3	2.5	2.8	2.4	1.9	1.1	1.1	1.9	1.8	1.9	1.2	2.8
26-Aug	1.5	1.5	1.0	1.2	1.4	1.5	1.3	1.5	1.4	2.0	2.6	2.8	2.5	2.0	2.0	2.0	2.2	2.0	2.7	1.8	1.1	0.7	0.6	0.3	2.8
27-Aug	0.2	0.3	0.3	0.2	0.4	0.4	0.2	0.3	0.9	1.3	1.4	1.1	1.7	2.0	2.0	2.3	1.9	1.7	1.3	1.2	1.3	1.4	0.7	0.7	2.3
28-Aug	0.5	0.9	0.7	0.7	0.9	0.7	0.9	1.0	1.0	1.0	1.0	1.4	1.3	1.0	0.5	0.7	1.1	0.9	0.9	0.8	0.7	0.5	0.8	1.1	1.4
29-Aug	0.8	1.1	1.3	1.4	1.4	1.7	1.5	1.7	1.4	1.7	1.8	1.2	1.8	1.6	2.1	1.9	1.8	1.3	1.3	0.8	0.6	0.6	0.4	1.1	2.1
30-Aug	0.9	0.4	0.4	0.7	0.6	0.8	1.0	0.8	0.8	1.0	0.8	1.5	1.5	1.7	1.6	1.9	1.8	1.4	1.6	1.8	1.2	1.4	0.9	1.1	1.9
31-Aug	0.8	0.4	0.5	0.4	0.5	0.5	1.0	1.2	1.8	1.3	1.0	1.5	1.4	1.6	1.0	0.8	0.6	1.6	1.5	0.9	0.6	0.4	0.6	0.5	1.8
2.3 2.7 2.8 2.6 2.5 2.5 2.6 2.8 2.5 2.8 2.9 3.1 3.1 2.8 3.3 2.8 2.8 2.8 2.8 2.4 2.3 2.2 2.0 2.0																									
Diurnal Maximum																									
DF - DAS Failure																									



Maximum Value: 2.1 km/h on Aug 9 12:00		Maximum Daily Average: 0.4 km/h on Aug 9		Hours in Service: 744																						
Minimum Value: -1.5 km/h on Aug 14 17:00		Minimum Daily Average: -0.3 km/h on Aug 14		Hours of Data: 733																						
Maximum Diurnal Average: 0.2 km/h at hour 7		Minimum Diurnal Average: -0.2 km/h at hour 17		Hours of Missing Data: 11																						
Monthly Average: 0.03 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.5 Q ₁ = -0.2 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.3		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-Aug	-0.1	-0.2	-0.2	-0.3	-0.5	-0.6	-0.5	-0.6	-0.3	0.2	0.2	0.0	-0.2	-0.1	-0.4	-0.4	-0.3	1.1	1.1	-0.2	0.1	0.0	0.0	0.1	-0.1	1.1
2-Aug	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	0.1	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.0	-0.2	0.1	0.3	0.4	0.1	0.2	0.3	--	0.4
3-Aug	0.4	0.1	0.1	0.1	0.1	0.3	1.5	0.5	0.2	0.1	0.1	-0.2	0.3	0.3	1.4	0.4	0.1	0.0	0.1	0.0	-0.4	-0.4	-0.3	-0.3	0.2	1.5
4-Aug	-0.2	-0.6	-0.7	-0.2	-0.3	-0.2	0.9	0.5	0.3	-0.3	-0.2	0.2	0.2	-0.1	0.0	0.4	0.1	-0.2	0.1	-0.2	-0.2	-0.2	-0.6	-0.5	-0.1	0.9
5-Aug	-0.2	0.1	-0.1	-0.2	-0.4	-0.5	-0.4	-0.3	0.3	0.4	-0.3	-0.2	-0.7	-0.4	-0.6	-0.2	-0.3	0.2	0.4	0.5	0.4	0.1	0.1	0.1	-0.1	0.5
6-Aug	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.1	0.3	0.2	0.0	0.2	0.1	-0.1	-0.2	-0.5	0.0	-0.3	-0.2	0.0	0.0	-0.1	0.4	0.4	0.0	0.4
7-Aug	0.2	0.0	0.2	0.5	0.4	0.2	0.1	-0.1	0.2	0.3	-0.5	-0.4	0.3	-0.1	0.2	-0.2	-0.2	0.1	0.0	0.5	0.4	0.0	-0.1	0.0	0.1	0.5
8-Aug	0.0	0.2	0.2	0.3	0.2	0.1	-0.1	0.6	0.6	0.1	-0.5	0.7	0.1	0.0	0.4	0.3	0.4	0.8	0.2	0.4	0.4	-0.2	0.3	0.0	0.2	0.8
9-Aug	1.1	0.4	-0.1	-0.2	-0.4	-0.1	-0.1	0.8	0.3	0.2	0.3	2.1	0.4	DF	0.2	0.4	0.5	0.7	1.2	0.8	0.4	0.5	0.5	0.3	0.4	2.1
10-Aug	0.5	1.1	0.6	0.4	0.2	0.3	0.4	0.4	-0.3	UO	0.3	0.1	0.2	0.3	0.4	0.2	0.2	0.0	0.1	0.1	0.5	0.7	0.3	0.1	0.3	1.1
11-Aug	0.4	0.3	0.1	0.4	0.4	0.5	0.0	0.3	0.3	-0.2	-0.3	-0.3	-0.1	0.2	0.6	0.0	-0.4	-0.3	-0.2	0.3	0.9	0.3	0.2	0.3	0.2	0.9
12-Aug	0.5	0.0	0.6	0.3	1.0	0.1	0.6	0.5	0.5	0.1	-0.5	0.0	-0.1	-0.1	0.3	0.2	-0.2	0.0	0.2	0.1	0.0	0.1	-0.4	0.2	0.2	1.0
13-Aug	-0.2	-0.3	-0.5	0.4	-0.7	0.4	-0.3	-0.5	-0.5	0.2	0.7	-0.3	-0.4	-0.8	-0.8	-0.5	-0.9	-0.6	-0.3	-0.4	-0.2	-0.2	0.0	0.3	-0.3	0.7
14-Aug	-0.2	0.0	0.1	-0.1	-0.2	0.0	0.0	0.3	-0.1	0.0	-1.0	-0.1	-0.6	-0.6	-0.7	-0.1	-1.5	-0.8	-0.4	-0.7	-1.1	-0.1	0.1	0.0	-0.3	0.3
15-Aug	-0.2	-0.5	-0.3	-0.2	-0.2	0.5	0.9	0.0	0.5	-0.5	0.5	-0.4	0.3	0.1	0.1	-0.2	0.2	0.1	0.3	0.0	-0.6	-0.4	-0.2	0.0	0.0	0.9
16-Aug	-0.1	0.0	-0.1	-0.3	-0.1	-0.2	-0.9	-0.2	-0.3	-0.1	-0.8	-1.1	-0.3	0.0	-0.7	0.0	-0.6	0.1	0.3	0.0	0.2	0.3	1.3	1.3	-0.1	1.3
17-Aug	1.4	1.1	-0.6	0.2	0.5	-0.3	0.1	0.6	0.5	0.3	0.5	0.3	-0.4	-0.4	-0.3	0.3	-0.5	-0.1	0.2	0.1	-0.1	-0.1	-0.1	-0.3	0.1	1.4
18-Aug	-0.3	-0.1	0.3	0.5	0.4	0.0	0.3	0.3	0.0	-0.2	0.3	0.0	-0.4	-0.1	-0.4	-0.6	-0.5	-0.2	-0.1	0.7	-0.2	0.0	0.2	-0.3	0.0	0.7
19-Aug	-0.5	-0.4	0.6	1.4	2.0	1.8	1.2	0.5	0.2	0.0	-0.1	-0.2	-0.2	-0.3	-1.0	-0.9	-0.5	-0.5	-0.2	-0.2	0.0	0.5	0.5	0.5	0.2	2.0
20-Aug	-0.1	0.4	-0.1	0.4	-0.4	-0.2	0.1	0.2	0.1	-0.1	-0.1	-0.6	-1.0	-0.6	-0.5	-0.7	-0.6	-0.2	0.1	0.3	0.1	0.0	0.0	-0.1	-0.1	0.4
21-Aug	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.2	0.0	-0.1	-0.2	-0.3	0.1	0.4	-0.1	0.1	-1.1	0.3	-0.3	-0.3	0.1	-0.1	0.0	0.3	0.3	-0.1	0.4
22-Aug	0.2	-0.1	0.2	0.1	0.1	0.1	0.3	-0.2	0.2	0.4	-0.7	0.7	0.0	0.4	0.6	-0.8	-0.2	0.0	-0.1	0.2	0.1	0.1	0.3	0.2	0.1	0.7
23-Aug	0.0	0.0	0.1	-0.1	-0.1	0.0	-0.2	-0.1	0.0	-0.1	-0.1	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.6	0.4	0.5	0.7	0.4	0.1	0.7
24-Aug	0.1	0.2	0.3	0.0	0.5	0.1	0.5	0.2	0.1	0.8	0.1	-0.2	-0.2	-0.3	-0.8	-0.3	0.1	-0.5	-0.4	-0.1	0.1	0.2	0.0	-0.1	0.0	0.8
25-Aug	-0.1	-0.1	0.0	0.0	0.3	0.1	0.6	-0.2	0.0	-0.2	-0.3	-0.3	0.2	0.6	-0.1	0.6	-0.1	-0.2	-0.3	-0.7	-1.0	-0.7	0.1	0.4	0.0	0.6
26-Aug	0.8	-0.8	-0.4	-0.5	-0.7	-0.5	-0.3	-0.5	-0.4	0.3	0.6	0.2	-0.5	-0.6	-0.3	-0.5	-0.9	-0.4	0.5	0.1	0.2	-0.1	0.1	0.1	-0.2	0.8
27-Aug	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	0.1	0.0	0.1	-0.1	0.0	0.9	0.9	0.9	0.5	-0.1	-0.1	0.1	0.1	-0.2	0.0	-0.1	0.1	0.9
28-Aug	0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.3	-0.2	-0.2	0.0	-0.3	0.3	-0.5	0.2	-0.2	0.1	-0.1	0.6	0.6	-0.5	-0.1	0.3	0.2	0.1	0.0	0.6
29-Aug	0.2	0.3	0.6	0.4	-0.2	-0.4	0.3	0.0	-1.1	-0.6	0.5	0.3	0.0	-0.2	0.4	0.0	-0.1	-0.3	0.4	0.3	0.0	0.0	-0.1	0.1	0.0	0.6
30-Aug	0.0	0.3	0.1	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.3	-0.3	0.3	0.6	0.1	-0.5	0.5	0.0	-0.5	-0.3	0.5	0.4	0.3	0.9	0.2	0.9
31-Aug	0.1	0.2	0.3	0.2	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	0.0	0.2	0.2	-0.3	-0.5	-0.2	-0.1	-0.2	-0.4	-0.1	-0.1	-0.2	-0.1	-0.1	0.3
																								Diurnal Average		
																								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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 3.6 km/h on Aug 13 12:00																				Hours of Data: 733					
Minimum Value: 0.1 km/h on Aug 22 21:00																				Hours of Missing Data: 11					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.3 Q ₃ = 1.9 P ₉₀ = 2.4 P ₉₉ = 3.2																				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-Aug	1.6	2.1	2.4	2.7	2.0	2.1	2.4	2.6	1.9	2.2	1.6	1.7	2.2	2.8	1.9	1.6	0.9	1.2	1.4	0.9	1.2	0.8	0.3	0.3	2.8
2-Aug	0.4	0.8	0.9	0.5	0.8	0.7	0.5	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.8	0.6	0.2	0.4	0.7	0.6	0.7	0.8	0.9
3-Aug	0.7	0.6	0.6	0.6	0.5	1.1	1.7	1.4	0.9	0.8	1.4	1.4	2.8	1.7	2.0	2.2	1.4	1.4	1.3	0.7	0.8	1.0	0.8	1.1	2.8
4-Aug	0.8	1.2	1.2	0.9	1.8	2.1	1.4	1.4	1.9	1.9	2.4	2.7	1.8	1.4	2.0	2.2	1.1	0.9	1.1	1.0	1.0	0.8	1.5	1.2	2.7
5-Aug	0.6	0.5	0.3	0.5	0.8	1.1	1.3	1.7	1.3	1.4	1.8	1.8	1.5	0.9	0.7	0.7	0.9	1.0	1.2	0.8	0.7	0.5	0.2	0.2	1.8
6-Aug	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.5	1.3	0.8	1.9	2.4	1.0	1.1	1.4	1.1	0.5	0.7	0.6	0.2	0.2	0.6	0.9	1.4	2.4
7-Aug	1.5	0.9	0.5	0.4	0.3	0.3	0.5	0.9	1.2	1.7	1.5	2.6	2.4	2.3	2.4	2.7	2.6	2.4	2.4	1.5	0.6	1.3	1.4	1.2	2.7
8-Aug	0.9	0.6	0.6	0.5	0.4	0.8	0.8	1.7	1.7	1.7	1.7	2.0	2.2	2.4	2.8	2.4	2.2	2.6	2.3	2.3	2.3	1.7	1.7	1.6	2.8
9-Aug	1.4	1.4	1.4	1.6	1.6	1.9	2.0	2.1	1.9	2.3	2.4	3.6	2.7	DF	2.8	2.9	3.0	2.9	2.1	2.0	2.0	1.9	1.9	2.0	3.6
10-Aug	2.4	2.5	2.1	1.8	1.7	1.7	1.8	1.8	2.7	UO	1.7	1.7	2.5	2.4	2.4	1.5	2.1	1.9	1.3	1.3	0.8	0.7	1.0	1.2	2.7
11-Aug	1.1	1.3	1.1	1.4	1.5	1.2	1.0	1.5	1.4	1.3	1.3	1.1	1.3	1.2	2.1	2.1	2.0	1.7	1.3	0.9	0.5	1.6	2.2	1.7	2.2
12-Aug	1.4	1.1	1.0	1.2	1.2	1.6	1.6	1.4	1.1	1.3	2.4	2.7	2.7	1.8	1.2	1.7	0.8	0.7	0.4	0.5	0.5	0.8	1.4	1.2	2.7
13-Aug	1.0	0.9	0.6	0.8	1.4	1.5	1.3	1.8	1.2	2.3	3.3	3.6	2.9	2.5	2.6	2.6	2.1	1.8	1.0	0.5	0.5	0.7	0.7	1.1	3.6
14-Aug	1.5	1.2	1.2	1.2	1.8	1.1	0.6	0.9	1.6	2.2	2.7	3.0	3.1	2.4	2.2	2.6	2.6	2.8	1.6	1.8	0.6	1.4	0.6	0.3	3.1
15-Aug	0.6	1.0	1.1	1.0	0.9	1.0	1.1	1.0	1.5	1.7	1.8	1.3	1.4	1.5	1.7	1.2	1.6	0.9	1.7	1.7	1.6	1.4	0.8	0.4	1.8
16-Aug	0.3	0.4	0.5	0.6	0.4	0.4	1.0	1.3	2.0	2.4	2.7	2.4	2.5	3.2	2.7	2.8	3.0	2.8	2.1	1.2	0.4	0.5	1.0	1.8	3.2
17-Aug	1.8	2.0	2.1	1.9	1.1	0.9	1.4	1.3	1.8	1.9	1.4	2.1	2.6	2.4	2.1	1.8	2.1	2.5	0.9	0.7	1.5	1.2	0.5	0.7	2.6
18-Aug	1.0	1.8	1.6	1.8	1.3	1.1	2.0	2.5	2.2	1.8	2.2	2.6	2.2	1.5	1.8	0.9	1.6	0.8	1.2	1.6	1.4	1.5	1.5	0.8	2.6
19-Aug	0.7	0.9	1.4	1.6	2.0	2.2	2.1	1.8	1.7	2.3	2.0	2.3	2.4	2.6	2.7	2.5	2.0	2.0	1.6	0.6	0.8	1.1	2.0	2.0	2.7
20-Aug	1.5	1.9	1.7	1.3	1.8	0.9	1.5	1.8	1.5	2.3	2.0	1.5	1.4	1.6	1.7	1.4	1.5	0.6	0.4	0.3	0.4	1.0	0.7	0.6	2.3
21-Aug	1.1	1.1	0.6	0.9	0.8	0.8	1.0	1.0	1.0	0.7	1.0	1.4	2.4	2.7	2.6	2.5	2.5	2.2	1.7	0.8	1.3	1.1	0.6	0.6	2.7
22-Aug	0.6	0.7	0.6	0.3	0.4	0.5	0.8	0.9	0.9	1.2	1.8	2.2	1.4	1.7	2.2	2.4	1.5	1.0	0.2	0.2	0.1	0.2	0.2	0.3	2.4
23-Aug	0.5	0.2	0.3	0.3	0.2	0.2	0.4	0.4	0.6	0.3	0.2	0.5	0.4	0.3	0.2	0.4	0.3	0.2	0.7	1.4	1.1	1.2	1.4	1.4	1.4
24-Aug	1.4	1.9	2.0	2.3	2.2	2.5	2.6	2.2	2.1	2.6	2.3	2.0	2.3	2.8	2.3	2.4	2.0	1.2	0.5	0.3	0.4	0.6	0.5	0.2	2.8
25-Aug	0.4	0.4	0.2	0.3	0.7	1.2	1.3	1.3	1.4	1.0	1.4	2.4	3.4	3.0	3.2	3.4	2.8	2.2	1.2	0.6	1.3	1.3	1.3	1.4	3.4
26-Aug	1.4	1.8	1.5	1.5	1.4	1.6	1.4	1.4	1.4	1.3	2.6	3.4	3.1	1.8	2.0	2.1	2.1	2.1	2.8	1.7	0.9	0.6	0.8	0.3	3.4
27-Aug	0.2	0.3	0.4	0.4	0.5	0.4	0.3	0.2	0.6	0.7	1.4	1.0	2.0	2.3	2.5	2.9	2.6	1.9	0.8	0.9	1.7	1.8	0.8	0.6	2.9
28-Aug	0.9	1.0	0.7	0.7	0.9	0.4	0.7	0.8	0.8	0.7	0.8	1.0	0.8	0.6	0.5	0.8	1.4	1.5	1.4	1.0	1.1	0.6	0.5	0.6	1.5
29-Aug	0.5	0.7	0.7	0.8	1.0	1.1	0.9	1.0	0.9	1.1	1.0	1.0	1.4	1.5	2.8	2.3	2.4	0.9	1.1	1.3	1.2	1.1	0.7	0.9	2.8
30-Aug	0.9	0.6	0.7	0.8	0.7	0.5	0.6	0.7	0.7	1.0	0.9	1.5	1.5	1.9	1.7	2.4	1.9	1.7	1.7	1.7	1.3	1.5	1.3	1.6	2.4
31-Aug	1.0	0.5	0.6	0.5	1.0	0.7	1.1	1.4	2.1	1.2	0.6	0.9	1.8	1.9	0.7	0.9	0.8	1.3	1.4	1.2	0.7	0.4	0.7	0.5	2.1
2.4 2.5 2.4 2.7 2.2 2.5 2.6 2.6 2.7 2.6 3.3 3.6 3.4 3.2 3.2 3.4 3.0 2.9 2.8 2.3 2.3 1.9 2.2 2.0																									
Diurnal Maximum																									
DF - DAS Failure UO - Unstable Operation																									



Maximum Value: 5.1 km/h on Aug 19 05:00																				Maximum Daily Average: 1.5 km/h on Aug 19					Hours in Service: 744	
Minimum Value: -1.7 km/h on Aug 21 16:00																				Minimum Daily Average: 0.0 km/h on Aug 20					Hours of Data: 734	
Maximum Diurnal Average: 0.6 km/h at hour 24																				Minimum Diurnal Average: 0.2 km/h at hour 16					Hours of Missing Data: 10	
Monthly Average: 0.35 km/h																				Percentiles: P ₁ = -1.1 P ₁₀ = -0.3 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.6 P ₉₀ = 1.1 P ₉₉ = 2.5					Hours of Calibration: 0	
																									Percent Operational Time: 98.7	
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-Aug	1.2	1.8	1.6	1.4	1.0	1.0	0.6	0.7	1.1	1.5	1.3	1.1	0.6	1.3	0.1	0.2	0.2	1.6	2.2	0.5	0.9	0.2	0.1	0.3	0.9	2.2
2-Aug	0.3	0.2	0.2	0.1	0.2	0.1	0.3	DF	DF	DF	DF	DF	DF	DF	DF	DF	0.2	-0.1	0.1	0.1	0.3	0.2	0.2	0.2	--	0.3
3-Aug	0.1	0.2	0.1	0.0	0.1	0.6	2.9	0.9	0.1	0.2	-0.1	-0.4	0.8	0.5	2.1	0.8	0.4	-0.3	0.0	0.1	-0.2	0.1	0.1	0.1	0.4	2.9
4-Aug	0.5	0.1	-0.1	0.3	0.8	1.1	2.1	2.0	1.6	0.3	0.3	1.0	0.1	1.2	0.3	0.3	0.3	0.3	0.9	0.3	-0.1	0.4	0.3	0.1	0.6	2.1
5-Aug	0.1	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.4	0.0	0.1	-0.5	-0.8	-0.5	-1.1	-0.2	-0.2	0.4	0.6	0.5	0.5	-0.4	-0.2	0.1	0.0	0.6
6-Aug	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.0	0.1	0.5	0.2	0.2	0.0	0.3	-0.1	0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.6	0.2	0.6
7-Aug	-0.3	0.2	0.4	0.2	0.7	0.3	-0.1	-0.1	0.2	0.5	-0.1	-0.1	0.9	0.1	0.5	-0.4	0.2	0.0	-0.3	0.9	1.2	0.7	-0.5	-0.1	0.2	1.2
8-Aug	0.0	0.1	0.4	0.0	0.1	0.2	0.0	1.0	0.3	-0.3	-1.0	0.6	-0.3	-0.3	0.2	-0.1	0.1	0.3	-0.3	-0.1	0.2	-0.3	0.2	-0.1	0.0	1.0
9-Aug	1.3	0.4	-0.6	-0.7	-1.0	-0.5	-0.2	0.9	-0.1	-0.2	-0.2	3.0	0.3	DF	0.0	-0.2	0.0	0.1	0.2	0.8	0.2	0.3	0.2	0.2	0.2	3.0
10-Aug	0.6	1.0	0.6	0.7	-0.3	-0.3	-0.2	0.1	0.5	0.0	0.2	0.0	-0.1	0.0	0.3	0.3	0.4	-0.1	0.0	-0.2	0.1	0.1	-0.1	0.3	0.2	1.0
11-Aug	0.9	0.7	0.6	0.8	0.8	0.9	0.2	0.5	0.5	-0.4	0.0	0.1	0.3	0.6	1.2	0.3	-0.2	0.0	0.0	0.3	1.1	0.4	0.0	0.4	0.4	1.2
12-Aug	0.8	0.6	1.3	1.5	2.3	1.8	2.2	1.4	1.3	0.5	0.2	0.2	0.1	0.3	0.9	1.0	0.0	0.0	0.4	0.5	0.4	0.4	0.4	0.9	0.8	2.3
13-Aug	0.4	-0.1	-0.2	-0.1	-1.1	0.1	-0.2	-0.6	-0.6	0.6	1.3	0.0	0.6	0.3	0.3	0.8	0.4	0.5	0.7	0.8	1.2	1.3	1.8	2.0	0.4	2.0
14-Aug	0.2	0.1	1.0	0.6	1.0	0.3	0.6	0.8	0.8	1.1	0.0	1.5	1.0	1.4	1.5	1.7	-0.2	0.5	0.8	0.5	0.0	1.0	0.3	0.1	0.7	1.7
15-Aug	0.2	0.2	0.0	0.2	0.0	0.4	0.2	-0.1	1.1	-0.9	1.1	-0.8	0.5	0.2	0.0	-0.7	-0.3	0.2	0.4	0.5	0.3	0.3	0.5	0.8	0.2	1.1
16-Aug	0.3	0.4	0.3	0.2	0.4	0.2	-0.5	0.1	0.4	0.3	-0.1	-1.0	0.6	0.8	-0.1	0.5	-0.3	1.0	0.8	0.7	1.2	1.5	2.6	3.9	0.6	3.9
17-Aug	2.1	1.4	-1.0	-0.3	0.7	-0.4	-0.1	0.8	1.1	0.6	0.4	0.5	0.4	0.6	0.6	0.7	-0.1	0.5	0.1	0.1	0.8	0.0	0.4	0.6	0.4	2.1
18-Aug	0.6	0.2	0.6	0.4	0.6	0.2	0.7	0.6	0.1	0.3	0.5	0.6	0.0	0.0	-0.1	0.0	0.3	0.6	0.7	1.0	0.8	0.5	0.7	0.4	0.4	1.0
19-Aug	0.3	0.4	2.2	2.9	5.1	4.2	2.9	1.7	1.4	1.4	1.3	0.8	0.7	0.6	0.0	0.2	0.5	0.8	0.9	0.5	0.6	1.4	2.4	1.9	1.5	5.1
20-Aug	0.7	0.5	0.0	0.4	0.2	0.4	0.8	0.1	0.4	0.0	0.0	-0.6	-1.4	-1.1	-1.2	-0.8	0.3	0.2	0.3	0.0	0.1	0.2	-0.3	0.0	0.0	0.8
21-Aug	0.7	0.5	0.3	0.5	-0.1	0.0	0.4	0.3	0.0	-0.4	0.0	-0.2	-0.1	-0.4	-0.1	-1.7	0.5	-0.3	-0.5	0.2	0.1	-0.4	0.0	0.4	0.0	0.7
22-Aug	0.7	0.6	-0.1	0.2	0.2	0.3	-0.3	-0.4	-0.1	0.5	-1.2	1.4	0.0	0.4	0.5	-1.1	0.3	0.3	0.1	0.2	0.0	0.1	0.4	0.2	0.1	1.4
23-Aug	0.3	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.2	0.6	1.1	1.0	0.9	1.2	0.8	0.4	1.2
24-Aug	0.6	0.7	0.4	0.2	0.5	0.1	0.6	0.4	0.6	1.2	0.4	0.4	0.3	0.4	-0.1	0.4	0.5	-0.1	0.3	0.5	0.7	0.7	0.4	0.2	0.4	1.2
25-Aug	0.1	0.1	0.3	0.2	0.3	-0.2	0.4	0.2	-0.2	-0.3	-0.4	0.1	1.0	1.3	0.4	1.0	0.4	0.1	0.0	-0.6	-0.6	0.0	1.3	2.1	0.3	2.1
26-Aug	2.1	-0.9	-0.8	-0.9	-0.8	-0.6	-0.2	-0.8	-0.5	0.2	1.0	1.3	0.2	0.3	0.8	0.7	0.6	0.7	0.8	0.6	0.4	0.1	0.3	0.3	0.2	2.1
27-Aug	0.2	0.3	0.5	0.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.1	1.9	1.5	1.5	1.1	0.8	0.7	0.9	0.9	0.3	0.5	0.2	0.5	1.9
28-Aug	0.3	0.2	0.1	0.3	0.3	0.1	0.2	0.2	-0.2	0.1	0.1	0.6	0.0	0.3	-0.3	0.1	0.0	1.4	1.0	-0.7	-0.5	0.0	0.1	0.1	0.2	1.4
29-Aug	0.1	0.2	0.1	-0.1	-0.4	-0.9	0.0	0.0	-0.5	-0.3	0.9	0.5	-0.1	0.0	1.0	0.2	0.0	0.0	1.0	0.2	-0.8	-0.7	-0.2	-0.3	0.0	1.0
30-Aug	0.0	0.3	0.2	0.5	0.4	0.5	0.6	0.2	0.1	0.2	0.0	-0.1	0.2	0.7	0.3	-0.7	1.0	0.2	-0.4	0.3	0.4	0.5	0.5	1.1	0.3	1.1
31-Aug	0.2	0.1	0.2	0.2	0.1	0.7	0.5	0.2	0.0	-0.4	-0.2	-0.2	0.3	0.3	-0.3	-0.5	0.2	0.4	0.1	0.1	0.3	0.3	0.5	0.5	0.2	0.7
																								Diurnal Average		
																								Diurnal Maximum		
DF - DAS Failure																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 4.3 km/h on Aug 9 12:00																				Hours of Data: 734					
Minimum Value: 0.1 km/h on Aug 25 01:00																				Hours of Missing Data: 10					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.8 Median = 1.3 Q ₃ = 2.0 P ₉₀ = 2.7 P ₉₉ = 3.6																				Hours of Calibration: 0					
																				Percent Operational Time: 98.7					
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-Aug	1.7	2.0	1.7	2.3	1.8	1.9	2.0	2.6	1.7	1.8	1.6	1.7	2.2	3.1	2.1	2.1	1.3	1.4	1.3	1.1	1.5	1.0	0.4	0.3	3.1
2-Aug	0.5	0.8	0.9	0.6	1.1	0.9	0.7	DF	DF	DF	DF	DF	DF	DF	DF	DF	1.1	0.6	0.3	0.4	0.5	0.4	0.7	1.2	1.2
3-Aug	0.8	0.7	0.8	0.7	0.5	1.1	1.7	1.7	1.4	1.0	1.5	1.5	3.5	2.2	2.5	2.7	1.4	3.6	2.4	0.5	1.1	1.2	1.0	1.2	3.6
4-Aug	0.9	1.1	1.3	0.8	2.0	2.3	1.2	1.5	2.2	2.3	2.6	3.0	2.6	1.8	1.8	2.7	1.3	1.0	0.8	1.0	1.1	1.0	1.2	1.4	3.0
5-Aug	0.8	0.7	0.6	0.5	0.7	0.8	0.9	1.5	1.4	1.8	2.2	2.3	1.6	1.2	1.0	0.8	1.3	1.1	1.1	0.8	0.7	0.5	0.3	0.2	2.3
6-Aug	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5	1.5	0.6	1.6	2.6	1.2	0.8	1.4	1.1	0.4	0.5	0.4	0.2	0.2	0.8	0.9	1.6	2.6
7-Aug	2.3	1.4	0.8	0.4	0.4	0.3	0.4	0.6	1.2	1.7	1.4	2.6	3.4	2.5	2.8	2.9	3.2	2.9	2.2	1.3	0.5	0.9	1.5	1.3	3.4
8-Aug	1.3	0.6	1.0	0.6	0.6	1.1	1.4	1.9	1.9	1.7	1.9	2.3	2.2	2.8	3.2	2.9	2.6	2.7	2.0	1.8	2.2	1.6	2.0	1.8	3.2
9-Aug	1.6	1.8	1.5	1.7	1.7	1.9	1.8	2.2	2.0	2.5	2.7	4.3	2.7	DF	3.1	2.5	2.5	2.4	2.5	2.4	1.9	1.8	2.1	2.1	4.3
10-Aug	2.4	2.6	2.3	2.3	1.8	1.6	1.5	1.7	1.7	1.6	1.5	1.5	2.0	2.1	2.4	1.5	2.1	2.0	1.4	1.4	0.7	0.7	0.8	1.0	2.6
11-Aug	1.2	1.5	1.2	1.6	1.5	1.3	1.2	1.3	1.6	1.5	1.7	1.1	1.3	1.3	2.3	2.1	2.0	1.7	1.4	1.0	0.3	1.6	2.3	2.0	2.3
12-Aug	1.4	0.9	0.9	1.2	1.2	1.1	1.5	1.2	1.1	1.3	2.9	2.9	3.0	2.4	1.4	1.6	0.8	0.7	0.5	0.6	0.5	0.7	1.2	1.2	3.0
13-Aug	0.9	0.7	0.8	0.7	1.1	1.5	1.2	1.5	1.4	3.6	3.7	3.7	3.0	2.2	2.4	2.1	1.9	1.5	1.0	0.8	0.7	0.9	0.9	1.8	3.7
14-Aug	1.7	1.1	1.0	1.5	2.1	1.3	0.8	0.9	1.8	2.1	2.7	3.1	2.9	1.7	1.5	2.4	2.3	2.7	1.6	1.6	0.6	1.5	0.8	0.6	3.1
15-Aug	0.8	0.8	0.9	0.8	0.8	1.1	0.9	1.0	1.4	2.4	2.7	1.0	1.3	1.6	1.7	1.5	1.7	1.3	2.1	1.6	1.6	1.6	0.8	0.5	2.7
16-Aug	0.3	0.3	0.6	0.4	0.4	0.3	1.1	1.6	2.0	2.4	2.9	3.3	2.7	3.4	2.9	3.0	3.3	3.3	1.8	0.8	0.4	0.4	0.7	0.8	3.4
17-Aug	1.9	2.3	2.1	1.8	0.9	0.9	1.1	1.0	2.0	2.0	1.5	2.2	2.7	2.6	2.2	2.1	2.8	3.0	1.0	0.6	1.6	1.3	0.8	0.7	3.0
18-Aug	1.0	1.8	1.8	1.8	1.1	1.1	1.9	2.5	2.5	1.9	2.3	2.9	2.0	1.6	2.0	0.9	1.8	0.9	1.1	1.5	1.3	1.8	1.9	0.7	2.9
19-Aug	0.7	0.8	1.0	1.5	1.9	2.1	1.8	1.6	1.8	2.0	2.1	2.3	2.5	2.9	2.9	2.5	2.0	1.8	1.2	0.5	0.5	0.8	1.2	1.6	2.9
20-Aug	1.7	2.2	2.0	1.7	1.7	0.8	1.4	1.8	1.6	2.4	2.2	1.9	1.8	2.0	1.8	1.8	1.4	0.9	0.5	0.4	0.5	1.4	0.7	0.7	2.4
21-Aug	0.9	1.0	0.7	1.0	1.1	1.0	1.1	1.1	1.1	0.9	1.1	1.7	2.8	3.3	3.3	3.2	3.3	2.6	1.7	0.5	0.7	0.8	0.8	0.7	3.3
22-Aug	0.7	0.8	1.4	0.5	0.4	0.5	0.9	0.9	1.0	1.5	1.9	2.7	1.8	2.0	2.8	3.0	1.9	1.2	0.3	0.2	0.1	0.2	0.3	0.3	3.0
23-Aug	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.2	0.3	0.3	0.3	0.3	0.9	1.6	1.5	1.7	1.7	1.7	1.7
24-Aug	2.0	2.2	2.3	2.7	2.7	2.7	3.0	2.6	2.3	3.0	2.6	2.6	2.8	2.9	2.6	2.8	2.4	1.2	0.5	0.3	0.5	0.9	0.9	0.2	3.0
25-Aug	0.1	0.3	0.2	0.3	0.8	1.1	0.9	1.1	1.4	1.2	1.6	2.8	4.1	3.8	4.0	3.7	3.3	2.4	0.9	0.4	0.4	0.7	1.0	1.0	4.1
26-Aug	1.4	1.8	1.1	1.1	1.0	1.0	0.8	1.3	1.6	1.9	3.3	3.9	3.4	1.5	1.6	2.0	2.2	2.1	2.7	2.0	1.2	0.8	0.9	0.4	3.9
27-Aug	0.3	0.4	0.5	0.5	0.5	0.3	0.3	0.2	0.4	0.5	1.8	1.2	2.2	2.9	3.2	3.6	3.1	2.1	0.6	0.8	1.7	1.7	1.0	1.2	3.6
28-Aug	1.1	1.3	0.8	0.6	0.6	0.5	0.6	0.8	0.5	0.7	0.8	1.1	1.1	0.9	1.0	0.9	1.4	1.3	1.5	0.7	0.7	0.6	0.7	0.9	1.5
29-Aug	0.8	0.7	0.7	0.9	1.1	1.2	1.0	0.5	1.0	1.0	0.9	1.1	1.5	2.0	3.6	3.0	2.5	0.8	0.6	0.9	0.6	0.8	0.7	1.2	3.6
30-Aug	0.9	0.7	0.6	0.8	0.7	0.5	0.7	0.9	0.6	0.7	1.0	1.5	1.9	2.3	2.0	2.5	2.1	2.1	1.4	1.6	1.7	1.4	1.6	1.6	2.5
31-Aug	1.3	0.6	0.6	0.7	0.9	0.7	0.9	1.3	1.9	1.3	0.7	1.4	2.0	2.2	1.0	1.1	1.1	1.3	1.7	1.6	1.0	0.5	0.6	0.6	2.2
2.4 2.6 2.3 2.7 2.7 2.7 3.0 2.6 2.5 3.6 3.7 4.3 4.1 3.8 4.0 3.7 3.3 3.6 2.7 2.4 2.2 1.8 2.3 2.1																									
Diurnal Maximum																									
DF - DAS Failure																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS04 BUFFALO VIEWPOINT AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BUFFALO VIEWPOINT (AMS04)
AUGUST 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	12.3	0	2.7	0
H2S (ppb) Average	709	35	35	100	2.8	0	1.3	0
THC (ppm) Average	710	34	34	100	4.7	-	3.2	-
NMHC(ppm) Average	710	34	34	100	1.173	-	0.575	-
CH4(ppm) Average	710	34	34	100	3.6	-	2.7	-
O3(ppb) Average	710	34	34	100	55.9	0	33.3	-
NO2(ppb) Average	707	37	37	100	26.5	0	14.1	-
NO(ppb) Average	707	37	37	100	90.8	-	18.9	-
NOX(ppb) Average	707	37	37	100	114.2	-	33	-
PM2.5(ug/m3) Average	741	2	3	99.87	477.4	158	189.3	17
Temperature (C) Average	744	0	0	100	30.2	-	22.4	-
Relative Humidity (%) Average	744	0	0	100	97.2	-	92.7	-
Wind Speed 10 m (km/h) Average	744	0	0	100	20	-	12	-
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 - BUFFALO VIEWPOINT (AMS04)
AUGUST 2023

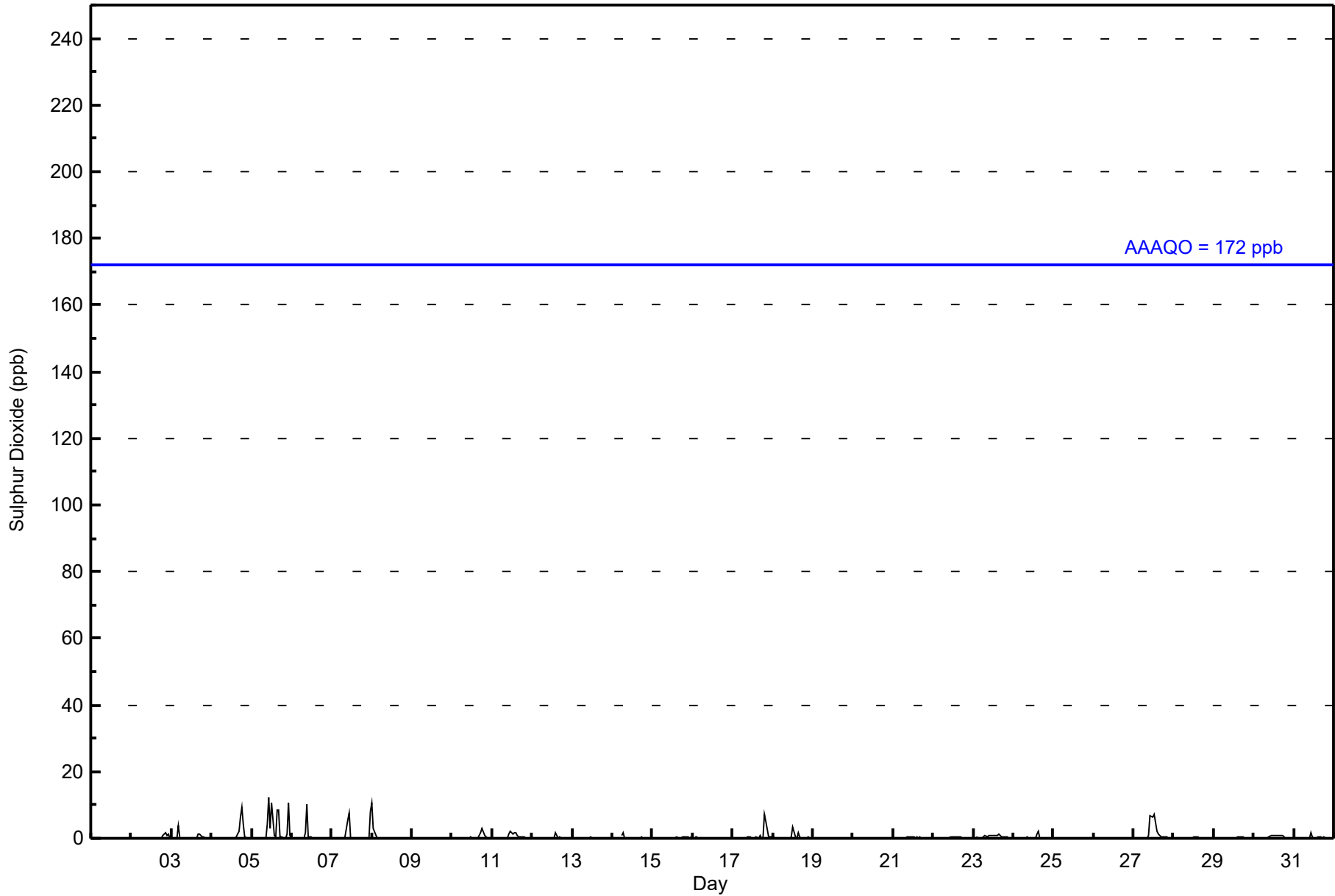
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	710	0.4	1.4	-	0	0	0	0	0.2	0.7	12.3
H2S (ppb) Average	709	0.3	0.4	-	0	0.1	0.1	0.2	0.3	0.6	2.8
THC (ppm) Average	710	2.26	0.3	-	2	2	2.1	2.2	2.3	2.6	4.7
NMHC(ppm) Average	710	0.106	0.159	-	0	0	0	0.1	0.1	0.2	1.173
CH4(ppm) Average	710	2.15	0.2	-	1.9	2	2	2.1	2.2	2.4	3.6
O3(ppb) Average	710	22.4	10.3	-	2.5	10.1	14.9	21.3	29	35.3	55.9
NO2(ppb) Average	707	2.93	4.3	-	0	0.2	0.5	1.3	3.4	7.9	26.5
NO(ppb) Average	707	1.09	6.5	-	0	0	0	0	0.1	0.8	90.8
NOX(ppb) Average	707	4.02	9.7	-	0	0.2	0.5	1.4	3.6	8.2	114.2
PM2.5(ug/m3) Average	741	51.37	66.5	-	2.7	6.2	11	24.3	73.1	124	477.4
Temperature 2 m (C) Average	744	17.19	4.5	-	6.5	12.4	13.8	16.4	20.3	23.5	30.2
Relative Humidity (%) Average	744	73.39	16.4	-	34.3	47.8	60.6	76.1	86.8	93.6	97.2
Wind Speed 10 m (km/h) Average	744	7.4	3	-	1	4	5	7	9	12	20
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
PM2.5	31 Aug 2023 15:00	31 Aug 2023 15:00	1	DAS Failure - data not recorded





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	707	99.58	99.58
11 - 20	3	0.42	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 - August 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	71	39	13	5	14	20	59	111	69	56	36	50	62	44	37	21	707
11 - 20	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
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	72	39	13	5	14	20	59	111	69	56	36	50	62	45	38	21	710

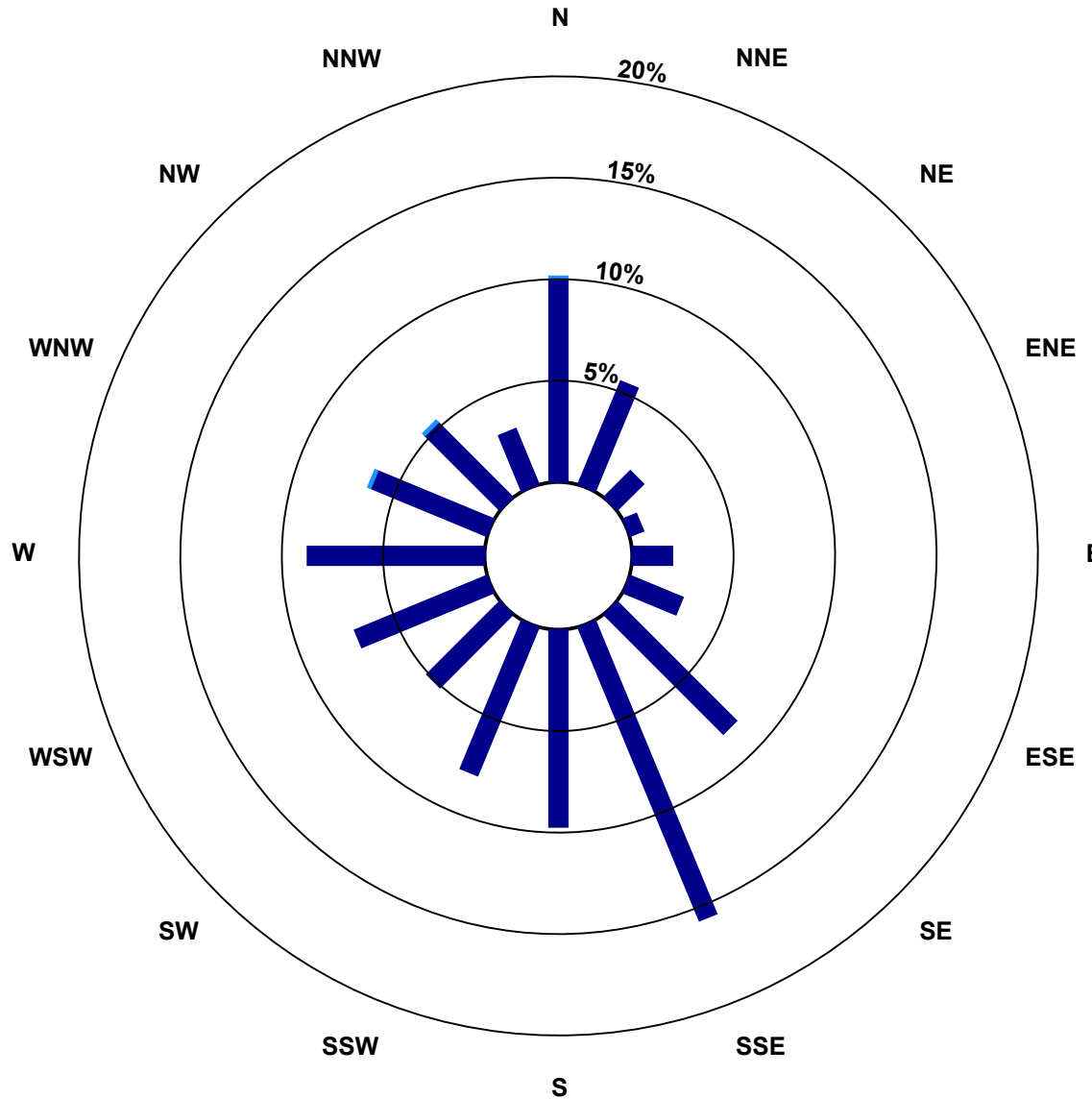
Total Number of Valid Hours: 710

Total Number of Hours: 744

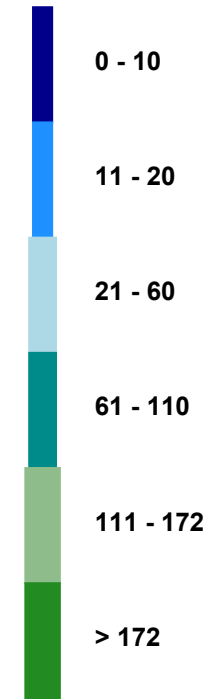


Wood Buffalo Environmental Association
Wind Rose Aug 2023

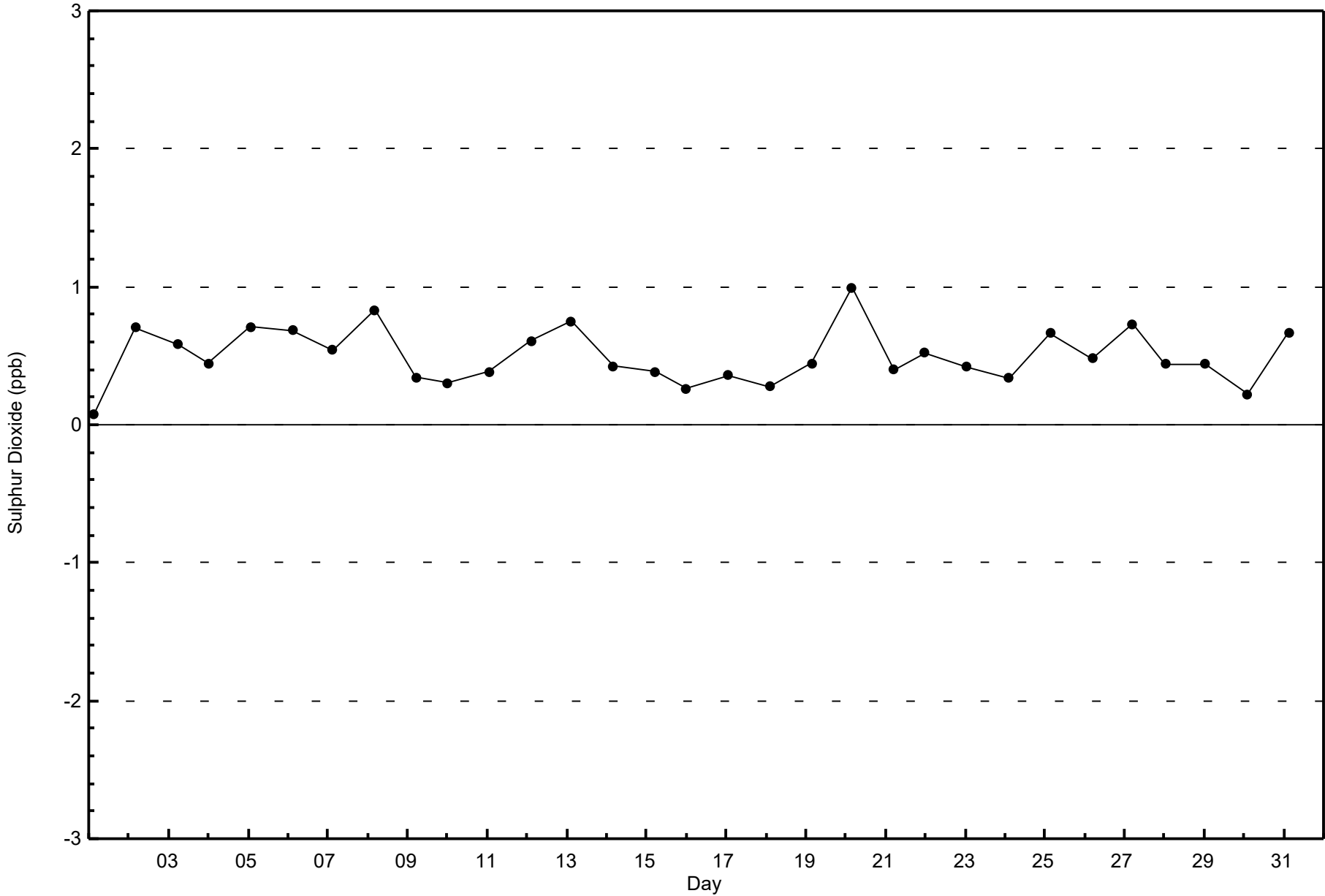
Sulphur Dioxide (SO₂) - ppb
Buffalo Viewpoint

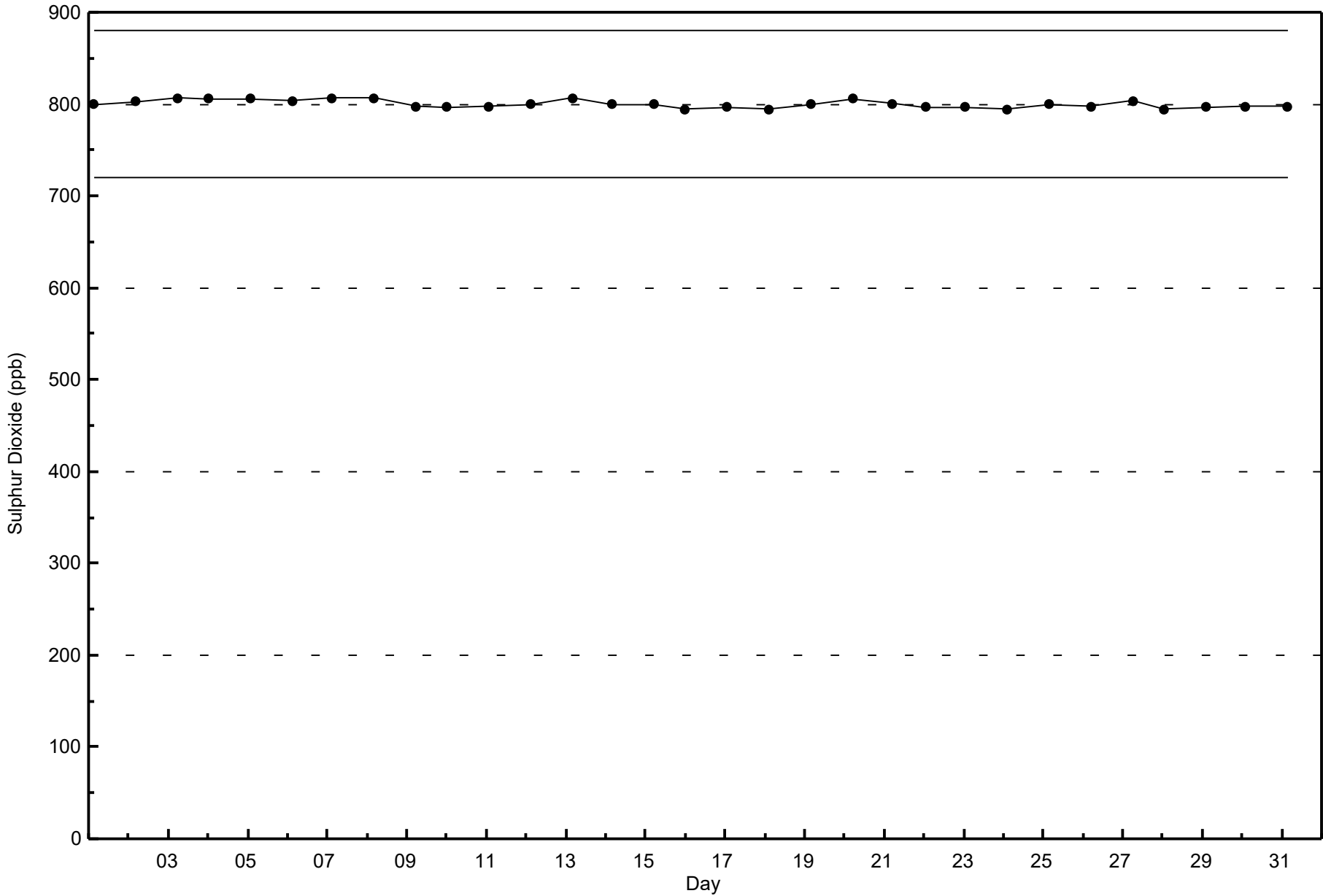


Classes (ppb)



Total Number of Valid Hours: 710







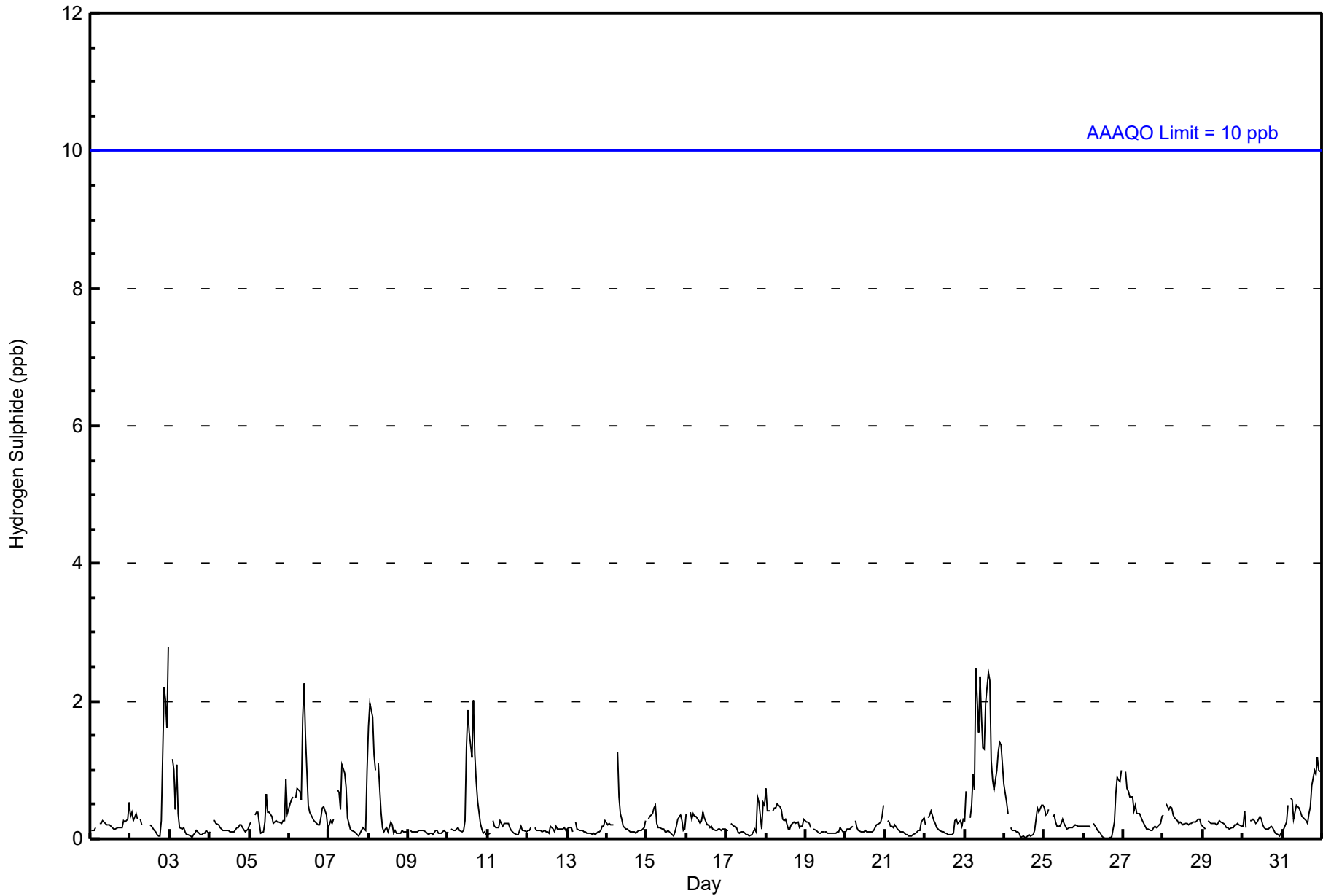
Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 2.8 ppb on Aug 3 00:00		Maximum Daily Average: 1.3 ppb on Aug 23		Hours of Data: 709														709								
Minimum Value: 0.0 ppb on Aug 26 14:00		Minimum Daily Average: 0.1 ppb on Aug 9		Hours of Missing Data: 35														35								
Maximum Diurnal Average: 0.4 ppb at hour 24		Minimum Diurnal Average: 0.2 ppb at hour 18		Hours of Calibration: 35														35								
Monthly Average: 0.30 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.6 P ₉₉ = 2.0		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-Aug	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.5	0.2	0.5
2-Aug	0.3	0.4	0.3	0.4	0.3	Z	0.3	0.2	C	C	C	C	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.3	2.2	2.0	1.6	2.8	0.6	2.8
3-Aug	Z	1.2	1.0	0.4	1.1	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.2
4-Aug	0.1	Z	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3
5-Aug	0.2	0.2	Z	0.3	0.4	0.4	0.2	0.1	0.1	0.2	0.7	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.9	0.4	0.3	0.9
6-Aug	0.5	0.6	0.6	Z	0.6	0.7	0.7	0.6	1.7	2.3	1.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.1	0.6	2.3
7-Aug	0.2	0.3	0.2	0.3	Z	0.7	0.7	0.4	1.1	1.0	0.8	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	1.0	0.4	1.1
8-Aug	1.6	2.0	1.8	1.2	1.0	Z	1.1	0.4	0.2	0.1	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	0.1	0.5	2.0
9-Aug	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	0.1
10-Aug	0.1	Z	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.3	1.3	1.9	1.5	1.2	2.0	1.2	0.8	0.5	0.2	0.1	0.1	0.1	0.1	0.5	2.0
11-Aug	0.1	0.1	Z	0.3	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	0.1	0.2	0.1	0.1	0.1	0.2	0.3
12-Aug	0.1	0.1	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2
13-Aug	0.1	0.2	0.2	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	0.2	0.2	0.3	0.1	0.3
14-Aug	0.2	0.2	0.2	0.2	0.2	Z	1.3	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	0.2	0.3	0.2	1.3
15-Aug	Z	0.3	0.3	0.4	0.4	0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.1	0.1	0.2	0.5
16-Aug	0.4	Z	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.4
17-Aug	0.1	0.1	Z	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	0.1	0.1	0.1	0.6	0.5	0.1	0.5	0.5	0.2	0.6
18-Aug	0.7	0.4	0.4	Z	0.4	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.7
19-Aug	0.2	0.3	0.2	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	0.2	0.1	0.1	0.1	0.3
20-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.5
21-Aug	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1	0.3
22-Aug	0.2	Z	0.3	0.3	0.4	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	0.3	0.2	0.3	0.2	0.3	0.2	0.4
23-Aug	0.3	0.7	Z	0.3	0.5	0.9	0.7	2.5	1.6	2.4	1.8	1.3	1.3	2.0	2.4	2.3	1.1	0.9	0.7	1.0	1.3	1.4	1.4	1.1	1.3	2.5
24-Aug	0.8	0.5	0.4	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.5	0.4	0.5	0.5	0.5	0.2	0.8
25-Aug	0.5	0.3	0.4	0.4	Z	0.3	0.4	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	0.5
26-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.9	0.9	0.8	1.0	0.3	1.0
27-Aug	Z	1.0	0.7	0.7	0.6	0.6	0.4	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	1.0
28-Aug	0.4	Z	0.5	0.4	0.5	0.5	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	0.3	0.2	0.3	0.5
29-Aug	0.2	0.1	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	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
30-Aug	0.2	0.4	0.2	Z	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.4
31-Aug	0.1	0.1	0.2	0.5	Z	0.6	0.6	0.3	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.4	0.5	0.8	1.0	0.9	1.2	1.0	1.0	0.5	1.2
																								Diurnal Average		
																								Diurnal Maximum		
																								0.3 0.4 0.4 0.3 0.4 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 0.2 0.3 0.3 0.3 0.3 0.4		
																								1.6 2.0 1.8 1.2 1.1 0.9 1.3 2.5 1.7 2.4 1.8 1.3 1.9 2.0 2.4 2.3 1.2 0.9 0.8 1.0 2.2 2.0 1.6 2.8		
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
Buffalo Viewpoint - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	708	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: 709

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint - August 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	73	39	14	5	14	20	60	113	66	58	34	49	61	43	38	21	708
3 - 4	0	0	0	0	0	0	1	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	73	39	14	5	14	20	61	113	66	58	34	49	61	43	38	21	709

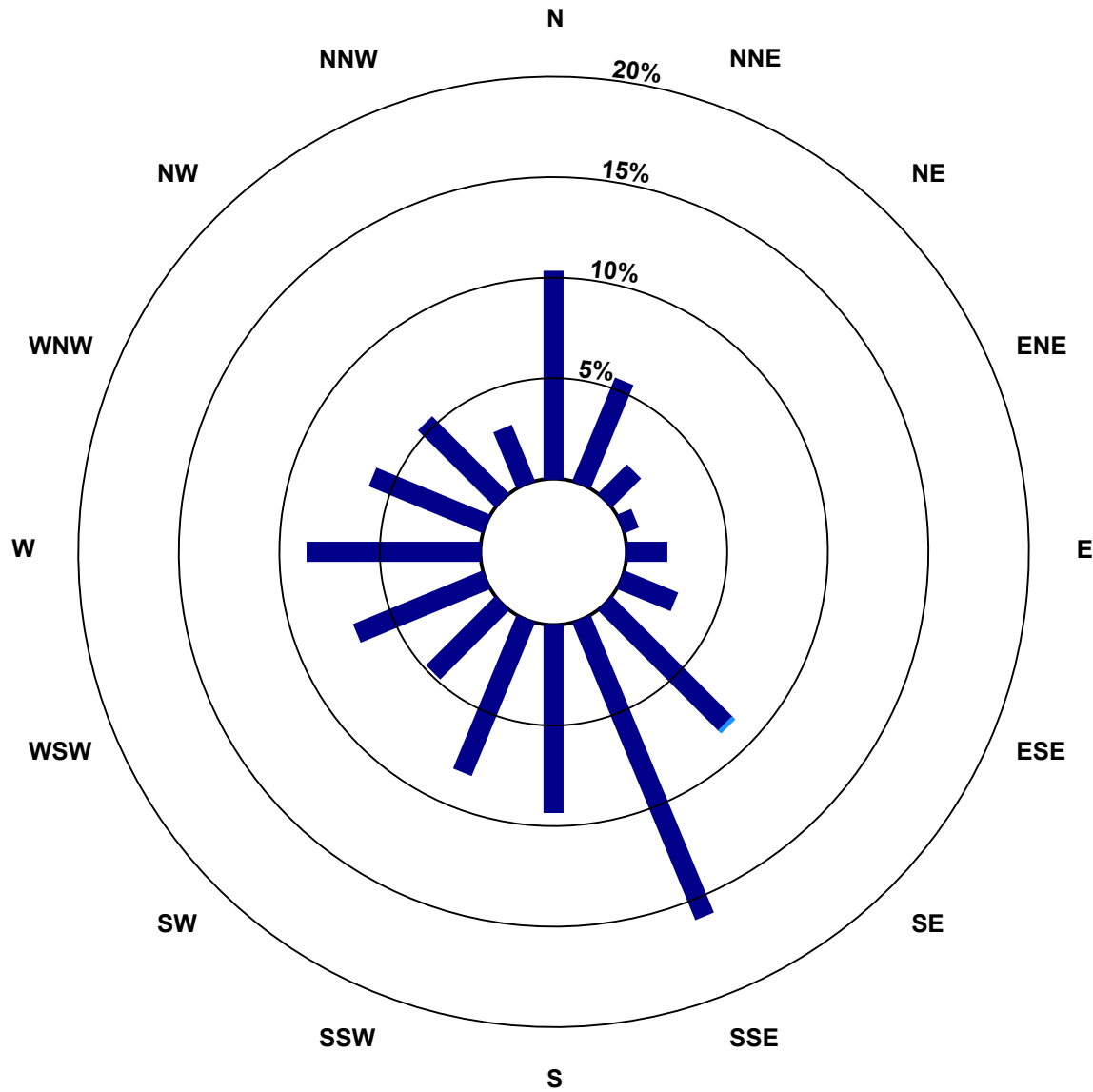
Total Number of Valid Hours: 709

Total Number of Hours: 744

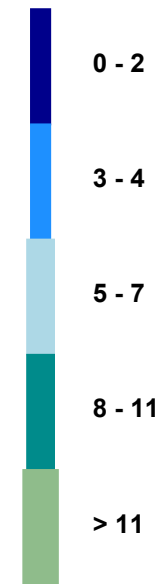


Wood Buffalo Environmental Association
Wind Rose Aug 2023

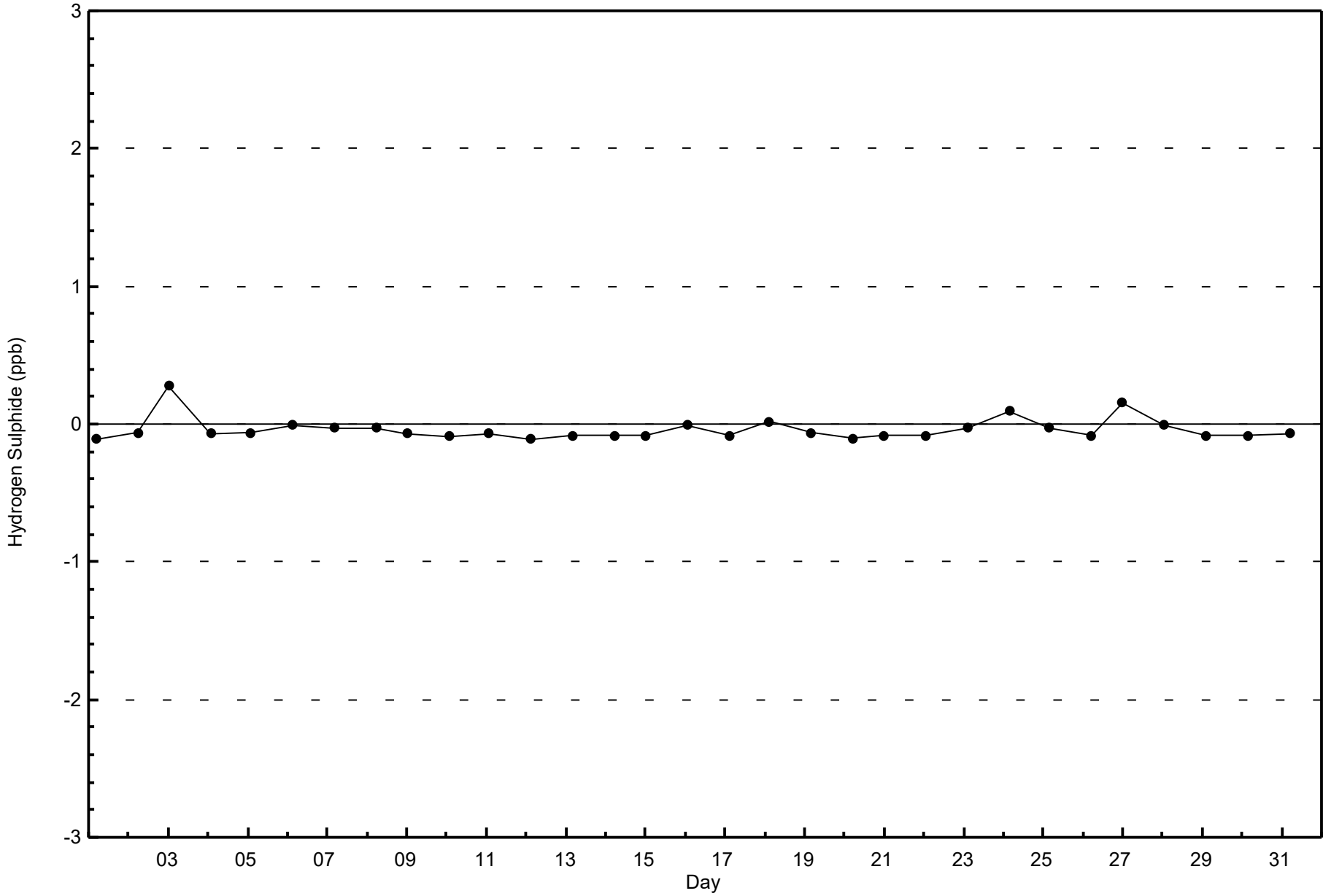
Hydrogen Sulphide (H₂S) - ppb
Buffalo Viewpoint

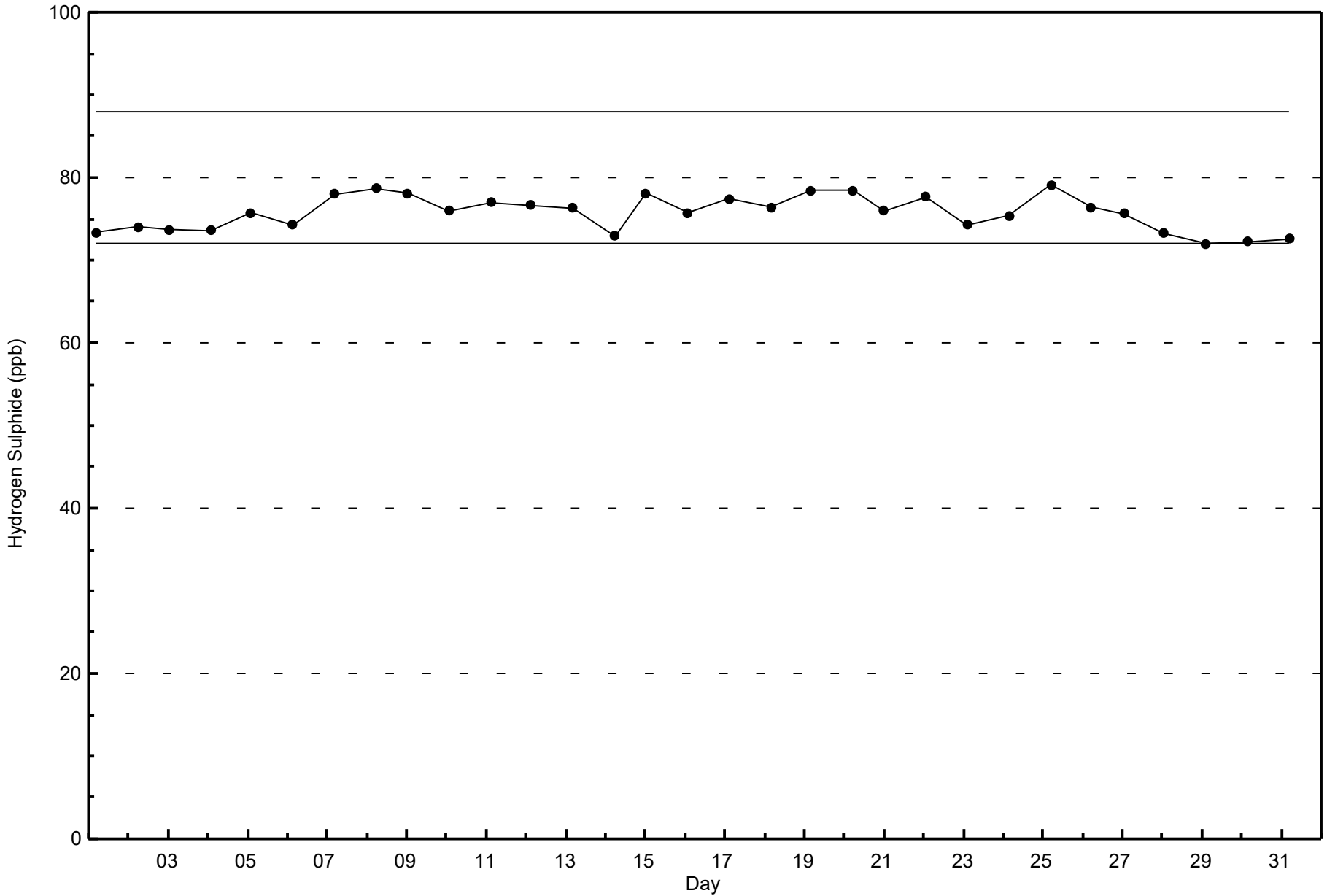


Classes (ppb)



Total Number of Valid Hours: 709







Wood Buffalo Environmental Association
Summary of Hour Averages

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

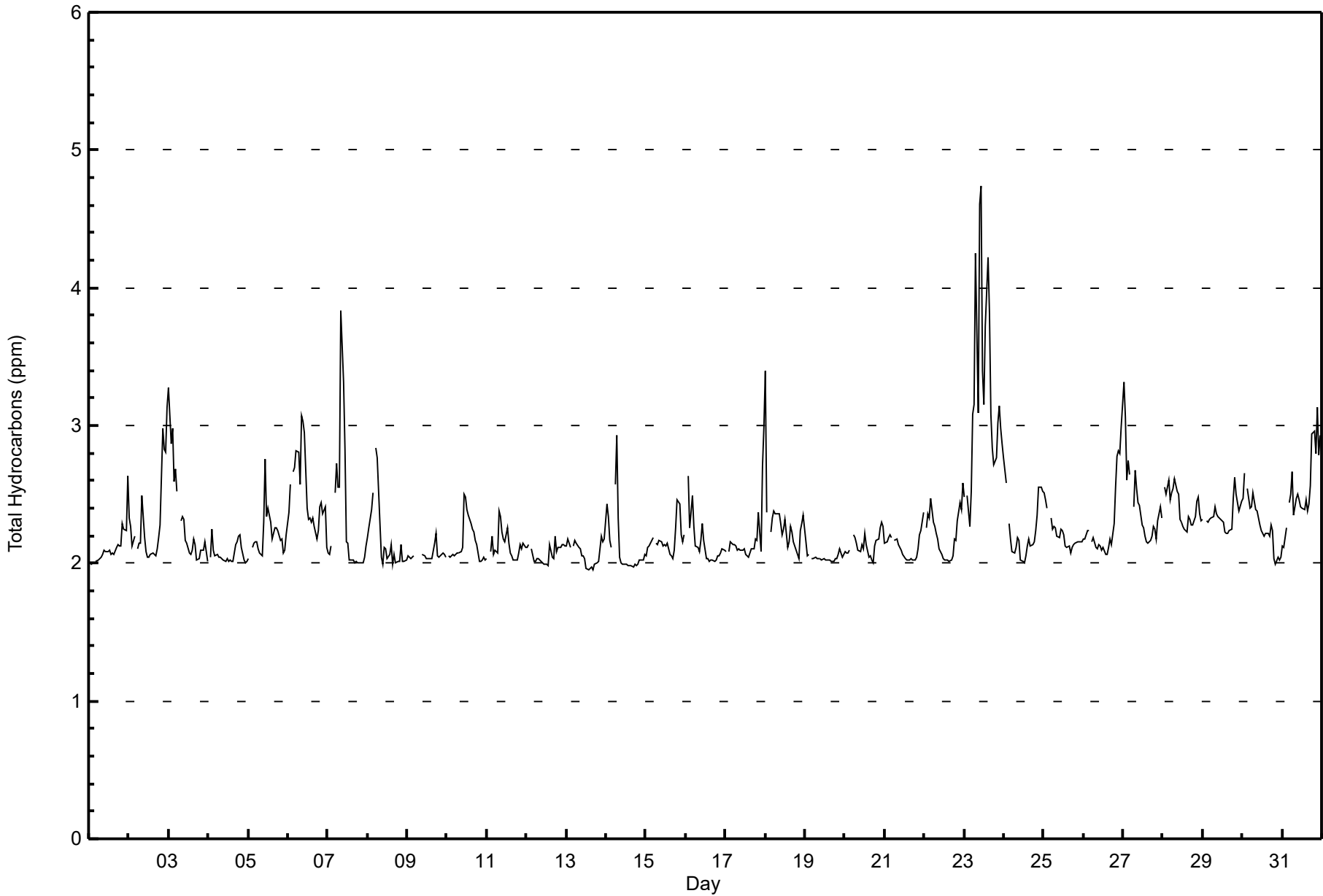
Maximum Value: 4.7 ppm on Aug 23 11:00		Maximum Daily Average: 3.2 ppm on Aug 23		Hours in Service: 744																							
Minimum Value: 2.0 ppm on Aug 13 17:00		Minimum Daily Average: 2.0 ppm on Aug 19		Hours of Data: 710																							
Maximum Diurnal Average: 2.3 ppm at hour 1		Minimum Diurnal Average: 2.2 ppm at hour 17		Hours of Missing Data: 34																							
Monthly Average: 2.26 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.2 Q ₃ = 2.3 P ₉₀ = 2.6 P ₉₉ = 3.4		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-Aug	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	2.3	2.2	2.2	2.6	2.1	2.6	
2-Aug	2.3	2.3	2.1	2.2	Z	2.1	2.1	2.1	2.5	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.3	3.0	2.8	2.8	3.1	2.3	3.1	
3-Aug	3.3	2.9	3.0	2.6	2.7	2.5	Z	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.0	2.3	3.3	2.3	
4-Aug	Z	2.0	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	2.1	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.1	2.2	
5-Aug	2.0	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.3	2.8	2.3	2.4	2.3	2.2	2.2	2.3	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.8	
6-Aug	2.4	2.6	Z	2.7	2.7	2.8	2.8	2.6	3.1	3.0	2.9	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.4	2.4	2.4	2.4	2.1	2.5	3.1	
7-Aug	2.1	2.1	2.1	Z	2.5	2.7	2.6	2.6	3.8	3.3	2.8	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	3.8	
8-Aug	2.2	2.3	2.4	2.5	Z	2.8	2.8	2.3	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.2	2.8	
9-Aug	2.1	2.0	2.0	2.0	2.1	Z	C	C	C	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.2	
10-Aug	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.5	
11-Aug	2.0	Z	2.1	2.2	2.1	2.1	2.1	2.4	2.3	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.4	
12-Aug	2.1	2.1	Z	2.1	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	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	
13-Aug	2.1	2.2	2.1	Z	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	2.1	2.2	2.2	2.2	2.1	2.2	
14-Aug	2.4	2.3	2.2	2.1	Z	2.6	2.9	2.3	2.0	2.0	2.0	2.0	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	2.9	
15-Aug	2.0	2.1	2.1	2.2	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.3	2.5	2.4	2.2	2.2	2.2	2.5	
16-Aug	Z	2.6	2.3	2.4	2.5	2.3	2.1	2.1	2.1	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.6	
17-Aug	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.4	2.1	2.7	3.0	3.0		
18-Aug	3.4	2.4	Z	2.2	2.3	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.3	2.1	2.2	2.3	2.2	2.2	2.1	2.1	2.0	2.2	2.3	2.3	2.3	3.4	
19-Aug	2.2	2.1	2.1	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	2.1	2.1	2.0	2.1	2.0	2.2	
20-Aug	2.1	2.1	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.2	2.2	2.3	2.3	2.3	2.3	
21-Aug	2.1	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4	2.1	2.4	
22-Aug	Z	2.3	2.4	2.3	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.3	2.4	2.4	2.6	2.2	2.6	
23-Aug	2.5	Z	2.5	2.3	2.5	3.1	3.2	4.2	3.1	4.6	4.7	3.4	3.2	3.7	4.2	3.8	3.1	2.8	2.7	2.8	3.0	3.1	3.0	2.9	3.2	4.7	
24-Aug	2.8	2.6	Z	2.3	2.2	2.1	2.1	2.1	2.2	2.2	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.6	2.5	2.5	2.2	2.8	
25-Aug	2.5	2.5	2.4	Z	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.5	
26-Aug	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.3	2.6	2.8	2.8	2.8	3.0	2.3	3.0	
27-Aug	3.3	3.1	2.6	2.7	2.6	Z	2.4	2.7	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.2	2.2	2.3	2.3	2.2	2.3	2.4	2.3	2.4	3.3	
28-Aug	Z	2.6	2.5	2.6	2.5	2.5	2.5	2.6	2.5	2.5	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.5	2.4	2.3	2.4	2.6
29-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.6	2.5	2.4	2.4	2.5	2.3	2.6
30-Aug	2.5	2.7	Z	2.5	2.4	2.4	2.5	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.0	2.0	2.0	2.0	2.3	2.7	
31-Aug	2.1	2.1	2.3	Z	2.4	2.5	2.7	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.5	2.4	2.4	2.6	2.9	3.0	2.8	3.1	2.8	2.9	2.5	3.1	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			

Z - zerospan C - Calibration



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	158	22.25	22.25
2.1 - 3.0	530	74.65	96.90
3.1 - 10.0	22	3.10	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 - August 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	8	4	1	0	5	13	14	8	5	11	27	35	14	2	2	158
2.1 - 3.0	60	30	8	4	14	15	45	96	60	51	25	21	25	28	31	17	530
3.1 - 10.0	3	1	1	0	0	0	1	1	1	0	0	2	2	3	5	2	22
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	39	13	5	14	20	59	111	69	56	36	50	62	45	38	21	710

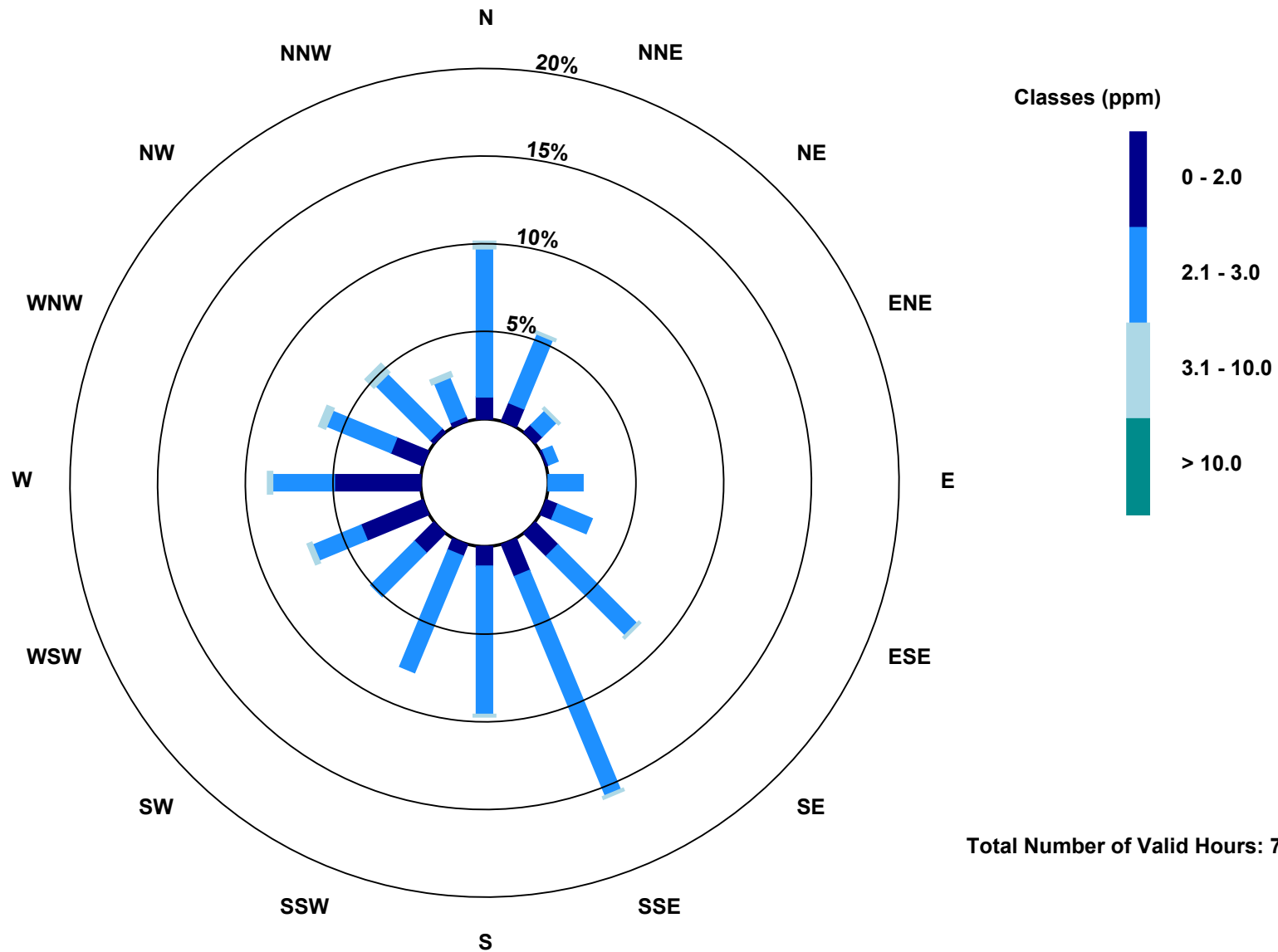
Total Number of Valid Hours: 710

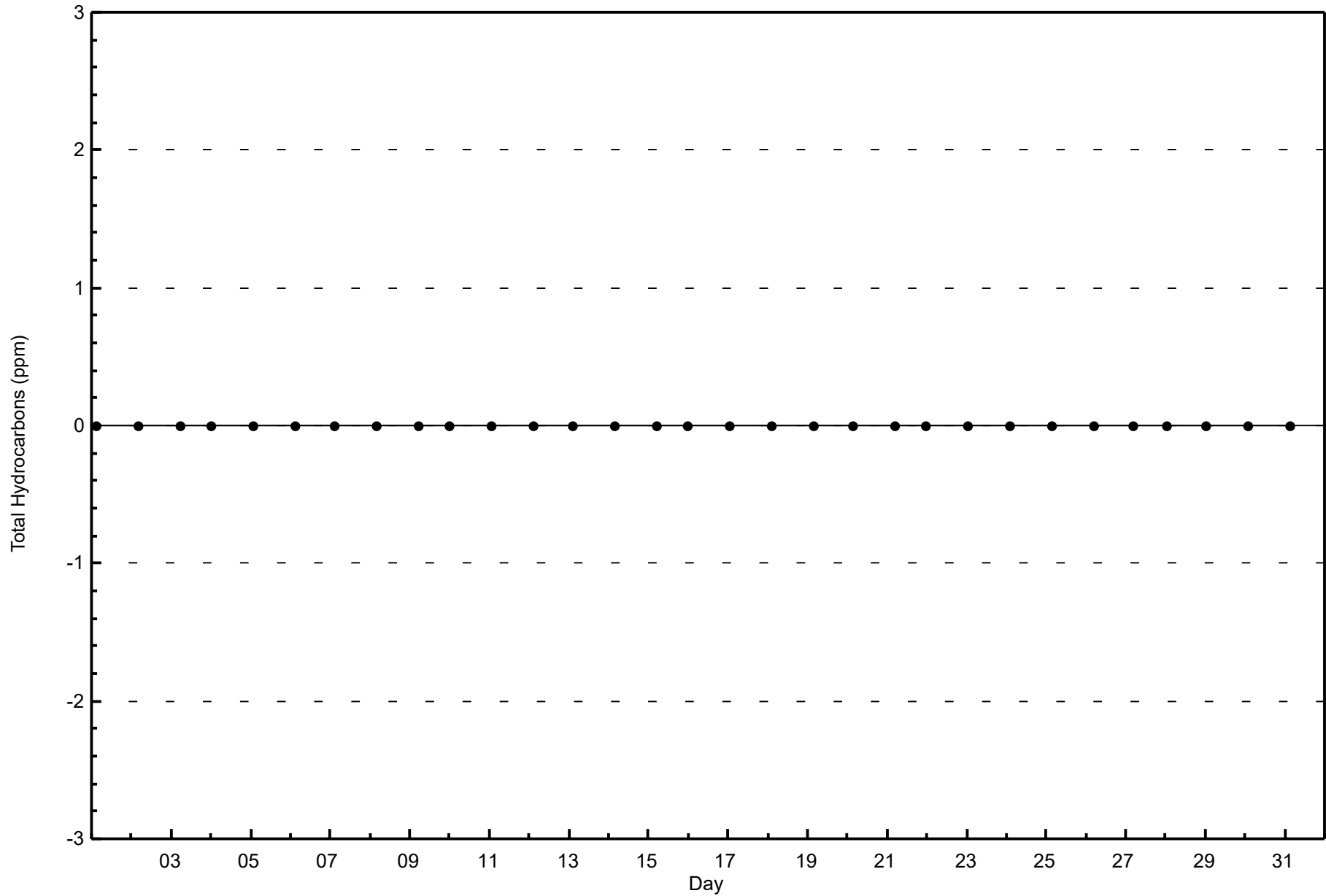
Total Number of Hours: 744

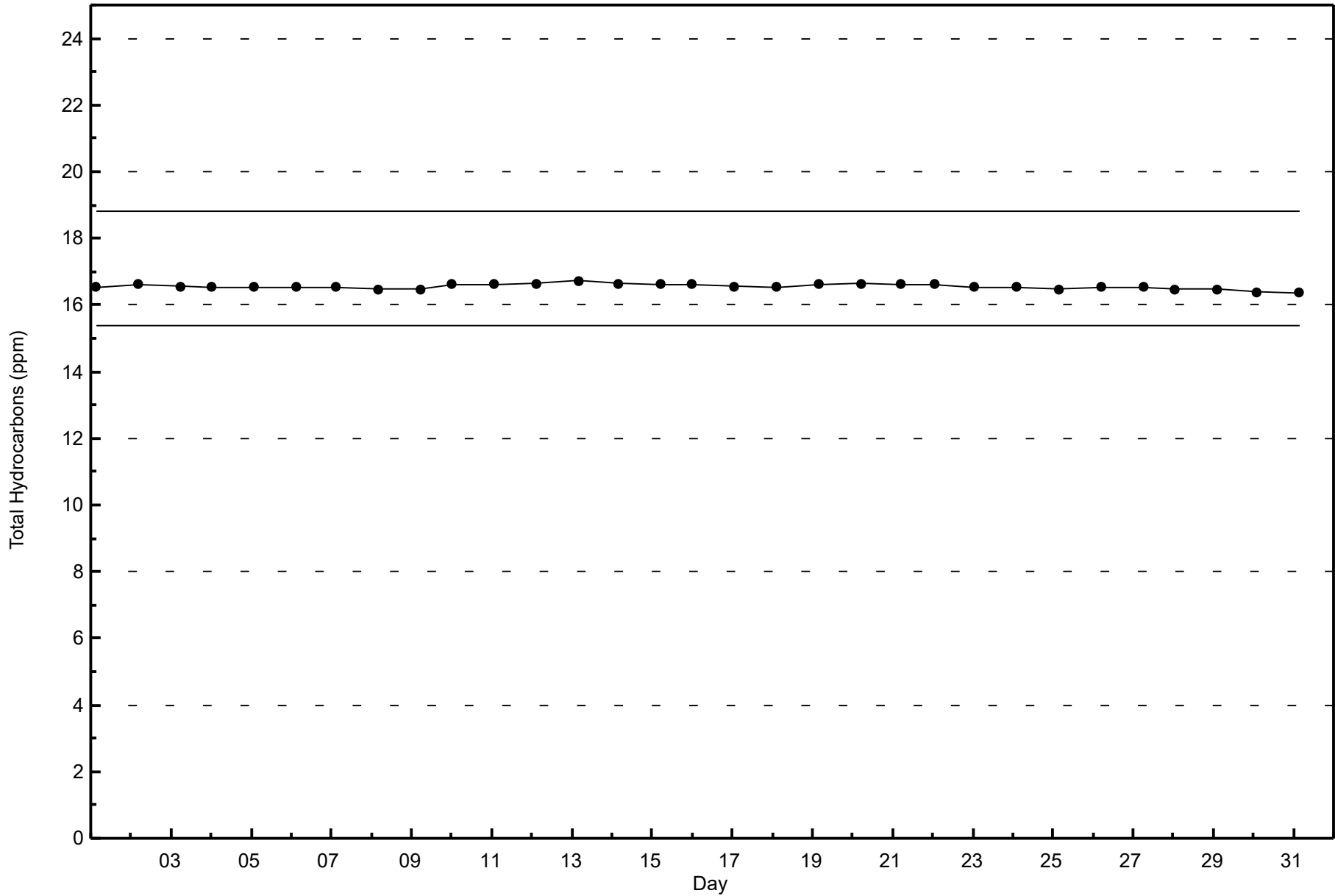


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Buffalo Viewpoint

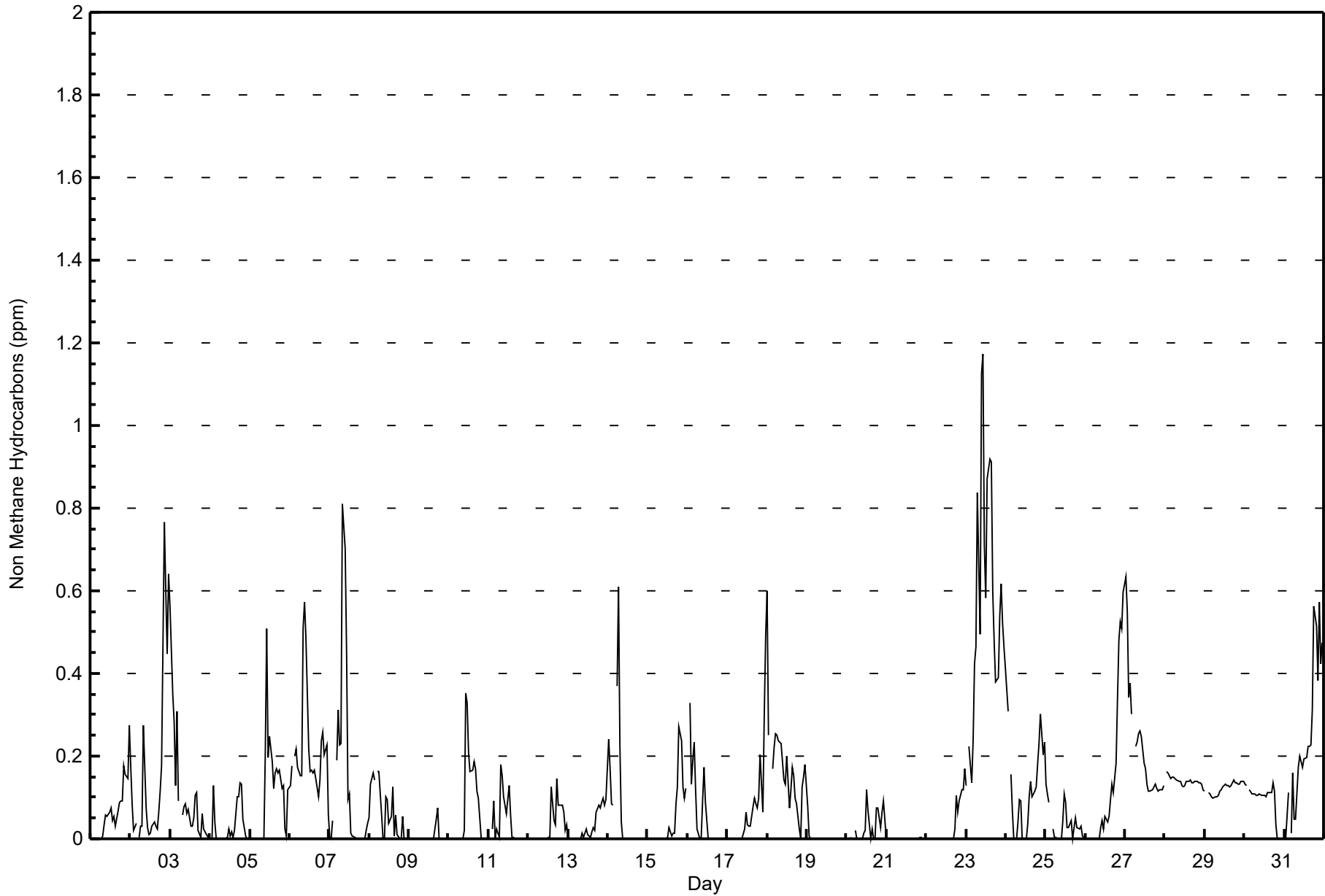








Maximum Value: 1.173 ppm on Aug 23 11:00																				Maximum Daily Average: 0.575 ppm on Aug 23					Hours in Service: 744	
Minimum Value: 0.000 ppm on Aug 1 01:00																				Minimum Daily Average: 0.000 ppm on Aug 21					Hours of Data: 710	
Maximum Diurnal Average: 0.146 ppm at hour 11																				Minimum Diurnal Average: 0.073 ppm at hour 3					Hours of Missing Data: 34	
Monthly Average: 0.106 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 = 0.8					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-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.001	0.006	0.034	0.057	0.053	0.063	0.073	0.045	0.054	0.030	0.069	0.087	0.091	0.093	0.177	0.156	0.144	0.273	0.066	0.273
2-Aug	0.177	0.084	0.020	0.037	Z	0.002	0.031	0.030	0.273	0.076	0.026	0.011	0.014	0.029	0.039	0.032	0.022	0.065	0.116	0.176	0.767	0.601	0.449	0.640	0.162	0.767
3-Aug	0.561	0.349	0.283	0.128	0.307	0.093	Z	0.057	0.078	0.084	0.062	0.072	0.031	0.031	0.052	0.104	0.112	0.020	0.003	0.061	0.022	0.016	0.010	0.000	0.110	0.561
4-Aug	Z	0.000	0.129	0.039	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.024	0.007	0.018	0.004	0.021	0.100	0.102	0.135	0.132	0.048	0.006	0.000	0.000	0.033	0.135
5-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.207	0.507	0.196	0.249	0.185	0.121	0.159	0.169	0.158	0.167	0.123	0.127	0.024	0.008	0.118	0.110	0.507
6-Aug	0.128	0.175	Z	0.200	0.219	0.172	0.152	0.153	0.512	0.573	0.485	0.217	0.162	0.165	0.158	0.167	0.145	0.102	0.142	0.238	0.259	0.202	0.229	0.058	0.218	0.573
7-Aug	0.004	0.001	0.045	Z	0.190	0.311	0.227	0.230	0.811	0.701	0.449	0.094	0.109	0.012	0.006	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.039	0.141	0.811
8-Aug	0.050	0.132	0.159	0.143	Z	0.163	0.163	0.057	0.000	0.000	0.103	0.093	0.037	0.055	0.126	0.006	0.058	0.011	0.000	0.000	0.056	0.000	0.000	0.000	0.061	0.163
9-Aug	0.000	0.000	0.000	0.000	0.000	Z	C	C	C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.075
10-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.353	0.329	0.210	0.162	0.166	0.185	0.169	0.115	0.098	0.002	0.000	0.000	0.000	0.000	0.079	0.353
11-Aug	0.000	Z	0.025	0.092	0.002	0.023	0.005	0.179	0.151	0.102	0.080	0.060	0.127	0.059	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.179
12-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.002	0.127	0.045	0.035	0.144	0.082	0.081	0.081	0.064	0.020	0.035	0.031	0.144
13-Aug	0.003	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.012	0.002	0.014	0.025	0.010	0.003	0.017	0.029	0.022	0.063	0.080	0.074	0.089	0.097	0.082	0.094	0.031	0.097
14-Aug	0.242	0.169	0.084	0.083	Z	0.370	0.611	0.224	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079	0.611
15-Aug	0.000	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.026	0.008	0.014	0.012	0.083	0.124	0.270	0.237	0.125	0.098	0.124	0.049	0.270
16-Aug	Z	0.330	0.132	0.191	0.235	0.119	0.023	0.000	0.002	0.091	0.173	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.330
17-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.022	0.065	0.035	0.029	0.032	0.076	0.098	0.085	0.074	0.099	0.202	0.066	0.301	0.490	0.073	0.490
18-Aug	0.599	0.249	Z	0.170	0.220	0.253	0.252	0.238	0.230	0.185	0.142	0.133	0.198	0.073	0.119	0.172	0.152	0.098	0.084	0.024	0.000	0.125	0.149	0.181	0.176	0.599
19-Aug	0.078	0.006	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	0.004	0.078
20-Aug	0.000	0.000	0.000	0.005	Z	0.019	0.000	0.000	0.000	0.000	0.013	0.019	0.120	0.067	0.001	0.025	0.000	0.000	0.074	0.075	0.028	0.066	0.093	0.048	0.028	0.120
21-Aug	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	0.003	0.004	0.000	0.001	0.000	0.004
22-Aug	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	0.024	0.106	0.064	0.093	0.119	0.119	0.168	0.030	0.168
23-Aug	0.129	Z	0.223	0.135	0.237	0.425	0.463	0.839	0.496	1.124	1.173	0.711	0.582	0.871	0.918	0.911	0.599	0.478	0.379	0.388	0.538	0.616	0.523	0.465	0.575	1.173
24-Aug	0.414	0.308	Z	0.155	0.066	0.002	0.000	0.042	0.095	0.091	0.000	0.000	0.000	0.037	0.102	0.140	0.101	0.115	0.126	0.179	0.229	0.302	0.203	0.235	0.128	0.414
25-Aug	0.133	0.108	0.088	Z	0.023	0.003	0.003	0.000	0.000	0.000	0.043	0.108	0.087	0.027	0.026	0.043	0.000	0.028	0.052	0.026	0.025	0.031	0.008	0.003	0.038	0.133
26-Aug	0.002	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.027	0.045	0.025	0.054	0.039	0.053	0.095	0.132	0.111	0.183	0.339	0.483	0.526	0.509	0.597	0.140	0.597
27-Aug	0.634	0.548	0.344	0.376	0.302	Z	0.225	0.233	0.254	0.262	0.248	0.182	0.170	0.132	0.115	0.114	0.120	0.126	0.133	0.123	0.115	0.119	0.120	0.128	0.223	0.634
28-Aug	Z	0.164	0.160	0.145	0.149	0.149	0.146	0.144	0.138	0.137	0.128	0.125	0.130	0.138	0.138	0.143	0.137	0.134	0.137	0.139	0.136	0.137	0.133	0.120	0.139	0.164
29-Aug	0.115	Z	0.110	0.107	0.102	0.099	0.101	0.102	0.105	0.114	0.119	0.125	0.131	0.128	0.128	0.126	0.130	0.141	0.136	0.137	0.134	0.134	0.139	0.140	0.122	0.141
30-Aug	0.133	0.128	Z	0.117	0.109	0.107	0.108	0.104	0.107	0.108	0.103	0.106	0.106	0.103	0.112	0.113	0.112	0.135	0.115	0.035	0.000	0.000	0.000	0.000	0.090	0.135
31-Aug	0.000	0.000	0.111	Z	0.012	0.158	0.049	0.047	0.173	0.199	0.185	0.172	0.193	0.196	0.223	0.225	0.228	0.310	0.563	0.514	0.383	0.572	0.425	0.475	0.235	0.572
																				0.131 0.106 0.073 0.085 0.084 0.091 0.088 0.089 0.117 0.134 0.146 0.098 0.092 0.085 0.092 0.096 0.089 0.091 0.103 0.109 0.136 0.133 0.122 0.143					Diurnal Average	
																				0.634 0.548 0.344 0.376 0.307 0.425 0.611 0.839 0.811 1.124 1.173 0.711 0.582 0.871 0.918 0.911 0.599 0.478 0.563 0.514 0.767 0.616 0.523 0.640					Diurnal Maximum	
Z - zerospan		C - Calibration																								





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	258	36.34	36.34
0.006 - 0.05	99	13.94	50.28
0.06 - 0.1	199	28.03	78.31
> 0.1	154	21.69	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 - August 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	12	8	3	2	0	2	44	51	28	19	13	21	36	14	4	1	258
0.006 - 0.05	6	6	1	2	0	6	0	11	8	12	9	14	11	8	2	3	99
0.06 - 0.1	23	8	5	1	5	9	13	41	28	20	8	9	9	8	6	6	199
> 0.1	31	17	4	0	9	3	2	8	5	5	6	6	6	15	26	11	154
Totals	72	39	13	5	14	20	59	111	69	56	36	50	62	45	38	21	710

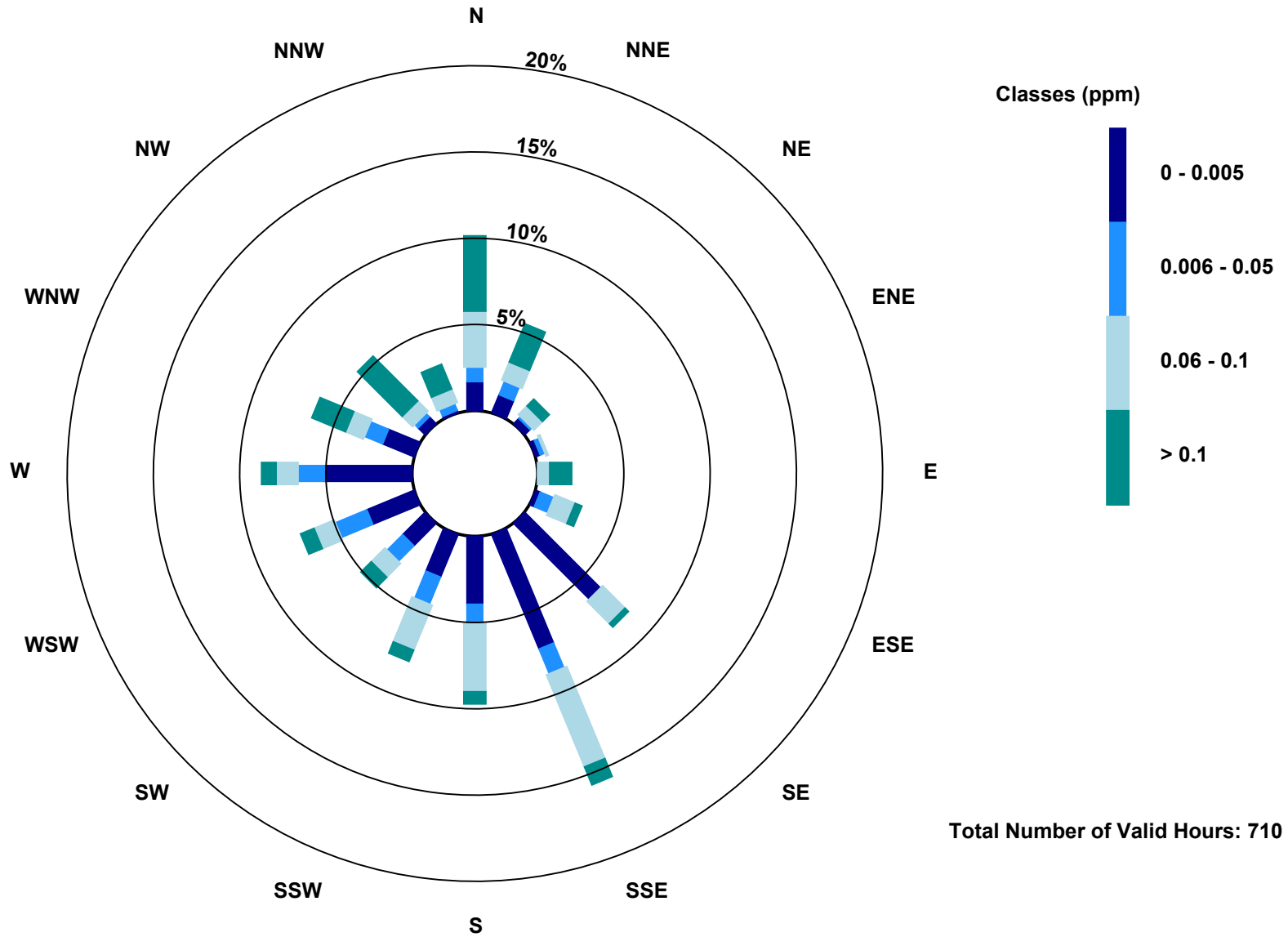
Total Number of Valid Hours: 710

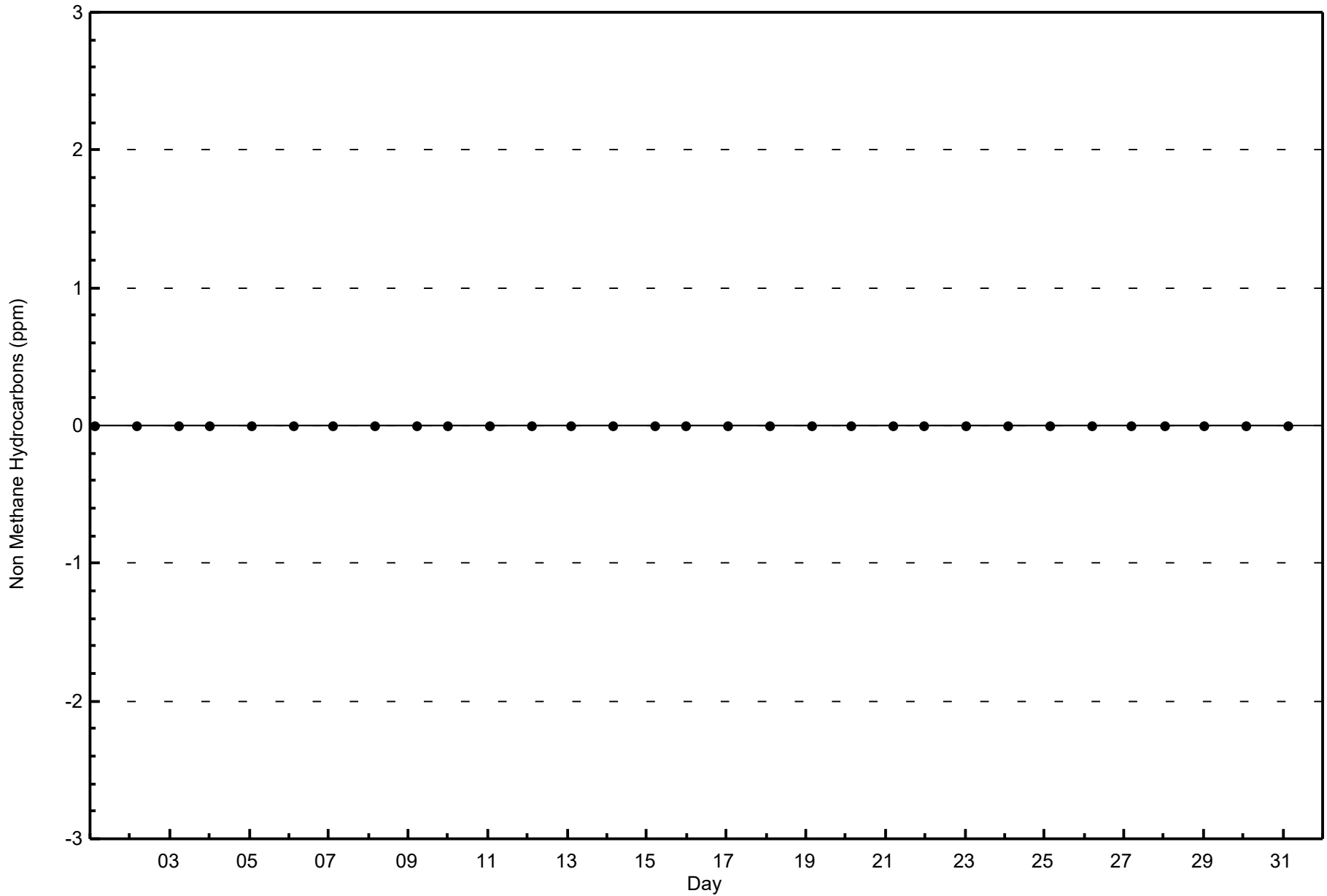
Total Number of Hours: 744

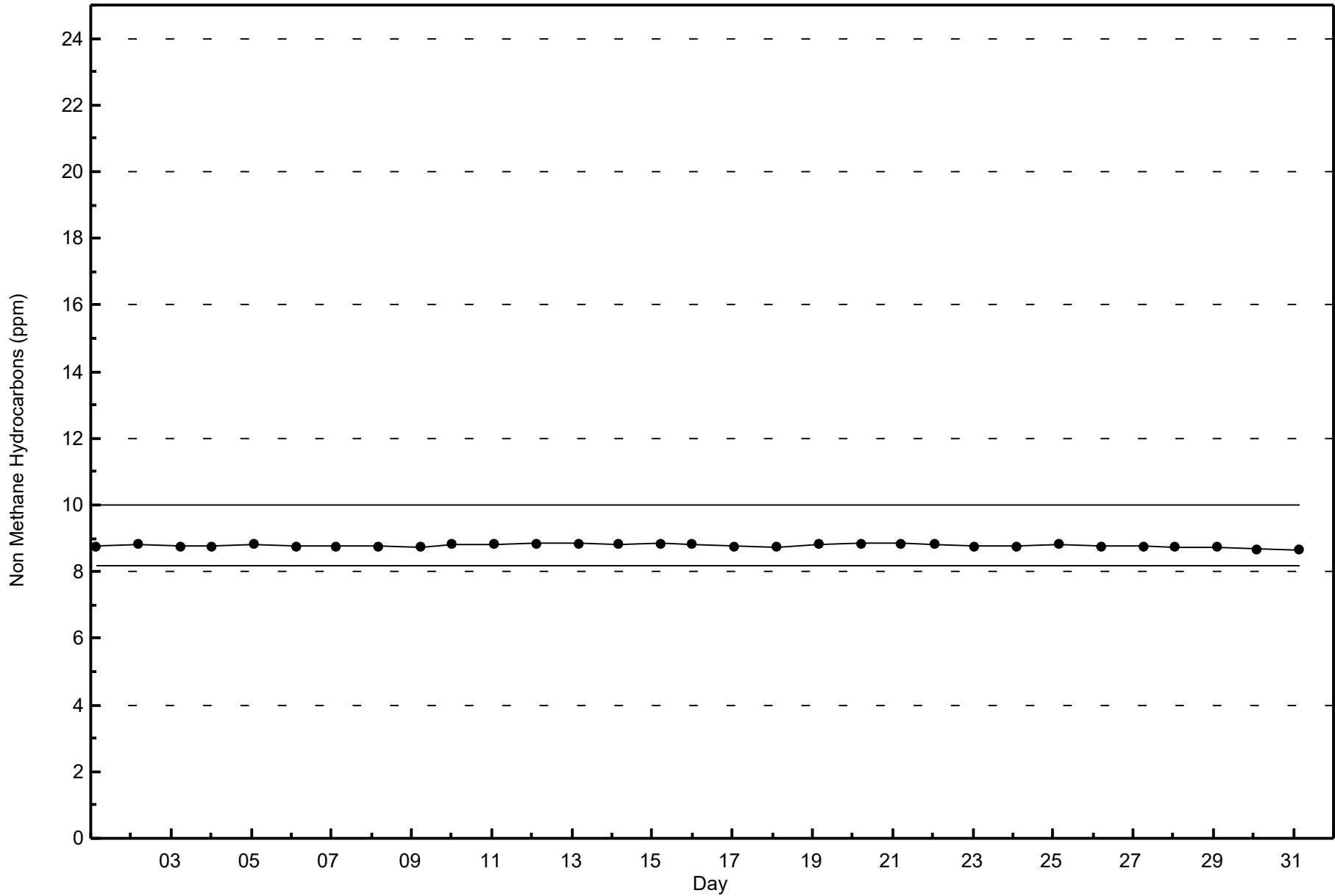


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Buffalo Viewpoint









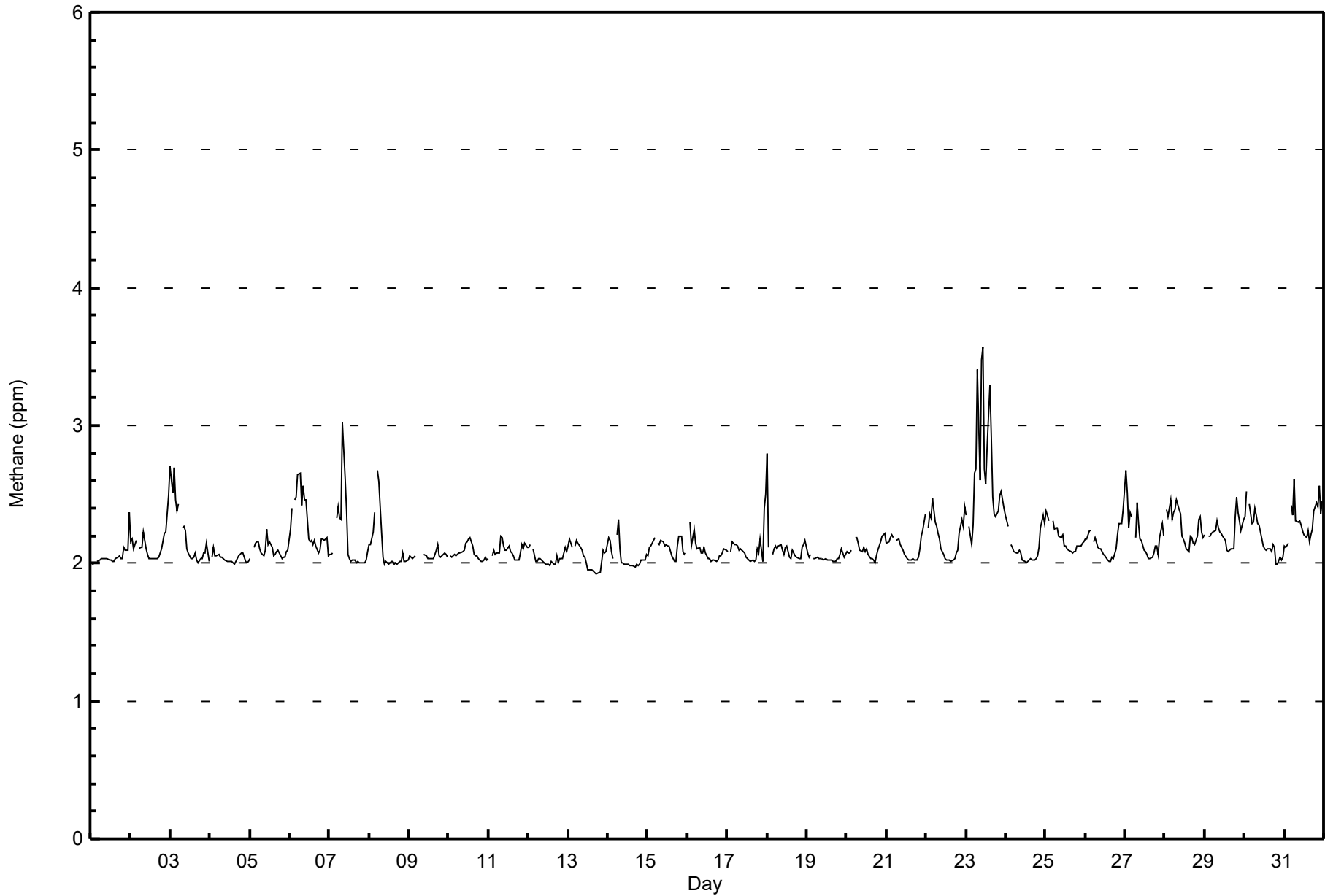
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum																										
Maximum Value: 3.6 ppm on Aug 23 11:00		Maximum Daily Average: 2.7 ppm on Aug 23		Hours of Data: 710														2.0		2.4																												
Minimum Value: 1.9 ppm on Aug 13 18:00		Minimum Daily Average: 2.0 ppm on Aug 4		Hours of Missing Data: 34														2.1		2.5																												
Maximum Diurnal Average: 2.2 ppm at hour 6		Minimum Diurnal Average: 2.1 ppm at hour 18		Hours of Calibration: 34														2.2		2.7																												
Monthly Average: 2.15 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.8		Percent Operational Time: 100.0														2.0		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-Aug	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	2.1	2.0	2.0	2.1	2.1	2.1	2.4	2.0	2.4																							
2-Aug	2.2	2.2	2.1	2.2	Z	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.4	2.5	2.1	2.5																							
3-Aug	2.7	2.5	2.7	2.5	2.4	2.4	Z	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.2	2.7																							
4-Aug	Z	2.0	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	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1																							
5-Aug	2.0	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.2																							
6-Aug	2.2	2.4	Z	2.5	2.5	2.6	2.7	2.4	2.6	2.5	2.5	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.3	2.7																							
7-Aug	2.1	2.1	2.1	Z	2.3	2.4	2.3	2.3	3.0	2.6	2.4	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	3.0																							
8-Aug	2.1	2.1	2.2	2.4	Z	2.7	2.6	2.2	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	2.1	2.7																							
9-Aug	2.1	2.0	2.0	2.0	2.1	Z	C	C	C	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.1																							
10-Aug	Z	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2																							
11-Aug	2.0	Z	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	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.2																							
12-Aug	2.1	2.1	Z	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	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1																							
13-Aug	2.1	2.2	2.1	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.2																							
14-Aug	2.2	2.2	2.1	2.0	Z	2.2	2.3	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	2.0	2.3																							
15-Aug	2.0	2.1	2.1	2.2	2.2	Z	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.2																							
16-Aug	Z	2.3	2.1	2.2	2.3	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	2.1	2.1	2.1	2.1	2.1	2.1	2.3																							
17-Aug	2.1	Z	2.1	2.2	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	2.1	2.1	2.2	2.0	2.4	2.5	2.1	2.5																							
18-Aug	2.8	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	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.8																						
19-Aug	2.1	2.0	2.1	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	2.0	2.1	2.0	2.1																							
20-Aug	2.1	2.1	2.1	2.1	Z	2.2	2.2	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	2.2	2.2	2.2	2.2	2.1	2.2																						
21-Aug	2.1	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.4	2.1	2.4																							
22-Aug	Z	2.3	2.4	2.3	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.2	2.5																							
23-Aug	2.4	Z	2.3	2.1	2.3	2.7	2.7	3.4	2.6	3.5	3.6	2.7	2.6	2.9	3.3	2.9	2.5	2.4	2.3	2.4	2.5	2.5	2.4	2.7	3.6																							
24-Aug	2.4	2.3	Z	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	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.4																						
25-Aug	2.4	2.3	2.3	Z	2.3	2.2	2.3	2.3	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	2.2	2.2	2.4																						
26-Aug	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.1	2.4																							
27-Aug	2.7	2.5	2.3	2.4	2.3	Z	2.2	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.2	2.7																						
28-Aug	Z	2.4	2.3	2.5	2.3	2.4	2.4	2.5	2.4	2.4	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.3	2.5																						
29-Aug	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.5	2.4	2.3	2.2	2.3	2.5																						
30-Aug	2.3	2.5	Z	2.4	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.5																							
31-Aug	2.1	2.1	2.1	Z	2.4	2.3	2.6	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.4	2.6	2.4	2.4	2.3	2.6																						
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	2.1	2.1	2.2	2.2	2.2	Diurnal Average		
2.8																								2.5	2.7	2.5	2.5	2.7	2.7	3.4	3.0	3.5	3.6	2.7	2.6	2.9	3.3	2.9	2.5	2.4	2.4	2.5	2.5	2.6	2.5	2.5	Diurnal Maximum	
Z - zerospan C - Calibration																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	226	31.83	31.83
2.1 - 3.0	480	67.61	99.44
3.1 - 10.0	4	0.56	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 - August 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	20	11	5	3	2	10	13	16	11	14	13	39	43	18	4	4	226
2.1 - 3.0	51	28	8	2	12	10	46	95	58	42	23	10	19	27	32	17	480
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	72	39	13	5	14	20	59	111	69	56	36	50	62	45	38	21	710

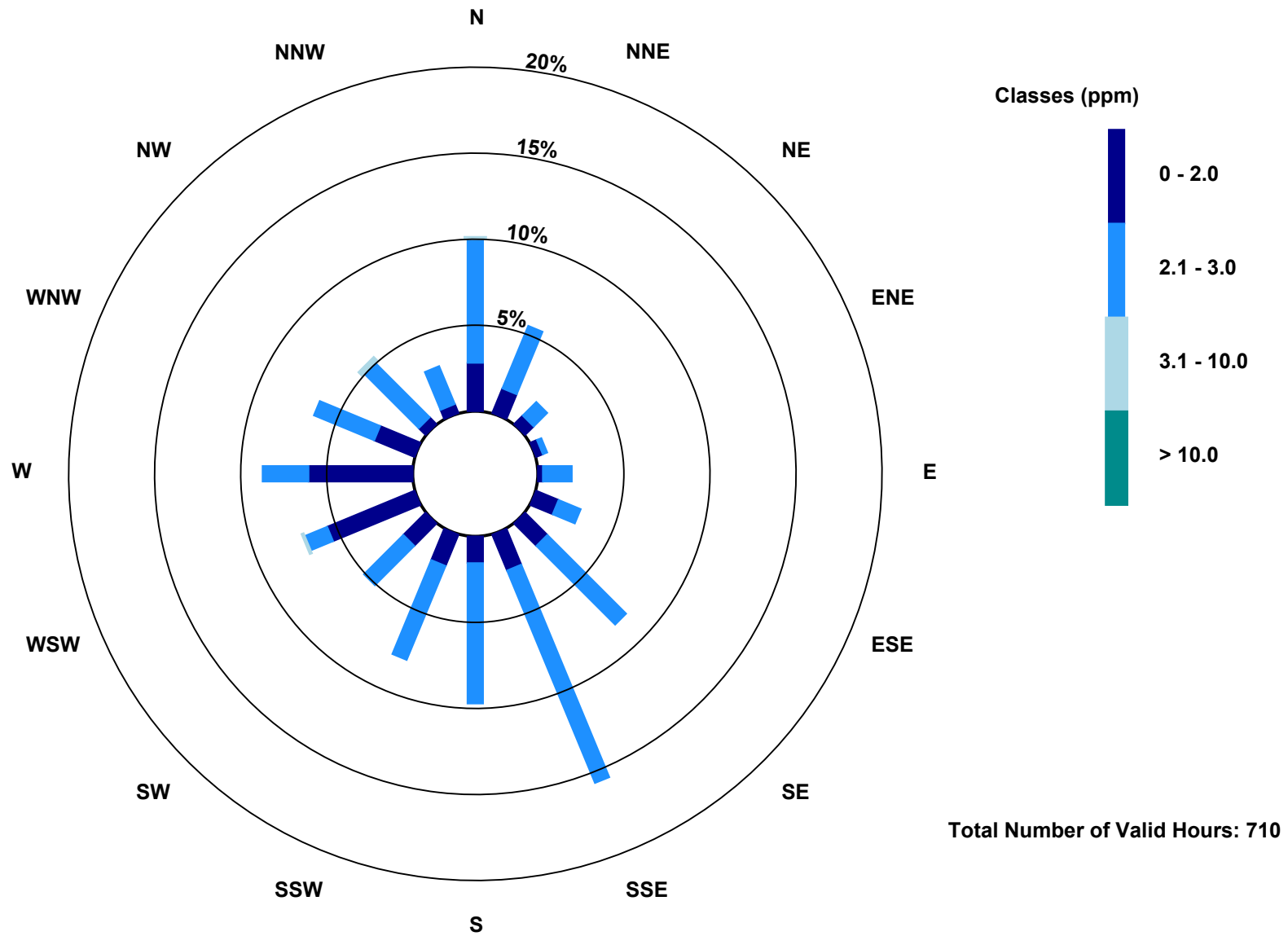
Total Number of Valid Hours: 710

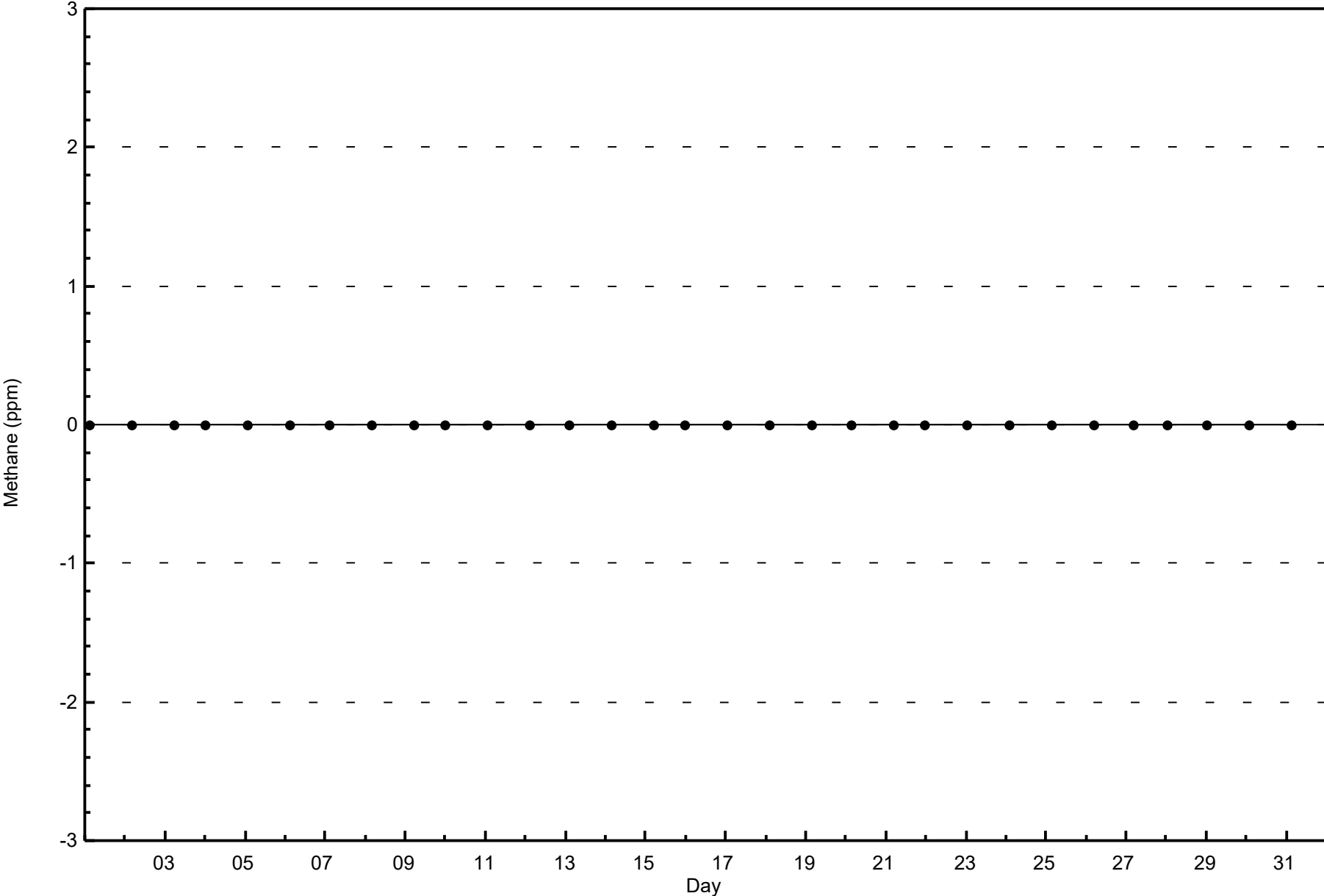
Total Number of Hours: 744

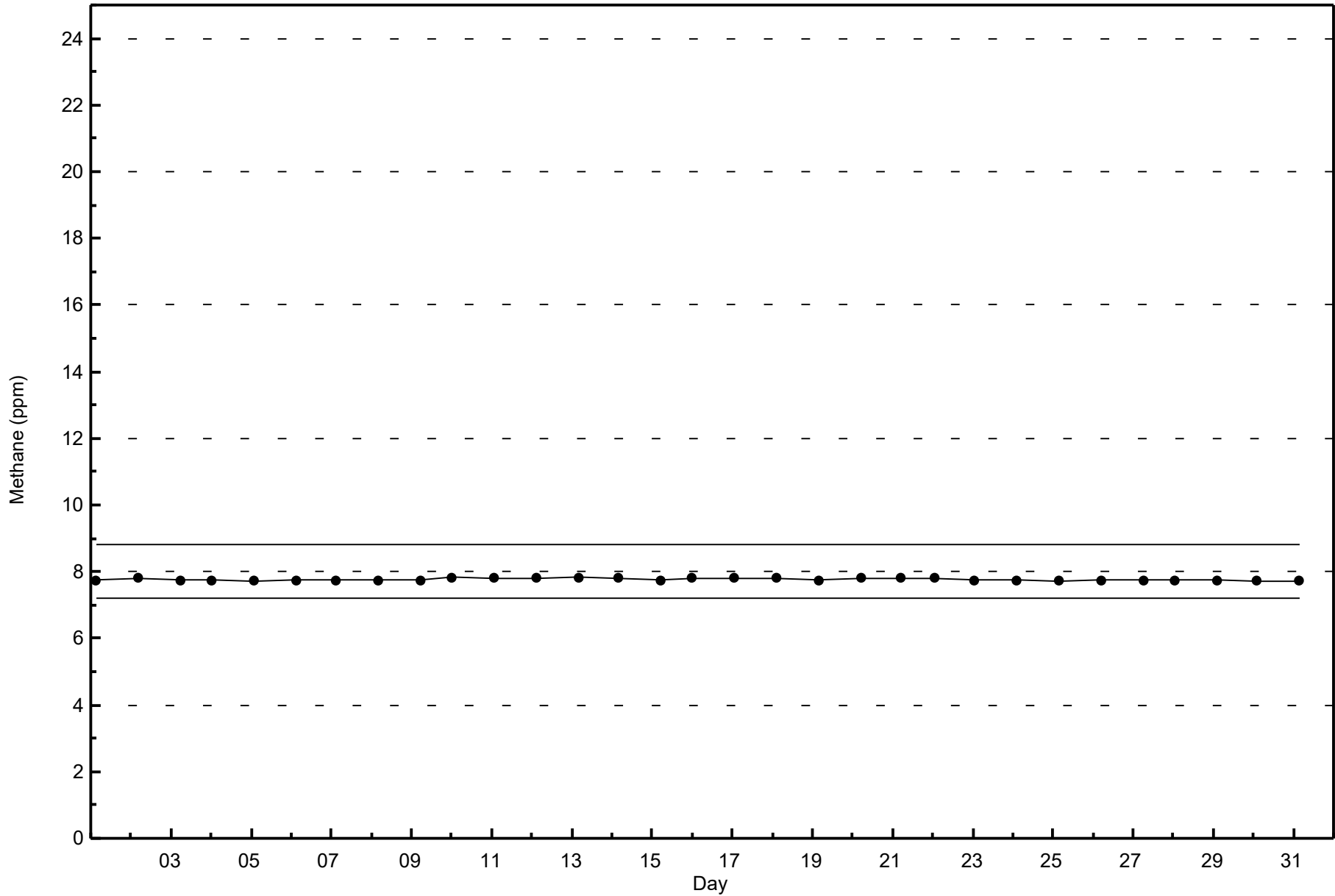


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Buffalo Viewpoint







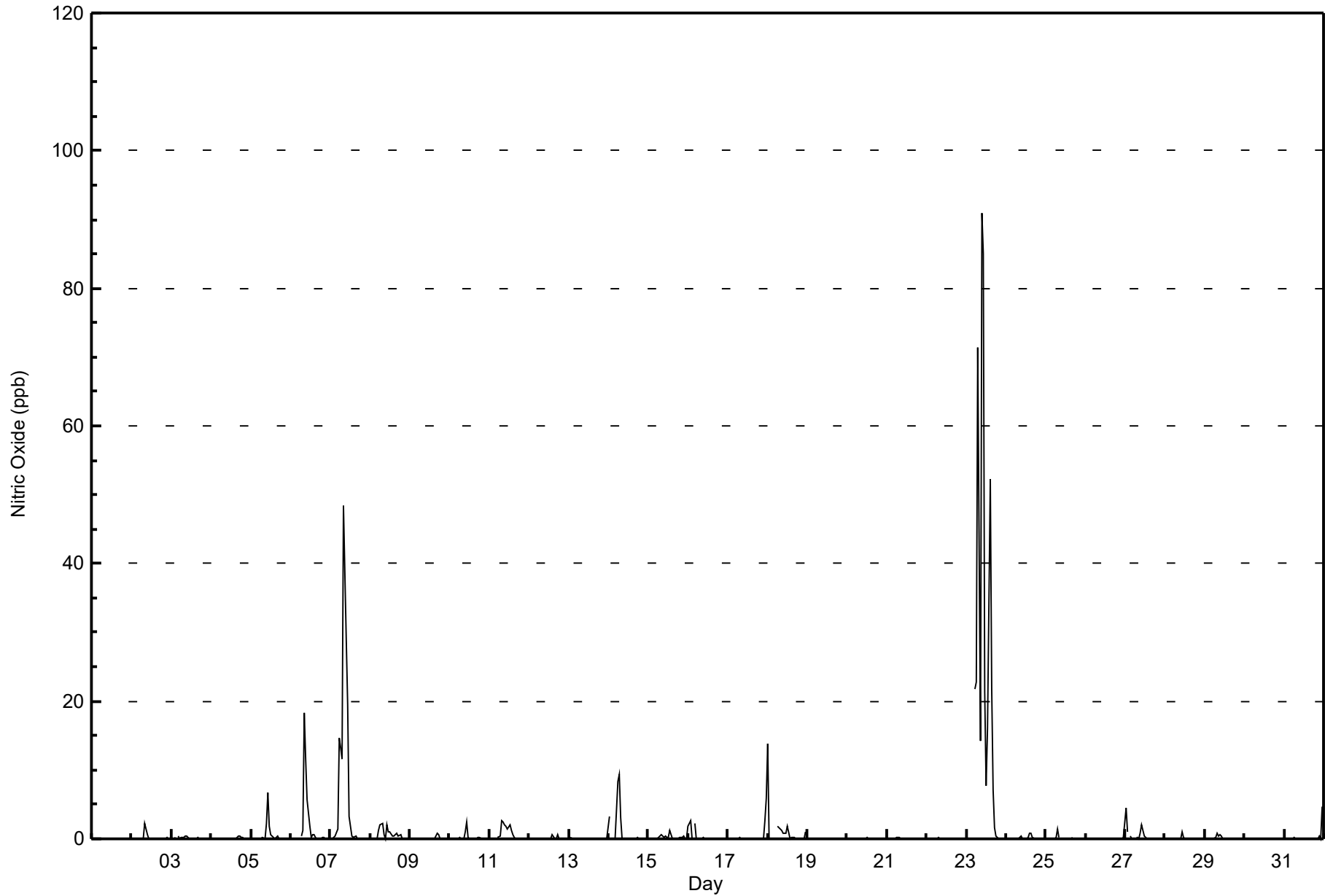


Maximum Value: 90.8 ppb on Aug 23 10:00																				Maximum Daily Average: 18.9 ppb on Aug 23					Hours in Service: 744		
Minimum Value: 0.0 ppb on Aug 1 04:00																				Minimum Daily Average: 0.0 ppb on Aug 19					Hours of Data: 707		
Maximum Diurnal Average: 4.7 ppb at hour 10																				Minimum Diurnal Average: 0.0 ppb at hour 21					Hours of Missing Data: 37		
Monthly Average: 1.09 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.8 P ₉₉ = 21.8					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-Aug	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	0.0	0.0	0.2	0.0	0.2	
2-Aug	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	2.3
3-Aug	0.0	0.0	0.2	Z	0.4	0.1	0.1	0.2	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
4-Aug	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.4
5-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	2.2	6.6	1.8	0.6	0.3	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	6.6
6-Aug	0.0	0.0	0.1	0.0	0.0	Z	0.5	1.1	18.4	11.5	5.7	1.9	0.2	0.7	0.6	0.3	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	1.8	18.4	
7-Aug	Z	0.1	0.1	0.5	1.5	14.6	13.3	11.6	48.5	28.9	19.5	3.2	1.9	0.4	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	48.5	
8-Aug	0.1	Z	0.0	0.0	0.0	1.1	2.0	2.2	0.6	0.0	2.1	1.1	1.1	0.5	0.4	0.6	0.8	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.6	2.2	
9-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	
10-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	1.0	2.4	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.2	2.4	
11-Aug	0.0	0.0	0.0	0.0	Z	0.3	0.5	2.6	2.5	1.9	1.8	1.4	2.1	1.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.6	
12-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
13-Aug	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	0.0	0.0	0.0	0.0	0.1	
14-Aug	3.2	Z	0.0	0.0	0.0	8.4	9.4	3.0	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	1.1	9.4	
15-Aug	0.0	0.0	Z	0.1	0.0	0.0	0.2	0.5	0.6	0.2	0.4	0.2	0.3	1.2	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.4	0.0	0.0	0.2	1.2	
16-Aug	1.9	2.6	0.0	Z	2.3	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	0.3	2.6	
17-Aug	0.0	0.0	0.0	0.0	Z	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	2.6	5.9	5.9	
18-Aug	13.9	0.0	0.0	0.0	0.0	Z	1.8	1.7	1.2	0.8	0.8	0.8	1.8	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.1	1.1	13.9	
19-Aug	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	
20-Aug	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	0.0	0.1	
21-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.1	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	0.2	
22-Aug	0.0	0.0	0.0	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	0.1	
23-Aug	0.0	0.0	0.0	0.0	Z	21.8	22.7	71.3	14.3	90.8	85.0	21.4	7.8	16.0	52.2	21.7	7.1	1.6	0.5	0.0	0.0	0.0	0.0	0.0	18.9	90.8	
24-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.1	0.8	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	
25-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.2	C	C	C	C	C	C	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	1.4	
26-Aug	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	0.2	0.0	0.2	
27-Aug	4.6	0.9	Z	0.4	0.0	0.0	0.0	0.1	0.1	0.9	2.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	4.6	
28-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.0	0.0	1.0	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	1.0	
29-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.2	0.7	0.3	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	0.1	0.7	
30-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
31-Aug	Z	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	0.3	0.1	4.7	0.2	4.7	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	98.59	98.59
21 - 40	5	0.71	99.29
41 - 80	3	0.42	99.72
81 - 159	2	0.28	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
Buffalo Viewpoint - August 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	38	13	5	13	20	60	108	68	56	34	47	65	44	33	21	697
21 - 40	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	1	5
41 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3
81 - 159	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	38	13	5	13	20	60	109	68	56	34	48	66	47	35	22	707

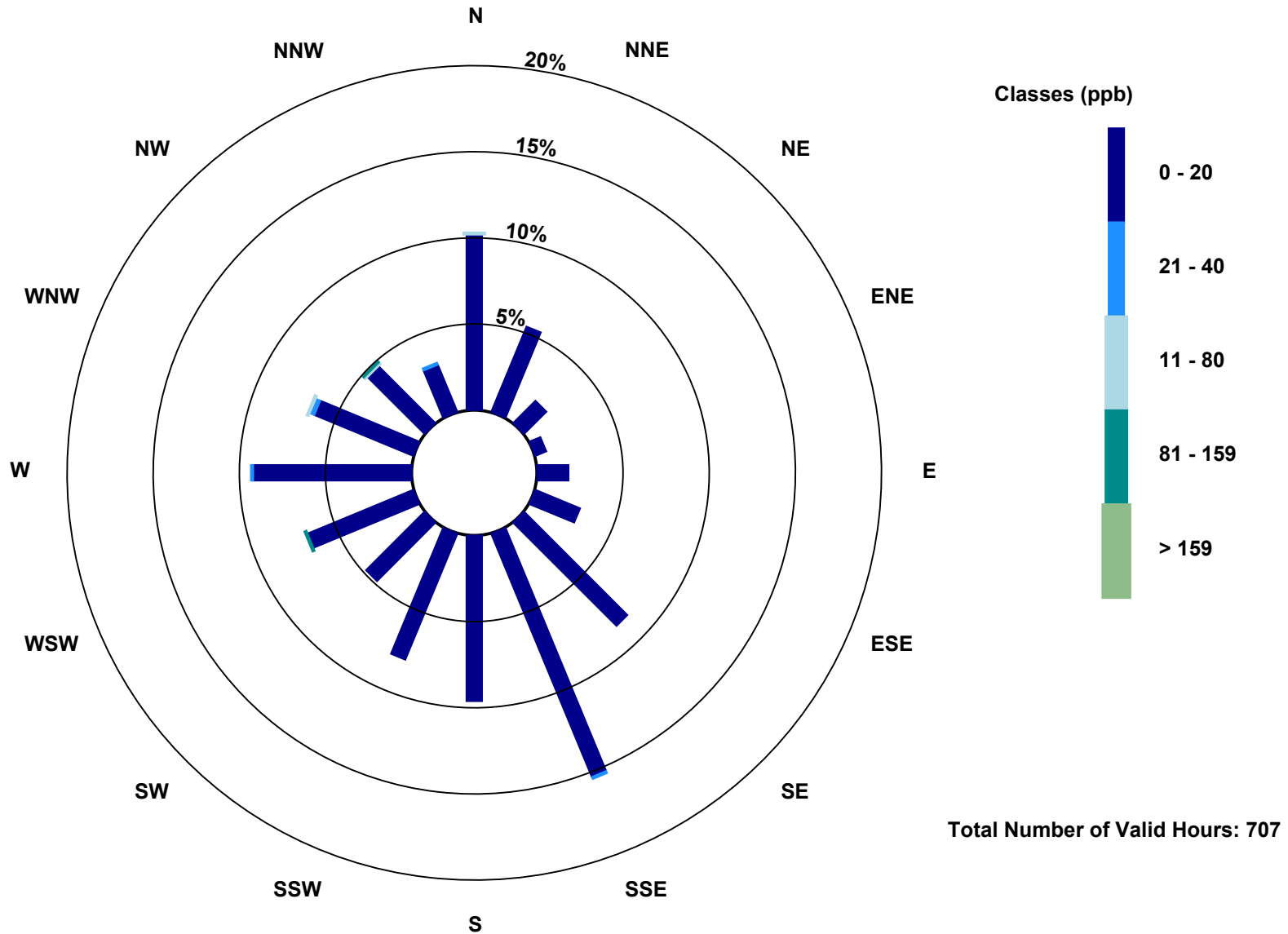
Total Number of Valid Hours: 707

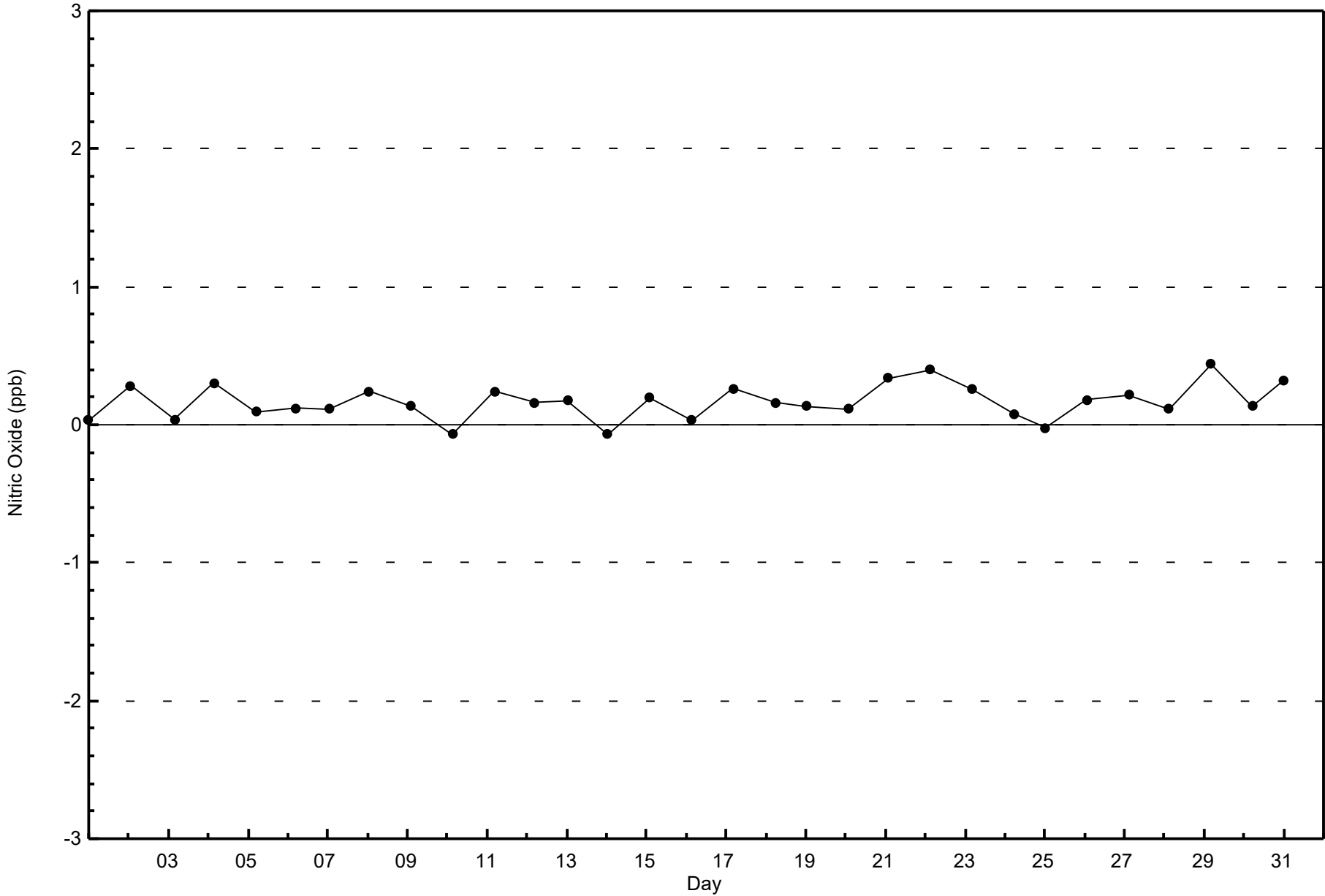
Total Number of Hours: 744

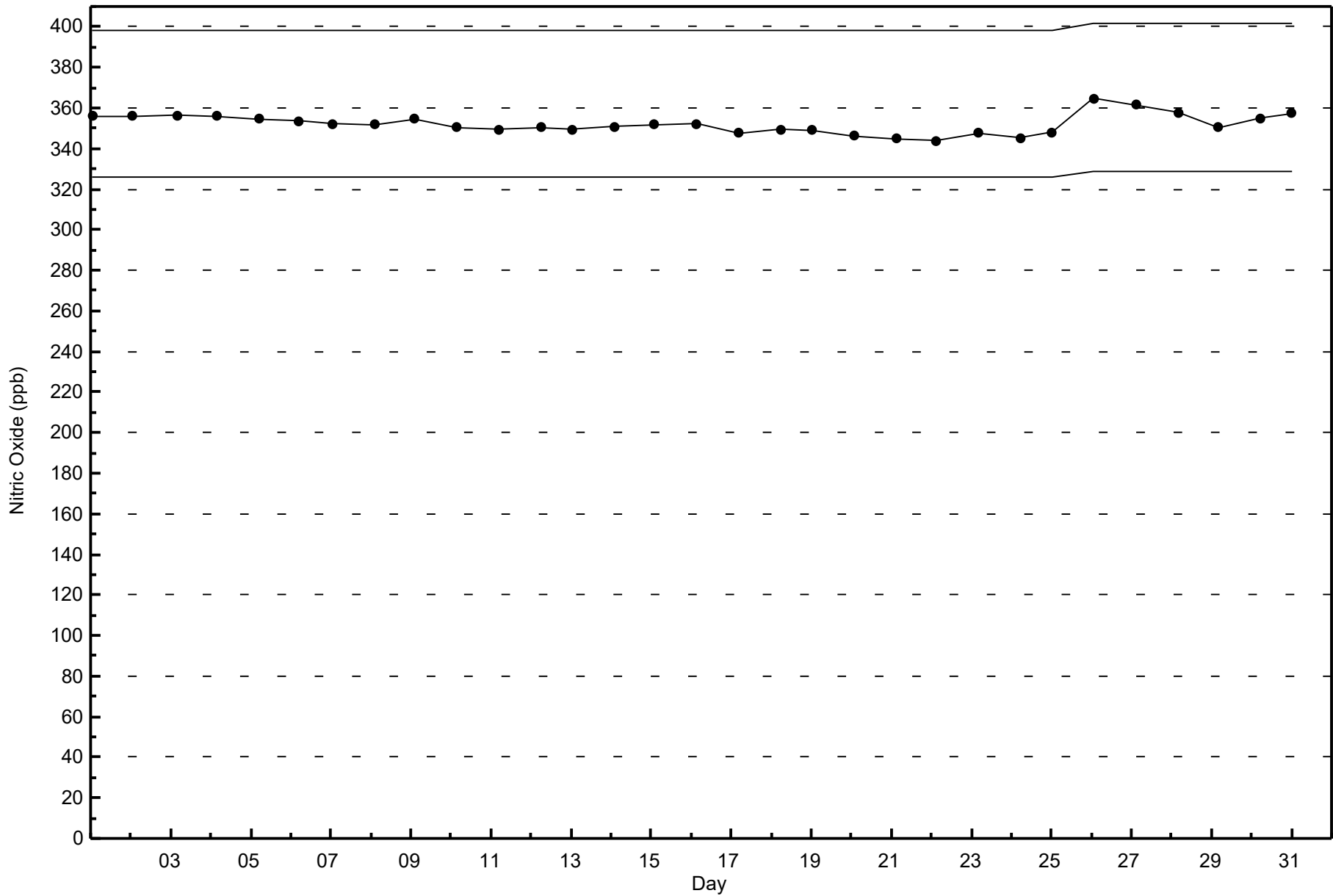


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 26.5 ppb on Aug 23 16:00	Maximum Daily Average: 14.1 ppb on Aug 23		Hours of Data:	707
Minimum Value: 0.0 ppb on Aug 4 15:00	Minimum Daily Average: 0.1 ppb on Aug 19		Hours of Missing Data:	37
Maximum Diurnal Average: 4.8 ppb at hour 1	Minimum Diurnal Average: 1.8 ppb at hour 14		Hours of Calibration:	37
Monthly Average: 2.93 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.3 Q ₃ = 3.4 P ₉₀ = 7.9 P ₉₉ = 19.7		Percent Operational Time:	100.0

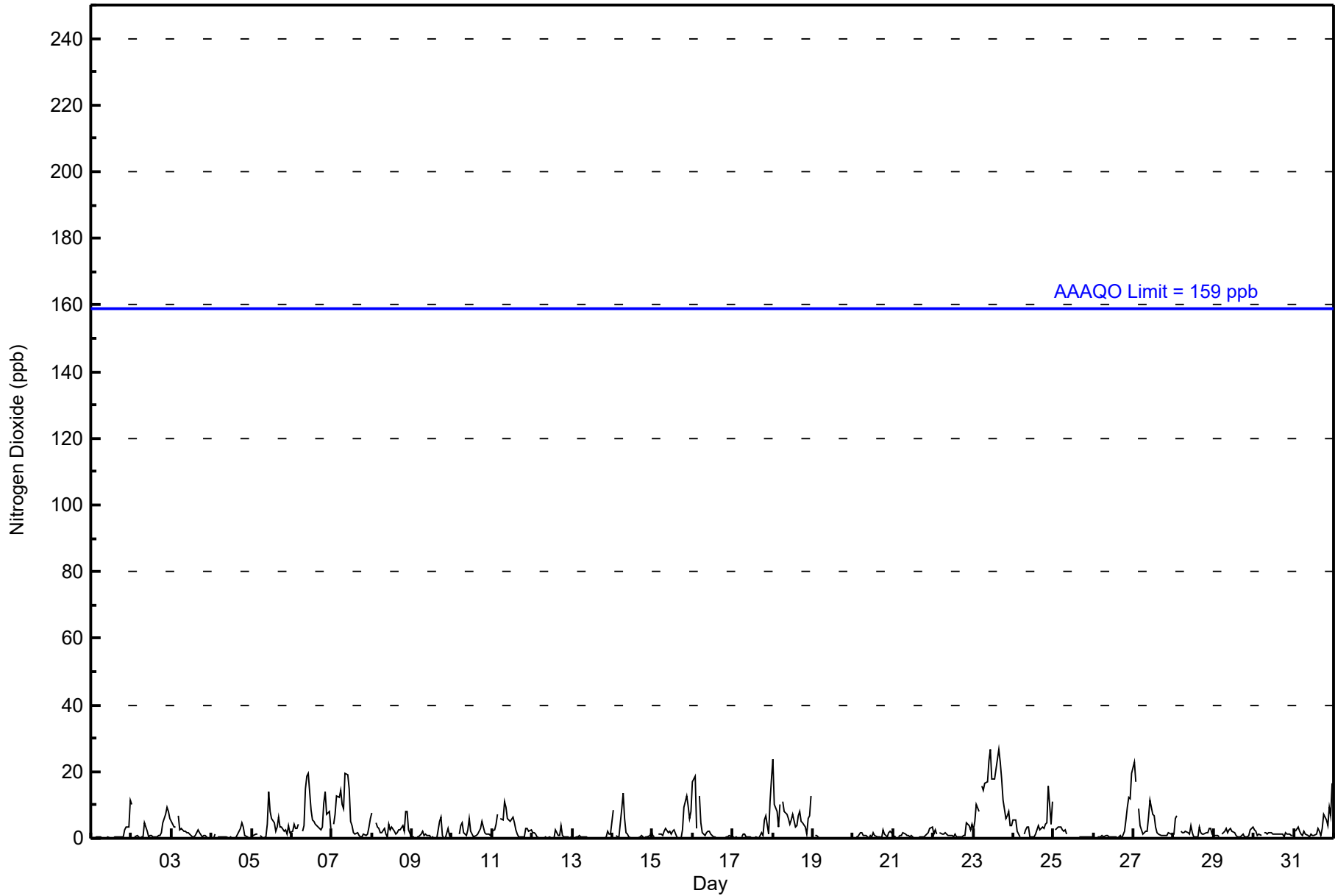
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	Z	0.1	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.5	0.4	0.4	0.6	0.4	0.5	2.5	3.6	3.4	11.3	1.2	11.3																							
2-Aug	10.3	Z	0.6	0.7	0.4	0.2	0.4	0.4	4.6	2.0	0.5	0.9	0.7	0.6	0.5	0.6	0.7	0.7	1.5	4.6	7.1	9.5	8.0	5.9	2.7	10.3																							
3-Aug	5.2	3.4	3.2	Z	6.8	2.5	2.8	2.0	2.1	1.9	1.5	1.2	0.6	0.5	0.8	1.6	2.7	1.9	0.6	0.7	0.8	0.5	0.1	0.1	1.9	6.8																							
4-Aug	0.2	0.2	1.2	Z	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.3	0.2	0.1	0.0	0.6	2.1	3.0	4.7	3.4	0.7	0.3	0.1	0.0	0.8	4.7																							
5-Aug	0.5	0.7	1.1	1.2	Z	0.7	0.6	0.2	0.3	4.4	13.8	8.0	5.8	4.5	2.2	3.5	6.2	3.6	3.6	2.2	2.4	1.4	4.0	1.6	3.2	13.8																							
6-Aug	2.2	4.4	3.0	3.1	4.4	Z	2.0	3.7	14.8	18.6	19.5	8.3	5.5	5.0	4.4	4.0	3.6	2.5	3.2	10.7	13.9	7.0	7.9	2.9	6.7	19.5																							
7-Aug	Z	4.4	7.1	12.8	12.1	14.4	10.1	9.1	19.3	18.9	15.0	4.9	3.9	1.7	1.3	1.7	0.9	0.5	0.6	1.4	0.7	1.4	3.2	5.8	6.6	19.3																							
8-Aug	7.8	Z	4.8	3.4	2.9	1.7	1.5	2.9	1.2	0.4	4.1	2.6	3.5	2.0	1.4	1.9	2.4	2.4	3.8	2.1	8.0	8.2	2.6	0.4	3.1	8.2																							
9-Aug	0.5	0.3	Z	0.5	0.3	1.2	2.1	1.0	1.4	1.0	0.8	0.2	0.4	0.1	0.1	0.2	5.2	6.4	0.9	0.0	0.1	3.0	0.8	0.1	1.2	6.4																							
10-Aug	0.2	0.2	0.0	Z	1.2	3.7	4.5	1.6	0.7	2.7	6.1	2.1	1.4	0.6	0.7	1.1	2.1	3.1	5.1	1.5	1.2	1.1	1.4	0.7	1.9	6.1																							
11-Aug	2.1	2.4	4.2	7.0	Z	6.1	5.4	10.9	9.2	6.1	5.4	5.1	6.5	4.7	2.6	1.4	0.6	0.3	0.4	0.5	2.9	2.8	2.3	2.5	4.0	10.9																							
12-Aug	1.5	1.7	1.4	0.4	0.1	Z	0.2	0.1	0.3	0.2	0.4	0.0	0.2	0.1	2.5	0.8	0.8	3.8	0.9	0.4	0.5	0.3	0.2	0.6	0.8	3.8																							
13-Aug	Z	0.2	0.4	0.6	0.7	0.4	0.3	0.4	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3	1.2	1.4	0.4	2.3																							
14-Aug	8.6	Z	0.9	0.6	0.4	8.8	13.4	6.0	1.5	1.1	0.6	0.2	0.2	0.0	0.2	0.0	0.5	0.9	0.3	0.0	0.3	0.4	0.8	2.0	2.1	13.4																							
15-Aug	0.9	0.6	Z	1.1	1.2	1.3	0.8	2.1	3.1	1.7	2.0	1.2	2.1	2.4	0.3	0.2	0.1	0.1	2.6	9.5	12.7	9.6	5.8	7.9	3.0	12.7																							
16-Aug	17.1	18.7	2.9	Z	12.5	4.8	1.7	1.0	1.5	2.0	2.2	1.4	0.6	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.5	0.5	0.7	0.5	3.0	18.7																							
17-Aug	0.5	0.2	0.5	0.2	Z	0.6	1.1	1.4	0.6	0.4	0.3	0.2	0.2	0.0	0.3	0.1	1.0	1.9	0.8	5.5	6.8	1.4	11.2	18.0	2.3	18.0																							
18-Aug	23.6	10.1	8.2	3.3	10.0	Z	11.2	7.9	7.3	6.0	4.3	5.7	7.2	3.2	4.0	6.8	8.2	4.9	4.6	3.2	1.2	6.0	6.7	12.7	7.2	23.6																							
19-Aug	Z	0.9	0.7	0.3	0.0	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	0.1	0.0	0.0	0.1	0.9																							
20-Aug	0.0	Z	0.5	0.6	1.5	1.6	1.0	0.9	0.7	0.1	0.7	0.6	1.5	1.0	0.4	0.6	0.5	0.1	2.7	1.4	0.6	1.5	2.3	1.8	1.0	2.7																							
21-Aug	0.8	0.5	Z	0.3	0.9	0.9	1.6	1.4	0.9	0.7	0.6	0.7	0.1	0.1	0.1	0.2	0.5	0.4	0.5	0.9	1.4	1.7	2.8	3.6	0.9	3.6																							
22-Aug	1.4	2.6	1.2	Z	1.7	1.4	1.4	1.5	1.1	0.9	0.9	0.8	0.6	1.1	0.5	0.5	0.6	0.5	0.7	0.9	4.5	3.9	2.7	4.2	1.5	4.5																							
23-Aug	2.7	5.2	10.1	8.2	Z	15.7	14.3	16.7	16.8	23.4	26.5	17.6	17.6	17.8	23.9	26.5	22.9	17.6	11.5	6.1	6.8	8.2	3.9	3.9	14.1	26.5																							
24-Aug	5.7	5.6	2.3	1.1	0.4	Z	1.4	2.4	3.5	3.5	0.5	0.3	0.5	1.4	2.7	3.7	2.7	3.2	3.1	4.3	4.7	15.8	4.3	11.0	3.7	15.8																							
25-Aug	Z	2.7	2.8	3.6	3.5	2.4	2.3	2.5	1.2	C	C	C	C	C	C	0.5	0.4	0.4	0.5	0.4	0.3	0.4	0.6	0.6	--	3.6																							
26-Aug	0.5	Z	0.6	0.3	0.4	0.8	0.6	0.7	0.7	0.5	0.3	0.4	0.4	0.4	0.1	0.3	1.0	0.2	2.2	5.7	9.5	12.2	11.9	19.7	3.0	19.7																							
27-Aug	23.0	16.9	Z	8.7	3.7	1.4	1.5	2.1	2.1	6.3	11.4	7.3	6.7	3.6	1.6	1.2	0.9	0.9	0.9	1.0	1.0	1.5	1.1	1.2	4.6	23.0																							
28-Aug	1.3	6.1	6.8	Z	2.0	1.6	1.8	2.0	1.7	1.3	3.7	1.8	0.5	0.6	0.6	3.2	1.9	1.1	1.4	1.7	1.6	2.8	3.1	1.2	2.2	6.8																							
29-Aug	0.8	0.7	0.7	0.3	Z	1.4	2.3	2.8	1.6	2.6	3.0	2.1	1.7	0.7	0.4	0.3	0.5	1.1	0.4	0.5	0.5	1.0	2.5	3.6	1.4	3.6																							
30-Aug	2.5	2.0	0.8	1.4	0.8	Z	1.9	1.6	1.2	1.5	1.5	1.3	1.2	1.2	1.1	1.3	1.3	1.2	0.6	1.5	1.4	1.4	1.0	0.9	1.3	2.5																							
31-Aug	Z	2.3	3.5	2.2	1.4	0.8	2.1	1.4	0.7	0.6	1.3	0.9	0.8	1.2	3.1	2.0	1.0	3.0	7.2	5.5	3.7	9.2	6.8	16.7	3.4	16.7																							
																								4.8	3.6	2.6	2.5	2.7	2.9	2.9	2.8	3.3	3.6	4.2	2.6	2.4	1.8	1.9	2.1	2.3	2.1	2.1	2.5	3.2	3.8	3.3	4.6	Diurnal Average	
																								23.6	18.7	10.1	12.8	12.5	15.7	14.3	16.7	19.3	23.4	26.5	17.6	17.6	17.8	23.9	26.5	22.9	17.6	11.5	10.7	13.9	15.8	11.9	19.7	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
Buffalo Viewpoint - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	700	99.01	99.01
21 - 40	7	0.99	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
Buffalo Viewpoint - August 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	38	13	5	13	20	60	109	68	56	34	46	66	47	33	20	700
21 - 40	1	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	7
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	73	38	13	5	13	20	60	109	68	56	34	48	66	47	35	22	707

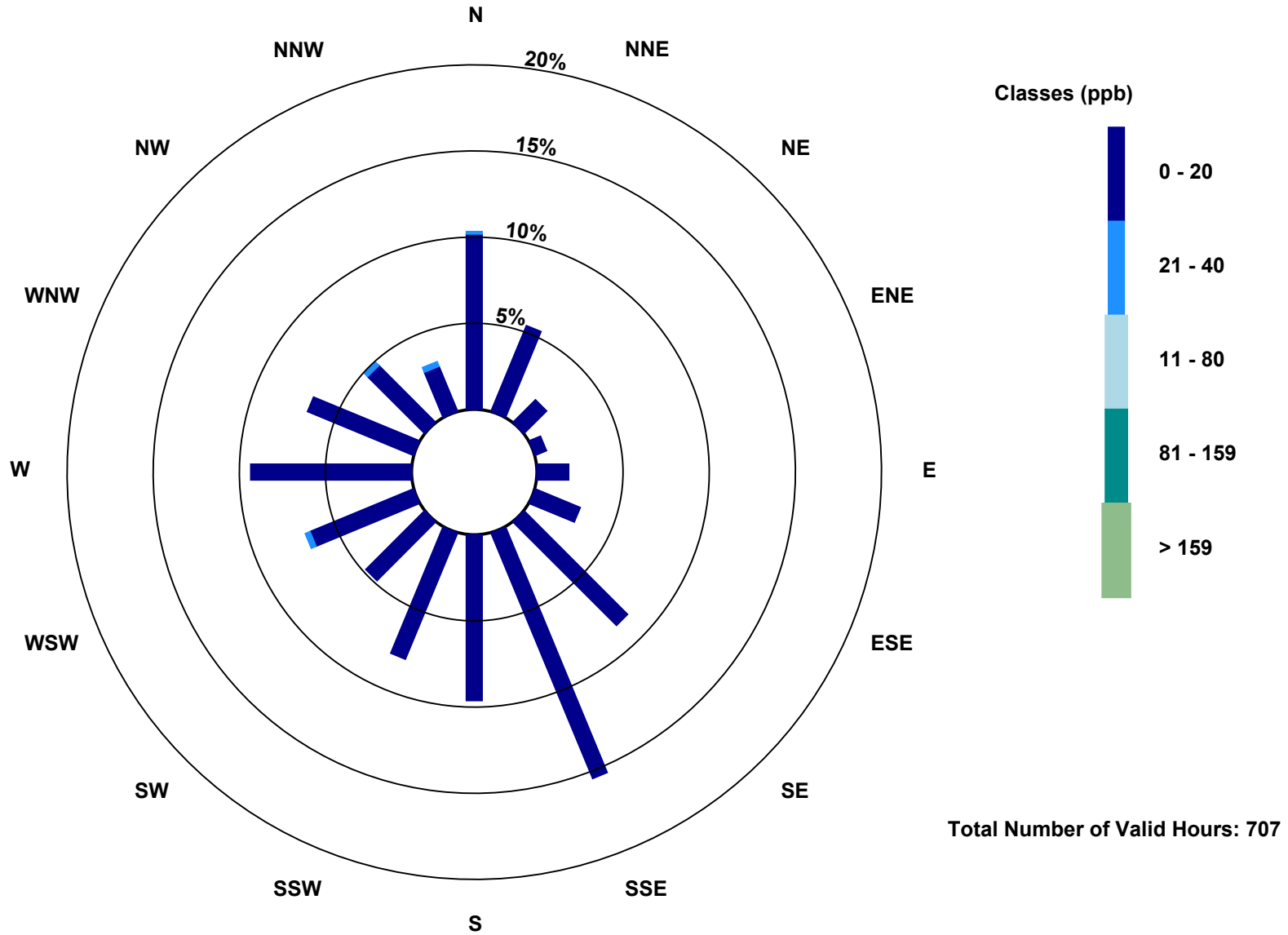
Total Number of Valid Hours: 707

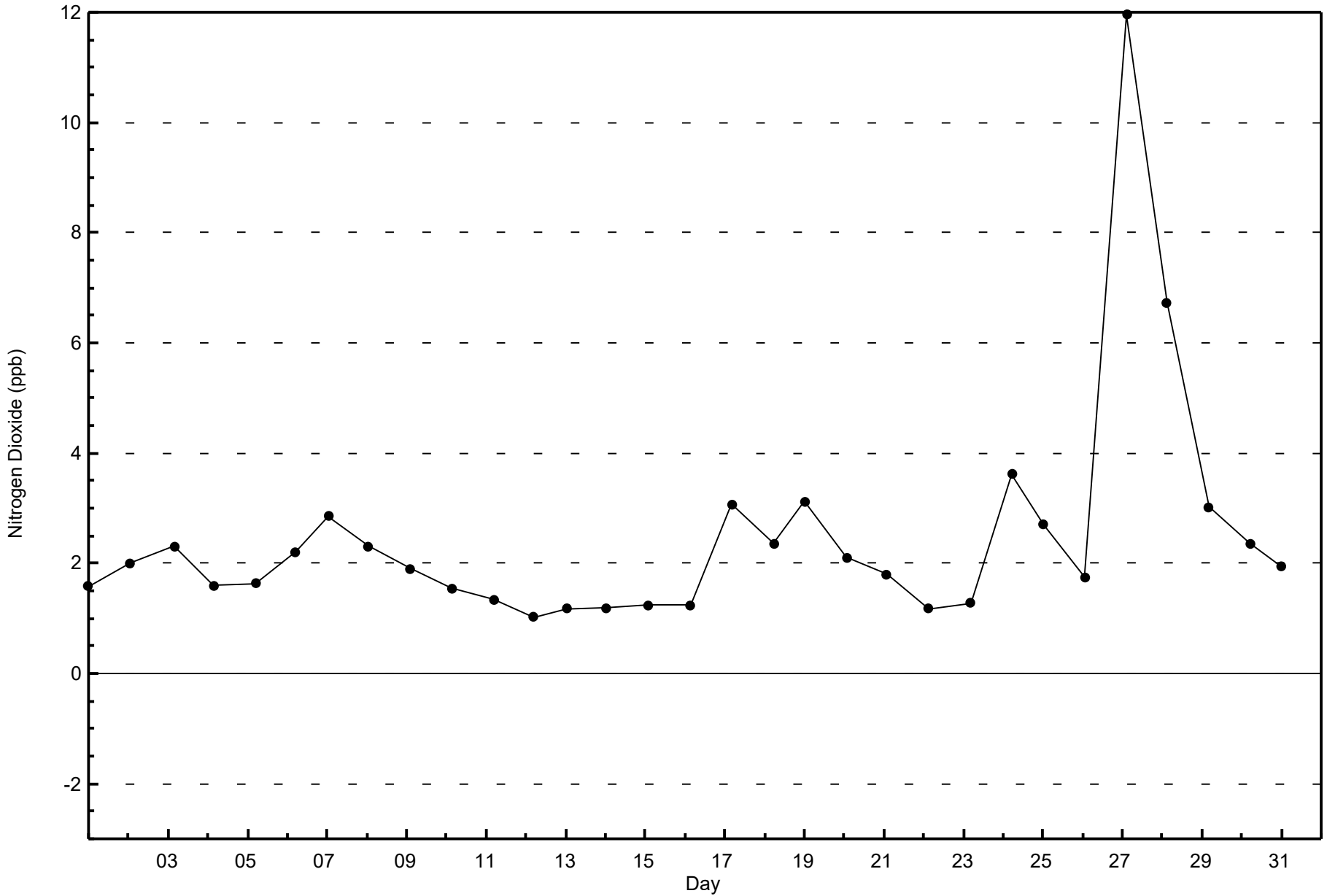
Total Number of Hours: 744

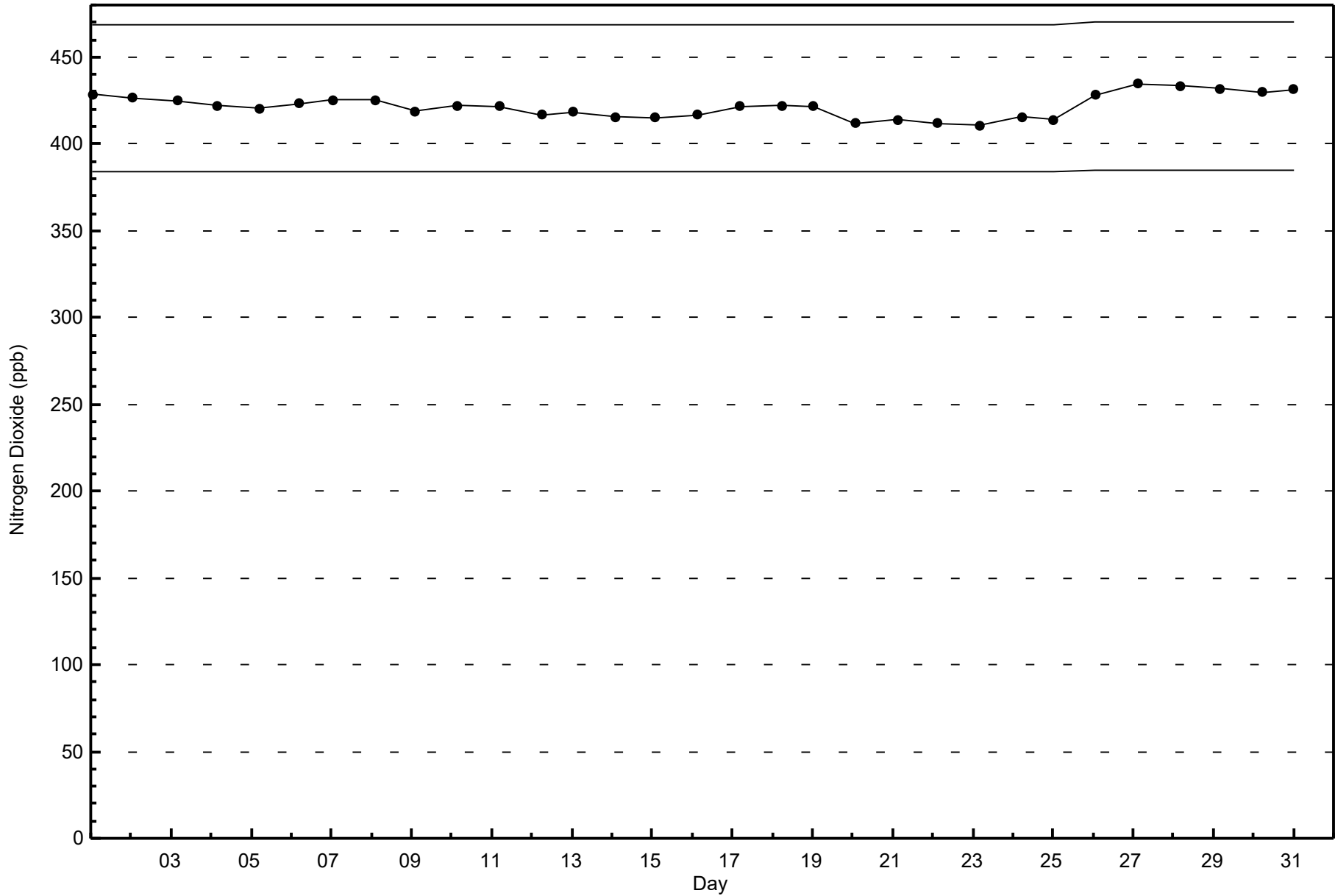


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association
Summary of Hour Averages

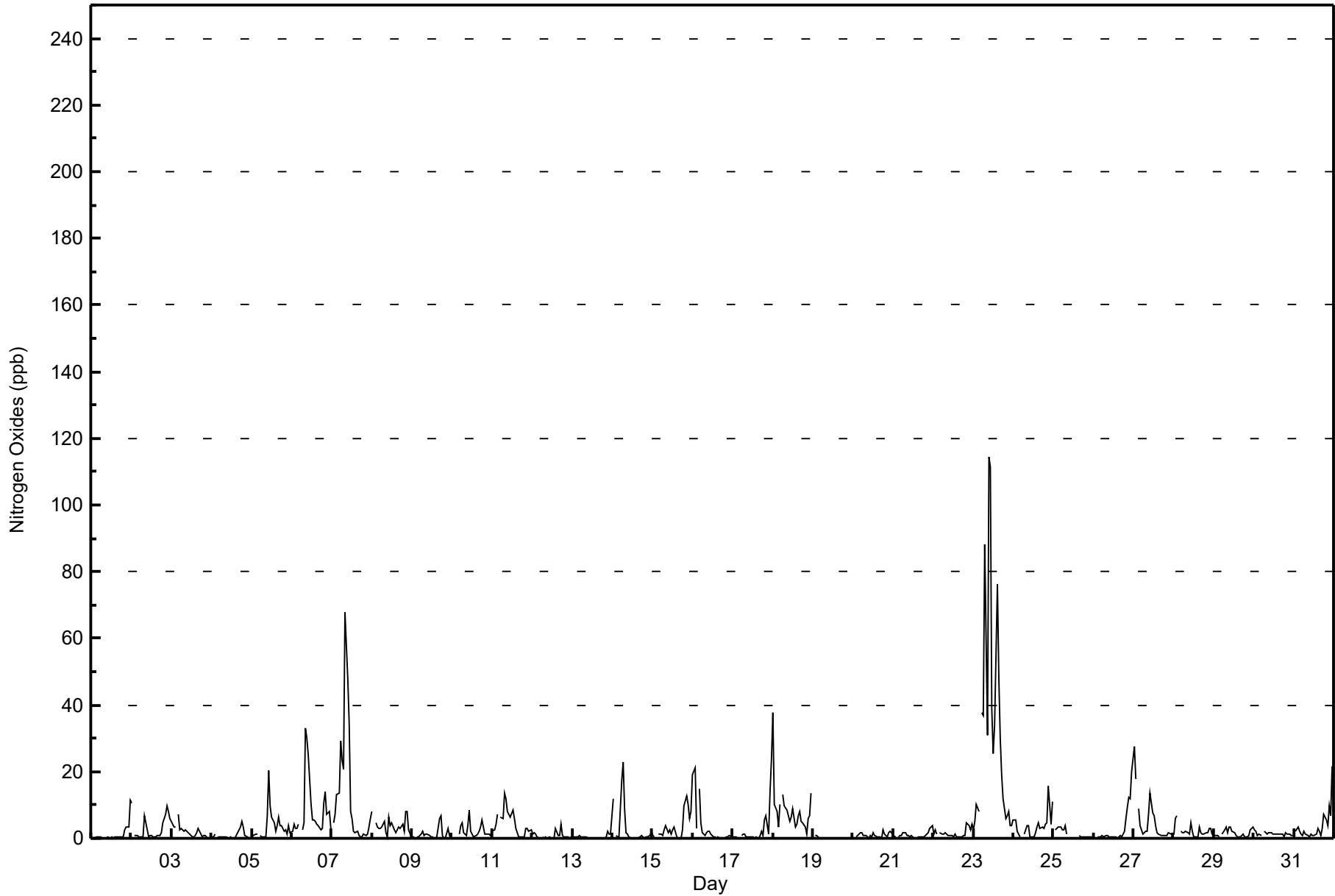
Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744						
Maximum Value: 114.2 ppb on Aug 23 10:00		Maximum Daily Average: 33.0 ppb on Aug 23																	707								
Minimum Value: 0.0 ppb on Aug 5 00:00		Minimum Daily Average: 0.1 ppb on Aug 19																	37								
Maximum Diurnal Average: 8.5 ppb at hour 11		Minimum Diurnal Average: 2.2 ppb at hour 19																	37								
Monthly Average: 4.02 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.5 Median = 1.4 Q ₃ = 3.6 P ₉₀ = 8.2 P ₉₉ = 38.9																	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-Aug	Z	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.5	0.4	0.4	0.6	0.4	0.5	2.5	3.6	3.4	11.5	1.2	11.5	
2-Aug	10.4	Z	0.6	0.7	0.4	0.2	0.4	0.4	6.9	2.6	0.5	0.9	0.7	0.6	0.5	0.6	0.7	0.8	1.5	4.7	7.1	9.6	8.0	5.9	2.8	10.4	
3-Aug	5.2	3.4	3.4	Z	7.2	2.6	2.9	2.2	2.6	2.3	1.7	1.2	0.6	0.5	0.8	1.6	3.0	2.0	0.6	0.7	0.8	0.5	0.1	0.1	2.0	7.2	
4-Aug	0.2	0.2	1.2	Z	0.4	0.3	0.4	0.4	0.4	0.4	0.1	0.3	0.2	0.1	0.0	0.6	2.4	3.4	5.0	3.6	0.7	0.3	0.1	0.0	0.9	5.0	
5-Aug	0.5	0.7	1.1	1.2	Z	0.7	0.6	0.3	0.3	6.6	20.4	9.8	6.4	4.8	2.2	3.7	6.6	3.6	3.6	2.2	2.4	1.4	4.0	1.6	3.7	20.4	
6-Aug	2.2	4.4	3.1	3.1	4.4	Z	2.5	4.8	33.2	30.1	25.2	10.2	5.7	5.7	5.0	4.3	3.7	2.5	3.2	10.8	14.1	7.0	7.9	2.9	8.5	33.2	
7-Aug	Z	4.5	7.2	13.3	13.6	29.0	23.4	20.7	67.8	47.8	34.5	8.1	5.8	2.1	1.5	2.0	0.9	0.5	0.6	1.4	0.7	1.4	3.2	5.8	12.9	67.8	
8-Aug	7.9	Z	4.8	3.4	2.9	2.8	3.5	5.1	1.8	0.4	6.2	3.7	4.6	2.5	1.8	2.5	3.2	2.8	4.3	2.1	8.0	8.2	2.6	0.4	3.7	8.2	
9-Aug	0.5	0.3	Z	0.5	0.3	1.2	2.2	1.0	1.4	1.1	0.9	0.2	0.4	0.1	0.1	0.2	5.9	6.9	0.9	0.0	0.1	3.0	0.8	0.1	1.2	6.9	
10-Aug	0.2	0.2	0.0	Z	1.2	3.7	4.6	1.6	0.7	3.7	8.5	2.3	1.5	0.6	0.7	1.1	2.2	3.3	5.4	1.5	1.2	1.1	1.4	0.7	2.1	8.5	
11-Aug	2.1	2.4	4.2	7.0	Z	6.4	5.9	13.5	11.7	8.0	7.2	6.5	8.6	6.0	3.2	1.5	0.6	0.3	0.4	0.5	2.9	2.8	2.3	2.5	4.6	13.5	
12-Aug	1.5	1.7	1.4	0.4	0.1	Z	0.2	0.1	0.3	0.2	0.5	0.0	0.2	0.1	3.0	0.8	0.8	4.4	0.9	0.4	0.5	0.3	0.2	0.6	0.8	4.4	
13-Aug	Z	0.3	0.4	0.6	0.7	0.4	0.3	0.4	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3	1.2	1.4	0.4	2.3		
14-Aug	11.8	Z	0.9	0.6	0.4	17.2	22.8	9.0	1.5	1.1	0.6	0.2	0.2	0.0	0.2	0.0	0.5	1.1	0.3	0.0	0.3	0.4	0.8	2.0	3.1	22.8	
15-Aug	0.9	0.6	Z	1.2	1.2	1.3	1.0	2.6	3.7	1.9	2.4	1.4	2.4	3.6	0.3	0.2	0.1	0.1	2.6	9.8	12.9	10.0	5.8	7.9	3.2	12.9	
16-Aug	19.0	21.3	2.9	Z	14.8	4.8	1.7	1.0	1.5	2.1	2.2	1.4	0.6	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.5	0.5	0.7	0.5	3.3	21.3	
17-Aug	0.5	0.2	0.5	0.2	Z	0.6	1.1	1.5	0.6	0.4	0.3	0.2	0.2	0.0	0.3	0.1	1.0	1.9	0.8	5.5	6.8	1.4	13.8	23.9	2.7	23.9	
18-Aug	37.5	10.1	8.2	3.3	10.0	Z	13.0	9.6	8.5	6.8	5.1	6.5	9.0	3.3	4.2	6.9	8.3	5.0	4.6	3.2	1.2	6.0	6.7	13.8	8.3	37.5	
19-Aug	Z	0.9	0.7	0.3	0.0	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	0.1	0.0	0.0	0.1	0.9	
20-Aug	0.0	Z	0.5	0.6	1.5	1.6	1.0	0.9	0.7	0.1	0.7	0.6	1.6	1.0	0.4	0.6	0.5	0.1	2.7	1.4	0.6	1.5	2.3	1.8	1.0	2.7	
21-Aug	0.8	0.5	Z	0.3	0.9	0.9	1.7	1.6	0.9	0.7	0.6	0.7	0.1	0.1	0.1	0.2	0.5	0.4	0.5	0.9	1.4	1.7	2.8	3.6	1.0	3.6	
22-Aug	1.4	2.6	1.2	Z	1.7	1.4	1.4	1.6	1.1	0.9	0.9	0.8	0.6	1.1	0.5	0.5	0.6	0.5	0.7	0.9	4.5	3.9	2.7	4.2	1.5	4.5	
23-Aug	2.7	5.2	10.1	8.2	Z	37.5	37.0	88.0	31.1	114.2	111.5	39.0	25.4	33.8	76.1	48.2	30.0	19.2	12.0	6.1	6.8	8.2	3.9	3.9	33.0	114.2	
24-Aug	5.7	5.6	2.3	1.1	0.4	Z	1.4	2.4	3.8	4.0	0.5	0.3	0.5	1.5	3.5	4.5	2.8	3.3	3.1	4.3	4.7	15.8	4.3	11.1	3.8	15.8	
25-Aug	Z	2.7	2.8	3.6	3.5	2.4	2.6	3.9	1.4	C	C	C	C	C	C	0.7	0.4	0.4	0.5	0.4	0.3	0.4	0.6	0.6	--	3.9	
26-Aug	0.5	Z	0.6	0.3	0.4	0.8	0.6	0.7	0.7	0.5	0.3	0.4	0.4	0.4	0.1	0.3	1.0	0.2	2.2	5.7	9.5	12.2	11.9	19.9	3.0	19.9	
27-Aug	27.6	17.8	Z	9.1	3.7	1.4	1.5	2.2	2.2	7.2	13.4	7.8	6.9	3.6	1.6	1.2	0.9	0.9	0.9	1.0	1.0	1.5	1.1	1.2	5.0	27.6	
28-Aug	1.3	6.1	6.8	Z	2.0	1.6	1.8	2.1	1.7	1.3	4.7	1.9	0.5	0.6	0.6	3.2	1.9	1.1	1.4	1.7	1.6	2.8	3.1	1.2	2.2	6.8	
29-Aug	0.8	0.7	0.7	0.3	Z	1.4	2.5	3.5	1.9	3.3	3.5	2.1	1.7	0.7	0.4	0.3	0.5	1.1	0.4	0.5	0.5	1.0	2.5	3.6	1.5	3.6	
30-Aug	2.5	2.0	0.8	1.4	0.8	Z	2.0	1.6	1.2	1.5	1.5	1.3	1.2	1.2	1.1	1.3	1.3	1.2	0.6	1.5	1.4	1.4	1.0	0.9	1.3	2.5	
31-Aug	Z	2.3	3.5	2.2	1.4	0.8	2.2	1.4	0.7	0.6	1.3	0.9	0.8	1.2	3.1	2.0	1.0	3.0	7.2	5.5	3.7	9.5	6.9	21.4	3.6	21.4	
		5.8	3.7	2.6	2.5	2.9	4.7	4.6	5.9	6.2	8.3	8.5	3.6	2.9	2.5	3.7	2.9	2.6	2.3	2.2	2.5	3.2	3.9	3.4	5.0	Diurnal Average	
		37.5	21.3	10.1	13.3	14.8	37.5	37.0	88.0	67.8	114.2	111.5	39.0	25.4	33.8	76.1	48.2	30.0	19.2	12.0	10.8	14.1	15.8	13.8	23.9	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	96.18	96.18
21 - 40	20	2.83	99.01
41 - 80	4	0.57	99.58
81 - 159	3	0.42	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
Buffalo Viewpoint - August 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	67	37	12	5	13	20	60	107	68	56	34	46	65	43	27	20	680
21 - 40	5	1	1	0	0	0	0	2	0	0	0	1	1	2	6	1	20
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	4
81 - 159	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	38	13	5	13	20	60	109	68	56	34	48	66	47	35	22	707

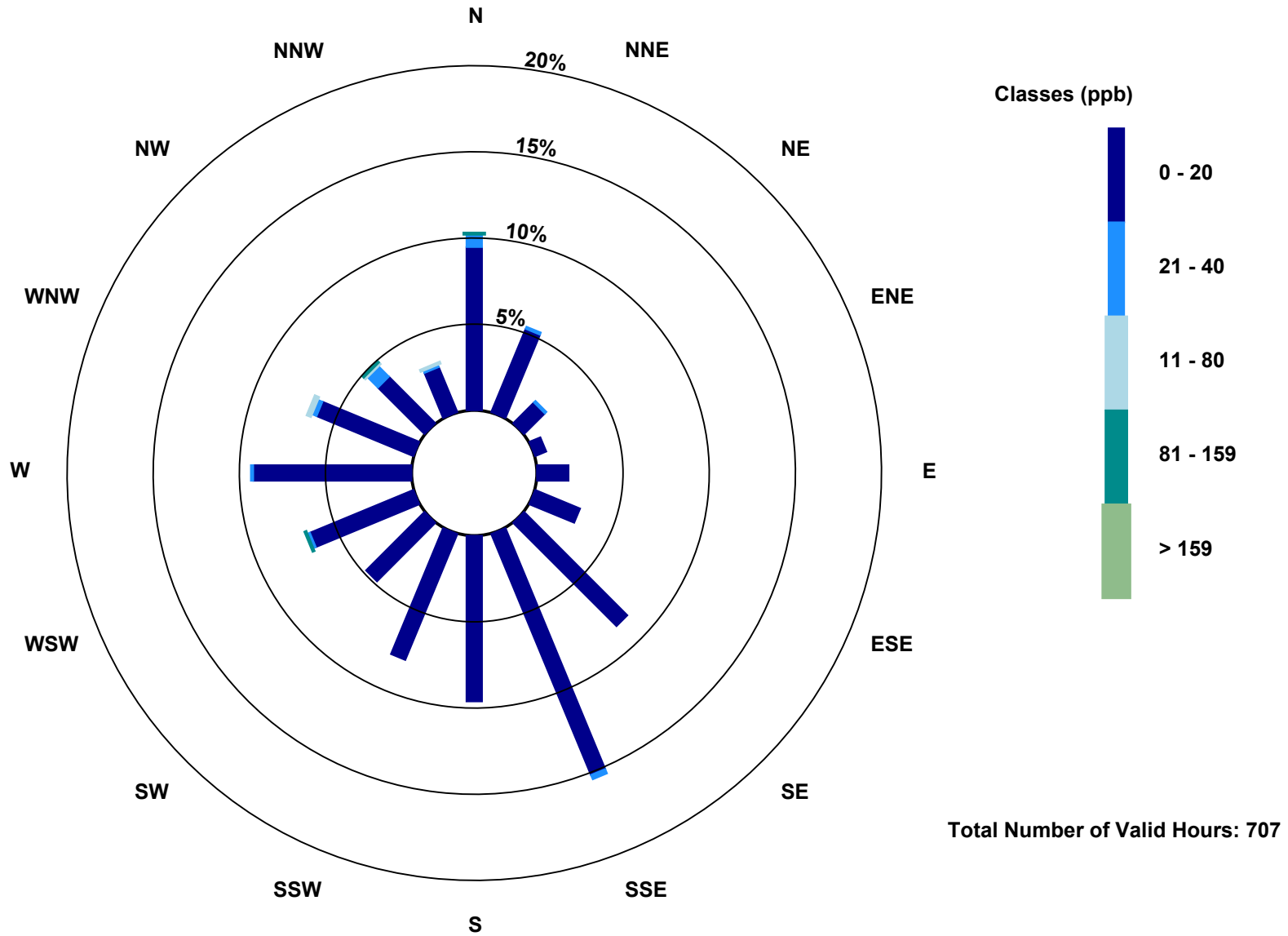
Total Number of Valid Hours: 707

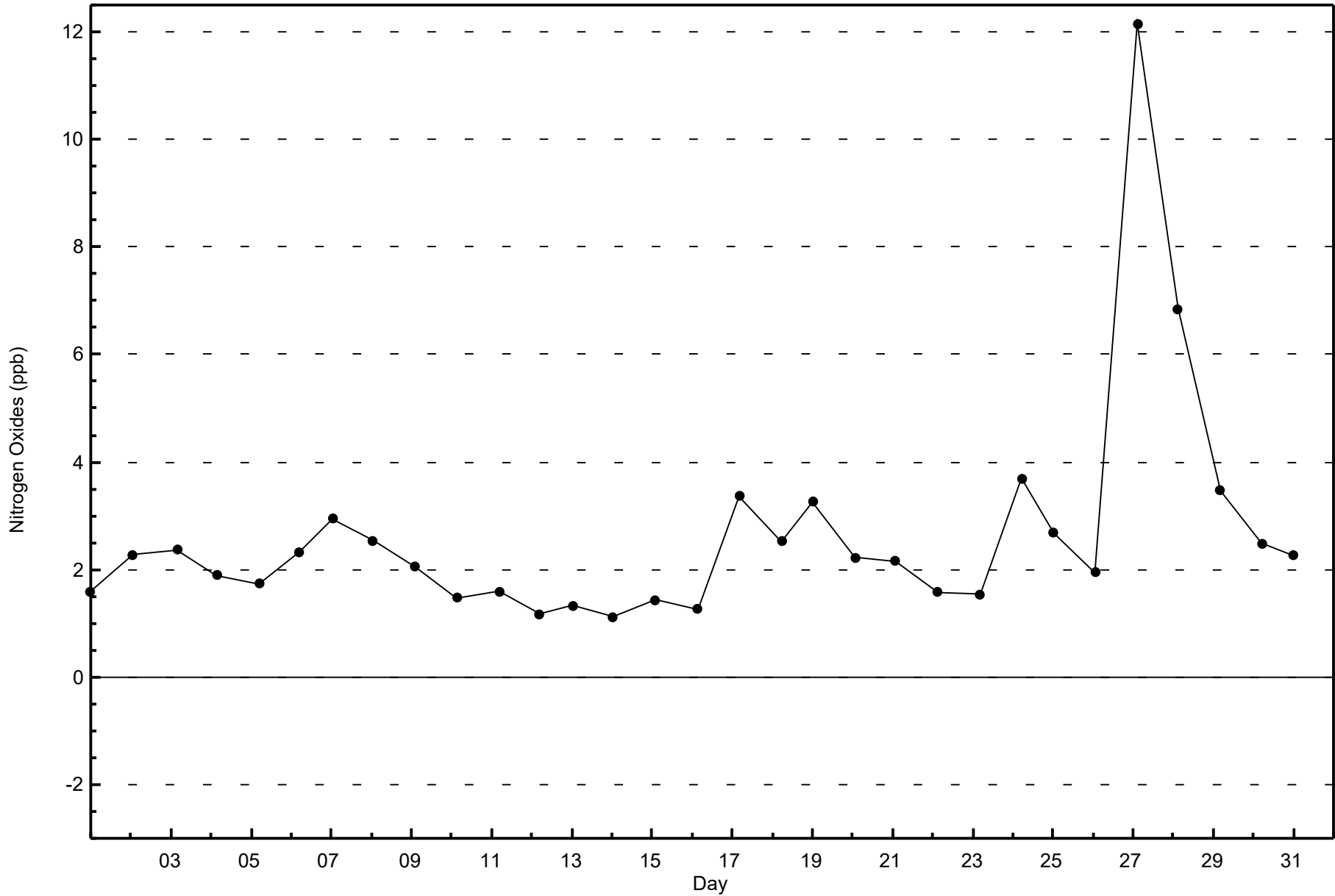
Total Number of Hours: 744

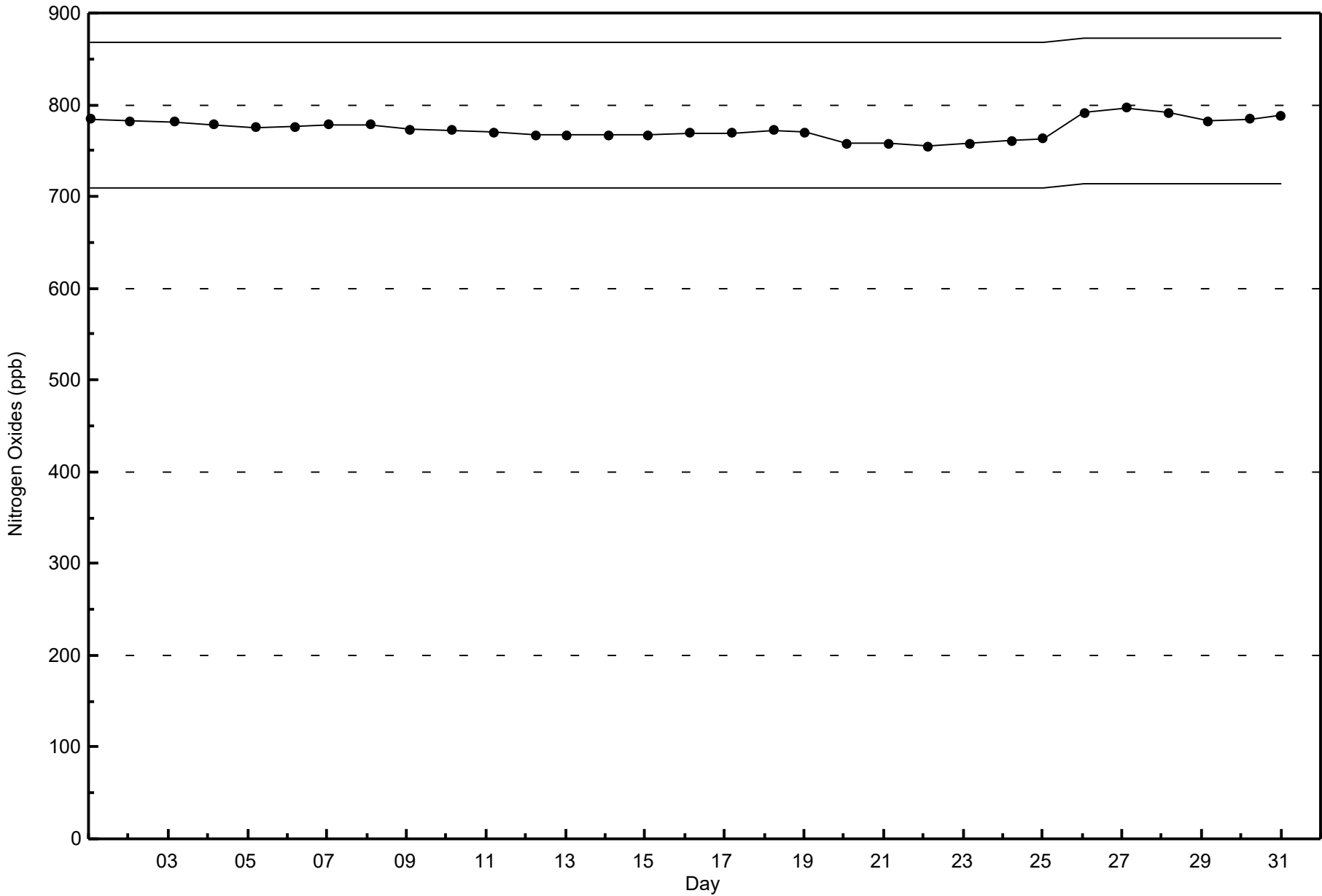


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Buffalo Viewpoint









Wood Buffalo Environmental Association

Summary of Hour Averages

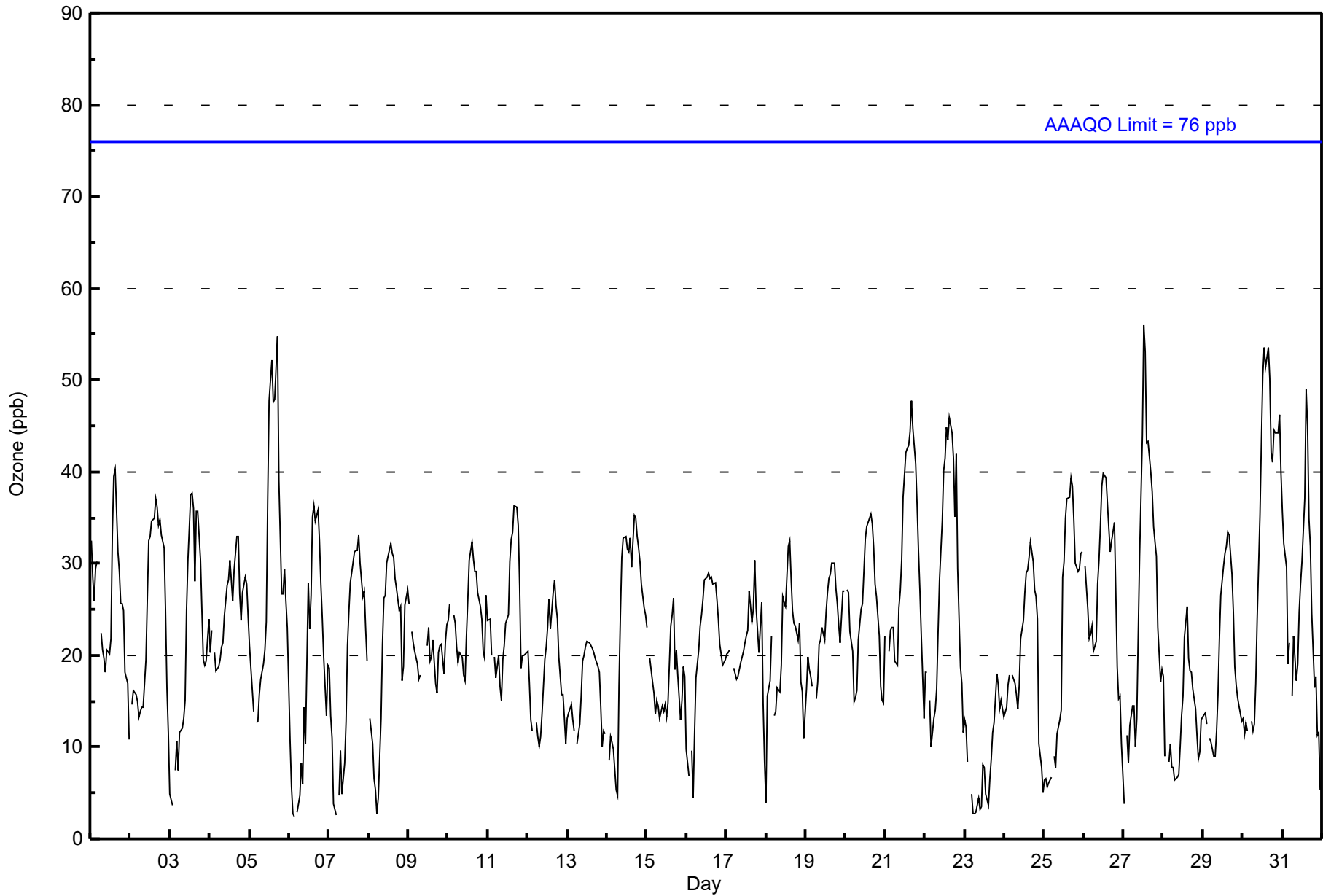
Ozone (O₃) - ppb

Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 55.9 ppb on Aug 27 13:00	Maximum Daily Average: 33.3 ppb on Aug 30		Hours of Data:	710
Minimum Value: 2.5 ppb on Aug 6 04:00	Minimum Daily Average: 8.7 ppb on Aug 23		Hours of Missing Data:	34
Maximum Diurnal Average: 32.5 ppb at hour 15	Minimum Diurnal Average: 13.2 ppb at hour 6		Hours of Calibration:	34
Monthly Average: 22.40 ppb	Percentiles: P ₁ = 2.9 P ₁₀ = 10.1 Q ₁ = 14.9 Median = 21.3 Q ₃ = 29.0 P ₉₀ = 35.3 P ₉₉ = 51.3		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-Aug	32.6	28.6	25.9	29.5	30.2	Z	22.4	20.7	19.7	18.2	20.5	20.1	21.8	33.2	39.5	40.3	31.2	29.1	25.6	25.6	24.9	18.2	17.0	10.9	25.5	40.3																							
2-Aug	Z	14.7	16.2	15.7	15.0	13.3	13.9	14.3	14.4	19.5	26.3	32.5	33.0	34.6	35.0	37.0	36.1	34.1	34.8	33.2	31.8	24.9	16.5	11.6	24.3	37.0																							
3-Aug	4.9	3.7	Z	7.5	10.8	7.5	11.6	12.1	13.1	15.1	24.9	30.4	37.5	37.7	36.0	28.1	35.7	35.7	30.3	24.9	19.5	19.0	19.3	23.9	21.3	37.7																							
4-Aug	20.2	22.7	Z	20.3	18.3	18.8	19.5	20.8	21.3	24.3	27.6	28.2	30.4	28.3	26.0	29.3	33.0	33.0	26.7	23.8	26.8	28.6	27.8	24.2	25.2	33.0																							
5-Aug	21.0	18.6	13.8	Z	12.7	12.8	15.6	17.4	19.1	20.6	23.6	37.0	47.7	52.1	47.6	48.0	51.4	54.7	39.0	26.7	26.7	29.4	26.0	23.0	29.8	54.7																							
6-Aug	10.6	5.7	2.8	2.5	Z	2.9	4.7	8.2	5.9	14.3	10.4	28.0	22.9	26.5	35.1	36.3	34.7	35.8	32.4	27.7	24.1	19.8	13.4	18.9	18.4	36.3																							
7-Aug	18.6	13.4	10.9	3.9	2.6	Z	4.8	9.5	4.9	8.2	12.8	21.1	24.7	27.9	29.0	31.3	31.4	31.5	33.1	30.0	26.5	26.9	22.9	19.4	19.4	33.1																							
8-Aug	Z	13.1	10.4	6.6	5.3	2.7	4.4	13.2	21.2	26.3	26.5	30.1	30.8	32.3	31.1	30.6	28.4	27.3	24.8	25.3	17.2	18.8	25.4	27.1	20.8	32.3																							
9-Aug	25.6	Z	22.5	21.4	20.5	19.1	17.4	17.8	C	C	C	21.1	23.0	19.4	19.9	21.7	17.0	15.8	20.3	21.0	21.2	18.0	21.5	23.4	20.4	25.6																							
10-Aug	23.8	25.7	Z	24.3	23.5	20.9	19.2	20.3	19.9	17.8	17.3	22.1	26.1	30.4	32.3	30.5	29.2	29.1	26.9	25.3	24.0	20.5	19.6	26.5	24.1	32.3																							
11-Aug	23.8	23.9	19.9	Z	19.8	17.5	20.0	16.6	15.1	19.5	21.1	23.5	24.5	30.3	32.7	33.4	36.4	36.2	34.2	27.6	18.6	20.0	20.0	20.3	24.1	36.4																							
12-Aug	20.4	17.0	13.0	11.7	Z	12.6	11.1	10.1	11.1	13.6	19.5	20.9	23.0	26.0	22.9	26.9	28.3	25.5	24.0	19.9	15.7	15.7	13.1	10.4	17.9	28.3																							
13-Aug	13.1	13.7	14.7	13.0	11.7	Z	10.3	12.4	15.5	19.4	19.9	20.9	21.5	21.3	21.1	20.8	20.4	19.7	18.8	18.1	14.4	10.0	11.8	11.4	16.2	21.5																							
14-Aug	Z	8.6	11.2	10.5	9.8	5.4	4.7	16.6	24.2	30.7	32.8	33.0	31.5	31.2	32.7	29.5	35.3	35.0	33.0	31.7	30.3	27.7	25.1	24.4	24.1	35.3																							
15-Aug	23.0	Z	19.7	17.1	15.9	13.5	15.0	14.4	13.1	14.5	13.9	14.6	13.2	14.8	23.1	24.5	26.2	18.4	20.6	17.8	12.9	15.1	18.8	17.7	17.3	26.2																							
16-Aug	9.8	6.9	Z	9.7	4.5	11.5	17.6	20.5	23.1	24.3	26.1	28.2	28.5	29.0	28.4	28.5	27.8	27.8	26.1	23.9	21.2	20.1	18.9	19.5	21.0	29.0																							
17-Aug	20.1	20.3	20.6	Z	18.6	18.0	17.4	17.6	18.4	19.2	20.4	21.4	22.1	22.8	27.0	23.7	25.0	30.3	25.2	22.7	20.2	25.9	14.7	8.5	20.9	30.3																							
18-Aug	4.0	15.6	17.3	22.0	Z	13.4	14.0	16.5	16.0	18.9	26.4	25.8	25.4	31.8	32.5	28.4	24.9	23.5	23.2	21.7	23.5	17.0	16.0	10.9	20.4	32.5																							
19-Aug	16.4	19.8	18.5	17.7	16.6	Z	15.2	17.0	21.1	21.6	23.1	21.6	24.7	26.8	28.3	28.8	30.1	30.0	27.3	25.7	23.3	21.4	27.0	26.9	23.0	30.1																							
20-Aug	Z	27.2	26.9	22.6	20.5	14.9	15.5	16.2	21.6	25.1	25.6	29.2	32.6	34.1	34.9	35.3	34.4	31.7	27.8	26.4	22.1	16.6	15.1	14.8	24.8	35.3																							
21-Aug	22.1	Z	20.5	22.7	23.0	23.0	19.3	18.9	25.1	27.0	30.3	37.2	42.2	42.5	42.8	44.4	47.7	44.7	40.9	36.4	31.4	27.2	22.3	13.2	30.6	47.7																							
22-Aug	18.1	18.1	Z	15.1	10.1	13.1	14.1	16.4	22.4	28.1	34.6	40.1	41.5	44.8	43.5	46.0	44.3	41.6	35.0	42.0	29.4	18.8	16.9	11.5	28.1	46.0																							
23-Aug	13.0	12.3	8.4	Z	5.0	2.7	2.9	4.5	3.2	3.5	8.0	7.7	4.9	3.7	6.6	8.7	11.5	12.7	17.9	16.8	14.3	15.2	14.1	8.7	8.7	17.9																							
24-Aug	13.3	14.3	16.8	17.9	Z	17.9	17.0	15.7	14.2	16.7	21.9	23.8	26.8	29.0	29.3	30.6	32.3	30.1	27.2	26.4	24.0	10.4	7.7	5.0	20.4	32.3																							
25-Aug	6.4	6.6	5.7	6.1	6.7	Z	9.0	7.8	11.4	13.0	14.0	28.5	30.2	34.9	37.1	37.3	39.3	38.5	34.7	30.1	29.1	29.5	31.1	31.3	22.5	39.3																							
26-Aug	Z	29.8	25.1	21.9	22.3	23.1	20.5	21.6	27.8	30.3	34.1	38.4	39.8	39.4	36.7	33.8	31.3	32.4	34.4	26.9	18.7	15.2	15.5	10.4	27.4	39.8																							
27-Aug	3.8	Z	11.3	8.2	12.4	14.5	14.5	10.1	13.1	22.1	30.7	43.9	55.9	53.2	43.2	43.3	39.9	37.9	34.0	32.3	30.8	23.1	17.1	18.4	26.7	55.9																							
28-Aug	17.8	8.9	Z	8.3	10.3	7.8	7.7	6.4	6.8	7.1	10.1	13.4	15.6	22.0	25.4	19.7	18.2	18.1	16.4	14.2	11.3	8.7	9.4	13.0	12.9	25.4																							
29-Aug	13.3	13.7	12.6	Z	11.0	10.5	9.0	9.0	11.8	15.7	21.7	26.6	29.8	31.1	31.9	33.4	33.2	28.8	24.8	18.8	16.8	15.4	14.5	12.8	19.4	33.4																							
30-Aug	13.2	11.5	12.6	11.7	Z	12.8	11.7	12.5	16.9	23.9	35.2	43.1	50.5	53.5	51.4	53.6	50.2	42.0	41.0	44.6	44.2	44.2	46.3	39.9	33.3	53.6																							
31-Aug	35.8	32.2	29.6	19.1	21.4	Z	15.5	22.1	17.2	19.1	24.8	27.8	30.1	37.1	48.9	45.1	34.9	31.9	24.5	16.5	17.7	11.3	11.6	5.3	25.2	48.9																							
																								17.1	16.5	16.3	14.9	14.6	13.2	13.4	14.7	16.3	19.2	22.7	27.1	29.5	31.7	32.5	32.5	32.2	31.0	28.4	26.0	23.1	20.4	19.3	17.7	Diurnal Average	
																								35.8	32.2	29.6	29.5	30.2	23.1	22.4	22.1	27.8	30.7	35.2	43.9	55.9	53.5	51.4	53.6	51.4	54.7	41.0	44.6	44.2	44.2	46.3	39.9	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
Buffalo Viewpoint - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	330	46.48	46.48
21 - 50	371	52.25	98.73
51 - 82	9	1.27	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
Buffalo Viewpoint - August 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	39	15	7	3	3	6	25	74	37	23	11	15	27	17	17	11	330
21 - 50	34	20	7	2	11	14	32	38	30	32	25	33	35	29	18	11	371
51 - 82	0	2	0	0	0	0	1	2	1	2	0	0	0	0	1	0	9
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	37	14	5	14	20	58	114	68	57	36	48	62	46	36	22	710

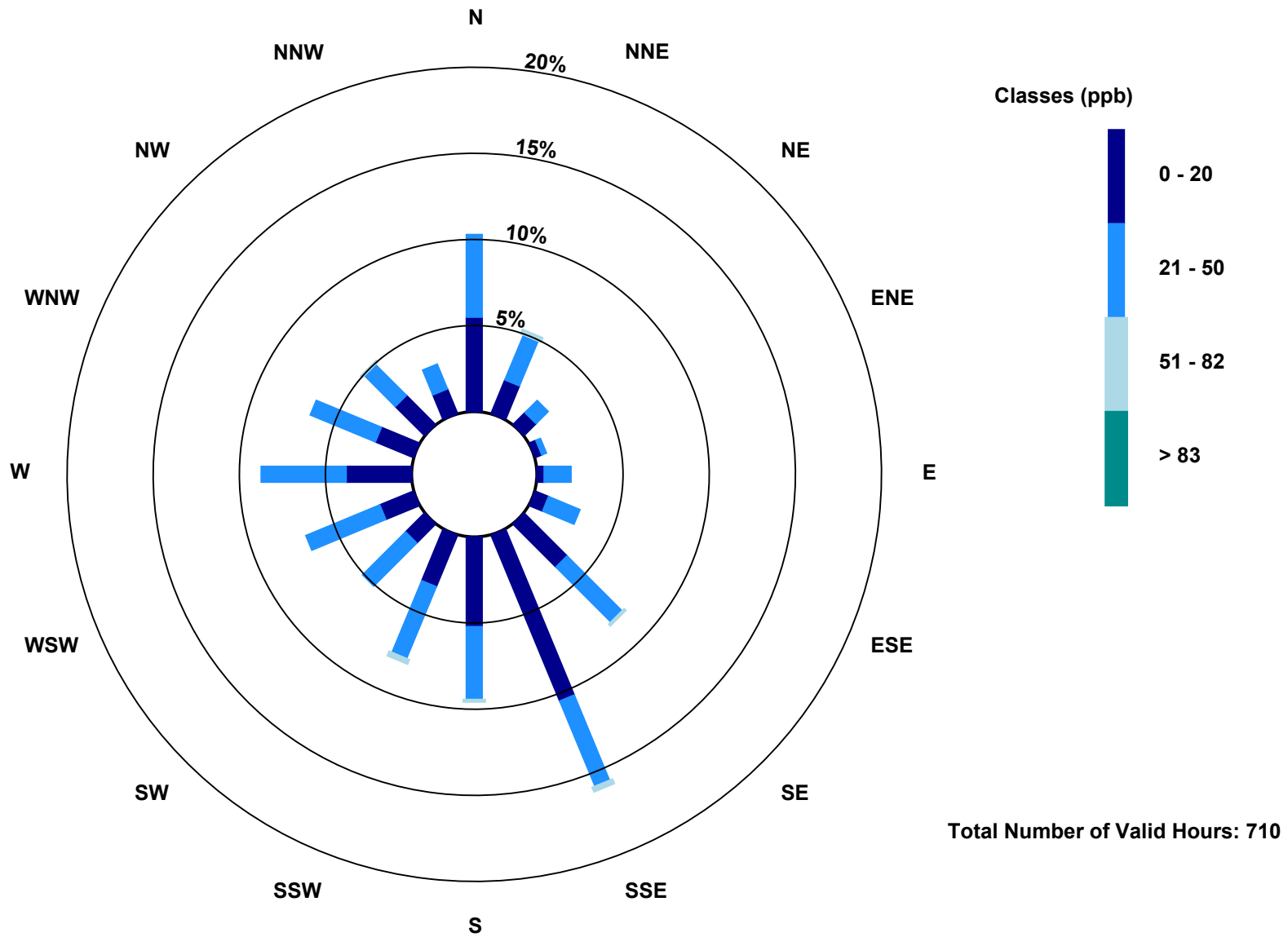
Total Number of Valid Hours: 710

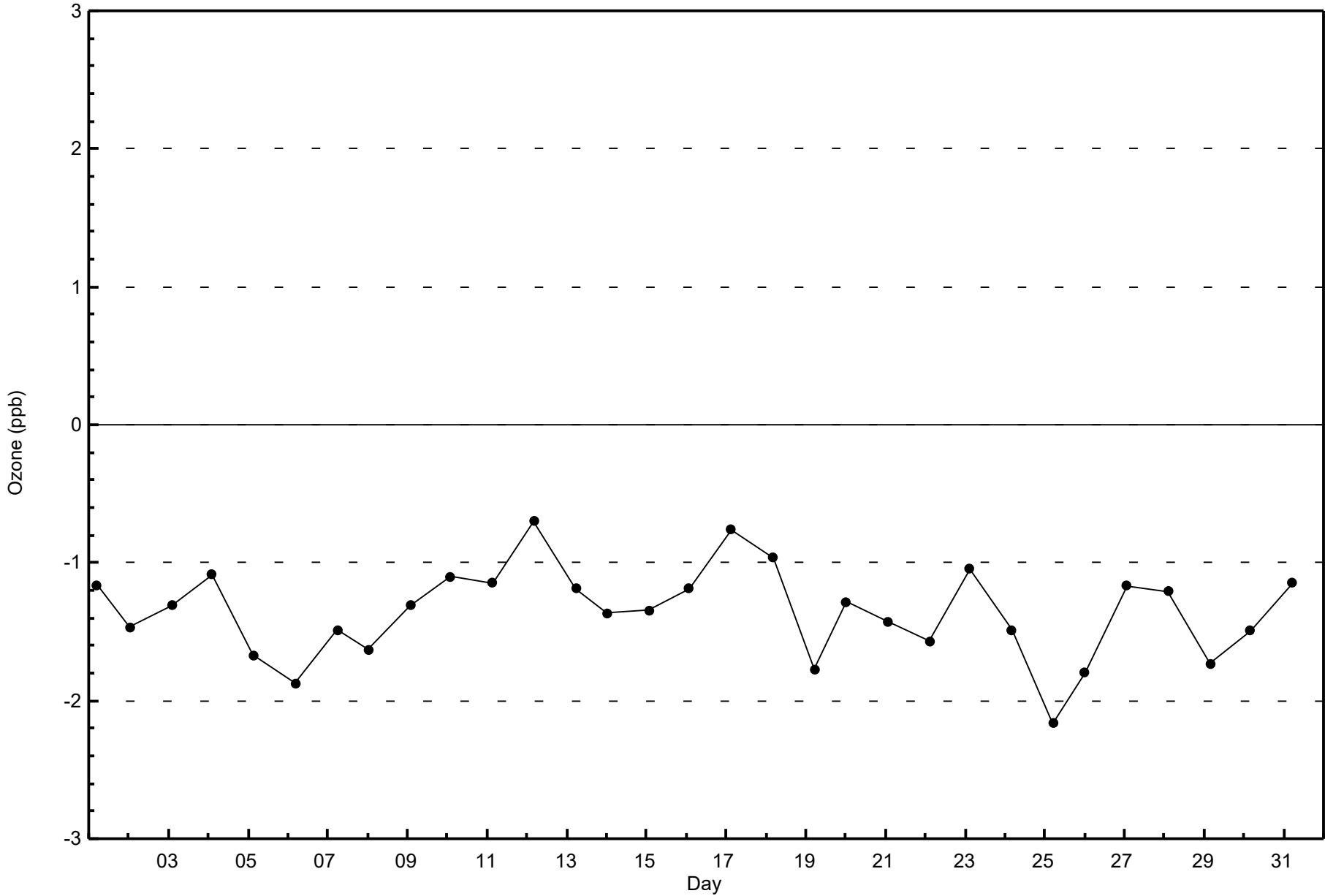
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Buffalo Viewpoint

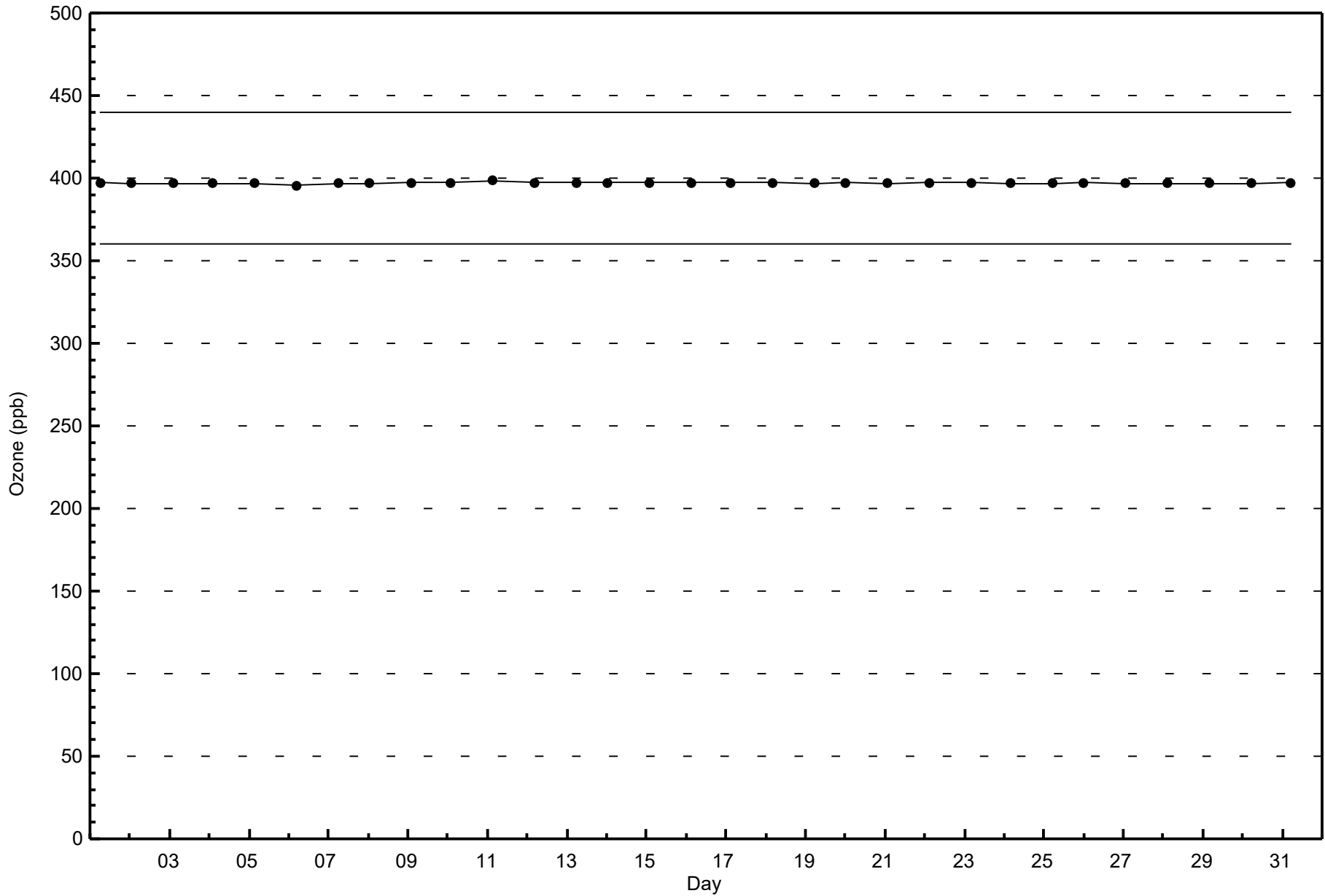






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Buffalo Viewpoint - August 2023





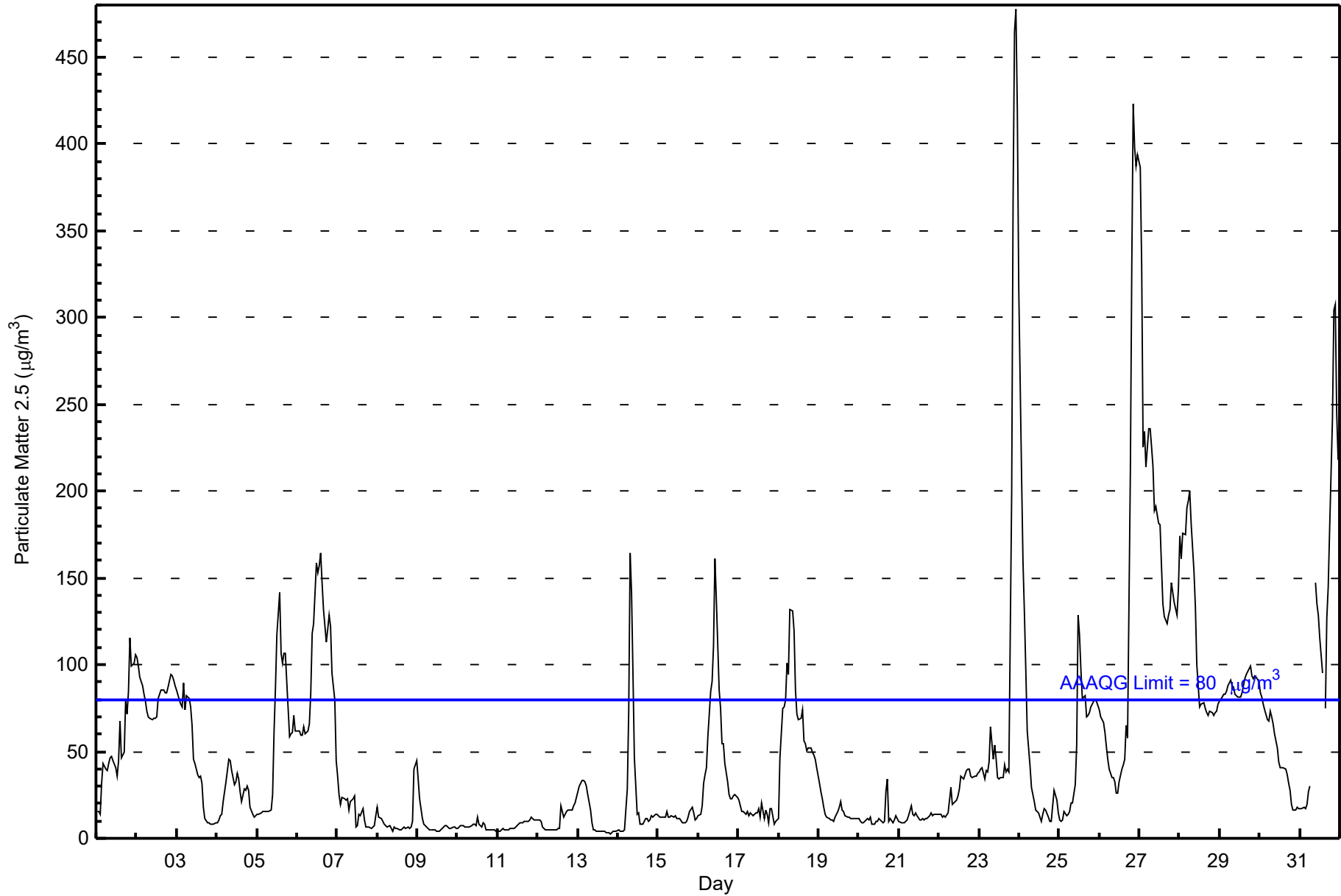
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO):		1-hr: 158		24-hr: 17		Hours in Service:		744																		
Maximum Value: 477.4 µg/m ³ on Aug 23 23:00		Maximum Daily Average: 189.3 µg/m ³ on Aug 27				Hours of Data:		741																		
Minimum Value: 2.7 µg/m ³ on Aug 13 20:00		Minimum Daily Average: 6.7 µg/m ³ on Aug 10				Hours of Missing Data:		3																		
Maximum Diurnal Average: 71.2 µg/m ³ at hour 22		Minimum Diurnal Average: 42.0 µg/m ³ at hour 16				Hours of Calibration:		2																		
Monthly Average: 51.37 µg/m ³		Percentiles: P ₁ = 3.7 P ₁₀ = 6.2 Q ₁ = 11.0 Median = 24.3 Q ₃ = 73.1 P ₉₀ = 124.0 P ₉₉ = 378.9				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-Aug	15.8	15.4	13.7	31.9	43.4	39.7	39.4	43.1	46.0	47.0	44.6	40.5	35.9	45.0	67.5	46.7	49.4	80.1	71.4	84.3	115.6	99.4	100.6	105.6	55.1	115.6
2-Aug	104.0	99.7	92.7	87.6	82.7	78.8	72.9	70.2	68.9	68.6	69.2	68.8	70.4	80.3	85.1	85.8	85.3	83.6	84.1	87.1	94.6	93.5	90.8	88.1	83.0	104.0
3-Aug	85.8	80.0	77.3	76.0	89.3	74.2	82.3	80.8	75.6	65.2	45.4	43.3	36.7	35.0	35.4	31.6	17.8	11.0	9.1	8.9	8.2	8.4	8.2	8.8	45.6	89.3
4-Aug	8.6	10.7	12.8	13.5	20.9	32.4	39.4	45.9	45.0	38.7	31.3	32.2	37.1	33.9	27.0	20.9	28.7	27.8	29.8	28.0	17.8	14.1	12.5	13.0	25.9	45.9
5-Aug	13.5	14.1	15.0	15.1	15.3	15.3	15.4	15.8	16.5	25.5	61.3	86.6	117.0	141.8	106.9	101.2	106.8	106.4	90.4	58.9	59.9	61.1	70.4	61.9	58.0	141.8
6-Aug	61.4	61.6	59.1	59.2	64.3	60.5	61.6	66.0	84.2	118.3	124.0	158.4	152.9	157.0	164.2	146.9	132.0	113.4	120.4	128.5	121.7	95.4	79.6	45.1	101.5	164.2
7-Aug	35.5	25.5	19.3	23.3	22.4	22.1	22.5	16.7	21.6	22.6	24.1	6.2	7.7	13.6	13.1	16.8	10.9	6.6	6.8	6.9	5.4	6.5	7.7	13.0	15.7	35.5
8-Aug	18.0	12.6	11.6	9.6	8.4	7.4	6.8	7.0	5.4	3.9	6.1	5.3	5.9	5.2	4.8	5.8	6.2	5.8	6.3	5.4	6.4	9.9	40.0	44.6	10.3	44.6
9-Aug	33.8	22.8	16.7	11.8	7.7	6.3	5.3	4.7	4.5	4.8	4.7	4.3	4.2	4.3	4.9	6.1	7.0	7.1	6.3	6.0	5.9	6.5	6.5	6.0	8.3	33.8
10-Aug	6.1	6.6	7.6	7.4	6.4	6.3	6.3	6.5	7.1	7.8	7.9	7.5	12.1	8.2	6.2	8.9	8.2	4.9	5.2	5.0	4.7	4.5	4.7	4.0	6.7	12.1
11-Aug	4.3	4.2	4.6	5.5	4.6	4.7	4.5	5.6	5.6	5.4	5.7	6.4	8.5	9.3	8.7	9.0	10.0	9.7	10.1	10.9	12.1	11.5	10.6	10.4	7.6	12.1
12-Aug	10.2	10.7	9.4	6.6	4.9	4.7	4.8	4.8	5.0	5.0	5.1	4.9	5.4	6.0	18.9	12.0	13.9	15.2	16.2	16.4	16.5	18.4	20.7	23.4	10.8	23.4
13-Aug	27.1	30.3	33.3	33.1	32.7	30.3	25.0	16.4	9.0	4.9	4.7	4.4	4.1	3.8	3.7	3.7	3.3	2.9	2.7	3.0	3.7	3.7	4.0	4.0	12.2	33.3
14-Aug	5.0	4.4	4.0	4.2	4.8	28.3	73.0	164.4	141.5	95.1	46.2	13.8	14.8	8.0	8.3	8.5	11.4	11.0	10.0	11.0	12.7	12.6	13.5	13.6	30.0	164.4
15-Aug	12.7	12.3	12.0	12.5	12.5	15.1	12.5	12.1	12.6	12.1	12.7	11.3	11.2	11.2	8.7	8.7	9.2	9.9	11.9	15.9	18.0	14.3	10.9	11.5	12.2	18.0
16-Aug	12.7	13.6	19.1	31.7	36.8	41.0	58.4	84.3	90.3	110.7	161.0	137.7	85.6	75.1	54.3	54.5	43.2	32.2	24.8	22.4	23.1	24.5	24.9	23.7	53.6	161.0
17-Aug	21.8	18.8	15.2	15.5	14.2	15.1	13.1	14.8	13.7	13.3	14.9	15.0	17.1	12.6	20.6	11.7	16.6	13.5	9.1	16.9	16.7	8.2	9.6	10.2	14.5	21.8
18-Aug	11.4	46.8	74.6	75.6	79.7	101.0	94.0	131.5	131.0	119.5	85.7	71.7	68.2	69.2	74.2	56.1	54.9	50.7	52.1	52.0	49.4	48.1	45.7	40.4	70.1	131.5
19-Aug	31.9	26.5	23.0	17.6	13.6	12.1	11.6	11.0	10.3	9.4	12.2	15.4	17.8	21.4	16.5	15.5	13.1	12.2	11.8	11.3	11.0	11.5	11.2	11.1	15.0	31.9
20-Aug	11.1	9.8	9.3	9.3	10.5	11.8	10.3	12.0	8.4	8.4	9.9	10.1	11.7	10.5	8.7	9.8	26.8	34.0	9.9	11.2	9.0	10.3	12.7	11.7	12.0	34.0
21-Aug	9.5	9.0	9.2	9.2	9.6	10.3	13.2	18.7	13.8	13.0	14.4	12.8	10.6	10.9	11.1	10.9	11.0	11.6	13.1	15.0	13.4	14.0	13.8	13.9	12.2	18.7
22-Aug	13.5	13.6	12.5	12.7	12.3	15.0	21.6	29.1	19.5	20.1	21.8	24.3	28.7	35.8	34.7	34.2	39.2	40.1	39.5	35.4	35.2	35.5	35.9	37.3	27.0	40.1
23-Aug	38.2	40.2	40.7	34.3	39.0	38.1	43.5	64.5	45.9	53.7	45.5	35.0	34.0	34.8	35.2	42.3	38.0	39.6	37.9	198.8	368.0	464.4	477.4	418.6	112.8	477.4
24-Aug	317.6	209.1	159.3	130.4	96.9	61.8	41.8	29.3	25.4	21.4	16.1	14.9	12.3	9.7	13.5	16.7	15.9	12.2	9.4	10.1	19.1	27.9	21.7	14.4	54.5	317.6
25-Aug	10.9	10.0	10.3	15.4	12.9	14.1	15.7	20.2	20.0	31.2	54.0	128.6	117.3	96.8	80.9	82.0	69.7	70.8	72.6	75.6	79.2	79.7	78.9	76.7	55.2	128.6
26-Aug	73.8	69.9	66.5	61.4	53.0	45.4	40.2	35.2	34.9	32.7	25.6	26.2	32.7	40.2	42.0	45.6	64.9	57.9	211.9	330.6	423.2	398.0	387.6	393.6	124.7	423.2
27-Aug	386.1	329.7	225.4	234.0	213.9	235.7	235.8	225.7	214.0	188.6	191.4	181.8	180.6	157.0	135.1	128.1	123.6	128.2	131.9	146.9	141.8	135.8	128.5	144.3	189.3	386.1
28-Aug	174.1	161.1	175.4	175.3	190.2	194.2	199.9	181.2	153.5	133.2	100.3	88.2	75.8	77.3	77.9	74.6	72.6	70.9	73.1	72.3	70.8	72.2	73.0	77.5	117.3	199.9
29-Aug	79.2	81.2	83.2	83.4	84.9	88.0	91.1	88.1	86.8	83.2	82.0	81.6	81.6	84.0	87.5	91.9	94.3	97.7	99.4	93.7	92.1	93.5	92.9	90.2	88.0	99.4
30-Aug	84.0	81.7	76.9	74.4	68.2	67.5	72.9	70.1	65.9	60.3	51.8	44.0	41.0	40.8	40.5	39.8	36.8	31.5	28.0	19.2	16.2	16.6	18.0	17.2	48.5	84.0
31-Aug	16.8	16.9	18.1	17.2	19.7	26.7	30.3	C	C	146.9	135.4	128.9	115.3	95.0	DF	74.6	126.7	145.0	178.4	241.7	304.5	307.3	244.8	218.3	124.2	307.3
55.9 50.0 45.4 45.0 44.4 45.3 47.3 52.5 49.4 50.7 48.9 48.7 46.9 46.2 43.2 42.0 43.5 43.4 47.9 59.0 70.2 71.2 69.6 66.2																								Diurnal Average		
386.1 329.7 225.4 234.0 213.9 235.7 235.8 225.7 214.0 188.6 191.4 181.8 180.6 157.0 164.2 146.9 132.0 145.0 211.9 330.6 423.2 464.4 477.4 418.6																								Diurnal Maximum		
C - Calibration DF - DAS Failure																										
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}) - $\mu\text{g}/\text{m}^3$
Buffalo Viewpoint - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	60	8.10	8.10
6 - 15	239	32.25	40.35
16 - 25	79	10.66	51.01
26 - 80	207	27.94	78.95
> 81.0	156	21.05	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
Buffalo Viewpoint - August 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	2	8	3	1	2	3	10	2	3	4	2	9	7	2	1	1	60
6 - 15	18	8	3	3	8	11	28	32	32	19	13	16	21	13	7	7	239
16 - 25	12	3	1	0	0	1	4	16	7	9	1	8	6	8	1	2	79
26 - 80	24	4	3	1	2	1	15	46	15	11	14	10	23	17	14	7	207
> 81.0	20	17	4	0	2	4	7	22	15	16	7	6	9	7	15	5	156
Totals	76	40	14	5	14	20	64	118	72	59	37	49	66	47	38	22	741

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

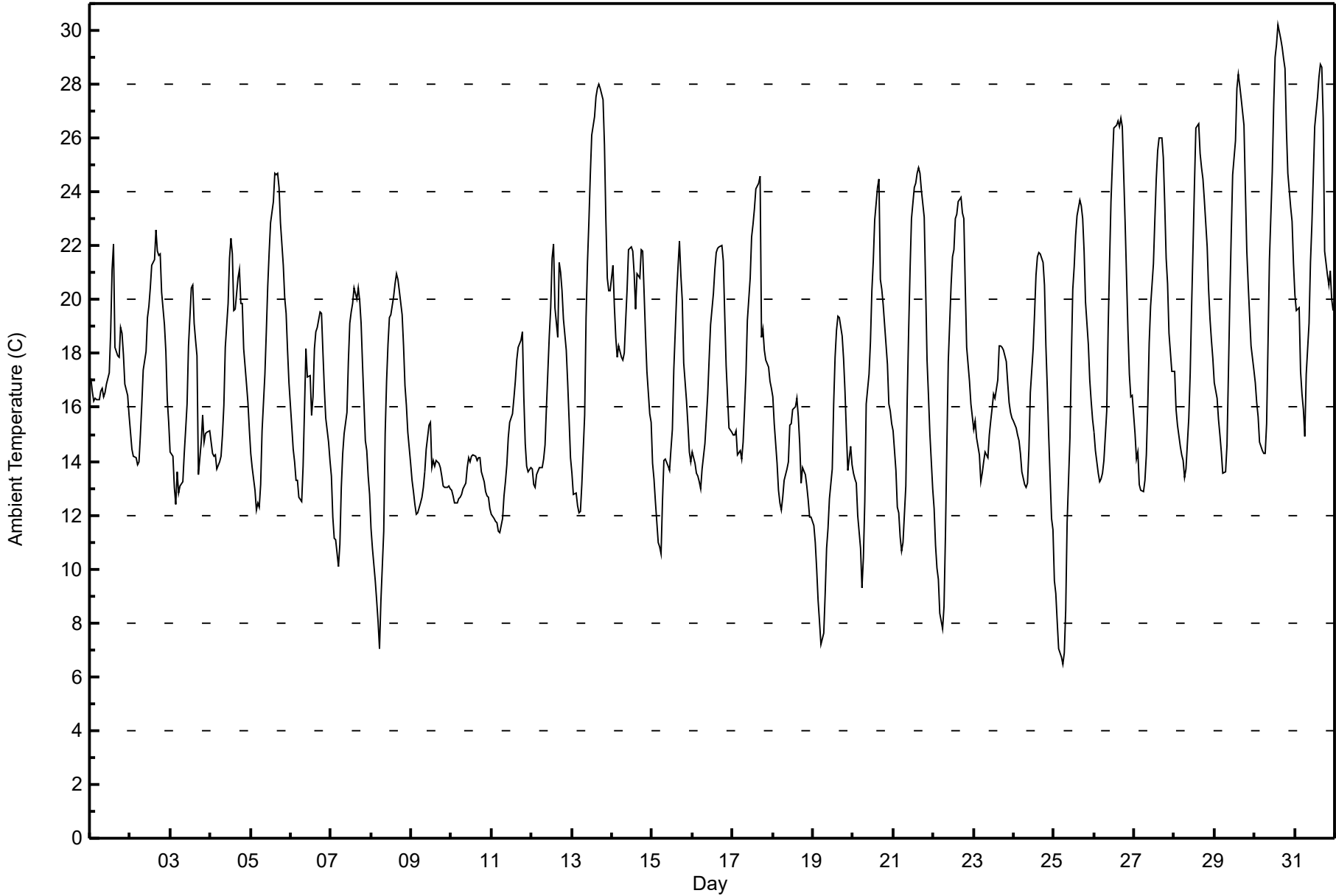
Ambient Temperature (AT) - C
Buffalo Viewpoint - August 2023

Maximum Value: 30.2 C on Aug 30 15:00 Minimum Value: 6.5 C on Aug 25 06:00 Maximum Diurnal Average: 21.9 C at hour 16 Monthly Average: 17.19 C		Maximum Daily Average: 22.4 C on Aug 30 Minimum Daily Average: 13.3 C on Aug 10 Minimum Diurnal Average: 12.4 C at hour 6 Percentiles: P ₁ = 7.9 P ₁₀ = 12.4 Q ₁ = 13.8 Median = 16.4 Q ₃ = 20.3 P ₉₀ = 23.5 P ₉₉ = 28.6		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-Aug	17.1	16.6	16.2	16.3	16.3	16.3	16.6	16.7	16.4	16.5	16.9	17.3	18.8	21.1	22.1	18.2	17.9	17.8	19.0	18.8	18.0	16.9	16.5	15.7	17.5	22.1																						
2-Aug	15.1	14.4	14.2	14.1	13.9	14.0	15.0	16.2	17.4	18.1	19.4	19.8	20.4	21.3	21.5	22.6	21.8	21.7	21.7	20.3	19.1	18.1	16.3	15.4	18.0	22.6																						
3-Aug	14.3	14.2	13.0	12.4	13.6	12.8	13.1	13.2	14.3	15.2	16.1	18.3	20.5	20.6	19.1	18.5	17.9	13.5	14.7	15.7	14.7	15.0	15.1	15.1	15.5	20.6																						
4-Aug	14.7	14.3	14.2	14.3	13.7	14.0	14.2	15.0	16.1	18.2	19.9	21.6	22.3	21.7	19.6	19.7	20.8	21.1	19.9	19.8	18.2	16.9	16.2	15.2	17.6	22.3																						
5-Aug	14.3	13.8	12.9	12.2	12.4	12.3	13.1	15.1	17.2	18.8	20.5	21.7	22.8	23.7	24.7	24.7	24.2	22.8	21.3	20.1	19.5	18.1	16.9	18.7	24.7	24.7																						
6-Aug	15.3	14.5	14.0	13.3	13.3	12.7	12.5	13.8	16.0	18.2	17.1	17.2	15.7	16.4	18.2	18.8	19.0	19.5	19.5	18.1	16.7	15.6	14.7	14.0	16.0	19.5																						
7-Aug	13.4	11.9	11.1	11.1	10.1	10.9	13.0	14.3	15.0	15.8	17.7	19.1	19.5	19.9	20.4	20.0	20.5	20.0	19.1	17.6	14.7	14.4	13.4	12.8	15.7	20.5																						
8-Aug	11.5	10.8	9.5	8.9	8.1	7.0	8.8	11.4	15.0	16.9	18.3	19.3	19.4	20.1	20.6	21.0	20.8	20.3	19.5	18.3	16.8	16.1	15.1	13.9	15.3	21.0																						
9-Aug	13.3	12.8	12.4	12.0	12.1	12.5	12.7	13.0	13.6	14.5	15.3	15.5	13.7	14.0	13.8	14.0	13.9	13.8	13.4	13.1	13.0	13.1	13.1	13.0	13.4	15.5																						
10-Aug	12.9	12.7	12.4	12.5	12.6	12.7	12.8	13.0	13.2	13.8	14.1	14.0	14.2	14.2	14.2	14.0	14.1	14.1	13.6	13.2	12.9	12.7	12.6	12.3	13.3	14.2																						
11-Aug	12.0	11.9	11.8	11.7	11.4	11.4	11.9	12.7	13.3	13.9	14.8	15.4	15.7	16.4	17.0	17.8	18.2	18.5	18.8	16.4	14.7	13.8	13.6	13.7	14.4	18.8																						
12-Aug	13.7	13.1	13.1	13.5	13.8	13.8	13.8	14.1	14.6	16.0	18.7	19.7	21.6	22.1	19.7	18.6	21.4	21.0	20.3	19.3	18.1	16.9	15.5	14.2	16.9	22.1																						
13-Aug	13.6	12.8	12.8	12.3	12.1	12.1	13.1	15.7	19.3	21.4	22.9	24.6	26.1	26.8	27.5	27.9	28.0	27.9	27.4	25.8	23.0	20.8	20.3	20.3	20.6	28.0																						
14-Aug	21.3	19.8	18.6	17.9	18.3	17.9	17.8	18.0	19.2	20.4	21.9	22.0	21.8	20.9	19.7	21.0	20.8	21.9	21.8	20.3	18.7	17.3	15.8	15.5	19.5	22.0																						
15-Aug	13.9	13.3	12.5	11.0	10.8	10.6	12.5	14.0	14.1	13.8	13.7	14.4	15.2	17.4	20.2	21.2	22.2	20.9	19.9	17.7	16.3	15.4	14.3	14.0	15.4	22.2																						
16-Aug	14.3	13.9	13.6	13.5	13.3	13.0	13.7	14.7	15.5	16.5	17.8	19.1	20.3	21.1	21.7	21.9	22.0	22.0	21.4	19.5	17.5	16.4	15.2	15.1	17.2	22.0																						
17-Aug	15.0	15.0	15.1	14.3	14.4	14.1	14.7	15.9	17.2	19.3	20.8	22.4	22.8	23.4	24.1	24.3	24.6	18.6	18.9	18.1	17.8	17.5	17.0	16.7	18.4	24.6																						
18-Aug	16.4	15.4	13.9	12.9	12.4	12.2	12.7	13.3	13.7	14.0	15.3	15.4	15.9	16.0	16.3	15.7	14.7	13.2	13.8	13.5	13.1	12.5	11.9	11.9	14.0	16.4																						
19-Aug	11.6	11.0	10.0	8.8	8.0	7.2	7.6	9.1	10.8	11.5	12.6	13.7	16.1	17.8	18.8	19.4	19.3	18.7	17.8	16.6	15.1	13.6	14.5	13.9	13.5	19.4																						
20-Aug	13.5	13.3	13.2	12.0	10.8	9.3	10.4	12.5	16.1	17.3	18.4	20.3	21.5	23.0	24.2	24.5	20.8	20.4	19.8	19.1	17.6	16.1	15.8	15.4	16.9	24.5																						
21-Aug	15.1	13.7	12.3	12.1	11.2	10.7	11.0	13.1	16.4	18.9	21.1	23.0	24.2	24.3	24.7	24.9	24.7	24.1	23.1	20.5	17.7	16.5	15.0	13.0	18.0	24.9																						
22-Aug	12.3	10.9	10.0	9.6	8.4	7.8	8.6	11.2	14.6	17.7	20.6	21.6	21.9	23.0	23.2	23.7	23.8	23.2	23.0	20.5	18.3	17.0	16.1	15.7	16.8	23.8																						
23-Aug	15.2	15.5	14.9	14.2	13.3	13.5	14.0	14.3	14.1	15.0	15.5	16.0	16.5	16.3	17.0	18.3	18.3	18.2	18.1	17.7	16.9	16.2	15.8	15.6	15.9	18.3																						
24-Aug	15.5	15.2	15.0	14.8	14.3	13.6	13.1	13.0	13.2	14.4	16.5	18.2	19.5	20.9	21.6	21.7	21.7	21.4	20.5	18.3	16.7	14.9	11.9	11.5	16.6	21.7																						
25-Aug	9.6	9.1	8.1	7.0	6.7	6.5	6.9	8.5	11.7	14.9	17.9	20.4	21.3	22.4	23.1	23.7	23.5	23.0	21.8	19.9	18.3	17.0	16.2	15.6	15.5	23.7																						
26-Aug	15.1	14.4	13.6	13.2	13.4	13.6	14.0	15.9	18.9	21.4	23.6	25.1	26.4	26.5	26.6	26.4	26.7	26.4	22.9	20.9	18.9	17.2	16.4	16.4	19.7	26.7																						
27-Aug	15.0	14.1	14.3	13.1	12.9	12.9	13.3	14.2	16.1	18.4	19.8	21.3	23.0	24.5	25.5	26.0	26.0	25.3	23.5	21.5	20.6	18.8	17.4	17.3	19.0	26.0																						
28-Aug	17.3	15.9	15.4	14.5	14.3	14.0	13.4	13.7	15.6	17.3	19.8	22.0	24.3	26.4	26.5	25.4	24.9	24.5	23.7	22.0	20.4	19.3	18.5	17.8	19.5	26.5																						
29-Aug	16.9	16.3	15.6	15.0	14.3	13.5	13.6	14.6	17.3	20.0	22.4	24.6	25.9	27.9	28.4	28.0	27.5	26.5	24.0	21.8	20.6	19.4	18.3	17.4	20.4	28.4																						
30-Aug	16.9	16.2	15.7	14.7	14.4	14.3	14.3	15.4	18.4	21.5	24.8	27.2	29.0	29.5	30.2	29.7	29.4	28.9	28.6	26.3	24.7	23.4	22.9	21.3	22.4	30.2																						
31-Aug	20.2	19.6	19.7	17.3	16.5	15.9	14.9	17.2	19.1	21.4	22.8	24.6	26.4	27.5	28.3	28.8	28.6	26.8	21.8	20.9	20.6	21.1	20.0	19.6	21.7	28.8																						
																								14.7	14.1	13.5	12.9	12.6	12.4	12.8	14.0	15.6	17.1	18.6	19.8	20.7	21.5	21.9	21.9	21.9	21.2	20.5	19.1	17.7	16.8	15.9	15.4	Diurnal Average
																								21.3	19.8	19.7	17.9	18.3	17.9	17.8	18.0	19.3	21.5	24.8	27.2	29.0	29.5	30.2	29.7	29.4	28.9	28.6	26.3	24.7	23.4	22.9	21.3	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	23	3.09	3.09
10 - 20	522	70.16	73.25
> 20	199	26.75	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

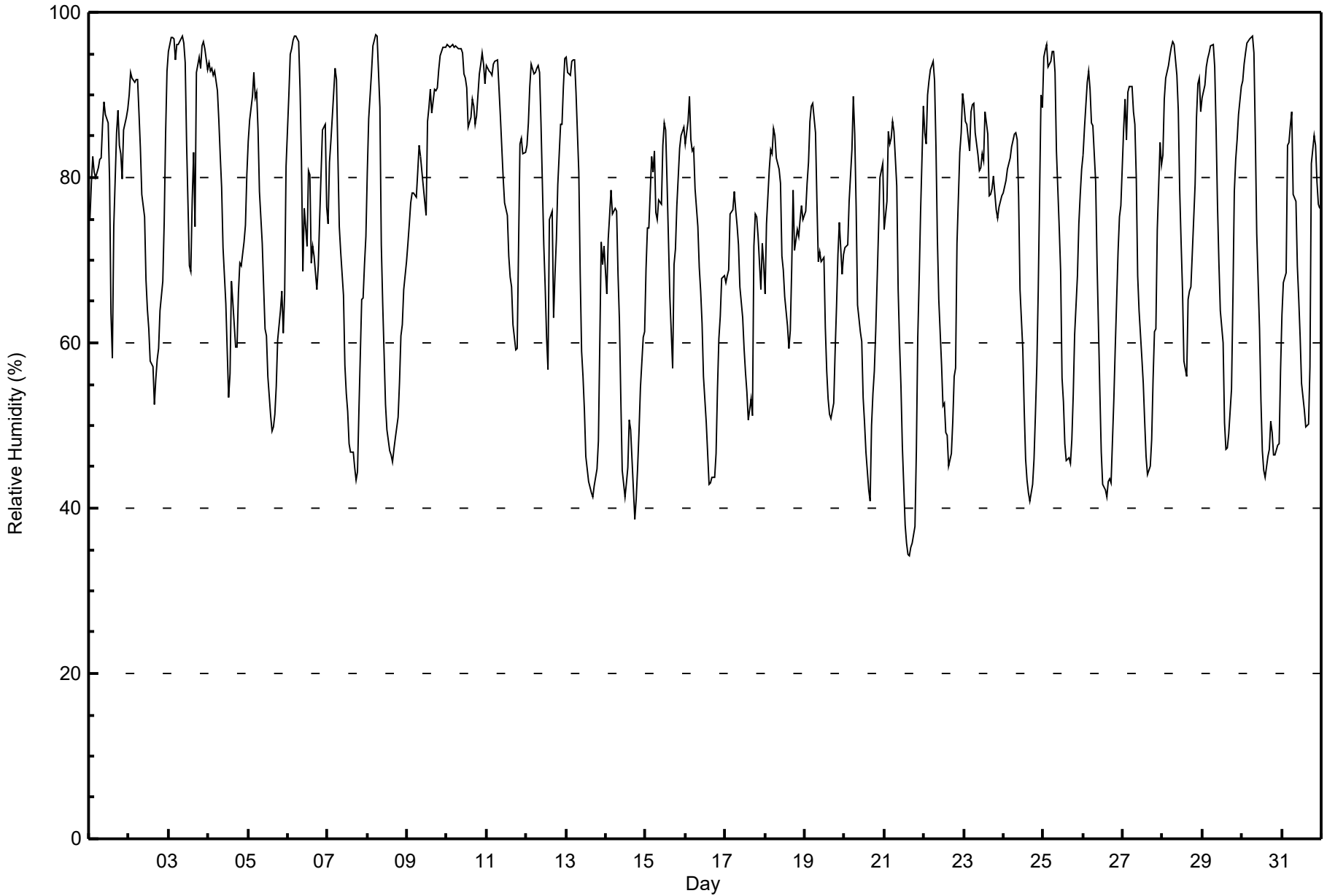
Relative Humidity (RH) - %
Buffalo Viewpoint - August 2023

Maximum Value: 97.2 % on Aug 8 06:00 Maximum Daily Average: 92.7 % on Aug 10																						Hours in Service:	744																							
Minimum Value: 34.3 % on Aug 21 16:00 Minimum Daily Average: 57.1 % on Aug 14																						Hours of Data:	744																							
Maximum Diurnal Average: 89.6 % at hour 6 Minimum Diurnal Average: 56.2 % at hour 15																						Hours of Missing Data:	0																							
Monthly Average: 73.39 % Percentiles: P ₁ = 39.5 P ₁₀ = 47.8 Q ₁ = 60.6 Median = 76.1 Q ₃ = 86.8 P ₉₀ = 93.6 P ₉₉ = 96.9																						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-Aug	75.0	79.3	82.6	80.6	79.9	81.2	82.2	82.3	86.5	89.2	87.6	86.7	79.7	63.6	58.1	74.1	85.4	88.2	83.8	82.9	79.8	85.7	87.3	88.4	81.3	89.2																				
2-Aug	90.0	92.7	92.1	91.5	91.9	91.8	87.8	83.5	78.0	75.2	67.6	64.1	61.7	57.8	57.2	52.5	55.7	57.9	59.3	63.9	67.4	74.6	85.2	92.9	74.7	92.9																				
3-Aug	95.3	96.9	97.0	96.7	94.3	96.2	96.2	96.8	97.2	96.3	93.9	84.0	69.3	68.6	77.2	83.0	74.0	92.7	94.5	93.3	96.0	96.4	95.5	93.1	90.6	97.2																				
4-Aug	93.9	92.8	93.2	92.4	93.0	90.5	86.9	82.8	78.9	71.5	64.7	59.0	53.5	56.3	67.5	64.9	59.5	59.5	66.1	69.6	69.3	72.2	74.3	80.3	74.7	93.9																				
5-Aug	84.4	87.0	89.9	92.8	89.7	90.4	85.7	78.3	72.0	66.8	61.7	60.8	55.9	51.2	49.3	49.9	51.4	54.8	60.3	63.9	66.3	61.3	65.8	81.4	69.6	92.8																				
6-Aug	90.1	95.0	95.6	96.6	97.1	97.2	96.4	90.6	82.1	68.7	76.3	71.8	80.8	80.4	69.7	71.8	70.5	66.4	69.4	75.1	80.4	85.8	86.5	76.4	82.1	97.2																				
7-Aug	74.5	81.8	84.5	87.3	93.2	91.8	82.8	74.0	71.0	65.8	57.3	53.9	51.7	47.8	46.8	46.8	44.9	43.4	44.5	51.8	65.3	65.4	69.5	72.9	65.4	93.2																				
8-Aug	80.6	87.1	92.8	95.9	96.5	97.2	97.2	88.5	71.9	64.7	58.7	52.5	49.4	46.9	46.5	45.6	47.1	48.5	51.0	55.2	60.9	62.1	66.5	69.8	68.1	97.2																				
9-Aug	72.1	74.5	76.9	78.1	78.1	77.6	80.7	83.9	82.6	80.6	77.2	75.3	86.8	88.4	90.7	87.9	90.6	90.5	90.9	93.1	94.8	95.8	95.7	95.7	84.9	95.8																				
10-Aug	96.1	96.0	95.7	96.1	95.8	95.9	95.8	95.5	95.7	95.0	92.6	92.0	90.8	86.1	87.3	89.5	88.6	86.5	87.4	92.6	93.7	95.1	93.7	91.3	92.7	96.1																				
11-Aug	93.5	93.0	92.7	92.4	93.7	94.1	94.2	90.9	87.5	83.7	80.0	77.0	75.4	70.5	67.9	66.8	62.2	59.1	59.4	71.6	84.1	84.8	82.9	83.0	80.8	94.2																				
12-Aug	83.8	86.5	91.1	93.8	92.5	92.7	93.3	93.6	92.6	86.6	71.9	66.9	60.6	56.8	75.0	75.9	63.0	68.3	72.6	79.2	86.4	86.5	91.0	94.3	81.5	94.3																				
13-Aug	94.6	92.7	92.3	94.1	94.2	94.3	90.4	80.7	68.3	59.1	55.9	51.9	46.3	43.3	42.5	41.8	41.4	42.8	44.7	48.2	60.2	72.3	69.5	71.8	66.4	94.6																				
14-Aug	65.9	72.5	75.3	78.4	75.5	76.2	75.9	68.3	62.6	53.2	44.5	41.3	43.1	45.0	50.8	49.5	42.2	38.6	41.1	44.9	49.4	54.6	60.6	61.4	57.1	78.4																				
15-Aug	68.9	73.9	73.9	82.5	80.7	83.2	75.7	74.9	77.3	76.8	83.9	86.6	85.7	79.5	65.7	61.3	57.0	69.4	71.3	76.6	83.5	85.1	85.6	86.1	76.9	86.6																				
16-Aug	84.0	86.7	89.8	84.6	83.2	83.5	78.6	74.0	69.2	66.3	62.3	56.0	50.3	46.7	42.9	43.0	43.8	43.7	46.6	54.3	60.4	63.2	67.8	68.1	64.5	89.8																				
17-Aug	67.4	68.2	68.8	75.7	76.1	78.4	76.1	74.2	71.9	66.8	63.1	59.3	56.4	54.2	50.7	53.2	51.1	71.7	75.5	75.2	72.9	66.5	71.9	69.5	67.3	78.4																				
18-Aug	66.0	74.4	81.0	83.3	82.8	85.9	85.0	82.3	81.1	79.4	70.5	68.8	65.6	62.0	59.3	61.5	69.0	78.5	71.2	73.7	72.8	74.9	76.7	74.8	74.2	85.9																				
19-Aug	76.0	79.4	81.9	86.8	88.7	89.0	85.4	77.0	69.8	71.0	69.8	70.3	61.9	56.6	53.2	51.4	50.9	52.7	59.0	64.5	70.7	74.6	68.2	70.6	70.0	89.0																				
20-Aug	71.6	71.6	71.8	77.2	83.3	89.9	85.3	76.4	64.6	61.4	60.2	53.4	50.4	46.7	42.1	40.9	50.0	53.9	56.7	61.5	73.7	80.1	80.9	81.7	66.0	89.9																				
21-Aug	73.7	77.2	85.6	84.0	84.8	86.8	85.6	79.0	66.4	59.9	54.8	47.5	38.0	35.8	34.3	34.3	35.3	35.7	37.7	46.9	60.6	67.7	75.8	88.7	61.5	88.7																				
22-Aug	85.4	84.1	90.0	91.7	93.0	94.1	91.8	83.7	72.7	65.3	57.3	52.4	52.6	49.2	48.8	45.1	46.7	50.5	55.9	56.9	72.0	83.0	85.4	90.2	70.7	94.1																				
23-Aug	88.9	86.7	86.4	83.2	87.9	88.8	88.9	85.4	82.8	80.9	81.1	82.9	82.0	88.0	85.3	77.8	78.0	78.6	80.2	76.1	75.1	76.4	77.1	77.8	82.3	88.9																				
24-Aug	78.2	79.6	81.0	81.7	82.4	83.7	85.2	85.4	84.6	77.6	66.4	59.2	51.8	45.9	43.4	41.8	40.8	42.9	46.0	51.3	57.3	66.3	90.0	88.5	67.1	90.0																				
25-Aug	94.6	95.3	96.2	93.4	94.1	95.3	95.3	92.7	83.2	73.9	68.6	55.8	52.8	47.8	45.7	46.1	45.4	48.3	53.8	61.1	68.1	74.4	78.0	81.1	72.5	96.2																				
26-Aug	82.8	85.9	91.5	92.9	90.7	86.6	86.3	79.5	69.7	62.1	54.1	46.9	42.9	42.2	41.4	43.2	43.6	43.1	53.3	59.5	65.3	70.9	75.2	76.6	66.1	92.9																				
27-Aug	85.9	89.4	84.6	90.4	91.0	88.0	86.4	80.0	68.2	63.9	58.1	55.1	50.4	46.2	44.1	45.0	48.3	55.6	61.3	61.7	73.8	84.3	81.4	70.2	91.0																					
28-Aug	82.8	89.6	92.0	93.6	94.7	95.7	96.4	96.1	92.4	88.2	78.5	72.1	66.4	57.7	56.0	65.3	66.3	66.8	70.8	79.1	87.3	91.4	92.0	88.0	81.6	96.4																				
29-Aug	89.7	91.2	93.5	94.4	95.2	96.0	96.1	93.4	85.7	76.7	69.6	63.9	60.0	50.3	47.1	47.4	49.1	54.4	65.4	78.4	82.3	84.6	87.6	91.1	76.8	96.1																				
30-Aug	91.8	93.8	95.0	96.2	96.7	96.9	97.1	95.1	85.1	73.1	61.7	53.1	46.9	44.6	43.8	46.2	47.1	50.4	49.2	46.4	46.4	47.6	47.8	56.6	67.0	97.1																				
31-Aug	63.4	67.3	68.4	83.8	84.3	86.3	87.9	78.0	77.1	69.3	65.3	60.7	55.1	51.9	49.8	50.1	50.1	57.1	81.7	85.1	84.0	79.5	76.8	76.3	70.4	87.9																				
																						82.0	84.6	86.5	88.5	88.9	89.6	88.1	84.0	78.7	73.3	68.4	64.0	60.6	57.2	56.2	56.5	56.3	59.5	63.1	67.5	72.5	75.9	78.9	80.6	Diurnal Average
																						96.1	96.9	97.0	96.7	97.1	97.2	97.2	96.8	97.2	96.3	93.9	92.0	90.8	88.4	90.7	89.5	90.6	92.7	94.5	93.3	96.0	96.4	95.7	95.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Speed: 20 km/h on Aug 24 12:00	Maximum Daily Speed Average: 11.8 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 8 05:00	Minimum Daily Speed Average: 0.4 km/h on Aug 15	Hours of Data: 744
Maximum Diurnal Speed Average: 3.3 km/h at hour 14	Minimum Diurnal Speed Average: 0.3 km/h at hour 19	Hours of Missing Data: 0
Monthly Average Velocity: 1.5 km/h 236.3 deg	Percentiles: $P_1 = 1$ $P_{10} = 4$ $Q_1 = 5$ Median = 7 $Q_3 = 9$ $P_{90} = 12$ $P_{99} = 17$	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-Aug	WSW14	WSW17	W15	W16	W18	W17	W16	W13	W12	WSW9	WSW10	WSW10	WSW10	W15	NW11	WSW7	S4	SSW8	SW7	W10	NW8	NNE4	N4	NW6	W9.5	W18
2-Aug	WNW4	SW5	W5	W5	WNW9	W6	WNW7	WNW8	WNW7	W7	WNW6	W6	SW6	SW6	SSW4	SW5	WSW5	WSW4	NE2	E4	ESE4	SE3	ESE3	SE1	W3.4	WNW9
3-Aug	S2	NE2	S5	E4	E3	SE4	S5	SSE5	S3	SSE5	SSE6	SSE6	S8	SSE7	SE9	SSE1	NNE9	ESE3	S5	S5	SSE6	SSW4	SW4	W8	SSE3.4	SSE9
4-Aug	W8	WNW10	NW11	WNW9	WNW9	W10	W12	W13	W11	W9	W9	WNW9	WNW6	SW5	SW11	NNW3	E3	SW6	SW5	WSW5	W5	WSW6	W7	WNW9	W7.2	W13
5-Aug	WNW6	W3	SSW4	SW5	SW6	SW5	WSW7	WSW6	W7	WNW6	WNW6	N5	NW4	NW4	NW4	NE4	NNE8	NNE8	NNE9	NNE8	NE6	ENE5	N2	NW3	NW2.4	NNE9
6-Aug	SSW3	WNW2	SSW3	SW2	SSW3	SSE5	SSE5	ESE3	NE8	SSE6	NNE8	NE13	NNE4	NNE3	NNE9	NNE5	NNE6	N6	NNE6	NNE4	N5	NNW6	NNE8	NE9	NNE3.0	NE13
7-Aug	NNE3	N6	NNE7	NE5	SW3	N3	N2	N4	WNW6	WNW6	NW7	N11	N11	NNE12	N13	N12	N11	NNE13	NNE12	NNE9	N7	NNE7	NNE7	ENE7	N6.8	N13
8-Aug	NNE4	NE3	NNE1	NE1	SSE1	SSE4	S3	SSW4	SE7	SE8	ESE9	ESE10	ESE9	ESE10	ESE12	ESE11	ESE13	ESE13	ESE12	SE9	ESE8	SE9	SSE7	SSE8	ESE6.5	ESE13
9-Aug	SE8	SE7	SSE7	SSE7	SE7	SSE7	SE8	SSE9	SE8	SE8	SE9	SSE12	SE11	SE12	SE13	SE13	ESE10	ESE7	SE8	SE8	SE8	SE9	SE10	SE11	SE9.0	SE13
10-Aug	SE12	SE11	SSE9	SE8	SE10	SE9	SE9	SE9	SE7	ESE7	E8	E10	E11	E12	E12	E11	E10	E12	E9	NE8	NE5	NE4	ENE4	NE8	E7.7	SE12
11-Aug	NNE10	NNE9	NNE7	NNE9	NNE8	NNE8	N7	N8	N5	NNE4	NW3	WNW4	WNW5	W6	SW5	SW5	WSW6	WSW6	SW4	SSE4	SE5	SSE4	SSE5	SSE5	N1.8	NNE10
12-Aug	S6	SSE5	SSW5	SW5	WSW9	WSW10	W13	W9	W10	W10	WNW10	W7	NNW3	W11	WNW5	WSW8	WNW7	W6	WSW4	SSW5	SSW5	SSW5	SSW6	SSW5	WSW6.0	W13
13-Aug	SSE7	SSE7	SSE6	SSE5	SSE6	S7	SSE6	SSE8	S6	SSW10	SSW12	SW13	WSW15	WSW18	WSW16	WSW17	WSW15	WSW11	WSW9	SW7	SSW7	S8	SSW6	W4	SW7.5	WSW18
14-Aug	NW6	S6	S6	W2	WNW12	NNW12	NW4	W9	WSW10	W12	WNW14	W14	W14	WSW16	WSW18	W15	WNW15	WNW12	W9	W10	W8	W9	NW6	WNW5	W8.9	WSW18
15-Aug	WNW5	WSW6	SSW5	SSE6	SSE6	S5	SSE4	SE5	SE7	SSE7	SSE6	SE7	SE6	SSE5	S3	NE1	S2	ENE2	NNW6	N16	N16	N16	N11	NNW8	ENE0.4	N16
16-Aug	NNW5	WNW5	WNW7	NW8	NW5	W5	W8	WNW10	NW11	WNW10	NW9	WNW9	W9	WNW10	W10	WSW10	SW11	SW10	SSW8	SSW6	SSE6	SSE7	SE7	SSE8	W5.2	SW11
17-Aug	SSE9	SE9	SE8	SE7	SE5	SSE5	SSE5	S5	S5	SSW5	WSW3	WSW6	W11	W10	W8	SSW4	WNW4	NNW11	NW1	SSW2	NNW9	NNE6	WNW5	WNW9	SW2.0	W11
18-Aug	NNW9	N9	N7	N9	N10	N7	N12	N16	NNW11	N11	N15	NNW13	NW9	N9	N9	NW8	NNW13	N13	N17	N12	N14	N12	NNW10	NW10	N10.8	N17
19-Aug	NW11	WNW11	W10	W10	W12	W11	W13	W12	W13	W14	WSW13	SW9	WSW13	WSW12	WSW13	WSW15	WSW16	WSW13	SW8	SW9	SSW8	S7	SSW10	SSW8	WSW10.1	WSW16
20-Aug	SSW8	S7	SSW5	ENE3	SW2	S7	S7	SSE5	SSW2	NW7	N6	NNW5	N6	N6	N7	NW7	WNW10	WNW1	E3	S4	SW4	S4	SSE4	SSW4	SW1.2	WNW10
21-Aug	SSW6	SSW4	SE7	S6	SE5	S5	S6	S5	S5	S6	SE6	SSE6	SSW8	S8	S7	SSW7	S7	S7	SSE5	SSE4	SSE4	SSE5	SSE5	SSE6	S5.5	SSW8
22-Aug	S6	S6	S4	SSE4	S7	SSE8	SSE8	S5	S6	S8	S8	SSE8	S4	SSE5	SE4	SSW4	NW5	NNW4	NNW3	N2	S3	SSE5	SSE5	SSE3	S3.9	SSE8
23-Aug	SW2	N3	N6	NNE6	N4	SSE2	W1	N6	N5	NW6	WSW4	WNW5	NW4	NW4	NW5	NNW6	N6	N7	N8	N14	NNE15	NNE15	NNE15	N15	N5.8	NNE15
24-Aug	N16	N13	N12	N15	N15	N16	N16	N17	N17	N17	N19	N20	N18	N17	N13	N11	N10	N8	N7	NNW5	WNW4	WNW3	WSW2	WSW4	N11.8	N20
25-Aug	S5	SSW4	S5	SSE8	S7	S7	S6	SSE6	SSE6	SSE6	SSE7	SSW11	SSW12	SSW10	SW11	SSW10	SSW10	SSW6	SSE5	SSE6	SSE8	SSE7	SE7	SE8	S6.9	SSW12
26-Aug	SE8	SE7	SE8	SE7	SE7	SSE7	SSE7	SSE7	SSW7	SSW8	SSW11	SW13	SW12	WSW12	WSW12	W9	W7	WNW8	N17	N14	N10	N5	NNE5	NW3	SW2.2	N17
27-Aug	WSW4	W4	NW6	SW4	WSW5	WNW7	W4	SSW2	SW2	S3	SSW6	SSW4	SSW7	SSW8	SSW8	SSW9	SSW8	SW6	SSW5	S6	S8	SE6	SE6	SSE3	SSW4.1	SSW9
28-Aug	N1	SSE5	SSE6	S6	SSE7	SSE6	S7	S6	SSE4	S4	S6	S5	S6	SW4	S4	SE6	SE5	SSE6	S5	SSE5	SE6	SSE6	SSE6	S7	SSE5.1	S7
29-Aug	SSE7	SSE6	SSE6	SSE7	SSE7	S7	SSE6	S5	SSE6	SE6	SE7	ESE7	ESE9	SSE9	S9	SSW8	S5	SSE4	SE5	SSE6	SSE6	SSE6	SSE6	SSE6	SSE6.1	S9
30-Aug	S6	SSW5	SSW6	S7	SSE7	SSE7	SSE8	SSE7	SSE5	SSE4	SSE7	SE9	S8	SSE7	SSE7	SE8	SE8	SSE5	SSE7	SSE8	SSE5	SSE6	S7	SSE5	SSE6.3	SE9
31-Aug	SSE4	ESE5	SE4	S6	S3	W3	S6	SSW5	WSW7	W4	SW5	SW5	NW7	NW7	WNW4	WNW5	WNW6	NNW8	NW2	NNW8	NNW8	NW9	NW11	NW9	WNW2.9	NW11

SW1.3	SSW1.4	SSW1.5	SSW1.3	SW2.1	SW2.2	SW2.6	SW2.2	WSW2.3	WSW2.7	WSW2.1	WSW1.7	WSW2.9	WSW3.3	WSW2.8	WSW2.6	W1.8	W1.2	N0.3	N0.5	NNE0.5	ESE0.8	SSE0.5	WSW0.4	Diurnal Average
N16	WSW17	W15	W16	W18	W17	N16	N17	N17	N17	N19	N20	N18	WSW18	WSW18	WSW17	WSW16	WSW13	N17	N16	N16	N16	NNE15	N15	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

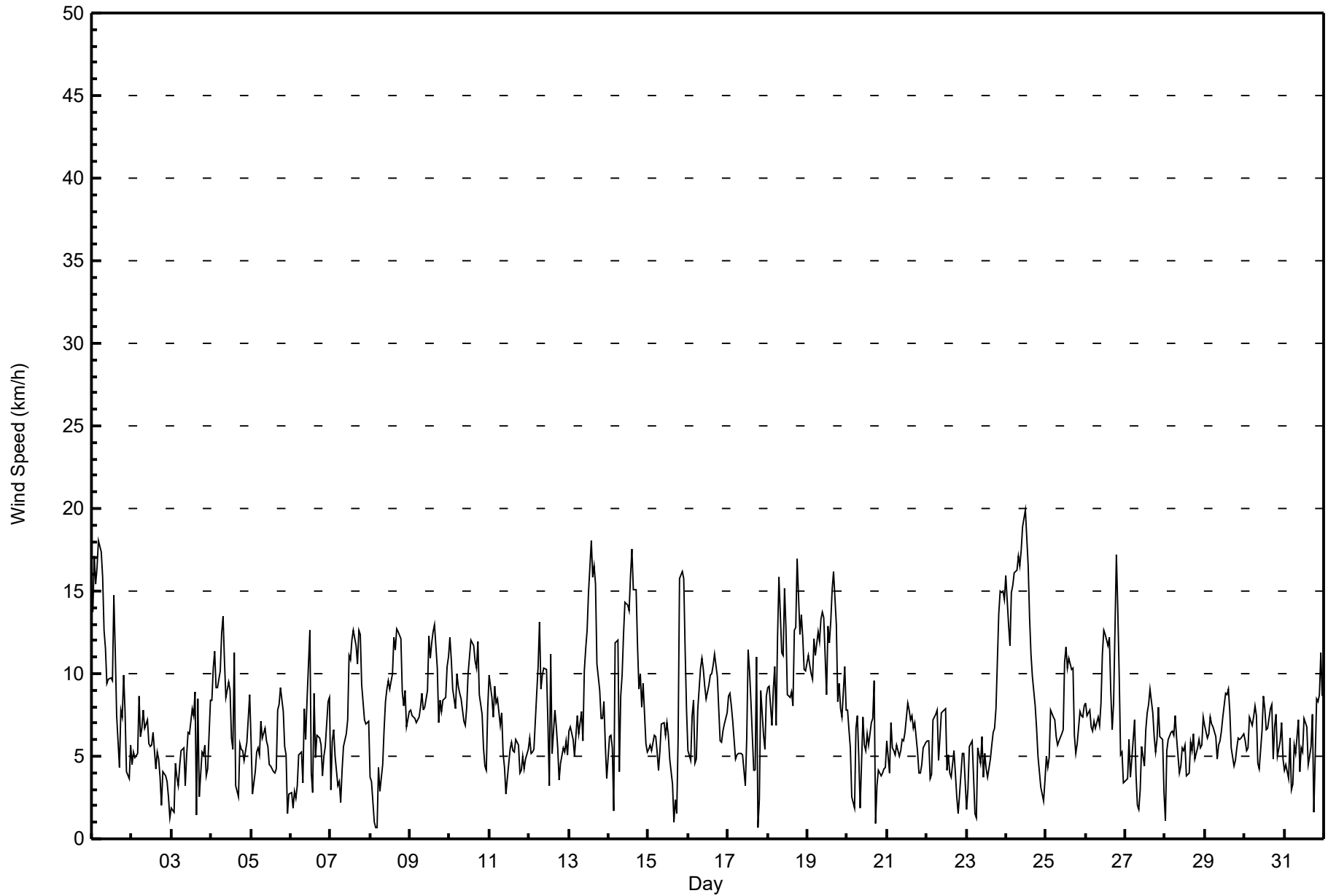
Wind Speed (WS) - km/h
Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Aug 6 11:00 Minimum Value: 0 km/h on Aug 21 23:00 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: 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-Aug	4	4	3	4	4	3	4	3	3	3	3	4	4	3	6	1	2	2	2	2	1	1	2	2	6
2-Aug	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	1	2
3-Aug	1	1	1	1	2	1	2	1	1	2	2	3	3	4	3	6	3	3	2	1	1	2	2	6	
4-Aug	2	3	3	2	2	2	3	3	3	3	3	2	2	3	4	2	2	2	2	2	1	2	2	4	
5-Aug	2	2	1	2	2	1	3	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	3	
6-Aug	1	1	1	1	1	1	1	2	3	2	8	3	2	3	3	2	2	2	1	1	1	1	2	8	
7-Aug	2	1	1	2	1	1	1	1	1	2	2	3	4	4	4	4	3	4	4	3	1	1	1	4	
8-Aug	1	1	2	2	2	2	1	1	2	3	3	4	3	3	4	4	4	4	4	3	3	3	2	4	
9-Aug	2	2	2	2	3	2	3	3	2	3	3	4	4	3	4	4	3	2	3	2	3	2	3	4	
10-Aug	4	3	3	3	3	3	3	2	2	2	2	3	3	3	3	3	2	3	3	2	2	2	2	4	
11-Aug	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	3	2	1	1	1	1	2	2	3	
12-Aug	2	1	1	1	3	3	3	2	2	3	3	3	2	4	4	3	2	2	2	1	1	1	1	4	
13-Aug	1	1	1	1	1	2	2	3	2	3	3	4	5	5	5	5	4	3	2	1	1	1	2	5	
14-Aug	4	1	2	2	3	3	2	3	3	3	4	4	4	5	4	3	4	3	3	3	2	2	2	5	
15-Aug	2	1	2	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	5	5	4	4	3	5	
16-Aug	2	1	2	2	3	1	2	3	3	3	2	3	3	3	3	3	3	2	1	1	1	2	2	3	
17-Aug	2	2	2	2	2	1	1	2	2	2	1	3	3	3	3	1	7	7	3	1	4	3	2	7	
18-Aug	3	4	3	2	2	3	3	4	3	3	4	4	3	2	3	2	6	3	4	3	3	3	2	6	
19-Aug	3	3	3	2	3	3	3	3	3	3	4	3	4	4	4	5	4	4	2	2	1	1	3	5	
20-Aug	3	3	3	2	2	2	2	1	2	2	2	2	2	2	2	5	4	1	1	1	1	1	1	5	
21-Aug	2	2	2	1	1	1	2	1	2	2	2	3	3	3	3	3	2	2	2	1	1	1	0	3	
22-Aug	1	1	2	1	1	1	2	1	2	2	3	3	2	3	2	2	2	1	1	1	1	2	1	3	
23-Aug	1	2	1	1	1	1	1	1	1	2	1	2	1	2	1	1	1	2	4	4	3	3	3	4	
24-Aug	4	4	3	4	4	4	4	4	4	4	4	5	4	5	4	3	3	2	1	1	1	1	1	5	
25-Aug	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	2	1	2	2	2	2	3	
26-Aug	2	2	2	1	1	2	2	2	2	3	3	4	4	3	3	3	2	3	6	4	3	1	1	6	
27-Aug	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	
28-Aug	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	2	2	2	1	1	1	1	2	2	
29-Aug	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	2	2	1	1	1	1	1	1	3	
30-Aug	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3	1	3	2	2	2	3	3	
31-Aug	1	1	1	2	2	2	2	1	3	1	1	2	2	2	2	1	2	5	4	2	2	3	3	5	
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	239	32.12	32.12
6 - 11	404	54.30	86.42
12 - 19	100	13.44	99.87
20 - 28	1	0.13	100.00
29 - 38	0	0.00	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
Buffalo Viewpoint - August 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	14	10	9	4	5	5	11	42	32	27	20	11	12	16	14	7	239
6 - 11	31	23	4	1	6	11	49	75	40	31	14	20	35	28	24	12	404
12 - 19	30	7	1	0	3	4	4	1	0	2	3	19	19	4	0	3	100
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	76	40	14	5	14	20	64	118	72	60	37	50	66	48	38	22	744

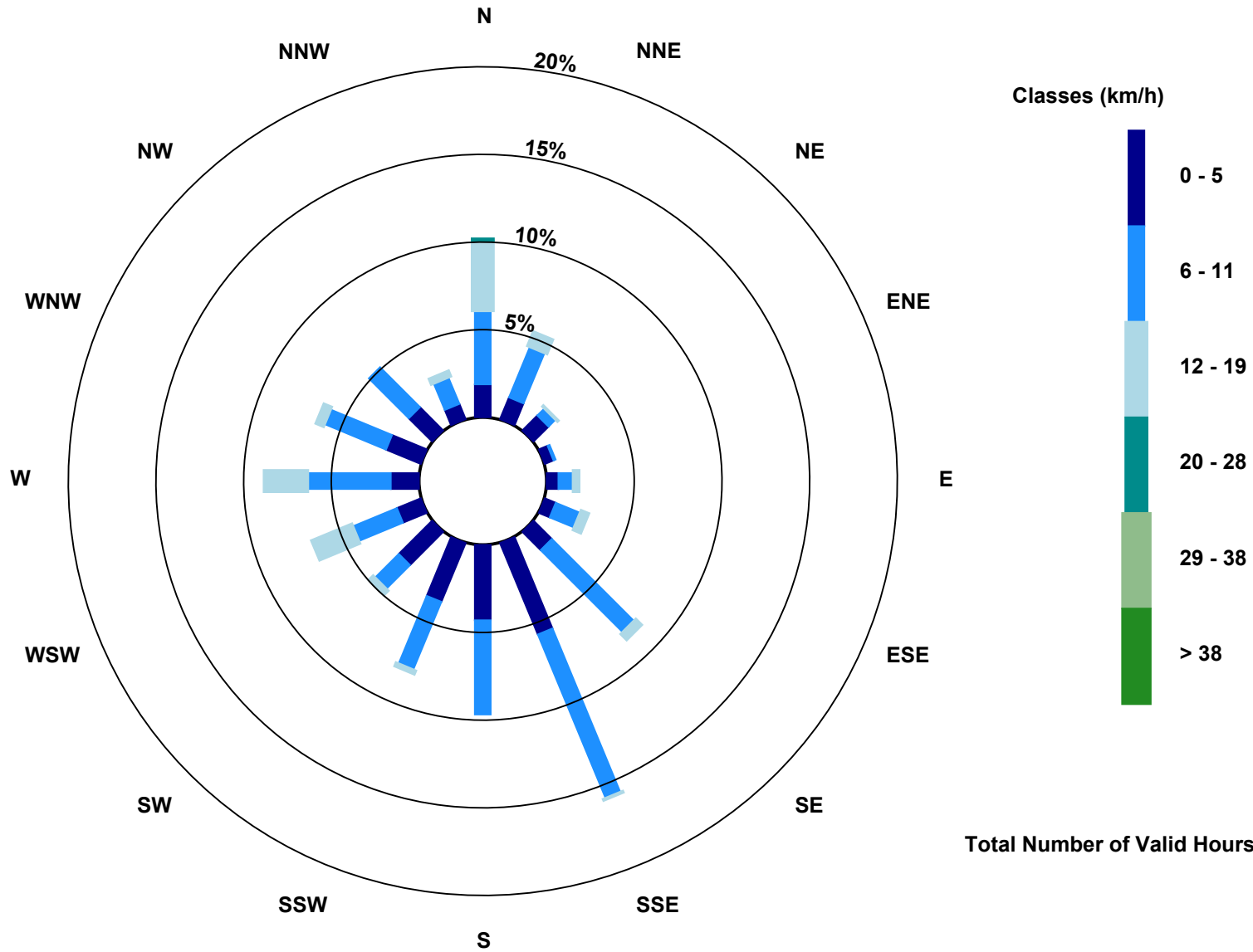
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Buffalo Viewpoint





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 355 deg on Aug 24 12:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 354.4 deg on Aug 24		Hours of Data:	744
Direction of Minimum Speed: 158 deg on Aug 8 05:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 0.4 deg on Aug 15		Percent Operational Time:	100.0
Monthly Average Direction: 236.3 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-Aug	244	258	264	269	261	259	268	272	260	241	240	241	241	276	308	241	183	195	218	266	313	12	2	313	261.3
2-Aug	288	227	275	261	282	280	287	291	284	275	289	277	235	228	211	236	250	254	44	83	111	143	110	138	262.1
3-Aug	180	35	179	101	92	144	177	156	173	166	158	154	172	157	146	149	15	118	176	170	162	205	231	275	162.9
4-Aug	267	297	311	282	282	272	268	267	266	260	269	294	290	233	236	347	91	227	232	249	272	251	279	294	271.8
5-Aug	300	271	207	226	222	225	240	250	277	288	298	351	309	310	312	35	31	25	16	24	49	64	351	319	318.7
6-Aug	205	284	207	217	205	166	160	117	53	165	13	42	16	19	23	15	13	8	12	15	7	348	18	35	29.6
7-Aug	12	1	15	39	235	351	10	5	299	301	310	5	4	12	359	8	9	24	30	13	4	25	32	57	7.7
8-Aug	31	40	24	35	158	163	182	198	136	129	114	113	110	106	103	117	115	119	119	125	123	130	154	151	121.3
9-Aug	144	145	151	147	137	147	143	150	146	146	142	151	137	135	130	127	115	121	131	139	132	124	137	141	137.8
10-Aug	133	138	147	140	131	125	126	130	133	108	99	84	85	93	93	82	84	84	83	53	38	52	69	34	101.0
11-Aug	12	19	15	13	12	18	11	356	1	33	313	299	294	274	229	218	243	242	224	148	133	157	164	148	349.2
12-Aug	188	162	210	231	253	247	263	272	266	268	284	268	332	259	295	249	287	269	250	213	212	212	207	202	250.6
13-Aug	161	150	155	157	164	169	153	168	180	213	210	221	244	251	249	249	246	252	230	196	179	195	269	216.7	
14-Aug	317	189	175	276	294	332	305	269	252	273	282	281	265	251	255	259	300	290	261	281	269	262	318	300	274.7
15-Aug	295	242	192	155	163	169	161	142	136	149	168	143	142	150	187	53	191	78	330	359	349	352	351	342	62.4
16-Aug	330	288	287	316	306	278	270	293	304	296	305	289	267	286	274	244	221	222	211	194	157	147	144	154	264.0
17-Aug	149	146	143	132	141	147	161	173	191	207	239	254	261	266	267	202	298	329	319	192	340	29	302	315	229.6
18-Aug	331	350	2	360	351	5	356	354	347	358	0	344	323	2	2	315	336	352	354	358	358	356	345	320	349.8
19-Aug	312	296	278	268	270	270	263	259	259	259	256	235	253	248	249	251	247	248	218	223	207	182	211	193	251.4
20-Aug	201	188	201	69	227	173	185	161	199	306	356	344	10	2	8	306	287	296	95	169	217	175	153	202	232.2
21-Aug	207	199	131	173	144	170	181	178	176	175	133	151	207	186	185	200	184	177	163	154	163	164	152	154	172.4
22-Aug	169	179	188	167	182	158	157	182	171	184	170	163	190	151	141	206	323	341	344	4	180	161	159	151	171.4
23-Aug	222	4	4	17	354	165	272	357	359	317	254	295	315	316	322	346	2	9	10	11	16	13	13	10	358.3
24-Aug	7	1	357	359	357	357	358	358	356	357	1	355	357	355	350	355	357	353	349	332	301	303	237	238	354.4
25-Aug	171	194	172	158	178	170	172	168	165	156	149	203	212	212	216	201	197	199	168	161	158	156	151	139	179.6
26-Aug	141	140	133	128	137	149	148	161	197	199	209	217	234	243	251	267	280	289	9	4	356	359	14	316	222.5
27-Aug	245	278	305	235	255	284	270	209	226	186	193	212	204	212	208	207	213	214	201	182	178	144	135	152	211.3
28-Aug	4	154	154	170	164	166	171	170	151	177	175	178	184	219	190	124	135	153	178	156	145	149	167	172	164.2
29-Aug	167	163	163	160	164	169	167	180	156	131	130	118	116	166	189	193	177	165	144	149	150	160	163	160	158.6
30-Aug	174	199	194	178	166	163	168	157	150	164	163	137	178	158	156	144	144	147	153	166	156	165	171	158	162.3
31-Aug	157	107	131	191	182	268	169	196	249	272	218	221	305	309	300	300	294	345	310	344	344	314	312	312	287.8

223.4 212.5 207.1 203.8 229.8 215.6 218.1 233.3 242.0 239.1 244.6 240.5 248.2 246.9 248.5 239.6 272.4 280.5 8.8 1.5 28.7 111.5 149.8 240.0
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

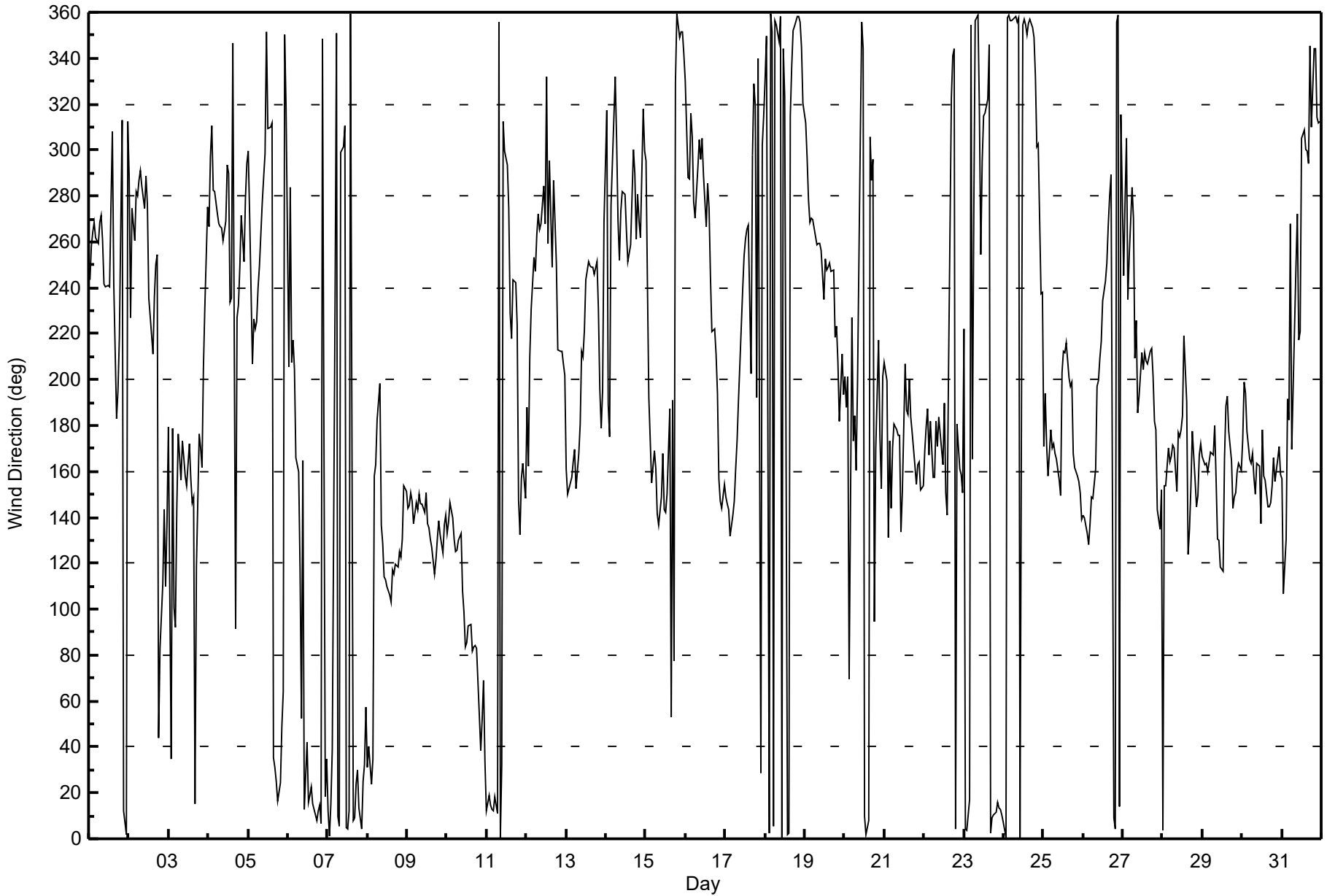
Wind Direction (WD) - deg
Buffalo Viewpoint - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Aug 17 19:00											Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0														
Minimum Value: 9 deg on Aug 13 02:00																									
Percentiles: P ₁ = 11 P ₁₀ = 15 Q ₁ = 19 Median = 24 Q ₃ = 32 P ₉₀ = 49 P ₉₉ = 87																									
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-Aug	19	14	13	14	13	13	16	16	16	19	19	20	26	24	24	49	44	17	18	13	36	30	32	24	49
2-Aug	43	23	44	42	19	24	23	27	26	29	38	42	37	33	53	48	25	26	66	23	18	25	55	80	80
3-Aug	80	69	37	49	58	35	32	25	45	34	30	39	41	34	32	94	49	78	53	35	17	34	54	16	94
4-Aug	16	21	20	21	20	15	14	15	21	25	26	33	34	33	20	82	78	14	19	23	51	27	17	20	82
5-Aug	20	62	42	34	24	26	30	19	25	29	42	58	61	66	72	52	24	22	18	18	16	13	58	30	72
6-Aug	35	60	30	51	40	21	16	46	35	29	90	22	52	89	27	36	25	23	24	46	12	16	15	19	90
7-Aug	58	11	14	14	25	33	72	35	26	24	38	23	27	29	25	24	28	25	22	21	14	11	13	12	72
8-Aug	28	26	77	94	87	28	29	24	37	37	34	36	32	30	25	27	25	28	24	27	26	28	32	32	94
9-Aug	28	31	28	32	31	28	28	30	29	30	31	31	31	27	30	27	23	31	29	29	30	25	29	30	32
10-Aug	28	27	28	29	29	27	28	28	26	24	21	17	19	19	20	15	16	16	18	31	27	39	41	21	41
11-Aug	20	20	18	18	19	16	19	26	26	32	60	49	27	33	33	39	40	33	29	24	18	30	30	31	60
12-Aug	23	21	17	17	19	19	14	15	14	16	25	43	78	26	60	22	30	32	46	16	14	25	18	13	78
13-Aug	12	9	17	23	20	20	24	25	31	20	21	21	22	20	21	21	20	16	22	15	16	23	74	74	
14-Aug	54	19	24	91	21	19	46	17	20	17	21	20	16	18	16	17	23	24	19	20	20	13	47	24	91
15-Aug	47	16	39	14	14	23	28	26	27	31	35	28	24	43	56	81	70	68	53	21	20	19	17	19	81
16-Aug	27	21	19	19	38	23	19	22	21	22	26	31	35	32	28	24	17	18	19	14	14	16	22	26	38
17-Aug	25	23	22	21	30	15	28	31	31	30	55	40	21	24	26	39	75	57	96	73	36	33	31	16	96
18-Aug	17	19	25	17	16	23	19	21	21	20	20	29	29	23	23	22	26	17	19	18	21	19	17	21	29
19-Aug	21	22	19	14	14	16	13	15	15	13	17	22	24	26	25	22	21	19	15	14	13	21	16	22	26
20-Aug	31	45	48	78	79	17	18	25	83	26	35	43	34	63	28	51	23	89	47	20	12	21	21	36	89
21-Aug	25	46	12	22	27	15	19	24	30	35	42	49	38	39	42	34	38	29	26	25	21	13	11	17	49
22-Aug	20	16	60	15	17	17	19	25	30	27	36	36	62	49	63	60	46	30	11	19	52	28	16	32	63
23-Aug	73	36	12	9	25	70	85	26	28	23	42	32	22	24	17	17	17	15	19	19	19	18	19	85	
24-Aug	21	22	20	21	19	19	19	21	19	21	21	22	22	23	25	25	20	21	17	17	16	23	32	42	42
25-Aug	15	20	11	15	12	14	15	21	30	31	34	23	22	22	21	25	22	25	26	29	29	27	23	21	34
26-Aug	20	21	18	18	20	17	21	23	29	24	22	22	25	21	19	28	28	24	22	21	17	18	12	22	29
27-Aug	30	28	15	47	24	15	24	49	68	78	37	49	32	31	28	22	20	15	17	18	10	16	11	82	82
28-Aug	88	18	19	16	21	21	13	20	26	22	31	37	38	45	32	20	30	31	25	20	15	20	28	25	88
29-Aug	17	17	14	15	13	12	13	24	24	26	26	24	23	33	29	27	29	24	21	14	11	13	13	15	33
30-Aug	16	13	15	15	16	16	18	19	36	48	38	30	44	40	44	31	31	27	27	29	26	33	35	31	48
31-Aug	28	34	46	21	45	49	32	20	28	43	33	43	28	38	53	36	26	43	83	19	17	19	19	19	83
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS05
MANNIX
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
AUGUST 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	68.3	0	13.3	0
H2S (ppb) Average	708	36	36	100	14	2	2.9	0
THC (ppm) Average	708	36	36	100	5.6	-	3.6	-
NMHC(ppm) Average	708	36	36	100	2.802	-	0.746	-
CH4(ppm) Average	708	36	36	100	4.1	-	2.9	-
Temperature 2 m (C) Average	744	0	0	100	30.1	-	22.4	-
Temperature 20 m (C) Average	744	0	0	100	29.4	-	23.1	-
Temperature 45 m (C) Average	744	0	0	100	29	-	23.4	-
Temperature 75 m (C) Average	744	0	0	100	28.8	-	23.9	-
Temperature 90 m (C) Average	744	0	0	100	28.7	-	24.2	-
Relative Humidity 2 m (%) Average	744	0	0	100	98	-	92	-
Relative Humidity 20 m (%) Average	744	0	0	100	97	-	89	-
Relative Humidity 45 m (%) Average	744	0	0	100	97	-	88	-
Relative Humidity 75 m (%) Average	744	0	0	100	100	-	92	-
Relative Humidity 90 m (%) Average	744	0	0	100	99	-	90	-
Wind Speed 20 m (km/h) Average	744	0	0	100	25	-	14	-
Wind Speed 45 m (km/h) Average	744	0	0	100	38	-	21	-
Wind Speed 75 m (km/h) Average	744	0	0	100	42	-	24	-
Wind Speed 90 m (km/h) Average	744	0	0	100	42	-	25	-
Wind Direction 20 m (deg) Average	744	0	0	100	-	-	-	-
Wind Direction 45 m (deg) Average	744	0	0	100	-	-	-	-
Wind Direction 75 m (deg) Average	744	0	0	100	-	-	-	-
Wind Direction 90 m (deg) Average	744	0	0	100	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	0	0	100	1.4	-	0.7	-
Vertical Wind Speed 45 m (km/h) Average	744	0	0	100	1.5	-	0.7	-
Vertical Wind Speed 75 m (km/h) Average	744	0	0	100	1.5	-	0.4	-
Vertical Wind Speed 90 m (km/h) Average	744	0	0	100	1.9	-	0.7	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)

AUGUST 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	1.66	5.5	-	0	0	0.1	0.2	0.6	2.8	68.3
H2S (ppb) Average	708	0.69	1.3	-	0	0.1	0.1	0.3	0.6	1.7	14.3
THC (ppm) Average	708	2.25	0.4	-	1.9	2	2	2.1	2.4	2.7	5.6
NMHC(ppm) Average	708	0.145	0.233	-	0	0	0	0.1	0.2	0.4	2.802
CH4(ppm) Average	708	2.11	0.2	-	1.9	1.9	2	2.1	2.2	2.3	4.1
Temperature 2 m (C) Average	744	16.94	4.6	-	6.8	11.9	13.5	16.1	20.1	23.5	30.1
Temperature 20 m (C) Average	744	17.54	4.1	-	7.3	12.9	14.4	17	20.3	23.1	29.4
Temperature 45 m (C) Average	744	17.54	4	-	7.1	12.9	14.4	17	20.2	23.1	29
Temperature 75 m (C) Average	744	17.6	4	-	7	13	14.5	17.2	20.2	23	28.8
Temperature 90 m (C) Average	744	17.72	4	-	7.2	13	14.7	17.3	20.3	23	28.7
Relative Humidity 2 m (%) Average	744	76.3	17	-	38	51	63	79	91	96	98
Relative Humidity 20 m (%) Average	744	70.5	16	-	33	47	58	72	83	90	97
Relative Humidity 45 m (%) Average	744	68.2	15	-	30	46	56	69	81	87	97
Relative Humidity 75 m (%) Average	744	67.7	15	-	29	46	56	69	80	88	100
Relative Humidity 90 m (%) Average	744	66.5	15	-	28	46	56	68	77	85	99
Wind Speed 20 m (km/h) Average	744	9.1	4	-	0	4	6	9	12	15	25
Wind Speed 45 m (km/h) Average	744	13.5	6	-	1	6	9	13	17	21	38
Wind Speed 75 m (km/h) Average	744	15.1	7	-	1	6	10	15	20	25	42
Wind Speed 90 m (km/h) Average	744	15.7	8	-	0	6	10	15	21	26	42
Wind Direction 20 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 45 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 75 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Wind Direction 90 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Vertical Wind Speed 20 m (km/h) Average	744	0.13	0.4	-	-1.1	-0.3	-0.1	0.1	0.4	0.6	1.4
Vertical Wind Speed 45 m (km/h) Average	744	0.05	0.4	-	-1	-0.5	-0.3	0	0.4	0.6	1.5
Vertical Wind Speed 75 m (km/h) Average	744	0.22	0.3	-	-0.7	-0.1	0	0.2	0.4	0.6	1.5
Vertical Wind Speed 90 m (km/h) Average	744	0.04	0.5	-	-1.3	-0.6	-0.3	0	0.3	0.7	1.9

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MANNIX (AMS05)
AUGUST 2023

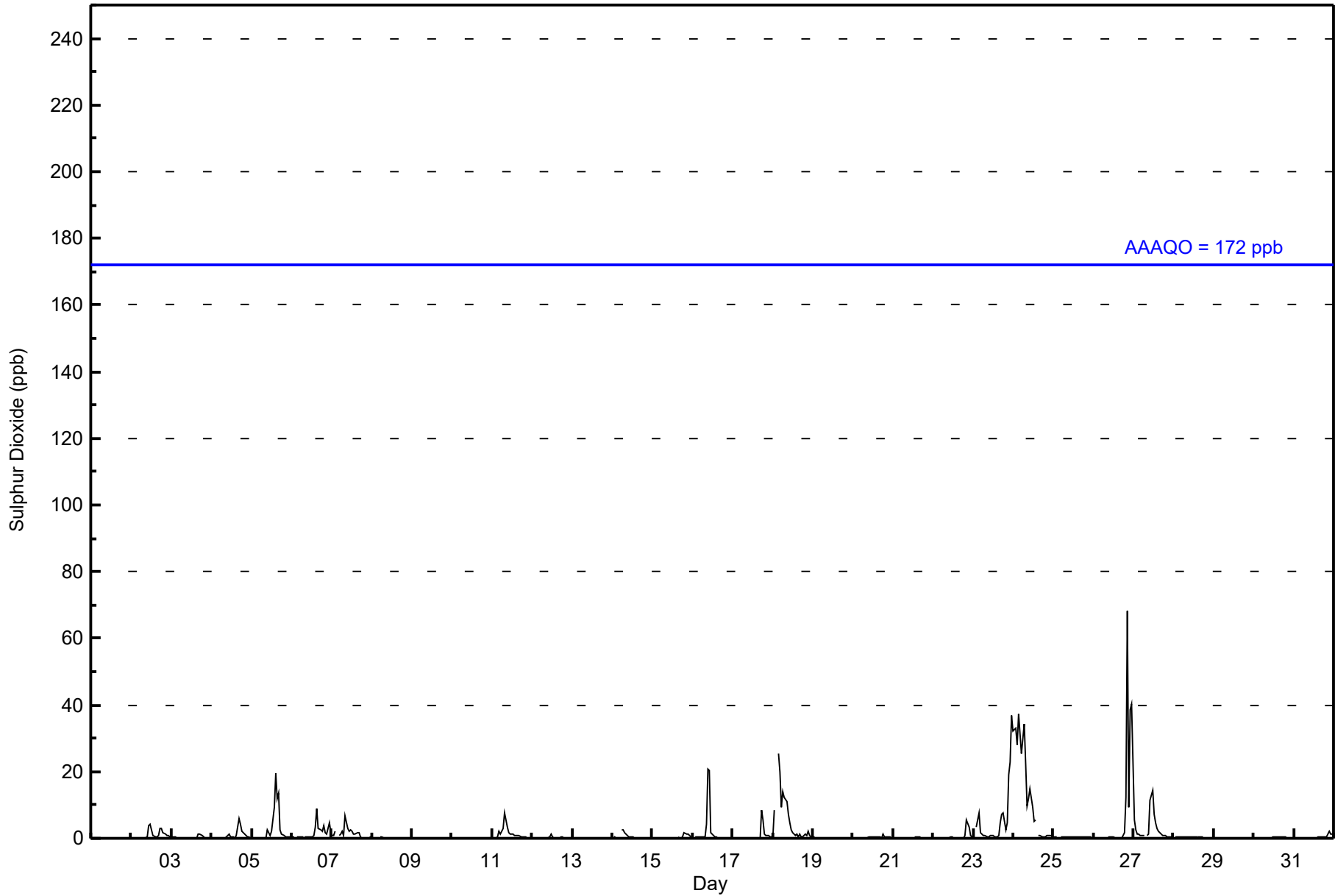
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
				No operational issues to report



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mannix - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Mannix - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	679	95.90	95.90
11 - 20	13	1.84	97.74
21 - 60	15	2.12	99.86
61 - 110	1	0.14	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 - August 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	35	29	13	8	21	15	54	134	61	30	30	70	89	31	26	33	679
11 - 20	8	2	0	0	0	0	1	0	1	0	0	0	0	1	0	0	13
21 - 60	13	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	15
61 - 110	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	57	31	13	8	21	15	55	134	62	30	30	70	89	34	26	33	708

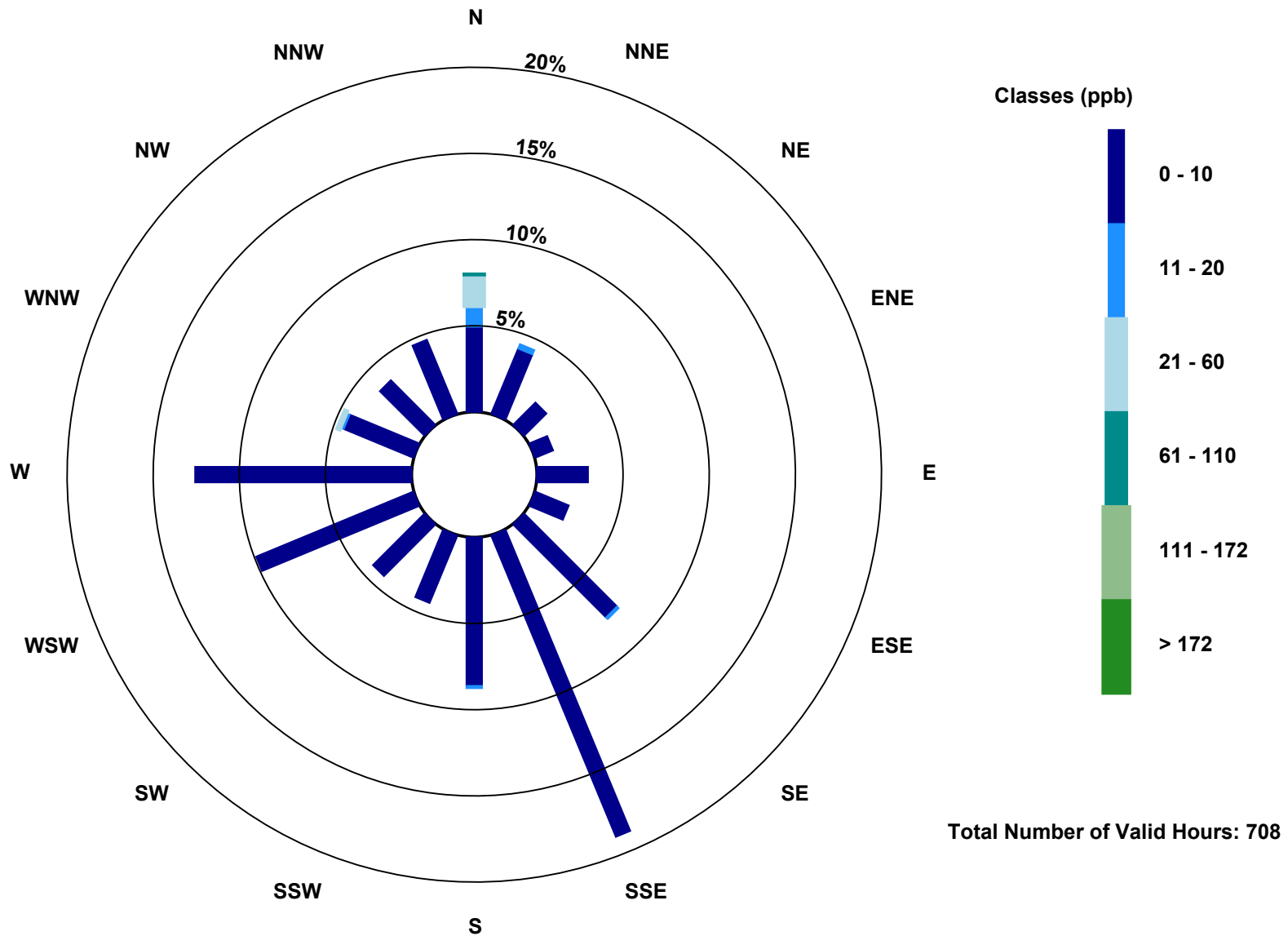
Total Number of Valid Hours: 708

Total Number of Hours: 744

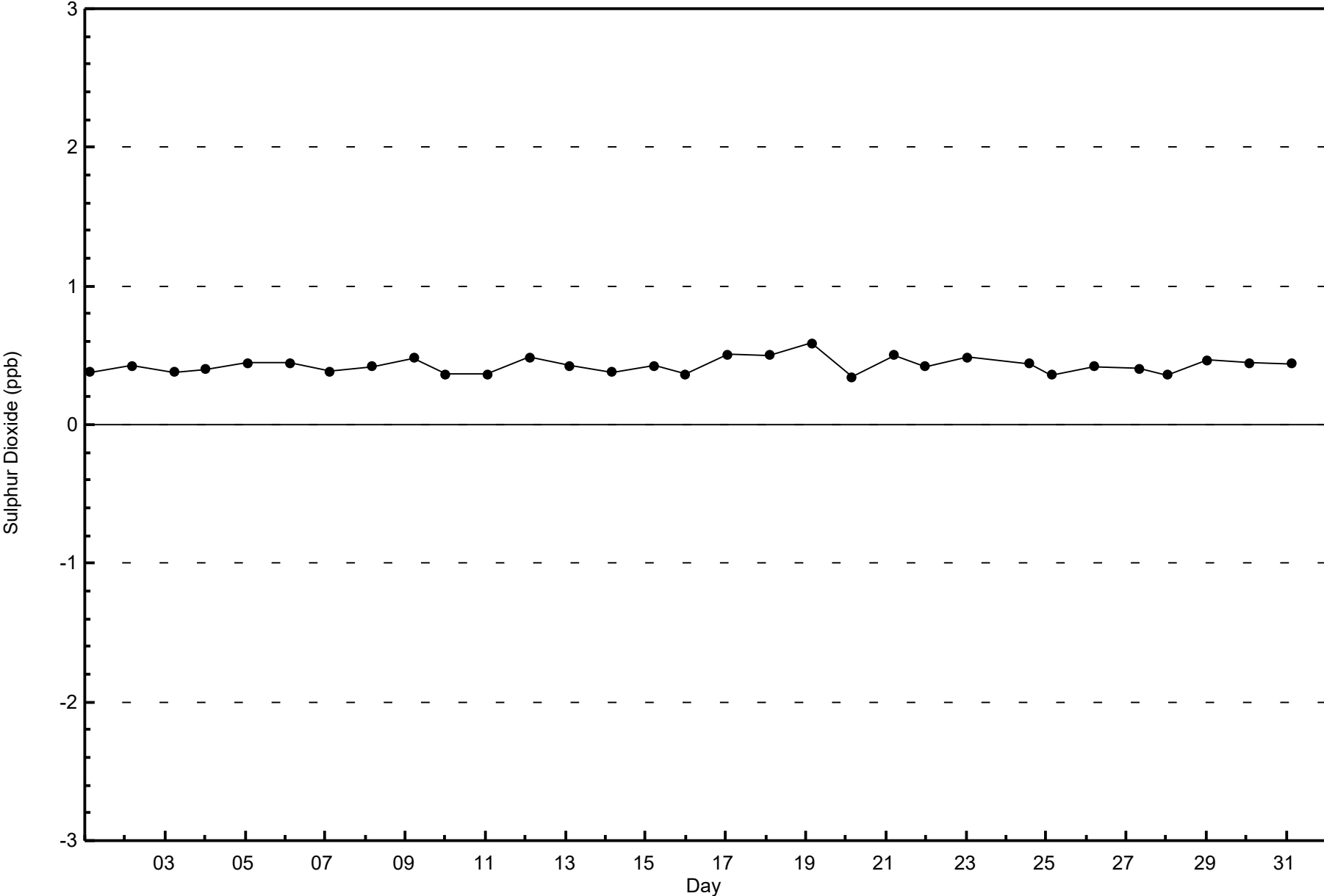


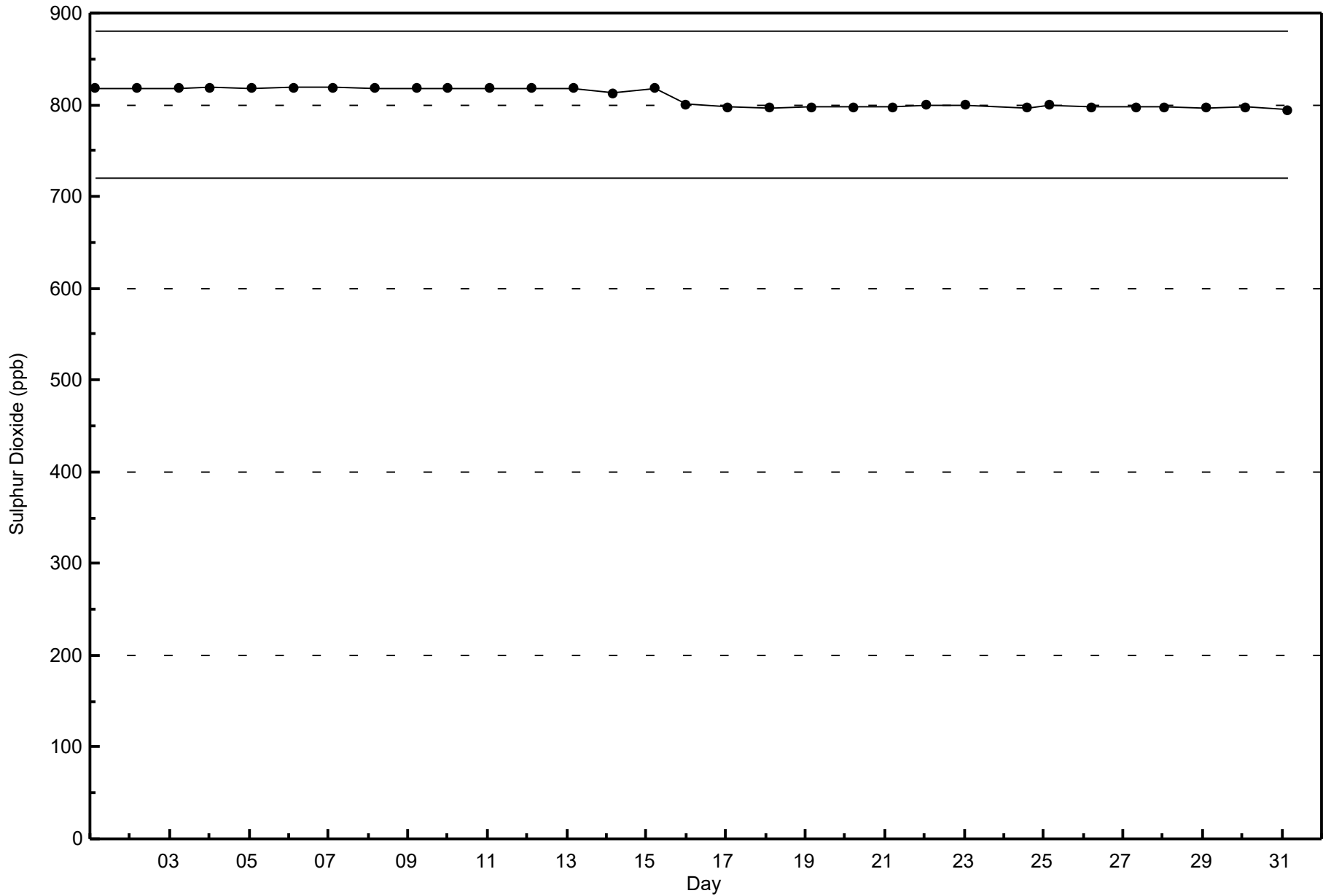
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Mannix



Total Number of Valid Hours: 708



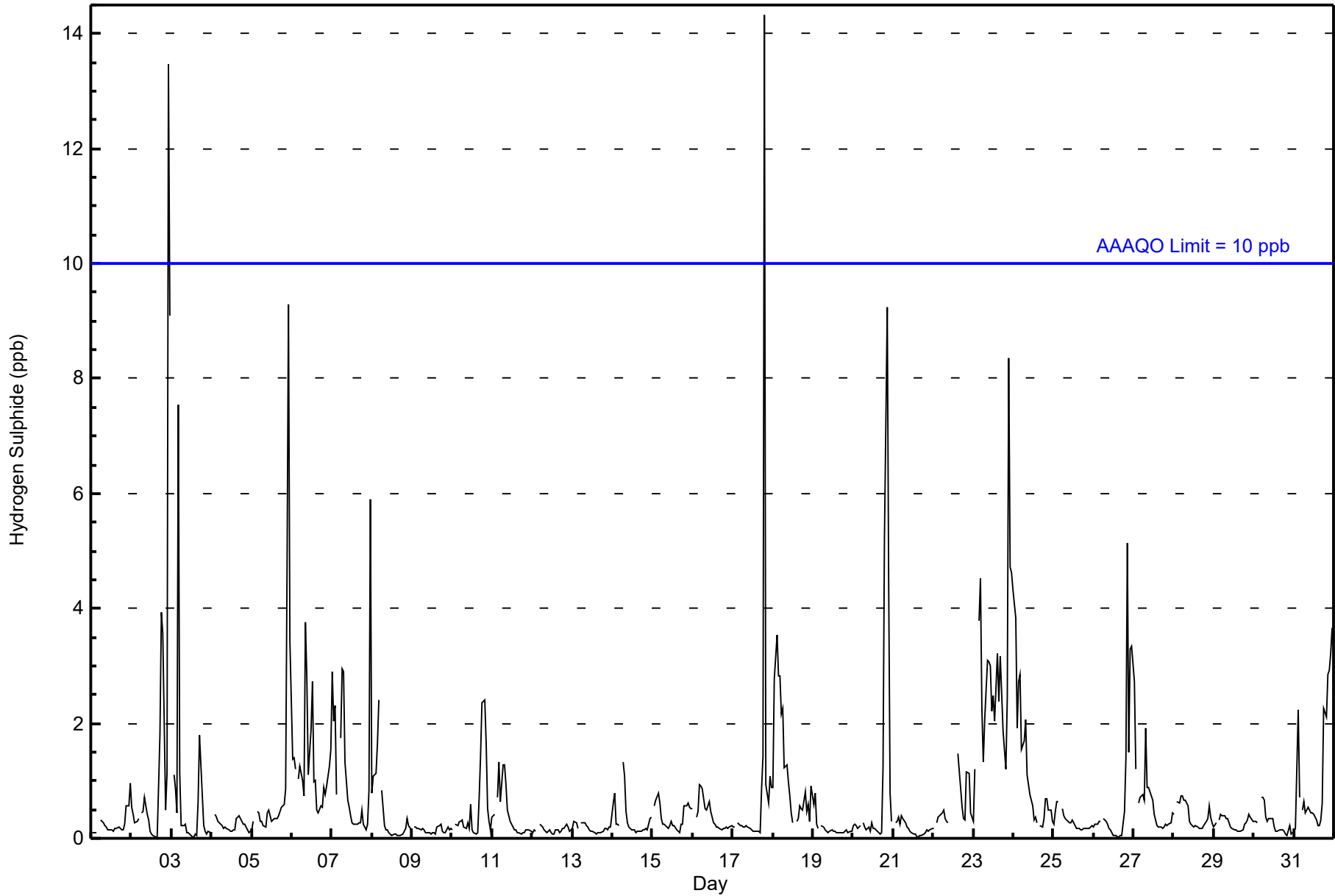




Number of Exceedences (AAAQO):	1-hr: 2	24-hr: 0	Hours in Service:	744
Maximum Value: 14.3 ppb on Aug 17 20:00	Maximum Daily Average: 2.9 ppb on Aug 23		Hours of Data:	708
Minimum Value: 0.0 ppb on Aug 2 16:00	Minimum Daily Average: 0.1 ppb on Aug 9		Hours of Missing Data:	36
Maximum Diurnal Average: 1.4 ppb at hour 23	Minimum Diurnal Average: 0.3 ppb at hour 14		Hours of Calibration:	36
Monthly Average: 0.69 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.6 P ₉₀ = 1.7 P ₉₉ = 5.9		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-Aug	0.1	0.1	0.1	0.1	Z	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.6	0.6	1.0	0.2	1.0																							
2-Aug	0.5	0.4	0.3	0.3	0.4	Z	0.4	0.5	0.7	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.9	1.8	3.9	3.6	0.5	1.1	13.5	9.1	1.7	13.5																							
3-Aug	Z	1.1	0.9	0.4	7.6	1.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.6	1.8	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.7	7.6																							
4-Aug	0.1	Z	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4																						
5-Aug	0.1	0.3	Z	0.5	0.4	0.3	0.3	0.2	0.2	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.9	4.8	9.3	3.5	1.1	9.3																							
6-Aug	1.4	1.4	1.2	Z	1.0	1.2	1.0	0.7	3.8	2.8	1.1	1.9	2.7	1.0	1.0	0.5	0.4	0.6	0.5	0.9	0.7	0.9	1.2	1.5	1.3	3.8																							
7-Aug	2.9	2.0	2.3	0.8	Z	1.7	2.9	2.9	1.3	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.2	0.1	0.3	0.8	5.9	1.2	5.9																							
8-Aug	0.8	1.1	1.1	1.7	2.4	Z	0.8	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.4	2.4																							
9-Aug	Z	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	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2																						
10-Aug	0.1	Z	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.6	0.1	0.1	0.1	0.1	0.7	1.4	2.4	2.4	1.7	0.5	0.3	0.1	0.6	2.4																							
11-Aug	0.4	0.4	Z	0.7	1.3	0.6	1.3	1.3	0.9	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.4	1.3																							
12-Aug	0.1	0.2	0.1	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	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3																							
13-Aug	0.2	0.3	0.3	0.2	Z	0.3	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	0.2	0.2	0.1	0.2	0.2	0.2	0.3																							
14-Aug	0.6	0.8	0.2	0.2	0.2	Z	1.3	1.1	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	1.3																							
15-Aug	Z	0.6	0.7	0.8	0.6	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.6	0.6	0.6	0.5	0.5	0.4	0.8																							
16-Aug	0.5	Z	0.4	0.5	0.9	0.9	0.5	0.5	0.6	0.7	0.5	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	0.4	0.9																							
17-Aug	0.2	0.2	Z	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	0.1	0.9	1.4	14.3	0.9	0.6	1.1	0.9	1.0	14.3																							
18-Aug	0.9	2.8	3.5	2.8	2.8	2.2	2.3	1.2	1.3	1.0	0.7	0.4	0.3	Z	0.3	0.3	0.6	0.5	0.5	0.8	0.5	0.6	0.3	0.9	1.2	3.5																							
19-Aug	0.6	0.8	0.3	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8																							
20-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.1	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	1.2	5.2	9.2	4.4	0.8	0.3	1.1	9.2																							
21-Aug	Z	0.3	0.3	0.4	0.2	0.4	0.4	0.3	0.2	0.2	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	0.2	0.4																							
22-Aug	0.2	Z	0.3	0.4	0.4	0.4	0.5	0.3	0.3	0.3	C	C	C	C	C	1.5	0.9	0.5	0.4	0.3	1.1	1.1	0.4	0.4	0.5	1.5																							
23-Aug	0.3	1.2	Z	3.8	4.5	2.3	1.3	2.1	3.1	3.1	3.0	2.2	2.5	2.0	3.2	2.4	3.2	2.5	1.9	1.2	2.5	8.4	4.7	4.6	2.9	8.4																							
24-Aug	4.3	3.8	1.9	2.7	2.9	1.5	1.7	2.1	1.1	0.9	0.8	0.6	0.3	0.4	0.3	Z	0.2	0.2	0.3	0.7	0.7	0.5	0.5	0.3	1.3	4.3																							
25-Aug	0.2	0.5	0.6	0.6	Z	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6																							
26-Aug	0.2	0.2	0.3	0.3	0.3	Z	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.5	1.4	5.1	1.5	3.3	3.3	0.8	5.1																							
27-Aug	2.7	1.2	Z	0.6	0.7	0.8	0.7	1.9	0.9	0.9	0.8	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7	2.7																							
28-Aug	0.4	Z	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.4	0.3	0.4	0.7																							
29-Aug	0.2	0.3	Z	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.4																						
30-Aug	0.3	0.3	0.3	Z	0.7	0.7	0.7	0.4	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.3	0.7																							
31-Aug	0.1	0.2	2.2	0.7	Z	0.5	0.6	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.6	2.3	2.1	2.9	2.9	3.2	3.7	1.1	3.7																							
																								0.7	0.8	0.8	0.7	1.2	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.6	1.2	1.0	1.0	1.4	1.3	Diurnal Average	
																								4.3	3.8	3.5	3.8	7.6	2.3	2.9	2.9	3.8	3.1	3.0	2.2	2.7	2.0	3.2	2.4	3.2	2.5	3.9	14.3	9.2	8.4	13.5	9.1	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
Mannix - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	662	93.50	93.50
3 - 4	32	4.52	98.02
5 - 7	7	0.99	99.01
8 - 11	5	0.71	99.72
> 11	2	0.28	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mannix - August 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	29	8	4	16	14	56	140	57	29	28	70	89	32	17	32	662
3 - 4	13	2	4	0	2	1	0	0	1	0	0	0	1	1	7	0	32
5 - 7	3	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0	7
8 - 11	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	5
> 11	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
Totals	58	31	13	8	21	15	56	140	59	29	28	70	90	34	24	32	708

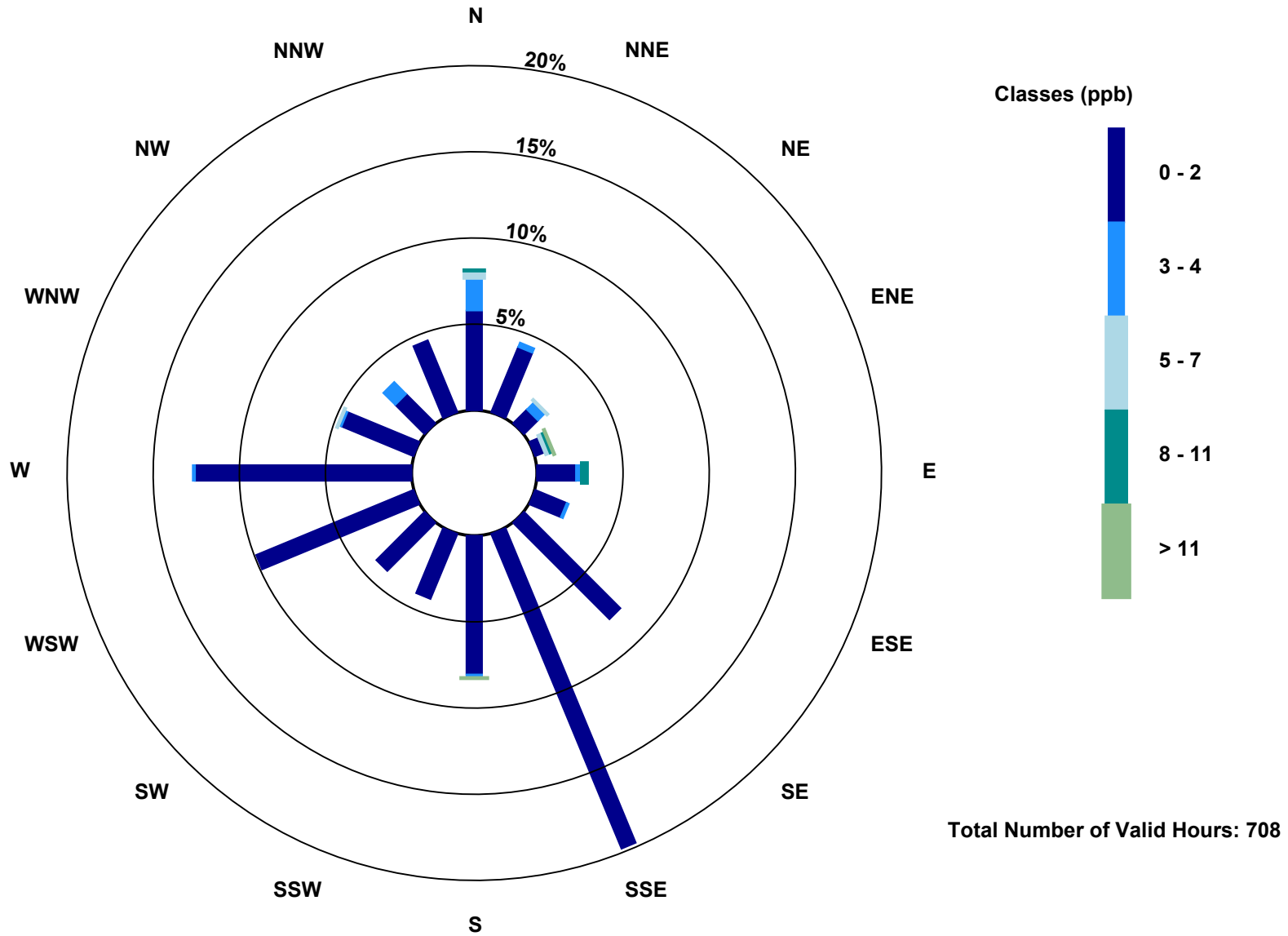
Total Number of Valid Hours: 708

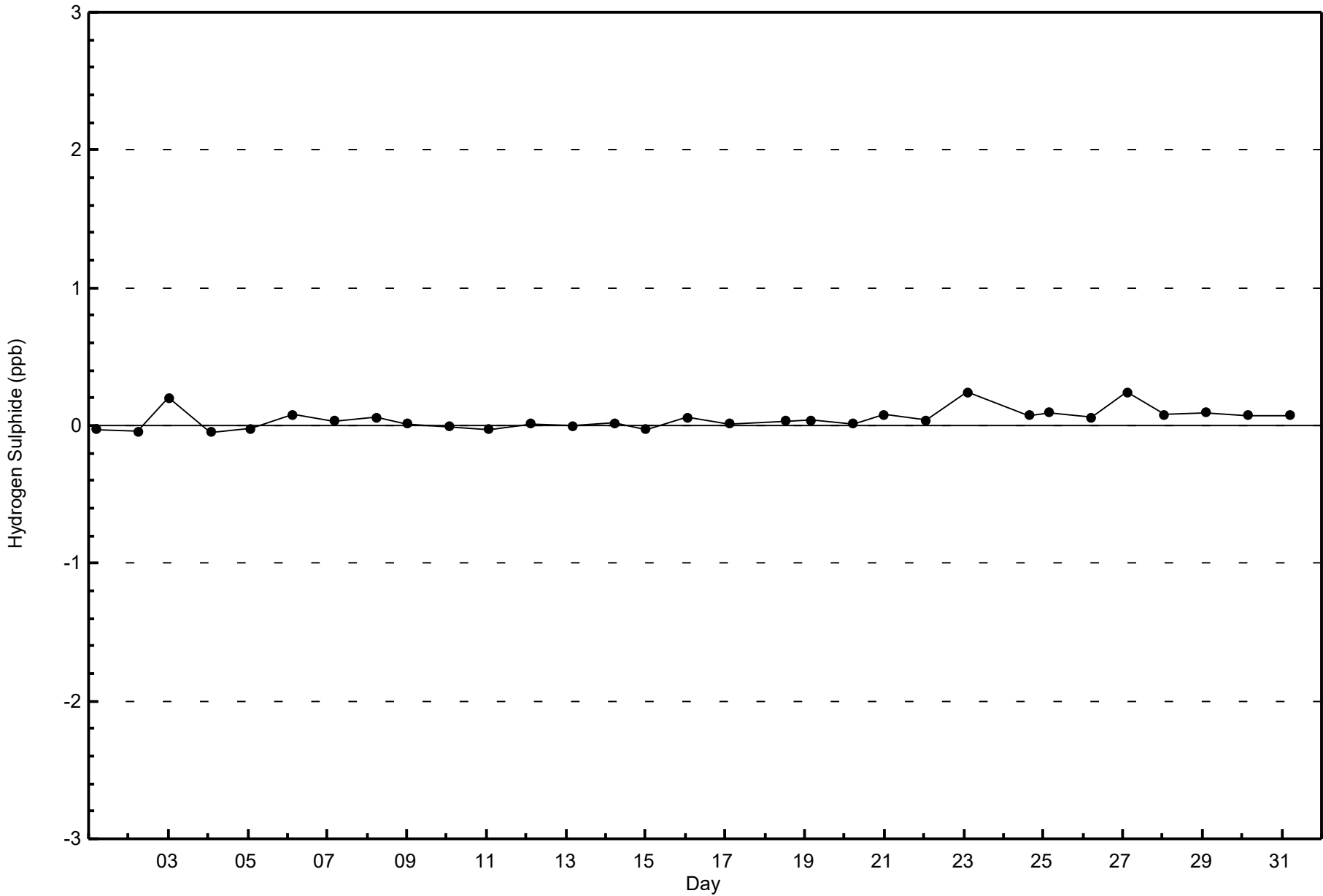
Total Number of Hours: 744

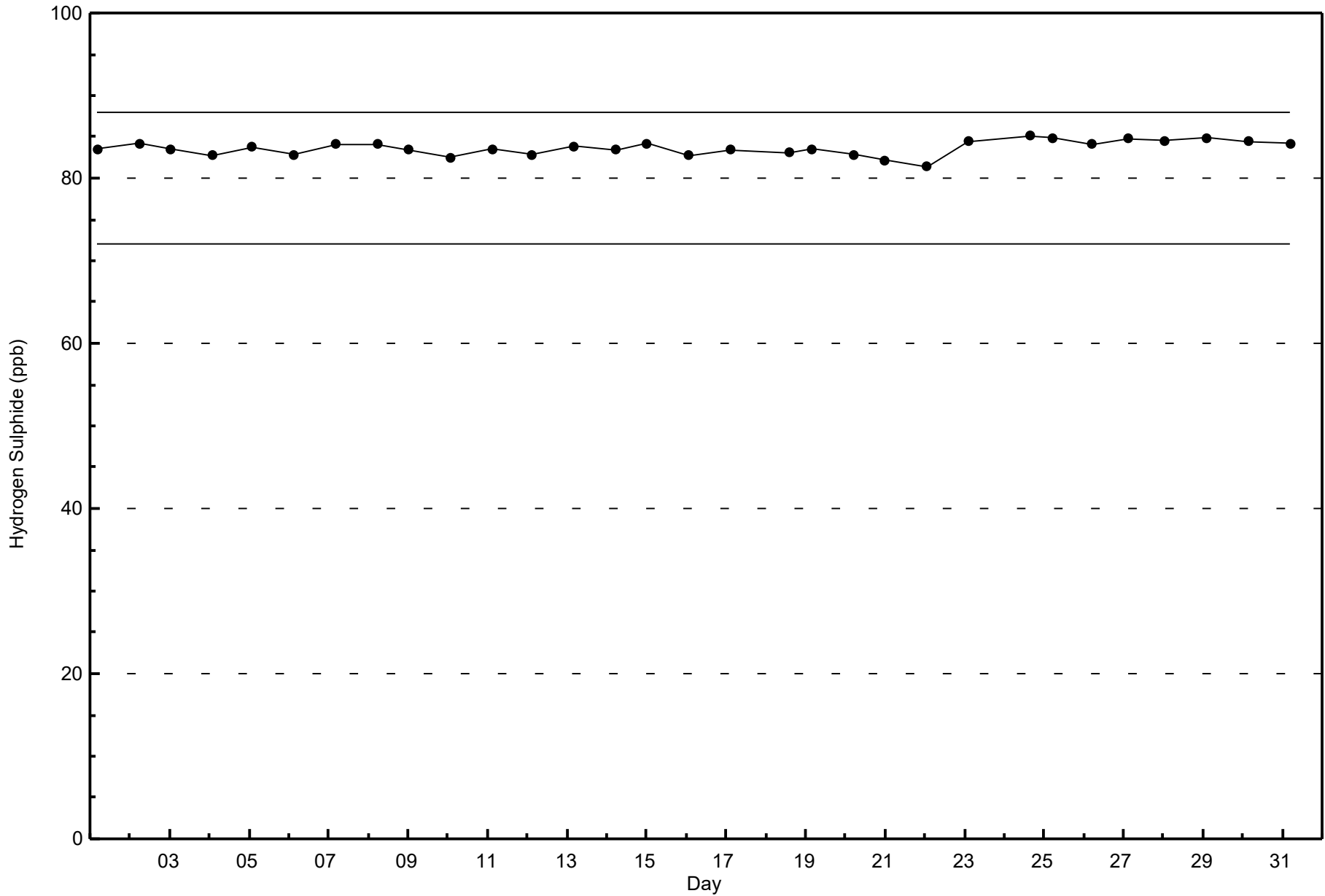


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Mannix









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

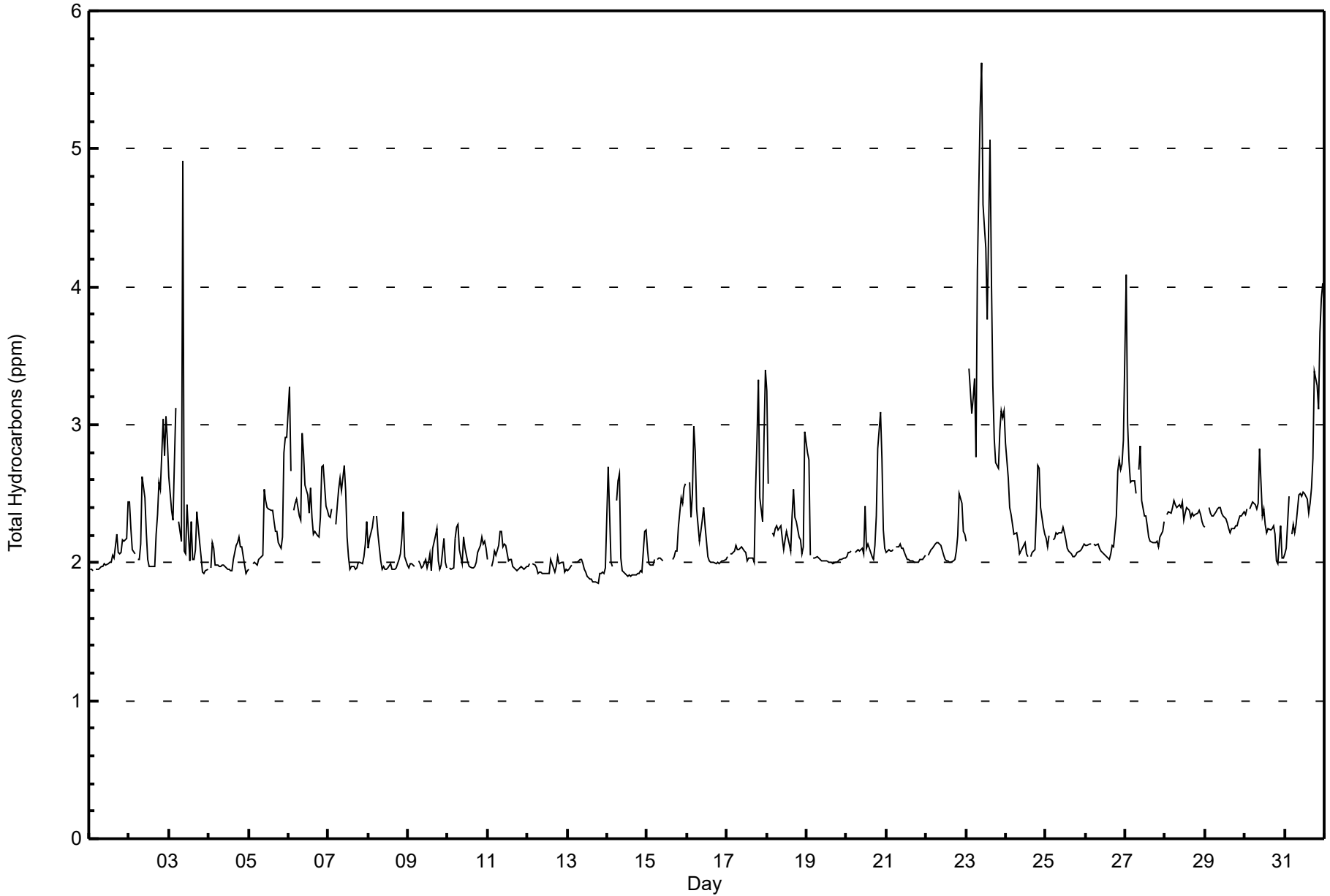
Mannix - August 2023

Maximum Value: 5.6 ppm on Aug 23 10:00																				Maximum Daily Average: 3.6 ppm on Aug 23					Hours in Service:	744
Minimum Value: 1.9 ppm on Aug 13 19:00																				Minimum Daily Average: 1.9 ppm on Aug 13					Hours of Data:	708
Maximum Diurnal Average: 2.4 ppm at hour 9																				Minimum Diurnal Average: 2.1 ppm at hour 16					Hours of Missing Data:	36
Monthly Average: 2.25 ppm																				Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.4 P ₉₀ = 2.7 P ₉₉ = 4.1					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-Aug	2.0	2.0	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.4	2.0	2.4
2-Aug	2.4	2.2	2.1	2.1	Z	2.0	2.0	2.1	2.6	2.5	2.2	2.0	2.0	2.0	2.0	2.2	2.4	2.6	2.5	3.0	2.8	3.1	2.9	2.3	3.1	
3-Aug	2.6	2.4	2.3	2.7	3.1	Z	2.3	2.2	4.9	2.1	2.1	2.4	2.0	2.3	2.0	2.0	2.1	2.4	2.2	2.0	1.9	1.9	2.0	2.3	4.9	
4-Aug	Z	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.2	2.1	2.1	2.0	1.9	1.9	2.0	2.2	
5-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.2	2.8	2.9	2.9	2.3	2.9	
6-Aug	3.3	2.7	Z	2.4	2.4	2.5	2.3	2.3	2.9	2.8	2.6	2.5	2.4	2.5	2.3	2.2	2.2	2.2	2.3	2.7	2.7	2.4	2.4	2.5	3.3	
7-Aug	2.3	2.3	2.4	Z	2.3	2.4	2.5	2.6	2.5	2.7	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.7		
8-Aug	2.1	2.2	2.3	2.3	Z	2.3	2.2	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	2.4	2.0	2.0	2.1	2.4	
9-Aug	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	2.1	1.9	2.1	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
10-Aug	Z	2.0	2.0	2.0	2.2	2.3	2.3	2.1	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.2	2.1	2.3	
11-Aug	2.0	Z	2.0	2.0	2.1	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	
12-Aug	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	
13-Aug	1.9	2.0	2.0	Z	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	1.9	1.9	1.9	1.9	2.0	1.9	2.0		
14-Aug	2.7	2.4	2.0	2.0	Z	2.5	2.6	2.6	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2	2.2	2.1	2.7		
15-Aug	2.1	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.1	2.1	2.3	2.5	2.4	2.5	2.1	2.6	
16-Aug	Z	2.6	2.3	2.5	3.0	2.8	2.4	2.2	2.2	2.3	2.4	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	3.0	
17-Aug	2.0	Z	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	2.0	2.0	2.5	2.9	3.3	2.5	2.3	2.9	2.3	3.4	
18-Aug	3.2	2.6	Z	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.1	2.2	2.2	2.1	2.1	2.3	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.3	3.2	
19-Aug	2.8	2.7	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	2.1	2.8	
20-Aug	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.4	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.8	3.1	2.8	2.2	2.2	3.1	
21-Aug	2.1	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	
22-Aug	Z	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	2.0	2.0	2.0	2.0	2.1	2.2	2.5	2.4	2.2	2.1	2.5	
23-Aug	2.2	Z	3.4	3.1	3.2	3.3	2.8	4.1	5.3	5.6	4.6	4.4	4.3	3.8	5.1	4.0	3.3	2.9	2.7	2.7	3.0	3.1	3.0	3.6	5.6	
24-Aug	2.9	2.6	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	Z	2.0	2.1	2.1	2.4	2.7	2.7	2.4	2.3	2.2	2.3	2.9	
25-Aug	2.2	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	
26-Aug	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.7	2.8	2.7	2.7	2.9	2.2	2.9	
27-Aug	4.1	3.0	2.7	2.6	2.6	2.6	2.5	Z	2.7	2.8	2.5	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.3	2.5	4.1	
28-Aug	Z	2.3	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	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	
29-Aug	2.3	Z	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.3	2.4	
30-Aug	2.3	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.4	2.8	2.3	2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.2	2.0	2.0	2.3	2.0	2.3	2.8	
31-Aug	2.1	2.1	2.5	Z	2.2	2.3	2.2	2.3	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.5	2.8	3.4	3.3	3.1	3.7	3.9	2.7	4.0	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mannix - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mannix - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	262	37.01	37.01
2.1 - 3.0	415	58.62	95.62
3.1 - 10.0	31	4.38	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 - August 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	7	1	0	10	6	30	33	19	14	18	53	56	5	1	2	262
2.1 - 3.0	46	22	12	7	9	9	24	101	42	16	11	17	31	25	16	27	415
3.1 - 10.0	4	2	0	1	2	0	1	0	1	0	1	0	2	4	9	4	31
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	31	13	8	21	15	55	134	62	30	30	70	89	34	26	33	708

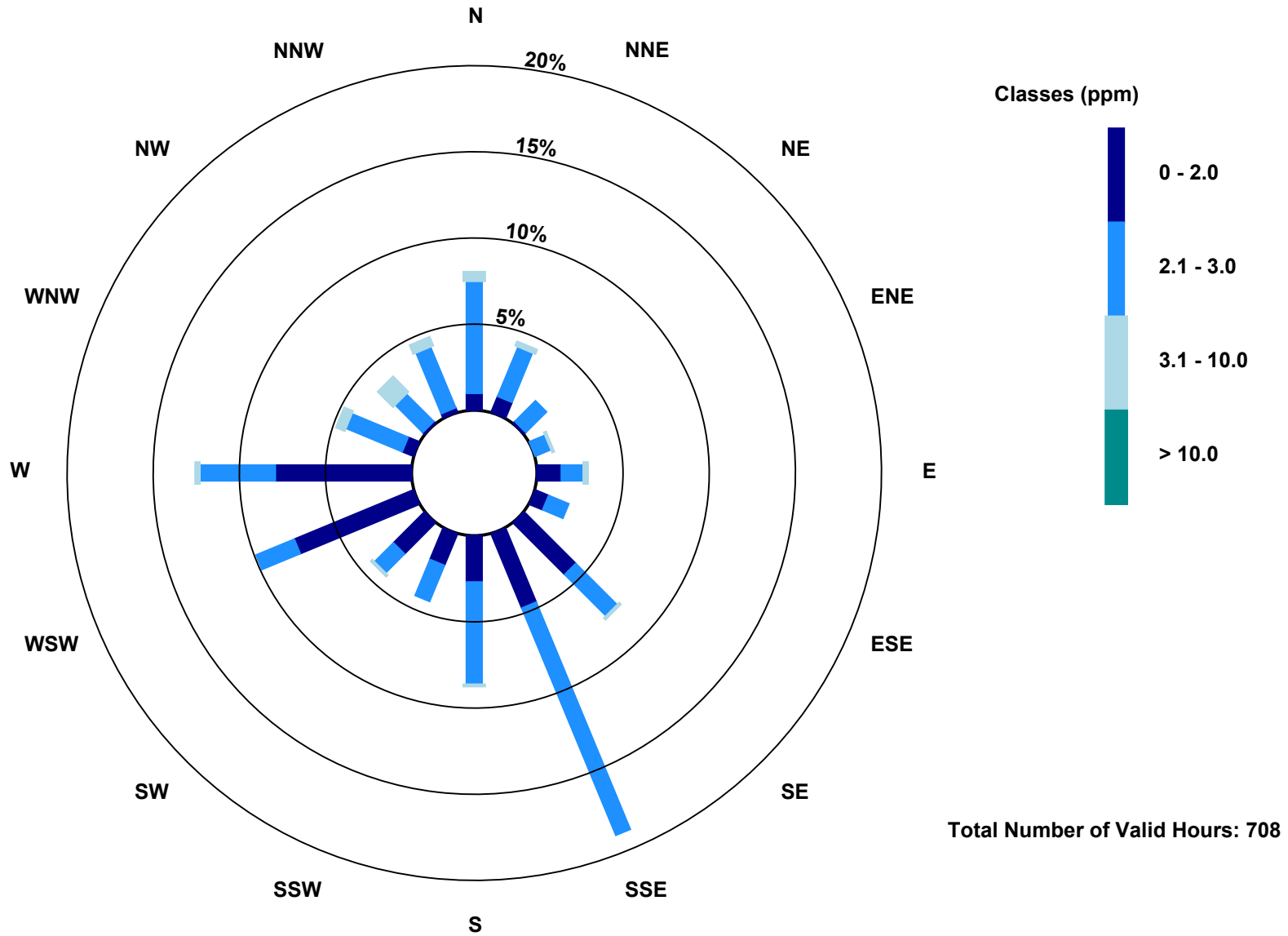
Total Number of Valid Hours: 708

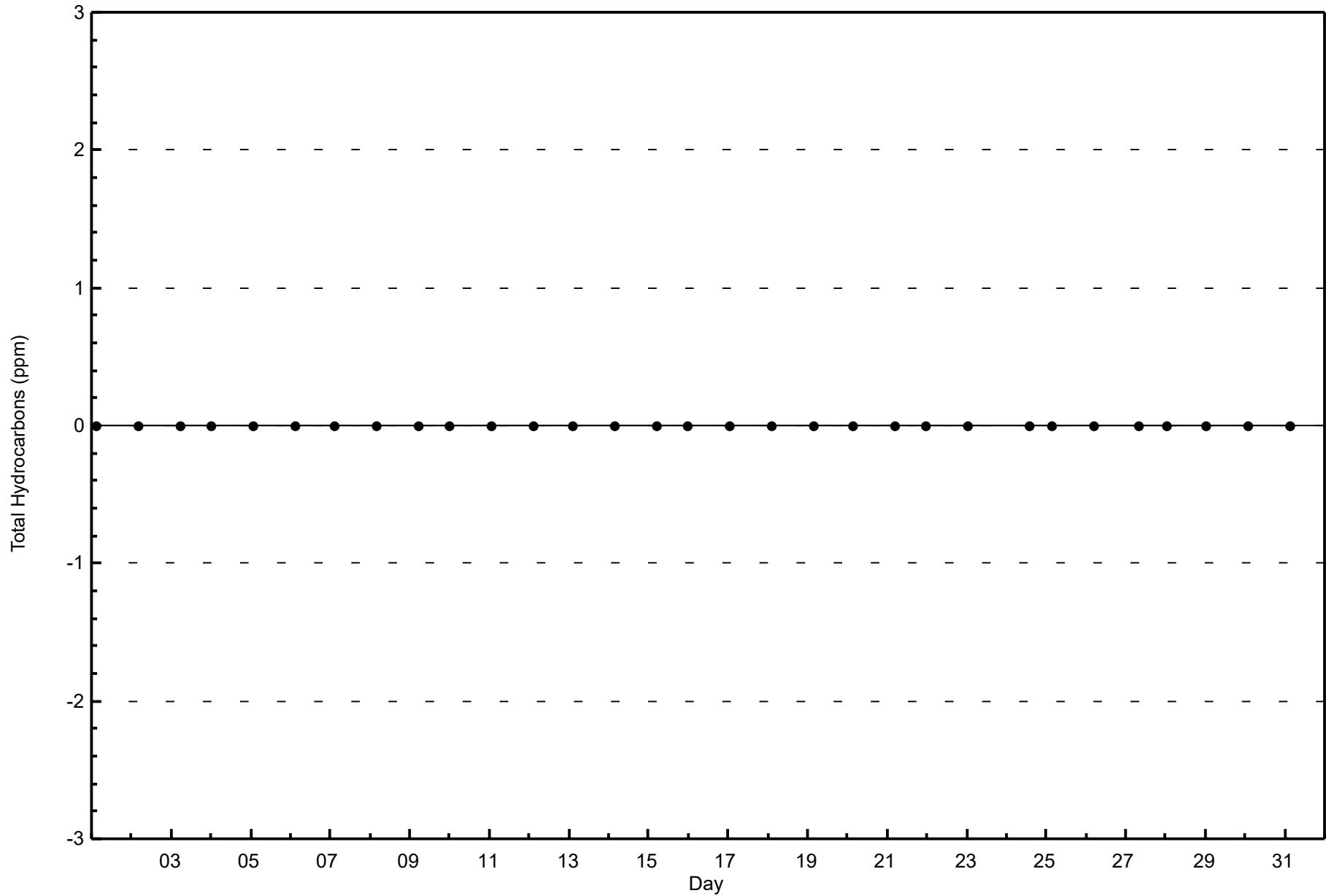
Total Number of Hours: 744

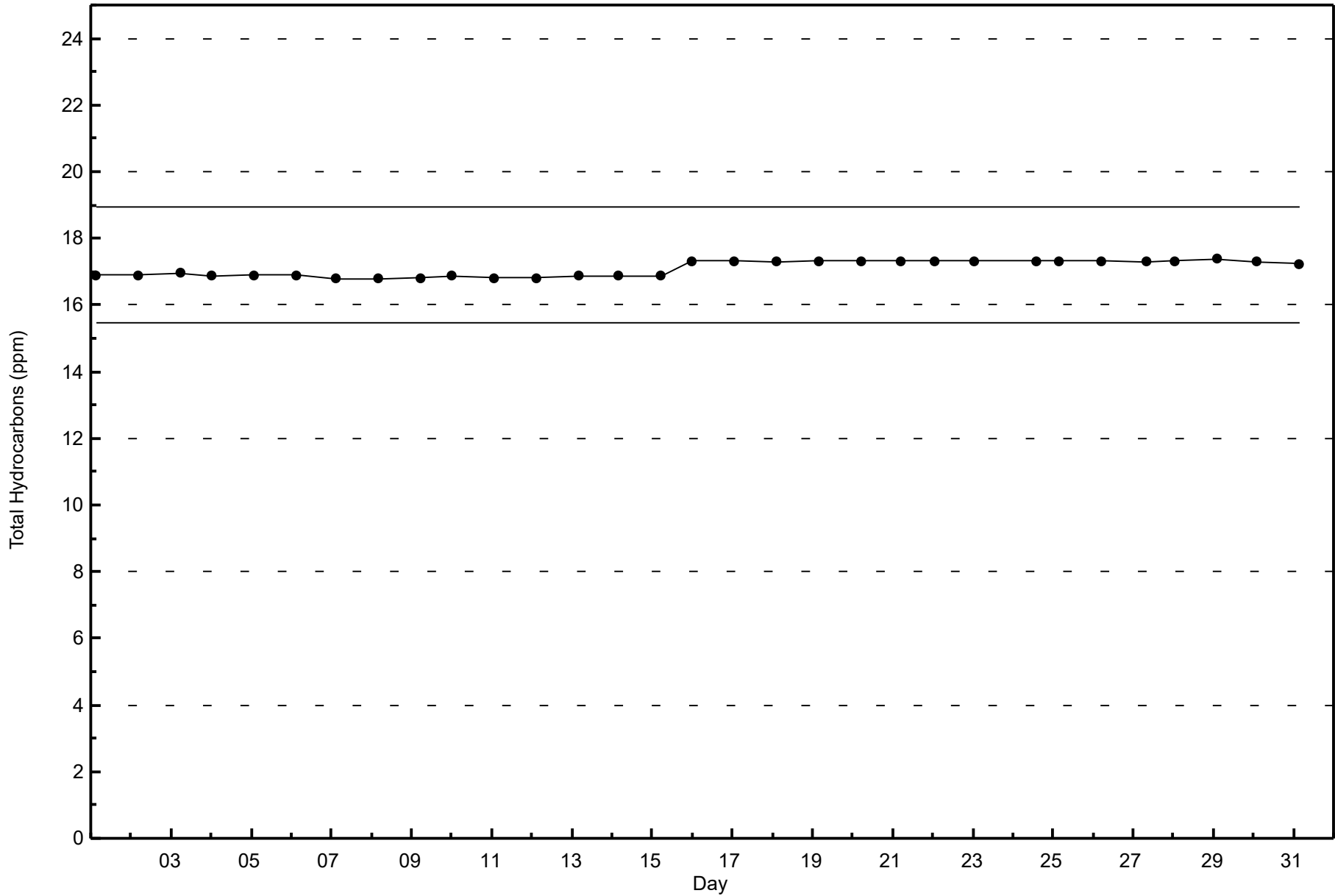


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Mannix

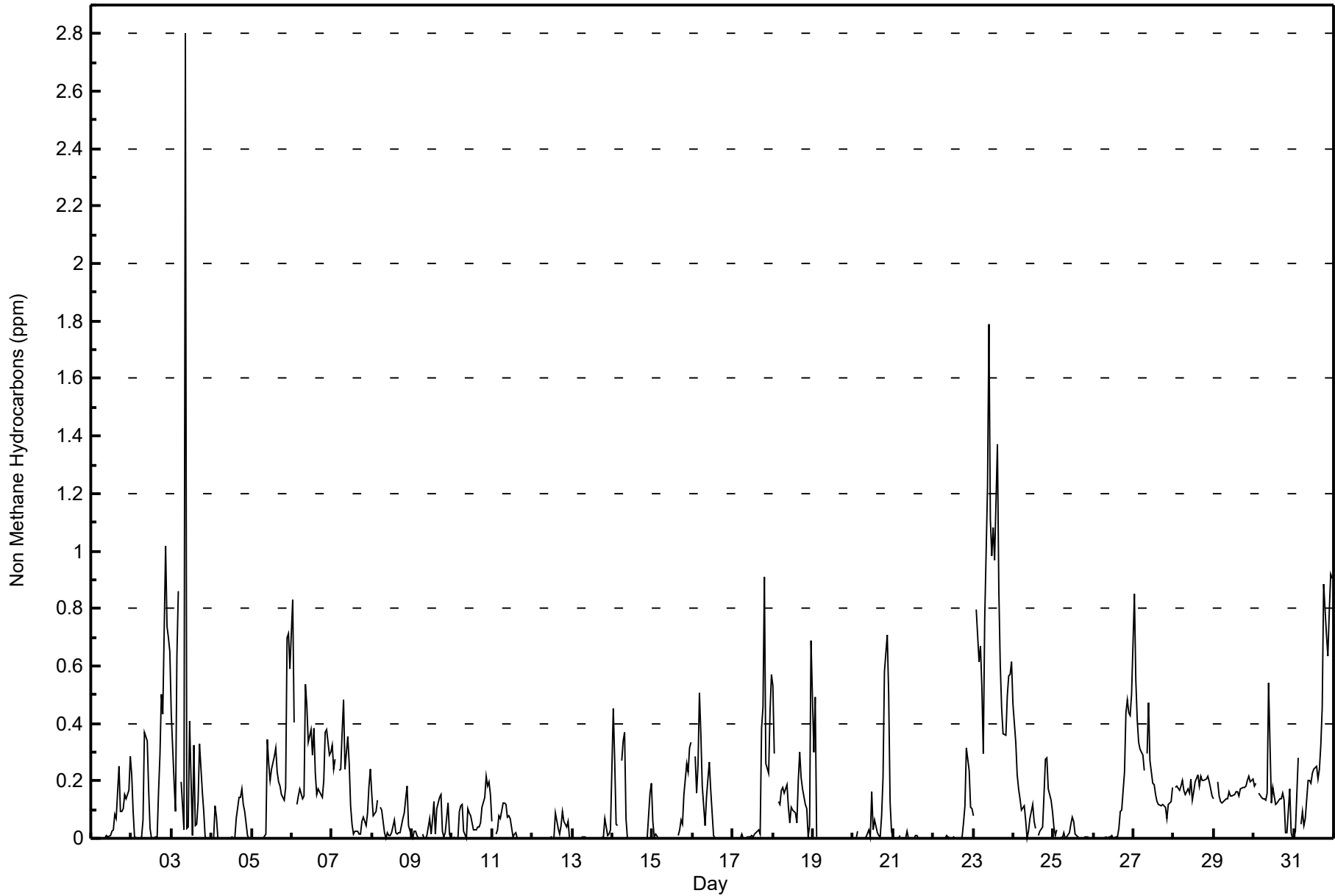








Maximum Value: 2.802 ppm on Aug 3 09:00																				Maximum Daily Average: 0.746 ppm on Aug 23					Hours in Service: 744		
Minimum Value: 0.000 ppm on Aug 1 01:00																				Minimum Daily Average: 0.002 ppm on Aug 21					Hours of Data: 708		
Maximum Diurnal Average: 0.220 ppm at hour 24																				Minimum Diurnal Average: 0.090 ppm at hour 16					Hours of Missing Data: 36		
Monthly Average: 0.145 ppm																				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 = 1.0					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-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.002	0.000	0.008	0.006	0.009	0.025	0.032	0.083	0.071	0.249	0.095	0.095	0.103	0.153	0.139	0.166	0.284	0.066	0.284	
2-Aug	0.219	0.094	0.004	0.000	Z	0.000	0.004	0.062	0.367	0.337	0.169	0.035	0.001	0.002	0.003	0.003	0.162	0.290	0.499	0.431	1.018	0.738	0.698	0.649	0.252	1.018	
3-Aug	0.431	0.196	0.092	0.635	0.861	Z	0.197	0.029	2.802	0.036	0.039	0.410	0.011	0.325	0.045	0.048	0.126	0.327	0.162	0.095	0.005	0.000	0.000	0.000	0.299	2.802	
4-Aug	Z	0.000	0.113	0.072	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.003	0.000	0.068	0.143	0.141	0.170	0.120	0.095	0.010	0.000	0.000	0.000	0.041	0.170	
5-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.346	0.259	0.201	0.241	0.286	0.312	0.230	0.196	0.180	0.154	0.130	0.175	0.699	0.714	0.589	0.206	0.714	
6-Aug	0.831	0.401	Z	0.118	0.148	0.174	0.140	0.149	0.534	0.464	0.332	0.377	0.292	0.383	0.228	0.150	0.173	0.152	0.141	0.201	0.367	0.379	0.290	0.302	0.292	0.831	
7-Aug	0.324	0.241	0.273	Z	0.236	0.240	0.368	0.483	0.241	0.353	0.262	0.115	0.049	0.012	0.026	0.026	0.015	0.017	0.059	0.076	0.047	0.086	0.181	0.239	0.173	0.483	
8-Aug	0.154	0.079	0.095	0.135	Z	0.108	0.097	0.020	0.001	0.020	0.012	0.011	0.020	0.065	0.019	0.017	0.018	0.018	0.067	0.091	0.135	0.182	0.045	0.008	0.062	0.182	
9-Aug	0.000	0.023	0.022	0.011	0.001	Z	0.015	0.001	0.000	0.008	0.070	0.016	0.064	0.129	0.014	0.103	0.141	0.151	0.026	0.003	0.019	0.121	0.014	0.000	0.041	0.151	
10-Aug	Z	0.005	0.001	0.001	0.092	0.113	0.118	0.024	0.001	0.102	0.091	0.077	0.053	0.030	0.031	0.038	0.037	0.055	0.108	0.144	0.218	0.180	0.199	0.153	0.081	0.218	
11-Aug	0.057	Z	0.015	0.029	0.078	0.070	0.125	0.123	0.119	0.075	0.079	0.070	0.007	0.015	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.038	0.125	
12-Aug	0.000	0.000	Z	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.005	0.091	0.036	0.012	0.047	0.094	0.059	0.039	0.057	0.000	0.000	0.019	0.094	
13-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.003	0.007	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.004	0.067	0.038	0.008	0.017	0.032	0.008	0.067	
14-Aug	0.451	0.268	0.049	0.043	Z	0.271	0.340	0.370	0.068	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.160	0.194	0.096	0.096	0.451	
15-Aug	0.057	0.006	0.017	0.000	0.000	Z	0.000	0.000	0.000	0.000		C	C	C	C	C	0.009	0.028	0.066	0.047	0.152	0.258	0.231	0.316	0.334	0.085	0.334
16-Aug	Z	0.285	0.156	0.256	0.508	0.365	0.181	0.042	0.141	0.207	0.264	0.169	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.112	0.508	
17-Aug	0.000	Z	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.001	0.005	0.007	0.008	0.005	0.017	0.021	0.029	0.016	0.385	0.457	0.909	0.259	0.224	0.444	0.572	0.147	0.909
18-Aug	0.530	0.296	Z	0.130	0.116	0.166	0.179	0.156	0.186	0.106	0.053	0.107	0.098	0.089	0.055	0.203	0.299	0.210	0.171	0.118	0.104	0.007	0.042	0.689	0.179	0.689	
19-Aug	0.302	0.491	0.003	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	0.035	0.491	
20-Aug	0.000	0.001	0.000	0.022	Z	0.000	0.000	0.000	0.004	0.028	0.007	0.162	0.032	0.062	0.020	0.008	0.007	0.079	0.213	0.580	0.709	0.504	0.130	0.025	0.113	0.709	
21-Aug	0.000	0.000	0.000	0.000	0.012	Z	0.000	0.000	0.023	0.000	0.002	0.000	0.000	0.009	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.023	
22-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.005	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.006	0.053	0.111	0.313	0.235	0.107	0.101	0.041	0.313	
23-Aug	0.078	Z	0.795	0.614	0.667	0.528	0.293	0.763	1.225	1.790	1.109	0.982	1.079	0.967	1.372	0.866	0.606	0.451	0.365	0.359	0.498	0.566	0.568	0.617	0.746	1.790	
24-Aug	0.466	0.336	0.222	0.174	0.137	0.101	0.115	0.063	0.002	0.023	0.069	0.120	0.061	0.036	Z	0.010	0.025	0.037	0.151	0.276	0.282	0.174	0.133	0.092	0.135	0.466	
25-Aug	0.040	0.008	0.029	Z	0.006	0.000	0.017	0.001	0.007	0.019	0.051	0.073	0.060	0.014	0.009	0.002	0.000	0.000	0.001	0.006	0.004	0.002	0.002	0.000	0.015	0.073	
26-Aug	0.001	0.000	0.000	0.000	Z	0.000	0.000	0.004	0.000	0.003	0.003	0.008	0.002	0.003	0.003	0.033	0.093	0.096	0.229	0.437	0.483	0.436	0.428	0.502	0.120	0.502	
27-Aug	0.851	0.549	0.412	0.335	0.307	0.288	0.234	Z	0.294	0.473	0.270	0.191	0.186	0.155	0.129	0.117	0.114	0.118	0.111	0.107	0.067	0.120	0.129	0.175	0.249	0.851	
28-Aug	Z	0.177	0.181	0.167	0.180	0.201	0.166	0.153	0.170	0.159	0.209	0.134	0.160	0.199	0.223	0.184	0.215	0.203	0.204	0.208	0.216	0.198	0.172	0.150	0.184	0.223	
29-Aug	0.140	Z	0.196	0.148	0.127	0.123	0.134	0.139	0.138	0.164	0.149	0.147	0.151	0.163	0.162	0.149	0.174	0.176	0.175	0.181	0.200	0.215	0.196	0.207	0.163	0.215	
30-Aug	0.183	0.194	Z	0.156	0.144	0.139	0.139	0.134	0.155	0.539	0.124	0.176	0.148	0.120	0.125	0.140	0.140	0.157	0.131	0.018	0.018	0.172	0.019	0.001	0.142	0.539	
31-Aug	0.006	0.024	0.281	Z	0.048	0.096	0.043	0.068	0.201	0.199	0.190	0.225	0.242	0.253	0.205	0.239	0.325	0.459	0.885	0.707	0.636	0.789	0.919	0.904	0.345	0.919	
																								Diurnal Average			
																								Diurnal Maximum			
Z - zerospan C - Calibration																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Mannix - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	219	30.93	30.93
0.006 - 0.05	122	17.23	48.16
0.06 - 0.1	132	18.64	66.81
> 0.1	235	33.19	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 - August 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	1	0	0	0	0	0	17	53	31	13	16	41	45	2	0	0	219
0.006 - 0.05	7	5	0	1	9	5	18	20	10	5	6	13	11	6	3	3	122
0.06 - 0.1	20	6	1	3	2	7	10	22	9	11	5	7	14	7	1	7	132
> 0.1	29	20	12	4	10	3	10	39	12	1	3	9	19	19	22	23	235
Totals	57	31	13	8	21	15	55	134	62	30	30	70	89	34	26	33	708

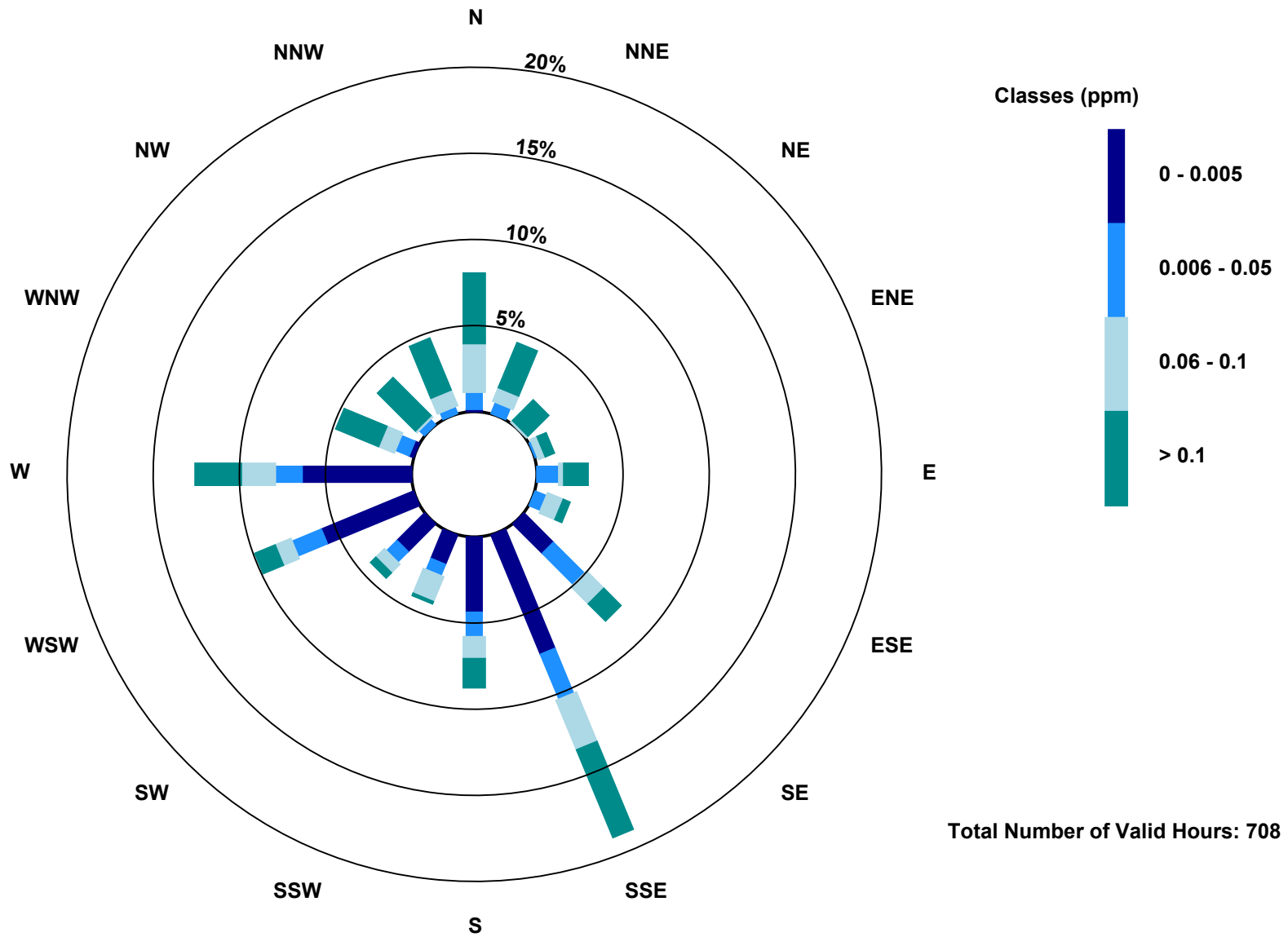
Total Number of Valid Hours: 708

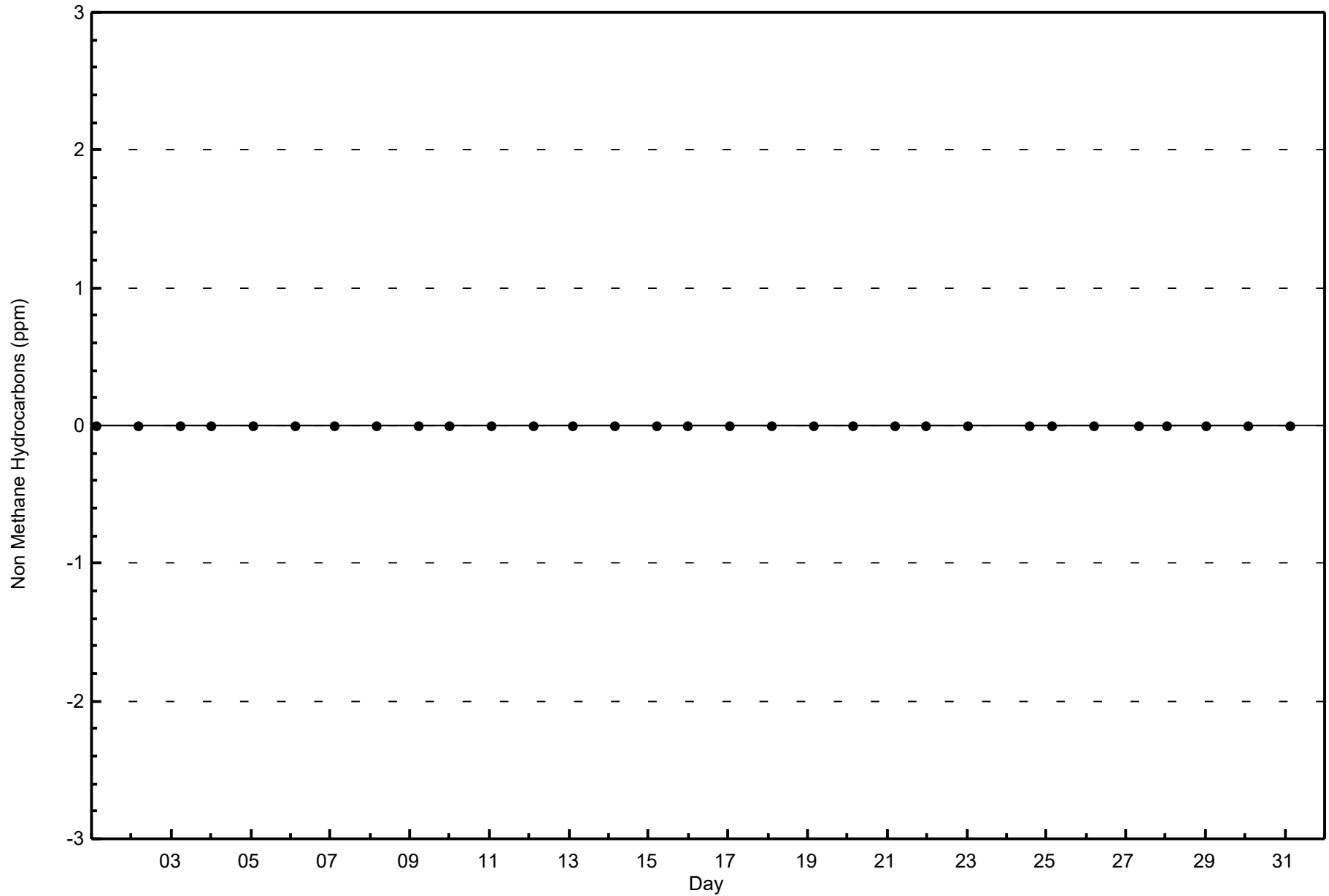
Total Number of Hours: 744

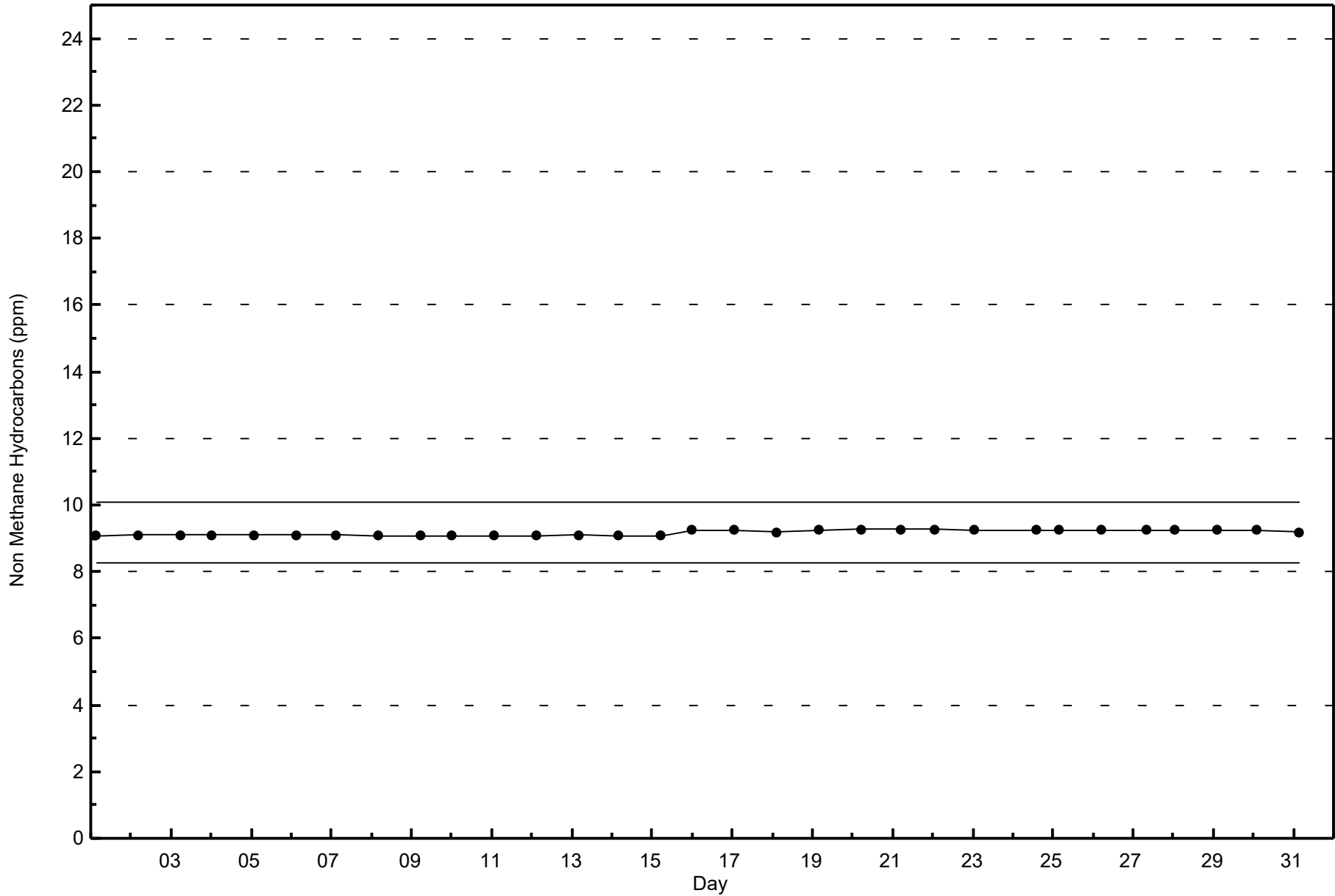


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Mannix









Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

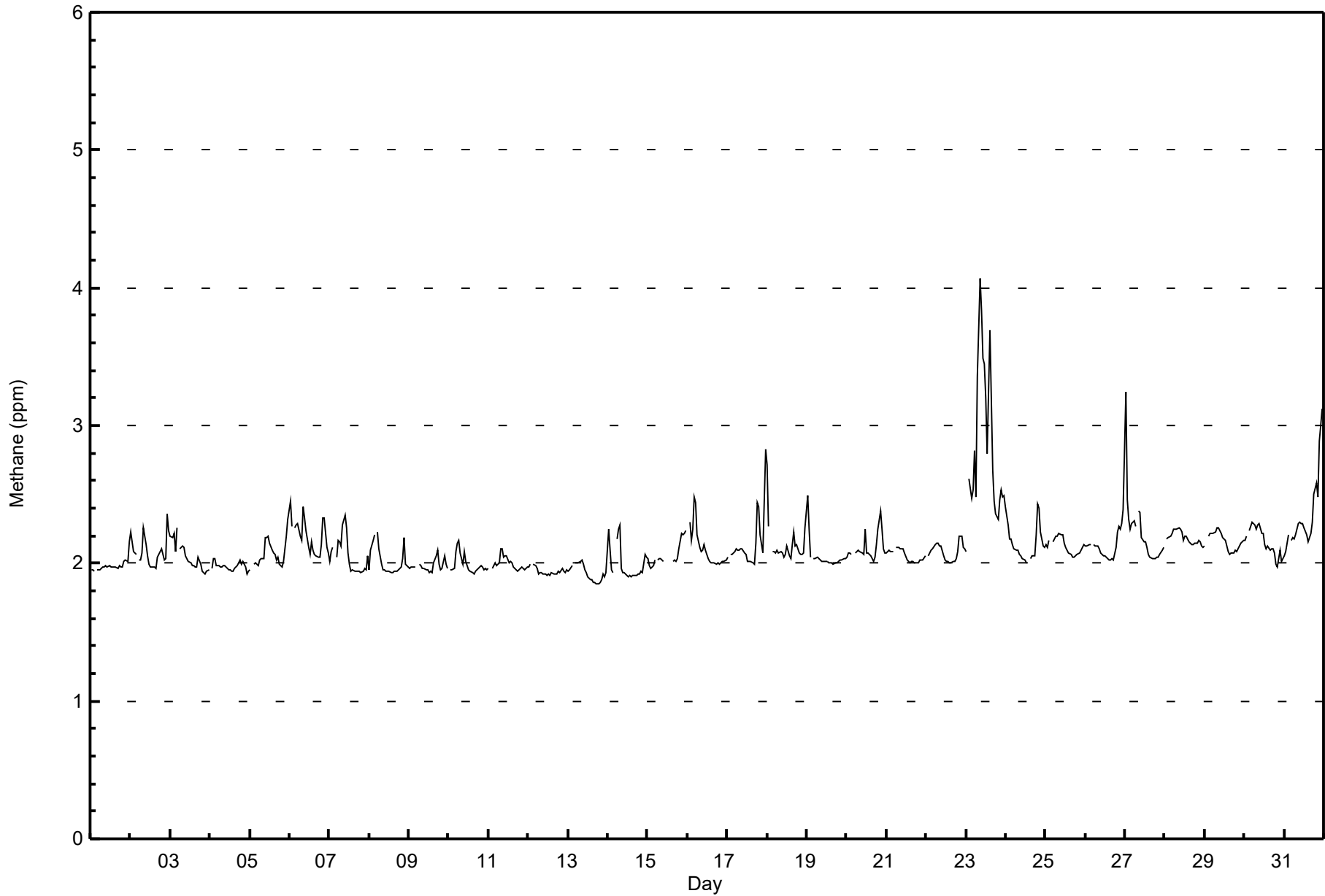
Mannix - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744								
Maximum Value: 4.1 ppm on Aug 23 09:00		Maximum Daily Average: 2.9 ppm on Aug 23		Hours of Data:														708										
Minimum Value: 1.9 ppm on Aug 13 19:00		Minimum Daily Average: 1.9 ppm on Aug 13		Hours of Missing Data:														36										
Maximum Diurnal Average: 2.2 ppm at hour 9		Minimum Diurnal Average: 2.0 ppm at hour 17		Hours of Calibration:														36										
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 3.2		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-Aug	2.0	2.0	1.9	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	2.2	2.0	2.2			
2-Aug	2.2	2.2	2.1	2.1	Z	2.0	2.0	2.1	2.3	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.4	2.2	2.1	2.4			
3-Aug	2.2	2.2	2.2	2.1	2.3	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	1.9	1.9	1.9	1.9	2.0	2.0	2.3			
4-Aug	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0			
5-Aug	1.9	Z	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.1	2.3		
6-Aug	2.4	2.3	Z	2.3	2.3	2.3	2.2	2.2	2.4	2.3	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.1	2.3	2.3	2.1	2.1	2.2	2.4		
7-Aug	2.0	2.1	2.1	Z	2.0	2.2	2.2	2.1	2.3	2.4	2.3	2.1	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.4		
8-Aug	2.0	2.1	2.2	2.2	Z	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.2		
9-Aug	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	
10-Aug	Z	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.1	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	2.0	2.2		
11-Aug	2.0	Z	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	
12-Aug	2.0	2.0	Z	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	2.0	1.9	2.0	2.0	
13-Aug	1.9	2.0	2.0	Z	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	
14-Aug	2.2	2.1	2.0	1.9	Z	2.2	2.3	2.3	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.0	2.0	2.0	2.3	2.3	
15-Aug	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	C	C	C	C	C	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	
16-Aug	Z	2.3	2.2	2.2	2.5	2.4	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	2.0	2.1	2.5	2.5	
17-Aug	2.0	Z	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	2.0	2.0	2.1	2.4	2.4	2.2	2.1	2.5	2.8	2.2	2.8	2.8	
18-Aug	2.7	2.3	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.7	2.7
19-Aug	2.5	2.3	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	2.1	2.5	2.5	2.5
20-Aug	2.0	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.2	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.4
21-Aug	2.1	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.1
22-Aug	Z	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	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.2	2.2
23-Aug	2.1	Z	2.6	2.5	2.5	2.8	2.5	3.4	4.1	3.8	3.5	3.4	3.2	2.8	3.7	3.2	2.7	2.4	2.4	2.3	2.5	2.5	2.5	2.5	2.9	4.1	4.1	
24-Aug	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	Z	2.0	2.0	2.1	2.2	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.4	2.4	2.4
25-Aug	2.1	2.1	2.2	Z	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	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
26-Aug	2.1	2.1	2.1	2.1	Z	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	2.1	2.2	2.3	2.2	2.3	2.4	2.1	2.4	2.4	
27-Aug	3.2	2.5	2.3	2.2	2.3	2.3	2.3	Z	2.4	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	3.2	3.2	
28-Aug	Z	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	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.3	2.3
29-Aug	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.3	2.3	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	2.2	2.3	2.3	2.3
30-Aug	2.2	2.2	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.2	2.3	2.3	2.3
31-Aug	2.1	2.1	2.2	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.5	2.6	2.5	2.9	3.0	3.1	2.4	3.1	3.1	
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration																												



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Mannix - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Mannix - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	337	47.60	47.60
2.1 - 3.0	361	50.99	98.59
3.1 - 10.0	10	1.41	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 - August 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	3	14	9	34	34	22	18	22	59	62	12	2	5	337
2.1 - 3.0	39	13	8	5	7	6	21	100	40	12	8	11	26	20	18	27	361
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	6	1	10
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	31	13	8	21	15	55	134	62	30	30	70	89	34	26	33	708

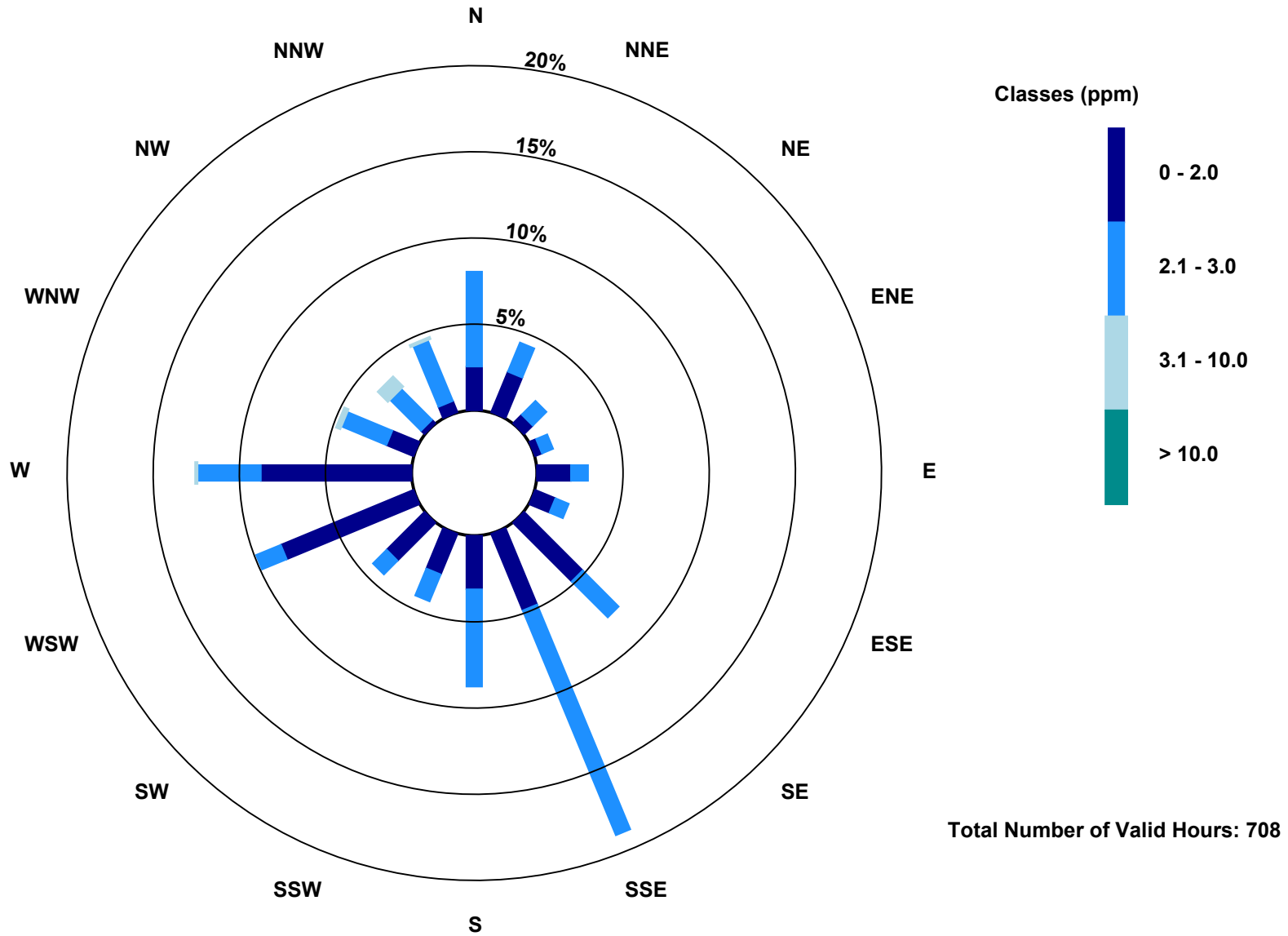
Total Number of Valid Hours: 708

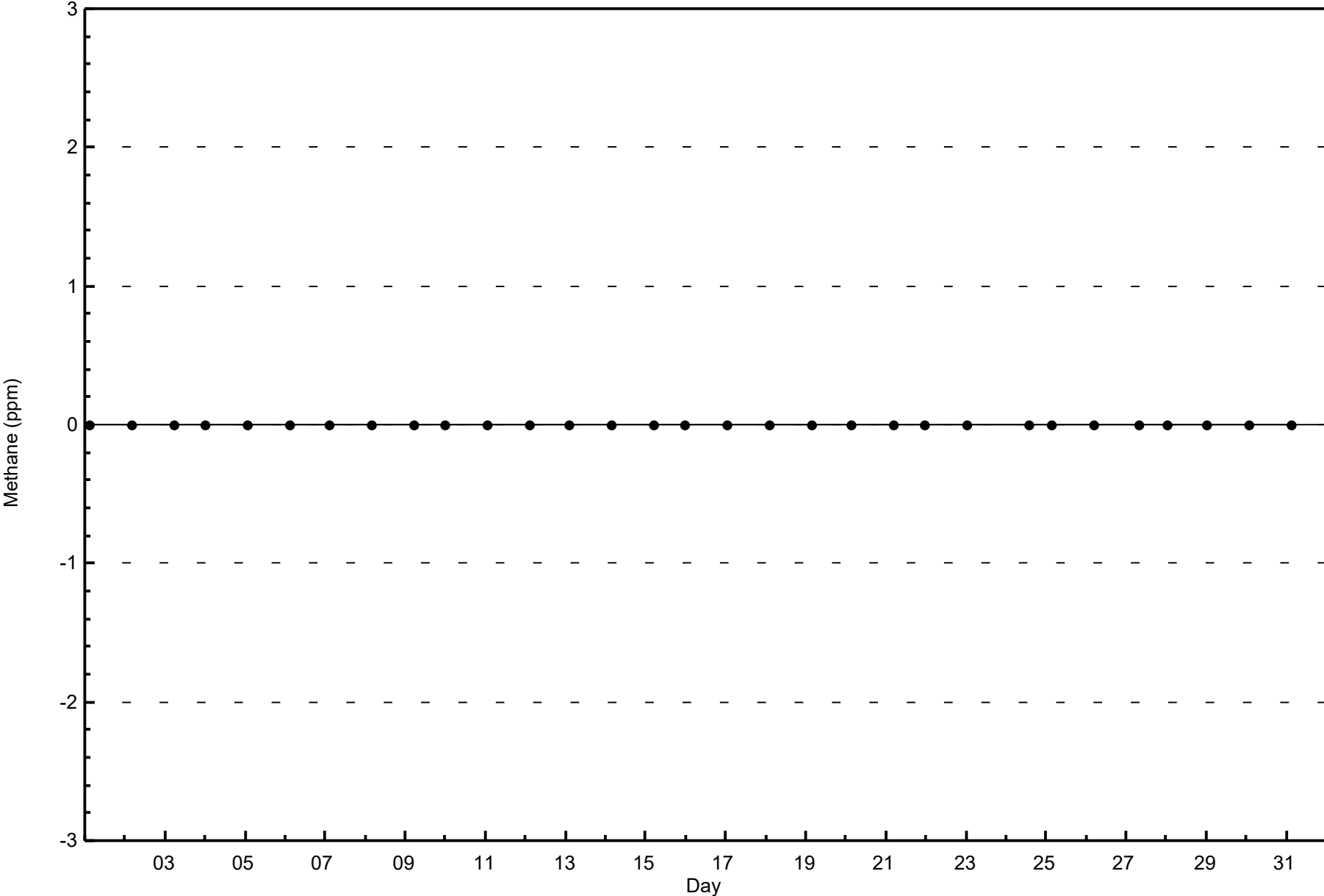
Total Number of Hours: 744

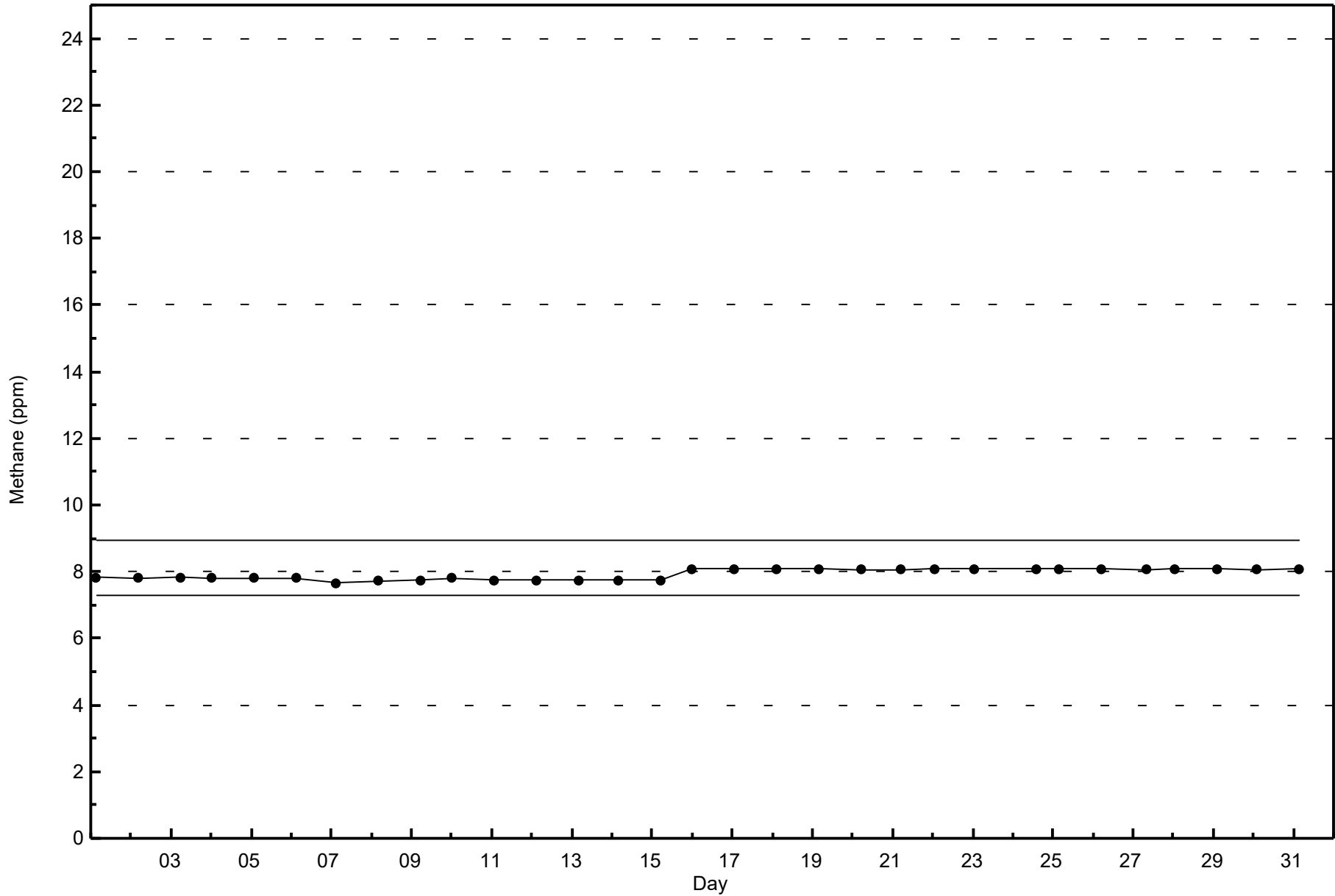


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Mannix

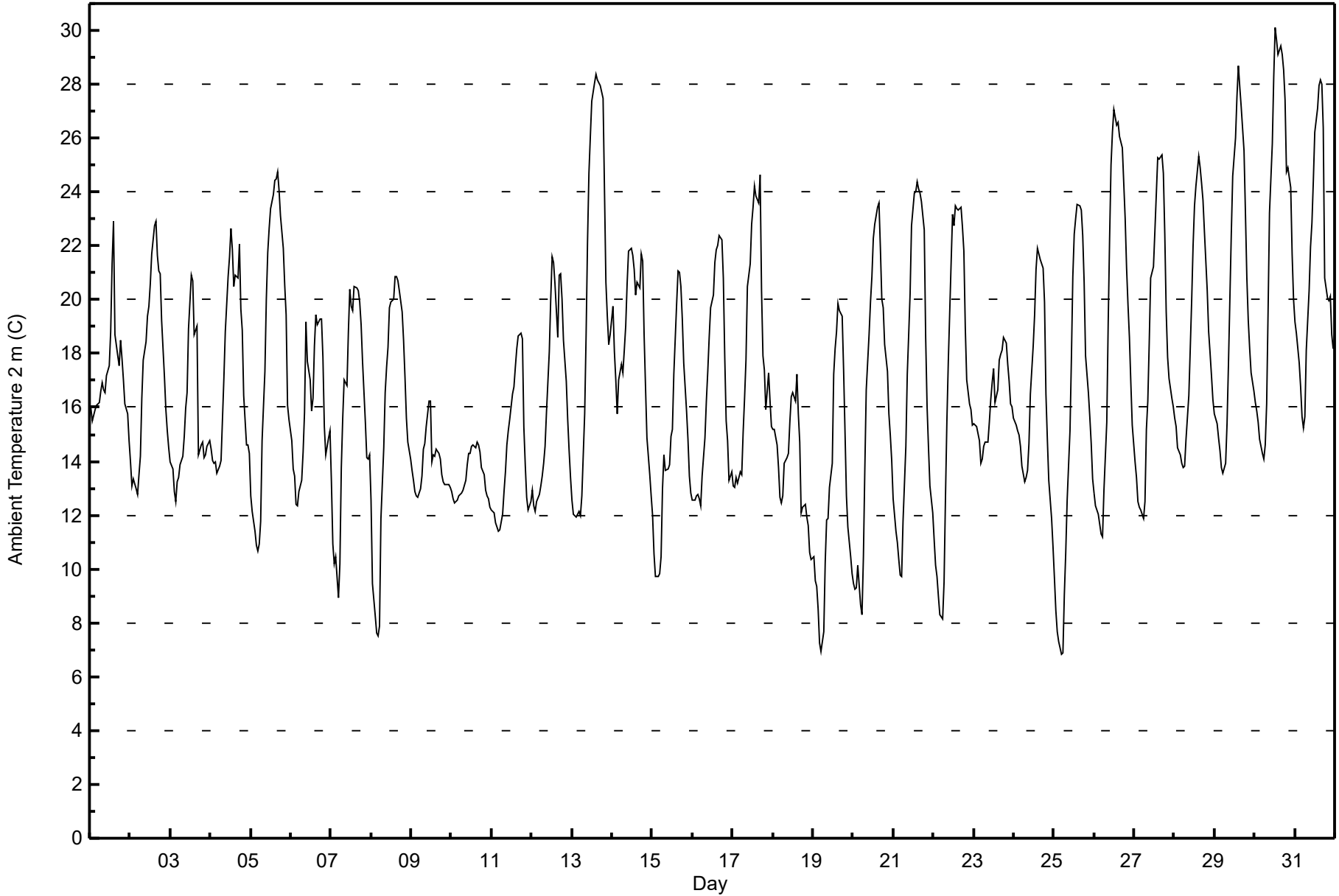








Maximum Value: 30.1 C on Aug 30 13:00		Maximum Daily Average: 22.4 C on Aug 30		Hours in Service:	744																																											
Minimum Value: 6.8 C on Aug 25 05:00		Minimum Daily Average: 12.9 C on Aug 19		Hours of Data:	744																																											
Maximum Diurnal Average: 22.0 C at hour 15		Minimum Diurnal Average: 12.0 C at hour 5		Hours of Missing Data:	0																																											
Monthly Average: 16.94 C		Percentiles: P ₁ = 7.7 P ₁₀ = 11.9 Q ₁ = 13.5 Median = 16.1 Q ₃ = 20.1 P ₉₀ = 23.5 P ₉₉ = 28.3		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-Aug	16.0	15.5	15.7	15.9	16.1	16.2	16.6	16.9	16.6	16.5	17.2	17.6	18.8	21.3	22.9	18.7	17.9	17.6	18.5	17.8	17.0	16.1	15.7	14.8	17.2	22.9																						
2-Aug	14.0	13.1	13.3	13.0	12.8	13.5	14.2	16.3	17.7	18.4	19.4	19.7	20.6	21.7	22.8	22.9	21.6	21.1	21.0	19.2	17.1	15.9	15.1	14.5	17.5	22.9																						
3-Aug	14.0	13.7	12.8	12.5	13.2	13.4	13.9	14.2	14.9	16.0	16.5	18.9	20.9	20.7	18.7	18.9	19.0	14.2	14.6	14.7	14.1	14.3	14.6	14.8	15.6	20.9																						
4-Aug	14.5	14.0	13.9	14.0	13.5	13.8	14.0	15.5	17.1	18.8	20.9	21.6	22.7	21.9	20.5	20.9	20.8	22.1	19.7	18.8	16.4	14.6	14.6	14.3	17.5	22.7																						
5-Aug	12.7	12.1	11.4	10.9	10.7	10.9	11.8	14.8	17.3	20.0	21.8	22.6	23.4	23.9	24.4	24.5	24.7	24.0	23.1	21.9	20.5	19.4	16.1	15.5	18.3	24.7																						
6-Aug	14.8	13.7	13.5	12.4	12.3	12.9	13.3	14.3	15.8	19.2	17.7	17.0	15.9	16.3	18.3	19.4	19.1	19.3	19.3	17.8	15.3	14.2	14.9	15.1	15.9	19.4																						
7-Aug	13.3	10.9	10.2	10.5	9.0	10.2	13.7	15.6	17.0	16.8	18.8	20.4	19.8	19.6	20.5	20.4	20.4	19.9	19.1	17.7	15.5	14.1	14.1	14.2	15.9	20.5																						
8-Aug	12.6	9.5	8.2	7.6	7.5	7.9	11.9	14.5	16.6	17.5	18.2	19.7	19.9	20.0	20.9	20.9	20.7	20.3	19.5	18.5	17.1	15.6	14.7	14.1	15.6	20.9																						
9-Aug	13.7	13.3	12.9	12.7	12.7	13.0	13.4	14.4	14.7	15.3	16.2	16.2	14.0	14.2	14.2	14.5	14.3	14.1	13.5	13.2	13.1	13.1	13.1	13.0	13.9	16.2																						
10-Aug	12.9	12.6	12.5	12.6	12.7	12.8	12.8	12.9	13.3	13.9	14.3	14.3	14.6	14.6	14.5	14.7	14.6	14.3	13.8	13.5	12.9	12.7	12.6	12.3	13.4	14.7																						
11-Aug	12.2	12.1	11.7	11.6	11.4	11.5	12.0	12.9	13.6	14.6	15.1	15.5	16.5	16.7	17.5	18.2	18.7	18.8	18.5	15.3	13.9	12.7	12.2	12.5	14.4	18.8																						
12-Aug	12.9	12.4	12.1	12.5	12.8	13.1	13.5	13.9	14.5	15.8	18.0	20.0	21.6	21.4	20.6	18.6	20.9	21.0	20.0	18.5	17.0	15.5	14.4	13.4	16.4	21.6																						
13-Aug	12.6	12.0	11.9	12.0	12.2	12.0	12.7	15.8	18.6	22.1	24.7	26.1	27.4	28.0	28.4	28.2	28.1	28.0	27.5	24.0	20.7	19.4	18.3	18.7	20.4	28.4																						
14-Aug	19.8	18.1	17.0	15.8	17.0	17.6	17.3	18.1	19.0	20.6	21.8	21.9	21.7	21.1	20.2	20.6	20.4	21.7	21.4	18.7	16.8	14.9	13.5	12.7	18.7	21.9																						
15-Aug	12.0	10.5	9.7	9.7	9.9	10.4	13.0	14.2	13.6	13.7	13.9	14.9	15.2	17.3	19.9	21.1	21.0	20.5	19.3	17.7	15.9	14.8	13.4	12.8	14.8	21.1																						
16-Aug	12.5	12.6	12.7	12.8	12.6	12.4	13.5	14.9	16.2	17.3	18.6	19.7	20.2	21.4	21.8	22.0	22.4	22.2	20.8	17.9	15.5	14.8	13.3	13.6	16.7	22.4																						
17-Aug	13.1	13.0	13.4	13.2	13.6	13.5	15.1	16.4	17.8	20.5	21.3	22.8	23.5	24.2	23.8	23.6	24.7	20.3	17.9	17.4	15.9	17.3	16.2	15.3	18.1	24.7																						
18-Aug	15.2	15.2	14.6	13.8	12.6	12.5	12.7	13.9	14.1	14.3	15.4	16.4	16.6	16.2	17.2	15.8	14.7	12.1	12.3	12.4	11.9	11.6	10.6	10.3	13.9	17.2																						
19-Aug	10.5	9.6	9.4	8.5	7.3	6.9	7.6	10.3	11.8	11.9	13.0	13.9	17.2	18.2	18.8	19.9	19.6	19.4	17.4	15.1	12.7	11.6	10.5	9.8	12.9	19.9																						
20-Aug	9.5	9.2	9.3	10.1	8.7	8.3	10.5	13.7	16.7	18.7	19.9	20.9	22.3	22.8	23.5	23.6	21.9	20.0	19.7	18.3	17.3	15.8	15.0	14.0	16.2	23.6																						
21-Aug	12.6	11.4	11.0	10.3	9.8	9.7	11.8	14.5	17.3	18.7	20.3	22.7	24.0	24.0	24.4	24.1	24.0	23.7	22.6	18.6	16.0	14.5	13.1	12.1	17.1	24.4																						
22-Aug	11.1	10.1	9.7	9.0	8.3	8.1	9.5	12.6	15.5	17.7	21.4	23.2	22.8	23.5	23.4	23.3	23.4	22.7	21.8	19.0	17.0	16.1	15.9	15.3	16.7	23.5																						
23-Aug	15.4	15.4	15.3	14.7	13.9	14.1	14.6	14.7	14.7	15.4	16.3	16.9	17.4	16.2	16.7	17.7	17.9	18.1	18.6	18.4	17.6	17.0	16.1	16.0	16.2	18.6																						
24-Aug	15.6	15.4	15.1	15.0	14.5	13.8	13.2	13.4	13.7	14.7	16.5	18.3	19.4	21.1	21.9	21.7	21.5	21.2	19.9	16.5	14.8	13.3	11.9	10.8	16.4	21.9																						
25-Aug	9.6	8.5	7.7	7.3	6.8	6.9	9.0	10.6	12.5	15.1	17.8	20.8	22.5	23.0	23.5	23.5	23.3	22.4	20.6	17.9	16.6	15.7	14.7	13.3	15.4	23.5																						
26-Aug	12.8	12.4	12.0	11.7	11.3	11.2	12.9	15.4	19.1	22.3	25.0	26.2	27.1	26.5	26.6	26.1	25.8	25.6	23.0	21.2	19.8	18.6	16.9	15.3	19.4	27.1																						
27-Aug	14.0	13.4	12.5	12.3	12.2	11.9	12.5	15.2	16.2	18.4	20.8	21.2	22.5	23.9	25.3	25.2	25.4	24.7	22.5	19.5	17.9	17.1	16.4	16.0	18.2	25.4																						
28-Aug	15.6	15.3	14.5	14.2	13.9	13.8	13.8	14.8	16.5	18.2	20.0	22.0	23.5	24.2	25.3	24.9	24.4	23.7	22.5	20.3	18.8	18.0	17.2	16.3	18.8	25.3																						
29-Aug	15.8	15.4	14.9	14.4	13.8	13.5	13.9	15.4	17.6	20.0	22.4	24.6	26.0	27.5	28.7	27.9	27.1	25.5	23.2	20.8	19.2	18.2	17.3	16.6	20.0	28.7																						
30-Aug	16.2	15.9	15.4	14.8	14.3	14.1	14.6	16.1	19.5	23.2	25.8	28.3	30.1	29.6	29.1	29.4	29.1	28.6	27.4	24.7	24.9	24.2	21.7	20.0	22.4	30.1																						
31-Aug	19.2	18.8	17.7	16.8	15.7	15.2	15.6	18.1	20.3	22.0	22.9	24.5	26.2	27.1	28.0	28.1	28.0	26.4	20.8	20.1	20.0	20.1	18.7	18.2	21.2	28.1																						
																								13.8	13.1	12.7	12.3	12.0	12.1	13.1	14.7	16.1	17.7	19.1	20.3	21.1	21.6	22.0	21.9	21.8	21.1	20.0	18.2	16.8	15.8	14.9	14.4	Diurnal Average
																								19.8	18.8	17.7	16.8	17.0	17.6	17.3	18.1	20.3	23.2	25.8	28.3	30.1	29.6	29.1	29.4	29.1	28.6	27.5	24.7	24.9	24.2	21.7	20.0	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

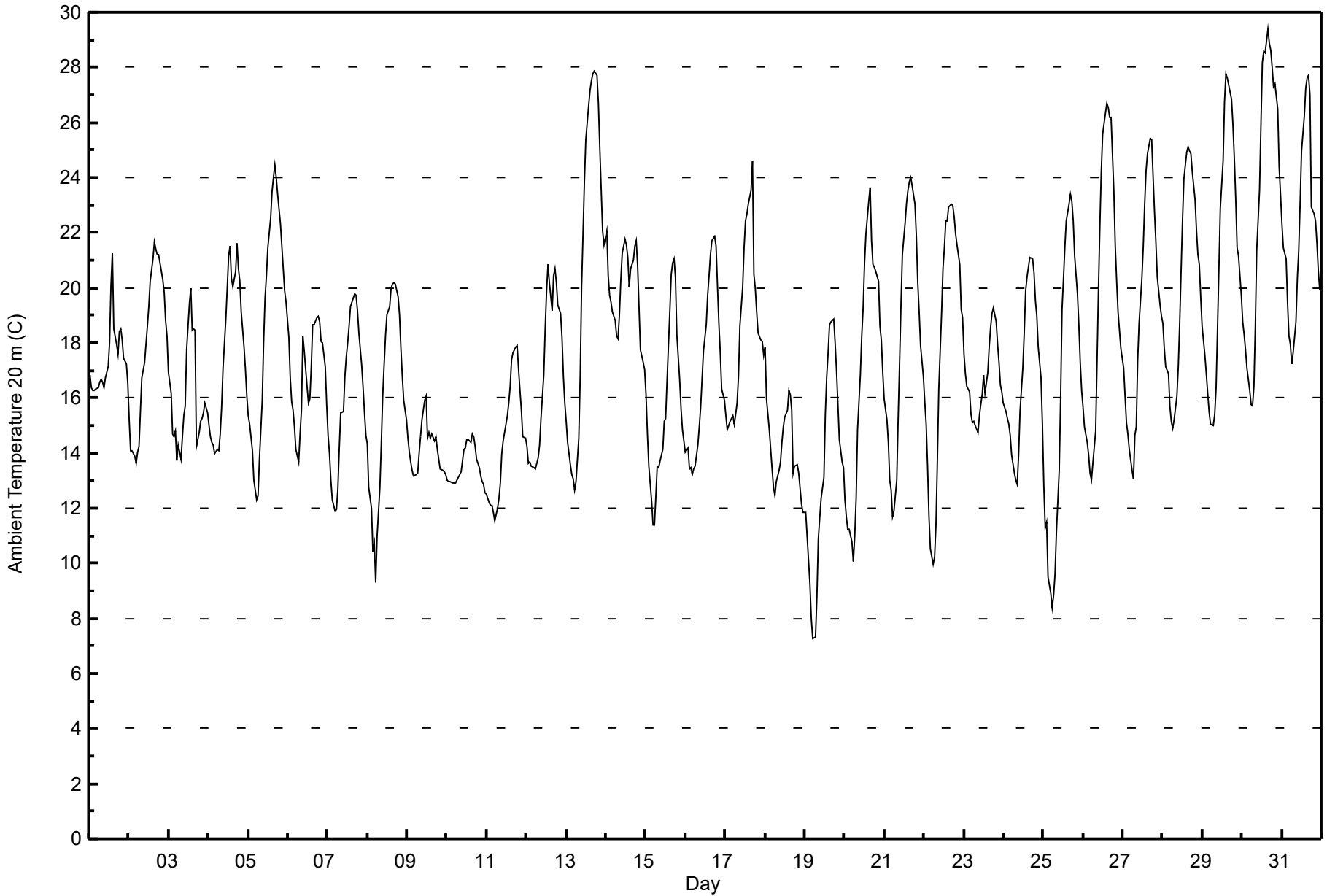
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	35	4.70	4.70
10 - 20	515	69.22	73.92
> 20	194	26.08	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 29.4 C on Aug 30 16:00		Maximum Daily Average: 23.1 C on Aug 30		Hours in Service: 744																							
Minimum Value: 7.3 C on Aug 19 06:00		Minimum Daily Average: 13.3 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 21.7 C at hour 17		Minimum Diurnal Average: 13.2 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 17.54 C		Percentiles: P ₁ = 9.3 P ₁₀ = 12.9 Q ₁ = 14.4 Median = 17.0 Q ₃ = 20.3 P ₉₀ = 23.1 P ₉₉ = 27.8		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-Aug	16.8	16.4	16.3	16.3	16.3	16.4	16.6	16.7	16.6	16.3	16.7	17.1	18.0	20.1	21.2	18.5	17.9	17.6	18.4	18.5	18.1	17.4	17.3	16.5	17.4	21.2	
2-Aug	15.2	14.1	14.1	13.9	13.6	14.0	14.3	15.5	16.7	17.3	18.0	18.6	19.3	20.2	21.1	21.7	21.4	21.2	21.2	20.9	20.3	19.8	18.8	18.3	17.9	21.7	
3-Aug	16.9	16.2	14.7	14.6	14.8	13.7	14.3	13.8	14.6	15.3	15.7	17.7	19.4	20.0	18.5	18.5	18.4	14.2	14.8	15.2	15.3	15.4	15.8	15.5	16.0	20.0	
4-Aug	15.0	14.6	14.4	14.3	14.0	14.1	14.1	14.7	15.7	17.1	18.9	20.0	21.2	21.5	20.3	20.0	20.6	21.6	20.7	20.2	19.1	17.8	17.1	16.1	17.6	21.6	
5-Aug	15.4	15.0	14.1	13.0	12.6	12.3	12.5	13.8	15.9	18.1	19.6	20.4	21.5	22.5	23.5	24.0	24.4	24.0	23.4	22.3	21.5	20.7	19.9	19.5	18.7	24.4	
6-Aug	18.2	16.7	15.9	15.6	14.9	14.1	13.7	14.7	15.6	18.3	17.7	16.4	15.8	16.0	17.1	18.7	18.7	18.9	19.0	18.7	18.1	18.0	17.1	15.8	16.8	19.0	
7-Aug	14.6	14.0	13.0	12.3	11.9	11.9	12.7	14.2	15.4	15.5	16.8	17.5	18.0	18.6	19.3	19.6	19.8	19.7	19.2	18.4	17.2	16.4	15.5	14.6	16.1	19.8	
8-Aug	14.4	12.8	12.0	10.4	10.7	9.3	11.0	12.8	14.3	16.1	17.2	18.3	19.0	19.3	20.0	20.2	20.2	20.1	19.7	19.0	17.8	16.8	15.9	15.2	15.9	20.2	
9-Aug	14.5	14.0	13.7	13.4	13.2	13.2	13.3	14.0	14.6	15.2	15.9	16.1	14.6	14.8	14.6	14.7	14.4	14.6	14.1	13.8	13.4	13.4	13.3	13.2	14.2	16.1	
10-Aug	13.0	12.9	13.0	12.9	12.9	12.9	13.0	13.1	13.3	13.7	14.1	14.2	14.5	14.5	14.4	14.7	14.6	14.2	13.8	13.5	13.2	13.0	12.8	12.6	13.5	14.7	
11-Aug	12.5	12.2	12.1	12.1	11.9	11.5	12.0	12.4	12.9	14.0	14.4	14.7	15.4	15.8	16.4	17.4	17.6	17.9	17.9	17.0	16.3	15.6	14.6	14.5	14.5	17.9	
12-Aug	14.2	13.6	13.7	13.5	13.5	13.4	13.6	13.9	14.3	15.2	16.8	18.5	19.9	20.9	20.2	19.1	20.5	20.7	20.2	19.4	19.1	18.2	16.8	15.8	16.9	20.9	
13-Aug	15.2	14.4	13.6	13.2	13.1	12.7	13.0	14.6	16.8	20.0	21.9	23.8	25.4	26.6	27.2	27.5	27.7	27.9	27.7	26.7	25.1	23.5	22.0	21.6	20.9	27.9	
14-Aug	22.1	20.4	19.7	19.5	19.1	18.8	18.2	18.2	19.0	20.3	21.3	21.8	21.6	21.1	20.0	20.7	21.0	21.5	21.7	20.8	19.2	17.7	17.3	17.0	19.9	22.1	
15-Aug	16.1	14.7	13.5	12.3	11.4	11.4	12.4	13.5	13.5	13.9	14.1	15.1	15.2	16.6	19.2	20.5	20.9	21.1	20.4	18.3	16.7	15.6	14.8	14.5	15.7	21.1	
16-Aug	14.0	14.2	13.4	13.5	13.2	13.4	13.5	14.3	14.9	15.7	16.7	17.7	18.7	19.8	20.5	21.2	21.7	21.9	21.5	20.1	18.7	17.6	16.3	15.9	17.0	21.9	
17-Aug	15.3	14.8	15.0	15.2	15.4	15.1	15.4	15.8	16.8	18.6	20.1	21.4	22.4	22.7	23.0	23.5	24.6	20.5	20.0	19.1	18.4	18.1	18.1	17.5	18.6	24.6	
18-Aug	17.8	16.0	14.8	14.1	13.4	12.7	12.5	13.0	13.4	13.7	14.4	14.9	15.3	15.6	16.3	16.1	15.6	13.3	13.5	13.6	13.3	12.7	12.1	11.8	14.2	17.8	
19-Aug	11.9	11.0	10.1	9.3	8.0	7.3	7.3	8.8	10.9	11.7	12.4	13.1	15.4	16.8	17.6	18.7	18.7	18.9	18.0	17.0	15.7	14.5	13.7	13.5	13.3	18.9	
20-Aug	12.3	11.7	11.2	11.2	10.8	10.1	11.0	12.3	14.8	16.8	18.3	19.3	20.9	22.0	23.1	23.7	21.7	20.8	20.7	20.6	20.3	18.6	18.1	17.0	17.0	23.7	
21-Aug	16.0	15.2	14.4	13.0	12.7	11.7	11.9	13.0	15.2	17.2	19.3	21.2	22.4	23.1	23.5	23.9	24.0	23.7	23.0	21.9	20.2	19.1	17.9	16.8	18.3	24.0	
22-Aug	15.8	15.1	13.5	11.7	10.5	10.0	10.2	11.4	13.7	16.3	19.1	20.7	21.4	22.4	22.4	22.9	23.1	23.0	22.6	22.0	21.5	20.9	19.2	18.9	17.8	23.1	
23-Aug	17.6	16.9	16.4	16.2	15.4	15.1	15.2	15.0	14.8	15.3	15.8	16.1	16.9	16.2	16.9	17.8	18.6	19.0	19.3	18.8	17.9	17.3	16.5	16.2	16.7	19.3	
24-Aug	15.8	15.5	15.3	15.1	14.6	13.9	13.3	13.0	12.9	13.9	15.5	17.1	18.4	19.9	20.4	20.7	21.1	21.0	20.6	19.5	19.0	17.8	16.7	15.1	16.9	21.1	
25-Aug	12.8	11.3	11.5	9.5	8.9	8.4	8.8	9.6	11.1	13.4	16.0	19.2	20.3	21.5	22.4	23.0	23.4	23.1	22.4	21.2	19.8	18.6	17.3	16.3	16.2	23.4	
26-Aug	15.6	15.0	14.4	14.0	13.3	13.0	13.6	14.8	17.3	20.0	22.2	24.2	25.6	26.3	26.7	26.5	26.2	26.2	23.5	21.5	20.2	19.1	18.4	17.8	19.8	26.7	
27-Aug	17.1	16.1	15.1	14.7	14.2	13.4	13.1	14.7	15.0	17.3	18.7	20.4	21.5	23.0	24.2	24.9	25.4	25.4	24.0	22.8	21.6	20.4	19.4	19.0	19.2	25.4	
28-Aug	18.7	17.8	17.1	16.9	15.7	15.2	14.9	15.2	16.1	17.1	18.7	20.6	22.4	24.0	24.9	25.1	25.0	24.8	24.2	23.2	22.1	21.2	20.8	19.7	20.1	25.1	
29-Aug	18.6	17.5	16.9	16.2	15.5	15.1	15.0	15.4	16.4	18.5	20.7	22.9	24.6	26.7	27.8	27.6	27.4	26.9	25.9	24.7	23.2	21.5	21.2	19.7	21.1	27.8	
30-Aug	18.7	18.3	17.7	17.1	16.3	15.8	15.7	16.4	18.6	21.4	23.6	25.9	28.2	28.6	28.5	29.4	28.9	28.6	28.0	27.3	27.4	26.5	24.4	23.4	23.1	29.4	
31-Aug	22.3	21.5	21.1	19.5	18.2	18.0	17.2	17.7	18.8	20.3	21.4	23.1	25.0	26.3	27.3	27.6	27.7	27.0	22.9	22.7	22.4	21.6	20.6	19.9	22.1	27.7	
		16.0	15.2	14.6	14.0	13.5	13.2	13.3	14.1	15.2	16.6	17.8	19.0	19.9	20.7	21.2	21.6	21.7	21.3	20.7	20.0	19.1	18.2	17.4	16.7	Diurnal Average	
		22.3	21.5	21.1	19.5	19.1	18.8	18.2	18.2	19.0	21.4	23.6	25.9	28.2	28.6	28.5	29.4	28.9	28.6	28.0	27.3	27.4	26.5	24.4	23.4	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

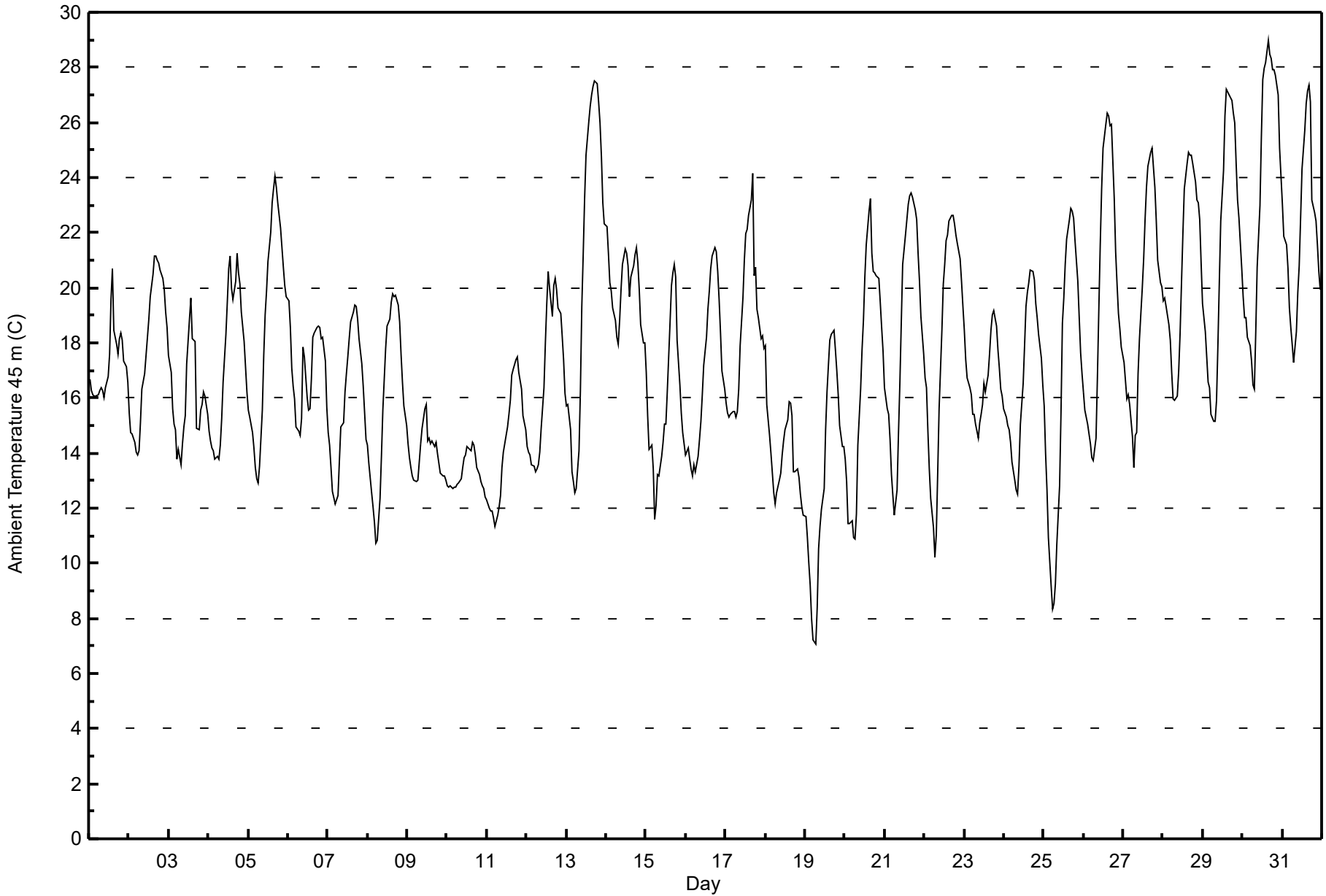
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	12	1.61	1.61
10 - 20	527	70.83	72.45
> 20	205	27.55	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 29.0 C on Aug 30 16:00 Minimum Value: 7.1 C on Aug 19 07:00 Maximum Diurnal Average: 21.3 C at hour 17 Monthly Average: 17.54 C		Maximum Daily Average: 23.4 C on Aug 30 Minimum Daily Average: 13.2 C on Aug 19 Minimum Diurnal Average: 13.3 C at hour 7 Percentiles: P ₁ = 9.2 P ₁₀ = 12.9 Q ₁ = 14.4 Median = 17.0 Q ₃ = 20.2 P ₉₀ = 23.1 P ₉₉ = 27.7		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-Aug	16.7	16.3	16.1	16.1	16.1	16.1	16.3	16.4	16.3	16.0	16.4	16.8	17.6	19.6	20.7	18.4	18.0	17.6	18.2	18.4	18.1	17.3	17.1	16.6	17.2	20.7
2-Aug	15.5	14.8	14.7	14.4	14.0	13.9	14.1	15.1	16.3	16.9	17.5	18.2	18.9	19.7	20.5	21.1	21.1	21.0	20.9	20.7	20.3	19.9	19.1	18.6	17.8	21.1
3-Aug	17.6	16.9	15.6	15.1	14.8	13.8	14.1	13.6	14.4	14.9	15.3	17.2	18.9	19.6	18.2	18.1	18.1	14.9	14.9	15.6	15.8	16.2	16.1	15.4	16.0	19.6
4-Aug	14.8	14.4	14.2	14.1	13.8	13.9	13.8	14.3	15.2	16.6	18.3	19.5	20.7	21.2	20.0	19.6	20.2	21.3	20.6	20.1	19.1	18.1	17.1	16.2	17.4	21.3
5-Aug	15.5	15.3	14.7	14.2	13.5	13.1	12.9	13.5	15.6	17.6	19.0	19.9	20.9	22.0	23.1	23.6	24.1	23.7	20.3	22.2	21.5	20.8	20.1	19.7	18.7	24.1
6-Aug	19.5	18.6	17.1	16.4	16.0	14.9	14.8	14.6	15.3	17.9	17.5	16.0	15.5	15.6	16.7	18.2	18.4	18.6	18.6	18.5	18.2	18.2	17.3	15.7	17.0	19.5
7-Aug	14.8	14.3	13.5	12.6	12.1	12.3	12.4	13.7	15.0	15.1	16.2	16.9	17.5	18.1	18.8	19.1	19.4	19.3	18.9	18.2	17.2	16.4	15.5	14.5	15.9	19.4
8-Aug	14.3	13.6	12.6	12.0	11.5	10.7	10.8	12.3	13.9	15.5	16.7	17.8	18.6	18.9	19.5	19.8	19.7	19.7	19.4	18.8	17.6	16.6	15.7	15.0	15.9	19.8
9-Aug	14.4	13.8	13.5	13.2	13.0	12.9	13.0	13.7	14.3	14.9	15.6	15.8	14.4	14.6	14.3	14.4	14.2	14.4	14.0	13.6	13.3	13.2	13.2	13.0	13.9	15.8
10-Aug	12.8	12.8	12.8	12.7	12.8	12.7	12.8	12.9	13.1	13.5	13.8	13.9	14.2	14.2	14.1	14.4	14.3	13.9	13.5	13.2	13.0	12.8	12.7	12.4	13.3	14.4
11-Aug	12.3	12.0	11.9	11.9	11.7	11.3	11.7	12.0	12.5	13.5	14.0	14.3	14.9	15.4	15.9	16.8	17.1	17.4	17.5	16.9	16.6	16.3	15.4	14.9	14.3	17.5
12-Aug	14.2	14.0	13.9	13.6	13.5	13.3	13.4	13.6	14.0	14.9	16.4	18.0	19.4	20.6	20.0	18.9	20.1	20.3	19.9	19.3	19.1	18.2	17.4	16.2	16.8	20.6
13-Aug	15.7	15.8	14.9	13.3	13.0	12.6	12.7	14.1	16.3	19.3	21.2	23.2	24.8	26.1	26.6	27.0	27.3	27.5	27.4	26.8	26.0	24.8	23.1	22.3	20.9	27.5
14-Aug	22.2	21.2	20.2	19.9	19.3	18.8	18.2	18.0	18.8	19.9	20.8	21.4	21.2	20.8	19.7	20.4	20.8	21.2	21.5	20.9	19.9	18.6	18.0	18.0	20.0	22.2
15-Aug	17.0	15.3	14.2	14.3	13.4	11.6	12.1	13.2	13.2	13.9	14.4	15.0	15.1	16.2	18.8	20.1	20.6	20.9	20.4	18.1	16.5	15.4	14.7	14.3	15.8	20.9
16-Aug	13.9	14.2	13.8	13.4	13.2	13.6	13.3	13.9	14.5	15.1	16.1	17.2	18.2	19.2	19.9	20.7	21.1	21.4	21.3	20.6	19.6	18.3	17.0	16.3	16.9	21.4
17-Aug	15.8	15.5	15.3	15.4	15.5	15.5	15.3	15.5	16.3	17.9	19.6	21.0	22.0	22.1	22.6	23.2	24.2	20.5	20.7	19.2	18.9	18.1	18.3	17.8	18.6	24.2
18-Aug	17.9	15.8	14.6	14.0	13.3	12.6	12.2	12.6	13.0	13.3	13.9	14.5	14.9	15.2	15.9	15.8	15.4	13.3	13.3	13.4	13.1	12.5	12.0	11.7	13.9	17.9
19-Aug	11.7	10.9	10.0	9.2	8.0	7.2	7.1	8.4	10.5	11.3	12.0	12.7	14.8	16.2	17.2	18.1	18.3	18.4	17.7	17.0	16.1	15.0	14.2	14.3	13.2	18.4
20-Aug	13.8	13.0	11.5	11.5	11.5	11.0	10.9	11.8	14.3	16.3	17.8	18.8	20.4	21.6	22.8	23.2	21.3	20.6	20.5	20.4	20.3	19.5	18.6	17.7	17.0	23.2
21-Aug	16.4	15.6	15.4	14.5	13.2	12.5	11.7	12.6	14.7	16.5	18.7	20.8	21.9	22.5	23.0	23.3	23.4	23.3	22.8	22.5	21.3	20.3	19.0	17.6	18.5	23.4
22-Aug	16.7	16.4	14.8	13.4	12.4	11.3	10.2	11.0	13.3	15.6	18.4	20.1	20.9	21.7	21.9	22.4	22.6	22.6	22.3	21.9	21.6	21.1	20.3	19.3	18.0	22.6
23-Aug	18.4	17.4	16.7	16.4	16.1	15.4	15.1	14.5	15.1	15.4	15.8	16.5	16.2	16.8	17.6	18.5	19.0	19.2	18.6	17.8	17.1	16.3	16.1	16.7	19.2	19.2
24-Aug	15.6	15.3	15.0	14.9	14.4	13.7	13.0	12.7	12.5	13.5	15.1	16.5	17.9	19.3	19.8	20.2	20.6	20.6	20.3	19.4	18.9	18.3	17.4	16.5	16.7	20.6
25-Aug	15.7	14.0	12.7	10.9	9.1	8.3	8.5	9.3	10.7	12.8	15.5	18.7	19.6	20.9	21.8	22.5	22.9	22.8	22.5	21.7	20.2	18.9	17.6	16.9	16.4	22.9
26-Aug	16.2	15.6	15.1	14.7	14.3	13.8	13.7	14.5	16.8	19.2	21.5	23.6	25.1	25.9	26.4	26.2	25.9	25.9	23.3	21.3	20.1	19.1	18.5	17.9	19.8	26.4
27-Aug	17.3	16.6	16.0	16.1	15.8	14.6	13.5	14.6	14.7	16.9	18.2	20.0	21.1	22.5	23.6	24.4	24.9	25.1	24.3	23.7	22.4	21.0	20.2	20.0	19.5	25.1
28-Aug	19.5	19.6	19.3	18.7	18.1	16.9	15.9	15.9	16.1	17.0	18.4	20.2	21.9	23.6	24.5	24.9	24.8	24.8	24.5	23.8	23.2	23.1	22.5	20.9	20.8	24.9
29-Aug	19.4	18.4	17.5	16.6	16.4	15.4	15.2	15.2	15.9	17.9	20.2	22.4	24.2	26.2	27.2	27.1	27.0	26.8	26.3	26.0	24.5	23.2	22.5	20.7	21.3	27.2
30-Aug	19.7	18.9	18.9	18.2	17.9	17.4	16.5	16.3	18.4	20.8	23.0	25.5	27.6	28.0	28.2	29.0	28.5	28.3	27.9	27.9	27.7	27.0	25.0	24.0	23.4	29.0
31-Aug	23.0	21.9	21.5	20.7	19.3	18.6	17.9	17.3	18.4	19.8	20.8	22.5	24.3	25.7	26.7	27.2	27.3	26.8	23.2	22.7	22.4	21.5	20.6	19.9	22.1	27.3
	16.4	15.7	15.1	14.6	14.1	13.5	13.3	13.8	14.8	16.1	17.4	18.5	19.5	20.3	20.8	21.2	21.3	21.0	20.6	20.0	19.4	18.6	17.8	17.1	Diurnal Average	
	23.0	21.9	21.5	20.7	19.3	18.8	18.2	18.0	18.8	20.8	23.0	25.5	27.6	28.0	28.2	29.0	28.5	28.3	27.9	27.9	27.7	27.0	25.0	24.0	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

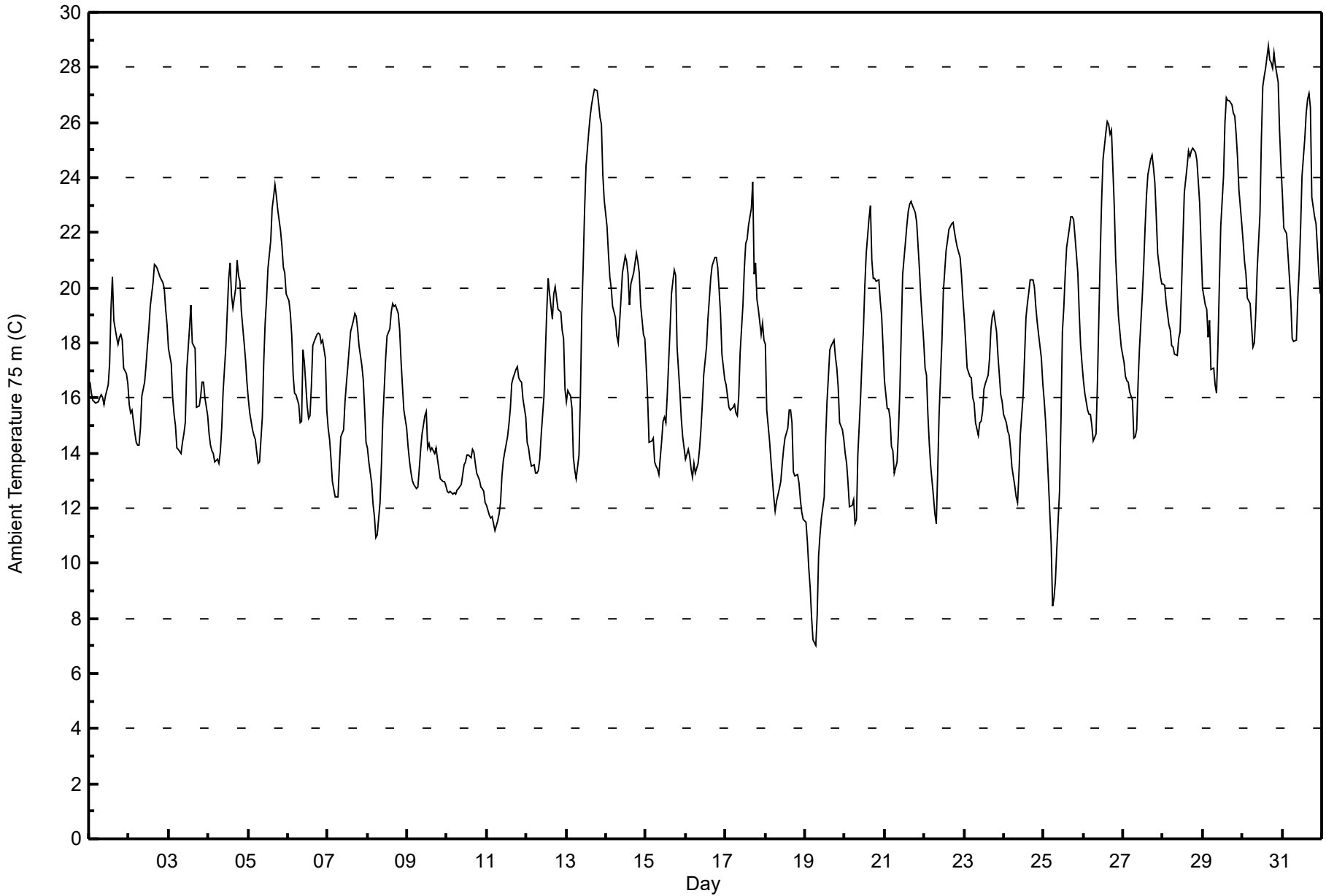
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	9	1.21	1.21
10 - 20	538	72.31	73.52
> 20	197	26.48	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 28.8 C on Aug 30 16:00		Maximum Daily Average: 23.9 C on Aug 30		Hours in Service: 744																							
Minimum Value: 7.0 C on Aug 19 07:00		Minimum Daily Average: 13.1 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 21.0 C at hour 17		Minimum Diurnal Average: 13.8 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 17.60 C		Percentiles: P ₁ = 9.6 P ₁₀ = 13.0 Q ₁ = 14.5 Median = 17.2 Q ₃ = 20.2 P ₉₀ = 23.0 P ₉₉ = 27.6		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-Aug	16.6	16.2	15.9	15.9	15.8	15.9	16.0	16.1	16.0	15.8	16.1	16.5	17.3	19.3	20.4	18.8	18.2	18.0	18.2	18.3	18.1	17.1	16.9	16.5	17.1	20.4	
2-Aug	15.8	15.5	15.6	14.7	14.4	14.3	14.3	14.9	16.0	16.6	17.2	17.9	18.5	19.3	20.2	20.8	20.8	20.7	20.6	20.4	20.2	20.0	19.2	18.6	17.8	20.8	
3-Aug	17.8	17.3	16.0	15.4	15.0	14.2	14.2	14.0	14.4	14.7	15.1	17.0	18.5	19.4	18.0	17.9	17.8	15.7	15.7	16.0	16.6	16.6	16.0	15.4	16.2	19.4	
4-Aug	14.7	14.3	14.1	14.0	13.7	13.8	13.6	14.0	14.9	16.2	17.9	19.2	20.4	20.9	19.7	19.3	20.0	21.0	20.4	20.2	19.1	18.0	17.4	16.6	17.2	21.0	
5-Aug	16.0	15.5	14.8	14.7	14.5	14.1	13.6	13.7	15.3	17.3	18.7	19.6	20.7	21.7	22.9	23.3	23.8	23.3	22.8	22.1	21.5	20.8	20.5	19.8	18.8	23.8	
6-Aug	19.5	19.1	18.3	16.8	16.2	16.1	15.8	15.1	15.2	17.7	17.3	15.7	15.3	15.4	16.4	17.9	18.1	18.3	18.3	18.3	18.0	18.1	17.5	15.6	17.1	19.5	
7-Aug	14.9	14.5	13.8	13.0	12.4	12.4	12.4	13.6	14.6	14.8	15.9	16.5	17.1	17.8	18.4	18.8	19.0	19.0	18.5	17.9	17.2	16.7	15.6	14.4	15.8	19.0	
8-Aug	14.2	13.7	12.9	12.2	11.7	10.9	11.0	12.2	13.6	15.2	16.3	17.4	18.2	18.5	19.1	19.4	19.3	19.4	19.0	18.5	17.3	16.4	15.5	14.9	15.7	19.4	
9-Aug	14.2	13.7	13.3	13.0	12.9	12.7	12.8	13.4	14.1	14.7	15.4	15.5	14.2	14.3	14.1	14.2	14.0	14.2	13.8	13.4	13.1	13.0	13.0	12.8	13.7	15.5	
10-Aug	12.6	12.5	12.6	12.5	12.6	12.5	12.6	12.7	12.9	13.2	13.6	13.7	14.0	13.9	13.8	14.1	14.0	13.6	13.3	13.0	12.8	12.7	12.6	12.2	13.1	14.1	
11-Aug	12.1	11.7	11.7	11.7	11.5	11.2	11.5	11.8	12.2	13.1	13.7	14.0	14.6	15.1	15.6	16.5	16.7	17.1	17.2	16.7	16.6	16.6	15.9	15.3	14.2	17.2	
12-Aug	14.4	14.2	13.8	13.5	13.6	13.3	13.2	13.4	13.8	14.6	16.1	17.6	19.2	20.3	19.8	18.9	19.8	20.0	19.7	19.2	19.1	18.4	18.2	16.3	16.7	20.3	
13-Aug	15.8	16.3	16.1	15.6	13.8	13.4	13.1	13.9	16.1	19.1	20.8	22.8	24.4	25.7	26.2	26.7	27.0	27.2	27.2	26.7	26.2	25.9	24.1	23.2	21.1	27.2	
14-Aug	22.2	21.3	20.4	20.0	19.3	18.9	18.2	18.0	18.7	19.6	20.5	21.1	20.9	20.5	19.4	20.1	20.6	20.9	21.3	21.0	20.5	19.4	18.3	18.1	20.0	22.2	
15-Aug	17.1	16.0	14.4	14.5	14.6	13.7	13.5	13.4	13.2	14.5	15.1	15.3	15.1	16.1	18.5	19.8	20.2	20.7	20.5	17.9	16.2	15.2	14.6	14.2	16.0	20.7	
16-Aug	13.8	14.1	13.9	13.4	13.1	13.6	13.3	13.7	14.1	14.8	15.8	16.8	17.9	18.9	19.6	20.3	20.8	21.1	21.1	20.7	20.0	19.1	17.6	16.7	16.8	21.1	
17-Aug	16.5	16.1	15.7	15.6	15.6	15.8	15.5	15.3	16.1	17.6	19.4	20.7	21.6	21.8	22.3	22.9	23.9	20.5	20.9	19.6	19.2	18.3	18.7	18.1	18.6	23.9	
18-Aug	18.0	15.6	14.4	13.8	13.1	12.4	11.9	12.2	12.7	13.0	13.6	14.1	14.5	14.9	15.5	15.6	15.1	13.3	13.2	13.2	12.9	12.3	11.9	11.6	13.7	18.0	
19-Aug	11.5	10.8	9.8	9.1	8.0	7.2	7.0	8.1	10.3	11.0	11.6	12.4	14.5	15.9	16.8	17.7	17.9	18.1	17.5	17.1	16.4	15.1	14.8	14.5	13.1	18.1	
20-Aug	14.0	13.6	12.9	12.1	12.1	12.3	11.5	11.6	13.9	16.1	17.4	18.5	20.1	21.3	22.5	23.0	21.0	20.4	20.3	20.2	20.3	19.5	19.0	17.8	17.1	23.0	
21-Aug	16.6	15.6	15.6	15.3	14.2	14.1	13.3	13.7	14.8	16.3	18.4	20.5	21.7	22.2	22.8	23.0	23.1	23.0	22.7	22.4	21.5	20.7	19.6	18.1	18.7	23.1	
22-Aug	17.1	16.8	15.4	14.4	13.5	12.4	11.8	11.4	13.3	15.4	18.1	19.8	20.6	21.4	21.7	22.1	22.3	22.4	22.0	21.7	21.5	21.1	20.4	19.6	18.2	22.4	
23-Aug	18.9	18.0	17.1	16.8	16.7	16.0	15.8	15.1	14.7	15.1	15.2	15.5	16.3	16.5	16.8	17.4	18.5	19.0	19.1	18.4	17.5	16.8	16.1	15.8	16.8	19.1	
24-Aug	15.4	15.1	14.8	14.6	14.2	13.5	12.8	12.4	12.2	13.3	14.7	16.1	17.5	18.9	19.4	19.8	20.3	20.3	20.0	19.3	18.8	18.3	17.5	16.5	16.5	20.3	
25-Aug	15.9	15.2	14.1	13.0	10.7	8.4	8.7	9.3	10.5	12.7	15.2	18.4	19.3	20.5	21.4	22.2	22.6	22.6	22.5	21.9	20.5	19.1	17.9	17.2	16.7	22.6	
26-Aug	16.6	16.2	15.6	15.4	15.4	15.0	14.5	14.7	16.5	18.9	21.2	23.2	24.7	25.6	26.0	25.9	25.6	25.7	23.0	21.1	20.0	19.0	18.4	17.9	19.8	26.0	
27-Aug	17.3	16.8	16.6	16.6	16.2	15.9	14.6	14.6	14.8	16.5	17.8	19.7	20.8	22.2	23.4	24.1	24.7	24.8	24.3	23.8	22.6	21.3	20.4	20.1	19.6	24.8	
28-Aug	20.1	20.1	19.5	18.7	18.4	17.9	17.8	17.6	17.5	18.1	18.4	20.0	21.7	23.5	24.4	25.0	24.8	25.0	25.0	24.9	24.6	23.8	23.0	21.5	21.3	25.0	
29-Aug	20.0	19.4	19.2	18.2	18.8	17.0	17.1	16.5	16.2	17.9	20.1	22.2	24.0	26.0	26.9	26.8	26.8	26.7	26.4	26.2	25.6	24.7	23.6	22.3	22.0	26.9	
30-Aug	21.7	21.0	20.5	19.6	19.4	18.6	17.8	18.0	19.1	20.7	22.7	25.4	27.3	27.7	28.0	28.8	28.3	28.2	28.0	28.5	28.1	27.5	25.7	24.4	23.9	28.8	
31-Aug	23.4	22.2	21.9	21.2	20.4	19.5	18.1	18.0	18.1	19.6	20.6	22.1	24.1	25.4	26.3	26.9	27.0	26.5	23.3	22.6	22.3	21.5	20.5	19.8	22.1	27.0	
		16.6	16.1	15.5	15.0	14.6	14.1	13.8	14.0	14.7	15.9	17.1	18.2	19.2	20.0	20.5	20.9	21.0	20.9	20.5	20.0	19.5	18.8	18.1	17.3	Diurnal Average	
		23.4	22.2	21.9	21.2	20.4	19.5	18.2	18.0	19.1	20.7	22.7	25.4	27.3	27.7	28.0	28.8	28.3	28.2	28.0	28.5	28.1	27.5	25.7	24.4	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

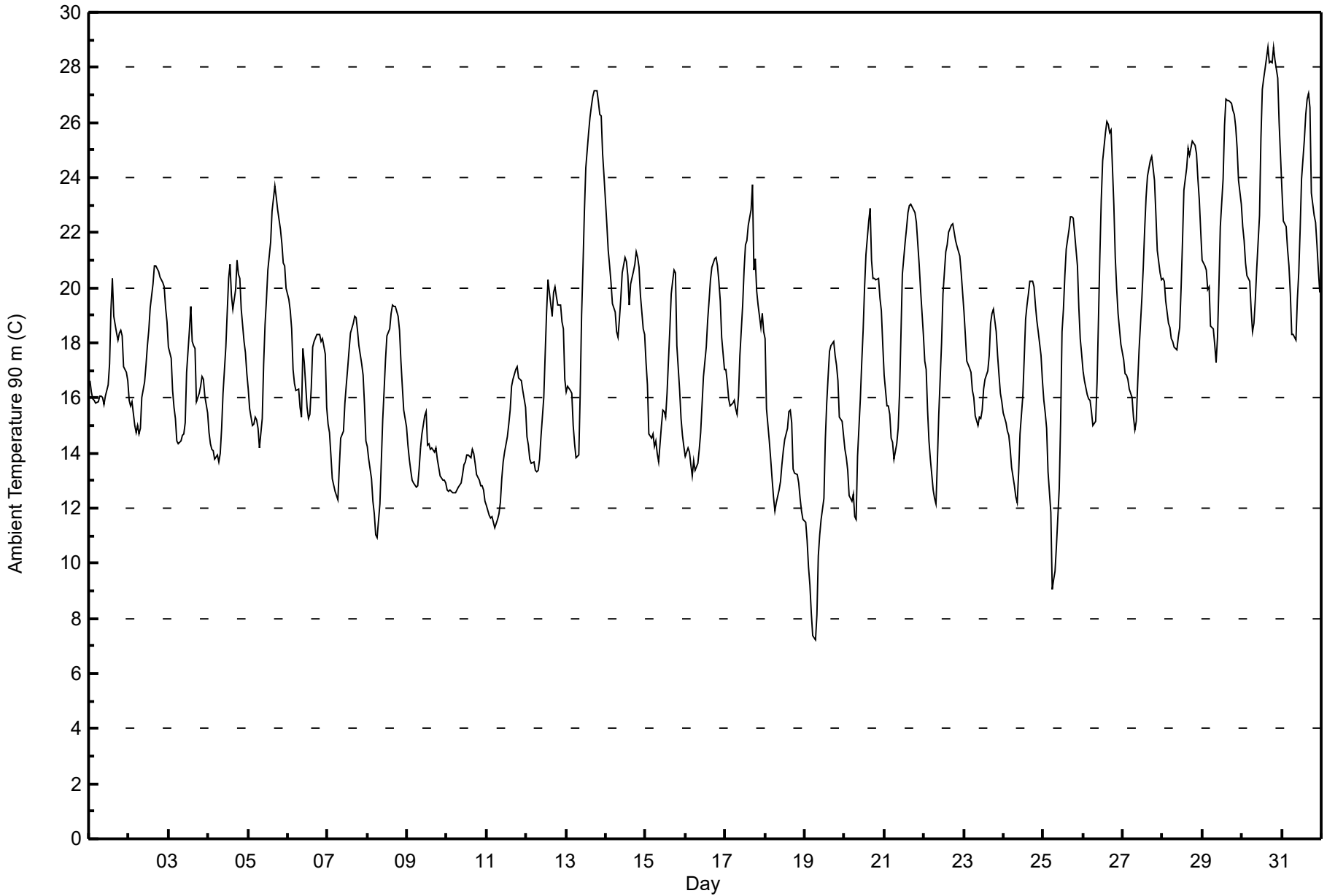
Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	9	1.21	1.21
10 - 20	537	72.18	73.39
> 20	198	26.61	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 28.7 C on Aug 30 20:00		Maximum Daily Average: 24.2 C on Aug 30		Hours in Service: 744																							
Minimum Value: 7.2 C on Aug 19 07:00		Minimum Daily Average: 13.1 C on Aug 10		Hours of Data: 744																							
Maximum Diurnal Average: 21.0 C at hour 17		Minimum Diurnal Average: 14.1 C at hour 7		Hours of Missing Data: 0																							
Monthly Average: 17.72 C		Percentiles: P ₁ = 9.8 P ₁₀ = 13.0 Q ₁ = 14.7 Median = 17.3 Q ₃ = 20.3 P ₉₀ = 23.0 P ₉₉ = 27.6		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-Aug	16.6	16.2	16.0	15.9	15.8	15.9	16.0	16.1	16.0	15.8	16.1	16.5	17.2	19.2	20.3	19.0	18.4	18.1	18.3	18.5	18.2	17.1	16.9	16.6	17.1	20.3	
2-Aug	15.9	15.7	15.9	15.0	14.7	15.0	14.7	14.9	16.0	16.6	17.2	17.9	18.5	19.3	20.1	20.8	20.8	20.7	20.6	20.4	20.2	20.0	19.3	18.8	17.9	20.8	
3-Aug	17.9	17.4	16.3	15.7	15.2	14.4	14.3	14.5	14.6	14.7	15.1	16.9	18.5	19.3	18.0	17.9	17.8	15.9	16.2	16.4	16.8	16.7	16.1	15.4	16.3	19.3	
4-Aug	14.8	14.4	14.2	14.1	13.8	13.9	13.7	14.0	14.9	16.2	17.9	19.1	20.3	20.9	19.8	17.2	20.0	21.0	20.5	20.4	19.2	18.0	17.6	16.9	17.3	21.0	
5-Aug	16.3	15.6	15.0	15.0	15.3	15.2	14.9	14.2	15.3	17.3	18.7	19.6	20.6	21.6	22.8	23.2	23.7	23.3	22.8	22.1	21.6	20.9	20.8	20.0	19.0	23.7	
6-Aug	19.6	19.2	18.5	17.0	16.5	16.3	16.3	15.7	15.3	17.8	17.3	15.7	15.2	15.4	16.4	17.9	18.1	18.3	18.3	18.3	18.1	18.1	17.6	15.7	17.2	19.6	
7-Aug	15.1	14.7	13.9	13.1	12.6	12.5	12.3	13.5	14.6	14.8	15.8	16.5	17.1	17.8	18.4	18.7	19.0	18.9	18.5	17.9	17.2	16.8	15.7	14.4	15.8	19.0	
8-Aug	14.3	13.8	13.1	12.2	11.8	11.1	10.9	12.1	13.7	15.2	16.3	17.4	18.2	18.5	19.1	19.4	19.3	19.3	19.0	18.5	17.3	16.4	15.6	14.9	15.7	19.4	
9-Aug	14.3	13.8	13.4	13.0	12.9	12.8	12.8	13.4	14.2	14.7	15.4	15.5	14.3	14.4	14.1	14.2	14.0	14.2	13.8	13.5	13.1	13.0	13.0	12.9	13.8	15.5	
10-Aug	12.6	12.6	12.7	12.5	12.6	12.6	12.7	12.8	12.9	13.2	13.6	13.7	14.0	13.9	13.8	14.1	14.0	13.6	13.2	13.0	12.8	12.8	12.7	12.2	13.1	14.1	
11-Aug	12.1	11.7	11.7	11.7	11.5	11.3	11.6	11.8	12.2	13.1	13.7	14.0	14.6	15.0	15.6	16.4	16.7	17.0	17.1	16.7	16.7	16.6	16.2	15.6	14.2	17.1	
12-Aug	14.6	14.3	13.8	13.6	13.7	13.4	13.3	13.4	13.8	14.6	16.0	17.6	19.1	20.3	19.8	19.0	19.8	20.0	19.7	19.4	19.4	18.7	18.5	16.7	16.8	20.3	
13-Aug	16.2	16.4	16.3	16.2	15.0	14.3	13.8	13.9	16.2	19.0	20.8	22.8	24.4	25.6	26.2	26.6	26.9	27.1	27.2	26.7	26.3	26.2	24.8	24.1	21.4	27.2	
14-Aug	22.3	21.3	20.8	20.2	19.4	19.1	18.4	18.2	18.9	19.6	20.5	21.1	20.9	20.5	19.4	20.1	20.6	20.9	21.3	21.1	20.7	19.7	18.5	18.3	20.1	22.3	
15-Aug	17.3	16.5	14.7	14.5	14.7	14.3	14.5	14.0	13.7	15.0	15.5	15.5	15.3	16.2	18.5	19.8	20.2	20.7	20.5	17.9	16.3	15.3	14.6	14.3	16.2	20.7	
16-Aug	13.9	14.2	14.0	13.6	13.2	13.7	13.4	13.6	14.1	14.8	15.7	16.8	17.8	18.8	19.5	20.3	20.8	21.1	21.1	20.8	20.2	19.5	18.2	17.1	16.9	21.1	
17-Aug	17.0	16.6	16.0	15.7	15.8	15.9	15.6	15.4	16.1	17.6	19.4	20.7	21.6	21.7	22.3	22.9	23.8	20.6	21.0	19.9	19.4	18.5	19.1	18.4	18.8	23.8	
18-Aug	18.2	15.6	14.4	13.8	13.1	12.4	11.9	12.2	12.7	12.9	13.6	14.1	14.5	14.9	15.5	15.6	15.1	13.4	13.2	13.2	12.9	12.4	11.9	11.6	13.7	18.2	
19-Aug	11.5	10.8	9.9	9.2	8.2	7.4	7.2	8.1	10.3	11.0	11.6	12.4	14.5	15.8	16.8	17.7	17.9	18.1	17.5	17.2	16.6	15.3	15.2	14.7	13.1	18.1	
20-Aug	14.1	13.8	13.4	12.4	12.3	12.5	11.7	11.6	13.9	16.0	17.3	18.5	20.0	21.2	22.4	22.9	21.0	20.4	20.3	20.3	20.4	19.6	19.2	18.0	17.2	22.9	
21-Aug	16.8	15.7	15.7	15.4	14.5	14.4	13.8	14.3	14.9	16.2	18.3	20.5	21.6	22.2	22.7	23.0	23.1	22.9	22.7	22.4	21.6	20.8	19.9	18.3	18.8	23.1	
22-Aug	17.3	17.0	15.6	14.5	13.8	12.7	12.4	12.2	13.7	15.4	18.0	19.8	20.5	21.3	21.6	22.0	22.3	22.3	22.0	21.7	21.5	21.2	20.6	19.8	18.3	22.3	
23-Aug	19.1	18.3	17.3	17.1	16.9	16.3	16.0	15.3	15.0	15.3	15.2	15.5	16.3	16.7	17.0	17.5	18.7	19.1	19.2	18.4	17.5	16.9	16.1	15.9	16.9	19.2	
24-Aug	15.4	15.1	14.8	14.7	14.2	13.5	12.8	12.4	12.2	13.2	14.7	16.1	17.4	18.8	19.4	19.8	20.2	20.3	20.0	19.3	18.8	18.4	17.5	16.6	16.5	20.3	
25-Aug	15.9	15.5	14.9	13.3	11.9	9.0	9.4	9.7	10.6	12.7	15.2	18.4	19.2	20.5	21.4	22.1	22.6	22.6	22.5	22.0	20.8	19.3	18.2	17.6	16.9	22.6	
26-Aug	17.0	16.7	16.1	16.0	15.9	15.5	15.0	15.2	16.6	18.8	21.1	23.2	24.6	25.6	26.0	25.9	25.6	25.8	23.0	21.1	20.0	19.1	18.5	18.0	20.0	26.0	
27-Aug	17.4	16.9	16.9	16.7	16.3	16.0	15.3	14.9	15.1	16.5	17.7	19.6	20.7	22.1	23.3	24.1	24.6	24.8	24.4	23.9	22.7	21.4	20.6	20.3	19.7	24.8	
28-Aug	20.3	20.3	19.5	18.7	18.6	18.2	18.0	17.8	17.7	18.2	18.5	20.0	21.6	23.6	24.3	25.0	24.8	25.1	25.3	25.2	24.8	24.0	23.2	22.1	21.5	25.3	
29-Aug	21.0	20.8	20.6	19.9	20.0	18.6	18.5	17.9	17.3	18.2	20.1	22.2	24.0	25.9	26.8	26.8	26.8	26.7	26.4	26.3	25.8	25.1	23.9	23.0	22.6	26.8	
30-Aug	22.2	21.7	20.9	20.5	20.2	19.2	18.4	18.7	19.6	20.7	22.7	25.4	27.2	27.6	28.0	28.7	28.2	28.2	28.2	28.2	28.7	28.3	27.6	26.0	24.2	28.7	
31-Aug	23.5	22.4	22.2	21.4	20.8	19.8	18.3	18.3	18.1	19.6	20.6	22.1	24.0	25.4	26.3	26.8	27.0	26.5	23.4	22.6	22.4	21.6	20.6	19.8	22.2	27.0	
		16.8	16.3	15.7	15.2	14.9	14.4	14.1	14.2	14.8	16.0	17.1	18.2	19.2	20.0	20.5	20.9	21.0	20.9	20.6	20.1	19.6	18.9	18.3	17.5	Diurnal Average	
		23.5	22.4	22.2	21.4	20.8	19.8	18.5	18.7	19.6	20.7	22.7	25.4	27.2	27.6	28.0	28.7	28.2	28.2	28.2	28.7	28.3	27.6	26.0	24.7	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	9	1.21	1.21
10 - 20	530	71.24	72.45
> 20	205	27.55	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

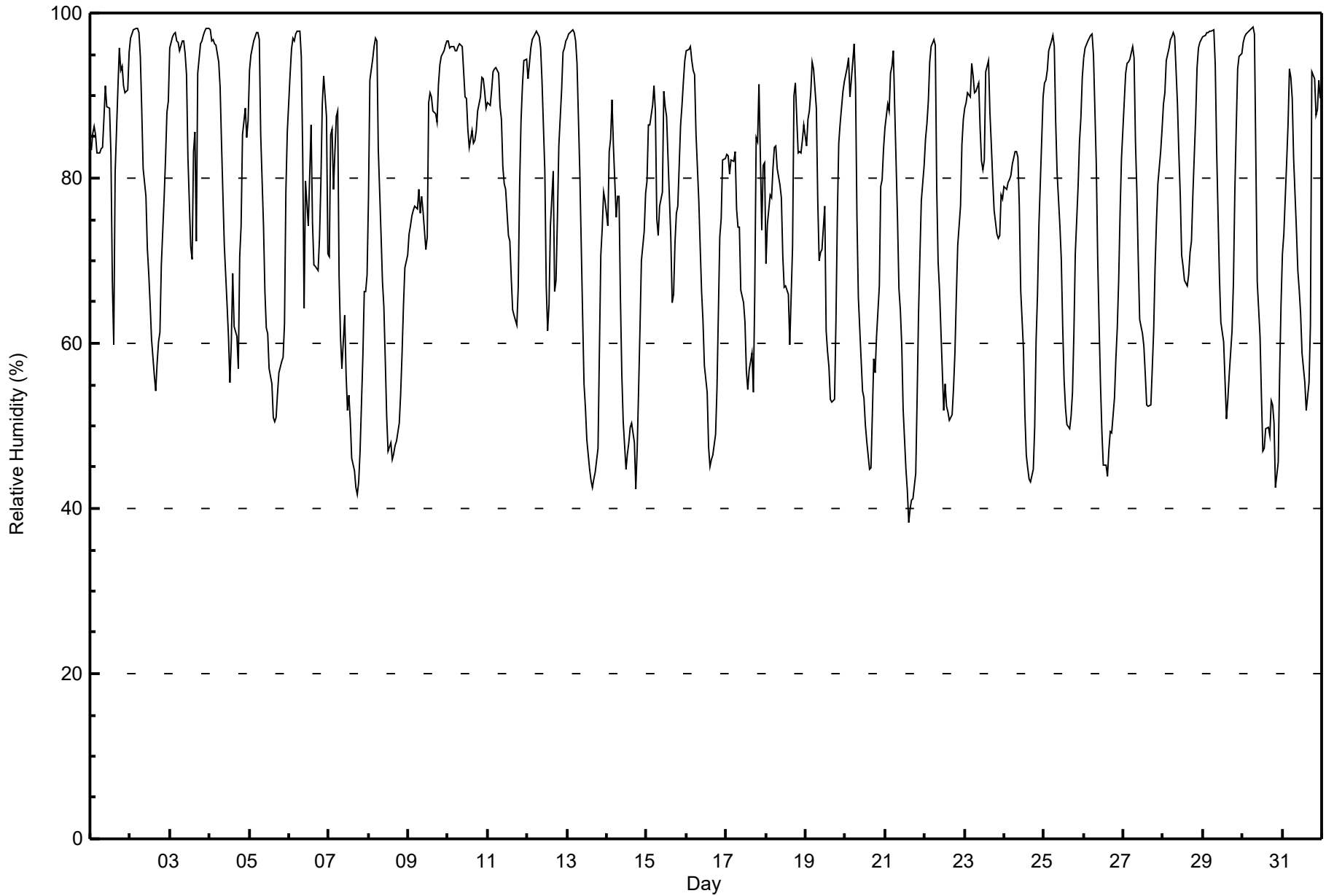
Mannix - August 2023

Maximum Value: 98 % on Aug 30 07:00										Maximum Daily Average: 91.7 % on Aug 3										Hours in Service: 744																												
Minimum Value: 38 % on Aug 21 15:00										Minimum Daily Average: 61.8 % on Aug 7										Hours of Data: 744																												
Maximum Diurnal Average: 92.6 % at hour 5										Minimum Diurnal Average: 59.0 % at hour 15										Hours of Missing Data: 0																												
Monthly Average: 76.3 %										Percentiles: P ₁ = 42 P ₁₀ = 51 Q ₁ = 63 Median = 79 Q ₃ = 91 P ₉₀ = 96 P ₉₉ = 98										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-Aug	83	85	86	85	83	83	84	84	87	91	89	88	83	67	60	81	91	96	93	94	91	90	91	95	85.9	96																						
2-Aug	97	97	98	98	98	98	95	88	81	78	72	69	65	61	56	54	58	60	61	70	78	82	88	89	78.8	98																						
3-Aug	96	97	97	98	97	96	95	97	97	95	93	83	72	70	83	86	72	93	96	97	97	98	98	98	91.7	98																						
4-Aug	98	97	97	96	96	94	91	84	78	72	65	61	55	60	69	62	61	57	70	74	85	88	85	87	78.4	98																						
5-Aug	93	95	97	97	98	98	97	85	74	66	62	61	57	55	51	51	51	54	57	58	58	62	78	86	72.5	98																						
6-Aug	93	96	97	97	97	98	98	95	83	64	80	74	80	86	75	69	69	69	73	80	89	92	88	71	83.8	98																						
7-Aug	70	85	86	79	87	88	68	61	57	63	56	52	54	51	46	45	43	42	43	47	58	66	66	68	61.8	88																						
8-Aug	78	92	94	96	97	97	84	73	67	64	58	51	47	48	46	47	48	48	50	54	59	65	69	71	66.7	97																						
9-Aug	73	74	75	76	77	76	79	76	78	76	71	73	89	90	90	88	88	87	91	94	95	95	96	97	83.5	97																						
10-Aug	97	96	96	96	95	95	96	96	96	93	90	90	86	84	86	84	85	86	88	90	92	92	90	88	91.1	97																						
11-Aug	89	89	91	93	93	93	93	89	87	81	79	79	73	72	68	64	63	62	67	79	87	91	94	94	82.1	94																						
12-Aug	92	94	96	97	97	98	97	97	96	92	81	67	62	65	74	81	66	68	75	84	91	95	96	97	85.7	98																						
13-Aug	97	97	98	98	98	97	94	81	72	63	55	52	48	45	43	43	44	44	47	59	71	74	78	77	69.8	98																						
14-Aug	74	83	85	90	84	75	78	78	66	56	50	45	47	48	50	50	48	42	47	54	62	70	74	78	63.9	90																						
15-Aug	80	86	86	89	91	88	75	73	77	78	90	89	87	82	73	65	66	72	76	77	86	89	92	94	81.7	94																						
16-Aug	95	96	96	94	93	93	85	77	72	66	63	57	54	47	45	46	46	49	55	64	73	75	82	82	71.1	96																						
17-Aug	83	83	80	82	82	83	76	74	74	66	65	63	57	54	57	59	54	66	85	84	91	74	82	82	73.2	91																						
18-Aug	70	74	78	78	81	84	84	81	79	78	71	67	67	66	60	66	72	90	91	83	83	83	85	87	77.3	91																						
19-Aug	84	87	88	90	94	93	88	77	70	71	71	77	62	59	57	53	53	53	63	75	84	87	90	92	75.8	94																						
20-Aug	93	93	95	90	94	96	91	75	66	58	54	53	50	48	45	45	51	58	56	61	67	79	80	84	70.1	96																						
21-Aug	86	89	88	93	94	96	88	75	67	64	60	52	45	42	38	40	41	41	44	53	64	71	77	82	66.2	96																						
22-Aug	85	87	89	94	96	97	96	79	70	66	57	52	55	52	52	51	51	55	59	66	72	77	84	87	71.9	97																						
23-Aug	88	89	90	90	94	92	90	91	91	86	82	81	82	93	94	88	84	80	76	73	73	73	78	78	84.9	94																						
24-Aug	79	79	79	80	80	82	83	83	83	77	66	59	51	46	45	44	43	45	50	60	66	74	85	90	67.9	90																						
25-Aug	91	92	93	95	97	97	96	87	81	74	70	62	56	52	50	50	51	54	61	71	79	84	87	92	76.0	97																						
26-Aug	95	96	97	97	97	98	95	82	70	62	55	49	45	45	44	47	49	49	53	58	62	68	76	82	69.6	98																						
27-Aug	89	93	94	94	94	96	95	84	78	70	63	61	60	56	53	52	52	57	62	69	75	79	83	86	74.8	96																						
28-Aug	89	90	94	96	97	97	98	97	89	83	78	71	69	68	67	68	71	72	78	87	93	96	96	97	85.1	98																						
29-Aug	97	97	98	98	98	98	98	94	83	76	68	63	60	55	51	53	56	62	67	78	86	93	95	95	80.0	98																						
30-Aug	97	97	97	98	98	98	98	98	83	67	61	54	47	47	50	50	49	53	53	50	42	46	56	65	68.9	98																						
31-Aug	71	73	82	86	93	92	90	82	74	69	66	64	59	55	52	54	55	62	93	92	88	88	92	90	75.9	93																						
																								87.1	89.7	90.9	91.6	92.6	92.4	89.5	83.6	78.2	73.2	69.1	65.0	62.0	60.4	59.0	59.2	59.1	62.1	67.2	72.1	77.3	80.6	84.2	85.8	Diurnal Average
																								98	97	98	98	98	98	98	98	97	95	93	90	89	93	94	88	91	96	96	97	97	98	98	98	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mannix - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Mannix - August 2023**

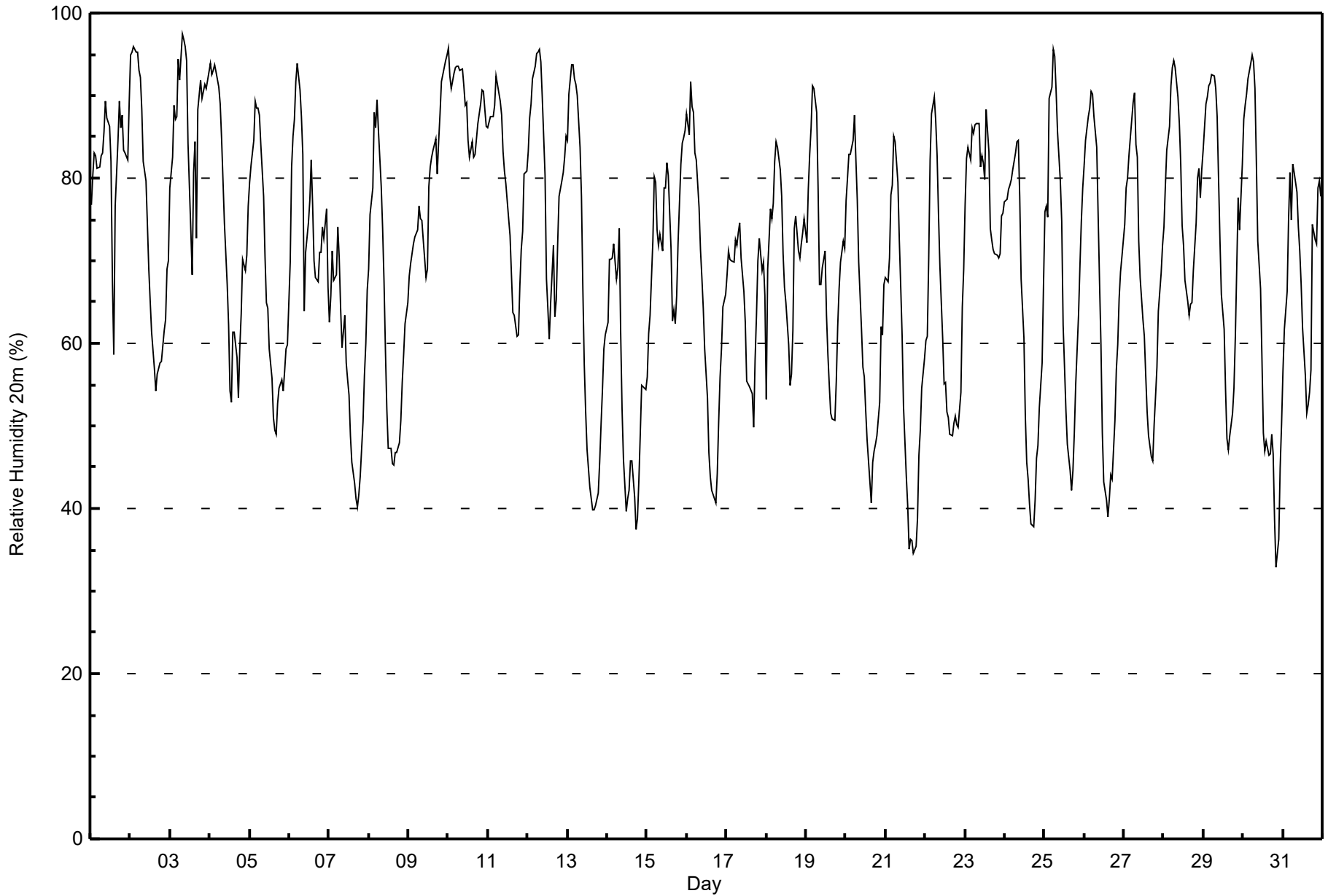
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	2	0.27	0.27
40 - 60	156	20.97	21.24
60 - 80	223	29.97	51.21
80 - 100	363	48.79	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 97 % on Aug 3 08:00										Maximum Daily Average: 89.2 % on Aug 10										Hours in Service: 744																													
Minimum Value: 33 % on Aug 30 21:00										Minimum Daily Average: 54.3 % on Aug 14										Hours of Data: 744																													
Maximum Diurnal Average: 86.7 % at hour 6										Minimum Diurnal Average: 55.1 % at hour 17										Hours of Missing Data: 0																													
Monthly Average: 70.5 %										Percentiles: P ₁ = 38 P ₁₀ = 47 Q ₁ = 58 Median = 72 Q ₃ = 83 P ₉₀ = 90 P ₉₉ = 95										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-Aug	77	80	83	83	81	81	83	83	86	89	87	86	82	68	59	77	85	89	86	88	83	83	82	89	82.1	89																							
2-Aug	95	95	96	95	95	93	92	88	82	80	74	69	65	61	57	54	56	57	58	58	61	63	69	70	74.4	96																							
3-Aug	79	82	89	87	87	94	92	97	97	96	94	84	74	68	81	84	73	88	92	90	90	91	91	93	87.3	97																							
4-Aug	94	93	93	94	93	91	89	85	80	75	67	62	54	53	61	61	58	53	60	64	70	69	71	77	73.5	94																							
5-Aug	79	82	85	89	88	89	88	84	78	71	65	64	59	56	51	50	49	53	55	56	54	57	59	60	67.4	89																							
6-Aug	70	81	85	87	92	94	91	87	83	64	71	75	77	82	77	70	68	67	71	71	74	73	76	67	77.2	94																							
7-Aug	62	66	71	68	68	74	70	64	60	63	58	56	54	49	46	43	41	40	42	44	51	56	60	66	57.2	74																							
8-Aug	69	76	79	88	86	89	86	79	74	67	59	52	47	47	45	45	47	47	48	51	55	59	62	65	63.5	89																							
9-Aug	68	70	71	72	73	74	77	75	75	72	68	69	79	81	83	83	85	81	84	88	92	93	94	95	79.2	95																							
10-Aug	96	92	91	93	93	94	94	93	93	91	89	89	85	83	84	82	83	85	87	89	91	90	88	86	89.2	96																							
11-Aug	86	88	87	87	89	92	90	89	88	83	81	79	75	73	68	64	63	61	61	67	71	74	81	81	78.3	92																							
12-Aug	83	87	89	92	94	95	95	96	94	90	80	68	64	61	65	72	63	65	72	78	80	81	82	85	80.5	96																							
13-Aug	85	90	94	94	92	91	90	84	78	67	57	52	47	43	41	40	40	42	46	50	54	59	61	64.0	94																								
14-Aug	63	70	70	70	72	68	69	74	61	52	46	40	41	42	46	46	41	37	39	43	49	55	54	54.3	74																								
15-Aug	56	61	63	72	80	79	74	72	73	71	79	79	82	80	71	63	64	62	66	72	82	84	85	86	73.2	86																							
16-Aug	88	85	92	89	88	83	82	76	71	68	64	59	53	47	44	42	42	41	44	51	56	59	64	66	64.8	92																							
17-Aug	68	71	70	70	70	72	72	73	75	70	66	63	55	55	55	54	50	58	63	70	73	69	70	66	65.8	75																							
18-Aug	53	69	76	75	77	82	84	84	81	78	71	67	65	60	55	56	62	74	75	71	70	72	73	75	71.1	84																							
19-Aug	72	79	83	86	91	91	88	79	67	67	69	71	63	59	55	51	51	51	55	62	67	70	72	72	69.6	91																							
20-Aug	77	80	83	83	85	88	82	77	70	62	57	56	52	48	43	41	46	47	48	49	53	62	61	67	63.1	88																							
21-Aug	68	68	70	78	79	85	84	80	73	67	61	52	44	40	35	36	36	35	35	39	46	50	55	58	57.2	85																							
22-Aug	60	61	70	82	88	90	87	83	76	69	60	55	55	52	51	49	49	50	51	50	50	54	64	69	63.6	90																							
23-Aug	77	82	84	82	86	85	87	87	87	81	83	82	80	88	83	74	73	71	71	71	70	71	75	76	79.4	88																							
24-Aug	77	77	79	79	80	81	83	84	85	78	68	61	51	46	44	40	38	38	41	46	48	52	58	67	62.5	85																							
25-Aug	76	77	75	90	91	96	95	91	86	80	75	62	57	52	48	45	42	45	49	55	63	69	75	79	69.6	96																							
26-Aug	82	85	87	89	90	90	88	84	76	67	60	49	43	41	39	41	44	44	51	57	60	65	69	71	65.4	90																							
27-Aug	74	79	80	83	85	89	90	84	83	72	68	63	61	56	52	49	46	46	50	54	57	64	68	72	67.7	90																							
28-Aug	74	79	83	86	91	93	94	93	90	87	82	74	72	68	65	63	65	65	69	74	80	81	78	81	78.7	94																							
29-Aug	83	89	90	91	92	93	92	91	87	80	72	66	62	54	48	47	49	51	55	61	69	78	74	82	73.2	93																							
30-Aug	87	89	90	92	94	95	94	91	82	72	67	58	49	47	48	47	47	49	47	39	33	36	45	50	64.4	95																							
31-Aug	57	62	66	75	81	75	82	81	78	74	71	67	62	56	52	52	54	57	74	73	72	79	80	78	69.0	82																							
																								75.3	78.8	81.5	83.9	85.5	86.7	85.9	83.5	79.5	74.3	70.0	65.5	61.6	58.6	56.5	55.6	55.1	56.4	59.4	62.0	65.2	68.2	70.8	73.0	Diurnal Average	
																								96	95	96	95	95	96	95	97	97	96	94	89	85	88	84	84	85	89	92	90	92	93	94	95	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity 20m (RH20m) - %
Mannix - August 2023**

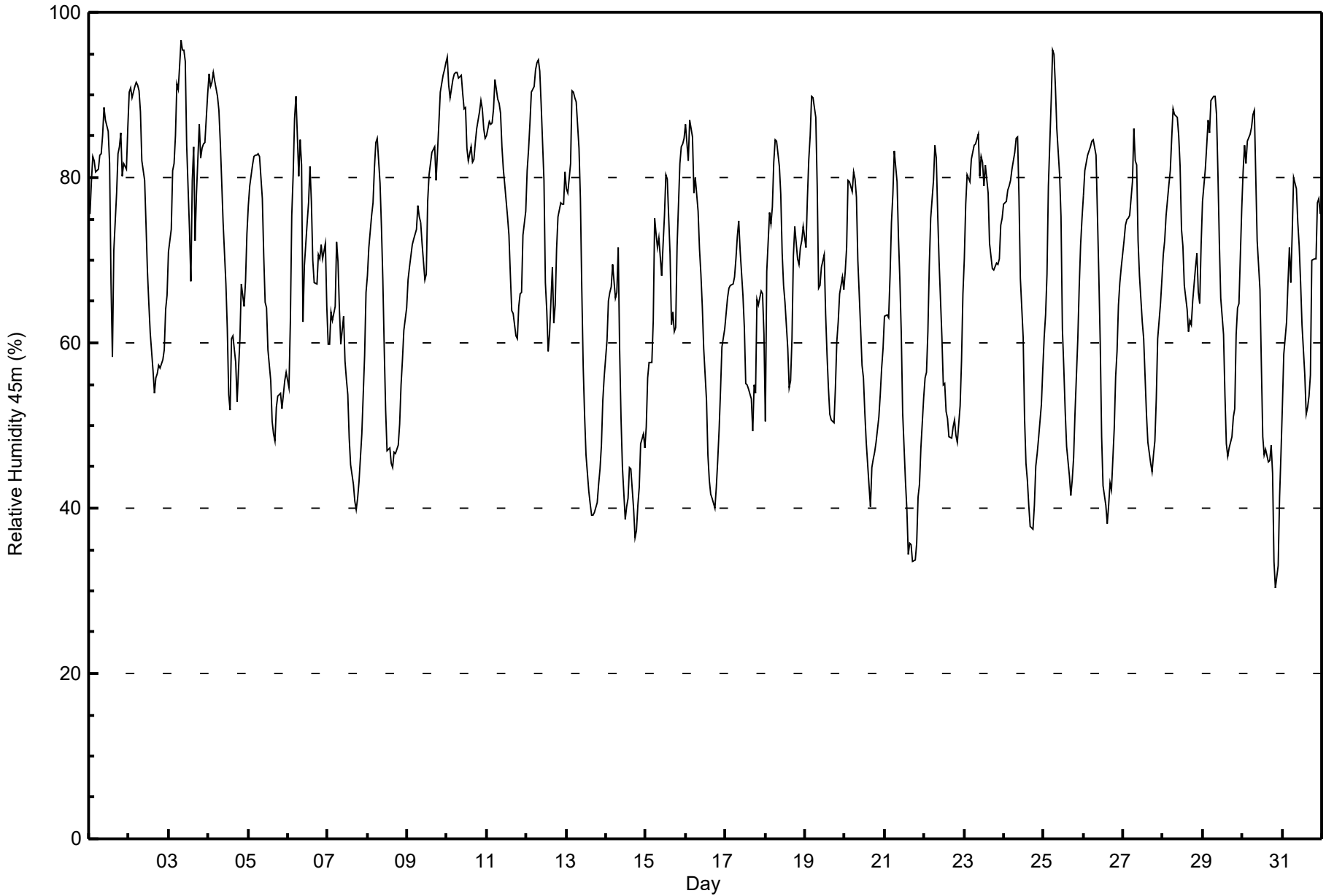
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	17	2.28	2.28
40 - 60	186	25.00	27.28
60 - 80	286	38.44	65.73
80 - 100	255	34.27	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 97 % on Aug 3 08:00											Maximum Daily Average: 88.2 % on Aug 10											Hours in Service: 744				
Minimum Value: 30 % on Aug 30 21:00											Minimum Daily Average: 51.5 % on Aug 14											Hours of Data: 744				
Maximum Diurnal Average: 83.6 % at hour 7											Minimum Diurnal Average: 54.2 % at hour 17											Hours of Missing Data: 0				
Monthly Average: 68.2 %											Percentiles: P ₁ = 36 P ₁₀ = 46 Q ₁ = 56 Median = 69 Q ₃ = 81 P ₉₀ = 87 P ₉₉ = 94											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-Aug	76	80	82	82	81	81	83	83	85	88	87	86	82	67	58	71	78	83	84	85	80	82	81	86	80.4	88
2-Aug	90	91	90	91	91	91	91	88	82	80	74	69	65	61	57	54	56	56	57	57	58	59	64	66	72.4	91
3-Aug	71	74	81	82	85	91	91	97	95	95	94	84	74	67	80	84	72	78	86	82	84	84	84	90	83.6	97
4-Aug	93	91	92	93	92	90	88	84	80	75	67	62	54	52	60	61	58	53	57	61	67	64	67	73	72.1	93
5-Aug	77	79	81	83	83	83	83	83	78	71	65	64	59	55	51	49	48	52	54	54	52	54	55	56	65.3	83
6-Aug	55	62	76	80	87	90	80	85	82	63	69	75	77	81	77	70	67	67	71	70	72	70	72	64	73.4	90
7-Aug	60	60	64	63	64	72	70	64	60	63	58	56	54	48	45	43	41	40	41	43	49	54	58	66	55.6	72
8-Aug	68	71	75	77	81	84	85	79	74	68	59	52	47	47	45	45	47	47	48	50	55	58	62	64	62.0	85
9-Aug	68	69	71	72	73	74	77	75	75	72	68	68	77	80	82	83	84	80	83	87	90	92	93	94	78.5	94
10-Aug	95	91	90	92	92	93	93	92	92	90	88	88	84	82	84	82	82	84	86	88	89	88	86	85	88.2	95
11-Aug	85	87	86	87	88	92	90	89	88	84	81	79	75	73	68	64	64	61	61	64	66	66	73	76	76.9	92
12-Aug	81	83	87	90	91	93	94	94	93	89	80	67	64	59	61	69	62	65	71	75	77	77	77	81	78.3	94
13-Aug	79	78	82	90	90	90	89	83	77	66	57	51	46	42	41	39	39	40	41	43	45	48	53	56	61.1	90
14-Aug	60	65	66	67	69	66	66	71	59	51	45	39	40	41	45	45	40	36	37	40	43	48	49	47	51.5	71
15-Aug	50	56	58	58	63	75	73	71	73	68	72	76	80	80	71	62	64	61	62	72	82	84	84	85	69.9	85
16-Aug	86	82	87	86	85	78	80	76	71	68	64	59	53	46	43	42	41	40	42	46	50	54	59	62	62.6	87
17-Aug	64	65	67	67	67	68	70	73	75	71	66	62	55	55	54	53	49	55	54	65	65	66	66	61	63.0	75
18-Aug	50	69	76	74	76	82	85	84	81	78	71	67	65	59	55	55	61	71	74	70	69	72	72	74	70.4	85
19-Aug	72	78	82	85	90	90	87	79	67	67	69	71	64	59	55	51	51	50	55	60	63	66	68	66	68.4	90
20-Aug	69	72	80	79	78	81	80	78	70	62	57	56	52	48	43	40	45	46	47	48	51	54	57	59	60.4	81
21-Aug	63	63	63	68	75	78	83	79	73	68	61	51	43	40	34	36	36	34	34	36	41	43	47	53	54.3	83
22-Aug	56	57	61	69	75	80	84	82	76	70	61	55	55	52	51	49	49	50	51	49	48	52	58	66	60.5	84
23-Aug	70	77	80	80	82	83	84	84	85	80	83	82	79	82	78	72	71	69	69	70	70	74	75	75	77.0	85
24-Aug	77	77	78	79	80	81	83	85	85	78	68	61	51	45	43	40	38	37	40	45	47	49	53	57	61.5	85
25-Aug	61	63	68	79	89	96	95	91	86	80	75	62	57	52	48	44	41	43	46	52	60	67	72	75	66.7	96
26-Aug	78	81	83	83	84	84	85	83	76	68	60	49	43	40	38	40	43	42	50	56	59	65	67	69	63.5	85
27-Aug	72	74	75	75	75	80	86	82	82	72	68	63	60	56	51	48	45	44	46	48	53	61	65	68	64.6	86
28-Aug	71	72	75	79	81	85	88	88	87	85	81	74	72	67	64	61	63	62	65	69	71	66	65	72	73.5	88
29-Aug	77	81	84	87	85	89	90	90	88	81	72	65	61	54	48	46	47	49	51	52	61	64	65	76	69.3	90
30-Aug	81	84	82	84	85	86	88	88	80	72	66	57	49	47	47	46	46	48	44	34	30	33	41	47	61.0	88
31-Aug	52	59	63	67	72	67	73	80	79	75	72	67	62	56	51	52	54	56	70	70	70	77	77	76	66.5	80
71.1											73.9											Diurnal Average				
95											92											Diurnal Maximum				





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	21	2.82	2.82
40 - 60	205	27.55	30.38
60 - 80	308	41.40	71.77
80 - 100	210	28.23	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744

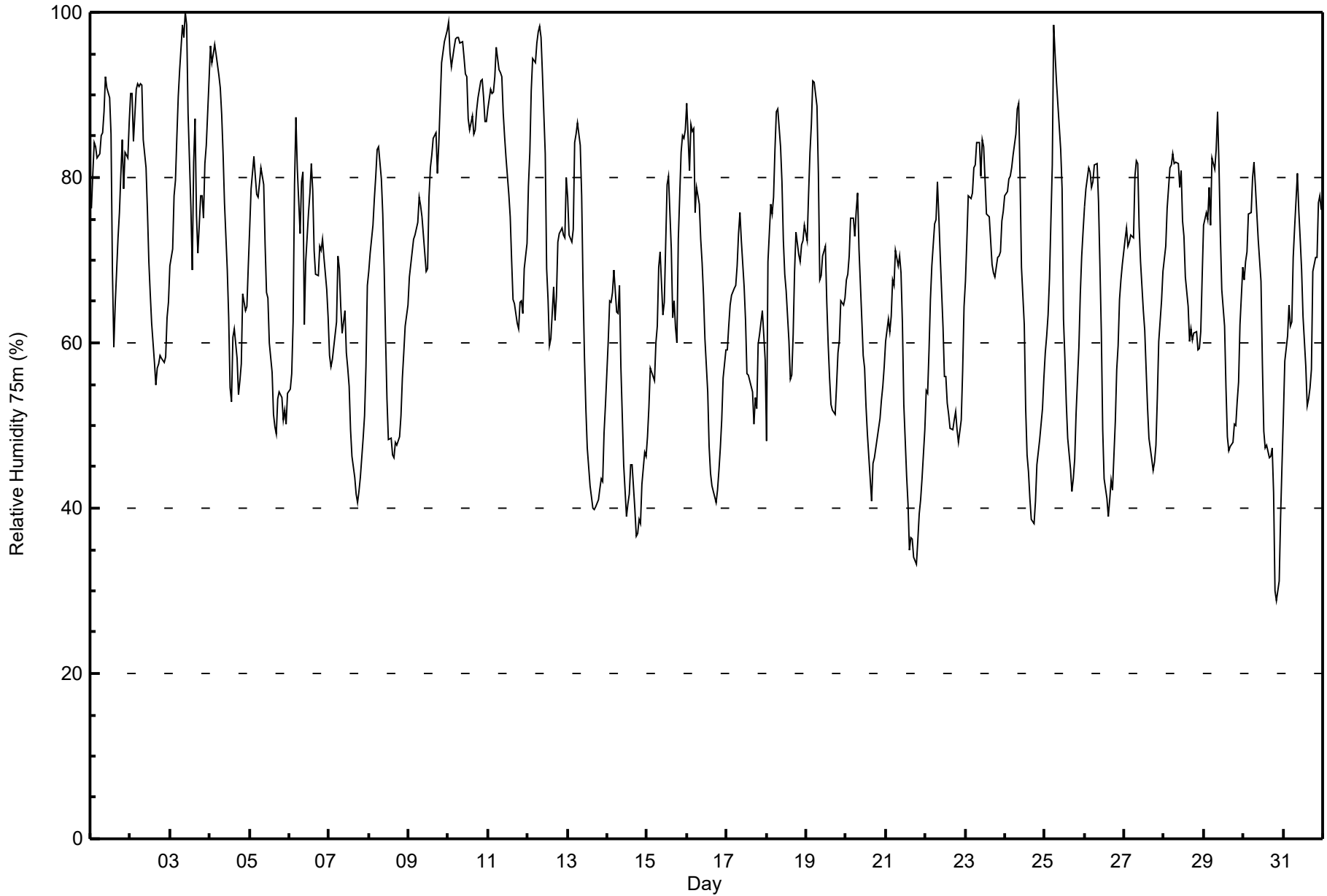


Maximum Value: 100 % on Aug 3 10:00														Maximum Daily Average: 91.7 % on Aug 10														Hours in Service: 744											
Minimum Value: 29 % on Aug 30 21:00														Minimum Daily Average: 50.5 % on Aug 14														Hours of Data: 744											
Maximum Diurnal Average: 82.0 % at hour 8														Minimum Diurnal Average: 54.7 % at hour 18														Hours of Missing Data: 0											
Monthly Average: 67.7 %														Percentiles: P ₁ = 36 P ₁₀ = 46 Q ₁ = 56 Median = 69 Q ₃ = 80 P ₉₀ = 88 P ₉₉ = 97														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-Aug	76	81	84	84	82	83	85	85	88	92	91	90	85	69	59	65	73	76	80	84	79	83	82	87	81.0	92													
2-Aug	90	90	84	91	91	91	91	91	85	81	76	70	66	62	58	55	57	57	59	58	58	58	63	65	72.8	91													
3-Aug	69	71	78	80	85	90	93	99	97	100	98	88	76	69	82	87	75	71	78	78	75	82	84	92	83.2	100													
4-Aug	96	94	95	96	95	92	91	88	83	77	69	63	55	53	61	62	58	54	55	58	66	64	64	69	73.2	96													
5-Aug	74	79	83	80	78	78	79	81	79	72	66	66	60	56	51	50	49	53	54	53	51	52	50	54	64.5	83													
6-Aug	54	56	62	79	87	81	73	80	81	62	70	76	78	82	78	71	68	68	72	71	73	70	67	63	71.8	87													
7-Aug	58	57	58	59	63	70	69	64	61	64	59	57	55	49	46	44	42	41	42	44	48	51	57	67	55.3	70													
8-Aug	69	71	74	77	80	83	84	80	76	69	61	53	48	49	46	46	48	48	49	51	56	59	62	65	62.6	84													
9-Aug	68	69	71	73	73	75	78	77	75	73	69	69	78	81	83	85	85	81	84	89	94	96	97	98	80.0	98													
10-Aug	99	95	93	96	97	97	97	96	96	95	92	92	87	86	87	85	86	88	90	92	92	90	87	87	91.7	99													
11-Aug	88	91	90	90	92	96	93	93	92	88	85	82	78	75	70	65	65	62	62	65	65	64	69	72	78.8	96													
12-Aug	79	83	90	94	94	96	98	98	97	93	83	69	65	60	61	67	63	66	72	73	74	73	73	80	79.2	98													
13-Aug	78	73	72	74	84	85	87	84	78	67	58	52	47	43	41	40	40	40	41	42	44	43	49	52	58.9	87													
14-Aug	60	65	65	66	69	64	63	67	57	51	45	39	40	42	45	45	40	37	37	39	38	43	47	46	50.5	69													
15-Aug	49	52	57	56	56	60	62	69	71	63	65	72	79	80	71	63	65	62	60	73	83	85	85	86	67.6	86													
16-Aug	89	81	86	86	86	76	79	77	73	70	66	60	54	47	44	43	42	41	42	45	47	51	56	59	62.4	89													
17-Aug	59	62	65	66	67	67	69	73	76	72	67	63	56	56	55	54	50	53	52	60	61	64	61	58	61.9	76													
18-Aug	48	70	77	76	78	83	88	88	84	80	72	68	66	60	56	56	61	69	73	71	70	72	74	74	71.3	88													
19-Aug	72	78	83	87	92	92	89	80	68	68	70	72	65	60	56	53	52	51	55	59	60	65	65	65	69.0	92													
20-Aug	68	68	71	75	75	73	76	78	71	63	59	57	52	49	44	41	45	46	47	48	51	53	55	57	59.3	78													
21-Aug	60	63	61	63	68	67	71	69	71	68	62	52	44	41	35	36	36	34	33	36	39	41	44	49	51.9	71													
22-Aug	54	54	59	65	69	74	75	79	75	71	62	56	56	53	51	50	50	51	52	50	48	51	57	64	59.4	79													
23-Aug	67	72	78	77	78	81	81	84	84	80	85	84	80	76	75	72	70	69	68	70	70	71	75	76	76.0	85													
24-Aug	78	78	80	80	81	83	85	88	89	80	69	62	52	46	44	41	39	38	41	45	47	48	52	56	62.7	89													
25-Aug	59	61	63	68	82	99	95	91	89	83	79	63	58	53	48	45	42	43	46	51	60	66	71	74	66.2	99													
26-Aug	76	79	81	81	79	79	82	82	77	70	61	50	44	41	39	41	43	42	50	57	60	65	68	69	63.1	82													
27-Aug	73	74	72	72	73	73	80	82	82	74	70	64	62	57	52	49	46	45	46	48	53	60	65	69	64.1	82													
28-Aug	70	72	76	81	82	83	82	82	82	79	81	75	73	68	64	60	62	60	61	61	59	59	61	68	70.9	83													
29-Aug	74	76	75	79	74	82	81	83	88	81	73	66	62	55	49	47	47	48	50	50	53	55	62	69	65.9	88													
30-Aug	68	70	71	76	76	80	82	79	76	73	68	57	49	47	48	46	46	47	42	30	29	31	39	45	57.2	82													
31-Aug	51	58	61	65	62	63	70	74	81	76	73	69	63	57	52	53	55	57	69	70	70	77	78	76	65.8	81													
														70.1	72.3	74.7	77.1	78.9	80.5	81.5	82.0	80.0	75.3	71.0	66.3	62.4	58.7	56.6	55.4	54.8	54.7	56.8	58.7	60.4	62.7	65.0	68.1	Diurnal Average	
														99	95	95	96	97	99	98	99	97	100	98	92	87	86	87	87	86	88	90	92	94	96	97	98	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

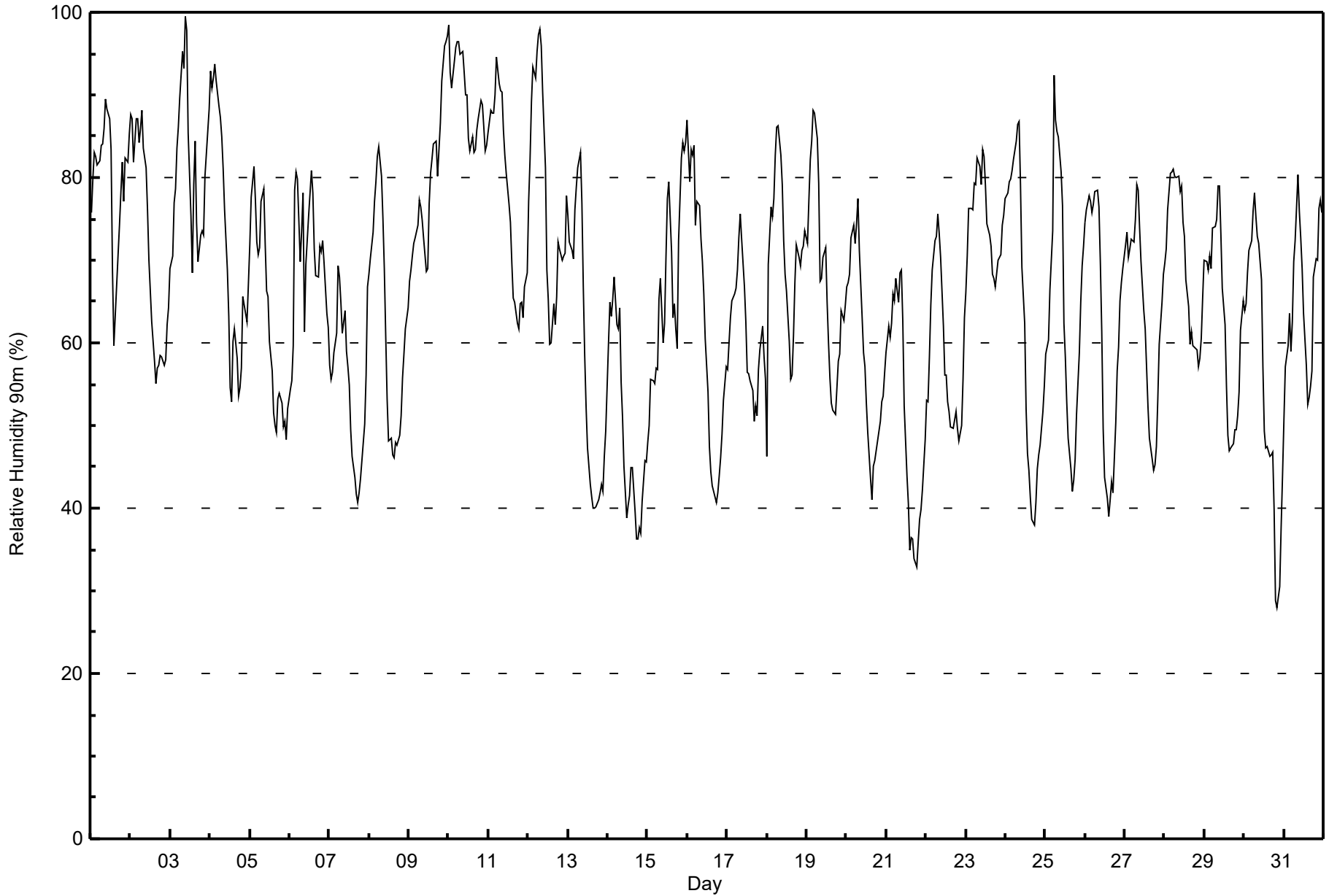
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	22	2.96	2.96
40 - 60	216	29.03	31.99
60 - 80	326	43.82	75.81
80 - 100	180	24.19	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 99 % on Aug 3 10:00										Maximum Daily Average: 89.6 % on Aug 10										Hours in Service: 744																													
Minimum Value: 28 % on Aug 30 21:00										Minimum Daily Average: 49.6 % on Aug 14										Hours of Data: 744																													
Maximum Diurnal Average: 79.6 % at hour 8										Minimum Diurnal Average: 54.4 % at hour 18										Hours of Missing Data: 0																													
Monthly Average: 66.5 %										Percentiles: P ₁ = 36 P ₁₀ = 46 Q ₁ = 56 Median = 68 Q ₃ = 77 P ₉₀ = 85 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-Aug	76	80	83	83	82	82	84	84	86	90	88	87	83	69	60	63	71	74	78	82	77	82	82	85	79.6	90																							
2-Aug	88	87	82	87	87	84	86	88	84	81	76	70	66	62	58	55	57	57	58	58	57	58	62	64	71.4	88																							
3-Aug	69	71	77	79	84	86	90	95	93	99	98	85	75	69	79	84	75	70	73	74	73	80	83	88	81.2	99																							
4-Aug	93	91	92	94	92	89	87	85	81	76	69	63	55	53	60	62	58	54	55	57	66	64	62	67	71.8	94																							
5-Aug	72	78	81	77	72	71	71	77	79	72	66	66	60	57	52	50	49	53	54	53	50	51	48	52	62.9	81																							
6-Aug	54	55	60	79	81	80	70	74	78	61	69	76	78	81	78	71	68	68	72	71	72	70	63	62	70.5	81																							
7-Aug	57	56	56	59	61	69	68	65	61	64	59	57	55	49	46	44	42	41	42	43	48	50	56	67	54.8	69																							
8-Aug	68	70	73	77	79	83	84	80	75	69	61	53	48	48	46	46	48	48	49	51	56	59	62	64	62.4	84																							
9-Aug	67	69	71	72	73	74	77	76	75	73	69	69	77	81	82	84	84	80	83	87	92	96	97	97	79.3	97																							
10-Aug	98	93	91	94	96	96	96	95	95	93	90	90	85	83	85	83	83	86	87	89	89	86	83	84	89.6	98																							
11-Aug	85	88	88	88	90	95	91	90	90	86	83	81	77	75	70	65	65	62	62	65	65	63	67	68	77.4	95																							
12-Aug	77	82	89	93	92	95	97	98	96	90	81	69	65	60	60	65	62	66	72	71	70	71	71	78	77.9	98																							
13-Aug	75	72	71	70	76	79	81	83	77	67	58	52	47	43	41	40	40	40	41	42	43	42	46	49	57.4	83																							
14-Aug	60	65	63	65	68	62	62	64	55	51	45	39	40	42	45	45	39	36	36	38	37	41	46	46	49.6	68																							
15-Aug	48	50	56	55	55	57	57	65	68	60	62	70	77	79	71	63	65	62	59	72	82	84	83	84	66.1	84																							
16-Aug	87	79	83	83	84	74	77	77	72	70	66	61	54	48	44	43	42	41	42	44	46	49	53	57	61.5	87																							
17-Aug	57	60	63	65	66	67	69	73	76	73	67	63	56	56	55	54	51	52	51	57	59	62	58	56	61.0	76																							
18-Aug	46	70	76	75	77	83	86	86	83	79	72	68	66	60	56	56	61	67	72	70	69	71	72	74	70.7	86																							
19-Aug	72	77	82	84	88	88	85	79	67	68	70	71	65	60	56	53	52	51	55	58	59	64	63	64	68.0	88																							
20-Aug	67	67	68	73	74	72	74	77	71	63	59	57	53	49	44	41	45	46	47	48	51	53	54	56	58.7	77																							
21-Aug	59	62	61	62	66	65	68	65	69	69	63	52	44	41	35	36	36	34	33	36	39	40	42	48	51.0	69																							
22-Aug	53	53	58	65	69	72	73	76	73	70	62	56	56	53	52	50	50	51	52	50	48	50	56	63	58.7	76																							
23-Aug	66	71	76	76	76	79	79	82	81	79	83	83	79	74	73	72	68	68	67	70	70	71	74	76	74.8	83																							
24-Aug	77	78	80	80	81	82	84	86	87	79	69	62	52	47	45	41	39	38	41	45	46	48	52	55	62.2	87																							
25-Aug	59	59	60	66	74	92	87	86	85	81	77	62	58	53	48	45	42	43	46	51	59	65	69	72	64.2	92																							
26-Aug	75	76	78	77	76	77	78	78	76	70	61	50	44	41	39	41	43	42	50	57	59	65	67	69	62.1	78																							
27-Aug	72	73	70	71	72	72	75	79	78	74	70	64	62	57	52	49	46	45	45	47	53	60	65	68	63.4	79																							
28-Aug	70	71	76	80	81	81	80	80	80	78	79	75	73	68	64	60	61	60	60	59	57	58	61	66	69.9	81																							
29-Aug	70	70	69	70	69	74	74	75	79	79	73	67	62	55	49	47	47	48	50	49	51	54	61	65	62.8	79																							
30-Aug	64	65	68	71	72	76	78	75	73	72	68	57	49	47	47	46	46	47	40	29	28	31	38	44	55.5	78																							
31-Aug	51	57	60	63	59	62	70	72	80	76	73	69	64	57	53	53	55	57	68	70	70	76	77	76	65.3	80																							
																								68.8	70.8	73.0	75.4	76.5	78.0	78.7	79.6	78.2	74.6	70.5	65.9	62.2	58.6	56.3	55.1	54.5	54.4	56.1	57.9	59.4	61.7	63.7	66.6	Diurnal Average	
																								98	93	92	94	96	96	97	98	96	99	98	90	85	83	85	84	84	86	87	89	92	96	97	97	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	23	3.09	3.09
40 - 60	234	31.45	34.54
60 - 80	338	45.43	79.97
80 - 100	149	20.03	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 25 km/h on Aug 24 04:00	Maximum Daily Speed Average: 14.1 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 8 05:00	Minimum Daily Speed Average: 1.5 km/h on Aug 11	Hours of Data: 744
Maximum Diurnal Speed Average: 3.9 km/h at hour 14	Minimum Diurnal Speed Average: 0.3 km/h at hour 23	Hours of Missing Data: 0
Monthly Average Velocity: 1.9 km/h 215.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 4 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 23	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-Aug	WSW15	WSW15	W18	W18	W19	W18	W17	W17	W16	WSW13	WSW13	WSW14	WSW13	W18	W13	W11	SW5	SW9	SW9	W8	W18	N7	N5	W18	W13	W11.5	W19
2-Aug	WSW4	WSW7	W8	WSW7	W9	W9	W7	W5	W5	WSW8	WSW6	WSW7	W7	WSW8	WSW6	W5	NE4	E4	E5	E4	E4	E4	ENE4	E3	WSW3.1	W9	
3-Aug	S2	WSW2	SSW7	SE4	E3	SSE5	SE8	S5	SE4	S6	SSE8	SE7	S6	SE9	SE11	SSE10	NNE9	NNW5	WSW4	S5	SSW6	SSW8	SW6	W6	SSE3.9	SE11	
4-Aug	W11	W14	W10	W10	W12	W13	W13	W15	W14	W9	W9	W9	W9	W4	SW12	NNW5	N3	WSW5	WSW6	WSW5	WSW6	WSW7	W9	W8	W8.7	W15	
5-Aug	W11	W14	W10	W10	W12	W13	W13	W15	W14	W9	W9	W9	W9	W4	SW12	NNW5	N3	WSW5	WSW6	WSW5	WSW6	WSW7	W9	W8	W8.7	W15	
6-Aug	W4	NE2	WSW3	W18	W3	S3	SW3	SE1	NE9	ESE7	NNE7	NE14	NE5	NNW3	NNE8	N5	N6	N7	N6	NNW4	NNW4	NNW6	NNE10	NE10	NNE3.5	NE14	
7-Aug	NE6	NNW5	NNE7	NNE7	NNE2	N3	NE3	NNE3	W3	W9	NW7	NNW9	NNW9	N10	N13	NNE11	NNE14	NNE13	NE14	NNE11	NNE11	NNE11	NNE9	ENE10	NNE7.2	NNE14	
8-Aug	E6	SW3	W3	W3	SSE0	SSW4	SSE3	SSE8	SSE9	SE8	ESE8	ESE10	E11	E12	E13	ESE13	ESE16	ESE15	ESE15	ESE13	ESE12	SE12	SE12	SE10	ESE7.9	ESE16	
9-Aug	SE13	SE15	SE15	SE14	SE13	SE13	SE10	SE12	SE13	SE14	SE17	SSE18	SE17	SE18	SE18	SE14	ESE13	SE12	SE15	SE15	SE13	SE12	SE13	SE13	SE14.1	SSE18	
10-Aug	SE14	SE15	SE14	SE14	ESE11	SE11	SE11	SE12	SE11	ESE11	ESE11	E13	E16	E16	E14	E15	E15	E14	ENE9	ENE10	NNE8	NNE8	NNE9	NNE10	E10.2	E16	
11-Aug	N12	NNE10	N9	N8	N8	N7	N6	N8	NNW4	NNE3	W4	W18	W5	W6	WSW6	WSW5	SW7	WSW7	SW5	SSE6	SSE7	SSE9	SSE9	SSE9	NW1.5	N12	
12-Aug	S7	S5	SSW6	SW7	WSW8	WSW9	WSW9	W9	W9	W10	W12	W10	W10	W10	W11	W9	W11	W10	WSW6	WSW5	WSW7	SW10	SSW6	WSW7.2	W12		
13-Aug	S7	SSE8	SSE8	SSE9	SSE10	SSE10	SSE10	SE9	SSE10	SSW14	SW17	SW19	WSW19	WSW21	WSW23	WSW23	WSW17	WSW13	WSW7	SSW8	SW10	SW9	WSW7	SSW9.6	WSW23		
14-Aug	NW6	S8	SSW8	S4	W12	NNW14	NNW6	W9	W14	W18	W18	W23	W21	WSW23	WSW22	WSW20	W17	W15	W9	W12	W13	W12	W12	W12	W11.6	WSW23	
15-Aug	W7	WSW5	SSE7	SSE9	SSE10	SE8	SE9	SE11	SE11	SE11	SE9	SE8	SE8	SE8	SE2	SW3	E6	SSW1	W18	N15	NNW16	NNW14	NNW9	NNW9	SSE1.7	NNW16	
16-Aug	WSW1	NW3	W7	W18	W7	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	WSW7.4	W16	
17-Aug	SSE11	SSE12	SSE11	SSE10	SSE9	SSE10	SSE11	SSE11	SSE5	S5	SSE4	SSW6	W15	W14	W11	WSW6	W18	W18	W18	W18	W18	W18	W18	W18	SSW2.8	W15	
18-Aug	NNW12	N14	N23	N19	N15	N20	N17	N12	N14	N12	N17	NNW12	NW11	NNW12	NNW11	NW9	NW13	NNW13	NNW12	N9	NNW12	NNW13	NNW12	NW8	NNW12.8	N23	
19-Aug	NW10	W18	W14	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	W13	WSW11.2	WSW21	
20-Aug	SSE8	SSE8	SSE9	SE6	SSE6	S7	S7	S7	S4	WSW2	W3	NNE4	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	S2.6	W18	
21-Aug	WSW5	S7	SSE8	SSE10	SE7	SSE9	SSE8	SSE8	SSE6	SE6	SE5	SE9	SSE10	SSE9	SSE9	SSE8	S9	S11	S8	S9	S9	SSE9	S4	SSE8	SSE7.6	S11	
22-Aug	SSE7	SSE9	SSE7	SSE7	S7	S7	S6	SSE9	SSE7	SSE6	SSE7	SSE9	S7	S6	SSE7	SSW4	WSW5	NNE2	NE3	N5	NNE2	ESE2	SW3	SSE4	SSE4.5	SSE9	
23-Aug	S3	N3	N4	NNE4	NNW2	SW1	WSW2	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	NW4	N7.0	N24	
24-Aug	N16	N16	N22	N25	N25	N21	N19	N14	N14	N16	N22	NNE20	N18	N15	NNW12	NW12	NW10	NW9	NW8	NNW5	NNW5	NW5	N4	W5	N13.4	N25	
25-Aug	WSW8	SW4	S4	SSE6	SSE6	SSE7	SSE7	SSE8	SSE8	SE9	SSW10	SSW13	SSW12	SSW13	SSW12	SSW11	SSW7	S8	S11	S13	S11	S10	SSE10	S8.1	SSW13		
26-Aug	SSE11	SSE11	SSE11	SSE11	SSE10	SSE9	SSE8	SSE9	SSE8	S9	S11	SW14	SW15	WSW17	WSW15	W12	W11	W11	N22	NNE22	N21	NNE16	N9	N5	SW2.5	NNE22	
27-Aug	W18	W6	W6	W7	W7	W18	W4	W1	WSW4	SSE4	S5	SE4	SSE6	SSE8	S7	S9	SSW8	SSW8	SSW8	S8	S10	S6	SSE7	SSE7	SSW4.3	S10	
28-Aug	SE5	SSE7	SSE7	S9	SSE9	SSE8	S9	SSE7	SSE5	SSE7	SSE8	SSE8	SSE5	ESE5	SSE6	SSE8	SSE9	SSE9	SSE9	SSE9	SSE9	SSE9	SSE10	SSE12	SSE7.6	SSE12	
29-Aug	SSE9	SSE11	SSE10	SSE10	SSE11	SSE10	SSE9	SSE8	SE7	SE7	SE8	SE9	SE10	SSE8	S10	SSW9	SSW7	S6	SSE7	S8	SSE9	SSE8	SSE8	SSE7	SSE8.2	SSE11	
30-Aug	SSE7	SE8	SSE9	SSE8	SSE10	SSE9	S7	S8	SSE6	SSE6	SSE7	SSE8	S8	S8	SE10	SSE11	SSE14	SSE10	SSE12	SSE13	SE11	SSE13	SSE8	SSE8	SSE9.0	SSE14	
31-Aug	S7	S4	E5	S7	SW4	SSW4	S7	SSW5	SW7	S4	SSE5	SSE5	WSW3	W6	W18	W18	W18	W18	W18	W18	W18	W18	W18	W18	W2.4	N11	

SSW1.7	SSW2.3	S2.2	SSW2.2	SSW2.4	SSW2.2	SSW2.6	SSW3.1	SSW2.3	SSW2.7	SSW2.3	SW2.6	SW3.4	SW3.9	SW3.8	SW3.7	WSW2.6	W2.2	W0.8	E0.6	N0.5	ESE0.5	S0.3	SSE1.1	Diurnal Average
N16	N16	N23	N25	N25	N21	N19	W17	W16	W18	N22	W23	W21	WSW23	WSW22	WSW23	WSW23	WSW20	N22	NNE22	N21	N24	N23	N21	Diurnal Maximum

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



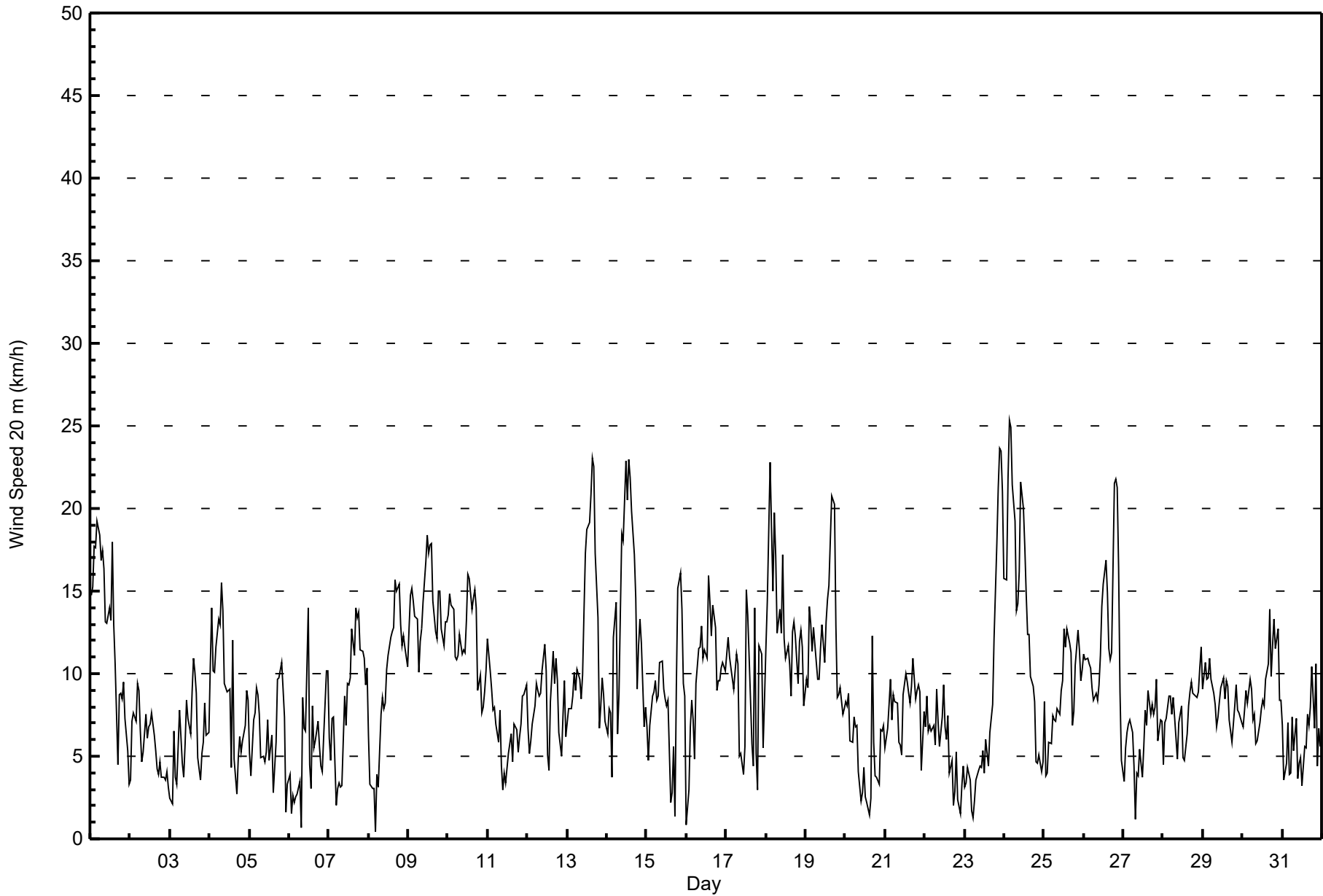
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h

Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0														Hours in Service: 744											
Maximum Value: 9 km/h on Aug 3 18:00														Hours of Data: 744											
Minimum Value: 1 km/h on Aug 25 01:00														Hours of Missing Data: 0											
Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7														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-Aug	4	4	4	4	4	4	4	4	4	3	4	5	4	5	5	8	4	3	3	2	4	2	2	1	8
2-Aug	1	3	1	2	2	2	2	2	2	2	3	2	3	3	3	3	3	2	2	2	1	1	2	1	3
3-Aug	1	2	1	2	2	3	3	3	2	3	3	3	4	5	6	5	5	9	5	2	2	2	2	2	9
4-Aug	2	3	3	3	3	3	3	3	3	3	3	3	4	3	5	5	3	2	2	2	2	2	2	5	5
5-Aug	3	2	1	2	1	2	1	2	2	2	3	3	3	3	2	3	3	3	3	3	2	2	2	1	3
6-Aug	1	1	2	2	1	2	2	2	3	3	7	5	2	4	3	3	2	2	2	2	2	2	2	3	7
7-Aug	3	2	2	2	1	1	2	2	3	2	4	4	4	4	6	5	5	5	5	3	2	2	2	2	6
8-Aug	3	2	2	3	2	2	1	4	3	3	4	4	4	5	5	5	5	5	5	5	4	4	4	3	5
9-Aug	4	5	5	5	4	4	4	4	4	5	6	6	6	6	6	5	4	4	5	5	4	4	4	4	6
10-Aug	5	5	4	4	4	4	4	4	4	4	3	4	4	4	4	5	4	4	3	3	2	2	2	2	5
11-Aug	3	3	2	3	2	2	2	3	2	2	2	2	2	2	3	3	3	3	2	2	1	1	2	2	3
12-Aug	2	2	1	2	2	2	2	2	2	3	3	4	3	6	4	5	3	3	2	2	2	2	2	1	6
13-Aug	1	1	2	2	3	3	4	4	3	4	6	7	7	6	6	6	6	5	4	2	2	2	1	2	7
14-Aug	4	2	2	2	6	6	4	3	3	5	5	5	5	7	6	4	4	4	3	3	2	2	3	1	7
15-Aug	2	2	2	1	2	3	3	3	3	3	5	3	3	3	3	3	2	3	4	5	5	5	4	2	5
16-Aug	2	2	2	3	2	2	2	3	4	4	4	4	4	5	5	5	5	4	3	2	2	2	2	2	5
17-Aug	3	3	3	3	2	2	3	4	2	3	2	4	5	5	3	3	4	6	4	2	6	3	2	3	6
18-Aug	4	5	8	7	5	6	6	5	5	5	6	5	4	4	4	4	5	4	4	3	4	4	4	3	8
19-Aug	4	3	3	2	2	3	3	3	3	3	3	3	4	4	5	6	5	5	3	2	2	2	2	2	6
20-Aug	2	2	2	2	3	2	3	3	2	3	2	2	2	3	3	3	5	3	2	2	3	2	1	1	5
21-Aug	2	2	2	2	3	2	3	3	2	2	2	4	4	5	4	4	5	4	3	2	2	2	2	2	5
22-Aug	2	1	2	2	2	2	2	3	4	3	3	5	4	4	4	3	3	2	2	1	1	1	1	2	5
23-Aug	2	1	1	1	1	2	2	1	2	2	3	2	2	3	2	3	2	2	5	5	6	7	7	7	7
24-Aug	6	7	7	8	7	6	6	6	5	7	7	6	6	5	6	5	4	4	3	2	2	2	1	2	8
25-Aug	1	2	2	2	1	2	3	2	3	3	3	5	6	5	5	5	5	3	2	3	3	3	2	2	6
26-Aug	2	2	2	2	2	2	2	3	4	4	5	7	5	5	4	3	3	3	8	6	7	5	3	3	8
27-Aug	1	1	1	1	1	2	1	1	2	2	3	2	3	4	4	4	4	3	2	2	2	2	1	2	4
28-Aug	2	2	2	1	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	1	1	2	3	3
29-Aug	2	2	2	2	3	3	2	2	3	3	3	4	3	4	4	4	2	2	1	1	2	1	2	2	4
30-Aug	2	2	2	2	2	2	2	2	2	3	3	2	3	3	4	4	4	3	3	4	5	4	3	2	5
31-Aug	3	1	2	2	2	2	2	2	2	3	2	3	2	3	3	3	2	4	4	3	3	3	3	3	4
														6 7 8 8 7 6 6 6 5 7 7 7 7 7 6 8 6 9 8 6 7 7 7 7 7											
Diurnal Maximum																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	157	21.10	21.10
6 - 11	400	53.76	74.87
12 - 19	162	21.77	96.64
20 - 28	25	3.36	100.00
29 - 38	0	0.00	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 20 m (WS20m) - km/h
Mannix - August 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	6	4	9	2	7	13	15	5	10	16	20	13	10	10	157
6 - 11	17	19	5	4	3	6	23	131	47	21	12	29	43	16	13	11	400
12 - 19	21	3	2	0	9	7	28	7	1	5	8	19	30	6	3	13	162
20 - 28	13	2	0	0	0	0	0	0	0	0	0	8	2	0	0	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	59	33	13	8	21	15	58	151	63	31	30	72	95	35	26	34	744

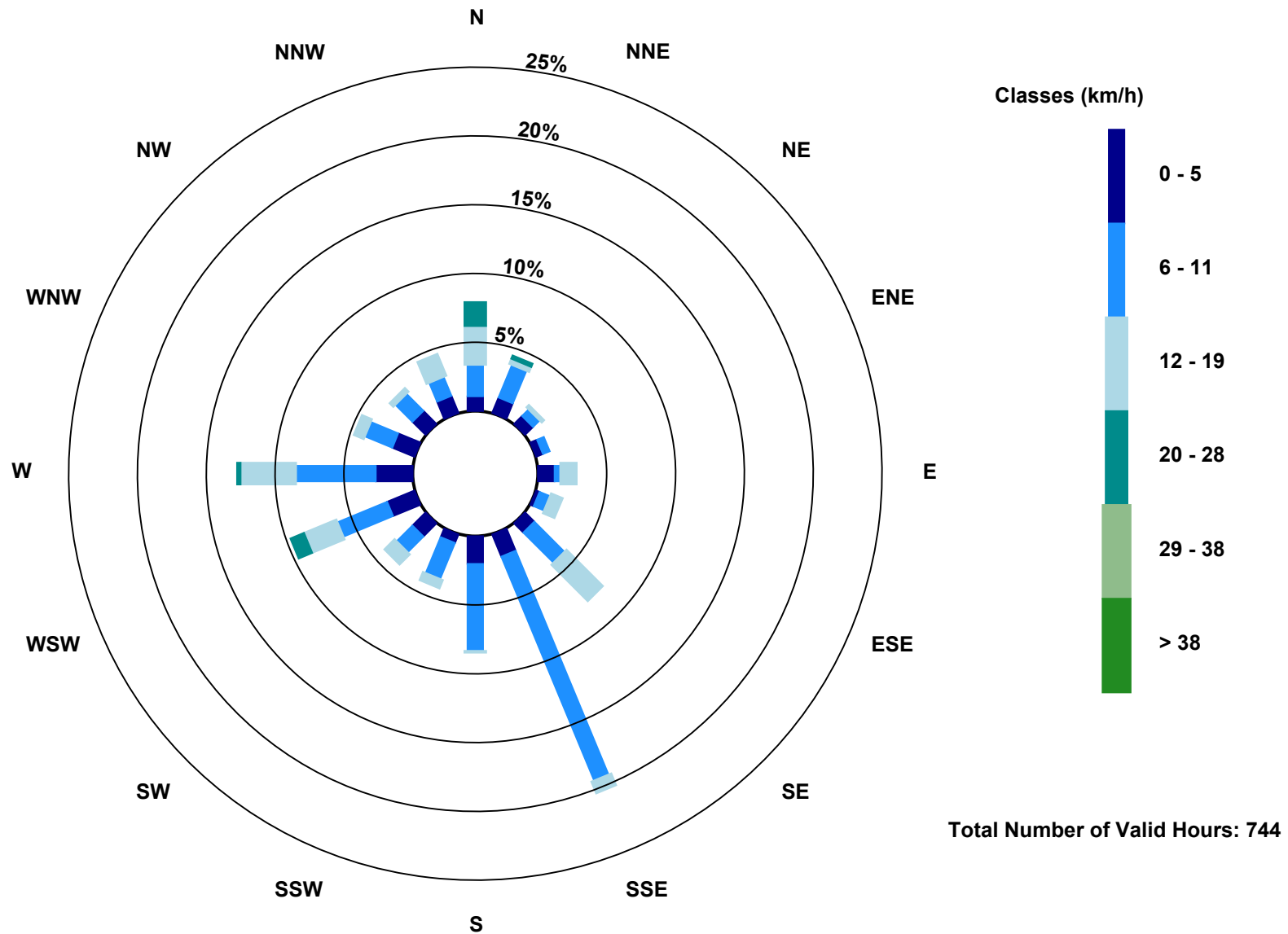
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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

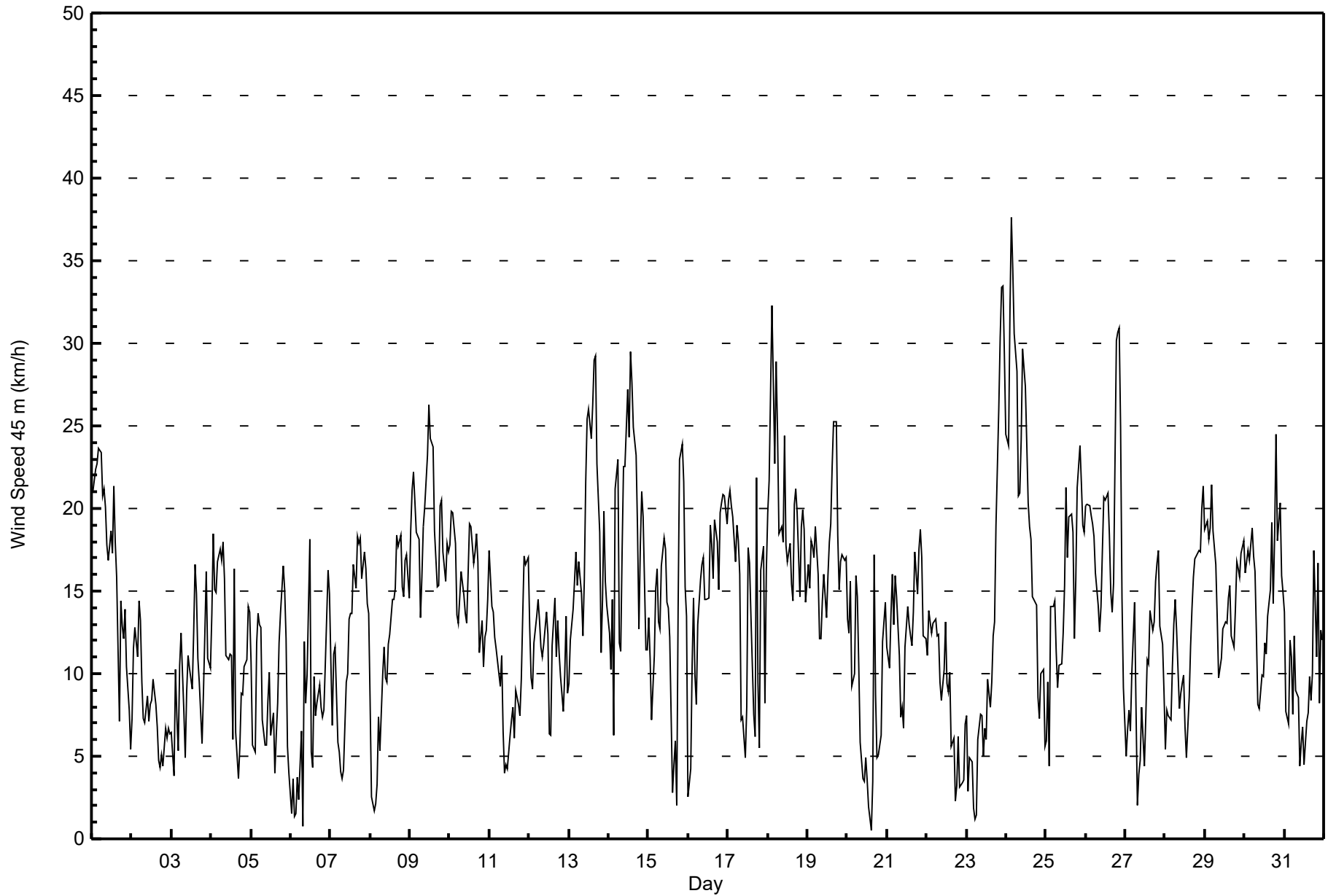




Maximum Speed: 38 km/h on Aug 24 04:00 Minimum Speed Value: 1 km/h on Aug 20 15:00 Maximum Diurnal Speed Average: 5.2 km/h at hour 16 Monthly Average Velocity: 2.8 km/h 206.3 deg		Maximum Daily Speed Average: 20.1 km/h on Aug 24 Minimum Daily Speed Average: 1.2 km/h on Aug 11 Minimum Diurnal Speed Average: 0.2 km/h at hour 21 Percentiles: $P_1 = 2$ $P_{10} = 6$ $Q_1 = 9$ Median = 13 $Q_3 = 17$ $P_{90} = 21$ $P_{99} = 31$		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 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-Aug	WSW21	WSW22	W22	W23	W24	WSW23	W21	W21	WSW20	WSW18	WSW17	WSW19	WSW17	W21	W18	WSW16	SW7	SSW14	SW13	WSW12	W14	N10	N8	NW5	WSW15.1	W24
2-Aug	W7	W12	W13	W11	W14	W13	W9	W11	WSW9	WSW7	WSW8	WSW8	SW10	SW8	WSW7	NE5	ENE4	E5	E4	E7	E6	ENE7	E6	W4.3	W14	
3-Aug	SE6	SE4	S10	SE7	E5	SSE10	SE12	S8	SE5	SSE9	SE11	SE10	S9	SE12	SE17	SE15	NNE11	NW9	SW6	SSE9	SSW12	SSW16	SW11	W10	SSE6.5	SE17
4-Aug	W14	W18	W15	W15	W17	W18	W17	WSW18	W16	W11	W11	W11	W11	W6	SW16	NW6	N4	WSW6	WSW9	WSW9	WSW10	WSW11	W14	W14	W11.7	W18
5-Aug	W11	W11	SW5	WSW12	WSW14	WSW13	WSW13	WSW7	W6	W6	NW8	NW10	W11	W8	W11	N6	N8	NE12	NNE14	NNE15	NE12	ENE6	N4	NW4.3	NNE16	
6-Aug	NNE2	N4	ENE1	NW1	W11	WSW2	SW7	SE1	NNE12	ESE8	NNE10	NE18	NNE5	NNW4	N10	N7	N8	N9	N8	NNW7	NNW8	NNW10	NNE16	NE15	N5.7	NE18
7-Aug	NE11	N7	N11	NNE12	NNE6	N5	NNE4	NNE4	W4	W9	NW10	NNW13	NNW14	N14	N17	N15	NNE18	NNE18	NNE18	NNE16	N17	NNE16	NNE14	ENE14	N10.5	NNE18
8-Aug	E8	SE3	S2	SW2	ESE3	SE7	SE5	SE10	SE12	SE10	E9	ESE12	E12	E15	E14	ESE15	E18	ESE18	ESE18	ESE15	ESE15	SE17	SE17	ESE15	ESE10.7	E18
9-Aug	SE19	SE21	SE22	SE20	SE19	ESE18	ESE13	SE16	SE19	SE20	SE23	SE26	SE24	SE24	SE24	ESE19	ESE15	ESE15	SE20	SE21	ESE17	ESE16	SE18	ESE17	SE19.3	SE26
10-Aug	ESE18	ESE20	SE20	ESE18	ESE14	ESE13	ESE15	SE16	ESE15	ESE14	E13	E16	E19	E19	E17	E17	E18	ENE17	ENE11	NE13	NNE10	NNE12	NNE13	NNE14	E13.0	ESE20
11-Aug	N17	N14	N14	N12	N12	N11	N9	N11	NNW7	N4	W5	W11	W6	W7	WSW8	SW6	SW9	WSW8	SW7	SSE10	SSE13	SSE17	SSE17	SE17	NW1.2	N17
12-Aug	SSE13	S10	SSW9	WSW12	WSW13	WSW15	WSW13	WSW12	WSW11	W12	W14	W12	W6	W6	W12	W15	W11	W13	W11	WSW10	WSW8	WSW10	WSW13	SW9	WSW10.1	WSW15
13-Aug	S9	S12	SSE14	SSE16	SE17	SSE15	SE17	SSE15	SE12	SSE16	S22	SSW25	SW26	SW24	WSW26	WSW29	WSW29	WSW23	WSW19	WSW11	SW15	SW20	WSW16	WSW14	SSW14.6	WSW29
14-Aug	NW12	S10	SSW15	SW6	W21	NNW23	NNW12	W11	W17	W23	W23	W27	WSW24	WSW29	WSW28	WSW25	W23	W19	W13	W18	W21	W20	NNW11	NNW11	W15.9	WSW29
15-Aug	W11	W11	S7	S11	SSE15	SSE16	SE13	SE13	SE17	SSE18	SSE14	SE14	SE14	SE12	SE3	WSW4	E6	SSW2	NNW14	N23	NNW24	NNW22	NNW15	NNW14	S2.4	NNW24
16-Aug	NNW3	NW4	W11	NNW15	NNW10	NW8	W13	NNW16	NNW17	NNW17	NNW14	W14	W15	WSW19	W18	WSW16	SW19	SW18	SSW15	S20	S20	S21	S21	S19	WSW10.5	S21
17-Aug	SSE20	SSE21	SSE20	SSE19	SSE17	SSE19	SE18	SSE16	SSE7	SSE7	SSE5	SSW8	W18	W17	WSW13	WSW8	NNW6	NNW22	NNW9	SSE6	NW16	NNE18	NNW8	NW16	SSW4.6	NNW22
18-Aug	NW20	N22	N32	N28	N23	N29	N25	N18	N19	NNW18	N24	NNW18	NW17	NNW18	NNW15	NW14	NW20	NNW21	NNW20	N15	NNW19	NNW20	NNW19	NW14	NNW19.4	N32
19-Aug	NW17	NNW15	W18	W18	WSW17	W19	WSW16	WSW12	WSW12	WSW14	WSW16	SW13	WSW16	WSW18	WSW19	WSW23	WSW25	WSW25	SW18	SW15	SW17	SSW17	SSW17	SSW17	WSW15.8	WSW25
20-Aug	S13	SSE12	SSE16	SE9	SSE10	S16	S15	S11	S6	WSW4	W3	N5	NNW4	ENE2	SE1	SSE3	W17	NNW9	NE5	NE5	E6	SSE12	SSE13	S14	S5.1	W17
21-Aug	WSW12	SSW10	SSE14	S16	SSE13	SSE16	SSE15	SSE11	SSE7	SE8	SE7	SE12	SE14	SSE13	SSE12	SSE12	S14	S17	SSE15	SSE18	SSE19	SSE17	SSE12	SSE12	SSE12.4	SSE19
22-Aug	SE11	SE14	SE13	SE12	SSE13	SSE13	SSE12	SSE12	SSE9	SSE8	SSE10	SSE13	SSE9	SSE9	SSE10	SSW6	WSW6	N2	NE3	N6	N3	E3	SSE4	SE7	SSE7.2	SE14
23-Aug	SE7	N3	NNW5	NNE5	NNE2	SSW1	WSW1	NW6	NW8	NW7	W5	NNW7	NNW6	NNW10	NW8	NNW9	N12	N13	N19	N26	N30	N33	N34	N29	N10.3	N34
24-Aug	N25	N24	N32	N38	N34	N31	N28	N21	N21	N24	N30	N27	N24	N20	NNW19	NW18	NW15	NW14	NW14	NNW9	NNW7	NNW10	N10	N6	N20.1	N38
25-Aug	W6	WSW9	S4	SSE14	SSE14	SSE14	SSE11	SSE9	SE11	SE11	SE12	S15	S21	S17	S20	S20	SSW19	SSW12	S16	S21	S24	S22	S19	SSE19	S13.9	S24
26-Aug	SSE20	SSE20	SSE20	SSE20	SSE19	SSE18	SSE16	SSE14	SSE13	S14	S17	SSW21	SW21	WSW21	WSW18	W15	W14	W15	N30	N31	N31	N25	N15	N9	SSW4.6	N31
27-Aug	NNW5	W7	W8	NW7	NNW10	NNW14	NNW8	NW2	WSW4	SSE5	S8	SE4	SSE7	SSE11	SSE11	S14	S13	SSW13	SSW16	S17	S17	S13	S12	SSE9	SSW6.3	S17
28-Aug	SE5	SSE8	S7	SSW7	S10	SSE13	S15	SSE13	SSE8	SSE9	SSE9	SSE10	SSE7	ESE5	SE9	SE12	SE14	SE16	SSE17	SSE17	SSE17	SSE17	SSE20	SSE21	SSE11.6	SSE21
29-Aug	SSE19	SSE19	SSE18	SSE19	SSE21	SSE19	SSE17	SSE13	SSE10	SE10	SE11	SE13	SE13	SSE13	S15	SSW15	SSW12	S12	SSE14	SSE17	SSE16	SSE16	SSE17	SSE18	SSE14.8	SSE21
30-Aug	SSE16	SSE17	SE17	SSE17	SSE19	SSE17	SSE16	SSE12	SSE8	SSE8	SSE10	SSE10	SSE12	SSE11	SE13	SSE15	SE19	SSE14	SSE18	SSE24	SE18	SE20	SSE16	SE15	SSE15.0	SSE24
31-Aug	SSE14	SSE8	E7	SSE12	SSW11	WSW8	S12	SSW9	SW9	SSE4	SE6	SSE7	WSW5	W7	NNW8	NNW10	W8	NNW10	NNW17	NNW11	N17	NW8	NW13	NW12	W3.3	NNW17
S2.4 S3.5 S3.3 S3.1 SSW3.7 S3.5 S4.2 SSW4.1 SSW2.9 SSW3.6 SSW3.1 SSW3.6 SW4.5 SW4.9 SW5.0 SW5.2 WSW3.0 WSW3.2 WSW1.6 SSE1.1 W0.2 SSE1.2 SSE1.2 SSE1.7																								Diurnal Average		
N25 N24 N32 N38 N34 N31 N28 W21 N21 N24 N30 N27 SW26 WSW29 WSW28 WSW29 WSW29 WSW25 N30 N31 N31 N33 N34 N29																								Diurnal Maximum		
All monthly, daily, and diurnal averages have been calculated using vector methods																										



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 13 km/h on Aug 3 18:00 Minimum Value: 1 km/h on Aug 6 01:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 7																	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-Aug	3	3	3	4	3	4	3	4	3	3	3	4	4	4	4	10	6	3	2	3	4	3	2	2	10
2-Aug	1	4	2	2	1	2	2	2	2	3	3	2	2	3	3	3	3	2	2	2	2	1	1	2	4
3-Aug	2	3	2	3	2	4	4	4	2	3	2	3	4	7	8	4	5	13	5	3	2	3	2	13	
4-Aug	1	3	2	2	3	2	2	3	3	3	3	3	4	3	5	5	3	2	2	1	2	2	3	7	
5-Aug	4	2	1	2	1	2	2	3	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	4	
6-Aug	1	1	1	1	2	1	1	3	3	3	10	4	3	4	3	3	2	2	2	1	2	2	2	10	
7-Aug	3	3	1	1	2	1	3	2	3	2	3	4	4	4	6	5	4	5	4	3	2	2	2	6	
8-Aug	3	1	2	2	3	2	2	4	3	3	4	4	4	5	5	5	6	5	5	5	4	4	3	6	
9-Aug	5	5	5	4	4	4	4	4	4	5	5	6	6	6	6	6	5	5	6	5	5	4	4	6	
10-Aug	5	5	4	4	4	4	4	4	4	4	3	4	5	4	5	5	4	4	3	3	2	2	2	5	
11-Aug	3	2	2	2	2	2	2	3	2	2	2	2	2	2	3	3	3	4	2	3	1	1	2	4	
12-Aug	3	1	1	2	2	2	2	2	1	3	3	4	3	7	4	5	2	2	1	3	2	2	1	7	
13-Aug	1	2	2	2	3	2	3	3	2	4	4	6	5	5	6	6	6	5	4	2	3	2	1	6	
14-Aug	7	4	3	2	6	6	6	4	3	4	6	4	4	8	5	4	4	4	2	4	1	1	3	8	
15-Aug	4	3	2	1	2	2	2	3	3	4	3	2	3	3	3	3	2	5	6	5	4	5	4	6	
16-Aug	3	1	2	2	1	2	2	2	3	3	3	3	4	4	4	4	5	4	2	2	2	2	1	5	
17-Aug	2	1	2	4	2	2	2	3	2	2	3	4	4	4	3	3	7	7	6	4	8	4	2	8	
18-Aug	3	4	7	7	5	7	7	4	5	4	5	4	4	3	4	4	5	6	4	3	4	3	3	7	
19-Aug	3	3	2	2	2	2	3	3	2	3	3	3	4	4	5	5	4	5	3	2	2	1	2	5	
20-Aug	1	3	2	4	4	2	2	2	3	3	2	2	2	3	3	3	5	2	2	2	3	5	2	5	
21-Aug	2	1	3	2	5	2	2	3	1	2	2	4	4	5	3	5	4	3	2	1	1	2	3	5	
22-Aug	1	1	2	1	1	1	2	3	3	2	3	4	4	4	4	3	3	2	2	1	1	1	1	4	
23-Aug	3	2	2	1	2	2	2	2	2	2	3	2	3	2	2	3	2	2	5	4	5	5	6	6	
24-Aug	6	7	7	6	5	5	5	6	4	7	6	5	6	5	4	4	4	3	2	4	3	2	1	7	
25-Aug	1	1	3	1	1	2	3	2	2	2	3	6	4	4	4	4	4	3	2	3	2	3	2	6	
26-Aug	1	1	2	1	1	1	2	2	3	3	4	5	4	5	5	3	3	2	8	5	6	5	4	8	
27-Aug	1	2	2	1	2	2	1	2	2	3	3	2	3	3	4	4	3	2	3	1	1	2	2	4	
28-Aug	2	1	1	1	2	2	2	2	2	1	1	2	2	2	2	2	1	2	3	2	1	1	2	3	
29-Aug	1	1	2	2	2	3	2	2	2	2	2	2	2	3	3	3	2	2	1	1	1	2	3	3	
30-Aug	1	3	3	2	1	2	2	2	2	3	3	2	3	3	3	3	4	2	3	4	6	6	5	6	
31-Aug	3	2	2	4	4	3	2	2	2	3	2	3	3	3	3	3	2	5	3	4	4	3	4	5	
Diurnal Maximum																									





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	70	9.41	9.41
6 - 11	212	28.49	37.90
12 - 19	351	47.18	85.08
20 - 28	94	12.63	97.72
29 - 38	17	2.28	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 45 m (WS45m) - km/h
Mannix - August 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	7	4	3	4	2	8	6	2	2	1	7	4	4	4	4	70
6 - 11	17	4	1	3	8	1	19	36	13	7	12	23	27	16	13	12	212
12 - 19	17	16	5	3	10	23	36	86	23	15	9	37	33	12	13	13	351
20 - 28	17	0	0	0	0	1	13	11	11	2	4	13	13	0	2	7	94
29 - 38	14	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	17
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	73	27	10	9	22	27	76	139	49	26	26	83	77	32	32	36	744

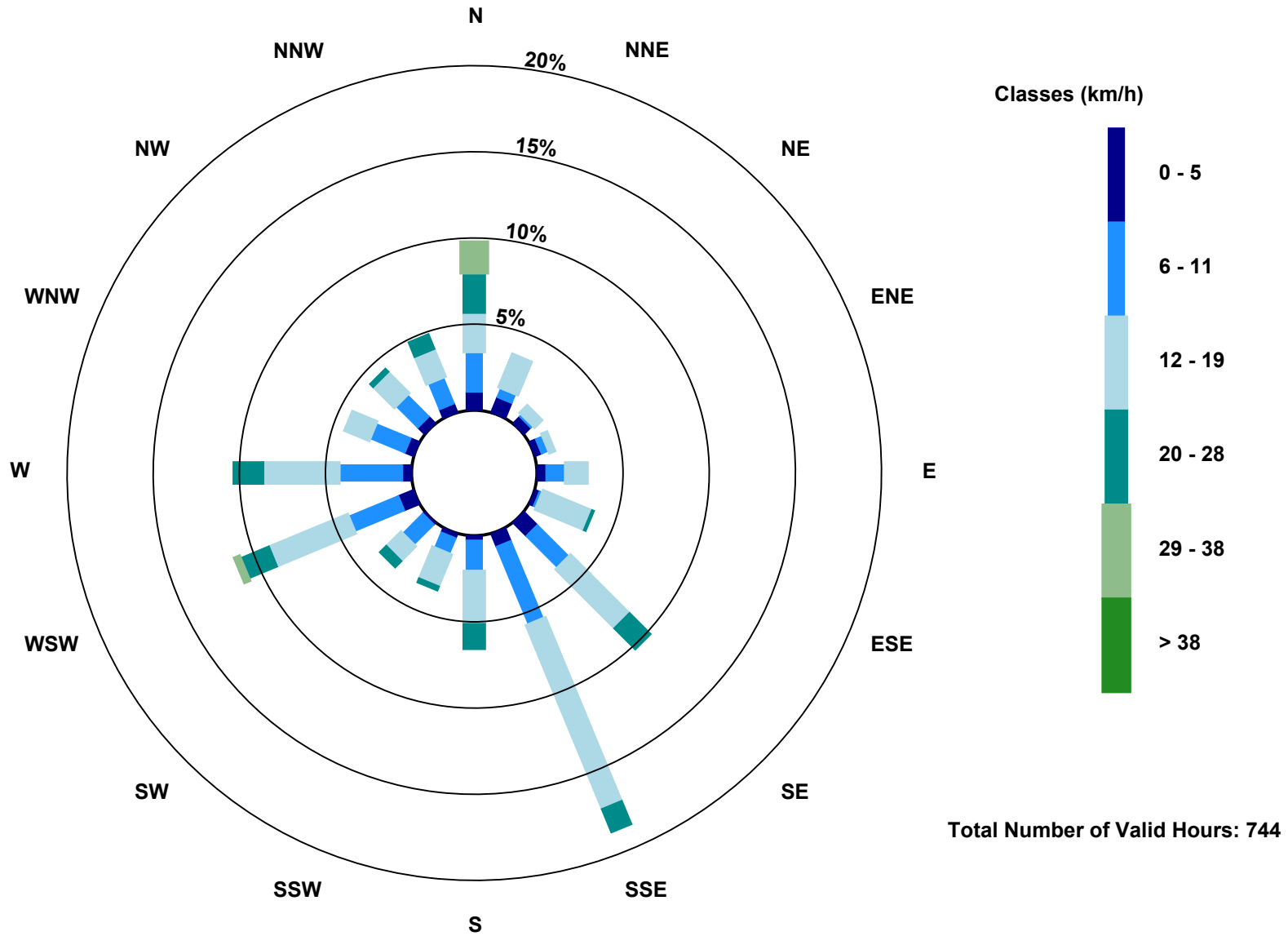
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Maximum Speed: 42 km/h on Aug 24 04:00	Maximum Daily Speed Average: 22.9 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 20 15:00	Minimum Daily Speed Average: 0.7 km/h on Aug 11	Hours of Data: 744
Maximum Diurnal Speed Average: 5.7 km/h at hour 16	Minimum Diurnal Speed Average: 0.6 km/h at hour 22	Hours of Missing Data: 0
Monthly Average Velocity: 3.2 km/h 220.4 deg	Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 10 Median = 15 Q ₃ = 20 P ₉₀ = 25 P ₉₉ = 35	Percent Operational Time: 100.0

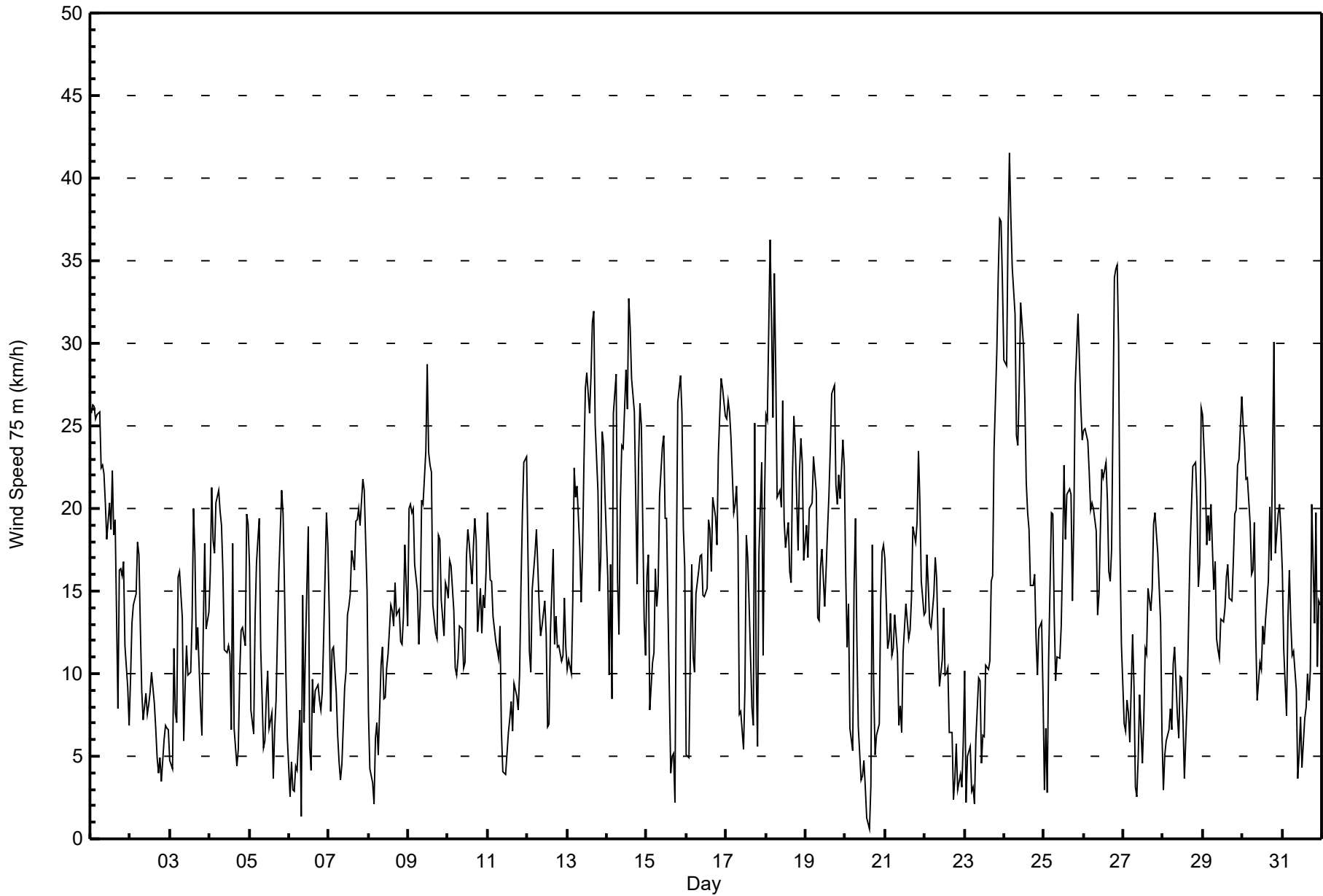
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1-Aug	WSW26	WSW26	W26	W25	W26	W26	W22	W23	W22	WSW20	WSW18	WSW20	WSW19	W22	W21	W18	W19	WSW8	SW16	SW16	W16	W21	NNE12	N9	NW7	W17.0	WSW26
2-Aug	WNW10	W13	WNW14	WNW15	WNW18	WNW17	WNW13	WNW9	W7	WSW9	WSW8	WSW8	WSW9	SW10	WSW8	WSW7	NE5	ENE4	E5	E3	E6	E7	E7	E7	W5.1	WNW18	
3-Aug	SE5	ESE4	SSE12	SE8	E7	SSE16	SE16	S13	SE6	SSE9	SSE12	SE10	S10	SE13	SE20	SSE17	NNE11	NW13	WSW8	SSE6	SSW13	SSW18	SW13	W14	SSE7.3	SE20	
4-Aug	W16	W21	WNW18	WNW17	WNW20	W21	W20	W19	W16	W11	W11	W12	W11	W7	SW18	NW7	N4	WSW5	WSW10	WSW13	WSW13	W12	W20	W19	W13.5	W21	
5-Aug	WNW16	NW8	W6	W13	W17	W18	W19	WSW12	W6	W6	NW9	NW10	WNW7	W8	WNW4	N7	N8	NE12	NNE16	NNE21	NE20	ENE15	ENE10	NNE6	NW5.8	NNE21	
6-Aug	NNE3	NNE5	N3	NW3	NW4	WNW4	WSW8	SSE1	NNE15	ESE7	NNE12	NE19	NE6	NNW4	NNE10	N8	N9	N9	N8	NNW8	NNW9	NNW12	NNE20	NE18	NNE6.6	NNE20	
7-Aug	ENE14	NNE8	NNE11	NE12	NNE9	N6	NE5	NNE4	WNW4	WNW9	NW10	NNW14	NNW14	N15	N17	N16	NNE19	NNE19	NNE20	NNE19	NNE22	NNE21	NE18	ENE15	NNE11.7	NNE22	
8-Aug	E8	SE4	ESE3	SE2	ESE6	SE7	SE5	SE11	SE12	SE8	ESE9	ESE10	E11	E14	E14	ESE13	ESE15	ESE14	ESE14	ESE12	ESE12	SE13	SE18	SE13	ESE10.0	SE18	
9-Aug	SE20	SE20	SE20	SE20	SE17	SE15	SE12	SE14	SE21	SE20	SE23	SE29	SE23	SE23	SE22	ESE14	ESE12	ESE12	SE18	SE18	SE14	ESE12	SE16	SE15	SE17.9	SE29	
10-Aug	SE15	SE17	SE17	SE14	ESE10	ESE10	ESE11	SE13	SE13	ESE10	ESE11	E17	E19	E18	E15	E18	E19	ENE18	ENE13	NE15	NE12	NNE15	NE14	NNE16	E12.3	E19	
11-Aug	N20	NNE16	NNE16	N13	N13	N12	N11	N13	NNW6	N4	W4	WNW4	W6	W7	WSW8	SW7	SW9	WSW9	SW8	SSE10	SSE15	SSE20	SSE23	SSE23	N0.7	SSE23	
12-Aug	SSE17	SW11	SW10	WSW15	WSW17	WSW19	WSW17	W14	W12	W13	W14	W12	W7	W7	W12	W18	W12	W13	W12	WSW12	WSW11	WSW11	W15	WSW12	WSW12.0	WSW19	
13-Aug	SW10	S11	S10	SSE15	SSE22	SSE21	SSE21	SSE18	SSE14	S18	S23	SSW27	SW28	SW26	WSW28	WSW31	WSW32	WSW25	WSW21	WSW15	SW17	WSW25	WSW24	WSW21	SW17.3	WSW32	
14-Aug	NW16	S10	SW17	WSW8	WNW26	N28	N16	W12	W24	W24	W24	W28	W26	WSW33	WSW31	WSW28	W26	W21	W15	W23	WNW26	W25	NW13	WNW11	W18.2	WSW33	
15-Aug	WNW16	W17	SW8	SSW11	SSW11	SSE16	SSE14	SSE15	SSE21	SSE24	SSE24	SSE19	SSE14	S4	WSW5	E5	SSW2	WNW16	N26	NNW28	NNW26	NNW19	NNW16	SSW3.0	NNW28		
16-Aug	NNW5	NNW5	WNW11	NW17	WNW11	NNW10	WNW15	WNW16	WNW17	WNW17	WNW15	W15	W15	W19	W19	WSW16	SW21	SW19	SSW18	SSW23	SSW26	SSW28	S27	S26	WSW11.8	SSW28	
17-Aug	S25	S27	S26	S24	SSE20	SSE20	SSE21	SSE18	S8	S8	S5	SSW9	W18	W17	WSW14	WSW8	WNW7	NNW25	NNW10	SE6	NW17	NNE23	N11	NW21	SSW5.7	S27	
18-Aug	NNW26	N25	N36	N31	N26	N34	N28	N21	N21	N20	N27	NNW19	NW18	NNW19	NNW16	NW16	NW22	NNW26	NNW24	N17	NNW22	NNW24	NNW23	NNW17	N22.4	N36	
19-Aug	NW19	WNW17	W20	W20	W20	W23	WSW21	WSW13	WSW13	WSW16	WSW18	WSW14	WSW16	WSW19	WSW21	WSW24	WSW27	WSW27	SW21	SW20	SW22	SSW21	SW24	SW23	WSW18.3	WSW27	
20-Aug	SSW16	SSW12	S14	SSE7	SSE5	S15	SSW19	S12	S7	WSW4	W4	N5	WNW3	ENE1	SSE1	S3	W18	WNW9	NE5	NE6	E7	SSE14	S17	SSW18	SSW5.8	SSW19	
21-Aug	WSW17	SSW12	S12	S14	S11	S11	SSE14	SSE11	SSE7	SSE8	SE6	SE11	SE14	SSE13	SSE12	SSE13	S15	S19	SSE18	SSE19	SSE23	S20	SSE16	SSE14	SSE12.8	SSE23	
22-Aug	SE14	SE17	SE15	SE13	SE13	SE15	SSE17	SSE16	SSE12	SSE9	S11	SSE14	SSE10	SSE10	SSE10	SSW6	WSW6	NNE2	NE4	N6	N3	E4	SE3	SE6	SSE8.2	SE17	
23-Aug	SE10	ENE2	NNW5	NNE6	E3	SSE3	SE2	NNW6	NW10	NW10	W5	NW6	NNW6	NW11	NNW10	NNW11	N16	N16	N24	N30	N34	N38	N37	N34	N11.8	N38	
24-Aug	N29	N29	N37	N42	N38	N35	N32	N24	N24	N27	N32	N30	N27	N22	NNW20	NW19	NW15	NW15	NNW12	NNW10	N13	NNE13	N9	N22.9	N42		
25-Aug	W3	WSW7	SSW3	SE11	SSE20	SSE20	SSE14	SSE10	SSE11	SSE11	SSE13	SSW17	SSW23	SSW18	S21	SSW21	SSW21	SSW14	S19	S27	S32	S29	S26	S24	S16.2	S32	
26-Aug	S25	S25	S24	S22	S20	S20	S20	S19	S14	S15	S19	SSW22	SW22	WSW23	WSW20	W16	W16	W18	N34	NNE34	N35	N30	N18	N12	SW6.3	N35	
27-Aug	N7	WNW6	NW8	N8	NW6	NW12	NW9	NNW3	W3	SSE5	S9	SSE5	SSE7	S12	S11	S15	S14	SSW15	SSW19	SSW20	SSW18	SSW17	SSW13	S6	SSW6.3	SSW20	
28-Aug	SSW3	SSW5	SW6	SW7	SW8	S7	SSW11	SSW12	S7	SSE6	SSE10	SSE10	SSE7	SE4	SSE8	SE13	SE17	SSE20	SSE23	SSE23	S20	S15	S17	S26	S11.0	S26	
29-Aug	S26	S22	S18	S20	S18	S20	S15	SSE17	SSE12	SSE11	SE11	SE13	SE13	SSE14	S16	SSW17	SSW15	S14	S17	S20	SSE20	SSE23	SSE23	SSE27	S17.0	SSE27	
30-Aug	SSE25	SSE24	SSE22	SSE22	SSE19	SE16	SE16	SE19	SE12	SSE8	SSE11	SE10	SSE13	SSE12	SE13	SSE16	SSE20	SSE17	SSE23	SSE30	SE17	SE20	SSE20	SE19	SSE17.5	SSE30	
31-Aug	SE16	SSE11	ESE7	SSE13	SSW16	WSW13	S11	SSW11	SW9	S4	SSE5	S7	WSW4	W7	WNW8	WNW10	W8	NW10	NNW20	NNW13	N20	NW10	NW14	NW14	W3.5	NNW20	

SSW3.0	SSW3.8	SSW2.9	SW2.8	SW3.8	SW3.5	SSW4.3	SSW4.8	SSW3.3	SSW4.0	SSW3.5	SSW4.0	SW5.0	SW5.4	SW5.5	SW5.7	WSW4.1	W3.8	WSW2.2	SSW0.9	NNW1.3	SSW0.6	S1.3	SSW2.0	Diurnal Average
N29	N29	N37	N42	N38	N35	N32	N24	N24	N27	N32	N30	SW28	WSW33	WSW31	WSW31	WSW32	WSW27	N34	NNE34	N35	N38	N37	N34	Diurnal Maximum

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: 15 km/h on Aug 3 18:00														Hours of Data: 744											
Minimum Value: 1 km/h on Aug 5 05:00														Hours of Missing Data: 0											
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8														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-Aug	3	3	3	4	3	4	3	4	3	3	3	4	4	4	4	9	5	5	2	2	5	3	3	3	9
2-Aug	2	2	2	1	2	2	2	2	2	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	3
3-Aug	2	2	2	4	2	4	6	3	3	3	2	3	4	7	8	4	5	15	5	3	4	3	2	2	15
4-Aug	1	3	2	2	3	2	2	2	2	2	3	3	4	3	5	5	4	2	3	1	2	1	3	7	7
5-Aug	4	2	1	2	1	2	1	5	2	2	3	3	3	3	3	3	3	3	3	1	2	2	2	1	5
6-Aug	1	1	1	1	1	1	2	3	4	3	12	3	3	4	3	3	2	2	2	2	2	3	2	3	12
7-Aug	4	3	1	1	2	1	3	2	3	2	3	4	4	4	5	5	5	4	4	3	1	1	3	2	5
8-Aug	3	2	2	1	4	3	2	4	3	3	4	4	4	5	6	6	6	4	5	4	5	6	5	5	6
9-Aug	6	7	6	6	6	5	6	6	6	6	7	7	9	8	8	6	4	5	7	7	6	5	6	6	9
10-Aug	6	7	6	6	4	4	4	5	5	4	4	4	5	5	5	5	5	4	3	3	2	2	2	1	7
11-Aug	3	2	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	3	2	2	1	2	3
12-Aug	3	1	1	2	2	2	2	2	2	2	2	4	3	8	4	5	2	2	1	2	2	2	1	2	8
13-Aug	1	2	1	2	3	2	3	4	2	4	4	6	5	5	5	6	5	5	3	2	3	2	1	3	6
14-Aug	8	4	4	3	6	6	7	5	3	4	6	4	4	9	4	4	4	3	2	5	2	2	5	3	9
15-Aug	3	3	2	1	2	3	2	2	2	4	3	3	3	3	3	3	2	5	7	5	4	5	4	3	7
16-Aug	5	1	3	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	2	2	4	2	2	2	5
17-Aug	2	2	2	4	1	1	1	4	3	3	4	4	4	4	3	4	7	8	7	4	10	4	3	5	10
18-Aug	4	4	6	7	5	7	7	4	5	4	5	4	3	3	4	4	6	7	4	3	4	3	3	4	7
19-Aug	3	2	2	2	2	2	3	3	3	3	3	2	4	4	5	5	4	4	2	1	2	1	2	2	5
20-Aug	3	2	2	4	3	3	2	3	3	3	2	3	3	3	3	4	5	3	2	2	2	6	2	1	6
21-Aug	2	3	2	2	4	2	2	3	2	2	2	4	4	5	4	5	4	2	2	2	1	2	1	3	5
22-Aug	2	1	3	3	3	3	1	3	3	2	3	4	3	4	4	3	3	2	2	1	1	1	1	4	4
23-Aug	3	1	2	1	2	2	2	3	3	2	3	2	3	1	2	3	2	2	6	3	4	4	4	5	6
24-Aug	5	7	6	4	5	4	5	5	4	7	5	5	6	5	4	4	3	3	3	4	3	2	1	4	7
25-Aug	1	1	2	3	2	2	4	2	2	2	3	6	4	4	4	4	4	3	2	3	2	2	2	1	6
26-Aug	1	1	1	1	1	1	1	2	3	3	4	5	4	5	5	4	4	3	7	5	5	5	4	4	7
27-Aug	1	1	2	2	2	1	3	2	1	3	2	2	3	4	4	4	3	2	2	2	2	2	3	2	4
28-Aug	2	2	1	1	2	1	2	2	1	1	1	2	2	2	2	2	1	1	2	1	1	2	3	2	3
29-Aug	1	1	2	2	2	1	3	1	2	1	2	2	2	3	3	3	2	2	2	1	2	1	2	1	3
30-Aug	1	1	2	2	2	2	4	3	3	3	2	2	3	3	4	3	4	3	4	3	8	10	6	4	10
31-Aug	3	2	3	4	4	3	2	1	2	3	2	3	3	2	3	3	2	7	4	5	4	3	4	3	7
														Diurnal Maximum											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	66	8.87	8.87
6 - 11	185	24.87	33.74
12 - 19	295	39.65	73.39
20 - 28	169	22.72	96.10
29 - 38	28	3.76	99.87
> 38	1	0.13	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed 75 m (WS75m) - km/h
Mannix - August 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	4	4	3	5	2	7	7	4	4	0	4	5	5	2	5	66
6 - 11	13	8	2	1	8	10	14	24	16	7	12	18	15	12	14	11	185
12 - 19	14	12	8	5	8	10	39	41	26	20	7	23	38	19	14	11	295
20 - 28	17	6	1	0	0	0	12	30	25	10	9	18	25	3	2	11	169
29 - 38	19	1	0	0	0	0	1	1	2	0	0	4	0	0	0	0	28
> 38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	69	31	15	9	21	22	73	103	73	41	28	67	83	39	32	38	744

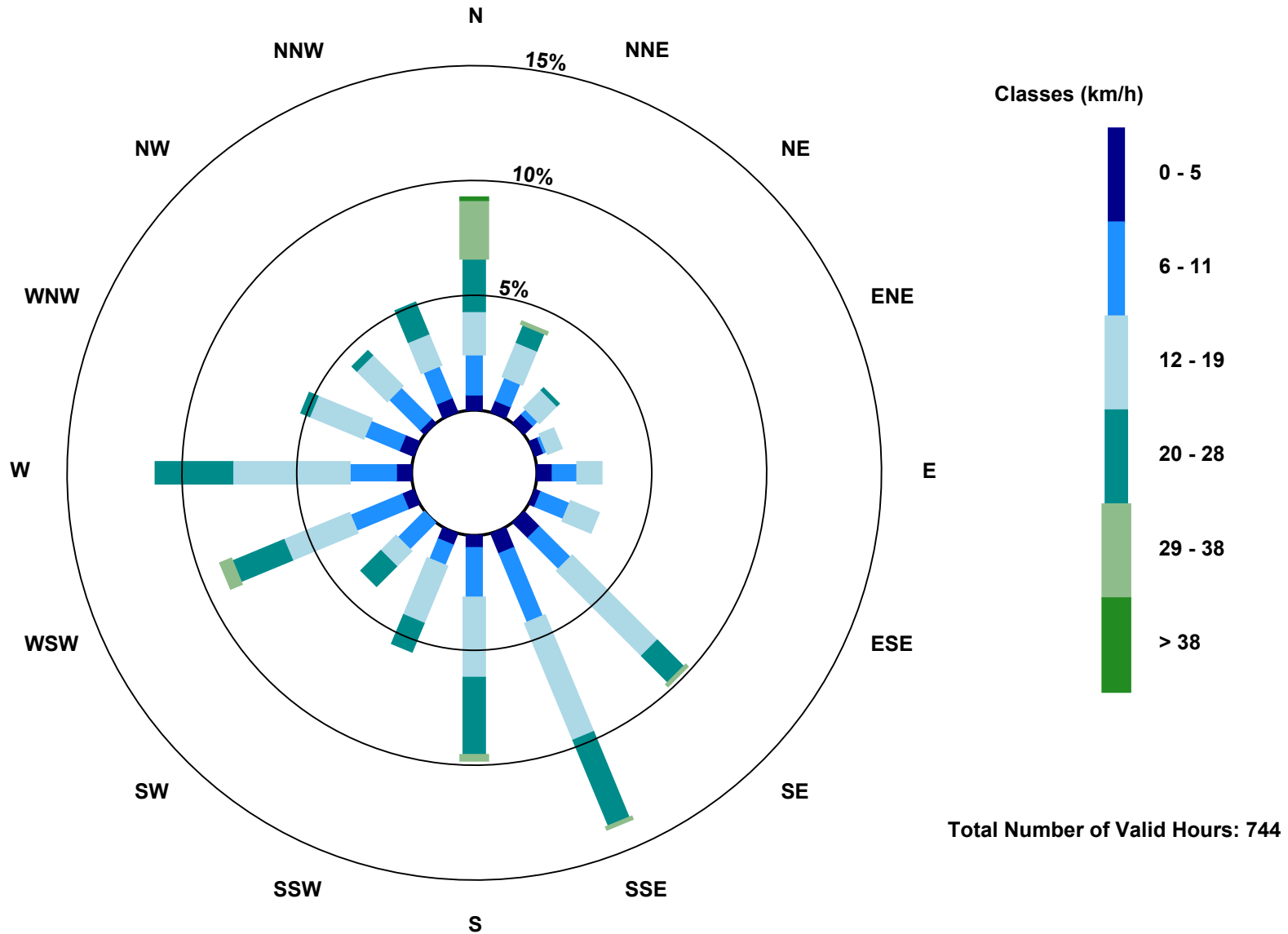
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Maximum Speed: 42 km/h on Aug 24 04:00	Maximum Daily Speed Average: 23.9 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 20 15:00	Minimum Daily Speed Average: 0.9 km/h on Aug 11	Hours of Data: 744
Maximum Diurnal Speed Average: 5.6 km/h at hour 16	Minimum Diurnal Speed Average: 0.6 km/h at hour 22	Hours of Missing Data: 0
Monthly Average Velocity: 3.2 km/h 229.8 deg	Percentiles: P ₁ = 3 P ₁₀ = 6 Q ₁ = 10 Median = 15 Q ₃ = 21 P ₉₀ = 26 P ₉₉ = 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-Aug	WSW28	WSW28	W28	W26	W27	W27	W23	W23	W23	WSW21	WSW19	WSW21	WSW19	W22	W20	W8	SW15	SW18	W18	W19	NNE12	N10	NW7	W17.7	WSW28	
2-Aug	NW10	WNW12	WNW14	WNW16	WNW19	WNW19	WNW15	WNW10	WNW7	WSW9	WSW7	WSW8	WSW9	SW10	WSW8	WSW7	NE5	ENE4	ENE5	E4	E8	E8	E8	WNW5.1	WNW19	
3-Aug	ESE6	ESE5	SSE10	SE9	E8	SE17	SE17	S15	SE8	SSE9	SSE12	SE10	S10	SE13	SE21	SSE18	NNE12	WNW14	WSW9	SSE4	SSW12	SSW18	SW13	SSE7.4	SE21	
4-Aug	W17	WNW23	WNW19	WNW18	WNW22	WNW23	W21	W19	W16	W12	W11	W12	W11	W7	SW19	NW7	N5	WSW5	WSW10	WSW14	W13	W12	W22	W14.3	WNW23	
5-Aug	WNW19	NW10	WNW8	W16	W17	W18	W18	W20	W14	W6	W6	NW9	WNW10	WNW7	W7	WNW4	N7	N9	NE13	NNE17	NNE22	NE21	NE17	NNW7.0	NNE22	
6-Aug	NNE3	N5	N4	NW4	NW4	WNW4	W8	WSW1	NNE16	ESE9	NNE12	NE19	NE6	NNW4	N10	N8	N9	N10	N9	NNW8	NNW9	N13	NNE21	N7.1	NNE21	
7-Aug	ENE15	NNE8	NE11	NE11	NNE10	N7	NE6	NNE4	WNW5	WNW9	NW10	NNW14	NNW14	N15	N18	N17	NNE19	NNE20	NNE21	NNE20	NNE22	NNE22	NE19	NNE12.1	NNE22	
8-Aug	E10	ESE6	ESE5	ESE3	ESE8	SE9	ESE6	SE10	SE11	SE9	ESE10	ESE12	E12	E15	E15	ESE16	ESE20	ESE19	ESE20	ESE17	ESE16	ESE17	SE19	ESE12.3	ESE20	
9-Aug	SE22	SE23	SE22	SE22	SE19	SE18	SE15	SE16	SE22	SE22	SE25	SE29	SE26	SE25	SE25	ESE20	ESE19	ESE17	SE22	SE22	ESE19	ESE18	SE19	SE21.0	SE29	
10-Aug	ESE20	ESE21	SE19	ESE19	ESE16	ESE15	ESE15	ESE16	ESE16	ESE15	ESE14	E18	E21	E21	E19	E20	E21	ENE19	ENE13	NE16	NE13	NNE15	NE14	E14.9	ESE21	
11-Aug	N20	NNE16	N16	N14	N13	N12	N12	N14	NNW7	N4	W4	WNW4	W6	W7	WSW8	SW7	SW9	WSW9	SW8	SSE9	SSE15	SSE19	SSE24	NNW0.9	SSE24	
12-Aug	S17	SW12	WSW11	WSW16	WSW19	WSW20	WSW18	W15	W13	W14	W14	W12	WNW7	W7	W13	W19	W12	W14	W12	WSW12	WSW12	W11	W14	WSW12.7	WSW20	
13-Aug	SW11	SSW11	SSW9	S12	SSE21	S20	SSE21	SSE18	SSE15	S17	SSW22	SW28	SW29	SW26	WSW28	WSW32	WSW32	WSW26	WSW22	WSW16	WSW18	WSW26	WSW27	SW18.2	WSW32	
14-Aug	NW18	S10	SW18	WSW10	WNW28	NNW31	N17	W13	W22	W24	W24	W29	W26	WSW34	WSW32	WSW29	W27	W21	W17	W25	WNW28	W27	WNW14	W19.4	WSW34	
15-Aug	WNW17	W21	WSW10	SW11	SSW11	S13	SSE11	SSE16	SSE22	SSE26	SSE26	SSE20	SSE21	SSE14	S4	WSW5	E5	SSW2	WNW17	N27	NNW30	NNW28	NNW20	SW3.4	NNW30	
16-Aug	NNW7	NNW6	WNW11	NW17	NW12	NNW11	WNW16	WNW17	WNW18	WNW17	WNW15	W15	W15	W19	W19	WSW16	SW21	SW20	SSW18	SSW24	SSW27	SSW30	SSW29	WSW12.5	SSW30	
17-Aug	S27	S29	S28	S25	S19	SSE19	SSE20	S18	S7	S7	S5	SSW9	W19	W17	WSW14	WSW8	WNW7	NNW26	NNW12	ESE5	NW18	NNE25	NNE13	SW6.1	S29	
18-Aug	NNW29	N27	N37	N32	N26	N36	N29	N21	N22	NNW21	N27	NNW20	NW18	NNW20	NNW17	NW16	NW23	NNW27	NNW26	N19	NNW24	NNW26	NNW25	NNW23.6	N37	
19-Aug	NW20	WNW18	W21	W21	W22	W25	W23	WSW14	WSW14	WSW17	WSW18	WSW14	WSW16	WSW19	WSW21	WSW24	WSW27	WSW28	SW23	SW22	SW24	SW22	SW27	WSW19.3	WSW28	
20-Aug	SSW17	SSW12	SSW12	S5	S3	SSW14	SSW19	S13	SSW7	WSW4	W4	N5	WNW3	ENE1	SW0	S3	W18	WNW10	NNE5	NE7	E8	SSE15	S19	SSW5.7	SSW19	
21-Aug	WSW19	SW12	S11	SSW13	S9	S9	SSE10	S9	SSE6	SSE8	SE7	SE12	SE14	SSE13	SSE12	SSE12	S14	S19	SSE18	SSE19	SSE24	S21	SSE16	S12.2	SSE24	
22-Aug	SE15	SE18	SE16	SE15	SE15	SE16	SSE19	SSE19	SSE14	SSE10	S11	SSE14	SSE10	SSE10	SSE10	SSW6	WSW7	N2	NE4	N6	N3	E4	ESE3	SSE8.8	SSE19	
23-Aug	SE11	E4	N4	N6	E3	SE5	ESE3	NNW5	NW10	NW11	W4	NW7	NNW7	NW11	NNW11	NNW12	N16	N17	N25	N31	N35	N39	N38	N12.3	N39	
24-Aug	N31	N30	N38	N42	N38	N36	N33	N25	N25	N28	N33	N27	N22	NNW20	NW19	NW15	NW16	NW17	NNW14	NNW11	N14	NNE14	N10	N23.9	N42	
25-Aug	W2	WSW5	WSW3	E8	SSE16	SSE20	SSE11	SSE8	SSE11	SSE11	SSE13	SSW17	SSW22	SSW18	S20	SSW21	SSW21	SSW15	S20	S29	S34	S31	SSW28	S16.2	S34	
26-Aug	S26	SSW26	S24	SSW23	SSW20	SSW21	SSW18	S19	S14	S14	S18	SW23	SW22	WSW23	WSW21	W17	W16	W18	N35	N35	N36	N32	N19	SW7.5	N36	
27-Aug	N8	NW7	NW9	N9	NW6	NW12	NW10	NNW4	WNW3	SSE5	S8	SSE4	SSE7	S11	S11	S15	SSW14	SW15	SSW20	SSW20	SSW19	SSW18	SSW14	SW6.1	SSW20	
28-Aug	WSW5	SW6	WSW6	WSW7	SW8	SSW5	SSW10	SSW11	SSW8	S5	SSE9	SSE9	S7	SE4	SSE8	SE12	SE17	SSE20	SSE23	S22	S19	S13	S14	S10.0	SSE23	
29-Aug	S23	S16	SSW13	S13	SSW13	S14	S9	SSE12	SSE12	SSE12	SSE11	SSE13	SSE13	SSE14	S16	SSW16	SSW15	S15	S17	S19	S19	SSE21	SSE24	S15.1	SSE26	
30-Aug	SSE25	SSE23	SSE21	SSE24	SSE20	SE15	SE16	SE21	SE13	SSE8	SSE11	SE10	SSE13	SSE11	SE13	SSE15	SSE20	SSE17	SSE25	SSE30	SE19	SE21	SSE21	SSE17.7	SSE30	
31-Aug	SE17	SE12	ESE10	SSE14	SSW17	WSW14	S9	SSW10	WSW9	SSW3	SSE5	S7	WSW4	W8	WNW8	WNW10	W8	NW11	NNW21	NNW14	N21	NNW12	NW15	W3.6	NNW21	

SW3.3	SW3.8	SW2.9	WSW2.8	WSW3.8	WSW3.4	SW3.7	SSW4.7	SW3.4	SSW4.0	SSW3.5	SSW4.1	SW4.9	SW5.3	SW5.5	SW5.6	WSW4.0	W3.9	W2.5	WSW0.9	WNW1.8	W0.6	SW1.3	SW2.0	Diurnal Average
N31	N30	N38	N42	N38	N36	N33	N25	N25	N28	N33	N30	SW29	WSW34	WSW32	WSW32	WSW32	WSW28	N35	N35	N36	N39	N38	N35	Diurnal Maximum

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

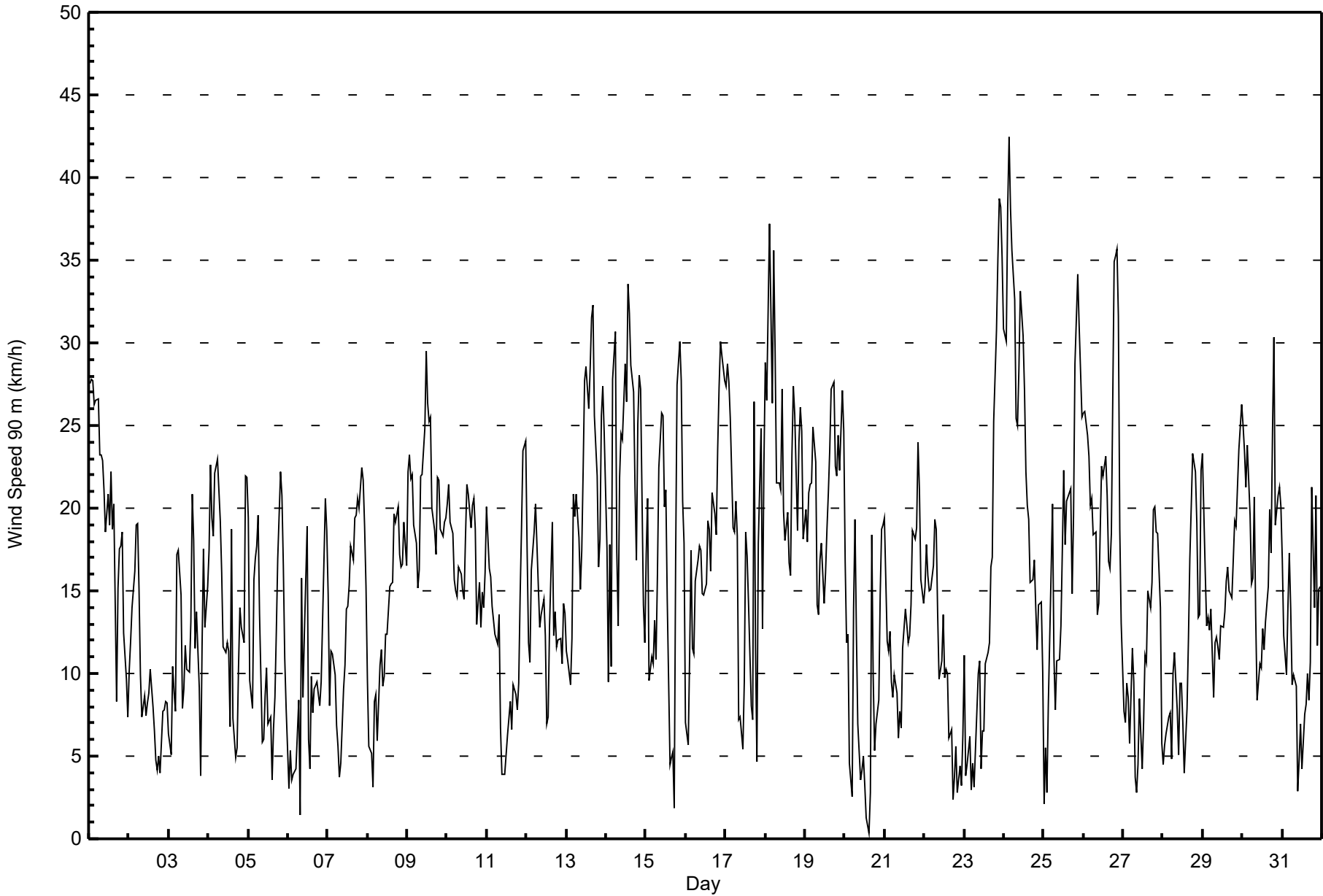


Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 16 km/h on Aug 3 18:00 Minimum Value: 1 km/h on Aug 25 01:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 5 P ₉₉ = 8																		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0							
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	3	3	3	4	3	4	4	4	3	3	3	4	4	4	4	9	4	6	2	2	5	3	3	2	9
2-Aug	2	2	2	1	3	2	2	2	2	3	2	2	2	3	3	3	3	2	2	2	1	1	2	3	3
3-Aug	2	2	2	2	1	3	5	3	2	3	2	3	4	7	7	3	5	16	5	3	4	3	3	2	16
4-Aug	1	3	2	2	3	2	2	3	2	2	3	3	4	3	5	5	4	2	3	1	3	2	3	7	7
5-Aug	5	3	1	2	1	2	2	4	2	2	3	3	3	3	3	3	3	3	3	1	2	2	2	2	5
6-Aug	1	1	1	1	1	2	2	3	4	4	12	3	3	4	3	3	2	2	2	2	2	3	2	3	12
7-Aug	4	3	1	1	2	1	3	2	3	2	3	4	4	4	5	5	5	4	4	3	1	1	3	2	5
8-Aug	4	2	3	2	4	2	2	4	3	3	4	4	4	5	5	5	5	5	6	5	5	4	4	4	6
9-Aug	5	5	5	5	4	4	5	4	4	5	5	6	7	7	6	5	5	5	6	5	5	4	5	5	7
10-Aug	5	5	5	4	4	4	3	4	4	4	3	4	5	5	4	5	5	4	3	3	2	1	2	1	5
11-Aug	3	2	2	2	2	2	3	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	1	1	3
12-Aug	3	1	1	2	2	2	2	2	2	2	2	3	3	8	4	5	2	2	1	2	2	1	2	1	8
13-Aug	2	2	1	2	4	3	3	4	2	3	4	6	5	5	5	6	4	5	3	2	3	2	1	2	6
14-Aug	9	4	3	4	6	6	7	6	3	4	5	4	4	8	4	4	4	4	2	5	2	2	6	3	9
15-Aug	3	4	2	2	2	3	2	2	2	4	2	3	3	3	3	3	2	5	6	5	4	5	4	3	6
16-Aug	5	1	3	2	2	2	2	2	3	3	3	3	4	4	4	4	4	3	2	2	4	2	2	1	5
17-Aug	2	2	2	4	2	1	2	4	3	3	4	4	3	4	3	4	7	9	7	4	11	4	4	6	11
18-Aug	4	4	6	7	4	7	8	4	5	4	5	4	3	3	4	4	6	7	3	3	4	3	2	4	8
19-Aug	2	2	2	2	2	2	2	4	3	3	3	2	4	4	5	5	4	3	2	1	2	2	2	2	5
20-Aug	3	2	2	4	2	2	2	3	2	3	2	3	3	3	3	4	5	2	2	2	2	6	1	2	6
21-Aug	2	4	2	3	3	2	2	2	2	2	2	3	3	4	3	5	4	2	1	2	1	2	2	3	5
22-Aug	2	1	3	2	2	3	1	2	3	2	3	3	3	4	4	3	3	2	2	1	1	1	1	4	4
23-Aug	3	1	1	1	3	1	2	2	4	2	3	2	3	1	1	3	2	2	6	3	4	3	4	5	6
24-Aug	5	7	5	4	4	4	5	5	3	6	5	5	6	5	4	4	3	3	3	4	3	2	1	4	7
25-Aug	1	1	1	3	3	3	4	2	2	2	2	5	3	4	4	4	4	3	2	4	2	2	2	1	5
26-Aug	1	1	1	1	1	1	1	1	3	3	4	5	4	5	5	3	3	3	7	4	5	5	4	4	7
27-Aug	1	1	2	2	1	1	2	2	1	3	2	2	3	4	4	4	3	2	2	2	2	3	3	2	4
28-Aug	3	2	2	1	2	1	2	2	1	1	1	2	2	2	2	2	1	1	2	2	1	2	2	3	3
29-Aug	3	2	2	2	2	2	2	2	1	1	2	2	2	3	3	3	2	2	1	1	1	1	3	1	3
30-Aug	1	2	1	2	2	2	4	3	2	3	2	2	3	3	4	3	3	3	4	2	7	8	6	4	8
31-Aug	3	2	3	4	4	3	2	2	2	3	2	3	3	2	2	3	2	7	4	5	5	3	3	3	7
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	66	8.87	8.87
6 - 11	175	23.52	32.39
12 - 19	286	38.44	70.83
20 - 28	177	23.79	94.62
29 - 38	38	5.11	99.73
> 38	2	0.27	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 90 m (WS90m) - km/h
Mannix - August 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	3	2	3	5	6	2	4	6	3	1	8	4	6	2	3	66
6 - 11	14	2	7	0	7	7	12	25	14	11	8	18	14	12	15	9	175
12 - 19	16	12	8	4	5	19	27	34	27	23	7	23	36	22	13	10	286
20 - 28	14	8	1	0	4	5	15	26	12	15	12	17	27	5	3	13	177
29 - 38	20	0	0	0	0	0	1	1	4	2	1	5	1	0	0	3	38
> 38	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Totals	74	25	18	7	21	37	57	90	63	54	29	71	82	45	33	38	744

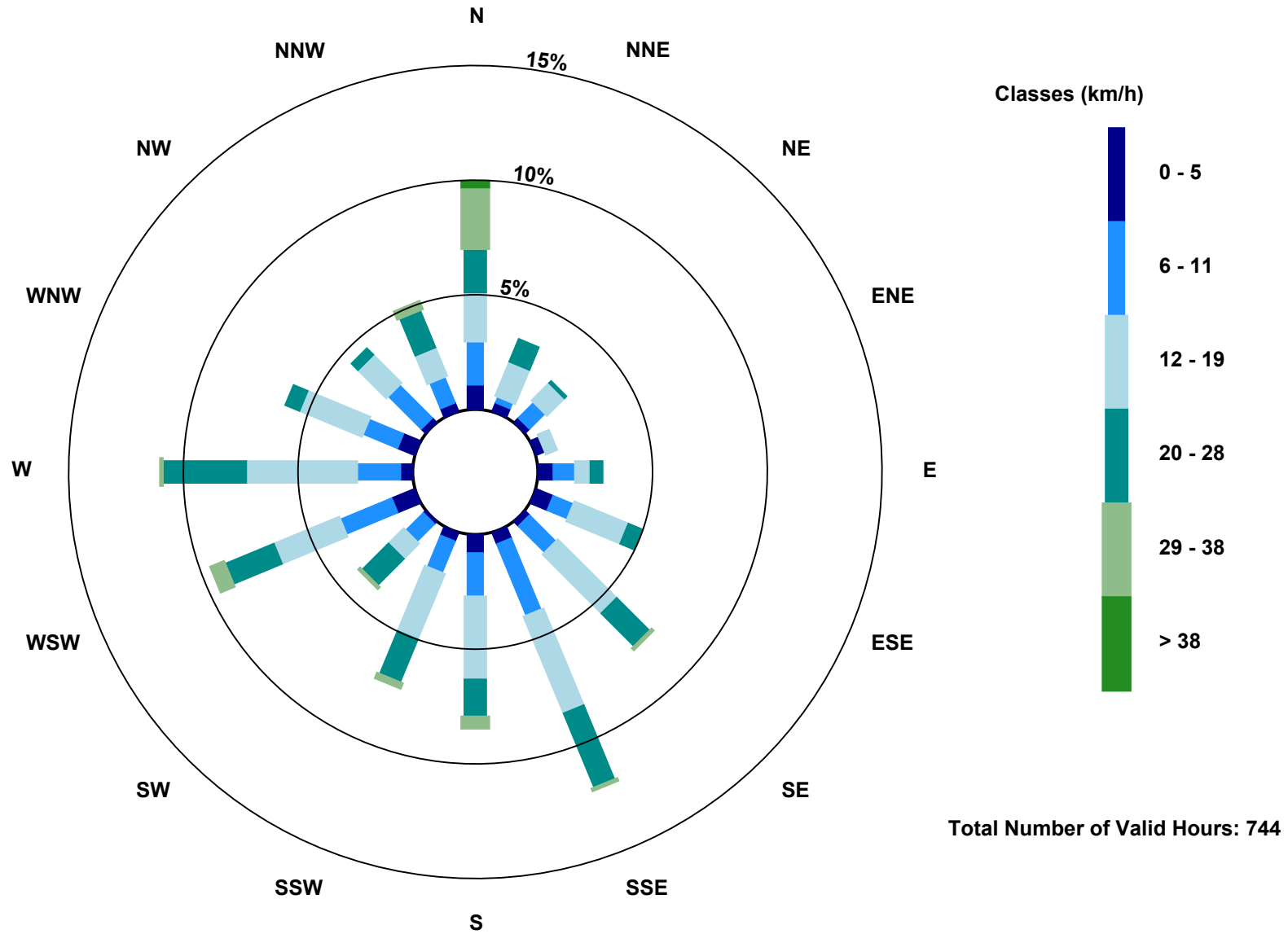
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg

Mannix - August 2023

Direction of Maximum Speed: 5 deg on Aug 24 04:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 133.1 deg on Aug 9	Hours of Data: 744
Direction of Minimum Speed: 162 deg on Aug 8 05:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.5 deg on Aug 11	Percent Operational Time: 100.0
Monthly Average Direction: 215.5 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-Aug	243	251	263	263	266	261	272	273	263	246	243	242	244	267	290	263	232	218	230	260	291	8	9	301	261.4
2-Aug	256	240	268	256	263	267	270	280	270	254	248	258	260	242	238	261	42	83	91	101	99	82	73	82	256.6
3-Aug	175	248	213	139	79	150	142	188	137	169	150	142	180	145	145	150	27	333	240	169	195	198	232	269	167.6
4-Aug	269	276	282	282	278	272	260	262	264	268	263	269	279	268	235	329	4	254	246	246	252	250	269	264	267.2
5-Aug	288	262	206	234	237	240	242	232	268	263	315	311	290	260	298	14	3	50	32	31	38	57	65	320	305.2
6-Aug	281	43	258	291	260	184	217	139	40	123	14	51	37	344	15	5	9	359	351	332	333	339	13	46	13.5
7-Aug	46	336	13	33	26	1	38	26	278	279	317	331	342	8	11	15	23	30	34	23	13	14	30	66	13.0
8-Aug	80	236	265	266	162	192	162	152	147	129	104	113	95	94	98	115	105	110	118	119	121	137	142	129	120.3
9-Aug	133	133	134	137	132	129	129	132	138	135	139	148	136	137	137	129	114	129	133	133	128	126	130	128	133.1
10-Aug	127	129	133	130	123	125	130	135	132	114	102	84	92	95	95	89	84	83	74	59	28	25	21	19	98.7
11-Aug	8	15	4	356	358	359	353	357	341	20	276	300	278	270	241	240	234	251	234	162	156	157	164	153	313.8
12-Aug	171	177	194	229	237	245	254	259	261	264	271	278	283	262	279	264	269	274	271	255	243	243	235	198	252.2
13-Aug	173	166	156	150	148	155	149	154	145	167	194	219	226	241	246	252	247	245	245	241	208	219	232	249	213.3
14-Aug	326	186	199	181	283	348	339	264	268	275	279	270	263	251	256	258	278	277	261	275	273	259	295	283	269.9
15-Aug	276	251	157	160	160	156	145	146	146	156	167	150	148	147	160	236	93	201	284	358	341	344	342	342	156.6
16-Aug	249	304	263	295	271	292	274	286	295	287	289	277	281	264	271	249	236	223	206	189	180	179	171	169	251.7
17-Aug	160	158	157	159	154	151	151	162	166	169	159	204	264	270	259	250	282	339	347	179	319	21	328	307	209.8
18-Aug	328	358	10	6	2	10	8	358	8	351	353	342	320	332	335	310	315	344	333	352	340	344	340	322	348.6
19-Aug	320	294	273	267	254	257	247	239	250	260	252	243	252	249	243	250	251	253	234	222	215	197	206	195	248.7
20-Aug	161	152	156	138	158	172	180	176	185	252	279	15	303	72	141	152	286	297	42	47	81	183	160	186	172.5
21-Aug	240	184	159	166	145	157	163	166	156	142	132	137	147	152	155	164	176	173	173	172	170	167	180	158	162.7
22-Aug	162	164	162	167	174	173	177	166	155	156	168	166	171	173	162	198	249	29	56	4	24	122	228	147	166.3
23-Aug	190	349	11	26	299	220	257	307	318	310	269	295	324	292	318	348	359	0	7	9	6	5	8	9	353.6
24-Aug	1	8	6	5	7	8	6	358	351	358	9	14	9	355	336	322	326	320	321	344	342	320	351	280	356.6
25-Aug	250	231	186	162	153	159	159	166	147	147	146	195	197	198	192	195	205	196	178	174	173	172	173	162	179.9
26-Aug	165	165	163	161	161	161	159	163	166	180	187	219	225	249	253	271	275	276	8	13	9	12	5	349	226.4
27-Aug	287	270	259	268	275	283	272	261	254	159	188	142	151	167	173	171	193	213	206	177	173	175	156	149	200.4
28-Aug	132	154	158	169	166	160	170	162	150	157	154	157	153	111	151	154	153	148	159	161	154	158	165	163	156.7
29-Aug	162	159	155	158	161	158	158	155	146	143	142	145	143	158	188	205	198	187	166	169	161	159	157	148	161.2
30-Aug	154	146	154	153	163	165	173	169	166	162	164	158	170	169	146	162	151	160	157	159	138	147	160	154	157.4
31-Aug	171	185	101	188	221	204	173	206	233	172	148	165	249	278	290	288	281	301	333	343	354	316	311	314	263.4

200.7 193.0 189.4 192.4 210.5 201.5 196.8 201.1 212.5 207.7 212.8 215.6 228.1 231.9 231.8 235.5 254.0 261.5 263.9 88.6 8.9 119.1 175.3 160.3
Diurnal Average

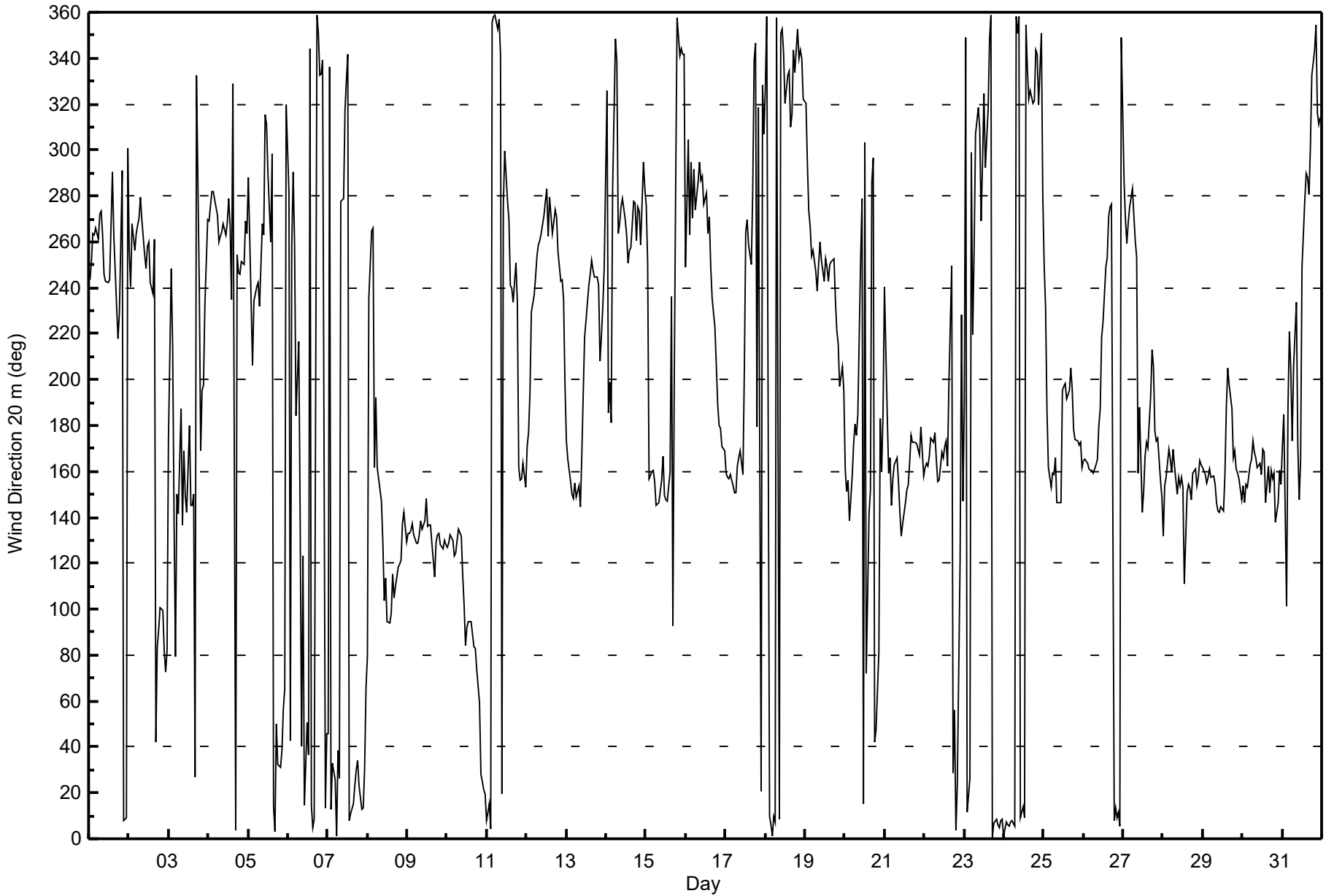
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Aug 20 15:00 Minimum Value: 5 deg on Aug 28 04:00 Percentiles: P ₁ = 7 P ₁₀ = 10 Q ₁ = 12 Median = 17 Q ₃ = 26 P ₉₀ = 44 P ₉₉ = 85																			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-Aug	11	11	9	10	9	10	11	10	12	12	13	14	18	16	22	35	70	15	16	11	44	13	14	41	70
2-Aug	22	22	13	17	11	11	15	37	33	22	40	25	28	28	39	44	58	37	24	15	22	24	22	50	58
3-Aug	39	56	12	38	55	39	26	37	44	22	16	23	39	21	15	16	55	86	80	31	14	14	20	15	86
4-Aug	8	9	13	12	11	9	11	11	11	18	24	26	26	41	14	65	85	26	22	16	18	21	6	29	85
5-Aug	54	54	17	13	5	9	9	19	25	44	40	26	51	32	70	50	32	19	14	12	13	12	68	20	70
6-Aug	14	52	43	45	31	37	19	92	26	26	73	18	50	80	23	37	26	20	22	17	16	17	15	13	92
7-Aug	54	49	11	9	61	44	26	54	81	17	37	31	30	32	28	36	23	21	16	13	9	8	16	12	81
8-Aug	29	35	34	65	88	38	35	19	19	24	38	26	24	22	24	22	18	16	16	16	16	12	12	12	88
9-Aug	11	11	11	12	11	11	13	12	12	12	13	15	12	12	13	14	15	15	12	11	11	12	11	11	15
10-Aug	12	11	11	12	12	12	12	12	13	15	12	13	13	13	14	13	14	13	23	21	16	12	11	11	23
11-Aug	13	13	13	15	13	14	22	16	27	60	45	29	26	27	29	58	36	33	28	21	8	7	10	14	60
12-Aug	17	16	11	13	9	11	12	11	12	12	15	19	51	83	28	16	18	13	10	11	11	7	7	24	83
13-Aug	11	10	10	11	13	12	13	17	16	22	20	20	20	18	19	14	15	14	13	19	11	11	7	37	37
14-Aug	61	22	13	29	23	24	34	17	9	11	12	10	11	11	11	17	14	20	13	6	12	32	10	61	
15-Aug	27	61	12	7	10	11	14	14	12	19	15	17	15	15	85	81	31	83	36	15	14	15	16	15	85
16-Aug	89	58	15	14	14	27	14	12	17	16	21	21	24	18	19	27	19	17	16	12	11	13	11	10	89
17-Aug	10	9	10	13	11	10	11	14	28	34	38	49	18	20	22	45	55	24	75	70	33	16	37	16	75
18-Aug	14	19	12	15	15	14	16	20	17	19	19	21	21	18	20	21	19	17	15	16	15	14	14	18	21
19-Aug	15	21	8	10	10	10	12	16	19	15	14	18	22	19	17	17	16	13	13	11	11	9	12	13	22
20-Aug	13	10	10	28	33	13	17	20	43	86	63	51	76	94	100	69	23	22	27	30	80	25	9	26	100
21-Aug	23	27	11	8	28	8	14	13	21	23	24	19	22	28	26	30	23	17	13	10	9	6	32	12	32
22-Aug	7	8	11	13	15	19	16	13	20	29	28	26	33	39	35	57	54	70	51	8	52	39	44	19	70
23-Aug	43	34	9	18	67	80	81	30	24	29	78	30	28	25	24	13	13	12	15	13	12	13	12	13	81
24-Aug	16	19	14	13	12	13	15	19	17	19	15	15	18	23	26	21	24	19	18	27	21	20	25	31	31
25-Aug	7	19	30	14	14	12	15	14	16	17	16	35	21	25	20	19	20	21	12	10	11	12	14	9	35
26-Aug	9	10	9	9	9	11	12	14	22	24	23	26	20	14	14	20	14	15	28	12	12	12	14	22	28
27-Aug	19	9	9	6	13	12	22	64	65	35	35	49	32	29	32	27	24	18	12	17	13	17	14	12	65
28-Aug	20	14	14	5	10	17	11	12	19	12	15	16	31	27	15	12	10	10	11	11	8	6	8	9	31
29-Aug	10	9	10	11	11	12	11	13	16	16	15	16	15	25	28	19	15	14	9	8	8	8	9	11	28
30-Aug	11	11	10	9	9	10	14	12	17	22	23	17	20	26	19	15	13	15	12	20	18	18	27	13	27
31-Aug	13	49	26	18	40	44	13	25	17	61	33	41	68	38	34	23	20	31	23	23	18	29	22	24	68
89 61 43 65 88 80 81 92 81 86 78 51 76 94 100 81 85 86 80 70 80 39 68 50																									
Diurnal Maximum																									





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 45 m (WD45m) - deg

Mannix - August 2023

Direction of Maximum Speed: 2 deg on Aug 24 04:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 354.0 deg on Aug 24	Hours of Data: 744
Direction of Minimum Speed: 140 deg on Aug 20 15:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.2 deg on Aug 11	Percent Operational Time: 100.0
Monthly Average Direction: 206.3 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-Aug	239	247	259	260	262	257	267	269	258	242	239	239	238	262	288	257	236	213	225	257	292	8	9	313	257.3
2-Aug	279	259	278	278	276	273	274	282	273	252	246	255	252	233	233	257	38	74	84	93	92	81	77	86	265.7
3-Aug	129	138	177	140	83	148	135	179	139	166	145	138	173	140	139	145	25	326	234	167	195	198	229	272	161.5
4-Aug	268	274	284	281	278	272	259	258	261	261	259	264	274	260	232	324	356	248	245	244	246	256	269	268	265.4
5-Aug	288	294	234	250	251	251	254	240	269	265	314	308	289	262	294	5	358	41	26	25	32	53	63	357	315.2
6-Aug	12	9	58	320	300	250	232	141	31	115	13	42	32	336	9	356	6	356	349	332	332	340	13	40	9.3
7-Aug	47	352	9	25	27	358	33	19	276	278	319	329	336	1	6	6	17	23	26	20	10	12	27	64	9.3
8-Aug	82	128	184	236	110	137	140	144	139	125	100	109	92	88	95	111	101	105	113	113	114	127	133	123	114.1
9-Aug	128	126	126	129	125	123	121	126	133	130	133	143	128	128	129	120	109	120	125	125	122	119	124	122	126.3
10-Aug	119	122	125	121	116	116	122	125	123	109	97	79	85	89	90	84	79	76	65	51	26	22	21	16	91.6
11-Aug	5	10	4	354	355	357	353	352	337	5	270	291	275	265	240	232	224	239	226	156	151	152	153	145	320.9
12-Aug	164	190	212	241	245	244	252	258	258	259	267	274	278	264	275	259	264	269	267	250	240	244	244	221	249.2
13-Aug	189	171	157	147	145	153	146	153	145	167	188	212	220	234	239	246	242	240	240	241	221	222	238	252	208.1
14-Aug	317	173	207	215	281	344	341	263	264	272	275	265	258	247	250	252	275	274	259	271	274	263	300	290	268.7
15-Aug	290	259	182	179	163	151	141	142	144	153	161	149	144	145	167	239	89	200	285	354	339	341	336	337	169.1
16-Aug	333	319	274	296	285	313	279	284	291	284	286	273	276	258	266	242	229	217	203	189	182	181	173	172	244.0
17-Aug	162	163	159	161	155	147	146	158	168	165	165	196	259	265	253	243	282	336	334	167	311	17	343	311	196.5
18-Aug	326	355	5	2	359	6	3	355	4	347	350	338	318	330	331	307	314	339	331	351	336	340	338	321	344.6
19-Aug	317	295	272	268	257	259	248	238	245	254	247	235	248	244	238	244	245	247	230	221	218	202	213	206	244.8
20-Aug	185	164	152	140	156	174	180	174	183	253	276	2	295	69	140	167	280	294	36	47	83	166	162	191	176.8
21-Aug	242	193	163	169	150	153	155	161	150	141	132	135	142	147	148	162	171	169	168	164	159	161	162	148	160.1
22-Aug	140	138	141	142	149	147	166	156	154	155	166	161	164	168	157	194	240	11	47	359	10	88	149	128	151.0
23-Aug	144	0	338	28	33	195	240	320	314	313	265	298	325	302	320	345	357	357	4	5	2	1	4	4	352.4
24-Aug	360	2	2	2	3	4	2	356	351	356	5	9	5	351	333	318	322	319	318	331	339	338	8	355	354.0
25-Aug	260	242	186	153	149	152	152	160	141	142	142	190	191	191	188	190	199	192	180	175	172	171	176	167	175.8
26-Aug	167	167	165	164	165	166	164	165	166	179	181	212	218	244	248	265	270	273	4	9	5	7	2	353	207.7
27-Aug	334	280	274	312	283	288	283	317	254	157	184	144	148	165	167	171	189	210	206	184	178	191	171	155	201.4
28-Aug	139	161	184	194	184	155	170	166	147	153	153	156	153	109	146	144	144	142	155	157	152	157	166	164	157.3
29-Aug	165	160	155	154	159	156	155	153	147	143	135	141	139	156	185	199	194	181	166	166	157	153	154	150	159.4
30-Aug	150	148	145	151	154	156	156	155	151	157	160	149	168	165	142	156	146	157	152	153	129	139	150	146	150.6
31-Aug	153	163	101	167	204	245	171	198	233	168	144	161	248	278	287	282	274	300	331	343	351	318	310	310	260.0

189.7 187.8 179.6 183.9 199.2 190.1 185.9 192.7 203.0 199.6 203.7 208.0 220.1 226.4 227.3 229.7 247.8 257.3 251.7 148.5 261.6 149.2 164.3 167.9
Diurnal Average

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



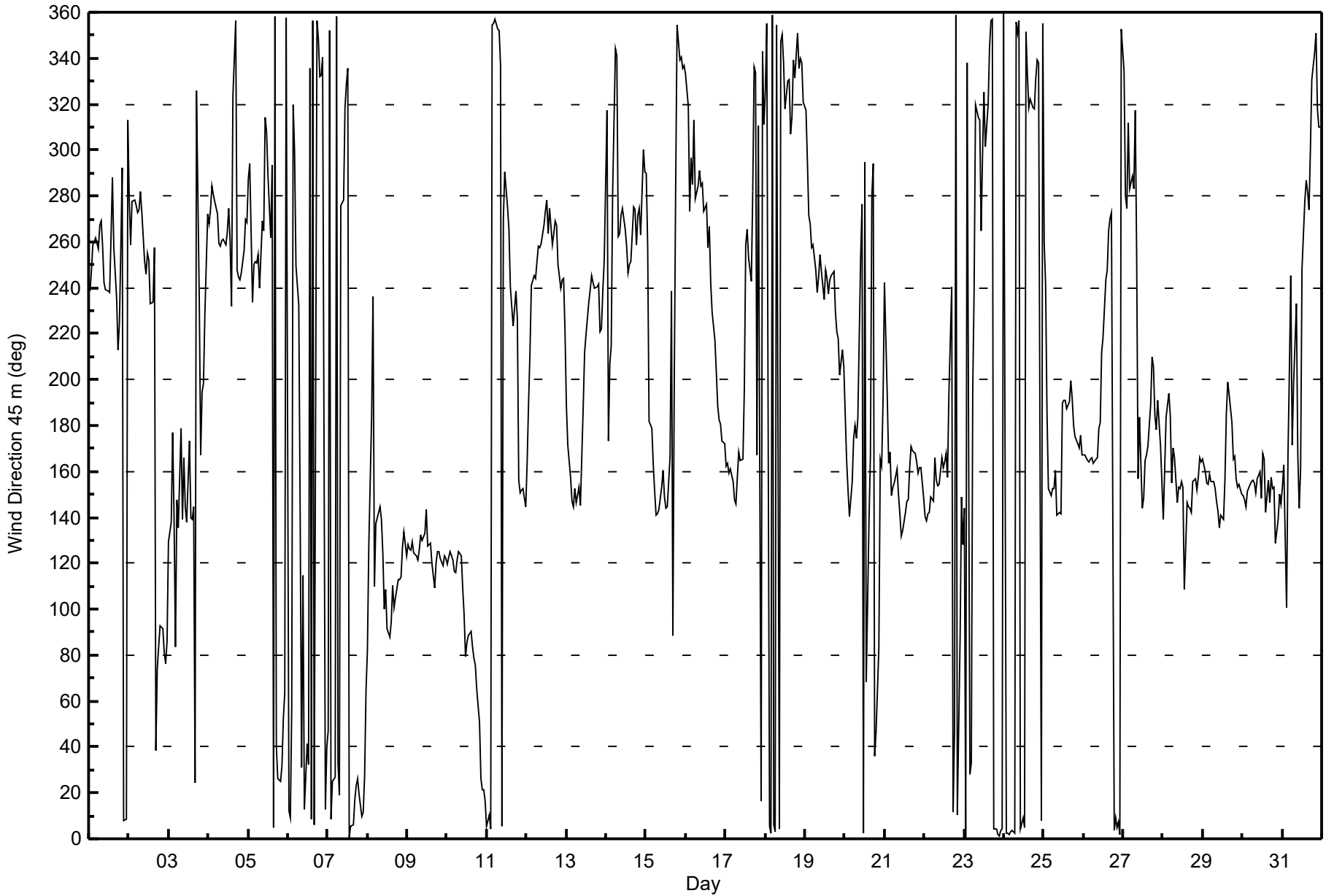
Wood Buffalo Environmental Association

Summary of Hour Standard Deviations

Wind Direction 45 m (WD45m) - deg

Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 108 deg on Aug 20 15:00 Minimum Value: 2 deg on Aug 26 05:00 Percentiles: P ₁ = 2 P ₁₀ = 6 Q ₁ = 8 Median = 12 Q ₃ = 20 P ₉₀ = 33 P ₉₉ = 81																		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-Aug	8	7	7	7	6	7	9	7	9	7	8	9	14	13	18	25	56	11	10	11	44	9	10	32	56
2-Aug	15	10	9	13	9	7	9	29	29	17	31	18	23	22	32	33	74	36	22	15	14	16	10	28	74
3-Aug	10	40	13	27	47	26	19	30	33	14	11	15	31	14	9	11	55	86	63	29	7	10	17	11	86
4-Aug	6	6	9	8	8	6	7	9	9	13	20	21	21	26	10	62	78	24	19	10	9	14	5	11	78
5-Aug	41	32	32	9	3	2	5	14	20	36	28	18	42	28	56	32	25	14	9	7	8	10	16	15	56
6-Aug	36	24	55	68	17	47	12	78	26	21	68	13	46	73	14	26	16	13	13	13	9	17	11	9	78
7-Aug	18	40	9	6	14	13	24	38	68	17	31	21	22	26	24	30	18	14	10	8	6	5	16	9	68
8-Aug	12	21	76	87	46	24	22	14	12	17	28	21	23	19	22	19	14	13	12	12	14	8	8	8	87
9-Aug	7	5	6	7	7	6	8	8	8	7	8	11	7	7	11	10	12	11	8	7	7	9	7	7	12
10-Aug	9	8	6	7	9	10	9	8	9	12	11	11	12	11	12	12	12	12	20	19	14	8	8	6	20
11-Aug	8	8	8	11	10	9	13	10	17	54	41	25	19	20	21	44	25	29	23	22	4	2	3	7	54
12-Aug	13	18	9	9	6	6	7	7	9	9	12	15	44	70	24	15	15	9	8	5	8	5	6	18	70
13-Aug	15	11	8	5	6	6	7	9	10	15	10	12	15	16	16	12	10	10	8	10	8	6	4	27	27
14-Aug	56	30	7	19	13	22	22	15	6	8	9	8	8	9	8	8	15	11	19	12	5	9	27	6	56
15-Aug	17	10	23	9	8	6	6	7	6	10	9	13	10	9	80	81	28	84	34	10	9	10	10	10	84
16-Aug	88	42	12	13	12	23	12	8	10	12	16	16	18	14	14	22	13	13	10	5	5	8	5	5	88
17-Aug	6	3	4	7	6	5	5	8	16	26	38	44	16	17	18	36	56	20	71	63	43	12	36	9	71
18-Aug	9	14	7	9	8	8	10	13	11	15	14	16	15	12	14	15	14	11	9	13	9	8	8	13	16
19-Aug	9	17	6	6	6	5	7	11	15	10	9	15	17	16	13	15	12	9	8	6	6	4	5	6	17
20-Aug	9	15	5	22	20	6	8	11	29	61	59	47	68	92	108	69	21	19	23	22	11	17	4	24	108
21-Aug	12	23	9	11	25	4	4	7	10	17	16	13	14	21	19	27	15	9	6	2	4	3	7	11	27
22-Aug	3	6	10	3	9	10	10	7	12	18	17	18	25	30	24	48	42	71	44	11	43	22	27	11	71
23-Aug	19	41	8	20	64	83	81	19	15	21	45	27	24	21	16	9	7	7	10	7	7	7	7	7	83
24-Aug	10	11	8	6	7	7	8	11	10	13	9	10	14	17	17	14	19	14	10	20	12	13	4	25	25
25-Aug	7	8	35	5	5	6	7	8	9	9	9	26	12	16	13	12	12	13	5	5	4	6	7	4	35
26-Aug	3	2	3	2	2	3	4	7	14	13	14	19	15	11	11	16	11	13	25	7	7	7	8	10	25
27-Aug	17	14	14	22	8	4	23	61	60	34	21	41	29	22	26	22	16	10	4	11	12	13	11	9	61
28-Aug	26	18	13	17	10	6	9	6	12	7	8	10	20	26	10	7	5	4	6	6	3	3	3	2	26
29-Aug	3	3	5	4	2	5	4	6	8	9	8	8	9	20	22	9	7	6	5	2	5	4	3	3	22
30-Aug	3	4	5	7	4	4	9	8	13	19	16	11	15	20	15	10	8	13	7	14	15	15	16	8	20
31-Aug	9	31	20	20	28	30	12	21	13	52	21	31	51	26	25	17	15	33	22	18	14	22	15	16	52
Diurnal Maximum																									





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction 75 m (WD75m) - deg

Mannix - August 2023

Direction of Maximum Speed: 4 deg on Aug 24 04:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 357.7 deg on Aug 24	Hours of Data: 744
Direction of Minimum Speed: 158 deg on Aug 20 15:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 0.7 deg on Aug 11	Percent Operational Time: 100.0
Monthly Average Direction: 220.4 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-Aug	240	250	261	263	265	259	269	271	260	244	242	240	240	263	290	262	251	218	228	262	298	16	11	323	260.0
2-Aug	298	277	294	294	287	285	284	289	279	254	248	257	255	235	237	257	48	76	81	97	94	86	91	96	278.3
3-Aug	124	119	158	138	93	147	138	173	139	164	148	142	173	144	141	147	31	312	238	158	198	204	233	278	162.7
4-Aug	274	281	294	289	284	279	266	262	263	261	260	267	274	262	234	324	357	245	248	252	254	263	272	274	270.4
5-Aug	294	313	276	270	268	263	261	254	277	272	319	311	294	268	291	7	2	42	29	29	37	59	62	32	323.7
6-Aug	31	14	3	314	313	288	248	168	32	112	17	44	39	340	12	5	10	2	354	339	338	348	25	49	13.1
7-Aug	60	22	28	39	28	1	39	28	284	286	325	333	341	4	8	8	20	26	28	23	14	23	36	75	17.2
8-Aug	96	130	123	137	110	134	125	144	142	129	102	111	96	89	97	113	103	108	114	114	116	127	134	128	115.8
9-Aug	133	131	130	132	129	128	127	130	135	134	136	146	131	131	132	121	113	120	129	129	126	121	128	127	130.5
10-Aug	124	126	128	124	118	117	123	126	126	112	102	81	88	90	93	87	81	78	67	55	36	32	34	25	89.9
11-Aug	11	15	12	1	1	3	1	356	338	8	268	286	274	264	239	233	224	237	225	158	154	156	154	148	351.0
12-Aug	167	215	230	252	254	248	255	263	262	263	269	275	279	262	273	261	264	273	270	254	245	256	263	243	254.3
13-Aug	220	191	182	164	154	167	157	161	157	172	190	213	220	233	239	246	243	241	242	247	234	238	246	254	215.1
14-Aug	321	175	221	245	283	349	352	272	267	274	277	267	260	247	252	253	279	277	263	276	284	275	304	297	274.0
15-Aug	289	266	223	205	193	167	156	153	152	160	163	157	150	153	189	238	93	194	290	359	344	345	340	340	197.9
16-Aug	337	336	286	305	303	335	289	291	295	287	287	274	276	259	268	243	230	218	206	197	193	195	186	183	245.8
17-Aug	179	180	172	170	167	157	154	165	180	174	182	203	259	266	254	243	285	339	335	144	316	21	8	323	203.5
18-Aug	333	360	9	5	3	8	6	359	7	350	355	342	323	335	336	313	320	345	338	355	340	345	344	328	349.1
19-Aug	322	300	278	276	266	266	256	243	245	255	247	237	247	244	239	245	247	248	231	228	227	213	223	215	248.3
20-Aug	204	199	179	158	163	190	192	184	191	249	269	357	287	67	158	178	280	298	39	52	88	166	174	204	195.0
21-Aug	241	209	182	190	171	169	161	168	156	153	142	141	146	151	150	165	172	171	168	164	162	169	164	148	167.7
22-Aug	136	138	138	134	134	137	150	153	163	162	169	162	166	168	159	194	239	16	52	359	6	85	133	131	148.0
23-Aug	136	68	345	18	89	150	124	327	314	321	272	310	334	321	328	348	360	1	9	8	5	5	7	7	359.1
24-Aug	4	5	6	4	6	6	4	360	356	0	6	11	8	356	338	323	326	322	323	333	343	350	13	11	357.7
25-Aug	266	252	213	145	159	157	158	164	147	148	148	194	193	192	189	193	201	196	187	181	177	178	187	182	180.0
26-Aug	182	183	179	183	189	190	179	176	175	183	183	213	219	244	248	264	273	275	7	12	7	9	6	0	222.0
27-Aug	352	301	314	349	314	307	306	329	270	162	186	152	155	170	171	174	191	212	209	196	196	206	200	187	208.6
28-Aug	211	205	221	228	215	182	196	204	190	166	161	164	163	128	154	141	144	147	162	168	171	174	172	172	170.9
29-Aug	173	175	176	172	181	173	173	165	164	155	142	146	146	159	186	199	195	184	173	176	168	164	157	155	169.5
30-Aug	158	159	152	154	150	138	142	141	138	162	161	146	167	166	146	157	148	163	158	153	130	140	149	146	151.0
31-Aug	145	151	117	159	208	252	178	203	235	184	148	171	245	280	286	283	272	306	338	347	356	326	317	317	264.0

210.4 207.6 209.5 215.7 225.9 219.6 202.4 200.5 210.4 209.7 207.0 209.7 219.9 228.7 229.7 233.3 250.6 260.3 254.6 196.8 284.7 202.2 188.5 193.5
Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

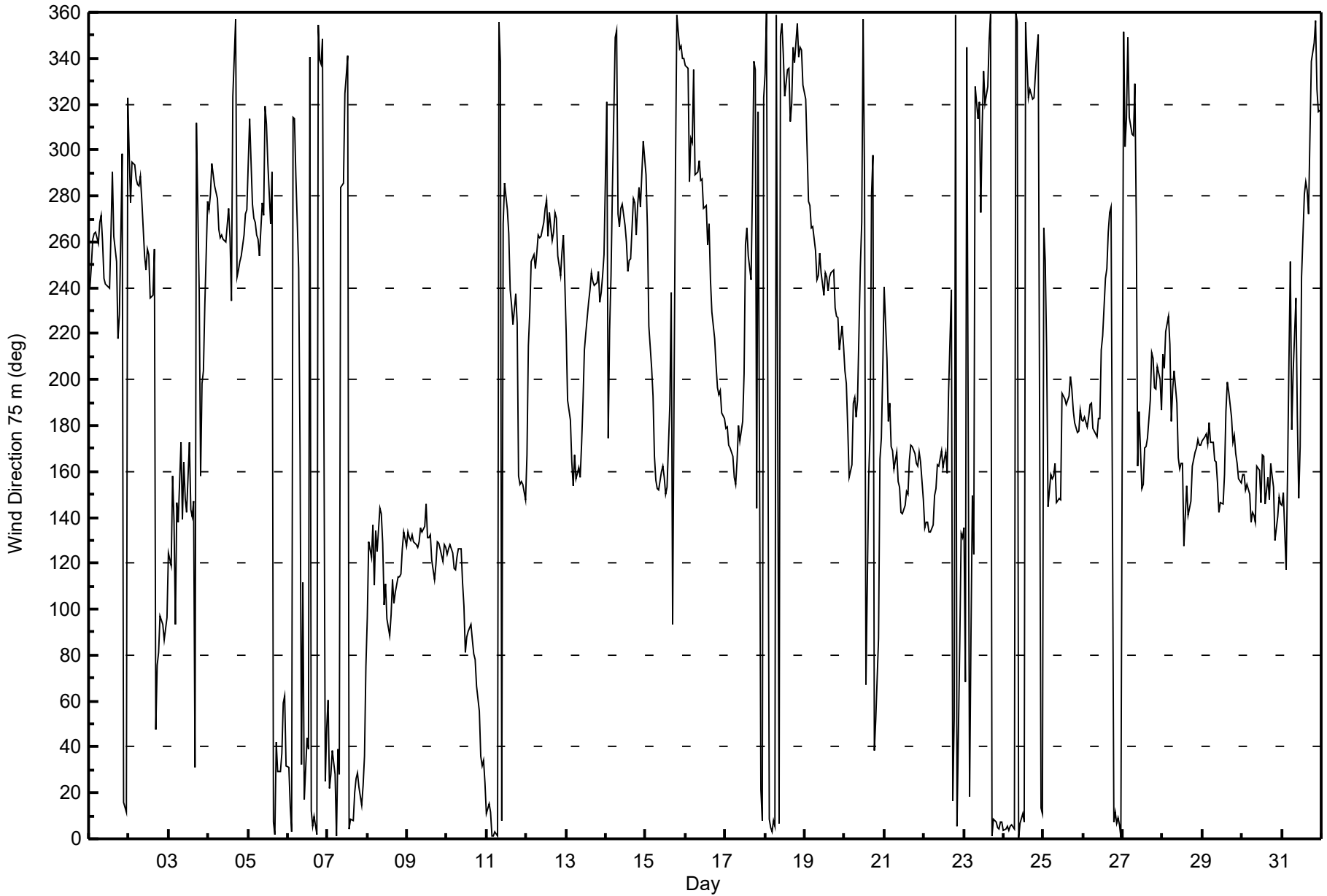
Wind Direction 75 m (WD75m) - deg
Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 107 deg on Aug 20 15:00 Minimum Value: 2 deg on Aug 30 00:00 Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 11 Q ₃ = 18 P ₉₀ = 30 P ₉₉ = 73																	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-Aug	6	6	6	7	6	7	8	7	9	6	8	8	12	12	17	23	37	12	9	11	44	8	11	27	44
2-Aug	15	8	5	8	9	6	8	24	28	15	24	18	20	18	35	33	74	36	23	18	12	13	10	20	74
3-Aug	13	37	6	25	38	15	14	18	21	13	9	15	24	11	7	9	54	73	60	39	5	6	20	8	73
4-Aug	5	7	7	7	6	6	7	8	9	13	16	19	22	23	9	62	63	23	17	9	7	11	4	4	63
5-Aug	15	27	26	7	3	5	3	9	24	32	24	14	36	29	58	33	24	13	7	4	8	7	5	15	58
6-Aug	32	10	21	26	9	22	11	76	26	22	63	12	46	79	14	21	14	12	11	12	8	16	12	7	79
7-Aug	12	24	10	7	10	12	24	32	59	18	31	19	20	23	23	28	16	12	9	6	3	3	18	8	59
8-Aug	15	19	54	55	24	20	18	13	11	15	26	19	22	17	23	19	15	14	14	14	14	11	8	10	55
9-Aug	7	6	7	7	8	8	11	9	7	7	8	10	8	9	11	13	14	13	9	8	10	12	9	9	14
10-Aug	11	10	9	11	12	13	12	11	11	14	13	10	12	11	13	12	10	11	17	16	13	8	9	6	17
11-Aug	7	8	8	9	8	7	9	7	18	43	44	26	17	19	19	37	22	24	20	23	5	2	2	6	44
12-Aug	18	17	10	6	4	4	7	6	9	9	11	13	48	70	21	14	14	8	8	5	5	7	6	10	70
13-Aug	17	10	11	9	4	7	6	8	8	11	9	10	14	16	15	11	9	9	7	7	5	5	2	25	25
14-Aug	53	27	8	14	12	20	16	19	7	7	9	8	7	8	7	15	11	18	12	4	9	27	6	53	
15-Aug	17	5	24	11	11	7	4	6	4	6	9	11	6	9	70	70	29	73	35	8	7	9	7	9	73
16-Aug	77	30	17	15	11	22	11	7	9	11	16	15	15	14	13	20	13	11	8	7	5	6	4	4	77
17-Aug	6	4	4	4	5	4	3	6	15	23	39	40	15	15	17	41	37	17	68	59	47	10	35	8	68
18-Aug	7	13	6	8	7	6	8	11	9	13	12	14	14	11	12	14	13	8	6	13	8	6	6	12	14
19-Aug	7	16	6	5	4	4	5	10	12	8	8	15	16	13	12	14	11	8	7	5	5	5	5	5	16
20-Aug	7	18	11	38	37	8	11	10	24	63	49	47	81	100	107	74	21	21	20	19	9	17	4	23	107
21-Aug	8	19	11	11	28	10	5	7	12	16	20	13	12	18	17	23	12	7	5	3	2	2	3	14	28
22-Aug	4	4	5	6	4	4	6	5	9	13	13	15	23	25	23	40	37	70	40	15	38	19	22	15	70
23-Aug	7	50	17	24	35	27	68	14	8	17	43	30	23	19	10	8	4	6	7	5	5	5	5	6	68
24-Aug	7	9	6	5	5	5	6	9	9	10	7	9	13	16	16	12	17	12	8	13	11	12	3	7	17
25-Aug	25	7	56	7	2	4	5	8	8	9	9	20	10	13	11	10	12	11	4	4	3	5	5	3	56
26-Aug	5	4	5	4	4	6	4	5	11	12	12	16	14	9	10	15	11	14	24	5	6	4	7	6	24
27-Aug	13	14	20	14	26	8	22	44	45	39	16	36	27	19	25	20	13	8	3	9	11	8	9	14	45
28-Aug	52	23	14	14	13	19	17	10	10	13	8	9	18	23	10	4	3	2	8	4	3	5	4	2	52
29-Aug	3	4	6	7	4	6	4	3	6	9	8	8	8	17	19	9	6	4	3	2	4	3	3	2	19
30-Aug	2	3	5	5	6	4	10	6	7	20	14	11	12	17	13	9	6	13	7	12	14	16	12	7	20
31-Aug	6	16	20	16	27	12	17	23	12	53	21	26	70	24	21	16	15	36	23	15	12	17	16	13	70
77 50 56 55 38 27 68 76 59 63 63 47 81 100 107 74 74 73 68 59 47 19 35 27																									
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

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

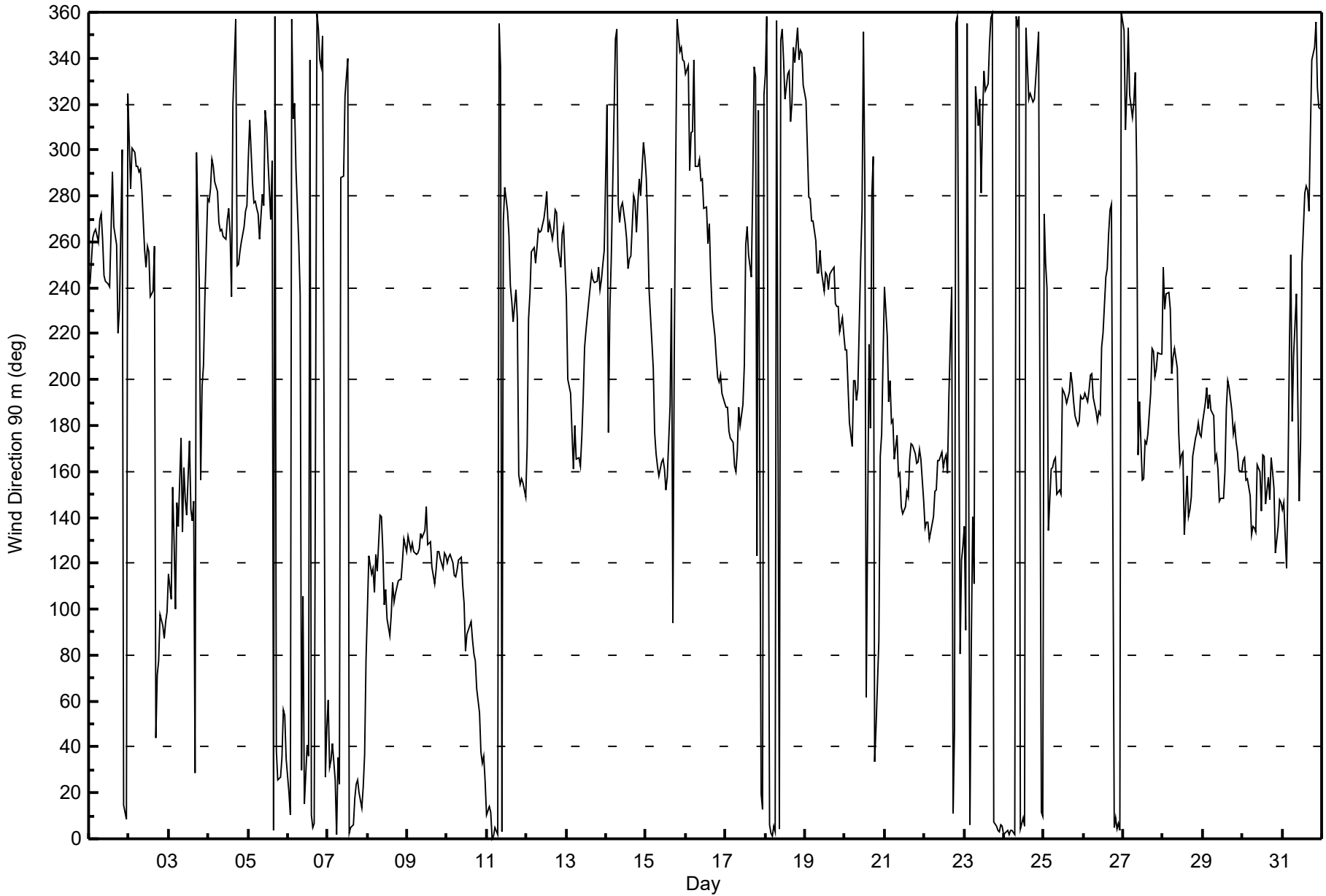




Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 90 m (WD90m) - deg
Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 111 deg on Aug 20 15:00 Minimum Value: 1 deg on Aug 21 22:00 Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 17 P ₉₀ = 28 P ₉₉ = 74																		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-Aug	6	5	6	6	6	6	7	7	8	6	7	8	12	11	16	22	27	23	9	11	43	8	10	24	43
2-Aug	13	8	5	7	10	7	7	22	27	15	20	17	20	17	33	33	72	40	22	15	7	11	8	16	72
3-Aug	9	34	7	25	35	13	13	14	16	12	11	16	22	11	7	10	55	67	55	68	7	4	21	8	68
4-Aug	4	7	6	6	6	6	6	8	8	13	15	18	21	20	8	60	55	22	16	9	9	9	4	4	60
5-Aug	7	15	20	7	4	4	3	8	25	30	22	13	35	29	55	35	22	12	6	3	8	5	5	11	55
6-Aug	30	9	18	23	14	25	11	91	26	19	60	11	43	81	13	21	13	11	10	12	7	15	13	6	91
7-Aug	11	17	10	5	9	12	21	28	52	18	28	18	20	21	23	24	16	11	8	5	2	3	19	9	52
8-Aug	13	17	37	43	19	16	14	14	12	14	23	16	19	17	21	17	12	11	9	10	11	9	7	8	43
9-Aug	6	5	5	6	6	5	8	7	6	6	7	10	7	7	10	9	10	10	7	6	7	6	6	6	10
10-Aug	7	7	6	7	8	8	8	7	8	9	9	10	11	10	12	12	10	11	17	17	13	8	9	7	17
11-Aug	7	7	8	8	8	6	8	6	16	38	40	27	17	18	16	32	20	23	20	25	6	3	2	6	40
12-Aug	22	14	9	5	4	4	6	6	8	8	10	12	45	66	19	12	13	8	8	6	5	8	5	7	66
13-Aug	16	9	10	12	6	12	10	7	8	10	8	9	13	15	14	10	9	9	7	6	4	5	2	23	23
14-Aug	49	27	8	13	11	19	13	20	7	7	8	7	7	8	6	7	14	11	17	11	3	8	25	5	49
15-Aug	15	5	22	10	12	11	8	5	5	5	10	12	6	9	68	75	31	80	34	7	7	8	7	8	80
16-Aug	42	26	17	15	9	22	10	7	8	10	14	14	14	13	12	19	12	11	8	7	4	6	5	5	42
17-Aug	7	4	4	4	6	4	4	6	16	23	38	39	14	14	16	34	31	16	55	62	46	10	31	7	62
18-Aug	6	12	5	7	6	6	8	11	9	13	12	13	13	10	12	14	13	8	5	12	7	5	5	11	14
19-Aug	6	15	5	5	3	3	5	10	11	8	8	14	17	13	12	13	10	7	6	4	4	5	5	5	17
20-Aug	6	16	13	58	80	10	11	10	22	59	40	42	68	98	111	76	20	21	18	19	7	20	4	22	111
21-Aug	7	17	10	9	30	15	8	9	14	19	21	14	13	19	17	23	12	7	5	3	2	1	4	14	30
22-Aug	3	3	5	3	3	6	4	4	9	12	13	15	22	25	22	41	34	66	39	15	36	19	19	13	66
23-Aug	7	44	23	24	42	20	53	23	6	14	47	28	22	19	8	7	4	5	7	4	4	5	5	5	53
24-Aug	7	8	5	4	5	5	6	8	8	9	7	8	13	16	16	11	15	12	7	10	10	11	3	4	16
25-Aug	32	9	41	7	6	4	6	8	9	10	9	19	10	13	11	10	12	10	4	4	3	5	4	3	41
26-Aug	5	4	6	4	4	5	6	5	10	12	12	15	14	9	9	14	11	13	24	5	5	4	6	5	24
27-Aug	13	12	16	13	26	10	15	35	28	47	15	36	27	21	25	19	12	7	3	8	10	6	8	16	47
28-Aug	48	21	12	9	13	19	13	12	7	17	8	10	18	21	12	5	3	2	9	4	5	7	7	4	48
29-Aug	4	6	8	10	6	8	9	5	5	8	9	9	8	17	18	8	6	4	3	2	3	2	3	2	18
30-Aug	2	3	5	2	7	4	10	6	5	23	15	12	13	18	14	9	6	14	7	13	13	17	12	8	23
31-Aug	6	13	15	15	25	10	22	24	12	60	22	26	48	24	19	15	14	35	23	15	11	16	15	11	60
																		49 44 41 58 80 25 53 91 52 60 60 42 68 98 111 76 72 80 55 68 46 20 31 24							
Diurnal Maximum																									





Maximum Value: 1.4 km/h on Aug 8 17:00		Maximum Daily Average: 0.7 km/h on Aug 9		Hours in Service: 744																						
Minimum Value: -1.1 km/h on Aug 24 04:00		Minimum Daily Average: -0.5 km/h on Aug 24		Hours of Data: 744																						
Maximum Diurnal Average: 0.2 km/h at hour 10		Minimum Diurnal Average: 0.0 km/h at hour 21		Hours of Missing Data: 0																						
Monthly Average: 0.13 km/h		Percentiles: P ₁ = -0.9 P ₁₀ = -0.3 Q ₁ = -0.1 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.6 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-Aug	0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.0	-0.2	-0.1	0.0	0.0	0.1	0.1	-0.1	-0.3	-0.2	-0.1	0.0	0.3
2-Aug	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.1	0.0	0.0	-0.2	0.2	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.0	0.4
3-Aug	0.1	0.0	-0.2	0.3	0.1	0.2	0.4	0.2	0.3	0.4	0.4	0.5	0.3	0.6	0.6	0.6	-0.2	-0.1	0.1	0.2	0.0	0.1	0.0	0.1	0.6	
4-Aug	0.1	0.1	0.0	0.1	0.0	-0.1	0.1	-0.1	0.0	0.1	0.1	-0.1	-0.2	0.1	0.3	0.1	0.0	-0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	
5-Aug	0.0	0.1	-0.1	0.0	-0.1	0.0	0.1	0.0	-0.2	0.0	0.2	-0.2	-0.2	0.1	-0.1	0.0	-0.2	0.3	0.0	-0.1	0.0	0.2	0.0	-0.4	0.3	
6-Aug	-0.2	0.0	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.1	0.5	-0.2	0.3	0.2	0.0	-0.3	0.0	0.0	-0.3	-0.2	-0.1	-0.2	-0.3	-0.4	0.0	0.5	
7-Aug	0.1	-0.3	-0.2	-0.2	0.0	-0.1	-0.1	0.2	0.1	-0.3	0.1	-0.3	-0.2	0.1	-0.3	-0.2	-0.4	0.0	-0.2	-0.2	-0.4	-0.4	-0.2	0.4	0.4	
8-Aug	0.5	-0.1	-0.1	-0.2	0.0	-0.1	0.4	0.2	0.5	0.5	0.5	0.8	0.7	1.0	0.9	0.7	1.4	1.1	1.1	1.1	0.8	0.5	0.5	0.4	1.4	
9-Aug	0.4	0.8	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.8	0.9	0.7	0.8	0.8	0.8	0.9	0.9	0.5	0.7	0.6	0.7	0.6	0.6	0.9	
10-Aug	0.8	0.9	0.7	0.7	0.8	0.6	0.5	0.6	0.6	0.8	1.0	0.9	0.9	1.0	1.0	1.1	0.8	0.8	0.5	0.3	-0.2	-0.1	-0.2	-0.3	1.1	
11-Aug	-0.4	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	0.1	0.4	0.1	0.0	0.0	0.0	-0.1	0.1	0.1	-0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	
12-Aug	0.2	0.2	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.1	-0.1	-0.1	-0.1	-0.2	0.3	0.1	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	
13-Aug	0.2	0.3	0.4	0.5	0.7	0.5	0.7	0.7	0.5	0.8	0.3	0.4	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.0	-0.1	0.0	-0.2	0.8	
14-Aug	-0.2	0.1	0.1	0.0	-0.1	-0.7	-0.2	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	-0.1	-0.1	-0.3	0.0	0.2	0.0	0.1	-0.1	-0.1	0.0	0.2	
15-Aug	-0.2	0.1	0.1	0.2	0.3	0.6	0.5	0.4	0.6	0.7	0.4	0.5	0.5	0.5	0.3	0.4	0.5	0.1	-0.2	-0.6	-0.7	-0.5	-0.4	-0.4	0.7	
16-Aug	-0.1	0.0	0.0	-0.3	0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	0.0	0.2	0.0	0.1	0.1	0.2	0.2	0.5	0.4	0.5	
17-Aug	0.6	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.3	0.5	0.4	0.3	-0.1	0.0	0.0	0.2	-0.1	-0.6	-0.2	0.1	-0.5	-0.3	-0.2	-0.4	0.8	
18-Aug	-0.6	-0.4	-0.8	-0.6	-0.5	-0.7	-0.6	-0.2	-0.4	-0.3	-0.6	-0.4	-0.3	-0.5	-0.5	-0.2	-0.6	-0.7	-0.6	-0.3	-0.5	-0.5	-0.4	-0.3	-0.2	
19-Aug	-0.3	-0.2	0.1	0.1	0.0	0.0	0.3	0.2	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	-0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.3	
20-Aug	0.3	0.3	0.5	0.2	0.2	0.3	0.3	0.5	0.4	0.2	0.2	0.0	0.4	-0.3	0.0	0.2	-0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.2	0.5	
21-Aug	0.0	0.1	0.4	0.4	0.4	0.5	0.6	0.4	0.4	0.3	0.3	0.6	0.5	0.5	0.5	0.3	0.4	0.5	0.3	0.3	0.4	0.4	0.2	0.4	0.6	
22-Aug	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.5	0.3	0.6	0.4	0.4	0.3	0.5	0.2	0.2	0.0	0.3	0.2	-0.1	0.0	0.1	0.0	0.2	0.6	
23-Aug	0.2	-0.2	-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	-0.2	-0.2	-0.3	-0.5	-0.8	-0.9	-0.9	-1.0	-0.8	0.2	
24-Aug	-0.5	-0.4	-0.9	-1.1	-1.0	-0.9	-0.8	-0.3	-0.6	-0.5	-0.6	-0.6	-0.5	-0.3	-0.2	-0.5	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.4	-0.2	
25-Aug	-0.2	-0.1	0.0	0.3	0.3	0.5	0.5	0.4	0.4	0.5	0.6	0.3	0.3	0.0	0.3	0.3	0.3	0.2	0.2	0.4	0.4	0.5	0.4	0.6	0.6	
26-Aug	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.0	0.1	0.1	0.0	-0.1	0.1	-0.9	-1.0	-0.8	-0.8	-0.3	-0.3	0.7	
27-Aug	-0.1	0.1	0.0	-0.1	-0.3	-0.1	-0.1	0.1	0.0	0.2	0.3	0.5	0.3	0.4	0.5	0.6	0.4	0.2	0.1	0.2	0.4	0.2	0.2	0.2	0.6	
28-Aug	0.1	0.2	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.5	0.4	0.5	0.4	0.6	0.5	0.5	0.5	0.6	0.7	0.7	
29-Aug	0.5	0.7	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.6	0.5	0.6	0.4	0.4	0.1	0.1	0.4	0.3	0.6	0.4	0.4	0.3	0.7	
30-Aug	0.3	0.4	0.5	0.5	0.4	0.5	0.4	0.2	0.0	0.2	0.3	0.2	0.5	0.4	0.6	0.5	0.7	0.6	0.7	0.5	0.6	0.8	0.2	0.4	0.8	
31-Aug	0.2	0.1	0.2	0.0	0.0	0.0	0.2	0.1	-0.2	0.3	0.2	0.4	0.3	0.0	0.2	-0.1	-0.2	-0.2	-0.4	-0.4	-0.4	-0.1	-0.3	-0.1	0.4	
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 3.8 km/h on Aug 24 04:00																				Hours of Data: 744					
Minimum Value: 0.2 km/h on Aug 23 03:00																				Hours of Missing Data: 0					
Percentiles: P ₁ = 0.3 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.3 Q ₃ = 1.8 P ₉₀ = 2.3 P ₉₉ = 3.2																				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-Aug	1.8	2.0	1.8	1.8	1.8	2.1	1.9	1.8	1.8	1.8	1.9	2.1	2.2	2.3	2.1	1.7	1.0	1.3	1.3	0.9	1.4	0.9	0.6	0.4	2.3
2-Aug	0.4	0.6	0.5	0.4	0.7	0.9	0.8	1.2	1.2	1.4	1.4	1.2	1.4	1.6	1.7	1.5	1.2	1.0	0.7	0.5	0.5	0.3	0.4	0.4	1.7
3-Aug	0.4	0.3	0.4	0.4	0.6	1.1	1.3	1.0	0.8	1.1	1.3	1.6	1.6	1.6	1.8	1.7	1.7	1.8	0.9	0.7	0.6	1.0	0.7	0.7	1.8
4-Aug	0.8	1.4	1.2	1.3	1.4	1.3	1.5	1.6	1.6	1.6	1.8	1.7	1.7	1.0	1.7	2.0	1.3	1.0	0.7	0.6	0.5	0.5	0.5	0.7	2.0
5-Aug	0.7	0.5	0.3	0.4	0.4	0.6	0.6	0.8	1.2	1.5	1.6	1.8	1.6	1.6	1.5	1.4	1.3	1.6	1.5	1.5	1.2	0.9	0.4	0.3	1.8
6-Aug	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.6	1.6	1.4	1.8	2.4	1.1	1.3	1.6	1.6	1.2	1.3	1.1	0.6	0.5	0.8	1.2	1.5	2.4
7-Aug	1.0	0.5	0.5	0.6	0.4	0.3	0.8	1.2	1.4	1.3	1.9	2.2	2.1	2.1	2.4	2.3	2.3	2.2	2.2	1.5	1.3	1.1	1.2	1.4	2.4
8-Aug	0.9	0.3	0.3	0.4	0.4	0.5	0.9	1.5	1.6	1.7	1.7	2.0	2.0	2.2	2.2	2.2	2.6	2.4	2.6	2.2	2.1	1.9	1.7	1.6	2.6
9-Aug	1.8	2.3	2.3	2.3	1.9	2.0	1.6	1.8	2.0	2.2	2.5	2.7	2.6	2.7	2.6	2.5	2.2	2.0	2.2	2.2	1.9	2.0	2.0	2.0	2.7
10-Aug	2.2	2.3	2.0	2.1	1.9	1.8	1.7	2.0	1.8	1.8	1.7	1.9	2.2	2.1	2.1	2.1	2.1	2.0	1.5	1.5	1.0	1.0	1.0	1.2	2.3
11-Aug	1.8	1.4	1.3	1.1	1.1	1.0	1.1	1.4	1.1	1.3	1.2	1.0	1.3	1.2	1.4	1.5	1.5	1.3	1.1	0.7	0.6	0.7	0.9	1.2	1.8
12-Aug	1.0	0.6	0.5	0.6	0.7	1.0	1.2	1.1	1.0	1.1	1.6	1.8	1.7	1.6	1.5	1.3	1.3	1.2	0.8	0.7	0.3	0.3	0.4	0.5	1.8
13-Aug	0.5	0.7	0.7	1.1	1.5	1.3	1.6	1.7	1.6	2.1	2.7	2.9	2.9	2.8	2.8	2.9	2.9	2.4	1.9	0.9	0.7	1.0	0.3	0.9	2.9
14-Aug	1.5	0.8	0.9	0.4	1.8	2.7	1.4	0.9	1.4	2.0	2.2	2.2	2.1	3.0	2.7	2.4	2.2	1.9	1.2	1.2	0.7	0.7	0.7	0.4	3.0
15-Aug	0.7	0.4	0.5	0.7	1.0	1.2	1.4	1.4	1.6	1.6	1.4	1.3	1.4	1.4	1.5	1.3	1.2	0.9	1.5	2.5	2.6	2.5	1.6	1.2	2.6
16-Aug	0.6	0.4	0.5	1.2	0.8	0.8	1.1	1.6	2.1	2.1	1.9	1.9	2.0	2.1	2.0	2.1	2.2	2.2	1.5	1.2	1.1	1.2	1.3	1.3	2.2
17-Aug	1.3	1.4	1.3	1.5	1.1	1.2	1.5	1.6	1.1	1.5	1.2	1.6	2.0	2.1	1.7	1.2	1.5	2.5	1.1	0.8	2.1	1.6	0.7	1.4	2.5
18-Aug	2.0	2.5	3.1	2.9	2.5	3.1	2.9	2.5	2.3	2.3	3.0	2.3	2.2	2.1	1.9	1.6	2.2	2.1	2.0	1.7	2.1	2.0	1.9	1.5	3.1
19-Aug	1.8	1.3	1.2	1.2	1.2	1.5	1.6	1.6	1.4	1.6	1.9	1.7	2.1	2.2	2.2	2.4	2.6	2.5	1.7	1.1	0.9	1.0	1.1	1.0	2.6
20-Aug	0.8	0.8	1.0	0.9	0.8	1.0	1.3	1.4	1.3	1.4	1.4	1.6	1.6	1.7	1.5	1.5	1.9	1.0	0.6	0.4	0.5	0.7	0.6	0.7	1.9
21-Aug	0.5	0.6	0.8	0.9	0.9	0.9	1.3	1.3	1.2	1.4	1.4	1.7	1.9	1.8	1.8	1.7	1.7	1.8	1.3	1.0	0.9	0.7	0.4	0.6	1.9
22-Aug	0.5	0.7	0.6	0.7	0.8	0.8	0.9	1.5	1.3	1.4	1.6	1.7	1.7	1.7	1.6	1.5	1.2	1.1	0.7	0.3	0.2	0.2	0.2	0.4	1.7
23-Aug	0.4	0.3	0.2	0.3	0.4	0.4	0.5	0.7	0.8	0.9	0.9	1.1	0.9	0.8	0.8	1.0	1.1	1.2	1.9	2.6	3.2	3.5	3.3	3.1	3.5
24-Aug	2.9	3.0	3.6	3.8	3.5	3.3	3.2	2.7	2.6	2.9	3.2	3.2	3.0	2.8	2.6	2.4	2.2	1.9	1.5	0.9	0.7	0.8	0.4	0.3	3.8
25-Aug	0.4	0.4	0.4	0.6	0.8	1.1	1.2	1.2	1.3	1.4	1.6	2.1	2.7	2.2	2.4	2.3	2.3	1.3	1.1	1.3	1.8	1.6	1.3	1.1	2.7
26-Aug	1.3	1.3	1.3	1.2	1.3	1.1	1.2	1.5	1.7	2.0	2.3	2.5	2.5	2.3	2.1	1.7	1.4	1.4	3.1	3.0	3.2	2.3	1.4	0.7	3.2
27-Aug	0.3	0.2	0.3	0.3	0.5	0.7	0.5	0.5	0.9	1.2	1.5	1.3	1.6	1.7	1.7	1.7	1.6	1.4	1.0	0.9	1.1	0.8	0.7	0.6	1.7
28-Aug	0.5	0.6	0.5	0.6	0.7	0.8	1.0	1.0	0.8	1.0	1.1	1.2	1.2	1.2	1.0	1.0	1.1	1.2	1.1	1.0	0.7	0.7	1.0	1.3	1.3
29-Aug	1.1	1.2	1.1	1.2	1.5	1.3	1.2	1.2	1.3	1.4	1.5	1.6	1.6	1.8	1.9	1.9	1.3	0.9	0.7	0.7	0.9	0.6	0.6	0.8	1.9
30-Aug	0.7	1.0	0.9	0.8	0.9	1.1	1.0	1.1	1.1	1.3	1.5	1.3	1.7	1.6	1.6	1.7	2.1	1.5	1.6	1.9	1.6	1.8	1.2	0.8	2.1
31-Aug	0.8	0.5	0.6	0.6	0.5	0.7	0.9	1.1	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.2	1.4	1.6	1.1	1.7	0.8	1.1	1.2	1.7
2.9 3.0 3.6 3.8 3.5 3.3 3.2 2.7 2.6 2.9 3.2 3.2 3.0 3.0 2.8 2.9 2.9 2.5 3.1 3.0 3.2 3.5 3.3 3.1																									
Diurnal Maximum																									



Summary of Hour Averages

Mannix - August 2023

Maximum Value: 1.5 km/h on Aug 8 20:00		Maximum Daily Average: 0.7 km/h on Aug 9		Hours in Service: 744																																													
Minimum Value: -1.0 km/h on Aug 18 18:00		Minimum Daily Average: -0.4 km/h on Aug 14		Hours of Data: 744																																													
Maximum Diurnal Average: 0.2 km/h at hour 10		Minimum Diurnal Average: -0.1 km/h at hour 21		Hours of Missing Data: 0																																													
Monthly Average: 0.05 km/h		Percentiles: P ₁ = -0.8 P ₁₀ = -0.5 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.4 P ₉₀ = 0.6 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-Aug	-0.6	-0.6	-0.3	-0.5	-0.4	-0.5	0.0	-0.4	-0.4	-0.6	-0.4	-0.3	-0.2	-0.4	0.1	-0.6	-0.2	-0.4	-0.3	-0.2	-0.4	-0.2	-0.2	-0.3	-0.4	0.1																							
2-Aug	-0.3	-0.3	-0.5	-0.5	-0.6	-0.5	-0.4	-0.2	0.0	-0.3	0.2	-0.3	-0.1	0.2	-0.2	-0.5	0.3	0.3	0.5	0.3	0.2	0.1	0.1	0.0	-0.1	0.5																							
3-Aug	0.1	0.1	-0.2	0.2	0.2	0.4	0.4	0.0	0.2	0.4	0.3	0.7	0.1	0.8	0.7	0.8	0.2	-0.3	-0.2	0.1	-0.3	-0.2	-0.4	-0.3	0.2	0.8																							
4-Aug	-0.3	-0.3	-0.2	-0.3	-0.5	-0.3	-0.3	-0.6	-0.3	0.1	0.0	-0.3	-0.6	0.2	-0.3	0.5	0.1	-0.3	-0.3	-0.2	-0.3	-0.3	-0.5	-0.3	-0.2	0.5																							
5-Aug	-0.3	-0.2	-0.3	-0.3	-0.5	-0.2	-0.2	-0.1	-0.1	-0.3	0.1	-0.6	-0.6	0.3	0.1	-0.2	0.0	0.5	0.1	0.1	0.0	0.2	0.0	-0.3	-0.1	0.5																							
6-Aug	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.3	-0.1	0.0	0.5	-0.1	0.5	0.4	-0.1	-0.3	0.0	0.0	-0.4	-0.3	-0.2	-0.2	-0.4	-0.1	0.3	0.0	0.5																							
7-Aug	0.1	-0.3	-0.3	-0.3	0.0	-0.2	0.0	0.2	0.2	-0.4	0.1	-0.2	-0.4	0.5	0.2	0.3	-0.2	0.3	0.3	0.0	-0.2	-0.2	0.1	0.5	0.0	0.5																							
8-Aug	0.5	0.0	0.0	-0.3	0.1	0.0	0.5	0.2	0.4	0.8	0.4	0.7	0.7	1.0	1.0	0.7	1.5	1.1	1.4	1.5	1.1	0.3	0.6	0.3	0.6	1.5																							
9-Aug	0.6	0.9	0.9	0.8	0.7	0.7	0.6	0.3	0.6	0.5	0.8	1.0	0.6	0.8	0.9	0.8	1.0	1.0	0.5	0.6	0.3	0.5	0.5	0.6	0.7	1.0																							
10-Aug	0.6	0.8	0.8	0.3	0.9	0.7	0.3	0.5	0.8	0.9	0.8	0.6	0.9	1.0	0.9	1.0	0.9	0.8	0.5	0.3	0.0	0.0	0.0	-0.1	0.6	1.0																							
11-Aug	-0.4	-0.1	-0.3	-0.2	-0.4	-0.2	-0.1	-0.2	0.0	0.5	0.2	-0.1	0.0	0.2	-0.1	0.3	-0.2	-0.3	0.3	0.2	0.4	0.5	0.5	0.6	0.0	0.6																							
12-Aug	0.2	-0.1	-0.4	-0.4	-0.5	-0.6	-0.4	-0.2	-0.3	-0.4	-0.4	-0.5	-0.7	0.2	-0.1	-0.3	-0.3	-0.1	-0.1	-0.3	-0.3	-0.4	-0.3	-0.2	-0.3	0.2																							
13-Aug	-0.1	0.0	0.1	0.5	0.8	0.7	0.8	0.9	0.5	1.0	0.0	0.0	-0.6	-0.1	-0.2	-0.8	-0.8	-0.5	-0.5	-0.3	-0.4	-0.5	-0.6	-0.6	0.0	1.0																							
14-Aug	-0.3	0.2	-0.4	-0.2	-0.5	-0.6	-0.2	-0.2	-0.3	-0.3	-0.6	-0.5	-0.5	-0.6	-0.8	-0.8	-0.6	-0.2	-0.2	-0.4	-0.5	-0.5	-0.4	-0.3	-0.4	0.2																							
15-Aug	-0.5	-0.2	-0.1	-0.1	0.1	0.4	0.6	0.6	1.0	0.8	0.6	0.7	0.6	0.5	0.3	0.3	0.7	-0.1	-0.5	-0.2	-0.7	-0.5	-0.5	-0.8	0.1	1.0																							
16-Aug	-0.1	-0.2	-0.3	-0.5	-0.2	-0.1	-0.3	-0.4	0.0	-0.2	0.0	-0.4	-0.1	-0.6	-0.5	-0.2	-0.4	-0.5	-0.2	-0.1	-0.1	-0.1	0.1	0.1	-0.2	0.1																							
17-Aug	0.5	0.6	0.7	0.7	0.6	0.7	0.9	0.7	0.5	0.9	0.2	0.2	-0.2	-0.1	-0.3	0.3	-0.4	-0.6	-0.3	-0.1	-0.5	-0.2	-0.2	-0.6	0.2	0.9																							
18-Aug	-0.8	-0.1	-0.4	0.0	-0.1	-0.2	0.1	0.3	0.0	-0.1	-0.4	-0.3	-0.1	-0.7	-0.4	-0.1	-0.6	-1.0	-0.7	-0.4	-0.7	-0.6	-0.8	-0.5	-0.4	0.3																							
19-Aug	-0.5	-0.3	-0.2	-0.2	-0.5	-0.4	-0.3	-0.1	-0.4	-0.2	-0.5	-0.2	-0.1	-0.4	-0.3	-0.3	-0.6	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.1																							
20-Aug	-0.1	0.0	0.4	0.1	0.1	0.1	0.1	0.2	0.5	0.4	0.0	0.1	0.9	-0.6	0.0	0.2	-0.2	-0.1	0.1	0.0	0.3	0.1	0.3	-0.1	0.1	0.9																							
21-Aug	-0.4	-0.1	0.4	0.2	0.3	0.3	0.6	0.1	0.2	0.4	0.1	0.5	0.2	0.6	0.7	0.3	0.2	0.3	0.2	0.3	0.5	0.4	0.3	0.3	0.3	0.7																							
22-Aug	0.5	0.5	0.6	0.6	0.7	0.4	0.0	0.3	0.2	0.6	0.5	0.3	0.2	0.8	0.1	0.1	-0.2	0.7	0.3	-0.1	-0.1	0.0	0.0	0.2	0.3	0.8																							
23-Aug	0.3	-0.1	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.1	-0.3	0.0	0.1	0.0	-0.3	-0.2	-0.3	-0.2	-0.4	-0.3	-0.5	-0.6	-0.6	-0.7	-0.4	-0.2	0.3																							
24-Aug	-0.1	0.0	-0.4	-0.7	-0.6	-0.4	-0.2	0.2	-0.3	-0.2	-0.3	0.0	0.3	0.2	0.2	-0.4	0.0	-0.2	-0.3	-0.4	-0.6	-0.3	-0.2	-0.2	-0.2	0.3																							
25-Aug	-0.3	-0.3	0.0	0.5	0.5	0.4	0.6	0.1	0.6	0.6	0.8	0.2	0.2	0.1	0.1	-0.2	0.1	0.0	0.1	0.1	0.2	0.3	0.1	0.3	0.2	0.8																							
26-Aug	0.3	0.4	0.5	0.5	0.4	0.3	0.4	0.5	0.7	0.5	0.4	0.2	-0.3	-0.6	-0.4	-0.1	-0.2	-0.3	-0.6	-0.5	-0.5	-0.3	-0.3	-0.2	0.0	0.7																							
27-Aug	-0.2	-0.3	-0.4	-0.4	-0.5	-0.6	-0.4	0.1	-0.2	0.3	0.6	0.5	0.5	0.3	1.2	1.0	0.3	-0.3	-0.4	0.0	0.0	-0.1	0.0	0.1	0.0	1.2																							
28-Aug	0.1	0.0	-0.1	-0.2	-0.2	0.1	-0.1	-0.1	0.0	0.1	0.2	0.1	0.2	0.4	0.6	0.3	0.5	0.6	0.5	0.5	0.5	0.3	0.3	0.6	0.2	0.6																							
29-Aug	0.4	0.5	0.4	0.5	0.6	0.5	0.3	0.7	0.7	0.4	0.4	0.6	0.4	0.6	0.6	-0.1	-0.2	-0.1	0.2	0.2	0.6	0.5	0.5	0.5	0.4	0.7																							
30-Aug	0.4	0.5	0.6	0.4	0.3	0.5	0.5	0.0	-0.4	0.3	0.2	-0.1	1.0	0.2	0.3	0.6	0.7	0.4	0.7	0.6	0.7	1.1	0.5	0.5	0.4	1.1																							
31-Aug	0.4	0.1	0.1	0.2	-0.2	-0.3	0.0	-0.1	-0.3	0.4	0.0	0.5	0.1	0.1	0.3	-0.3	-0.4	-0.3	-0.7	-0.2	-0.4	0.0	-0.4	0.0	-0.1	0.5																							
																								0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	Diurnal Average		
																								0.6	0.9	0.9	0.8	0.9	0.7	0.9	0.9	1.0	1.0	0.8	1.0	1.0	1.0	1.2	1.0	1.5	1.1	1.4	1.5	1.1	1.1	0.6	0.6	Diurnal Maximum	



Summary of Hour Standard Deviations

Mannix - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.4 km/h on Aug 24 13:00		Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0																							
Minimum Value: 0.1 km/h on Aug 6 03:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.4 Q ₃ = 2.0 P ₉₀ = 2.5 P ₉₉ = 3.2																									
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-Aug	1.9	1.9	1.9	1.9	1.9	2.1	2.0	2.0	1.9	1.9	1.9	2.2	2.3	2.5	2.3	1.5	0.8	1.0	1.2	1.0	1.3	1.0	0.7	0.5	2.5
2-Aug	0.5	0.4	0.4	0.4	0.6	0.7	0.8	1.2	1.4	1.8	2.1	1.7	1.7	2.1	2.3	1.9	1.6	1.2	1.0	0.6	0.5	0.4	0.5	0.6	2.3
3-Aug	0.6	0.3	0.4	0.5	0.6	0.9	1.2	0.8	0.8	1.2	1.4	2.1	2.2	1.9	1.9	2.0	1.9	1.7	0.9	0.6	0.4	0.4	0.6	0.8	2.2
4-Aug	0.8	1.1	1.1	1.0	1.3	1.2	1.4	1.7	1.8	2.0	2.3	2.3	2.0	1.4	1.8	2.4	1.4	1.2	0.6	0.7	0.6	0.4	0.6	0.6	2.4
5-Aug	0.7	0.7	0.3	0.2	0.3	0.4	0.3	1.0	1.5	1.7	2.0	2.0	2.1	2.2	2.2	2.0	1.8	1.8	1.6	1.4	1.0	0.7	0.4	0.5	2.2
6-Aug	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.6	1.5	1.4	1.9	2.2	1.4	1.3	1.8	1.8	1.4	1.3	1.2	0.6	0.5	0.9	1.1	1.4	2.2
7-Aug	1.1	0.6	0.5	0.7	0.6	0.2	0.9	1.4	1.7	1.6	2.5	3.0	2.4	2.5	3.0	2.7	2.4	2.5	2.2	1.7	1.2	0.9	1.3	1.3	3.0
8-Aug	1.1	0.4	0.4	0.4	0.7	0.6	1.1	1.6	2.0	2.3	2.1	2.5	2.7	2.5	2.8	2.7	2.9	2.8	3.0	2.6	2.5	2.1	1.7	1.6	3.0
9-Aug	1.6	1.8	2.0	2.1	1.8	1.7	1.7	1.8	2.1	2.4	2.8	3.0	2.8	2.7	2.9	2.8	2.6	2.6	2.4	2.2	1.9	2.3	1.9	2.0	3.0
10-Aug	2.5	2.5	1.9	2.2	2.2	2.2	2.0	2.0	2.1	2.2	2.1	2.1	2.5	2.5	2.5	2.5	2.4	2.3	1.6	1.6	1.0	1.0	0.9	1.1	2.5
11-Aug	1.6	1.2	1.2	1.0	1.0	1.0	1.2	1.4	1.4	1.8	1.6	1.2	1.7	1.6	1.8	2.0	1.9	1.6	1.4	0.6	0.3	0.3	0.5	1.0	2.0
12-Aug	0.9	0.6	0.6	0.5	0.6	1.0	1.2	1.2	1.1	1.3	1.9	2.0	2.2	2.1	1.7	1.4	1.6	1.2	0.8	0.5	0.5	0.3	0.2	0.4	2.2
13-Aug	0.5	0.4	0.4	0.9	1.5	1.2	1.5	1.8	1.5	2.1	2.6	3.1	2.9	3.2	3.1	3.3	3.0	2.5	1.9	1.0	0.4	0.5	0.3	0.7	3.3
14-Aug	1.4	0.5	0.5	0.6	1.5	2.5	1.5	0.7	1.3	2.0	2.3	2.3	3.3	3.3	2.9	2.4	2.3	2.0	1.4	1.1	0.6	0.4	0.7	0.3	3.3
15-Aug	0.4	0.6	0.5	0.7	0.5	0.8	1.2	1.3	1.5	1.2	0.9	1.4	1.5	1.5	1.9	1.7	1.5	1.3	1.3	2.4	2.6	2.5	1.7	1.2	2.6
16-Aug	0.9	0.4	0.3	0.7	0.7	0.9	0.9	1.3	2.0	2.1	2.2	2.3	2.2	2.5	2.4	2.3	2.4	2.0	1.3	0.7	0.6	0.7	0.7	0.9	2.5
17-Aug	0.8	0.6	1.0	1.0	0.9	0.7	1.2	1.3	1.2	1.9	1.5	2.0	2.2	2.5	2.0	1.5	1.8	2.3	1.0	0.7	1.8	1.5	0.6	1.2	2.5
18-Aug	2.0	2.5	3.0	2.8	2.5	2.9	2.9	2.6	2.3	2.5	3.0	2.5	2.4	2.0	2.3	1.6	1.9	2.0	2.1	1.8	2.1	2.0	1.9	1.4	3.0
19-Aug	1.6	1.0	1.1	1.0	0.7	1.0	1.5	1.8	1.6	1.9	2.1	1.9	2.7	2.5	2.6	2.9	2.7	2.5	1.5	0.9	0.7	0.6	0.8	0.8	2.9
20-Aug	0.7	0.9	0.8	0.9	0.6	0.6	1.1	1.4	1.7	2.0	1.9	2.0	2.0	2.2	1.9	2.0	1.8	1.1	0.7	0.5	0.4	0.6	0.4	0.6	2.2
21-Aug	0.6	0.6	0.8	0.4	0.7	0.4	0.7	0.9	1.3	1.8	1.7	2.2	2.6	2.4	2.4	2.2	1.9	1.5	1.0	0.3	0.3	0.2	0.2	0.3	2.6
22-Aug	0.2	0.3	0.5	0.3	0.3	0.3	0.7	1.2	1.2	1.6	2.0	2.3	2.3	2.5	2.4	2.0	1.7	1.4	0.9	0.3	0.2	0.2	0.3	0.5	2.5
23-Aug	0.4	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.8	0.8	1.0	1.3	0.9	0.5	0.6	0.8	1.0	1.2	1.7	2.2	2.7	3.1	2.8	3.1	3.1
24-Aug	3.0	3.3	3.2	3.2	3.0	2.8	3.0	2.7	2.7	2.9	2.9	3.1	3.4	3.3	3.2	2.7	2.5	2.0	1.5	1.1	1.1	1.0	0.4	0.4	3.4
25-Aug	0.2	0.2	0.2	0.3	0.7	0.9	1.0	1.0	1.5	1.6	1.9	2.1	2.7	2.5	2.3	2.2	2.3	1.2	0.7	0.8	1.2	1.3	1.1	0.6	2.7
26-Aug	0.6	0.6	0.5	0.5	0.3	0.5	0.7	1.2	1.7	2.3	2.6	2.7	2.4	2.3	2.4	1.8	1.5	1.5	2.8	2.6	2.9	2.2	1.3	0.8	2.9
27-Aug	0.4	0.3	0.4	0.4	0.2	0.4	0.3	0.5	0.8	1.6	2.0	1.7	2.0	2.1	2.2	2.1	1.7	1.4	0.5	0.5	0.7	0.9	0.7	0.5	2.2
28-Aug	0.8	0.5	0.4	0.3	0.2	0.3	0.4	0.5	0.6	0.6	1.2	1.1	1.6	1.4	1.2	0.8	0.9	0.9	0.7	0.6	0.4	0.5	0.4	0.5	1.6
29-Aug	0.8	0.4	0.5	0.6	0.5	0.7	0.8	1.0	1.1	1.3	1.5	1.7	1.7	2.1	2.1	1.6	1.0	0.7	0.4	0.3	0.4	0.4	0.4	0.7	2.1
30-Aug	0.6	0.7	0.5	0.4	0.4	0.3	0.7	0.9	1.0	1.4	1.7	1.6	2.1	1.8	1.7	1.6	2.2	1.6	1.4	1.4	1.4	1.4	1.0	0.6	2.2
31-Aug	0.4	0.7	0.9	0.4	0.5	0.6	0.6	0.9	1.6	1.5	1.7	2.0	2.0	2.1	2.1	1.8	1.5	1.5	1.6	1.4	1.7	1.0	1.0	1.1	2.1
3.0 3.3 3.2 3.2 3.0 2.9 3.0 2.7 2.7 2.9 3.0 3.1 3.4 3.3 3.2 3.3 3.0 2.8 3.0 2.6 2.9 3.1 2.8 3.1																									
Diurnal Maximum																									



Maximum Value: 1.5 km/h on Aug 20 13:00		Maximum Daily Average: 0.4 km/h on Aug 29		Hours in Service: 744																						
Minimum Value: -0.7 km/h on Aug 12 13:00		Minimum Daily Average: -0.1 km/h on Aug 9		Hours of Data: 744																						
Maximum Diurnal Average: 0.4 km/h at hour 10		Minimum Diurnal Average: 0.1 km/h at hour 22		Hours of Missing Data: 0																						
Monthly Average: 0.22 km/h		Percentiles: P ₁ = -0.5 P ₁₀ = -0.1 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.6 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-Aug	-0.2	0.1	0.4	0.2	0.4	0.2	0.5	0.3	0.2	-0.1	0.2	0.2	0.3	0.4	1.0	-0.1	0.1	-0.1	0.1	0.3	0.2	0.0	0.0	0.1	0.2	1.0
2-Aug	0.2	0.3	0.2	0.0	-0.1	0.1	-0.1	0.2	0.5	0.1	0.7	0.0	0.1	0.5	0.2	0.0	0.8	0.1	0.7	0.4	0.3	0.1	-0.1	0.1	0.2	0.8
3-Aug	0.1	0.3	0.2	0.1	0.3	0.3	0.1	0.3	0.2	0.5	0.2	0.5	0.2	0.6	-0.1	0.6	0.3	0.0	0.1	0.2	0.0	-0.1	0.0	0.2	0.2	0.6
4-Aug	0.2	0.4	0.5	0.4	0.2	0.3	0.3	0.0	0.1	0.5	0.3	0.3	-0.4	0.8	0.2	0.8	0.3	0.0	0.2	0.3	0.3	0.2	0.0	0.2	0.3	0.8
5-Aug	0.5	0.0	0.1	0.2	0.0	0.3	0.5	0.4	0.3	0.0	0.4	-0.2	0.6	0.8	0.2	-0.2	0.5	0.5	0.2	0.1	0.2	0.3	0.2	0.0	0.2	0.8
6-Aug	0.1	0.2	0.1	0.1	0.2	0.3	0.0	0.2	-0.1	0.1	0.1	0.5	0.6	0.2	-0.2	0.5	0.2	-0.1	-0.2	0.1	0.3	0.0	0.2	0.2	0.2	0.6
7-Aug	0.2	0.2	0.1	0.0	0.2	0.0	0.1	0.2	0.7	-0.2	0.5	0.2	0.1	0.9	0.6	0.5	0.1	0.2	0.5	0.2	0.1	0.1	0.3	0.2	0.2	0.9
8-Aug	0.2	0.3	0.2	0.1	0.1	0.2	0.7	0.0	-0.1	0.5	-0.1	0.2	0.4	0.5	0.7	0.2	0.6	0.5	0.7	1.1	0.8	-0.3	-0.3	-0.2	0.3	1.1
9-Aug	-0.2	-0.1	-0.1	0.0	-0.2	-0.2	0.2	-0.3	-0.2	-0.5	-0.3	0.3	-0.3	-0.2	0.0	0.2	0.7	0.5	-0.2	0.1	-0.3	-0.1	0.0	-0.1	-0.1	0.7
10-Aug	-0.2	0.1	0.0	-0.1	0.4	0.3	-0.2	-0.3	0.0	0.4	0.5	0.3	0.1	0.4	0.1	0.7	0.6	0.6	0.3	0.3	0.1	0.2	0.2	0.1	0.2	0.7
11-Aug	0.0	0.2	0.0	0.1	-0.1	0.1	0.1	-0.1	0.3	0.7	0.5	0.1	0.3	0.8	0.2	0.7	-0.2	0.0	0.4	0.2	0.4	0.6	0.5	0.2	0.3	0.8
12-Aug	0.2	0.1	-0.1	0.1	0.1	-0.1	0.2	0.3	0.1	0.1	0.1	-0.1	-0.7	0.4	0.3	0.2	0.1	0.4	0.3	0.1	0.0	0.1	0.2	0.1	0.1	0.4
13-Aug	0.0	0.1	0.1	0.4	0.8	0.7	0.7	0.8	0.5	0.9	0.0	0.1	-0.3	0.7	0.6	-0.2	-0.1	0.0	0.2	0.1	0.0	-0.1	-0.2	-0.1	0.2	0.9
14-Aug	0.3	0.3	-0.1	0.1	0.5	0.0	0.0	0.3	0.3	0.4	0.2	0.4	0.3	0.3	0.1	0.0	0.3	0.5	0.3	0.2	0.2	0.1	0.1	0.3	0.2	0.5
15-Aug	0.3	0.3	0.1	-0.1	0.0	0.3	0.6	0.4	0.6	0.8	0.6	0.5	0.7	0.3	0.2	0.5	0.6	0.2	0.1	0.5	-0.1	-0.2	-0.2	-0.5	0.3	0.8
16-Aug	0.4	0.0	0.2	0.2	0.3	0.4	0.3	0.3	0.6	0.5	0.9	0.3	0.3	0.1	0.0	0.3	-0.1	-0.2	0.0	-0.1	-0.1	-0.2	0.0	0.1	0.2	0.9
17-Aug	0.2	0.3	0.4	0.6	0.4	0.7	0.8	0.6	0.7	1.0	0.0	0.6	0.4	0.5	0.3	0.7	-0.7	-0.1	0.2	0.1	0.0	0.0	0.1	-0.1	0.3	1.0
18-Aug	-0.3	0.5	0.0	0.6	0.8	0.2	0.7	1.2	0.6	0.5	-0.2	0.3	0.6	-0.4	0.2	0.6	0.0	-0.4	-0.2	0.2	-0.3	-0.4	-0.5	-0.1	0.2	1.2
19-Aug	0.1	0.4	0.3	0.3	0.1	0.3	0.4	0.3	0.1	0.3	-0.1	0.1	0.5	0.3	0.1	0.4	0.3	0.2	-0.1	-0.1	-0.2	-0.1	0.0	-0.1	0.2	0.5
20-Aug	-0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.5	0.8	0.1	0.8	1.5	-0.7	0.2	0.7	0.5	0.3	0.2	0.1	0.3	0.4	0.3	0.1	0.3	1.5
21-Aug	-0.1	0.0	0.2	0.1	0.3	0.2	0.5	0.3	0.1	0.3	0.0	0.2	-0.4	0.3	0.7	0.2	0.2	0.4	0.4	0.5	0.6	0.2	0.6	0.1	0.2	0.7
22-Aug	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.0	0.4	0.5	0.2	0.2	0.8	-0.1	0.3	0.1	1.0	0.7	0.1	0.2	0.2	0.1	0.2	0.2	1.0
23-Aug	0.1	0.2	0.1	0.1	0.2	0.2	0.0	0.2	0.3	0.1	0.2	0.5	0.4	0.2	0.2	0.1	0.1	-0.2	0.0	-0.2	-0.3	-0.5	-0.4	-0.1	0.1	0.5
24-Aug	0.5	0.2	-0.1	-0.6	-0.4	-0.4	0.4	1.0	0.4	0.3	0.1	0.3	0.6	0.6	0.7	0.2	0.8	0.2	0.3	-0.1	-0.5	0.1	0.0	0.1	0.2	1.0
25-Aug	0.0	0.2	0.2	0.3	0.8	0.5	0.6	0.2	0.3	0.2	0.5	0.3	0.3	0.3	0.2	-0.1	0.4	0.1	0.2	0.2	0.3	0.3	0.1	0.2	0.3	0.8
26-Aug	0.2	0.2	0.4	0.3	0.2	0.1	0.3	0.5	0.8	0.6	0.5	0.5	0.0	0.0	0.5	0.5	0.3	0.3	-0.4	-0.2	-0.1	0.1	0.1	0.1	0.2	0.8
27-Aug	0.1	0.1	0.1	0.0	0.1	0.3	0.1	0.3	0.1	0.6	0.9	0.8	0.5	0.4	1.4	1.3	0.5	0.0	-0.1	0.0	0.0	-0.1	0.0	0.1	0.3	1.4
28-Aug	0.0	0.1	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.5	0.0	0.1	0.2	0.6	0.5	0.3	0.2	0.3	0.4	0.2	0.6
29-Aug	0.4	0.3	0.1	0.3	0.3	0.3	0.2	0.7	0.7	0.3	0.1	0.0	0.2	0.5	0.8	0.1	-0.1	0.1	0.3	0.4	0.6	0.7	0.8	0.9	0.4	0.9
30-Aug	0.8	0.8	0.5	0.5	0.3	0.1	0.4	-0.2	-0.3	0.2	0.1	-0.3	1.4	0.1	0.0	0.8	0.2	0.4	0.6	0.2	0.0	0.5	0.5	0.3	0.3	1.4
31-Aug	0.3	0.1	0.1	0.4	0.1	0.3	0.1	0.2	0.1	0.9	-0.1	0.6	0.2	0.6	0.7	0.1	-0.1	0.3	0.1	0.4	0.0	0.7	0.3	0.7	0.3	0.9
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0																				Hours in Service: 744					
Maximum Value: 3.8 km/h on Aug 8 17:00																				Hours of Data: 744					
Minimum Value: 0.1 km/h on Aug 6 03:00																				Hours of Missing Data: 0					
Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 1.3 Q ₃ = 2.2 P ₉₀ = 2.7 P ₉₉ = 3.4																				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-Aug	1.8	1.8	1.9	2.0	1.9	2.2	2.1	2.1	1.9	1.9	2.0	2.2	2.3	2.6	2.8	1.5	0.7	0.6	1.0	0.8	1.3	1.1	0.8	0.6	2.8
2-Aug	0.4	0.3	0.3	0.4	0.5	0.5	0.8	1.2	1.6	2.1	2.5	2.0	2.1	2.5	2.6	2.3	1.9	1.3	1.2	0.9	1.0	0.7	0.8	1.0	2.6
3-Aug	0.9	0.7	0.4	0.8	0.6	0.7	1.0	0.6	0.9	1.2	1.3	2.2	2.5	2.0	1.4	2.0	2.0	1.8	0.9	0.6	0.4	0.3	0.7	0.8	2.5
4-Aug	0.7	1.0	1.0	0.9	1.1	1.0	1.2	1.5	1.8	2.0	2.4	2.7	2.2	1.6	1.8	2.4	1.6	1.2	0.7	0.5	0.5	0.5	0.4	0.5	2.7
5-Aug	0.7	0.9	0.4	0.3	0.2	0.6	0.4	0.8	1.5	1.9	2.3	2.2	2.5	2.2	2.7	2.0	2.1	1.9	1.3	0.8	0.6	0.6	0.4	0.6	2.7
6-Aug	0.3	0.2	0.1	0.2	0.2	0.3	0.1	0.6	1.4	1.6	1.9	2.3	1.4	1.2	1.9	2.2	1.5	1.5	1.3	0.8	0.7	1.2	0.9	1.4	2.3
7-Aug	1.3	0.8	0.6	0.5	0.5	0.4	0.7	1.2	1.9	1.9	2.9	3.4	2.8	2.9	3.4	3.0	2.8	2.5	2.2	1.4	0.7	0.5	1.0	1.3	3.4
8-Aug	1.5	0.7	0.7	0.6	1.1	1.1	1.2	1.6	2.0	2.5	2.4	3.0	3.3	3.1	3.4	3.1	3.8	3.6	3.6	3.2	3.1	2.2	1.8	1.8	3.8
9-Aug	1.6	1.6	1.7	1.8	1.7	1.7	1.9	1.9	1.9	2.2	2.6	2.9	2.7	2.5	2.9	3.2	3.2	3.0	2.3	2.1	2.0	2.4	1.9	2.0	3.2
10-Aug	2.5	2.5	1.8	2.2	2.6	2.5	2.1	2.0	2.2	2.8	2.7	2.4	3.2	3.2	3.1	3.0	2.7	2.5	1.8	1.7	1.0	0.9	0.8	0.8	3.2
11-Aug	1.5	1.4	1.0	1.0	1.1	0.8	1.2	1.2	1.4	1.9	1.7	1.4	1.9	1.8	2.0	2.4	2.0	2.0	1.4	0.4	0.3	0.2	0.5	0.6	2.4
12-Aug	0.7	0.7	0.7	0.4	0.5	1.0	1.1	1.1	1.2	1.3	1.9	2.2	2.5	2.5	1.9	1.3	1.5	1.2	0.9	0.3	0.6	0.3	0.2	0.4	2.5
13-Aug	0.6	0.5	0.4	0.7	1.0	1.0	1.0	1.5	1.3	2.2	2.8	3.1	2.9	3.6	3.1	3.2	2.9	2.4	1.9	1.0	0.5	0.4	0.3	0.9	3.6
14-Aug	1.2	0.4	0.5	0.7	1.2	2.5	1.5	0.6	1.2	2.0	2.4	2.4	2.3	2.9	2.8	2.2	2.3	2.2	1.4	1.1	0.5	0.4	1.0	0.5	2.9
15-Aug	0.4	0.5	0.5	0.9	0.6	0.6	0.6	0.8	1.0	1.1	0.8	1.1	1.2	1.2	2.1	1.7	1.5	1.5	1.3	2.2	2.3	2.3	1.6	1.3	2.3
16-Aug	1.2	0.4	0.3	0.6	0.8	1.2	0.8	1.3	2.0	2.2	2.8	2.4	2.6	3.0	2.9	2.7	2.6	2.0	1.2	0.6	0.5	0.6	0.6	0.9	3.0
17-Aug	0.7	0.9	0.8	0.8	0.6	0.5	0.7	1.0	1.2	2.2	1.6	2.0	2.5	2.8	2.2	1.7	1.9	2.0	1.2	0.7	1.5	1.3	0.7	1.0	2.8
18-Aug	1.9	2.5	2.6	2.6	2.4	2.6	2.9	2.8	2.5	2.7	3.0	2.8	2.9	2.0	2.5	1.8	2.0	1.5	1.8	1.8	1.9	1.7	1.6	1.3	3.0
19-Aug	1.5	1.0	1.2	1.0	0.6	0.9	1.1	1.6	1.7	1.8	2.0	2.0	3.1	2.6	2.6	3.0	2.8	2.5	1.3	0.6	0.6	0.7	0.7	0.9	3.1
20-Aug	0.8	1.2	1.1	1.0	0.6	0.6	0.8	1.3	1.8	2.3	2.1	2.1	2.5	2.4	2.3	2.1	1.9	1.0	0.7	0.4	0.7	0.6	0.3	0.6	2.5
21-Aug	0.7	0.6	1.0	0.5	0.6	0.6	0.6	0.7	1.0	1.6	1.6	2.3	2.7	2.7	2.7	2.3	2.3	1.4	0.8	0.3	0.3	0.2	0.2	0.5	2.7
22-Aug	0.5	0.4	0.5	0.8	0.7	0.6	0.4	0.8	1.1	1.4	2.2	2.7	2.8	2.7	2.6	2.4	2.0	1.6	1.1	0.3	0.2	0.4	0.6	0.7	2.8
23-Aug	0.5	0.7	0.2	0.3	0.4	0.5	0.6	0.3	0.6	0.8	1.0	1.2	0.9	0.5	0.6	0.7	0.9	1.4	1.6	1.9	2.4	2.6	2.6	2.8	2.8
24-Aug	2.9	3.2	2.7	2.8	2.8	2.4	3.0	2.6	2.7	2.8	2.7	3.0	3.3	3.4	3.4	2.9	2.9	2.1	1.4	1.0	1.4	1.1	0.5	0.5	3.4
25-Aug	0.2	0.2	0.3	0.3	0.4	0.7	0.7	0.7	1.1	1.3	1.8	2.3	3.0	2.7	2.5	2.3	2.5	1.2	0.7	0.8	1.0	1.1	1.1	0.7	3.0
26-Aug	0.6	0.6	0.6	0.6	0.5	0.7	0.6	0.9	1.6	2.2	3.0	2.9	2.6	2.5	2.6	2.0	1.5	1.6	2.5	2.3	2.9	1.7	1.5	0.9	3.0
27-Aug	0.4	0.4	0.5	0.7	0.2	0.3	0.3	0.6	0.6	1.6	2.1	2.0	2.0	2.2	2.4	2.2	2.0	1.2	0.4	0.6	0.8	0.9	0.9	0.5	2.4
28-Aug	1.1	0.6	0.6	0.5	0.3	0.3	0.4	0.4	0.4	0.3	0.9	1.2	1.6	1.3	1.0	0.5	0.4	0.3	0.6	0.6	0.4	0.6	0.4	0.4	1.6
29-Aug	0.5	0.3	0.4	0.4	0.4	0.5	0.6	0.8	0.7	1.1	1.1	1.1	1.3	1.5	2.4	2.4	1.8	1.0	0.6	0.2	0.2	0.2	0.3	0.3	2.4
30-Aug	0.4	0.4	0.5	0.4	0.5	0.4	0.6	0.7	0.8	1.4	1.7	1.6	2.4	2.0	1.7	1.8	2.1	1.4	1.0	0.9	1.7	1.8	0.9	0.6	2.4
31-Aug	0.5	0.5	1.3	0.5	0.4	0.5	0.5	0.7	1.6	1.8	1.7	2.4	2.3	2.5	2.4	2.1	1.7	1.6	1.5	1.6	1.7	1.3	1.2	1.1	2.5
2.9 3.2 2.7 2.8 2.8 2.6 3.0 2.8 2.7 2.8 3.0 3.4 3.3 3.6 3.4 3.2 3.8 3.6 3.6 3.2 3.1 2.6 2.6 2.8																									
Diurnal Maximum																									



Summary of Hour Averages

Mannix - August 2023

Maximum Value: 1.9 km/h on Aug 24 08:00		Maximum Daily Average: 0.7 km/h on Aug 24		Hours in Service: 744																						
Minimum Value: -1.3 km/h on Aug 12 13:00		Minimum Daily Average: -0.4 km/h on Aug 13		Hours of Data: 744																						
Maximum Diurnal Average: 0.1 km/h at hour 20		Minimum Diurnal Average: -0.1 km/h at hour 3		Hours of Missing Data: 0																						
Monthly Average: 0.04 km/h		Percentiles: P ₁ = -1.0 P ₁₀ = -0.6 Q ₁ = -0.3 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 0.7 P ₉₉ = 1.3		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-Aug	-0.9	-0.6	-0.3	-0.4	-0.2	-0.5	-0.1	-0.3	-0.4	-0.7	-0.3	-0.3	-0.2	-0.1	0.8	-0.6	-0.1	-0.5	-0.5	-0.1	0.0	0.3	0.1	0.1	-0.2	0.8
2-Aug	0.1	0.0	-0.1	-0.2	-0.5	-0.1	-0.4	0.0	0.1	-0.3	0.3	-0.3	-0.3	0.0	-0.2	-0.2	0.9	-0.1	0.8	0.4	0.3	0.2	0.1	0.1	0.0	0.9
3-Aug	0.0	0.2	0.0	0.0	0.3	0.5	0.4	-0.1	0.0	0.2	0.1	0.4	-0.2	0.6	0.2	0.6	0.6	0.0	-0.2	0.0	-0.3	-0.6	-0.4	-0.1	0.1	0.6
4-Aug	-0.2	-0.1	0.1	0.1	-0.2	-0.1	-0.2	-0.5	-0.4	0.0	0.0	0.0	-0.7	0.6	-0.4	0.8	0.3	-0.2	-0.1	0.0	0.0	-0.2	-0.4	-0.2	-0.1	0.8
5-Aug	0.4	-0.1	0.0	-0.1	-0.3	0.0	0.2	0.1	0.1	-0.3	0.2	-0.5	-0.5	0.4	0.8	-0.3	0.6	0.8	0.6	0.8	0.7	0.6	0.4	0.2	0.2	0.8
6-Aug	0.1	0.1	0.1	0.0	0.0	0.1	-0.1	0.0	0.3	0.2	0.3	0.7	0.7	0.2	-0.1	0.5	0.3	0.0	-0.1	0.1	0.3	0.1	0.8	0.8	0.2	0.8
7-Aug	0.5	0.3	0.3	0.2	0.4	0.0	0.1	0.2	0.6	-0.6	0.5	0.0	0.2	1.3	1.0	1.0	0.7	0.8	1.0	0.6	0.7	0.8	0.9	0.4	0.5	1.3
8-Aug	0.3	0.3	0.1	0.1	0.1	0.0	0.8	-0.1	-0.3	0.2	-0.1	0.1	0.4	0.9	0.8	0.3	1.2	1.1	0.8	1.2	0.9	-0.5	-0.2	-0.5	0.3	1.2
9-Aug	0.1	-0.2	-0.7	-0.1	-0.6	-0.7	0.0	-0.5	0.2	-0.4	0.0	0.3	-0.4	-0.3	-0.1	0.1	0.8	0.2	-0.5	-0.5	-0.8	-0.7	-0.6	-0.5	-0.2	0.8
10-Aug	-0.8	-0.4	-0.5	-0.6	0.1	0.1	-0.6	-0.7	-0.5	0.3	0.6	0.7	0.8	1.0	0.5	1.1	1.1	1.0	0.7	0.7	0.4	0.6	0.5	0.5	0.3	1.1
11-Aug	0.5	0.6	0.3	0.3	0.0	0.3	0.2	0.0	0.2	0.5	0.1	-0.2	0.0	0.6	-0.2	0.5	-0.6	-0.4	0.0	0.1	0.1	0.0	0.0	0.3	0.1	0.6
12-Aug	-0.1	-0.4	-0.4	-0.3	-0.3	-0.6	-0.2	-0.1	-0.3	-0.4	-0.4	-0.6	-1.3	0.1	-0.1	-0.3	-0.4	0.0	0.0	-0.2	-0.4	-0.2	-0.1	-0.2	-0.3	0.1
13-Aug	-0.4	-0.4	-0.3	-0.1	0.3	0.1	0.1	0.3	0.1	0.4	-0.6	-0.8	-1.1	0.0	-0.2	-1.1	-1.0	-0.9	-0.5	-0.3	-0.6	-0.8	-0.8	-0.7	-0.4	0.4
14-Aug	0.2	0.0	-0.6	-0.2	0.0	0.5	0.3	0.0	-0.1	-0.1	-0.3	-0.2	-0.4	-0.8	-0.7	-0.6	-0.3	0.0	-0.1	-0.2	-0.3	-0.3	0.0	0.1	-0.2	0.5
15-Aug	0.0	-0.1	-0.2	-0.6	-0.4	-0.2	0.0	0.0	0.2	0.1	0.2	0.1	0.5	0.1	-0.1	0.3	0.5	0.0	-0.1	1.4	0.4	0.4	0.2	-0.4	0.1	1.4
16-Aug	0.4	0.0	-0.1	0.0	0.1	0.4	0.0	-0.1	0.3	0.2	0.5	0.0	-0.2	-0.4	-0.4	-0.4	-0.7	-0.8	-0.5	-0.7	-1.0	-1.2	-0.9	-0.8	-0.3	0.5
17-Aug	-0.6	-0.7	-0.3	0.0	-0.2	0.0	0.3	0.0	0.3	0.7	-0.4	0.3	-0.1	0.0	-0.1	0.3	-1.2	0.2	0.2	0.0	0.0	0.7	0.3	-0.1	0.0	0.7
18-Aug	-0.1	1.2	0.8	1.7	1.6	1.2	1.5	1.9	1.3	0.9	0.4	0.5	0.5	-0.3	0.3	0.6	-0.1	-0.1	0.1	0.7	0.0	-0.1	-0.2	0.0	0.6	1.9
19-Aug	0.0	0.1	-0.2	-0.1	-0.3	-0.2	-0.1	-0.2	-0.4	-0.2	-0.6	-0.4	0.1	-0.1	-0.6	-0.2	-0.4	-0.6	-0.8	-0.6	-0.8	-0.7	-0.6	-0.7	-0.4	0.1
20-Aug	-0.6	-0.4	-0.3	-0.2	-0.1	-0.4	-0.5	-0.3	0.1	0.6	-0.3	0.9	1.6	-1.3	-0.1	0.7	0.1	0.1	0.3	0.2	0.4	0.0	-0.1	-0.5	0.0	1.6
21-Aug	-0.6	-0.5	-0.2	-0.4	0.0	-0.2	0.0	-0.1	-0.1	0.2	-0.2	0.0	-0.7	0.1	0.6	-0.1	-0.3	-0.2	-0.1	-0.1	-0.1	-0.2	0.0	0.1	-0.1	0.6
22-Aug	0.4	0.6	0.5	0.1	0.3	0.3	0.0	-0.1	-0.4	0.2	0.0	-0.2	-0.1	0.7	-0.5	-0.2	-0.4	1.1	0.7	0.1	0.1	0.2	0.0	0.1	0.2	1.1
23-Aug	0.3	0.1	0.1	0.1	0.1	0.1	-0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.4	0.2	0.8	0.6	0.7	0.4	0.7	0.9	0.3	0.9	0.9
24-Aug	1.4	1.1	1.0	0.5	0.6	0.5	1.3	1.9	1.1	1.1	1.1	1.3	1.3	1.0	0.9	0.2	0.9	0.1	0.2	-0.1	-0.7	0.2	0.3	0.3	0.7	1.9
25-Aug	-0.1	-0.1	0.0	0.2	0.2	-0.1	0.0	-0.1	0.2	0.0	0.2	-0.3	-0.3	-0.3	-0.3	-0.8	-0.2	-0.4	-0.4	-0.7	-0.7	-0.5	-0.7	-0.6	-0.2	0.2
26-Aug	-0.6	-0.6	-0.5	-0.5	-0.6	-0.6	-0.5	-0.2	0.4	0.1	-0.1	-0.2	-0.7	-0.8	-0.1	0.0	-0.1	-0.2	0.4	0.8	1.1	1.1	0.5	0.4	-0.1	1.1
27-Aug	0.2	-0.1	0.0	0.1	0.0	0.1	0.0	0.2	-0.1	0.3	0.5	0.6	0.5	0.2	1.3	0.9	0.1	-0.5	-0.7	-0.6	-0.6	-0.6	-0.5	-0.2	0.0	1.3
28-Aug	-0.2	-0.2	-0.1	-0.2	-0.3	-0.1	-0.4	-0.4	-0.2	-0.1	-0.2	-0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.0	-0.1	-0.2	-0.3	-0.2	-0.1	-0.1	0.2
29-Aug	-0.2	-0.3	-0.4	-0.3	-0.3	-0.2	-0.3	0.2	0.3	-0.1	0.1	-0.2	0.0	0.2	0.3	-0.4	-0.6	-0.3	-0.2	0.0	-0.1	0.0	0.1	0.2	-0.1	0.3
30-Aug	0.0	0.0	0.2	0.0	0.1	0.3	0.2	0.0	-0.1	-0.1	-0.3	-0.7	1.1	-0.2	-0.2	0.5	0.0	0.0	0.1	0.1	-0.1	0.5	0.4	0.2	0.1	1.1
31-Aug	0.4	0.1	-0.1	0.1	-0.4	-0.1	-0.3	-0.2	-0.3	0.8	-0.5	0.3	-0.3	0.2	0.4	-0.3	-0.5	0.2	0.4	0.6	0.4	0.8	0.3	0.7	0.1	0.8
																								Diurnal Average		
																								Diurnal Maximum		



Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 3.8 km/h on Aug 7 15:00 Minimum Value: 0.1 km/h on Aug 6 03:00 Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 1.3 Q ₃ = 2.3 P ₉₀ = 2.8 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 Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	1.7	1.7	1.9	1.9	1.9	2.2	2.2	2.1	1.8	1.8	2.0	2.3	2.4	2.7	3.0	1.4	0.8	0.7	0.8	0.8	1.3	1.2	0.9	0.6	3.0
2-Aug	0.4	0.3	0.3	0.4	0.4	0.5	0.7	1.2	1.7	2.2	2.7	2.2	2.3	2.7	3.0	2.7	2.2	1.4	1.2	0.8	0.5	0.4	0.5	0.7	3.0
3-Aug	0.8	0.5	0.4	0.5	0.5	0.6	0.9	0.5	0.9	1.1	1.3	2.4	2.7	2.1	1.3	1.9	2.0	1.9	0.9	0.6	0.4	0.4	0.7	0.8	2.7
4-Aug	0.6	0.9	1.1	0.9	1.0	0.8	1.0	1.4	1.7	2.1	2.7	3.0	2.4	1.7	1.8	2.4	1.7	1.4	0.7	0.5	0.5	0.5	0.4	0.5	3.0
5-Aug	0.7	1.0	0.5	0.3	0.3	0.6	0.3	0.7	1.5	1.9	2.7	2.3	2.7	2.4	3.2	2.3	2.5	2.0	1.2	0.7	0.6	0.7	0.4	0.6	3.2
6-Aug	0.3	0.3	0.1	0.2	0.2	0.2	0.2	0.5	1.4	1.4	1.9	2.2	1.6	1.2	2.0	2.4	1.6	1.6	1.3	0.8	0.8	1.3	0.8	1.5	2.4
7-Aug	1.3	0.9	0.6	0.4	0.5	0.5	0.7	1.4	2.0	2.1	3.2	3.8	2.9	3.1	3.8	3.2	3.1	2.7	2.3	1.3	0.5	0.3	1.0	1.2	3.8
8-Aug	1.1	0.7	0.6	0.6	0.9	0.9	1.3	1.6	2.2	2.8	2.4	3.0	3.3	3.0	3.4	3.0	3.2	2.9	3.0	2.7	3.1	2.3	1.8	1.9	3.4
9-Aug	1.6	1.3	1.6	1.8	1.6	1.5	1.8	1.9	1.9	2.3	2.8	2.8	2.7	2.6	3.0	3.2	3.1	3.0	2.4	2.1	1.9	2.2	1.8	2.0	3.2
10-Aug	2.4	2.5	1.9	2.3	2.6	2.6	2.2	2.0	2.1	2.4	2.2	2.2	3.0	2.7	2.7	2.8	2.5	2.5	1.8	1.7	1.1	0.9	0.9	0.8	3.0
11-Aug	1.6	1.5	1.1	1.0	1.2	0.9	1.3	1.3	1.5	2.1	1.9	1.5	2.1	2.0	2.1	2.7	2.2	2.2	1.5	0.4	0.2	0.1	0.3	0.5	2.7
12-Aug	0.7	0.8	0.8	0.4	0.5	0.9	1.0	1.1	1.1	1.3	1.9	2.2	2.8	2.7	2.2	1.1	1.5	1.1	0.8	0.2	0.6	0.3	0.2	0.4	2.8
13-Aug	0.6	0.6	0.4	0.7	0.9	1.0	0.9	1.3	1.2	2.2	3.0	3.2	3.1	3.8	3.3	3.2	2.8	2.4	1.9	1.0	0.5	0.4	0.3	1.0	3.8
14-Aug	1.1	0.5	0.5	0.9	1.1	2.6	1.5	0.6	1.0	2.0	2.3	2.3	2.3	2.8	2.7	2.3	2.3	2.1	1.4	1.1	0.5	0.4	1.1	0.6	2.8
15-Aug	0.4	0.5	0.5	0.9	0.7	0.5	0.6	0.6	0.9	1.1	0.9	1.1	1.1	1.2	2.3	1.9	1.5	1.7	1.4	2.2	2.2	2.2	1.6	1.3	2.3
16-Aug	1.3	0.4	0.3	0.5	0.8	1.4	0.7	1.3	2.0	2.2	3.1	2.5	2.8	3.2	3.2	2.9	2.7	2.0	1.2	0.7	0.5	0.5	0.5	0.8	3.2
17-Aug	0.8	0.9	1.0	0.8	0.5	0.5	0.6	0.8	1.2	2.4	1.7	2.1	2.7	3.0	2.4	1.7	2.3	1.9	2.9	0.8	1.5	1.3	0.7	0.9	3.0
18-Aug	1.7	2.5	2.6	2.8	2.5	2.7	2.8	2.9	2.6	2.8	3.2	3.0	3.1	2.0	2.6	1.9	2.1	1.5	1.7	1.9	1.8	1.5	1.5	1.2	3.2
19-Aug	1.5	1.0	1.1	1.0	0.5	0.7	0.8	1.6	1.9	1.9	1.9	2.0	3.2	2.8	2.8	3.2	2.9	2.5	1.2	0.6	0.5	0.8	0.7	0.8	3.2
20-Aug	0.9	1.5	1.3	1.1	0.6	0.7	0.7	1.2	1.8	2.6	2.3	2.5	2.8	2.7	2.7	2.4	2.0	1.0	0.8	0.4	0.5	0.6	0.3	0.6	2.8
21-Aug	0.7	0.7	1.0	0.5	0.6	0.6	0.5	0.5	1.0	1.8	1.7	2.5	3.0	3.1	3.1	2.5	2.4	1.5	0.7	0.2	0.3	0.1	0.1	0.5	3.1
22-Aug	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.7	1.0	1.5	2.4	2.9	3.2	3.1	2.8	2.7	2.3	1.8	1.2	0.3	0.2	0.3	0.5	0.6	3.2
23-Aug	0.4	0.8	0.2	0.3	0.4	0.5	0.4	0.3	0.5	0.7	1.0	1.1	1.0	0.5	0.5	0.7	0.9	1.5	1.6	1.9	2.4	2.6	2.6	2.8	2.8
24-Aug	3.0	3.4	2.6	2.8	3.1	2.5	3.1	2.7	2.8	2.9	2.9	3.1	3.3	3.6	3.7	3.0	3.1	2.2	1.5	0.9	1.6	1.2	0.5	0.5	3.7
25-Aug	0.2	0.1	0.3	0.4	0.3	0.5	0.5	0.6	1.0	1.2	1.8	2.4	3.1	2.9	2.7	2.4	2.6	1.1	0.7	0.7	1.0	1.2	1.0	0.7	3.1
26-Aug	0.7	0.5	0.6	0.6	0.5	0.7	0.6	0.8	1.6	2.4	3.2	3.1	2.8	2.5	2.7	2.1	1.5	1.5	2.5	2.3	3.2	1.7	1.7	1.1	3.2
27-Aug	0.4	0.4	0.5	0.9	0.2	0.3	0.3	0.6	0.7	1.8	2.3	2.1	2.3	2.4	2.8	2.4	2.0	1.2	0.5	0.7	0.8	1.0	1.0	0.5	2.8
28-Aug	1.2	0.8	0.7	0.5	0.3	0.3	0.4	0.4	0.4	0.3	0.8	1.2	1.7	1.3	1.0	0.5	0.3	0.2	0.6	0.7	0.5	0.7	0.5	0.5	1.7
29-Aug	0.5	0.4	0.4	0.5	0.3	0.6	0.6	0.6	0.6	1.3	1.1	1.3	1.5	2.4	2.5	1.9	0.9	0.5	0.2	0.2	0.2	0.2	0.2	0.3	2.5
30-Aug	0.2	0.3	0.3	0.2	0.3	0.4	0.6	0.7	0.7	1.4	1.7	1.6	2.6	2.2	1.7	2.0	2.2	1.3	0.9	1.0	1.6	1.7	1.0	0.6	2.6
31-Aug	0.5	0.6	1.3	0.4	0.4	0.4	0.5	0.5	1.7	2.0	1.8	2.6	2.6	2.7	2.7	2.4	1.9	1.7	1.9	1.8	1.8	1.4	1.3	1.1	2.7
3.0 3.4 2.6 2.8 3.1 2.7 3.1 2.9 2.8 2.9 3.2 3.8 3.3 3.8 3.8 3.2 3.2 3.0 3.0 2.7 3.2 2.6 2.6 2.8																									
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS06
PATRICIA MCINNES
AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
AUGUST 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	38	39	99.87	13.5	0	3.2	0
TRS (ppb) Average	701	37	43	99.19	3.2	0	1.2	0
THC (ppm) Average	703	38	41	99.6	2.8	-	2.4	-
NMHC(ppm) Average	703	38	41	99.6	0.225	-	0.095	-
CH4(ppm) Average	703	38	41	99.6	2.7	-	2.4	-
O3 (ppb) Average	708	35	36	99.87	62.2	0	31.1	-
NO2 (ppb) Average	707	36	37	99.87	27	0	10.9	-
NO (ppb) Average	707	36	37	99.87	14.7	-	4.5	-
NOX (ppb) Average	707	36	37	99.87	38.7	-	15.4	-
NH3 (ppb) Average	595	44	149	85.89	47.1	0	20.9	-
PM2.5 (ug/m3) Average	743	1	1	100	344	91	164.3	16
Temperature 2 m (C) Average	744	0	0	100	29.7	-	21.3	-
Relative Humidity (%) Average	744	0	0	100	97.3	-	92.4	-
Wind Speed 10 m (km/h) Average	742	2	2	100	23	-	14	-
Wind Direction 10 m (deg) Average	742	2	2	100	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - PATRICIA McINNES (AMS06)
AUGUST 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	0.61	1.5	-	0	0	0	0.1	0.3	1.8	13.5
TRS (ppb) Average	701	0.46	0.3	-	0.1	0.3	0.3	0.4	0.5	0.7	3.2
THC (ppm) Average	703	2.15	0.2	-	2	2	2	2.1	2.2	2.4	2.8
NMHC(ppm) Average	703	0.03	0.03	-	0	0	0	0	0	0.1	0.225
CH4(ppm) Average	703	2.13	0.2	-	1.9	2	2	2.1	2.2	2.4	2.7
O3 (ppb) Average	708	24.26	9.9	-	3.7	11.7	16.6	23.4	30.8	37.4	62.2
NO2 (ppb) Average	707	2.43	3.3	-	0	0.1	0.4	1.3	3.3	5.8	27
NO (ppb) Average	707	0.74	1.6	-	0	0	0.1	0.3	0.6	1.4	14.7
NOX (ppb) Average	707	3.16	4.6	-	0	0.1	0.6	1.8	3.9	7	38.7
NH3 (ppb) Average	595	1.96	6.2	-	0	0	0	0	0	10.7	47.1
PM2.5 (ug/m3) Average	743	40.79	56.5	-	2.8	4.9	7.9	18.6	55.7	88.9	344
Temperature 2 m (C) Average	744	16.91	4.7	-	5.3	11.7	13.4	16.3	20.2	23.6	29.7
Relative Humidity (%) Average	744	72.48	16.5	-	30.7	48	58.6	75.4	86.7	92.7	97.3
Wind Speed 10 m (km/h) Average	742	8.9	4	-	1	3	5	8	12	15	23
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

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

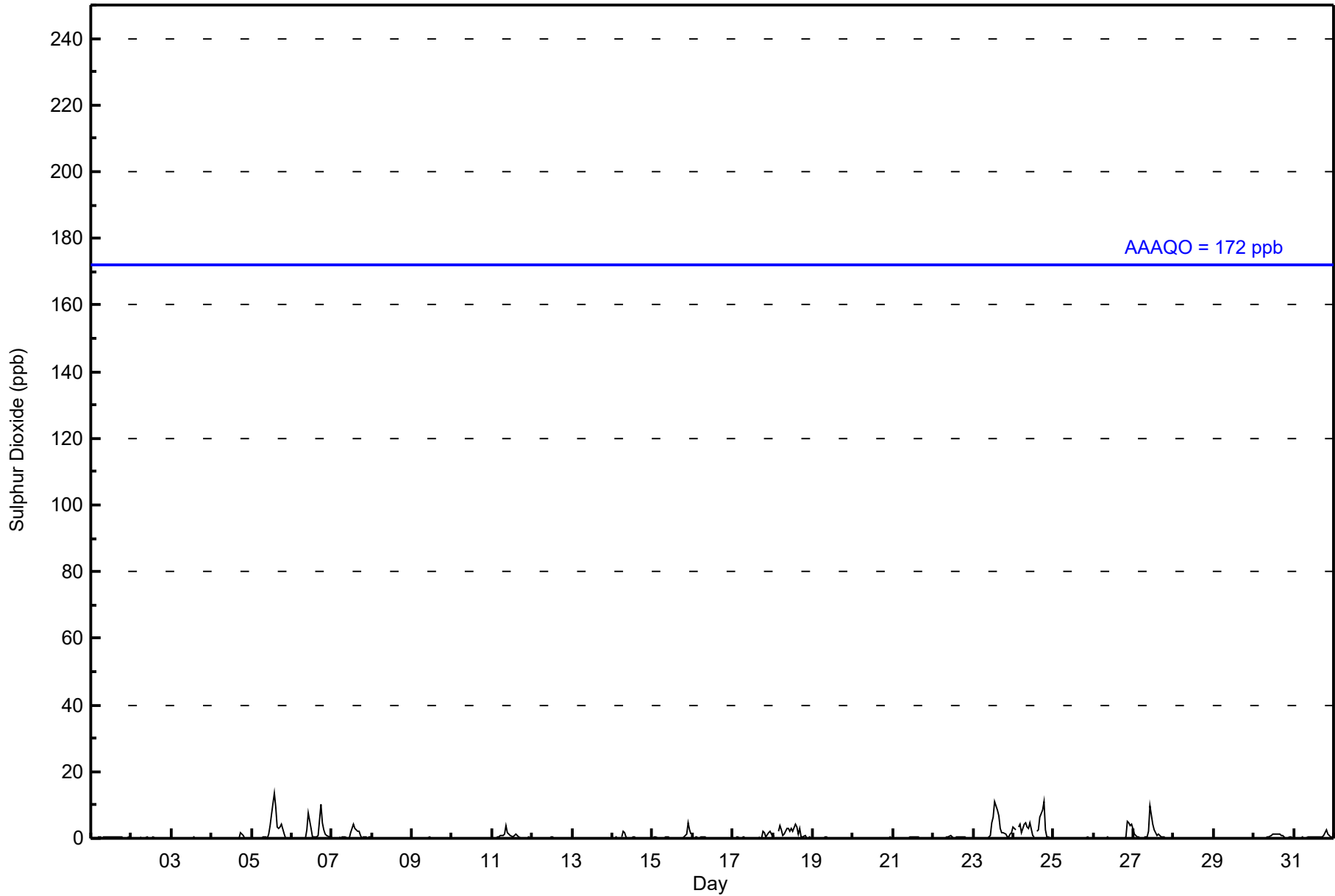
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	24 Aug 2023 14:00	24 Aug 2023 14:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	24 Aug 2023 10:00	24 Aug 2023 11:00	2	Maintenance - replaced support gas cylinder
NH3	02 Aug 2023 18:00	03 Aug 2023 10:00	17	Maintenance - replaced sample pump
TRS	28 Aug 2023 09:00	28 Aug 2023 13:00	5	Maintenance - repalced the scurbber beads
NH3	01 Aug 2023 02:00	31 Aug 2023 04:00	87	Stabilization after daily span



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	702	99.57	99.57
11 - 20	3	0.43	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
Patricia McInnes - August 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	55	13	13	5	15	59	35	31	48	95	74	50	62	56	33	56	700
11 - 20	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
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	56	13	13	5	15	59	35	31	48	95	74	50	62	57	33	57	703

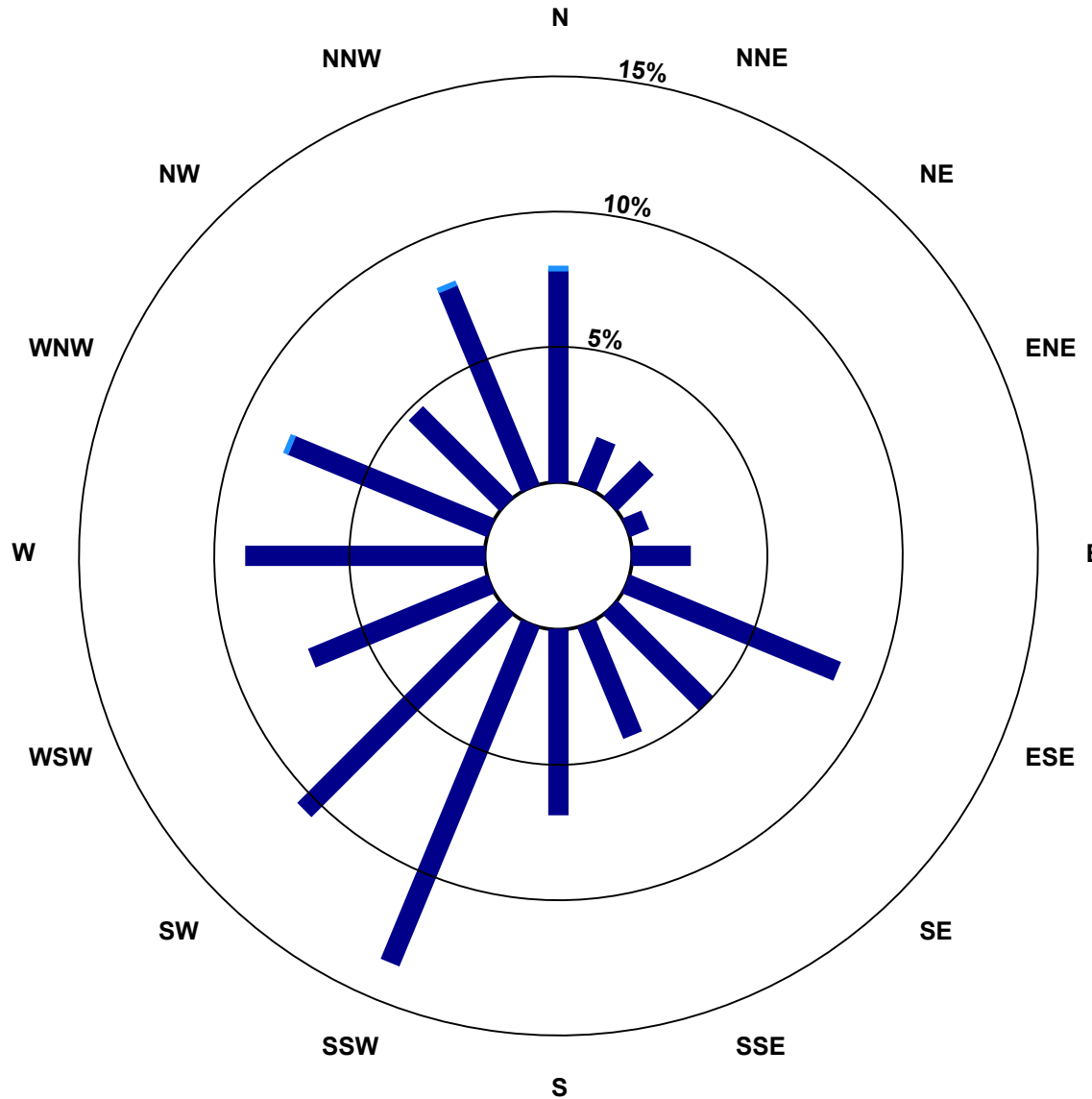
Total Number of Valid Hours: 703

Total Number of Hours: 744

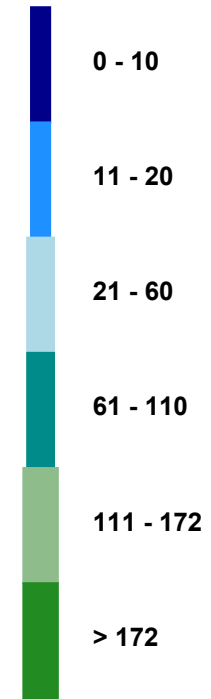


Wood Buffalo Environmental Association
Wind Rose Aug 2023

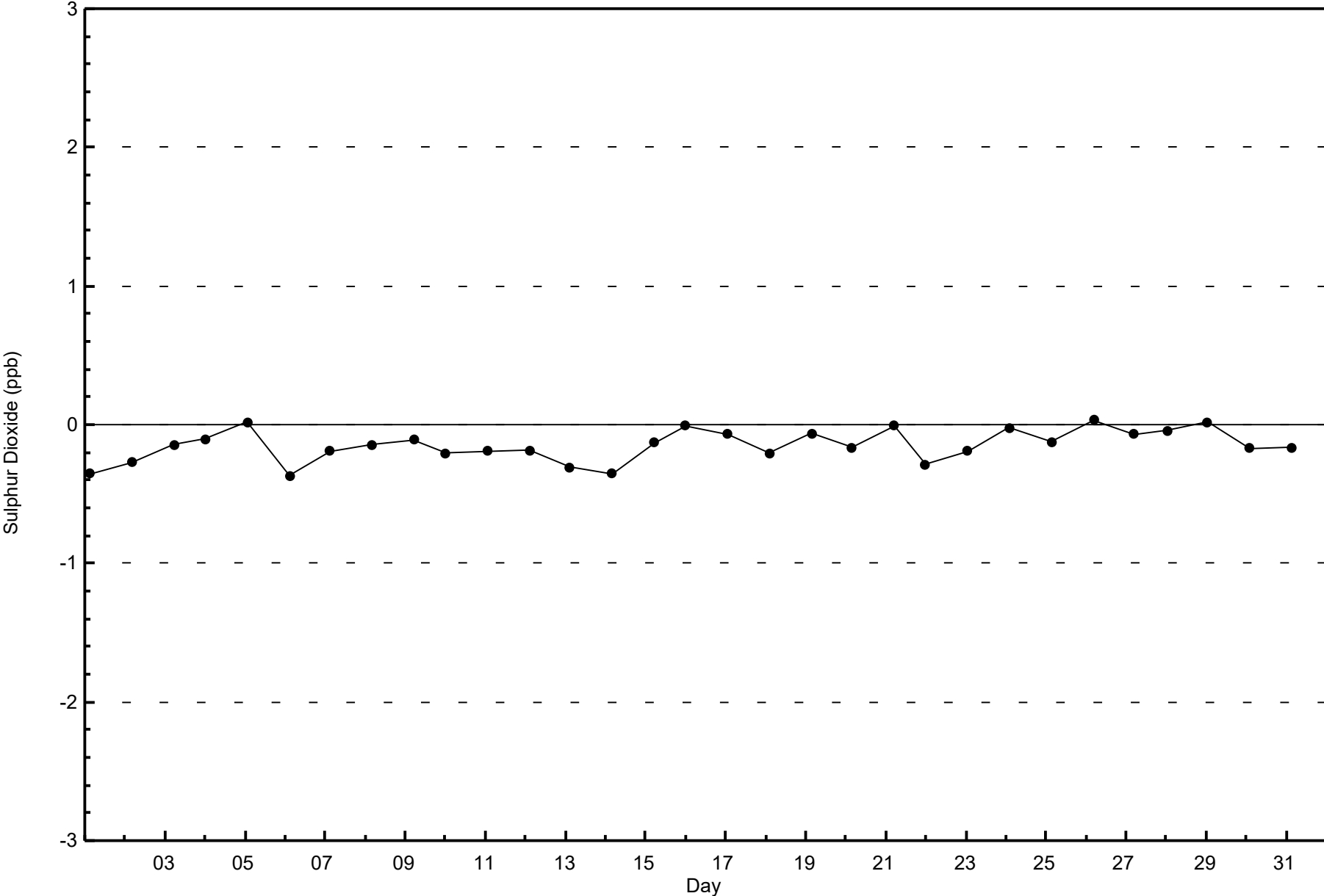
Sulphur Dioxide (SO₂) - ppb
Patricia McInnes

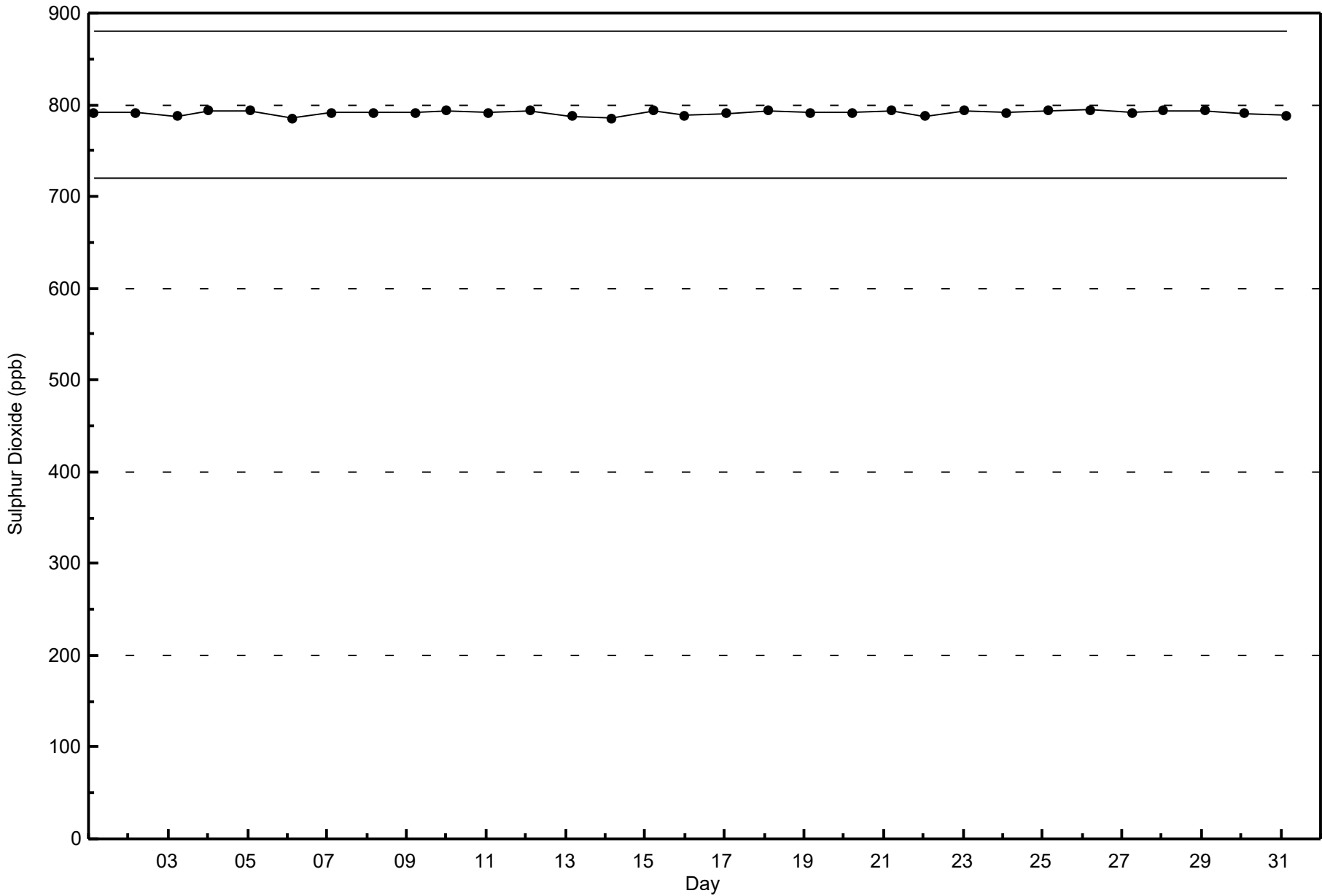


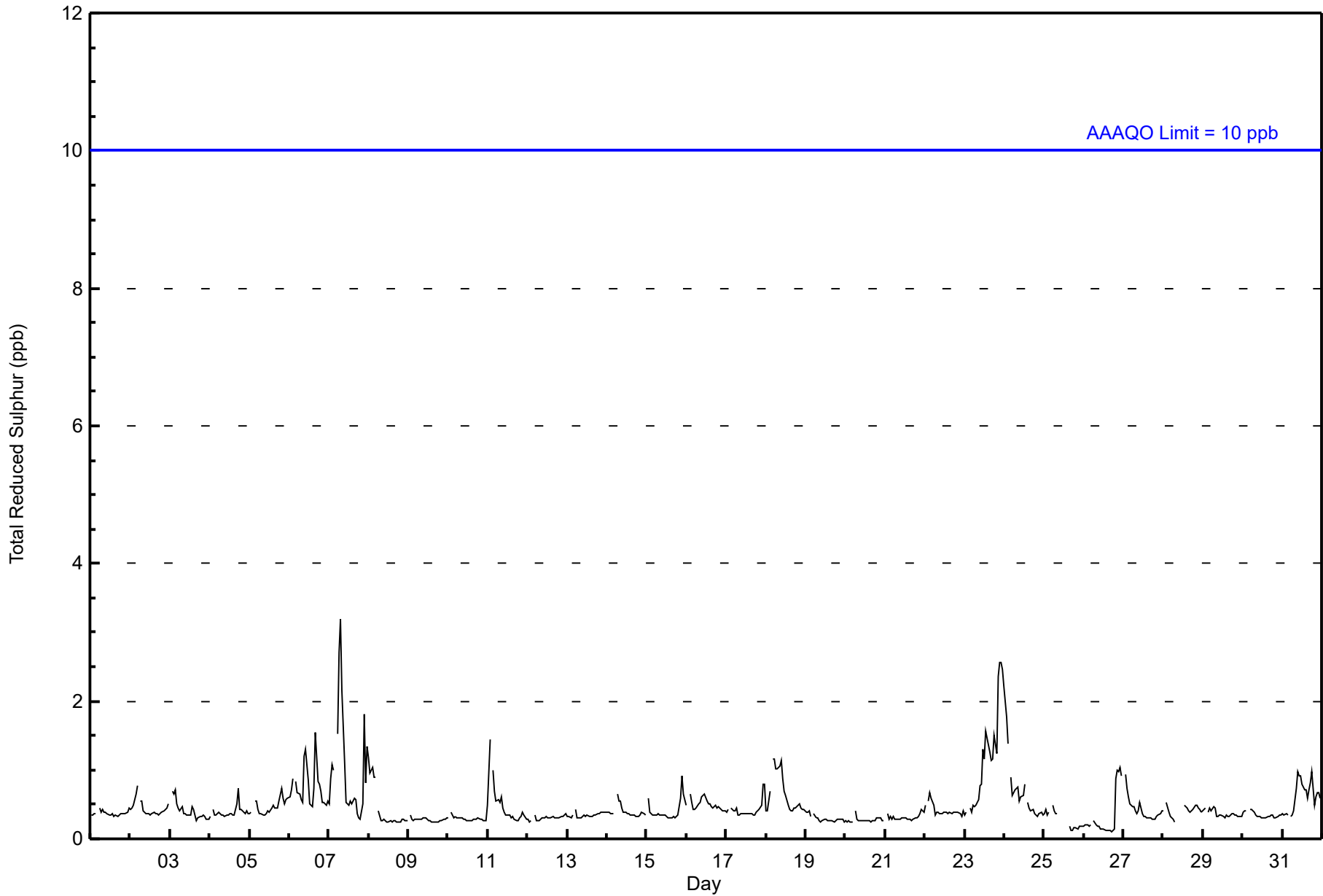
Classes (ppb)



Total Number of Valid Hours: 703









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	697	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: 701

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Patricia McInnes - August 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	54	13	13	5	15	58	37	31	46	90	77	49	64	59	32	54	697
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	56	13	13	5	15	58	37	31	46	90	77	49	64	59	32	56	701

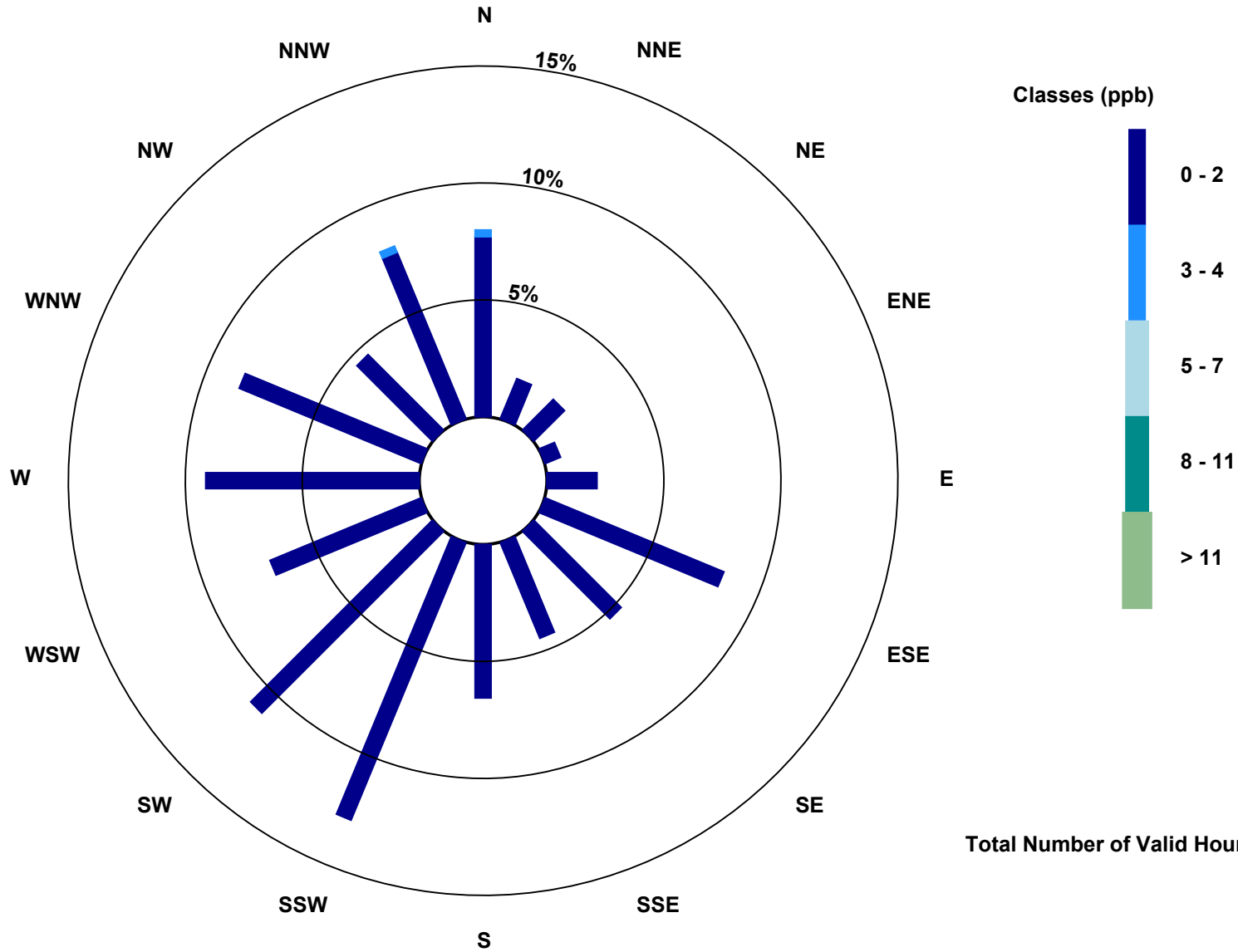
Total Number of Valid Hours: 701

Total Number of Hours: 744

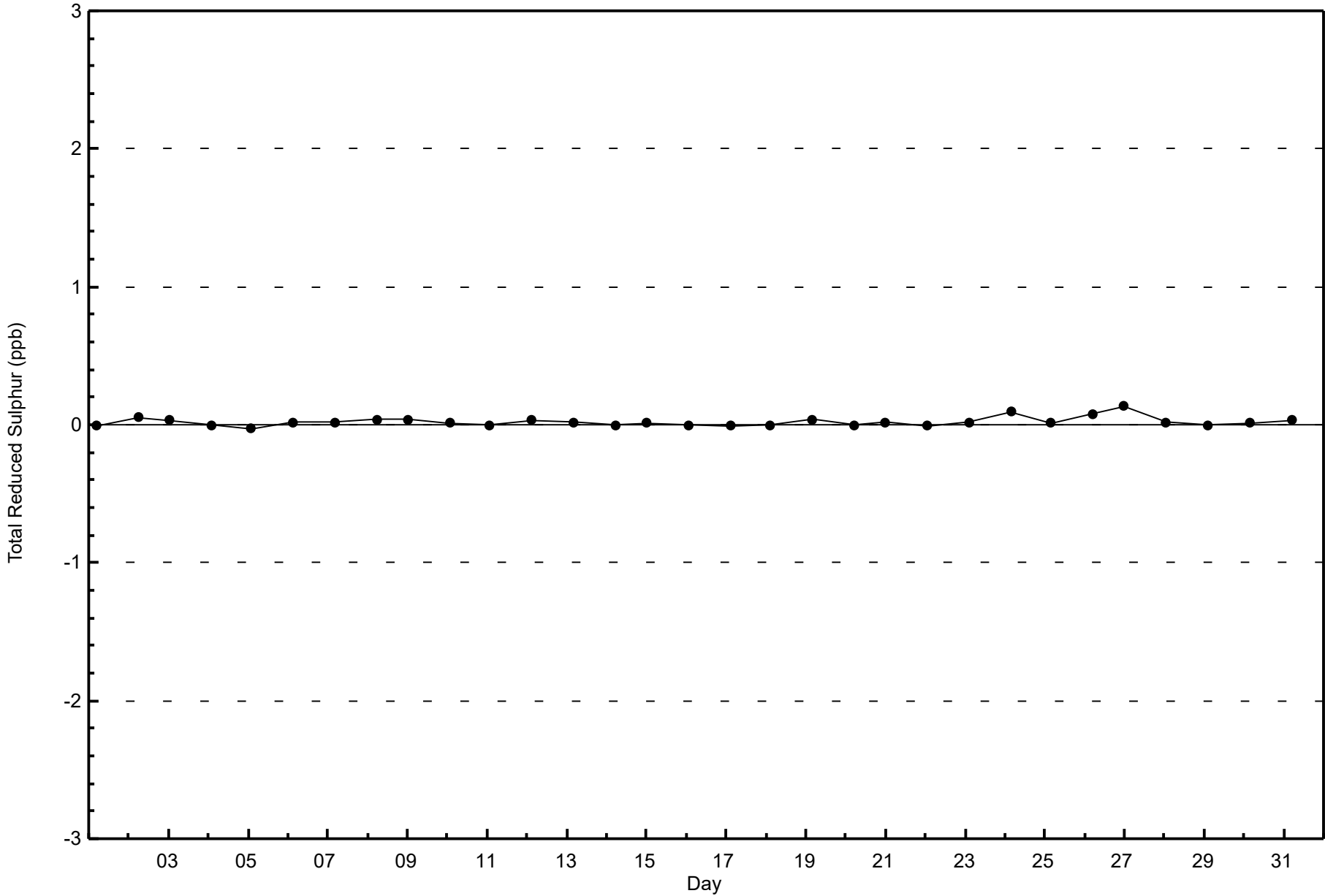


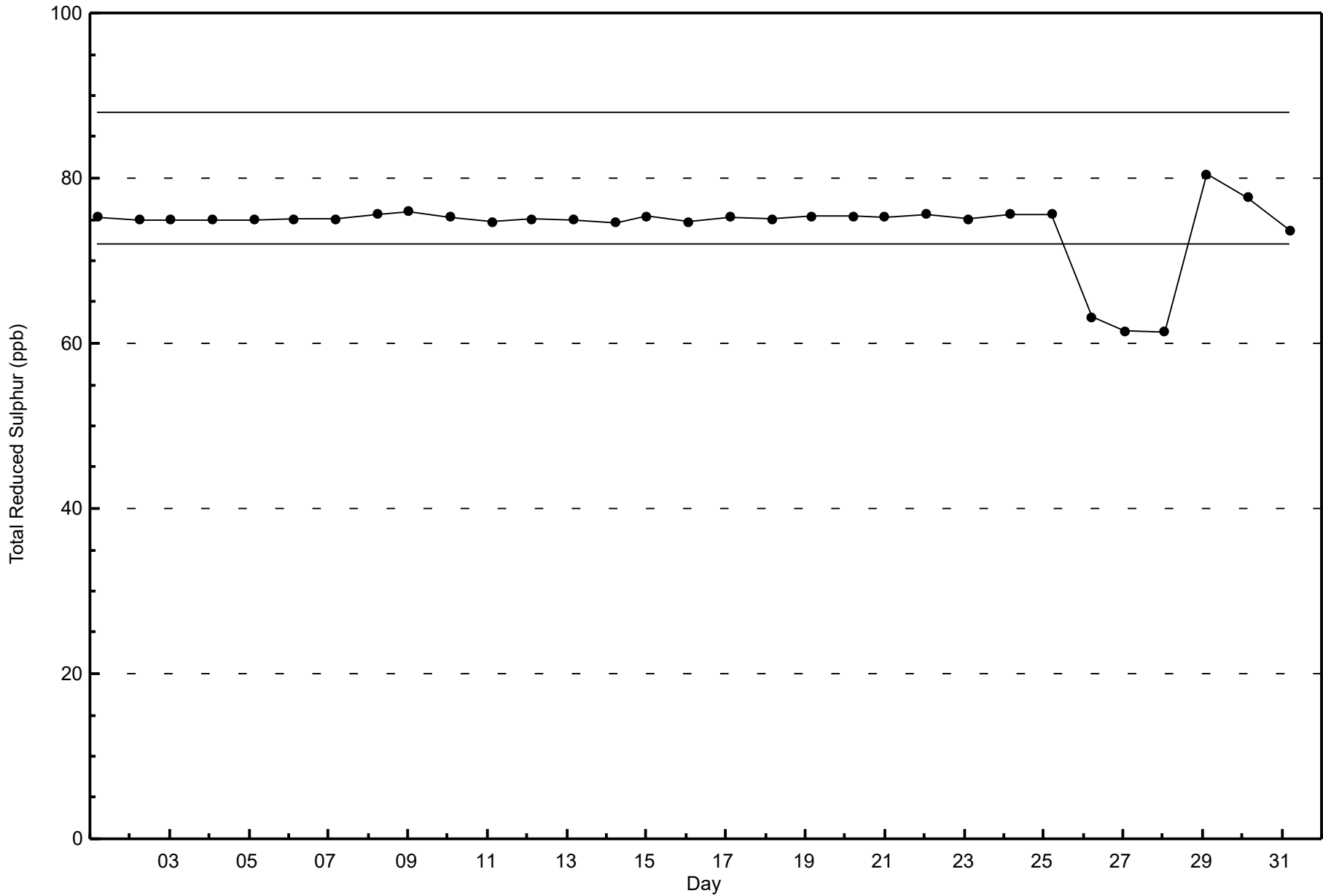
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Patricia McInnes



Total Number of Valid Hours: 701







Wood Buffalo Environmental Association
Summary of Hour Averages

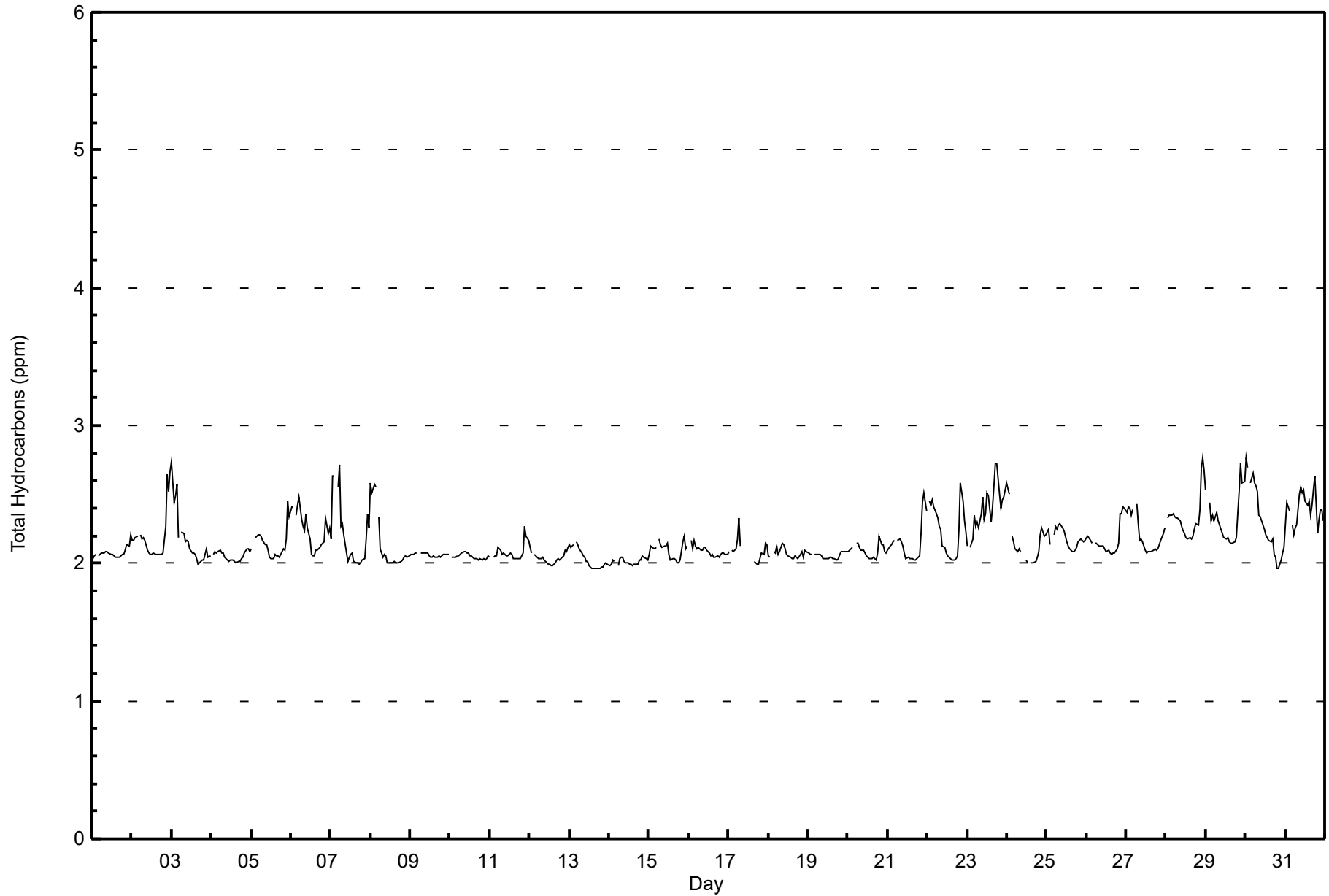
Total Hydrocarbons (THC) - ppm
Patricia McInnes - August 2023

Maximum Value: 2.8 ppm on Aug 28 23:00																				Maximum Daily Average: 2.4 ppm on Aug 23					Hours in Service: 744	
Minimum Value: 2.0 ppm on Aug 13 18:00																				Minimum Daily Average: 2.0 ppm on Aug 14					Hours of Data: 703	
Maximum Diurnal Average: 2.2 ppm at hour 2																				Minimum Diurnal Average: 2.1 ppm at hour 16					Hours of Missing Data: 41	
Monthly Average: 2.15 ppm																				Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.4 P ₉₉ = 2.7					Hours of Calibration: 38	
																									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-Aug	2.0	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	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
2-Aug	2.2	2.2	2.2	2.2	Z	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	2.3	2.6	2.5	2.7	2.2	2.7
3-Aug	2.7	2.4	2.5	2.6	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.2	2.7
4-Aug	Z	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	2.1	2.1	2.1	2.1	2.1	2.1
5-Aug	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.4	2.3	2.1	2.4
6-Aug	2.4	2.4	Z	2.3	2.4	2.5	2.3	2.3	2.2	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.3	2.2	2.5
7-Aug	2.2	2.6	2.6	Z	2.5	2.7	2.3	2.3	2.2	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.3	2.2	2.7
8-Aug	2.6	2.5	2.6	2.6	Z	2.3	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	2.1	2.0	2.1	2.1	2.6
9-Aug	2.1	2.1	2.1	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
10-Aug	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
11-Aug	2.0	Z	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.2	2.2	2.1	2.3
12-Aug	2.1	2.1	Z	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	2.1	2.1	2.1	2.0	2.1
13-Aug	2.1	2.1	2.1	Z	2.2	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	2.2
14-Aug	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	2.0	2.0	2.0	2.0	2.1
15-Aug	2.1	2.1	2.1	2.1	2.1	Z	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	2.2	2.2	2.1	2.1	2.1	2.2
16-Aug	Z	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	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2
17-Aug	2.1	Z	2.1	2.1	2.1	2.2	2.3	2.1	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	--	2.3	
18-Aug	2.1	2.0	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	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1
19-Aug	2.1	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1
20-Aug	2.1	2.1	2.1	2.1	Z	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2
21-Aug	2.1	2.1	2.1	2.2	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.5	2.4	2.1	2.5
22-Aug	Z	2.5	2.4	2.5	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.6	2.4	2.3	2.2	2.2	2.6
23-Aug	2.1	Z	2.1	2.2	2.4	2.3	2.3	2.3	2.4	2.5	2.3	2.4	2.5	2.5	2.3	2.4	2.6	2.7	2.7	2.5	2.4	2.5	2.5	2.5	2.4	2.7
24-Aug	2.6	2.5	Z	2.2	2.2	2.1	2.1	2.1	2.1	M	M	2.0	2.0	M	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.2	2.2	2.1	2.6
25-Aug	2.2	2.2	2.1	Z	2.2	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.3
26-Aug	2.2	2.2	2.2	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	2.1	2.1	2.1	2.4	2.4	2.4	2.4	2.2	2.4
27-Aug	2.4	2.4	2.4	2.3	2.4	Z	2.4	2.3	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	2.3	2.2	2.4
28-Aug	Z	2.3	2.3	2.4	2.4	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	2.3	2.3	2.4	2.7	2.8	2.7	2.8
29-Aug	2.5	Z	2.4	2.3	2.4	2.3	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.4	2.5	2.7	2.6	2.6	2.3	2.7
30-Aug	2.8	2.7	Z	2.6	2.7	2.6	2.6	2.5	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.3	2.8
31-Aug	2.3	2.4	2.4	Z	2.3	2.2	2.3	2.3	2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.4	2.5	2.6	2.2	2.3	2.4	2.4	2.3	2.4	2.6
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	192	27.31	27.31
2.1 - 3.0	511	72.69	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Patricia McInnes - August 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	12	7	3	3	5	20	10	6	2	5	21	27	29	18	9	15	192
2.1 - 3.0	42	6	10	2	10	39	25	25	46	90	53	23	33	39	24	42	509
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	13	13	5	15	59	35	31	48	95	74	50	62	57	33	57	701

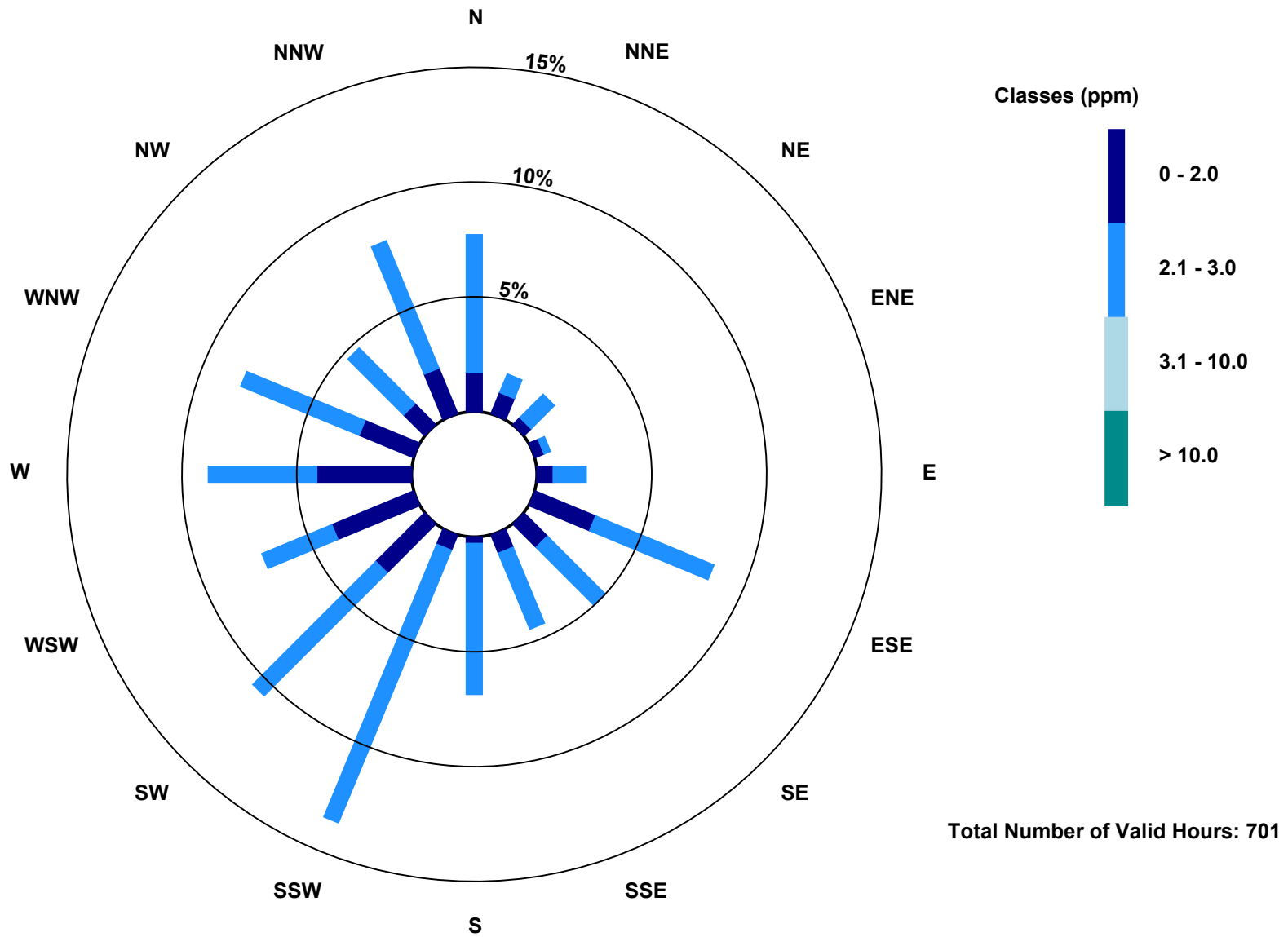
Total Number of Valid Hours: 701

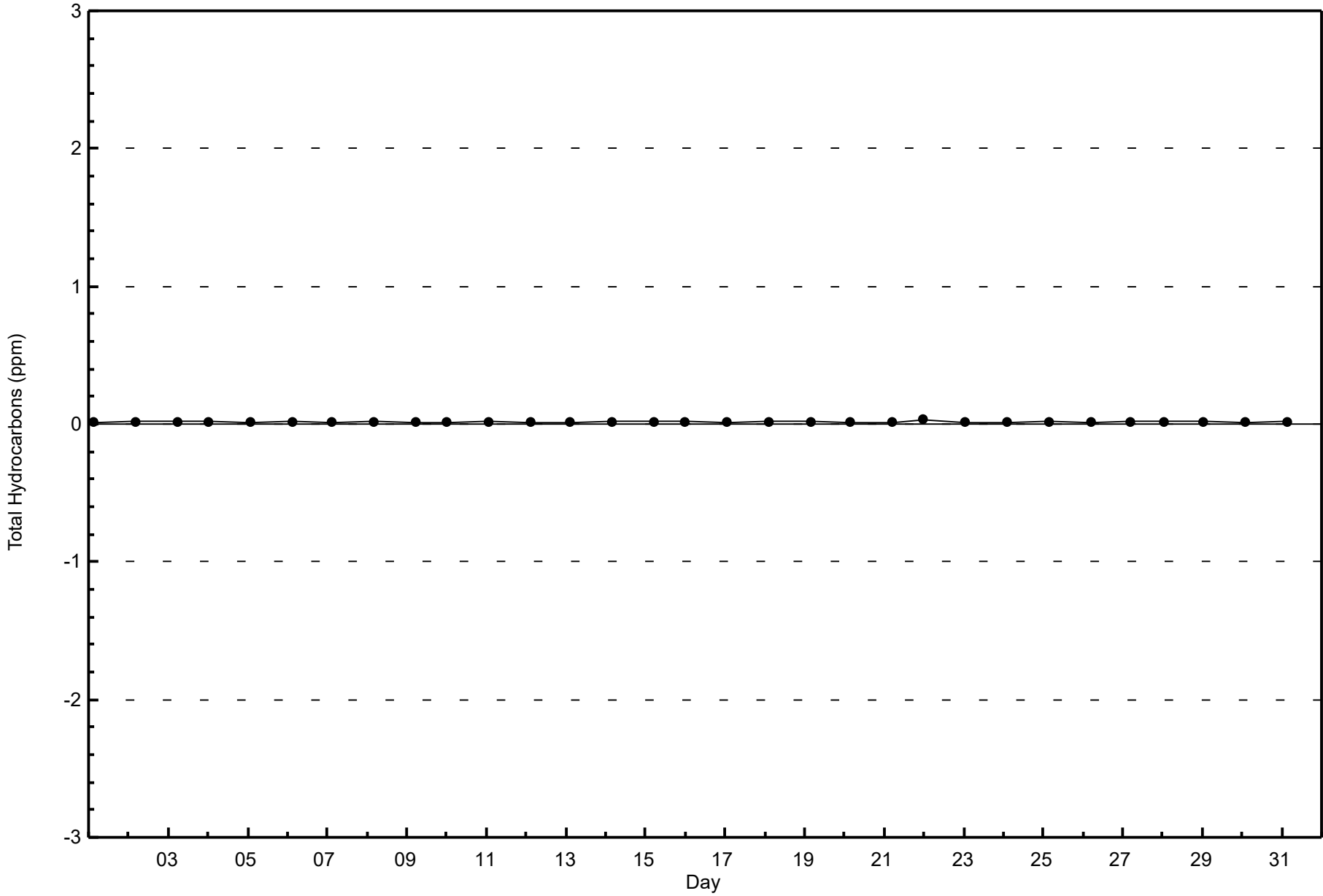
Total Number of Hours: 744

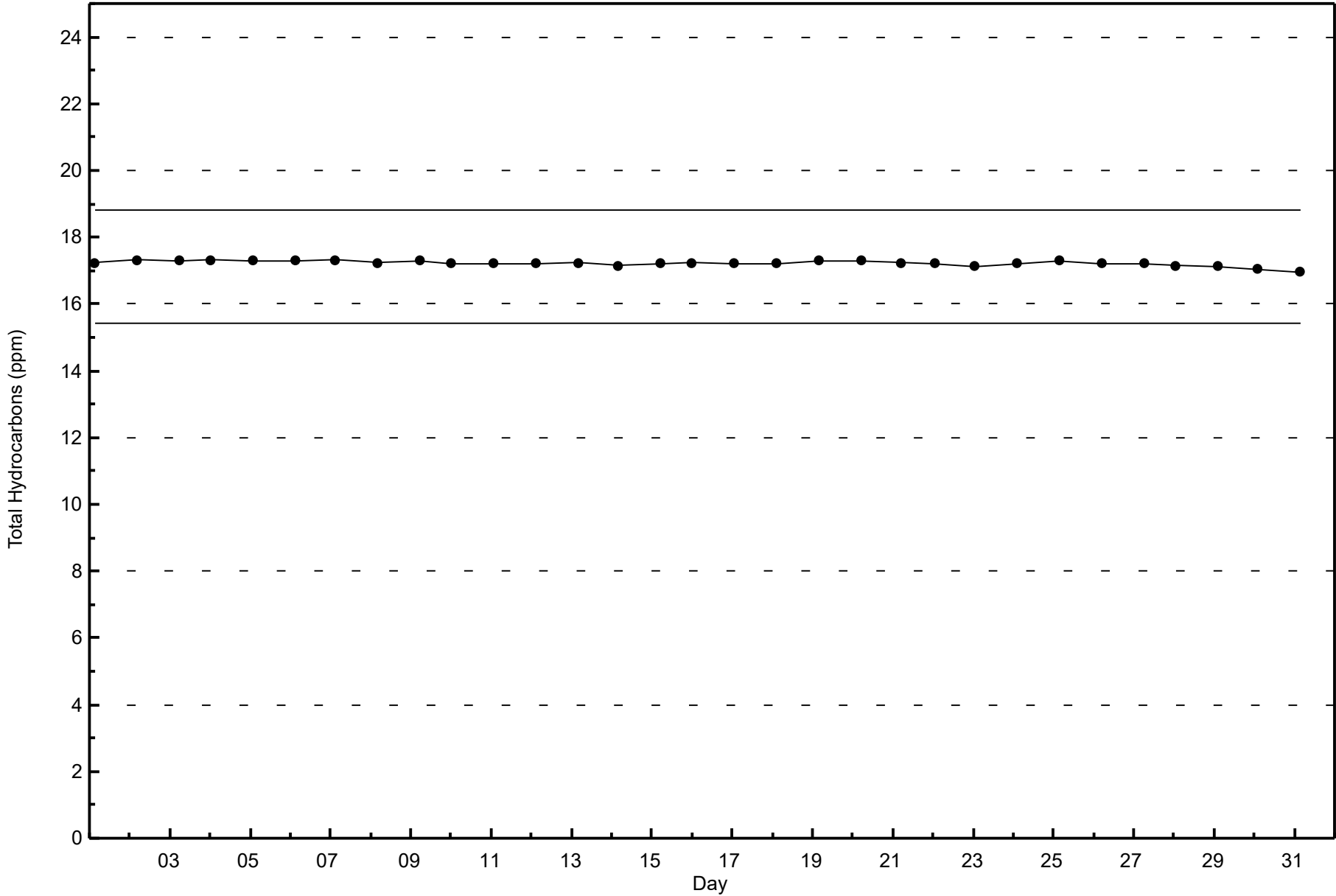


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Patricia McInnes





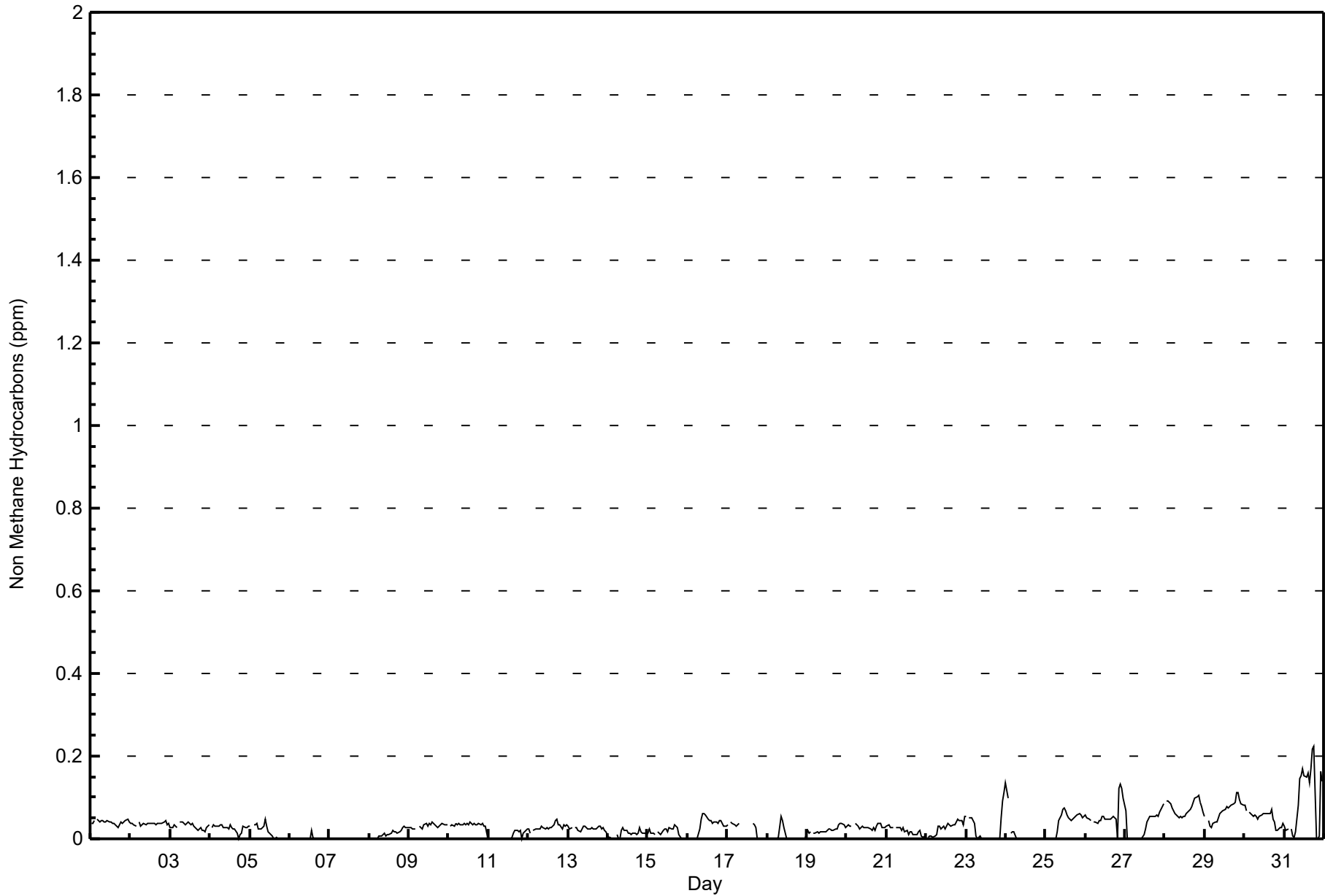




Summary of Hour Averages

Patricia McInnes - August 2023

Maximum Value: 0.225 ppm on Aug 31 19:00		Maximum Daily Average: 0.095 ppm on Aug 31		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Aug 4 18:00		Minimum Daily Average: 0.000 ppm on Aug 7		Hours of Data:	703																						
Maximum Diurnal Average: 0.036 ppm at hour 23		Minimum Diurnal Average: 0.021 ppm at hour 7		Hours of Missing Data:	41																						
Monthly Average: 0.030 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:	38																						
				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-Aug	0.037	0.038	0.044	Z	0.046	0.041	0.043	0.042	0.042	0.041	0.044	0.041	0.042	0.038	0.039	0.033	0.029	0.035	0.042	0.037	0.042	0.045	0.047	0.040	0.040	0.040	0.047
2-Aug	0.038	0.036	0.035	0.030	Z	0.040	0.032	0.035	0.036	0.033	0.038	0.037	0.036	0.037	0.038	0.036	0.036	0.038	0.036	0.036	0.040	0.044	0.035	0.038	0.036	0.044	0.044
3-Aug	0.028	0.026	0.033	0.031	0.026	Z	0.040	0.042	0.038	0.035	0.038	0.040	0.033	0.036	0.030	0.027	0.025	0.020	0.027	0.020	0.020	0.017	0.027	0.033	0.030	0.042	0.042
4-Aug	Z	0.027	0.032	0.031	0.031	0.031	0.033	0.035	0.028	0.028	0.026	0.025	0.033	0.028	0.023	0.024	0.013	0.000	0.011	0.012	0.030	0.028	0.026	0.030	0.025	0.035	0.035
5-Aug	0.031	Z	0.034	0.034	0.038	0.025	0.025	0.025	0.031	0.048	0.030	0.017	0.013	0.005	0.000	0.000	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.048	0.048
6-Aug	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	0.019	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.019	0.019
7-Aug	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
8-Aug	0.000	0.000	0.000	0.000	Z	0.000	0.006	0.008	0.012	0.013	0.007	0.010	0.010	0.015	0.019	0.017	0.017	0.014	0.016	0.021	0.026	0.031	0.026	0.027	0.013	0.031	0.031
9-Aug	0.029	0.026	0.025	0.025	0.025	Z	0.031	0.026	0.025	0.035	0.037	0.031	0.036	0.035	0.042	0.037	0.030	0.028	0.031	0.034	0.037	0.033	0.034	0.033	0.031	0.042	0.042
10-Aug	Z	0.031	0.034	0.031	0.036	0.033	0.036	0.034	0.033	0.037	0.035	0.036	0.034	0.042	0.034	0.037	0.033	0.034	0.036	0.035	0.037	0.029	0.029	0.014	0.034	0.042	0.042
11-Aug	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	0.004	0.012	0.019	0.021	0.018	0.021	0.000	0.014	0.019	0.024	0.007	0.024	0.024	
12-Aug	0.023	0.014	Z	0.020	0.022	0.022	0.022	0.025	0.032	0.027	0.025	0.028	0.024	0.027	0.026	0.032	0.044	0.049	0.035	0.035	0.025	0.034	0.031	0.034	0.029	0.049	0.049
13-Aug	0.030	0.024	0.027	Z	0.028	0.029	0.019	0.018	0.024	0.031	0.030	0.027	0.025	0.025	0.029	0.025	0.025	0.025	0.030	0.031	0.022	0.027	0.020	0.015	0.025	0.031	0.031
14-Aug	0.002	0.003	0.000	0.000	Z	0.009	0.000	0.000	0.020	0.028	0.022	0.019	0.013	0.013	0.011	0.013	0.012	0.011	0.015	0.026	0.015	0.014	0.012	0.011	0.012	0.028	0.028
15-Aug	0.012	0.025	0.015	0.012	0.010	Z	0.016	0.013	0.012	0.021	0.023	0.025	0.017	0.027	0.024	0.024	0.033	0.032	0.027	0.009	0.000	0.000	0.000	0.000	0.016	0.033	0.033
16-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.048	0.061	0.062	0.058	0.049	0.043	0.043	0.037	0.040	0.041	0.039	0.043	0.044	0.037	0.031	0.032	0.032	0.062	0.062
17-Aug	0.034	Z	0.042	0.036	0.035	0.032	0.035	0.036	C	C	C	C	C	C	C	C	0.038	0.035	0.026	0.000	0.000	0.000	0.000	0.000	--	0.042	0.042
18-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.054	0.044	0.028	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.054	0.054
19-Aug	0.019	0.014	0.017	Z	0.014	0.014	0.016	0.014	0.017	0.016	0.018	0.018	0.021	0.024	0.023	0.021	0.021	0.023	0.025	0.033	0.039	0.036	0.033	0.028	0.022	0.039	0.039
20-Aug	0.031	0.033	0.030	0.030	Z	0.037	0.035	0.030	0.025	0.031	0.027	0.026	0.028	0.026	0.024	0.021	0.026	0.021	0.032	0.036	0.036	0.028	0.028	0.027	0.029	0.037	0.037
21-Aug	0.029	0.033	0.029	0.026	0.028	Z	0.027	0.026	0.026	0.022	0.028	0.018	0.022	0.012	0.017	0.015	0.009	0.009	0.010	0.016	0.021	0.008	0.004	0.005	0.019	0.033	0.033
22-Aug	Z	0.003	0.006	0.005	0.004	0.006	0.009	0.030	0.032	0.023	0.030	0.025	0.030	0.036	0.035	0.032	0.032	0.034	0.041	0.047	0.046	0.043	0.033	0.054	0.028	0.054	0.054
23-Aug	0.055	Z	0.051	0.051	0.043	0.036	0.008	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	0.051	0.091	0.112	0.022	0.112	
24-Aug	0.137	0.097	Z	0.015	0.018	0.018	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	0.000	0.000	0.000	0.000	0.014	0.137	0.137
25-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.017	0.044	0.058	0.071	0.074	0.068	0.058	0.053	0.044	0.046	0.050	0.054	0.059	0.061	0.059	0.052	0.054	0.040	0.074	0.074
26-Aug	0.058	0.053	0.048	0.046	Z	0.041	0.040	0.036	0.044	0.046	0.054	0.054	0.048	0.047	0.046	0.046	0.050	0.054	0.048	0.000	0.120	0.133	0.123	0.098	0.058	0.133	0.133
27-Aug	0.066	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.009	0.023	0.039	0.048	0.054	0.054	0.055	0.054	0.057	0.053	0.065	0.078	0.085	0.032	0.085	0.085
28-Aug	Z	0.090	0.090	0.084	0.075	0.067	0.062	0.059	0.051	0.053	0.052	0.054	0.055	0.060	0.068	0.070	0.079	0.090	0.098	0.101	0.104	0.089	0.078	0.064	0.074	0.104	0.104
29-Aug	0.055	Z	0.045	0.030	0.026	0.038	0.040	0.040	0.051	0.060	0.066	0.068	0.070	0.076	0.074	0.077	0.080	0.084	0.088	0.114	0.110	0.094	0.084	0.080	0.067	0.114	0.114
30-Aug	0.081	0.068	Z	0.063	0.056	0.056	0.059	0.056	0.048	0.054	0.058	0.061	0.060	0.061	0.062	0.062	0.070	0.049	0.042	0.021	0.021	0.029	0.027	0.036	0.052	0.081	0.081
31-Aug	0.030	0.020	0.022	Z	0.024	0.007	0.004	0.017	0.081	0.146	0.154	0.170	0.152	0.148	0.158	0.135	0.169	0.217	0.225	0.000	0.000	0.008	0.162	0.138	0.095	0.225	0.225
		0.032	0.025	0.025	0.024	0.023	0.022	0.021	0.022	0.029	0.034	0.035	0.033	0.031	0.034	0.032	0.031	0.033	0.034	0.035	0.027	0.031	0.032	0.036	0.036	Diurnal Average	
		0.137	0.097	0.090	0.084	0.075	0.067	0.062	0.059	0.081	0.146	0.154	0.170	0.152	0.148	0.158	0.135	0.169	0.217	0.225	0.114	0.120	0.133	0.162	0.138	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	170	24.18	24.18
0.006 - 0.05	445	63.30	87.48
0.06 - 0.1	80	11.38	98.86
> 0.1	8	1.14	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes - August 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	35	9	7	2	3	0	1	1	5	9	10	6	6	14	16	46	170
0.006 - 0.05	16	4	5	3	12	56	30	22	27	64	52	42	54	40	12	5	444
0.06 - 0.1	3	0	0	0	0	3	4	8	16	21	11	1	1	1	4	6	79
> 0.1	0	0	1	0	0	0	0	0	0	1	1	1	1	2	1	0	8
Totals	54	13	13	5	15	59	35	31	48	95	74	50	62	57	33	57	701

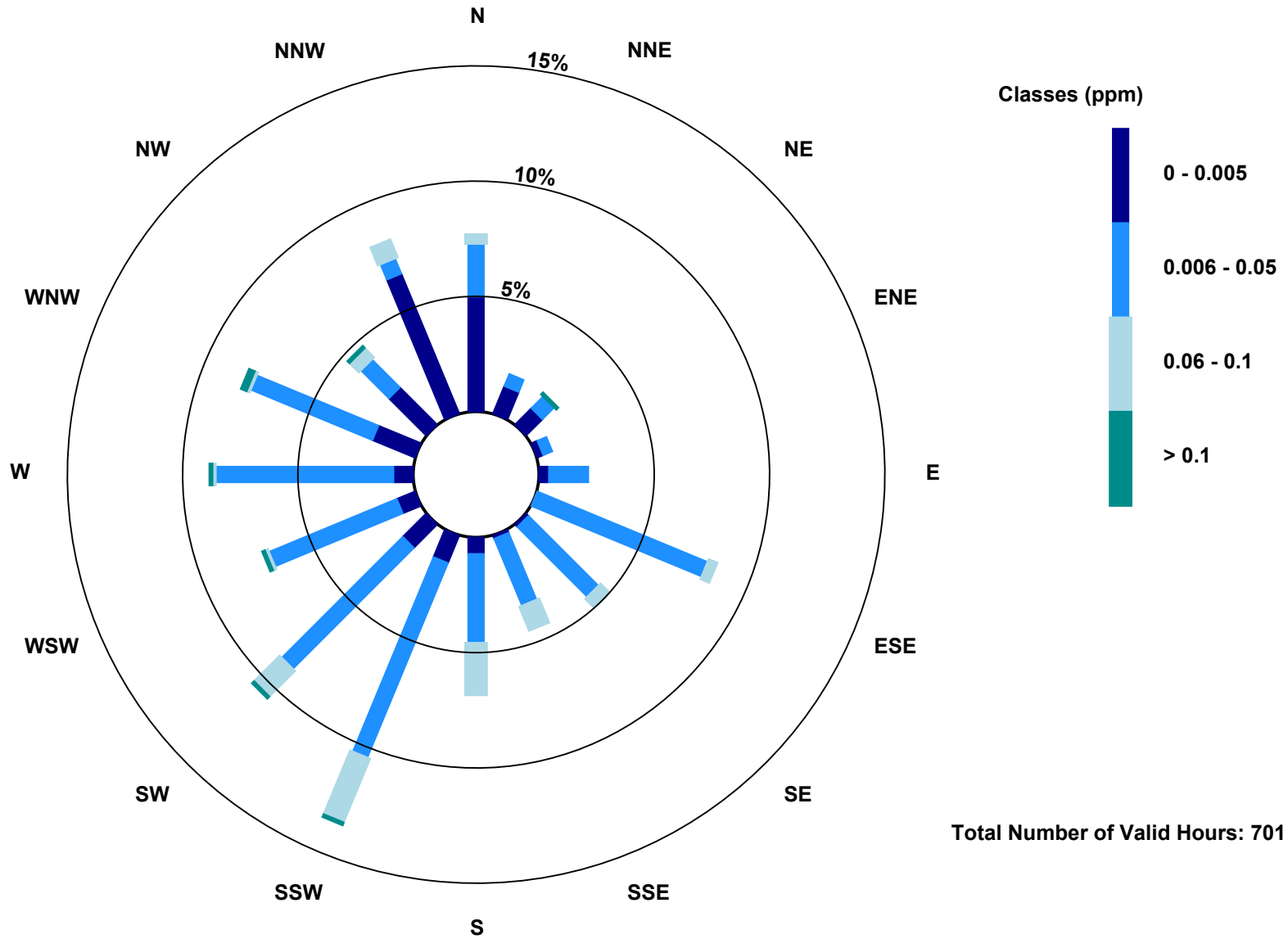
Total Number of Valid Hours: 701

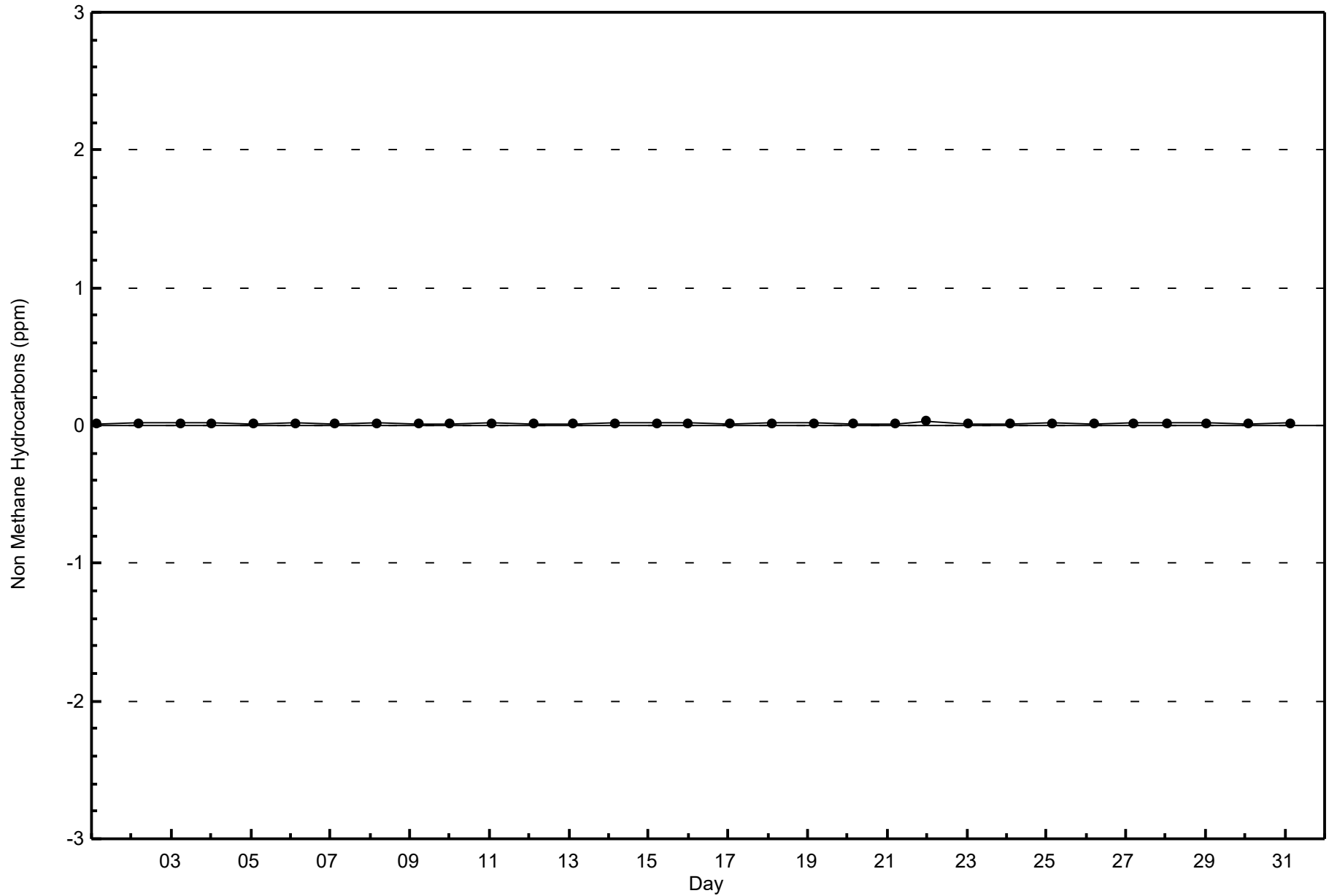
Total Number of Hours: 744

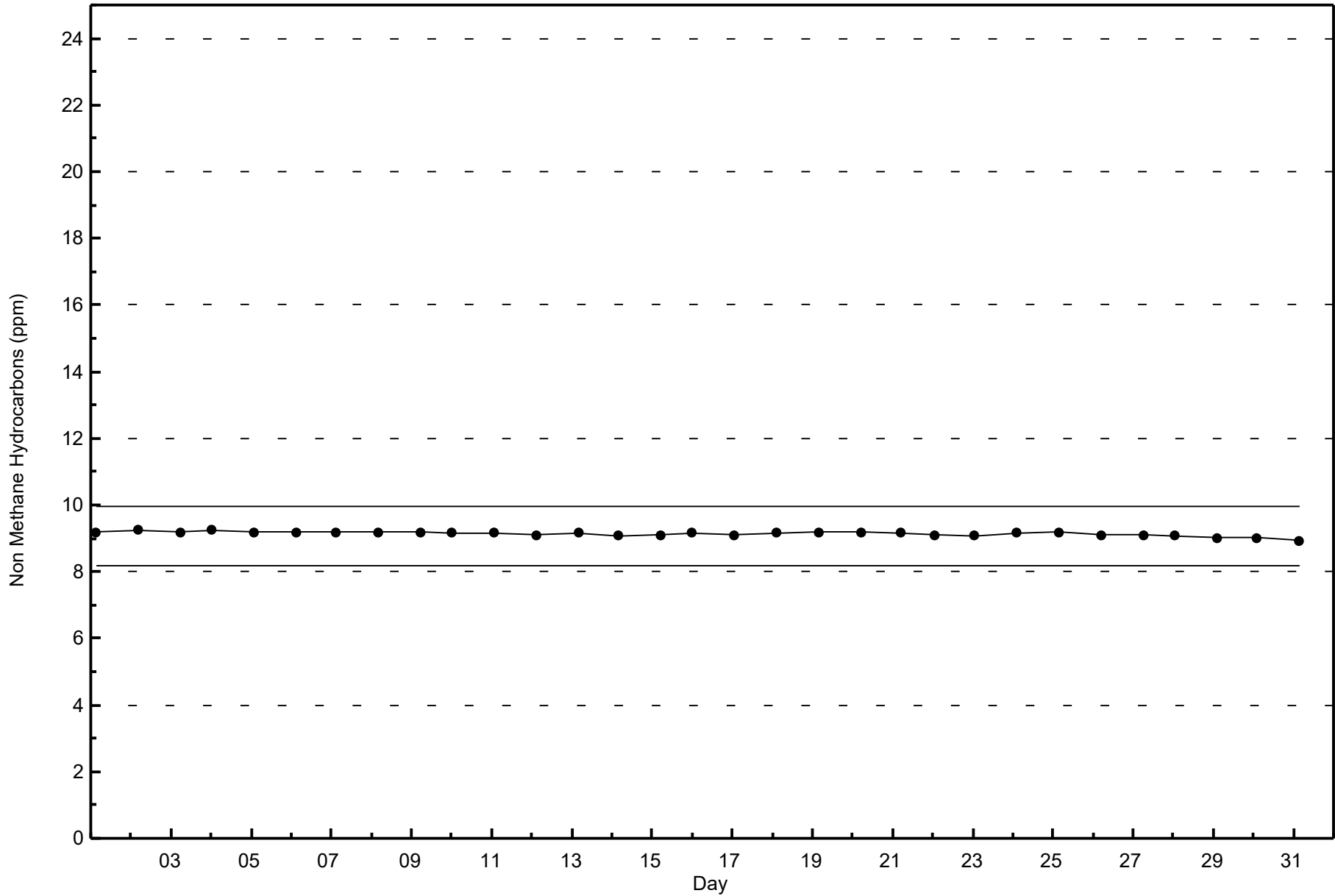


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Patricia McInnes









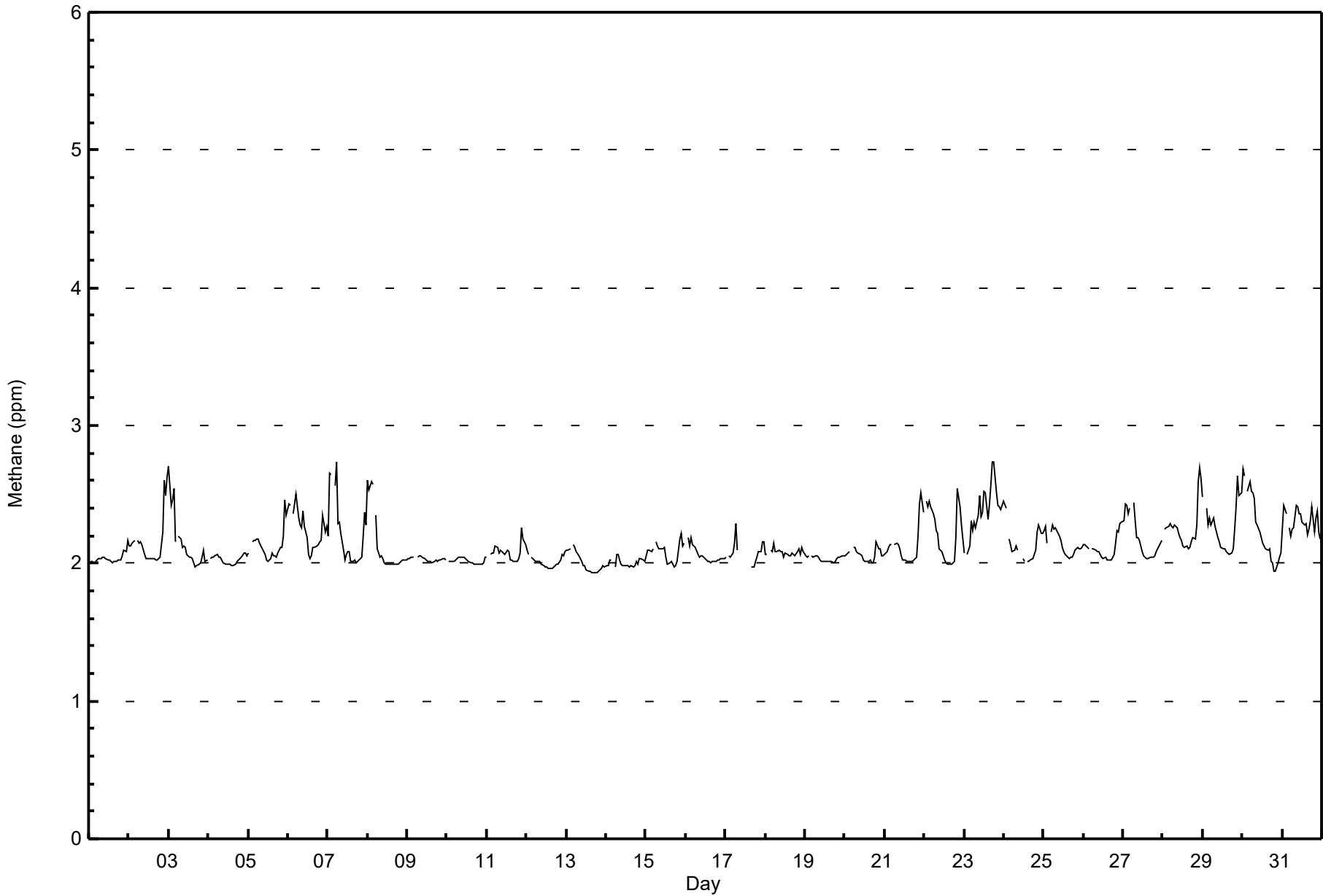
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Patricia McInnes - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 2.7 ppm on Aug 23 18:00		Maximum Daily Average: 2.4 ppm on Aug 23		Hours of Data: 703														703								
Minimum Value: 1.9 ppm on Aug 13 19:00		Minimum Daily Average: 2.0 ppm on Aug 14		Hours of Missing Data: 41														41								
Maximum Diurnal Average: 2.2 ppm at hour 2		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration: 38														38								
Monthly Average: 2.13 ppm		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 = 2.6		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-Aug	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	2.0	2.1	2.1	2.1	2.2	2.0	2.2
2-Aug	2.1	2.1	2.1	2.2	Z	2.2	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	2.0	2.2	2.6	2.5	2.6	2.2	2.6
3-Aug	2.7	2.4	2.5	2.5	2.2	Z	2.2	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	2.1	2.0	2.0	2.1	2.7
4-Aug	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1
5-Aug	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.2	2.5	2.4	2.1	2.5
6-Aug	2.4	2.4	Z	2.4	2.4	2.5	2.3	2.3	2.3	2.4	2.3	2.2	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.3	2.2	2.5
7-Aug	2.2	2.7	2.6	Z	2.6	2.7	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.3	2.2	2.7
8-Aug	2.6	2.5	2.6	2.6	Z	2.4	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.6
9-Aug	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	2.0	2.0	2.0	2.0	2.0	2.0
10-Aug	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	2.0	2.0
11-Aug	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.1	2.3
12-Aug	2.1	2.1	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	2.1	2.1	2.1	2.0	2.1
13-Aug	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	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.1
14-Aug	2.0	2.0	2.0	2.0	Z	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	2.1
15-Aug	2.1	2.1	2.1	2.1	2.1	Z	2.2	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	2.2	2.2	2.1	2.1	2.1	2.2
16-Aug	Z	2.2	2.1	2.2	2.1	2.1	2.1	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	2.1	2.2
17-Aug	2.0	Z	2.1	2.0	2.1	2.1	2.3	2.1	C	C	C	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	--	2.3
18-Aug	2.1	2.1	Z	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	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
19-Aug	2.1	2.0	2.1	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1
20-Aug	2.1	2.1	2.1	2.1	Z	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	2.2	2.1	2.1	2.1	2.1	2.1	2.2
21-Aug	2.1	2.1	2.1	2.1	2.1	Z	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	2.2	2.4	2.5	2.4	2.1	2.5
22-Aug	Z	2.4	2.4	2.5	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.5	2.4	2.3	2.2	2.2	2.5
23-Aug	2.1	Z	2.1	2.1	2.3	2.2	2.3	2.3	2.3	2.5	2.3	2.4	2.5	2.5	2.3	2.4	2.6	2.7	2.7	2.5	2.4	2.4	2.4	2.4	2.4	2.7
24-Aug	2.4	2.4	Z	2.2	2.1	2.1	2.1	2.1	2.1	M	M	2.0	2.0	M	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.2	2.2	2.1	2.4
25-Aug	2.2	2.3	2.1	Z	2.2	2.3	2.2	2.3	2.2	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	2.1	2.1	2.1	2.3
26-Aug	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.2	2.2	2.3	2.3	2.1	2.3
27-Aug	2.3	2.4	2.4	2.4	2.4	Z	2.4	2.3	2.2	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	2.1	2.2	2.2	2.4
28-Aug	Z	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.6	2.7	2.6	2.3
29-Aug	2.5	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.6	2.5	2.5	2.3	2.6
30-Aug	2.7	2.6	Z	2.5	2.6	2.5	2.5	2.5	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	1.9	1.9	2.0	2.0	2.1	2.7
31-Aug	2.2	2.4	2.4	Z	2.3	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.4	2.2	2.3	2.4	2.2	2.2	2.3	2.4
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Patricia McInnes - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	298	42.39	42.39
2.1 - 3.0	405	57.61	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Patricia McInnes - August 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	14	7	4	2	11	47	17	10	6	18	35	34	49	29	7	8	298
2.1 - 3.0	40	6	9	3	4	12	18	21	42	77	39	16	13	28	26	49	403
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	13	13	5	15	59	35	31	48	95	74	50	62	57	33	57	701

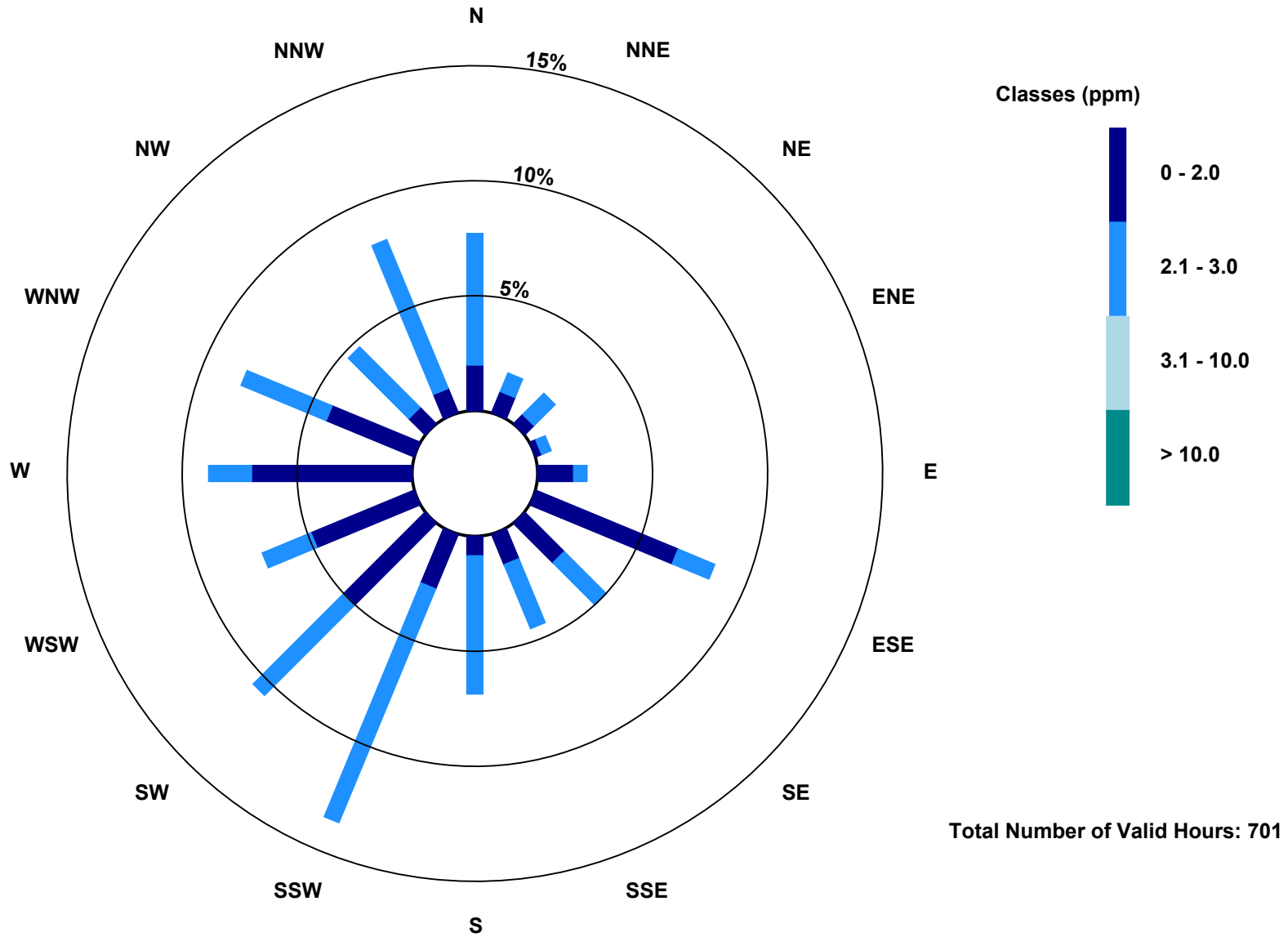
Total Number of Valid Hours: 701

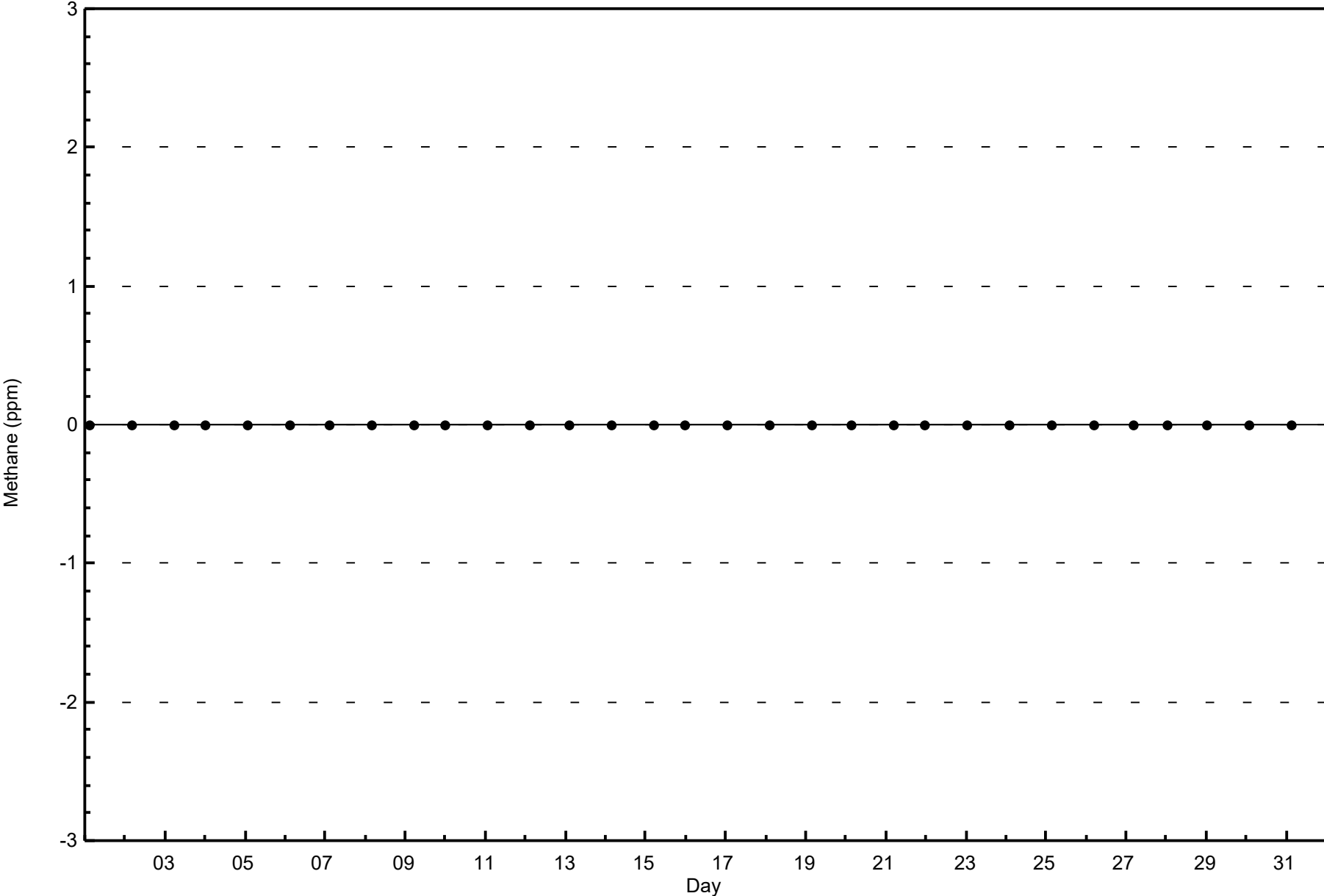
Total Number of Hours: 744

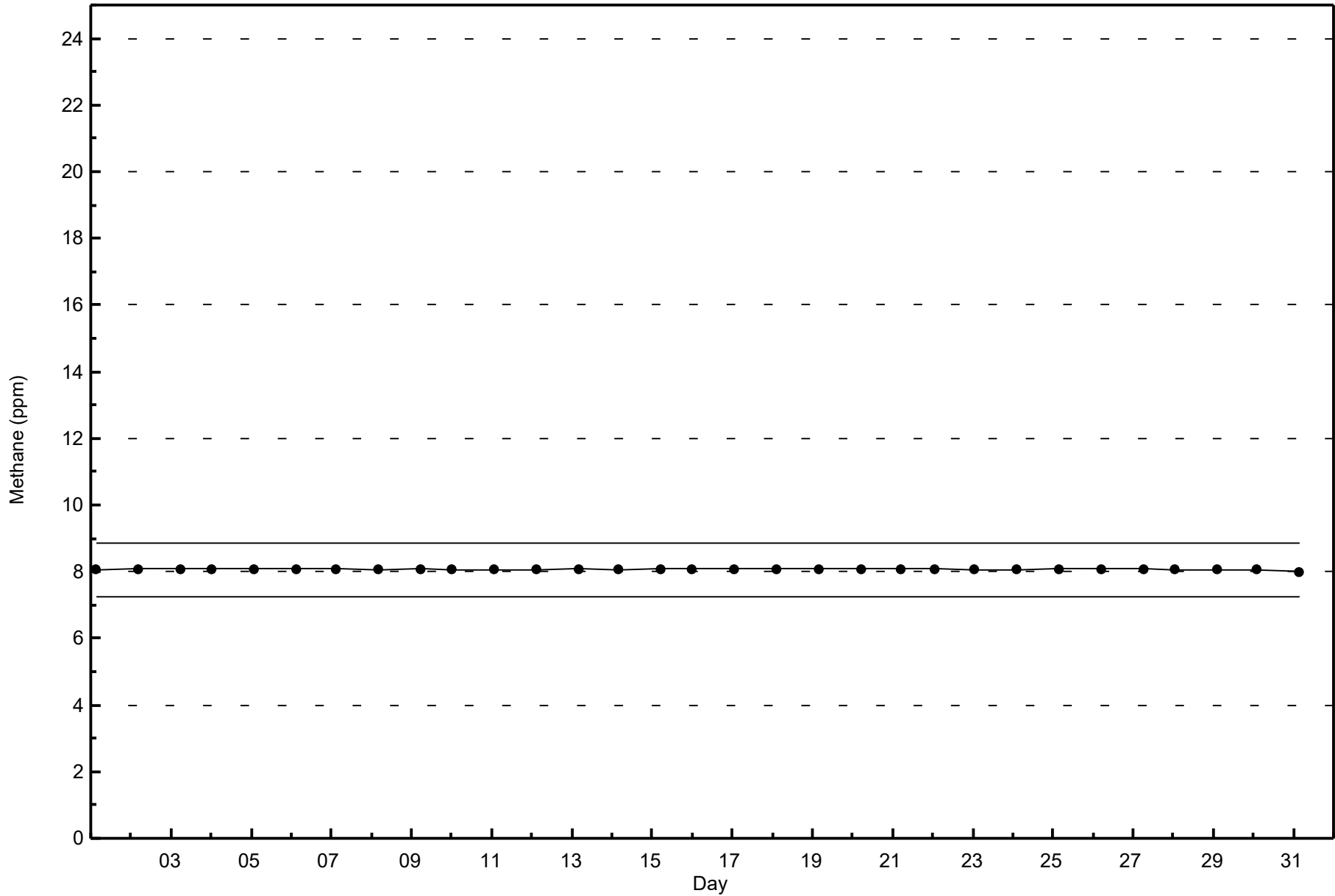


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Patricia McInnes - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 62.2 ppb on Aug 5 15:00	Maximum Daily Average: 31.1 ppb on Aug 5		Hours of Data:	708
Minimum Value: 3.7 ppb on Aug 28 21:00	Minimum Daily Average: 13.5 ppb on Aug 28		Hours of Missing Data:	36
Maximum Diurnal Average: 34.4 ppb at hour 15	Minimum Diurnal Average: 15.4 ppb at hour 6		Hours of Calibration:	35
Monthly Average: 24.26 ppb	Percentiles: P ₁ = 5.9 P ₁₀ = 11.7 Q ₁ = 16.6 Median = 23.4 Q ₃ = 30.8 P ₉₀ = 37.4 P ₉₉ = 52.4		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-Aug	35.0	32.1	27.4	27.4	30.4	Z	24.9	24.7	23.8	24.1	22.9	25.9	31.3	34.6	38.3	31.2	34.0	37.6	35.3	27.0	24.2	25.0	23.8	20.9	28.8	38.3
2-Aug	Z	20.4	18.5	8.7	7.6	14.1	15.1	13.3	14.1	22.8	30.4	34.3	37.7	37.8	39.5	36.0	35.3	37.0	35.1	30.9	18.9	10.2	9.6	11.2	23.4	39.5
3-Aug	8.8	Z	10.7	13.0	18.3	18.1	23.6	25.1	26.9	27.4	29.7	38.4	43.1	38.0	33.5	37.2	43.0	38.2	35.7	30.6	23.2	24.6	26.6	23.4	27.7	43.1
4-Aug	20.5	21.6	Z	21.3	21.4	21.5	23.1	25.9	30.2	33.6	35.5	33.6	35.1	36.4	37.1	38.4	35.4	35.8	33.9	30.3	27.4	21.1	22.8	27.0	29.1	38.4
5-Aug	24.3	21.0	18.0	Z	14.4	13.6	13.7	12.1	15.5	18.9	25.2	36.2	45.4	53.7	62.2	53.8	53.3	52.7	53.9	48.3	29.8	20.5	15.1	12.9	31.1	62.2
6-Aug	8.3	7.9	9.0	7.7	Z	6.1	9.8	13.7	13.5	15.6	26.2	29.2	38.2	38.0	39.7	37.5	43.4	40.7	39.0	36.0	31.6	24.6	26.8	23.3	24.6	43.4
7-Aug	18.9	10.2	7.8	6.7	6.9	Z	11.1	13.0	16.6	22.8	27.5	27.7	27.8	26.5	31.3	33.4	35.6	35.2	33.5	31.7	30.6	28.9	23.8	20.1	22.9	35.6
8-Aug	Z	11.7	10.7	10.7	9.6	9.6	17.1	21.1	22.5	25.6	30.3	33.0	33.4	33.8	34.0	33.2	31.6	30.1	28.7	27.1	28.9	30.1	30.8	29.3	24.9	34.0
9-Aug	26.0	Z	23.8	22.7	22.0	20.1	19.3	18.7	17.8	18.5	21.6	23.4	21.5	21.2	21.2	22.5	22.9	21.5	23.3	23.1	23.1	22.3	22.0	22.8	21.8	26.0
10-Aug	22.8	26.1	Z	26.2	25.1	24.4	23.4	22.2	21.0	21.9	23.0	26.2	30.1	31.5	33.5	31.5	30.8	30.4	30.8	31.7	30.4	29.3	30.9	27.6	27.4	33.5
11-Aug	24.6	22.6	22.1	Z	21.5	17.7	18.9	21.0	21.5	C	C	C	C	26.4	32.2	33.5	34.3	33.5	34.5	27.6	12.1	8.1	13.9	18.9	23.4	34.5
12-Aug	17.1	15.5	13.7	12.2	Z	11.8	12.1	13.4	14.7	16.3	21.4	26.3	25.3	29.6	28.5	30.1	28.1	24.9	25.4	21.7	21.2	16.2	13.8	18.4	19.9	30.1
13-Aug	16.9	16.2	16.5	13.3	8.5	Z	12.9	15.1	18.4	19.5	21.8	22.2	22.2	22.3	22.3	21.5	21.3	21.0	19.5	17.4	15.8	15.4	15.0	15.5	17.8	22.3
14-Aug	Z	12.9	11.0	10.9	11.6	12.6	11.7	14.2	26.9	34.6	34.3	32.8	31.1	32.3	34.1	33.8	33.5	32.8	31.6	28.6	28.1	28.4	29.3	29.7	25.5	34.6
15-Aug	28.7	Z	21.9	22.1	19.7	18.6	18.0	17.7	15.9	15.9	15.0	13.5	20.8	26.1	24.6	24.2	27.8	28.0	27.7	26.0	20.8	14.5	16.4	15.2	20.8	28.7
16-Aug	16.5	15.6	Z	13.9	16.2	14.7	15.6	20.3	26.3	28.6	29.0	30.7	31.9	31.3	30.1	29.1	29.4	29.0	27.3	23.5	21.4	20.3	21.1	20.5	23.6	31.9
17-Aug	20.0	18.3	17.3	Z	16.0	14.6	14.8	17.7	18.7	21.0	22.7	23.0	25.3	24.4	25.4	23.1	24.6	27.8	32.0	26.8	18.4	23.3	19.8	19.9	21.5	32.0
18-Aug	24.8	24.5	22.3	25.1	Z	27.3	25.8	23.4	22.8	24.9	27.1	33.2	33.7	33.4	34.0	35.6	31.1	28.0	27.0	21.3	19.6	21.3	17.7	19.1	26.2	35.6
19-Aug	19.0	17.8	17.5	17.1	15.5	Z	16.6	17.2	23.2	28.2	30.2	28.8	27.6	27.7	29.1	30.6	30.9	31.2	29.5	26.7	25.1	23.8	24.1	25.8	24.5	31.2
20-Aug	Z	23.7	22.3	21.4	18.9	13.7	16.4	22.0	24.6	28.2	30.1	34.2	37.5	37.9	37.3	34.3	33.6	36.4	28.9	21.1	15.6	21.3	30.0	31.4	27.0	37.9
21-Aug	32.0	Z	27.9	25.5	25.0	23.2	22.9	21.9	24.0	24.5	37.7	42.6	40.6	43.7	47.2	44.1	42.3	41.7	39.1	34.8	24.8	15.4	15.9	14.7	30.9	47.2
22-Aug	14.1	12.3	Z	10.0	8.3	12.5	13.0	18.4	18.9	26.5	33.2	34.8	40.6	44.2	44.1	44.6	43.9	41.1	39.1	24.6	12.7	16.1	14.4	14.2	25.3	44.6
23-Aug	23.1	22.0	21.4	Z	15.1	11.5	10.3	10.8	11.7	9.9	16.9	18.5	9.8	12.7	19.3	17.0	11.8	8.8	7.0	12.9	19.6	22.2	20.2	17.4	15.2	23.1
24-Aug	14.9	14.6	16.1	16.7	Z	17.4	15.7	15.0	15.9	17.1	20.2	24.4	28.1	M	32.3	33.4	33.6	33.6	30.6	26.3	24.9	20.8	13.6	13.7	21.8	33.6
25-Aug	16.5	15.4	22.7	17.9	14.4	Z	9.7	9.0	11.0	12.6	18.7	24.6	29.0	35.6	39.4	42.9	41.1	41.6	36.4	32.2	32.9	34.5	35.1	33.0	26.4	42.9
26-Aug	Z	26.6	27.0	27.3	24.4	23.2	23.8	24.7	27.7	30.1	34.2	39.5	41.6	39.6	39.3	35.8	32.4	31.1	31.3	34.4	30.6	26.9	23.8	23.7	30.4	41.6
27-Aug	23.5	Z	10.7	11.1	10.1	11.4	6.8	15.0	20.4	26.4	37.2	41.5	44.4	46.2	46.0	44.8	42.0	40.9	36.3	30.2	23.0	24.0	24.3	22.9	27.8	46.2
28-Aug	21.0	16.3	Z	13.4	13.7	13.0	12.6	12.2	13.3	14.4	13.6	16.2	20.3	21.8	21.1	21.5	17.9	14.7	8.4	5.6	3.7	3.9	5.3	6.4	13.5	21.8
29-Aug	9.2	8.2	8.6	Z	6.5	7.6	4.8	8.3	13.0	17.6	22.7	27.7	29.9	29.3	31.2	31.4	30.1	24.3	13.5	9.7	4.9	5.9	7.1	8.1	15.6	31.4
30-Aug	6.0	6.5	5.8	6.1	Z	7.3	7.2	11.4	19.6	23.4	31.5	42.7	43.2	48.0	54.1	46.8	38.6	42.7	43.7	52.5	51.3	40.5	35.5	32.7	30.3	54.1
31-Aug	21.7	20.0	18.6	24.4	27.1	Z	20.3	19.8	15.0	14.3	16.4	17.7	20.4	22.0	25.8	26.7	27.0	29.3	27.1	39.7	27.2	21.4	20.4	21.4	22.8	39.7

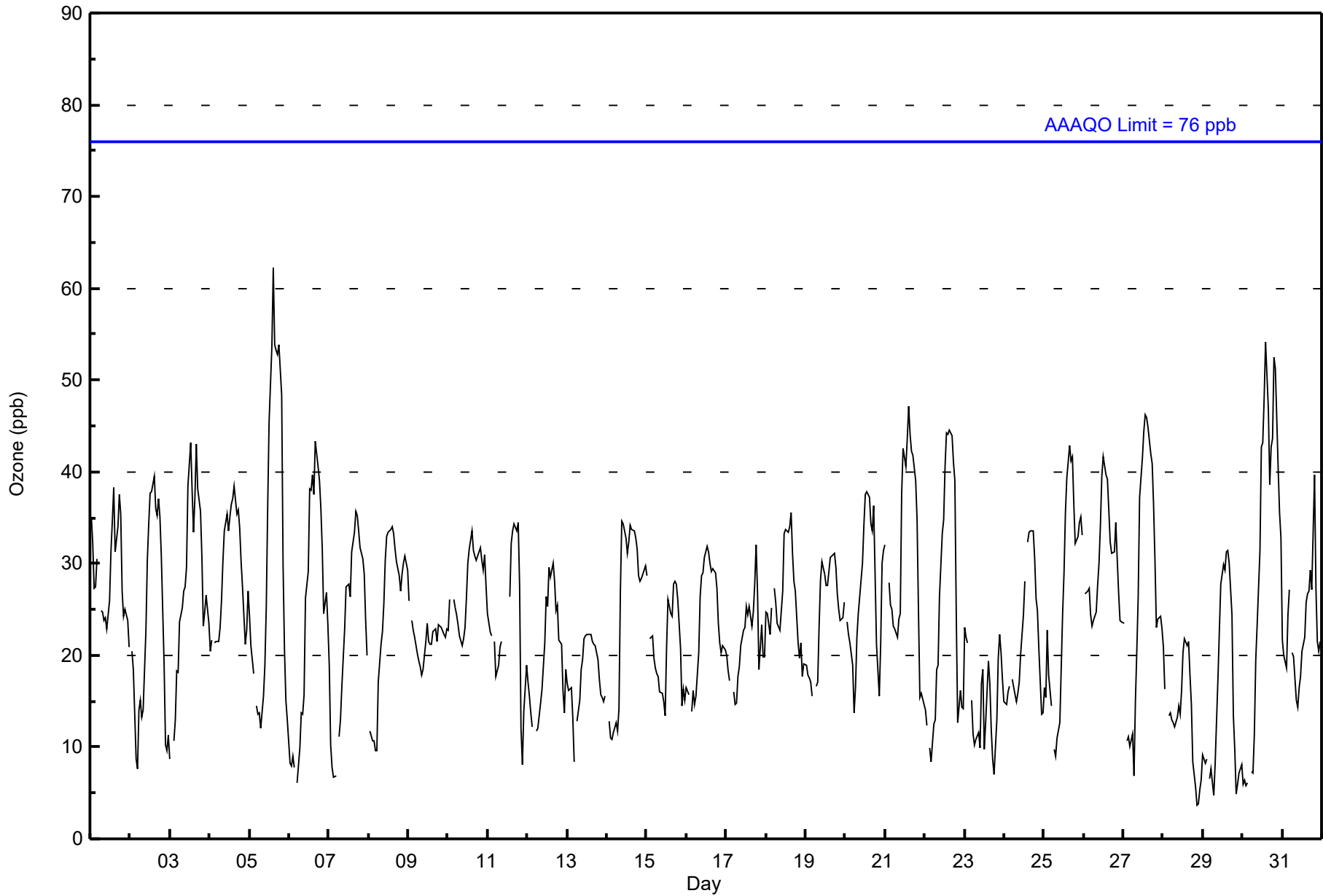
19.8	17.7	17.3	16.6	16.5	15.4	15.8	17.4	19.5	22.2	26.2	29.4	31.6	32.9	34.4	33.5	32.9	32.3	30.5	27.8	23.3	21.3	20.9	20.7	Diurnal Average	
35.0	32.1	27.9	27.4	30.4	27.3	25.8	25.9	30.2	34.6	37.7	42.7	45.4	53.7	62.2	53.8	53.3	52.7	53.9	52.5	51.3	40.5	35.5	33.0	Diurnal Maximum	

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



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Patricia McInnes - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Patricia McInnes - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	254	35.88	35.88
21 - 50	445	62.85	98.73
51 - 82	9	1.27	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
Patricia McInnes - August 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	19	1	4	2	1	5	14	14	30	51	32	9	15	21	11	25	254
21 - 50	33	10	7	1	13	53	21	16	16	46	45	37	52	41	20	32	443
51 - 82	1	2	1	1	1	1	2	0	0	0	0	0	0	0	0	0	9
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	13	12	4	15	59	37	30	46	97	77	46	67	62	31	57	706

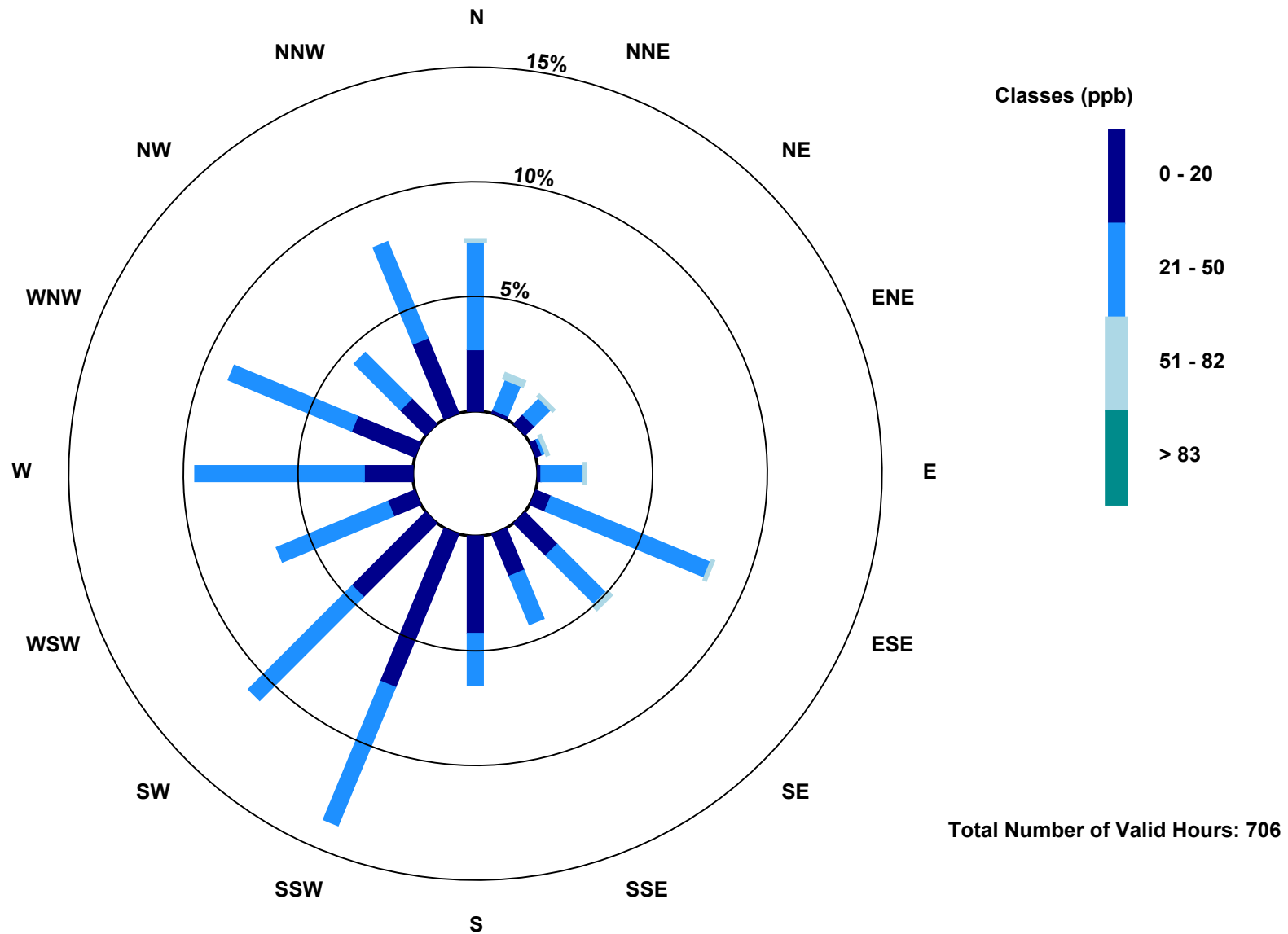
Total Number of Valid Hours: 706

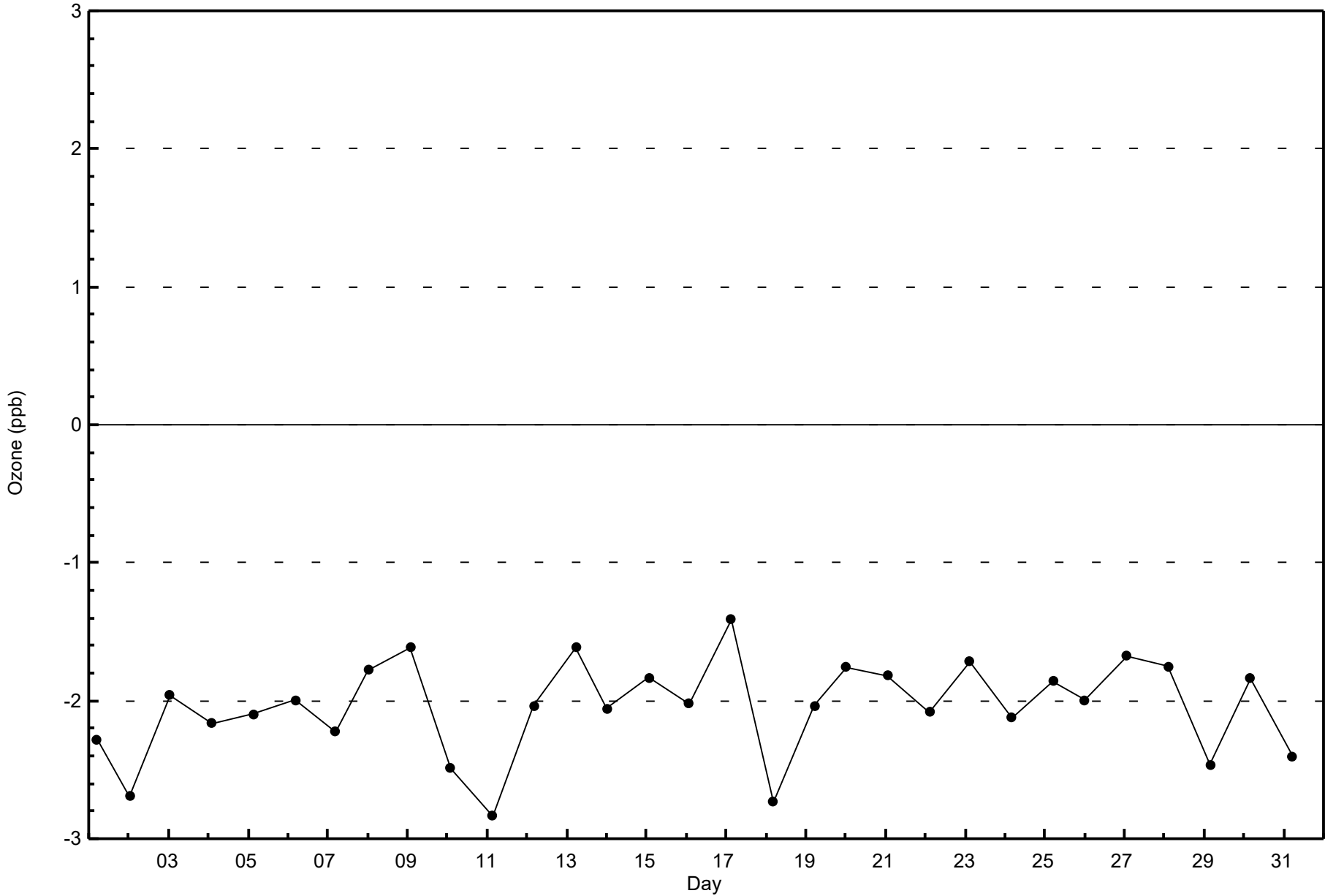
Total Number of Hours: 744

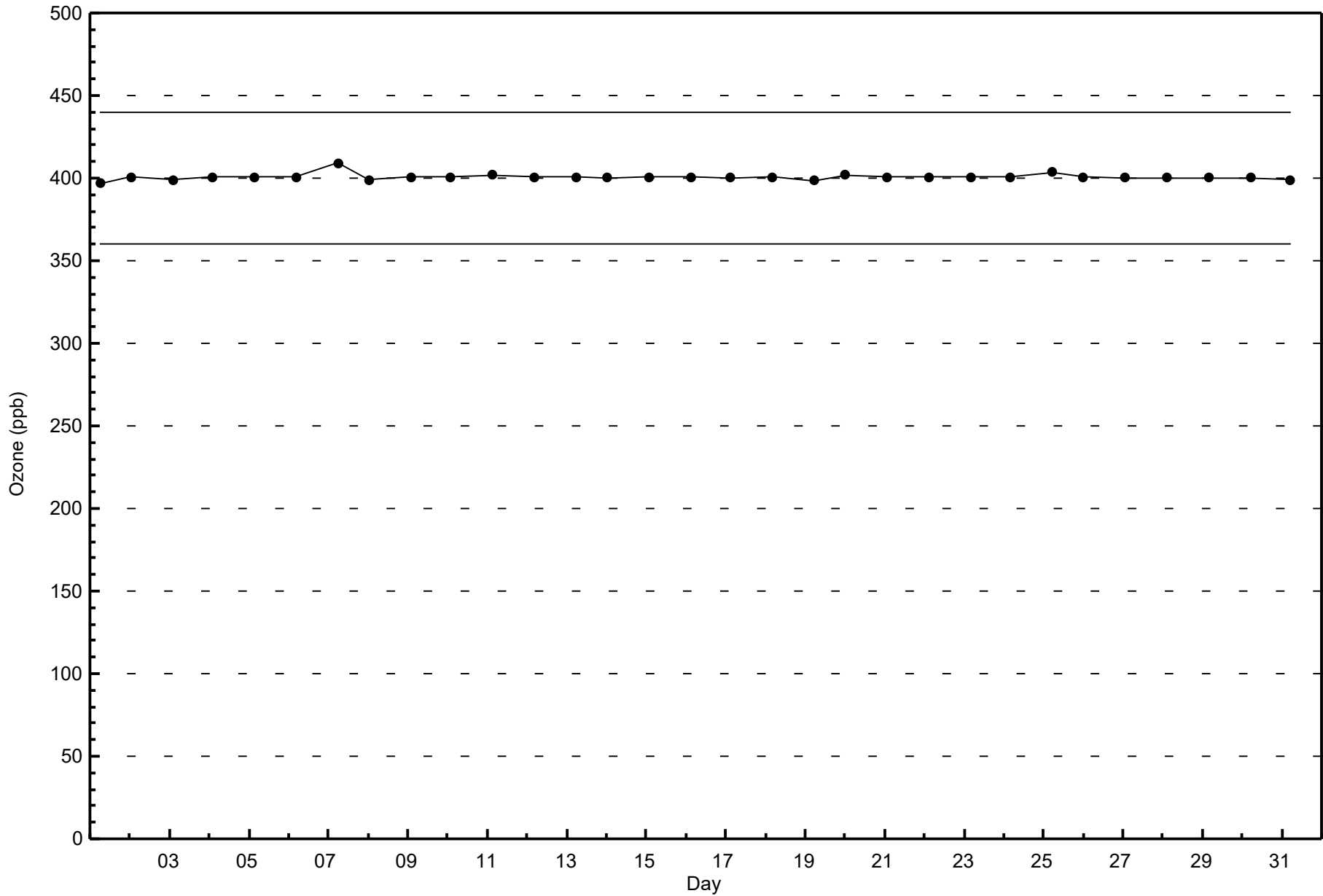


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

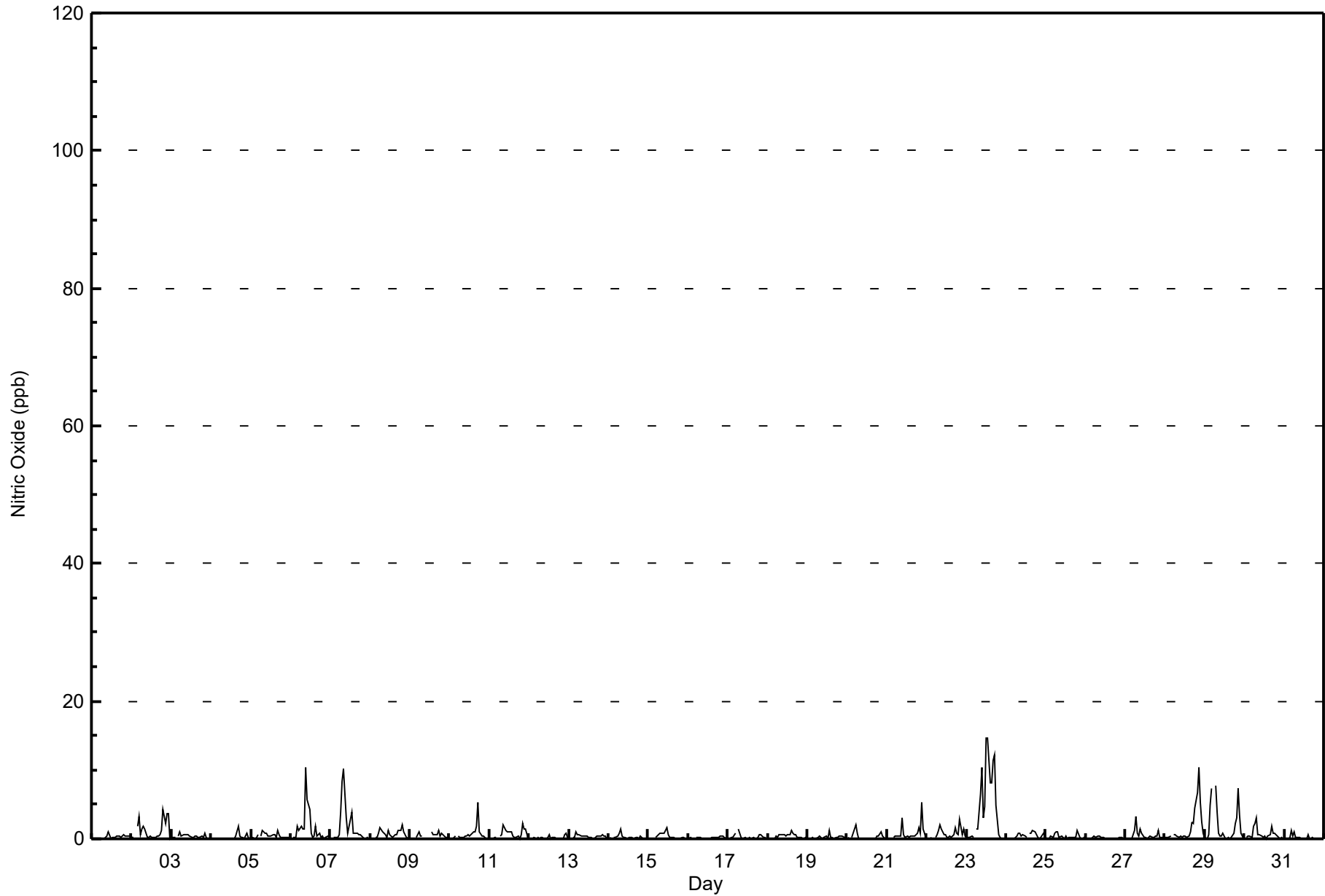
Nitric Oxide (NO) - ppb
Patricia McInnes - August 2023

Maximum Value: 14.7 ppb on Aug 23 13:00		Maximum Daily Average: 4.5 ppb on Aug 23		Hours in Service: 744																											
Minimum Value: 0.0 ppb on Aug 4 01:00		Minimum Daily Average: 0.1 ppb on Aug 26		Hours of Data: 707																											
Maximum Diurnal Average: 1.3 ppb at hour 10		Minimum Diurnal Average: 0.1 ppb at hour 1		Hours of Missing Data: 37																											
Monthly Average: 0.74 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 0.6 P ₉₀ = 1.4 P ₉₉ = 10.0		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-Aug	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.9	0.1	0.1	0.3	0.2	0.4	0.4	0.2	0.4	0.5	0.4	0.3	0.4	0.3	0.3	0.9					
2-Aug	0.3	0.1	Z	1.9	3.3	0.7	1.4	1.9	1.4	0.3	0.2	0.3	0.2	0.2	0.2	0.5	0.3	0.6	1.3	4.3	2.3	3.6	3.6	0.1	1.3	4.3					
3-Aug	0.2	0.2	0.2	Z	0.3	0.9	0.5	0.5	0.7	0.6	0.7	0.4	0.1	0.2	0.5	0.3	0.2	0.2	0.5	0.2	0.7	0.2	0.1	0.1	0.4	0.9					
4-Aug	0.0	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.4	1.8	0.4	0.2	0.1	0.1	0.9	0.3	0.0	0.2	1.8					
5-Aug	0.1	0.1	0.0	0.1	0.5	Z	0.4	1.3	0.8	0.8	0.4	0.5	0.5	0.6	0.6	0.2	1.3	0.7	0.2	0.2	0.1	0.2	0.2	0.2	0.4	1.3					
6-Aug	Z	0.2	0.2	0.2	1.8	1.2	1.9	1.3	1.5	10.3	5.6	4.4	0.8	0.2	0.5	1.8	0.4	0.8	0.3	0.3	0.1	0.2	0.3	0.1	1.5	10.3					
7-Aug	0.0	Z	0.2	0.2	0.2	0.7	3.9	8.4	10.1	3.0	0.8	1.8	2.7	3.8	0.8	0.8	0.8	0.7	0.6	0.4	0.1	0.1	0.1	0.0	1.8	10.1					
8-Aug	0.0	0.0	Z	0.2	0.2	0.9	1.6	0.9	0.8	0.6	0.3	1.1	0.5	0.1	0.4	0.5	0.5	1.2	1.2	2.1	1.0	0.6	0.2	0.1	0.7	2.1					
9-Aug	0.1	0.0	0.1	Z	0.2	1.1	0.4	0.5	C	C	C	C	C	1.0	0.7	0.5	0.7	1.3	0.5	0.7	0.6	0.3	0.1	0.1	0.5	1.3					
10-Aug	0.0	0.0	0.0	0.4	Z	0.3	0.3	0.1	0.3	0.4	0.4	0.7	0.4	0.6	0.9	1.0	1.8	5.3	1.0	0.3	0.4	0.2	0.0	0.0	0.6	5.3					
11-Aug	0.0	0.1	0.1	0.2	0.3	Z	0.4	0.7	2.1	1.6	1.3	0.9	0.9	1.0	0.5	0.1	0.1	0.4	0.1	0.7	2.2	1.5	1.5	0.0	0.7	2.2					
12-Aug	Z	0.0	0.0	0.3	0.0	0.2	0.1	0.2	0.3	0.0	0.0	0.2	0.5	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.6	0.8	0.2	0.2	0.8					
13-Aug	0.1	Z	0.1	0.2	0.9	0.7	0.6	0.4	0.5	0.3	0.4	0.3	0.3	0.3	0.1	0.1	0.1	0.4	0.3	0.4	0.5	0.4	0.3	0.1	0.3	0.9					
14-Aug	0.1	0.2	Z	0.3	0.1	0.4	0.9	1.4	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0.1	0.3	0.1	0.4	0.2	0.0	0.0	0.0	0.3	1.4					
15-Aug	0.0	0.0	0.0	Z	0.3	0.4	0.6	0.8	0.9	0.9	1.3	1.7	0.6	0.3	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.4	1.7					
16-Aug	0.1	0.2	0.1	0.0	Z	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.4	0.5	0.4	0.1	0.0	0.1	0.5					
17-Aug	0.0	0.1	0.2	0.3	0.8	Z	1.4	0.8	0.3	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.6	0.6	0.1	0.2	0.0	0.3	1.4					
18-Aug	Z	0.0	0.0	0.0	0.1	0.4	0.3	0.6	0.6	0.7	0.6	0.5	0.6	0.6	1.2	0.8	0.6	0.6	0.3	0.2	0.2	0.0	0.0	0.1	0.4	1.2					
19-Aug	0.0	Z	0.1	0.2	0.0	0.1	0.1	0.3	0.2	0.1	0.2	0.4	0.0	1.3	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.5	0.2	0.0	0.2	1.3					
20-Aug	0.0	0.2	Z	0.1	1.4	2.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	1.0	0.4	0.1	0.1	0.3	2.0					
21-Aug	0.0	0.0	0.0	Z	0.2	0.5	0.4	0.4	0.5	3.0	0.5	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.8	1.6	0.8	5.3	1.5	0.2	0.8	5.3					
22-Aug	0.0	0.0	0.1	0.2	Z	0.2	0.6	1.1	2.0	1.4	0.6	0.7	0.2	0.2	0.3	0.1	0.5	1.5	0.7	0.6	2.9	0.7	1.4	0.4	0.7	2.9					
23-Aug	0.3	0.3	0.2	0.4	0.3	Z	1.4	1.4	6.5	10.4	3.0	4.7	14.7	14.7	8.1	8.1	11.4	12.3	4.8	0.6	0.1	0.0	0.0	0.0	4.5	14.7					
24-Aug	Z	0.0	0.0	0.1	0.1	0.1	0.4	0.9	0.8	0.5	0.6	0.4	0.2	M	0.8	0.8	1.3	1.0	0.6	0.3	0.1	0.1	0.8	0.6	0.5	1.3					
25-Aug	0.0	Z	0.0	0.3	0.3	0.7	1.0	1.0	0.3	0.3	0.1	0.0	0.5	0.1	0.1	0.3	0.1	0.2	0.2	1.2	0.2	0.1	0.0	0.1	0.3	1.2					
26-Aug	0.0	0.1	Z	0.0	0.2	0.4	0.3	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.4					
27-Aug	0.0	0.0	0.0	Z	0.0	1.2	3.2	0.8	0.4	1.4	0.8	0.2	0.1	0.1	0.3	0.4	0.2	0.1	0.3	0.4	1.2	0.2	0.2	0.3	0.5	3.2					
28-Aug	0.1	0.2	0.2	0.4	Z	0.5	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.1	0.4	1.1	2.4	2.3	4.4	6.7	10.4	5.2	2.4	0.7	1.7	10.4					
29-Aug	0.1	0.0	0.6	4.8	7.3	Z	7.7	3.8	0.8	0.3	0.4	0.8	0.0	0.0	0.3	0.0	0.3	0.8	2.3	3.0	7.3	3.5	0.9	0.0	2.0	7.7					
30-Aug	Z	0.2	0.5	0.4	0.1	1.9	2.2	3.1	0.6	0.7	0.4	0.1	0.5	0.0	0.4	0.5	1.9	0.8	0.7	0.5	0.4	0.1	0.1	0.0	0.7	3.1					
31-Aug	0.0	Z	0.0	0.2	1.3	0.3	1.1	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.6	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.2	1.3					
		0.1	0.1	0.1	0.4	0.8	0.6	1.1	1.1	1.1	1.3	0.7	0.7	0.9	0.9	0.6	0.6	0.9	1.1	0.7	0.9	1.1	0.8	0.5	0.1	Diurnal Average					
		0.3	0.3	0.6	4.8	7.3	2.0	7.7	8.4	10.1	10.4	5.6	4.7	14.7	14.7	8.1	8.1	11.4	12.3	4.8	6.7	10.4	5.3	3.6	0.7	Diurnal Maximum					
Z - zerospan		C - Calibration			M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Nitric Oxide (NO) - ppb
Patricia McInnes - August 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	57	12	13	4	15	58	33	30	49	95	74	50	69	57	32	57	705
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	57	12	13	4	15	58	33	30	49	95	74	50	69	57	32	57	705

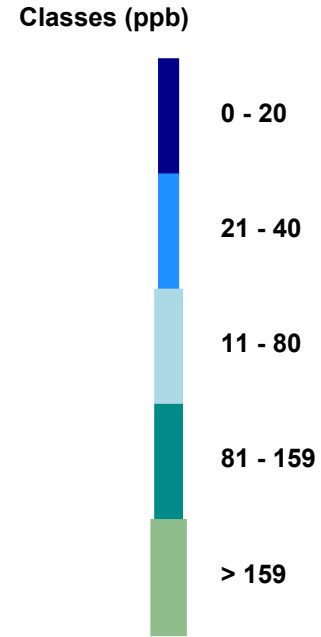
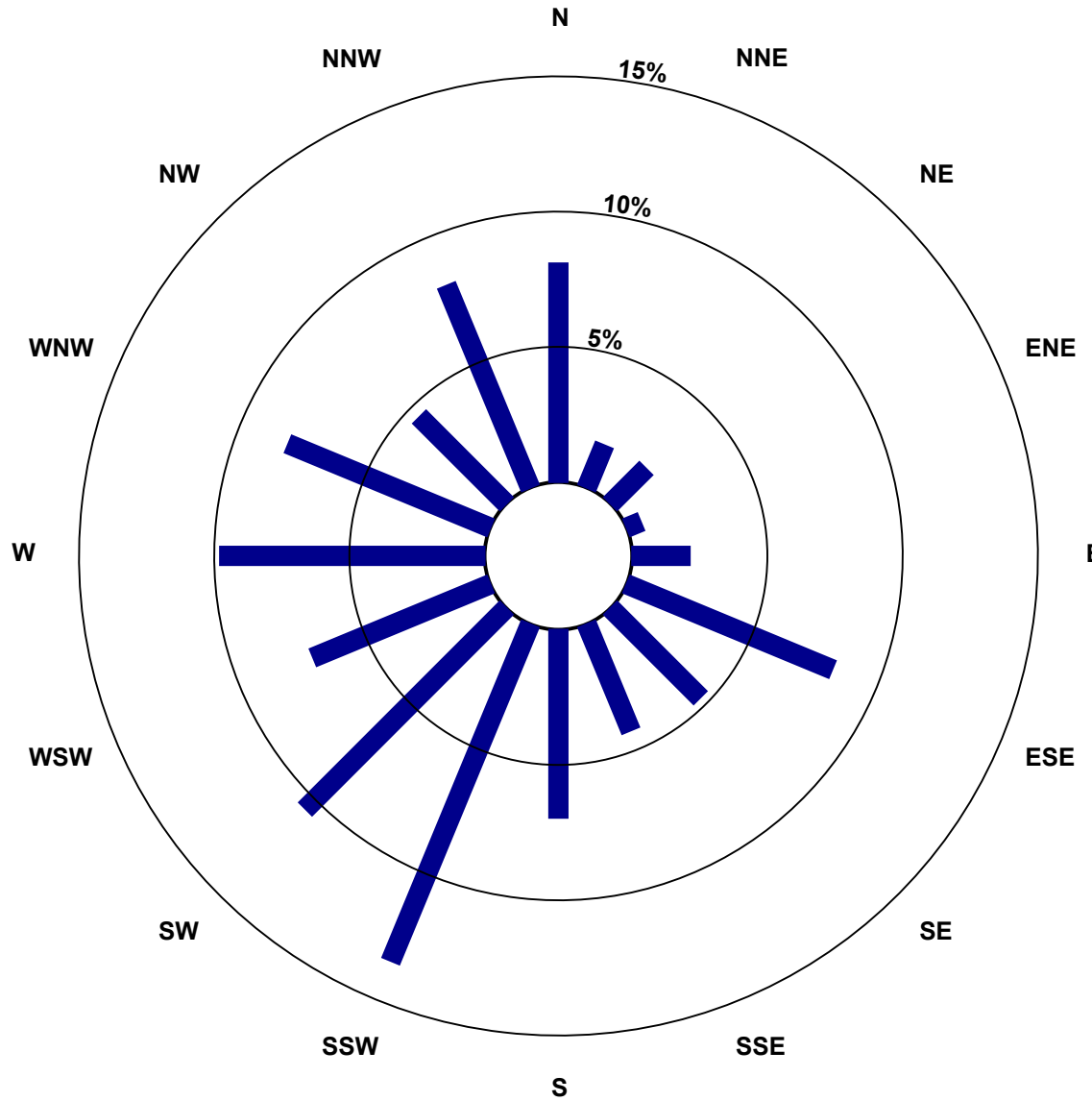
Total Number of Valid Hours: 705

Total Number of Hours: 744

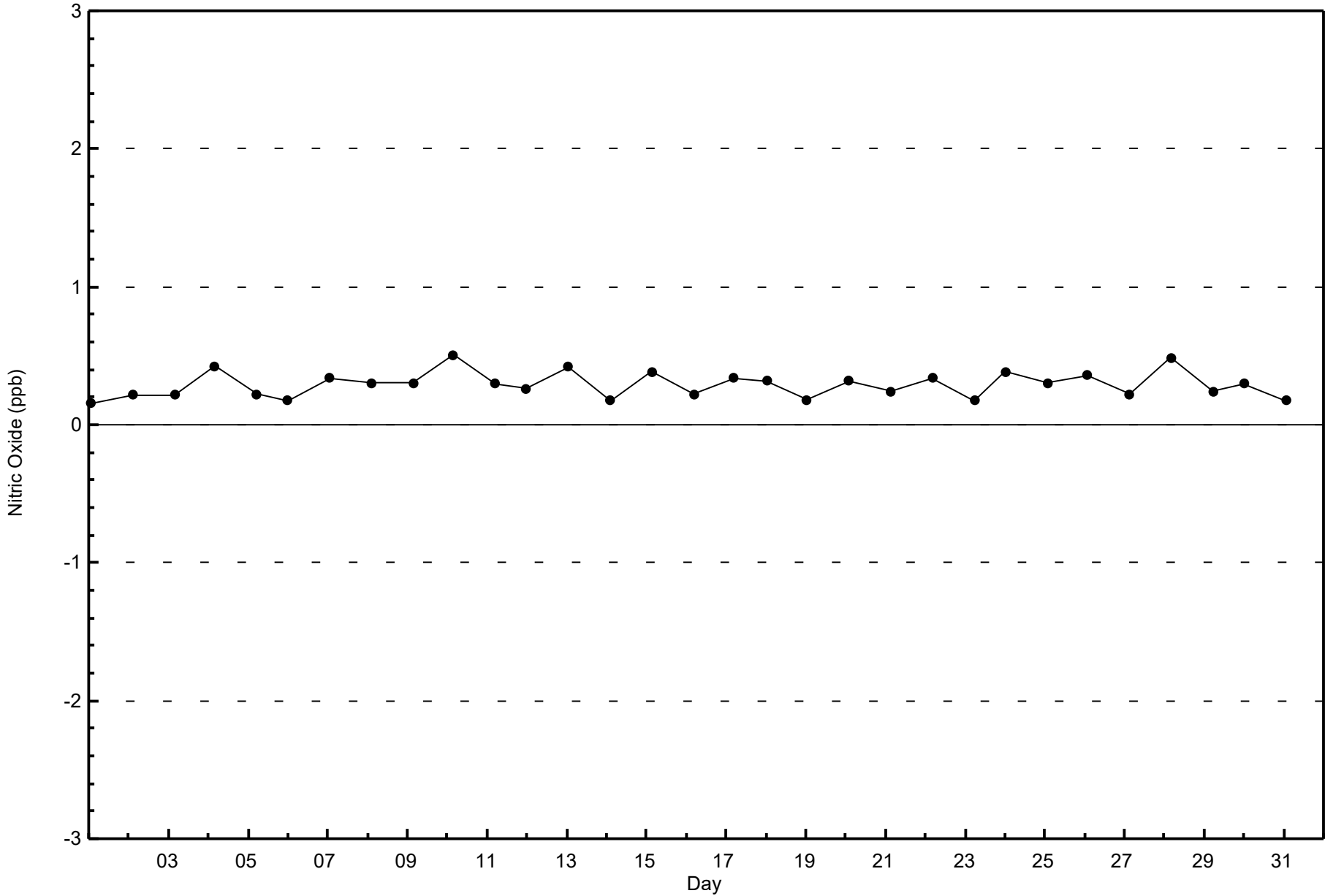


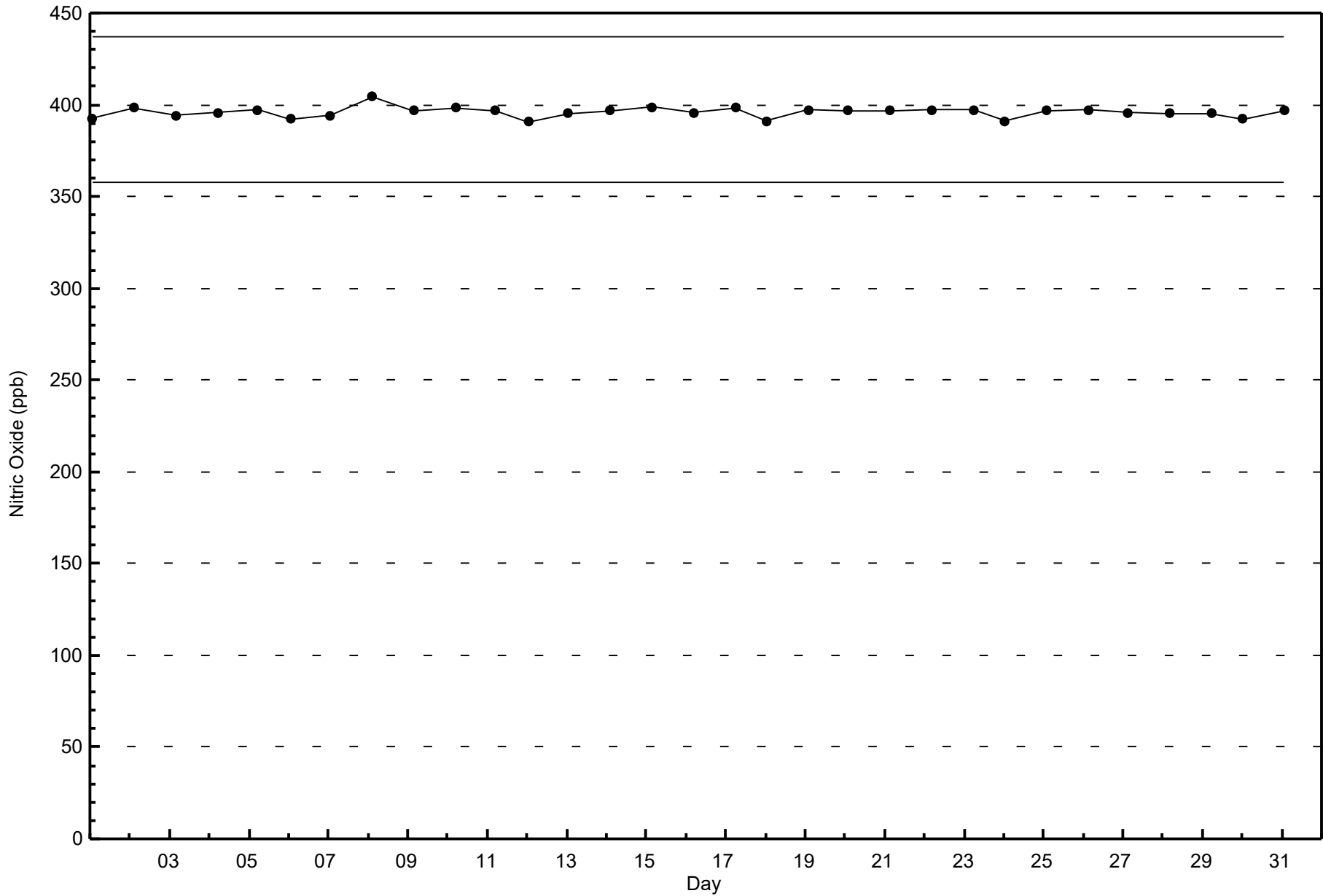
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Patricia McInnes



Total Number of Valid Hours: 705







Wood Buffalo Environmental Association
Summary of Hour Averages

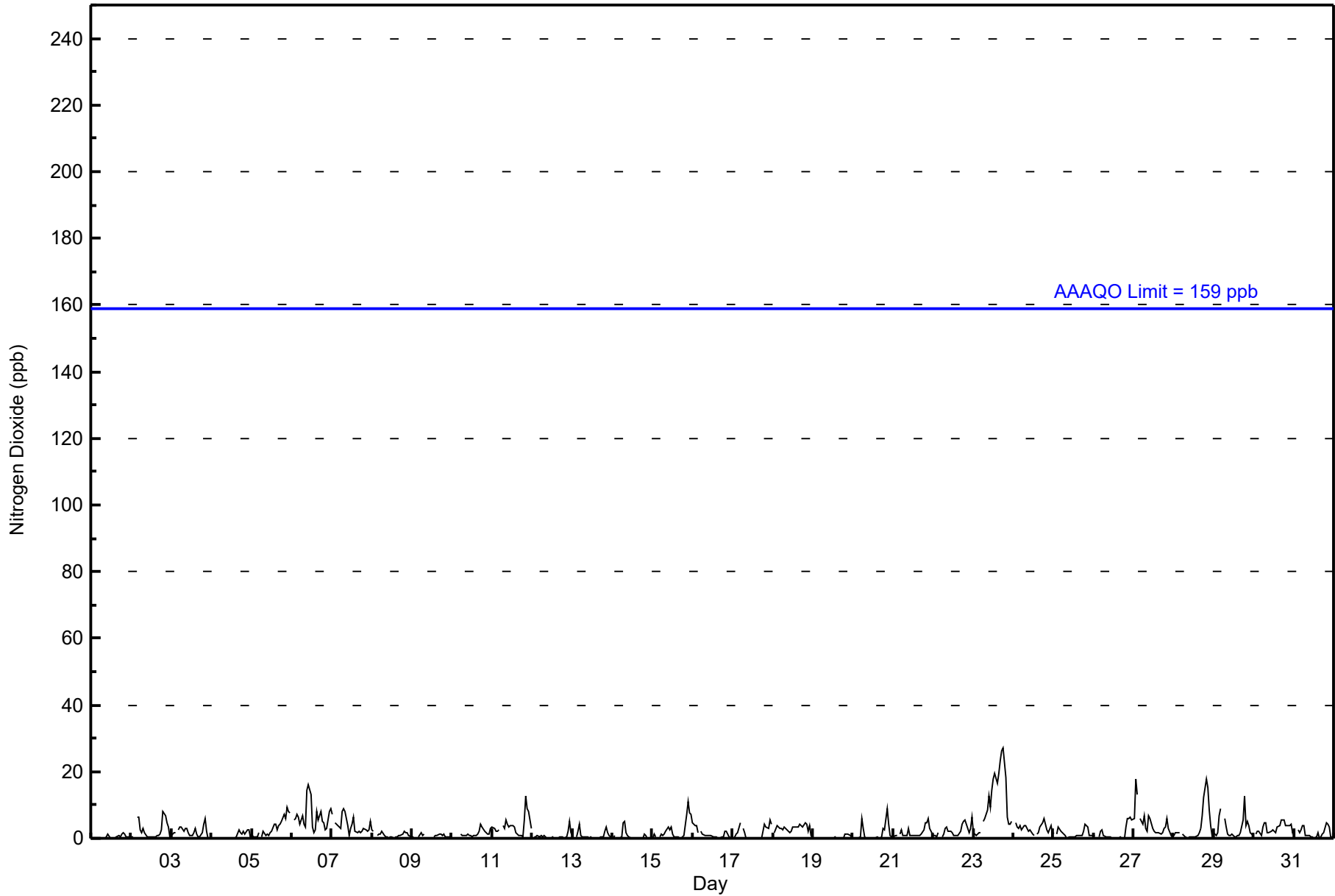
Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum																									
Maximum Value: 27.0 ppb on Aug 23 19:00		Maximum Daily Average: 10.9 ppb on Aug 23																	Hours of Data: 707		Hours of Missing Data: 37																											
Minimum Value: 0.0 ppb on Aug 1 03:00		Minimum Daily Average: 0.2 ppb on Aug 19																	Hours of Calibration: 36		Percent Operational Time: 99.9																											
Maximum Diurnal Average: 4.4 ppb at hour 21		Minimum Diurnal Average: 1.5 ppb at hour 1																																														
Monthly Average: 2.43 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.4 Median = 1.3 Q ₃ = 3.3 P ₉₀ = 5.8 P ₉₉ = 17.8																																														
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-Aug	0.2	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	1.4	0.0	0.0	0.1	0.3	0.7	0.6	1.1	1.5	1.2	0.6	0.5	0.3	0.4	1.5																							
2-Aug	0.3	0.5	Z	6.2	6.2	2.7	1.9	2.9	1.5	0.5	0.3	0.3	0.4	0.5	0.5	0.9	1.0	1.1	2.5	8.1	6.6	4.8	3.5	0.5	8.1																							
3-Aug	1.0	1.6	1.7	Z	2.4	3.5	3.4	2.2	3.1	2.8	1.6	0.8	0.9	1.7	2.8	1.3	0.3	0.4	1.6	4.2	5.8	2.0	0.2	0.0	5.8																							
4-Aug	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	0.4	2.6	1.9	1.3	2.0	1.1	2.5	2.5	0.6	0.6	2.6																							
5-Aug	1.2	0.6	0.4	0.6	1.9	Z	0.5	2.2	0.9	1.1	0.7	1.5	2.1	4.1	3.0	2.5	4.0	4.2	5.0	7.2	6.1	9.3	8.2	7.6	9.3																							
6-Aug	Z	5.3	5.9	7.4	6.5	4.4	6.8	4.4	3.5	14.5	16.1	13.2	3.6	1.8	2.7	8.1	5.4	8.1	5.1	4.5	2.4	3.0	8.2	8.7	16.1																							
7-Aug	7.3	Z	4.7	4.2	3.5	2.8	7.9	8.9	8.1	3.8	1.0	2.8	4.2	6.5	2.2	1.6	2.3	1.7	2.1	3.0	2.7	2.2	2.4	4.9	8.9																							
8-Aug	2.6	2.0	Z	0.9	1.2	1.4	2.2	0.8	0.6	0.6	0.2	0.4	0.3	0.1	0.3	0.5	0.7	0.8	1.2	2.1	1.8	1.5	1.0	0.5	2.6																							
9-Aug	0.6	0.2	0.2	Z	0.6	1.9	1.0	1.1	C	C	C	C	C	0.6	0.7	0.8	1.4	1.4	0.7	1.1	0.5	0.4	0.3	0.1	1.9																							
10-Aug	0.0	0.0	0.1	0.2	Z	1.3	1.0	1.0	1.0	1.1	1.0	0.9	0.5	0.7	0.9	1.3	2.2	4.2	3.3	2.0	1.8	1.1	1.1	3.1	4.2																							
11-Aug	3.6	2.8	2.0	2.2	2.4	Z	3.7	3.0	5.4	4.1	3.6	3.7	3.9	3.2	1.5	1.1	0.9	0.9	0.6	5.5	12.8	8.9	8.1	3.0	12.8																							
12-Aug	Z	0.5	0.4	0.7	0.4	0.7	0.3	0.7	0.3	0.2	0.1	0.2	0.5	0.1	0.2	0.2	0.3	0.5	0.4	0.2	0.5	2.3	5.0	1.8	5.0																							
13-Aug	0.7	Z	0.4	2.0	4.3	0.9	0.5	0.3	0.3	0.3	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.3	0.4	2.0	3.3	1.9	1.0	0.3	4.3																							
14-Aug	0.0	0.9	Z	0.1	0.0	0.4	4.8	5.0	1.9	0.7	0.3	0.2	0.1	0.0	0.0	0.2	0.1	0.2	1.2	1.0	0.1	0.1	0.0	0.0	5.0																							
15-Aug	0.0	1.2	0.5	Z	0.5	1.3	1.0	1.3	2.3	3.2	2.5	3.4	1.4	0.5	0.3	0.4	0.1	0.1	0.4	0.7	7.1	11.2	7.6	7.3	11.2																							
16-Aug	4.8	4.0	3.7	1.9	Z	2.0	1.2	0.9	0.9	0.9	0.9	0.8	0.5	0.4	0.5	0.2	0.0	0.3	0.5	2.0	2.3	1.4	0.3	0.1	4.8																							
17-Aug	0.0	0.6	1.3	1.7	4.7	Z	3.0	1.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	4.3	3.6	2.8	5.3	4.2	5.3																							
18-Aug	Z	1.9	4.0	3.2	3.1	2.8	2.7	3.3	2.5	2.2	1.7	2.0	3.3	3.2	3.3	3.3	4.3	4.0	3.6	4.5	4.1	2.0	4.0	1.0	4.5																							
19-Aug	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	0.4	0.0	0.0	0.0	0.0	0.0	1.2	1.4	1.3	0.9	0.1	1.4																							
20-Aug	0.0	0.2	Z	0.1	0.5	5.9	3.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.6	3.0	2.4	8.7	4.1	0.8	0.4	8.7																							
21-Aug	0.3	0.7	0.9	Z	1.2	2.7	0.9	0.7	0.8	3.1	1.0	0.7	0.7	0.7	1.0	0.9	0.8	1.3	2.6	4.5	4.7	6.1	2.9	1.2	6.1																							
22-Aug	0.9	1.0	0.5	1.5	Z	0.5	1.3	2.8	3.3	2.3	2.2	1.5	0.9	1.0	0.8	0.8	2.0	4.1	5.1	5.5	4.1	1.8	3.1	6.2	6.2																							
23-Aug	1.6	1.3	1.0	1.9	1.6	Z	4.9	5.8	8.4	12.8	9.4	14.3	18.0	19.6	16.6	19.4	23.3	26.4	27.0	18.3	6.5	4.2	4.4	4.9	27.0																							
24-Aug	Z	4.6	3.4	3.0	3.7	2.4	3.8	3.9	2.9	2.3	2.5	1.1	0.8	M	1.3	1.8	3.5	4.5	5.9	4.3	2.4	1.7	3.7	1.3	5.9																							
25-Aug	1.8	Z	1.1	3.2	2.1	1.8	1.2	0.7	0.1	0.3	0.4	0.3	0.4	0.4	0.7	0.8	0.7	1.0	2.0	4.2	3.3	0.8	0.9	0.9	4.2																							
26-Aug	0.9	0.9	Z	0.6	2.1	2.5	0.7	0.5	0.4	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.4	0.1	0.1	3.4	6.1	6.1	6.4	5.7	6.4																							
27-Aug	5.9	17.6	13.2	Z	6.0	4.2	6.7	2.9	2.3	6.7	5.9	3.1	2.1	1.9	1.7	1.9	1.2	1.5	3.1	3.2	6.1	3.1	0.8	0.8	17.6																							
28-Aug	0.8	1.5	1.6	1.8	Z	1.2	0.8	0.3	0.2	0.6	0.6	0.4	0.3	0.3	0.7	1.6	3.0	6.9	12.2	17.8	15.2	8.3	4.0	1.0	17.8																							
29-Aug	1.9	0.7	1.6	6.8	8.7	Z	5.9	3.6	1.1	0.8	0.7	1.1	0.5	0.5	0.7	0.8	1.7	5.5	12.9	3.7	5.1	3.9	1.5	1.0	12.9																							
30-Aug	Z	1.2	2.1	2.3	0.8	3.2	4.8	4.5	1.9	1.8	2.1	2.5	2.2	1.5	3.3	3.8	5.3	5.3	5.6	3.8	3.9	3.7	4.1	1.9	5.6																							
31-Aug	2.4	Z	2.5	1.7	2.5	3.8	3.9	1.0	0.8	0.7	0.3	0.4	0.0	0.3	1.7	0.1	0.4	1.3	1.5	4.8	4.3	3.2	0.4	0.4	4.8																							
																								1.5	2.1	2.0	2.1	2.6	2.1	2.6	2.2	1.8	2.3	1.9	1.9	1.6	1.7	1.6	1.8	2.2	2.9	3.7	4.3	4.4	3.4	3.0	2.3	Diurnal Average
																								7.3	17.6	13.2	7.4	8.7	5.9	7.9	8.9	8.4	14.5	16.1	14.3	18.0	19.6	16.6	19.4	23.3	26.4	27.0	18.3	15.2	11.2	8.2	8.7	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
Patricia McInnes - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.58	99.58
21 - 40	3	0.42	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
Patricia McInnes - August 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	12	13	4	15	58	33	30	49	95	74	50	69	57	32	56	702
21 - 40	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
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	57	12	13	4	15	58	33	30	49	95	74	50	69	57	32	57	705

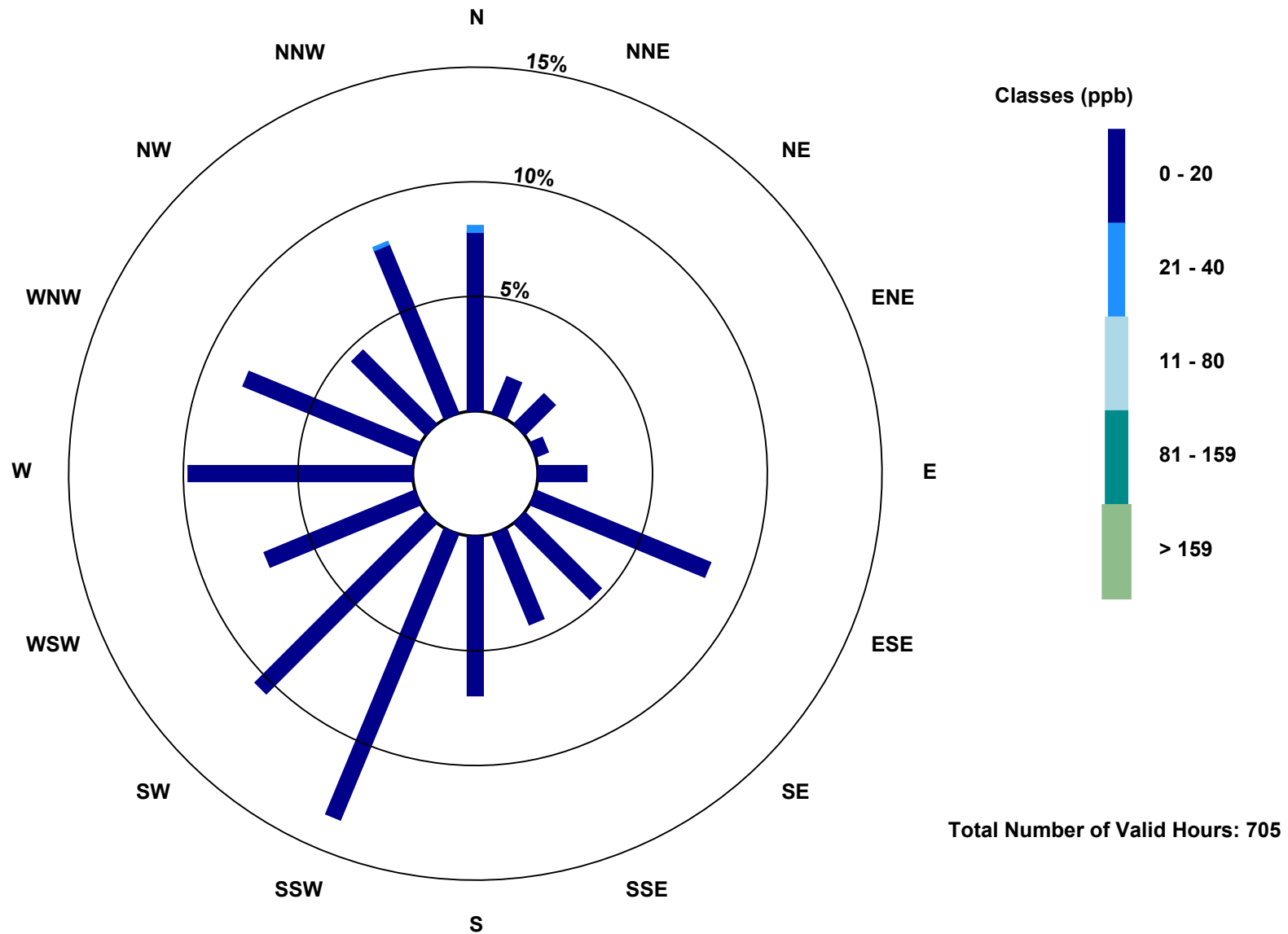
Total Number of Valid Hours: 705

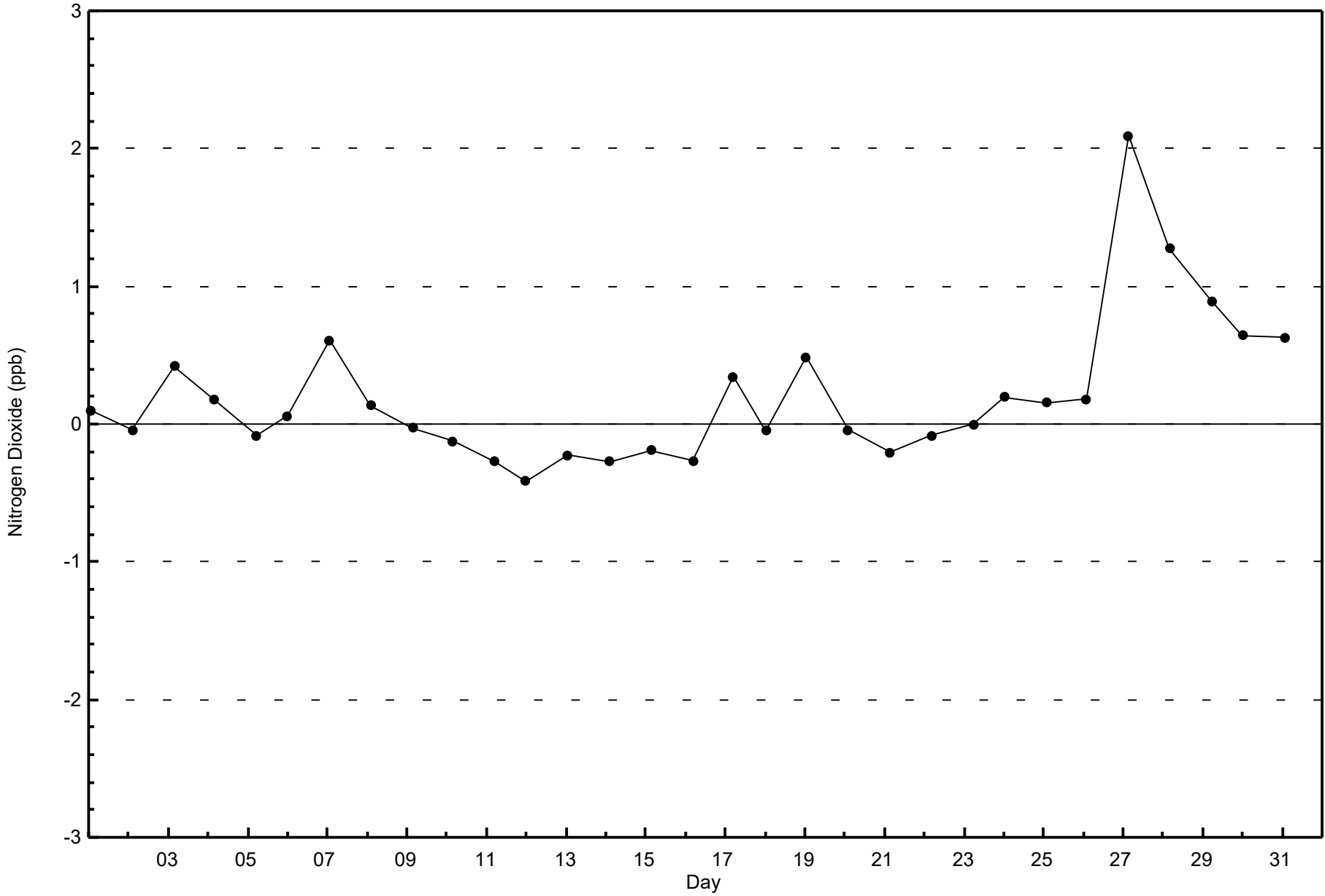
Total Number of Hours: 744

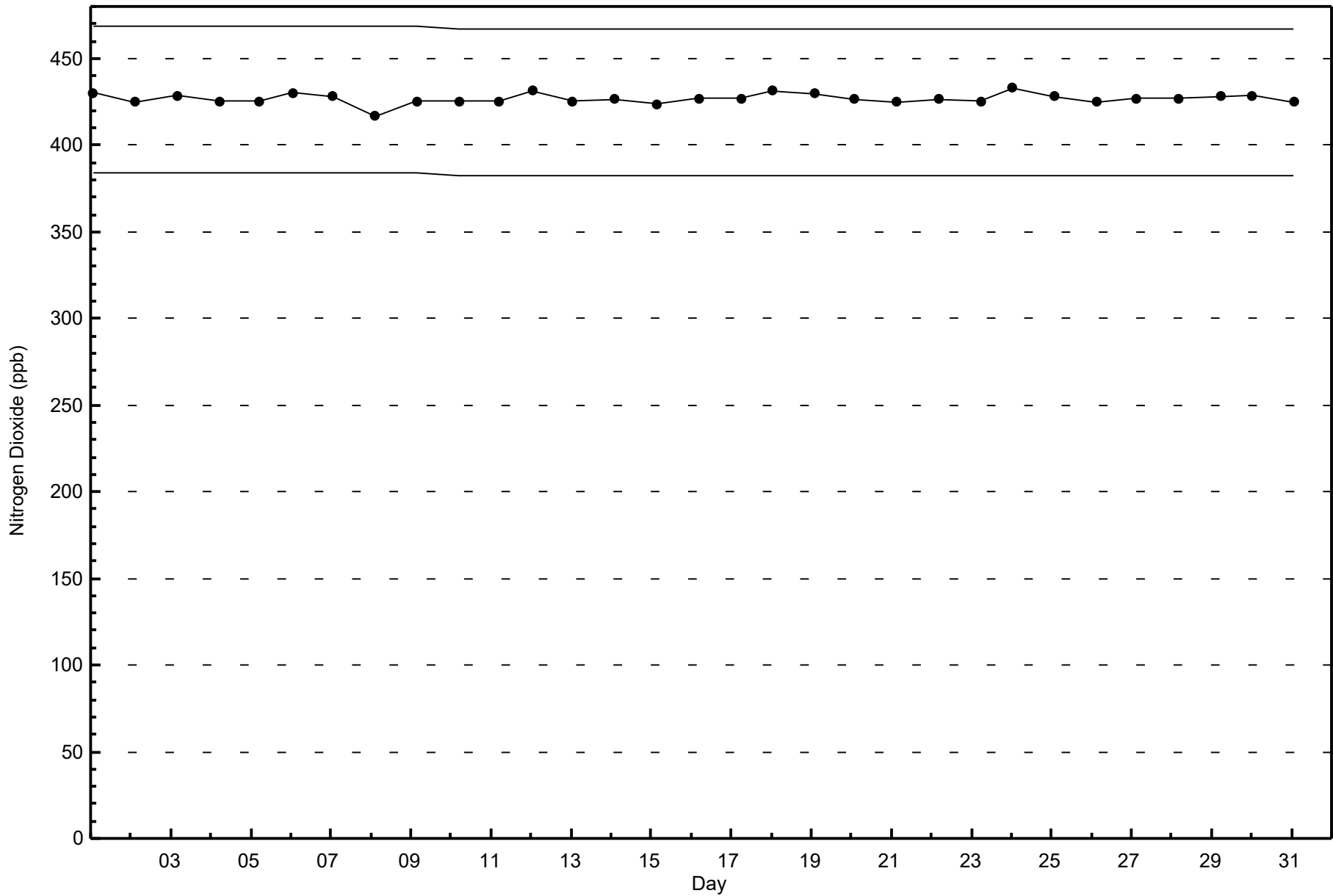


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Patricia McInnes









Wood Buffalo Environmental Association
Summary of Hour Averages

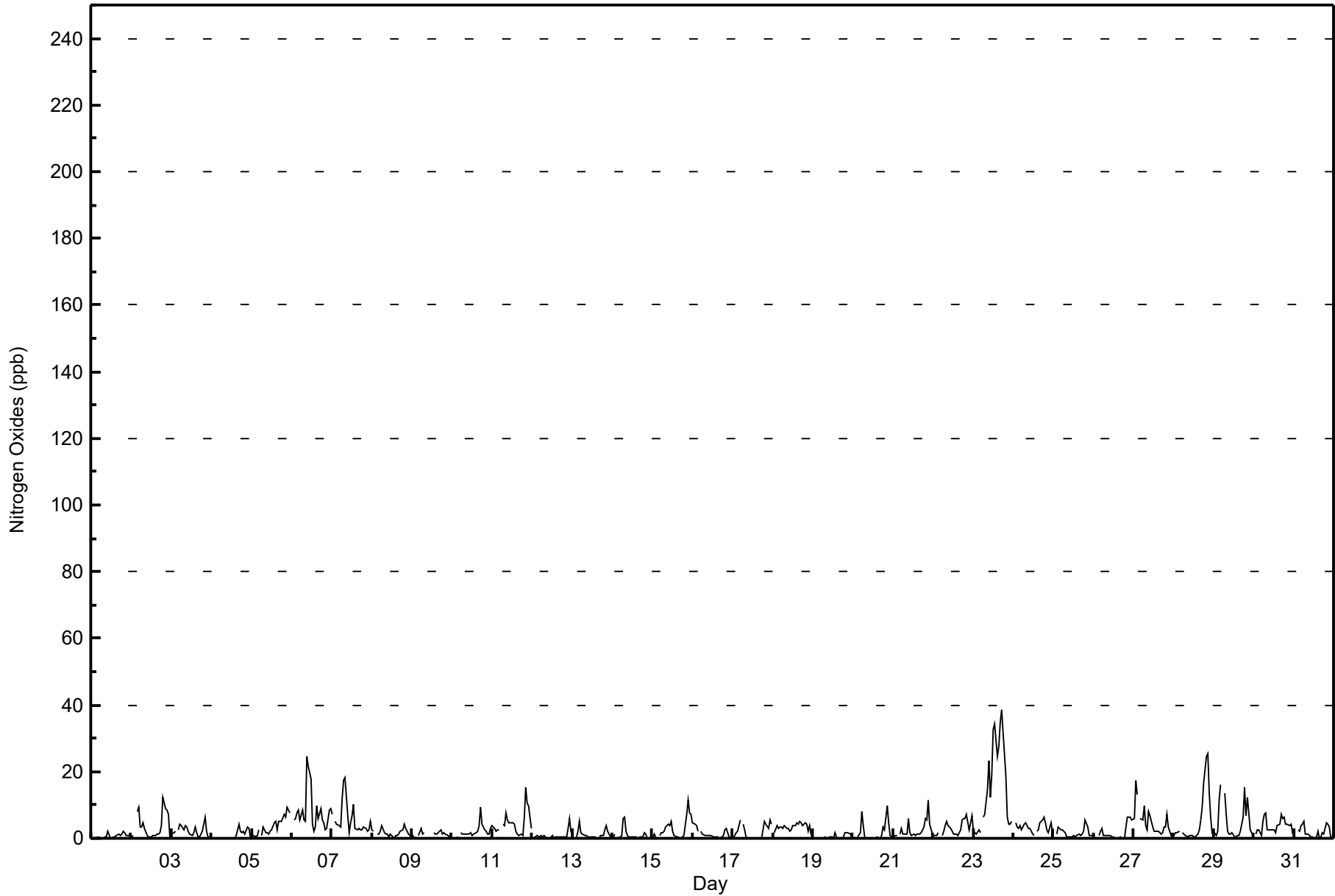
Nitrogen Oxides (NO_x) - ppb
Patricia McInnes - August 2023

Maximum Value: 38.7 ppb on Aug 23 18:00																				Maximum Daily Average: 15.4 ppb on Aug 23					Hours in Service: 744																								
Minimum Value: 0.0 ppb on Aug 4 01:00										Minimum Daily Average: 0.5 ppb on Aug 19										Hours of Data: 707																													
Maximum Diurnal Average: 5.5 ppb at hour 21										Minimum Diurnal Average: 1.5 ppb at hour 1										Hours of Missing Data: 37																													
Monthly Average: 3.16 ppb										Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.6 Median = 1.8 Q ₃ = 3.9 P ₉₀ = 7.0 P ₉₉ = 24.8										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-Aug	0.2	Z	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.6	2.3	0.1	0.1	0.3	0.7	1.1	0.8	1.5	2.0	1.6	0.9	0.9	0.6	0.7	2.3																								
2-Aug	0.6	0.6	Z	8.1	9.5	3.4	3.3	4.8	2.9	0.8	0.5	0.6	0.6	0.7	0.7	1.4	1.3	1.7	3.8	12.4	8.9	8.4	7.1	0.6	3.6	12.4																							
3-Aug	1.2	1.8	1.9	Z	2.7	4.4	3.9	2.7	3.8	3.4	2.3	1.2	1.0	1.9	3.3	1.6	0.5	0.6	2.1	4.4	6.5	2.2	0.3	0.1	2.3	6.5																							
4-Aug	0.0	0.1	0.0	0.0	Z	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.8	4.4	2.3	1.5	2.1	1.2	3.4	2.8	0.6	0.8	4.4	4.4																							
5-Aug	1.3	0.7	0.4	0.7	2.4	Z	0.9	3.5	1.7	1.9	1.1	2.0	2.6	4.7	4.9	2.7	5.3	4.9	5.2	7.4	6.2	9.5	8.4	7.8	3.7	9.5																							
6-Aug	Z	5.5	6.1	7.6	8.3	5.6	8.7	5.7	5.0	24.8	21.7	17.6	4.4	2.0	3.2	9.9	5.8	8.9	5.4	4.8	2.5	3.2	8.5	8.8	8.0	24.8																							
7-Aug	7.3	Z	4.9	4.4	3.7	3.5	11.8	17.3	18.2	6.8	1.8	4.6	6.9	10.3	3.0	2.4	3.1	2.4	2.7	3.4	2.8	2.3	2.5	4.9	5.7	18.2																							
8-Aug	2.6	2.0	Z	1.1	1.4	2.3	3.8	1.7	1.4	1.2	0.5	1.5	0.8	0.2	0.7	1.0	1.2	2.0	2.4	4.2	2.8	2.1	1.2	0.6	1.7	4.2																							
9-Aug	0.7	0.2	0.3	Z	0.8	3.0	1.4	1.6	C	C	C	C	C	1.6	1.4	1.3	2.1	2.7	1.2	1.8	1.1	0.7	0.4	0.2	1.2	3.0																							
10-Aug	0.0	0.0	0.1	0.6	Z	1.6	1.3	1.1	1.3	1.5	1.4	1.6	0.9	1.3	1.8	2.3	4.0	9.5	4.3	2.3	2.2	1.3	1.1	3.1	2.0	9.5																							
11-Aug	3.6	2.9	2.1	2.4	2.7	Z	4.1	3.7	7.5	5.7	4.9	4.6	4.8	4.2	2.0	1.2	1.0	1.3	0.7	6.2	15.0	10.4	9.6	3.0	4.5	15.0																							
12-Aug	Z	0.5	0.4	1.0	0.4	0.9	0.4	0.9	0.6	0.2	0.1	0.4	1.0	0.2	0.3	0.3	0.3	0.6	0.5	0.2	0.5	2.9	5.8	2.0	0.9	5.8																							
13-Aug	0.8	Z	0.5	2.2	5.2	1.6	1.1	0.7	0.8	0.6	0.6	0.6	0.4	0.1	0.1	0.2	0.7	0.7	2.4	3.8	2.3	1.3	0.4	1.2	5.2	5.2																							
14-Aug	0.1	1.1	Z	0.4	0.1	0.8	5.7	6.4	2.2	0.9	0.4	0.3	0.3	0.2	0.3	0.1	0.3	0.4	0.3	1.6	1.2	0.1	0.1	0.0	1.0	6.4																							
15-Aug	0.0	1.2	0.5	Z	0.8	1.7	1.6	2.1	3.2	4.1	3.8	5.1	2.0	0.8	0.6	0.6	0.1	0.1	0.4	0.8	7.3	11.4	7.7	7.3	2.7	11.4																							
16-Aug	4.9	4.2	3.8	1.9	Z	2.2	1.5	1.0	0.9	0.9	0.9	0.8	0.5	0.4	0.6	0.3	0.2	0.5	0.7	2.4	2.8	1.8	0.4	0.1	1.5	4.9																							
17-Aug	0.0	0.7	1.5	2.0	5.5	Z	4.4	2.6	0.4	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	2.4	4.9	4.2	2.9	5.5	4.2	1.8	5.5																							
18-Aug	Z	1.9	4.0	3.2	3.2	3.2	3.0	3.9	3.1	2.9	2.3	2.5	3.9	3.8	4.5	4.1	4.9	4.6	3.9	4.7	4.3	2.0	4.0	1.1	3.4	4.9																							
19-Aug	0.0	Z	0.1	0.2	0.0	0.1	0.1	0.3	0.2	0.1	0.2	0.4	0.0	1.7	0.3	0.2	0.1	0.2	0.3	1.6	1.8	1.8	1.1	0.1	0.5	1.8																							
20-Aug	0.0	0.4	Z	0.2	1.9	7.9	3.7	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.7	3.3	2.7	9.7	4.5	0.9	0.5	1.6	9.7																							
21-Aug	0.3	0.7	0.9	Z	1.4	3.2	1.3	1.1	1.3	6.1	1.5	1.0	1.1	1.0	1.4	1.3	1.3	1.7	3.4	6.1	5.5	11.4	4.4	1.4	2.6	11.4																							
22-Aug	0.9	1.0	0.6	1.7	Z	0.7	1.9	3.9	5.3	3.7	2.8	2.2	1.1	1.2	1.1	0.9	2.5	5.6	5.8	6.1	7.0	2.5	4.5	6.6	3.0	7.0																							
23-Aug	1.9	1.6	1.2	2.3	1.9	Z	6.3	7.2	14.9	23.2	12.4	19.0	32.7	34.3	24.7	27.5	34.7	38.7	31.8	18.9	6.6	4.2	4.4	4.9	15.4	38.7																							
24-Aug	Z	4.6	3.4	3.1	3.8	2.5	4.2	4.8	3.7	2.8	3.1	1.5	1.0	M	2.1	2.6	4.8	5.5	6.5	4.6	2.5	1.8	4.5	1.9	3.4	6.5																							
25-Aug	1.8	Z	1.1	3.5	2.4	2.5	2.2	1.7	0.4	0.6	0.5	0.3	0.9	0.5	0.8	1.1	0.8	1.2	2.2	5.4	3.5	0.9	0.9	1.0	1.6	5.4																							
26-Aug	0.9	1.0	Z	0.6	2.3	2.9	1.0	0.9	0.7	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.5	0.1	0.1	3.4	6.2	6.2	6.6	5.7	1.8	6.6																							
27-Aug	5.9	17.6	13.2	Z	6.0	5.4	9.9	3.7	2.7	8.1	6.7	3.3	2.2	2.0	2.0	2.3	1.4	1.6	3.4	3.6	7.3	3.3	1.0	1.1	4.9	17.6																							
28-Aug	0.9	1.7	1.8	2.2	Z	1.7	1.3	0.6	0.4	0.9	0.8	0.7	0.6	0.4	1.1	2.7	5.4	9.2	16.6	24.5	25.6	13.5	6.4	1.7	5.2	25.6																							
29-Aug	2.0	0.7	2.2	11.6	16.0	Z	13.6	7.4	1.9	1.1	1.1	1.9	0.5	0.5	1.0	0.8	2.0	6.3	15.2	6.7	12.4	7.4	2.4	1.0	5.0	16.0																							
30-Aug	Z	1.4	2.6	2.7	0.9	5.1	7.0	7.6	2.5	2.5	2.5	2.6	2.7	1.5	3.7	4.3	7.2	6.1	6.3	4.3	4.3	3.8	4.2	1.9	3.8	7.6																							
31-Aug	2.4	Z	2.5	1.9	3.8	4.1	5.0	1.3	1.1	0.9	0.4	0.5	0.0	0.4	2.3	0.1	0.4	1.6	1.5	4.9	4.3	3.2	0.4	0.4	1.9	5.0																							
																								1.5	2.2	2.2	2.5	3.4	2.7	3.7	3.3	3.0	3.6	2.6	2.6	2.5	2.6	2.2	2.4	3.1	3.9	4.4	5.2	5.5	4.3	3.5	2.4	Diurnal Average	
																								7.3	17.6	13.2	11.6	16.0	7.9	13.6	17.3	18.2	24.8	21.7	19.0	32.7	34.3	24.7	27.5	34.7	38.7	31.8	24.5	25.6	13.5	9.6	8.8	Diurnal Maximum	
Z - zerospan		C - Calibration					M - Maintenance																																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	98.30	98.30
21 - 40	12	1.70	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 Oxides (NO_x) - ppb
Patricia McInnes - August 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	53	12	12	4	14	58	32	29	49	95	74	50	69	57	32	53	693
21 - 40	4	0	1	0	1	0	1	1	0	0	0	0	0	0	0	4	12
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	57	12	13	4	15	58	33	30	49	95	74	50	69	57	32	57	705

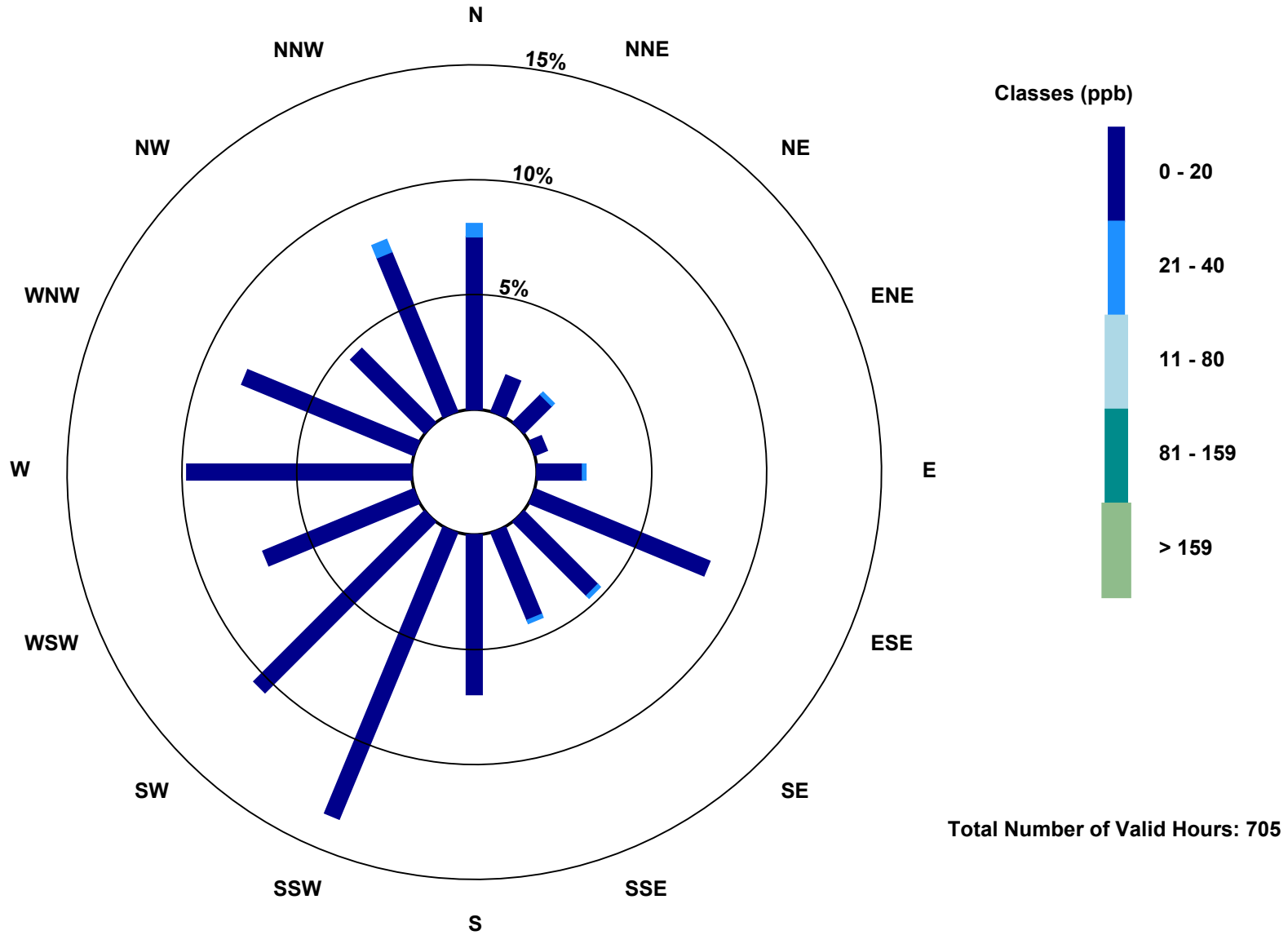
Total Number of Valid Hours: 705

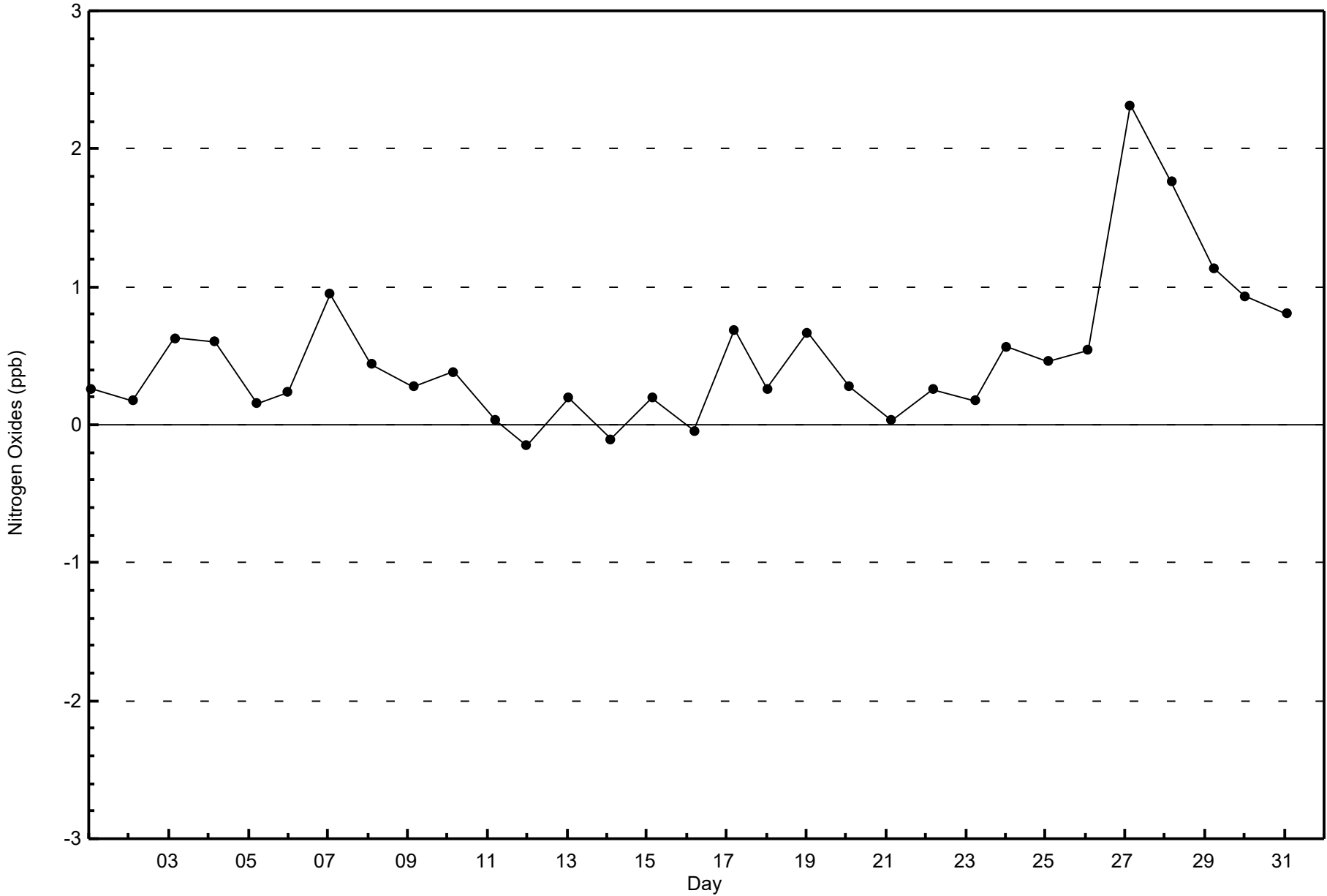
Total Number of Hours: 744

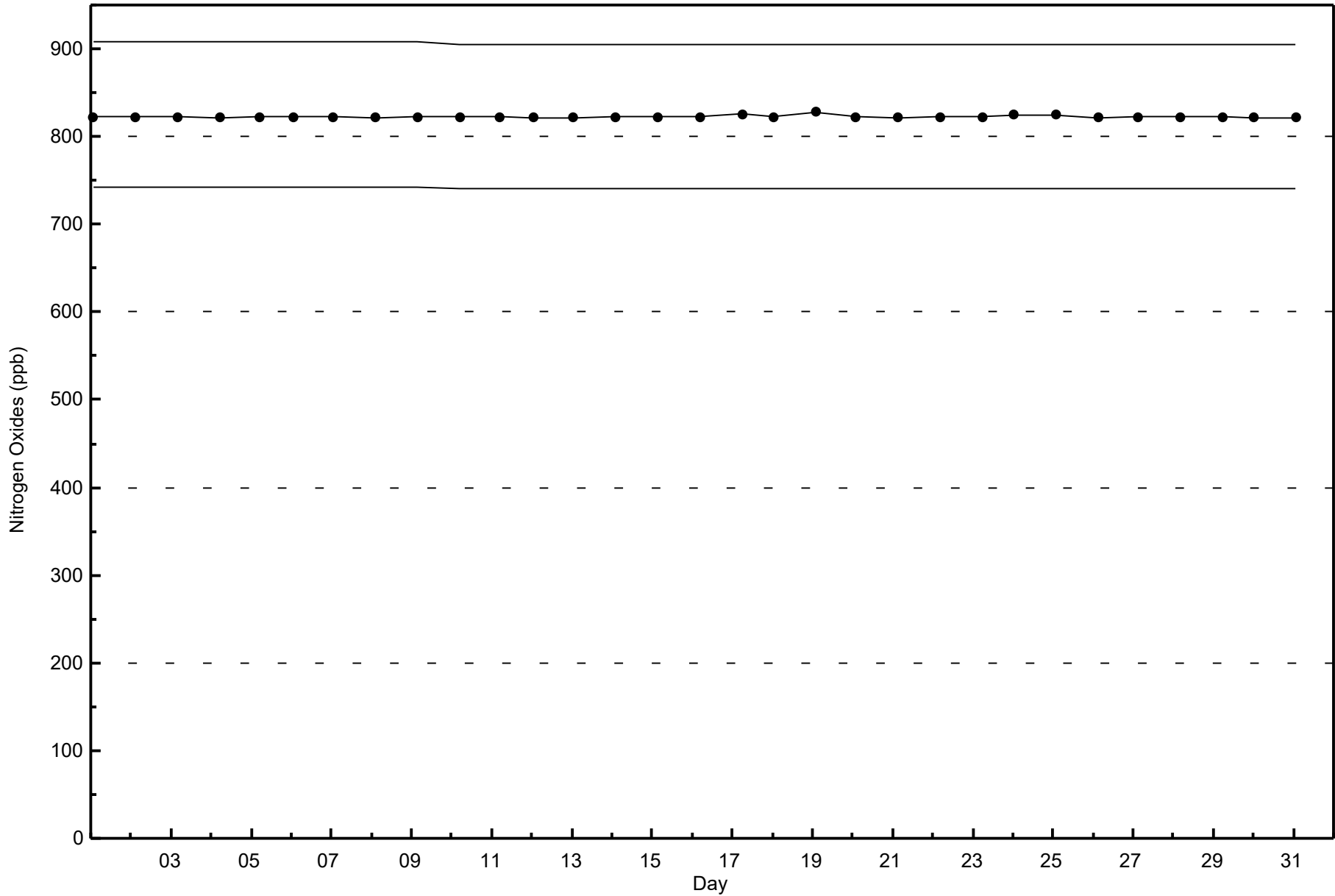


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Patricia McInnes









Wood Buffalo Environmental Association

Summary of Hour Averages

Ammonia (NH₃) - ppb

Patricia McInnes - August 2023

Number of Exceedences (AAAQO): 1-hr: 0	Hours in Service: 744
Maximum Value: 47.1 ppb on Aug 27 02:00	Maximum Daily Average: 20.9 ppb on Aug 27
Minimum Value: 0.0 ppb on Aug 1 05:00	Hours of Data: 595
Maximum Diurnal Average: 4.7 ppb at hour 2	Hours of Missing Data: 149
Monthly Average: 1.96 ppb	Hours of Calibration: 44
Minimum Daily Average: 0.0 ppb on Aug 1	Percent Operational Time: 85.9
Minimum Diurnal Average: 0.0 ppb at hour 5	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 10.7 P ₉₉ = 28.1	

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-Aug	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		
2-Aug	0.0	Z	RE	RE	RE	0.0	0.0	0.0	C	C	C	C	C	C	C	C	C	M	M	M	M	M	M	M	M	M	M	0.0	0.0	
3-Aug	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	24.5	16.0	13.0	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4-Aug	0.0	0.0	0.0	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	
5-Aug	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	
6-Aug	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	
7-Aug	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	
8-Aug	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	
9-Aug	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	
10-Aug	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	
11-Aug	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	
12-Aug	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	
13-Aug	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	0.0	
14-Aug	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	
15-Aug	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	
16-Aug	0.0	0.0	0.0	Z	RE	RE	RE	0.0	0.0	0.0	10.3	0.0	13.6	15.6	14.4	12.9	12.2	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	15.6
17-Aug	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	
18-Aug	0.0	0.0	0.0	0.0	0.0	Z	RE	RE	RE	14.0	12.6	10.8	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	14.0
19-Aug	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	0.0	
20-Aug	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	
21-Aug	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	
22-Aug	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	
23-Aug	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	
24-Aug	28.1	25.8	17.2	11.2	0.0	Z	RE	RE	RE	0.0	0.0	0.0	0.0	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	28.1	
25-Aug	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	0.0	
26-Aug	0.0	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	7.4	39.9	
27-Aug	44.2	47.1	Z	RE	RE	RE	18.7	18.5	17.8	18.4	18.1	17.8	16.9	18.5	19.0	19.7	19.3	18.0	17.8	16.4	16.2	16.5	19.0	19.1	0.0	0.0	20.9	47.1		
28-Aug	17.8	16.2	15.4	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	2.4	17.8	
29-Aug	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	
30-Aug	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	
31-Aug	Z	RE	RE	RE	0.0	0.0	0.0	0.0	11.1	15.9	14.6	14.4	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	26.6	

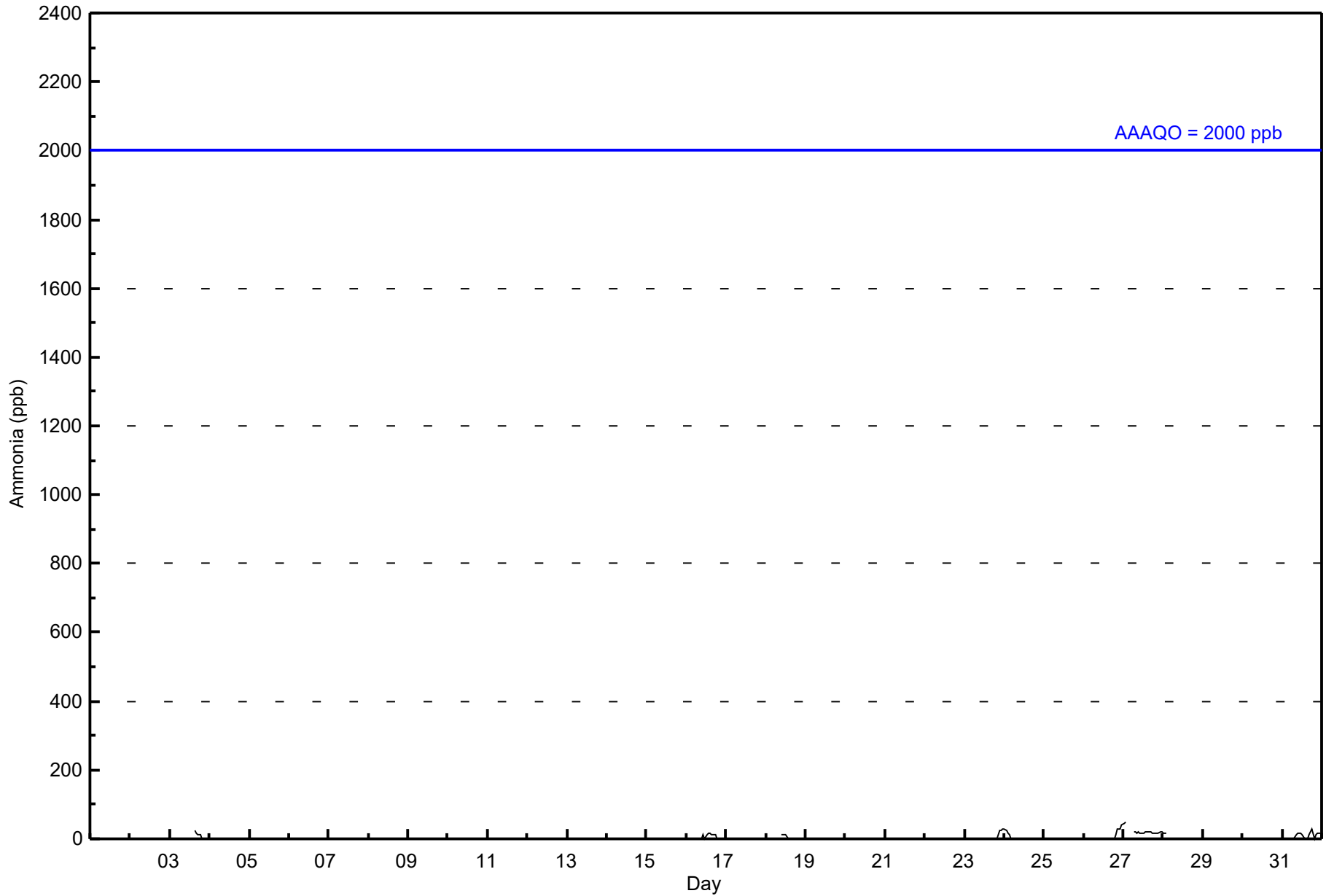
3.8	4.7	2.2	1.1	0.0	0.0	1.1	1.0	1.2	1.7	1.9	1.5	1.8	1.2	1.2	1.9	2.0	2.0	1.8	1.0	2.4	2.8	3.0	3.3					Diurnal Average
44.2	47.1	17.2	11.2	0.0	0.0	18.7	18.5	17.8	18.4	18.1	17.8	16.9	18.5	19.0	24.5	19.3	19.4	26.6	16.4	28.4	28.5	30.4	39.9					Diurnal Maximum

Z - zerospan C - Calibration M - Maintenance RE - Recovery
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 2000 ppb



Wood Buffalo Environmental Association
Hourly Averages

Ammonia (NH₃) - ppb
Patricia McInnes - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 5	532	89.41	89.41
6 - 10	2	0.34	89.75
11 - 15	21	3.53	93.28
16 - 20	27	4.54	97.82
21 - 25	3	0.50	98.32
> 26	10	1.68	100.00

Total Number of Valid Hours: 595

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ammonia (NH₃) - ppb
Patricia McInnes - August 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	37	11	10	4	11	50	31	22	30	71	49	42	59	40	21	42	530
6 - 10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
11 - 15	6	0	0	0	0	0	0	1	0	1	3	2	2	2	2	2	21
16 - 20	1	0	0	0	0	0	0	1	4	7	8	1	2	1	2	0	27
21 - 25	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3
> 26	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	10
Totals	48	12	10	4	11	50	31	24	35	79	60	45	63	44	26	51	593

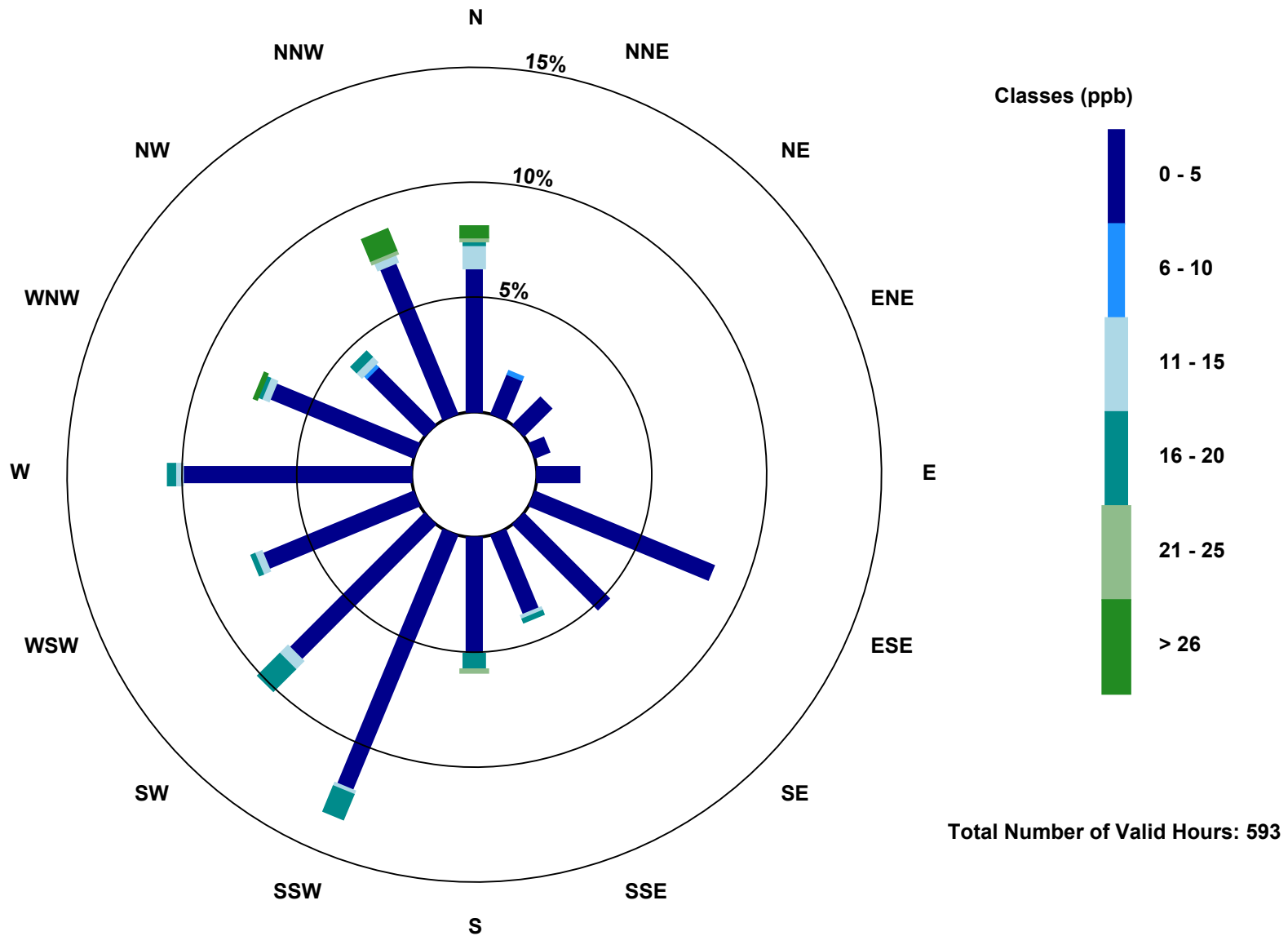
Total Number of Valid Hours: 593

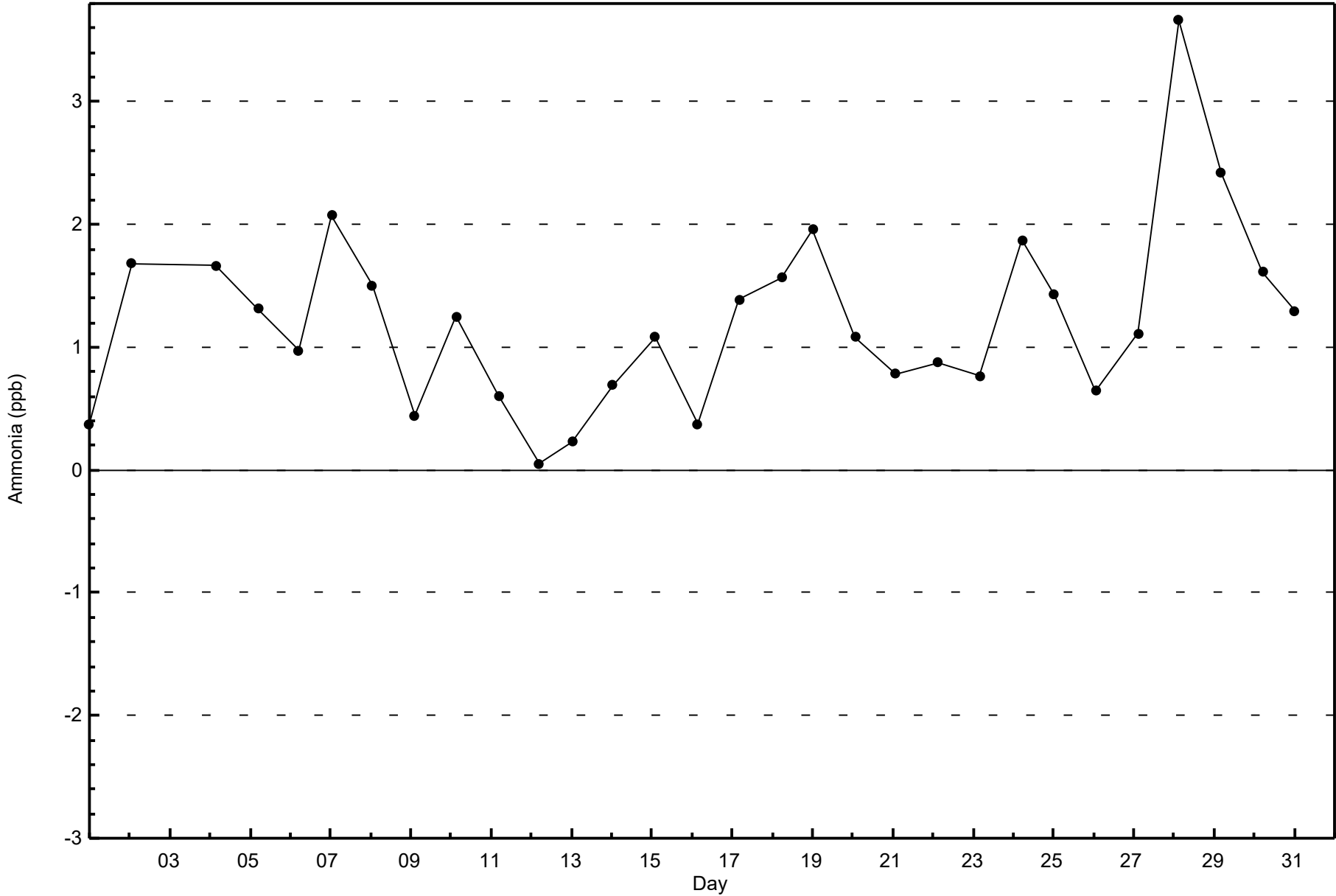
Total Number of Hours: 744

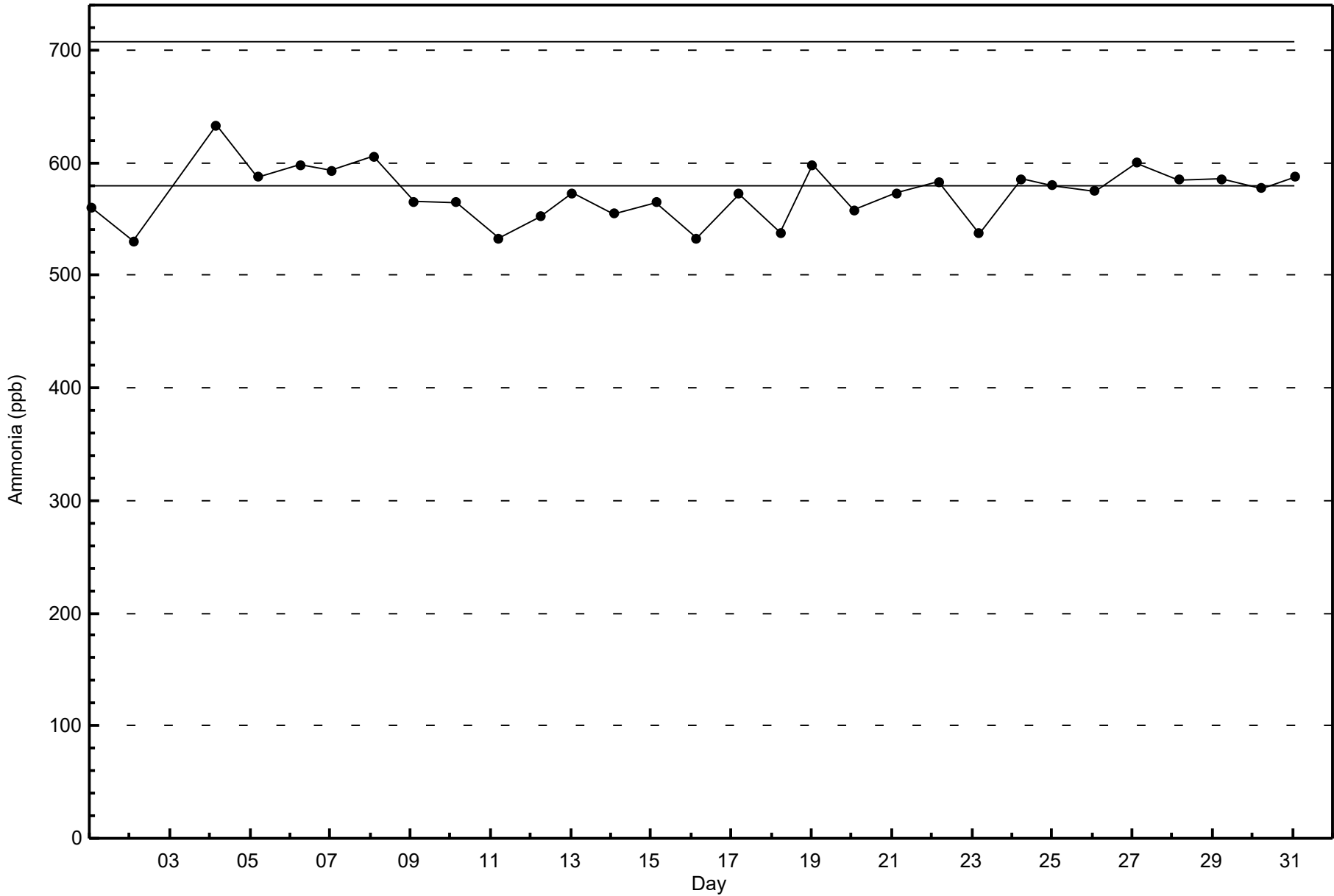


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ammonia (NH₃) - ppb
Patricia McInnes





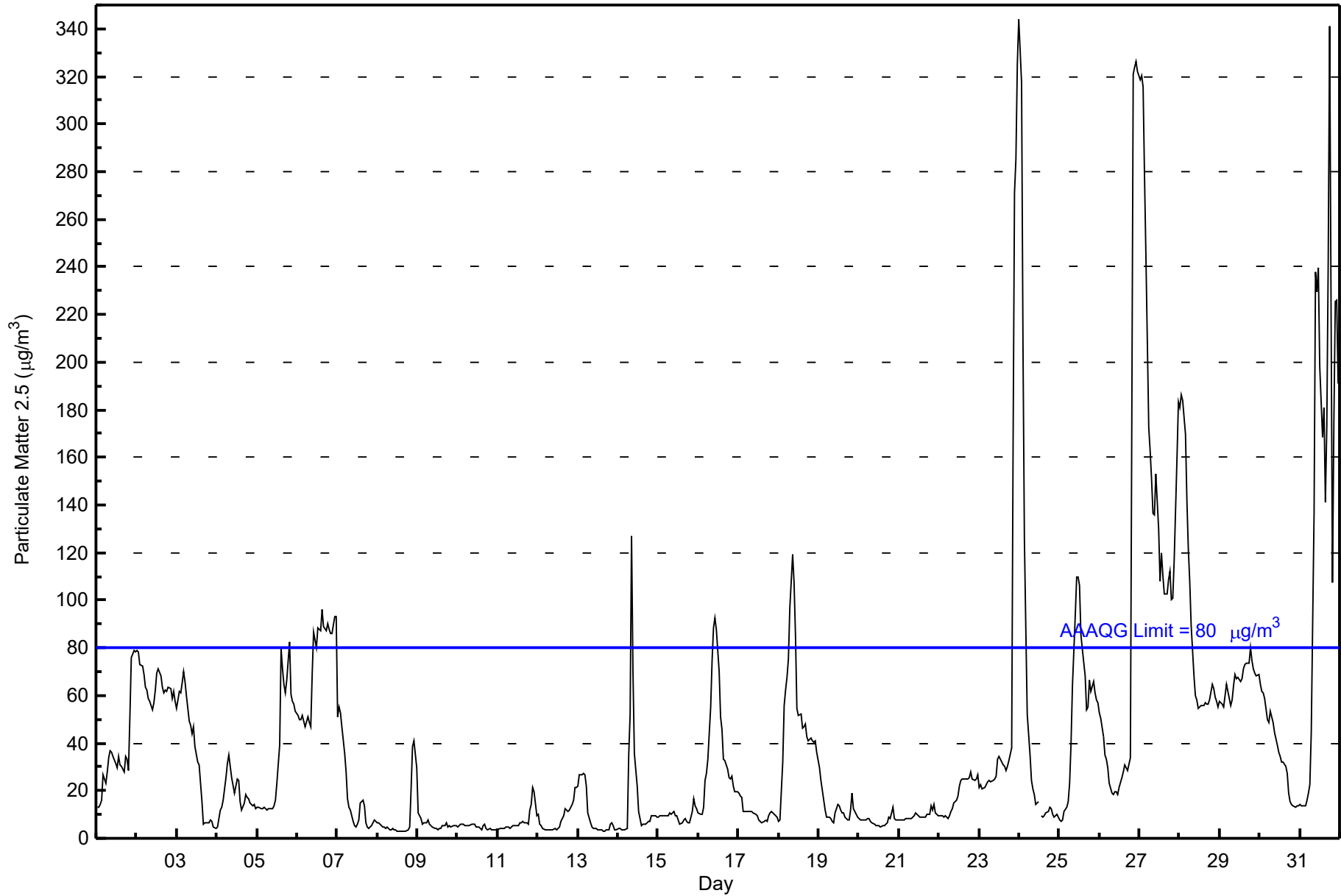




Number of Exceedences (AAAQO):	1-hr: 91	24-hr: 16	Hours in Service:	744
Maximum Value: 344.0 µg/m ³ on Aug 24 01:00	Maximum Daily Average: 164.3 µg/m ³ on Aug 27		Hours of Data:	743
Minimum Value: 2.8 µg/m ³ on Aug 13 17:00	Minimum Daily Average: 4.8 µg/m ³ on Aug 10		Hours of Missing Data:	1
Maximum Diurnal Average: 56.9 µg/m ³ at hour 23	Minimum Diurnal Average: 32.4 µg/m ³ at hour 7		Hours of Calibration:	1
Monthly Average: 40.79 µg/m ³	Percentiles: P ₁ = 3.2 P ₁₀ = 4.9 Q ₁ = 7.9 Median = 18.6 Q ₃ = 55.7 P ₉₀ = 88.9 P ₉₉ = 319.8		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-Aug	13.1	13.2	14.4	16.3	26.8	23.4	27.9	34.0	37.0	36.1	34.4	31.5	29.9	34.6	30.7	30.1	27.8	34.6	33.0	28.8	50.9	75.7	78.9	78.3	35.1	78.9
2-Aug	78.8	78.3	73.2	72.4	68.9	63.2	62.4	58.9	57.6	54.0	57.0	62.2	69.5	70.9	68.3	63.2	61.4	62.0	61.8	63.8	63.0	58.8	61.7	57.2	64.5	78.8
3-Aug	54.6	61.4	60.9	65.3	69.8	66.0	60.1	49.4	47.2	44.1	47.1	38.8	32.1	30.6	23.2	15.5	5.8	6.5	6.3	6.3	7.8	6.9	4.9	4.2	34.0	69.8
4-Aug	4.9	8.5	12.0	12.9	16.1	25.4	31.2	35.0	30.3	25.4	19.2	21.9	25.1	24.6	15.5	11.7	14.9	18.6	17.0	16.7	14.9	13.8	14.1	12.5	18.4	35.0
5-Aug	12.8	13.0	12.6	12.6	12.9	12.5	12.1	12.2	12.3	12.7	13.7	16.2	23.1	39.4	79.5	71.1	64.5	61.0	66.7	82.4	60.4	57.4	56.6	53.2	36.3	82.4
6-Aug	51.8	50.0	49.8	51.4	49.2	46.7	50.9	48.9	47.0	69.0	86.7	80.3	88.6	88.1	87.2	95.9	89.0	87.3	89.9	87.8	86.1	86.0	93.3	93.0	73.1	95.9
7-Aug	51.1	55.3	52.6	46.6	35.6	28.0	16.8	13.3	11.8	7.4	5.2	4.9	6.1	7.9	14.7	15.9	13.6	6.8	4.9	4.4	5.3	6.7	7.7	7.3	17.9	55.3
8-Aug	6.5	6.5	5.4	5.0	4.9	4.1	4.7	3.8	3.8	4.1	3.3	3.3	3.2	3.0	3.1	3.1	3.2	3.1	3.6	4.6	20.9	38.8	40.9	29.8	8.9	40.9
9-Aug	10.9	9.5	8.1	6.2	6.4	6.5	7.6	5.7	5.5	5.0	3.9	3.9	3.8	4.0	4.4	5.3	5.6	6.3	5.0	5.1	5.0	5.1	5.3	5.1	5.8	10.9
10-Aug	5.0	5.4	5.8	5.7	5.4	5.3	5.3	5.4	5.6	6.0	5.9	5.0	4.6	4.5	3.7	5.4	5.9	4.0	3.6	3.9	3.7	3.6	3.5	3.7	4.8	6.0
11-Aug	3.8	4.4	4.4	4.2	4.0	5.0	4.6	4.4	4.8	5.2	5.3	5.3	5.4	6.6	6.8	7.1	6.7	6.4	6.0	11.6	14.0	21.6	19.4	9.7	7.4	21.6
12-Aug	10.2	5.8	5.1	4.2	3.7	3.7	3.6	3.7	3.6	3.9	3.9	3.8	4.1	4.9	6.9	9.6	12.4	11.7	11.1	11.7	14.1	16.0	21.6	21.6	8.4	21.6
13-Aug	22.2	26.8	26.7	27.0	26.9	22.2	10.7	6.3	4.7	4.0	3.9	3.9	3.5	3.3	3.3	3.0	2.8	3.3	3.7	5.7	6.6	5.1	3.6	3.7	9.7	27.0
14-Aug	4.0	4.0	3.8	3.7	3.7	4.4	35.2	51.9	127.0	69.9	35.4	21.9	11.3	8.2	5.6	6.0	6.7	7.0	7.1	9.2	9.5	9.8	9.0	19.2	127.0	
15-Aug	8.8	9.3	9.3	9.7	9.4	9.5	9.5	10.6	10.1	11.2	9.4	9.3	7.7	5.9	6.5	7.7	8.3	7.2	6.4	6.6	11.4	16.4	13.5	12.3	9.4	16.4
16-Aug	10.5	10.3	10.4	13.3	24.1	27.1	33.3	54.9	74.5	88.5	92.6	88.0	70.2	51.3	45.9	33.2	32.9	28.8	25.4	25.1	26.0	22.0	19.9	19.7	38.7	92.6
17-Aug	19.1	17.7	17.0	11.1	11.0	11.0	11.3	11.6	11.4	10.7	10.2	9.5	7.9	7.1	6.8	7.3	7.6	7.4	9.7	10.6	11.4	9.9	9.7	8.8	10.7	19.1
18-Aug	7.2	7.6	32.1	55.9	62.4	67.4	75.4	96.4	119.4	107.2	85.7	54.5	51.4	52.3	46.0	46.9	48.2	42.9	41.1	42.3	41.1	40.6	40.9	36.4	54.2	119.4
19-Aug	29.6	24.3	20.1	16.2	12.1	8.8	8.8	8.3	7.0	6.7	10.8	14.1	13.4	11.7	10.4	10.4	8.8	7.5	7.9	11.6	19.1	12.7	10.1	9.0	12.5	29.6
20-Aug	8.2	7.8	7.8	7.6	7.7	8.2	8.1	7.1	6.7	6.0	5.6	5.3	5.1	5.0	5.2	5.2	6.1	6.3	8.6	8.5	13.3	8.5	7.7	7.7	7.2	13.3
21-Aug	7.9	7.9	7.9	7.8	8.2	8.5	8.2	8.2	8.8	9.6	10.4	10.2	8.9	8.7	8.9	9.0	9.0	10.3	10.1	13.4	12.1	14.2	10.7	9.7	9.5	14.2
22-Aug	9.5	9.6	9.4	9.0	9.4	8.6	9.4	11.1	12.6	14.7	16.2	18.0	22.2	24.1	24.7	25.1	25.0	24.8	25.3	28.0	24.9	24.3	24.9	26.6	18.2	28.0
23-Aug	21.5	22.4	20.9	21.1	22.4	23.6	24.2	23.6	24.1	25.2	26.2	33.4	34.2	33.3	30.9	30.1	28.6	30.3	32.7	38.1	165.6	270.9	285.4	324.8	66.4	324.8
24-Aug	344.0	317.5	207.0	125.8	88.4	52.5	35.1	24.5	20.5	18.1	14.3	15.5	C	9.4	8.7	9.7	10.9	11.3	13.0	12.2	10.0	8.7	10.0	8.9	59.8	344.0
25-Aug	7.7	7.1	7.5	11.1	12.9	15.6	23.2	40.0	64.0	93.8	110.0	110.0	106.1	85.6	79.4	68.1	54.0	55.4	66.2	61.6	65.7	61.4	58.3	56.8	55.1	110.0
26-Aug	53.0	50.5	42.6	34.8	33.2	29.5	23.1	19.2	18.6	19.7	19.3	18.4	21.7	25.6	27.6	30.6	29.8	28.5	33.6	174.2	320.8	323.8	326.4	321.9	84.4	326.4
27-Aug	318.8	320.6	315.4	278.3	244.5	172.5	162.4	150.9	136.2	135.6	152.9	130.0	108.1	119.8	110.2	102.7	102.8	108.6	111.9	100.1	101.0	117.1	160.1	183.1	164.3	320.6
28-Aug	181.1	186.3	184.0	169.4	141.6	121.7	108.3	89.3	68.4	59.7	58.2	54.5	55.0	55.9	55.8	57.0	56.1	56.1	58.0	64.6	62.7	59.6	57.8	55.4	88.2	186.3
29-Aug	57.3	56.3	55.2	60.1	64.6	61.8	55.7	58.0	63.8	68.7	67.0	67.5	66.1	67.1	71.4	73.1	73.8	73.7	80.3	74.7	71.0	69.2	68.3	69.1	66.4	80.3
30-Aug	64.7	61.6	61.1	58.9	49.8	48.4	53.6	50.9	48.6	44.4	39.3	36.0	34.3	32.3	31.8	30.3	27.5	19.2	15.3	14.1	13.6	12.8	13.8	13.7	36.5	64.7
31-Aug	14.0	13.4	13.5	13.6	15.9	19.2	22.7	44.7	137.2	238.0	229.5	239.9	198.3	168.6	180.9	141.2	173.4	242.6	341.3	107.4	174.3	225.3	225.9	191.2	140.5	341.3
48.1 47.5 43.7 39.9 37.2 32.6 32.4 33.6 39.7 42.1 41.4 39.3 37.4 35.3 35.6 33.2 33.0 34.8 38.9 36.5 48.6 54.9 56.9 56.2																								Diurnal Average		
344.0 320.6 315.4 278.3 244.5 172.5 162.4 150.9 137.2 238.0 229.5 239.9 198.3 168.6 180.9 141.2 173.4 242.6 341.3 174.2 320.8 323.8 326.4 324.8																								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 - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	107	14.40	14.40
6 - 15	243	32.71	47.11
16 - 25	80	10.77	57.87
26 - 80	224	30.15	88.02
> 81.0	89	11.98	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
Patricia McInnes - August 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	6	3	2	2	6	29	4	0	0	5	14	10	7	3	2	14	107
6 - 15	11	5	0	1	3	14	17	14	14	34	32	26	28	24	8	12	243
16 - 25	9	2	1	0	1	9	4	6	4	13	6	3	8	7	4	3	80
26 - 80	15	2	6	2	4	9	12	10	28	37	13	10	21	25	11	18	223
> 81.0	15	2	4	0	1	0	0	2	4	13	15	2	5	4	8	13	88
Totals	56	14	13	5	15	61	37	32	50	102	80	51	69	63	33	60	741

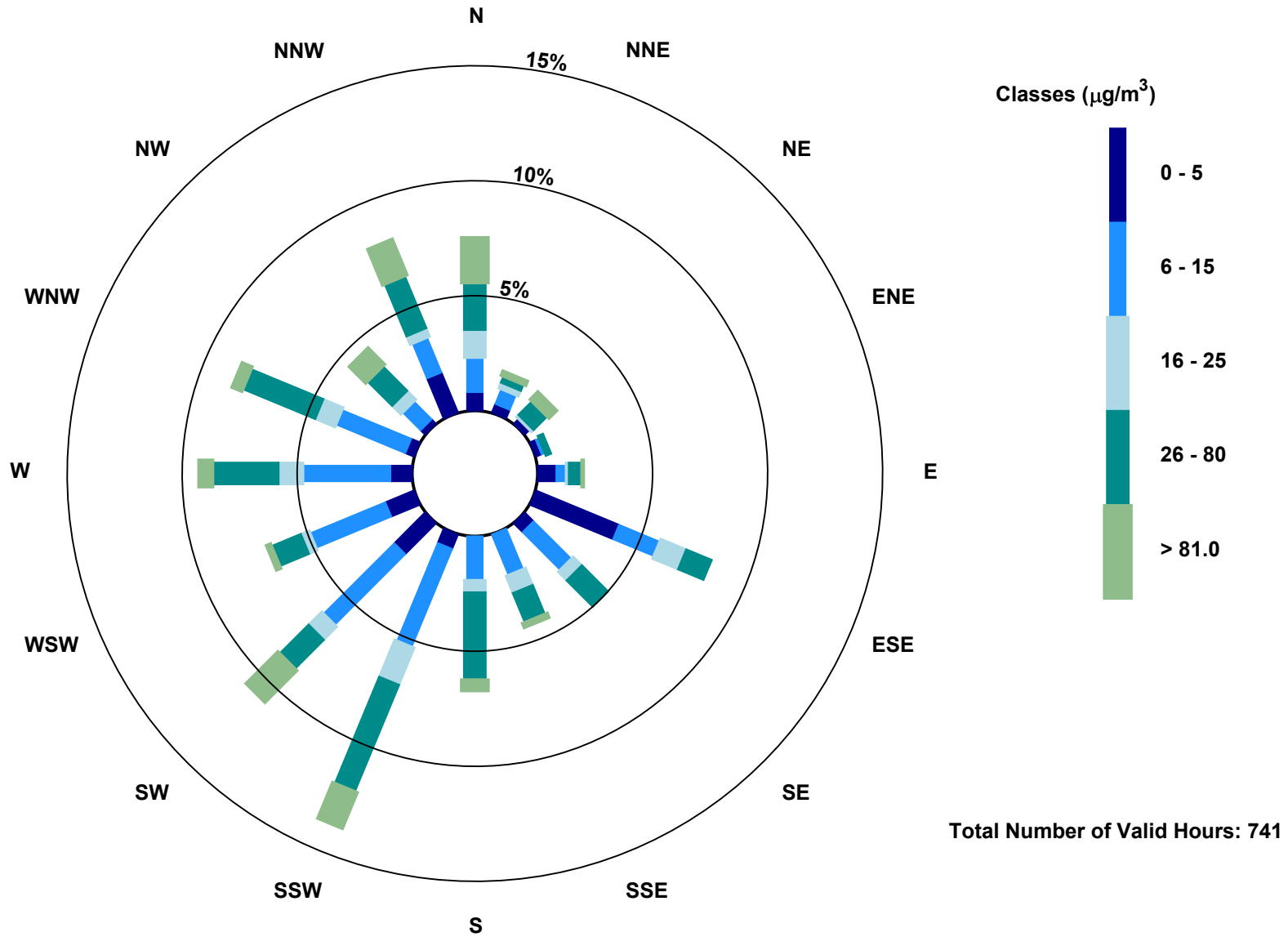
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

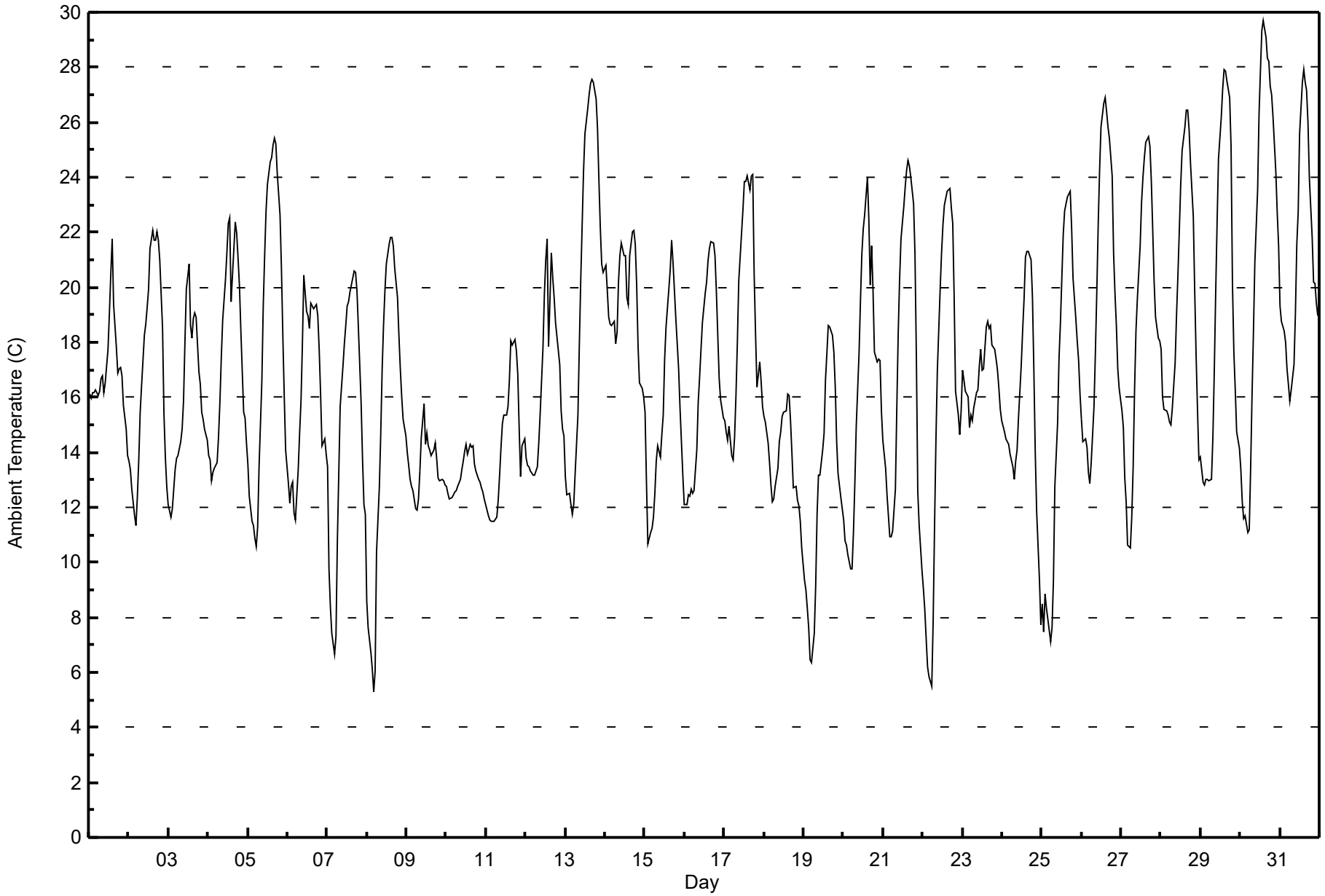
Ambient Temperature (AT) - C
Patricia McInnes - August 2023

Maximum Value: 29.7 C on Aug 30 15:00		Maximum Daily Average: 21.3 C on Aug 30		Hours in Service: 744																																												
Minimum Value: 5.3 C on Aug 8 05:00		Minimum Daily Average: 12.8 C on Aug 19		Hours of Data: 744																																												
Maximum Diurnal Average: 21.9 C at hour 16		Minimum Diurnal Average: 11.9 C at hour 6		Hours of Missing Data: 0																																												
Monthly Average: 16.91 C		Percentiles: P ₁ = 6.6 P ₁₀ = 11.7 Q ₁ = 13.4 Median = 16.3 Q ₃ = 20.2 P ₉₀ = 23.6 P ₉₉ = 27.9		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-Aug	16.1	16.0	16.2	16.2	16.3	16.1	16.2	16.7	16.8	16.2	16.5	17.7	19.1	20.5	21.8	19.4	17.8	16.9	17.1	17.1	16.8	15.7	14.9	13.9	17.0	21.8																						
2-Aug	13.7	13.4	12.7	11.7	11.3	12.4	13.7	15.4	16.4	18.3	18.7	19.3	19.9	21.4	22.0	21.7	21.7	22.0	21.7	21.0	18.5	15.4	13.8	12.8	17.0	22.0																						
3-Aug	12.1	11.7	11.9	12.7	13.4	13.8	13.9	14.4	14.9	15.9	18.0	19.9	20.8	18.6	18.1	18.9	19.0	18.9	17.0	16.5	15.5	15.2	14.8	14.4	15.8	20.8																						
4-Aug	13.9	13.7	12.9	13.3	13.4	13.6	14.5	15.8	17.4	18.8	20.3	22.3	22.3	22.5	19.5	20.4	22.4	22.0	21.0	20.0	18.4	15.5	15.3	14.3	17.6	22.5																						
5-Aug	13.6	12.4	11.5	11.3	10.9	10.6	11.3	13.5	16.6	19.3	21.2	22.8	23.8	24.5	24.7	25.2	25.4	25.2	24.2	22.6	20.7	18.3	16.1	14.1	18.3	25.4																						
6-Aug	12.9	12.1	12.8	12.9	11.8	11.6	13.4	14.7	15.9	17.9	20.4	19.1	19.0	18.5	19.4	19.3	19.2	19.4	18.9	17.8	16.1	14.2	14.5	13.9	16.1	20.4																						
7-Aug	13.5	9.8	8.4	7.4	6.7	7.3	10.8	13.2	15.7	17.1	18.0	18.6	19.3	19.5	19.8	20.4	20.6	20.5	19.9	18.5	15.7	13.8	12.1	11.8	14.9	20.6																						
8-Aug	8.6	7.6	6.7	6.1	5.3	6.0	10.4	12.7	14.6	17.0	18.6	19.9	20.9	21.6	21.8	21.8	21.5	20.7	19.6	18.2	17.0	16.0	15.2	14.6	15.1	21.8																						
9-Aug	14.0	13.5	13.0	12.8	12.6	11.9	11.9	12.3	13.3	14.5	15.8	14.3	14.7	14.3	14.1	13.9	14.1	14.4	13.8	13.0	13.0	13.0	13.0	12.8	13.5	15.8																						
10-Aug	12.8	12.5	12.3	12.3	12.4	12.6	12.6	12.7	13.0	13.4	13.7	14.0	14.3	13.9	14.3	14.2	14.2	13.6	13.3	13.0	12.9	12.7	12.5	12.3	13.2	14.3																						
11-Aug	12.1	11.7	11.6	11.5	11.5	11.5	11.7	12.2	13.1	14.2	15.1	15.3	15.3	15.7	16.6	18.0	17.9	18.1	17.7	16.9	14.9	13.1	14.2	14.5	14.3	18.1																						
12-Aug	13.8	13.5	13.5	13.3	13.2	13.2	13.3	13.5	14.4	15.4	17.8	19.7	21.0	21.8	17.8	21.3	20.3	19.6	18.7	18.2	17.2	15.5	14.9	14.6	16.5	21.8																						
13-Aug	13.1	12.4	12.5	12.1	11.7	12.1	13.2	15.4	17.9	20.2	22.2	24.2	25.6	26.5	27.0	27.4	27.5	27.5	26.9	25.8	23.9	22.1	20.8	20.6	20.4	27.5																						
14-Aug	20.8	19.9	18.9	18.6	18.6	18.7	18.0	18.3	20.2	21.2	21.6	21.1	21.2	19.6	19.4	21.2	22.0	22.1	21.6	20.1	17.9	16.5	16.3	16.0	19.6	22.1																						
15-Aug	15.5	12.9	10.7	11.1	11.2	11.7	12.5	13.7	14.2	13.8	14.6	15.4	17.4	18.6	19.9	20.7	21.7	20.9	19.9	18.9	17.0	15.6	14.4	13.2	15.6	21.7																						
16-Aug	12.1	12.1	12.4	12.4	12.7	12.5	12.6	14.1	15.8	16.8	17.8	18.7	19.8	20.2	21.0	21.4	21.7	21.6	21.1	19.8	18.2	16.7	15.9	15.3	16.8	21.7																						
17-Aug	15.2	14.8	14.5	14.9	13.9	13.7	14.6	16.1	18.0	20.2	22.0	22.8	23.8	23.9	24.1	23.5	24.0	24.1	20.5	18.3	16.4	17.3	16.6	15.7	18.7	24.1																						
18-Aug	15.3	15.1	14.4	13.6	12.8	12.2	12.3	12.8	13.4	14.4	14.8	15.3	15.4	15.5	16.1	16.1	15.2	14.0	12.7	12.8	12.2	12.0	11.5	10.5	13.8	16.1																						
19-Aug	9.3	9.0	8.3	7.6	6.5	6.4	7.4	9.2	11.7	13.2	13.1	14.1	14.7	16.6	17.6	18.6	18.6	18.3	17.7	16.4	14.4	13.2	12.4	11.9	12.8	18.6																						
20-Aug	11.5	10.8	10.6	10.3	9.8	9.8	11.1	12.9	14.9	17.6	19.5	21.2	22.1	22.7	24.0	22.5	20.1	21.5	19.9	17.6	17.3	17.4	17.3	15.5	16.6	24.0																						
21-Aug	14.4	13.4	12.5	11.7	10.9	11.0	11.2	12.6	15.6	18.3	20.3	21.8	22.9	23.6	24.3	24.6	24.4	24.0	23.0	21.2	17.4	12.6	11.3	9.7	17.2	24.6																						
22-Aug	9.0	8.3	7.2	6.2	5.8	5.5	7.9	11.3	14.5	17.0	20.0	21.2	22.2	23.0	23.2	23.5	23.6	22.9	22.3	19.7	16.2	15.4	14.6	15.5	15.7	23.6																						
23-Aug	17.0	16.6	16.2	16.0	14.9	15.4	15.1	15.6	16.1	16.3	17.1	17.7	17.0	17.1	18.5	18.7	18.5	18.6	17.9	17.8	17.4	17.0	16.3	15.5	16.9	18.7																						
24-Aug	15.2	14.7	14.5	14.4	14.3	14.0	13.5	13.0	13.7	14.1	15.3	17.2	18.4	19.6	21.1	21.3	21.3	21.0	19.7	17.0	14.0	11.9	9.4	7.7	15.7	21.3																						
25-Aug	8.5	7.5	8.8	8.3	7.5	7.1	7.6	9.4	12.7	15.1	17.4	18.7	20.3	21.9	22.8	23.3	23.4	23.5	22.2	20.4	18.9	18.0	17.3	16.1	15.7	23.5																						
26-Aug	15.2	14.4	14.5	14.2	13.3	12.9	13.6	15.6	17.6	19.8	22.3	24.3	25.8	26.7	26.9	26.4	25.8	25.4	24.0	21.2	19.8	18.6	17.0	16.3	19.7	26.9																						
27-Aug	15.5	14.9	13.1	12.2	10.6	10.5	11.7	13.5	16.3	18.4	19.6	21.5	23.1	24.0	24.7	25.3	25.5	25.1	23.8	22.0	20.2	18.9	18.2	18.0	18.6	25.5																						
28-Aug	17.8	16.0	15.6	15.5	15.4	15.1	15.0	15.6	17.3	19.0	20.5	22.0	23.7	25.0	25.8	26.4	26.4	25.7	24.5	22.6	19.9	17.6	15.5	13.7	19.7	26.4																						
29-Aug	13.8	12.9	12.8	13.0	13.0	13.0	13.0	14.6	16.9	19.8	22.3	24.6	26.2	27.2	27.9	27.8	27.5	26.9	25.1	20.1	17.7	16.2	14.8	14.1	19.2	27.9																						
30-Aug	13.4	12.2	11.6	11.7	11.1	11.2	13.4	16.1	18.4	20.9	23.5	26.3	27.9	29.3	29.7	29.1	28.3	28.2	27.3	27.0	26.2	24.2	22.7	21.5	21.3	29.7																						
31-Aug	19.3	18.8	18.4	18.0	17.0	16.5	15.9	16.3	17.2	19.0	21.6	22.7	25.6	27.4	27.9	27.4	27.1	26.0	24.0	21.8	20.2	20.1	19.4	19.0	21.1	27.9																						
																								13.8	13.1	12.6	12.4	11.9	11.9	12.7	14.0	15.6	17.2	18.7	19.8	20.8	21.3	21.7	21.9	21.8	21.6	20.5	19.1	17.5	16.1	15.3	14.5	Diurnal Average
																								20.8	19.9	18.9	18.6	18.6	18.7	18.0	18.3	20.2	21.2	23.5	26.3	27.9	29.3	29.7	29.1	28.3	28.2	27.3	27.0	26.2	24.2	22.7	21.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	39	5.24	5.24
10 - 20	512	68.82	74.06
> 20	193	25.94	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

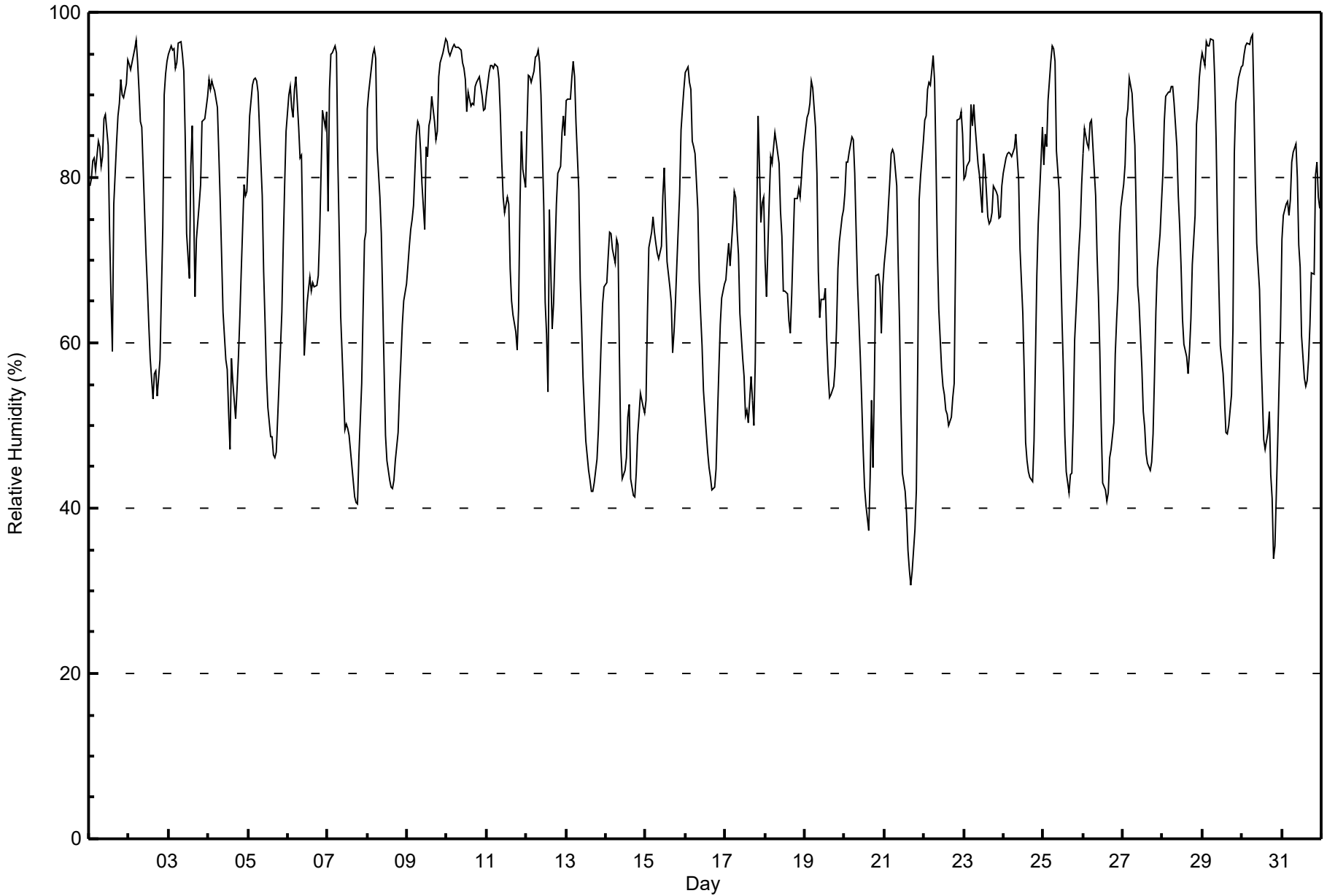
Relative Humidity (RH) - %
Patricia McInnes - August 2023

Maximum Value: 97.3 % on Aug 30 07:00 Maximum Daily Average: 92.4 % on Aug 10																						Hours in Service: 744 Hours of Data: 744				
Minimum Value: 30.7 % on Aug 21 17:00 Minimum Daily Average: 55.9 % on Aug 14 Maximum Diurnal Average: 88.4 % at hour 6 Minimum Diurnal Average: 55.4 % at hour 16 Monthly Average: 72.48 % Percentiles: P ₁ = 38.2 P ₁₀ = 48.0 Q ₁ = 58.6 Median = 75.4 Q ₃ = 86.7 P ₉₀ = 92.7 P ₉₉ = 96.4																						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-Aug	79.0	79.9	82.0	82.3	80.9	84.3	83.7	81.4	82.5	87.1	87.6	83.9	73.6	65.8	59.0	76.8	84.2	87.4	89.0	91.8	90.0	89.7	91.3	94.3	82.8	94.3
2-Aug	93.7	93.0	94.0	95.6	96.6	94.0	90.7	86.8	86.2	76.0	70.9	66.9	62.2	58.1	53.3	56.2	56.7	53.6	55.7	58.0	73.8	90.0	92.5	94.0	77.0	96.6
3-Aug	94.9	96.0	95.5	95.7	93.3	94.0	96.3	96.4	95.0	92.8	84.9	73.2	67.8	81.3	86.3	77.0	65.6	72.5	76.8	79.1	86.7	87.0	87.1	89.9	86.0	96.4
4-Aug	91.9	90.6	91.7	91.1	90.5	88.5	82.9	77.1	70.5	63.6	58.0	56.7	51.6	47.2	58.2	55.3	50.8	54.4	58.2	63.1	68.6	79.2	77.7	78.4	70.7	91.9
5-Aug	82.6	87.5	91.1	91.8	92.0	91.7	90.3	86.1	77.7	68.6	62.6	56.1	52.2	48.7	48.7	46.4	46.1	46.8	50.9	59.3	63.8	71.8	79.2	85.5	69.9	92.0
6-Aug	90.0	91.0	88.4	87.3	90.7	92.3	86.2	82.4	82.8	72.0	58.5	64.7	66.4	67.9	66.2	67.2	66.8	67.0	68.1	73.2	80.7	88.2	86.1	88.0	78.0	92.3
7-Aug	75.9	90.7	95.0	95.0	95.9	95.2	81.7	72.8	63.3	54.2	49.4	50.2	49.7	48.8	46.9	43.2	41.3	40.7	40.5	46.3	55.0	63.9	72.3	73.3	64.2	95.9
8-Aug	88.3	90.3	93.4	95.0	95.6	94.5	83.6	77.7	73.2	65.3	56.9	48.8	45.7	43.4	42.5	42.3	43.4	45.7	49.2	54.0	57.9	62.2	65.1	67.2	65.9	95.6
9-Aug	69.3	71.7	73.7	74.9	76.5	85.1	86.8	86.3	83.3	79.3	73.7	83.8	82.5	86.3	87.1	89.8	86.7	84.5	85.5	92.2	93.9	95.1	95.9	96.8	84.2	96.8
10-Aug	96.4	95.2	94.8	95.7	96.1	95.7	95.7	95.8	95.4	93.9	93.3	91.8	88.0	90.4	88.6	89.0	88.8	91.1	91.6	92.3	91.0	89.8	88.2	88.4	92.4	96.4
11-Aug	89.9	92.7	93.6	93.6	93.2	93.7	93.4	91.9	87.6	81.9	77.7	75.8	77.7	76.7	69.0	65.1	63.4	61.4	59.1	64.0	76.6	85.7	81.0	78.9	80.1	93.7
12-Aug	86.0	92.5	92.2	91.5	92.9	94.6	94.7	95.5	93.8	90.0	76.4	64.9	61.0	54.0	76.0	61.7	64.7	70.9	76.7	80.4	81.4	85.5	87.4	85.2	81.2	95.5
13-Aug	89.3	89.6	89.5	92.0	94.1	92.1	86.6	78.5	67.7	62.3	55.9	51.8	48.1	44.5	43.4	42.1	42.1	43.0	45.9	49.5	54.9	60.3	64.8	66.8	64.8	94.1
14-Aug	67.3	70.6	73.4	73.1	71.4	69.6	72.6	71.9	58.5	47.1	43.6	44.6	46.1	51.0	52.5	43.5	41.5	41.3	44.2	48.9	51.2	53.9	52.2	51.5	55.9	73.4
15-Aug	53.1	63.3	71.6	73.4	75.2	73.4	72.1	70.9	70.1	71.7	77.7	81.1	75.4	69.8	66.7	64.8	58.8	61.4	65.0	69.5	78.2	85.7	88.3	90.6	72.0	90.6
16-Aug	92.8	93.4	91.5	90.7	84.4	83.7	82.9	76.0	67.5	63.3	59.7	54.2	49.2	46.9	44.9	43.8	42.3	42.5	44.8	51.0	56.7	62.2	65.4	67.1	64.9	93.4
17-Aug	67.7	70.0	72.0	69.4	74.6	78.2	77.7	73.6	70.7	63.5	58.2	56.0	51.2	51.9	50.3	55.9	53.1	50.0	57.8	74.7	87.5	74.5	76.9	77.7	66.4	87.5
18-Aug	69.8	65.5	77.4	82.6	81.7	83.6	85.4	84.2	81.7	75.9	73.0	66.3	66.4	65.9	62.6	61.1	65.7	71.7	77.5	77.5	78.7	77.6	80.1	83.1	74.8	85.4
19-Aug	85.9	87.3	87.8	89.0	91.7	90.9	86.2	80.5	68.6	63.1	65.2	65.2	66.7	60.6	56.3	53.4	53.7	54.7	57.2	61.8	68.9	72.3	75.3	76.0	71.6	91.7
20-Aug	78.2	81.8	81.8	83.0	84.9	84.7	80.4	73.5	67.1	58.2	52.8	47.1	42.5	40.3	37.3	43.7	53.0	44.9	55.0	68.2	68.3	66.9	61.3	66.8	63.4	84.9
21-Aug	69.5	73.1	76.4	79.5	82.8	83.3	82.8	79.0	69.7	62.2	51.7	44.3	42.0	39.3	34.9	32.6	30.7	32.4	37.4	42.2	57.6	77.3	80.2	84.3	60.2	84.3
22-Aug	87.0	87.5	90.7	91.5	91.2	94.7	91.6	82.0	71.2	64.1	56.9	54.7	53.7	51.9	51.3	50.0	51.0	53.4	55.0	70.7	86.9	87.1	88.0	85.2	72.8	94.7
23-Aug	79.8	80.2	81.4	82.1	88.8	86.3	88.8	86.0	81.7	80.4	78.0	75.8	82.9	81.4	75.2	74.4	74.7	75.8	79.0	78.3	77.8	75.1	75.3	79.0	79.9	88.8
24-Aug	80.5	82.4	82.9	83.1	82.9	82.6	83.6	85.2	82.5	79.8	71.4	63.6	56.5	48.0	45.7	44.5	43.7	43.3	48.1	58.0	68.1	74.5	82.0	86.0	69.1	86.0
25-Aug	81.5	85.3	83.8	89.3	94.1	96.0	95.6	94.0	83.3	78.3	69.9	62.7	56.5	48.8	44.4	41.8	44.1	44.2	50.5	60.3	67.5	71.2	74.0	79.2	70.7	96.0
26-Aug	82.9	85.9	84.1	83.6	86.7	86.9	84.0	77.8	70.6	65.6	58.7	49.8	43.1	42.3	40.9	41.9	46.1	47.1	50.3	58.6	62.8	66.4	73.2	76.5	65.2	86.9
27-Aug	79.2	81.5	87.1	88.3	92.1	90.1	86.8	83.9	75.2	67.0	64.7	57.0	51.8	49.8	46.7	45.5	44.7	45.6	48.9	55.9	63.8	68.9	73.2	77.0	67.7	92.1
28-Aug	80.4	86.8	89.9	90.4	90.3	91.1	91.1	89.0	83.8	77.9	74.0	69.1	62.9	59.8	58.3	56.3	58.9	62.8	69.4	75.4	86.4	88.6	92.0	93.8	78.3	93.8
29-Aug	95.1	93.5	96.4	95.9	95.9	96.8	96.7	92.1	84.5	74.3	66.6	59.7	56.3	53.0	49.1	49.0	49.9	53.7	61.6	82.9	89.0	90.5	92.1	93.4	77.8	96.8
30-Aug	93.5	95.0	95.9	96.3	96.1	96.9	97.3	89.1	79.4	72.1	66.4	59.0	53.6	48.2	47.2	49.2	51.7	44.1	41.2	33.9	35.4	48.1	55.2	61.8	66.9	97.3
31-Aug	72.5	75.5	76.9	77.1	75.4	77.3	81.9	83.1	84.1	80.1	71.9	69.2	60.8	55.8	54.8	55.4	58.0	62.1	68.5	68.3	80.4	81.9	77.6	76.3	71.9	84.1
82.1 84.5 86.3 87.1 88.0 88.4 86.8 83.2 77.7 72.0 66.7 62.8 59.5 57.3 56.3 55.4 55.6 56.5 60.0 65.8 72.2 76.5 78.4 80.4																								Diurnal Average		
96.4 96.0 96.4 96.3 96.6 96.9 97.3 96.4 95.4 93.9 93.3 91.8 88.0 90.4 88.6 89.8 88.8 91.1 91.6 92.3 93.9 95.1 95.9 96.8																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

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





Maximum Speed: 23 km/h on Aug 13 15:00	Maximum Daily Speed Average: 14.4 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 22 20:00	Minimum Daily Speed Average: 1.5 km/h on Aug 2	Hours of Data: 742
Maximum Diurnal Speed Average: 3.8 km/h at hour 14	Minimum Diurnal Speed Average: 1.1 km/h at hour 20	Hours of Missing Data: 2
Monthly Average Velocity: 2.5 km/h 254.2 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 8 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 20	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-Aug	SW10	WSW13	WSW14	W15	W14	WSW15	W16	W16	WSW14	WSW11	SW8	W12	W18	W18	W14	WSW11	W7	W8	SW7	SW8	W7	W8	WNW8	WNW6	W11.2	W18
2-Aug	WNW8	WNW7	WNW5	SSW3	S2	WNW2	WSW2	SE3	S4	NW3	W5	WNW7	WNW8	NW6	NNW5	SE6	S4	SSW3	E4	E5	NE2	NNW2	W1	NW2	W1.5	WNW8
3-Aug	NW2	WSW2	SSW2	ENE2	S6	SE5	SSE4	SE4	SE7	SSE6	E5	ESE6	ESE6	ESE11	ESE8	S11	SW8	N8	N5	E1	SW3	SW3	WSW11	W11	SSE2.5	S11
4-Aug	W10	W11	W11	WNW10	WNW10	WNW12	WNW14	WNW12	WNW12	W10	WNW10	WNW15	W15	WNW11	WSW17	W11	N11	NNW6	W6	WSW8	WSW8	WSW4	SSW7	SW7	W9.2	WSW17
5-Aug	SSW6	SW5	SW6	SW6	SSW6	SSW6	SSW5	S5	SSE4	ENE3	N5	N5	NNW9	N11	NNE10	NE4	E6	ENE7	NNE9	NNE9	N7	N6	N4	WSW3	N1.7	N11
6-Aug	WNW4	W3	WNW2	W1	SW1	WSW2	S2	S4	NE4	NE6	E5	NE14	NE14	NE9	NE9	NNE12	N11	NNW10	NNW10	N10	NNW6	NW7	NNW8	N9	N4.8	NE14
7-Aug	NE4	NW3	WNW5	WNW5	WNW6	NNW5	N6	NNW5	NNW4	NNE8	N11	N11	N12	N12	N13	NNE14	NNE15	NNE12	NNE13	N10	NNW8	NNW8	NNW7	N5	N7.6	NNE15
8-Aug	N3	NNW3	NNW3	NNW3	NNW2	WSW1	ESE6	ESE9	ESE11	ESE12	ESE13	ESE11	E12	SE12	ESE14	ESE15	ESE17	ESE19	ESE16	ESE14	ESE13	ESE13	SE12	SE13	ESE9.1	ESE19
9-Aug	ESE10	ESE13	ESE13	SE12	ESE15	ESE11	SE13	ESE15	ESE16	ESE14	SE14	SE14	SE15	ESE18	ESE18	ESE16	ESE15	ESE16	ESE16	ESE14	ESE13	ESE13	ESE14	ESE15	ESE14.4	ESE18
10-Aug	ESE16	ESE17	ESE16	ESE14	ESE14	ESE13	ESE13	ESE13	ESE11	ESE11	E11	E12	E15	E13	ESE13	E14	E13	E13	ENE10	NE8	NE8	NNE9	NNE8	N9	E10.6	ESE17
11-Aug	N8	NNW9	NNW8	NNW10	NNW9	NNW8	NNW9	NNW10	NNW10	N7	NW5	ENE1	NW5	WNW6	W6	NW6	WSW6	SW7	WSW6	SSE3	SE4	S3	SE4	SE4	NW3.9	NNW10
12-Aug	SSW6	SSW5	SSW6	SSW7	WSW8	SW8	WSW6	SW5	WSW7	W8	WNW12	WNW11	NNW6	WNW13	WSW12	WSW14	W11	W10	WNW9	W9	W7	SW3	SSE4	SSW6	WSW6.6	WSW14
13-Aug	SSW5	SSW6	SW10	S6	S5	SSW8	SSW8	SSW10	SSW14	SSW13	SSW16	SW17	SW20	SW22	SW23	WSW22	WSW21	SW17	SW13	SW7	SW7	SW8	SW10	SW11	SW12.1	SW23
14-Aug	W9	SW6	SW8	SW11	W13	NNW11	NNW10	WSW7	W8	WNW12	WNW17	W17	W14	W20	W15	W17	WNW15	WNW12	WNW7	W7	WNW10	WNW11	WNW12	W10	W10.6	W20
15-Aug	WNW8	S5	SSW6	SW10	SSW9	SSW9	SSW7	S7	SE7	SE5	SE7	SSE7	S8	SSW11	SW12	SW13	WSW11	WSW10	W10	NW12	NNW16	NNW17	NNW14	NW9	WSW4.7	NNW17
16-Aug	WNW8	WNW6	WSW3	WNW5	NW7	NW5	WNW7	WNW10	WNW11	NW12	NW11	WNW10	WNW12	WNW13	W11	W13	WSW14	SW14	SSW10	SSW7	SSW7	SSW7	SSW9	SSW8	W7.0	WSW14
17-Aug	S8	SSE6	SSE7	SSE7	SSE5	SSE5	SE4	SSE7	SW5	WSW9	SW9	SW11	W14	W14	WNW14	W6	W7	WNW11	N8	NW5	WNW5	NNW12	NNW8	WNW10	WSW4.3	W14
18-Aug	WNW9	NNW11	NNW15	NNW14	N13	N14	N18	N17	N16	N17	N18	N16	NNW14	NW14	NNW13	NW12	NW10	NNW14	NNW11	NNW11	NNW9	NNW9	NW8	NW9	NNW12.3	N18
19-Aug	WNW9	WNW10	WNW12	W10	W9	W11	W10	WSW10	WSW14	WSW15	WSW19	W17	WSW13	WSW15	WSW13	W15	W19	WSW18	WSW14	SW9	SW9	SW7	SSW7	SW11	WSW11.6	W19
20-Aug	SW11	SW11	SW13	SW14	WNW2	S3	SSW5	SW14	WSW13	WSW12	WSW11	W11	W14	WSW6	WSW3	W7	WNW14	NW6	N5	WNW2	S4	SSW5	SSW8	SW11	WSW7.4	WNW14
21-Aug	WSW13	S7	SSW6	SSW10	SSW9	SSW7	SSW10	SW10	SSW7	S7	S9	S9	SSE8	SSW6	SE8	SSE13	SSE12	SE10	SSE8	SSE8	SSE4	W2	W2	SW2	S6.7	WSW13
22-Aug	W1	SSW2	SSW2	S3	SSW2	SW3	SSW3	SSW3	SE5	SE5	ESE6	ESE8	SE5	SSE6	SSE4	ESE5	SE4	ESE6	ESE5	ESE1	NW4	NW3	W1	SE3	SE2.5	ESE8
23-Aug	ESE5	SE4	ESE4	NE3	NW2	NNE4	N4	E2	N6	N11	NNW10	N11	NNW10	NNW10	N12	N11	NNW9	N11	NNW12	N14	NNW15	NNW15			N7.6	NNW15
24-Aug	NNW14	NNW15	N15	N17	N18	N18	N17	N17	N17	N20	N21	N19	N21	NNE18	NNW14	NNW15	NW13	NW11	WNW8	WNW7	NW7	WNW5	SSW3	SW3	NNW12.8	N21
25-Aug	SW5	SW4	SSW7	SSW6	SSW6	SSW6	S7	SSW8	SSW10	SSW11	SSW13	SSW16	SSW14	C	C	SSW14	SW12	SW11	SSW7	S8	S8	SSW11	SSW10	SSW7	SSW9.0	SSW16
26-Aug	S6	S7	SSW7	SW7	SSW5	SSW6	SSW8	SW11	SW14	SSW12	SSW14	SW18	SW19	WSW18	W15	W11	W9	W8	NW10	N14	N15	N15	N10	NNW10	WSW6.5	SW19
27-Aug	NNW8	NNW6	SW5	SW5	W4	WNW4	SSW2	SSW4	W2	SSE4	S8	SSW5	SW4	SSW7	S9	SSW10	SSW11	SW11	SW8	SSW7	S5	SW8	SW13	WSW14	WSW5.4	WSW14
28-Aug	SW9	S6	SSE6	SSW9	SW10	SW9	SW10	SW11	SW9	SSW7	S6	SSW7	SW7	SW8	S6	SSE6	SE7	SSE5	SSE4	SE4	SSE4	S4	S4	S3	SSW5.9	SW11
29-Aug	S5	SSW3	SSW4	SSW5	SSW5	SSW5	S5	S6	S7	S8	S8	SSW8	SSW10	SSW10	SSW9	SSW9	SSW7	S5	S3	SSW3	SSW3	SSW2	SSW3	S3	SSW5.4	SSW10
30-Aug	S3	SSW3	SSW4	SSW3	SSW2	SSW3	S3	SSE3	SSE9	SE7	SSE5	SSE4	SE7	SE5	ESE9	ESE9	SE7	SSE7	SE7	SE9	SE10	SE5	ESE5	SE5	SE5.1	SE10
31-Aug	S3	SSE2	S3	SW3	W4	S6	SSW4	SW9	SW7	SW9	SW7	SSW9	WSW6	NW3	NE6	W12	WNW9	W9	WNW12	NNW14	NW10	NW12	NW12	NW10	W4.9	NNW14

WSW2.9	SW2.4	SW3.0	SW3.3	WSW2.0	WSW2.3	WSW2.0	SW3.2	SW2.0	WSW1.9	WSW2.3	WSW3.0	W3.3	W3.8	W2.8	WSW3.5	WSW3.4	W2.7	WNW1.7	NW1.1	NNW1.0	NNW2.4	W2.3	W2.9			Diurnal Average
ESE16	ESE17	ESE16	N17	N18	N18	N18	N17	N17	N20	N21	N19	N21	SW22	SW23	WSW22	WSW21	ESE19	ESE16	ESE14	NNW16	NNW17	NNW15	NNW15			Diurnal Maximum

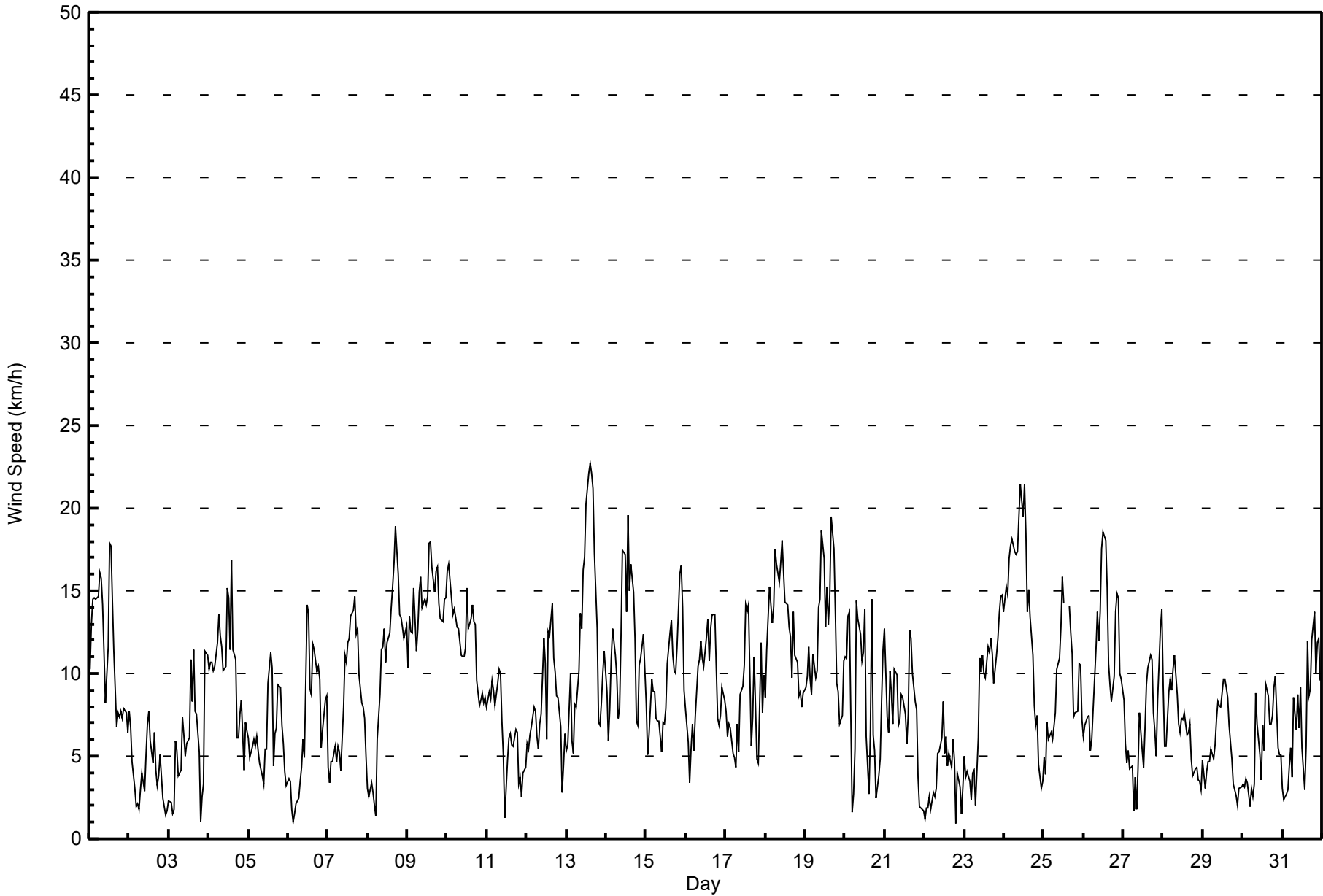
C - Calibration
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Aug 12 14:00 Minimum Value: 0 km/h on Aug 29 23:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 5														Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 2 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-Aug	2	2	2	3	3	3	3	3	3	2	1	4	4	3	3	3	3	3	2	1	2	1	2	1	4
2-Aug	1	1	2	1	2	1	1	2	1	2	2	2	2	3	2	3	2	2	2	1	2	1	1	2	3
3-Aug	1	1	1	1	4	2	3	2	2	2	2	4	3	2	5	3	5	3	2	2	2	3	2	5	
4-Aug	1	2	2	1	2	2	2	3	2	2	3	3	4	3	3	4	4	2	1	1	2	1	3	2	4
5-Aug	2	2	2	1	1	1	2	1	1	2	3	3	3	4	3	3	2	2	2	2	1	1	2	1	4
6-Aug	1	1	1	1	1	1	1	1	5	2	2	5	4	3	3	2	2	2	2	1	2	1	2	2	5
7-Aug	2	1	1	1	1	1	2	1	2	3	4	3	4	4	4	4	4	3	3	2	1	1	1	2	4
8-Aug	1	1	1	1	1	1	3	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3	3	3	4
9-Aug	2	3	3	3	3	3	3	3	3	3	4	3	4	4	4	4	3	4	4	3	3	3	3	3	4
10-Aug	3	4	4	3	3	3	3	3	3	3	3	3	4	3	4	4	3	3	2	2	2	2	2	2	4
11-Aug	2	2	1	1	1	1	2	2	2	2	2	2	1	2	2	2	2	2	1	1	1	1	1	1	2
12-Aug	1	2	2	1	1	1	3	2	1	1	4	4	2	8	4	3	2	2	1	1	2	2	2	1	8
13-Aug	2	1	3	1	1	2	2	3	3	4	4	4	5	5	5	4	4	4	3	2	1	1	1	2	5
14-Aug	3	2	2	2	2	3	3	2	3	3	4	4	3	5	3	3	4	3	1	3	2	2	2	1	5
15-Aug	2	2	2	2	2	2	2	2	2	2	2	1	2	3	4	3	2	2	2	3	3	4	3	1	4
16-Aug	1	1	1	1	2	1	1	2	3	3	3	4	3	3	4	3	3	3	4	2	1	2	2	2	4
17-Aug	2	1	1	2	1	2	2	2	3	2	2	4	3	3	3	3	2	4	2	3	2	4	2	2	4
18-Aug	1	4	3	3	3	3	5	4	4	4	4	4	3	3	3	2	2	5	2	2	2	2	2	1	5
19-Aug	1	1	2	1	2	2	2	2	3	3	4	4	4	3	3	5	3	4	3	1	2	1	2	2	5
20-Aug	2	2	2	2	3	2	3	3	3	3	3	3	3	4	3	2	3	4	1	2	1	1	2	2	4
21-Aug	2	2	3	2	3	2	3	3	2	2	2	3	3	3	3	4	3	3	2	1	2	1	1	1	4
22-Aug	1	2	1	1	1	1	1	1	2	1	2	3	3	3	2	2	2	1	1	1	1	2	2	2	3
23-Aug	2	2	2	1	1	1	1	1	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
24-Aug	3	3	3	3	4	4	4	4	4	4	5	5	5	5	3	3	3	2	1	1	1	1	1	1	5
25-Aug	2	1	2	1	1	1	1	2	3	3	5	4	4	C	C	3	3	3	2	2	2	3	3	2	5
26-Aug	1	1	1	1	1	1	2	3	3	3	3	4	4	4	4	3	2	2	5	3	3	3	2	2	5
27-Aug	1	2	1	1	1	2	1	1	1	2	2	2	2	3	3	3	3	3	2	1	1	2	2	2	3
28-Aug	3	1	1	2	3	3	3	3	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	3
29-Aug	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	1	1	1	1	1	0	1	3
30-Aug	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	2	2	2	2	3	2	4	2	1	4
31-Aug	1	1	2	2	2	2	2	3	3	2	2	2	3	3	3	2	3	2	4	3	4	2	3	2	4
	3	4	4	3	4	4	5	4	5	4	5	5	5	8	5	5	4	5	5	4	4	4	3	3	
	Diurnal Maximum																								
C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	189	25.47	25.47
6 - 11	349	47.04	72.51
12 - 19	195	26.28	98.79
20 - 28	9	1.21	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
Patricia McInnes - August 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	2	5	3	6	6	18	16	25	33	16	8	11	13	11	9	189
6 - 11	22	6	6	2	2	19	11	14	25	60	47	20	34	32	15	34	349
12 - 19	25	6	2	0	7	36	8	2	0	9	14	21	23	18	7	17	195
20 - 28	3	0	0	0	0	0	0	0	0	0	3	2	1	0	0	0	9
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	57	14	13	5	15	61	37	32	50	102	80	51	69	63	33	60	742

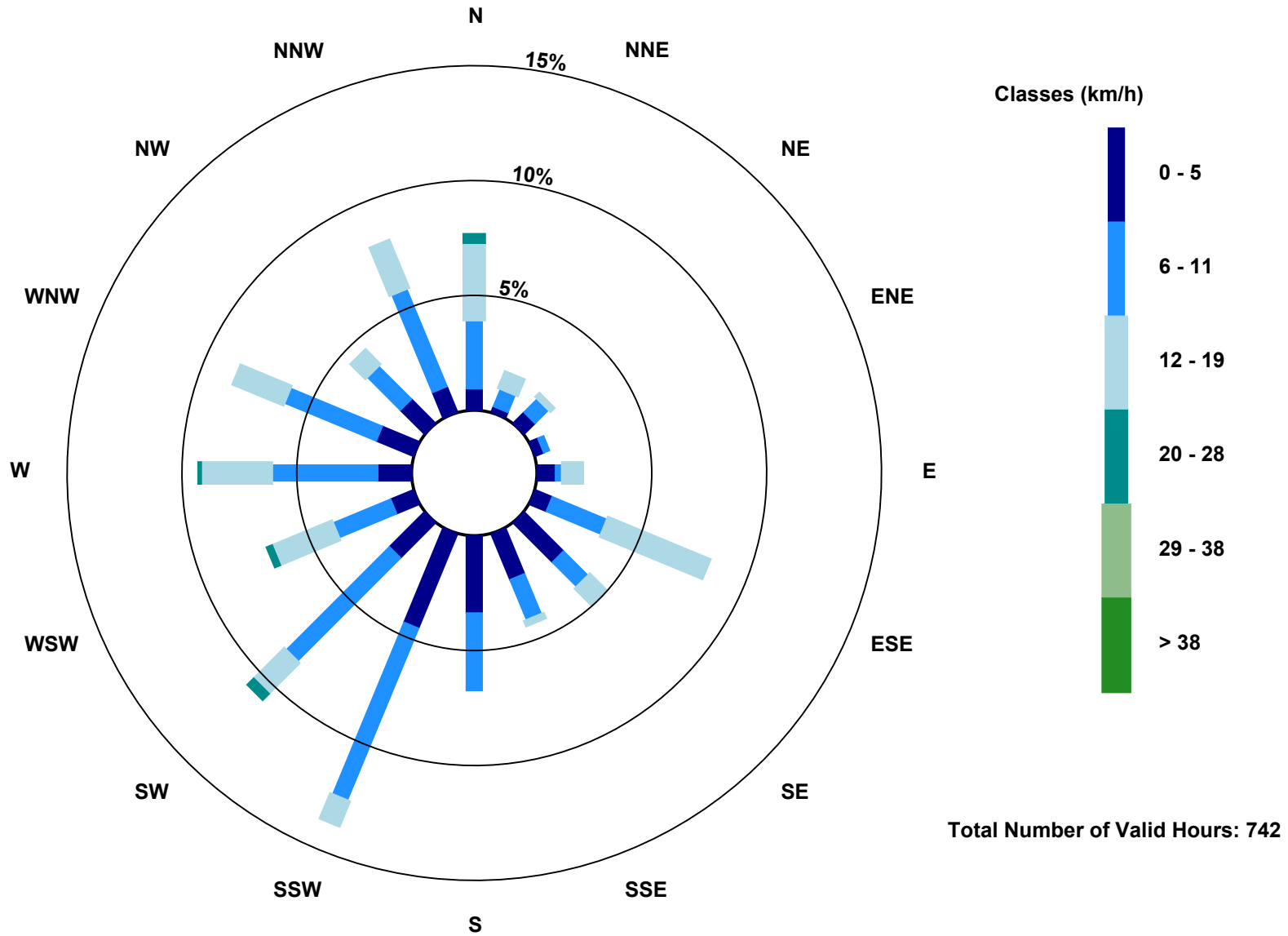
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Patricia McInnes





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 232 deg on Aug 13 15:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 120.8 deg on Aug 9	Hours of Data: 742
Direction of Minimum Speed: 118 deg on Aug 22 20:00	Hours of Missing Data: 2
Direction of Minimum Daily Speed Average: 1.5 deg on Aug 2	Percent Operational Time: 100.0
Monthly Average Direction: 254.2 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-Aug	236	246	249	267	269	255	261	272	258	245	230	262	272	268	281	251	267	267	230	231	259	280	284	298	260.5
2-Aug	293	285	292	198	174	298	249	135	169	305	281	287	301	305	345	137	179	198	91	93	43	331	271	308	277.7
3-Aug	318	258	195	73	179	135	148	135	127	160	94	123	107	113	122	176	215	355	11	82	217	231	238	267	159.9
4-Aug	259	265	268	284	289	293	292	293	292	280	286	285	279	282	256	266	354	336	270	238	248	253	208	221	276.9
5-Aug	196	218	226	226	199	208	204	188	165	61	356	360	347	9	29	46	85	62	24	13	10	2	3	257	10.8
6-Aug	285	267	292	277	234	246	171	180	34	49	87	39	43	38	40	18	3	340	348	349	332	322	341	354	7.7
7-Aug	43	304	303	289	296	340	358	333	336	16	10	360	357	10	1	19	20	24	24	10	344	336	339	11	0.3
8-Aug	354	337	334	338	328	254	111	118	108	107	107	104	100	127	109	110	113	107	106	104	116	118	126	127	109.4
9-Aug	122	116	121	125	120	122	127	122	121	120	130	125	128	121	115	117	120	122	123	122	116	115	116	115	120.8
10-Aug	117	118	119	118	114	113	114	117	114	103	83	90	92	98	103	85	87	79	70	37	47	33	20	1	94.2
11-Aug	353	341	335	332	338	336	335	335	340	356	316	66	316	284	278	305	242	233	249	154	144	169	133	144	320.2
12-Aug	202	212	212	212	248	234	239	226	245	259	294	286	344	294	248	258	274	279	285	267	277	228	151	194	256.9
13-Aug	194	205	217	187	185	206	193	208	209	207	210	224	233	226	232	238	238	229	233	229	219	226	234	233	222.4
14-Aug	259	215	222	230	261	329	333	240	271	289	287	277	269	269	260	265	285	293	299	275	286	288	288	273	275.2
15-Aug	283	180	195	222	206	213	203	178	143	141	141	153	175	202	218	222	253	257	269	310	335	333	332	314	240.9
16-Aug	302	299	243	296	321	318	295	285	302	319	313	291	296	282	280	260	250	226	213	196	200	200	201	198	268.9
17-Aug	187	162	149	168	160	157	126	165	227	248	226	236	268	279	283	267	269	284	351	323	291	346	335	298	258.5
18-Aug	296	330	343	347	356	354	1	8	2	357	354	2	345	325	331	318	305	337	333	339	332	334	314	308	342.0
19-Aug	298	294	295	272	261	266	264	239	251	258	257	260	249	257	252	261	262	247	255	227	226	219	211	226	255.6
20-Aug	225	223	225	225	291	178	195	229	237	251	258	266	266	253	240	276	285	308	353	295	177	211	204	236	244.1
21-Aug	243	187	209	201	196	195	206	215	204	169	172	184	165	192	144	149	153	142	158	155	166	262	271	224	183.1
22-Aug	267	195	211	180	197	229	211	207	133	131	121	112	133	151	153	120	138	110	121	118	307	308	278	139	145.2
23-Aug	110	129	115	49	313	27	359	95	9	352	348	4	347	336	352	348	352	351	345	350	348	352	346	347	355.4
24-Aug	346	347	351	354	358	359	356	357	352	351	0	6	11	13	347	336	322	315	302	287	305	302	213	235	348.3
25-Aug	226	216	213	201	197	194	184	197	212	193	212	213	209	C	C	212	218	214	197	185	187	209	208	192	205.4
26-Aug	189	189	213	215	198	202	212	220	219	208	209	224	231	250	269	276	270	274	309	356	352	360	351	346	253.1
27-Aug	340	332	219	235	264	301	197	210	264	168	186	206	225	196	186	192	211	228	219	198	190	221	233	242	221.2
28-Aug	230	171	166	203	218	223	218	223	220	206	177	212	224	223	188	165	127	147	164	144	168	170	178	183	197.7
29-Aug	182	193	199	199	195	192	173	176	174	174	187	203	212	212	205	213	204	187	173	211	209	212	206	176	195.2
30-Aug	184	200	211	198	207	192	170	154	148	124	150	147	124	139	110	116	143	167	142	140	127	129	120	142	143.3
31-Aug	182	156	191	223	263	188	201	229	214	222	217	211	248	321	36	272	292	276	288	327	317	305	311	311	271.3

248.7 234.7 232.8 235.7 245.4 249.5 240.5 222.8 225.3 241.1 249.4 256.5 270.0 266.4 260.1 243.6 258.4 264.6 285.7 305.2 297.5 302.3 270.1 260.6
 Diurnal Average

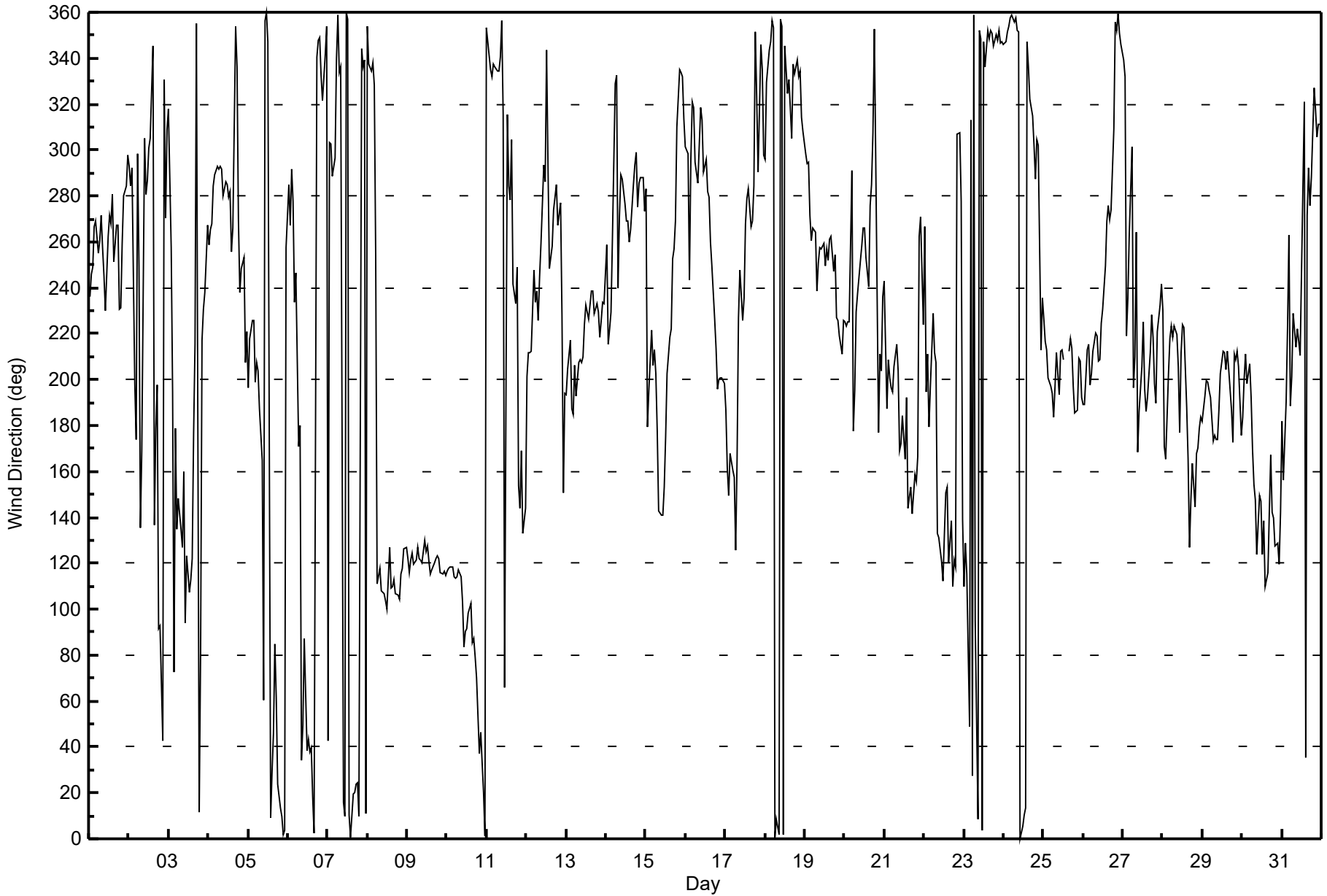
C - Calibration
 All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 88 deg on Aug 11 12:00 Minimum Value: 5 deg on Aug 24 20:00 Percentiles: P ₁ = 8 P ₁₀ = 11 Q ₁ = 14 Median = 18 Q ₃ = 26 P ₉₀ = 48 P ₉₉ = 76																			Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 2 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-Aug	11	9	9	14	14	11	13	12	12	13	13	20	15	16	19	25	42	40	25	12	16	16	13	10	42
2-Aug	12	20	39	49	74	71	61	57	37	65	39	30	22	54	46	52	62	64	68	20	52	43	64	56	74
3-Aug	42	47	71	69	23	31	50	40	25	29	36	39	70	20	18	30	28	58	49	79	82	72	13	15	82
4-Aug	10	13	22	10	10	11	10	13	16	22	26	19	22	19	19	20	34	31	20	10	15	14	18	15	34
5-Aug	20	38	14	12	19	16	19	21	56	70	40	54	30	26	28	57	38	28	19	12	12	13	24	26	70
6-Aug	12	22	65	78	68	37	48	21	79	31	36	24	20	30	26	19	18	16	14	14	16	10	9	16	79
7-Aug	41	30	17	11	9	18	32	19	44	34	26	28	26	25	23	21	19	26	14	20	10	7	13	21	44
8-Aug	18	45	28	42	49	68	17	22	16	19	22	29	30	30	22	20	19	14	14	14	14	12	13	13	68
9-Aug	13	12	13	13	12	13	12	12	12	13	18	13	13	14	13	13	13	13	13	13	13	13	13	12	18
10-Aug	12	12	12	12	13	14	13	13	15	14	14	16	15	14	16	15	17	14	16	17	15	13	17	13	17
11-Aug	13	12	9	10	11	10	10	11	15	28	44	88	49	20	27	38	38	34	17	43	13	18	19	34	88
12-Aug	19	20	16	15	14	11	56	15	19	12	18	28	36	32	16	17	13	12	13	10	12	56	40	19	56
13-Aug	22	19	14	16	15	15	16	18	17	21	18	18	19	14	15	14	14	13	16	14	11	8	10	9	22
14-Aug	49	23	14	10	17	17	24	19	24	19	14	11	12	15	13	12	15	17	14	14	9	7	8	9	49
15-Aug	10	34	22	15	16	15	19	18	20	52	18	18	22	19	17	21	19	10	15	23	12	11	10	20	52
16-Aug	7	11	36	20	18	19	9	12	26	17	21	34	21	20	24	20	16	21	17	16	15	15	16	16	36
17-Aug	15	13	12	12	14	25	20	22	55	25	31	26	17	14	13	24	21	38	32	48	42	18	25	11	55
18-Aug	13	9	13	15	16	16	16	15	17	18	19	21	21	14	14	11	13	22	10	12	11	16	16	9	22
19-Aug	12	8	8	10	10	11	15	14	13	15	11	16	15	20	19	21	14	12	13	11	10	14	13	10	21
20-Aug	10	11	11	11	78	59	20	12	15	17	23	20	19	42	84	19	15	64	25	62	29	13	17	13	84
21-Aug	11	22	24	16	17	23	16	16	31	23	22	27	36	58	51	23	21	20	13	11	40	59	64	46	64
22-Aug	55	41	47	29	28	16	36	39	26	26	33	27	55	49	68	50	57	26	15	79	21	23	50	30	79
23-Aug	19	22	21	44	50	26	20	35	33	15	15	15	15	12	17	15	14	14	14	14	15	14	14	14	50
24-Aug	14	14	16	16	16	15	16	17	18	16	16	17	17	18	24	18	16	13	9	5	9	44	19	10	44
25-Aug	17	23	12	18	16	18	17	20	19	20	22	18	19	C	C	20	17	16	19	15	15	17	16	15	23
26-Aug	15	13	15	12	13	13	12	13	15	19	19	18	18	19	14	13	11	11	20	15	16	15	14	13	20
27-Aug	10	32	14	22	30	48	49	15	71	42	30	40	66	42	28	20	20	17	18	17	22	15	9	10	71
28-Aug	27	23	21	19	14	13	11	12	14	28	22	26	28	28	26	25	15	21	31	12	18	15	16	10	31
29-Aug	12	14	11	10	11	14	12	15	15	18	29	26	19	23	23	19	20	14	15	17	18	39	15	11	39
30-Aug	21	14	13	14	46	35	70	61	18	20	45	74	41	36	19	19	25	23	29	25	16	48	28	18	74
31-Aug	37	60	54	53	56	36	49	21	23	19	30	21	44	74	48	18	15	15	30	12	13	11	10	12	74
55 60 71 78 78 71 70 61 79 70 45 88 70 74 84 57 62 64 68 79 82 72 64 56																									
Diurnal Maximum																									
C - Calibration																									





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS07 ATHABASCA VALLEY AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ATHABASCA VALLEY (AMS07)
AUGUST 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	704	36	40	99.46	11.5	0	2	0
TRS (ppb) Average	703	37	41	99.46	4.7	0	1.7	0
THC (ppm) Average	672	35	72	95.03	3.9	-	3	-
NMHC (ppm) Average	672	35	72	95.03	0.872	-	0.442	-
CH4(ppm) Average	672	35	72	95.03	3.1	-	2.5	-
O3 (ppb) Average	704	34	40	99.19	60.4	0	31.3	-
NO2 (ppb) Average	705	35	39	99.46	32.8	0	14.5	-
NO (ppb) Average	705	35	39	99.46	42.5	-	9.5	-
NOX (ppb) Average	705	35	39	99.46	64.5	-	24	-
PM2.5 (ug/m3) Average	738	3	6	99.6	391.2	94	208.8	16
CO(ppm) Average	680	34	64	95.97	3.6	0	1.4	-
Temperature 2 m (C) Average	744	0	0	100	29.5	-	21.8	-
Relative Humidity (%) Average	744	0	0	100	98.5	-	88.4	-
Barometric Pressure (inHg) Average	654	0	90	87.9	29.3	-	29.2	-
Wind Speed 10 m (km/h) Average	744	0	0	100	23	-	15	-
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)
AUGUST 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	704	0.36	1	-	0	0	0.1	0.1	0.2	0.8	11.5
TRS (ppb) Average	703	0.41	0.5	-	0.1	0.1	0.2	0.3	0.4	0.9	4.7
THC (ppm) Average	672	2.18	0.3	-	1.9	2	2	2.1	2.2	2.4	3.9
NMHC (ppm) Average	672	0.04	0.132	-	0	0	0	0	0	0.1	0.872
CH4(ppm) Average	672	2.14	0.2	-	1.9	2	2	2.1	2.2	2.3	3.1
O3 (ppb) Average	704	21.89	10.8	-	3.4	9.1	12.5	21.2	29.8	36.2	60.4
NO2 (ppb) Average	705	4.4	3.8	-	0.5	1.2	2	3.4	5.6	8.2	32.8
NO (ppb) Average	705	1.5	3	-	0	0.1	0.3	0.6	1.4	3.4	42.5
NOX (ppb) Average	705	5.9	6	-	0.6	1.6	2.6	4.4	7.3	10.4	64.5
PM2.5 (ug/m3) Average	738	44.48	64.3	-	2.7	5.4	9.2	20.2	58.8	94.6	391.2
CO(ppm) Average	680	0.4	0.4	-	0.1	0.2	0.2	0.3	0.4	0.7	3.6
Temperature 2 m (C) Average	744	17.76	4.5	-	7.1	12.9	14.3	17.2	20.8	24.4	29.5
Relative Humidity (%) Average	744	72.96	16	-	30.6	48.5	61.1	76.7	86.7	91.3	98.5
Barometric Pressure (inHg) Average	654	29.01	0.2	-	28.5	28.8	28.9	29	29.1	29.2	29.3
Wind Speed 10 m (km/h) Average	744	8	5	-	0	3	4	7	11	14	23
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

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

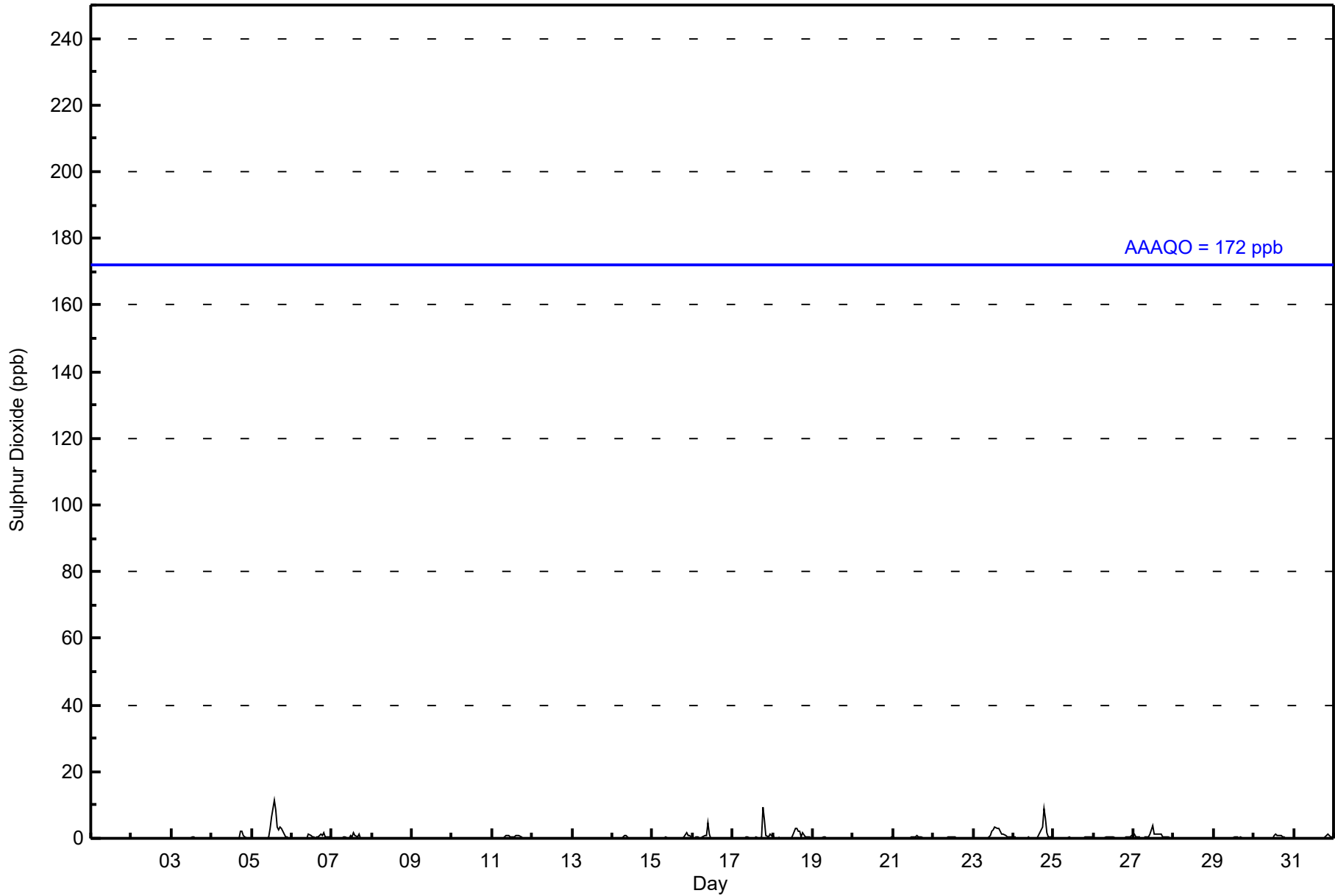
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
AIR QUALITY ANALYZERS	28 Aug 2023 07:00	28 Aug 2023 09:00	3	Station power failure
ALL GASEOUS ANALYZERS	28 Aug 2023 15:00	28 Aug 2023 15:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	19 Aug 2023 12:00	20 Aug 2023 10:00	23	Unstable Operations - flatline in analyzer output signal
THC/NMHC/CH4	20 Aug 2023 11:00	20 Aug 2023 11:00	1	Maintenance - analyzer rebooted
THC/NMHC/CH4	29 Aug 2023 03:00	29 Aug 2023 09:00	7	Unstable Operations - support gas depleted
THC/NMHC/CH4	29 Aug 2023 10:00	29 Aug 2023 11:00	2	Maintenance - replaced support gas cylinder
O3	29 Aug 2023 19:00	29 Aug 2023 20:00	2	Unstable Operations - excessive baseline noise
CO	21 Aug 2023 08:00	22 Aug 2023 08:00	25	Unstable Operations - flatline in analyzer output signal
CO	22 Aug 2023 09:00	22 Aug 2023 09:00	1	Maintenance - analyzer rebooted
Barometric Pressure	28 Aug 2023 07:00	01 Sep 2023 00:00	90	Unstable Operations - flatline in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	703	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: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Athabasca Valley - August 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	23	3	7	6	31	47	144	51	27	37	86	50	27	32	34	98	703
11 - 20	1	0	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	24	3	7	6	31	47	144	51	27	37	86	50	27	32	34	98	704

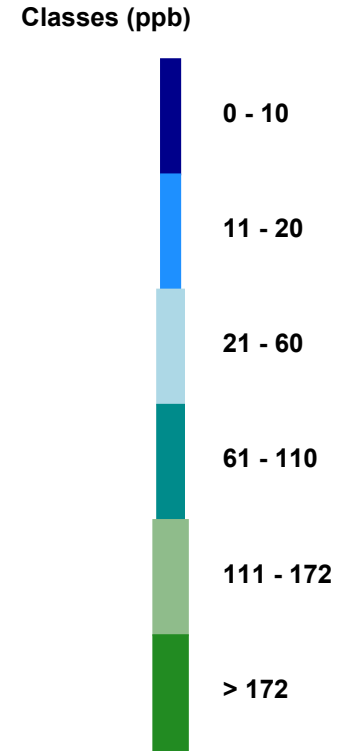
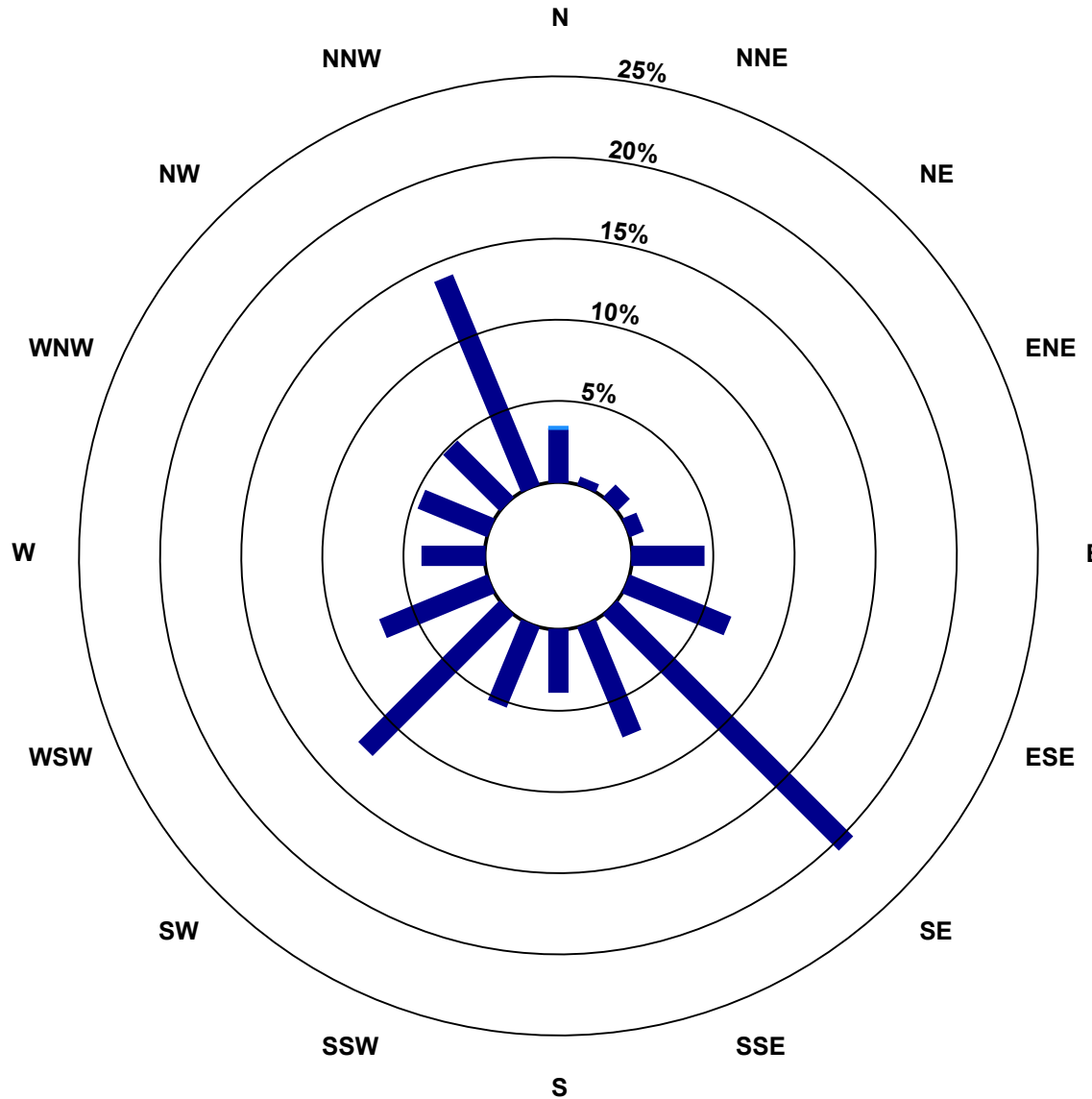
Total Number of Valid Hours: 704

Total Number of Hours: 744

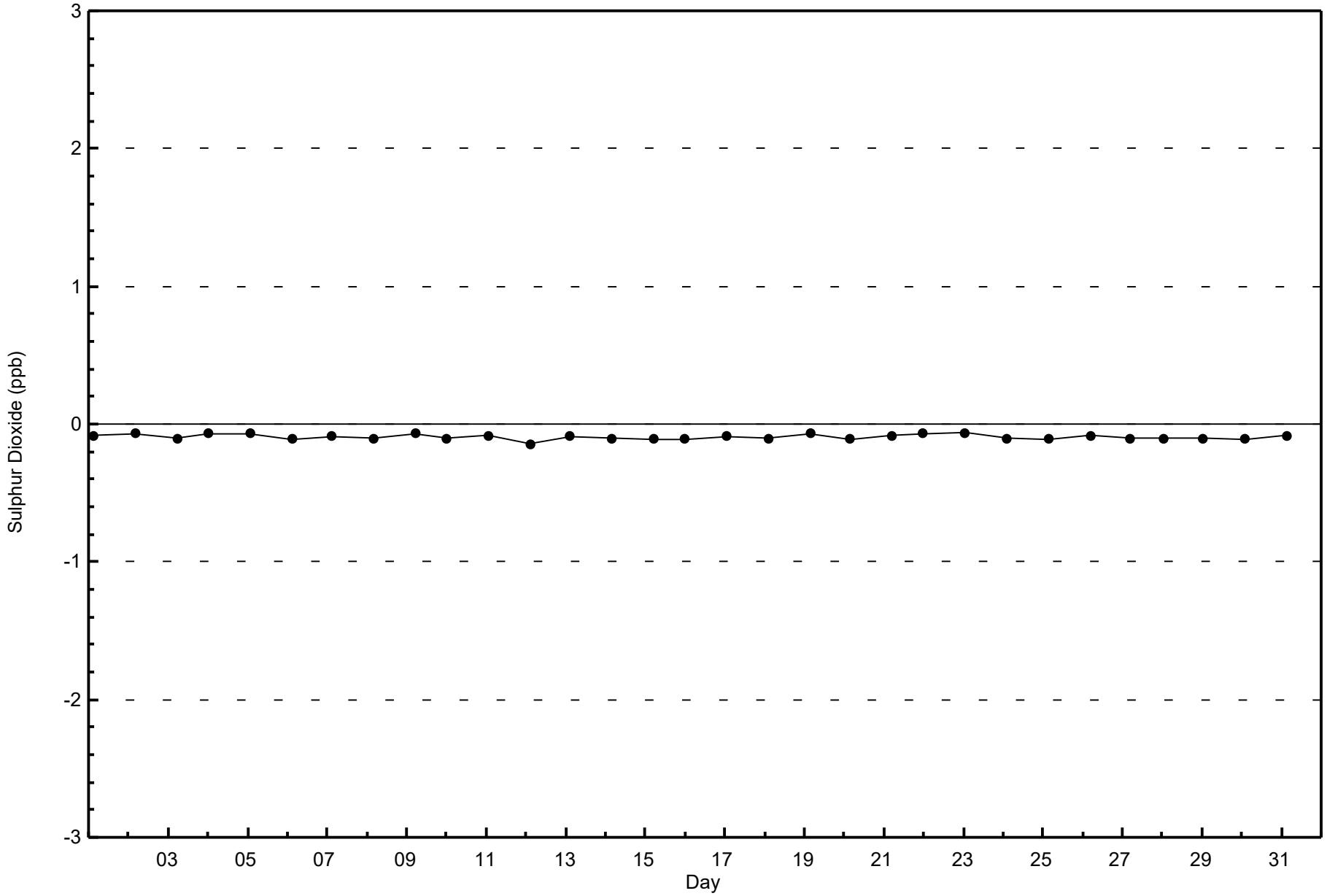


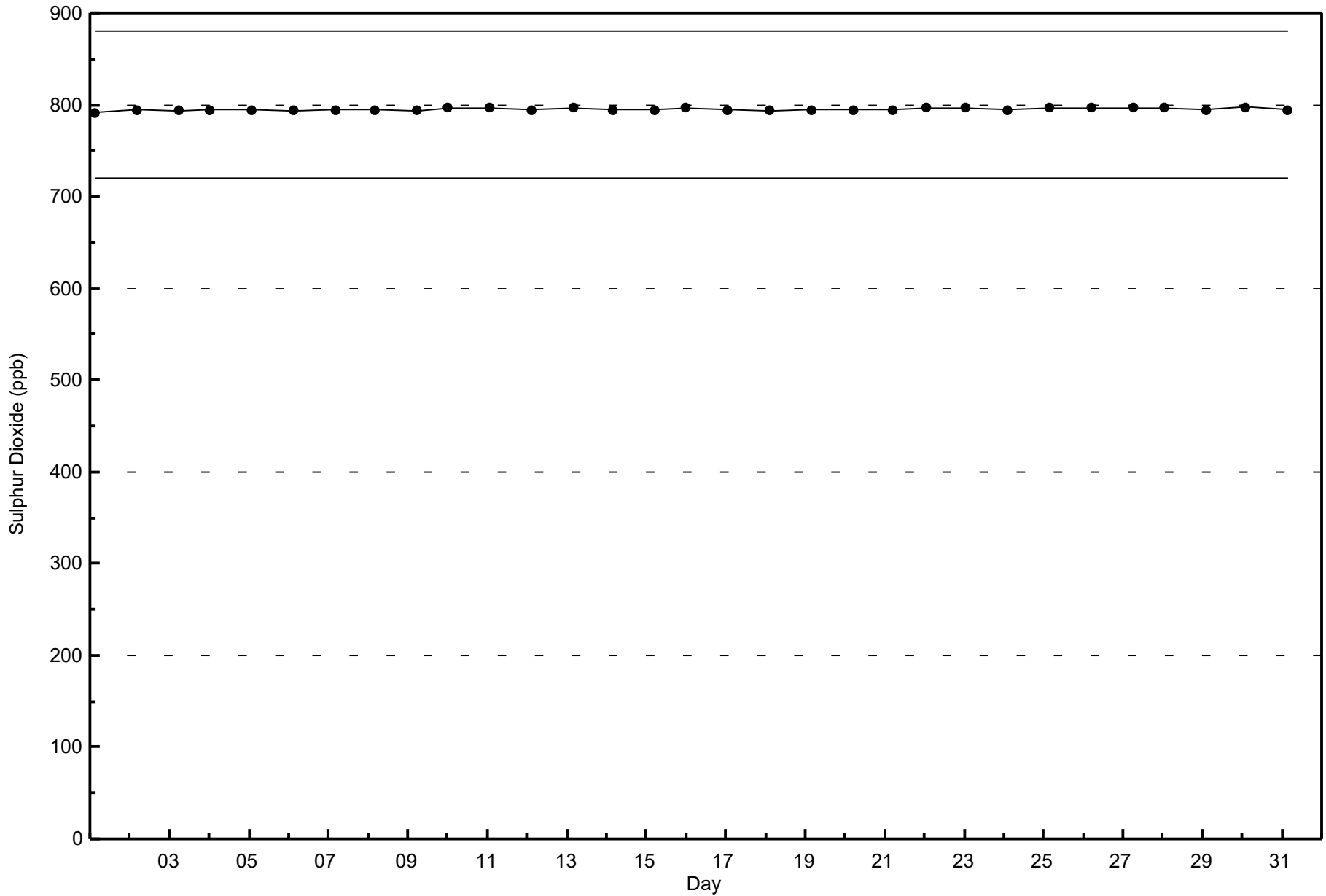
Wood Buffalo Environmental Association
Wind Rose Aug 2023

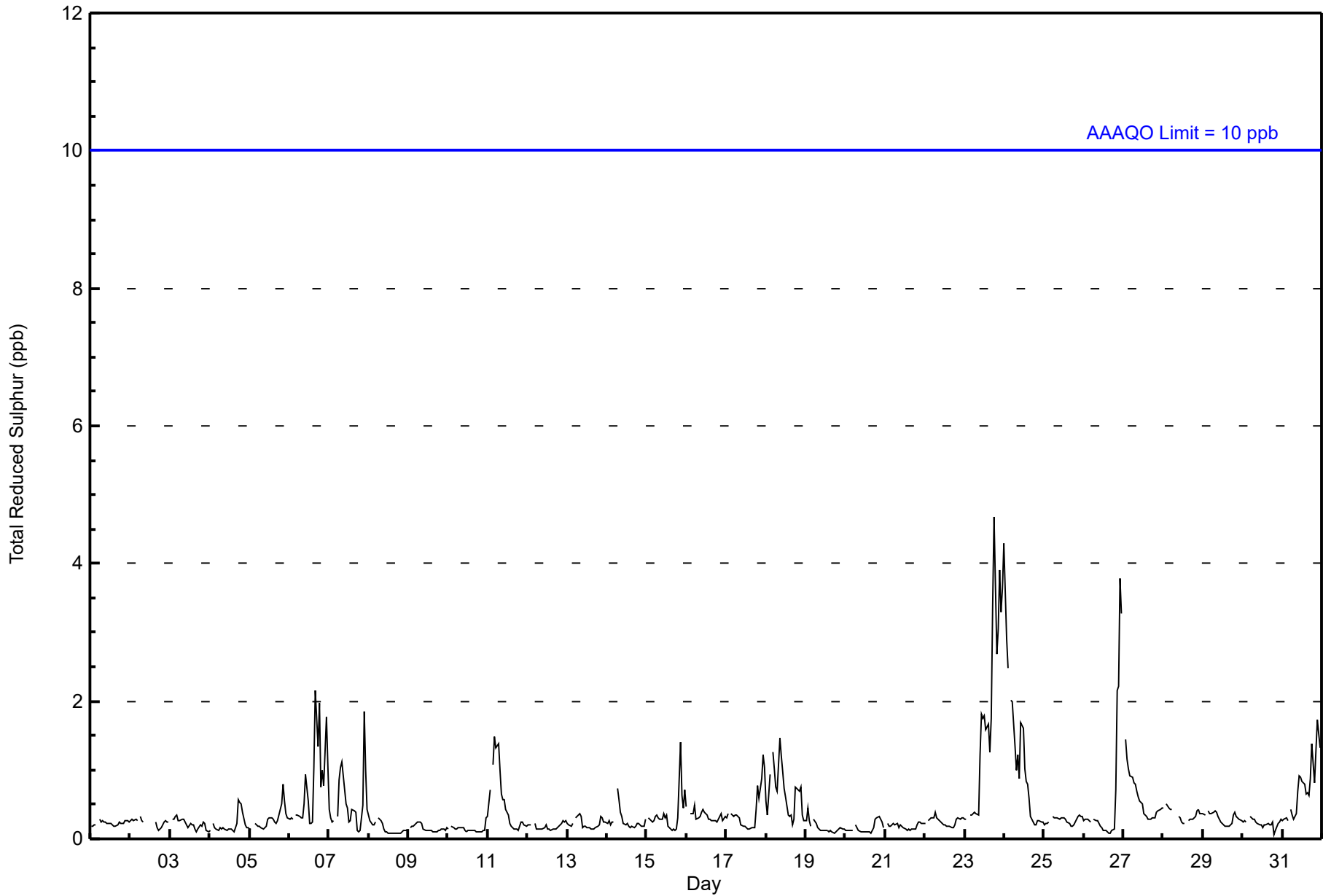
Sulphur Dioxide (SO₂) - ppb
Athabasca Valley



Total Number of Valid Hours: 704









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	692	98.44	98.44
3 - 4	10	1.42	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: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Athabasca Valley - August 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	23	3	7	7	32	48	149	49	28	35	83	48	27	31	34	88	692
3 - 4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	10
5 - 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	24	3	7	7	32	48	149	49	28	35	83	48	27	31	34	98	703

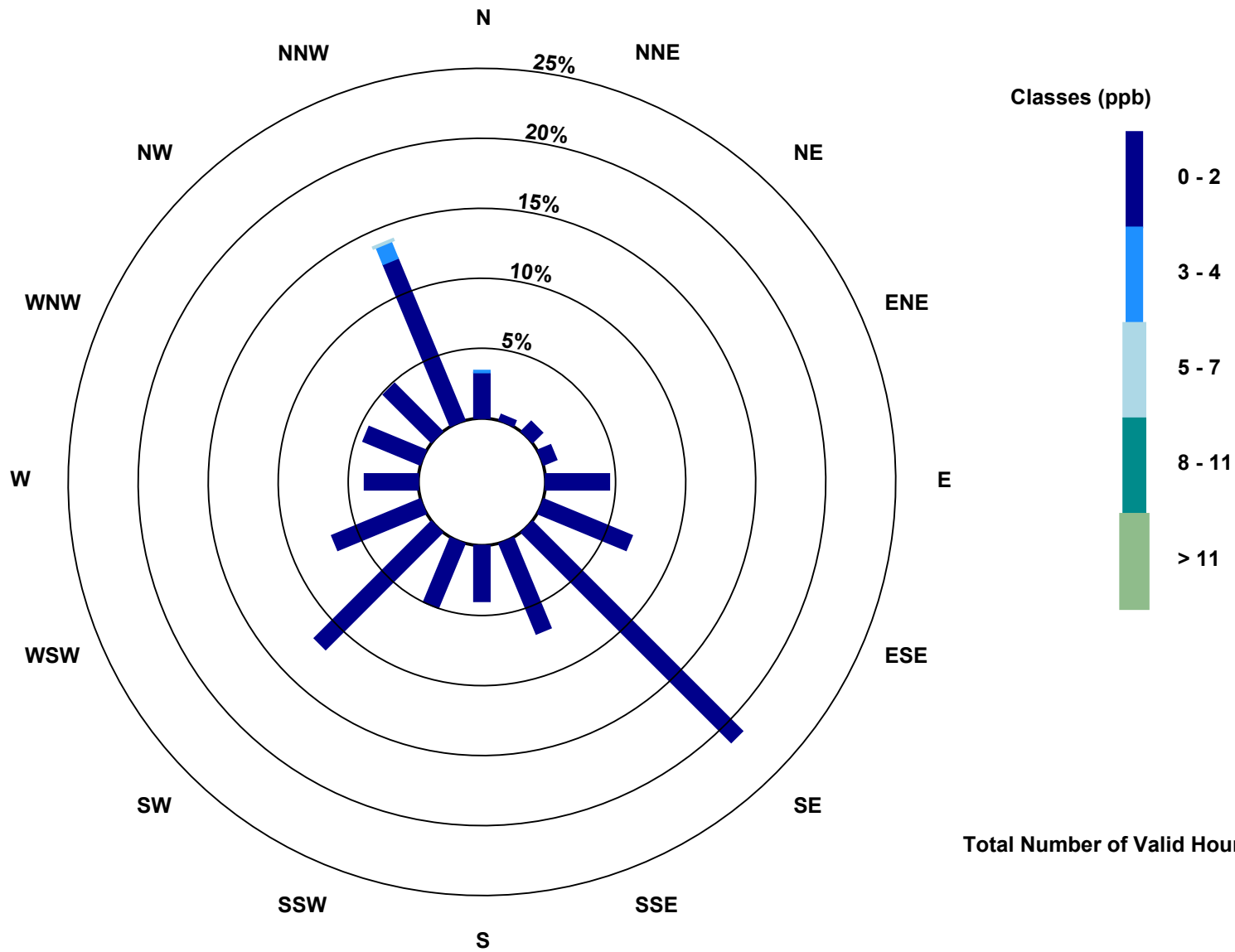
Total Number of Valid Hours: 703

Total Number of Hours: 744

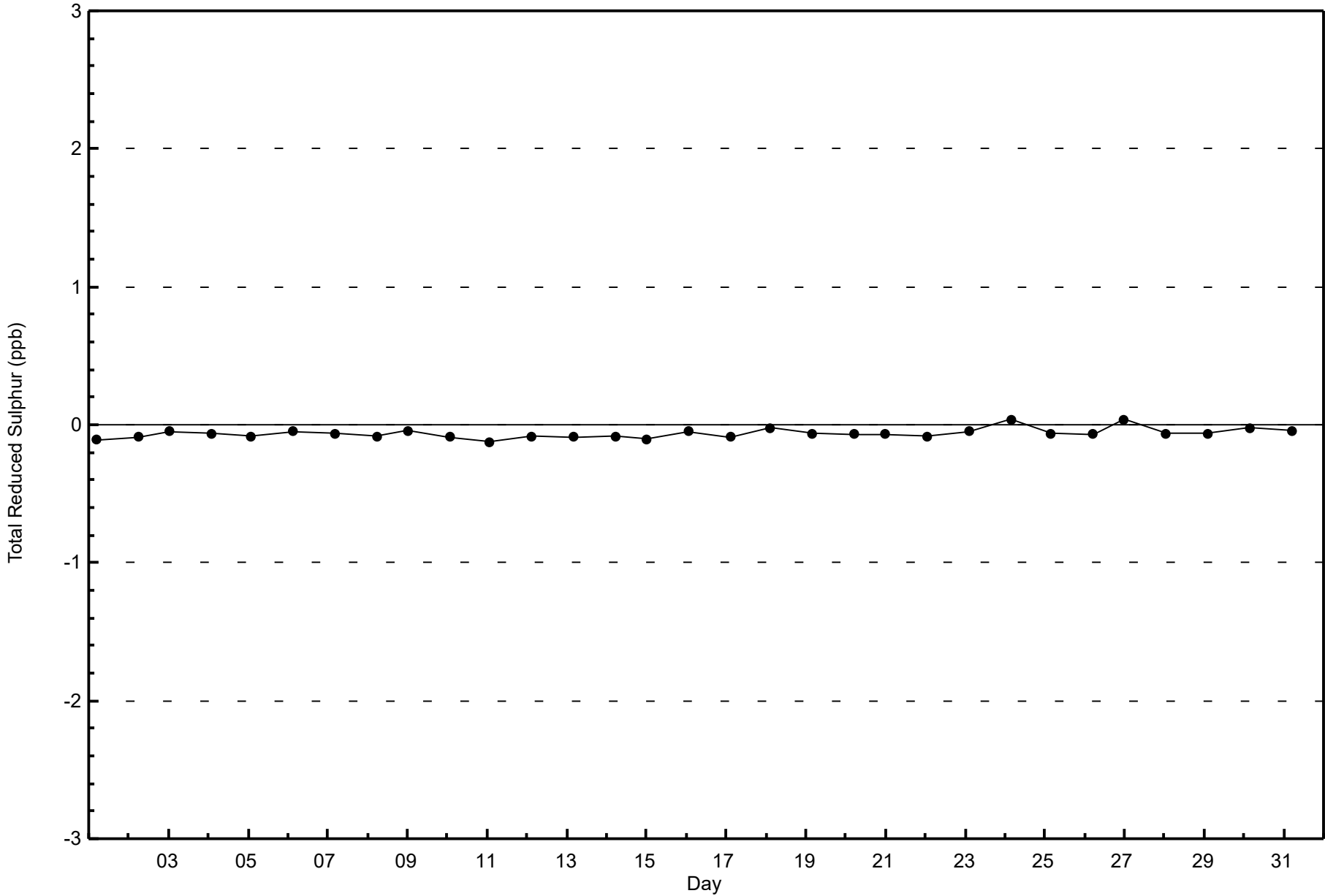


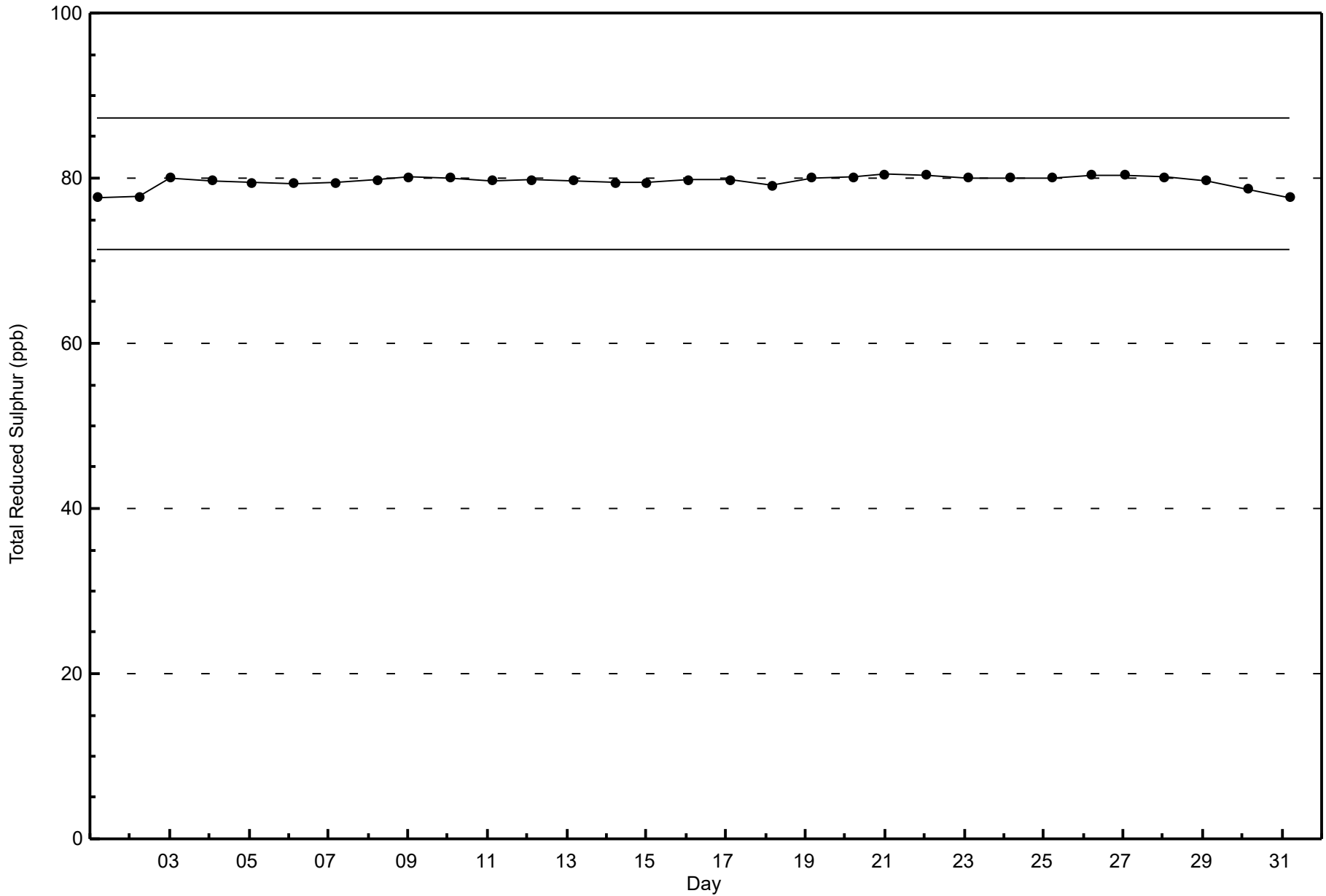
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Athabasca Valley



Total Number of Valid Hours: 703

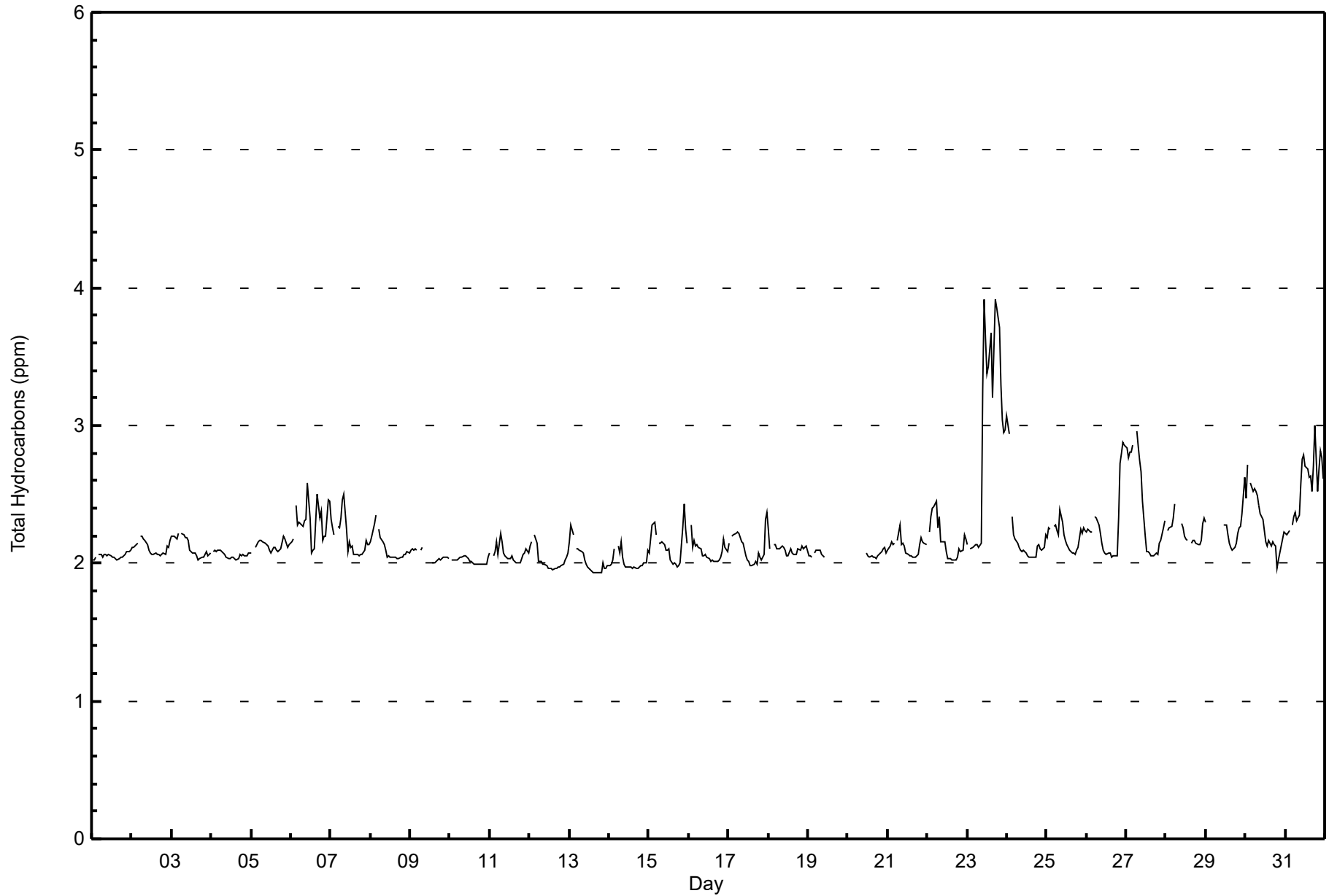






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Athabasca Valley - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Athabasca Valley - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	178	26.49	26.49
2.1 - 3.0	481	71.58	98.07
3.1 - 10.0	13	1.93	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Athabasca Valley - August 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	0	3	2	10	10	26	5	8	4	31	16	15	21	9	9	178
2.1 - 3.0	13	3	4	4	19	32	112	41	18	29	51	30	11	11	25	78	481
3.1 - 10.0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	13
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	24	3	7	6	29	42	138	46	26	33	82	46	26	32	34	98	672

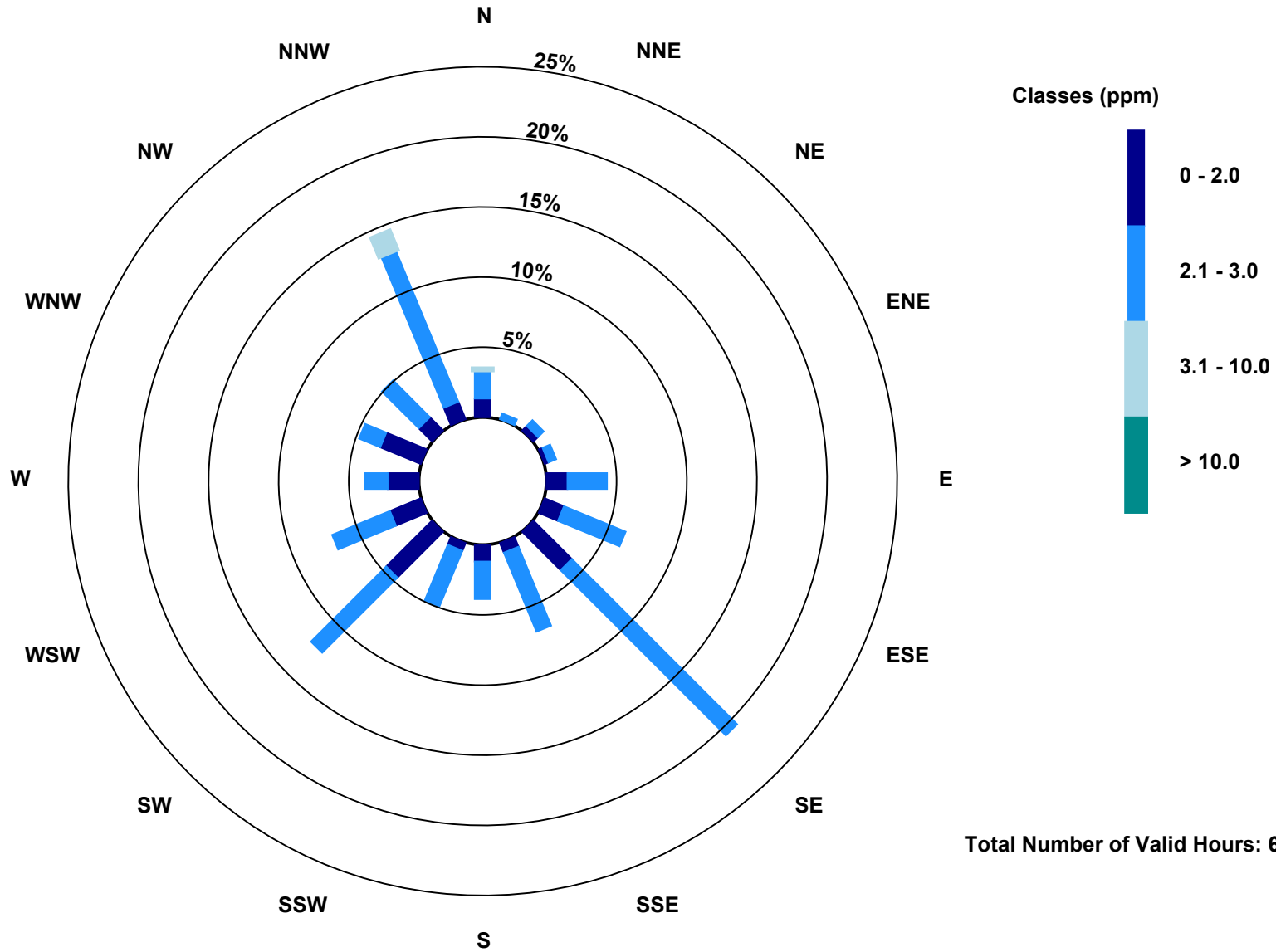
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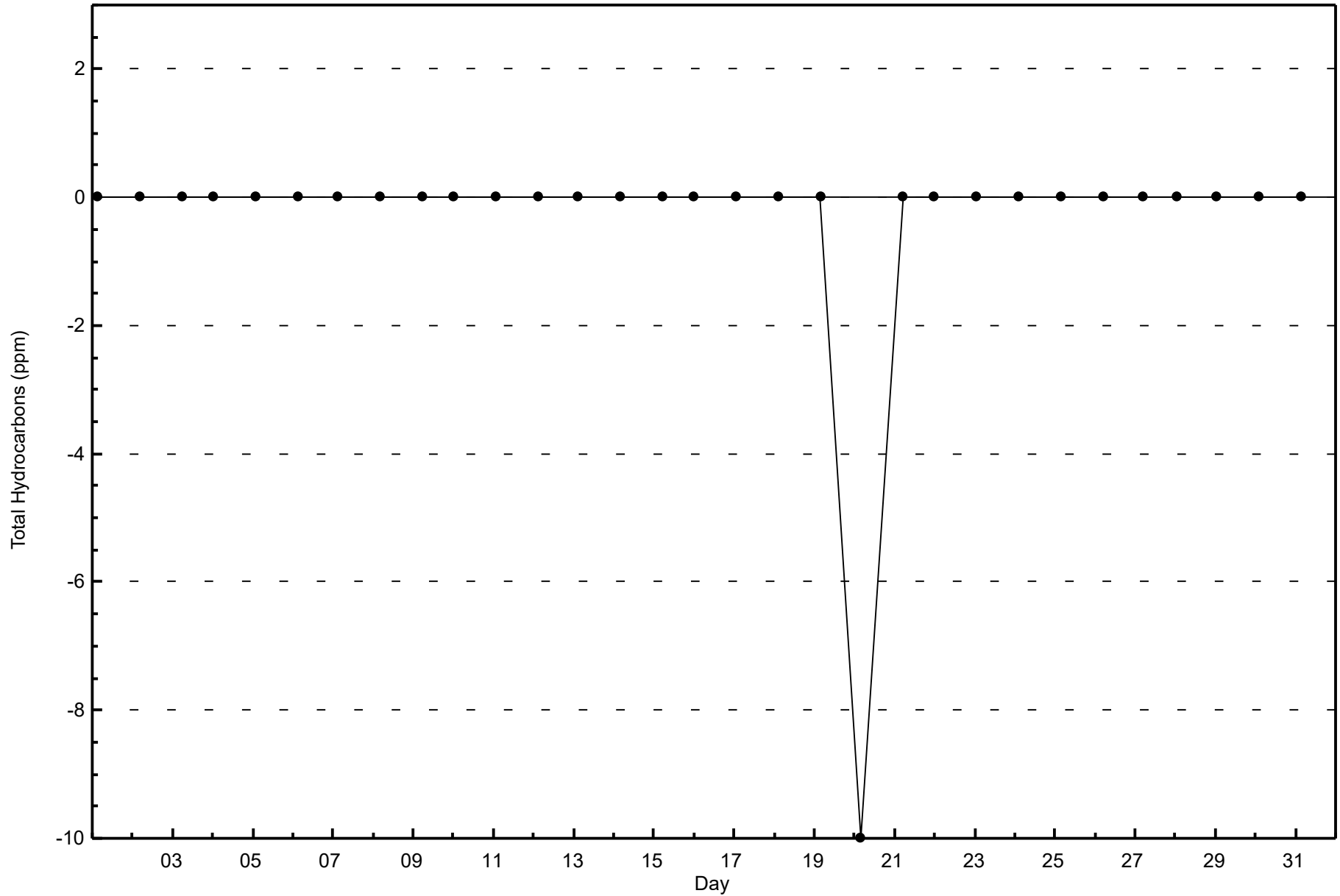
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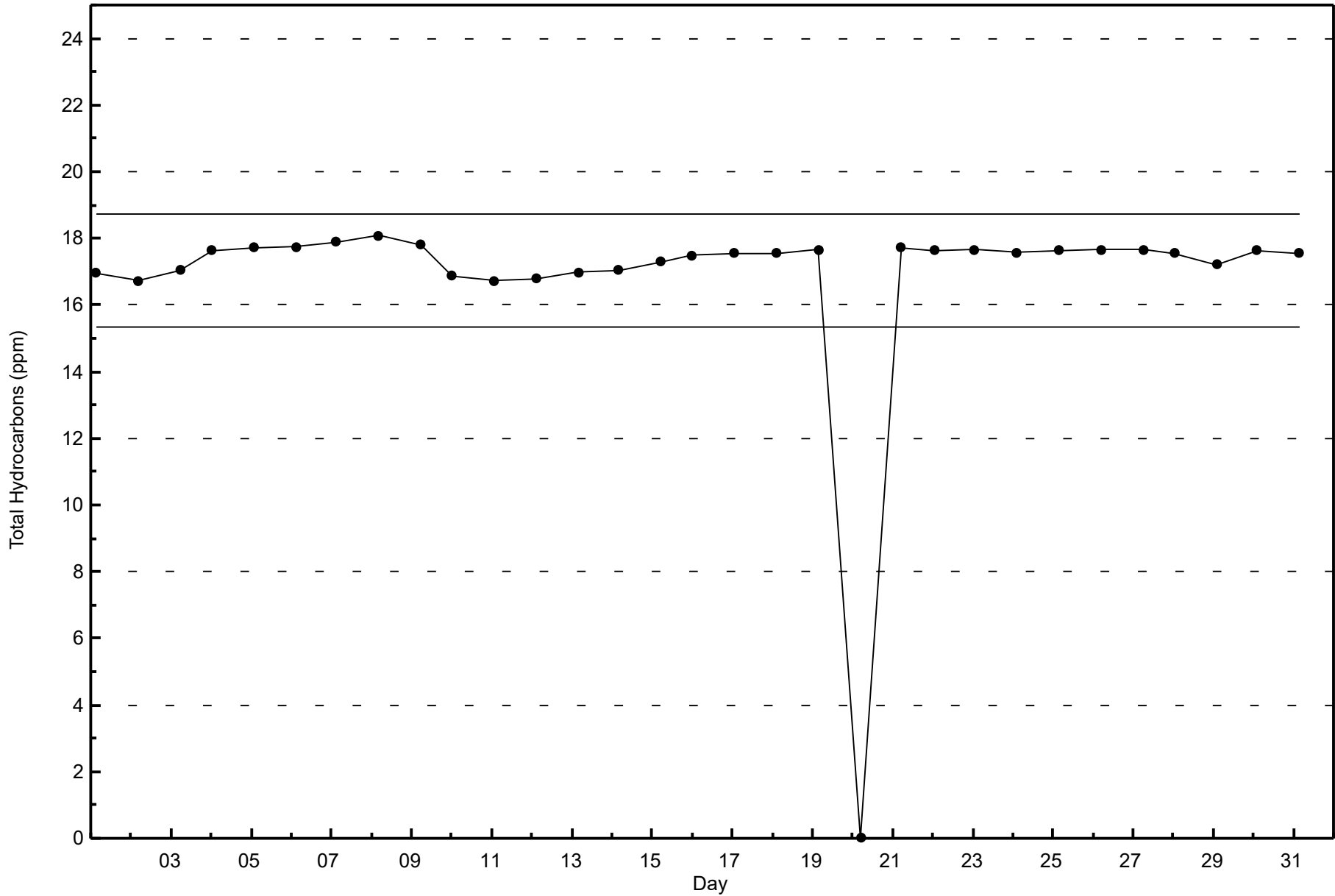


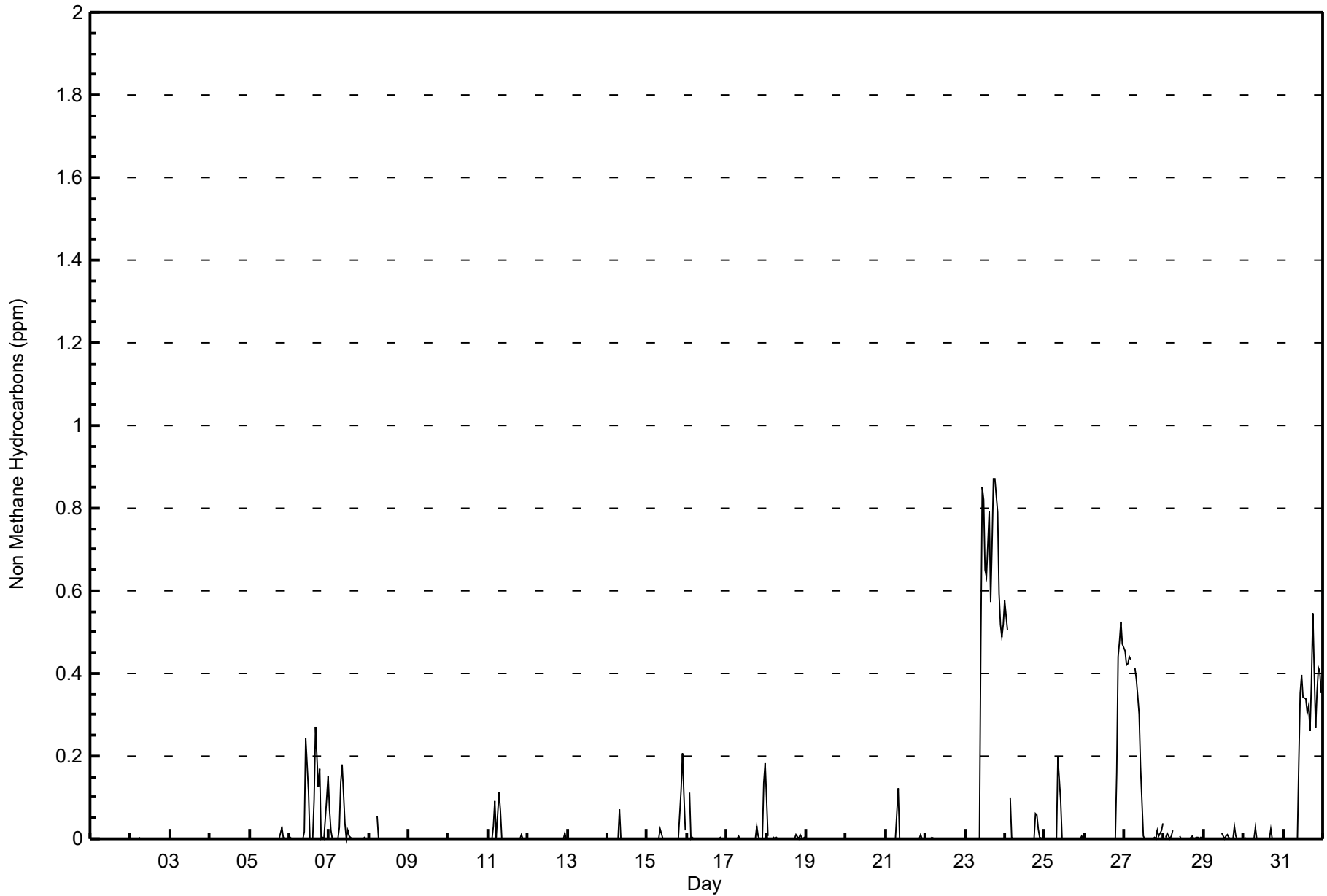
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Athabasca Valley











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	559	83.18	83.18
0.006 - 0.05	38	5.65	88.84
0.06 - 0.1	20	2.98	91.82
> 0.1	55	8.18	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley - August 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	3	6	6	25	39	122	43	26	29	70	37	24	29	26	52	559
0.006 - 0.05	0	0	0	0	2	1	12	2	0	1	3	3	1	0	3	10	38
0.06 - 0.1	0	0	1	0	0	0	2	0	0	0	2	3	1	1	1	9	20
> 0.1	2	0	0	0	2	2	2	1	0	3	7	3	0	2	4	27	55
Totals	24	3	7	6	29	42	138	46	26	33	82	46	26	32	34	98	672

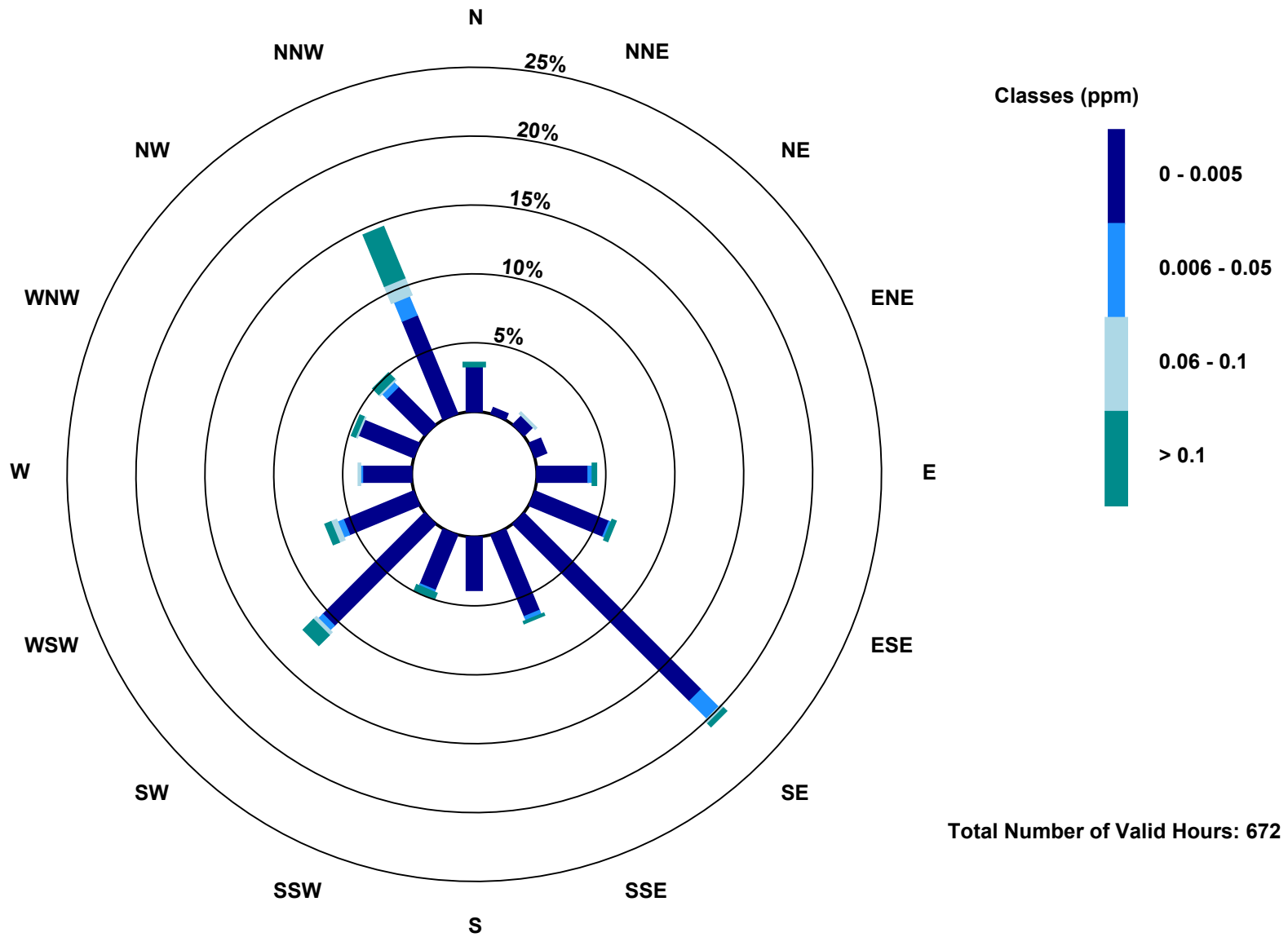
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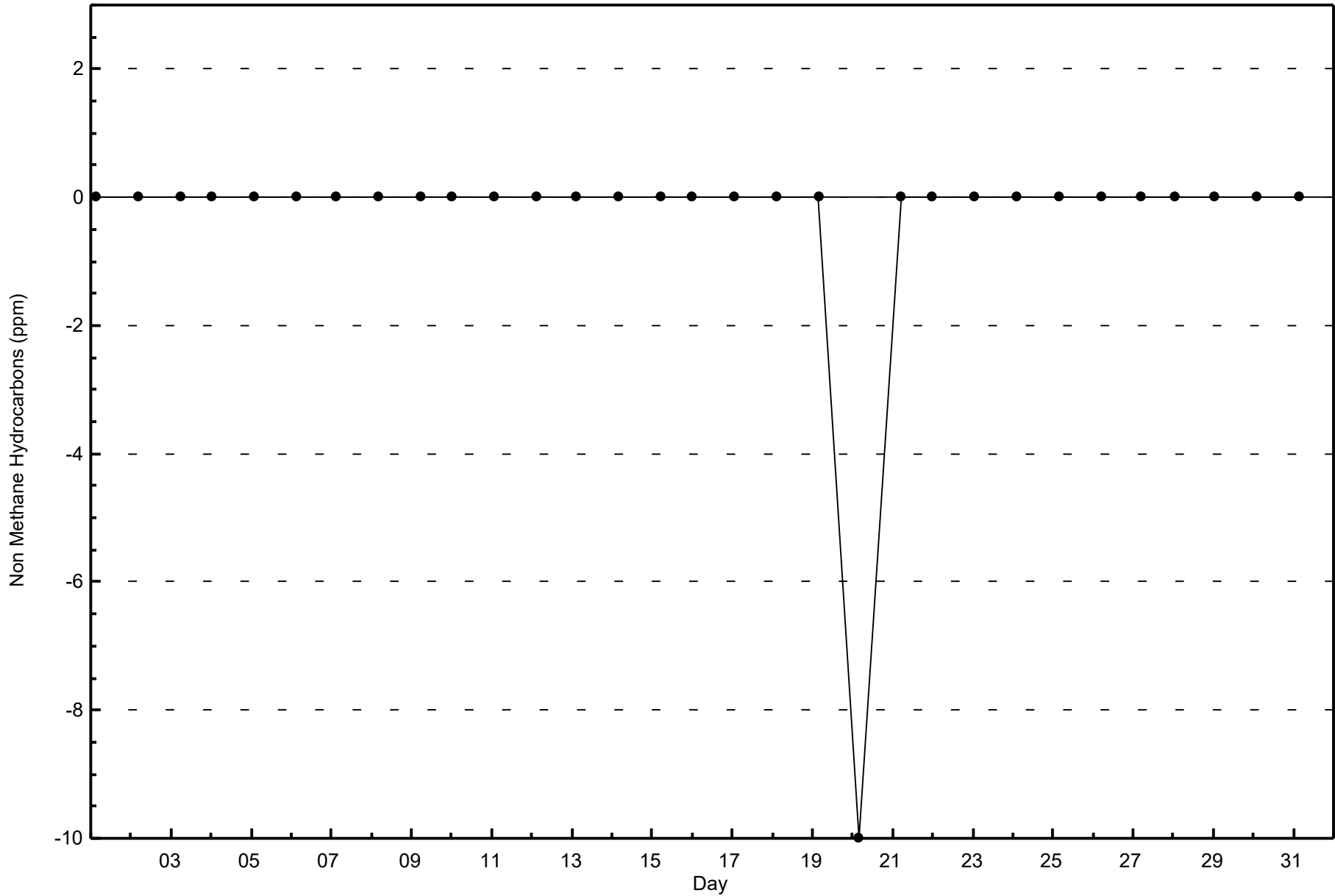
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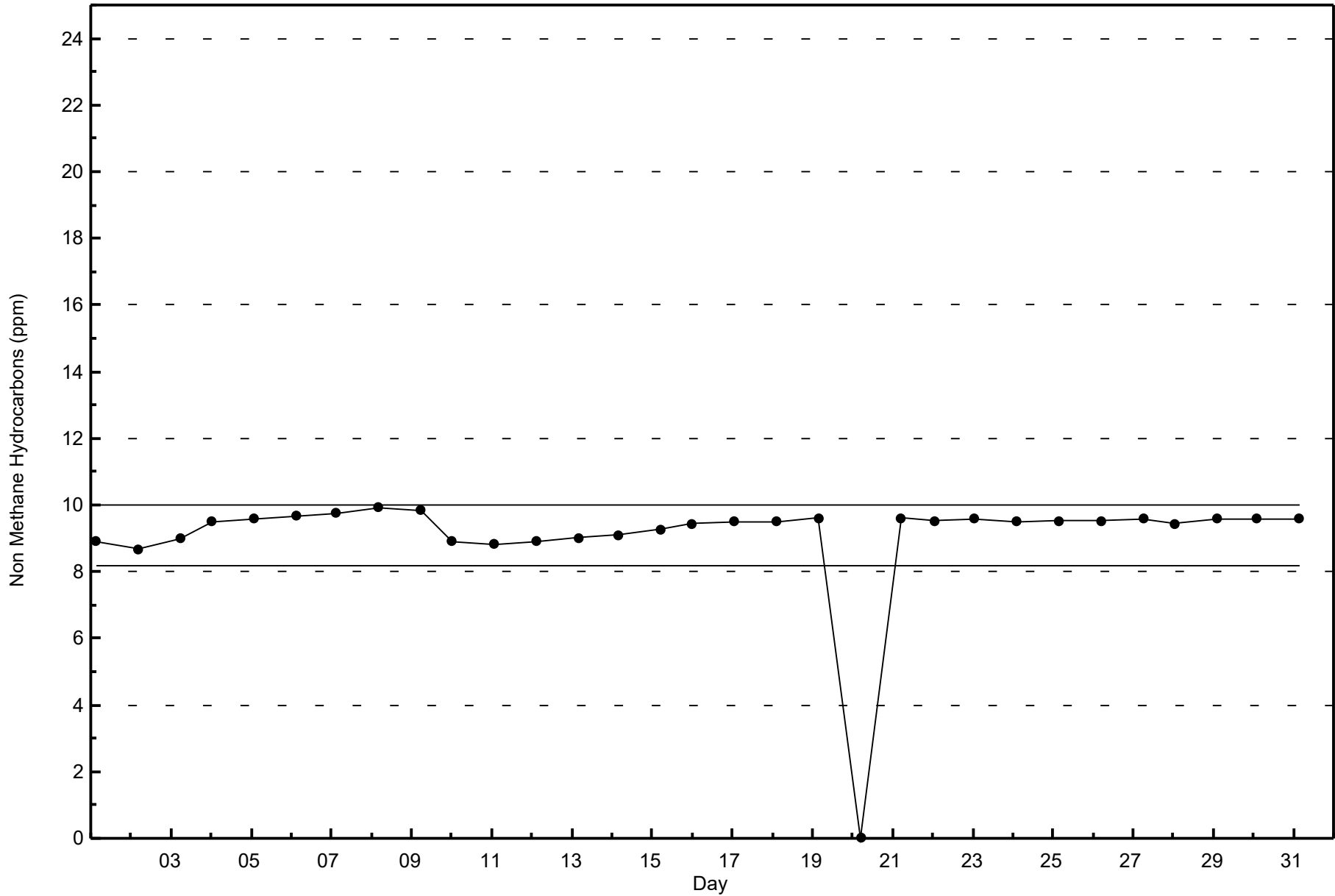


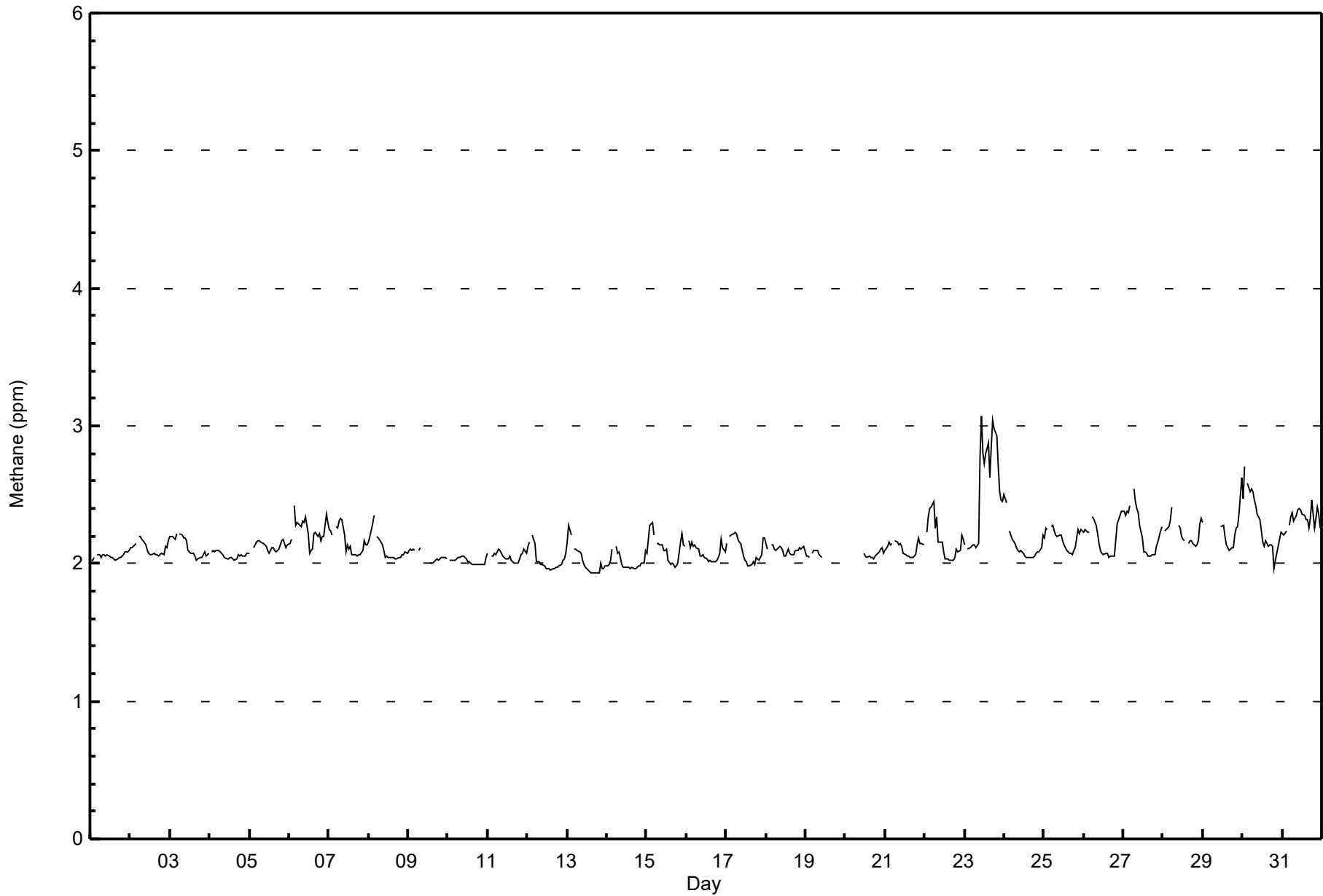
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Athabasca Valley











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Athabasca Valley - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	179	26.64	26.64
2.1 - 3.0	492	73.21	99.85
3.1 - 10.0	1	0.15	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 672

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Athabasca Valley - August 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	0	3	2	10	10	26	5	8	4	31	16	15	21	9	10	179
2.1 - 3.0	15	3	4	4	19	32	112	41	18	29	51	30	11	11	25	87	492
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	24	3	7	6	29	42	138	46	26	33	82	46	26	32	34	98	672

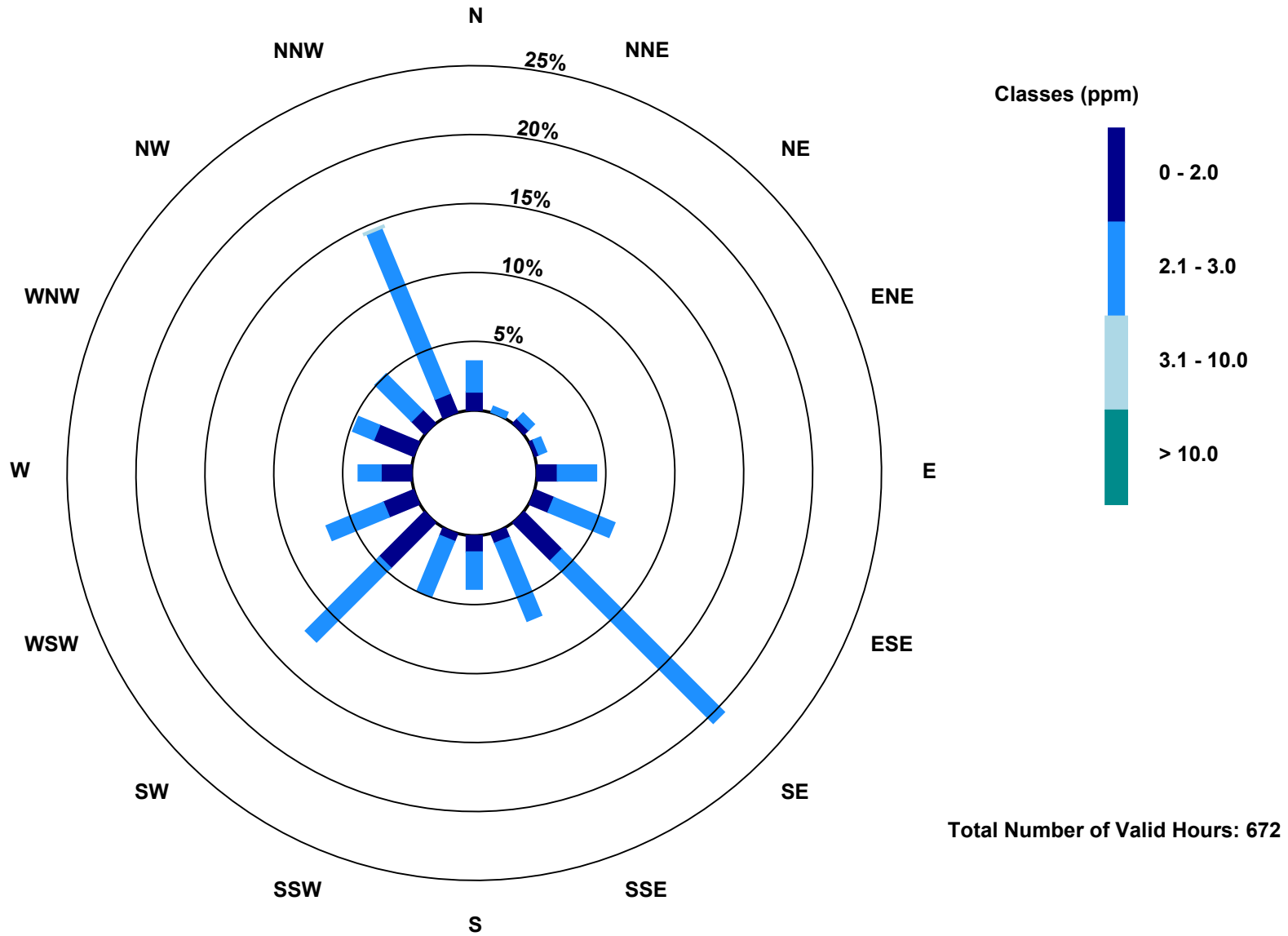
Total Number of Valid Hours: 672

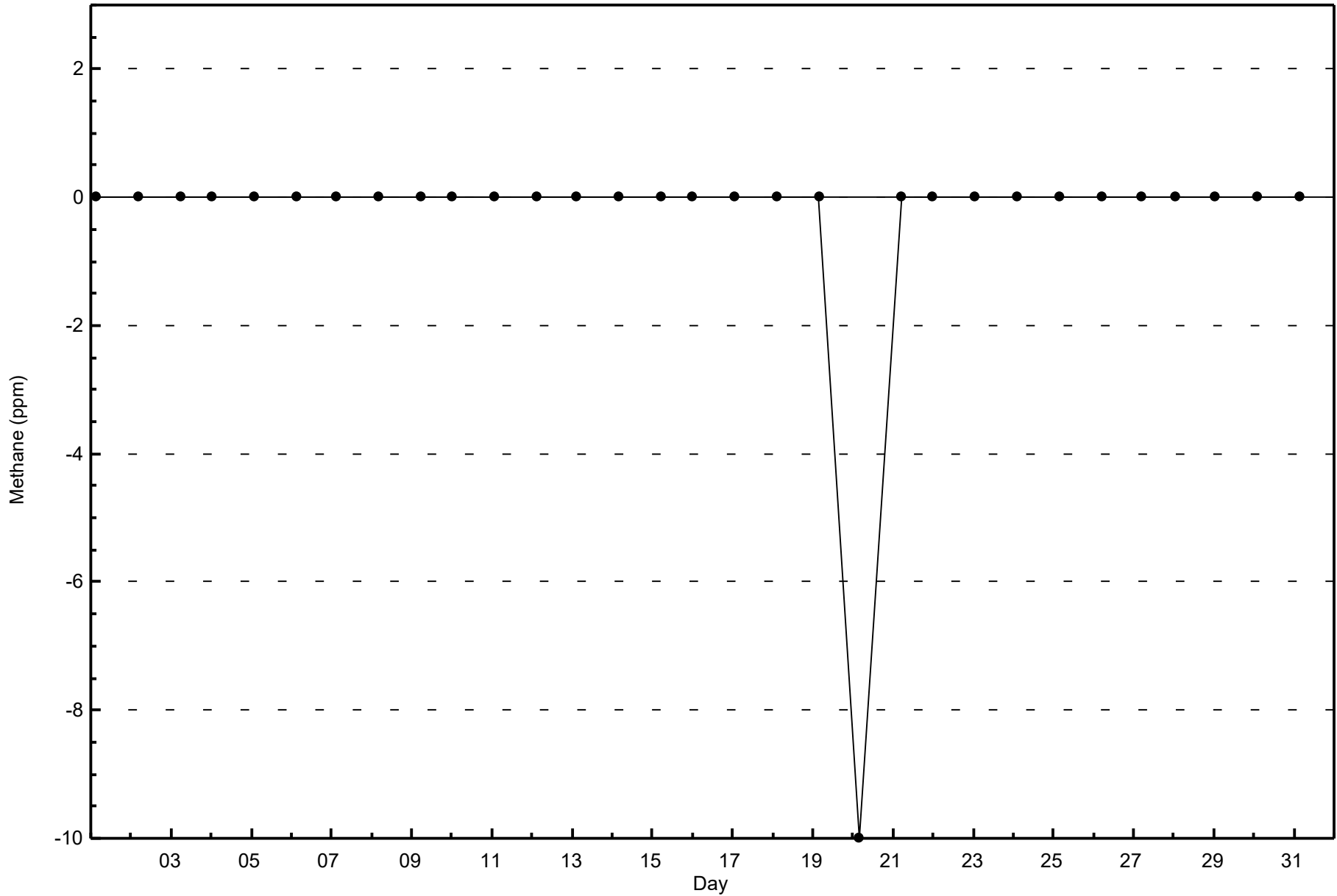
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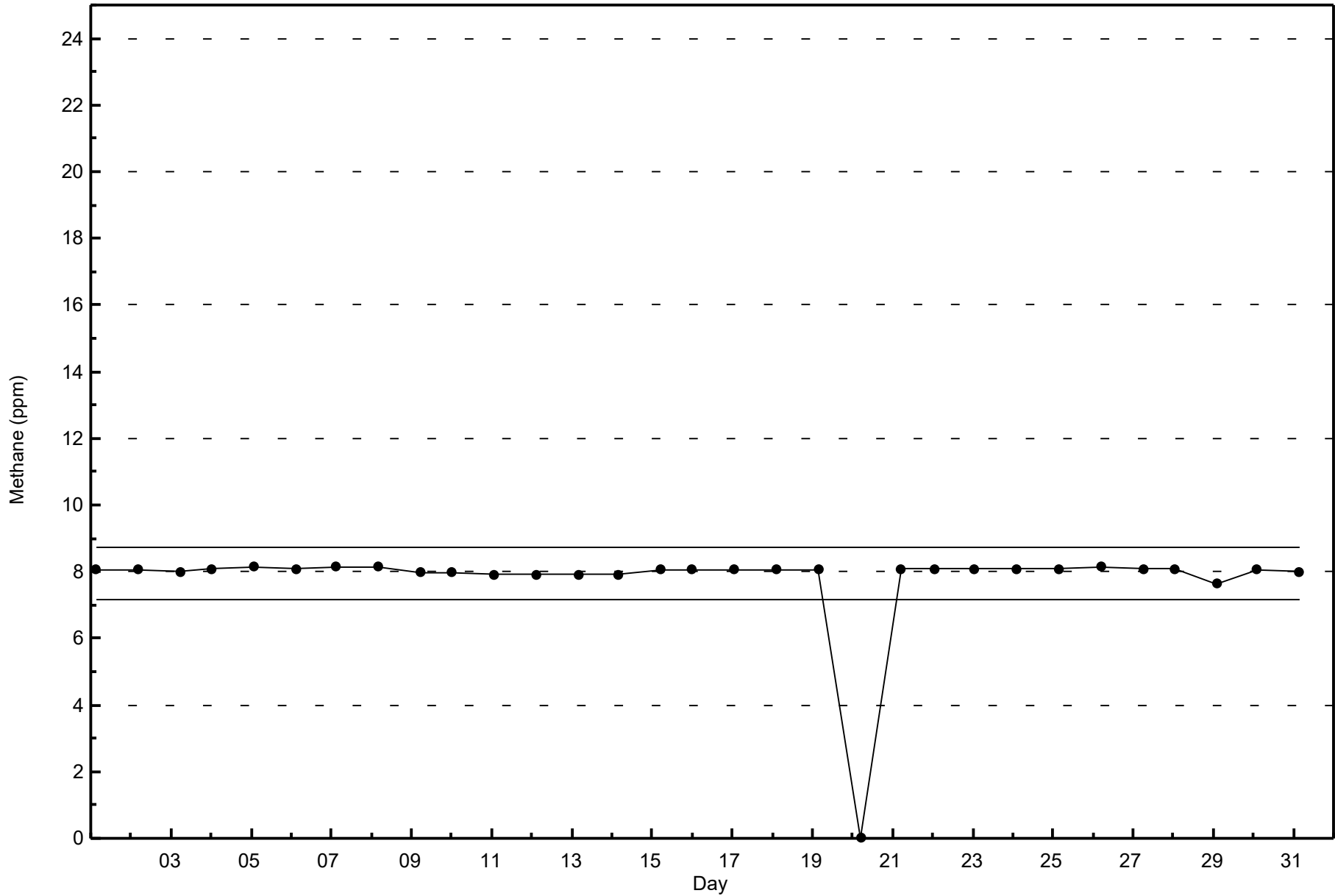


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Athabasca Valley









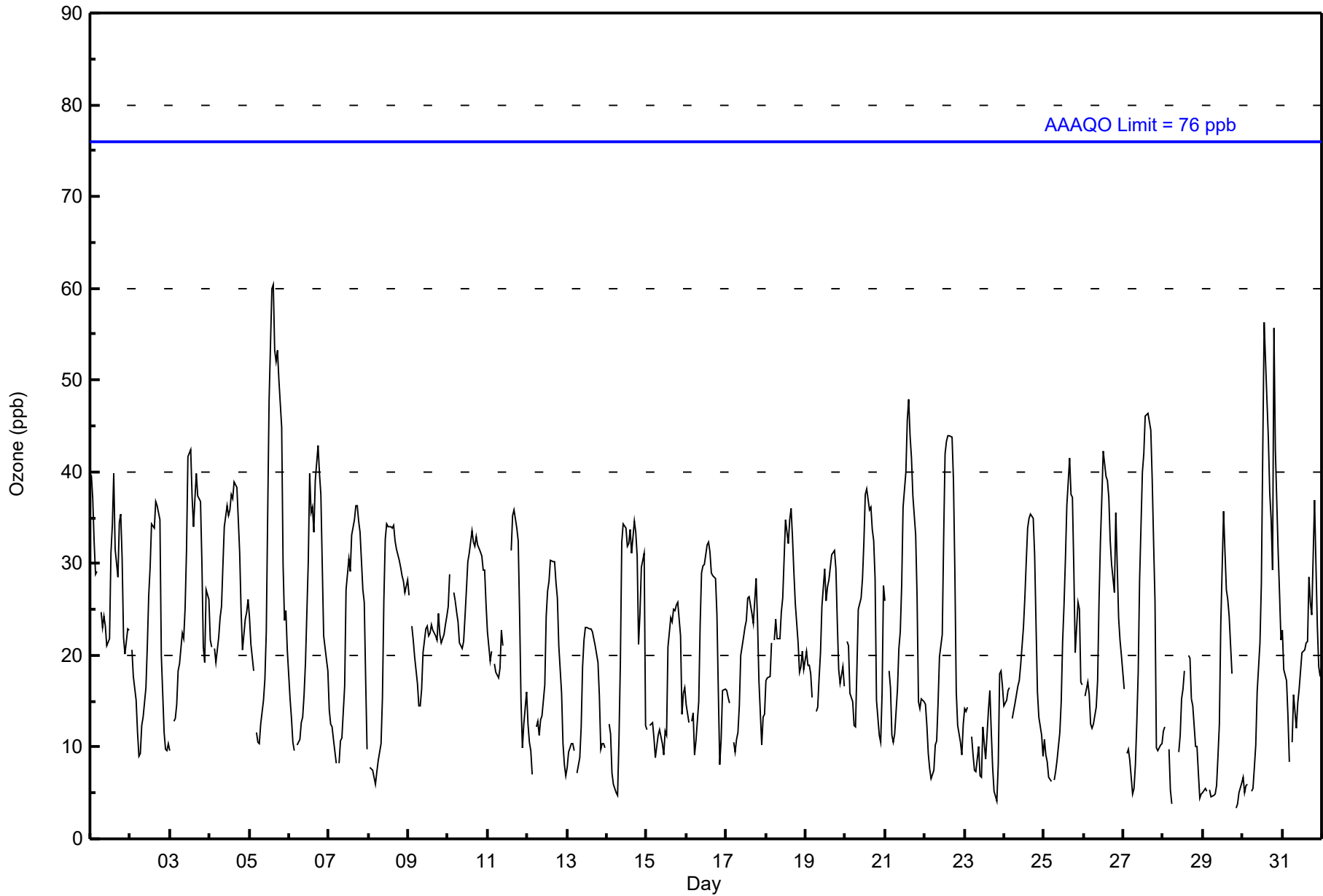
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Athabasca Valley - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744																					
Maximum Value: 60.4 ppb on Aug 5 15:00		Maximum Daily Average: 31.3 ppb on Aug 5		Hours of Data: 704																							
Minimum Value: 3.4 ppb on Aug 29 21:00		Minimum Daily Average: 11.0 ppb on Aug 23		Hours of Missing Data: 40																							
Maximum Diurnal Average: 34.2 ppb at hour 15		Minimum Diurnal Average: 11.5 ppb at hour 6		Hours of Calibration: 34																							
Monthly Average: 21.89 ppb		Percentiles: P ₁ = 4.7 P ₁₀ = 9.1 Q ₁ = 12.5 Median = 21.2 Q ₃ = 29.8 P ₉₀ = 36.2 P ₉₉ = 52.0		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-Aug	39.7	37.0	32.3	28.9	29.2	Z	24.8	23.1	24.2	23.2	21.0	21.8	31.2	34.2	39.8	31.6	28.6	34.5	35.4	30.6	21.9	20.1	22.9	22.7	28.6	39.8	
2-Aug	Z	20.6	17.7	15.1	11.6	9.1	9.3	12.4	13.3	16.4	21.0	26.5	29.6	34.3	33.9	36.8	36.2	35.6	34.7	19.9	11.6	9.8	9.6	10.4	20.7	36.8	
3-Aug	9.6	Z	12.8	13.1	14.6	18.4	19.1	22.3	21.9	25.1	31.4	41.7	42.5	37.2	34.0	37.1	39.8	37.4	36.8	30.0	21.0	19.3	27.2	26.0	26.9	42.5	
4-Aug	21.6	20.9	Z	20.7	19.2	21.9	24.1	25.4	29.8	34.1	36.3	35.2	35.8	37.6	37.1	38.9	38.3	34.7	31.1	24.9	20.6	24.0	24.6	26.0	28.8	38.9	
5-Aug	24.1	21.2	18.4	Z	11.6	10.6	10.4	12.4	15.0	17.4	22.6	35.4	47.8	60.0	60.4	53.3	52.1	53.2	50.0	44.8	29.9	23.7	24.9	20.6	31.3	60.4	
6-Aug	15.2	13.2	10.5	9.6	Z	10.2	10.8	12.6	13.3	15.7	19.2	30.2	39.8	35.6	36.2	33.4	39.1	42.8	39.8	37.6	29.8	22.1	19.5	18.2	24.1	42.8	
7-Aug	14.0	12.5	12.1	10.8	8.2	Z	8.2	10.6	11.0	16.7	27.1	28.8	30.6	29.2	33.1	34.8	36.3	36.3	34.6	33.4	27.1	25.8	17.3	9.8	22.1	36.3	
8-Aug	Z	7.8	7.4	6.8	5.9	7.4	8.6	10.4	15.4	26.0	32.6	34.3	34.0	34.0	33.8	34.1	32.4	31.6	30.4	29.6	28.7	28.0	26.8	28.3	23.2	34.3	
9-Aug	26.6	Z	23.2	21.6	19.8	16.9	14.5	14.6	16.3	20.3	22.9	23.3	22.2	22.4	23.3	22.8	22.1	21.6	24.5	22.3	21.4	22.3	23.4	24.2	21.4	26.6	
10-Aug	25.3	28.8	Z	26.8	26.0	24.8	23.7	21.4	20.7	21.4	24.3	27.2	30.1	31.2	33.5	32.3	31.9	33.0	32.0	31.3	30.9	29.2	29.3	25.6	27.9	33.5	
11-Aug	22.5	19.4	20.4	Z	19.1	18.1	17.6	18.6	22.7	21.1	C	C	C	C	31.4	35.3	35.8	33.9	32.5	24.5	15.0	9.9	12.5	16.0	22.4	35.8	
12-Aug	12.5	10.6	9.5	7.0	Z	12.2	12.8	11.2	13.0	13.5	16.7	24.2	26.9	28.0	30.4	30.2	30.1	28.0	26.3	21.0	15.9	10.3	8.1	6.9	17.6	30.4	
13-Aug	7.8	9.5	10.3	10.3	9.6	Z	7.2	8.8	12.2	18.8	21.7	23.0	23.0	22.9	22.9	22.6	21.8	21.1	19.3	15.5	9.7	10.4	10.4	9.9	15.2	23.0	
14-Aug	Z	12.5	11.4	7.2	5.9	5.1	4.7	10.8	19.2	32.3	34.2	33.9	31.8	32.2	33.7	31.2	34.6	33.4	30.9	21.3	24.5	29.6	31.1	12.3	22.8	34.6	
15-Aug	11.9	Z	12.3	12.6	10.9	8.9	10.1	11.3	11.9	10.4	9.1	11.7	11.3	20.8	24.1	23.7	25.1	24.9	25.5	25.8	22.1	13.5	15.8	16.5	16.1	25.8	
16-Aug	14.6	12.7	Z	12.7	13.7	9.2	10.7	15.0	23.4	29.0	29.8	29.8	32.0	32.3	31.2	29.0	28.7	28.4	24.4	16.0	8.1	10.8	16.1	16.4	20.6	32.3	
17-Aug	16.2	15.4	14.8	Z	10.6	9.4	10.9	11.6	14.5	20.0	22.0	23.0	23.8	26.2	26.5	24.6	23.5	26.0	28.4	23.8	17.2	10.2	13.3	13.6	18.5	28.4	
18-Aug	17.2	17.5	17.7	21.3	Z	21.7	23.9	21.8	21.8	24.8	26.3	30.5	34.8	32.2	34.7	35.9	32.8	29.0	25.6	21.3	18.1	18.7	20.5	18.5	24.6	35.9	
19-Aug	20.5	19.0	19.0	18.0	15.4	Z	13.9	14.4	17.6	20.3	25.4	29.4	25.9	27.4	28.2	29.6	31.0	31.5	29.4	23.6	18.4	16.9	18.8	16.7	22.2	31.5	
20-Aug	Z	21.5	21.1	15.8	14.9	12.3	12.2	18.5	25.0	26.2	28.4	32.3	37.5	38.1	35.9	36.2	33.7	32.4	28.4	15.1	11.3	10.5	15.8	27.6	24.0	38.1	
21-Aug	25.9	Z	18.3	16.5	11.3	10.5	11.5	16.4	20.8	22.6	27.7	36.1	40.0	45.7	47.9	44.0	41.6	37.3	33.2	26.3	15.0	14.3	15.3	15.0	25.8	47.9	
22-Aug	14.7	12.4	9.3	7.6	6.6	7.6	10.1	10.7	14.8	19.8	22.3	32.8	42.0	43.4	44.0	43.9	43.8	39.0	29.1	16.0	12.3	10.6	9.2	12.5	21.4	44.0	
23-Aug	14.1	13.9	14.4	Z	11.1	9.2	7.5	7.4	10.0	6.9	6.8	12.2	10.3	8.8	14.0	16.2	11.8	7.8	5.2	4.1	8.0	17.9	18.4	16.7	11.0	18.4	
24-Aug	14.4	15.0	16.1	16.6	Z	13.2	14.9	15.7	16.6	17.3	19.0	23.0	26.2	30.2	33.9	35.0	35.5	34.9	30.9	23.4	16.0	13.3	11.3	9.0	20.9	35.5	
25-Aug	10.9	9.2	8.4	6.7	6.2	Z	6.4	7.2	8.6	11.6	15.0	21.5	25.5	30.5	36.2	41.5	37.5	37.2	29.4	20.3	25.8	25.0	17.1	16.7	19.8	41.5	
26-Aug	Z	15.5	17.1	15.8	12.6	12.0	12.5	14.4	17.2	25.8	32.4	37.0	42.3	39.6	39.1	37.3	32.5	29.8	26.9	35.6	29.8	24.1	21.6	20.0	25.7	42.3	
27-Aug	16.3	Z	9.3	9.7	8.5	4.9	5.5	8.1	12.7	18.1	28.3	40.0	41.9	46.1	46.3	46.4	44.5	39.2	32.3	25.9	9.8	9.6	10.2	10.4	22.8	46.4	
28-Aug	11.7	12.2	Z	9.7	5.3	3.8	PF	PF	PF	9.5	11.2	15.2	16.3	18.3	M	20.0	19.7	15.2	14.5	10.0	10.1	7.2	4.4	4.9	11.5	20.0	
29-Aug	5.0	5.4	5.2	Z	5.4	4.6	4.7	4.8	5.7	9.1	12.5	23.4	35.6	31.3	27.1	26.2	24.2	18.0	UO	UO	3.4	3.9	5.0	6.1	12.7	35.6	
30-Aug	6.6	5.0	5.7	5.9	Z	5.1	5.5	7.8	10.2	16.1	21.3	27.8	42.2	56.3	52.1	43.6	37.7	34.8	29.2	55.7	42.5	31.2	26.6	21.7	25.7	56.3	
31-Aug	22.7	18.5	17.2	13.4	8.3	Z	10.6	15.6	12.0	14.9	16.4	18.2	20.3	20.6	21.4	21.5	28.5	25.8	24.4	37.0	30.0	23.2	18.8	17.7	19.9	37.0	
		17.0	15.7	14.5	13.9	12.4	11.5	12.2	13.8	16.4	19.5	22.8	27.6	31.1	32.9	34.2	33.2	32.6	31.2	29.2	25.6	19.5	17.6	17.6	16.7	Diurnal Average	
		39.7	37.0	32.3	28.9	29.2	24.8	24.8	25.4	29.8	34.1	36.3	41.7	47.8	60.0	60.4	53.3	52.1	53.2	50.0	55.7	42.5	31.2	31.1	28.3	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				UO - Unstable Operation				PF - Power Failure													
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		76 ppb																							





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	335	47.59	47.59
21 - 50	361	51.28	98.86
51 - 82	8	1.14	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Athabasca Valley - August 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	5	0	2	3	11	24	112	41	21	17	24	13	6	2	14	40	335
21 - 50	15	2	5	4	16	25	40	8	8	17	59	37	21	29	18	57	361
51 - 82	2	1	0	0	1	0	0	1	0	0	0	0	0	1	1	1	8
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	22	3	7	7	28	49	152	50	29	34	83	50	27	32	33	98	704

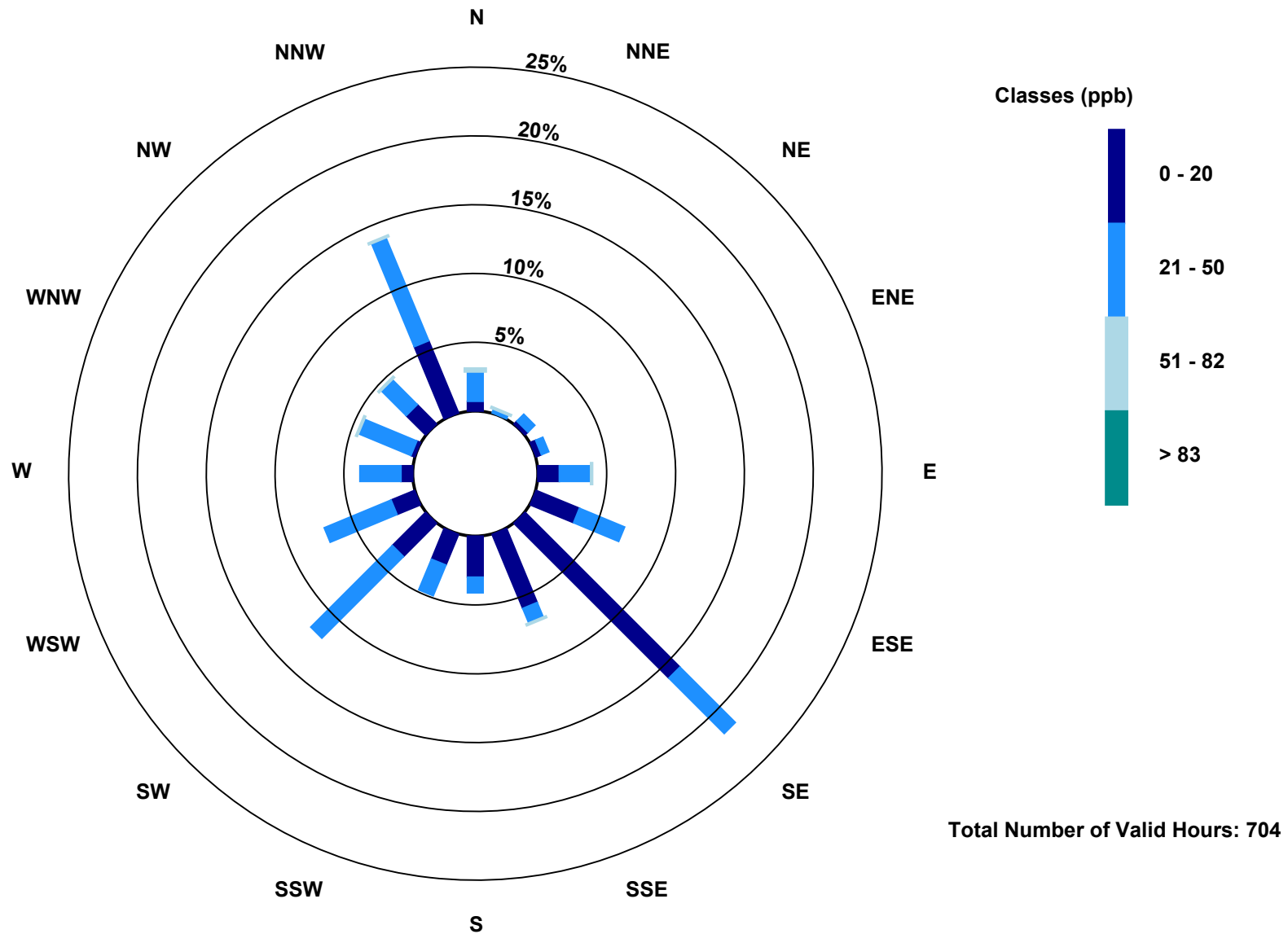
Total Number of Valid Hours: 704

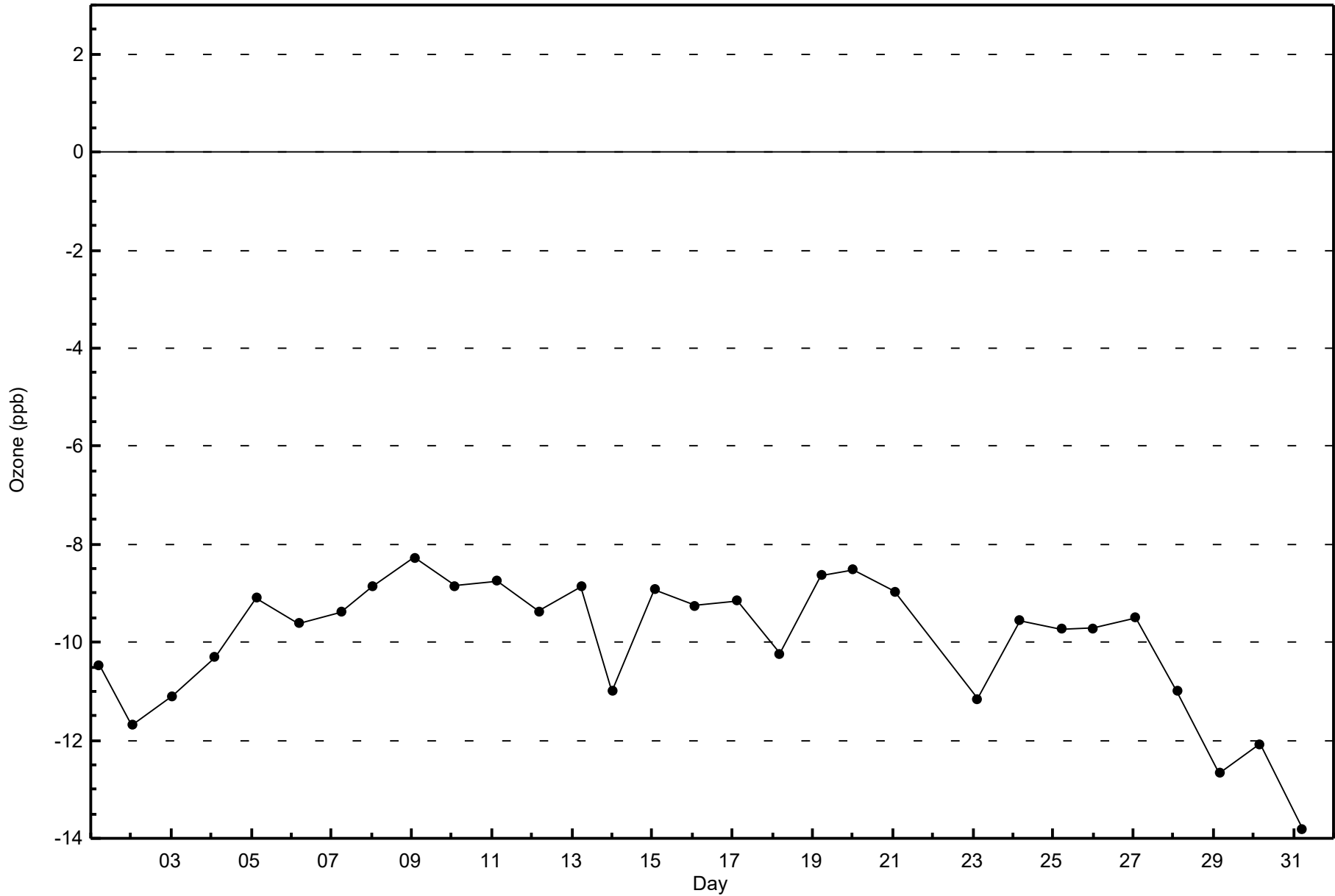
Total Number of Hours: 744

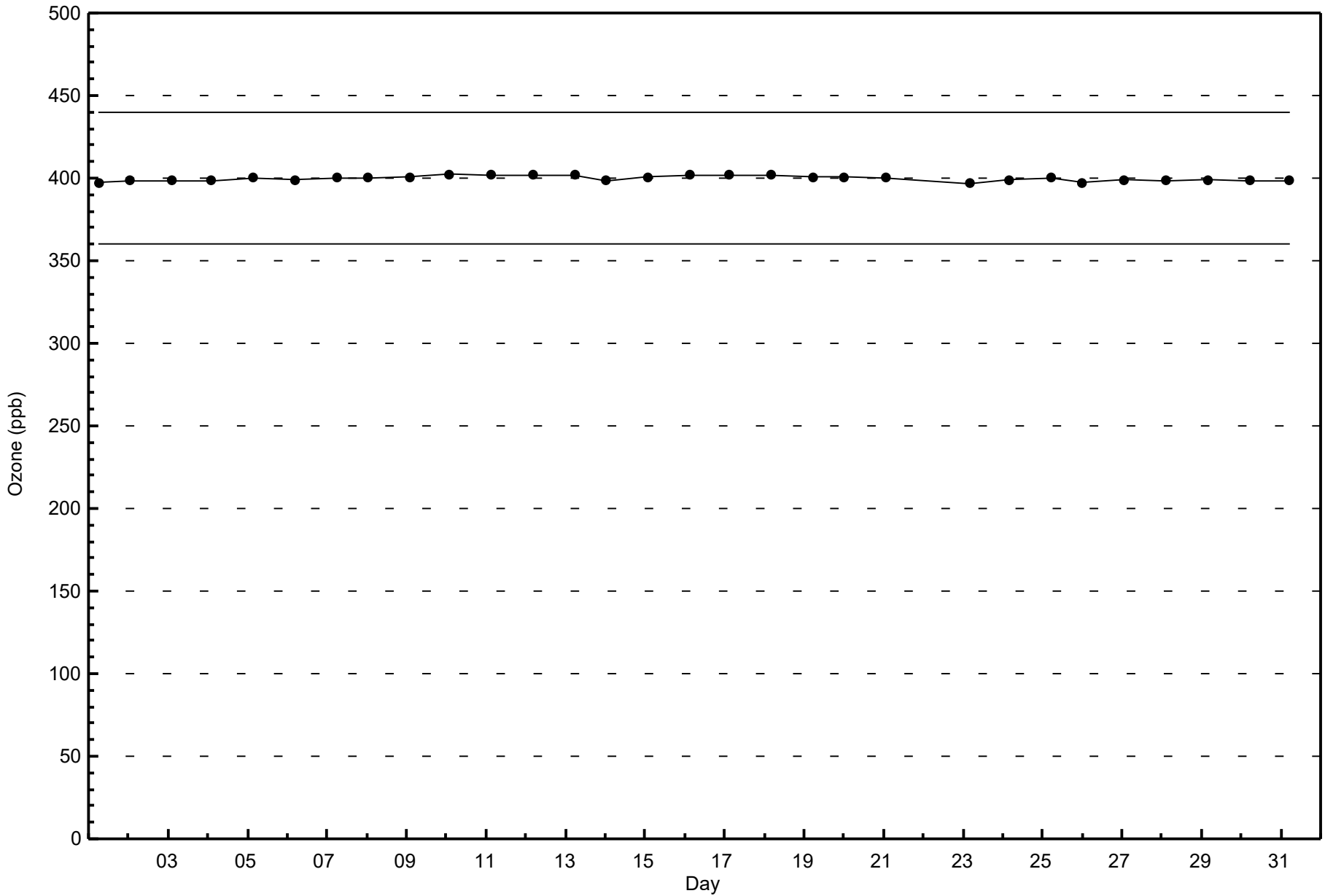


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

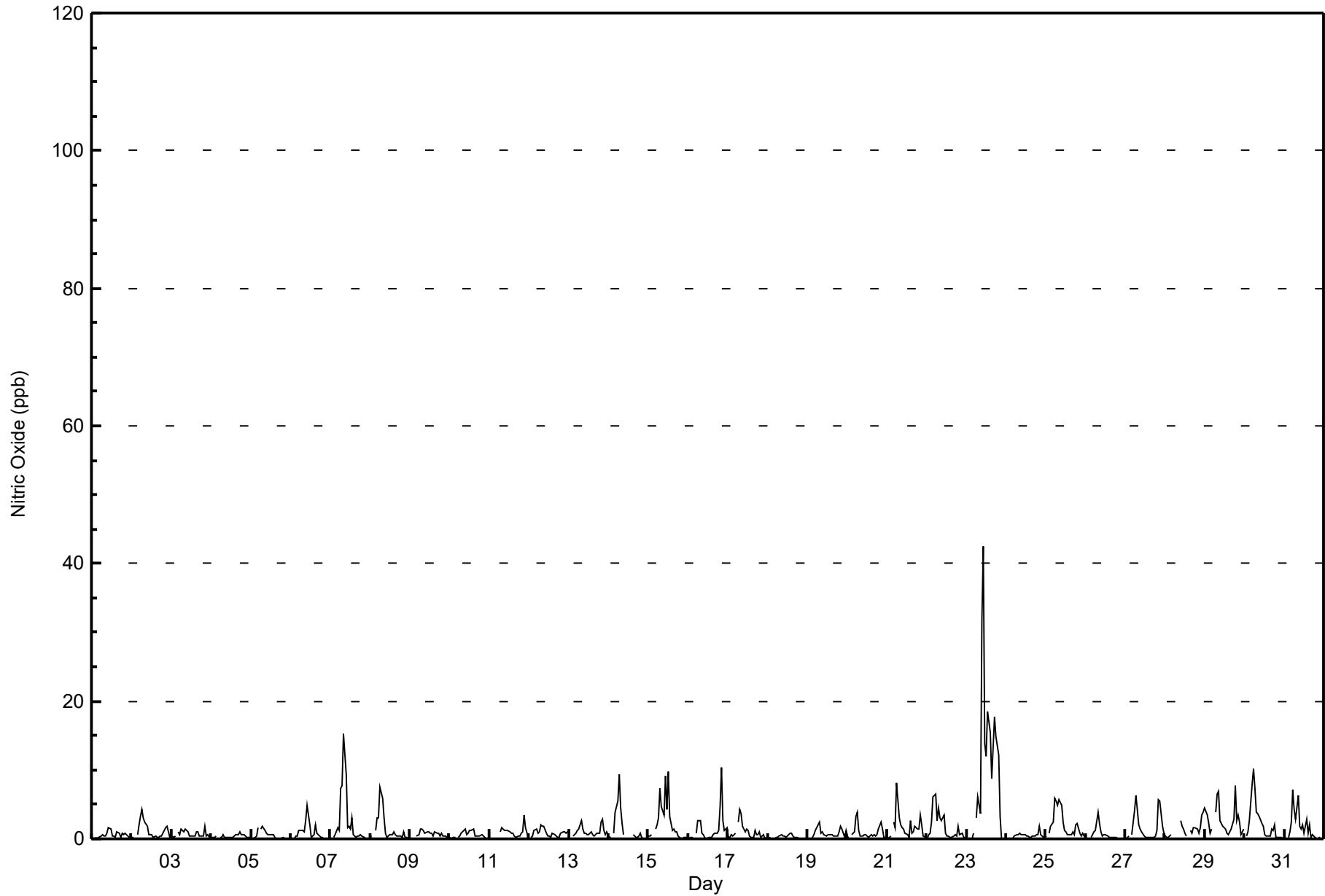
Athabasca Valley - August 2023

Maximum Value: 42.5 ppb on Aug 23 11:00																				Maximum Daily Average: 9.5 ppb on Aug 23					Hours in Service: 744	
Minimum Value: 0.0 ppb on Aug 19 01:00																				Minimum Daily Average: 0.3 ppb on Aug 18					Hours of Data: 705	
Maximum Diurnal Average: 3.2 ppb at hour 7																				Minimum Diurnal Average: 0.3 ppb at hour 2					Hours of Missing Data: 39	
Monthly Average: 1.50 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.3 Median = 0.6 Q ₃ = 1.4 P ₉₀ = 3.4 P ₉₉ = 13.8					Hours of Calibration: 35	
																									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-Aug	0.1	Z	0.1	0.1	0.2	0.5	0.6	0.4	0.4	0.8	1.6	1.4	0.4	0.4	0.3	1.0	0.9	0.3	0.9	0.6	0.8	0.7	0.1	0.1	0.6	1.6
2-Aug	0.2	0.2	Z	0.7	2.0	3.3	4.4	3.1	2.5	1.8	0.7	0.7	0.6	0.3	0.3	0.3	0.3	0.3	0.5	0.7	1.7	1.8	1.1	0.3	1.2	4.4
3-Aug	0.3	0.3	0.3	Z	1.0	0.7	1.5	1.1	1.5	1.3	1.0	0.5	0.4	0.4	0.3	1.0	1.1	0.4	0.3	0.5	1.7	0.3	0.5	0.1	0.7	1.7
4-Aug	0.1	0.2	0.2	0.4	Z	0.2	0.3	0.5	0.3	0.1	0.2	0.2	0.1	0.1	0.3	0.6	0.6	1.0	0.7	0.6	0.5	0.2	0.2	0.1	0.3	1.0
5-Aug	0.1	0.1	0.1	0.5	1.6	Z	1.5	1.8	1.3	0.8	0.6	0.6	0.7	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5	1.8
6-Aug	Z	0.1	0.0	0.4	0.4	1.2	1.1	1.1	0.9	2.6	4.8	2.0	0.2	0.3	0.5	2.0	0.8	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.9	4.8
7-Aug	0.2	Z	0.1	0.6	1.7	1.3	7.4	7.7	15.3	9.4	1.7	1.9	1.3	3.0	0.5	0.3	0.4	0.3	0.6	0.4	0.2	0.0	0.1	0.1	2.4	15.3
8-Aug	0.2	0.5	Z	1.2	3.0	3.0	7.5	5.9	3.1	0.9	0.2	0.4	0.5	0.6	0.9	0.6	0.3	0.4	0.3	0.2	1.1	0.2	0.1	0.1	1.4	7.5
9-Aug	0.0	0.0	0.1	Z	0.4	0.6	1.5	1.4	1.1	0.9	0.9	1.0	0.8	0.9	0.4	1.0	0.8	0.9	0.5	0.8	0.5	0.3	0.2	0.1	0.7	1.5
10-Aug	0.1	0.1	0.1	0.1	Z	0.2	0.4	0.8	1.1	1.4	0.6	0.7	1.2	1.3	1.5	0.3	0.4	0.4	0.4	0.6	0.4	0.2	0.1	0.1	0.5	1.5
11-Aug	0.1	0.1	0.1	0.1	0.1	Z	1.0	1.6	1.5	1.3	1.2	1.3	1.1	0.8	0.7	0.5	0.3	0.5	0.4	0.9	0.9	3.4	1.6	0.1	0.8	3.4
12-Aug	Z	0.2	0.3	1.2	1.4	0.7	1.0	2.0	1.9	1.9	0.9	0.4	0.3	0.3	0.7	0.6	0.5	0.3	0.3	0.7	1.1	1.0	0.8	1.0	0.8	2.0
13-Aug	1.0	Z	0.5	0.5	0.7	1.2	1.4	2.7	1.3	0.8	0.8	0.6	0.6	1.1	0.6	0.5	0.6	0.9	0.9	2.4	2.9	1.1	0.6	1.1	1.1	2.9
14-Aug	0.3	0.2	Z	0.8	3.9	5.4	9.3	4.6	2.2	0.6	C	C	C	C	C	0.6	0.2	0.2	0.3	0.7	0.3	0.0	0.0	0.3	1.7	9.3
15-Aug	0.4	0.4	0.5	Z	1.3	2.0	3.1	7.3	4.7	3.4	9.2	4.2	9.8	3.3	1.2	1.5	1.1	1.0	0.5	0.2	0.1	0.1	0.1	0.2	2.4	9.8
16-Aug	0.1	0.1	0.2	0.1	Z	0.8	2.7	2.6	0.9	0.6	0.2	0.1	0.1	0.2	0.2	0.6	0.8	0.8	1.3	4.7	10.3	2.7	1.3	1.6	1.4	10.3
17-Aug	0.2	0.1	0.6	0.4	0.9	Z	2.4	4.3	3.7	1.9	1.0	1.4	1.2	0.4	0.2	0.3	1.1	0.7	0.6	0.9	0.2	0.5	0.1	0.1	1.0	4.3
18-Aug	Z	0.1	0.0	0.0	0.1	0.3	0.3	0.4	0.5	0.5	0.3	0.3	0.3	0.8	0.7	0.5	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.3	0.8
19-Aug	0.0	Z	0.0	0.3	0.7	1.3	2.1	2.4	0.9	0.9	0.7	0.4	0.7	0.6	0.6	0.6	0.3	0.3	0.4	0.9	1.9	1.4	0.2	1.2	0.8	2.4
20-Aug	0.4	0.1	Z	0.6	1.0	3.3	3.8	1.2	0.4	0.4	0.5	0.5	0.4	0.3	0.6	0.5	0.7	0.5	0.5	1.5	2.3	1.3	0.2	0.2	0.9	3.8
21-Aug	0.1	0.1	0.3	Z	2.5	1.5	8.1	3.0	2.0	1.6	1.4	0.8	0.7	0.3	2.7	0.8	1.1	1.9	1.5	1.3	3.5	2.0	0.5	0.3	1.7	8.1
22-Aug	0.1	0.5	0.7	2.4	6.0	6.5	2.7	4.6	3.0	2.6	3.5	0.9	0.4	0.4	0.2	0.3	0.4	0.6	0.4	1.7	0.7	0.9	0.3	0.3	1.7	6.5
23-Aug	0.1	0.1	0.1	0.1	0.8	Z	3.1	6.1	3.7	32.0	42.5	13.9	12.0	18.4	15.4	8.8	13.1	17.7	14.8	12.2	3.2	0.0	0.0	0.0	9.5	42.5
24-Aug	Z	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.7	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.4	0.5	0.7	0.6	1.9	0.6	0.1	0.2	0.5	1.9
25-Aug	0.3	Z	0.7	1.9	2.4	5.9	5.5	4.8	5.7	4.9	2.5	1.1	1.1	0.7	0.6	0.6	0.9	0.6	2.0	2.2	0.8	0.4	0.7	0.3	2.0	5.9
26-Aug	0.3	0.3	Z	0.3	0.6	0.9	1.3	3.8	2.2	0.9	0.4	0.6	0.5	0.5	0.2	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.6	3.8
27-Aug	0.0	0.2	0.3	Z	0.7	4.0	6.3	4.3	2.1	1.3	1.1	0.4	0.2	0.2	0.1	0.1	0.2	0.3	0.3	1.1	5.8	5.5	1.9	0.9	1.6	6.3
28-Aug	0.5	0.1	0.3	0.6	Z	12.7	PF	PF	PF	2.6	1.9	1.4	0.7	0.5	M	1.2	0.9	1.6	1.6	1.5	0.7	1.6	3.5	3.9	2.0	12.7
29-Aug	4.5	3.4	2.2	0.8	1.5	Z	3.8	6.5	6.9	2.6	2.2	1.8	1.4	0.9	0.6	1.1	1.4	2.8	7.8	2.7	3.5	2.5	0.7	1.4	2.7	7.8
30-Aug	Z	0.5	1.0	2.7	8.0	10.1	7.2	3.9	3.6	3.3	2.2	1.8	0.7	0.3	0.3	0.4	1.4	1.2	2.0	0.2	0.3	0.3	0.1	0.1	2.2	10.1
31-Aug	0.1	Z	0.1	1.0	2.5	7.1	4.2	2.8	6.3	1.8	1.4	2.0	0.8	2.8	0.9	2.0	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.0	1.6	7.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Athabasca Valley - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Athabasca Valley - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.72	99.72
21 - 40	1	0.14	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: 705

Total Number of Hours: 744



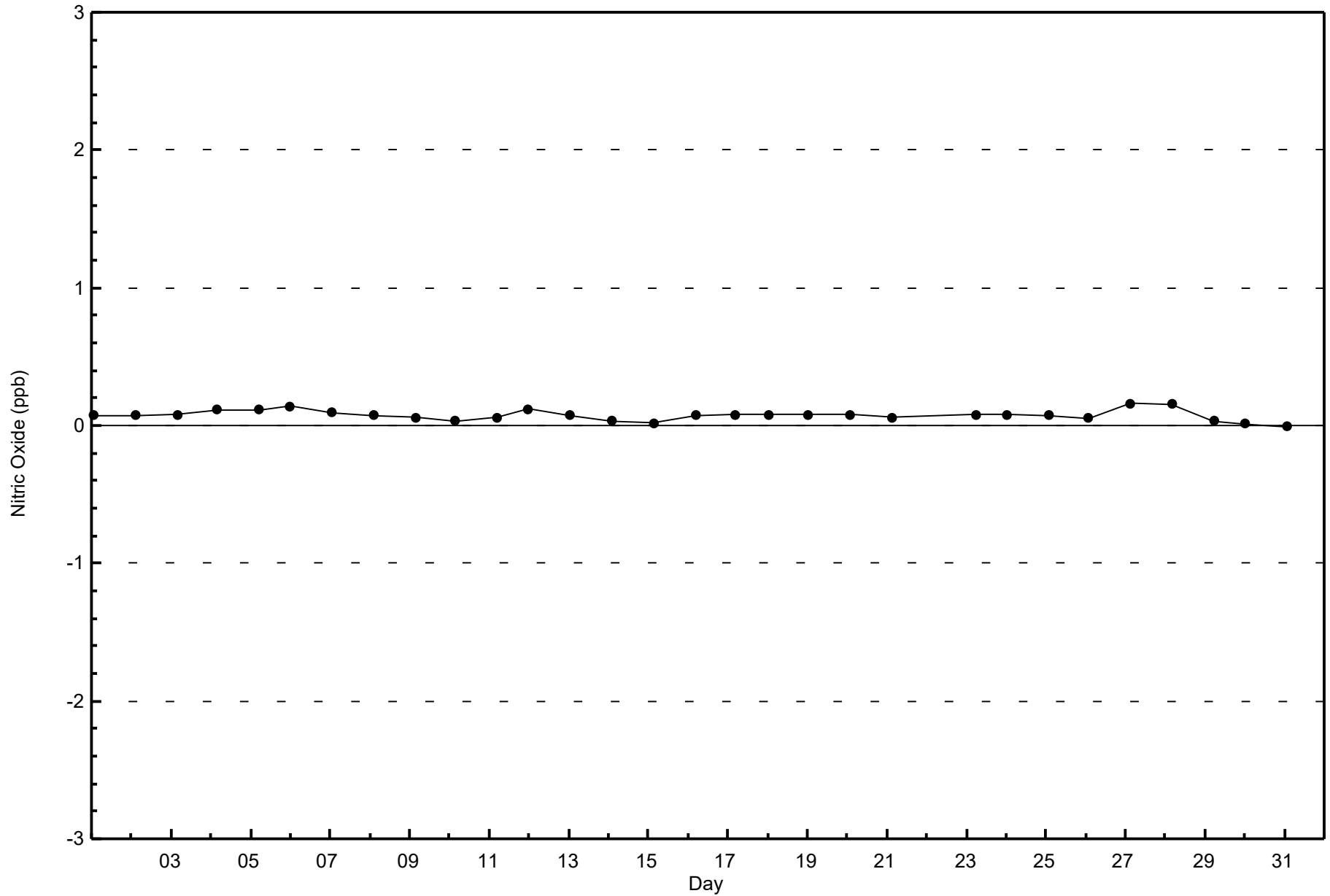
**Wood Buffalo Environmental Association
Frequency Distribution**

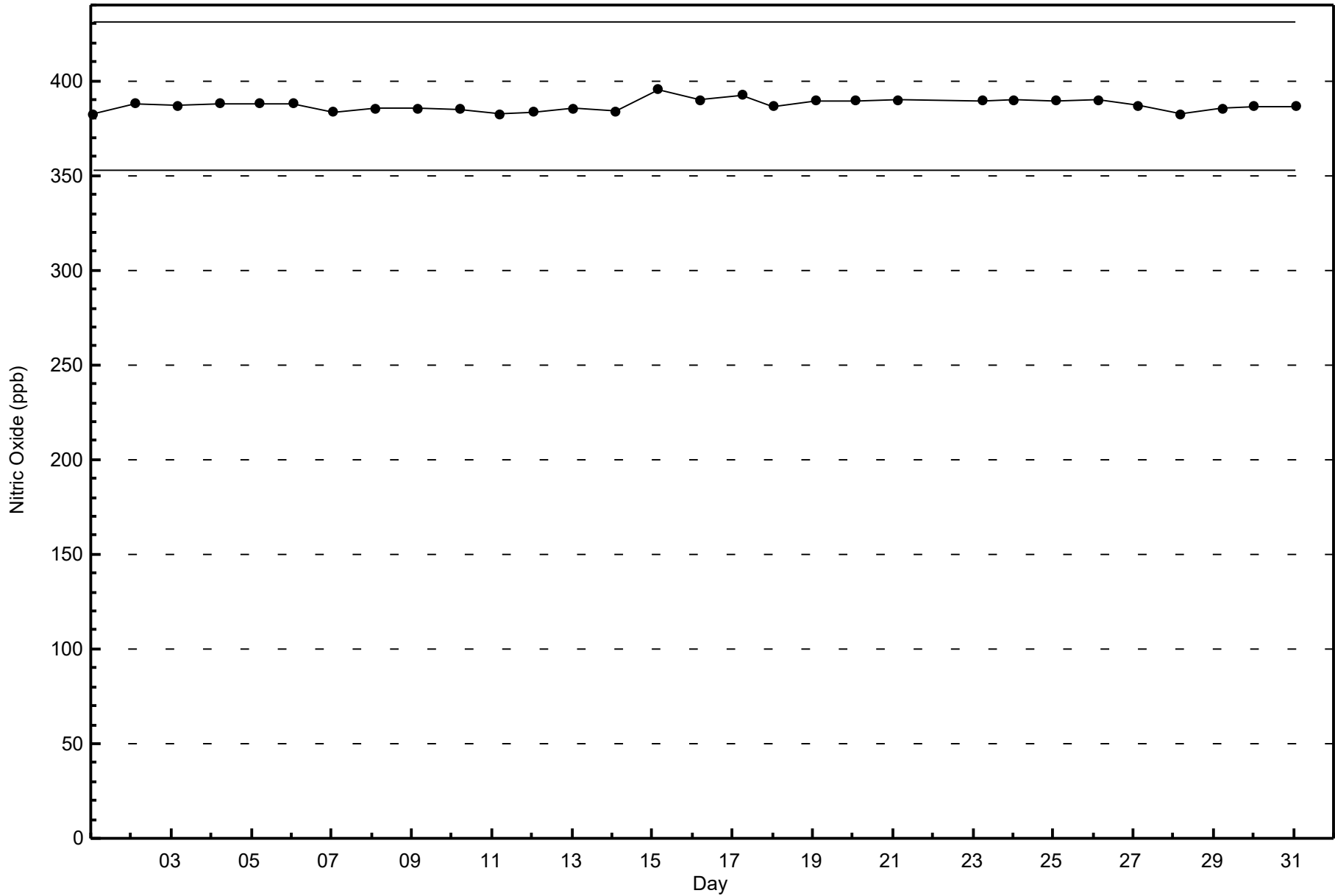
**Nitric Oxide (NO) - ppb
Athabasca Valley - August 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	24	3	7	7	32	46	152	51	28	35	85	48	25	30	32	98	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	24	3	7	7	32	46	152	51	28	35	85	48	25	30	32	100	705

Total Number of Valid Hours: 705

Total Number of Hours: 744







Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 32.8 ppb on Aug 23 19:00	Maximum Daily Average: 14.5 ppb on Aug 23		Hours of Data:	705
Minimum Value: 0.5 ppb on Aug 8 12:00	Minimum Daily Average: 1.6 ppb on Aug 10		Hours of Missing Data:	39
Maximum Diurnal Average: 7.7 ppb at hour 21	Minimum Diurnal Average: 2.9 ppb at hour 15		Hours of Calibration:	35
Monthly Average: 4.40 ppb	Percentiles: P ₁ = 0.7 P ₁₀ = 1.2 Q ₁ = 2.0 Median = 3.4 Q ₃ = 5.6 P ₉₀ = 8.2 P ₉₉ = 21.3		Percent Operational Time:	99.5

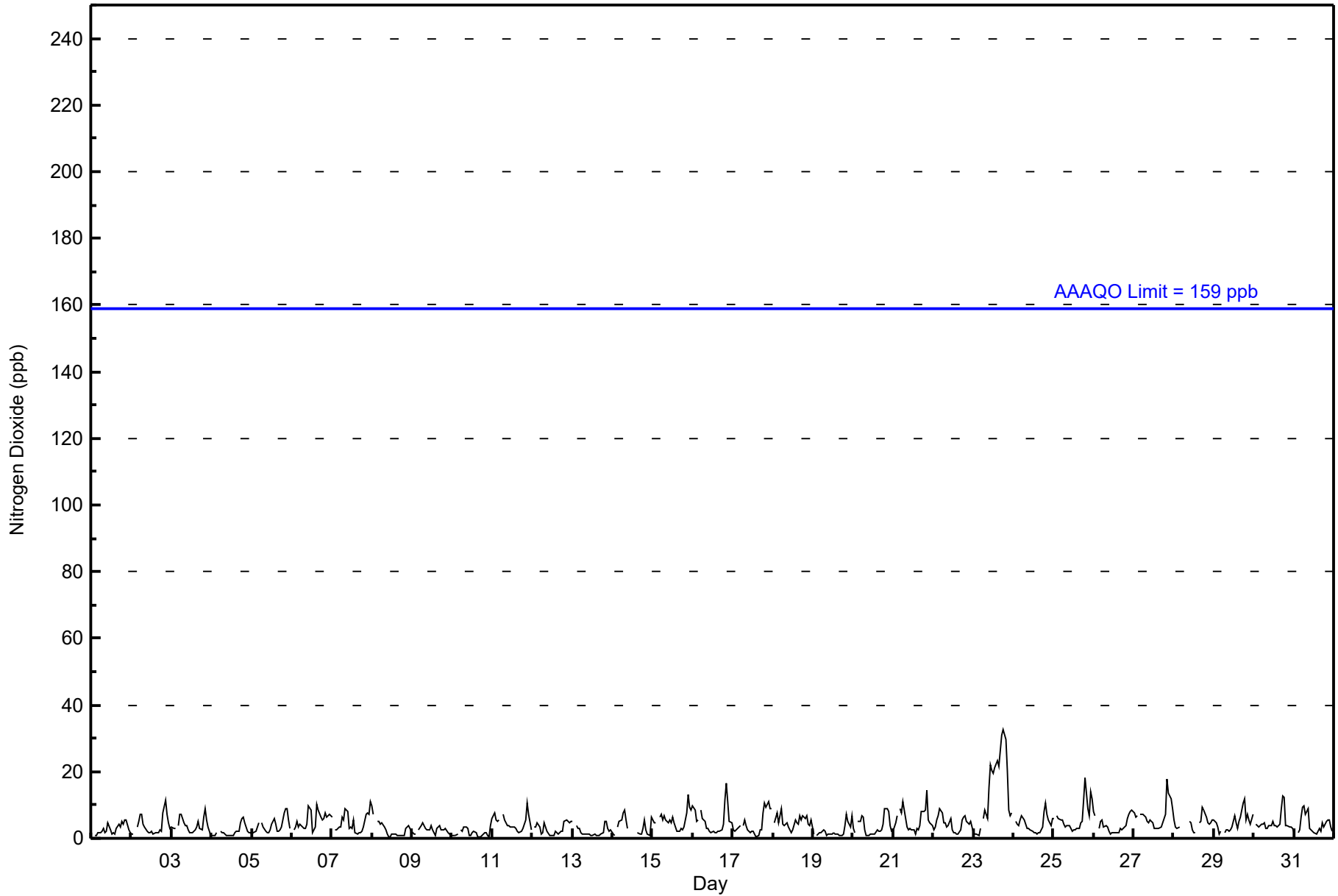
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	0.8	Z	0.8	0.9	1.7	1.9	2.2	2.9	1.8	2.3	4.7	2.6	1.3	1.6	1.4	2.9	4.1	3.3	5.1	4.4	5.7	5.7	2.7	1.5	2.7	5.7																							
2-Aug	1.4	1.1	Z	3.4	5.2	7.3	7.1	4.2	3.2	2.3	1.6	1.9	2.0	1.3	1.5	1.6	1.7	2.4	2.2	7.6	11.4	7.1	4.7	3.1	3.7	11.4																							
3-Aug	3.3	3.1	3.1	Z	3.9	7.1	7.0	4.5	4.0	4.0	2.7	1.6	1.7	2.3	2.7	3.5	4.9	2.9	2.5	6.3	9.1	5.7	3.4	0.8	3.9	9.1																							
4-Aug	1.0	0.7	0.9	1.7	Z	2.0	1.7	1.9	1.3	0.9	1.0	0.9	0.8	0.7	1.5	2.0	2.1	4.8	5.8	6.4	4.5	2.0	1.9	1.6	2.1	6.4																							
5-Aug	1.2	1.9	2.0	3.3	4.8	Z	4.6	3.5	2.1	1.5	1.6	2.4	4.1	5.8	4.2	2.2	2.0	2.6	3.5	7.5	8.9	8.9	5.6	2.8	3.8	8.9																							
6-Aug	Z	2.4	3.5	5.0	3.6	4.2	3.4	3.0	3.1	4.3	9.9	8.5	1.8	2.5	3.3	10.0	8.5	6.4	5.5	6.0	7.7	6.5	7.3	6.9	5.4	10.0																							
7-Aug	6.2	Z	2.7	2.5	3.6	3.6	6.5	5.4	9.1	7.9	2.8	3.6	3.0	5.5	1.9	1.4	1.8	1.6	2.3	3.3	7.2	7.7	7.2	11.1	4.7	11.1																							
8-Aug	9.8	7.3	Z	5.1	4.9	4.2	4.7	3.5	2.6	1.1	0.6	0.5	1.1	1.3	1.1	0.9	0.7	0.7	0.8	0.9	2.8	3.3	4.0	2.3	2.8	9.8																							
9-Aug	1.6	1.4	1.2	Z	2.4	3.7	4.7	3.7	3.1	2.5	2.4	3.7	2.5	1.5	1.0	3.0	3.8	2.7	2.4	2.7	2.8	1.9	1.2	1.0	2.5	4.7																							
10-Aug	0.8	0.7	1.0	1.3	Z	2.4	2.3	3.5	3.4	3.0	0.8	1.0	1.7	2.0	1.9	0.5	0.6	0.5	0.9	1.8	1.6	0.9	0.5	3.7	1.6	3.7																							
11-Aug	5.8	7.7	5.4	5.1	5.7	Z	7.0	5.7	4.8	3.8	3.7	3.4	3.3	3.6	3.1	2.1	1.9	2.1	2.8	4.3	5.4	10.8	7.2	2.6	4.7	10.8																							
12-Aug	Z	3.2	3.3	4.5	3.4	1.2	1.9	4.5	3.4	2.0	0.9	0.9	0.9	0.9	2.1	1.2	1.8	2.0	2.3	4.9	5.5	4.9	4.8	5.0	2.8	5.5																							
13-Aug	5.1	Z	3.7	2.9	3.1	1.8	1.2	1.2	1.2	1.1	1.2	0.9	0.9	1.1	1.0	0.8	0.9	1.4	1.9	4.9	5.2	2.8	2.3	2.6	2.1	5.2																							
14-Aug	1.3	0.8	Z	3.2	5.2	5.4	7.7	8.4	5.6	2.9	Z	C	C	C	C	C	1.7	1.3	1.4	2.9	5.7	2.6	1.4	0.8	6.3	8.4																							
15-Aug	5.3	4.7	4.8	Z	6.5	7.4	5.3	6.8	5.7	4.6	5.6	4.5	6.4	4.5	2.2	2.3	2.3	3.1	2.4	3.5	7.5	13.2	9.3	8.3	5.5	13.2																							
16-Aug	9.7	8.4	5.1	5.4	Z	8.4	6.1	5.2	2.8	3.0	2.3	1.7	2.0	1.6	1.6	2.0	2.3	2.4	4.4	11.3	16.4	10.9	5.0	4.7	5.3	16.4																							
17-Aug	2.6	2.1	2.5	2.8	4.0	Z	3.8	5.4	3.8	2.7	1.6	2.2	2.0	1.3	0.6	0.9	2.5	2.4	7.7	10.6	9.5	11.2	8.9	9.0	4.4	11.2																							
18-Aug	Z	4.8	7.5	4.5	6.9	8.7	4.1	3.9	4.5	3.3	2.4	1.8	2.7	5.4	4.6	4.2	6.6	5.5	6.9	6.1	6.6	4.4	3.9	5.7	5.0	8.7																							
19-Aug	1.4	Z	0.8	1.2	1.5	1.9	2.4	2.0	0.9	1.3	1.3	1.1	1.6	1.1	1.2	1.3	1.0	1.0	1.3	4.0	7.4	5.2	3.5	6.7	2.2	7.4																							
20-Aug	2.8	1.8	Z	5.0	5.0	6.8	6.5	2.6	0.9	1.0	1.3	1.4	1.3	1.3	2.4	2.1	2.3	2.6	4.2	8.7	9.1	7.9	3.7	2.2	3.6	9.1																							
21-Aug	2.1	4.5	6.7	Z	8.8	7.6	11.2	6.0	3.2	2.7	3.1	2.4	2.4	1.3	2.8	2.4	3.9	7.9	8.1	8.6	14.4	5.7	4.7	3.7	5.4	14.4																							
22-Aug	2.4	3.6	5.5	6.8	8.7	7.6	4.6	4.5	3.6	3.7	6.0	2.5	1.7	1.9	1.4	1.3	2.5	5.6	6.4	6.7	5.2	4.1	5.0	3.4	4.4	8.7																							
23-Aug	1.7	1.1	1.2	1.0	2.8	Z	6.1	8.5	5.8	15.4	22.0	20.3	19.7	21.3	23.3	21.6	26.2	31.0	32.8	29.7	20.2	8.3	6.7	7.5	14.5	32.8																							
24-Aug	Z	4.9	4.4	3.8	5.6	6.8	5.4	4.2	3.0	2.8	2.7	2.0	1.6	1.5	1.4	1.5	1.9	3.2	7.9	10.7	7.4	5.7	3.9	6.1	4.3	10.7																							
25-Aug	5.8	Z	6.6	5.9	5.7	5.6	4.1	3.4	3.8	4.0	2.9	2.2	2.6	2.4	2.9	3.1	4.7	4.9	11.6	18.3	8.7	6.6	13.9	11.9	6.2	18.3																							
26-Aug	8.2	6.9	Z	3.1	5.1	5.5	3.5	3.7	3.2	2.0	1.4	1.9	1.9	1.8	1.7	1.8	3.1	2.5	3.4	3.8	6.0	7.4	8.0	8.5	4.1	8.5																							
27-Aug	7.5	6.2	6.6	Z	7.3	7.3	6.7	6.2	5.0	4.7	5.7	4.8	2.8	3.1	2.9	3.0	3.4	4.5	6.0	7.3	17.9	13.6	11.9	8.9	6.7	17.9																							
28-Aug	5.4	3.2	2.9	3.2	Z	6.4	PF	PF	PF	5.0	4.6	2.7	1.6	1.6	M	4.6	5.0	9.4	8.3	6.3	4.5	4.2	4.6	5.4	4.7	9.4																							
29-Aug	5.3	4.6	3.6	1.4	2.2	Z	1.9	2.6	2.6	2.0	2.5	3.4	6.8	4.8	3.1	4.9	6.2	10.5	11.9	5.6	7.3	5.5	4.4	7.1	4.8	11.9																							
30-Aug	Z	4.2	4.0	3.4	4.4	4.3	4.7	3.1	3.0	4.0	4.0	5.2	3.8	3.7	3.2	4.3	8.9	12.6	12.1	3.7	3.8	3.5	3.2	3.1	4.8	12.6																							
31-Aug	1.6	Z	1.8	2.7	6.2	9.4	9.7	7.0	8.9	3.1	2.4	2.0	1.9	1.1	2.1	2.8	2.1	4.7	3.4	5.2	5.4	5.5	3.3	2.3	4.1	9.7																							
																								3.9	3.7	3.5	3.4	4.7	5.3	4.9	4.4	3.6	3.4	3.5	3.1	2.9	3.0	2.9	3.2	3.9	4.8	5.8	7.0	7.7	6.2	5.1	5.0	Diurnal Average	
																								9.8	8.4	7.5	6.8	8.8	9.4	11.2	8.5	9.1	15.4	22.0	20.3	19.7	21.3	23.3	21.6	26.2	31.0	32.8	29.7	20.2	13.6	13.9	11.9	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	98.87	98.87
21 - 40	8	1.13	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
Athabasca Valley - August 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	3	7	7	32	46	152	51	28	35	85	48	25	30	32	94	697
21 - 40	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8
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	24	3	7	7	32	46	152	51	28	35	85	48	25	30	32	100	705

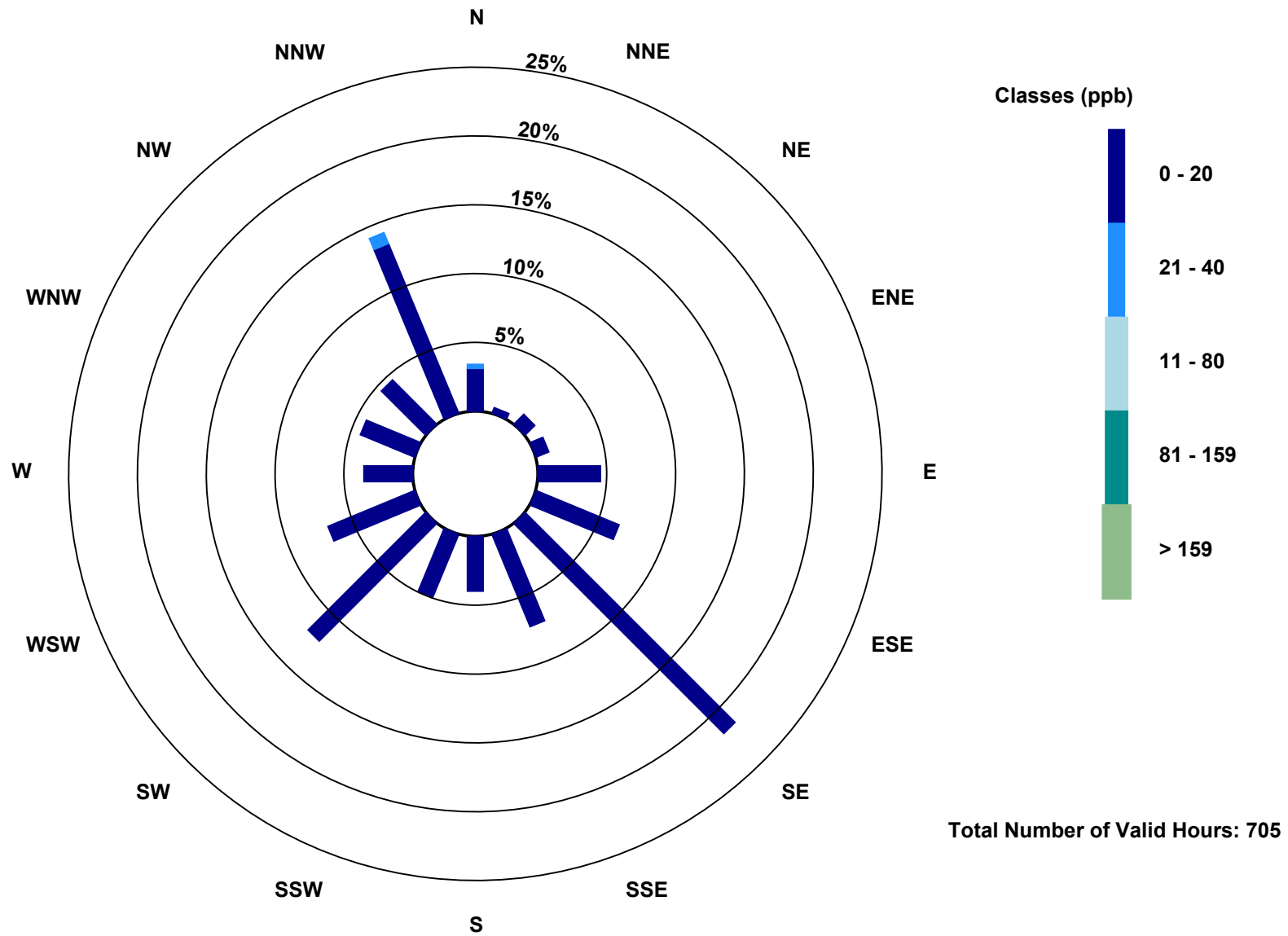
Total Number of Valid Hours: 705

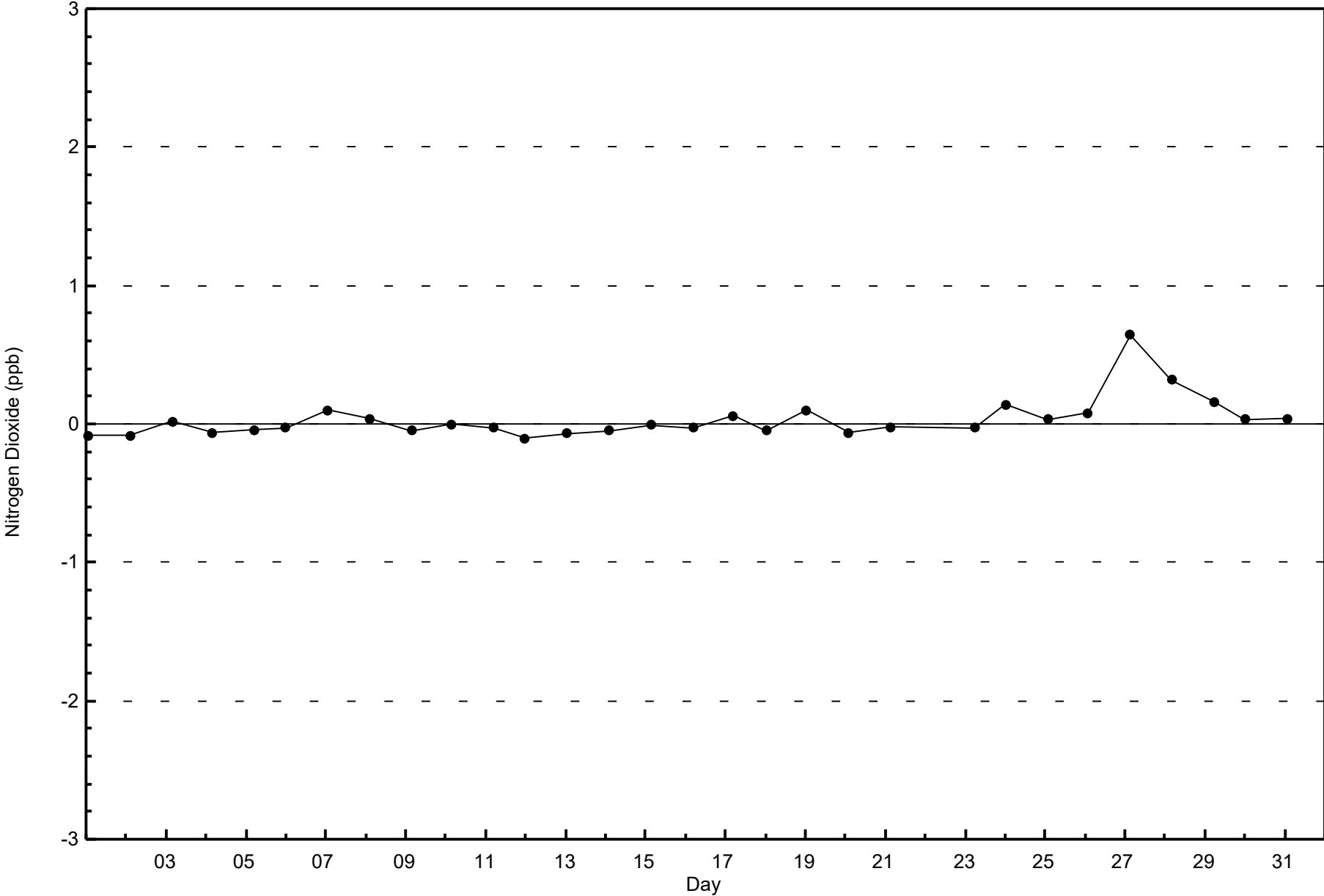
Total Number of Hours: 744

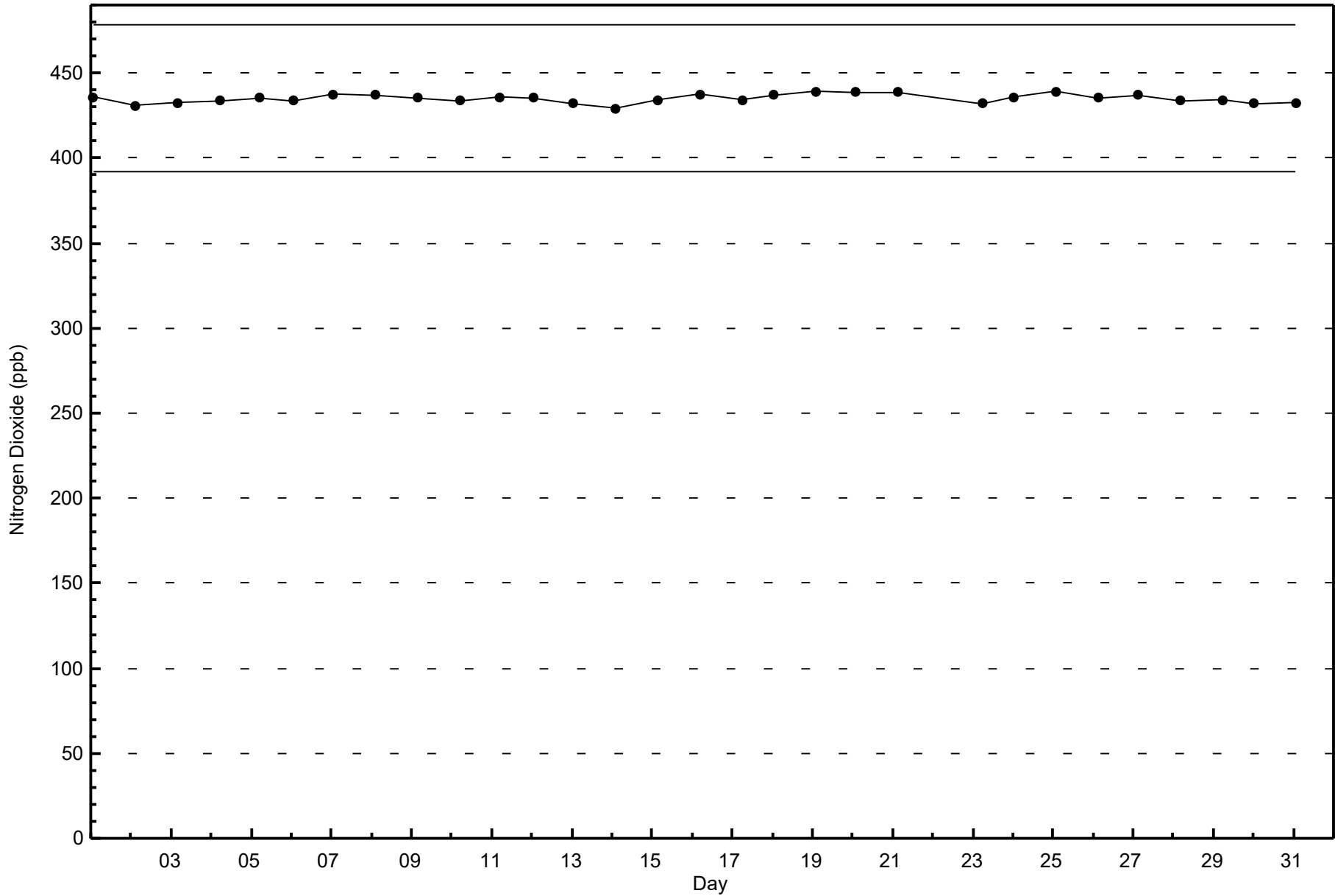


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Athabasca Valley









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - August 2023

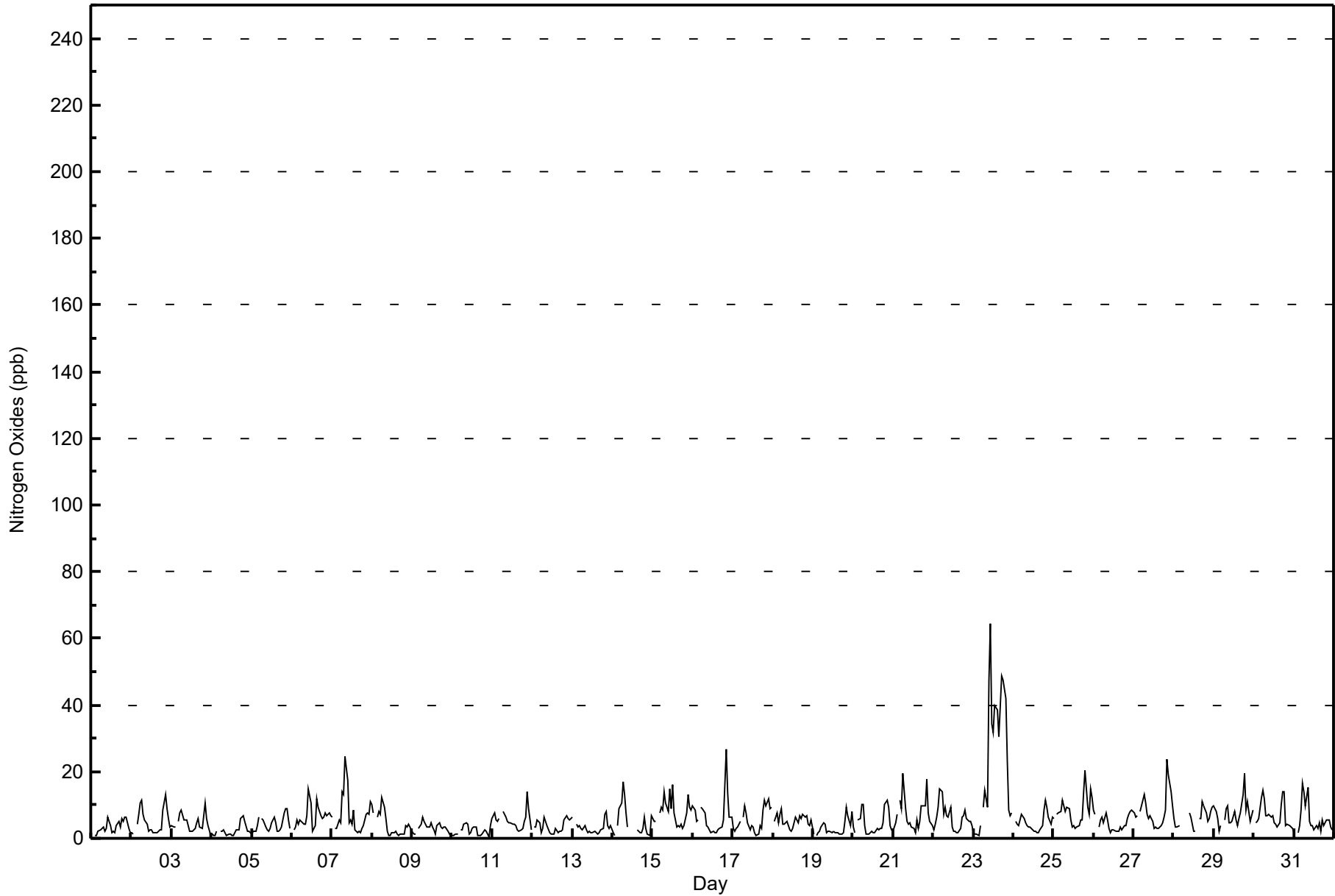
Maximum Value: 64.5 ppb on Aug 23 11:00																					Maximum Daily Average: 24.0 ppb on Aug 23					Hours in Service: 744	
Minimum Value: 0.6 ppb on Aug 10 23:00										Minimum Daily Average: 2.1 ppb on Aug 10											Hours of Data: 705						
Maximum Diurnal Average: 9.2 ppb at hour 21										Minimum Diurnal Average: 3.9 ppb at hour 3											Hours of Missing Data: 39						
Monthly Average: 5.90 ppb										Percentiles: P ₁ = 0.8 P ₁₀ = 1.6 Q ₁ = 2.6 Median = 4.4 Q ₃ = 7.3 P ₉₀ = 10.4 P ₉₉ = 38.6											Hours of Calibration: 35						
																					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-Aug	0.9	Z	0.9	1.0	1.9	2.4	2.8	3.3	2.2	3.1	6.3	4.0	1.7	2.0	1.7	3.9	5.0	3.6	6.0	5.0	6.5	6.4	2.8	1.6	3.3	6.5	
2-Aug	1.6	1.3	Z	4.1	7.2	10.6	11.5	7.3	5.7	4.1	2.3	2.6	2.6	1.6	1.8	1.9	2.0	2.7	2.7	8.3	13.1	8.9	5.8	3.4	4.9	13.1	
3-Aug	3.6	3.4	3.4	Z	4.9	7.8	8.5	5.6	5.5	5.3	3.7	2.1	2.1	2.7	3.0	4.5	6.0	3.3	2.8	6.8	10.8	6.0	3.9	0.9	4.6	10.8	
4-Aug	1.1	0.9	1.1	2.1	Z	2.2	2.0	2.4	1.6	1.0	1.2	1.1	0.9	0.8	1.8	2.6	2.7	5.8	6.5	7.0	5.0	2.2	2.1	1.7	2.4	7.0	
5-Aug	1.3	2.0	2.1	3.8	6.4	Z	6.1	5.3	3.4	2.3	2.2	3.0	4.8	6.5	4.5	2.3	2.1	2.7	3.6	7.6	9.0	8.9	5.6	2.8	4.3	9.0	
6-Aug	Z	2.5	3.5	5.4	4.0	5.4	4.5	4.1	4.0	6.9	14.7	10.5	2.0	2.8	3.8	12.0	9.3	6.8	5.8	6.2	7.8	6.6	7.4	7.0	6.2	14.7	
7-Aug	6.4	Z	2.8	3.1	5.3	4.9	13.9	13.1	24.4	17.3	4.5	5.5	4.3	8.5	2.4	1.7	2.2	1.9	2.9	3.7	7.4	7.7	7.3	11.2	7.1	24.4	
8-Aug	10.0	7.8	Z	6.3	7.9	7.2	12.2	9.4	5.7	2.0	0.8	0.9	1.6	1.9	2.0	1.5	1.0	1.1	1.1	1.1	3.9	3.5	4.1	2.4	4.2	12.2	
9-Aug	1.6	1.4	1.3	Z	2.8	4.3	6.2	5.1	4.2	3.4	3.3	4.7	3.3	2.4	1.4	4.0	4.6	3.6	2.9	3.5	3.3	2.2	1.4	1.1	3.1	6.2	
10-Aug	0.9	0.8	1.1	1.4	Z	2.6	2.7	4.3	4.5	4.4	1.4	1.7	2.9	3.3	3.4	0.8	1.0	0.9	1.3	2.4	2.0	1.1	0.6	3.8	2.1	4.5	
11-Aug	5.9	7.8	5.5	5.2	5.8	Z	8.0	7.3	6.3	5.1	4.9	4.7	4.4	4.4	3.8	2.6	2.2	2.6	3.2	5.2	6.3	14.2	8.8	2.7	5.5	14.2	
12-Aug	Z	3.4	3.6	5.7	4.8	1.9	2.9	6.5	5.3	3.9	1.8	1.3	1.2	1.2	2.8	1.8	2.3	2.3	2.6	5.6	6.6	5.9	5.6	6.0	3.7	6.6	
13-Aug	6.1	Z	4.2	3.4	3.8	3.0	2.6	3.9	2.5	1.9	2.0	1.5	1.5	2.2	1.6	1.3	1.5	2.3	2.8	7.3	8.1	3.9	2.9	3.7	3.2	8.1	
14-Aug	1.6	1.0	Z	4.0	9.1	10.8	17.0	13.0	7.8	3.5	C	C	C	C	C	2.3	1.5	1.6	3.2	6.4	2.9	1.4	0.8	6.6	5.2	17.0	
15-Aug	5.7	5.1	5.3	Z	7.8	9.4	8.4	14.1	10.4	8.0	14.8	8.7	16.2	7.8	3.4	3.8	3.4	4.1	2.9	3.7	7.6	13.3	9.4	8.5	7.9	16.2	
16-Aug	9.8	8.5	5.3	5.5	Z	9.2	8.8	7.8	3.7	3.6	2.5	1.8	2.1	1.8	1.8	2.6	3.1	3.2	5.7	16.0	26.7	13.6	6.3	6.3	6.8	26.7	
17-Aug	2.8	2.2	3.1	3.2	4.9	Z	6.2	9.7	7.5	4.6	2.6	3.6	3.2	1.7	0.8	1.2	3.6	3.1	8.3	11.5	9.7	11.7	9.0	9.1	5.4	11.7	
18-Aug	Z	4.9	7.5	4.5	7.0	9.0	4.4	4.3	5.0	3.8	2.7	2.1	3.0	6.2	5.3	4.7	6.8	5.8	7.1	6.2	6.7	4.4	3.9	5.7	5.3	9.0	
19-Aug	1.4	Z	0.8	1.5	2.2	3.2	4.5	4.4	1.8	2.2	2.0	1.5	2.3	1.7	1.8	1.9	1.3	1.3	1.7	4.9	9.3	6.6	3.7	7.9	3.0	9.3	
20-Aug	3.2	1.9	Z	5.6	6.0	10.1	10.3	3.8	1.3	1.4	1.8	1.9	1.7	1.6	3.0	2.6	3.0	3.1	4.7	10.2	11.4	9.2	3.9	2.4	4.5	11.4	
21-Aug	2.2	4.6	7.0	Z	11.3	9.1	19.3	9.0	5.2	4.3	4.5	3.2	3.1	1.6	5.5	3.2	5.0	9.8	9.6	9.9	17.9	7.7	5.2	4.0	7.0	19.3	
22-Aug	2.5	4.1	6.2	9.2	14.7	14.1	7.3	9.1	6.6	6.3	9.5	3.4	2.1	2.3	1.6	1.6	2.9	6.2	6.8	8.4	5.9	5.0	5.3	3.7	6.0	14.7	
23-Aug	1.8	1.2	1.3	1.1	3.6	Z	9.2	14.6	9.5	47.4	64.5	34.2	31.7	39.7	38.7	30.4	39.3	48.7	47.6	41.9	23.4	8.3	6.7	7.5	24.0	64.5	
24-Aug	Z	4.9	4.4	3.8	5.7	7.1	5.9	4.8	3.7	3.4	3.3	2.6	2.1	1.9	1.7	1.7	2.3	3.7	8.6	11.3	9.3	6.3	4.0	6.3	4.7	11.3	
25-Aug	6.1	Z	7.3	7.8	8.1	11.5	9.6	8.2	9.5	8.9	5.4	3.3	3.7	3.1	3.5	3.7	5.6	5.5	13.6	20.5	9.5	7.0	14.6	12.2	8.2	20.5	
26-Aug	8.5	7.2	Z	3.4	5.7	6.4	4.8	7.5	5.4	2.9	1.8	2.5	2.4	2.3	1.9	2.0	3.4	2.7	3.6	3.8	6.0	7.4	8.0	8.5	4.7	8.5	
27-Aug	7.5	6.4	6.9	Z	8.0	11.3	13.0	10.5	7.1	6.0	6.8	5.2	3.0	3.3	3.0	3.1	3.6	4.8	6.3	8.4	23.7	19.1	13.8	9.8	8.3	23.7	
28-Aug	5.9	3.3	3.2	3.8	Z	19.1	PF	PF	PF	7.6	6.5	4.1	2.3	2.1	M	5.8	5.9	11.0	9.9	7.8	5.2	5.8	8.1	9.3	6.7	19.1	
29-Aug	9.8	8.0	5.8	2.2	3.7	Z	5.7	9.1	9.5	4.6	4.7	5.2	8.2	5.7	3.7	6.0	7.6	13.3	19.7	8.3	10.8	8.0	5.1	8.5	7.5	19.7	
30-Aug	Z	4.7	5.0	6.1	12.4	14.4	11.9	7.0	6.6	7.3	6.2	7.0	4.5	4.0	3.5	4.7	10.3	13.8	14.1	3.9	4.1	3.8	3.3	3.2	7.0	14.4	
31-Aug	1.7	Z	1.9	3.7	8.7	16.5	13.9	9.8	15.2	4.9	3.8	4.0	2.7	3.9	3.0	4.8	2.3	5.3	3.8	5.3	5.5	5.6	3.4	2.3	5.7	16.5	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								Diurnal Maximum			

Z - zerospan C - Calibration M - Maintenance PF - Power Failure



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	689	97.73	97.73
21 - 40	11	1.56	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: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Athabasca Valley - August 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	3	7	7	32	46	152	49	27	35	85	48	25	29	32	90	689
21 - 40	1	0	0	0	0	0	0	2	1	0	0	0	0	1	0	6	11
41 - 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	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	24	3	7	7	32	46	152	51	28	35	85	48	25	30	32	100	705

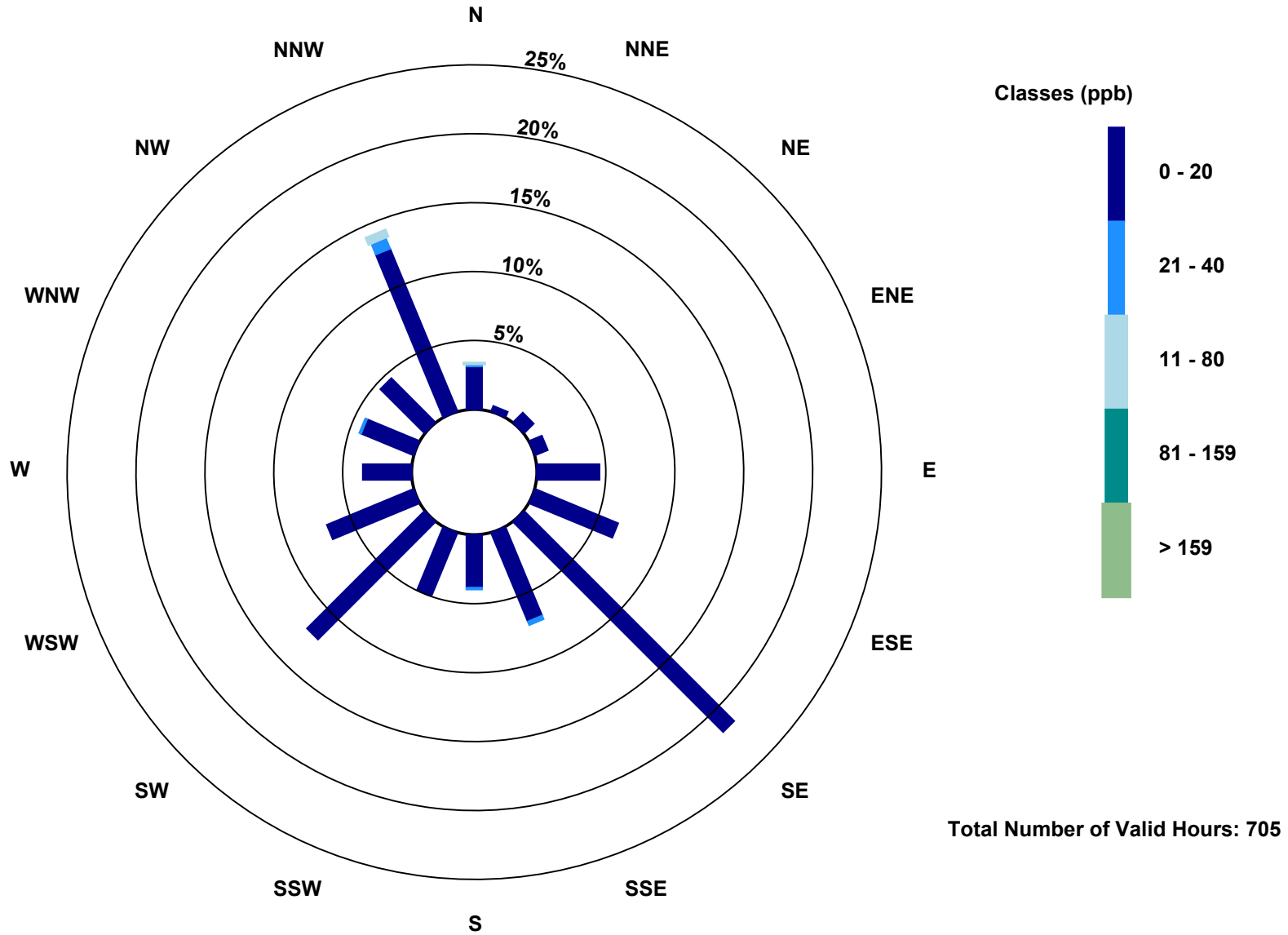
Total Number of Valid Hours: 705

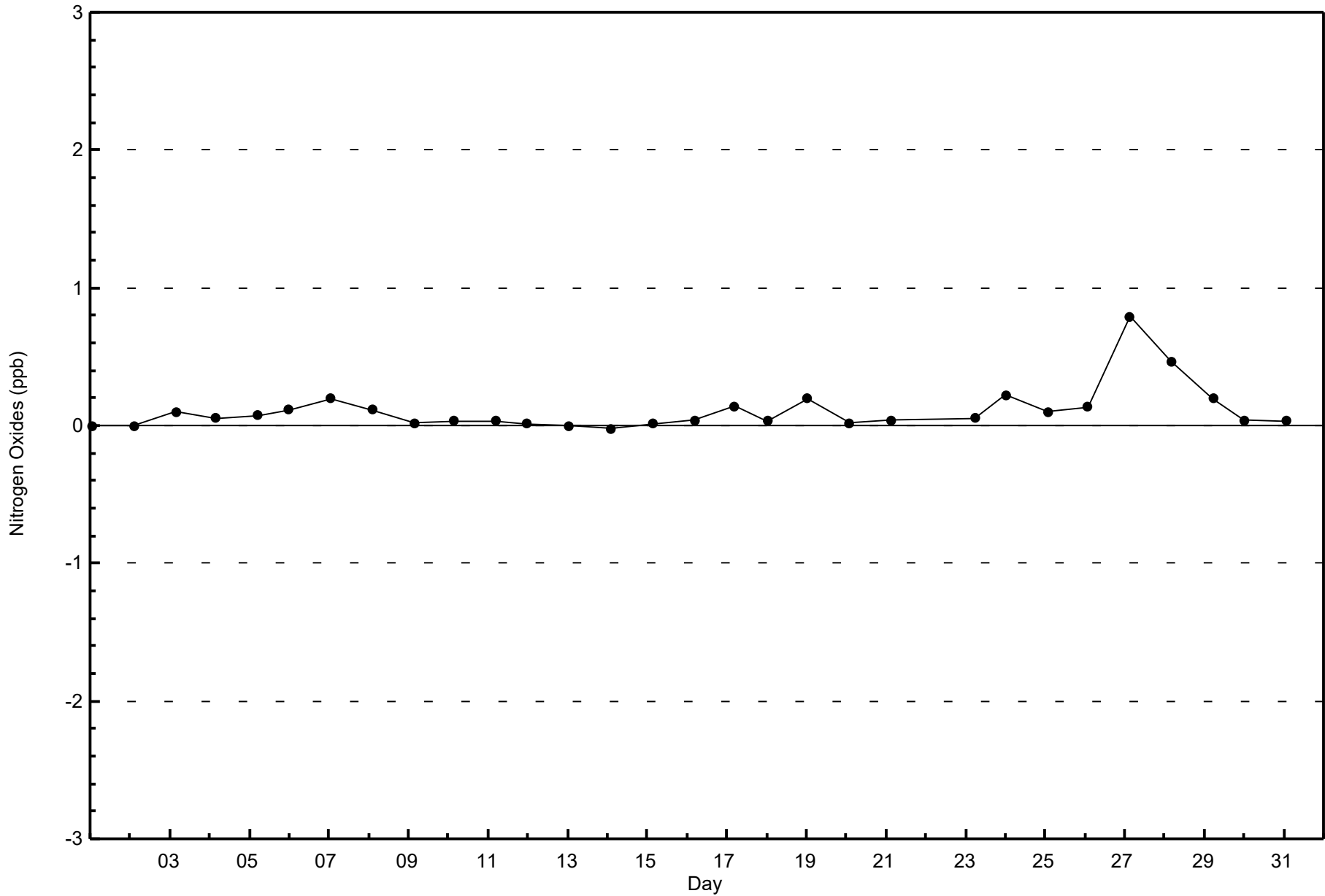
Total Number of Hours: 744

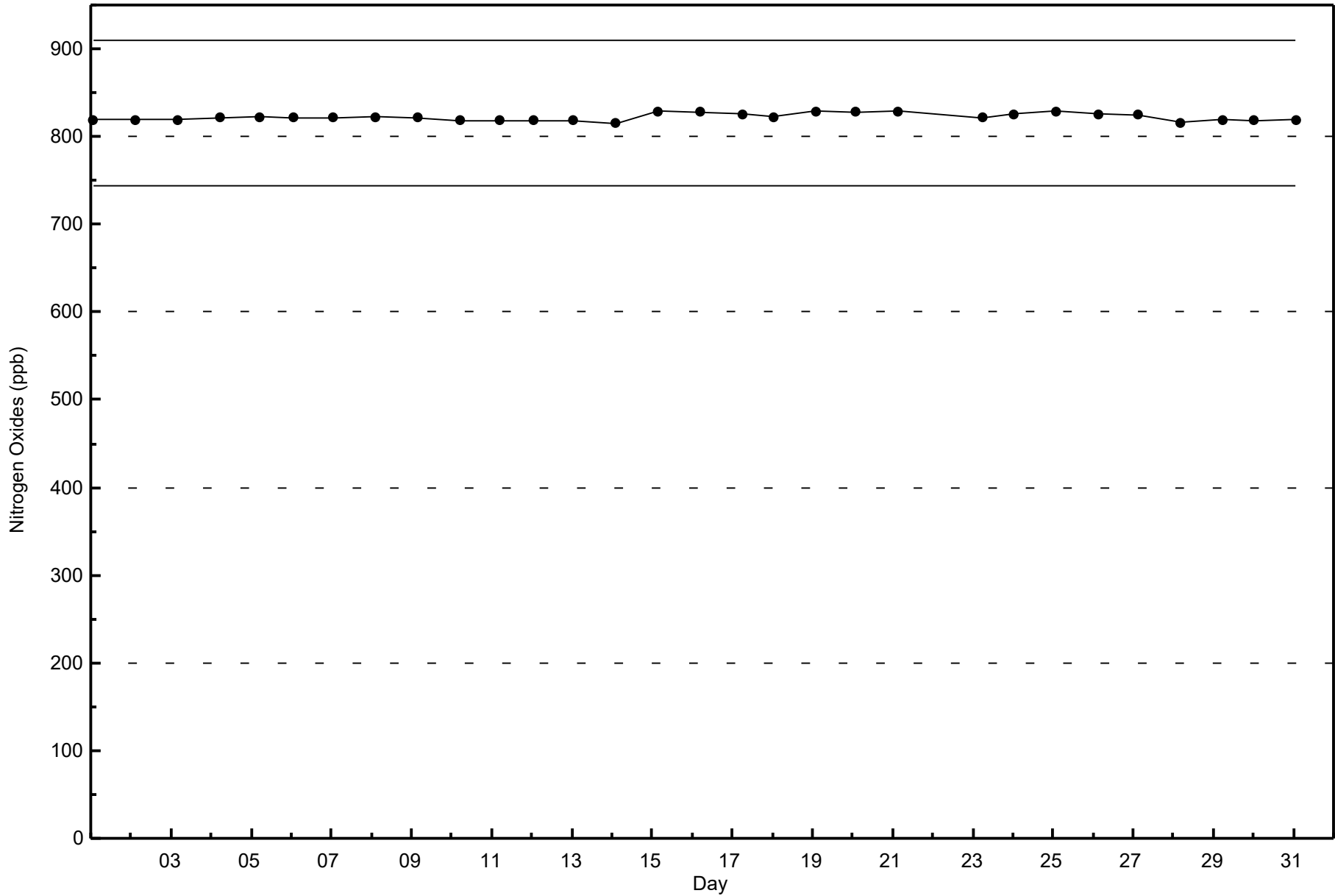


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Athabasca Valley









Wood Buffalo Environmental Association

Summary of Hour Averages

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

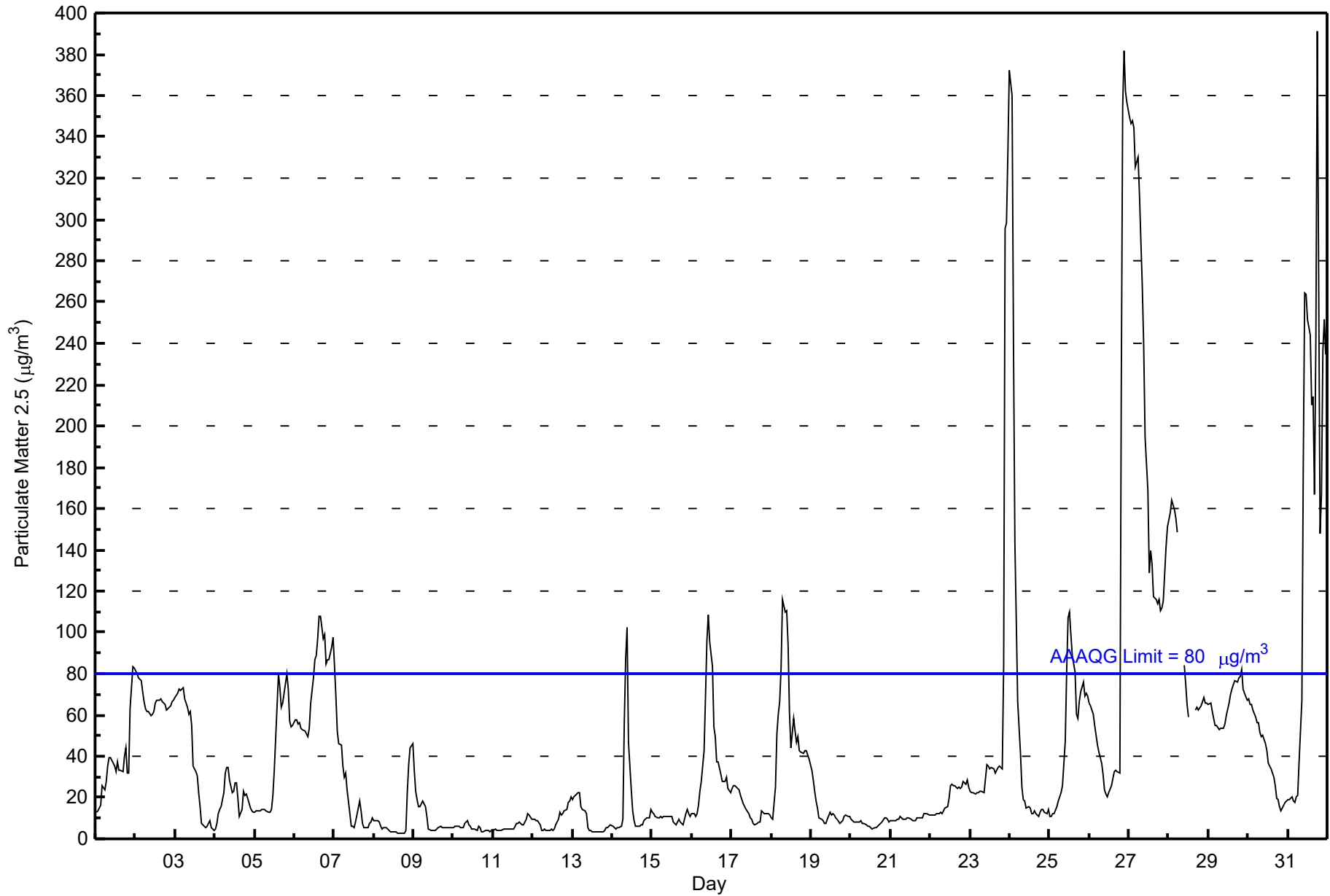
Athabasca Valley - August 2023

Number of Exceedences (AAAQO):	1-hr: 94	24-hr: 16	Hours in Service:	744
Maximum Value: 391.2 µg/m ³ on Aug 31 19:00	Maximum Daily Average: 208.8 µg/m ³ on Aug 27		Hours of Data:	738
Minimum Value: 2.7 µg/m ³ on Aug 8 18:00	Minimum Daily Average: 5.2 µg/m ³ on Aug 10		Hours of Missing Data:	6
Maximum Diurnal Average: 60.7 µg/m ³ at hour 24	Minimum Diurnal Average: 35.2 µg/m ³ at hour 17		Hours of Calibration:	3
Monthly Average: 44.48 µg/m ³	Percentiles: P ₁ = 3.1 P ₁₀ = 5.4 Q ₁ = 9.2 Median = 20.2 Q ₃ = 58.8 P ₉₀ = 94.6 P ₉₉ = 348.8		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-Aug	13.0	13.9	14.9	16.4	25.8	23.7	27.6	35.4	39.4	39.1	37.9	35.4	32.5	37.0	33.5	33.1	32.8	40.0	43.9	31.7	32.1	62.7	83.4	82.8	36.2	83.4
2-Aug	81.2	79.8	77.7	76.7	71.0	66.5	63.2	61.8	61.4	59.5	60.4	62.0	65.7	67.0	67.2	67.6	66.4	66.1	65.0	62.3	63.4	64.3	66.3	67.2	67.1	81.2
3-Aug	68.8	70.7	72.4	72.1	72.4	73.5	68.0	63.5	60.0	61.7	54.8	35.5	32.3	30.2	22.1	15.4	7.2	6.9	5.8	6.0	7.7	8.7	5.4	4.4	38.6	73.5
4-Aug	5.0	7.7	12.2	14.1	15.3	22.5	31.7	34.7	34.3	28.5	22.4	22.8	27.5	26.9	19.4	10.8	14.1	23.2	20.9	21.6	19.8	14.8	13.7	13.1	19.9	34.7
5-Aug	13.2	13.4	13.7	13.8	14.2	14.1	13.9	13.5	13.1	13.2	13.9	20.9	33.0	64.6	80.0	73.1	63.4	66.0	70.2	79.7	72.5	57.2	54.0	54.8	39.1	80.0
6-Aug	57.4	58.0	55.7	56.0	53.6	53.1	52.2	51.1	49.3	53.7	65.8	78.1	87.1	88.8	96.9	107.5	107.9	97.1	99.2	84.5	86.6	86.4	92.9	97.7	75.7	107.9
7-Aug	84.2	68.9	52.4	45.9	45.4	35.4	29.7	31.9	23.9	12.5	6.1	5.9	5.5	8.0	11.5	18.1	13.5	7.5	5.3	5.3	5.6	7.2	8.5	10.2	22.8	84.2
8-Aug	8.9	9.1	8.7	8.2	6.1	5.0	5.5	5.6	4.9	4.1	3.1	3.1	3.2	3.1	3.0	2.8	2.8	2.7	3.0	4.0	22.1	36.3	44.1	46.1	10.2	46.1
9-Aug	33.4	23.3	19.0	15.5	15.3	18.5	16.8	15.7	11.1	4.8	4.0	4.4	4.0	4.3	4.7	5.6	5.9	5.7	5.2	5.4	5.6	5.7	5.5	5.4	10.2	33.4
10-Aug	5.2	5.9	6.1	6.0	5.5	5.5	5.6	7.4	8.7	6.9	5.8	5.1	4.7	4.5	3.7	6.0	5.7	3.7	3.5	4.0	3.9	3.9	3.7	4.0	5.2	8.7
11-Aug	4.3	4.8	4.3	4.1	4.3	4.3	4.7	4.8	4.8	5.0	5.0	4.8	4.9	6.3	7.3	7.6	7.9	6.8	6.6	7.8	9.4	12.1	11.6	9.6	6.4	12.1
12-Aug	9.6	9.4	8.8	8.5	6.9	3.8	3.9	4.6	4.1	4.0	4.1	4.4	4.3	4.7	7.1	9.7	13.2	11.7	12.2	13.2	14.3	17.4	18.1	20.1	9.1	20.1
13-Aug	19.2	20.1	21.8	22.6	22.3	15.7	14.0	13.6	12.5	5.6	4.0	3.8	3.7	3.5	3.4	3.2	3.1	3.2	3.3	4.0	5.5	5.5	6.2	6.5	9.4	22.6
14-Aug	6.3	5.3	4.8	5.4	5.6	6.1	9.7	56.0	87.4	102.1	46.9	23.7	13.2	9.1	6.0	6.2	6.2	6.8	7.1	8.6	9.6	10.0	10.2	14.0	19.4	102.1
15-Aug	12.6	11.9	11.0	10.4	10.5	10.6	10.4	10.7	11.0	10.9	11.0	10.9	11.0	8.5	6.5	8.1	9.3	8.4	7.5	6.7	12.1	14.1	12.1	10.5	10.3	14.1
16-Aug	12.1	12.5	11.2	12.2	16.0	23.3	28.0	42.6	68.4	95.9	108.7	95.5	83.4	54.1	49.6	37.1	37.4	30.9	27.6	27.6	28.0	29.7	24.6	22.5	40.8	108.7
17-Aug	24.4	25.9	25.8	24.9	23.9	20.8	18.8	16.7	15.8	14.1	11.9	10.0	9.5	7.3	7.1	7.6	8.0	8.1	13.8	12.6	12.2	12.3	12.1	11.4	14.8	25.9
18-Aug	10.0	9.2	25.1	50.7	60.4	66.6	82.5	116.1	109.5	110.3	94.2	61.0	44.3	58.1	52.5	46.9	49.5	42.9	41.7	41.4	43.0	42.6	40.4	38.9	55.7	116.1
19-Aug	33.5	28.4	22.9	18.4	14.9	10.4	9.4	8.7	7.6	7.4	9.3	12.7	11.8	12.3	11.7	10.0	9.6	7.7	7.9	8.8	10.6	11.7	10.9	10.8	12.8	33.5
20-Aug	9.3	8.6	7.9	8.2	8.1	8.1	8.5	7.8	7.3	6.9	6.3	5.8	5.4	5.1	5.2	5.3	5.9	7.0	7.4	8.2	10.3	10.5	9.8	8.3	7.6	10.5
21-Aug	8.7	9.0	8.9	8.8	9.3	9.5	10.5	9.7	9.4	9.4	10.2	10.3	9.5	9.1	9.1	9.9	10.2	10.4	10.5	12.1	12.0	12.0	11.5	10.0	12.1	12.1
22-Aug	11.5	11.4	11.8	11.7	12.3	12.0	13.0	12.0	13.3	14.6	15.4	19.6	25.6	26.4	25.9	25.5	24.7	25.1	24.6	25.2	27.5	26.7	28.2	25.1	19.6	28.2
23-Aug	22.8	22.3	22.2	21.8	22.6	22.5	22.9	23.4	22.6	29.4	35.9	35.3	33.7	34.8	33.9	32.2	33.4	34.6	35.1	33.6	84.9	295.6	298.3	332.1	66.1	332.1
24-Aug	372.2	359.9	240.4	144.0	105.8	66.7	41.3	24.9	19.0	18.2	15.2	15.6	15.2	12.5	12.2	13.7	12.2	10.6	13.0	14.3	14.5	13.2	11.9	13.9	65.8	372.2
25-Aug	11.2	10.9	12.0	12.4	15.9	18.2	20.3	22.3	25.7	47.4	81.1	106.9	109.9	99.1	88.9	80.6	60.6	58.2	66.6	71.0	75.8	69.3	70.2	69.1	54.3	109.9
26-Aug	65.4	64.2	60.1	55.2	50.3	45.3	42.3	36.4	30.9	23.5	21.4	20.1	22.4	26.1	29.1	32.5	32.9	32.2	31.7	218.3	354.8	381.5	361.8	356.6	99.8	381.5
27-Aug	349.4	346.7	347.9	344.3	325.4	330.4	311.8	289.8	267.8	239.1	194.7	168.9	128.9	139.7	132.6	117.2	116.1	113.7	115.8	110.4	111.6	115.3	141.8	150.9	208.8	349.4
28-Aug	154.6	158.2	164.1	159.5	155.3	148.2	PF	PF	PF	83.9	75.5	65.3	58.8	C	C	C	62.1	63.9	62.2	64.2	66.8	68.2	65.7	65.8	96.8	164.1
29-Aug	65.1	65.8	61.9	58.3	55.2	55.2	53.2	53.7	53.8	53.5	55.8	59.7	65.6	69.7	72.4	74.5	76.5	75.9	78.2	78.5	81.9	72.3	70.7	66.9	65.6	81.9
30-Aug	67.8	65.0	65.0	62.4	58.7	56.3	56.4	51.5	49.6	49.9	45.8	42.7	36.9	35.3	33.8	29.6	25.5	19.9	18.8	15.7	13.6	16.0	17.4	18.3	39.7	67.8
31-Aug	19.3	18.8	20.5	18.4	17.5	20.3	21.2	37.0	67.1	181.3	264.2	263.9	251.4	244.3	210.3	214.1	166.5	242.2	391.2	147.7	166.6	236.4	251.5	234.3	154.4	391.2

53.5	52.2	48.1	44.7	42.8	41.0	36.6	38.8	39.8	45.0	44.9	42.4	40.2	40.0	38.2	37.0	35.2	36.7	42.1	39.8	47.9	58.7	60.1	60.7	Diurnal Average
372.2	359.9	347.9	344.3	325.4	330.4	311.8	289.8	267.8	239.1	194.7	168.9	128.9	139.7	132.6	117.2	116.1	113.7	115.8	110.4	111.6	115.3	141.8	150.9	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}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	83	11.25	11.25
6 - 15	250	33.88	45.12
16 - 25	86	11.65	56.78
26 - 80	225	30.49	87.26
> 81.0	94	12.74	100.00

Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - $\mu\text{g}/\text{m}^3$
Athabasca Valley - August 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	6	2	2	2	5	9	18	0	3	4	17	3	0	0	0	12	83
6 - 15	8	0	1	1	12	17	62	20	11	12	23	23	14	11	12	23	250
16 - 25	1	0	0	0	3	11	32	9	0	3	4	3	4	5	3	8	86
26 - 80	7	1	3	4	8	11	41	20	13	13	25	17	9	12	14	27	225
> 81.0	2	0	1	0	4	2	10	3	2	5	18	6	0	4	5	32	94
Totals	24	3	7	7	32	50	163	52	29	37	87	52	27	32	34	102	738

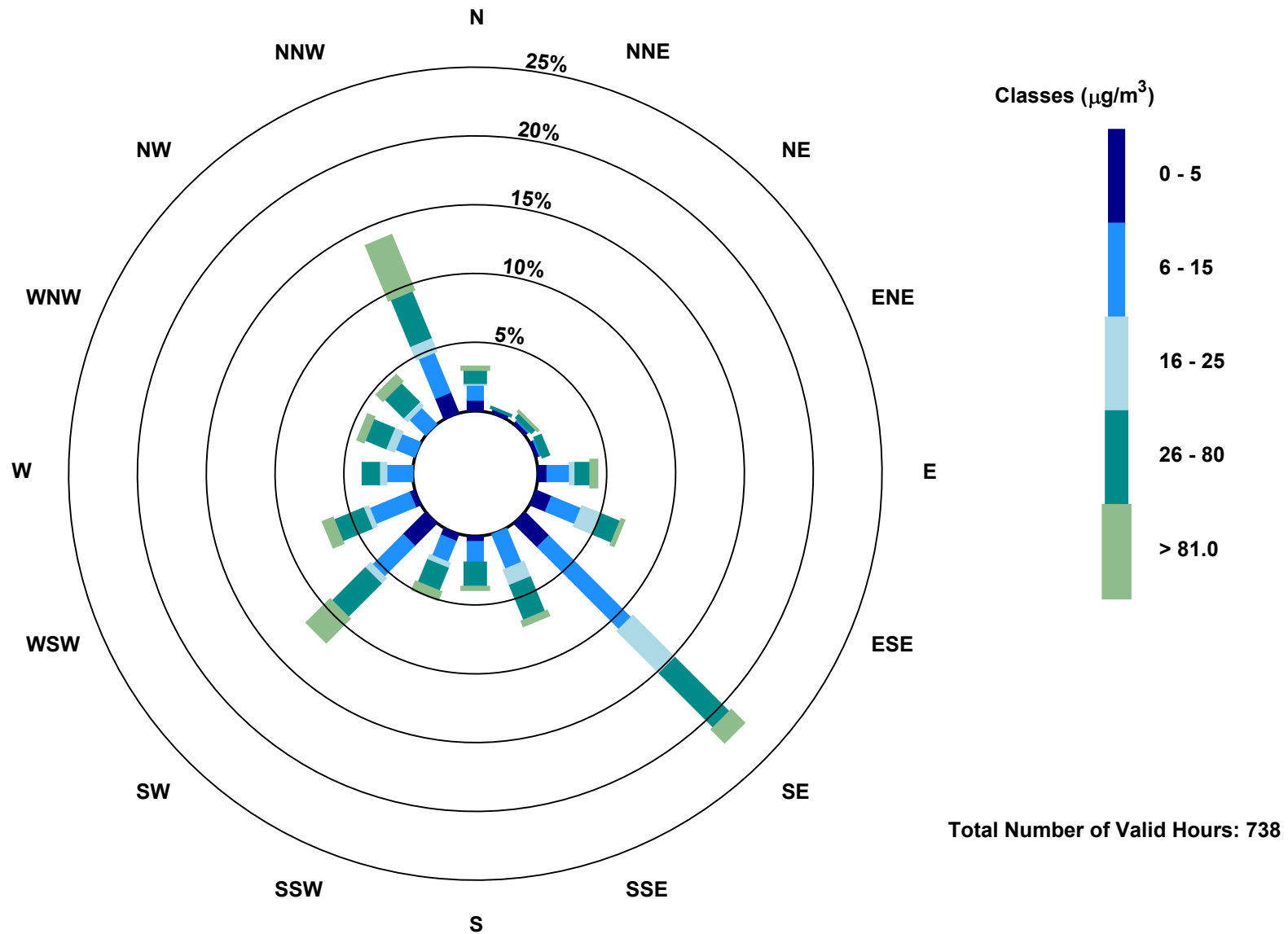
Total Number of Valid Hours: 738

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

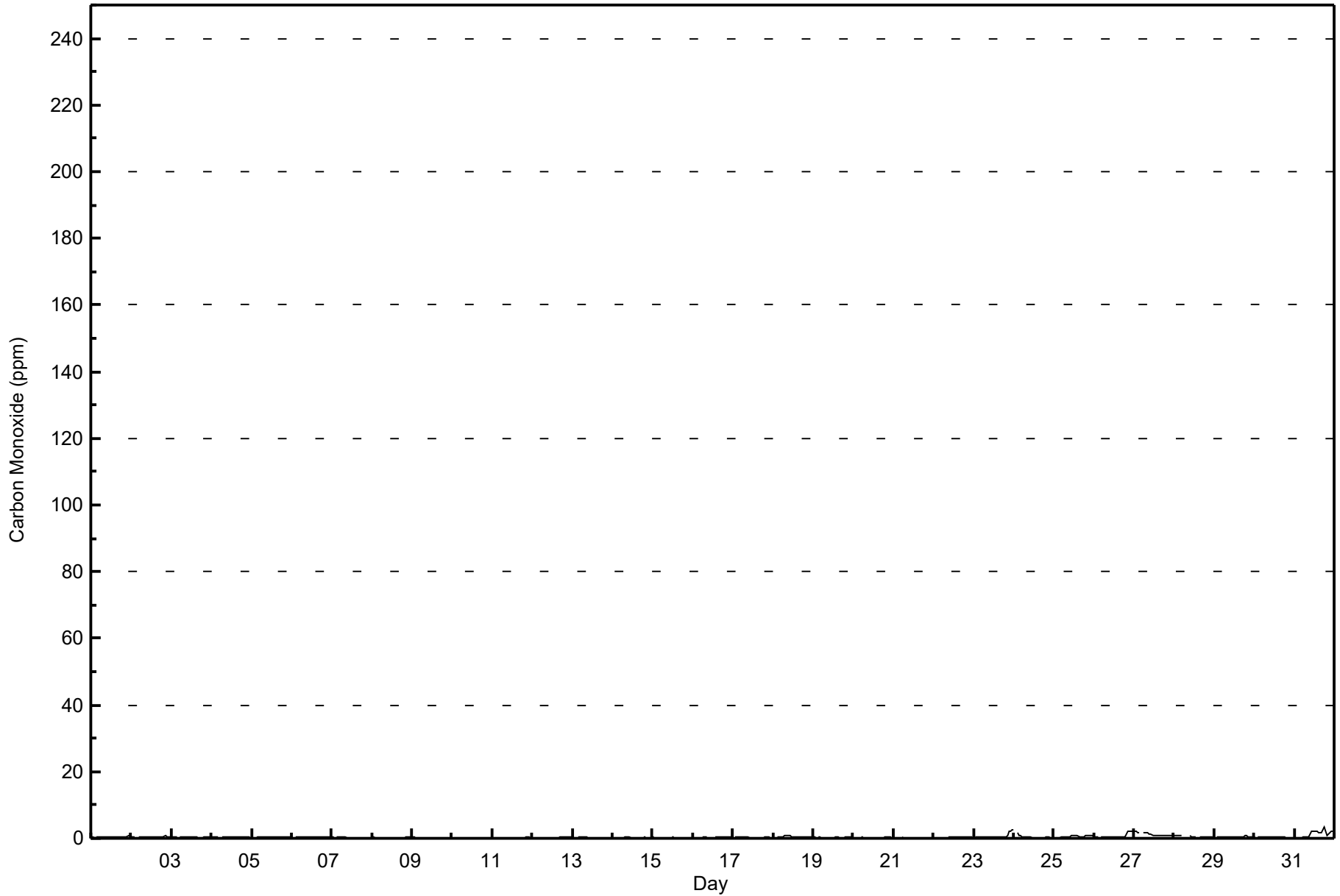
Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum							
Maximum Value: 3.6 ppm on Aug 31 19:00		Maximum Daily Average: 1.4 ppm on Aug 31		Hours of Data: 680																	Hours of Missing Data: 64		Hours of Calibration: 34							
Minimum Value: 0.1 ppm on Aug 14 03:00		Minimum Daily Average: 0.2 ppm on Aug 10		Hours of Calibration: 34																	Percent Operational Time: 96.0									
Maximum Diurnal Average: 0.5 ppm at hour 22		Minimum Diurnal Average: 0.3 ppm at hour 5		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 2.2																										
Monthly Average: 0.40 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-Aug	0.2	0.2	Z	0.3	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	0.5	0.5	0.5	0.6	0.7	0.6	0.4	0.7				
2-Aug	0.6	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	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.7			
3-Aug	0.5	0.5	0.5	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.4	0.5			
4-Aug	0.2	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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.3			
5-Aug	Z	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.5	0.5			
6-Aug	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	0.5	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			
7-Aug	0.4	0.4	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4		
8-Aug	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	0.3	0.3	0.3	0.3	0.2	0.3	0.3		
9-Aug	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	0.2	0.2	0.3	0.3		
10-Aug	0.2	0.2	0.2	0.2	0.1	Z	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2		
11-Aug	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	0.3	0.2	0.2	0.2	0.3	0.3		
12-Aug	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	0.2	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		
13-Aug	0.3	0.3	Z	0.3	0.3	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	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3		
14-Aug	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.3	0.4	0.4	0.3	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	0.4	0.4	
15-Aug	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	0.2	0.2	
16-Aug	0.2	0.2	0.1	0.2	0.2	Z	0.2	0.3	0.4	C	C	C	C	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.5	
17-Aug	Z	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	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	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
18-Aug	0.2	Z	0.2	0.4	0.4	0.5	0.6	0.8	0.8	0.8	0.7	0.5	0.4	0.5	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	0.4	0.8	
19-Aug	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	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	
20-Aug	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	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	
21-Aug	0.2	0.2	0.2	0.2	Z	0.2	0.2	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	
22-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
23-Aug	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	0.3	0.3	0.3	0.3	0.3	0.7	2.2	2.2	2.4	0.5	2.4	2.4	2.4	
24-Aug	2.8	Z	1.7	1.0	0.8	0.5	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	0.2	0.2	0.2	0.2	0.2	0.2	
25-Aug	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7	0.9	0.9	0.8	0.7	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.5	0.9	0.9	0.9	
26-Aug	0.6	0.5	0.5	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	1.4	2.2	2.3	2.2	2.1	0.7	2.3	2.3	2.3		
27-Aug	2.0	1.9	1.9	1.8	Z	1.8	1.7	1.6	1.5	1.4	1.1	0.9	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.8	0.9	0.9	1.2	2.0	2.0	2.0	2.0	
28-Aug	0.9	0.9	0.9	0.9	0.9	Z	PF	PF	PF	0.7	0.6	0.5	0.5	0.5	M	0.5	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.6	0.9	0.9	0.9	0.9	
29-Aug	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	0.6	0.7	0.7	0.5	0.5	0.5	0.4	0.5	0.7	0.7	0.7	0.7
30-Aug	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4
31-Aug	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.6	1.4	2.0	2.0	2.0	2.0	1.8	1.9	1.5	2.3	3.6	1.0	1.3	1.8	2.1	2.1	1.4	3.6	3.6	3.6	3.6	3.6
																								Diurnal Average		Diurnal Maximum				
																								0.5		2.8				
																								0.4		1.9				
																								0.4		1.9				
																								0.4		1.8				
																								0.3		0.9				
																								0.3		1.8				
																								0.3		1.7				
																								0.4		1.6				
																								0.4		1.5				
																								0.4		1.4				
																								0.4		2.0				
																								0.4		2.0				
																								0.4		2.0				
																								0.4		2.0				
																								0.4		1.8				
																								0.4		1.9				
																								0.3		1.5				
																								0.4		2.3				
																								0.4		3.6				
																								0.5		1.4				
																								0.5		2.2				
																								0.5		2.3				
																								0.5		2.2				
																								0.5		2.4				

Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Athabasca Valley - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	436	64.12	64.12
0.4 - 0.5	141	20.74	84.85
0.6 - 0.7	49	7.21	92.06
0.8 - 1.4	25	3.68	95.74
1.5 - 10	29	4.26	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Athabasca Valley - August 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	17	3	4	2	20	42	101	21	11	18	50	32	16	22	19	58	436
0.4 - 0.5	5	0	3	1	3	4	23	14	8	10	18	10	8	7	8	19	141
0.6 - 0.7	0	0	0	3	3	1	10	4	4	5	9	3	1	1	1	4	49
0.8 - 1.4	1	0	0	0	1	0	9	1	0	1	4	1	0	0	1	6	25
1.5 - 10	0	0	0	0	2	2	0	1	0	1	7	2	0	1	1	12	29
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	23	3	7	6	29	49	143	41	23	35	88	48	25	31	30	99	680

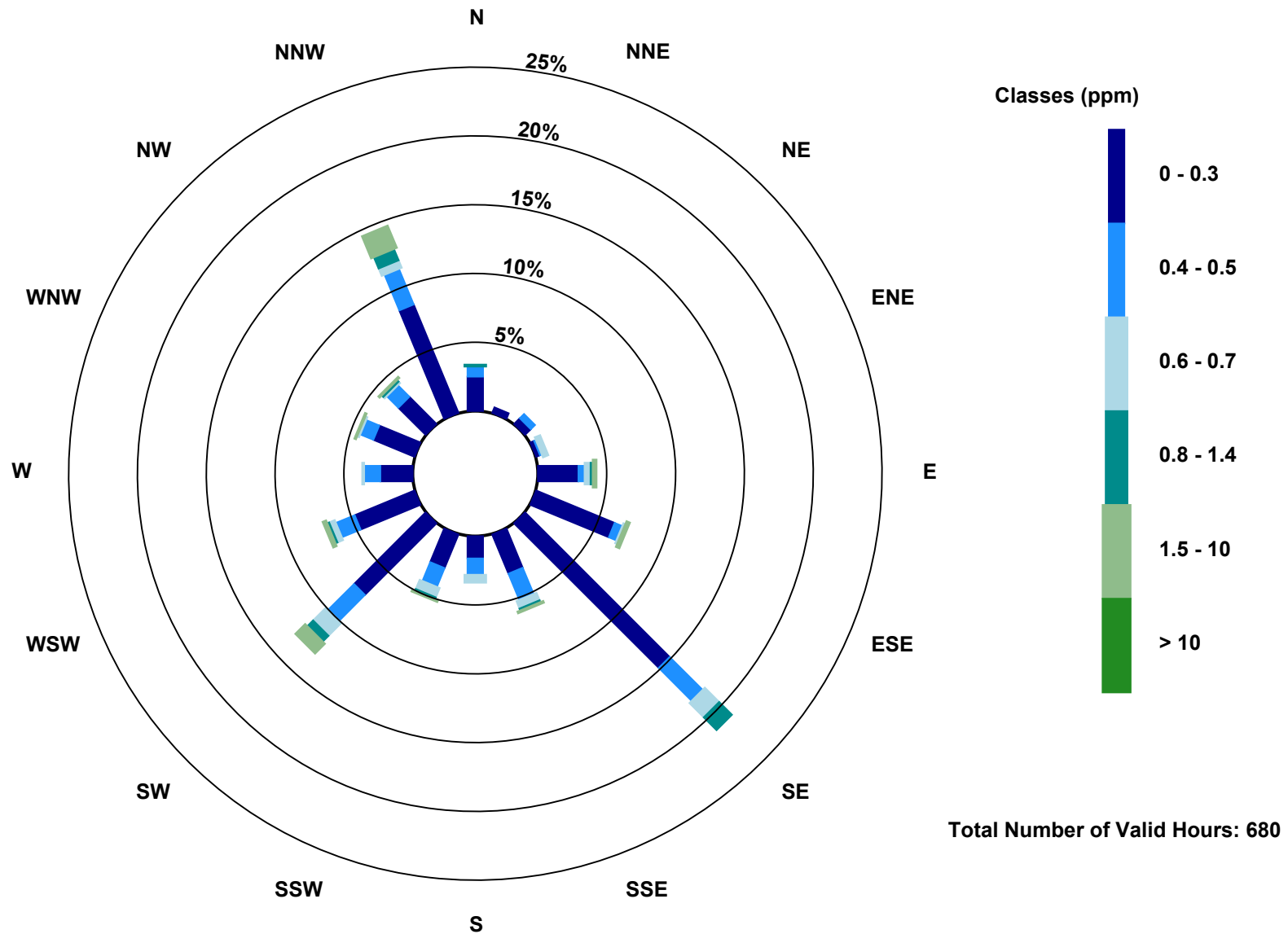
Total Number of Valid Hours: 680

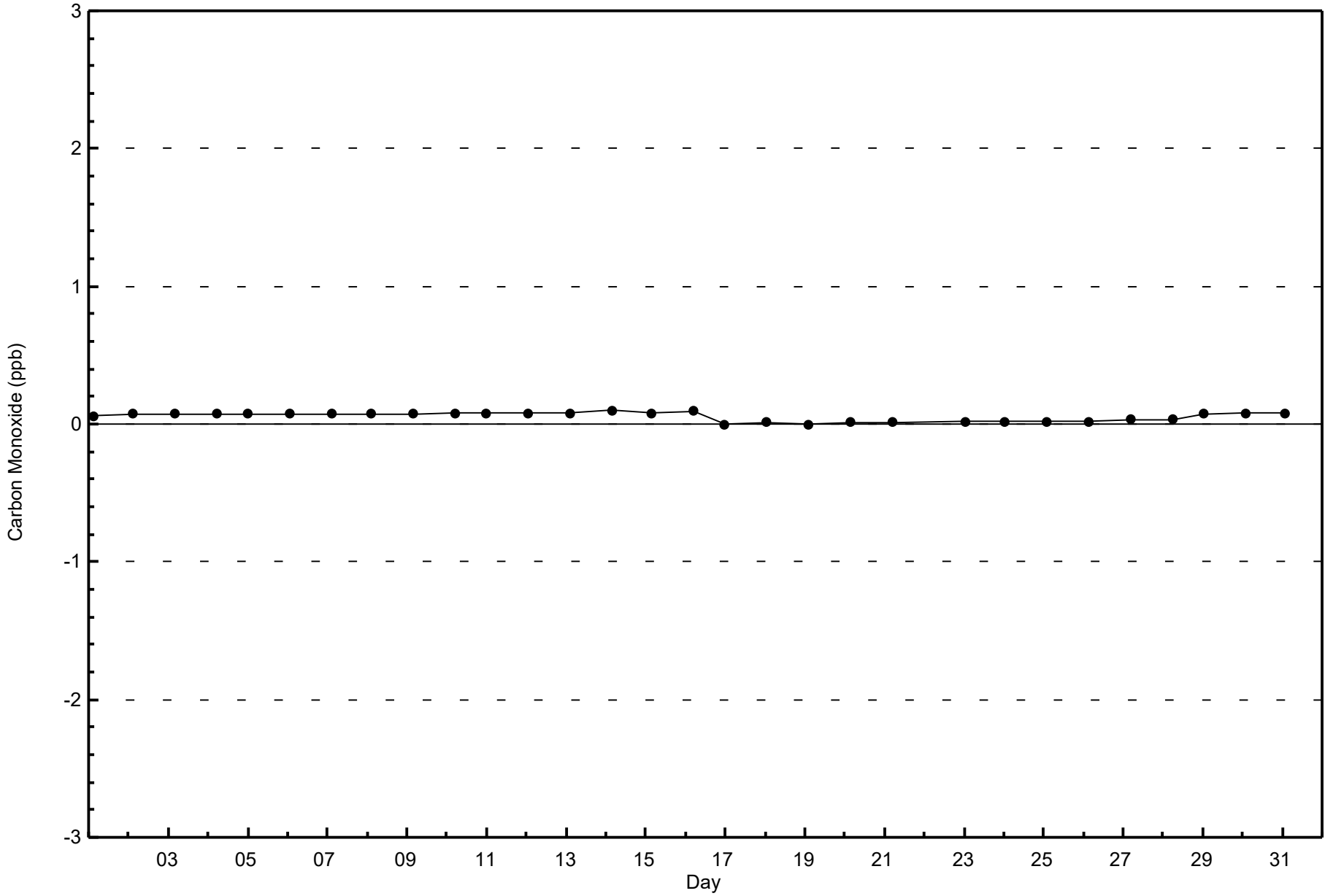
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Carbon Monoxide (CO) - ppm
Athabasca Valley

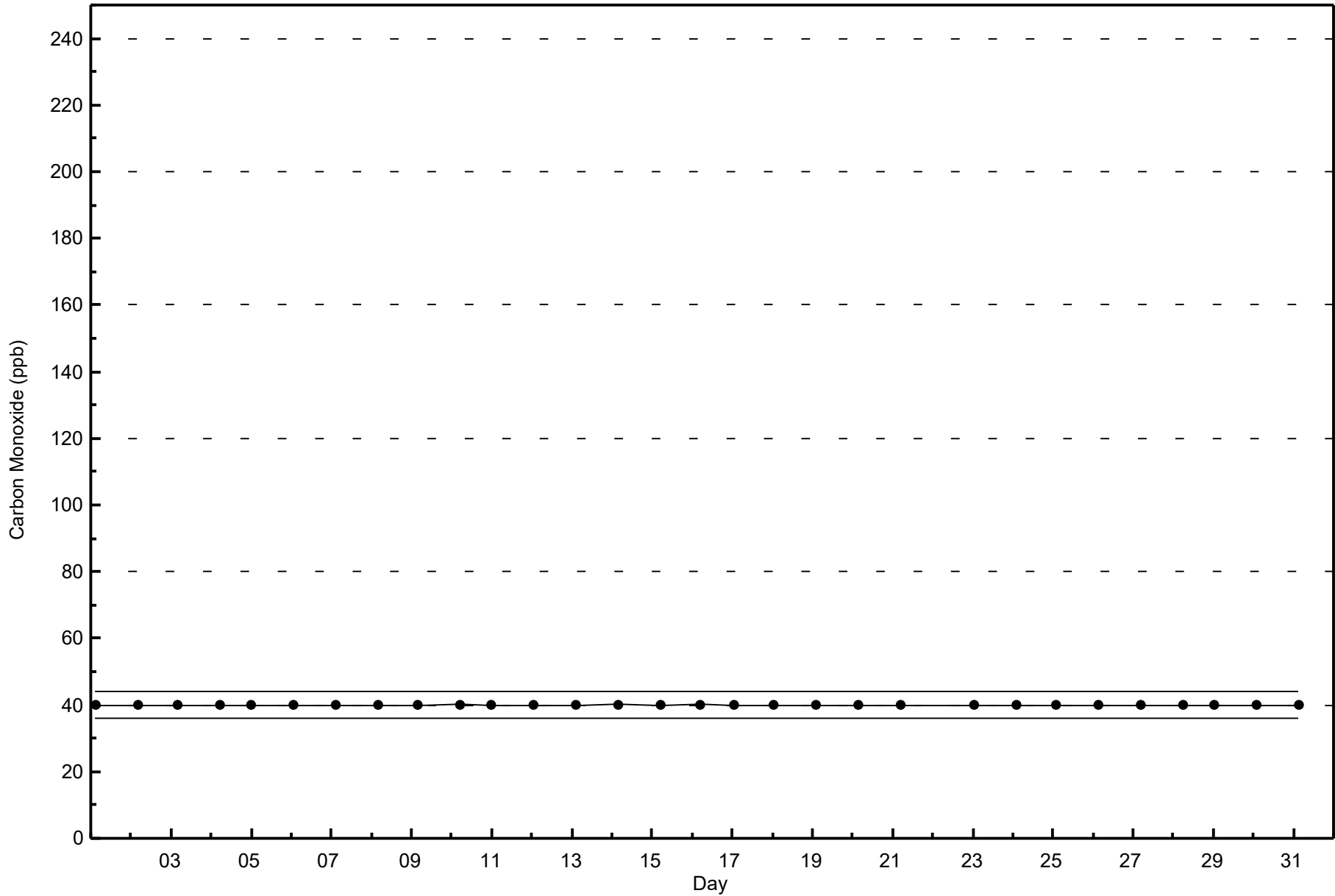






Wood Buffalo Environmental Association
Span Responses

Carbon Monoxide (CO) - ppb
Athabasca Valley - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

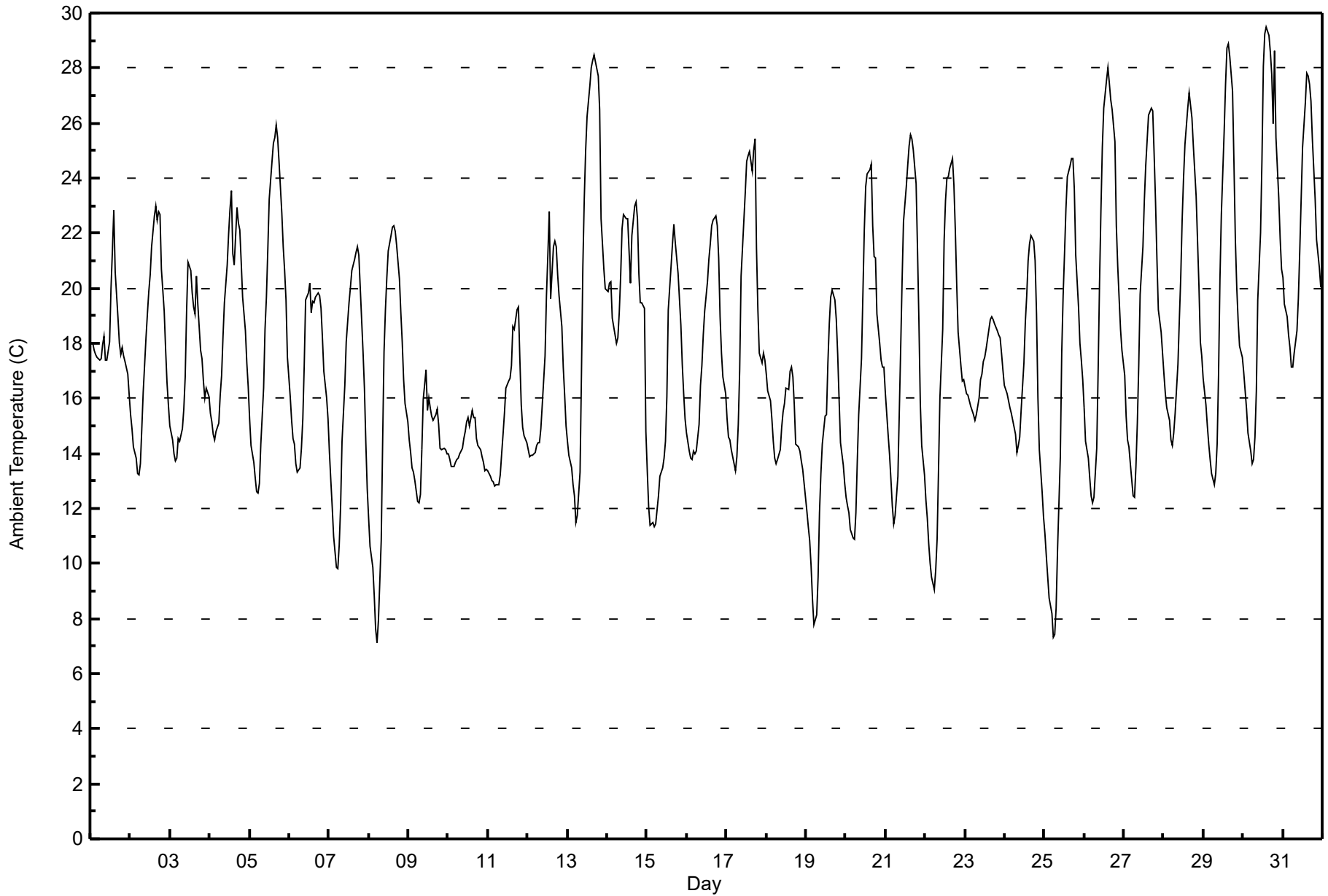
Ambient Temperature (AT) - C
Athabasca Valley - August 2023

Maximum Value: 29.5 C on Aug 30 15:00 Minimum Value: 7.1 C on Aug 8 06:00 Maximum Diurnal Average: 22.7 C at hour 17 Monthly Average: 17.76 C		Maximum Daily Average: 21.8 C on Aug 31 Minimum Daily Average: 14.0 C on Aug 19 Minimum Diurnal Average: 12.9 C at hour 6 Percentiles: P ₁ = 8.3 P ₁₀ = 12.9 Q ₁ = 14.3 Median = 17.2 Q ₃ = 20.8 P ₉₀ = 24.4 P ₉₉ = 28.4		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-Aug	18.0	18.0	17.8	17.6	17.5	17.4	17.5	18.0	18.2	17.4	17.4	18.1	20.0	21.3	22.9	20.6	18.9	18.0	17.6	17.8	17.5	17.4	16.9	16.1	18.2	22.9																						
2-Aug	15.4	14.9	14.3	13.8	13.3	13.2	13.6	14.9	16.2	18.2	19.1	19.9	20.5	21.5	22.6	23.0	22.5	22.8	22.7	20.7	19.2	17.8	16.6	15.7	18.0	23.0																						
3-Aug	15.0	14.5	14.0	13.7	13.8	14.6	14.4	14.9	15.6	16.8	19.2	21.0	20.7	19.9	19.3	19.0	20.4	19.4	17.8	17.4	16.6	16.0	16.4	16.1	16.9	21.0																						
4-Aug	15.5	15.2	14.7	14.5	14.8	15.1	16.1	16.8	18.3	19.5	20.9	22.0	22.9	23.5	21.3	20.8	22.9	22.4	22.1	20.9	19.7	18.5	17.3	16.4	18.8	23.5																						
5-Aug	15.3	14.3	13.7	13.1	12.6	12.6	12.9	14.4	16.4	18.5	19.7	21.4	23.2	24.6	25.3	25.5	25.9	25.4	24.6	22.7	21.5	20.7	19.6	17.5	19.2	25.9																						
6-Aug	16.0	15.2	14.5	14.3	13.6	13.3	13.5	14.2	15.2	17.2	19.6	19.9	20.2	19.1	19.5	19.5	19.7	19.8	19.7	19.3	18.2	17.0	16.0	15.3	17.1	20.2																						
7-Aug	14.0	13.0	12.1	11.0	9.9	9.8	10.7	12.1	14.4	16.5	18.0	18.7	19.5	20.0	20.6	21.1	21.3	21.5	21.2	20.1	17.7	16.4	14.4	12.7	16.1	21.5																						
8-Aug	11.6	10.6	9.9	8.9	7.6	7.1	8.0	10.8	14.4	17.7	19.2	20.4	21.3	21.9	22.2	22.3	22.1	21.6	20.3	19.1	18.1	16.7	15.8	15.2	15.9	22.3																						
9-Aug	14.5	14.0	13.5	13.3	13.0	12.2	12.2	12.5	14.1	16.0	17.0	15.5	16.0	15.7	15.4	15.2	15.4	15.6	15.0	14.2	14.2	14.2	14.2	14.0	14.5	17.0																						
10-Aug	14.0	13.8	13.5	13.5	13.7	13.8	13.8	14.0	14.2	14.5	14.8	15.1	15.3	15.0	15.6	15.3	15.3	14.6	14.3	14.1	13.9	13.7	13.4	13.4	14.3	15.6																						
11-Aug	13.4	13.2	13.0	13.0	12.8	12.8	12.9	13.2	14.0	14.7	15.4	16.4	16.6	16.7	17.2	18.6	18.5	19.2	19.3	17.4	15.8	14.9	14.7	14.4	15.3	19.3																						
12-Aug	14.2	13.9	13.9	13.9	14.0	14.3	14.4	14.4	14.9	15.8	17.5	19.7	21.2	22.8	19.6	21.5	21.7	21.5	20.5	19.7	18.6	17.1	16.1	15.0	17.3	22.8																						
13-Aug	14.4	13.9	13.5	12.9	12.5	11.5	11.8	13.3	16.9	20.8	23.3	25.0	26.2	27.4	28.0	28.3	28.5	28.2	27.7	26.5	22.5	21.6	20.7	20.0	20.6	28.5																						
14-Aug	19.9	20.2	20.3	18.9	18.6	18.0	18.2	19.1	20.4	22.2	22.7	22.5	22.5	21.3	20.2	21.9	23.0	23.1	22.5	20.5	19.5	19.5	19.3	14.8	20.4	23.1																						
15-Aug	13.4	12.0	11.4	11.5	11.3	11.4	12.0	12.5	13.2	13.5	13.8	14.5	16.1	19.2	20.8	21.6	22.3	21.6	21.1	20.5	18.7	17.2	16.2	15.3	15.9	22.3																						
16-Aug	14.7	14.1	13.8	13.8	14.1	14.0	14.1	15.0	16.5	17.2	18.3	19.2	20.2	21.1	21.6	22.3	22.5	22.6	22.3	21.1	19.0	17.7	16.8	16.2	17.8	22.6																						
17-Aug	15.3	14.6	14.5	14.1	13.6	13.4	13.9	15.0	17.0	20.4	22.5	23.5	24.6	24.8	25.0	24.3	25.0	25.4	21.5	19.2	17.6	17.3	17.7	17.4	19.1	25.4																						
18-Aug	16.9	16.3	15.9	15.2	14.4	13.8	13.6	13.8	14.1	15.0	15.5	15.8	16.4	16.3	17.0	17.1	16.8	15.7	14.3	14.2	14.1	13.7	13.4	12.9	15.1	17.1																						
19-Aug	11.9	11.3	10.8	9.9	8.7	7.8	8.2	9.5	11.8	13.3	14.3	15.3	15.4	17.3	18.7	19.7	19.9	19.6	18.9	17.6	16.0	14.4	13.6	12.9	14.0	19.9																						
20-Aug	12.4	12.1	11.9	11.3	10.9	10.9	11.8	13.7	15.4	17.5	19.8	22.1	23.7	24.2	24.3	24.5	22.3	21.1	21.1	19.1	18.0	17.4	17.2	17.1	17.5	24.5																						
21-Aug	16.2	14.7	14.0	13.0	12.1	11.4	11.7	13.2	15.5	17.9	20.3	22.4	23.7	24.5	25.2	25.6	25.4	25.0	23.8	21.4	18.8	15.8	14.3	13.2	18.3	25.6																						
22-Aug	12.3	11.7	10.7	10.0	9.5	9.0	9.8	10.9	13.4	16.0	18.5	21.7	23.2	24.0	24.0	24.4	24.7	23.7	22.1	20.1	18.4	17.2	16.6	16.7	17.0	24.7																						
23-Aug	16.4	16.2	16.1	15.7	15.6	15.4	15.2	15.4	16.0	16.7	16.9	17.3	17.5	17.8	18.5	18.9	19.0	18.9	18.7	18.4	18.3	18.2	17.7	17.0	17.2	19.0																						
24-Aug	16.5	16.2	15.9	15.6	15.4	15.2	14.7	14.1	14.3	14.6	15.6	17.3	18.8	19.7	21.0	21.6	21.9	21.7	21.0	19.1	16.0	14.1	12.6	11.7	16.9	21.9																						
25-Aug	11.1	10.3	9.5	8.7	8.2	7.3	7.4	8.4	10.5	13.9	17.6	19.7	21.3	22.9	24.0	24.4	24.7	24.7	23.6	21.2	19.3	18.0	17.4	16.7	16.3	24.7																						
26-Aug	15.7	14.4	13.8	13.1	12.5	12.2	12.4	14.2	17.0	20.2	22.8	25.1	26.5	27.6	28.0	27.5	26.9	26.5	25.3	22.3	20.8	19.6	18.5	17.7	20.0	28.0																						
27-Aug	16.8	15.3	14.5	14.3	13.7	12.5	12.4	13.5	15.1	17.2	19.8	21.5	23.2	24.5	25.4	26.3	26.5	26.5	24.8	23.1	21.0	19.2	18.4	17.6	19.3	26.5																						
28-Aug	16.9	16.2	15.6	15.2	14.5	14.3	14.7	15.5	17.2	18.9	20.4	22.5	24.0	25.2	26.6	27.1	26.7	26.2	25.1	23.4	21.7	20.1	18.0	17.5	20.1	27.1																						
29-Aug	16.7	15.8	15.0	14.3	13.8	13.3	12.9	13.3	14.3	16.8	20.3	22.7	25.7	27.4	28.7	28.9	28.4	27.2	24.6	21.7	20.0	18.8	17.9	17.5	19.8	28.9																						
30-Aug	16.9	16.3	15.6	14.7	14.1	13.6	13.8	14.6	16.3	19.6	22.0	24.6	28.1	29.2	29.5	29.2	28.6	27.8	26.0	28.6	25.5	23.3	21.8	20.7	21.7	29.5																						
31-Aug	20.4	19.4	19.0	18.3	17.9	17.2	17.2	17.7	18.5	19.6	21.3	23.2	25.1	26.7	27.8	27.7	27.4	26.8	25.4	23.3	21.7	21.3	20.7	20.0	21.8	27.8																						
																								15.2	14.6	14.1	13.6	13.2	12.9	13.1	14.0	15.5	17.2	18.8	20.1	21.3	22.0	22.4	22.7	22.7	22.4	21.5	20.2	18.6	17.6	16.8	16.0	Diurnal Average
																								20.4	20.2	20.3	18.9	18.6	18.0	18.2	19.1	20.4	22.2	23.3	25.1	28.1	29.2	29.5	29.2	28.6	28.2	27.7	28.6	25.5	23.3	21.8	20.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Athabasca Valley - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Athabasca Valley - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	21	2.82	2.82
10 - 20	500	67.20	70.03
> 20	223	29.97	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

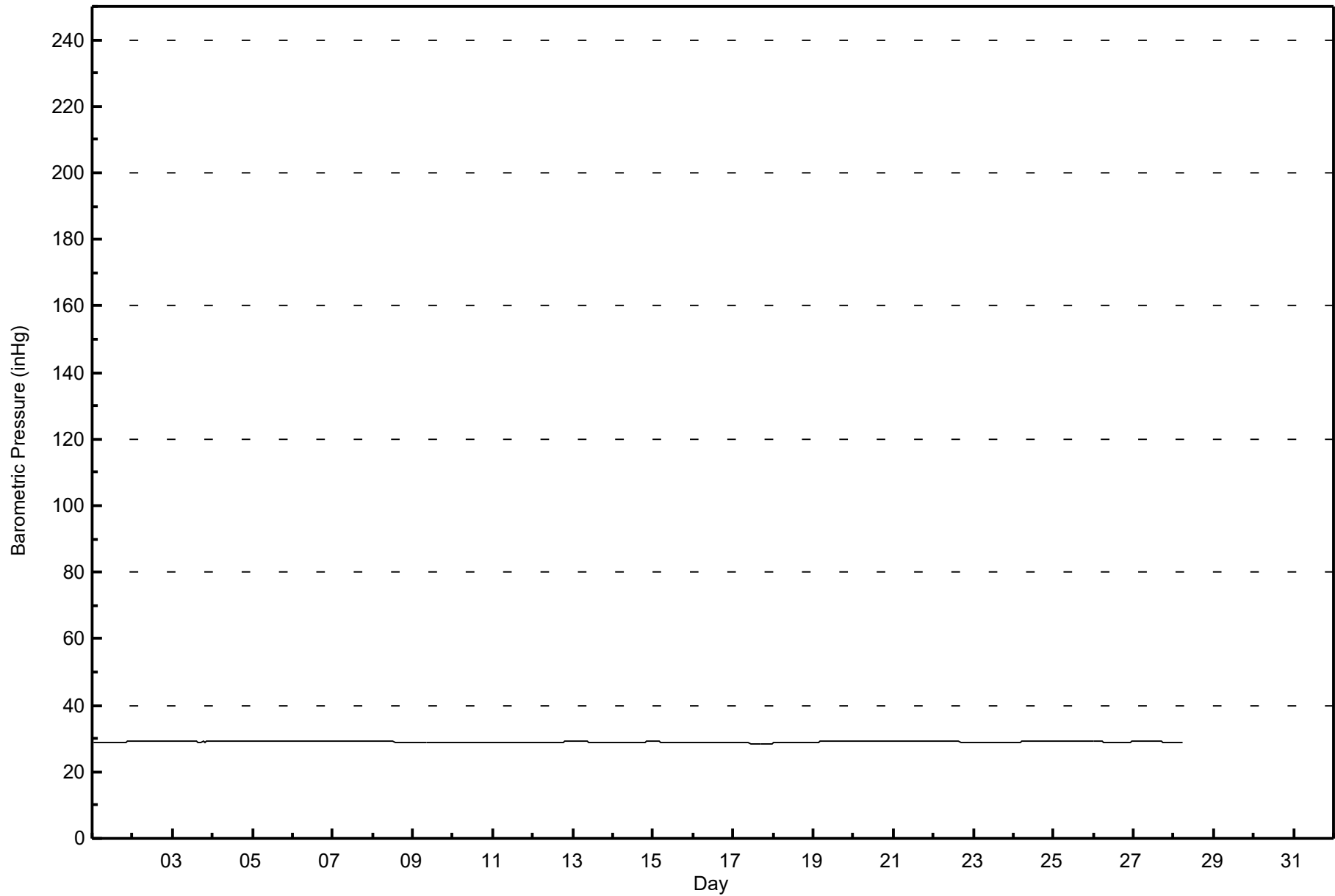
Barometric Pressure (BP) - inHg
Athabasca Valley - August 2023

Maximum Value: 29.3 inHg on Aug 25 09:00		Maximum Daily Average: 29.2 inHg on Aug 5		Hours in Service: 744																							
Minimum Value: 28.5 inHg on Aug 17 18:00		Minimum Daily Average: 28.6 inHg on Aug 17		Hours of Data: 654																							
Maximum Diurnal Average: 29.0 inHg at hour 8		Minimum Diurnal Average: 29.0 inHg at hour 19		Hours of Missing Data: 90																							
Monthly Average: 29.01 inHg		Percentiles: P ₁ = 28.6 P ₁₀ = 28.8 Q ₁ = 28.9 Median = 29.0 Q ₃ = 29.1 P ₉₀ = 29.2 P ₉₉ = 29.3		Hours of Calibration: 0																							
				Percent Operational Time: 87.9																							
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-Aug	28.9	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.0	29.1	
2-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1
3-Aug	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	29.0	29.0	29.0	29.0	29.0	29.1
4-Aug	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	29.1	29.1	29.2	29.2	29.2	29.1	29.2
5-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.2	29.3
6-Aug	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.2	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	29.2	29.2	29.2	29.3
7-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2
8-Aug	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	29.0	29.0	29.0	29.0	29.0	29.1	29.1
9-Aug	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.9	29.0
10-Aug	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.7	28.8
11-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
12-Aug	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	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.0	29.1	29.1
13-Aug	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	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	29.1
14-Aug	28.9	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.0	29.1	29.1
15-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	28.9	28.9	28.9	28.9	28.8	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.9	29.0
16-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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	28.8	28.8	28.9	29.0	29.0
17-Aug	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	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.8
18-Aug	28.6	28.6	28.6	28.6	28.7	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	29.0	28.8	29.0	29.0
19-Aug	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	29.1
20-Aug	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	29.2	29.2	29.2	29.2	29.2
21-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2
22-Aug	29.2	29.2	29.1	29.1	29.1	29.1	29.1	29.2	29.2	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	29.1	29.2
23-Aug	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	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0
24-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.1	29.3
25-Aug	29.3	29.3	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.3
26-Aug	29.1	29.1	29.1	29.1	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
27-Aug	29.1	29.1	29.1	29.1	29.1	29.1	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	29.0	29.1	29.2
28-Aug	29.0	29.0	29.0	29.0	29.0	29.0	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	29.0
29-Aug	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	--	--
30-Aug	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	--	--
31-Aug	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	--	--
																								Diurnal Average			
																								Diurnal Maximum			
UO - Unstable Operation																											



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Athabasca Valley - August 2023

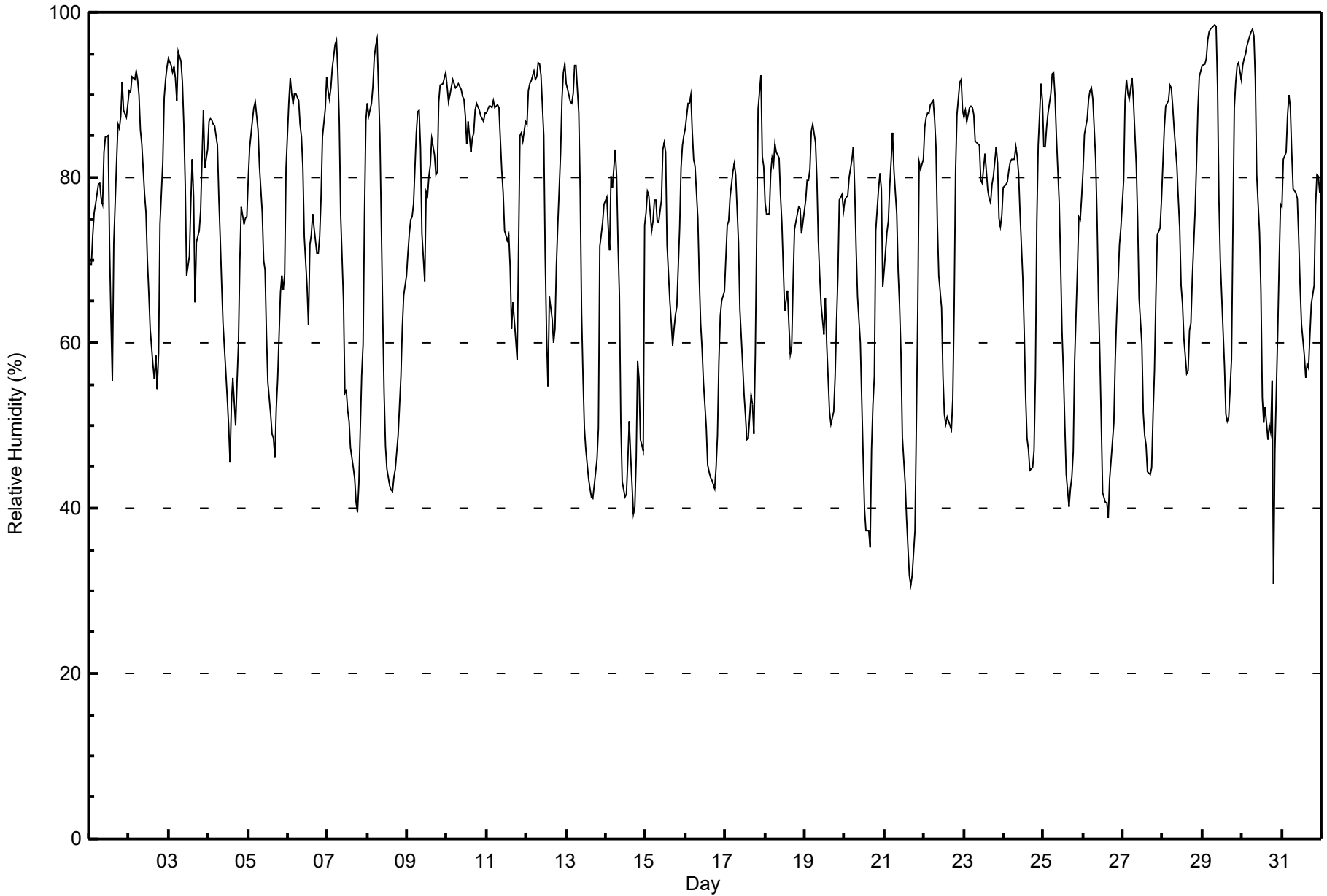




Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Athabasca Valley - August 2023

Maximum Value: 98.5 % on Aug 29 08:00		Maximum Daily Average: 88.4 % on Aug 10		Hours in Service: 744																																												
Minimum Value: 30.6 % on Aug 21 17:00		Minimum Daily Average: 58.8 % on Aug 14		Hours of Data: 744																																												
Maximum Diurnal Average: 88.3 % at hour 6		Minimum Diurnal Average: 54.8 % at hour 17		Hours of Missing Data: 0																																												
Monthly Average: 72.96 %		Percentiles: P ₁ = 37.3 P ₁₀ = 48.5 Q ₁ = 61.1 Median = 76.7 Q ₃ = 86.7 P ₉₀ = 91.3 P ₉₉ = 97.1		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-Aug	69.4	69.6	73.1	75.8	76.9	79.1	79.4	77.5	76.7	83.0	84.9	85.1	71.6	62.9	55.5	72.1	81.8	86.5	86.0	87.4	91.5	88.1	87.3	88.9	78.8	91.5																						
2-Aug	90.5	90.4	92.2	91.8	92.8	91.8	90.0	85.7	84.1	78.0	75.7	70.0	66.1	61.6	57.3	55.7	58.5	54.5	58.9	74.5	81.8	89.6	91.8	93.4	78.2	93.4																						
3-Aug	94.4	93.6	92.8	93.3	92.1	89.4	95.3	94.0	91.4	86.5	79.4	68.2	70.5	76.9	82.2	77.7	65.0	72.2	73.5	75.9	82.2	88.2	81.1	83.4	83.3	95.3																						
4-Aug	86.8	87.1	87.0	86.4	86.2	83.9	77.6	72.7	67.4	62.4	56.5	53.4	50.0	45.6	52.8	55.8	50.1	55.3	59.8	69.8	76.5	74.5	75.0	75.3	68.6	87.1																						
5-Aug	79.8	83.5	87.0	88.5	89.1	87.5	85.8	81.4	75.8	70.0	68.8	61.2	55.3	51.3	49.0	48.6	46.1	52.0	55.6	66.2	68.2	66.4	68.3	81.1	69.4	89.1																						
6-Aug	89.2	92.0	90.1	88.9	90.1	90.1	89.4	86.4	85.0	81.1	72.9	66.8	62.2	71.8	73.0	75.6	73.9	70.8	70.9	72.8	77.6	84.9	88.3	92.2	80.7	92.2																						
7-Aug	90.5	89.5	90.9	93.3	96.1	96.5	92.7	86.7	75.4	65.1	53.8	54.3	51.9	50.6	47.3	45.0	43.5	40.8	39.6	43.1	56.1	59.9	75.6	86.9	67.7	96.5																						
8-Aug	89.0	87.4	89.1	91.0	94.6	95.9	96.7	85.2	74.4	63.6	53.8	47.5	44.8	42.7	42.2	42.0	43.8	44.7	48.9	52.4	55.9	61.9	65.7	68.1	65.9	96.7																						
9-Aug	70.8	73.3	75.0	75.3	76.7	85.5	87.9	88.2	83.5	73.3	67.5	78.4	77.9	80.2	81.6	84.7	82.7	80.4	80.7	89.2	91.2	91.4	92.1	92.7	81.7	92.7																						
10-Aug	91.0	89.2	90.0	91.8	91.4	90.9	91.1	91.4	90.7	89.8	89.6	87.5	84.0	86.7	83.1	84.8	85.4	88.2	89.0	88.2	87.5	87.1	86.8	87.8	88.4	91.8																						
11-Aug	87.8	88.6	88.6	88.4	89.3	88.5	88.8	88.4	84.6	80.9	78.1	73.5	72.3	73.0	69.2	61.8	65.0	60.4	58.0	71.5	85.0	85.4	84.3	86.8	79.1	89.3																						
12-Aug	86.4	90.6	91.4	91.7	92.9	91.9	92.2	93.9	93.7	92.4	85.0	70.6	60.9	54.7	65.6	62.8	60.0	61.7	69.4	74.3	82.8	89.6	92.7	93.7	80.9	93.9																						
13-Aug	91.4	90.8	89.1	89.0	90.1	93.6	93.5	87.9	78.5	63.5	55.9	49.6	47.2	43.6	42.4	41.3	41.1	42.7	46.0	49.7	71.6	73.1	74.6	76.8	67.6	93.6																						
14-Aug	77.6	74.1	71.1	80.2	78.7	83.5	80.2	72.1	65.7	50.5	43.2	41.4	41.7	45.8	50.6	46.4	39.3	40.2	46.1	57.7	55.6	48.3	47.0	74.2	58.8	83.5																						
15-Aug	75.8	78.3	77.8	73.5	74.8	77.3	77.3	74.8	74.6	77.3	83.3	83.1	83.1	71.9	65.1	62.6	59.6	61.7	63.4	64.5	73.9	81.2	83.9	85.1	74.4	85.1																						
16-Aug	86.0	89.1	89.0	89.9	85.5	82.2	81.4	75.1	68.0	62.4	59.3	55.2	49.8	45.3	44.4	43.7	43.4	42.3	44.8	48.8	57.7	63.2	65.2	66.3	64.1	89.9																						
17-Aug	70.4	74.2	74.7	77.6	80.6	81.7	80.3	76.3	72.2	64.1	57.4	53.7	51.1	48.3	48.5	53.7	52.6	49.0	58.4	73.0	88.3	92.4	82.6	81.4	68.4	92.4																						
18-Aug	76.9	75.5	75.5	80.6	82.4	81.5	84.1	83.0	82.4	77.9	74.4	68.9	64.0	66.3	62.2	58.7	59.7	67.3	73.8	75.6	76.5	76.2	73.3	74.6	73.8	84.1																						
19-Aug	77.3	79.6	79.6	81.1	85.5	86.5	84.2	79.6	72.4	68.1	64.7	61.1	65.4	59.8	55.7	51.8	50.2	51.6	55.9	62.6	68.2	77.3	78.0	76.0	69.7	86.5																						
20-Aug	77.4	77.6	77.7	79.9	82.2	83.7	78.4	71.3	65.5	60.0	53.1	46.2	39.8	37.3	37.3	35.3	47.2	52.6	56.0	73.6	78.6	80.4	78.7	66.7	64.0	83.7																						
21-Aug	68.8	73.4	74.7	79.0	82.1	85.3	80.8	75.5	68.6	64.5	58.7	48.6	43.1	38.8	35.3	31.9	30.6	31.8	37.4	50.2	64.0	81.8	81.0	82.1	61.2	85.3																						
22-Aug	86.1	87.3	87.8	87.9	88.7	89.3	87.2	83.7	74.5	68.2	64.3	55.9	51.3	50.1	51.0	50.5	49.6	53.3	64.5	80.9	87.7	91.5	91.9	88.1	73.8	91.9																						
23-Aug	87.2	88.2	86.8	88.5	88.7	88.6	87.6	84.4	84.1	83.9	79.6	79.3	81.2	82.9	78.5	77.5	77.0	79.2	80.3	83.7	81.7	75.1	74.0	75.5	82.2	88.7																						
24-Aug	78.8	79.1	79.5	80.9	81.8	82.2	82.2	83.7	82.6	80.6	75.8	67.8	61.4	53.6	48.5	47.1	44.6	44.9	46.9	55.9	74.8	83.9	91.4	89.2	70.7	91.4																						
25-Aug	83.8	83.7	86.1	87.8	90.1	92.5	92.7	89.8	84.9	77.0	69.5	61.4	56.4	50.1	44.1	40.2	42.4	43.8	46.8	57.8	69.0	75.2	75.0	77.6	69.9	92.7																						
26-Aug	80.9	85.3	87.2	89.5	90.4	90.9	89.5	82.3	75.0	65.4	58.5	50.4	41.8	40.6	40.7	38.8	43.6	45.8	50.3	57.9	63.3	67.2	71.9	73.8	65.9	90.9																						
27-Aug	79.7	89.3	91.8	90.2	89.5	92.0	89.3	85.4	81.5	74.9	65.5	59.8	51.5	48.8	47.7	44.5	44.1	45.0	51.3	56.5	65.6	73.1	73.9	77.4	69.5	92.0																						
28-Aug	81.8	85.9	88.7	89.4	91.1	90.9	88.7	86.0	81.4	77.4	73.9	67.0	64.7	60.6	56.2	56.7	61.5	62.4	67.8	75.9	81.7	88.2	92.3	92.9	77.6	92.9																						
29-Aug	93.6	93.7	94.3	96.6	97.6	98.1	98.3	98.5	98.2	91.2	77.5	69.9	61.4	57.0	51.4	50.4	51.0	58.0	73.7	88.4	91.6	93.6	94.0	91.9	82.1	98.5																						
30-Aug	93.6	94.4	94.9	95.9	97.1	97.7	97.9	97.1	91.9	80.3	73.4	66.2	53.4	50.4	52.2	48.3	50.0	49.1	55.5	30.8	47.0	61.2	69.6	76.8	71.9	97.9																						
31-Aug	76.4	82.1	83.1	87.5	90.0	88.4	83.0	78.7	78.1	77.5	72.6	66.8	62.1	58.5	55.7	57.5	57.0	61.0	64.8	67.0	76.7	80.4	80.1	78.1	73.5	90.0																						
																								82.9	84.4	85.0	86.5	87.6	88.3	87.2	83.8	79.5	73.9	68.6	63.6	59.3	57.0	55.7	54.9	54.8	56.4	60.4	67.0	74.5	78.4	79.6	81.8	Diurnal Average
																								94.4	94.4	94.9	96.6	97.6	98.1	98.3	98.5	98.2	92.4	89.6	87.5	84.0	86.7	83.1	84.8	85.4	88.2	89.0	89.2	91.6	93.6	94.0	93.7	Diurnal Maximum





Maximum Speed: 23 km/h on Aug 14 14:00	Maximum Daily Speed Average: 14.0 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 27 11:00	Minimum Daily Speed Average: 1.4 km/h on Aug 5	Hours of Data: 744
Maximum Diurnal Speed Average: 4.3 km/h at hour 14	Minimum Diurnal Speed Average: 0.6 km/h at hour 10	Hours of Missing Data: 0
Monthly Average Velocity: 1.3 km/h 231.8 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 7 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 20	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-Aug	WSW13	WSW18	WSW19	WSW16	WSW13	WSW13	WSW12	W14	W15	WSW12	SSW5	SW8	W20	W20	W15	WSW14	WSW8	NNW7	S6	ESE3	SSE3	SW4	WNW7	WSW8	WSW10.2	W20
2-Aug	SW9	SW8	SW8	SSE4	SSE4	SE4	SE4	SE4	SSE2	S2	SSW6	SW8	SW6	WSW2	SW4	ENE2	NNW2	SW5	ENE3	NW3	W2	ENE1	SSW2	ESE2	SSW2.5	SW9
3-Aug	SE2	SSE4	SE5	SE5	SSE7	SE9	SSE6	SE5	SE8	SE8	ESE5	E4	E4	ESE10	ESE7	SE12	S3	N10	NNW8	W3	S2	SSE2	SW8	WSW8	SE3.3	SE12
4-Aug	SW9	WSW8	WSW9	WSW6	WSW7	W9	NW8	W4	NW5	NNW10	NNW10	NNW14	NNW13	NNW13	W20	SW10	N9	NNW7	NNW2	SW3	SSW4	SW6	SW6	SSW5	W6.5	W20
5-Aug	SSE6	SSE5	SSE5	SSE5	SSE5	SE6	SE5	SSE4	S3	E3	NNW4	NNW8	N8	N10	N10	NW5	WNW3	NNW6	N6	NNW7	NNW7	NNW5	WNW3	SSW1	NNW1.4	N10
6-Aug	SW4	S2	ENE4	SE4	SE7	SE6	SE6	SE6	NE2	W4	WSW6	NE9	NE8	NNW10	NNW9	NNW12	NNW14	NNW13	NNW11	N6	NNW4	NW5	NNW6	NNW8	N3.3	NNW14
7-Aug	SW4	SW3	WSW4	SW7	SW4	E2	NNW1	WSW3	WNW3	NNW6	NNW12	NNW14	NNW15	NNW16	NNW15	NNW13	NNW13	N11	NNE9	NNE8	NNW6	NNW7	N1	NE3	NNW5.7	NNW16
8-Aug	E3	SE3	ESE3	SE5	SE6	SE5	SE4	E4	ENE5	ESE9	ESE12	E10	SE11	SE13	SE13	ESE15	ESE15	ESE15	E13	ESE10	ESE7	ESE5	SE5	SE7	ESE8.0	ESE15
9-Aug	SE7	ESE8	ESE12	ESE10	SE11	SE8	SE10	SE10	SE11	SE12	SE15	SE11	SE12	SE14	SE15	SE10	SE10	SE11	SE12	SE9	SE8	SE7	SE9	SE9	SE10.4	SE15
10-Aug	SE13	SE11	SE9	SE8	SE10	SE10	SE9	SE8	ESE8	ESE7	E10	E11	E13	E12	ESE13	E16	E14	E13	ENE7	NE5	NE7	N7	N8	NNW7	E7.9	E16
11-Aug	NNW11	NNW12	NNW12	NNW12	NW11	NNW11	NNW13	NNW11	NNW10	NNW7	NNW6	N5	N6	NW7	WNW7	NW2	NW3	SW7	WSW5	SSE2	ESE2	SE3	SE5	SE8	NNW5.1	NNW13
12-Aug	SE8	SE7	SE6	SE5	SSW4	SW11	SSW4	S4	SSW4	SW7	SW6	N4	N2	WSW3	W10	SW13	W11	W13	W9	WSW3	ESE2	SE3	SSE1	SE4	SW3.5	W13
13-Aug	SE3	SSE5	SE7	SE8	SE9	SE11	SE12	SE12	E8	SW5	SW8	SW16	SW18	SW18	SW18	SW20	SW17	SW14	SW8	SW7	SE1	S5	SSE5	SSE4	SSW6.8	SW20
14-Aug	SW4	SSW8	S5	SE5	SE5	WNW1	NW6	SW8	SW8	WNW8	NNW15	NNW21	W20	W23	WSW18	WSW15	NNW17	NNW15	NW9	WSW6	W13	W15	NNW14	ESE6	W8.8	W23
15-Aug	SE5	SE6	SE6	SE6	SE8	SE7	SE8	SE12	SE10	SE9	SE9	SE13	SE9	S4	SW8	SW13	SW11	SW11	WSW11	NNW15	NNW21	NNW17	NW15	NW9	SSW2.5	NNW21
16-Aug	NNW6	WSW3	SW6	ESE1	NW5	NW5	WSW6	SW7	NW4	NNW12	NNW9	NNW11	WNW9	NNW11	NNW12	WSW12	SW12	SW12	SW6	S5	SSE6	SSE9	SSE9	SSE7	W4.2	NW12
17-Aug	SE9	SE11	SE11	SE10	SE11	SE10	SE10	SE10	ESE7	E5	SW10	SW10	SW11	W17	WNW16	NNW7	NW1	WNW4	NNW9	N4	W3	N2	NNW5	NW5	S1.9	W17
18-Aug	WSW5	NW8	NNW16	NNW15	NNW14	NNW15	NNW18	N15	NNW15	NNW16	NNW18	N15	NNW15	NW13	NNW10	NW13	NW15	NNW13	NNW15	NNW11	NNW10	NW7	NW10	NW10	NNW12.5	NNW18
19-Aug	NNW8	NW5	W6	WSW5	SW7	SW8	SSW7	SSW9	SSW11	SW14	WSW15	WSW15	SW12	SW14	SW16	WSW14	W18	WSW17	WSW14	SW9	SSW6	ESE2	SE3	SE5	SW8.5	W18
20-Aug	E4	ESE5	ESE4	SE5	ESE4	ESE3	SE5	S5	SSW14	SSW13	SSW10	SW8	SW12	SW11	SSW4	SW4	NNW13	N9	N3	W3	SSE2	S2	SSW4	SSW9	SSW3.6	SSW14
21-Aug	SE7	SE6	SE5	SE7	SE8	SE7	SSE8	SE6	SSW4	E3	N2	WSW7	WSW6	ENE6	E10	SE10	SE10	S9	S8	SSE5	SSE2	E2	SSE4	SE3	SE4.7	SE10
22-Aug	ESE1	SSE2	SSE3	SSE3	SSE4	S4	SE6	S3	SE6	SSE7	WNW3	E5	ESE8	E4	NE4	E8	SE2	SW3	NW2	W1	WSW2	ESE2	SSE2	ESE5	SE2.5	ESE8
23-Aug	SE5	ESE5	ESE5	E3	ESE4	ESE5	SE4	SE5	N4	NNW11	NNW11	NNW12	NNW11	NNW10	NNW11	N10	NNW14	NNW11	NNW10	N8	NNW9	NNW12	NNW15	NNW17	N6.3	NNW17
24-Aug	NNW16	NNW20	NNW21	NNW21	NNW20	NNW17	NNW21	NNW20	NNW20	NNW22	NNW20	NNW20	NNW20	NNW19	NNW14	NNW13	NNW13	NW13	NNW12	W6	WSW2	S3	ESE3	ESE3	NNW14.0	NNW22
25-Aug	SE5	SE5	SE6	SE8	SE8	SE11	SE11	SE10	SE10	SE8	S2	SW10	SW8	SW6	SW8	SW13	SSW9	SW7	S6	S4	E3	SE5	SE5	SE6	SSE5.4	SW13
26-Aug	SSE8	SE9	SE10	SE10	SE10	SE9	SE9	SE9	ESE6	SSE4	SSW7	SW12	SW16	SW16	SW13	WNW13	WNW9	WSW8	WNW9	NNW14	NNW14	NNW12	NNW7	NNW5	SW2.6	SW16
27-Aug	NNW4	SW2	S2	SSW5	SSW3	E3	ESE3	ESE5	E4	E4	SE0	WSW4	SSW8	SW7	WSW6	WSW4	SW4	SW4	SSW6	S4	SSE5	SE4	SE5	SE6	S2.6	SSW8
28-Aug	SE6	SE5	SE7	SE7	SE7	SE6	SSE5	SE5	ESE5	E5	E5	SSW4	SW6	SW7	SW6	SSE4	ESE6	SE7	SE8	SE9	SE8	SE5	S4	SSE5	SE4.9	SE9
29-Aug	SSE5	S4	SSE7	SE9	SSE9	SSE9	SSE10	SSE8	SE9	SE8	E7	NW3	WSW5	WSW5	SW5	SW6	SSW5	SSW4	SSW2	SE1	SSE1	S1	SE2	S2	SSE3.9	SSE10
30-Aug	SSW3	S1	S1	SSW3	SSW3	SW4	SSW3	SW4	WSW4	WSW1	W4	W5	ESE4	NNE3	E8	ESE10	SE8	SSE5	SSW4	SSE13	SE8	ESE6	SE5	SE4	SSE2.9	SSE13
31-Aug	SE7	SE3	SSE6	SE2	SSE2	SE6	SE7	S5	SSE4	SSW6	SW10	SW11	SW9	SW8	SW10	SW12	WNW8	WSW8	W14	NW17	NNW13	NNW9	NNW9	NW6	WSW3.7	NW17

S2.0	S2.2	SSE2.4	SSE2.5	SSE2.9	SSE2.6	SSE2.5	SSE2.8	SSE1.5	SW0.6	W1.9	W3.4	W3.5	W4.3	W4.1	WSW3.3	W3.5	W3.2	W2.4	NNW1.2	NNW1.1	NNW0.9	NNW1.0	S0.7	Diurnal Average
NNW16	NNW20	NNW21	NNW21	NNW20	NNW17	NNW21	NNW20	NNW20	NNW22	NNW20	NNW21	NNW20	W23	W20	SW20	W18	WSW17	NNW15	NW17	NNW21	NW17	NW15	NNW17	Diurnal Maximum

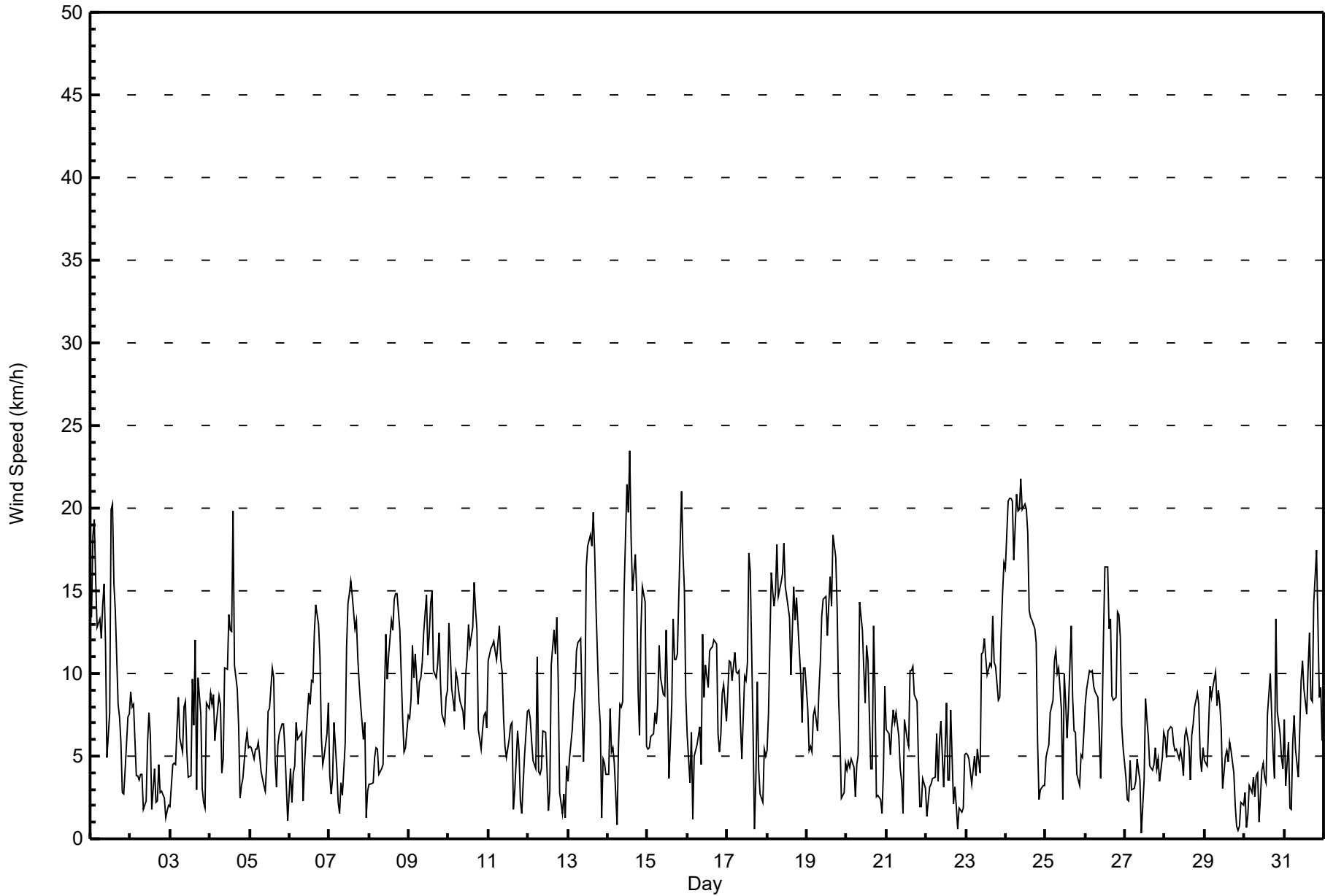
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Athabasca Valley - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Aug 14 14:00 Minimum Value: 1 km/h on Aug 2 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: 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-Aug	3	3	3	4	2	2	4	3	4	3	2	2	6	4	5	4	4	5	2	1	1	2	2	1	6
2-Aug	2	3	2	1	2	1	1	1	2	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	3
3-Aug	1	2	1	2	3	2	2	2	2	2	2	2	5	4	3	4	2	5	5	1	2	2	4	6	
4-Aug	3	2	2	2	2	2	3	2	2	3	4	5	4	4	6	6	4	3	1	2	1	2	2	1	6
5-Aug	1	1	1	1	1	1	1	1	2	2	2	2	3	2	2	2	1	1	2	1	1	1	2	3	3
6-Aug	2	1	1	1	2	1	1	2	1	2	2	4	4	3	2	2	2	2	2	2	1	1	2	2	4
7-Aug	2	2	2	1	2	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	2	1	2	2	3
8-Aug	2	1	1	1	1	1	1	1	2	3	3	3	4	4	4	5	4	4	3	2	3	2	2	2	5
9-Aug	2	3	3	2	2	2	2	2	3	3	5	3	4	4	4	3	3	3	3	3	2	2	3	3	5
10-Aug	4	3	2	2	3	2	3	2	2	2	3	3	4	4	4	4	4	3	2	2	2	2	2	2	4
11-Aug	2	2	2	2	1	2	2	2	2	2	1	2	2	2	3	1	1	2	1	1	2	2	2	2	3
12-Aug	1	1	1	1	3	2	3	2	1	1	2	3	2	7	8	4	4	3	3	2	1	1	1	1	8
13-Aug	1	1	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	2	2	1	2	2	1	4
14-Aug	3	3	2	2	2	1	2	2	2	4	5	4	4	9	4	4	4	4	1	2	3	3	3	2	9
15-Aug	2	1	1	1	1	2	2	2	2	2	3	3	2	2	4	4	3	2	1	4	4	3	3	2	4
16-Aug	2	2	2	1	2	1	1	2	2	3	3	3	4	4	3	4	4	3	2	1	2	1	1	1	4
17-Aug	2	2	2	2	2	2	2	2	2	2	3	2	3	4	3	4	1	5	3	4	2	1	2	3	5
18-Aug	2	4	4	5	3	3	5	4	3	4	5	4	4	4	2	2	2	4	3	2	2	3	2	2	5
19-Aug	2	2	2	2	2	2	2	3	2	2	4	3	3	3	3	4	4	4	3	2	2	1	1	1	4
20-Aug	2	2	1	1	1	2	2	3	3	2	3	2	4	4	2	4	6	3	2	1	2	1	3	3	6
21-Aug	2	2	2	1	2	2	2	2	2	2	2	2	2	3	4	3	4	2	1	2	1	1	2	1	4
22-Aug	1	1	1	1	1	2	3	1	2	2	1	4	3	3	2	2	2	1	1	1	1	2	1	1	4
23-Aug	1	2	1	1	1	1	1	1	2	3	2	2	2	2	3	2	3	3	2	2	2	3	3	3	3
24-Aug	3	3	3	3	4	4	4	4	4	5	4	4	4	4	3	3	2	2	2	3	1	2	1	1	5
25-Aug	1	1	1	1	1	2	2	2	1	1	3	2	2	1	2	3	3	2	1	1	2	1	1	1	3
26-Aug	1	2	1	1	2	2	2	2	2	2	2	4	4	4	4	3	3	1	4	5	4	4	2	2	5
27-Aug	2	2	2	2	2	1	2	1	2	1	1	2	2	1	2	1	1	1	1	1	2	1	1	1	2
28-Aug	1	2	3	2	1	1	1	1	1	1	2	2	2	2	1	1	2	2	2	2	2	1	1	2	3
29-Aug	1	1	2	2	2	2	2	2	2	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2
30-Aug	2	1	2	2	2	1	1	1	2	2	1	2	2	2	1	3	3	2	5	5	4	4	2	2	5
31-Aug	3	2	2	1	2	3	1	2	1	2	1	2	2	2	2	3	4	4	4	5	4	2	3	2	5
Diurnal Maximum																								6	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Athabasca Valley - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	270	36.29	36.29
6 - 11	316	42.47	78.76
12 - 19	139	18.68	97.45
20 - 28	19	2.55	100.00
29 - 38	0	0.00	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 - August 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	1	4	5	19	27	49	36	25	22	18	17	9	7	14	9	270
6 - 11	14	2	3	2	8	16	102	17	4	13	49	17	6	10	12	41	316
12 - 19	2	0	0	0	5	8	13	1	0	2	21	18	7	14	8	40	139
20 - 28	0	0	0	0	0	0	0	0	0	0	1	0	5	1	0	12	19
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	24	3	7	7	32	51	164	54	29	37	89	52	27	32	34	102	744

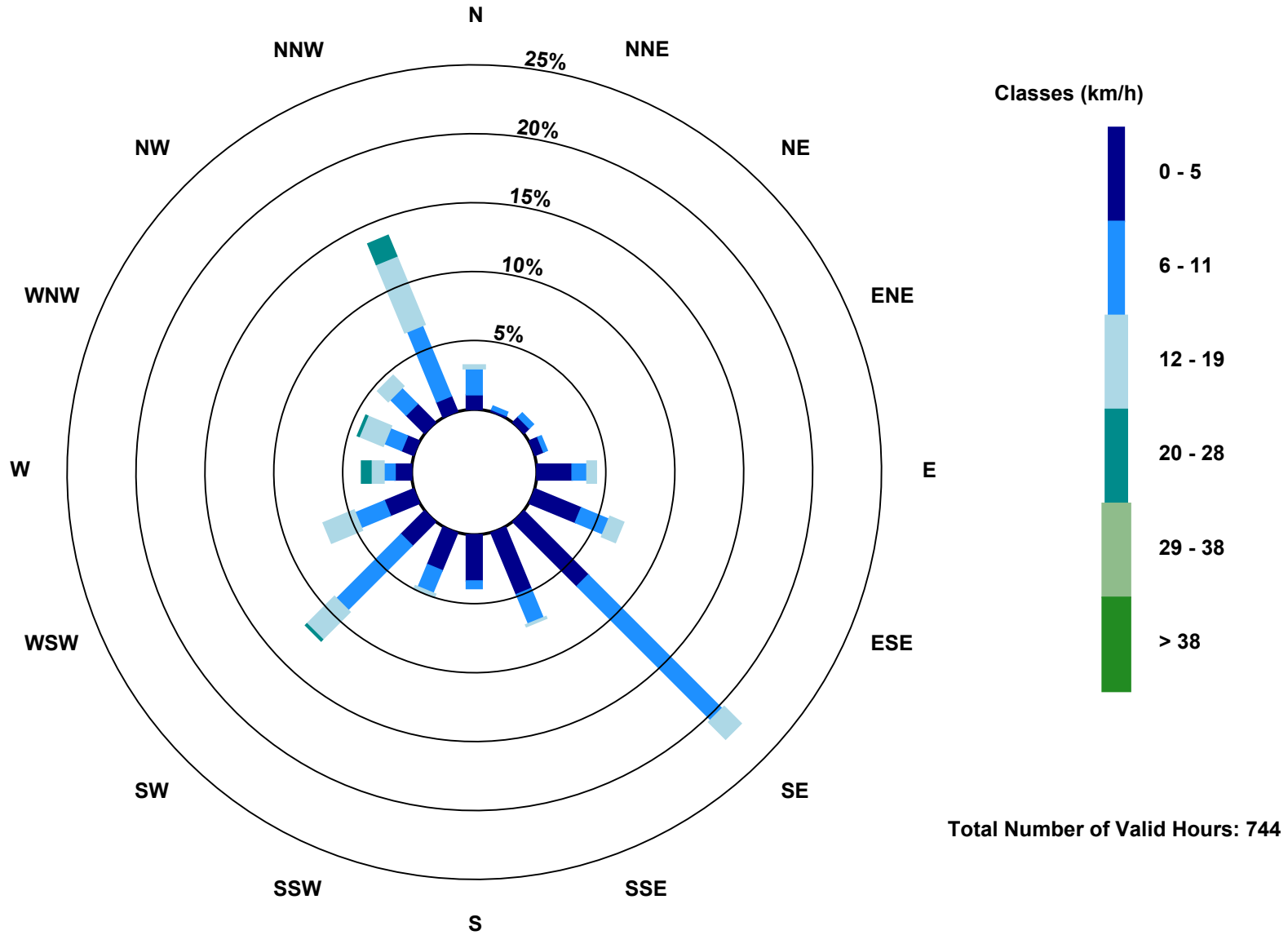
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Athabasca Valley





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Athabasca Valley - August 2023

Direction of Maximum Speed: 266 deg on Aug 14 14:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 334.0 deg on Aug 24	Hours of Data: 744
Direction of Minimum Speed: 137 deg on Aug 27 11:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 1.4 deg on Aug 5	Percent Operational Time: 100.0
Monthly Average Direction: 231.8 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-Aug	249	243	243	251	250	242	247	268	260	243	208	222	279	269	281	257	238	313	169	114	147	215	298	252	253.6
2-Aug	232	228	216	168	149	135	144	137	154	178	211	216	216	256	226	63	345	229	73	317	277	77	207	105	203.6
3-Aug	130	149	141	131	156	141	164	128	144	146	116	84	96	112	108	139	172	354	338	281	190	156	225	253	141.2
4-Aug	222	245	238	244	240	275	308	278	316	293	285	297	295	262	228	353	347	291	221	209	225	223	207	270.0	270.0
5-Aug	165	157	164	158	149	142	142	160	182	80	328	340	350	357	350	314	289	339	359	338	335	335	284	199	346.3
6-Aug	232	182	72	134	131	126	141	133	52	272	247	38	45	343	333	337	335	336	340	0	333	316	333	336	350.6
7-Aug	222	227	254	229	218	82	335	241	285	338	339	332	339	337	343	340	343	358	16	20	342	342	350	51	336.8
8-Aug	87	126	119	125	137	133	126	86	76	120	112	101	131	139	124	106	104	106	101	108	116	111	134	133	115.1
9-Aug	130	118	119	123	127	136	137	129	127	130	134	131	134	125	127	131	135	133	128	131	131	125	127	126	128.9
10-Aug	127	125	128	131	128	127	130	130	121	116	92	91	95	95	102	91	86	87	74	47	46	11	354	346	98.3
11-Aug	327	329	327	328	326	330	331	341	337	342	340	355	355	315	291	307	311	234	242	149	112	130	143	132	327.2
12-Aug	138	135	138	134	197	233	212	184	204	217	222	351	5	251	266	231	266	275	277	244	115	139	164	134	223.5
13-Aug	125	148	145	131	127	126	128	136	100	215	226	236	225	227	235	235	234	229	236	219	131	184	156	161	199.0
14-Aug	235	212	173	130	129	284	319	234	232	291	287	283	272	266	246	248	285	298	315	250	266	274	288	123	267.1
15-Aug	130	136	144	139	139	129	131	139	143	138	138	140	134	184	224	225	226	236	249	295	328	324	323	322	198.3
16-Aug	329	258	219	113	317	316	237	233	313	326	338	315	290	292	288	251	235	225	214	169	152	154	160	167	258.8
17-Aug	143	134	140	144	137	135	133	137	115	87	217	223	233	281	291	328	325	288	339	349	277	359	334	304	190.2
18-Aug	244	313	339	339	335	338	346	351	337	342	340	350	342	322	346	323	306	340	332	330	329	319	318	320	333.3
19-Aug	329	311	270	239	217	220	205	209	210	225	244	251	230	223	220	238	259	244	237	224	197	113	124	134	233.2
20-Aug	101	108	105	139	114	112	141	173	212	210	211	217	220	226	213	228	298	10	7	274	158	172	201	213	205.6
21-Aug	133	135	142	136	139	132	156	142	193	88	1	237	237	61	95	141	139	178	180	157	160	88	151	138	145.9
22-Aug	111	159	151	156	155	188	145	176	142	155	284	87	103	100	51	81	135	228	315	259	251	112	148	122	133.6
23-Aug	128	113	117	99	123	114	124	135	11	345	345	335	341	342	347	352	343	346	341	354	347	342	338	337	353.0
24-Aug	335	335	335	334	335	338	335	335	337	340	339	339	336	337	338	332	315	302	280	246	183	103	111	111	334.0
25-Aug	143	140	139	140	137	143	136	131	133	126	176	229	232	227	232	220	208	215	173	188	83	134	133	143	166.4
26-Aug	147	146	139	137	138	132	127	126	113	149	212	233	225	221	234	291	287	258	283	343	338	338	348	344	221.1
27-Aug	331	223	169	203	199	97	113	115	85	79	137	252	209	218	246	242	227	222	209	186	157	138	141	143	186.3
28-Aug	137	126	139	131	141	141	154	130	114	93	98	193	226	215	220	147	115	139	145	137	135	127	186	166	145.4
29-Aug	154	177	151	139	148	148	147	149	141	126	94	325	244	244	229	221	212	206	200	134	161	173	139	190	162.6
30-Aug	193	182	183	211	208	214	202	216	247	251	271	260	120	33	89	115	146	153	204	157	128	121	127	127	156.1
31-Aug	146	125	151	140	157	136	142	174	167	199	216	218	219	223	223	227	300	256	259	322	329	336	332	325	242.4

170.5 173.2 165.9 154.1 153.6 150.6 147.3 155.7 164.1 224.1 267.0 276.2 260.3 269.0 263.3 244.1 276.5 278.2 280.2 297.7 327.5 331.9 289.4 172.6
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

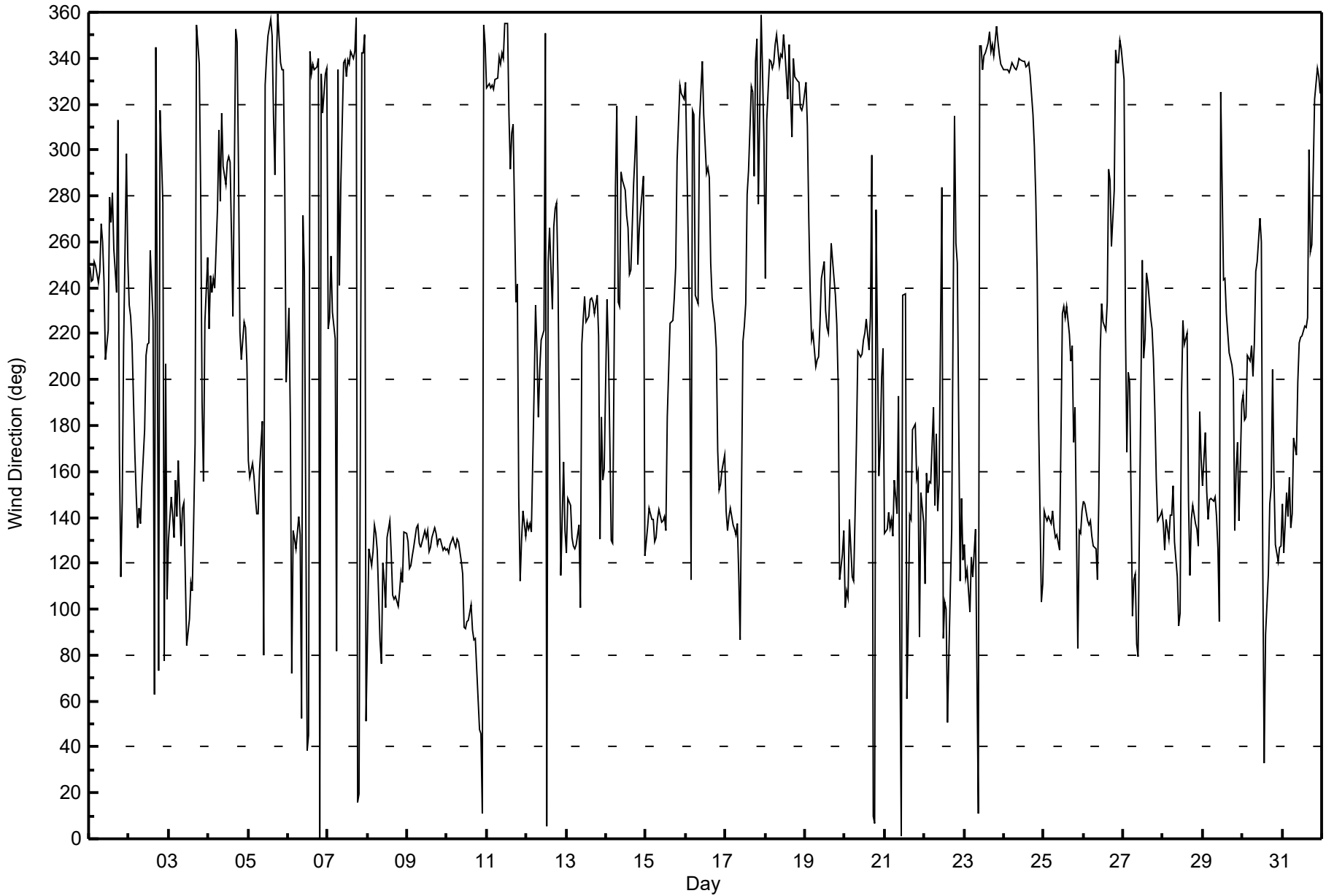
Wind Direction (WD) - deg
Athabasca Valley - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Aug 30 10:00 Minimum Value: 9 deg on Aug 11 03:00 Percentiles: P ₁ = 10 P ₁₀ = 12 Q ₁ = 16 Median = 22 Q ₃ = 37 P ₉₀ = 62 P ₉₉ = 90		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-Aug	12	11	11	15	15	11	16	13	14	14	27	20	18	12	21	27	56	45	26	54	62	57	29	19	62	
2-Aug	11	16	17	41	39	28	30	39	78	76	25	14	43	83	54	72	55	22	56	29	39	89	76	65	89	
3-Aug	60	33	26	31	27	21	42	37	31	23	47	85	87	23	31	28	70	26	39	51	83	67	23	60	87	
4-Aug	25	17	16	36	18	14	29	38	36	25	31	24	29	20	28	34	29	23	50	48	29	20	24	25	50	
5-Aug	27	22	29	21	18	12	17	28	62	82	34	20	31	22	23	32	22	24	19	14	12	20	41	81	82	
6-Aug	68	69	25	32	17	25	25	19	69	33	24	40	48	23	16	13	11	12	15	20	21	27	35	15	69	
7-Aug	60	85	44	13	23	58	67	34	31	18	14	15	16	14	20	17	20	25	21	15	19	14	85	45	85	
8-Aug	67	37	36	31	28	26	33	28	31	26	25	30	36	28	31	25	22	20	19	21	22	32	28	23	67	
9-Aug	24	19	16	16	15	17	15	13	15	15	18	18	17	17	16	18	19	17	16	17	21	27	20	19	27	
10-Aug	16	19	18	19	17	16	17	19	22	25	16	15	17	17	21	14	14	12	21	26	26	17	21	28	28	
11-Aug	11	12	9	10	10	10	11	16	15	25	23	38	23	36	25	86	59	24	17	60	87	52	28	24	87	
12-Aug	12	11	15	20	58	10	77	36	37	12	38	56	96	94	49	20	32	10	24	59	79	60	72	29	96	
13-Aug	29	15	16	14	16	13	13	10	25	52	24	14	14	15	13	13	13	12	16	81	53	37	36	81		
14-Aug	64	19	39	34	46	97	30	22	24	41	16	9	14	19	18	17	16	21	17	30	14	10	16	39	97	
15-Aug	33	27	14	12	13	22	13	12	13	19	31	13	13	57	25	15	14	11	15	25	10	11	11	21	57	
16-Aug	23	79	17	72	43	22	21	18	46	16	35	22	31	32	21	27	19	13	28	18	12	9	10	14	79	
17-Aug	14	12	12	14	12	15	14	14	26	34	23	16	16	16	18	45	97	74	22	73	51	65	26	45	97	
18-Aug	26	28	18	18	15	16	21	21	14	18	17	23	19	18	20	13	9	26	10	12	14	28	13	12	28	
19-Aug	19	35	37	50	22	19	16	18	14	13	19	19	19	17	13	23	18	14	10	16	24	61	49	16	61	
20-Aug	54	43	45	24	40	71	44	41	11	11	19	21	17	27	37	62	60	22	50	64	65	76	57	18	76	
21-Aug	41	12	18	13	11	17	15	47	66	88	83	23	42	53	29	31	31	14	11	27	61	80	50	44	88	
22-Aug	56	50	34	30	36	36	28	48	25	26	49	89	33	88	64	14	78	41	49	91	66	82	63	32	91	
23-Aug	31	30	28	33	30	21	30	19	60	19	19	11	16	18	18	21	18	20	17	21	21	18	13	12	60	
24-Aug	12	11	11	9	12	15	11	11	14	17	16	16	15	15	15	15	14	10	35	74	71	55	55	74	74	
25-Aug	36	17	13	11	11	10	10	10	10	19	77	15	19	22	19	13	22	23	18	47	42	16	13	11	77	
26-Aug	9	11	9	10	11	14	16	14	22	64	20	16	14	14	17	14	20	14	28	21	15	19	26	23	64	
27-Aug	54	83	63	49	58	44	29	20	77	68	102	39	12	17	29	29	21	16	18	21	26	39	15	10	102	
28-Aug	15	26	29	17	17	12	13	27	21	21	46	59	22	16	17	53	20	18	18	16	16	22	21	21	59	
29-Aug	25	23	22	14	14	15	13	15	14	21	22	46	20	25	32	16	10	33	26	76	82	68	47	61	82	
30-Aug	37	81	83	48	37	20	48	47	66	102	40	29	70	54	12	23	26	33	90	38	46	46	40	47	102	
31-Aug	26	60	33	69	88	32	21	36	39	24	12	12	17	17	14	17	29	30	24	19	21	21	20	15	88	
		68	85	83	72	88	97	77	48	78	102	102	89	96	94	64	86	97	74	90	91	87	89	85	81	
		Diurnal Maximum																								



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Athabasca Valley - August 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS08 FORT CHIPEWYAN AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
AUGUST 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	693	32	51	97.45	4.9	0	1.7	0
TRS (ppb) Average	708	35	36	99.87	3.5	0	1.2	0
O3(ppb) Average	708	34	36	99.73	57.2	0	39.3	-
NO2(ppb) Average	680	39	64	96.64	10.2	0	4.3	-
NO(ppb) Average	680	39	64	96.64	3	-	0.4	-
NOX(ppb) Average	680	39	64	96.64	10.4	-	4.5	-
PM2.5(ug/m3) Average	742	1	2	99.87	812.1	217	327.8	19
CO(ppm) Average	683	34	61	96.37	5.6	0	1.7	-
CO2(ppm) Average	706	35	38	99.6	479.4	-	455.1	-
Temperature 2 m (C) Average	744	0	0	100	28.1	-	21.1	-
Relative Humidity (%) Average	744	0	0	100	99.9	-	92.3	-
Wind Speed 10 m (km/h) Average	744	0	0	100	34	-	21	-
Wind Direction 10 m (deg) Average	744	0	0	100	-	-	-	-
PC(mm) Total	744	0	0	100	3.3	-	6.1	-
Leaf Wetness (% of range) Average	744	0	0	100	68.3	-	27.3	-
Global Solar Radiation (W/m2) Average	744	0	0	100	775.7	-	276.2	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)

AUGUST 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	693	0.32	0.5	-	0	0	0.1	0.1	0.4	0.7	4.9
TRS (ppb) Average	708	0.36	0.4	-	0.1	0.1	0.2	0.2	0.4	0.7	3.5
O3(ppb) Average	708	26.4	8.1	-	2.1	16.6	20.9	25.9	31.7	36.9	57.2
NO2(ppb) Average	680	0.93	1.3	-	0	0.1	0.2	0.5	1.1	2.2	10.2
NO(ppb) Average	680	0.14	0.2	-	0	0	0.1	0.1	0.2	0.3	3
NOX(ppb) Average	680	1.07	1.4	-	0	0.2	0.3	0.6	1.2	2.4	10.4
PM2.5(ug/m3) Average	742	74.1	105.5	-	1.7	4.5	12.4	38.4	90.7	188.6	812.1
CO(ppm) Average	683	0.41	0.7	-	0	0	0.1	0.2	0.4	1	5.6
CO2(ppm) Average	706	425.71	14.3	-	404.1	409.8	413.7	423	435.1	445	479.4
Temperature 2 m (C) Average	744	17.39	3.3	-	8.6	13.4	15.2	17.1	19.4	21.6	28.1
Relative Humidity (%) Average	744	73.3	14.4	-	29	52.6	63.3	75.3	83.9	90.9	99.9
Wind Speed 10 m (km/h) Average	744	11.6	6	-	1	5	8	11	15	19	34
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	23.19	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	4.55	10.7	-	0.1	0.6	0.9	1.1	1.4	11.7	68.3
Global Solar Radiation (W/m2) Average	744	172.86	213.1	-	0	0	0	72.1	292.9	517.3	775.7

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT CHIPEWYAN (AMS08)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS (except TRS)	24 Aug 2023 14:00	24 Aug 2023 14:00	1	Maintenance - sample manifold cleaned
ALL PARAMETERS	12 Aug 2023 19:00	12 Aug 2023 19:00	1	Station power failure
SO2	03 Aug 2023 23:00	04 Aug 2023 14:00	16	Unstable Operation - flatline in analyzer output signal
SO2	04 Aug 2023 15:00	04 Aug 2023 15:00	1	Maintenance - analyzer rebooted
NO2	28 Aug 2023 18:00	29 Aug 2023 16:00	23	Maintenance - stabilization post maintenance
CO	05 Aug 2023 02:00	05 Aug 2023 15:00	14	Unstable Operation - flatline in analyzer output signal
CO	30 Aug 2023 06:00	30 Aug 2023 16:00	11	Unstable Operation - flatline in analyzer output signal
CO2	30 Aug 2023 06:00	30 Aug 2023 06:00	1	DAS Failure - data not recorded



Wood Buffalo Environmental Association

Summary of Hour Averages

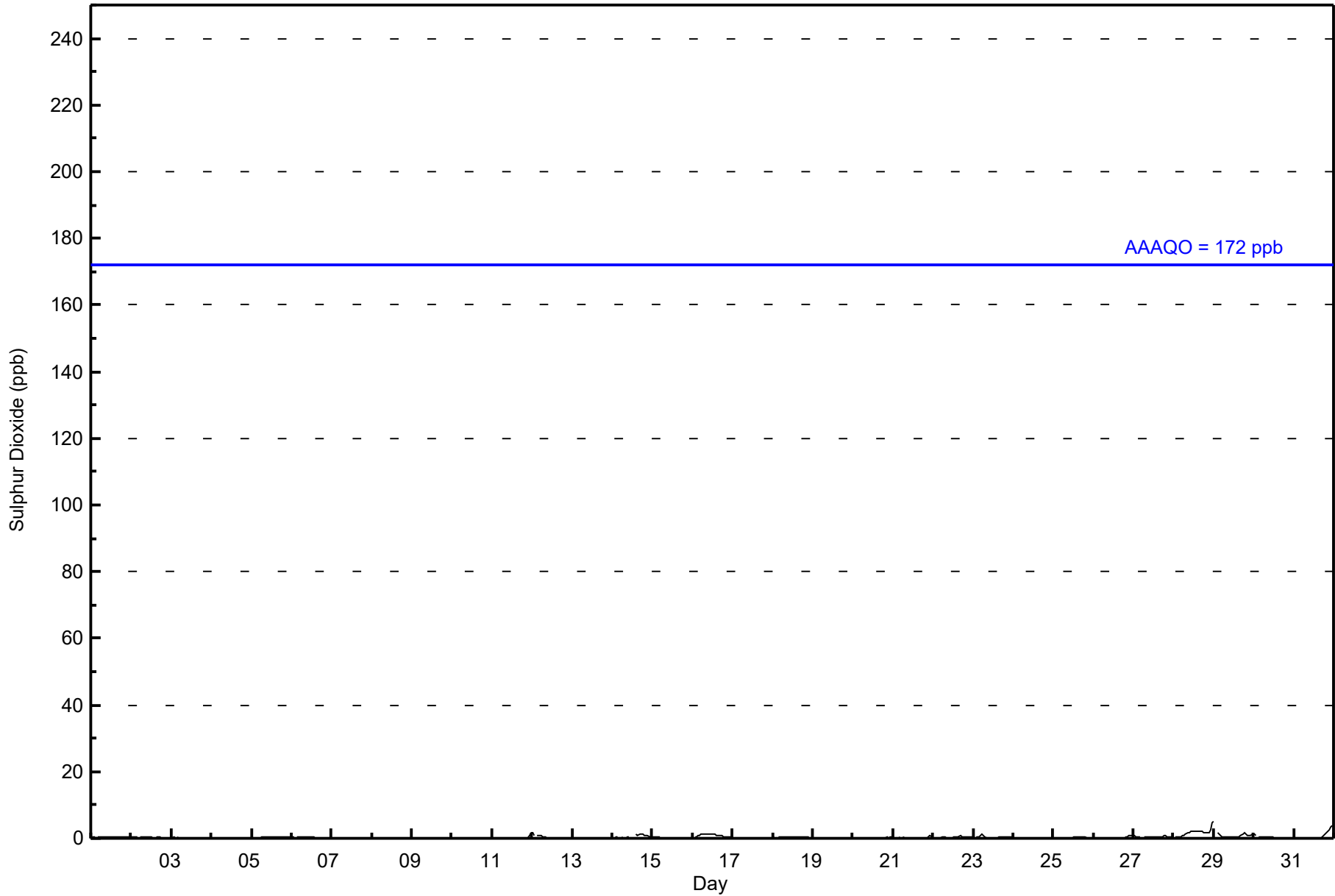
Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 4.9 ppb on Aug 29 01:00 Maximum Daily Average: 1.7 ppb on Aug 28																	Hours in Service: 744 Hours of Data: 693									
Minimum Value: 0.0 ppb on Aug 4 22:00 Minimum Daily Average: 0.0 ppb on Aug 17 Maximum Diurnal Average: 0.6 ppb at hour 24 Minimum Diurnal Average: 0.2 ppb at hour 3 Monthly Average: 0.32 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 2.2																	Hours of Missing Data: 51 Hours of Calibration: 32 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-Aug	0.3	0.4	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6
2-Aug	0.3	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
3-Aug	0.2	0.2	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	UO	UO	0.2	0.2
4-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
5-Aug	0.0	0.2	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5
6-Aug	0.5	0.5	Z	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5
7-Aug	0.1	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8-Aug	0.1	0.1	0.1	0.1	Z	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	0.1
9-Aug	0.0	0.0	0.0	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
10-Aug	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	0.1	0.1	0.1	0.1	0.2
11-Aug	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.4	1.6	1.6	0.1
12-Aug	1.8	0.9	Z	1.0	0.8	0.9	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	PF	0.1	0.1	0.1	0.1	0.1	0.1	0.3
13-Aug	0.1	0.1	0.1	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1
14-Aug	0.0	0.1	0.4	0.6	Z	0.2	0.1	0.0	0.0	0.3	0.5	C	C	C	1.1	0.9	1.1	1.2	1.1	1.0	0.9	0.7	0.6	0.4	0.6	1.2
15-Aug	0.4	0.3	0.3	0.3	0.3	Z	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	0.1	0.2	0.4	0.1
16-Aug	Z	0.4	0.5	0.8	1.0	1.2	1.4	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.9
17-Aug	0.2	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	0.0	0.0	0.1	0.1	0.2	0.0
18-Aug	0.2	0.3	Z	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.4
19-Aug	0.1	0.2	0.2	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2
20-Aug	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	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
21-Aug	0.2	0.2	0.2	0.2	0.2	Z	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	0.5	1.0	0.4	0.4	1.0
22-Aug	Z	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.7	0.6	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.3
23-Aug	0.4	Z	0.3	0.3	0.7	1.1	1.0	0.4	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	1.1
24-Aug	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
25-Aug	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.3	0.2	0.2	0.1	0.2	0.4
26-Aug	0.1	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	0.3	0.6	0.8	0.9	0.8	0.8	0.2
27-Aug	0.7	0.5	0.5	0.4	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.4	0.4	0.4	0.4	0.7
28-Aug	Z	0.3	0.3	0.4	0.5	0.7	0.9	1.1	1.5	1.8	2.0	2.1	2.2	2.2	2.2	2.2	2.1	2.0	1.8	1.7	1.6	1.6	2.6	4.7	4.7	1.7
29-Aug	4.9	Z	1.7	1.1	0.7	0.6	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.7	1.2	1.6	1.4	1.0	1.0	1.0	1.2	1.2	1.0
30-Aug	1.2	1.0	Z	0.6	0.5	0.4	0.4	0.4	0.4	0.5	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	0.0	0.0	0.3
31-Aug	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	0.5	1.0	1.6	2.2	2.7	3.4	4.0	4.0	0.7
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation 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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	693	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: 693

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan - August 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	19	15	27	103	39	38	27	35	48	51	56	61	69	58	34	693
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	13	19	15	27	103	39	38	27	35	48	51	56	61	69	58	34	693

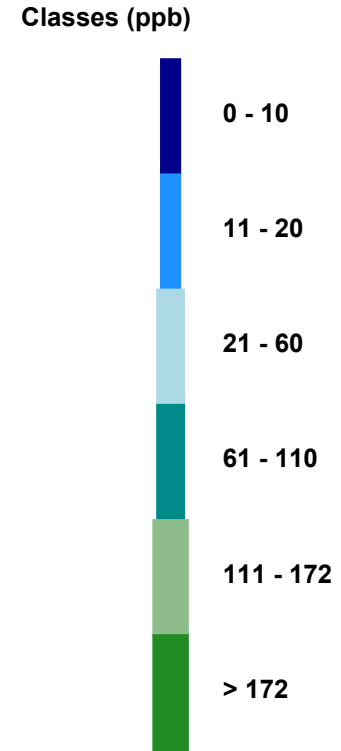
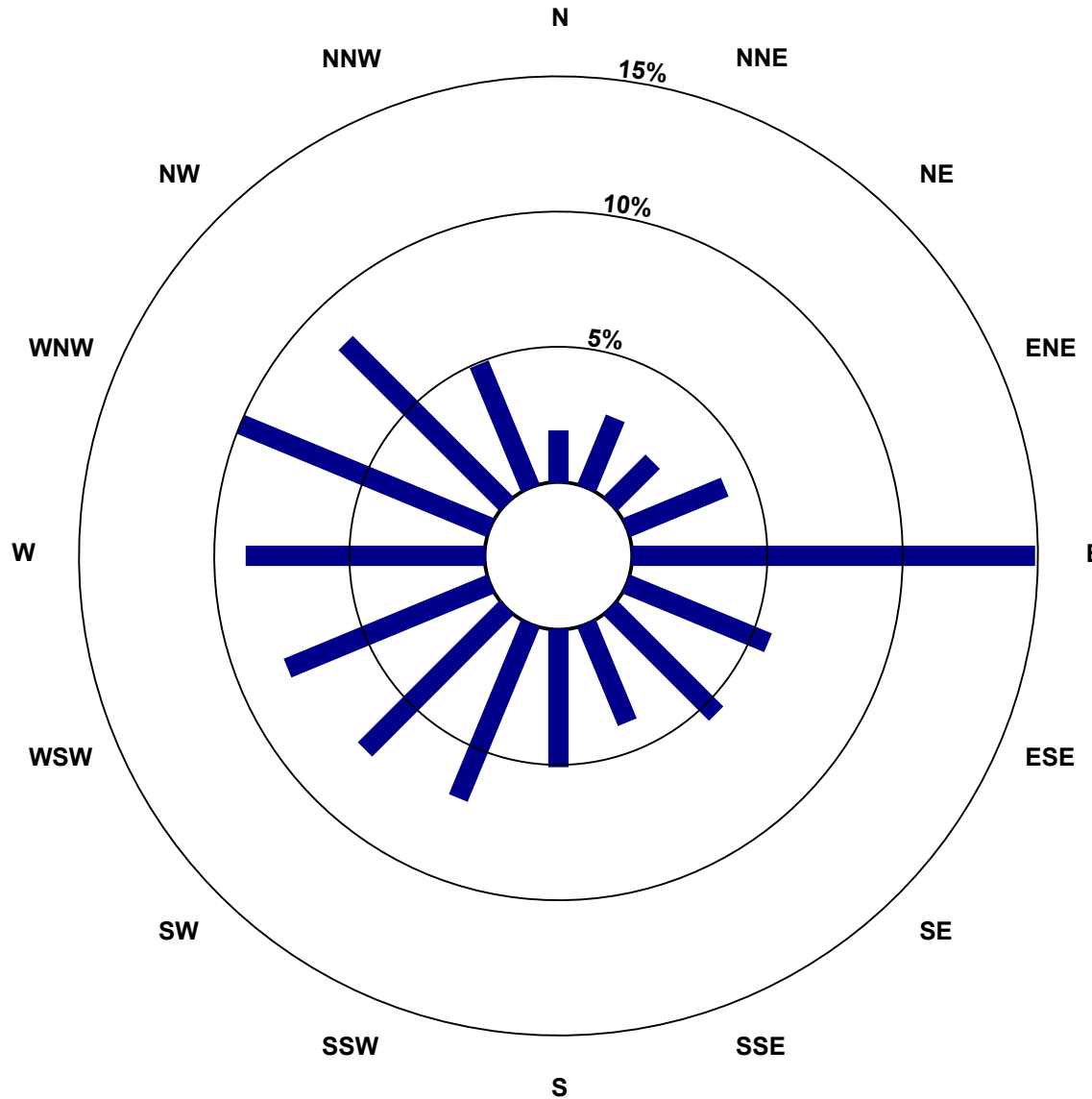
Total Number of Valid Hours: 693

Total Number of Hours: 744

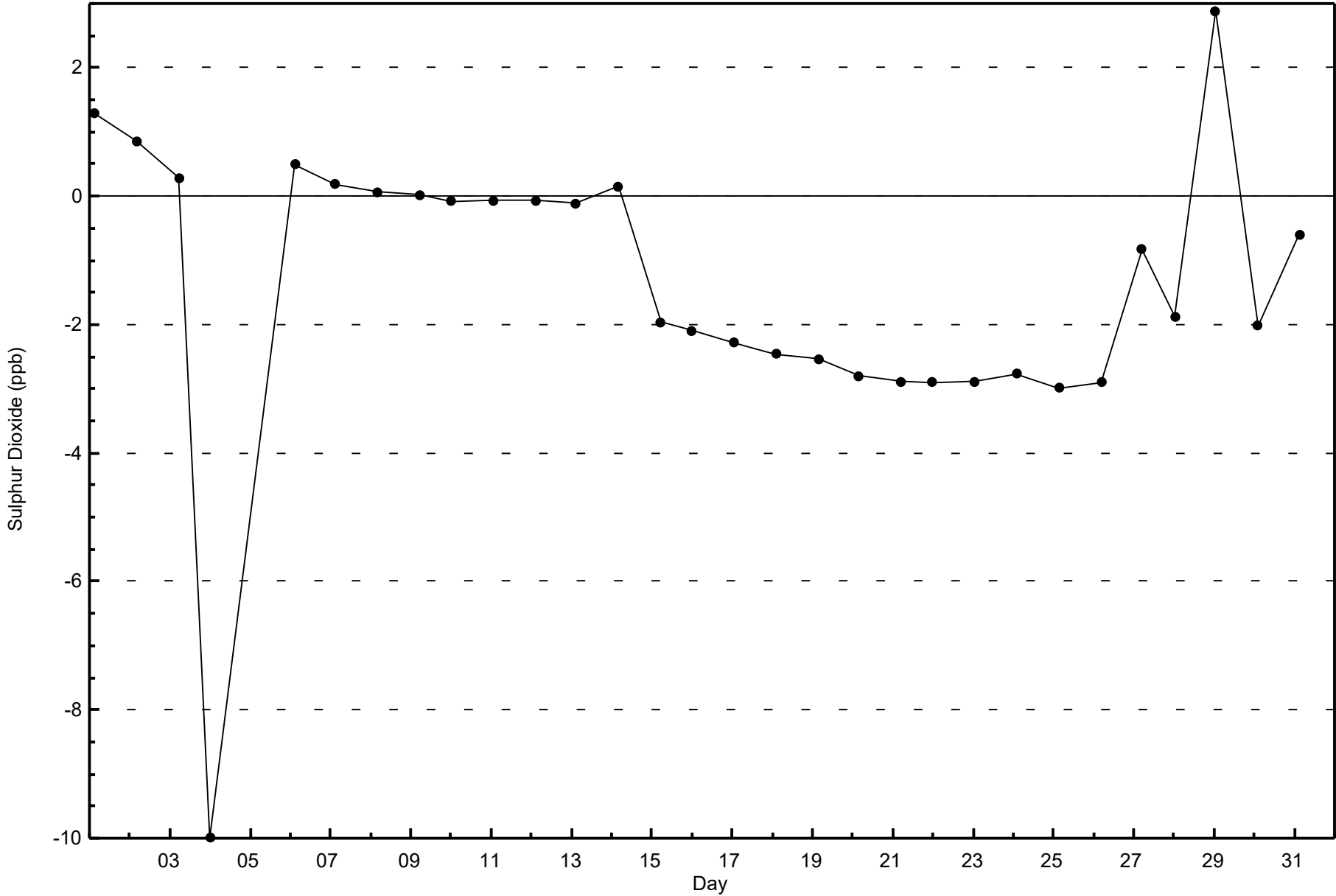


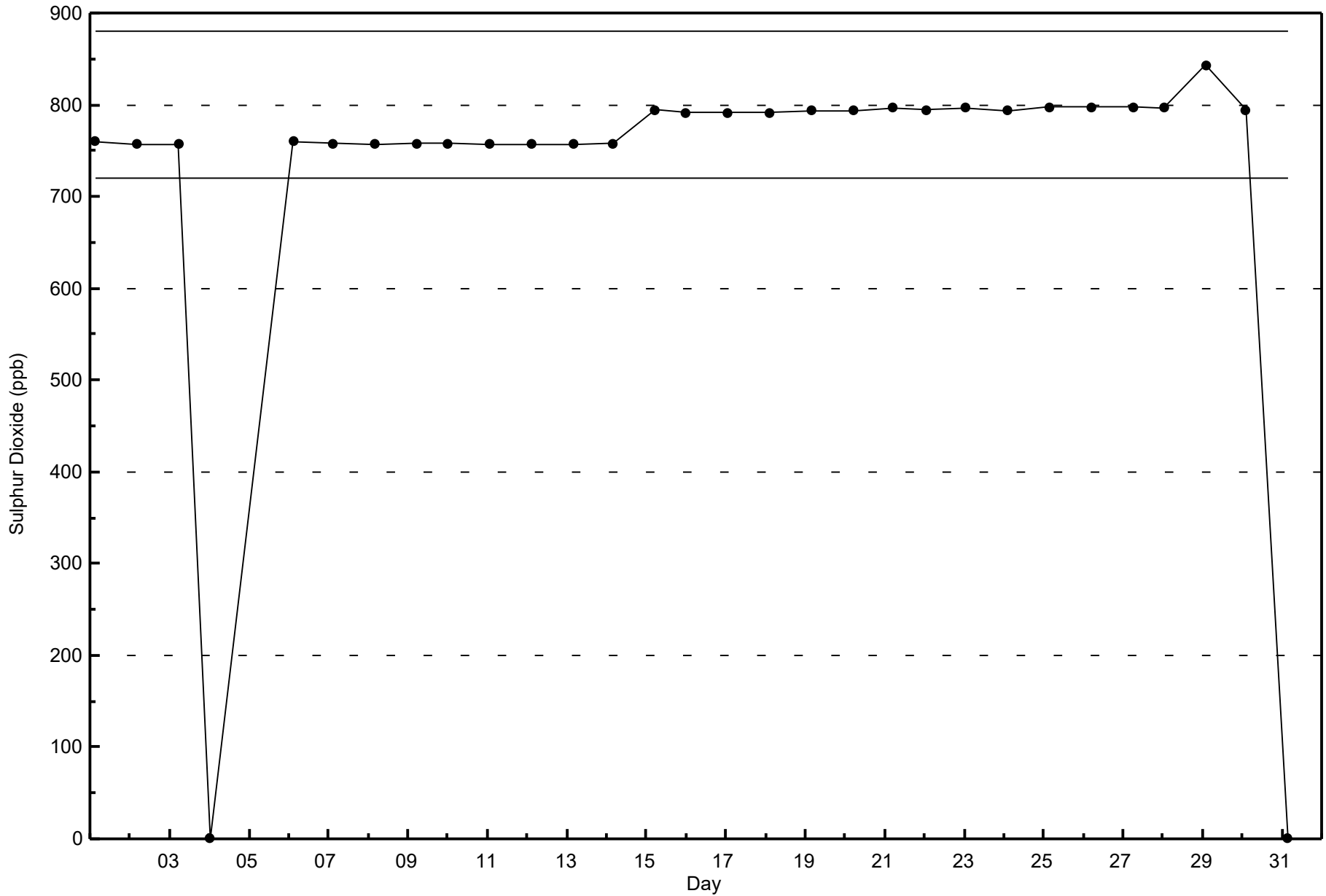
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Fort Chipewyan



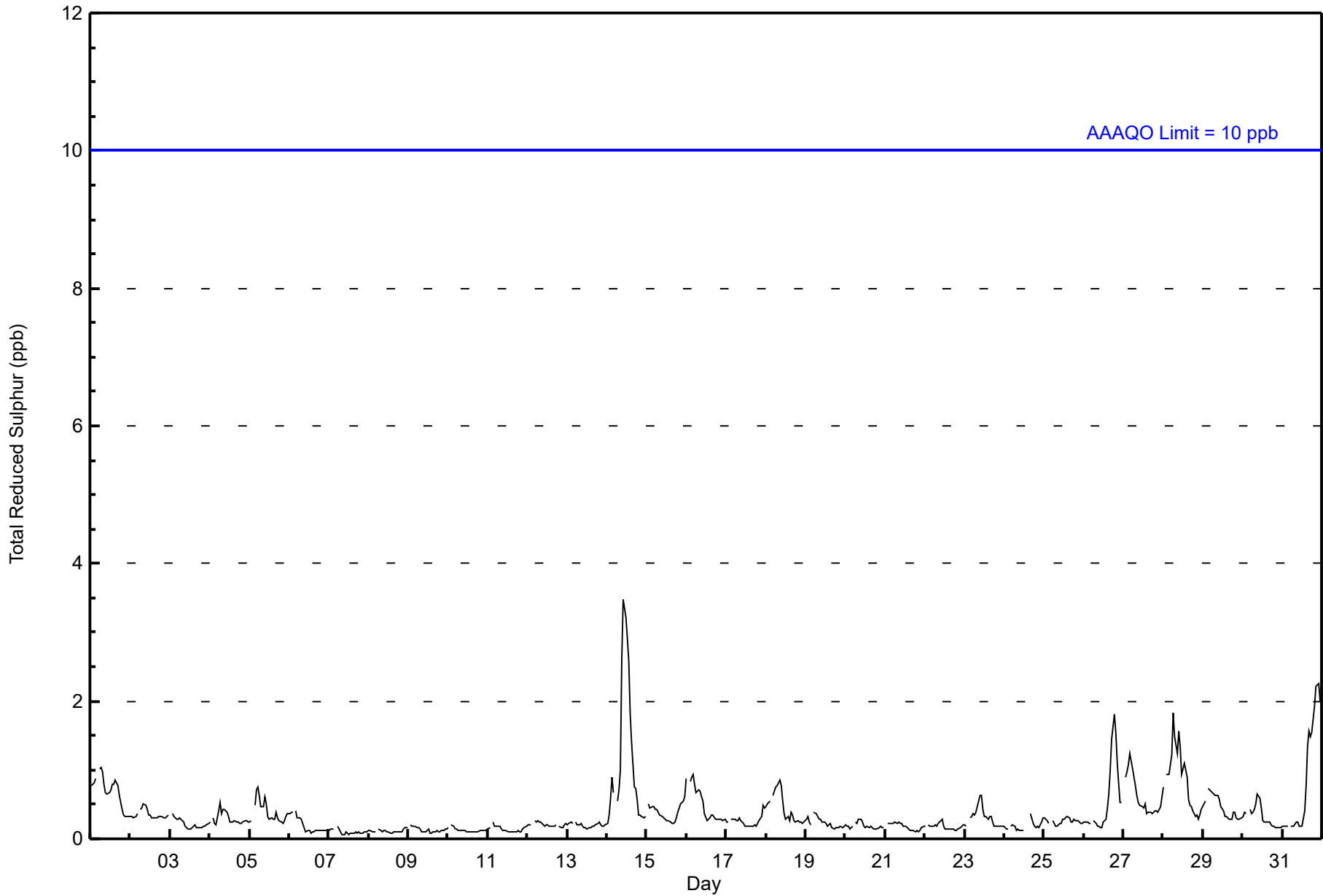
Total Number of Valid Hours: 693







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744						
Maximum Value: 3.5 ppb on Aug 14 11:00		Maximum Daily Average: 1.2 ppb on Aug 14		Hours of Data:														708								
Minimum Value: 0.1 ppb on Aug 7 09:00		Minimum Daily Average: 0.1 ppb on Aug 7		Hours of Missing Data:														36								
Maximum Diurnal Average: 0.4 ppb at hour 10		Minimum Diurnal Average: 0.3 ppb at hour 22		Hours of Calibration:														35								
Monthly Average: 0.36 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.7 P ₉₉ = 2.2		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-Aug	0.8	0.8	0.8	0.9	Z	1.0	1.0	1.0	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.7	1.0
2-Aug	0.3	0.3	0.3	0.3	0.4	Z	0.4	0.4	0.5	0.5	0.4	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	0.4	0.5
3-Aug	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
4-Aug	0.2	Z	0.3	0.2	0.2	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.5
5-Aug	0.3	0.3	Z	0.5	0.7	0.8	0.6	0.5	0.5	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.8
6-Aug	0.4	0.4	0.4	Z	0.4	0.3	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	0.1	0.1	0.1	0.1	0.2	0.4
7-Aug	0.1	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
8-Aug	0.1	0.1	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	0.2	0.2	0.1	0.2
9-Aug	Z	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	0.1	0.1	0.1	0.1	0.1	0.2
10-Aug	0.2	Z	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	0.1	0.1	0.2
11-Aug	0.1	0.2	Z	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	0.2	0.1	0.2	0.2
12-Aug	0.2	0.2	0.2	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
13-Aug	0.2	0.2	0.2	0.2	Z	0.3	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	0.3
14-Aug	0.2	0.3	0.6	0.9	0.7	Z	0.5	0.7	1.0	2.6	3.5	3.2	2.9	2.6	1.8	1.4	0.8	0.7	0.6	0.3	0.3	0.3	0.3	0.3	1.2	3.5
15-Aug	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.4	0.6
16-Aug	0.9	Z	0.8	0.9	0.9	0.8	0.7	0.7	0.7	0.6	0.6	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	0.5	0.9
17-Aug	0.2	0.2	Z	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	0.3	0.3	0.5	0.5	0.3	0.5
18-Aug	0.5	0.5	0.5	Z	0.6	0.7	0.8	0.8	0.9	0.8	0.6	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.4	0.9
19-Aug	0.3	0.3	0.2	0.2	Z	0.4	0.4	0.3	0.3	0.3	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	0.4
20-Aug	0.2	0.2	0.2	0.1	0.2	Z	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
21-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
22-Aug	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	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
23-Aug	0.2	0.2	Z	0.3	0.3	0.4	0.3	0.4	0.6	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6
24-Aug	0.2	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	C	C	C	C	0.4	0.2	0.2	0.2	0.2	0.2	0.3	0.4
25-Aug	0.3	0.3	0.3	0.2	Z	0.3	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	0.3	0.3	0.3	0.3	0.2	0.2	0.3
26-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.6	1.0	1.4	1.8	1.5	1.1	0.8	0.5	0.5	0.6	1.8	
27-Aug	Z	0.9	1.0	1.1	1.2	1.0	0.9	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	1.2	
28-Aug	0.8	Z	0.9	0.9	1.1	1.2	1.8	1.5	1.2	1.6	1.3	0.9	1.0	1.1	0.9	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.4	1.8	
29-Aug	0.5	0.5	Z	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.7	
30-Aug	0.3	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	
31-Aug	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.8	1.3	1.6	1.5	1.6	1.9	2.2	2.2	2.3	2.0	2.3	
																								Diurnal Average		
																								Diurnal Maximum		
																								0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 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		
																								0.9 0.9 1.0 1.1 1.2 1.2 1.8 1.5 1.2 2.6 3.5 3.2 2.9 2.6 1.8 1.4 1.6 1.5 1.8 1.9 2.2 2.2 2.3 2.0		
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

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.29	99.29
3 - 4	5	0.71	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 - August 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	12	19	16	27	99	39	39	26	37	46	52	55	71	71	58	36	703
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	5
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	12	19	16	27	99	39	39	26	37	46	52	55	73	74	58	36	708

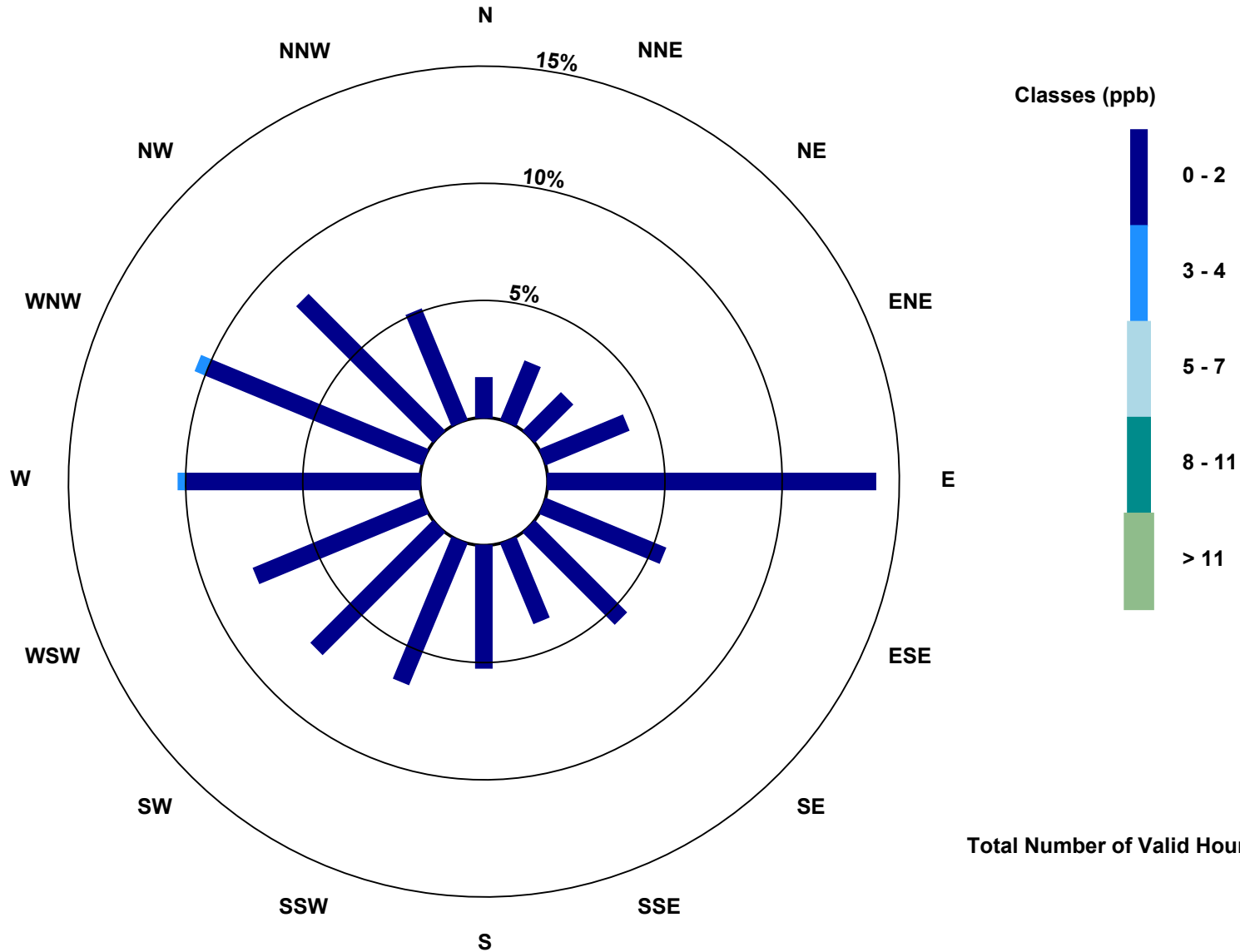
Total Number of Valid Hours: 708

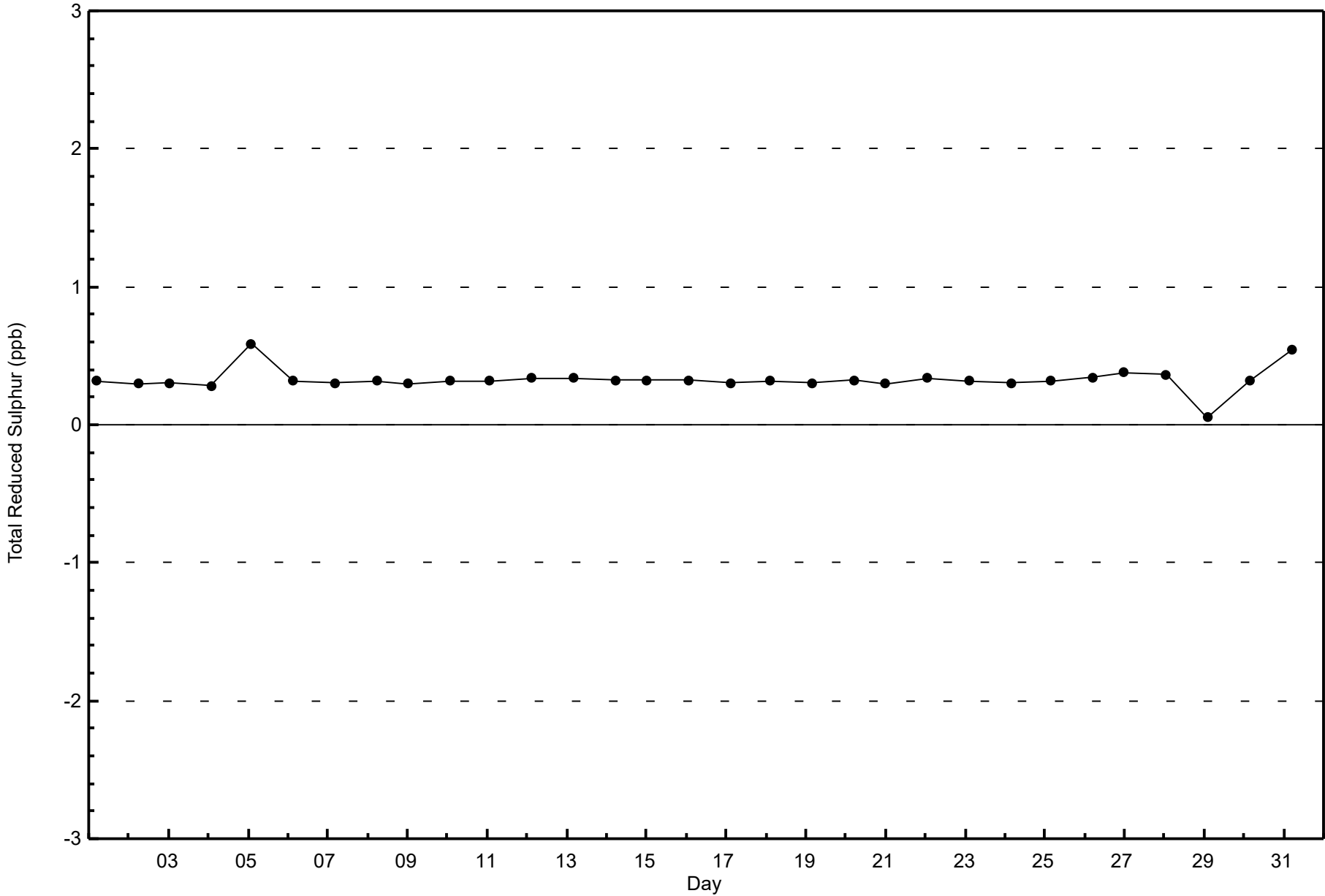
Total Number of Hours: 744

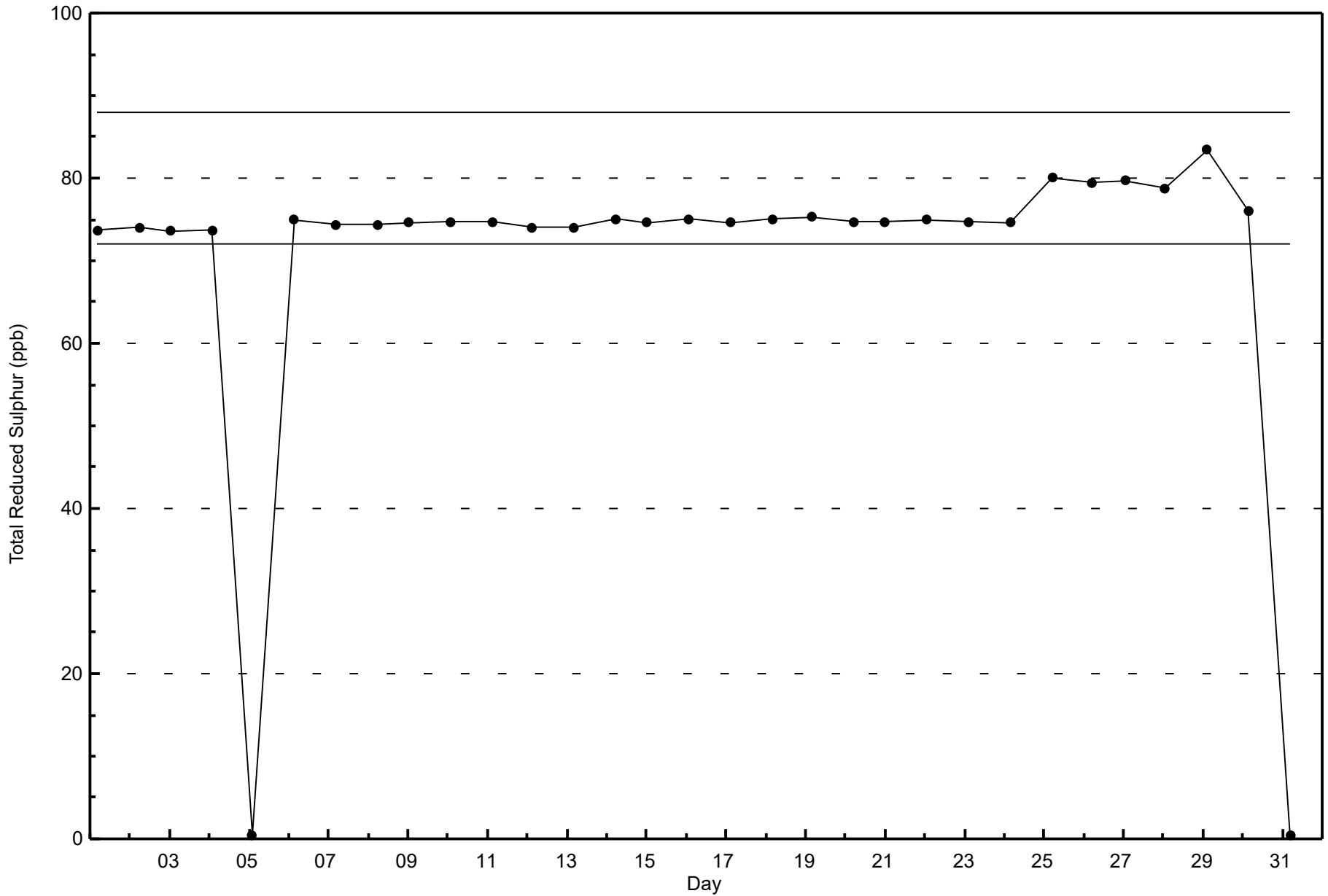


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Fort Chipewyan



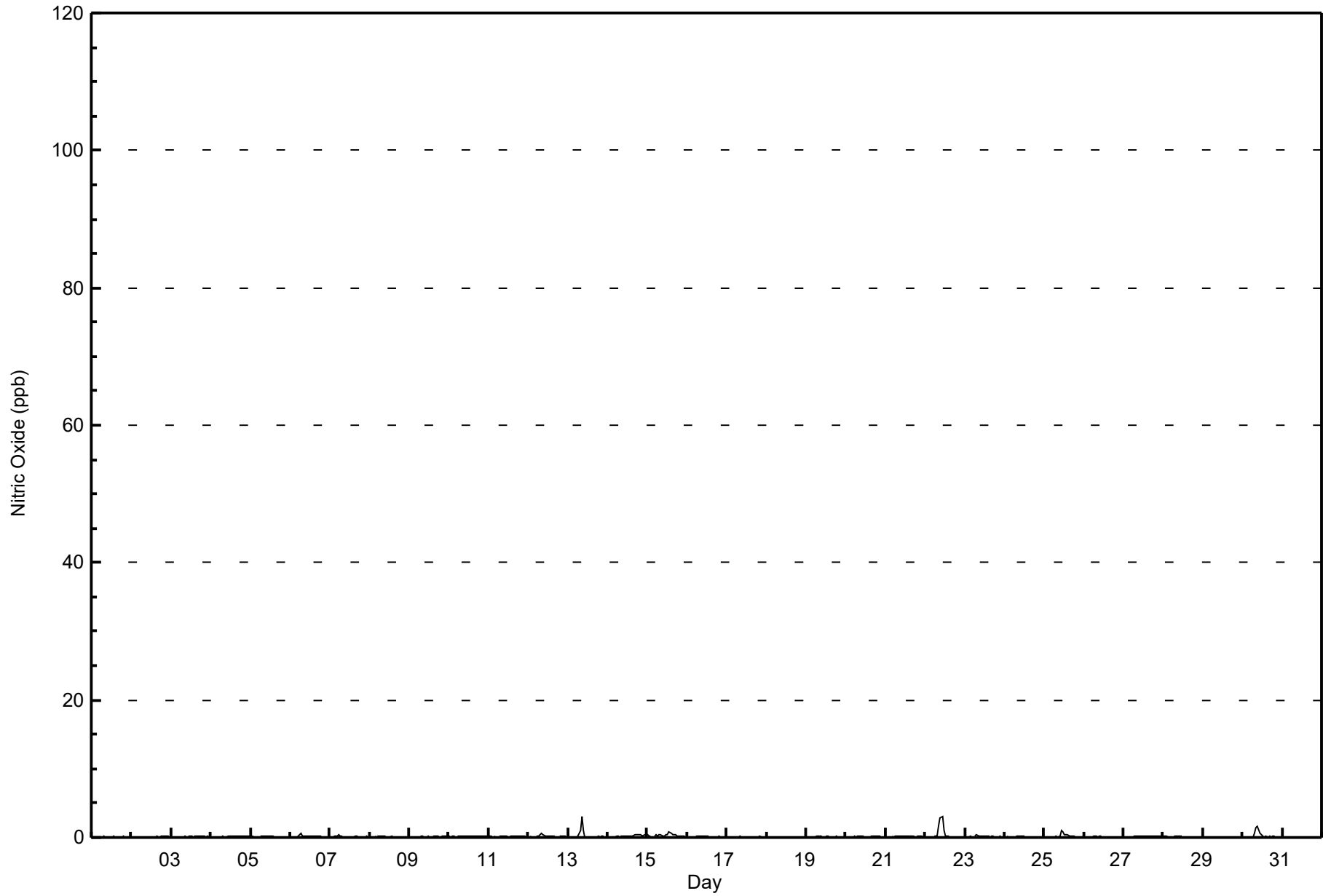






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Fort Chipewyan - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort Chipewyan - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	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: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Chipewyan - August 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	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680
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	14	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680

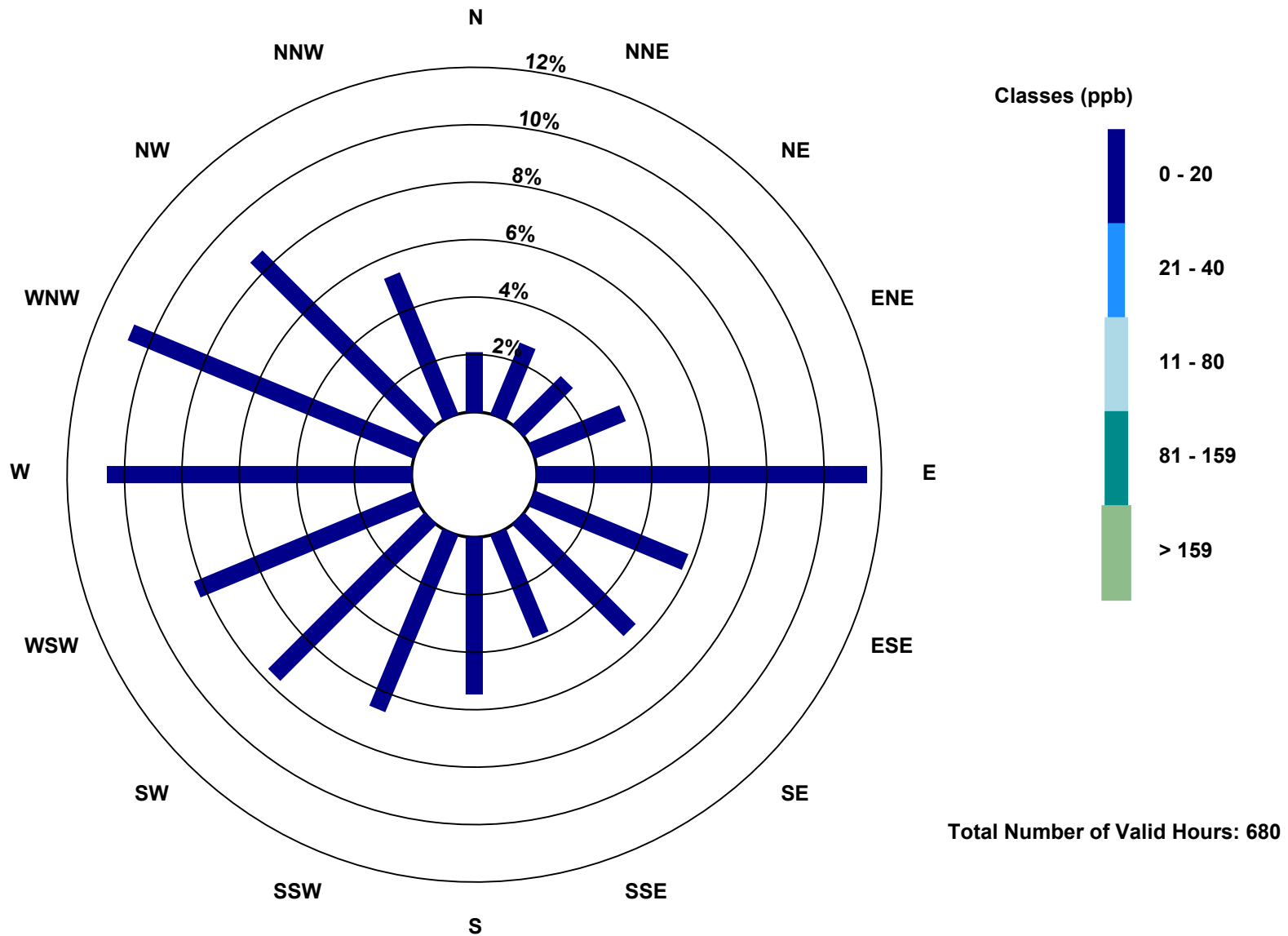
Total Number of Valid Hours: 680

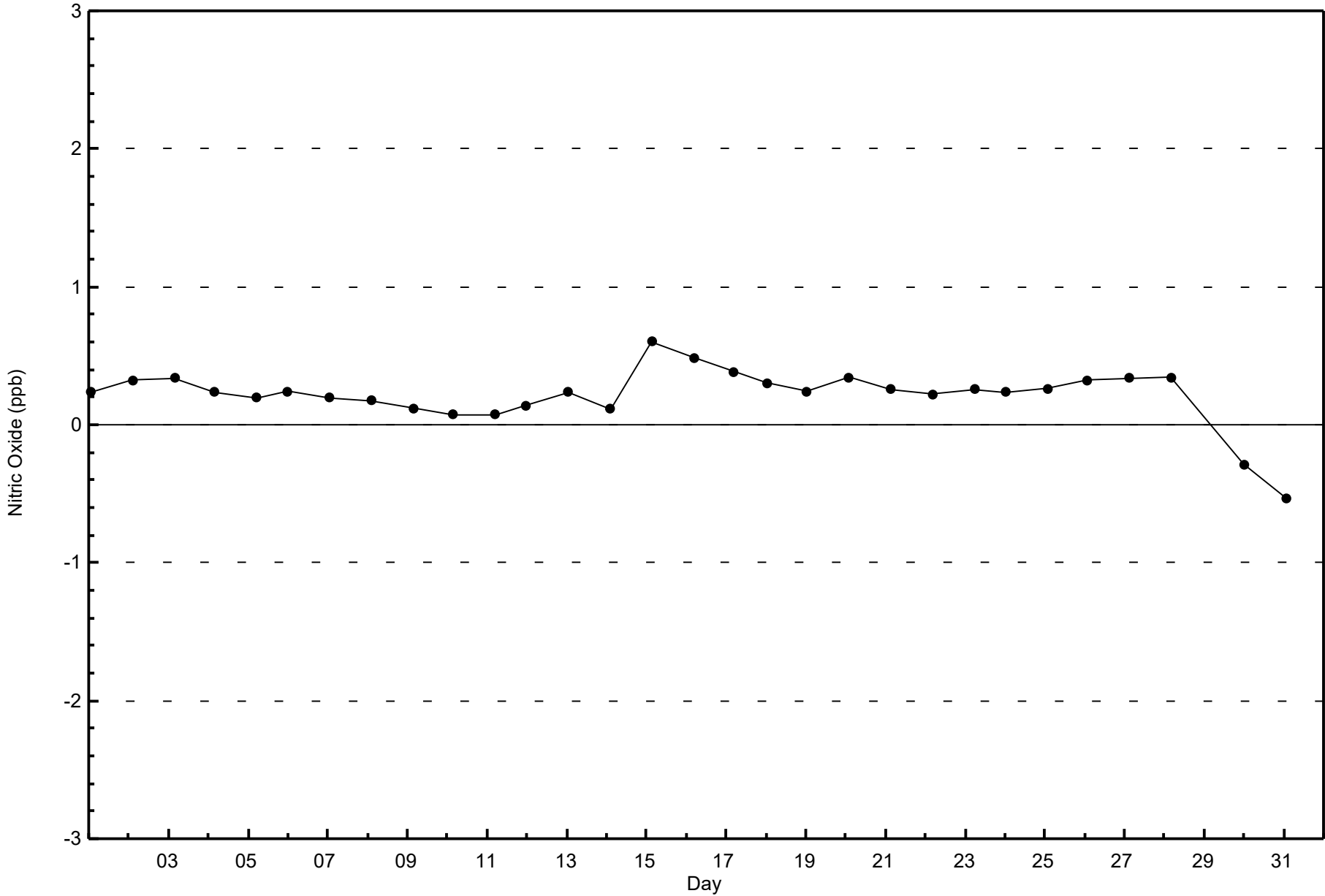
Total Number of Hours: 744

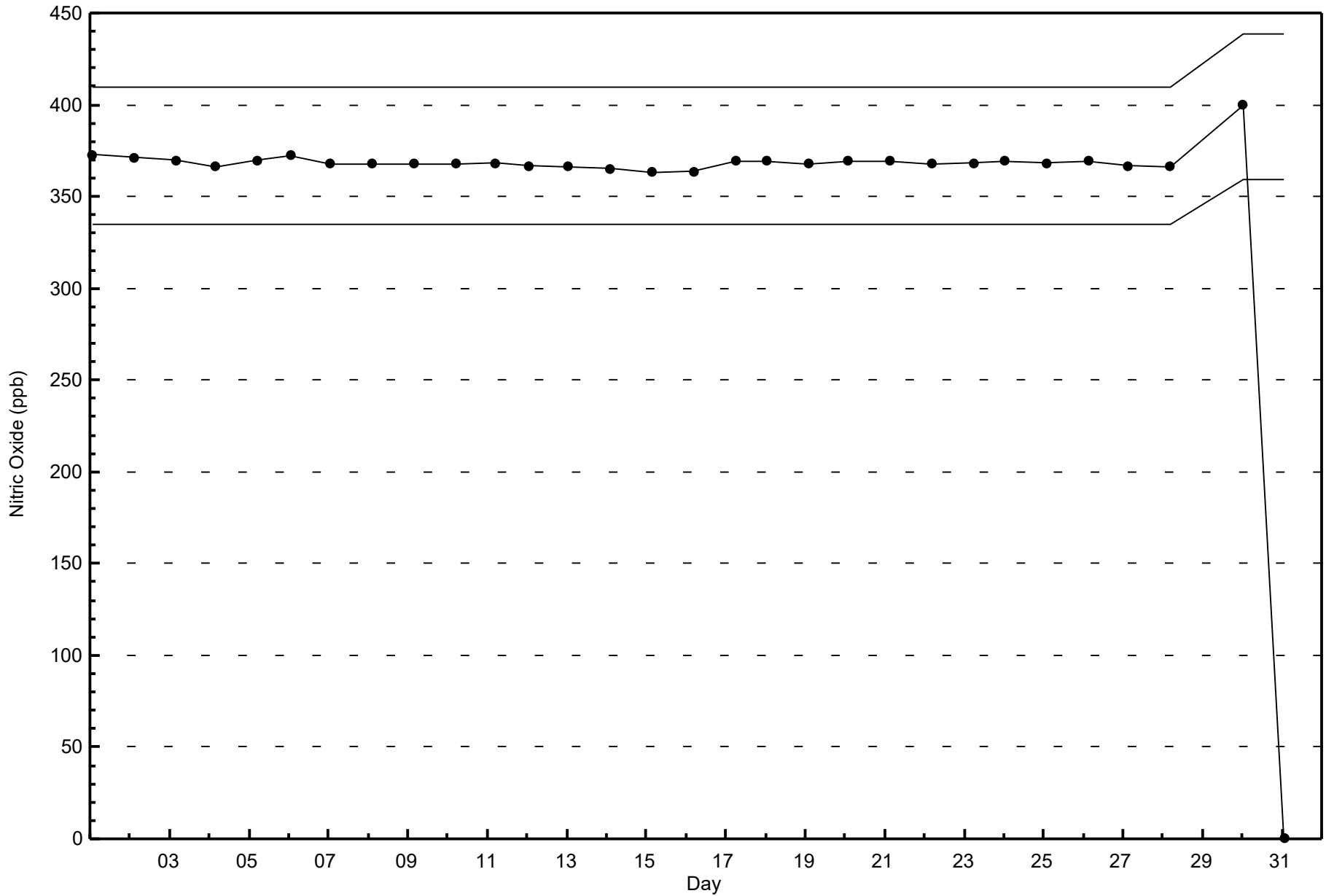


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 10.2 ppb on Aug 14 11:00	Maximum Daily Average: 4.3 ppb on Aug 14		Hours of Data:	680
Minimum Value: 0.0 ppb on Aug 2 07:00	Minimum Daily Average: 0.0 ppb on Aug 19		Hours of Missing Data:	64
Maximum Diurnal Average: 1.4 ppb at hour 4	Minimum Diurnal Average: 0.7 ppb at hour 23		Hours of Calibration:	39
Monthly Average: 0.93 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.5 Q ₃ = 1.1 P ₉₀ = 2.2 P ₉₉ = 6.5		Percent Operational Time:	96.6

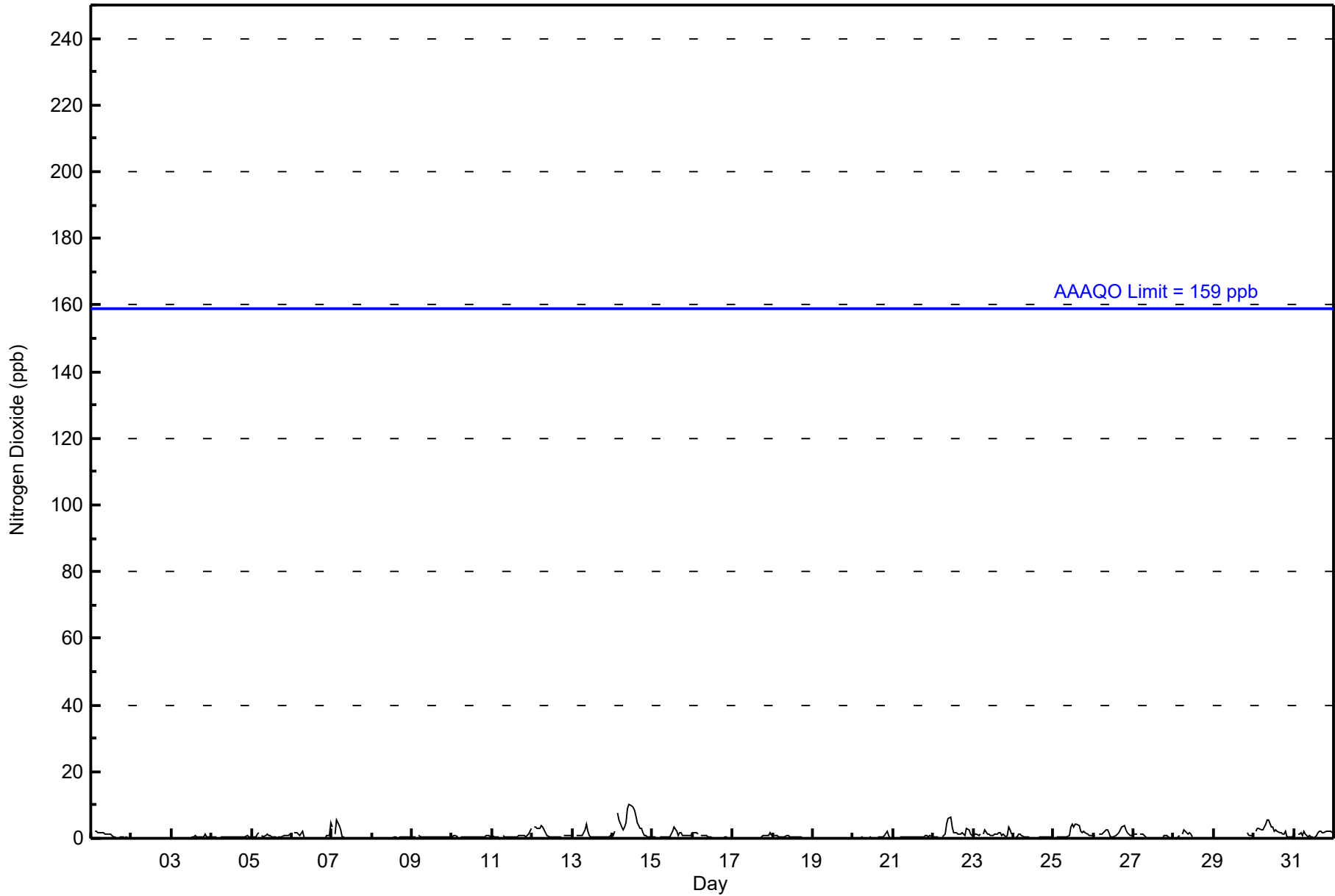
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	2.2	Z	2.0	2.3	1.8	1.5	1.7	1.9	1.4	1.1	1.1	1.2	0.9	0.5	0.3	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.2	0.2	1.0	2.3																							
2-Aug	0.2	0.2	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.0	0.1	0.2																							
3-Aug	0.1	0.1	0.0	Z	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.7	0.6	0.4	0.4	0.6	0.6	1.1	0.3	0.3	0.3	0.3	1.1																							
4-Aug	0.3	0.4	0.4	0.5	Z	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.3	0.4	0.5	0.8	0.6	0.5	0.4	0.8																							
5-Aug	0.4	0.4	0.5	1.4	1.8	Z	0.9	0.6	0.8	1.3	0.9	0.7	0.5	0.6	0.4	0.1	0.3	0.6	0.6	0.8	0.8	0.9	1.0	1.3	0.8	1.8																							
6-Aug	Z	1.5	1.5	1.6	1.2	0.8	2.2	0.5	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	0.8	0.9	4.5	0.7	4.5																							
7-Aug	3.5	Z	1.1	5.5	3.7	2.7	0.5	0.5	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.9	5.5																							
8-Aug	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	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.4																							
9-Aug	0.3	0.3	0.3	Z	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.6	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.7																							
10-Aug	0.6	0.9	0.8	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8	1.0	0.6	0.5	1.0																							
11-Aug	0.7	0.6	0.6	0.6	0.5	Z	0.7	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.7	0.5	0.7	1.4	2.9	0.7	2.9																							
12-Aug	Z	3.2	3.6	3.0	3.0	3.7	3.3	2.7	1.8	1.0	0.6	0.5	0.4	0.4	0.4	0.5	0.5	PF	0.9	0.8	0.9	0.8	0.7	1.5	3.7																								
13-Aug	0.7	Z	0.8	0.7	0.8	0.8	1.0	2.4	4.2	2.2	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.9	4.2																								
14-Aug	1.0	2.0	Z	7.6	5.6	3.4	2.4	3.2	4.8	9.1	10.2	9.6	9.5	8.4	6.7	4.7	2.8	2.8	1.8	0.8	0.8	0.6	0.5	0.4	4.3	10.2																							
15-Aug	0.4	0.4	0.4	Z	0.5	0.5	0.6	0.6	0.5	0.6	0.6	1.1	2.1	3.2	2.2	0.9	1.6	1.7	0.7	0.9	1.0	1.0	0.8	0.9	1.0	3.2																							
16-Aug	1.8	1.9	1.7	1.4	Z	1.0	0.7	0.8	0.7	0.6	0.5	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.1	0.0	0.0	0.6	1.9																							
17-Aug	0.0	0.0	0.0	0.0	0.1	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.8	0.7	1.0	0.8	1.6	0.9	0.3	1.6																							
18-Aug	Z	0.8	0.7	0.6	0.6	0.5	0.4	0.3	0.8	0.7	0.4	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.2	0.0	0.1	0.0	0.0	0.1	0.4	0.8																							
19-Aug	0.1	Z	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1																							
20-Aug	0.1	0.2	Z	0.2	0.1	0.4	0.2	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.3	0.6	0.6	0.4	0.9	2.0	1.0	0.1	0.1	0.4	2.0																							
21-Aug	0.1	0.1	0.1	Z	0.3	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.8	0.7	0.5	0.8	0.5	0.4	0.8																							
22-Aug	0.4	0.4	0.4	0.5	Z	0.6	1.0	1.1	4.1	5.9	6.5	3.2	1.9	1.8	1.6	1.2	1.4	1.6	1.3	0.9	2.9	2.4	1.4	0.9	1.9	6.5																							
23-Aug	0.8	1.1	1.2	1.0	1.1	Z	1.3	2.4	1.2	1.1	0.7	0.8	0.8	1.3	1.3	1.6	1.6	0.9	1.1	0.6	0.7	3.2	2.6	1.2	1.3	3.2																							
24-Aug	Z	0.4	0.3	1.3	1.2	0.8	0.5	0.4	0.3	0.3	0.2	0.2	0.2	M	0.2	0.2	0.3	0.3	0.6	0.5	0.5	0.6	0.4	0.4	0.5	1.3																							
25-Aug	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.9	3.6	4.3	3.6	4.3	3.9	2.3	1.9	2.1	1.8	1.3	1.0	0.8	0.7	1.8	1.8	4.3																							
26-Aug	0.9	1.0	Z	1.2	1.1	1.3	1.5	2.6	2.6	1.9	0.6	0.4	0.6	0.8	1.3	1.8	2.4	3.3	3.7	2.7	1.8	1.3	1.0	0.9	1.6	3.7																							
27-Aug	1.3	1.2	1.1	Z	1.2	1.1	0.7	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.7	0.3	0.1	0.1	0.5	1.3																							
28-Aug	0.1	0.1	0.2	0.8	Z	1.3	2.5	2.1	1.4	1.9	1.2	0.4	C	C	C	C	C	C	M	M	M	M	M	M	--	2.5																							
29-Aug	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	1.7	0.9	0.9	0.9	--	1.7																							
30-Aug	Z	2.2	2.9	2.9	2.4	2.6	3.3	4.2	5.6	5.4	3.6	3.3	2.3	2.4	2.3	1.6	1.7	1.1	1.3	2.1	0.5	0.3	0.4	0.4	2.4	5.6																							
31-Aug	1.5	Z	1.2	1.4	1.8	0.7	2.0	1.3	0.6	0.8	0.4	0.3	0.2	0.9	1.7	2.2	2.1	1.8	1.9	2.2	2.1	2.0	2.1	1.8	1.4	2.2																							
																								0.7	0.8	0.9	1.4	1.2	1.0	1.0	1.1	1.2	1.3	1.2	1.0	0.9	1.0	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.8	Diurnal Average		
																								3.5	3.2	3.6	7.6	5.6	3.7	3.3	4.2	5.6	9.1	10.2	9.6	9.5	8.4	6.7	4.7	2.8	3.3	3.7	2.7	2.9	3.2	2.6	4.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	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: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan - August 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	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680
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	14	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680

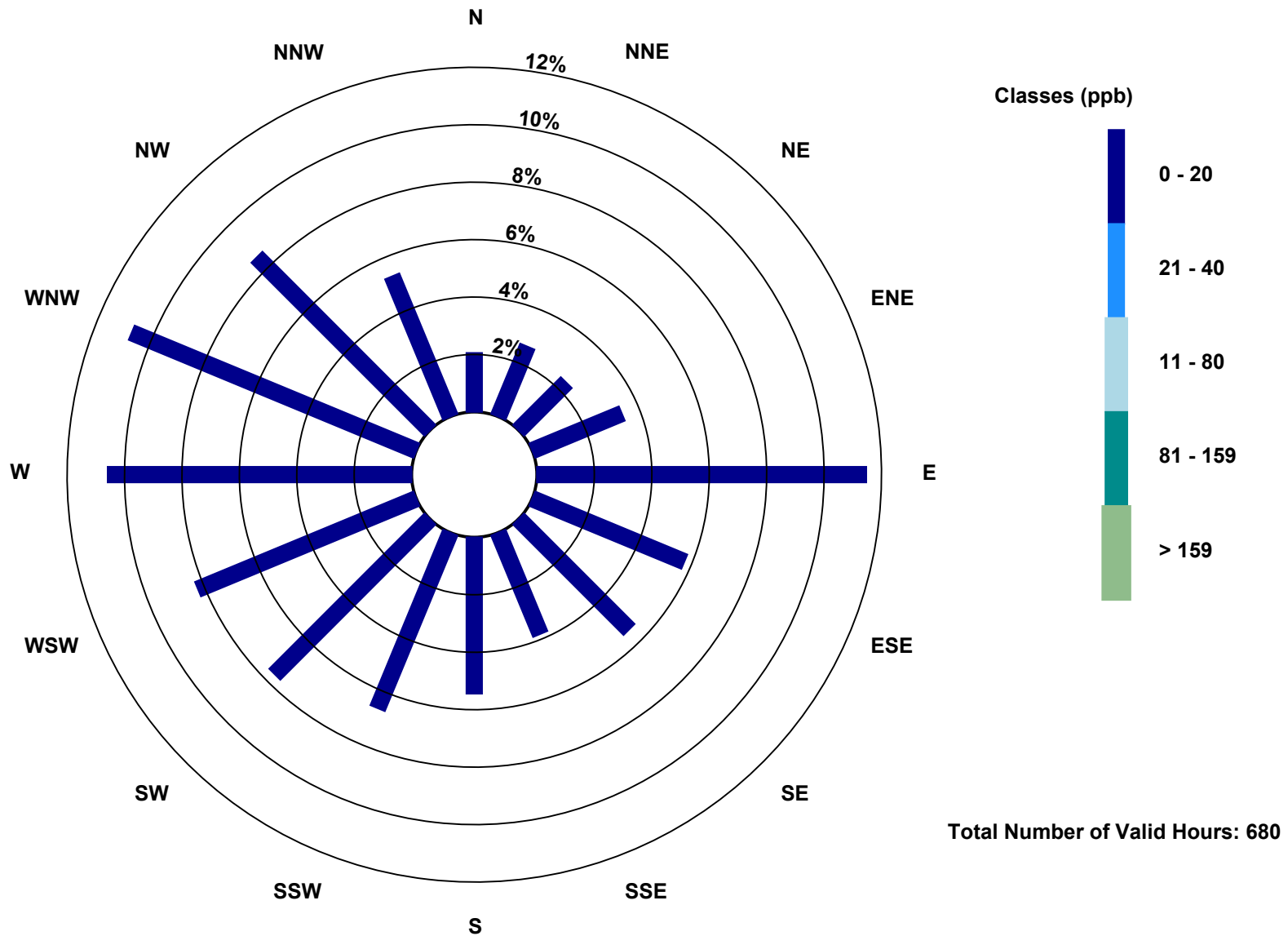
Total Number of Valid Hours: 680

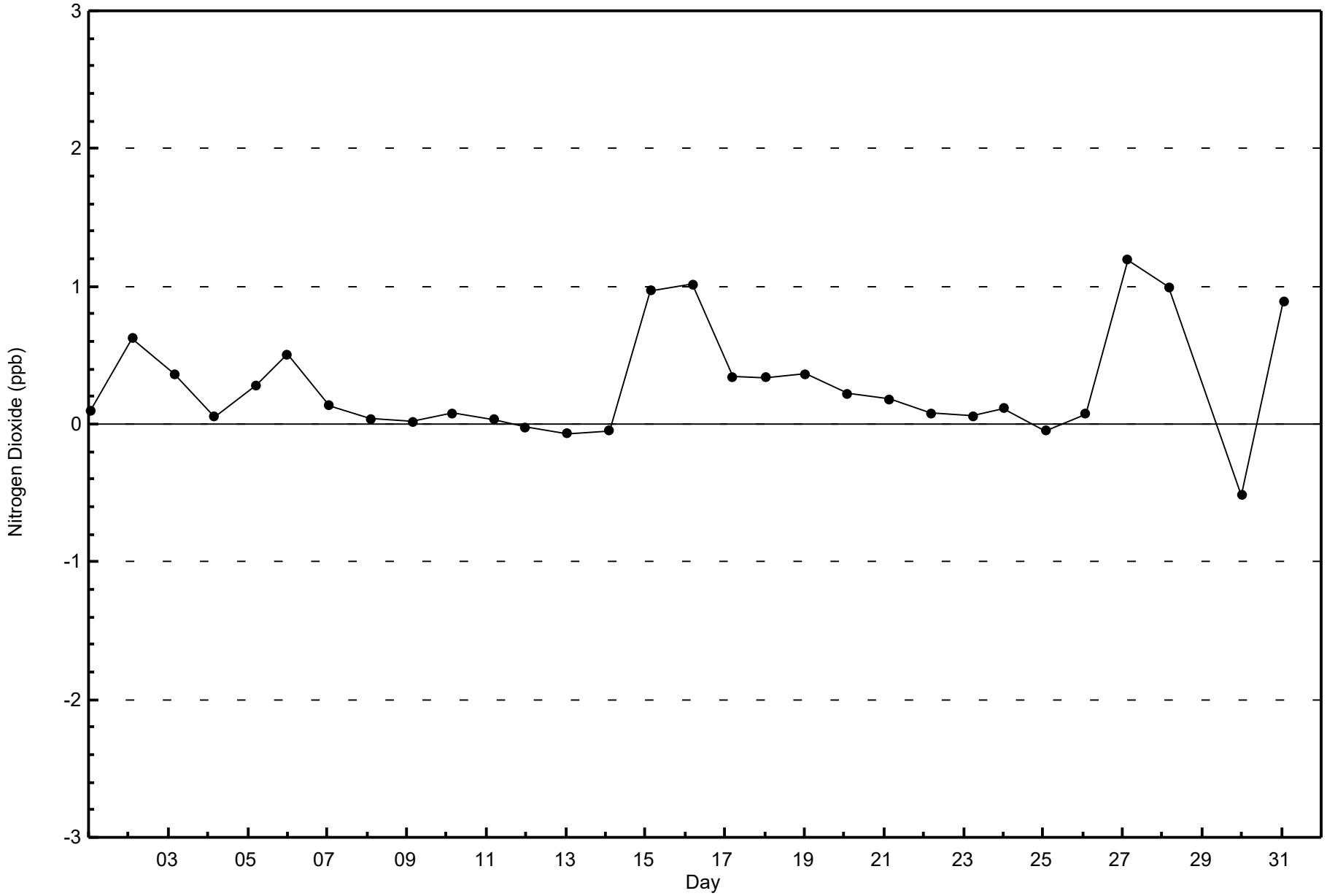
Total Number of Hours: 744

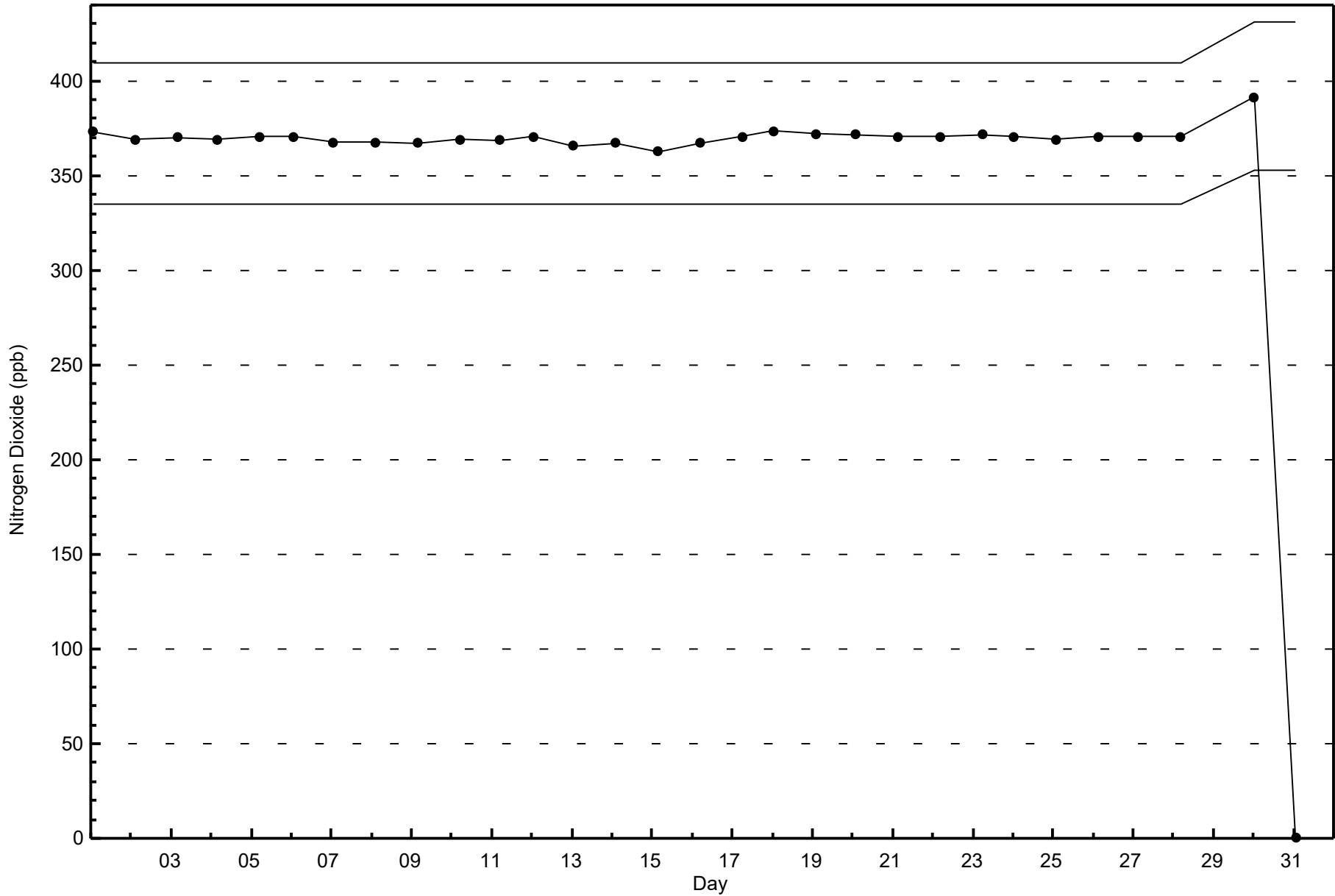


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Chipewyan









Wood Buffalo Environmental Association
Summary of Hour Averages

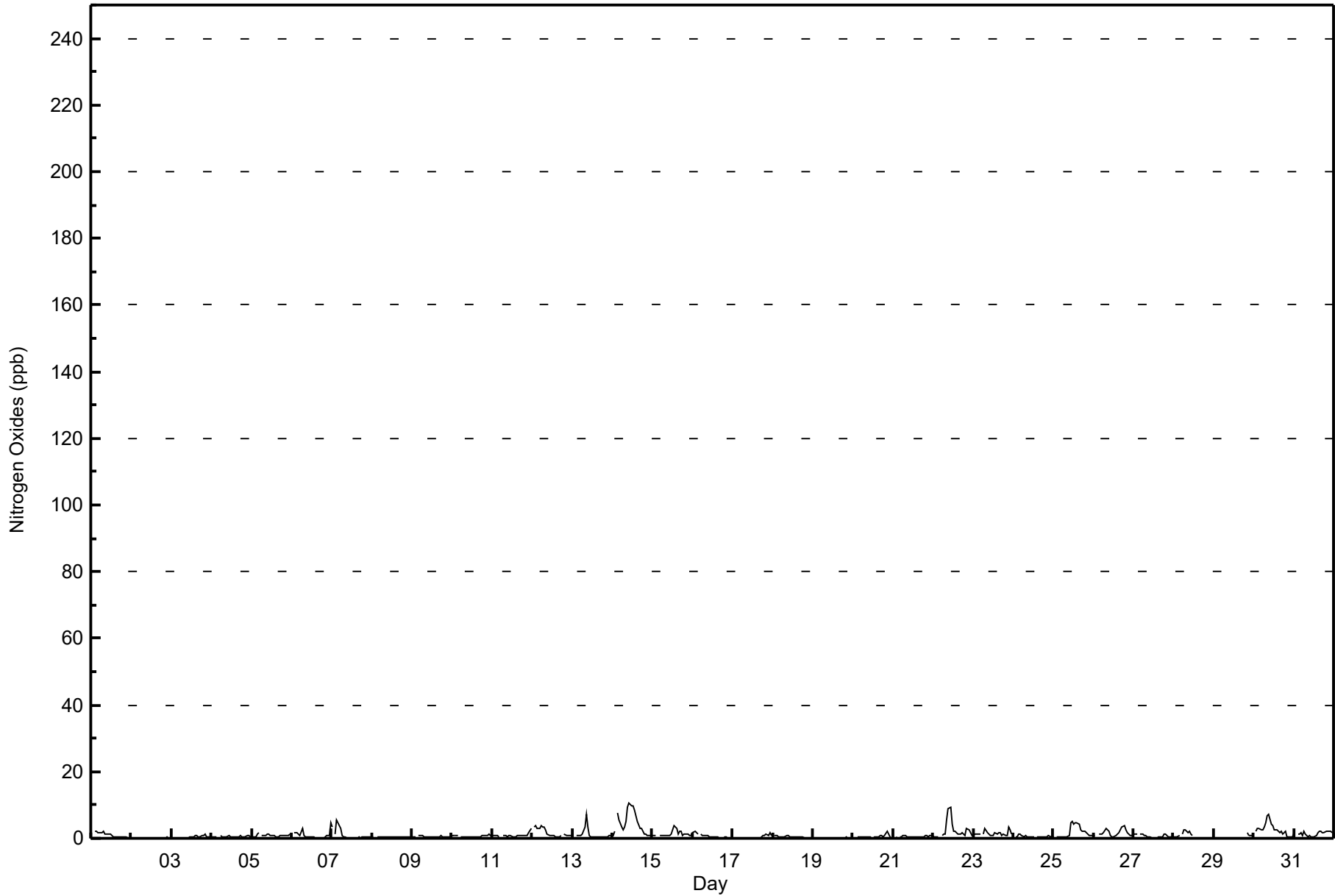
Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - August 2023

Maximum Value: 10.4 ppb on Aug 14 11:00		Maximum Daily Average: 4.5 ppb on Aug 14		Hours in Service: 744																									
Minimum Value: 0.0 ppb on Aug 17 16:00		Minimum Daily Average: 0.1 ppb on Aug 2		Hours of Data: 680																									
Maximum Diurnal Average: 1.6 ppb at hour 10		Minimum Diurnal Average: 0.8 ppb at hour 23		Hours of Missing Data: 64																									
Monthly Average: 1.07 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.6 Q ₃ = 1.2 P ₉₀ = 2.4 P ₉₉ = 7.9		Hours of Calibration: 39																									
				Percent Operational Time: 96.6																									
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-Aug	2.2	Z	2.0	2.3	1.8	1.5	1.7	2.0	1.4	1.1	1.1	1.2	0.9	0.6	0.4	0.3	0.3	0.3	0.4	0.6	0.2	0.3	0.2	0.2	1.0	2.3			
2-Aug	0.2	0.2	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.1	0.1	0.3			
3-Aug	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.5	0.8	0.7	0.5	0.5	0.8	0.7	1.2	0.4	0.4	0.4	0.4	1.2			
4-Aug	0.4	0.5	0.5	0.6	Z	0.6	0.5	0.5	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.6	0.9	0.7	0.6	0.6	0.9			
5-Aug	0.5	0.5	0.6	1.4	1.8	Z	1.0	0.8	1.0	1.4	1.1	0.9	0.6	0.7	0.5	0.2	0.4	0.7	0.7	0.8	0.8	0.9	1.0	1.3	0.9	1.8			
6-Aug	Z	1.5	1.5	1.6	1.2	0.9	2.8	0.7	0.5	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.9	1.0	4.8	0.9	4.8			
7-Aug	3.6	Z	1.2	5.6	3.9	3.1	0.7	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	1.0	5.6			
8-Aug	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	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.5			
9-Aug	0.4	0.4	0.4	Z	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.6	0.5	0.8	0.5	0.4	0.5	0.6	0.4	0.5	0.5	0.8			
10-Aug	0.7	1.0	0.9	0.7	Z	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.7	0.7	0.8	0.9	1.1	0.7	0.7	1.1			
11-Aug	0.8	0.7	0.7	0.7	0.6	Z	0.9	0.7	0.7	0.6	0.7	0.7	0.5	0.6	0.6	0.7	0.9	1.0	1.0	0.9	0.7	0.8	1.5	3.0	0.9	3.0			
12-Aug	Z	3.3	3.7	3.1	3.1	3.9	3.5	3.2	2.5	1.3	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6	PF	1.1	1.0	1.0	0.9	0.8	1.7	3.9			
13-Aug	0.8	Z	0.9	0.8	0.9	0.9	1.1	3.5	7.2	3.3	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	1.2	7.2			
14-Aug	1.0	2.0	Z	7.7	5.7	3.5	2.5	3.3	4.9	9.4	10.4	9.8	9.8	8.7	7.0	5.0	3.1	3.1	2.1	1.1	1.1	0.9	0.8	0.7	4.5	10.4			
15-Aug	0.7	0.7	0.7	Z	0.8	0.8	0.9	0.9	0.8	0.9	0.9	1.5	2.6	3.9	2.8	1.2	2.0	2.1	0.9	1.1	1.3	1.3	0.9	1.0	1.3	3.9			
16-Aug	1.8	1.9	1.7	1.4	Z	1.1	0.8	0.9	0.8	0.7	0.6	0.5	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.6	0.2	0.0	0.0	0.7	1.9			
17-Aug	0.0	0.0	0.0	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.5	0.9	0.8	1.2	0.8	1.6	0.9	0.3	1.6			
18-Aug	Z	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.8	0.8	0.5	0.3	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.1	0.1	0.0	0.0	0.1	0.4	0.8			
19-Aug	0.1	Z	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	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2			
20-Aug	0.2	0.2	Z	0.3	0.2	0.5	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.4	0.9	0.8	0.6	1.0	2.1	1.1	0.2	0.1	0.5	2.1			
21-Aug	0.2	0.2	0.2	Z	0.4	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.9	0.8	0.6	0.9	0.6	0.5	0.9			
22-Aug	0.5	0.5	0.5	0.6	Z	0.7	1.1	1.4	5.7	8.7	9.5	4.1	2.2	2.0	1.7	1.2	1.4	1.6	1.3	0.9	3.0	2.5	1.5	0.9	2.3	9.5			
23-Aug	0.9	1.2	1.3	1.1	1.2	Z	1.4	2.9	1.5	1.3	0.9	1.0	1.0	1.5	1.4	1.7	1.7	1.0	1.2	0.7	0.8	3.3	2.7	1.3	1.4	3.3			
24-Aug	Z	0.5	0.4	1.4	1.2	0.8	0.6	0.6	0.5	0.4	0.3	0.3	0.3	M	0.2	0.2	0.3	0.3	0.6	0.5	0.5	0.6	0.4	0.5	0.5	1.4			
25-Aug	0.4	Z	0.5	0.4	0.4	0.4	0.4	0.6	0.6	1.0	4.6	5.1	4.1	4.8	4.6	4.2	2.4	2.0	2.2	1.9	1.3	1.0	0.8	0.7	1.9	5.1			
26-Aug	0.9	1.0	Z	1.3	1.1	1.3	1.6	2.8	2.7	2.1	0.7	0.4	0.6	0.8	1.3	1.9	2.4	3.4	3.7	2.7	1.8	1.3	1.0	0.9	1.6	3.7			
27-Aug	1.3	1.2	1.1	Z	1.2	1.1	0.8	0.8	0.4	0.2	0.3	0.2	0.1	0.2	0.2	0.2	0.3	0.2	1.2	1.2	0.9	0.5	0.3	0.3	0.6	1.3			
28-Aug	0.3	0.3	0.4	0.9	Z	1.3	2.5	2.4	1.6	2.0	1.4	0.7	C	C	C	C	C	C	M	M	M	M	M	M	--	2.5			
29-Aug	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	1.7	0.9	0.9	0.9	--	1.7			
30-Aug	Z	2.2	2.9	2.9	2.4	2.6	3.4	4.8	6.9	7.0	4.2	3.7	2.4	2.5	2.4	1.6	1.9	1.1	1.6	2.3	0.5	0.3	0.4	0.4	2.6	7.0			
31-Aug	1.5	Z	1.2	1.4	1.8	0.7	2.0	1.3	0.6	0.8	0.4	0.3	0.2	1.0	1.8	2.2	2.1	1.8	1.9	2.2	2.1	2.0	2.1	1.8	1.4	2.2			
																								Diurnal Average					
																								Diurnal Maximum					
																								0.8 0.9 1.0 1.5 1.3 1.1 1.1 1.3 1.5 1.6 1.4 1.2 1.1 1.2 1.1 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.8 0.8					
																								3.6 3.3 3.7 7.7 5.7 3.9 3.5 4.8 7.2 9.4 10.4 9.8 9.8 8.7 7.0 5.0 3.1 3.4 3.7 2.7 3.0 3.3 2.7 4.8					
Z - zerospan																								C - Calibration		M - Maintenance		PF - Power Failure	



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	680	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: 680

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan - August 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	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680
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	14	18	16	23	78	39	37	26	37	45	52	56	72	73	58	36	680

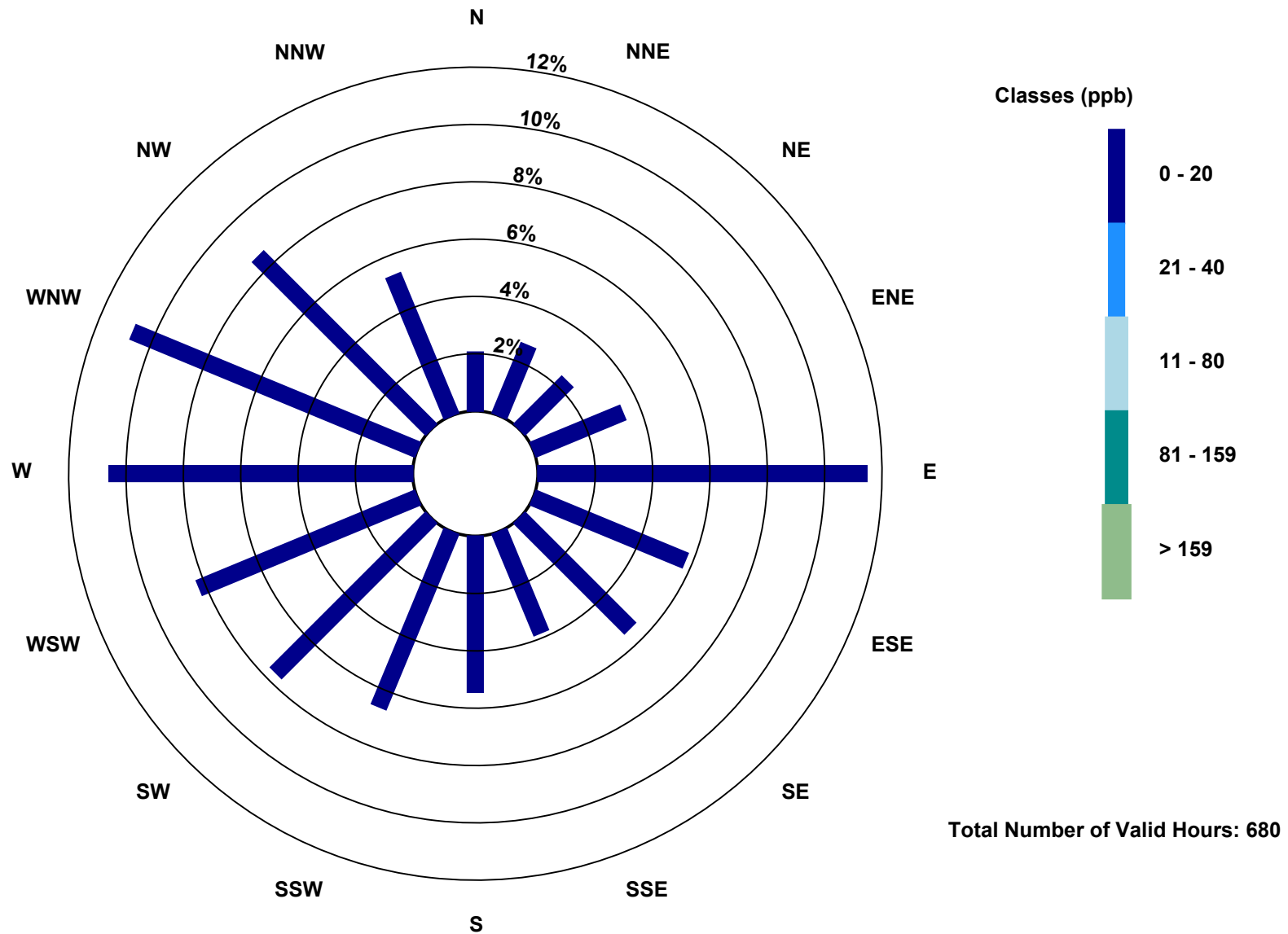
Total Number of Valid Hours: 680

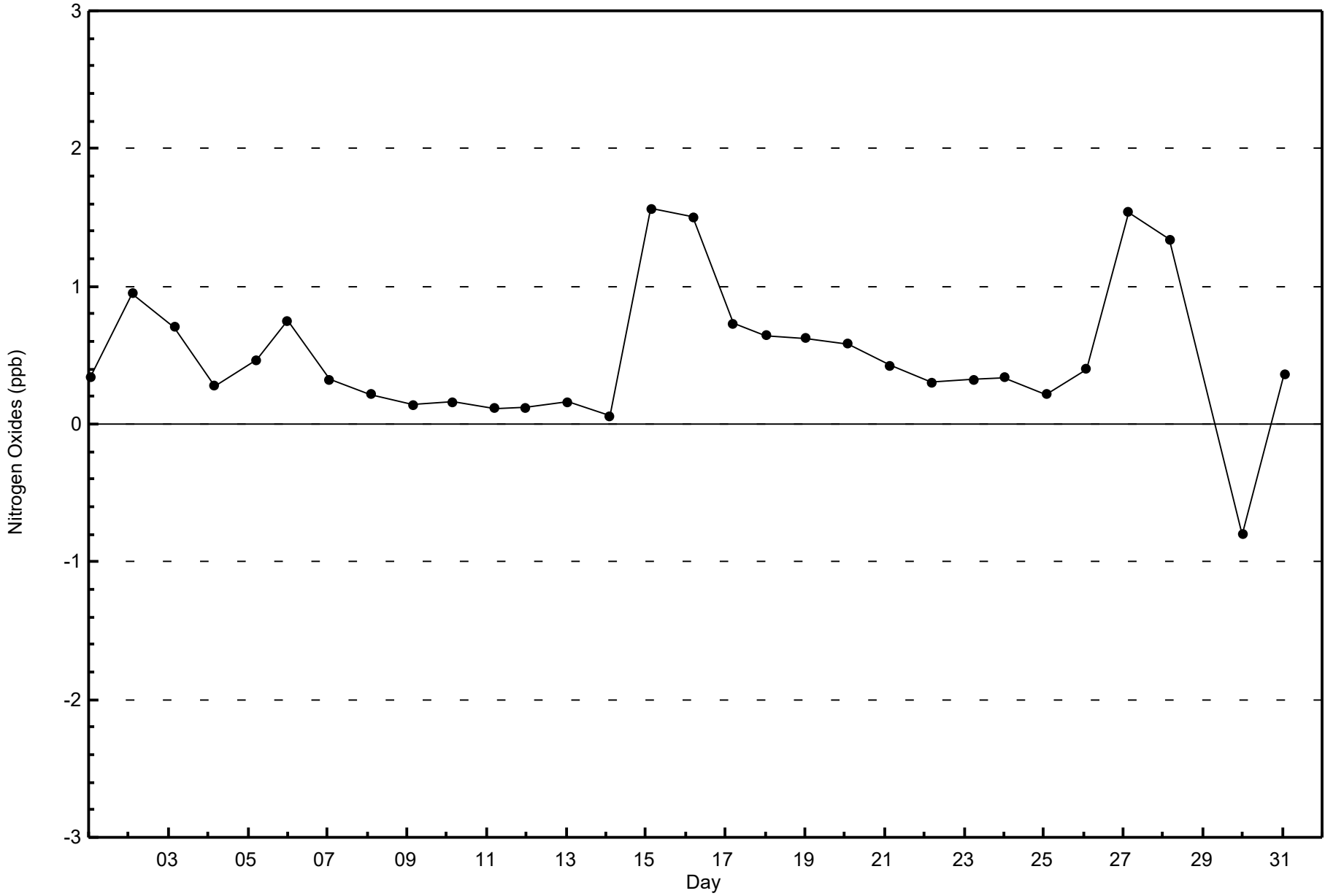
Total Number of Hours: 744

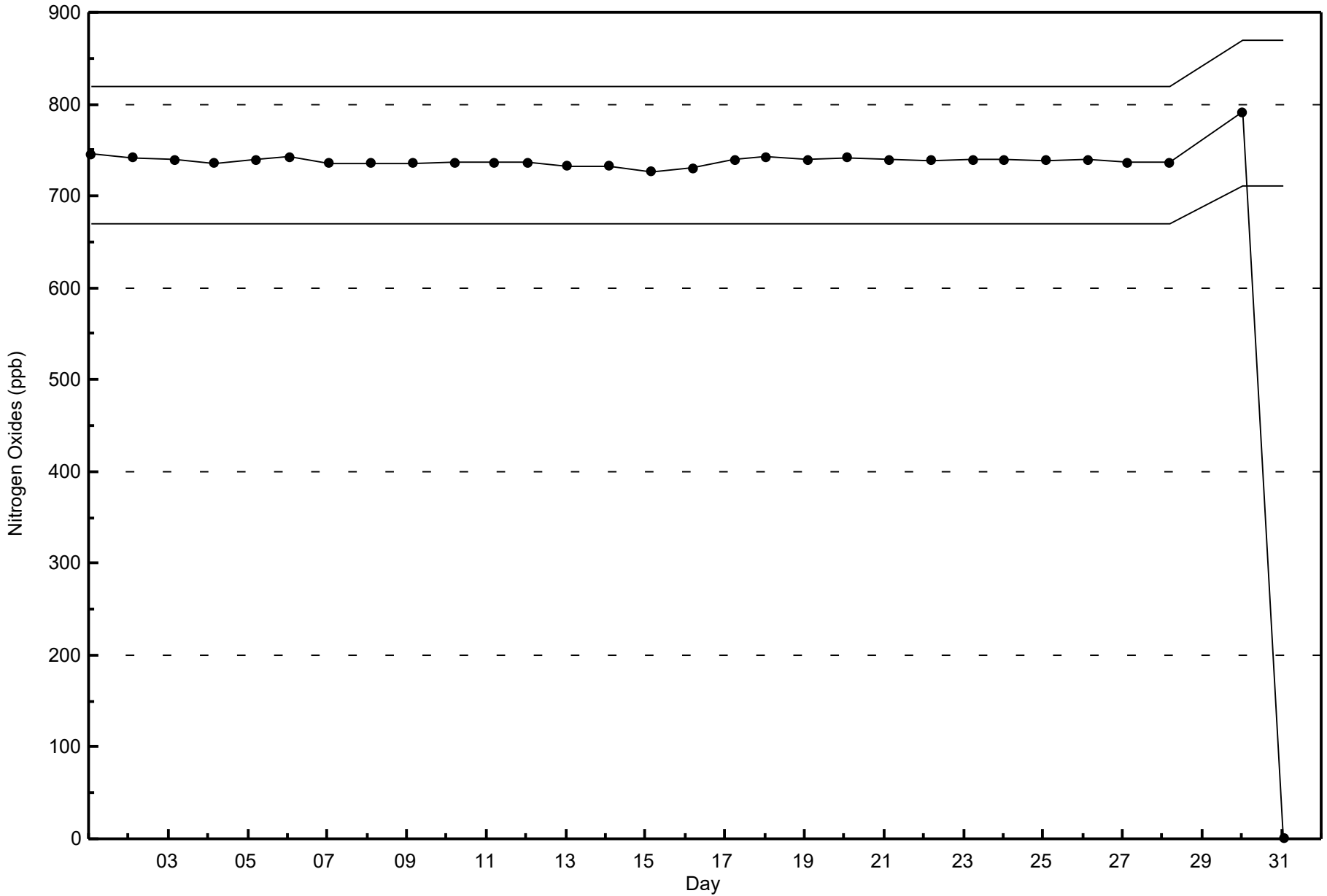


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Fort Chipewyan









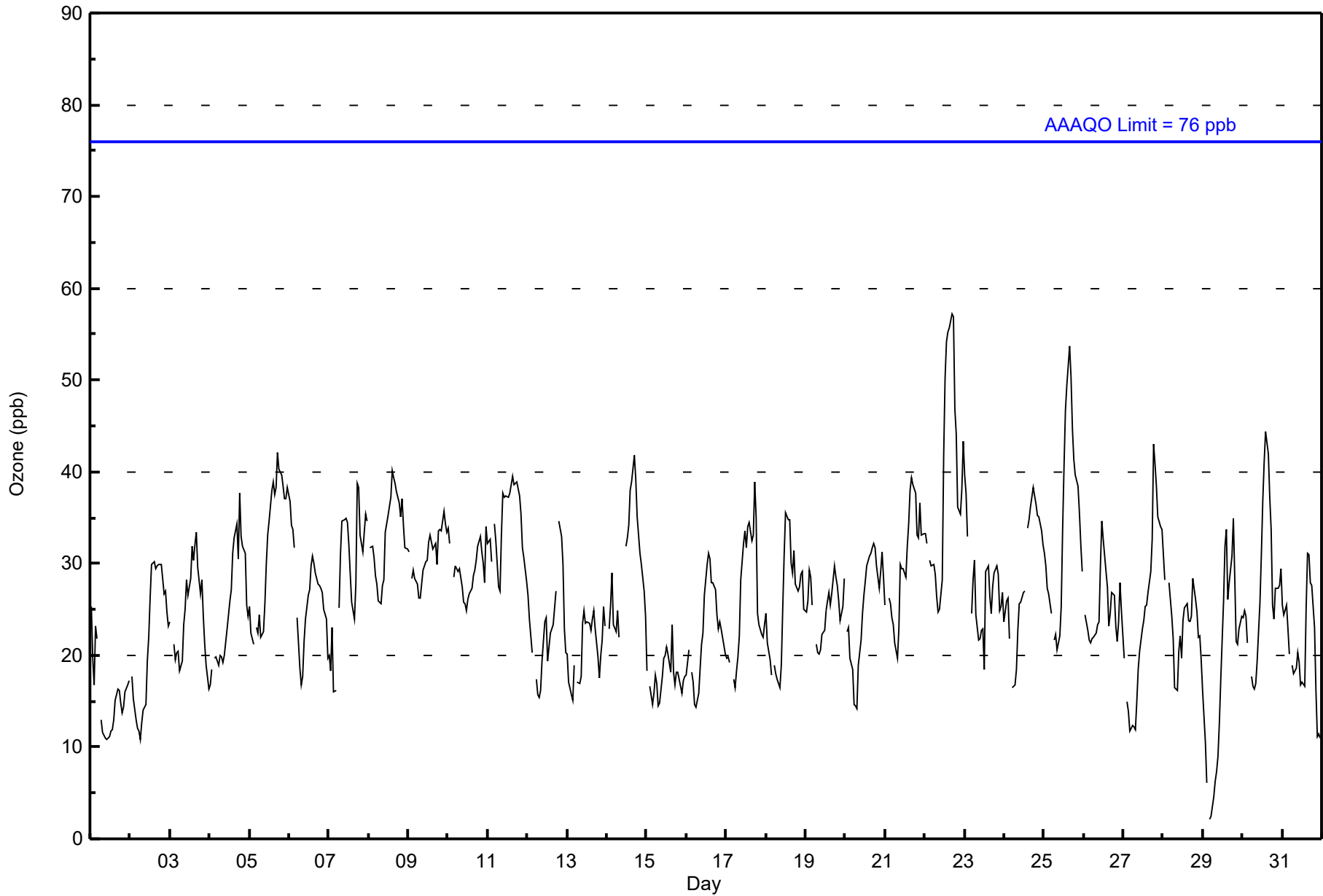
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Fort Chipewyan - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 57.2 ppb on Aug 22 17:00		Maximum Daily Average: 39.3 ppb on Aug 22																	Hours of Data:	708																													
Minimum Value: 2.1 ppb on Aug 29 05:00		Minimum Daily Average: 15.3 ppb on Aug 1																	Hours of Missing Data:	36																													
Maximum Diurnal Average: 32.2 ppb at hour 18		Minimum Diurnal Average: 19.3 ppb at hour 8																	Hours of Calibration:	34																													
Monthly Average: 26.40 ppb		Percentiles: P ₁ = 10.6 P ₁₀ = 16.6 Q ₁ = 20.9 Median = 25.9 Q ₃ = 31.7 P ₉₀ = 36.9 P ₉₉ = 50.1																	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-Aug	25.3	19.6	16.7	23.3	21.8	Z	13.0	11.6	11.2	11.0	10.8	11.2	11.8	11.9	13.0	15.1	16.3	16.1	14.8	13.7	14.3	16.0	16.8	17.2	15.3	25.3																							
2-Aug	Z	17.7	15.3	12.9	12.1	11.8	10.8	12.6	14.1	14.7	19.4	22.0	26.2	29.9	30.2	29.4	29.7	29.9	29.9	29.8	26.7	26.9	24.7	23.2	21.7	30.2																							
3-Aug	23.6	Z	21.2	19.5	20.3	20.5	18.2	19.3	23.3	25.0	28.2	26.5	28.4	31.8	30.4	32.0	33.5	29.6	26.8	28.2	24.3	21.3	18.9	16.3	24.6	33.5																							
4-Aug	16.8	18.5	Z	19.7	19.9	18.9	20.0	19.9	19.3	20.0	22.8	24.4	26.0	27.2	31.1	32.8	34.3	30.5	37.6	33.0	31.8	31.2	25.5	24.3	25.5	37.6																							
5-Aug	25.3	22.4	21.1	Z	23.0	22.4	24.4	21.9	22.6	25.7	29.8	33.0	34.6	38.0	38.9	37.5	38.4	42.1	40.3	39.7	38.5	37.0	37.1	38.3	31.8	42.1																							
6-Aug	36.7	34.1	33.7	31.8	Z	24.0	18.6	16.7	17.6	21.6	23.9	26.5	27.2	29.7	30.8	30.0	28.9	27.8	27.7	27.4	26.8	25.0	24.0	19.7	26.5	36.7																							
7-Aug	19.9	18.3	23.1	16.0	16.2	Z	25.2	31.0	34.6	34.8	35.0	34.5	32.0	28.9	25.8	24.0	27.8	38.7	38.3	33.1	31.2	33.5	35.3	34.6	29.2	38.7																							
8-Aug	Z	31.7	31.9	30.7	28.7	27.8	25.9	25.6	27.5	28.2	33.4	34.3	35.3	37.2	40.2	39.4	38.7	37.8	36.6	35.1	37.0	34.1	31.7	31.5	33.1	40.2																							
9-Aug	31.3	Z	28.4	29.3	28.3	27.8	26.2	26.2	27.8	29.2	30.2	30.3	32.3	33.0	32.3	31.6	32.2	29.9	33.5	33.7	33.6	35.7	34.3	33.4	30.9	35.7																							
10-Aug	33.9	32.2	Z	28.5	29.8	29.5	29.2	29.5	27.5	25.8	25.7	24.9	26.1	26.7	27.3	28.7	29.3	30.4	31.8	33.0	31.3	30.1	28.0	34.1	29.3	34.1																							
11-Aug	32.1	32.6	30.3	Z	34.3	32.5	27.5	27.0	33.1	37.6	37.1	37.3	37.3	37.7	38.6	39.5	38.6	38.8	38.1	37.3	35.4	31.7	30.7	28.1	34.5	39.5																							
12-Aug	26.5	24.0	22.1	20.3	Z	17.4	15.7	15.4	16.2	19.3	23.6	24.1	19.4	20.9	22.4	23.4	25.2	27.0	PF	34.6	33.0	30.0	22.8	20.3	22.9	34.6																							
13-Aug	20.1	17.1	15.7	15.0	18.9	Z	17.1	16.9	17.7	23.5	24.8	23.4	23.7	23.5	22.7	23.9	24.9	22.9	19.8	17.6	19.9	21.7	25.3	23.2	20.8	25.3																							
14-Aug	Z	22.9	25.5	28.9	23.4	22.6	24.9	21.9	C	C	C	31.9	32.9	34.1	38.0	38.9	41.9	39.2	35.0	33.1	31.1	29.9	27.0	24.3	30.4	41.9																							
15-Aug	18.3	Z	16.7	14.7	15.8	17.8	17.0	14.5	14.8	17.7	19.6	20.0	20.8	20.2	18.1	23.4	18.1	16.8	18.1	18.1	16.7	15.8	17.2	17.6	17.7	23.4																							
16-Aug	17.8	20.5	Z	18.1	17.1	14.7	14.3	15.9	18.7	21.1	22.4	26.5	29.8	31.1	30.5	27.9	27.8	27.2	24.5	22.8	23.6	22.8	22.0	20.1	22.5	31.1																							
17-Aug	19.7	19.8	19.2	Z	17.4	16.5	18.3	19.8	22.1	28.3	32.2	33.5	31.8	34.1	34.5	32.4	33.2	38.9	35.0	24.5	23.4	22.3	21.9	23.3	26.2	38.9																							
18-Aug	24.6	21.3	19.5	17.9	Z	18.9	18.0	17.3	16.5	18.9	25.1	30.8	35.5	34.8	34.7	30.1	28.9	31.4	27.8	27.0	27.5	28.8	29.1	25.0	25.6	35.5																							
19-Aug	24.7	25.9	29.3	28.6	25.5	Z	21.2	20.3	20.2	20.5	22.2	22.8	24.8	25.9	26.8	25.5	26.7	29.7	28.5	27.6	26.0	23.7	25.4	28.4	25.2	29.7																							
20-Aug	Z	22.6	23.0	19.8	18.4	14.7	14.5	14.2	18.9	21.7	24.6	26.5	28.0	29.8	30.8	31.2	31.8	32.2	31.7	29.8	27.3	29.2	31.2	28.6	25.2	32.2																							
21-Aug	25.4	Z	26.2	25.7	24.0	23.3	21.3	19.6	22.8	29.9	29.4	29.5	28.5	32.0	34.3	37.9	39.3	38.5	37.7	33.2	32.7	36.6	33.1	33.3	30.2	39.3																							
22-Aug	33.3	32.2	Z	30.3	29.8	29.8	28.9	26.3	24.7	25.0	28.2	41.7	50.1	54.2	55.2	55.7	57.2	57.0	46.8	44.1	36.2	35.3	38.2	43.4	39.3	57.2																							
23-Aug	39.7	37.6	32.9	Z	24.5	28.3	30.3	24.4	21.6	21.8	22.7	22.8	18.4	29.2	29.7	26.4	24.5	27.5	29.0	29.8	28.8	24.9	25.4	26.9	27.3	39.7																							
24-Aug	23.7	25.9	26.2	21.9	Z	16.5	16.8	18.4	22.7	25.6	25.8	26.8	27.0	Z	M	33.9	34.7	36.2	38.3	37.4	36.5	35.2	35.1	33.5	32.0	28.6	38.3																						
25-Aug	31.1	29.8	27.3	26.6	24.6	Z	21.6	22.2	20.6	22.1	25.4	33.8	40.6	46.7	49.4	53.7	50.3	44.6	41.4	39.7	38.5	35.5	32.1	29.1	34.2	53.7																							
26-Aug	Z	24.4	22.8	21.7	21.4	21.8	21.9	22.5	23.3	23.6	29.8	34.7	32.7	29.2	27.5	23.2	24.6	26.9	26.6	23.2	21.4	23.7	27.9	24.9	25.2	34.7																							
27-Aug	19.8	Z	14.9	13.9	11.8	12.4	12.2	11.9	15.0	18.4	20.4	22.9	23.8	25.3	25.5	26.9	29.1	32.7	43.0	40.9	38.4	35.1	34.1	33.7	24.4	43.0																							
28-Aug	31.0	28.2	Z	28.0	26.1	24.2	21.9	16.4	16.2	20.5	22.0	19.6	23.8	25.2	25.6	23.8	23.7	24.2	28.3	26.1	24.6	22.0	22.0	19.5	23.6	31.0																							
29-Aug	16.1	10.6	6.0	Z	2.1	2.5	4.6	6.2	7.4	9.0	12.7	17.4	25.9	31.9	33.7	26.1	28.0	30.8	34.9	28.4	21.6	21.1	22.9	24.3	18.4	34.9																							
30-Aug	24.0	24.8	24.3	21.3	Z	17.7	16.6	16.3	16.9	19.4	25.8	31.0	36.8	41.0	44.4	41.9	37.2	33.6	25.5	23.9	27.3	27.3	27.6	29.5	27.6	44.4																							
31-Aug	25.4	24.4	25.5	22.8	20.1	Z	18.9	18.0	18.7	20.2	19.2	16.7	17.1	16.6	25.1	31.1	31.0	27.9	27.6	23.0	16.2	11.1	11.4	11.0	20.8	31.1																							
																								25.6	24.6	23.0	22.6	21.4	20.6	19.8	19.3	20.5	22.7	25.1	27.1	28.7	30.6	31.7	31.6	31.8	32.2	31.8	29.9	28.4	27.6	27.0	26.4	Diurnal Average	
																								39.7	37.6	33.7	31.8	34.3	32.5	30.3	31.0	34.6	37.6	37.1	41.7	50.1	54.2	55.2	55.7	57.2	57.0	46.8	44.1	38.5	37.0	38.2	43.4	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Fort Chipewyan - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	172	24.29	24.29
21 - 50	530	74.86	99.15
51 - 82	6	0.85	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 - August 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	8	5	1	1	16	5	5	3	7	11	16	12	10	37	19	16	172
21 - 50	5	13	16	26	85	35	34	21	31	32	36	44	59	33	41	19	530
51 - 82	0	0	0	0	0	0	0	1	0	3	1	0	1	0	0	0	6
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	13	18	17	27	101	40	39	25	38	46	53	56	70	70	60	35	708

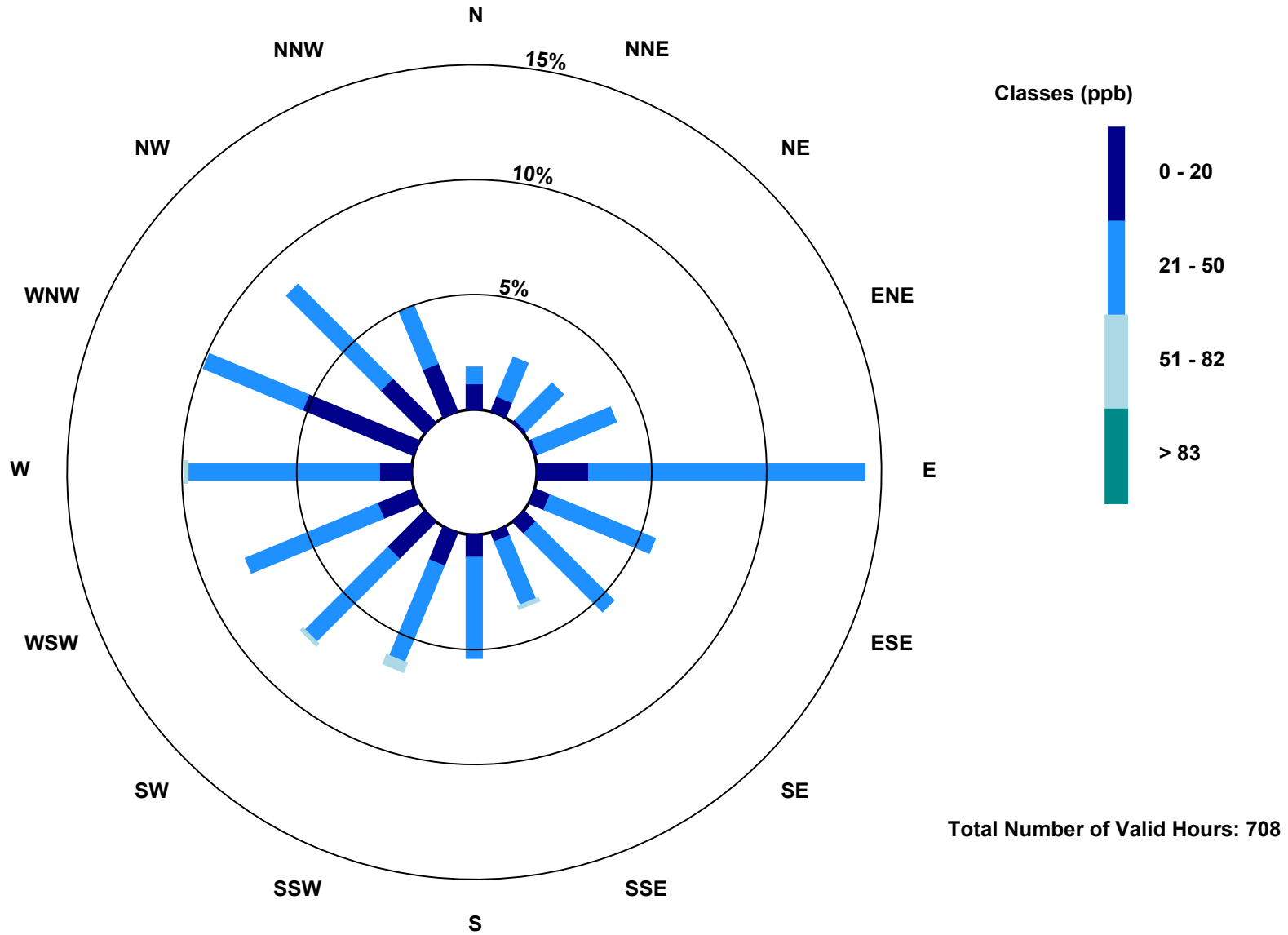
Total Number of Valid Hours: 708

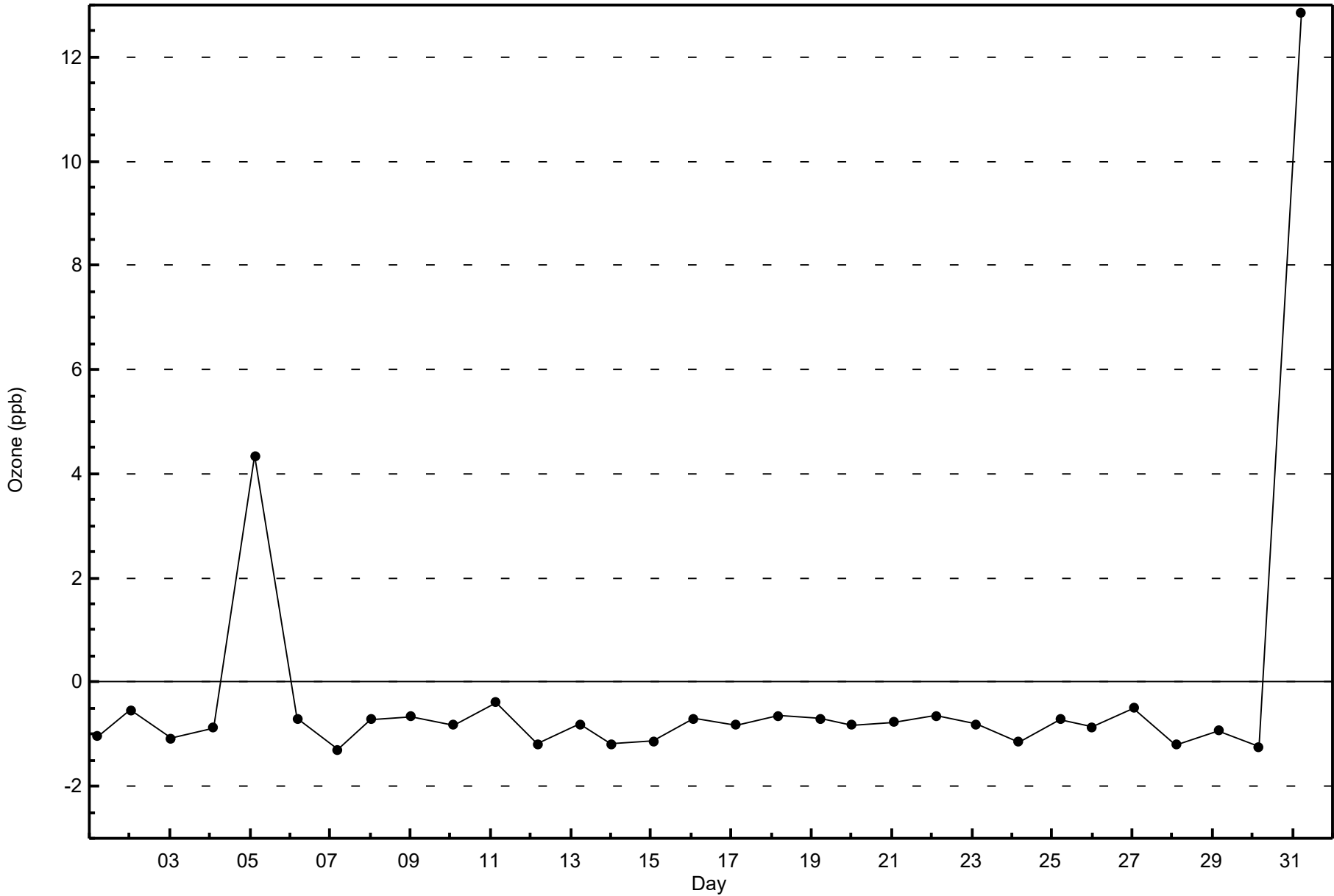
Total Number of Hours: 744

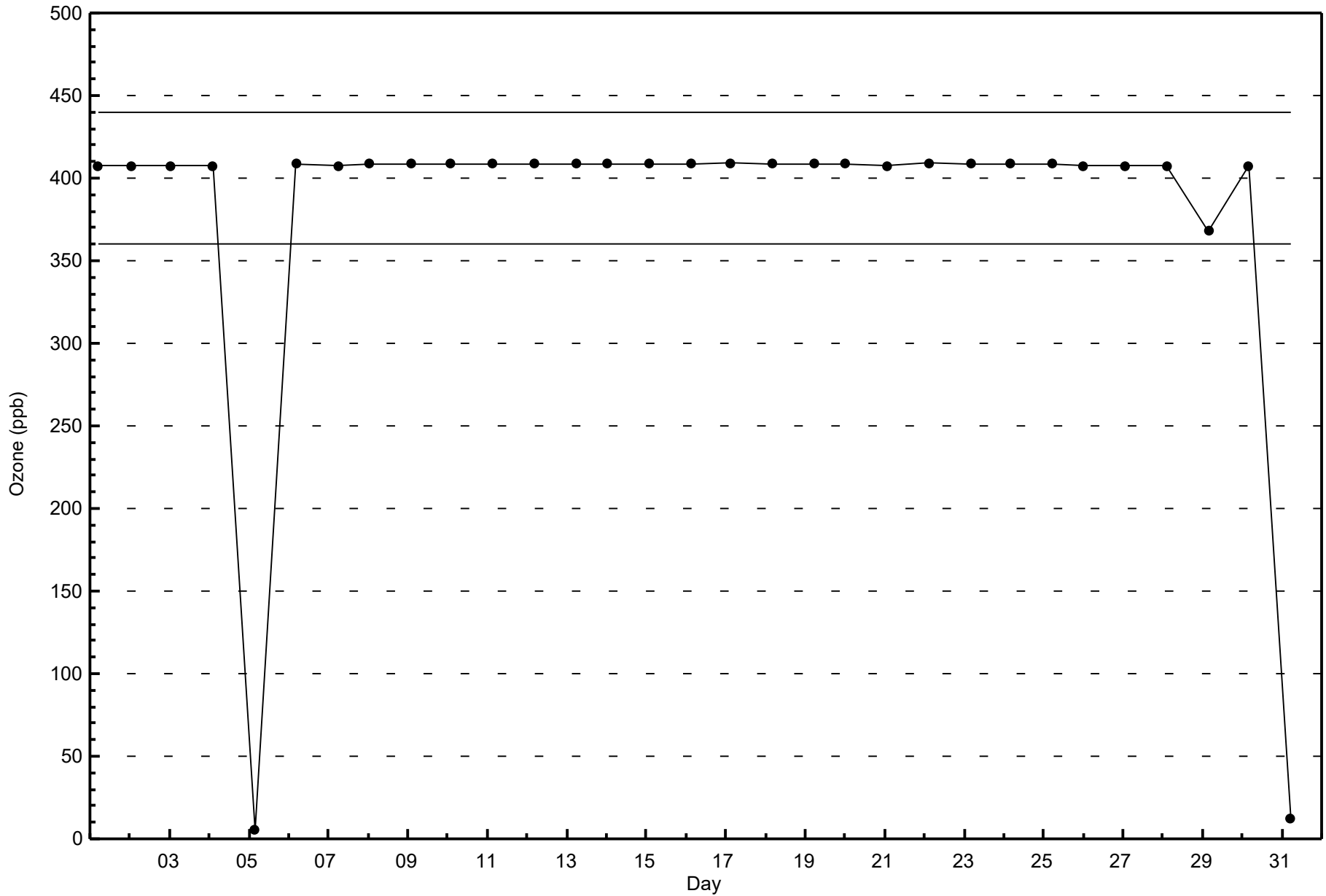


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Fort Chipewyan









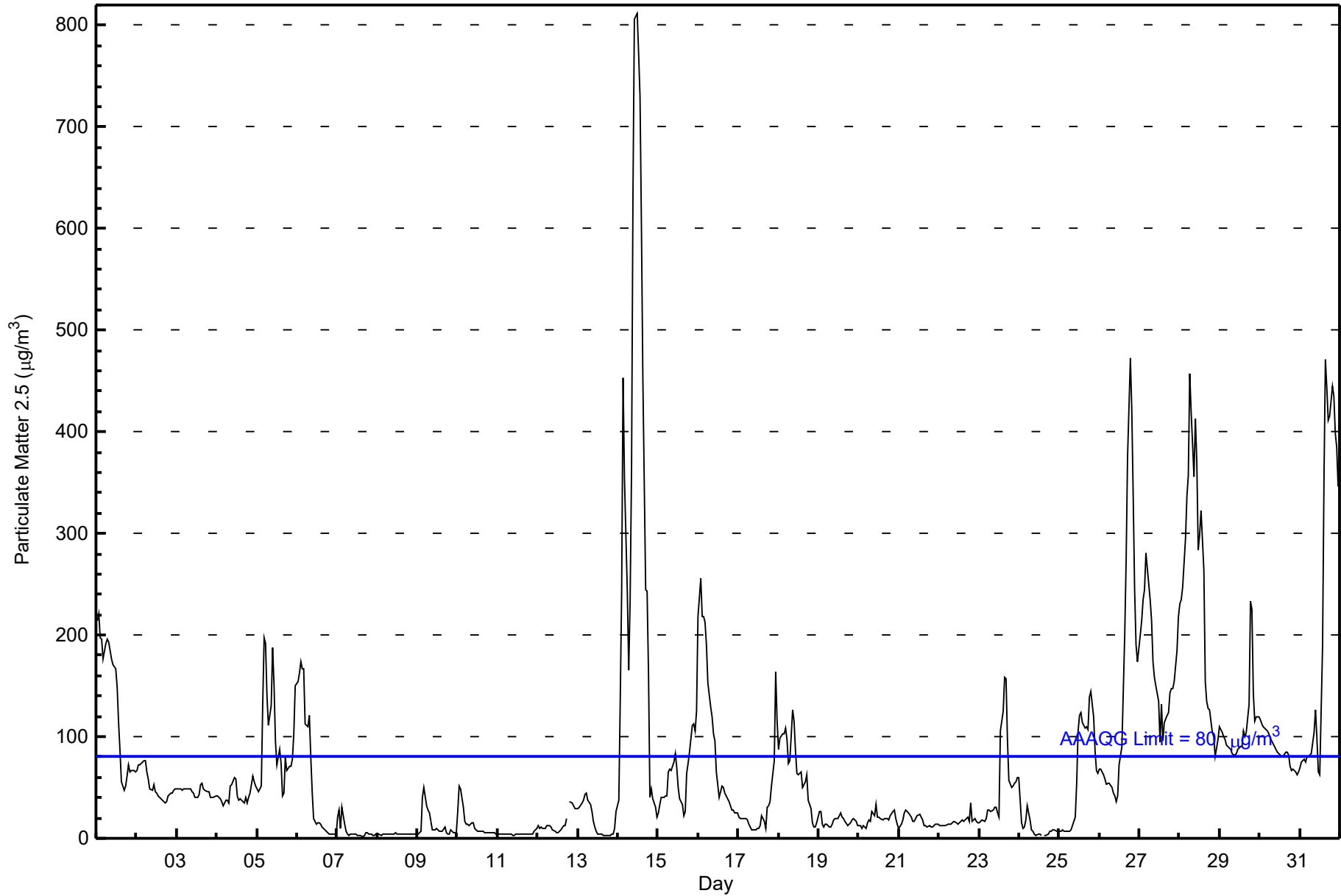
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Chipewyan - August 2023

Number of Exceedences (AAAQO):		1-hr: 217	24-hr: 19	Hours in Service:																	744					
Maximum Value: 812.1 µg/m ³ on Aug 14 12:00		Maximum Daily Average: 327.8 µg/m ³ on Aug 14																	Hours of Data:	742						
Minimum Value: 1.7 µg/m ³ on Aug 7 16:00		Minimum Daily Average: 4.1 µg/m ³ on Aug 8																	Hours of Missing Data:	2						
Maximum Diurnal Average: 84.9 µg/m ³ at hour 5		Minimum Diurnal Average: 61.5 µg/m ³ at hour 22																	Hours of Calibration:	1						
Monthly Average: 74.10 µg/m ³		Percentiles: P ₁ = 2.9 P ₁₀ = 4.5 Q ₁ = 12.4 Median = 38.4 Q ₃ = 90.7 P ₉₀ = 188.6 P ₉₉ = 465.4																	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-Aug	214.2	221.5	197.2	196.2	176.3	191.3	196.5	193.7	184.9	176.8	171.1	167.2	148.9	114.1	86.5	55.3	47.1	52.0	61.7	72.2	65.8	66.9	67.2	66.0	132.9	221.5
2-Aug	66.5	72.3	72.1	75.1	76.1	76.4	66.0	58.1	48.8	47.7	53.1	45.9	44.9	41.3	39.1	37.8	36.5	34.9	35.6	41.7	44.1	44.8	46.8	48.9	52.3	76.4
3-Aug	48.2	48.6	48.5	47.9	48.7	49.0	48.0	48.1	48.7	46.5	44.6	40.7	40.4	43.5	52.3	54.0	48.5	47.2	46.0	46.2	40.4	40.7	40.4	41.4	46.2	54.0
4-Aug	42.0	40.3	39.2	36.8	32.3	37.4	37.8	34.8	51.1	53.2	59.6	57.7	41.6	37.1	38.4	37.0	34.6	40.8	34.7	40.2	44.2	60.8	55.9	51.5	43.3	60.8
5-Aug	48.3	46.5	51.3	132.1	197.7	191.3	140.9	111.5	131.3	187.0	151.0	96.4	72.9	87.1	73.5	41.5	44.6	78.7	66.4	70.7	70.2	77.7	103.4	149.9	100.9	197.7
6-Aug	154.0	162.5	173.9	166.1	166.7	112.3	110.4	120.4	81.1	45.3	19.0	14.5	14.6	14.8	14.1	11.7	9.2	6.8	5.2	4.6	4.1	4.3	3.7	3.7	59.3	173.9
7-Aug	20.4	27.9	10.0	30.5	14.4	6.3	4.0	3.2	3.7	4.1	4.3	3.8	3.3	3.0	2.1	1.7	2.7	5.6	5.2	4.0	3.7	3.3	3.2	3.9	7.3	30.5
8-Aug	3.8	3.6	3.4	3.9	4.0	4.1	4.2	4.2	4.0	3.5	4.8	4.9	4.5	4.5	3.6	3.8	4.1	4.6	4.5	4.4	3.7	3.9	4.6	4.5	4.1	4.9
9-Aug	4.7	5.2	6.3	40.3	49.6	32.4	27.4	25.3	16.4	9.0	8.9	9.7	7.9	6.9	6.7	6.6	11.3	5.4	4.1	4.5	8.9	5.0	5.2	6.1	13.1	49.6
10-Aug	26.4	52.0	48.4	30.6	16.0	14.1	13.9	12.2	16.0	16.0	10.0	8.6	7.6	7.2	6.9	6.6	6.2	6.2	5.7	5.7	5.5	4.9	5.3	4.3	14.0	52.0
11-Aug	4.3	4.2	4.7	4.7	4.1	4.1	4.2	4.1	3.7	3.3	3.5	3.7	3.7	3.8	3.9	4.1	4.0	4.3	4.3	4.3	4.3	4.7	6.9	9.9	4.5	9.9
12-Aug	11.9	9.9	10.9	10.4	9.9	12.3	13.1	12.6	11.7	8.2	6.4	5.5	5.6	6.7	7.9	11.8	13.0	19.4	PF	36.7	34.3	31.5	29.5	29.5	15.2	36.7
13-Aug	29.7	30.3	34.3	37.9	43.2	44.0	37.2	33.2	26.3	16.3	11.1	6.8	4.7	4.0	3.7	3.1	2.7	2.9	2.9	3.1	3.8	3.8	9.8	25.9	17.5	44.0
14-Aug	37.2	136.5	243.0	452.5	353.2	243.2	165.8	235.0	363.3	632.7	806.0	812.1	772.9	729.2	602.4	453.0	244.4	243.9	162.1	40.4	48.5	38.7	30.3	20.2	327.8	812.1
15-Aug	24.9	33.4	39.8	40.4	41.5	41.4	65.8	68.5	67.2	74.5	83.8	69.2	49.7	38.5	33.4	22.3	25.8	64.4	74.3	84.2	110.9	113.2	105.2	125.3	62.4	125.3
16-Aug	217.9	256.3	218.6	218.7	212.4	190.9	153.0	129.3	119.6	102.7	96.0	65.1	40.3	45.2	51.2	49.8	44.1	39.1	35.6	32.0	27.9	27.3	25.1	24.5	100.9	256.3
17-Aug	21.3	19.6	19.3	19.2	19.5	17.9	14.3	10.7	9.0	7.8	8.3	9.9	9.6	12.5	22.5	16.4	9.1	30.2	32.5	36.8	51.1	75.9	164.2	115.6	31.4	164.2
18-Aug	88.0	98.0	103.4	102.6	108.0	96.6	73.9	76.5	126.4	115.7	86.5	63.4	61.9	64.8	50.2	52.4	54.9	62.1	37.6	29.1	15.8	10.9	10.4	15.0	66.8	126.4
19-Aug	26.2	26.5	14.0	10.7	14.5	13.8	11.5	10.8	14.1	17.6	19.8	19.5	21.8	25.7	21.1	18.9	16.2	11.8	13.4	15.5	17.7	19.2	17.1	12.5	17.1	26.5
20-Aug	12.6	12.9	9.7	12.1	10.2	15.6	18.2	16.9	26.9	22.7	33.9	20.8	20.6	19.0	17.7	20.0	19.5	19.5	18.3	21.9	26.9	28.4	19.6	13.6	19.1	33.9
21-Aug	9.4	13.5	18.5	25.6	28.2	27.0	24.5	21.5	17.4	17.2	19.1	22.0	23.4	20.8	17.7	12.6	12.0	11.5	12.1	11.2	11.4	12.4	14.2	13.5	17.4	28.2
22-Aug	12.7	12.4	12.5	12.5	12.9	13.4	14.5	14.4	15.1	16.3	15.9	13.4	15.0	17.1	17.4	17.3	19.8	21.0	16.9	34.7	17.1	19.7	16.0	15.3	16.4	34.7
23-Aug	15.0	16.6	17.9	16.3	19.4	27.6	27.4	26.7	28.3	30.4	31.3	25.4	20.9	105.1	125.6	157.8	157.0	97.7	56.4	50.4	51.6	53.8	55.1	59.8	53.1	157.8
24-Aug	59.4	15.6	9.4	10.9	18.1	31.8	17.8	8.4	7.3	3.5	3.1	3.5	3.8	2.4	C	2.3	2.3	4.6	6.6	7.2	7.8	8.4	7.2	7.6	10.8	59.4
25-Aug	7.4	7.6	7.7	7.5	7.5	6.9	6.9	7.8	13.1	21.5	53.6	105.1	120.4	123.1	114.4	107.8	110.4	106.4	138.6	145.2	119.6	86.6	67.0	64.0	64.8	145.2
26-Aug	68.5	68.2	62.5	57.9	53.4	54.8	54.6	50.1	44.8	42.2	36.7	42.0	71.9	90.3	146.6	199.9	273.9	375.8	473.0	421.0	336.6	244.5	190.1	173.3	151.4	473.0
27-Aug	199.5	214.4	234.7	244.9	280.6	250.5	234.3	213.8	174.4	157.8	150.4	134.9	94.2	132.0	96.5	114.7	120.9	123.4	143.6	146.8	147.0	154.9	184.8	217.7	173.6	280.6
28-Aug	230.3	234.8	247.0	295.3	336.5	356.5	456.7	419.7	355.4	412.7	371.6	283.4	298.5	322.4	263.8	153.7	134.3	128.5	126.7	103.6	99.6	81.2	89.0	97.9	245.8	456.7
29-Aug	110.3	104.7	100.2	96.9	92.2	90.8	87.4	83.8	81.7	81.9	84.0	87.0	90.4	90.8	105.3	100.0	104.7	132.2	233.3	225.1	142.7	115.6	120.2	119.0	111.7	233.3
30-Aug	117.0	112.6	109.3	108.0	105.9	103.1	98.9	95.3	93.6	90.5	85.3	83.0	81.4	80.7	80.2	84.5	85.0	82.4	71.5	66.2	67.6	65.3	62.6	64.9	87.3	117.0
31-Aug	69.5	75.5	77.6	74.7	80.4	80.5	81.6	83.8	104.2	126.3	99.1	64.7	63.0	188.8	353.7	471.5	442.8	411.4	415.2	445.2	435.4	398.4	385.5	346.2	224.0	471.5
64.6 70.4 72.4 84.5 84.9 78.6 74.5 72.1 73.9 83.6 84.9 77.1 72.9 80.1 81.9 75.2 69.1 73.4 78.1 72.7 66.7 61.5 62.8 62.9																								Diurnal Average		
230.3 256.3 247.0 452.5 353.2 356.5 456.7 419.7 363.3 632.7 806.0 812.1 772.9 729.2 602.4 471.5 442.8 411.4 473.0 445.2 435.4 398.4 385.5 346.2																								Diurnal Maximum		
C - Calibration PF - Power Failure																										
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 Chipewyan - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	99	13.34	13.34
6 - 15	128	17.25	30.59
16 - 25	78	10.51	41.11
26 - 80	223	30.05	71.16
> 81.0	214	28.84	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}) - µg/m³
Fort Chipewyan - August 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	1	5	2	6	33	11	14	4	7	1	2	9	4	0	0	0	99
6 - 15	2	3	1	4	10	9	7	11	16	13	12	13	18	4	3	2	128
16 - 25	2	1	1	1	7	9	4	3	2	5	16	11	11	1	1	3	78
26 - 80	5	9	9	9	9	5	13	7	7	19	20	19	23	31	27	11	223
> 81.0	4	2	4	7	44	8	4	2	7	10	5	5	18	40	31	23	214
Totals	14	20	17	27	103	42	42	27	39	48	55	57	74	76	62	39	742

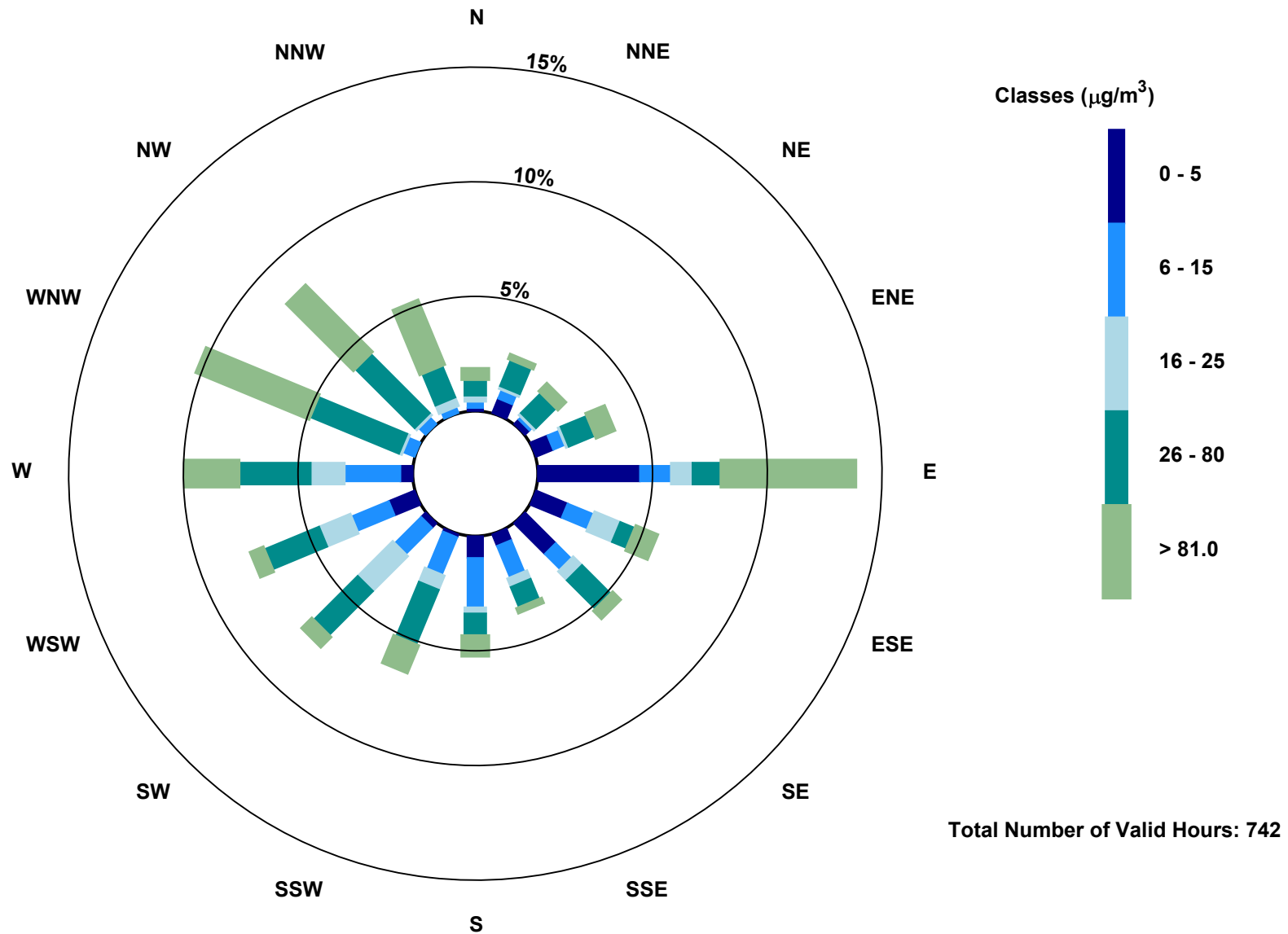
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association

Summary of Hour Averages

Carbon Monoxide (CO) - ppm

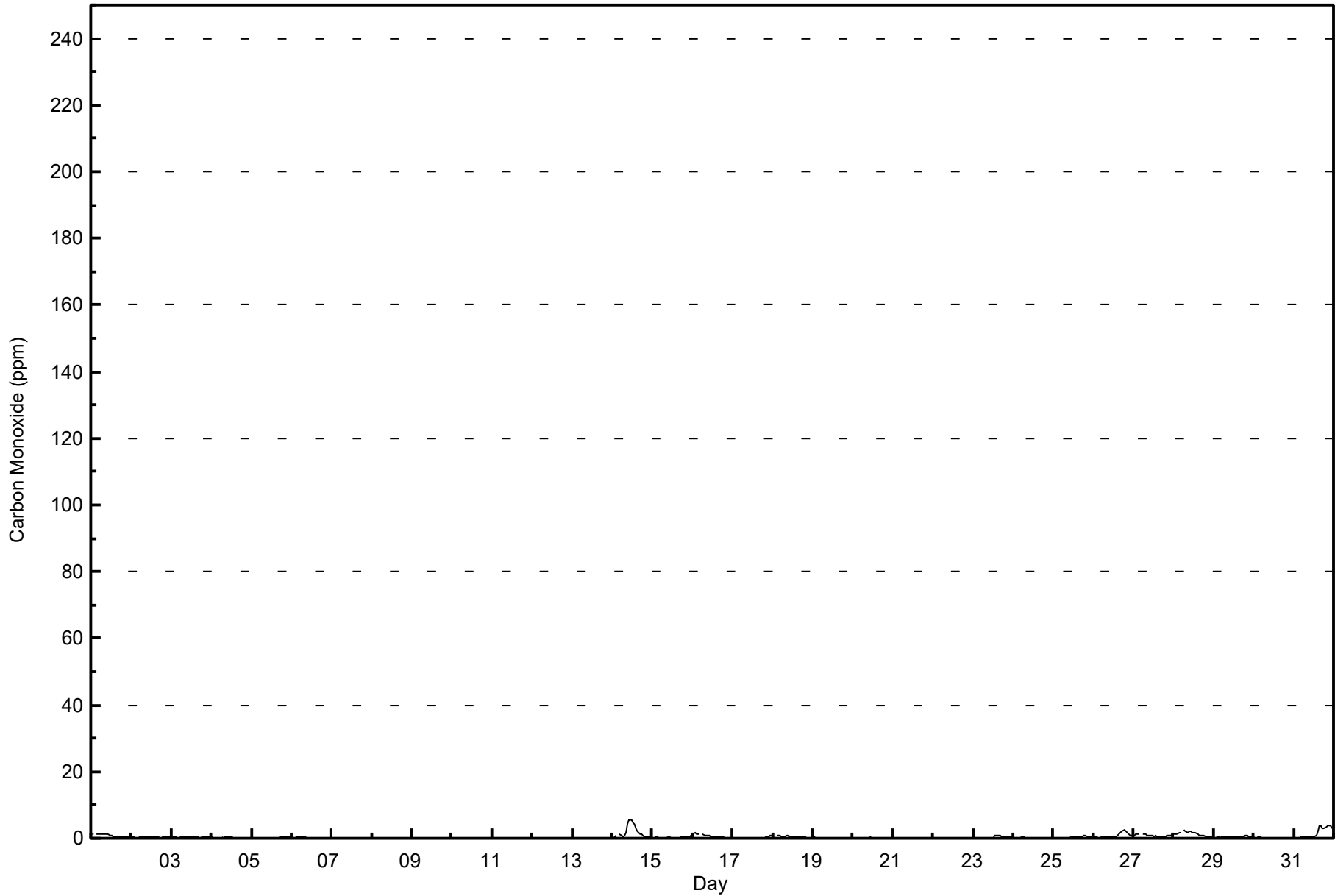
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744						
Maximum Value: 5.6 ppm on Aug 14 11:00				Maximum Daily Average: 1.7 ppm on Aug 14		Hours of Data:														683						
Minimum Value: 0.0 ppm on Aug 6 11:00				Minimum Daily Average: 0.0 ppm on Aug 7		Hours of Missing Data:														61						
Maximum Diurnal Average: 0.5 ppm at hour 11				Minimum Diurnal Average: 0.3 ppm at hour 6		Hours of Calibration:														34						
Monthly Average: 0.41 ppm				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 = 3.7		Percent Operational Time:														96.4						
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-Aug	1.3	1.3	Z	1.3	1.1	1.2	1.3	1.3	1.2	1.1	1.1	1.0	0.8	0.6	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.8	1.3
2-Aug	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.3	0.2	0.2	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	0.3	0.3	0.4
3-Aug	0.3	0.3	0.3	0.3	Z	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	0.2	0.2	0.2	0.2	0.2	0.2	0.3
4-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	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	0.1	0.2
5-Aug	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	0.1	0.1	0.3	0.2	0.3	0.2	0.3	0.4	0.5	--	0.5
6-Aug	0.5	Z	0.6	0.6	0.5	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	0.0	0.0	0.0	0.0	0.0	0.2	0.6
7-Aug	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
8-Aug	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
9-Aug	0.0	0.0	0.0	0.1	Z	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	0.1
10-Aug	0.1	0.1	0.1	0.1	0.0	Z	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	0.0	0.0	0.0	0.0	0.0	0.1
11-Aug	Z	0.1	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	0.1	0.1	0.1	0.1	0.0	0.1
12-Aug	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	0.1	0.1	0.1	0.1	0.1	PF	0.1	0.1	0.1	0.1	0.1	0.1	0.1
13-Aug	0.1	0.1	Z	0.1	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	0.0	0.2
14-Aug	0.1	0.3	0.9	Z	1.2	0.8	0.6	0.9	1.6	4.0	5.6	5.3	4.9	4.2	2.9	2.1	1.1	1.1	0.8	0.3	0.3	0.3	0.2	0.1	1.7	5.6
15-Aug	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.4	0.6	0.6	0.6	0.8	0.3	0.8
16-Aug	1.4	1.6	1.4	1.4	1.3	Z	1.1	1.0	0.9	0.7	0.7	0.5	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.7	1.6
17-Aug	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	0.2	0.2	0.2	0.3	0.4	0.8	0.7	0.2	0.8
18-Aug	0.6	Z	0.7	0.7	0.8	0.6	0.5	0.5	0.9	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.9
19-Aug	0.3	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	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3
20-Aug	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
21-Aug	0.1	0.2	0.2	0.2	Z	0.2	0.2	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	0.1	0.2
22-Aug	0.1	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2
23-Aug	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.7	0.7	0.9	0.8	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.9
24-Aug	0.3	Z	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	M	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25-Aug	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.4	0.4	0.4	0.7
26-Aug	0.5	0.5	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.5	0.9	1.1	1.5	2.1	2.5	2.2	1.7	1.2	0.8	0.8	0.9	2.5
27-Aug	1.0	1.1	1.2	1.3	Z	1.3	1.2	1.1	1.0	0.8	0.8	0.7	0.5	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.9	1.1	0.8	1.3
28-Aug	1.2	1.2	1.2	1.5	1.7	Z	2.5	2.2	1.9	2.2	2.0	1.5	1.7	1.9	1.5	0.9	0.8	0.7	0.7	0.5	0.5	0.4	0.4	0.5	1.3	2.5
29-Aug	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	0.5	0.5	0.5	0.6	0.9	0.9	0.6	0.6	0.6	0.6	0.5	0.9
30-Aug	0.6	Z	0.5	0.5	0.5	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	0.2	0.2	0.2	0.2	0.2	0.6
31-Aug	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.4	0.2	0.2	1.1	2.3	3.8	3.7	3.1	3.1	3.6	3.7	3.8	3.7	3.1	1.7	3.8
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance UO - Unstable Operation PF - Power Failure Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 13 ppm																										



Wood Buffalo Environmental Association
Hourly Averages

Carbon Monoxide (CO) - ppm
Fort Chipewyan - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort Chipewyan - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	475	69.55	69.55
0.4 - 0.5	79	11.57	81.11
0.6 - 0.7	37	5.42	86.53
0.8 - 1.4	57	8.35	94.88
1.5 - 10	32	4.69	99.56
> 10	0	0.00	99.56

Total Number of Valid Hours: 683

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Fort Chipewyan - August 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	12	19	12	19	57	32	36	25	29	29	44	48	55	24	19	15	475
0.4 - 0.5	0	0	1	1	18	3	3	0	2	14	7	2	2	7	11	8	79
0.6 - 0.7	1	0	0	3	8	0	0	1	4	2	2	3	1	5	5	2	37
0.8 - 1.4	1	0	1	3	2	1	0	0	1	1	0	1	8	22	7	9	57
1.5 - 10	0	0	1	0	4	0	0	0	0	0	0	1	5	7	11	3	32
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	19	15	26	89	36	39	26	36	46	53	55	71	65	53	37	680

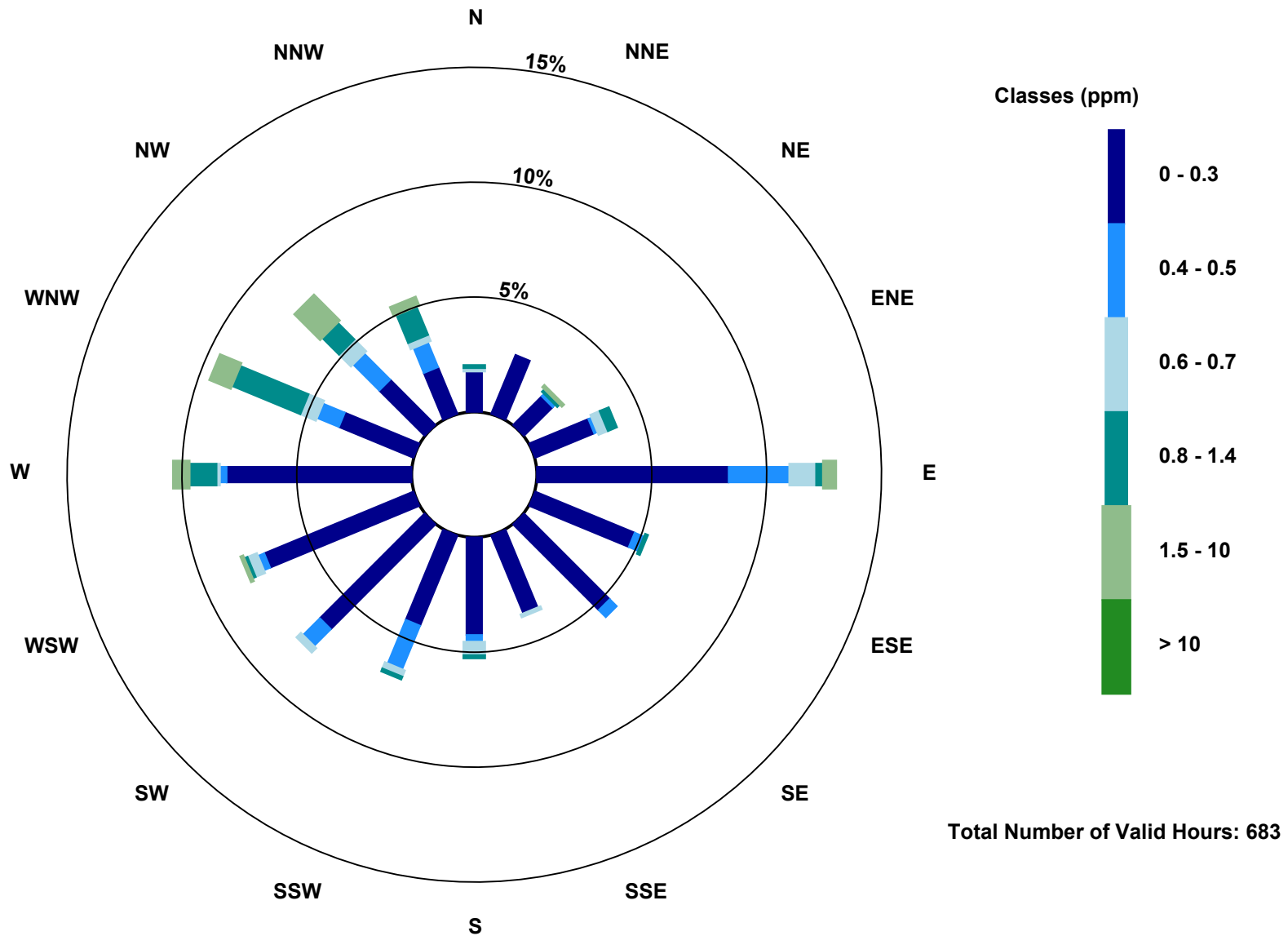
Total Number of Valid Hours: 683

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Carbon Monoxide (CO) - ppm
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

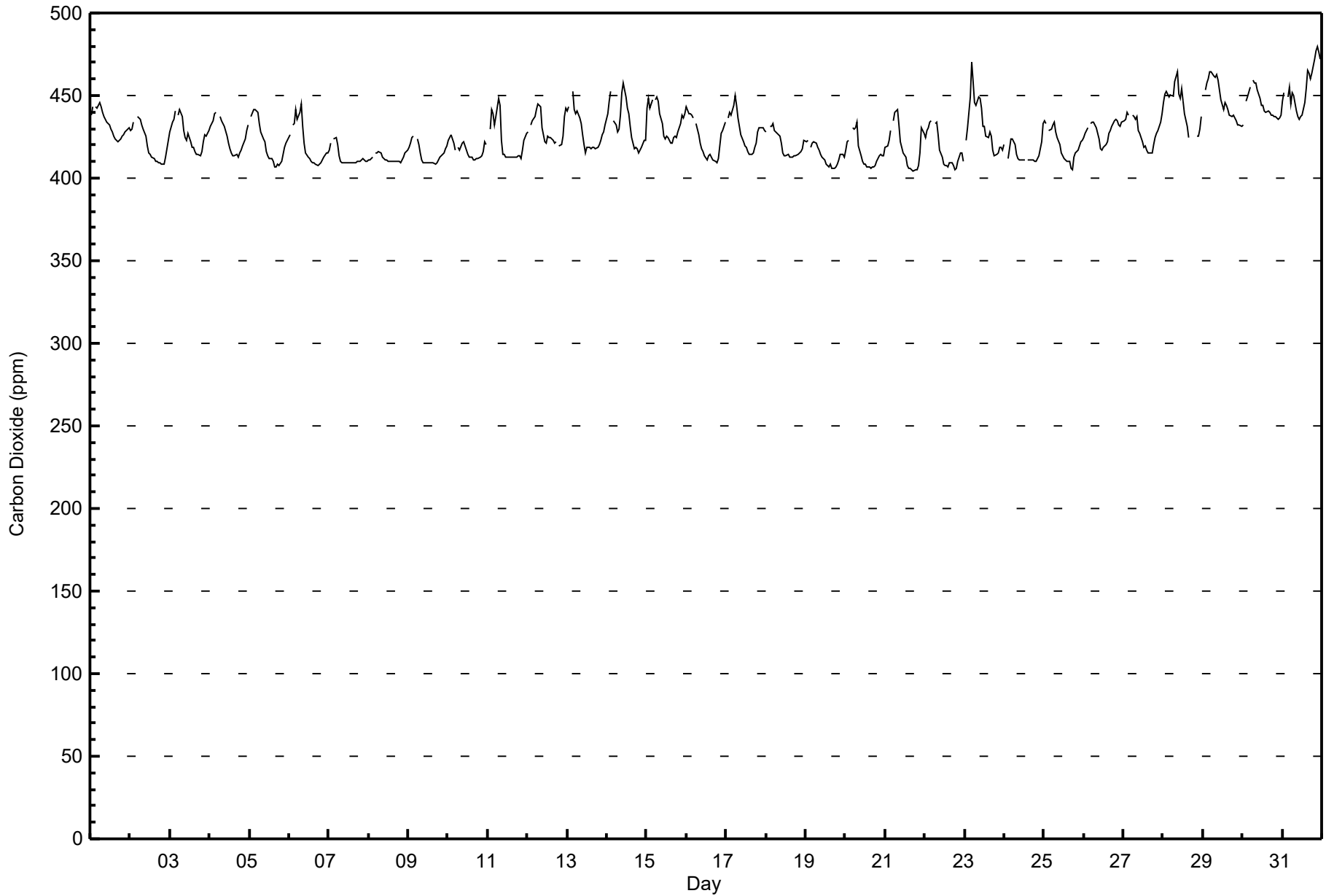
Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744				
Maximum Value: 479.4 ppm on Aug 31 22:00		Maximum Daily Average: 455.1 ppm on Aug 31																	Hours of Data:	706						
Minimum Value: 404.1 ppm on Aug 21 18:00		Minimum Daily Average: 412.2 ppm on Aug 8																	Hours of Missing Data:	38						
Maximum Diurnal Average: 437.9 ppm at hour 5		Minimum Diurnal Average: 416.5 ppm at hour 18																	Hours of Calibration:	35						
Monthly Average: 425.71 ppm		Percentiles: P ₁ = 406.1 P ₁₀ = 409.8 Q ₁ = 413.7 Median = 423.0 Q ₃ = 435.1 P ₉₀ = 445.0 P ₉₉ = 464.8																	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-Aug	438.5	442.9	Z	443.0	442.1	445.5	443.4	439.8	437.5	435.6	434.0	432.0	429.8	428.0	425.8	423.4	422.2	423.0	423.5	425.4	426.2	427.8	429.3	430.4	432.6	445.5
2-Aug	428.9	429.6	433.8	Z	437.2	436.2	435.7	431.9	429.6	425.1	419.1	415.4	414.3	413.0	412.2	410.5	410.3	409.6	409.1	408.7	408.5	412.4	417.9	423.0	420.5	437.2
3-Aug	427.8	433.6	435.7	441.0	Z	437.8	441.4	437.3	428.9	424.6	423.1	426.9	421.7	418.5	418.8	416.4	414.4	414.7	413.7	416.3	422.2	426.3	425.3	428.5	425.9	441.4
4-Aug	431.4	433.3	435.1	439.0	439.8	Z	437.5	434.4	432.7	431.1	425.3	421.4	418.1	415.3	413.7	413.6	414.3	412.6	414.8	416.8	419.6	423.8	429.2	432.2	425.4	439.8
5-Aug	Z	437.6	441.6	441.3	441.0	439.6	432.9	427.8	423.5	422.4	416.5	413.5	412.1	412.1	410.0	406.4	406.9	408.4	407.6	410.3	414.3	418.5	421.1	423.0	421.2	441.6
6-Aug	425.9	Z	431.8	432.9	441.3	435.8	439.9	445.1	431.6	421.0	414.9	412.6	411.9	410.4	409.3	408.9	408.3	407.9	408.5	409.1	410.8	412.6	414.9	415.1	420.0	445.1
7-Aug	417.1	421.6	Z	423.4	424.4	420.3	413.3	409.8	409.0	409.5	409.4	409.1	409.1	409.2	409.6	409.7	409.5	409.9	409.9	410.1	412.0	411.1	410.1	410.0	412.5	424.4
8-Aug	411.2	411.3	412.4	Z	414.9	415.5	416.3	414.9	413.0	412.0	411.2	411.0	410.3	410.0	410.3	410.4	410.3	410.0	409.8	409.3	411.2	412.6	415.0	417.1	412.2	417.1
9-Aug	418.9	421.3	425.0	425.6	Z	423.3	420.1	415.6	411.4	409.0	409.2	409.6	409.7	409.5	409.0	409.3	408.6	409.7	411.2	413.0	413.7	415.6	417.7	419.4	414.6	425.6
10-Aug	422.6	424.4	425.9	421.4	417.3	Z	419.0	416.9	421.0	421.8	419.8	417.1	414.3	413.0	412.7	410.8	411.0	412.1	411.8	412.7	413.8	416.2	421.8	420.8	417.3	425.9
11-Aug	Z	429.6	441.2	438.6	432.3	437.1	448.1	443.7	422.7	414.2	414.5	413.0	412.4	413.1	413.0	412.9	412.8	412.9	413.1	413.3	412.2	416.8	423.1	427.2	422.5	448.1
12-Aug	427.6	Z	431.9	434.6	437.4	441.3	445.2	444.5	443.0	430.2	422.2	420.9	425.3	424.4	424.4	423.2	421.5	421.7	PF	419.3	420.3	425.2	437.6	442.6	430.2	445.2
13-Aug	440.4	443.4	Z	452.5	441.9	439.2	440.4	436.8	433.1	426.1	420.0	415.6	418.4	418.5	418.1	418.2	418.4	417.8	418.5	420.3	422.7	426.3	427.7	432.5	428.1	452.5
14-Aug	438.8	446.5	452.5	Z	435.1	432.4	428.0	429.7	438.3	452.1	457.4	449.0	442.7	439.4	431.2	424.5	418.0	418.6	417.9	415.3	416.6	418.3	422.9	423.1	432.5	457.4
15-Aug	442.1	448.6	442.4	447.5	Z	447.3	449.4	446.4	439.0	432.7	425.3	424.1	425.2	424.3	421.3	421.4	424.7	425.5	424.6	427.9	433.2	438.3	436.4	439.1	434.2	449.4
16-Aug	443.6	439.3	438.9	438.1	436.8	Z	433.1	426.1	421.4	418.1	415.8	414.0	411.1	413.3	414.0	412.8	411.2	409.8	408.9	411.9	419.7	427.0	429.1	433.5	422.9	443.6
17-Aug	Z	436.7	439.5	438.0	443.8	449.8	443.7	436.6	431.6	426.4	421.8	419.4	418.4	415.7	414.6	414.6	415.3	418.4	420.9	428.2	430.3	430.3	430.9	428.6	428.4	449.8
18-Aug	427.7	Z	431.3	431.5	433.3	429.1	428.2	426.8	425.8	421.2	415.4	413.7	413.7	414.5	413.0	412.8	413.0	413.2	413.5	414.4	415.1	415.8	417.8	422.7	420.2	433.3
19-Aug	422.4	422.6	Z	418.4	421.2	421.8	421.0	418.9	416.6	414.3	412.4	411.3	408.7	407.7	407.0	408.5	406.3	406.4	407.1	408.8	411.4	414.4	414.4	412.5	413.6	422.6
20-Aug	416.8	422.2	422.6	Z	430.8	430.1	430.4	433.8	419.2	413.5	410.1	408.8	408.1	407.1	406.9	406.3	406.4	407.0	407.8	410.0	413.4	414.3	413.7	413.9	415.3	433.8
21-Aug	418.3	419.8	423.1	429.0	Z	435.0	439.7	441.3	432.4	421.9	419.0	415.1	412.8	408.0	406.1	406.1	405.4	404.1	404.7	405.0	408.0	415.5	430.8	427.0	418.6	441.3
22-Aug	424.7	428.8	430.3	434.0	434.6	Z	433.1	434.3	426.3	417.2	413.0	408.6	407.6	407.9	407.1	409.4	409.0	407.9	405.4	405.7	410.1	415.5	415.1	410.3	417.2	434.6
23-Aug	Z	422.8	430.6	448.9	470.2	458.4	445.9	444.2	448.9	448.4	442.2	431.6	431.6	425.2	424.7	428.3	425.6	416.9	413.7	414.5	415.2	418.4	418.5	417.2	432.2	470.2
24-Aug	420.0	Z	412.2	417.9	423.6	423.5	419.9	414.1	411.7	411.0	411.4	410.7	410.7	M	411.2	411.0	410.8	410.8	410.2	410.4	411.5	413.7	421.8	432.7	415.0	432.7
25-Aug	434.4	432.9	Z	429.1	429.4	432.5	434.0	427.9	424.8	420.0	415.4	413.3	411.6	411.4	410.2	409.8	406.3	404.8	412.6	415.1	416.6	419.2	421.7	422.9	419.8	434.4
26-Aug	424.2	427.0	430.4	Z	432.7	433.9	433.7	430.5	427.5	423.8	417.7	416.6	419.0	420.0	422.4	426.8	428.7	431.6	434.4	435.4	434.4	431.9	431.4	433.5	428.2	435.4
27-Aug	434.5	435.8	439.5	438.6	Z	438.0	437.2	435.3	437.0	429.2	427.5	421.6	418.5	419.1	416.7	415.5	415.4	415.2	420.5	424.9	426.9	428.5	433.6	439.3	428.2	439.5
28-Aug	445.8	451.1	453.0	449.4	450.7	Z	449.4	458.5	464.8	450.6	447.9	454.2	447.0	438.8	431.2	424.7	C	C	C	C	425.3	425.3	429.3	437.1	443.9	464.8
29-Aug	Z	453.2	457.8	459.8	464.6	464.5	462.0	461.3	462.9	459.6	453.3	447.1	441.7	445.6	444.0	441.9	438.2	437.0	438.3	436.8	434.5	432.5	432.0	431.6	447.8	464.6
30-Aug	432.6	Z	446.7	449.3	454.9	DF	459.3	458.0	457.5	453.4	448.7	444.2	443.7	440.7	439.8	440.5	440.1	438.5	438.2	437.5	437.0	435.9	436.3	438.4	444.1	459.3
31-Aug	446.8	451.7	Z	449.4	455.0	444.9	451.5	449.6	440.7	437.5	435.9	437.0	438.4	445.6	454.3	465.1	463.8	460.0	463.8	472.1	477.3	479.4	476.1	472.1	455.1	479.4
429.3 433.4 434.6 437.4 437.9 436.5 436.5 434.6 431.1 426.9 423.5 421.2 419.9 419.3 418.1 417.9 416.9 416.5 417.0 418.6 420.8 423.2 425.9 427.7																								Diurnal Average		
446.8 453.2 457.8 459.8 470.2 464.5 462.0 461.3 464.8 459.6 457.4 454.2 447.0 445.6 454.3 465.1 463.8 460.0 463.8 472.1 477.3 479.4 476.1 472.1																								Diurnal Maximum		
Z - zerospan			C - Calibration			M - Maintenance			DF - DAS Failure			PF - Power Failure														



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	308	43.63	43.63
420 - 440	292	41.36	84.99
440 - 460	91	12.89	97.88
460 - 480	15	2.12	100.00
480 - 500	0	0.00	100.00
> 500	0	0.00	100.00

Total Number of Valid Hours: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Fort Chipewyan - August 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	3	13	10	14	47	26	22	16	15	22	17	33	33	15	17	5	308
420 - 440	11	3	2	12	27	6	13	10	18	19	22	15	36	43	29	26	292
440 - 460	0	3	3	0	20	5	4	0	3	5	13	6	4	12	7	6	91
460 - 480	0	0	0	0	5	0	0	0	0	0	1	1	0	0	7	1	15
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	14	19	15	26	99	37	39	26	36	46	53	55	73	70	60	38	706

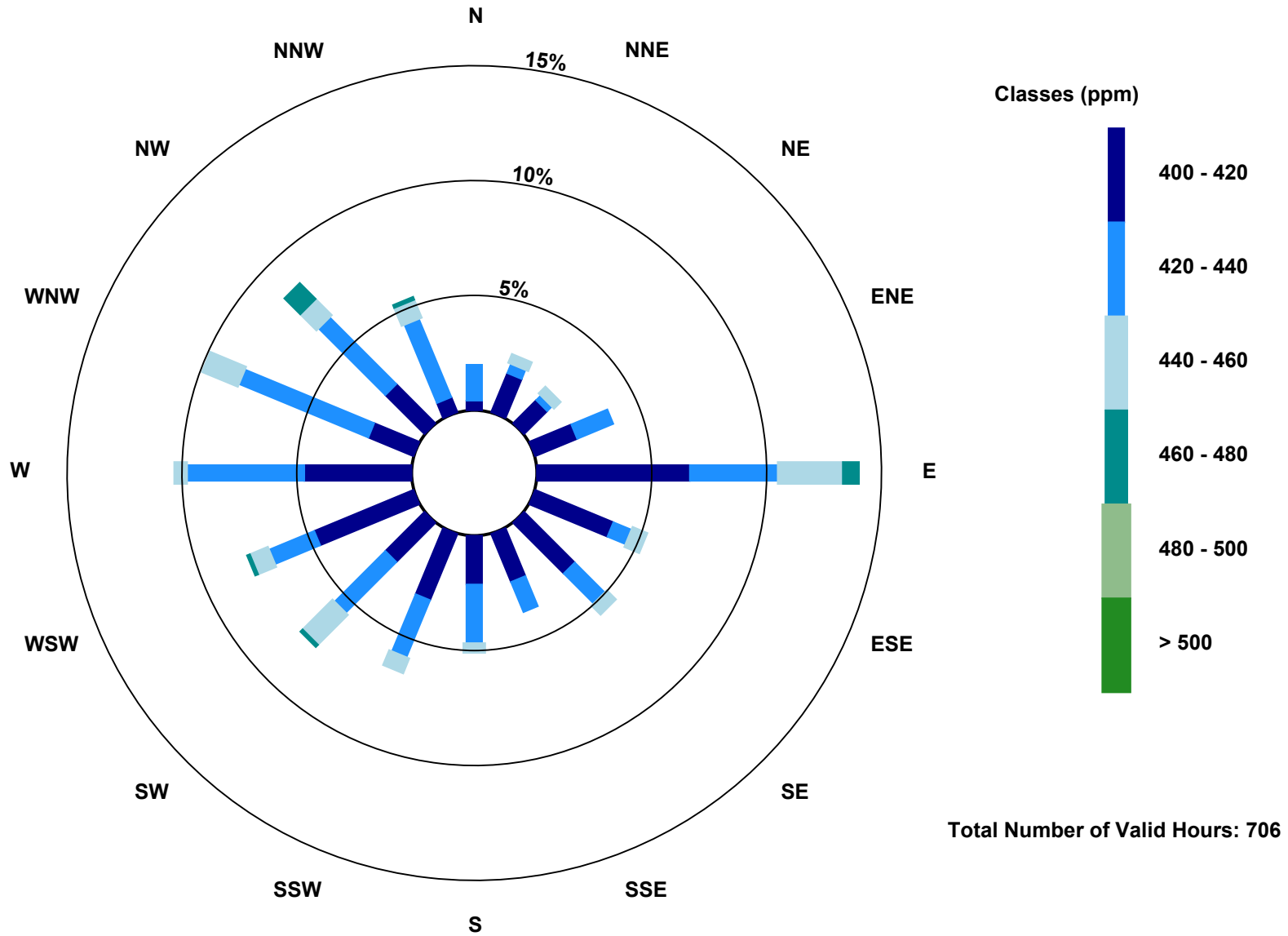
Total Number of Valid Hours: 706

Total Number of Hours: 744



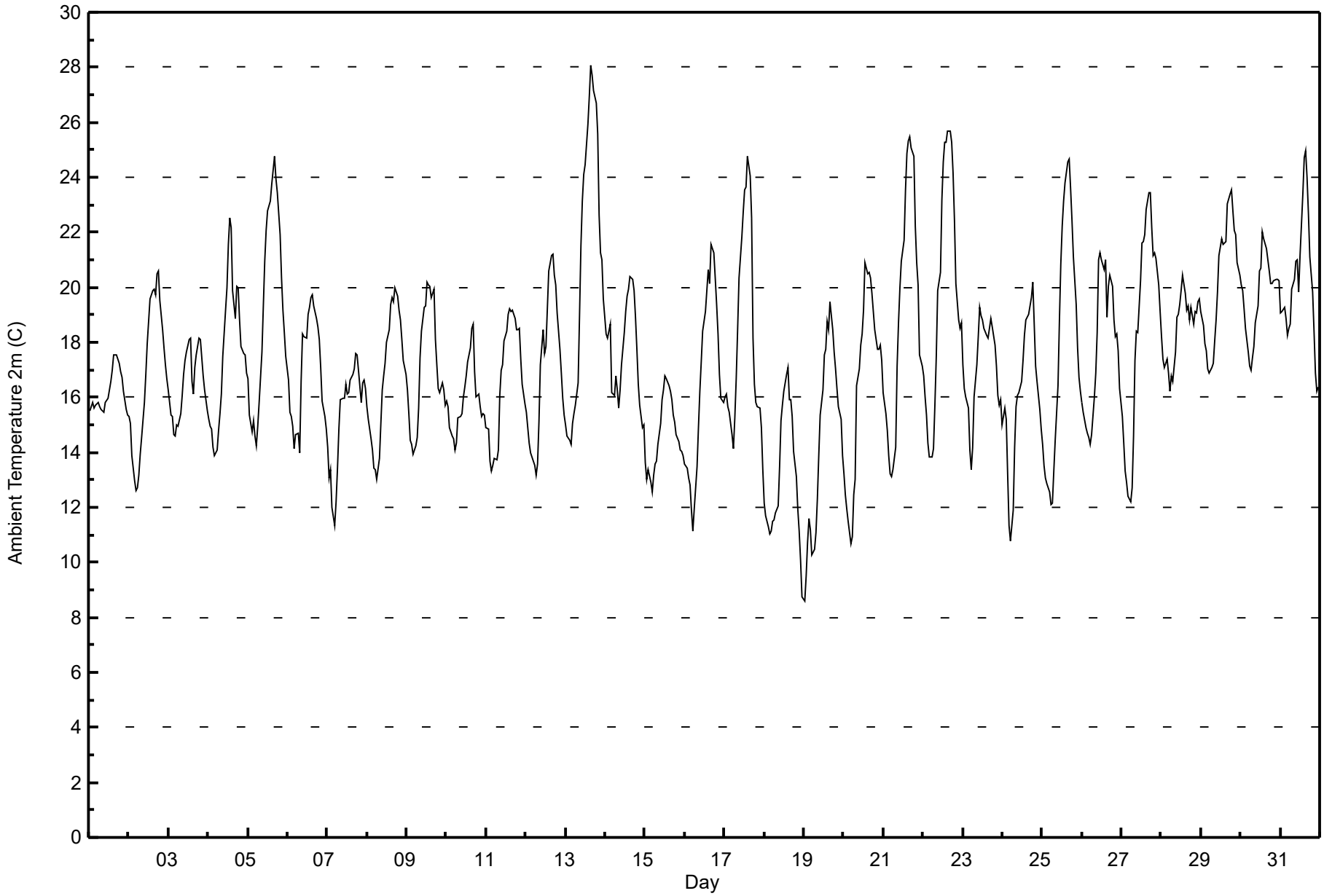
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Carbon Dioxide (CO₂) - ppm
Fort Chipewyan





Maximum Value: 28.1 C on Aug 13 16:00		Maximum Daily Average: 21.1 C on Aug 13		Hours in Service: 744																							
Minimum Value: 8.6 C on Aug 19 01:00		Minimum Daily Average: 13.1 C on Aug 18		Hours of Data: 744																							
Maximum Diurnal Average: 20.7 C at hour 17		Minimum Diurnal Average: 13.8 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 17.39 C		Percentiles: P ₁ = 10.8 P ₁₀ = 13.4 Q ₁ = 15.2 Median = 17.1 Q ₃ = 19.4 P ₉₀ = 21.6 P ₉₉ = 25.6		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-Aug	15.5	15.7	15.8	15.6	15.7	15.8	15.7	15.6	15.5	15.5	15.8	16.0	16.3	16.6	17.0	17.5	17.5	17.4	17.2	16.9	16.7	16.2	15.5	15.4	16.2	17.5	
2-Aug	15.3	15.0	13.9	13.0	12.6	12.7	13.1	13.9	14.5	15.8	16.8	17.9	18.8	19.6	19.9	19.9	19.7	20.5	20.6	19.5	18.5	17.8	17.2	16.7	16.8	20.6	
3-Aug	16.2	15.3	15.3	14.6	14.6	15.0	14.9	15.4	16.1	16.8	17.4	17.6	18.1	18.2	16.6	16.1	17.1	17.5	18.1	18.1	17.4	16.8	16.3	15.5	16.5	18.2	
4-Aug	15.2	15.0	14.8	14.2	13.9	14.1	14.8	15.4	16.1	17.5	19.2	20.0	21.5	22.5	22.2	19.9	18.8	20.0	20.0	18.8	17.9	17.6	17.5	16.9	17.7	22.5	
5-Aug	16.7	15.4	14.8	15.2	14.6	14.2	14.9	15.8	17.7	19.3	21.0	22.1	22.8	23.2	23.8	24.3	24.8	23.9	23.4	21.9	20.3	19.2	18.4	17.5	19.4	24.8	
6-Aug	16.6	15.5	15.3	15.0	14.1	14.7	14.7	14.0	16.6	18.3	18.2	18.2	19.0	19.3	19.6	19.7	19.3	18.9	18.6	18.1	17.1	15.8	15.3	14.9	16.9	19.7	
7-Aug	14.2	13.1	13.3	12.0	11.4	12.2	13.4	14.9	15.9	16.0	16.0	16.5	16.1	16.2	16.6	16.8	17.0	17.6	17.5	17.0	15.8	16.5	16.6	16.3	15.4	17.6	
8-Aug	15.7	15.2	14.5	14.1	13.4	13.4	13.0	13.8	15.0	16.3	16.8	17.2	18.0	18.5	19.4	19.6	19.5	20.0	19.7	19.2	18.8	18.1	17.4	16.8	16.8	20.0	
9-Aug	16.3	15.4	14.4	14.3	13.9	14.3	14.5	15.6	17.4	18.4	19.2	19.3	20.2	20.1	20.0	19.6	20.0	18.1	17.2	16.3	16.2	16.5	16.3	15.7	17.1	20.2	
10-Aug	15.9	15.6	14.9	14.6	14.5	14.1	14.3	15.3	15.3	15.4	16.0	16.4	16.8	17.3	17.8	18.5	18.7	16.9	16.0	16.1	15.7	15.3	15.4	15.3	15.9	18.7	
11-Aug	14.9	14.8	13.7	13.3	13.5	13.8	13.7	14.1	16.1	17.0	17.2	18.0	18.4	19.0	19.2	19.1	19.2	18.9	18.5	18.5	18.5	17.4	16.5	15.8	16.6	19.2	
12-Aug	15.5	14.9	14.4	14.0	13.7	13.5	13.2	13.6	15.1	17.2	18.5	17.6	17.8	19.2	20.6	21.2	21.2	20.4	20.1	19.1	17.8	16.9	16.0	15.3	16.9	21.2	
13-Aug	15.0	14.6	14.4	14.3	15.0	15.4	15.7	16.5	19.0	21.5	23.1	24.1	24.5	25.9	26.9	28.1	27.7	27.2	26.7	25.6	22.6	21.2	21.0	19.6	21.1	28.1	
14-Aug	18.3	18.2	18.4	18.6	16.2	16.0	16.8	16.3	15.6	16.3	17.2	18.4	19.1	19.7	19.9	20.4	20.3	19.9	18.9	17.7	16.5	15.7	14.9	15.0	17.7	20.4	
15-Aug	13.6	13.0	13.4	12.9	12.6	13.2	13.6	13.7	14.3	15.0	15.9	16.2	16.8	16.7	16.4	16.2	15.9	15.3	15.1	14.7	14.4	14.1	14.0	13.9	14.6	16.8	
16-Aug	13.6	13.4	13.1	12.8	11.9	11.2	11.9	13.5	14.9	16.2	17.3	18.4	19.1	19.9	20.6	20.1	21.6	21.3	20.3	19.4	18.3	16.8	16.0	15.8	16.6	21.6	
17-Aug	16.0	16.1	15.7	15.5	14.6	14.1	15.2	16.7	18.5	20.3	21.8	22.7	23.5	23.7	24.8	24.1	22.5	18.2	16.5	15.8	15.7	15.6	14.9	13.4	18.2	24.8	
18-Aug	12.1	11.7	11.3	11.0	11.1	11.5	11.6	11.8	12.1	13.5	15.1	15.7	16.2	16.8	17.1	15.9	15.9	15.3	14.0	13.1	12.0	11.2	10.1	8.7	13.1	17.1	
19-Aug	8.6	9.5	10.7	11.6	11.2	10.3	10.5	11.1	12.3	13.9	15.3	16.3	17.6	17.8	18.8	18.5	19.5	18.4	17.6	17.1	16.3	15.7	15.2	13.9	14.5	19.5	
20-Aug	13.2	12.5	11.9	11.5	10.7	10.9	12.5	13.0	16.4	17.0	17.9	18.3	19.2	20.9	20.5	20.5	20.4	19.8	19.1	18.5	17.8	17.8	17.9	17.3	16.5	20.9	
21-Aug	16.2	15.4	14.8	13.9	13.2	13.1	13.3	14.2	17.1	18.7	20.0	21.0	21.7	23.5	24.9	25.3	25.5	25.0	24.8	22.2	20.9	20.1	17.5	17.1	19.1	25.5	
22-Aug	16.8	16.0	15.4	14.3	13.8	13.8	14.1	15.7	17.5	19.9	20.5	23.2	24.6	25.2	25.3	25.7	25.7	25.3	24.1	22.4	20.1	18.8	18.5	18.7	19.8	25.7	
23-Aug	17.2	16.3	16.0	15.6	14.1	13.4	14.2	16.0	17.2	18.2	19.3	19.0	18.8	18.5	18.2	18.2	18.5	18.9	18.6	17.9	17.2	16.1	15.7	15.9	17.0	19.3	
24-Aug	15.0	15.6	15.2	13.2	11.3	10.8	11.9	14.2	15.7	16.1	16.2	16.6	17.3	18.2	18.8	18.9	19.0	19.6	20.2	18.7	17.1	16.6	15.6	14.8	16.1	20.2	
25-Aug	14.3	13.5	13.1	12.9	12.6	12.1	12.2	13.3	14.4	16.4	18.8	20.9	22.2	23.1	23.8	24.5	24.7	23.6	22.4	21.1	19.4	17.8	16.7	16.2	17.9	24.7	
26-Aug	15.8	15.5	14.9	14.7	14.5	14.3	14.6	16.0	16.9	18.4	21.0	21.2	21.0	20.7	21.0	18.9	20.0	20.4	20.0	18.8	18.2	18.3	17.7	16.3	17.9	21.2	
27-Aug	15.3	14.3	13.3	12.9	12.4	12.2	12.7	14.6	17.4	18.4	18.4	20.2	21.6	21.7	21.9	22.8	23.4	23.5	22.2	21.1	21.3	21.1	20.1	19.1	18.4	23.5	
28-Aug	18.2	17.4	17.1	17.4	16.9	16.2	16.8	16.6	17.7	18.9	19.0	19.4	19.9	20.5	19.8	19.2	19.3	18.8	19.3	18.7	19.1	19.0	19.5	19.6	18.5	20.5	
29-Aug	19.1	18.6	17.9	17.7	17.0	16.9	17.1	17.3	18.0	18.8	19.9	21.2	21.7	21.5	21.6	21.7	23.0	23.4	23.5	22.8	22.1	21.9	20.9	20.4	20.2	23.5	
30-Aug	20.1	19.9	19.2	18.5	17.6	17.1	17.0	17.4	17.9	18.7	19.3	20.6	20.7	22.0	21.7	21.4	21.0	20.6	20.2	20.2	20.2	20.3	20.3	20.2	19.7	22.0	
31-Aug	19.1	19.1	19.3	18.9	18.3	18.5	18.7	19.9	20.3	21.0	21.0	19.9	21.2	23.4	24.7	25.0	24.0	22.7	21.1	19.8	18.4	16.9	16.2	16.4	20.1	25.0	
		15.7	15.2	14.8	14.4	13.9	13.8	14.2	15.0	16.3	17.4	18.4	19.0	19.7	20.3	20.6	20.6	20.7	20.2	19.7	18.9	18.0	17.4	16.8	16.3	Diurnal Average	
		20.1	19.9	19.3	18.9	18.3	18.5	18.7	19.9	20.3	21.5	23.1	24.1	24.6	25.9	26.9	28.1	27.7	27.2	26.7	25.6	22.6	21.9	21.0	20.4	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Fort Chipewyan - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	3	0.40	0.40
10 - 20	593	79.70	80.11
> 20	148	19.89	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

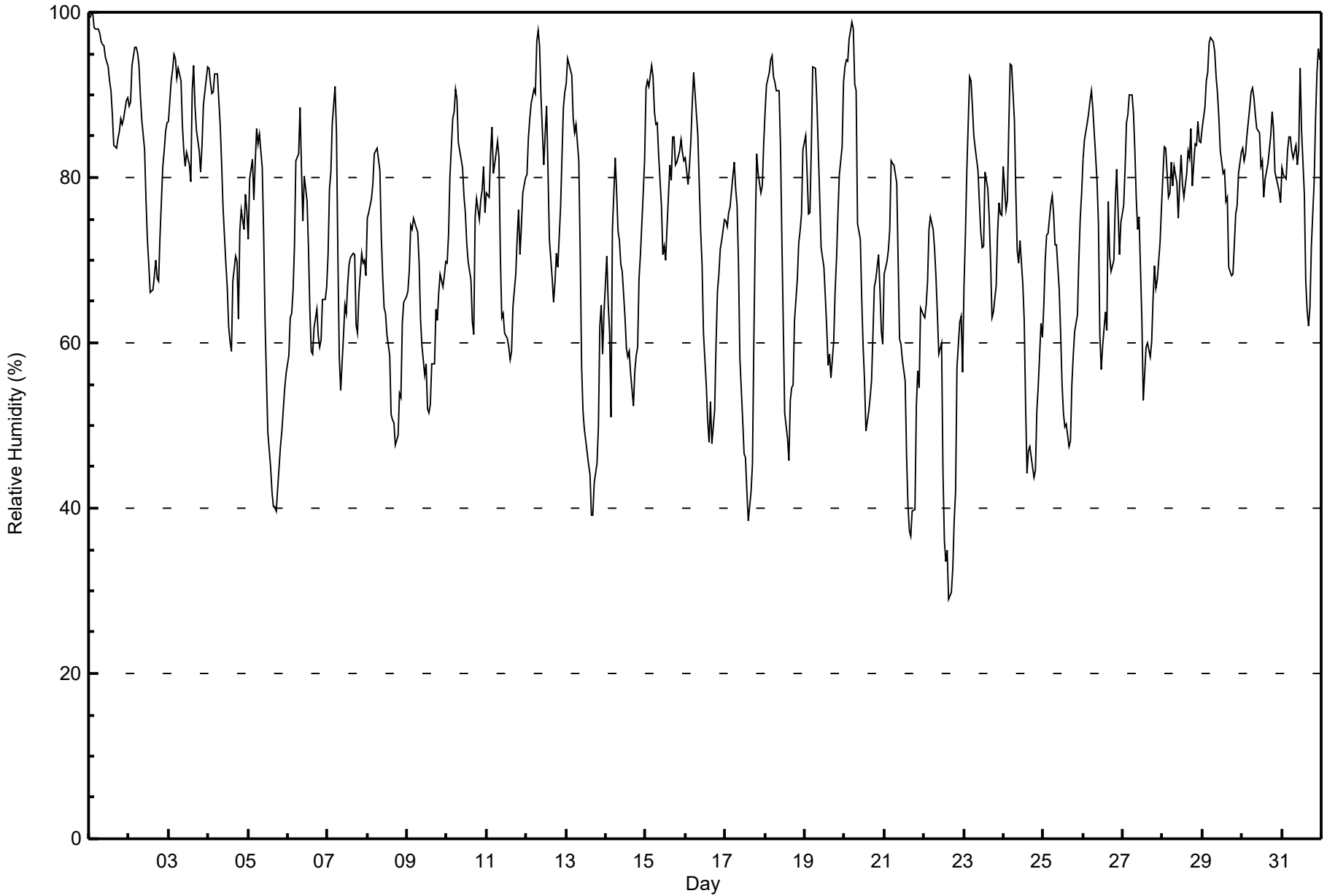
Relative Humidity (RH) - %
Fort Chipewyan - August 2023

Maximum Value: 99.9 % on Aug 1 03:00 Maximum Daily Average: 92.3 % on Aug 1																						Hours in Service:	744																								
Minimum Value: 29.0 % on Aug 22 16:00 Minimum Daily Average: 54.2 % on Aug 22																						Hours of Data:	744																								
Maximum Diurnal Average: 87.6 % at hour 6 Minimum Diurnal Average: 60.5 % at hour 15																						Hours of Missing Data:	0																								
Monthly Average: 73.30 % Percentiles: P ₁ = 37.7 P ₁₀ = 52.6 Q ₁ = 63.3 Median = 75.3 Q ₃ = 83.9 P ₉₀ = 90.9 P ₉₉ = 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-Aug	99.4	99.9	99.9	98.1	98.0	97.9	97.4	96.4	96.1	95.9	94.6	93.3	91.7	90.5	87.7	83.9	83.6	84.7	85.6	87.1	86.4	87.1	89.4	89.7	92.3	99.9																					
2-Aug	88.6	89.2	93.6	95.7	95.8	95.1	93.6	89.9	87.0	83.3	77.2	72.6	69.5	66.2	66.4	68.2	70.1	67.9	67.4	72.8	81.3	83.3	85.6	86.7	81.1	95.8																					
3-Aug	86.8	91.7	93.0	94.9	94.4	92.1	93.3	91.6	86.2	83.3	81.4	83.1	81.5	79.5	90.5	93.5	88.7	85.8	83.3	80.7	83.9	88.8	90.4	93.4	88.0	94.9																					
4-Aug	93.2	91.5	90.1	90.3	92.6	92.6	89.4	86.3	81.7	76.4	69.7	66.7	62.1	60.2	59.1	67.5	70.6	69.8	62.8	73.6	76.1	73.8	78.0	76.0	77.1	93.2																					
5-Aug	72.5	79.8	82.3	77.3	81.9	85.9	84.1	85.3	81.2	73.2	62.7	55.8	49.1	44.9	41.9	40.1	40.2	39.6	42.4	47.5	49.4	51.9	54.4	56.3	61.6	85.9																					
6-Aug	58.4	63.1	63.5	66.2	71.8	82.0	82.8	88.5	81.1	74.7	80.1	77.2	71.5	64.0	59.0	58.6	61.9	64.1	60.8	59.6	60.4	65.3	65.3	66.8	68.6	88.5																					
7-Aug	70.8	78.6	80.6	86.6	91.0	85.5	70.7	58.3	54.3	60.9	64.7	63.5	67.2	69.5	70.4	70.8	70.6	62.1	61.2	66.0	70.8	69.6	70.0	68.2	70.1	91.0																					
8-Aug	75.1	75.7	77.4	79.3	82.8	83.2	83.5	80.9	72.9	68.0	64.3	63.5	61.1	58.6	51.3	50.7	50.3	47.6	48.8	54.0	53.4	62.3	65.0	65.6	65.6	83.5																					
9-Aug	66.3	68.8	74.2	73.8	75.1	73.9	73.4	69.7	62.8	59.6	56.1	57.5	52.1	51.6	52.5	57.5	57.4	64.0	62.7	66.2	68.3	66.8	68.2	69.8	64.5	75.1																					
10-Aug	69.7	73.0	80.1	87.1	88.0	90.7	89.5	84.2	82.3	81.3	77.7	75.7	72.0	69.8	67.7	62.5	61.0	75.3	77.4	74.9	77.3	78.5	81.3	75.8	77.2	90.7																					
11-Aug	78.2	77.6	82.9	86.1	80.6	81.6	84.5	82.3	70.4	63.1	63.5	61.2	60.6	59.5	58.0	59.0	64.4	68.2	72.7	76.1	70.7	74.1	78.2	80.0	72.2	86.1																					
12-Aug	80.4	84.7	87.1	89.1	90.6	90.2	96.4	97.8	95.9	89.9	81.5	85.2	88.7	80.8	72.5	67.8	64.9	67.2	70.8	69.1	76.5	82.6	88.5	90.3	82.8	97.8																					
13-Aug	91.4	94.4	93.1	92.4	87.2	85.5	86.5	82.0	70.9	57.4	51.6	49.6	48.1	45.3	44.0	39.1	39.2	43.1	45.4	49.8	62.0	64.6	58.7	63.8	64.4	94.4																					
14-Aug	70.6	64.7	61.1	51.0	73.6	82.5	78.3	73.6	72.4	69.6	68.7	63.1	59.3	58.3	58.9	56.2	52.3	56.5	58.4	59.5	67.9	70.7	78.1	82.3	66.2	82.5																					
15-Aug	90.8	91.8	91.0	93.5	92.1	88.0	86.4	86.6	82.7	76.5	70.7	71.7	70.0	74.0	81.5	79.7	84.9	84.8	81.6	81.9	83.2	84.6	83.0	82.0	83.0	93.5																					
16-Aug	82.3	79.1	81.3	84.5	88.9	92.8	90.2	85.2	79.2	73.6	69.4	61.2	54.9	50.6	47.9	52.9	47.7	51.8	60.1	66.3	68.3	71.3	72.4	74.9	70.3	92.8																					
17-Aug	74.7	74.1	75.7	76.5	80.2	81.9	78.7	76.6	69.7	58.2	50.6	46.6	46.2	42.1	38.4	42.1	45.4	60.6	73.3	82.9	80.5	78.2	79.1	84.2	66.5	84.2																					
18-Aug	88.0	91.2	92.6	94.2	94.8	92.3	91.6	90.5	90.5	83.6	72.4	62.1	51.5	48.5	45.8	53.1	54.6	54.9	62.8	67.6	72.0	73.6	75.6	83.5	74.5	94.8																					
19-Aug	85.2	80.5	75.6	75.8	83.6	93.4	93.3	89.0	83.2	77.5	71.6	69.2	65.5	61.9	57.3	58.7	55.7	60.2	66.3	70.2	75.6	80.3	83.8	91.6	75.2	93.4																					
20-Aug	93.5	94.3	94.1	96.8	98.7	98.0	91.3	90.5	74.5	72.5	65.3	59.4	55.5	49.3	51.6	53.3	55.5	61.1	66.8	67.6	70.7	66.4	61.3	59.9	72.8	98.7																					
21-Aug	68.3	69.9	71.1	73.8	82.1	81.7	81.5	79.3	69.9	60.6	59.9	58.0	55.4	46.4	40.3	37.2	36.6	39.7	39.8	52.3	56.6	54.6	64.3	63.4	60.1	82.1																					
22-Aug	63.1	64.6	67.5	73.8	75.2	73.7	71.3	68.0	63.6	58.6	60.0	44.5	36.2	33.5	35.0	29.0	29.8	32.7	38.5	42.1	57.1	62.6	63.2	56.5	54.2	75.2																					
23-Aug	66.7	72.8	80.6	92.3	91.7	88.6	85.0	83.5	80.9	77.0	73.5	71.6	71.7	80.7	78.6	75.3	69.9	63.1	63.7	66.9	73.5	76.9	75.6	75.5	76.5	92.3																					
24-Aug	81.3	76.2	77.3	86.3	93.7	93.6	86.9	78.4	71.1	69.7	72.3	67.1	62.7	52.5	44.2	47.0	47.5	45.0	43.7	44.6	51.7	54.7	62.3	60.7	65.4	93.7																					
25-Aug	64.5	69.9	73.0	73.2	76.8	77.8	75.6	71.8	71.9	66.5	61.1	55.1	51.5	49.8	50.2	47.4	48.1	54.8	58.5	61.3	63.5	69.9	75.1	78.2	64.4	78.2																					
26-Aug	82.3	84.6	86.6	87.8	89.4	90.5	88.3	82.5	79.4	74.4	60.8	56.8	59.7	63.8	61.6	77.2	70.6	68.7	70.0	77.0	81.0	76.1	70.7	74.5	75.6	90.5																					
27-Aug	76.6	81.0	86.6	87.6	90.0	89.9	87.8	83.1	77.5	73.7	75.3	62.8	53.1	56.2	59.5	60.0	58.4	60.2	65.5	69.3	66.6	67.6	72.2	76.4	72.4	90.0																					
28-Aug	80.2	83.8	83.5	77.7	78.2	81.8	79.0	81.3	79.4	75.1	79.2	82.7	79.1	77.6	80.4	83.2	82.3	85.9	78.9	84.0	83.9	86.7	84.4	84.3	81.4	86.7																					
29-Aug	86.0	88.6	91.6	92.8	96.2	97.0	96.5	95.2	92.2	90.3	87.2	83.3	80.6	80.9	77.2	77.7	69.1	68.1	68.4	71.9	75.6	76.7	80.5	83.0	83.6	97.0																					
30-Aug	83.6	82.1	83.0	85.0	88.5	90.4	90.9	89.6	87.6	85.9	85.4	81.3	82.1	77.6	79.8	81.6	83.3	85.1	87.9	85.9	80.6	79.1	78.2	76.9	83.8	90.9																					
31-Aug	81.1	80.4	79.9	83.2	84.9	85.0	83.3	82.5	83.9	81.5	83.4	93.2	85.7	78.0	67.5	63.8	62.1	64.4	71.7	79.4	87.0	92.8	95.7	94.3	81.0	95.7																					
																						79.0	80.6	82.3	84.0	86.7	87.6	85.8	83.2	78.5	73.9	70.7	67.6	64.4	62.0	60.5	61.1	60.5	62.5	64.4	68.0	71.3	73.3	75.1	76.3	Diurnal Average	
																						99.4	99.9	99.9	98.1	98.7	98.0	97.4	97.8	96.1	95.9	94.6	93.3	91.7	90.5	90.5	93.5	88.7	85.9	87.9	87.1	87.0	92.8	95.7	94.3	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort Chipewyan - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Fort Chipewyan - August 2023**

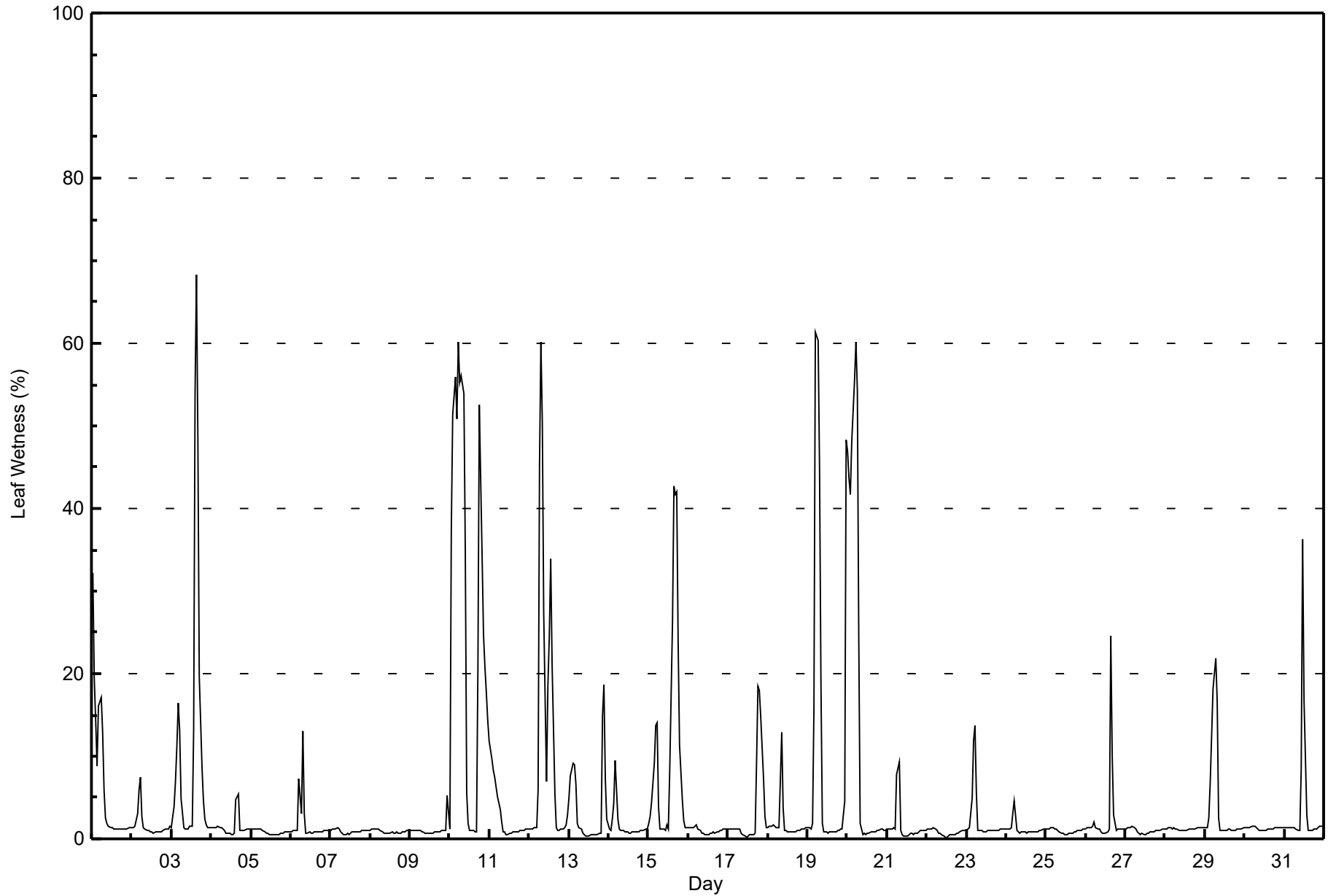
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	15	2.02	2.02
40 - 60	123	16.53	18.55
60 - 80	317	42.61	61.16
80 - 100	289	38.84	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 68.3 % on Aug 3 16:00 Maximum Daily Average: 27.3 % on Aug 10																				Hours in Service: 744 Hours of Data: 744							
Minimum Value: 0.1 % on Aug 22 13:00 Minimum Daily Average: 0.8 % on Aug 22 Maximum Diurnal Average: 10.1 % at hour 6 Minimum Diurnal Average: 1.4 % at hour 11 Monthly Average: 4.55 % Percentiles: $P_1 = 0.3$ $P_{10} = 0.6$ $Q_1 = 0.9$ Median = 1.1 $Q_3 = 1.4$ $P_{90} = 11.7$ $P_{99} = 55.8$																				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-Aug	32.2	19.5	14.4	8.7	16.2	17.1	12.9	5.9	2.6	1.9	1.5	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	6.2	32.2	
2-Aug	1.3	1.3	1.6	3.1	5.9	7.4	2.7	1.3	1.2	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.5	1.7	7.4	
3-Aug	1.4	3.9	7.0	11.2	16.5	13.1	4.9	1.3	1.2	1.1	1.1	1.5	1.5	13.3	53.9	68.3	48.6	19.7	8.5	4.5	2.3	1.7	1.3	1.4	12.1	68.3	
4-Aug	1.4	1.4	1.3	1.4	1.4	1.4	1.3	1.2	1.0	0.7	0.6	0.6	0.5	0.6	0.7	4.7	5.4	1.0	0.9	1.0	1.1	1.1	1.1	1.2	1.4	5.4	
5-Aug	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.0	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.9	0.8	1.3	
6-Aug	0.9	1.0	1.0	1.0	1.0	7.3	3.1	13.0	3.1	0.6	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.8	13.0	
7-Aug	1.1	1.1	1.2	1.3	1.3	1.1	0.9	0.7	0.5	0.5	0.6	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	1.3	1.3	
8-Aug	1.1	1.1	1.1	1.2	1.2	1.1	1.0	0.9	0.7	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.9	1.0	1.0	0.9	1.2	1.2
9-Aug	1.0	1.0	1.1	1.1	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.0	5.3	3.2	1.2	5.3	
10-Aug	1.3	37.3	51.3	56.0	50.8	60.2	55.2	56.0	53.9	34.7	5.6	1.9	1.1	1.0	1.0	0.9	0.9	20.6	52.6	34.2	24.8	20.9	17.8	14.5	27.3	60.2	
11-Aug	11.8	9.6	8.4	7.4	6.3	5.1	3.6	2.0	0.8	0.8	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.1	1.2	2.8	11.8	
12-Aug	1.2	1.2	1.3	1.3	1.3	6.0	45.2	60.1	50.5	27.4	7.0	18.7	24.6	33.9	21.0	5.4	1.3	1.0	1.0	1.1	1.2	1.4	1.7	3.0	13.2	60.1	
13-Aug	4.9	7.7	9.1	9.0	6.7	1.9	1.3	1.2	0.7	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.5	0.6	0.6	0.7	14.8	18.6	7.4	2.4	3.8	18.6	
14-Aug	1.1	1.1	2.3	4.2	9.5	2.4	1.1	1.1	1.1	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.1	1.1	1.2	1.2	1.6	9.5	
15-Aug	1.9	2.8	4.4	9.1	13.7	14.0	3.9	1.2	1.2	1.1	1.1	1.7	1.1	8.4	26.4	42.7	41.7	42.0	23.8	11.4	4.7	2.1	1.4	1.3	11.0	42.7	
16-Aug	1.3	1.3	1.3	1.3	1.5	1.7	1.2	1.0	0.7	0.6	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.0	1.7	
17-Aug	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.1	0.7	0.5	0.3	0.2	0.3	0.5	0.5	0.5	0.6	9.1	18.5	18.0	14.7	7.4	2.8	1.3	3.6	18.5	
18-Aug	1.3	1.4	1.6	1.7	1.5	1.4	1.4	1.3	12.9	3.7	1.0	1.0	0.9	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.2	1.2	1.2	1.3	1.8	12.9	
19-Aug	1.3	1.3	1.3	1.9	15.9	61.3	60.3	44.8	18.8	1.9	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.9	1.0	1.1	1.1	1.2	4.7	48.2	11.4	61.3	
20-Aug	46.9	43.7	41.6	48.1	55.5	60.2	54.3	24.5	1.8	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.1	16.2	60.2	
21-Aug	1.1	1.2	1.2	1.2	1.3	1.2	7.7	9.3	1.0	0.5	0.3	0.3	0.3	0.5	0.6	0.6	0.6	0.6	0.7	0.9	0.9	1.0	1.0	1.1	1.5	9.3	
22-Aug	1.1	1.1	1.2	1.2	1.3	1.2	0.9	0.7	0.6	0.4	0.4	0.2	0.1	0.3	0.5	0.5	0.4	0.5	0.6	0.7	0.9	1.0	1.0	1.0	0.8	1.3	
23-Aug	1.1	1.2	1.4	4.9	11.8	13.7	5.6	1.0	0.9	0.9	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.2	2.4	13.7	
24-Aug	1.2	1.2	1.2	1.4	3.0	4.5	1.0	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.1	1.1	1.1	1.2	4.5	
25-Aug	1.2	1.2	1.3	1.3	1.3	1.3	1.1	1.1	0.9	0.8	0.6	0.5	0.5	0.5	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	0.9	1.3	
26-Aug	1.3	1.3	1.4	1.4	1.5	2.1	1.3	1.1	1.2	0.9	0.6	0.7	0.8	0.9	1.2	24.6	10.2	2.8	1.1	1.2	1.2	1.2	1.2	1.2	2.6	24.6	
27-Aug	1.3	1.3	1.4	1.4	1.5	1.4	1.2	0.9	0.6	0.6	0.6	0.6	0.5	0.7	0.8	0.8	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.0	1.5	
28-Aug	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.1	0.9	1.0	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.3	
29-Aug	1.4	1.4	2.5	6.9	12.4	18.1	21.8	16.6	2.5	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.3	1.3	4.2	21.8	
30-Aug	1.3	1.3	1.3	1.4	1.4	1.5	1.4	1.3	1.2	1.1	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.5	
31-Aug	1.4	1.3	1.3	1.4	1.4	1.4	1.3	1.1	1.0	1.0	8.5	36.3	16.9	2.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.5	3.7	36.3	
																								Diurnal Average			
																								Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Fort Chipewyan - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	12	1.61	1.61
0.4 - 0.5	31	4.17	5.78
0.6 - 0.7	73	9.81	15.59
0.8 - 1.4	457	61.42	77.02
1.5 - 10	85	11.42	88.44
> 10	78	10.48	98.92

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

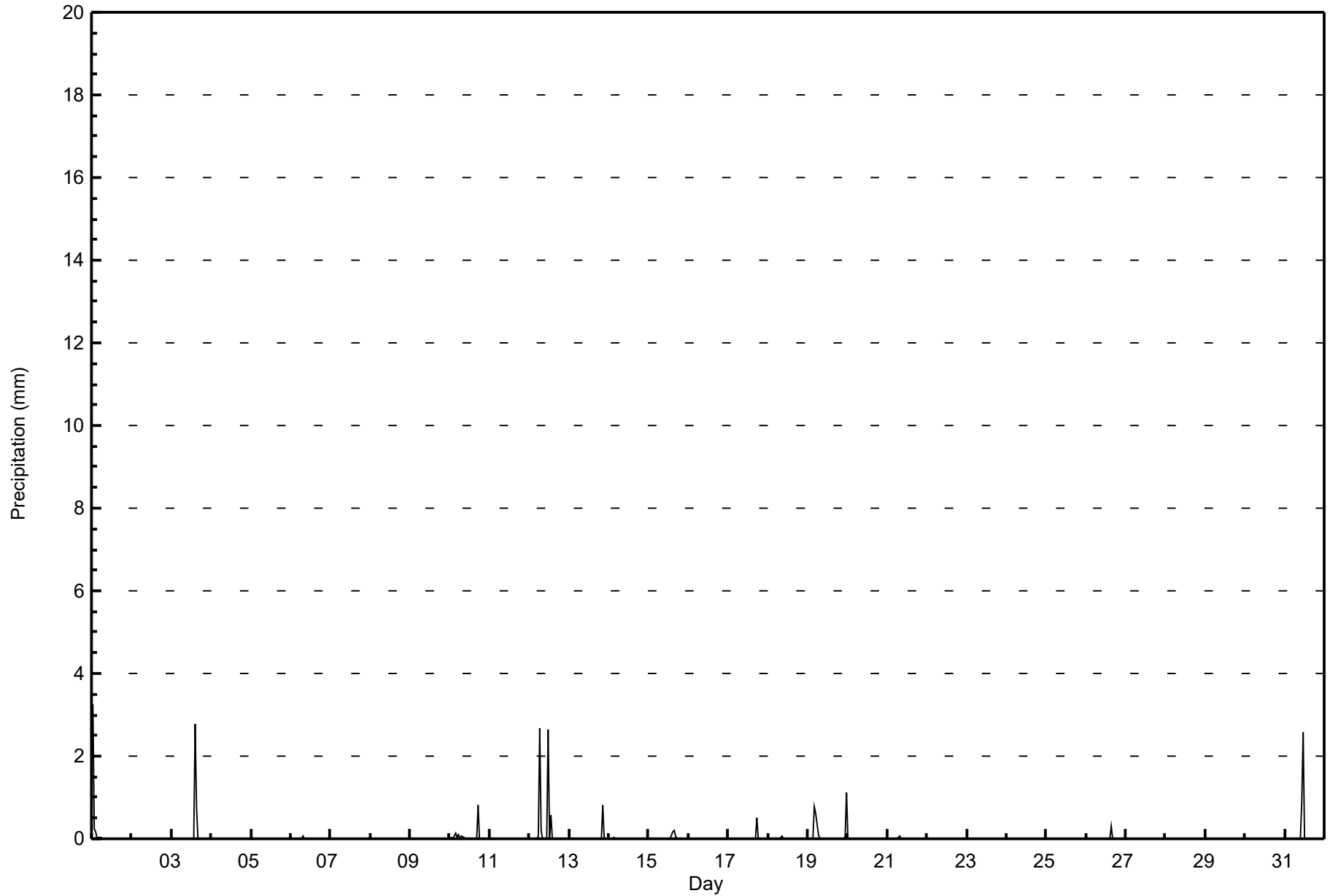
Fort Chipewyan - August 2023

Maximum Value: 3.3 mm on Aug 1 01:00		Maximum Daily Total: 6.1 mm on Aug 12		Hours in Service: 744																							
Minimum Value: 0.0 mm on Aug 1 04:00		Minimum Daily Total: 0.0 mm on Aug 2		Hours of Data: 744																							
Maximum Diurnal Total: 5.2 mm at hour 12		Minimum Diurnal Total: 0.0 mm at hour 10		Hours of Missing Data: 0																							
Monthly Total: 23.19 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 = 0.8		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-Aug	3.3	0.2	0.2	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	3.8	3.3	
2-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	2.8	
4-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
7-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	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	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.8	
11-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.1	2.7	0.2	0.0	0.0	0.0	2.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	2.7	
13-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8	0.8	0.8	
14-Aug	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	0.1	0.1	0.1	
15-Aug	0.0	0.0	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.2	
16-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	
18-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
19-Aug	0.0	0.0	0.0	0.0	0.8	0.6	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	1.1	2.7	1.1	
20-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
22-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	
27-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	2.6	
		3.3	0.3	0.2	0.2	0.9	0.8	2.8	0.4	0.1	0.0	0.9	5.2	0.0	0.6	3.0	1.3	0.1	1.3	0.0	0.0	0.8	0.0	0.1	1.1	Diurnal Average	
		3.3	0.2	0.2	0.1	0.8	0.6	2.7	0.2	0.1	0.0	0.9	2.6	0.0	0.6	2.8	0.8	0.1	0.8	0.0	0.0	0.8	0.0	0.1	1.1	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Fort Chipewyan - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Fort Chipewyan - August 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	730	98.12	98.12
0.4 - 0.5	1	0.13	98.25
0.6 - 0.7	2	0.27	98.52
0.8 - 1.4	6	0.81	99.33
1.5 - 10	5	0.67	100.00
> 10	0	0.00	100.00

Total Number of Valid Hours: 744

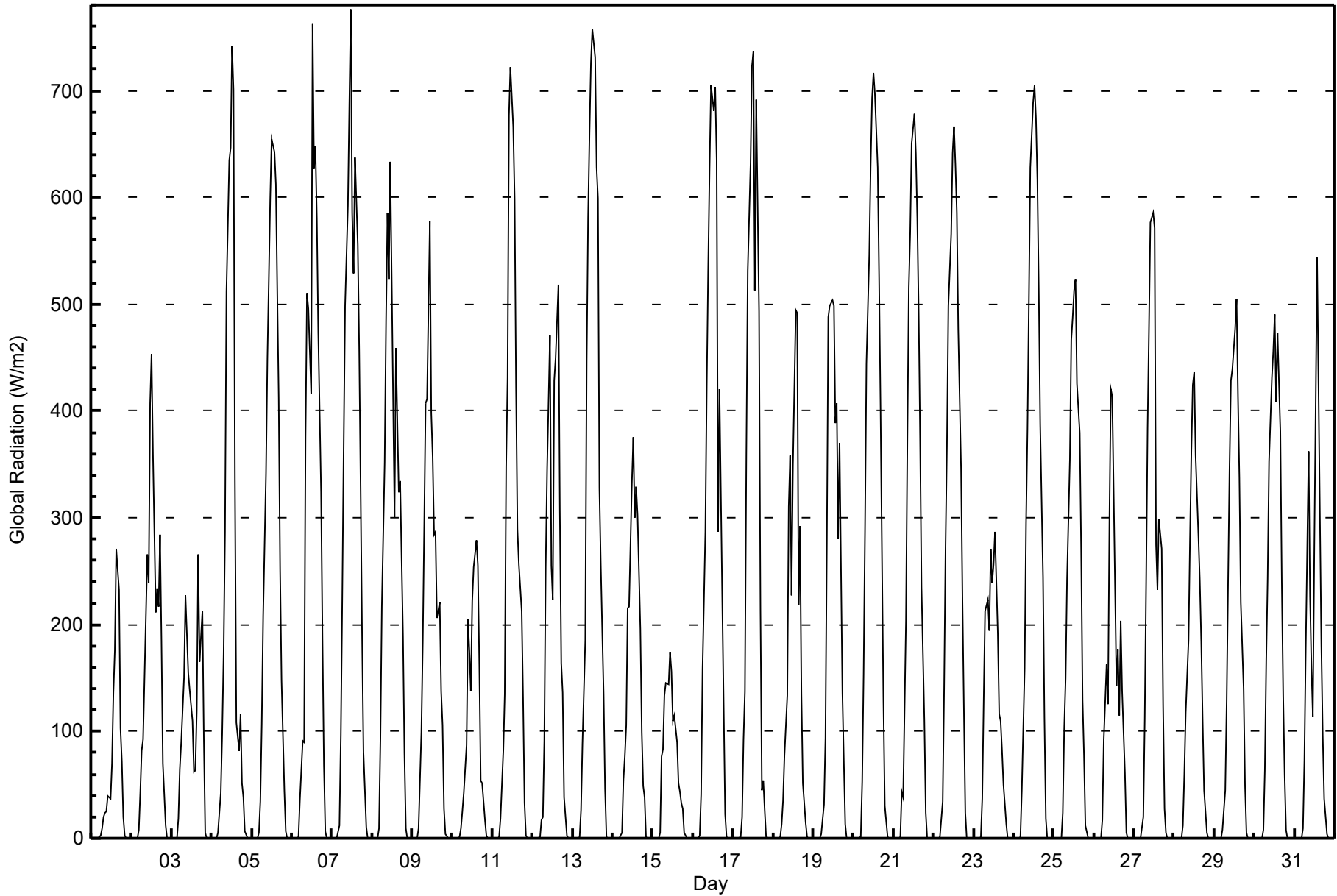
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Global Radiation (GR) - W/m2
Fort Chipewyan - August 2023

Maximum Value: 775.7 W/m2 on Aug 7 12:00 Maximum Daily Average: 276.2 W/m2 on Aug 7																							Hours in Service:	744		
Minimum Value: 0.0 W/m2 on Aug 1 01:00 Minimum Daily Average: 51.6 W/m2 on Aug 1																							Hours of Data:	744		
Maximum Diurnal Average: 483.1 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 24																							Hours of Missing Data:	0		
Monthly Average: 172.86 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 72.1 Q ₃ = 292.9 P ₉₀ = 517.3 P ₉₉ = 722.4																							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-Aug	0.0	0.0	0.0	0.0	0.5	3.2	9.0	19.5	23.8	25.2	39.7	36.4	69.8	136.1	176.3	270.5	232.1	102.9	71.3	19.8	3.0	0.1	0.0	0.0	51.6	270.5
2-Aug	0.0	0.0	0.0	0.1	7.4	42.0	82.4	92.3	149.4	265.5	238.7	407.7	453.6	360.0	211.1	233.8	216.6	284.5	186.8	70.7	11.9	0.1	0.0	0.0	138.1	453.6
3-Aug	0.0	0.0	0.0	0.1	17.9	64.3	89.3	150.3	226.8	191.8	155.1	138.5	109.6	62.3	63.2	119.5	265.1	165.3	213.3	94.3	5.1	0.0	0.0	0.0	88.8	265.1
4-Aug	0.0	0.0	0.0	0.0	4.9	41.9	98.3	171.8	286.9	511.2	634.5	645.9	741.6	700.8	337.0	107.9	81.6	116.2	52.2	38.5	7.2	0.0	0.0	0.0	190.8	741.6
5-Aug	0.0	0.0	0.0	0.1	4.9	34.4	107.3	209.3	341.4	450.1	522.6	598.8	654.1	642.2	612.3	510.0	412.8	250.7	148.7	45.2	6.2	0.2	0.0	0.0	231.3	654.1
6-Aug	0.0	0.0	0.0	0.0	1.7	35.1	91.1	89.3	375.6	510.4	495.5	416.3	762.6	627.2	647.6	580.6	472.8	323.3	186.4	68.1	7.0	0.1	0.0	0.0	237.1	762.6
7-Aug	0.0	0.0	0.0	0.0	11.9	96.5	225.3	366.1	498.7	592.6	687.0	775.7	585.5	528.2	636.6	555.8	456.2	328.5	193.2	80.3	9.9	0.1	0.0	0.0	276.2	775.7
8-Aug	0.0	0.0	0.0	0.0	9.7	92.3	216.3	351.4	484.9	585.1	524.2	632.8	522.0	300.3	458.1	389.4	323.4	334.4	188.7	79.1	8.7	0.0	0.0	0.0	229.2	632.8
9-Aug	0.0	0.0	0.0	0.0	8.6	98.6	183.1	292.2	407.8	411.6	577.3	397.7	356.6	284.5	287.3	206.5	221.4	137.7	106.1	27.3	4.2	0.0	0.0	0.0	167.0	577.3
10-Aug	0.0	0.1	0.0	0.0	0.8	9.0	24.7	42.9	87.6	204.3	175.0	137.0	222.4	253.3	279.4	254.9	163.1	53.9	52.0	17.8	2.0	0.0	0.0	0.0	82.5	279.4
11-Aug	0.0	0.0	0.0	0.0	1.4	18.2	81.5	135.0	347.9	430.4	676.4	722.1	666.1	598.3	421.8	289.4	257.1	212.5	129.8	32.7	2.9	0.0	0.0	0.0	209.3	722.1
12-Aug	0.0	0.0	0.0	0.0	1.3	16.9	19.8	90.7	254.3	346.7	470.7	254.5	223.9	428.5	449.9	518.3	306.1	164.4	136.1	38.1	2.2	0.0	0.0	0.0	155.1	518.3
13-Aug	0.0	0.0	0.0	0.0	1.6	26.0	88.3	184.8	447.2	582.0	660.2	726.1	757.7	730.6	627.5	598.8	328.3	255.3	134.8	46.1	1.7	0.0	0.0	0.0	258.2	757.7
14-Aug	0.0	0.0	0.1	0.0	0.4	5.1	54.5	77.3	105.2	215.7	216.6	333.5	374.9	300.0	328.8	302.1	196.1	99.4	48.6	38.5	1.9	0.0	0.0	0.0	112.4	374.9
15-Aug	0.0	0.0	0.0	0.0	4.8	76.4	83.8	133.2	145.6	144.2	175.1	155.9	110.1	115.0	90.4	52.0	43.1	32.6	28.3	5.4	0.3	0.0	0.0	0.0	58.2	175.1
16-Aug	0.0	0.0	0.0	0.0	2.1	40.5	158.6	286.5	425.7	533.8	628.6	704.8	680.3	703.0	634.3	286.3	420.5	220.1	120.2	22.3	0.7	0.0	0.0	0.0	244.5	704.8
17-Aug	0.0	0.0	0.0	0.0	1.5	19.8	92.3	137.6	360.0	532.1	632.3	722.6	736.6	513.0	691.8	492.9	213.1	44.9	54.6	26.8	1.6	0.0	0.0	0.0	219.7	736.6
18-Aug	0.0	0.0	0.0	0.0	0.8	12.8	35.5	78.2	133.8	310.1	358.7	227.0	350.2	494.5	491.4	218.7	292.4	135.2	51.6	14.1	0.9	0.0	0.0	0.0	133.6	494.5
19-Aug	0.0	0.0	0.0	0.0	0.0	4.1	31.2	94.3	277.6	488.0	498.3	503.1	498.6	389.0	406.5	280.5	370.2	136.8	73.1	13.1	0.4	0.0	0.0	0.0	169.4	503.1
20-Aug	0.0	0.0	0.0	0.0	1.3	53.3	153.0	287.7	444.0	546.2	629.4	693.3	716.9	697.0	628.4	522.8	402.0	265.1	131.9	29.8	0.8	0.0	0.0	0.0	258.5	716.9
21-Aug	0.0	0.0	0.0	0.0	1.0	43.8	38.8	203.7	373.3	515.1	566.9	650.2	678.7	641.8	580.9	491.5	373.6	235.1	111.4	24.4	0.6	0.0	0.0	0.0	230.5	678.7
22-Aug	0.0	0.0	0.0	0.0	0.9	34.4	139.9	271.5	368.0	498.6	565.4	641.1	666.1	630.3	585.7	477.1	346.2	221.9	120.3	24.3	0.4	0.0	0.0	0.0	233.0	666.1
23-Aug	0.0	0.0	0.0	0.0	0.7	37.1	127.9	212.5	223.4	193.7	271.1	239.4	256.7	286.7	192.2	116.0	110.4	82.4	50.3	13.0	0.1	0.0	0.0	0.0	100.6	286.7
24-Aug	0.0	0.0	0.0	0.0	0.7	45.3	158.2	294.2	383.7	502.8	627.7	689.0	704.8	674.6	615.6	513.6	387.5	243.9	112.0	18.7	0.3	0.0	0.0	0.0	248.9	704.8
25-Aug	0.0	0.0	0.0	0.0	0.3	24.0	103.0	148.8	241.5	354.1	467.1	487.2	512.4	523.2	425.6	378.9	269.9	129.5	77.8	11.5	0.1	0.0	0.0	0.0	173.1	523.2
26-Aug	0.0	0.0	0.0	0.0	0.2	16.7	92.8	162.5	125.7	297.1	420.9	414.2	323.5	143.3	177.4	115.0	203.5	138.0	60.8	5.6	0.0	0.0	0.0	0.0	112.4	420.9
27-Aug	0.0	0.0	0.0	0.0	0.2	20.4	111.1	242.6	383.0	477.0	576.2	585.1	570.9	275.1	232.3	299.1	271.3	124.7	28.3	5.0	0.0	0.0	0.0	0.0	175.1	585.1
28-Aug	0.0	0.0	0.0	0.0	0.1	12.0	59.2	117.2	184.6	277.4	362.7	423.8	435.9	357.9	282.7	240.8	184.0	109.2	44.4	4.8	0.0	0.0	0.0	0.0	129.0	435.9
29-Aug	0.0	0.0	0.0	0.0	0.0	7.4	44.6	128.5	239.0	345.0	428.4	438.8	476.7	504.8	413.9	337.4	220.7	139.7	49.3	4.7	0.0	0.0	0.0	0.0	157.5	504.8
30-Aug	0.0	0.0	0.0	0.0	0.0	8.3	63.9	167.1	243.8	353.3	430.5	455.9	490.3	407.9	473.9	380.2	241.2	132.9	59.2	8.0	0.0	0.0	0.0	0.0	163.2	490.3
31-Aug	0.0	0.0	0.0	0.0	0.0	9.3	72.9	179.2	362.2	226.0	159.9	114.1	267.8	543.2	422.6	300.8	181.0	96.8	37.2	3.3	0.0	0.0	0.0	0.0	124.0	543.2
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Fort Chipewyan - August 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	310	41.67	41.67
21 - 100	93	12.50	54.17
101 - 300	160	21.51	75.67
301 - 600	134	18.01	93.68
601 - 900	47	6.32	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 34 km/h on Aug 10 09:00	Maximum Daily Speed Average: 19.9 km/h on Aug 8	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 12 14:00	Minimum Daily Speed Average: 4.0 km/h on Aug 2	Hours of Data: 744
Maximum Diurnal Speed Average: 2.7 km/h at hour 11	Minimum Diurnal Speed Average: 0.1 km/h at hour 22	Hours of Missing Data: 0
Monthly Average Velocity: 0.9 km/h 187.0 deg	Percentiles: $P_1 = 2$ $P_{10} = 5$ $Q_1 = 8$ Median = 11 $Q_3 = 15$ $P_{90} = 19$ $P_{99} = 28$	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-Aug	W11	W10	W13	W13WNW13	WNW16	WNW16	WNW16	WNW15	WNW13	WNW11	WNW12	WNW14	WNW12	WNW15	WNW15	WNW16	WNW14	WNW13	WNW10	NW12	NW11	NW11	NW10	WNW12.8	WNW16		
2-Aug	NW10	WNW11	WNW9	WNW9	NW8	NW9	WNW8	WNW7	WNW7	W7	WNW9	NW10	NW8	W6	WSW5	SW8	SSW10	SSW8	SSE7	SSE10	SSE9	SSE9	SSE8	ESE4	W4.0	WNW11	
3-Aug	SE5	SSE5	SE7	SE5	S6	SE7	ESE7	E10	ESE11	E11	E14	ENE15	ENE16	ENE14	NE9	ENE11	ENE13	NE10	NE9	NNE9	N7	N9	N9	NNW8	ENE6.8	ENE16	
4-Aug	NNW8	NNW7	NW9	WNW7	WNW10	WNW9	W10	W12	W12	W14	W15	W17	W16	W17	W12WNW13	WSW11	WSW8	W10	W13	WNW9	WNW9	WNW10	WNW9	W10.5	W17		
5-Aug	WNW9	WNW8	WN9	NNW10	NW10	NW6	NW9	W8	W9WNW12	NW13	NW13	WNW14	WNW16	WNW15	WNW13	NW11	WNW11	WNW9	WNW7	WNW9	WNW7	WNW8	NNW9	NNW8	NNW7	NW9.7	WNW16
6-Aug	NNW9	NW5	NNW5	N9	NNW10	NNE7	N9	NNW9	N5	ENE7	ESE16	ESE13	ESE14	E18	E17	E16	E19	E20	E19	ENE14	NE7	N10	NNE12	NNE12	ENE8.2	E20	
7-Aug	NNE14	NNE13	NNE12	NNE12	N12	NNE12	NNE11	NNE13	NNE11	E12	E19	E17	E18	E18	E17	E17	E21	ENE22	ENE24	ENE20	NE13	E20	ESE24	E25	ENE14.1	E25	
8-Aug	E24	ESE25	ESE25	ESE28	ESE25	ESE21	ESE19	ESE16	ESE14	E16	E26	E27	E24	E23	SE26	SE25	SE24	SSE23	SSE20	SE12	SE16	SE17	SE19	SE19	ESE19.9	ESE28	
9-Aug	SE21	SE20	SE18	SE21	SE22	SE22	SE19	SE20	SSE22	SSE21	SE23	SE22	SSE20	S24	SSE20	ESE19	SE18	SSW26	S22	S14	SE12	ESE20	SE20	SE12	SE18.6	SSW26	
10-Aug	ESE15	SE17	SE20	ESE28	ESE34	ESE32	E29	E34	E34	E31	E30	ESE24	ESE21	E20	E16	ENE15	ENE15	S11	S8	SSE6	W2	ENE2	E4	SSE2	ESE17.3	E34	
11-Aug	SE4	S3	SW6	W6	WSW4	S2	S5	S6	S6	SE8	E10	E13	E15	E12	E13	E14	E16	E19	E17	E16	SE12	SSE13	S15	S14	ESE7.1	E19	
12-Aug	SSE15	S11	S7	S5	SSW6	SW7	SSW4	SSW3	SSW4	S4	SSE6	SW6	SSE3	NNW1	SSW4	W9	W8	W11	W8	WSW7	WSW6	SW8	SW10	SW8	SW5.2	SSE15	
13-Aug	SW9	SW11	SW10	SW10	SSW11	S11	S14	S18	SSW17	SW20	SW21	WSW23	WSW24	WSW22	WSW21	WSW26	WSW25	WSW18	WSW15	WSW15	W13	W8	NW7	WNW7	SW14.1	WSW26	
14-Aug	W7	W8	WNW16	WNW12	W10	WSW10	WNW13	WNW14	WNW10	WNW8	W12	WNW12	WNW11	W11	W12	W11	W9	WNW7	W9	WSW10	W9	W10	W9	W9	W10.1	WNW16	
15-Aug	SW10	WSW7	WSW5	SW5	WSW6	SW9	SW8	SW8	SSW7	SSW10	SSE4	S8	S4	SSW6	WSW6	WSW6	WNW5	NNW6	NNW7	NNW7	WNW6	WNW7	WNW9	WNW9	WSW4.7	SSW10	
16-Aug	NW10	NW11	WNW11	NW11	NW8	WNW8	WNW7	WNW9	W11	WSW14	WSW16	W18	WSW18	WSW18	WSW16	SW16	SW17	SW13	S11	SSW11	SW12	SW11	WSW8	SW9	WSW10.2	WSW18	
17-Aug	SW11	SW12	SW8	SSW6	SW12	SW12	WSW10	WSW9	WSW10	W13	W14	W14	W15	W16	W15	WSW19	W15	NNW12	NNW5	NW5	NW8	NNW9	NW9	NW11	W9.1	WSW19	
18-Aug	NW9	NW8	NW13	NW10	WNW8	NW8	NW9	NW11	NNW12	NNW12	NNW11	NW11	NW12	NW17	NNW15	NW17	NW16	NW16	NW17	NW13	NW12	NW11	WNW9	W10	NW11.8	NW17	
19-Aug	W11	W10	WSW11	W15	W16	W18	W15	W16	WNW15	W16	W16	W17	WSW17	W20	W19	W18	W19	W16	WSW12	WSW10	WSW11	WSW10	W12	W12	W14.5	W20	
20-Aug	NNW7	W8	NW8	WNW6	WNW7	NNW5	WSW2	WSW4	SSW5	ESE6	SE8	ESE13	ESE12	SSE11	SE13	ESE13	E13	E15	E13	ENE10	E8	E9	ESE18	E16	ESE5.0	ESE18	
21-Aug	ESE15	ESE13	ESE10	SE8	SE6	S4	SW5	SSW6	SW9	WSW11	SW12	SW14	SW14	WSW10	WSW10	W11	WSW10	SW9	WSW4	SSE4	S7	SSW11	SW10	SW10	SSW6.1	ESE15	
22-Aug	SW12	WSW11	SW6	SSW7	SSW5	SSW6	SW10	S4	SE5	SE4	ESE5	S11	SSW12	SSW11	SSE7	SSW11	SW9	W5	WNW6	NW5	S1	S3	SW6	SW5	SSW5.5	SSW12	
23-Aug	S3	SE2	E4	E5	SW5	WSW5	WSW5	WNW5	NW4	SW1	SW3	NNW6	NNW6	E12	E16	ENE12	NE11	NE12	NE10	NE11	NNE12	NNE12	NNE14	NNE15	NE4.7	E16	
24-Aug	NE15	NE19	NE17	NNE10	N11	N10	N8	N6	ENE11	ENE20	E23	E22	E18	E17	E20	E17	E11	ESE5	SSW4	WSW6	WSW6	SW7	SW8	WSW9	ENE7.6	E23	
25-Aug	SW7	SSW6	S5	S5	SSE6	SSE7	SSE7	S8	SSW10	SSW14	SSW16	SSW13	SSW13	SSW15	SW14	SSW15	SW11	SSW10	S18	S21	SSW19	SSW15	SSW14	SSW14	SSW11.4	S21	
26-Aug	SW14	SW15	SW13	SSW15	SW14	SSW13	SSW11	SSW15	SSW13	WSW8	WSW13	W17	W15	WNW10	NNW10	NW4	NW8	NW8	WNW5	W7	WNW9	NW8	NNW9	NNW8	WSW7.5	W17	
27-Aug	NNW11	NNW9	NNW8	NNW7	NNW9	NNW9	N4	WNW2	SSW5	S6	ESE5	SSE6	SW10	SSW10	S10	S9	S14	SSW13	SW13	SW9	WSW12	W13	W12	WNW9	WSW4.2	S14	
28-Aug	WNW9	WNW10	WNW10	NW9	NNW7	NE5	NE4	WNW3	WSW1	E5	E13	E10	E14	E16	E18	E17	E15	E18	E16	E16	E14	E15	E17	E14	ENE7.9	E18	
29-Aug	ESE10	SE6	S3	SE3	E6	E8	E7	E7	E6	E6	E8	E7	E13	E16	E19	E19	ENE15	ENE22	ENE24	ENE23	ENE19	E22	E17	E19	E12.1	ENE24	
30-Aug	E14	ESE17	ESE11	ESE10	ESE10	ESE8	ESE8	E7	E9	E10	E12	E10	E11	E6	E13	E13	E10	E10	E11	E10	ENE11	ENE10	NE7	N7	E9.7	ESE17	
31-Aug	NNW4	NNE4	ENE6	NE4	NE7	NNE7	NNE5	SE3	E8	ENE5	SE3	E4	WSW2	NW9	NW9	NW10	NNW11	NNW10	NW10	NW13	NW11	NW10	NW10	NW4	NNW4.6	NW13	

SW0.5SSW1.5WSW0.9WSW0.5 SW1.0SSW1.1 SW1.4 SW1.7SSW1.8 S1.7 SE2.7 SSE1.7 S1.7 S2.0 SE1.7 SSE1.7 SSE0.9 SSE0.7 SE0.9 S0.1 W0.8NNE0.1 S0.1WNW0.6	Diurnal Average
E24 ESE25 ESE25 ESE28 ESE34 ESE32 E29 E34 E34 E31 E30 ENE27 WSW24 S24 SE26 WSW26WSW25 SSW26 ENE24 ENE23 SSW19 E22 ESE24 E25	Diurnal Maximum

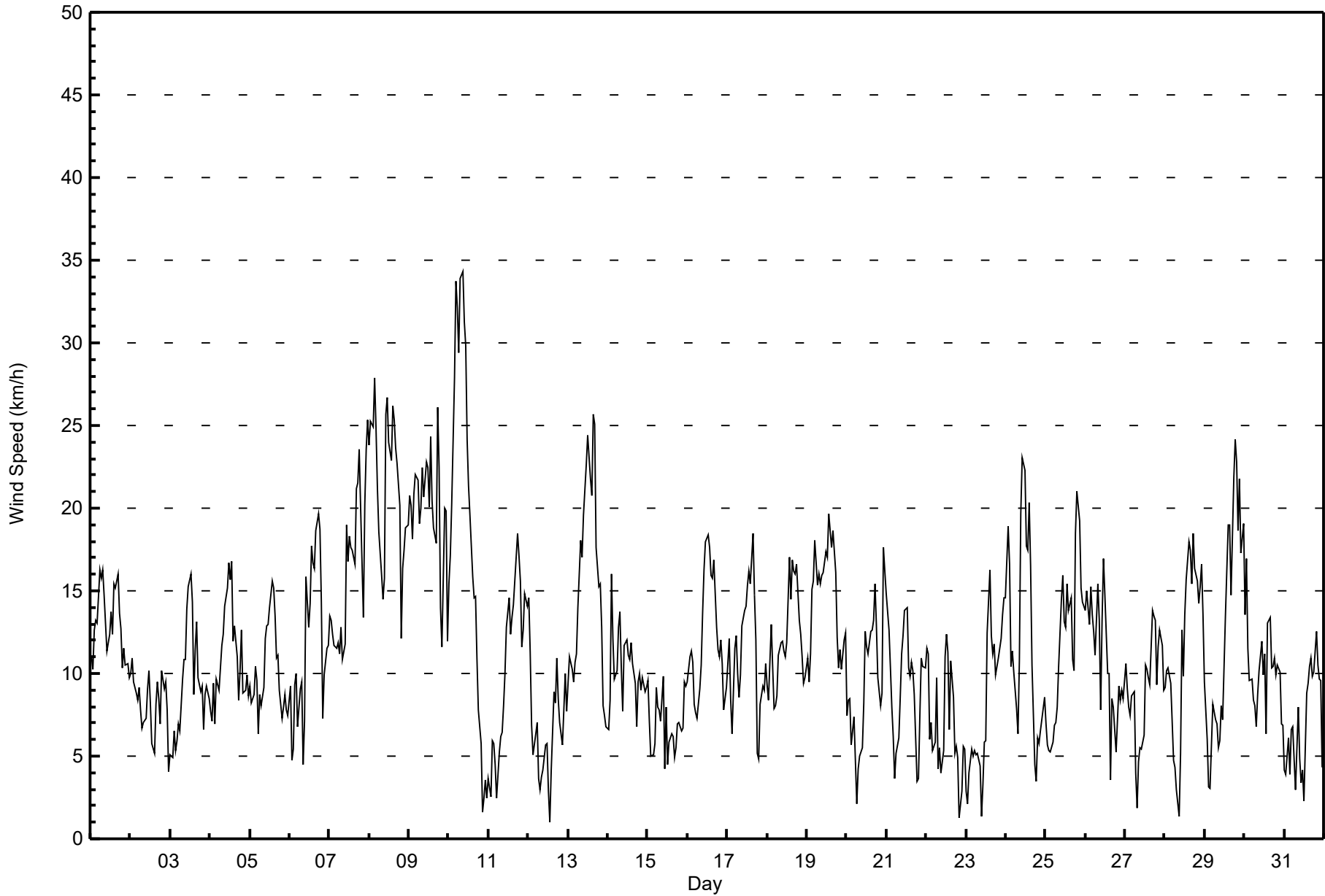
All monthly, daily, and diurnal averages have been calculated using vector methods



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Aug 7 22:00														Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0 Hours of Calibration: 0 Percent Operational Time: 100.0											
Minimum Value: 1 km/h on Aug 29 09:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 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-Aug	2	2	3	3	3	4	4	4	3	4	3	3	4	3	4	4	4	4	3	3	3	3	2	3	4
2-Aug	3	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	1	1	1	2	1	3
3-Aug	1	1	1	1	1	1	2	2	2	1	2	2	3	2	3	2	3	2	3	3	1	2	3	2	3
4-Aug	2	2	2	2	2	2	2	3	3	3	4	4	4	4	5	4	4	4	2	3	3	2	2	1	5
5-Aug	2	1	1	3	2	2	2	2	2	3	5	4	4	4	4	4	4	3	2	2	2	2	2	1	5
6-Aug	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	4	1	2	2	2	4
7-Aug	2	2	2	1	2	3	3	3	3	4	4	2	2	2	2	2	2	3	4	4	3	7	3	3	7
8-Aug	3	2	2	3	3	2	2	2	2	2	3	3	3	3	4	4	3	3	4	2	2	2	2	2	4
9-Aug	2	2	2	2	2	3	2	2	4	3	5	3	3	4	3	2	3	4	3	4	3	2	2	2	5
10-Aug	3	2	2	4	3	4	3	3	4	3	2	3	2	2	1	2	2	5	1	1	1	2	1	1	5
11-Aug	1	1	1	1	1	1	3	2	2	1	1	2	2	2	2	1	1	2	2	1	1	2	2	2	3
12-Aug	2	2	1	1	2	1	1	1	1	1	2	3	1	2	2	3	3	3	2	2	1	2	2	2	3
13-Aug	2	2	2	2	2	3	2	2	3	3	4	5	6	6	5	6	6	5	4	3	4	3	2	2	6
14-Aug	2	1	4	4	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	1	1	4
15-Aug	2	1	2	2	2	1	1	1	1	2	1	3	1	2	3	3	3	1	2	2	2	1	1	2	3
16-Aug	2	3	3	3	2	1	2	2	3	3	4	5	5	4	4	4	4	2	1	2	2	2	2	2	5
17-Aug	3	3	2	2	2	2	2	3	4	3	4	4	4	5	5	5	5	4	3	1	2	3	3	3	5
18-Aug	3	2	3	3	2	3	2	3	4	4	4	4	5	6	6	5	5	5	5	4	4	3	3	2	6
19-Aug	2	2	2	4	5	5	4	4	4	4	4	5	5	5	5	5	4	4	3	3	2	3	4	3	5
20-Aug	2	2	1	1	1	2	2	1	1	1	1	2	2	3	3	3	1	2	1	2	1	3	2	2	3
21-Aug	1	2	2	2	1	1	2	1	3	3	2	3	3	2	3	3	2	1	1	1	3	3	3	2	3
22-Aug	2	2	2	1	1	2	2	1	1	1	1	5	3	3	3	3	3	1	1	1	1	1	2	1	5
23-Aug	2	1	1	1	2	2	2	2	1	1	2	2	2	4	2	2	2	3	2	1	2	2	2	3	4
24-Aug	3	4	4	2	2	2	2	2	4	4	2	2	2	2	2	2	1	2	1	1	2	1	1	1	4
25-Aug	1	1	2	1	1	1	2	2	2	3	2	2	3	3	2	2	2	1	3	3	3	2	2	2	3
26-Aug	2	2	2	2	2	2	2	3	2	2	3	5	4	3	4	2	3	3	2	1	2	2	3	2	5
27-Aug	2	2	2	2	2	1	2	1	1	1	1	2	2	2	2	2	2	3	2	1	2	3	2	2	3
28-Aug	2	1	1	2	3	2	1	2	1	4	2	1	2	2	2	2	2	2	2	3	2	2	2	2	4
29-Aug	2	1	2	1	2	1	1	1	1	1	1	1	2	2	2	2	2	4	4	3	2	4	2	2	4
30-Aug	3	2	2	1	1	1	1	1	2	1	2	1	2	2	3	2	4	2	1	1	1	2	2	2	4
31-Aug	4	3	2	2	1	2	2	1	2	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4
														Diurnal Maximum											
														4 4 4 4 5 5 4 4 4 4 5 5 6 6 6 6 6 5 5 4 4 7 4 3											





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort Chipewyan - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	88	11.83	11.83
6 - 11	335	45.03	56.85
12 - 19	251	33.74	90.59
20 - 28	63	8.47	99.06
29 - 38	7	0.94	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
Fort Chipewyan - August 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	2	3	2	5	4	9	5	14	8	6	10	2	5	6	5	88
6 - 11	11	6	9	7	26	10	7	14	15	20	32	28	32	45	43	30	335
12 - 19	1	12	5	10	55	16	13	2	7	19	15	13	40	26	13	4	251
20 - 28	0	0	0	8	13	10	13	6	3	1	2	6	1	0	0	0	63
29 - 38	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	7
> 38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	14	20	17	27	104	42	42	27	39	48	55	57	75	76	62	39	744

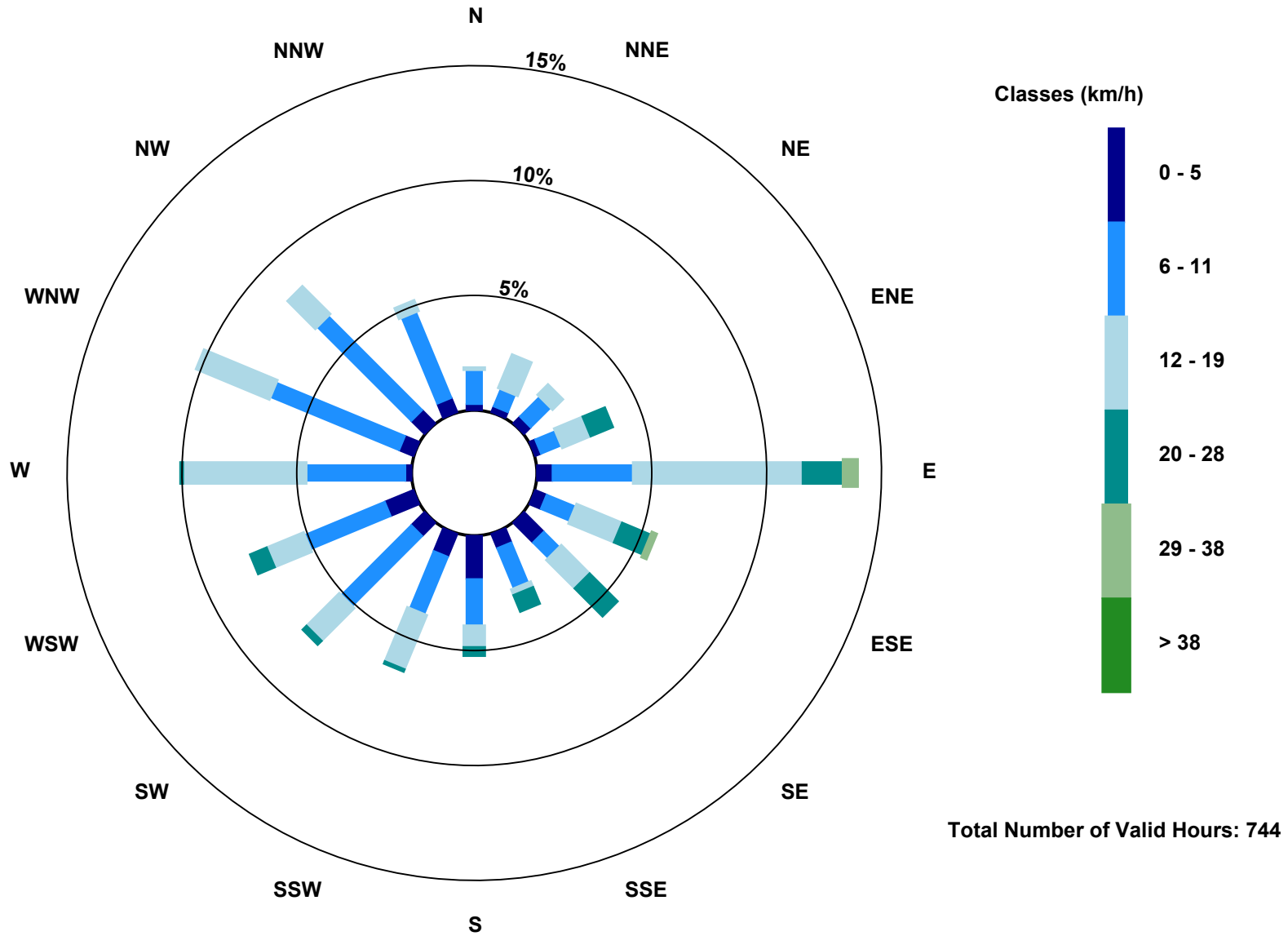
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Fort Chipewyan





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort Chipewyan - August 2023

Direction of Maximum Speed: 99 deg on Aug 10 09:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 113.4 deg on Aug 8	Hours of Data: 744
Direction of Minimum Speed: 328 deg on Aug 12 14:00	Hours of Missing Data: 0
Direction of Minimum Daily Speed Average: 4.0 deg on Aug 2	Percent Operational Time: 100.0
Monthly Average Direction: 187.0 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-Aug	280	277	279	281	282	288	288	290	292	296	294	293	302	303	298	293	292	303	300	297	304	314	311	316	294.1	
2-Aug	305	298	289	298	311	307	290	302	300	271	282	325	324	278	242	220	208	197	168	163	154	156	150	114	263.9	
3-Aug	138	167	128	136	169	143	114	90	105	95	82	73	71	76	54	78	74	44	39	33	4	350	350	343	73.6	
4-Aug	343	328	308	298	286	285	275	273	276	278	277	278	277	276	264	279	283	240	251	273	277	286	283	291	297	280.8
5-Aug	298	296	314	332	323	316	307	266	275	291	308	318	301	288	288	287	305	303	295	303	326	340	338	329	304.5	
6-Aug	341	314	348	358	343	31	350	339	1	66	106	113	107	94	95	97	90	86	85	73	52	10	31	18	62.2	
7-Aug	19	17	31	15	6	19	20	29	32	81	98	99	99	93	93	91	87	73	70	57	42	82	107	85	68.0	
8-Aug	101	104	105	104	109	107	113	115	118	98	79	79	81	88	126	130	134	152	153	145	133	125	132	134	113.4	
9-Aug	138	141	140	140	137	136	142	141	149	150	145	130	148	170	156	122	127	204	188	178	130	118	126	137	146.1	
10-Aug	117	136	127	111	113	113	100	95	99	98	100	107	107	99	80	71	67	175	183	164	260	59	91	162	106.5	
11-Aug	134	179	235	259	250	175	177	180	182	135	86	86	85	88	85	82	84	84	81	93	135	157	172	176	115.6	
12-Aug	161	182	175	169	203	219	206	209	208	180	161	215	149	328	195	267	276	268	264	258	238	227	225	229	216.5	
13-Aug	219	224	224	222	200	190	187	188	206	222	224	241	244	247	243	246	250	251	248	266	264	325	290	234.3		
14-Aug	264	280	288	296	281	255	282	288	301	299	278	297	283	269	277	279	278	288	267	258	259	268	279	269	279.2	
15-Aug	234	247	239	226	240	236	230	217	203	196	150	179	190	202	249	237	299	345	331	333	301	295	289	299	247.4	
16-Aug	307	307	302	308	305	297	300	300	278	252	254	259	255	247	249	234	229	214	186	213	219	221	239	226	254.3	
17-Aug	220	214	220	204	225	227	239	237	257	278	276	268	271	266	266	256	278	335	335	312	321	332	323	318	266.7	
18-Aug	319	325	318	317	297	312	306	318	334	336	329	325	319	323	327	315	318	315	316	318	312	310	293	278	316.9	
19-Aug	279	273	253	261	261	267	270	279	282	281	272	264	257	266	266	261	263	261	255	255	249	251	275	277	266.1	
20-Aug	331	268	307	291	295	330	253	245	202	117	130	120	120	163	126	118	93	87	80	73	84	84	111	101	105.9	
21-Aug	106	114	102	134	128	190	218	213	235	246	222	219	227	250	246	260	245	227	245	168	189	211	231	236	210.9	
22-Aug	232	237	232	207	197	192	214	179	129	131	109	188	211	203	150	207	223	265	290	306	178	185	223	227	209.3	
23-Aug	188	145	85	80	226	257	258	284	306	230	231	329	333	87	80	72	50	44	52	44	29	14	21	30	39.6	
24-Aug	34	56	55	21	1	353	5	9	59	78	89	91	94	94	89	91	99	117	213	256	255	227	220	237	70.6	
25-Aug	223	212	190	180	148	151	165	175	200	201	200	211	205	203	214	213	214	193	185	187	204	210	212	212	199.4	
26-Aug	214	214	214	213	214	210	202	202	209	240	241	262	276	293	335	326	319	317	299	280	286	321	340	339	250.8	
27-Aug	344	342	338	342	348	346	352	297	197	172	119	166	217	201	185	179	187	212	218	232	246	261	276	288	243.7	
28-Aug	288	293	298	324	330	46	47	283	252	87	89	85	86	85	85	85	87	88	84	85	87	87	89	96	76.6	
29-Aug	107	141	171	133	86	86	96	99	92	81	79	86	86	87	84	81	63	63	60	58	67	81	83	83	79.7	
30-Aug	81	104	108	115	106	103	102	99	90	89	90	89	91	99	91	90	91	89	93	91	75	78	53	3	90.7	
31-Aug	335	15	59	44	43	29	12	129	93	67	137	83	237	314	319	320	330	329	315	315	322	321	321	310	343.0	

232.8 213.1 246.0 238.9 228.9 208.1 224.4 217.4 197.7 170.4 140.1 158.5 179.0 183.6 141.5 166.8 157.7 166.9 146.0 187.8 269.9 17.3 187.3 299.5
 Diurnal Average

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

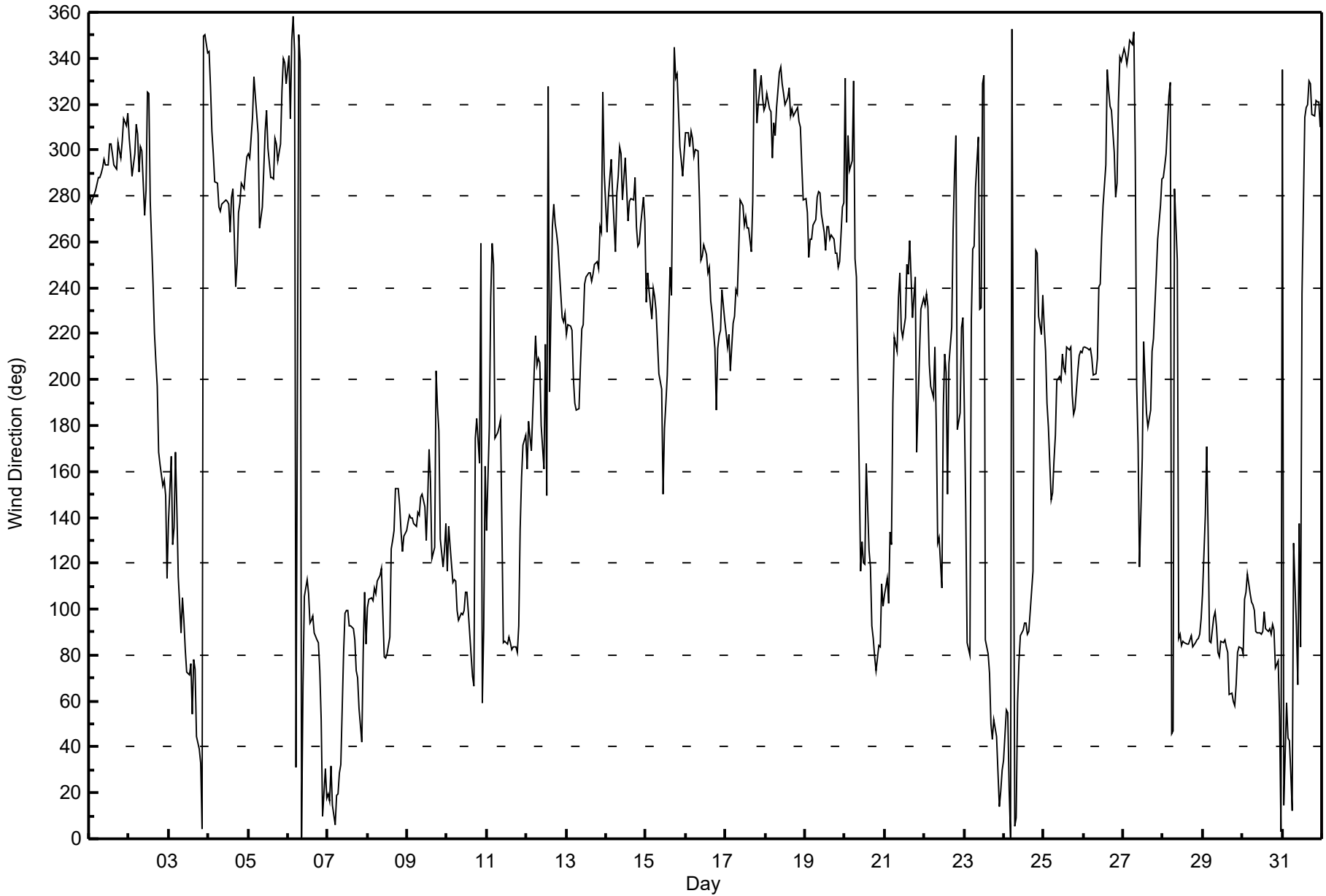
Wind Direction (WD) - deg
Fort Chipewyan - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 102 deg on Aug 12 14:00 Minimum Value: 3 deg on Aug 20 23:00 Percentiles: P ₁ = 5 P ₁₀ = 7 Q ₁ = 10 Median = 16 Q ₃ = 21 P ₉₀ = 30 P ₉₉ = 64											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-Aug	14	14	15	14	15	14	15	15	16	16	17	15	18	20	17	17	16	18	17	17	18	19	16	19	20
2-Aug	17	15	15	16	16	18	18	18	19	24	18	29	33	43	47	24	10	16	27	8	10	7	16	29	47
3-Aug	32	22	18	12	21	22	16	10	9	8	8	12	13	11	27	27	16	24	19	15	25	18	19	20	32
4-Aug	19	19	15	19	12	13	17	18	16	18	19	16	18	19	29	15	15	27	24	20	12	11	14	13	29
5-Aug	12	11	16	18	17	16	19	18	18	25	25	27	24	18	18	23	30	23	17	19	15	14	14	13	30
6-Aug	14	45	25	19	16	28	18	18	52	45	7	9	8	8	7	7	7	6	10	12	11	13	11	12	52
7-Aug	14	14	13	14	15	16	17	16	24	29	8	8	8	9	8	9	7	10	12	14	9	21	12	10	29
8-Aug	11	6	6	6	6	10	8	10	9	13	8	8	9	21	12	11	10	10	9	11	6	5	7	6	21
9-Aug	7	8	7	7	7	7	7	8	11	10	13	10	14	10	12	10	17	12	12	13	13	5	7	14	17
10-Aug	8	8	7	6	5	8	6	5	5	5	5	10	8	5	6	12	12	49	12	14	57	73	35	46	73
11-Aug	26	51	15	18	23	32	48	17	17	24	9	6	6	6	5	5	6	5	5	10	18	10	6	7	51
12-Aug	9	10	17	19	15	10	43	37	32	47	26	38	64	102	56	24	18	16	17	15	12	11	10	13	102
13-Aug	12	11	12	14	13	15	10	9	12	12	13	17	16	18	17	16	16	17	16	14	27	38	15	31	38
14-Aug	26	13	17	35	34	21	14	17	16	26	15	20	21	20	20	21	16	20	14	14	13	13	12	11	35
15-Aug	15	14	55	39	35	12	14	12	13	11	30	41	33	20	22	24	41	19	19	18	13	16	16	17	55
16-Aug	19	16	14	19	17	15	18	23	20	20	20	19	21	19	22	15	15	13	8	9	10	12	15	17	23
17-Aug	14	13	13	20	11	9	14	20	21	17	19	22	21	19	22	17	35	27	34	20	14	22	22	19	35
18-Aug	20	17	17	20	18	20	18	23	23	26	26	26	28	25	29	22	25	20	20	22	20	18	19	14	29
19-Aug	12	14	14	17	16	16	16	16	16	18	18	17	21	16	20	17	17	16	16	14	14	17	17	14	21
20-Aug	25	20	14	30	10	36	64	30	18	32	14	6	10	24	16	17	14	6	6	7	11	17	3	7	64
21-Aug	7	8	15	16	11	25	17	14	26	25	17	13	16	28	33	27	21	14	28	20	14	9	17	10	33
22-Aug	10	11	30	11	16	24	12	40	19	32	31	30	18	23	44	25	19	37	16	7	55	24	15	8	55
23-Aug	34	35	17	20	21	26	19	19	23	72	49	25	32	30	10	14	14	12	12	8	11	14	15	12	72
24-Aug	17	11	13	14	15	17	21	25	24	14	5	4	6	6	5	5	7	25	37	11	21	11	14	11	37
25-Aug	13	10	33	17	21	20	16	17	21	11	11	16	12	11	12	9	9	17	7	6	9	7	8	8	33
26-Aug	8	8	9	9	10	10	11	10	11	25	17	18	18	21	26	58	22	22	21	11	14	21	19	17	58
27-Aug	15	18	20	27	19	12	61	56	23	28	21	37	22	13	17	11	9	13	8	13	14	15	14	15	61
28-Aug	13	10	9	13	67	44	24	53	63	40	8	6	5	5	5	5	6	5	6	6	7	5	6	7	67
29-Aug	18	22	38	26	13	6	11	6	7	8	6	8	5	5	7	7	11	10	11	9	12	11	6	5	38
30-Aug	8	11	9	8	9	6	6	7	6	9	5	7	9	17	6	7	16	7	8	7	11	9	23	21	23
31-Aug	73	63	47	59	31	19	69	51	16	35	53	41	65	23	26	23	22	20	18	18	20	22	21	55	73
Diurnal Maximum																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Fort Chipewyan - August 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS09 BARGE LANDING AUGUST 2023

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

November 30, 2023
Revision 01

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
AUGUST 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	13.6	0	3	0
TRS(ppb) Average	708	36	36	100	2.5	0	1.1	0
THC(ppm) Average	699	36	45	98.79	3.7	-	2.7	-
NMHC(ppm) Average	699	36	45	98.79	0.716	-	0.201	-
CH4(ppm) Average	699	36	45	98.79	3.4	-	2.5	-
NO2 (ppb) Average	708	36	36	100	26.8	0	10.6	-
NO (ppb) Average	708	36	36	100	66	-	11.7	-
NOX (ppb) Average	708	36	36	100	83.3	-	20.8	-
PM2.5(ug/m3) Average	742	2	2	100	449.3	112	167.8	17
Temperature (C) Average	741	0	3	99.6	32	-	22.1	-
Relative Humidity (%) Average	744	0	0	100	99.1	-	93.7	-
Barometric Pressure (inHg) Average	744	0	0	100	29.2	-	29.2	-
Wind Speed 20 m (km/h) Average	741	2	3	99.87	19	-	13	-
Wind Direction 20 m (deg) Average	741	2	3	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
AUGUST 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	0.47	1.5	-	0	0	0	0.1	0.2	1	13.6
TRS(ppb) Average	708	0.47	0.4	-	0	0.2	0.3	0.4	0.5	0.9	2.5
THC(ppm) Average	699	2.17	0.3	-	1.9	2	2	2.1	2.3	2.5	3.7
NMHC(ppm) Average	699	0.069	0.089	-	0	0	0	0	0.1	0.2	0.716
CH4(ppm) Average	699	2.11	0.2	-	1.9	1.9	2	2.1	2.2	2.3	3.4
NO2 (ppb) Average	708	5.95	5.2	-	0	0.4	1.6	4.7	8.8	13.6	26.8
NO (ppb) Average	708	3.26	7.7	-	0	0	0.1	0.5	2.8	8.1	66
NOX (ppb) Average	708	9.21	10.8	-	0	0.5	1.8	5.4	12.7	21.5	83.3
PM2.5(ug/m3) Average	742	45.32	62.3	-	2.2	4.8	9.2	22.2	60.9	100.1	449.3
Temperature (C) Average	741	17.09	4.9	-	6.3	11.8	13.4	16.1	20.7	23.9	32
Relative Humidity (%) Average	744	76.08	18.1	-	33.3	47.9	62	79.1	93.1	97.8	99.1
Barometric Pressure (inHg) Average	744	28.9	0.2	-	28.5	28.6	28.8	28.9	29	29.1	29.2
Wind Speed 20 m (km/h) Average	741	8.5	4	-	1	4	6	8	11	14	19
Wind Direction 20 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - BARGE LANDING (AMS09)
AUGUST 2023

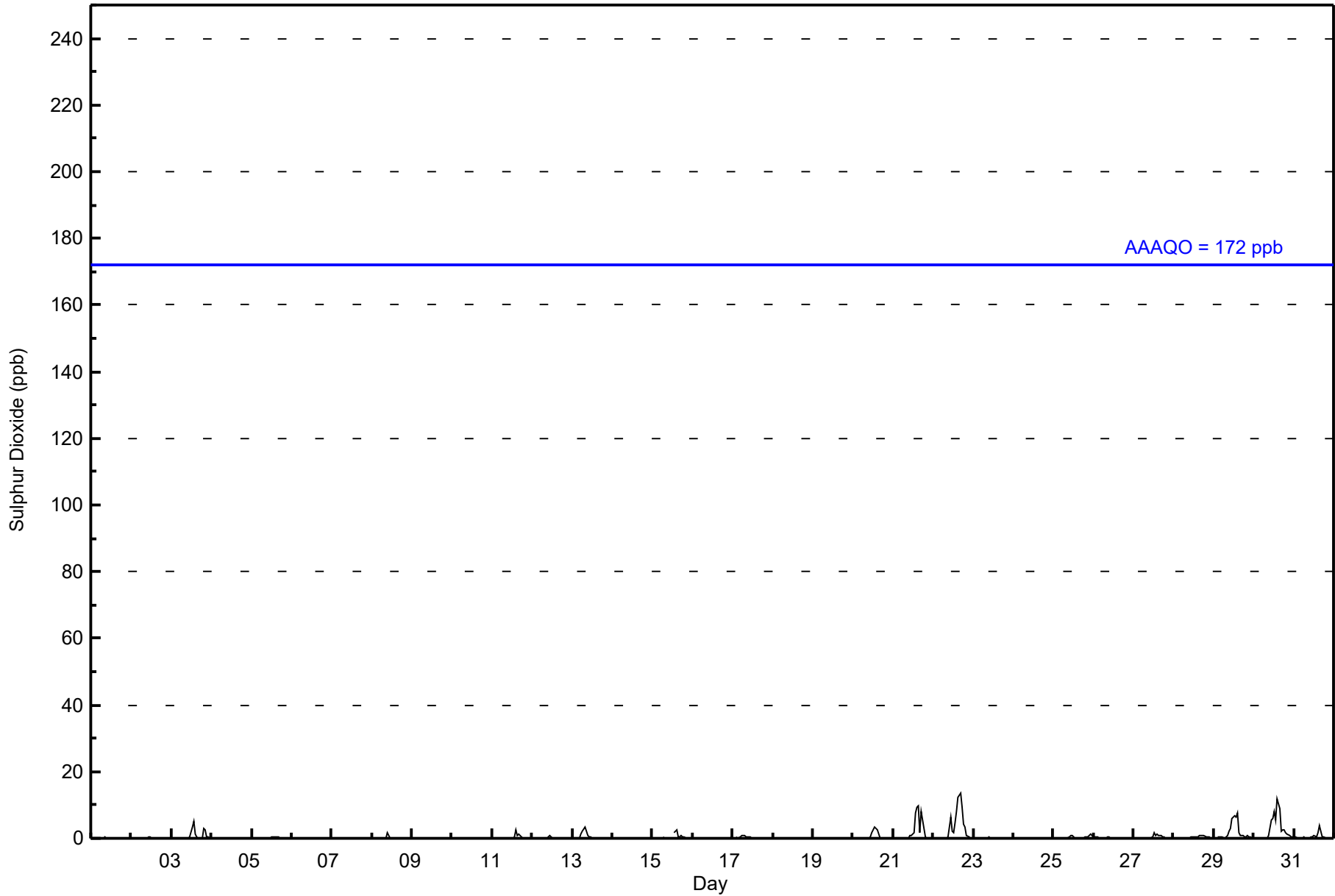
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/ NMHC/ CH4	01 Aug 2023 01:00	01 Aug 2023 03:00	3	Unstable Operation - excessive baseline drift
THC/ NMHC/ CH4	01 Aug 2023 06:00	01 Aug 2023 11:00	6	Unstable Operation - excessive baseline drift
Temperature 10 m	12 Aug 2023 14:00	12 Aug 2023 14:00	1	DAS Failure - data not recorded
Temperature 10 m	13 Aug 2023 13:00	13 Aug 2023 13:00	1	DAS Failure - data not recorded
Temperature 10 m	21 Aug 2023 14:00	21 Aug 2023 14:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction 20m	02 Aug 2023 19:00	02 Aug 2023 19:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Barge Landing - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Barge Landing - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	705	99.58	99.58
11 - 20	3	0.42	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
Barge Landing - August 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	52	16	17	11	12	24	55	83	73	64	75	52	49	27	39	53	702
11 - 20	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3
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	52	16	17	11	12	24	55	84	73	64	75	54	49	27	39	53	705

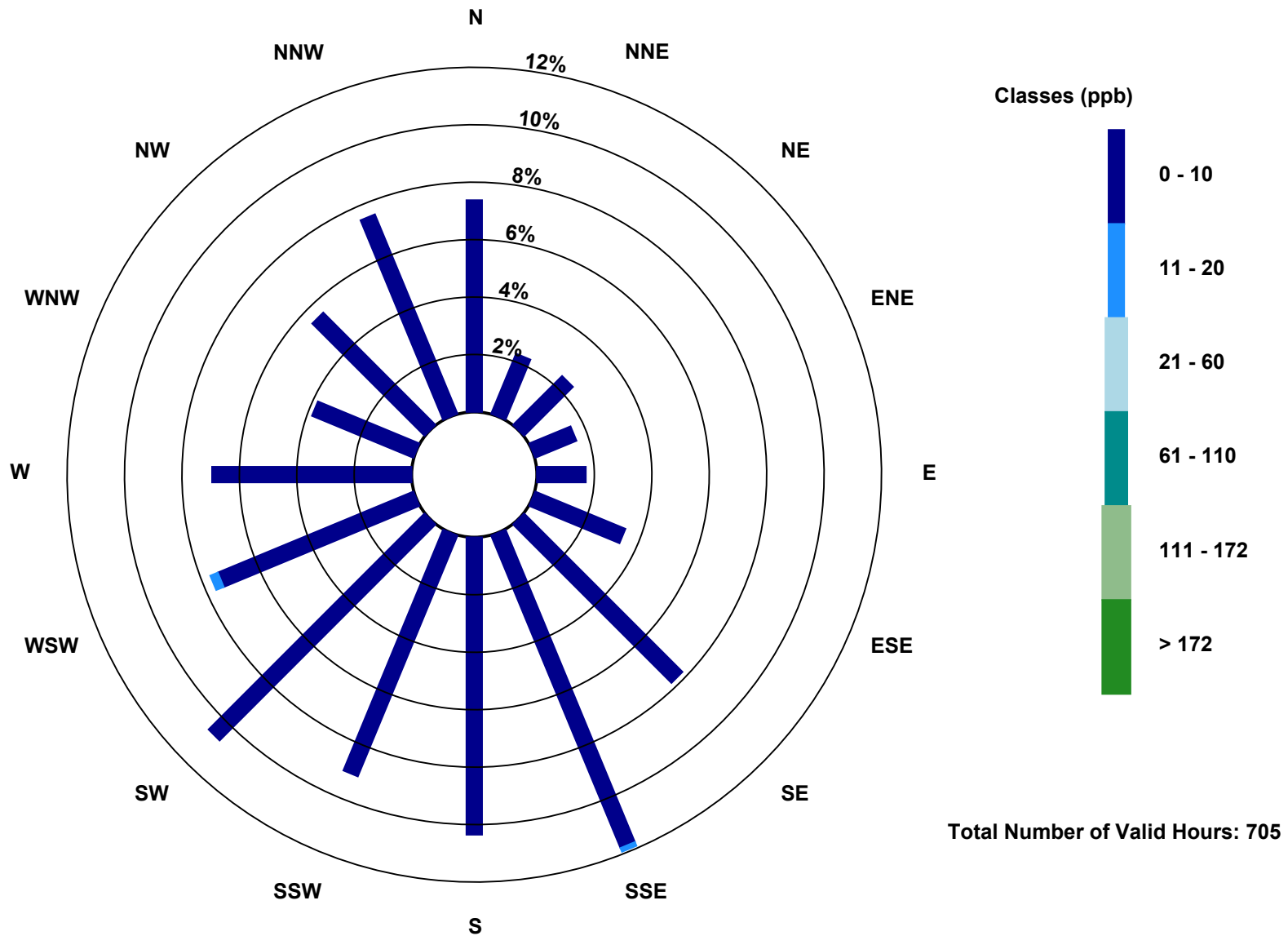
Total Number of Valid Hours: 705

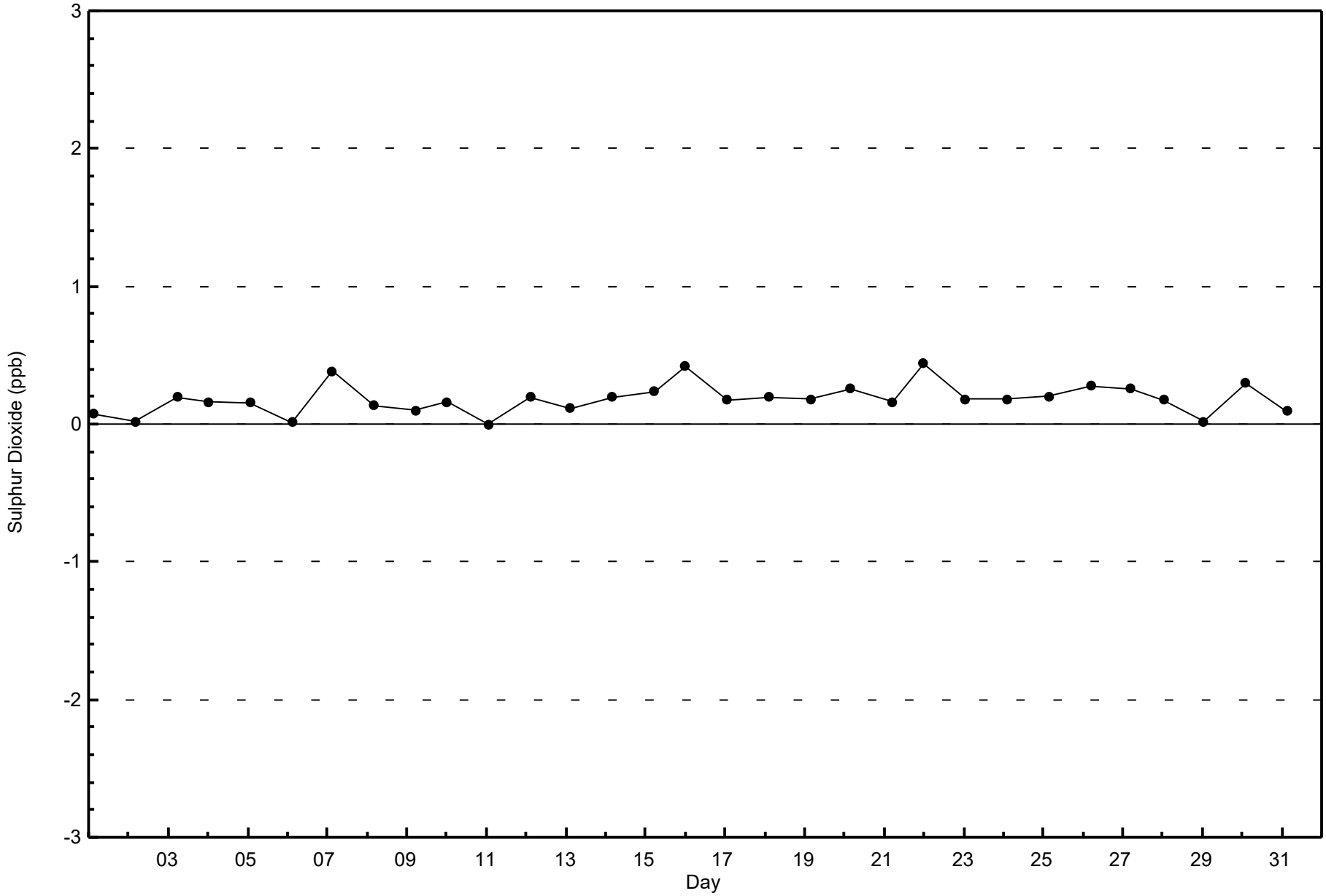
Total Number of Hours: 744

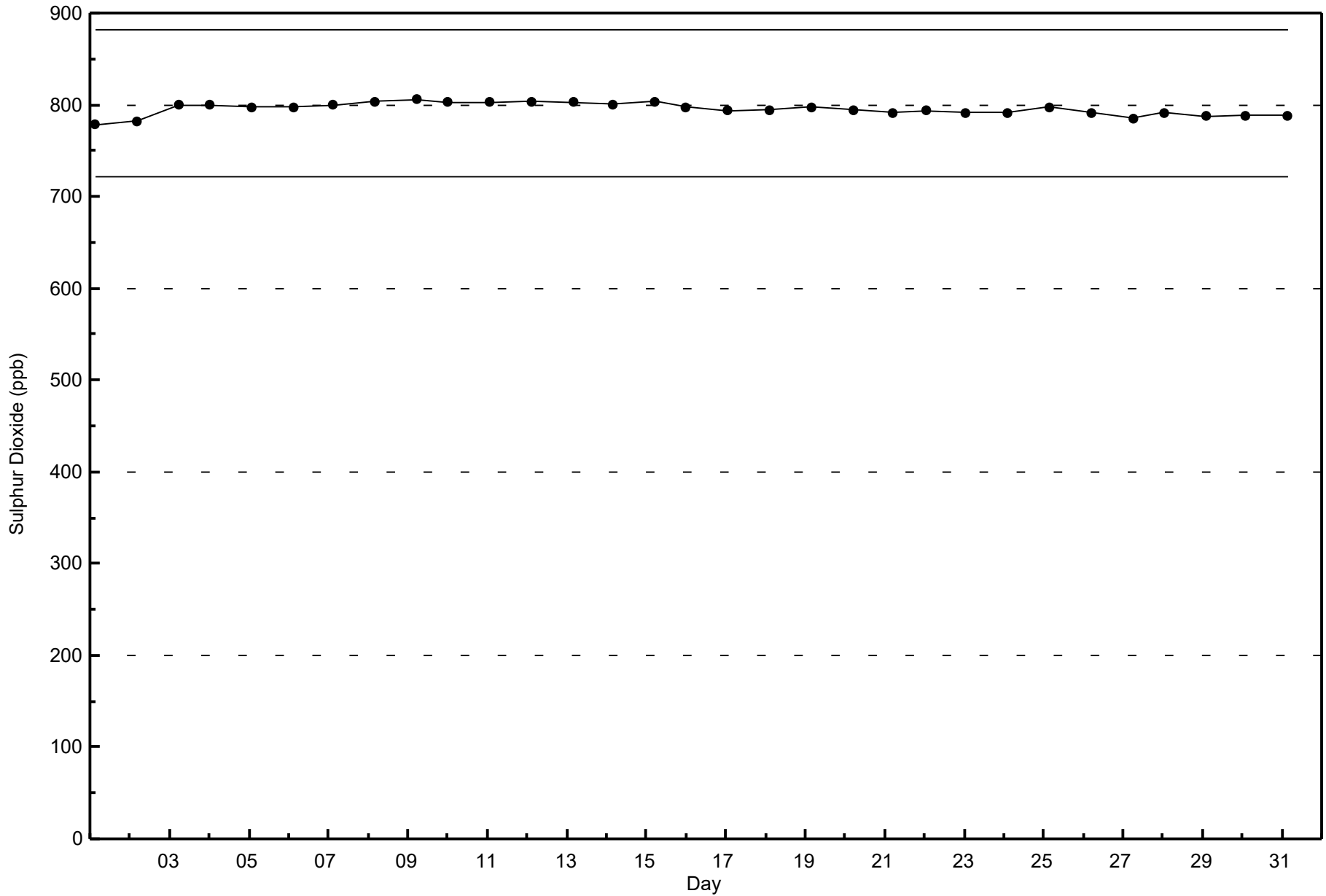


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

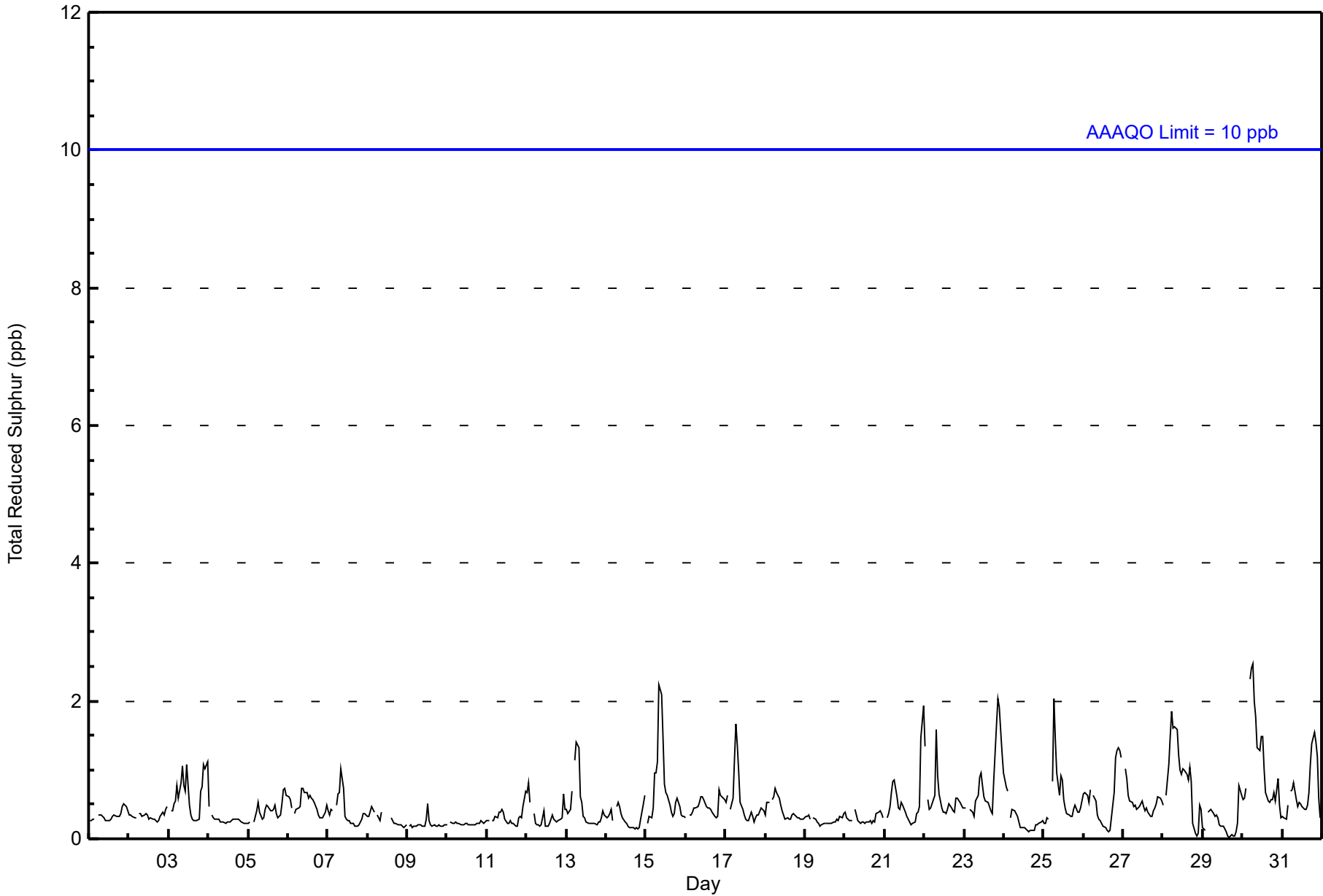
Barge Landing - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																																																					
Maximum Value: 2.5 ppb on Aug 30 07:00		Maximum Daily Average: 1.1 ppb on Aug 30														Hours of Data:		708																																																							
Minimum Value: 0.0 ppb on Aug 29 17:00		Minimum Daily Average: 0.2 ppb on Aug 9														Hours of Missing Data:		36																																																							
Maximum Diurnal Average: 0.7 ppb at hour 7		Minimum Diurnal Average: 0.3 ppb at hour 17														Hours of Calibration:		36																																																							
Monthly Average: 0.47 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.4 Q ₃ = 0.5 P ₉₀ = 0.9 P ₉₉ = 2.0														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-Aug	0.3	0.3	0.3	0.3	Z	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	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.5																																															
2-Aug	0.3	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.3	0.5																																															
3-Aug	Z	0.4	0.4	0.5	0.5	0.8	0.6	0.8	1.0	0.8	0.7	1.1	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.7	0.8	1.1	1.0	1.1	0.6	1.1																																															
4-Aug	0.5	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	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5																																															
5-Aug	0.2	0.2	Z	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.4	0.5	0.4	0.3	0.3	0.5	0.7	0.7	0.6	0.4	0.7																																																
6-Aug	0.6	0.6	0.5	Z	0.4	0.4	0.5	0.5	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.7																																															
7-Aug	0.4	0.3	0.4	0.4	Z	0.5	0.6	0.7	1.0	0.7	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.4	1.0																																															
8-Aug	0.3	0.3	0.5	0.4	0.4	Z	0.3	0.3	0.4	C	C	C	C	C	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5																																															
9-Aug	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	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5																																														
10-Aug	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	0.3	0.2	0.2	0.2	0.2	0.3	0.5																																														
11-Aug	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7	0.3	0.7																																														
12-Aug	0.7	0.8	0.5	Z	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.6	0.4	0.3	0.8																																															
13-Aug	0.4	0.4	0.4	0.7	Z	1.1	1.4	1.3	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.5	1.4																																															
14-Aug	0.3	0.3	0.4	0.4	0.3	Z	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.5	0.6	0.3	0.6																																															
15-Aug	Z	0.2	0.3	0.3	0.4	1.0	1.0	1.1	2.2	2.1	1.5	0.8	0.7	0.6	0.5	0.4	0.3	0.4	0.5	0.6	0.5	0.3	0.3	0.3	0.7	2.2																																															
16-Aug	0.3	Z	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.7	0.6	0.6	0.6	0.5	0.7																																															
17-Aug	0.5	0.6	Z	0.4	0.6	1.2	1.7	1.4	1.0	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.6	1.7																																															
18-Aug	0.4	0.5	0.5	Z	0.6	0.6	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7																																															
19-Aug	0.3	0.3	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	0.3	0.3	0.3	0.3	0.4	0.3	0.4																																															
20-Aug	0.4	0.3	0.3	0.3	0.3	Z	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.3	0.3	0.4																																															
21-Aug	Z	0.3	0.4	0.5	0.7	0.8	0.8	0.6	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.4	0.4	0.5	1.5	1.9	0.5	1.9																																															
22-Aug	1.3	Z	0.6	0.4	0.4	0.6	0.6	1.6	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.6	1.6																																															
23-Aug	0.4	0.5	Z	0.4	0.4	0.4	0.3	0.5	0.6	0.9	1.0	0.8	0.6	0.5	0.5	0.4	0.4	0.8	1.6	2.0	1.9	1.6	1.2	0.8	2.0																																																
24-Aug	1.0	0.8	0.7	Z	0.3	0.4	0.4	0.4	0.3	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	0.3	0.3	0.3	1.0																																															
25-Aug	0.2	0.2	0.3	0.3	Z	0.8	2.0	1.5	1.0	0.6	0.9	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.6	0.6	2.0																																															
26-Aug	0.6	0.7	0.6	0.5	0.7	Z	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.7	1.2	1.3	1.3	1.3	1.2	0.6	1.3																																															
27-Aug	Z	1.0	0.9	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.5	1.0																																																
28-Aug	0.5	Z	0.6	1.1	1.5	1.9	1.6	1.6	1.6	1.2	1.0	0.9	1.0	1.0	0.9	0.9	1.0	0.8	0.2	0.1	0.0	0.1	0.5	0.4	0.9	1.9																																															
29-Aug	0.2	0.1	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.8	0.6	0.2	0.8																																															
30-Aug	0.6	0.6	0.7	Z	2.3	2.5	2.5	2.0	1.8	1.3	1.3	1.5	1.5	1.0	0.7	0.5	0.5	0.6	0.6	0.7	0.5	0.9	0.5	0.3	1.1	2.5																																															
31-Aug	0.3	0.3	0.3	0.5	Z	0.7	0.7	0.8	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.7	1.1	1.4	1.5	1.4	1.2	0.6	0.3	0.7	1.5																																															
																								Diurnal Average		0.4		0.4		0.4		0.4		0.5		0.7		0.7		0.7		0.6		0.5		0.5		0.5		0.5		0.5																					
																								Diurnal Maximum		1.3		1.0		0.9		1.1		2.3		2.5		2.5		2.0		2.2		2.1		1.5		1.5		1.5		1.0		0.9		0.9		1.0		1.1		1.4		1.6		2.0		1.9		1.6		1.9	
Z - zerospan																								C - Calibration																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 10 ppb 24-hr 3 ppb																																																																									



Wood Buffalo Environmental Association
Hourly Averages

Total Reduced Sulphur (TRS) - ppb
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - August 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**

**Total Reduced Sulphur (TRS) - ppb
Barge Landing - August 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	52	15	17	11	9	26	58	85	73	65	73	53	49	27	40	51	704
3 - 4	0	0	0	0	0	0	0	1	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	52	15	17	11	9	26	58	86	73	65	73	53	49	27	40	51	705

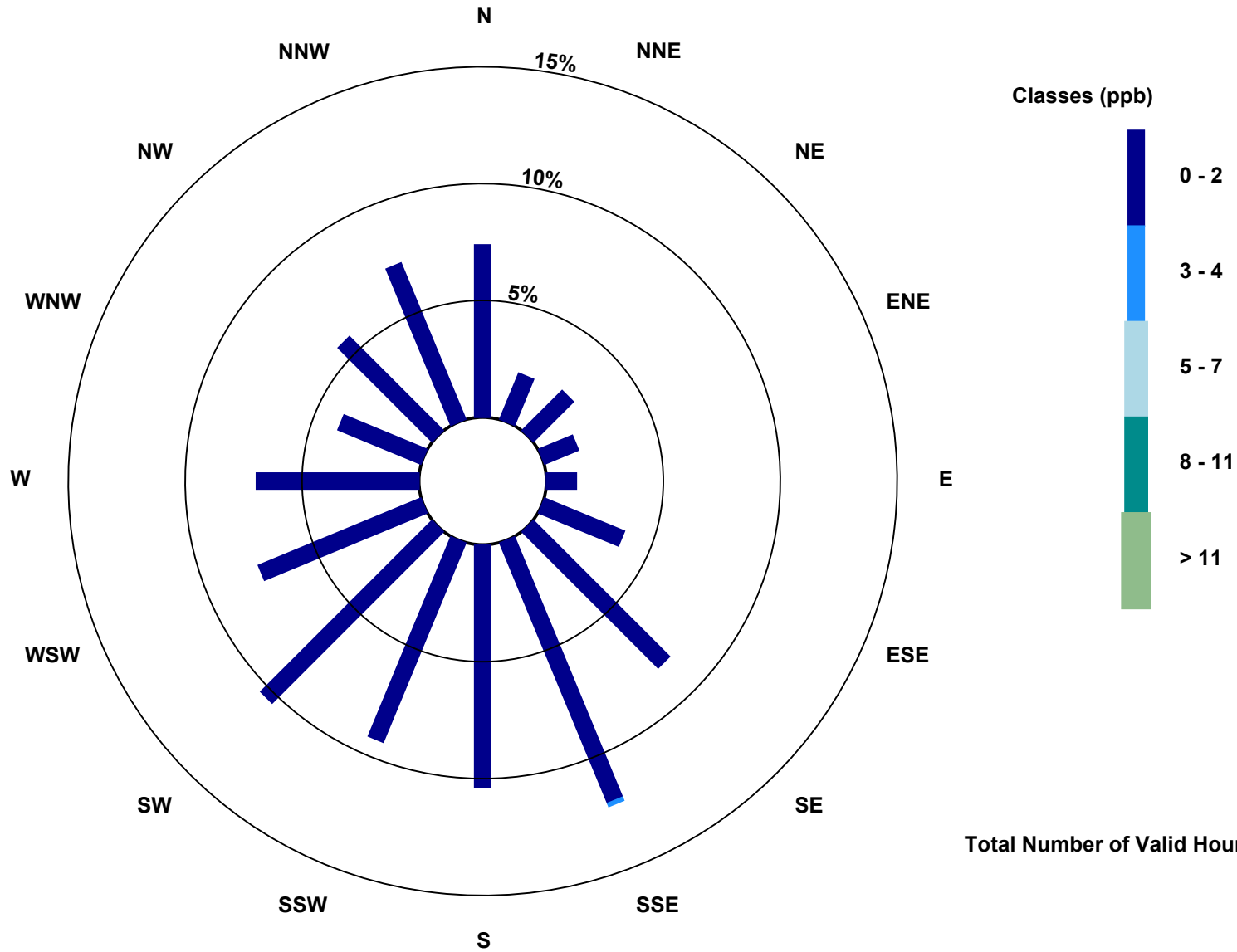
Total Number of Valid Hours: 705

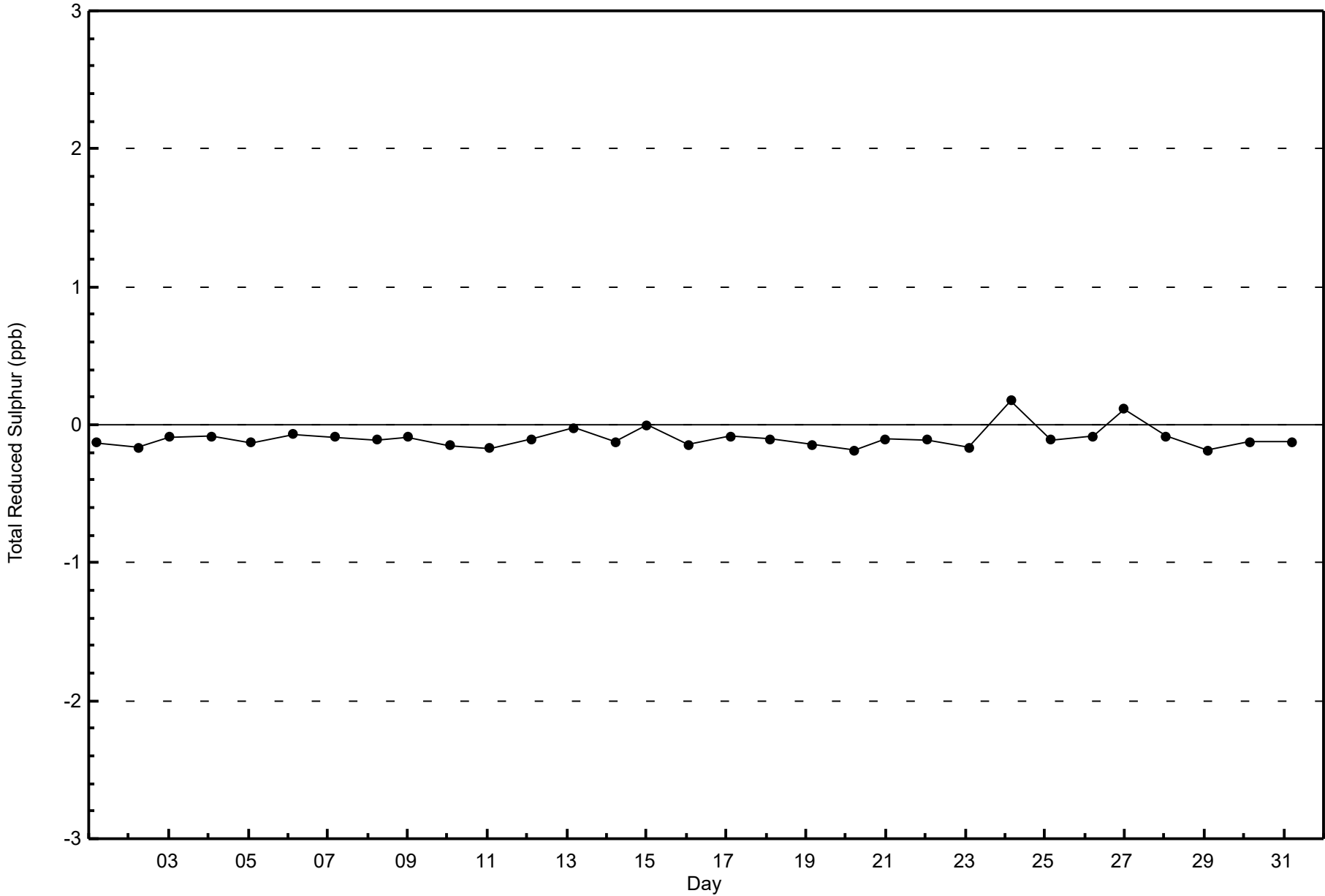
Total Number of Hours: 744

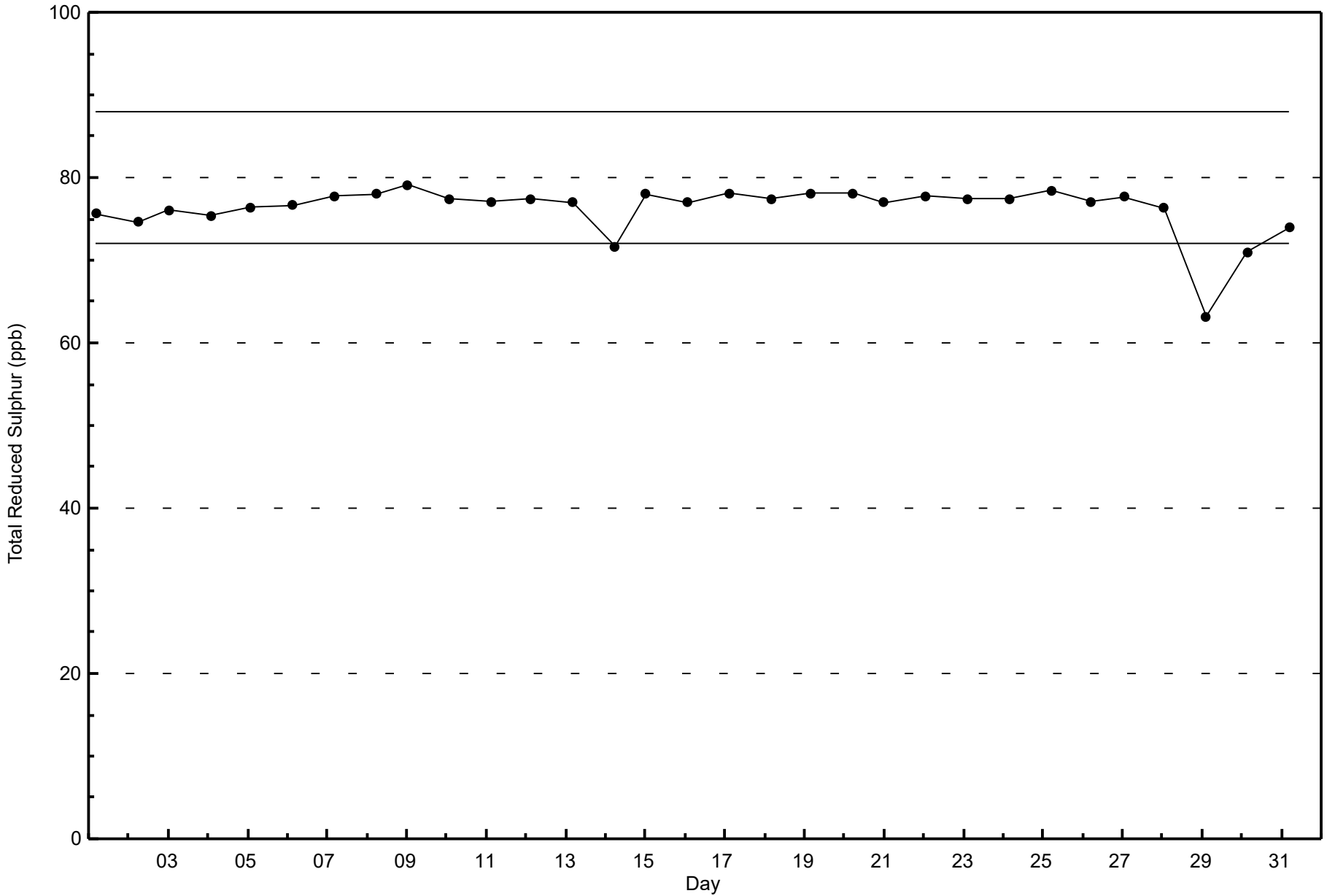


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

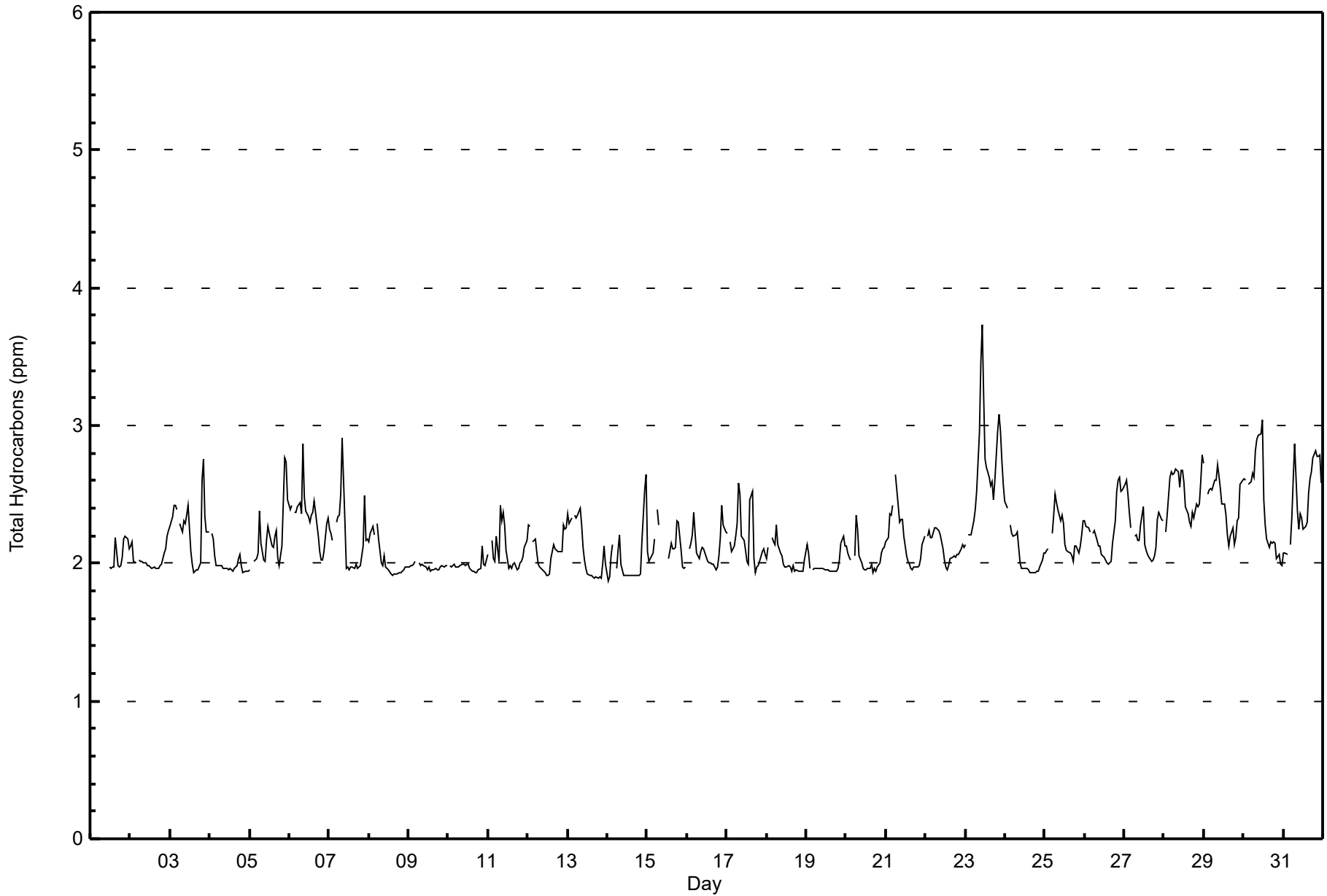
Barge Landing - August 2023

Maximum Value: 3.7 ppm on Aug 23 11:00																				Maximum Daily Average: 2.7 ppm on Aug 23					Hours in Service: 744	
Minimum Value: 1.9 ppm on Aug 14 01:00																				Minimum Daily Average: 2.0 ppm on Aug 9					Hours of Data: 699	
Maximum Diurnal Average: 2.3 ppm at hour 8																				Minimum Diurnal Average: 2.1 ppm at hour 18					Hours of Missing Data: 45	
Monthly Average: 2.17 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 = 2.9					Hours of Calibration: 36	
																									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-Aug	UO	UO	UO	Z	2.0	UO	UO	UO	UO	UO	2.0	2.0	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.1	--	2.2	
2-Aug	2.1	2.2	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	2.0	2.2
3-Aug	2.3	2.3	2.4	2.4	2.4	Z	2.3	2.2	2.3	2.3	2.3	2.4	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.6	2.8	2.3	2.2	2.2	2.2	2.8
4-Aug	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.2
5-Aug	1.9	Z	2.0	2.0	2.0	2.1	2.4	2.1	2.0	2.0	2.2	2.3	2.2	2.1	2.1	2.2	2.2	2.0	2.0	2.1	2.4	2.8	2.7	2.5	2.2	2.8
6-Aug	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.4	2.9	2.5	2.4	2.3	2.3	2.4	2.4	2.5	2.4	2.2	2.1	2.0	2.0	2.1	2.3	2.3	2.3	2.9
7-Aug	2.2	2.2	2.2	Z	2.3	2.3	2.3	2.5	2.9	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.5	2.2	2.2	2.2	2.9
8-Aug	2.2	2.2	2.3	2.2	Z	2.3	2.2	2.0	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.3
9-Aug	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	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10-Aug	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	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1
11-Aug	2.1	Z	2.2	2.0	2.0	2.2	2.0	2.4	2.3	2.4	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.1	2.4
12-Aug	2.3	2.3	Z	2.2	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3	2.2	2.3	2.1	2.3
13-Aug	2.4	2.3	2.3	Z	2.4	2.3	2.4	2.4	2.3	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.0	2.1	2.4
14-Aug	1.9	1.9	2.1	2.1	Z	2.0	2.1	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.2	2.5	2.6	2.0	2.6
15-Aug	2.1	2.0	2.0	2.1	2.2	Z	2.4	2.3	C	C	C	C	C	2.0	2.1	2.1	2.1	2.1	2.3	2.3	2.1	2.0	2.0	2.0	2.1	2.4
16-Aug	Z	2.1	2.1	2.2	2.4	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	2.3	2.2	2.1	2.4
17-Aug	2.2	Z	2.2	2.1	2.1	2.2	2.3	2.6	2.5	2.2	2.2	2.1	2.0	2.0	2.5	2.5	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.6
18-Aug	2.0	2.1	Z	2.2	2.2	2.1	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.3
19-Aug	2.1	2.1	2.0	Z	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	1.9	2.0	2.0	2.1	2.2	2.1	2.0	2.2
20-Aug	2.1	2.1	2.0	2.0	Z	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.1	2.1	2.1	2.0	2.3
21-Aug	2.2	2.2	2.4	2.4	2.4	Z	2.6	2.4	2.3	2.3	2.3	2.2	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	2.6
22-Aug	Z	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.3
23-Aug	2.1	Z	2.2	2.2	2.3	2.3	2.4	2.5	2.9	3.5	3.7	3.2	2.8	2.7	2.6	2.6	2.6	2.5	2.6	3.0	3.1	3.0	2.7	2.6	2.7	3.7
24-Aug	2.4	2.4	Z	2.3	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.4
25-Aug	2.1	2.1	2.1	Z	2.2	2.3	2.5	2.4	2.4	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.3	2.2	2.5
26-Aug	2.3	2.3	2.3	2.2	Z	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.6	2.6	2.5	2.5	2.2	2.6
27-Aug	2.6	2.6	2.5	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.3	2.4	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.3	2.4	2.3	2.3	2.2	2.6
28-Aug	Z	2.2	2.4	2.6	2.7	2.6	2.7	2.7	2.7	2.5	2.7	2.7	2.6	2.4	2.4	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.6	2.8	2.5	2.8
29-Aug	2.7	Z	2.5	2.5	2.5	2.5	2.6	2.6	2.7	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.2	2.3	2.1	2.2	2.3	2.3	2.6	2.6	2.4	2.7
30-Aug	2.6	2.6	Z	2.6	2.6	2.6	2.6	2.8	2.9	2.9	2.9	3.0	2.5	2.3	2.2	2.1	2.2	2.1	2.2	2.2	2.0	2.1	2.0	2.0	2.4	3.0
31-Aug	2.1	2.1	2.1	Z	2.1	2.3	2.6	2.9	2.4	2.2	2.4	2.3	2.3	2.3	2.3	2.5	2.6	2.7	2.8	2.8	2.8	2.8	2.8	2.6	2.5	2.9
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Barge Landing - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Barge Landing - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	294	42.06	42.06
2.1 - 3.0	401	57.37	99.43
3.1 - 10.0	4	0.57	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Barge Landing - August 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	10	5	11	4	9	16	34	10	15	24	42	32	26	17	14	24	293
2.1 - 3.0	41	11	6	7	3	8	21	74	58	39	29	16	22	10	25	29	399
3.1 - 10.0	1	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	16	17	11	12	24	55	84	73	64	73	48	48	27	39	53	696

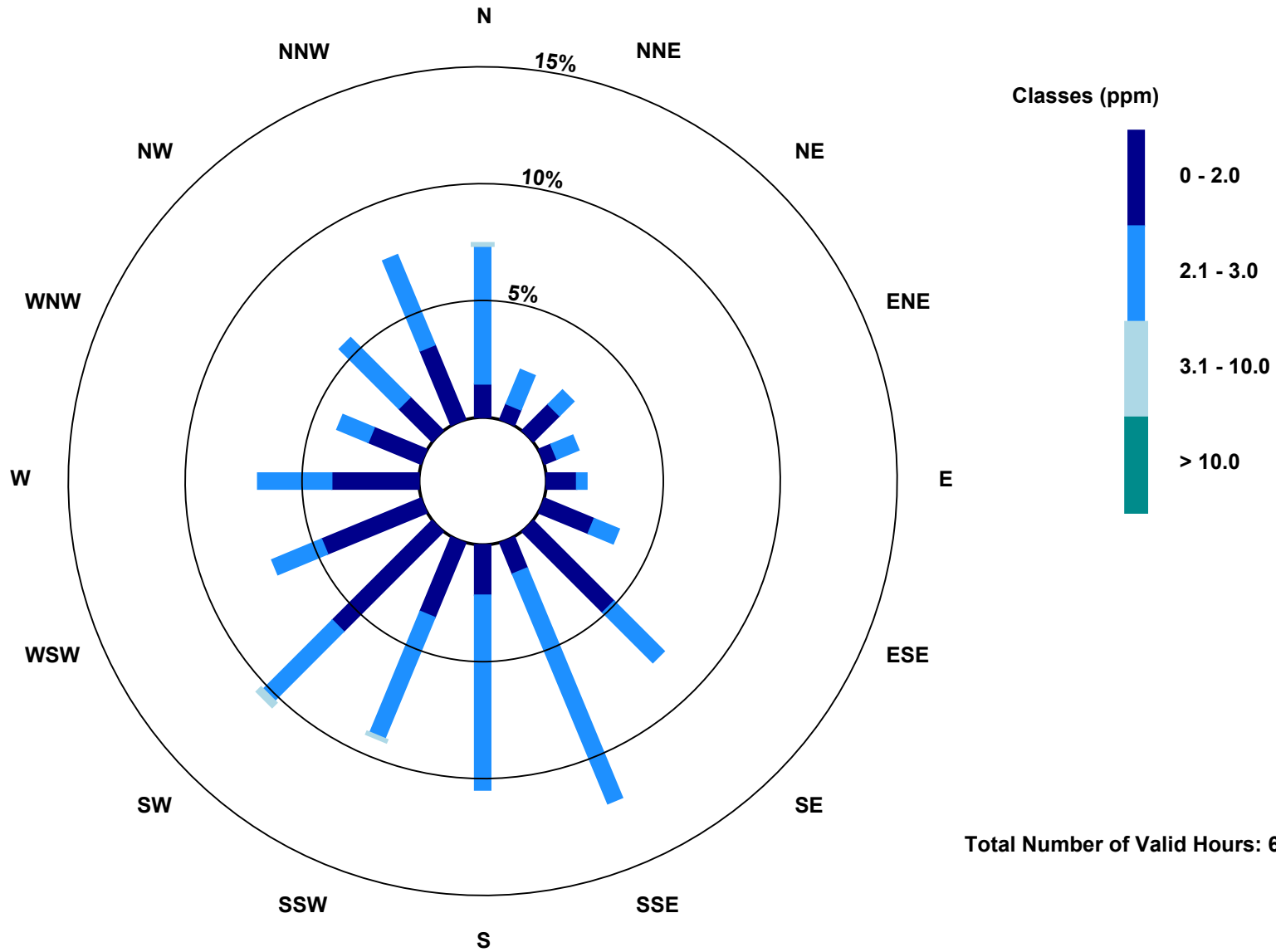
Total Number of Valid Hours: 696

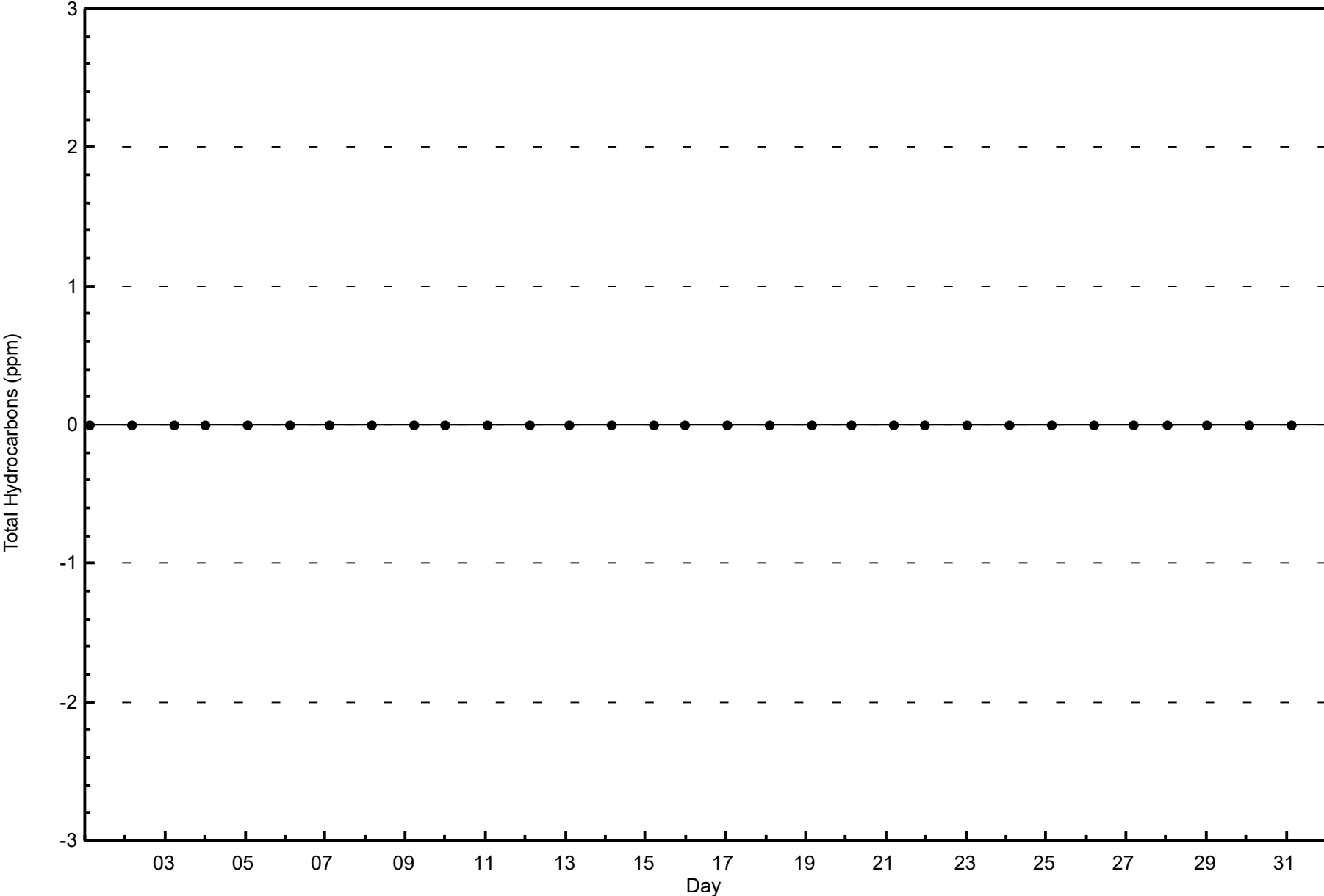
Total Number of Hours: 744

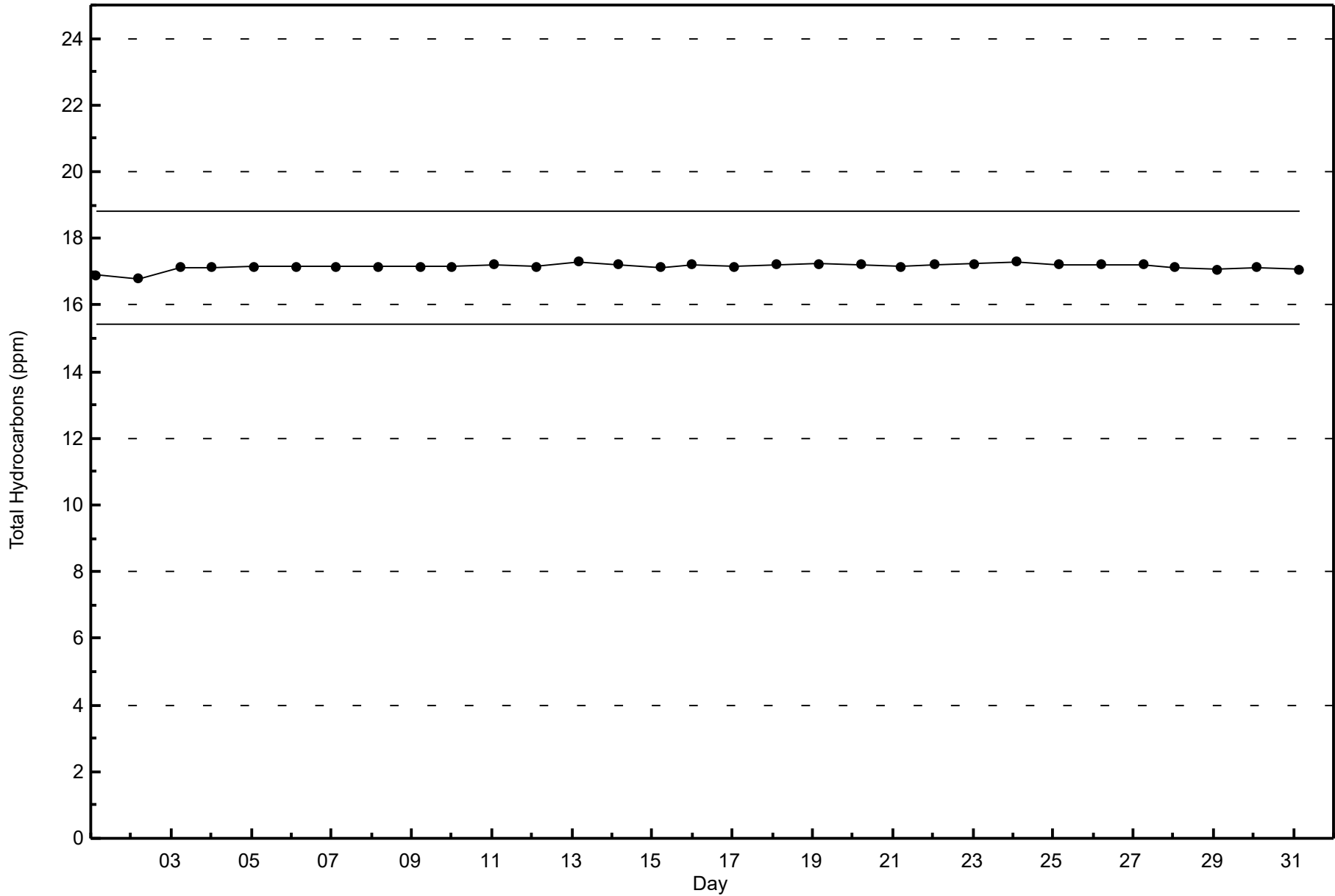


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Barge Landing







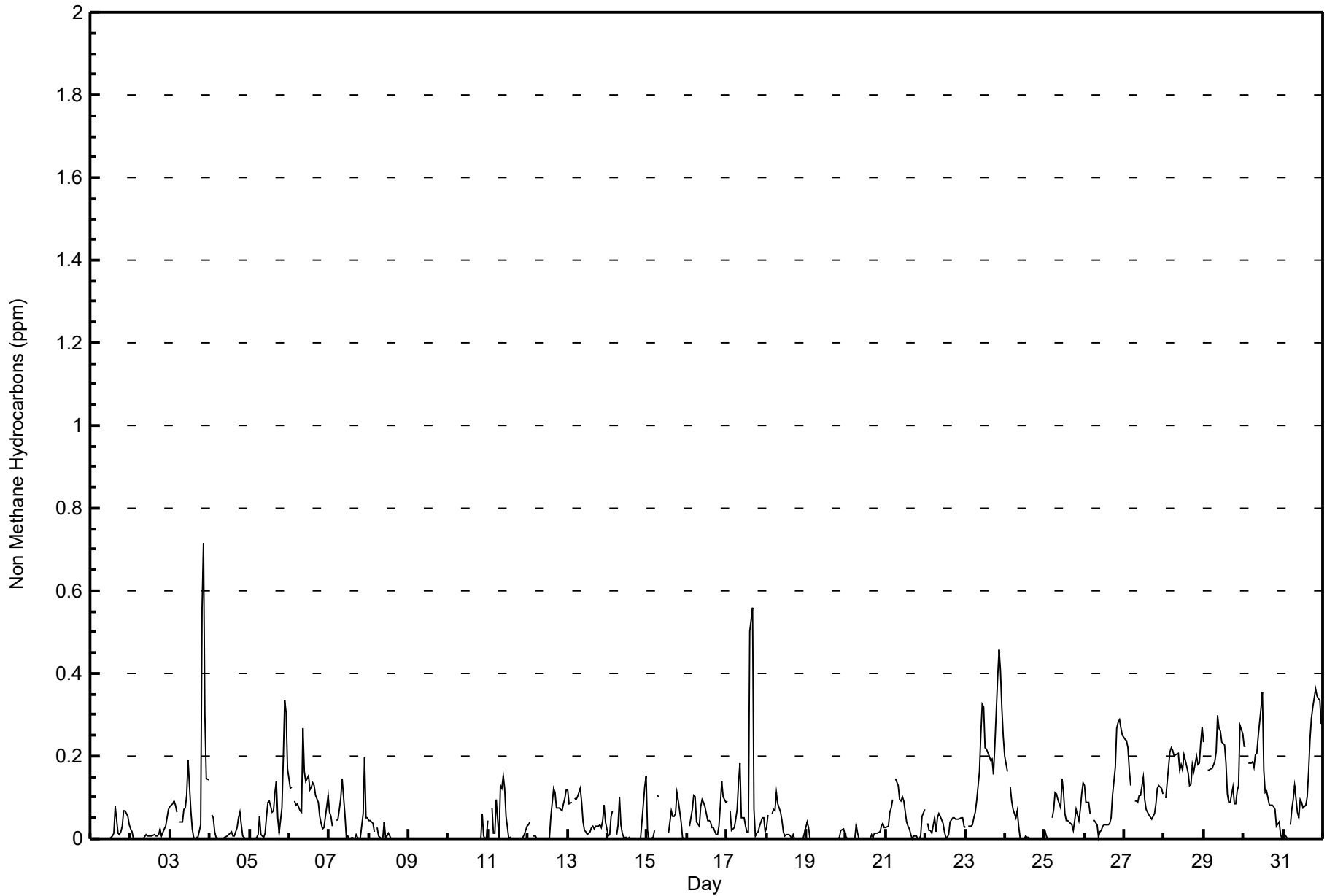


Maximum Value: 0.716 ppm on Aug 3 21:00																								Hours in Service: 744		
Minimum Value: 0.000 ppm on Aug 4 06:00																								Hours of Data: 699		
Maximum Diurnal Average: 0.098 ppm at hour 21																								Hours of Missing Data: 45		
Monthly Average: 0.069 ppm																								Hours of Calibration: 36		
Minimum Daily Average: 0.000 ppm on Aug 9																								Percent Operational Time: 98.8		
Minimum Diurnal Average: 0.043 ppm at hour 14																										
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 = 0.4																										
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-Aug	UO	UO	UO	Z	0.000	UO	UO	UO	UO	UO	0.000	0.003	0.006	0.012	0.080	0.014	0.011	0.015	0.029	0.067	0.069	0.055	0.035	--	0.080	
2-Aug	0.025	0.015	0.002	0.002	Z	0.001	0.002	0.001	0.001	0.009	0.006	0.007	0.006	0.007	0.009	0.006	0.008	0.009	0.022	0.007	0.023	0.030	0.051	0.072	0.014	0.072
3-Aug	0.080	0.084	0.091	0.081	0.063	Z	0.039	0.041	0.070	0.076	0.106	0.191	0.068	0.025	0.003	0.001	0.003	0.005	0.035	0.558	0.716	0.297	0.146	0.142	0.127	0.716
4-Aug	Z	0.058	0.052	0.016	0.002	0.000	0.000	0.000	0.001	0.002	0.007	0.012	0.015	0.018	0.008	0.006	0.026	0.050	0.063	0.036	0.008	0.000	0.001	0.000	0.017	0.063
5-Aug	0.000	Z	0.000	0.000	0.003	0.010	0.054	0.011	0.002	0.013	0.055	0.088	0.092	0.063	0.066	0.113	0.138	0.052	0.012	0.075	0.197	0.335	0.305	0.169	0.081	0.335
6-Aug	0.122	0.125	Z	0.091	0.082	0.083	0.067	0.065	0.268	0.163	0.140	0.152	0.120	0.125	0.136	0.127	0.104	0.087	0.056	0.037	0.025	0.027	0.079	0.106	0.104	0.268
7-Aug	0.066	0.055	0.031	Z	0.043	0.047	0.070	0.099	0.147	0.057	0.003	0.006	0.000	0.000	0.003	0.002	0.011	0.002	0.000	0.004	0.062	0.197	0.052	0.052	0.044	0.197
8-Aug	0.043	0.043	0.036	0.017	Z	0.026	0.007	0.000	0.001	0.041	0.005	0.006	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.043
9-Aug	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	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
10-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.006	0.000	0.005	0.003	0.063
11-Aug	0.043	Z	0.076	0.015	0.012	0.096	0.000	0.130	0.122	0.153	0.124	0.054	0.000	0.003	0.001	0.000	0.001	0.000	0.000	0.002	0.001	0.002	0.010	0.031	0.038	0.153
12-Aug	0.033	0.040	Z	0.008	0.007	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.004	0.055	0.123	0.111	0.075	0.075	0.075	0.068	0.085	0.097	0.119	0.043	0.123
13-Aug	0.120	0.084	0.087	Z	0.098	0.094	0.102	0.122	0.088	0.042	0.022	0.018	0.011	0.018	0.026	0.029	0.025	0.032	0.030	0.034	0.027	0.045	0.081	0.041	0.055	0.122
14-Aug	0.007	0.010	0.054	0.067	Z	0.010	0.035	0.103	0.034	0.014	0.003	0.004	0.001	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.125	0.152	0.029	0.152
15-Aug	0.021	0.001	0.001	0.002	0.022	Z	0.104	0.100	C	C	C	C	C	0.014	0.067	0.053	0.056	0.062	0.112	0.091	0.040	0.003	0.001	0.000	0.042	0.112
16-Aug	Z	0.030	0.051	0.071	0.104	0.102	0.042	0.032	0.079	0.093	0.087	0.077	0.046	0.044	0.040	0.026	0.027	0.011	0.012	0.030	0.082	0.140	0.102	0.089	0.062	0.140
17-Aug	0.092	Z	0.069	0.021	0.029	0.046	0.072	0.136	0.181	0.052	0.051	0.032	0.016	0.017	0.502	0.559	0.070	0.005	0.013	0.015	0.030	0.052	0.050	0.019	0.093	0.559
18-Aug	0.027	0.059	Z	0.062	0.071	0.068	0.113	0.085	0.065	0.044	0.017	0.008	0.011	0.009	0.006	0.001	0.010	0.001	0.001	0.000	0.000	0.000	0.000	0.015	0.029	0.113
19-Aug	0.040	0.028	0.000	Z	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	0.001	0.000	0.002	0.019	0.023	0.009	0.005	0.040
20-Aug	0.004	0.000	0.000	0.000	Z	0.000	0.033	0.014	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.010	0.002	0.014	0.015	0.014	0.017	0.030	0.037	0.029	0.010	0.037
21-Aug	0.027	0.030	0.064	0.075	0.096	Z	0.146	0.128	0.096	0.092	0.102	0.092	0.039	0.029	0.023	0.012	0.001	0.008	0.008	0.002	0.000	0.008	0.053	0.070	0.052	0.146
22-Aug	Z	0.038	0.022	0.019	0.014	0.052	0.016	0.050	0.061	0.055	0.038	0.016	0.005	0.004	0.012	0.040	0.050	0.050	0.049	0.048	0.047	0.050	0.052	0.031	0.036	0.061
23-Aug	0.027	Z	0.029	0.030	0.035	0.051	0.066	0.090	0.164	0.256	0.327	0.318	0.222	0.217	0.200	0.191	0.193	0.154	0.226	0.390	0.458	0.406	0.314	0.249	0.201	0.458
24-Aug	0.200	0.161	Z	0.124	0.092	0.071	0.051	0.069	0.030	0.005	0.000	0.001	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.036	0.200
25-Aug	0.016	0.003	0.004	Z	0.049	0.071	0.111	0.109	0.096	0.075	0.145	0.112	0.062	0.046	0.043	0.039	0.033	0.020	0.044	0.071	0.045	0.071	0.107	0.137	0.066	0.145
26-Aug	0.130	0.087	0.087	0.062	Z	0.044	0.044	0.033	0.005	0.016	0.019	0.032	0.034	0.033	0.039	0.052	0.105	0.173	0.267	0.281	0.289	0.267	0.251	0.104	0.289	
27-Aug	0.240	0.239	0.221	0.164	0.127	Z	0.090	0.092	0.090	0.105	0.107	0.148	0.095	0.071	0.063	0.056	0.048	0.053	0.059	0.083	0.121	0.127	0.123	0.109	0.114	0.240
28-Aug	Z	0.098	0.136	0.209	0.222	0.213	0.201	0.204	0.206	0.168	0.179	0.167	0.202	0.191	0.161	0.128	0.133	0.178	0.163	0.201	0.180	0.182	0.235	0.272	0.184	0.272
29-Aug	0.236	Z	0.168	0.166	0.171	0.170	0.188	0.209	0.299	0.269	0.262	0.233	0.226	0.183	0.110	0.088	0.090	0.127	0.084	0.084	0.115	0.130	0.276	0.253	0.180	0.299
30-Aug	0.224	0.224	Z	0.184	0.183	0.187	0.171	0.205	0.207	0.247	0.315	0.358	0.165	0.113	0.114	0.080	0.080	0.081	0.078	0.071	0.031	0.041	0.009	0.000	0.146	0.358
31-Aug	0.009	0.009	0.001	Z	0.034	0.072	0.096	0.129	0.064	0.050	0.095	0.088	0.076	0.082	0.101	0.162	0.240	0.290	0.318	0.363	0.345	0.339	0.336	0.277	0.155	0.363
																								Diurnal Average		
																								Diurnal Maximum		
0.073 0.061 0.051 0.059 0.060 0.061 0.064 0.075 0.082 0.072 0.076 0.074 0.051 0.043 0.058 0.064 0.049 0.048 0.054 0.083 0.098 0.097 0.096 0.088																										
																								0.240 0.239 0.221 0.209 0.222 0.213 0.201 0.209 0.299 0.269 0.327 0.358 0.226 0.217 0.502 0.559 0.240 0.290 0.318 0.558 0.716 0.406 0.336 0.277		
Z - zerospan C - Calibration UO - Unstable Operation																										



Wood Buffalo Environmental Association
Hourly Averages

Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	193	27.61	27.61
0.006 - 0.05	219	31.33	58.94
0.06 - 0.1	187	26.75	85.69
> 0.1	100	14.31	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744



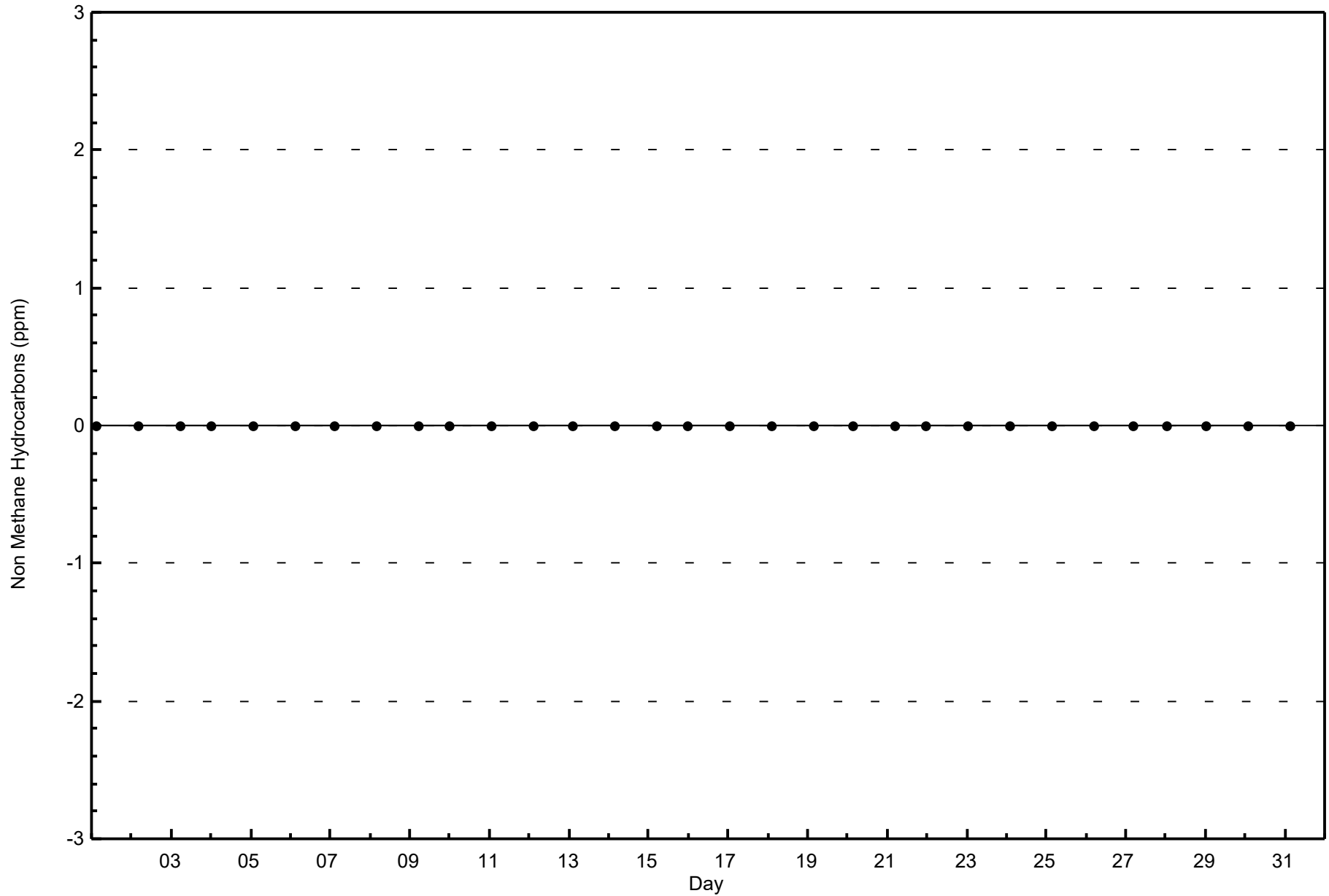
**Wood Buffalo Environmental Association
Frequency Distribution**

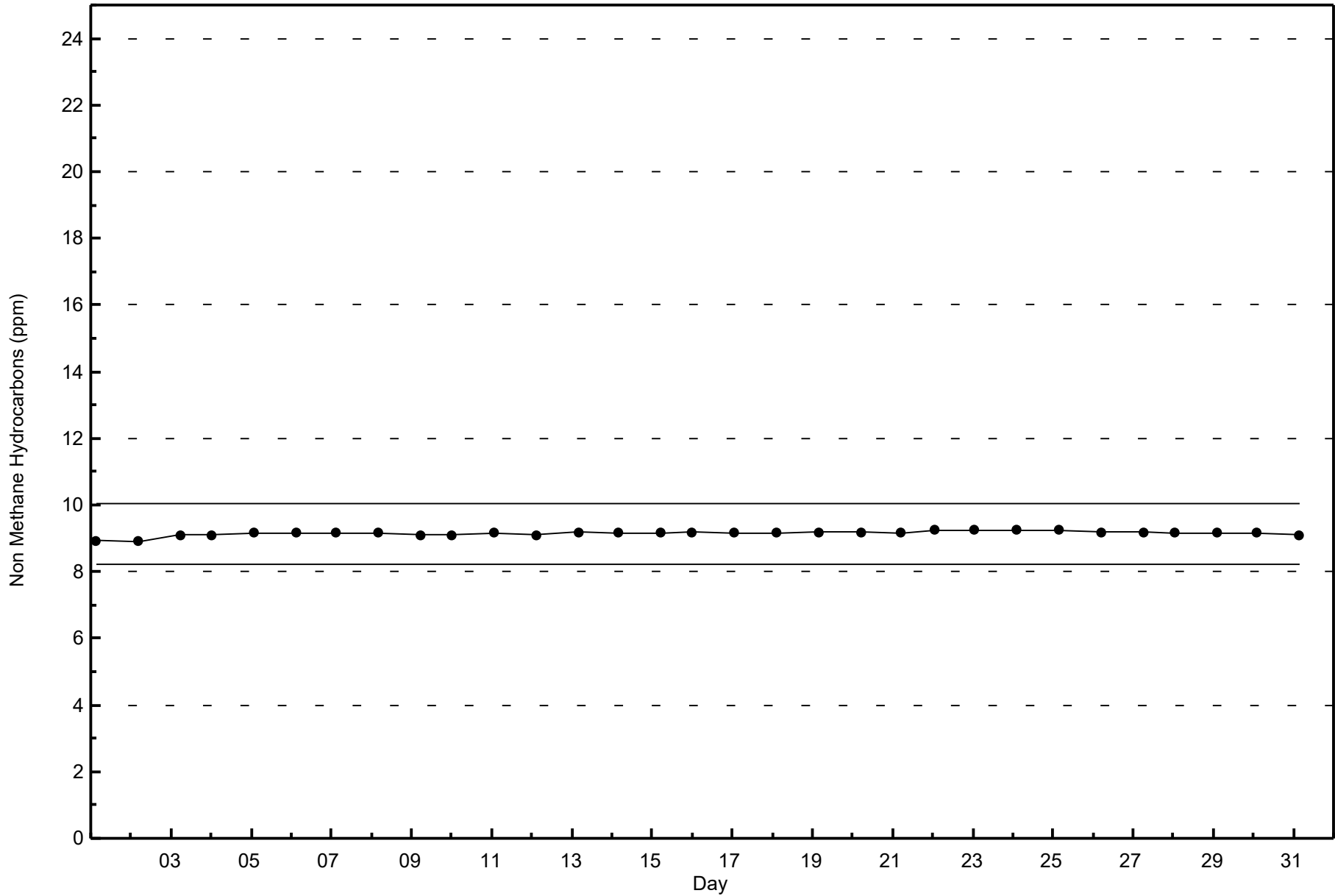
**Non Methane Hydrocarbons (NMHC) - ppm
Barge Landing - August 2023**

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	5	5	5	2	8	14	30	6	8	14	21	24	19	6	10	16	193
0.006 - 0.05	12	2	7	6	3	7	13	15	20	29	29	18	10	15	12	18	216
0.06 - 0.1	21	6	4	2	1	3	5	34	33	18	15	5	12	5	12	11	187
> 0.1	14	3	1	1	0	0	7	29	12	3	8	1	7	1	5	8	100
Totals	52	16	17	11	12	24	55	84	73	64	73	48	48	27	39	53	696

Total Number of Valid Hours: 696

Total Number of Hours: 744







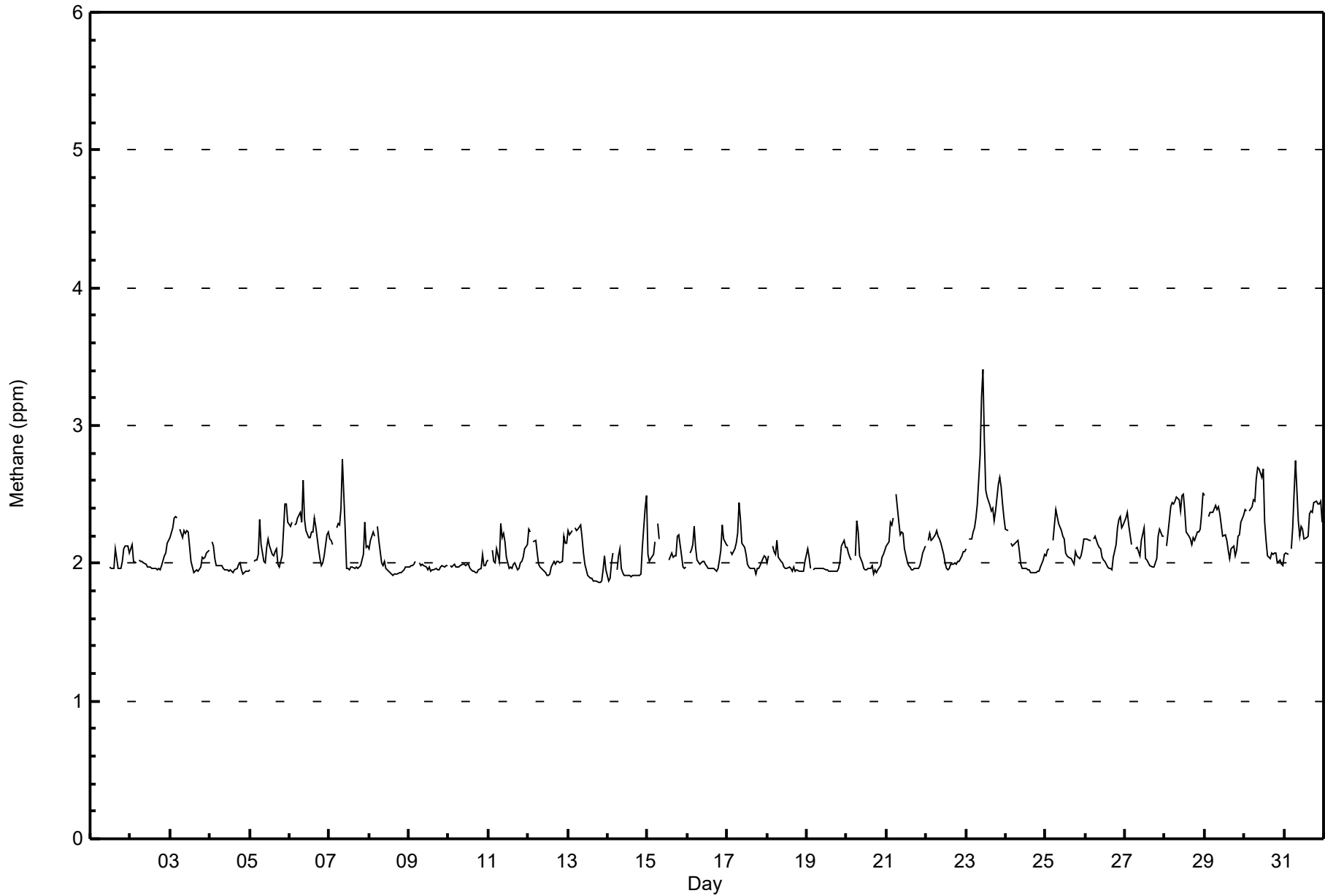
Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

Barge Landing - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744						
Maximum Value: 3.4 ppm on Aug 23 11:00		Maximum Daily Average: 2.5 ppm on Aug 23		Hours of Data:														699								
Minimum Value: 1.9 ppm on Aug 13 20:00		Minimum Daily Average: 2.0 ppm on Aug 9		Hours of Missing Data:														45								
Maximum Diurnal Average: 2.2 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 18		Hours of Calibration:														36								
Monthly Average: 2.11 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 1.9 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.3 P ₉₉ = 2.7		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-Aug	UO	UO	UO	Z	2.0	UO	UO	UO	UO	UO	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-Aug	2.1	2.1	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	2.1	2.2	2.0	2.2	
3-Aug	2.2	2.3	2.3	2.3	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.2	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.1	2.3	
4-Aug	Z	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.2	
5-Aug	1.9	Z	2.0	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.2	2.4	2.4	2.3	2.4	
6-Aug	2.3	2.3	Z	2.3	2.3	2.3	2.4	2.3	2.6	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.1	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.6	
7-Aug	2.2	2.2	2.1	Z	2.3	2.3	2.3	2.4	2.8	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.1	2.1	2.1	2.8	
8-Aug	2.1	2.2	2.2	2.2	Z	2.3	2.2	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.3	
9-Aug	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	1.9	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
10-Aug	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	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	
11-Aug	2.0	Z	2.1	2.0	2.0	2.1	2.0	2.3	2.2	2.2	2.2	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	2.3	
12-Aug	2.2	2.2	Z	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.1	2.0	2.2	
13-Aug	2.2	2.2	2.2	Z	2.3	2.2	2.2	2.3	2.2	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.3	
14-Aug	1.9	1.9	2.0	2.1	Z	2.0	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.1	2.4	2.5	2.0	2.5	
15-Aug	2.1	2.0	2.0	2.1	2.2	Z	2.3	2.2	C	C	C	C	C	2.0	2.1	2.0	2.1	2.0	2.2	2.2	2.1	2.0	2.0	2.0	2.3	
16-Aug	Z	2.1	2.1	2.1	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.1	2.3	2.2	2.1	2.1	2.3	
17-Aug	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.1	2.4	
18-Aug	2.0	2.1	Z	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.2	
19-Aug	2.1	2.0	2.0	Z	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	1.9	2.0	2.0	2.1	2.2	2.1	2.0	2.2	
20-Aug	2.1	2.1	2.0	2.0	Z	2.1	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.0	2.1	2.1	2.0	2.3	
21-Aug	2.1	2.2	2.3	2.3	2.3	Z	2.5	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.5	
22-Aug	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	
23-Aug	2.1	Z	2.2	2.2	2.2	2.3	2.3	2.4	2.8	3.2	3.4	2.9	2.5	2.4	2.4	2.4	2.3	2.4	2.6	2.6	2.6	2.4	2.3	2.5	3.4	
24-Aug	2.2	2.2	Z	2.2	2.1	2.1	2.2	2.2	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.1	2.0	2.2	
25-Aug	2.1	2.1	2.1	Z	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.1	2.1	2.2	2.4	
26-Aug	2.2	2.2	2.2	2.2	Z	2.2	2.2	2.1	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	2.3	2.1	2.3	
27-Aug	2.3	2.4	2.3	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.1	2.4	
28-Aug	Z	2.1	2.2	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.5	2.5	2.4	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.5	
29-Aug	2.5	Z	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.5	
30-Aug	2.4	2.4	Z	2.4	2.4	2.5	2.4	2.6	2.7	2.7	2.6	2.7	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.7	
31-Aug	2.1	2.1	2.1	Z	2.1	2.3	2.5	2.7	2.3	2.2	2.3	2.2	2.2	2.2	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.3	2.7	
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										
UO - Unstable Operation																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Barge Landing - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	348	49.79	49.79
2.1 - 3.0	349	49.93	99.71
3.1 - 10.0	2	0.29	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 699

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Barge Landing - August 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	13	5	12	6	9	16	36	16	22	34	49	34	32	20	15	28	347
2.1 - 3.0	39	11	5	5	3	8	19	68	51	30	22	14	16	7	24	25	347
3.1 - 10.0	0	0	0	0	0	0	0	0	0	0	2	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	52	16	17	11	12	24	55	84	73	64	73	48	48	27	39	53	696

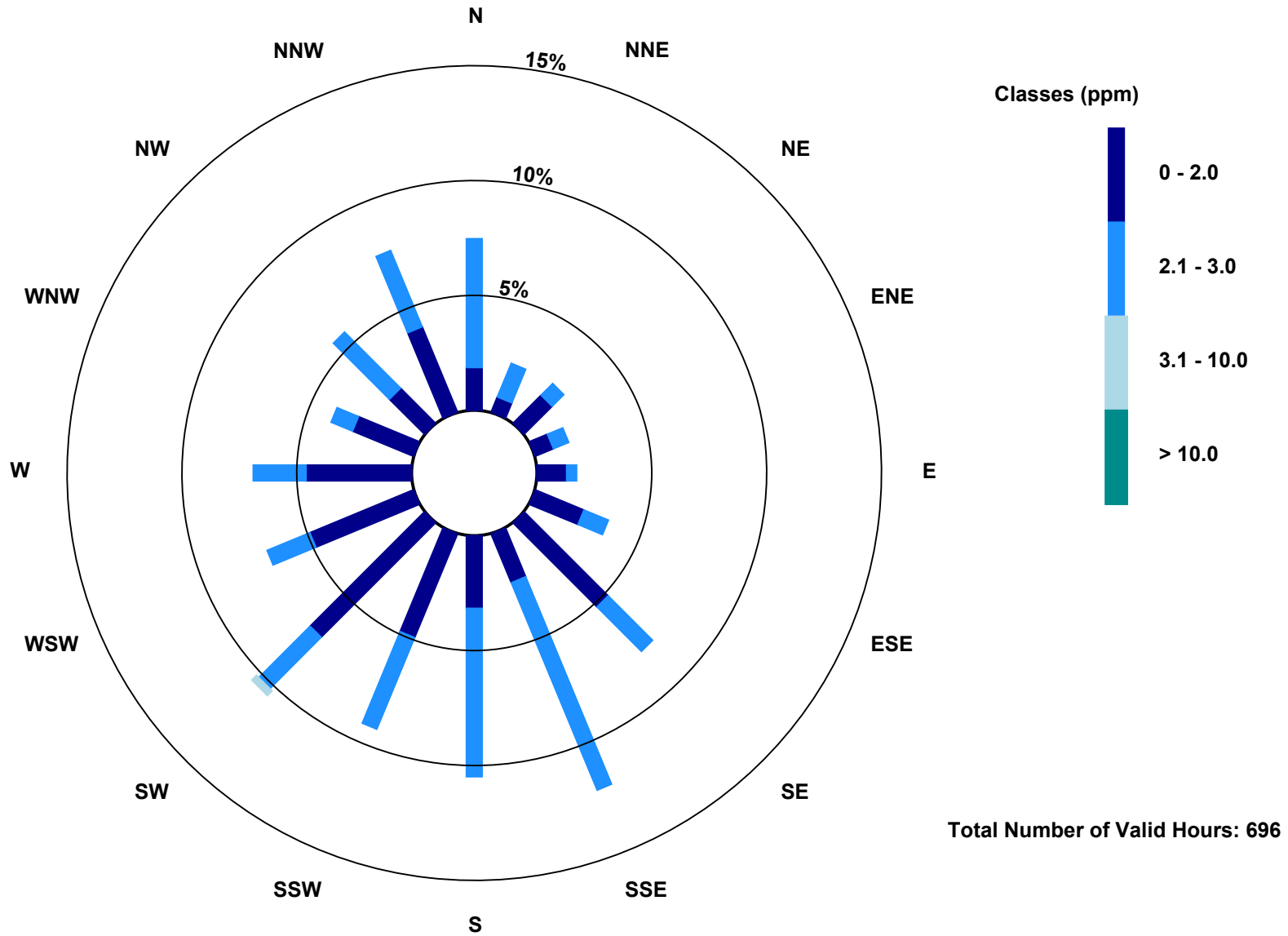
Total Number of Valid Hours: 696

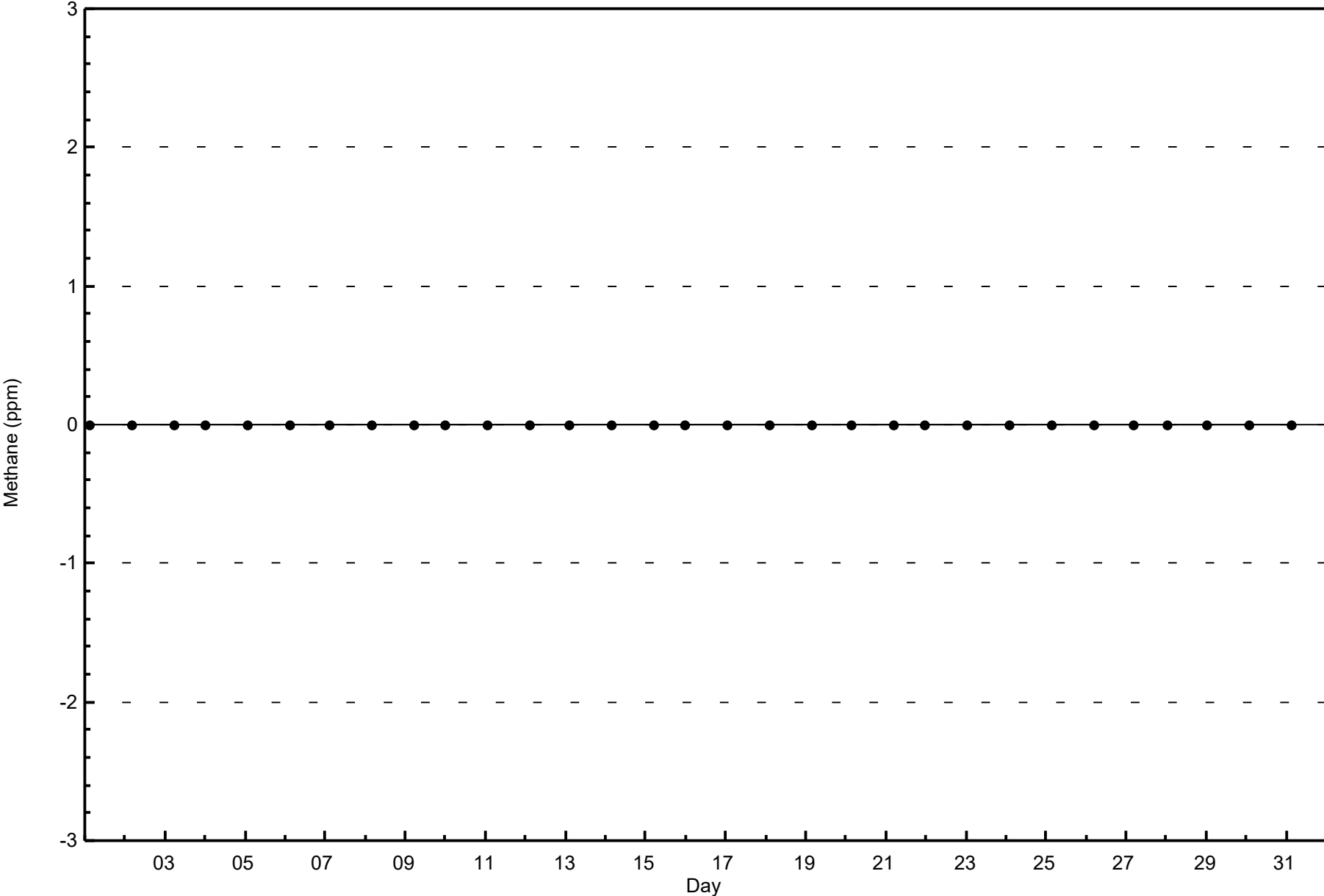
Total Number of Hours: 744

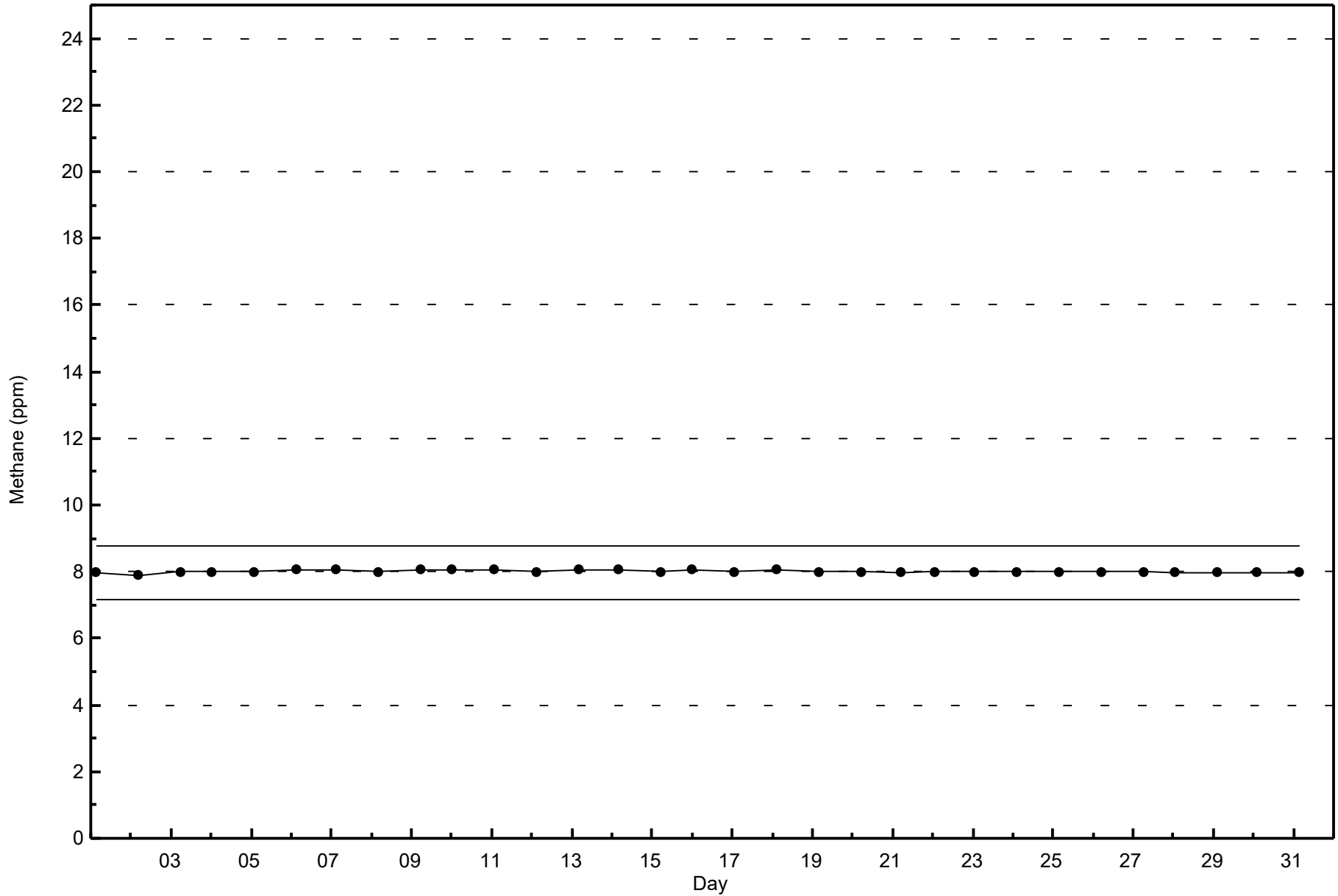


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

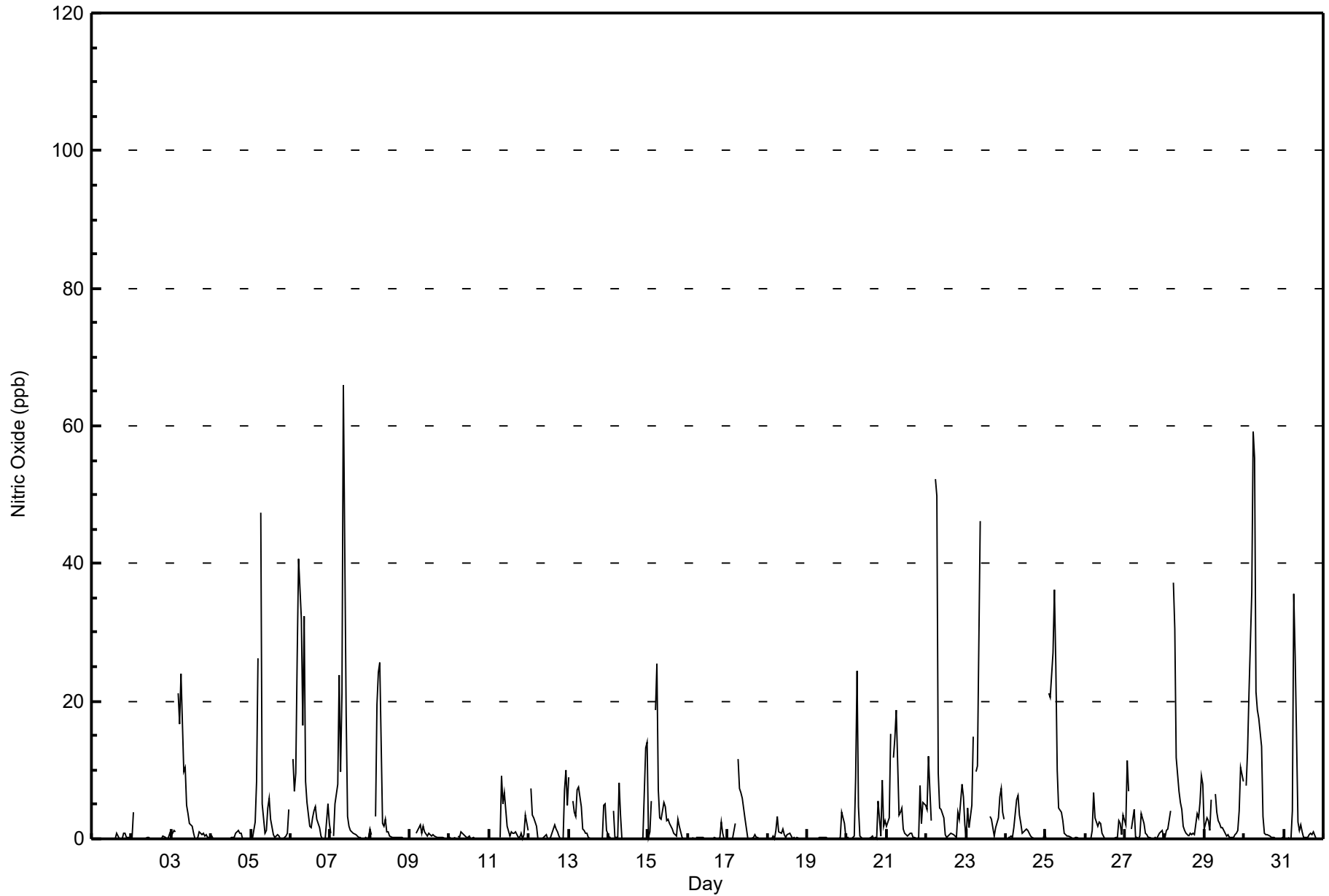
Barge Landing - August 2023

Maximum Value: 66.0 ppb on Aug 7 09:00																				Maximum Daily Average: 11.7 ppb on Aug 30					Hours in Service: 744	
Minimum Value: 0.0 ppb on Aug 1 03:00																				Minimum Daily Average: 0.2 ppb on Aug 1					Hours of Data: 708	
Maximum Diurnal Average: 14.3 ppb at hour 7																				Minimum Diurnal Average: 0.3 ppb at hour 18					Hours of Missing Data: 36	
Monthly Average: 3.26 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.5 Q ₃ = 2.8 P ₉₀ = 8.1 P ₉₉ = 40.5					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-Aug	0.6	Z	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	0.7	0.0	0.0	0.0	0.9	0.7	0.3	0.1	0.0	0.2	0.9
2-Aug	0.0	3.9	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.1	0.0	0.3	0.8	0.3	3.9
3-Aug	0.5	1.1	0.9	Z	21.1	16.8	24.0	9.7	10.4	4.9	3.6	2.3	1.9	0.7	0.1	0.0	0.2	1.0	0.5	0.9	0.5	0.6	0.1	0.1	4.4	24.0
4-Aug	0.3	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.9	1.3	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.2	1.3
5-Aug	0.0	0.1	2.5	8.3	26.3	Z	47.4	5.1	0.8	1.2	4.5	6.0	2.9	0.7	0.2	0.5	0.7	0.4	0.0	0.1	0.2	0.4	0.9	4.2	4.9	47.4
6-Aug	Z	11.7	6.9	9.5	26.2	40.7	32.0	16.5	32.3	8.4	5.2	1.9	1.7	3.0	4.0	4.6	2.9	1.6	0.4	0.0	0.0	0.0	5.2	2.2	9.4	40.7
7-Aug	0.8	Z	0.5	5.1	8.0	23.8	9.7	21.1	66.0	18.0	3.2	1.8	1.2	1.0	0.8	0.7	0.4	0.2	0.2	0.1	0.0	0.2	0.1	0.2	7.1	66.0
8-Aug	1.4	0.7	Z	3.4	19.4	24.2	25.6	2.3	1.8	2.8	1.1	1.1	0.4	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.1	3.7	25.6
9-Aug	0.0	0.0	0.1	Z	0.7	1.7	2.0	0.8	1.8	1.0	0.5	0.8	0.6	0.5	0.6	0.5	0.3	0.2	0.1	0.2	0.2	0.0	0.1	0.1	0.6	2.0
10-Aug	0.1	0.0	0.0	0.1	Z	0.5	0.2	1.0	0.5	0.5	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	1.0
11-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.3	9.2	5.0	6.7	4.3	1.8	0.4	1.0	0.9	0.8	1.0	0.1	0.1	0.7	0.0	0.7	3.4	1.2	1.6	9.2
12-Aug	Z	7.4	3.5	3.1	1.9	0.0	0.0	0.1	0.0	0.1	0.6	0.1	0.0	0.2	0.9	2.0	1.3	1.0	0.4	0.1	0.0	7.0	9.9	4.9	1.9	9.9
13-Aug	9.0	Z	5.5	3.9	3.3	7.2	7.5	4.7	1.5	1.3	0.7	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	5.1	1.2	2.5	9.0
14-Aug	0.2	0.2	Z	4.0	0.1	0.2	8.1	3.4	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	0.3	13.2	14.1	1.9	14.1
15-Aug	0.3	1.0	5.5	Z	18.7	25.5	7.1	3.0	2.8	5.4	4.7	2.7	2.8	2.3	1.5	0.8	0.5	0.4	2.9	1.9	0.1	0.0	0.0	0.0	3.9	25.5
16-Aug	0.0	0.0	0.0	0.1	Z	0.2	0.2	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	2.5	0.9	0.1	0.0	0.2	2.5
17-Aug	0.0	0.0	0.0	0.0	2.3	Z	11.6	7.2	6.8	5.9	2.8	1.5	0.0	0.0	0.0	0.1	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	1.7	11.6
18-Aug	Z	0.0	0.0	0.4	0.1	1.3	3.3	0.9	0.7	1.4	0.7	0.3	0.6	0.9	0.4	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.5	3.3
19-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	3.9	2.3	0.2	0.3	3.9
20-Aug	0.2	0.1	Z	0.0	0.5	8.9	24.5	4.6	0.4	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.0	0.2	0.0	5.5	0.4	8.5	1.8	2.6	2.6	24.5
21-Aug	1.8	3.0	15.3	Z	11.8	14.7	18.7	3.5	3.8	4.6	1.5	0.7	0.3	0.6	0.8	0.9	0.2	0.3	0.1	0.1	7.8	2.2	5.2	4.8	4.5	18.7
22-Aug	4.2	12.0	7.2	2.6	Z	52.4	49.9	9.5	4.4	4.3	3.0	0.7	0.2	0.5	0.7	0.8	0.7	0.5	0.1	3.8	2.9	8.0	6.1	2.1	7.7	52.4
23-Aug	0.2	4.5	1.7	4.8	14.9	Z	9.7	10.6	46.2	C	C	C	C	C	3.3	2.9	1.6	0.5	1.6	3.0	6.2	7.3	3.9	2.9	7.0	46.2
24-Aug	Z	0.3	0.3	0.3	0.3	1.7	5.7	6.4	3.4	2.2	0.9	1.3	1.3	1.2	0.9	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	1.0	1.2	6.4
25-Aug	0.1	Z	21.2	20.5	27.0	36.2	25.2	9.9	4.5	3.8	2.6	0.9	0.5	0.3	0.4	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	6.7	36.2
26-Aug	0.0	0.0	Z	0.1	1.2	6.7	3.1	1.8	2.3	2.3	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	2.7	2.2	0.5	3.5	1.2	6.7
27-Aug	2.1	11.3	7.0	Z	1.4	4.3	0.3	0.1	0.1	0.5	3.7	2.3	0.8	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.3	0.8	1.2	0.2	1.6	11.3
28-Aug	0.3	1.2	1.5	4.1	Z	37.3	30.5	11.9	6.9	5.2	4.2	1.7	1.2	0.8	0.4	0.9	0.7	0.9	0.7	3.7	3.1	5.4	9.1	8.0	6.1	37.3
29-Aug	1.5	3.1	2.6	1.2	5.7	Z	6.4	3.8	2.6	2.2	1.7	1.6	0.7	0.4	0.6	0.1	0.1	0.2	0.6	0.9	1.3	4.1	10.4	8.3	2.6	10.4
30-Aug	Z	7.7	12.9	21.2	35.7	59.1	55.3	21.3	18.8	17.5	13.4	3.2	0.9	0.6	0.6	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.2	11.7	59.1
31-Aug	0.0	Z	0.2	0.0	0.0	4.2	35.5	26.5	2.5	1.2	2.0	1.0	0.3	0.2	0.2	0.7	0.8	0.6	0.9	0.1	0.0	0.0	0.0	0.0	3.3	35.5
																								Diurnal Average		
																								Diurnal Maximum		
0.9 2.8 3.7 3.6 8.7 14.1 14.3 6.3 7.3 3.4 2.2 1.2 0.7 0.5 0.6 0.6 0.5 0.3 0.3 0.7 0.9 1.9 2.6 2.0																										
9.0 12.0 21.2 21.2 35.7 59.1 55.3 26.5 66.0 18.0 13.4 6.0 2.9 3.0 4.0 4.6 2.9 1.6 2.9 5.5 7.8 8.5 13.2 14.1																										
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Barge Landing - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Barge Landing - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	677	95.62	95.62
21 - 40	23	3.25	98.87
41 - 80	8	1.13	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
Barge Landing - August 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	52	16	17	11	9	25	55	75	70	56	72	53	48	27	37	51	674
21 - 40	0	0	0	1	2	1	2	5	4	5	1	0	0	0	2	0	23
11 - 80	0	0	0	0	0	0	2	2	0	2	0	0	1	0	1	0	8
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	52	16	17	12	11	26	59	82	74	63	73	53	49	27	40	51	705

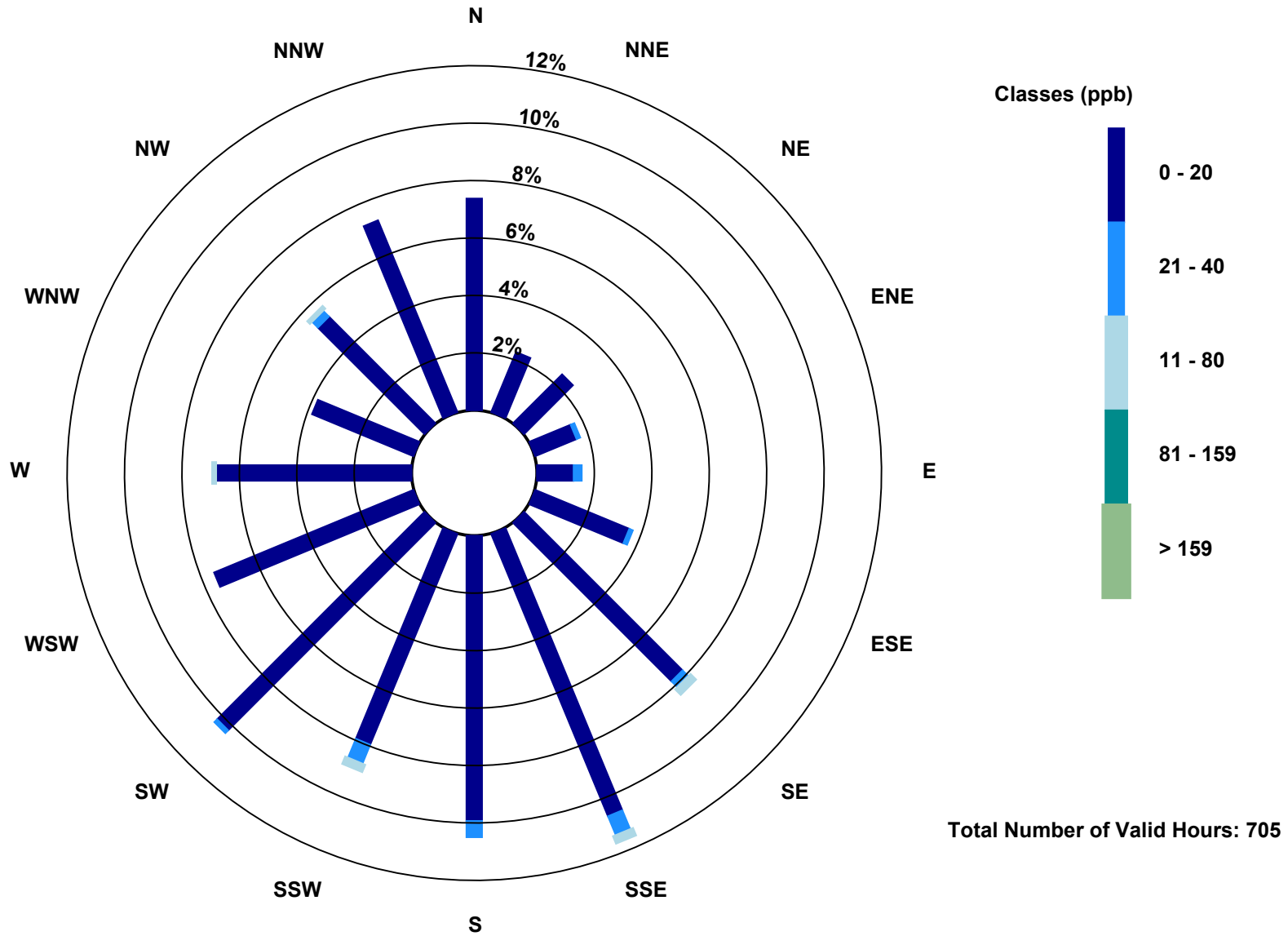
Total Number of Valid Hours: 705

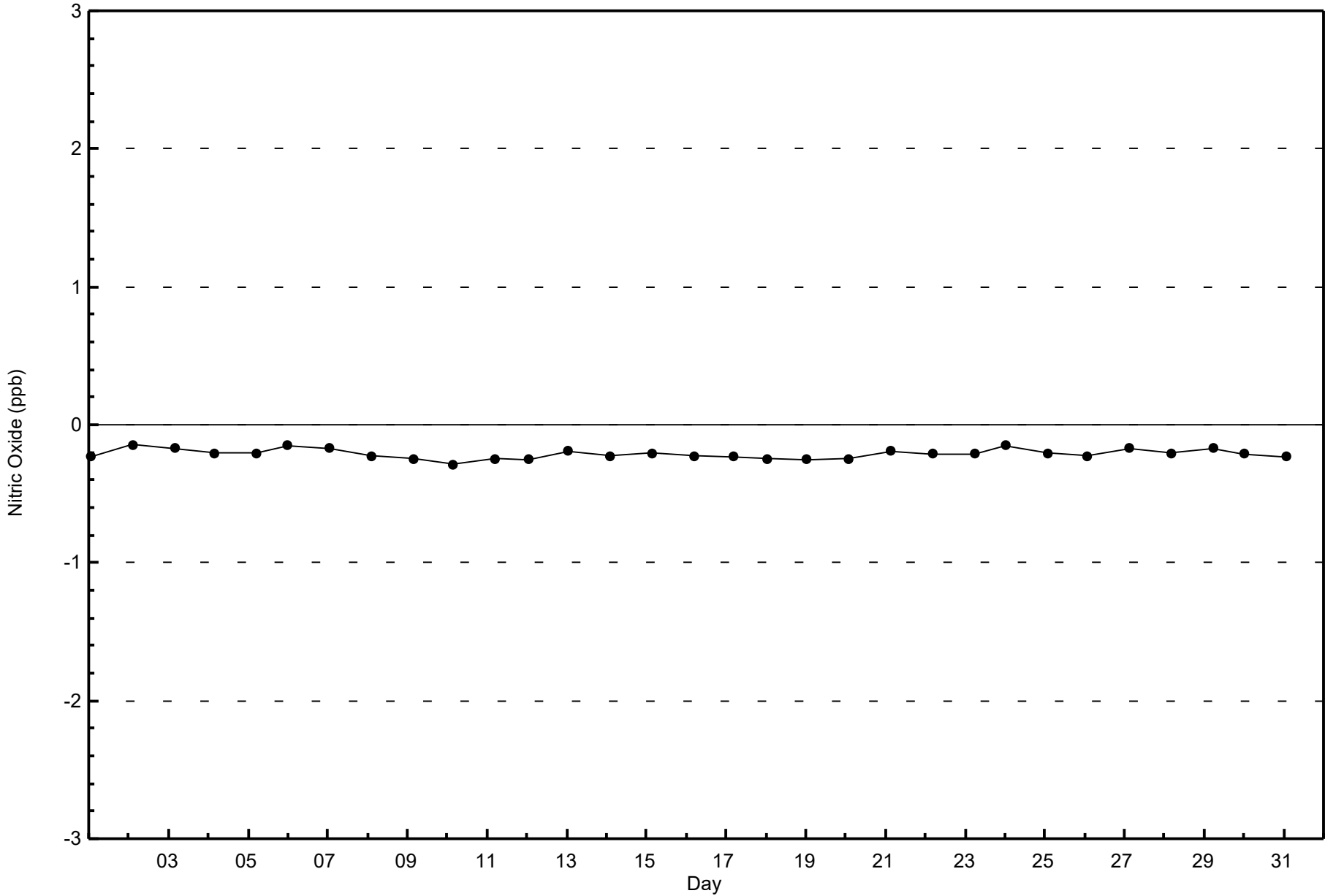
Total Number of Hours: 744

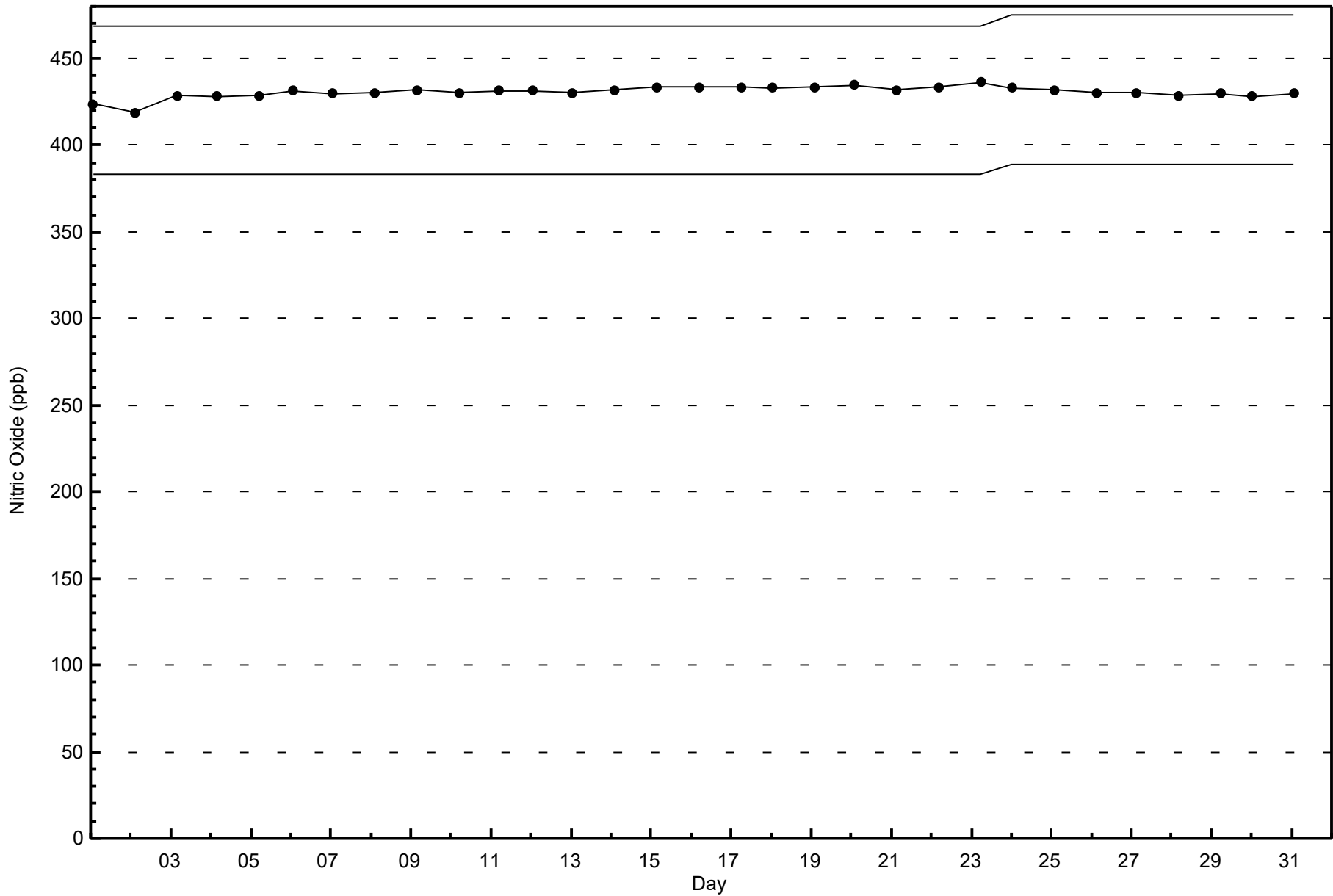


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Barge Landing









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

Barge Landing - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 26.8 ppb on Aug 26 21:00	Maximum Daily Average: 10.6 ppb on Aug 22		Hours of Data:	708
Minimum Value: 0.0 ppb on Aug 19 05:00	Minimum Daily Average: 2.1 ppb on Aug 4		Hours of Missing Data:	36
Maximum Diurnal Average: 10.2 ppb at hour 23	Minimum Diurnal Average: 2.9 ppb at hour 14		Hours of Calibration:	36
Monthly Average: 5.95 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 1.6 Median = 4.7 Q ₃ = 8.8 P ₉₀ = 13.6 P ₉₉ = 20.8		Percent Operational Time:	100.0

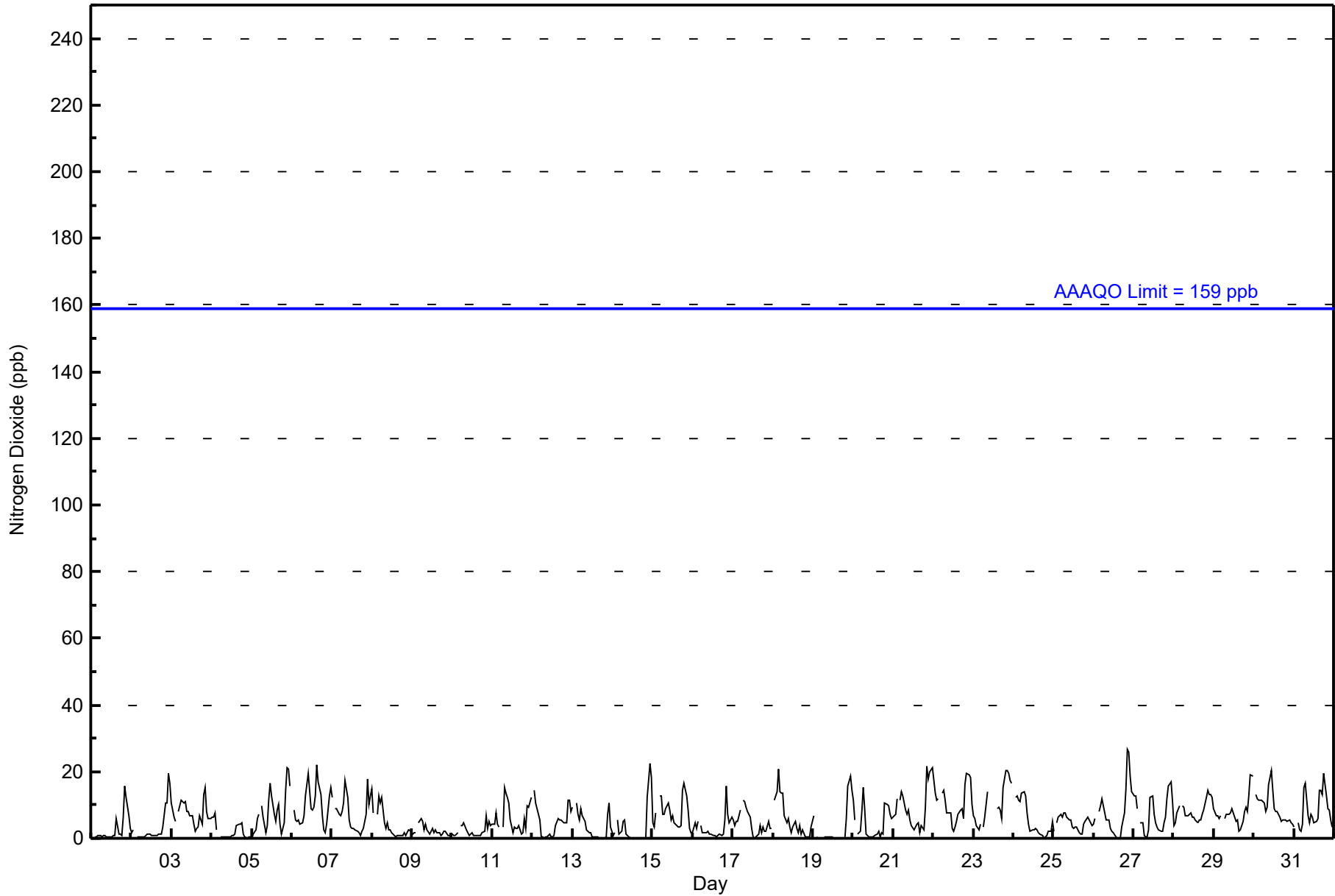
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	0.7	Z	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.6	0.4	0.3	0.4	0.7	0.9	6.1	1.2	1.1	0.8	6.4	15.7	12.3	6.8	3.0	2.7	15.7																							
2-Aug	1.9	2.7	Z	0.5	0.4	0.4	0.3	0.5	0.4	1.2	1.1	1.2	0.9	0.7	0.7	1.3	1.3	1.1	3.5	10.6	10.8	19.7	16.6	3.4	19.7																								
3-Aug	10.4	6.2	5.1	Z	8.0	9.9	11.6	10.6	11.1	8.2	7.9	6.6	6.7	4.3	2.3	2.9	3.6	6.6	4.2	13.2	15.2	8.1	5.8	5.8	7.6	15.2																							
4-Aug	6.3	6.4	7.5	2.7	Z	0.5	0.4	0.3	0.4	0.4	0.4	0.4	1.0	0.8	1.4	3.9	4.1	4.2	4.5	1.1	0.3	0.2	0.6	0.3	2.1	7.5																							
5-Aug	0.2	1.1	2.6	5.8	7.3	Z	9.8	6.2	1.6	3.9	11.3	16.5	12.5	7.0	5.2	8.4	10.1	4.2	1.2	4.7	14.2	21.1	20.7	15.7	8.3	21.1																							
6-Aug	Z	8.6	5.4	4.9	5.3	4.3	4.8	6.6	12.9	16.3	19.5	8.9	8.5	9.3	12.6	21.9	17.1	13.1	6.9	2.5	1.7	4.3	12.8	15.3	9.7	21.9																							
7-Aug	12.3	Z	9.0	8.8	7.3	6.8	8.1	10.8	17.3	12.2	5.6	3.6	2.8	2.8	2.6	2.2	1.7	1.0	2.2	2.9	7.1	17.9	10.3	12.8	7.3	17.9																							
8-Aug	14.7	7.5	Z	7.1	12.9	10.5	12.1	4.6	3.0	4.8	2.5	2.5	1.5	1.0	0.5	0.7	0.8	1.0	0.7	1.6	1.0	1.8	2.4	2.3	4.2	14.7																							
9-Aug	1.2	1.8	1.5	Z	4.8	5.8	5.1	2.7	4.3	2.5	1.3	2.1	3.0	1.9	2.7	1.9	1.7	0.9	1.4	2.1	2.1	0.8	0.9	1.4	2.3	5.8																							
10-Aug	1.1	0.9	0.9	1.6	Z	3.8	3.7	4.7	2.7	1.6	0.8	1.1	1.7	0.8	1.0	0.7	0.7	0.8	1.6	2.1	6.7	3.0	5.0	4.0	2.2	6.7																							
11-Aug	4.2	4.2	7.5	4.1	3.6	Z	3.2	15.1	13.7	12.4	10.5	5.7	1.9	3.4	2.9	3.0	4.0	1.4	1.9	6.0	3.1	9.8	9.3	12.3	6.2	15.1																							
12-Aug	Z	14.4	10.5	8.7	5.7	0.6	0.3	0.2	0.3	0.4	1.2	0.4	0.3	0.8	3.8	6.0	5.6	5.4	4.9	4.5	4.5	11.3	11.6	8.1	4.8	14.4																							
13-Aug	9.5	Z	10.5	7.1	5.3	8.8	6.6	5.2	2.7	2.3	1.7	1.8	0.6	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.3	7.2	10.7	3.7	10.7																							
14-Aug	1.0	1.9	Z	5.5	1.2	2.3	4.9	5.5	1.3	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	12.3	22.4	18.3	3.4	22.4																							
15-Aug	4.8	3.5	7.8	Z	12.8	12.6	7.3	7.3	8.9	10.4	8.3	5.5	6.7	4.6	3.7	3.3	3.3	3.8	14.3	16.5	12.5	8.4	2.8	1.9	7.4	16.5																							
16-Aug	1.9	4.5	2.8	5.0	Z	3.9	1.8	1.5	1.9	2.3	1.4	1.3	0.9	0.7	0.6	0.9	1.4	0.8	1.4	5.5	15.5	7.3	4.7	6.5	3.2	15.5																							
17-Aug	5.3	4.0	5.0	5.0	8.5	Z	11.5	11.1	9.4	7.9	6.3	2.8	0.3	0.1	0.4	1.1	3.7	1.9	3.2	2.1	2.1	5.1	3.1	3.0	4.5	11.5																							
18-Aug	Z	11.5	14.0	20.8	14.1	13.7	13.6	6.9	4.6	6.1	3.5	1.6	3.6	5.0	2.9	1.9	3.7	1.2	2.7	0.5	0.3	0.4	0.4	3.6	5.9	20.8																							
19-Aug	6.9	Z	0.3	0.1	0.0	0.0	0.1	0.5	0.4	0.5	0.4	0.3	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	5.9	15.5	18.5	14.2	2.8	18.5																							
20-Aug	11.6	5.7	Z	1.2	2.1	8.0	15.2	8.8	1.3	0.3	0.3	0.4	0.5	0.8	1.1	2.1	0.4	1.8	1.4	10.7	10.0	9.9	7.1	6.1	4.6	15.2																							
21-Aug	6.4	7.1	11.9	Z	11.4	13.9	12.8	8.4	7.4	8.4	5.3	4.0	2.5	3.6	4.3	4.6	1.8	3.7	2.7	9.2	21.7	17.6	19.8	21.0	9.1	21.7																							
22-Aug	17.3	13.7	11.5	11.8	Z	13.4	14.6	11.4	7.8	7.6	7.8	3.1	2.1	3.4	5.2	7.2	8.6	9.1	5.9	16.0	19.4	19.1	18.1	10.0	10.6	19.4																							
23-Aug	6.9	6.1	4.0	2.4	4.4	Z	3.4	6.3	13.8	C	C	C	C	C	9.0	9.5	8.5	5.9	15.4	20.3	20.3	19.4	17.5	16.5	10.5	20.3																							
24-Aug	Z	12.4	12.5	11.6	11.0	13.6	13.9	12.9	7.8	4.4	2.3	2.4	2.6	2.8	2.6	1.7	1.3	0.9	0.2	0.3	0.8	2.3	2.0	5.1	5.5	13.9																							
25-Aug	2.0	Z	4.5	6.3	7.3	6.5	7.6	7.8	6.2	5.7	5.4	3.3	3.1	3.4	3.2	1.8	1.2	1.1	4.1	5.0	6.2	5.6	4.8	4.0	4.6	7.8																							
26-Aug	4.3	5.8	Z	7.9	9.9	11.7	9.6	5.7	5.3	5.5	2.9	2.3	1.9	0.3	0.1	0.0	0.0	3.5	7.5	14.7	26.8	25.7	18.6	14.0	8.0	26.8																							
27-Aug	12.6	12.6	9.0	Z	4.7	4.6	0.9	0.6	0.4	2.6	12.3	12.5	7.2	4.8	3.4	2.4	2.0	2.0	4.6	6.2	11.9	15.5	16.9	11.0	7.0	16.9																							
28-Aug	4.0	4.5	7.8	9.6	Z	9.9	9.3	6.8	6.6	7.0	7.8	6.5	6.2	5.5	4.6	5.5	5.3	7.2	8.3	12.3	14.2	13.1	13.1	12.1	8.1	14.2																							
29-Aug	8.8	6.7	6.7	6.1	6.9	Z	6.1	7.1	7.0	7.2	7.6	8.8	6.2	5.0	5.7	2.3	2.7	5.1	8.1	9.5	8.2	12.5	19.1	18.7	7.9	19.1																							
30-Aug	Z	13.1	11.9	11.4	11.5	11.0	10.7	8.1	9.5	16.0	20.5	14.5	8.8	7.9	8.0	6.3	5.2	5.5	5.6	5.5	5.1	5.5	4.5	4.3	9.1	20.5																							
31-Aug	3.6	Z	4.7	2.6	2.3	4.2	15.3	16.4	6.8	4.5	7.0	6.2	4.6	5.0	5.8	14.3	14.6	13.0	19.3	12.5	9.1	8.6	5.3	3.2	8.2	19.3																							
																								6.2	6.7	6.7	6.1	6.5	7.0	7.3	6.5	5.7	5.5	5.5	4.2	3.3	2.9	3.2	4.0	3.7	3.5	4.4	6.4	8.8	10.1	10.2	8.9	Diurnal Average	
																								17.3	14.4	14.0	20.8	14.1	13.9	15.3	16.4	17.3	16.3	20.5	16.5	12.5	9.3	12.6	21.9	17.1	13.1	19.3	20.3	26.8	25.7	22.4	21.0	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
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Barge Landing - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	698	98.59	98.59
21 - 40	10	1.41	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
Barge Landing - August 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	15	17	12	11	26	58	81	73	63	72	53	49	27	39	49	695
21 - 40	2	1	0	0	0	0	1	1	1	0	1	0	0	0	1	2	10
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	52	16	17	12	11	26	59	82	74	63	73	53	49	27	40	51	705

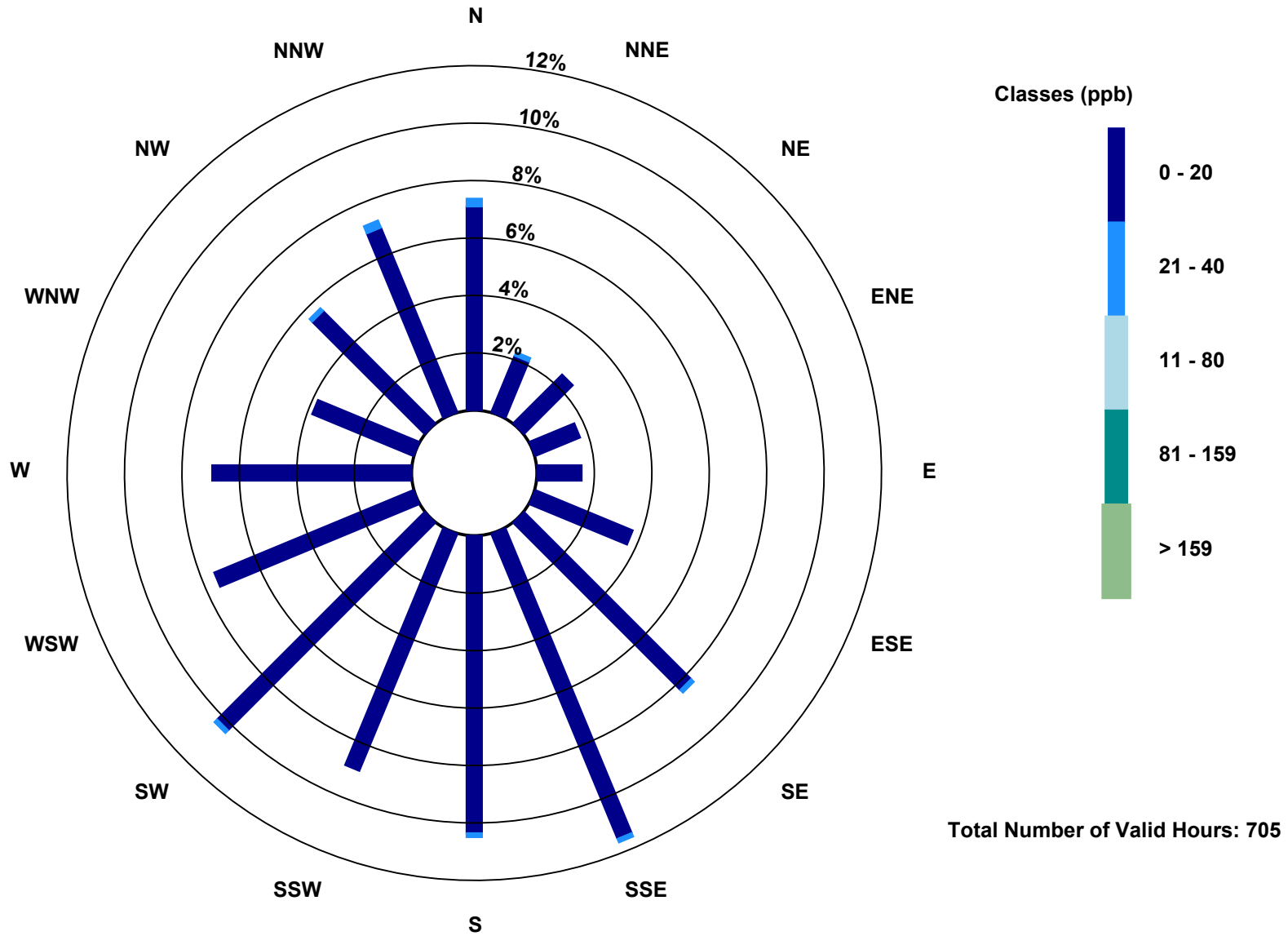
Total Number of Valid Hours: 705

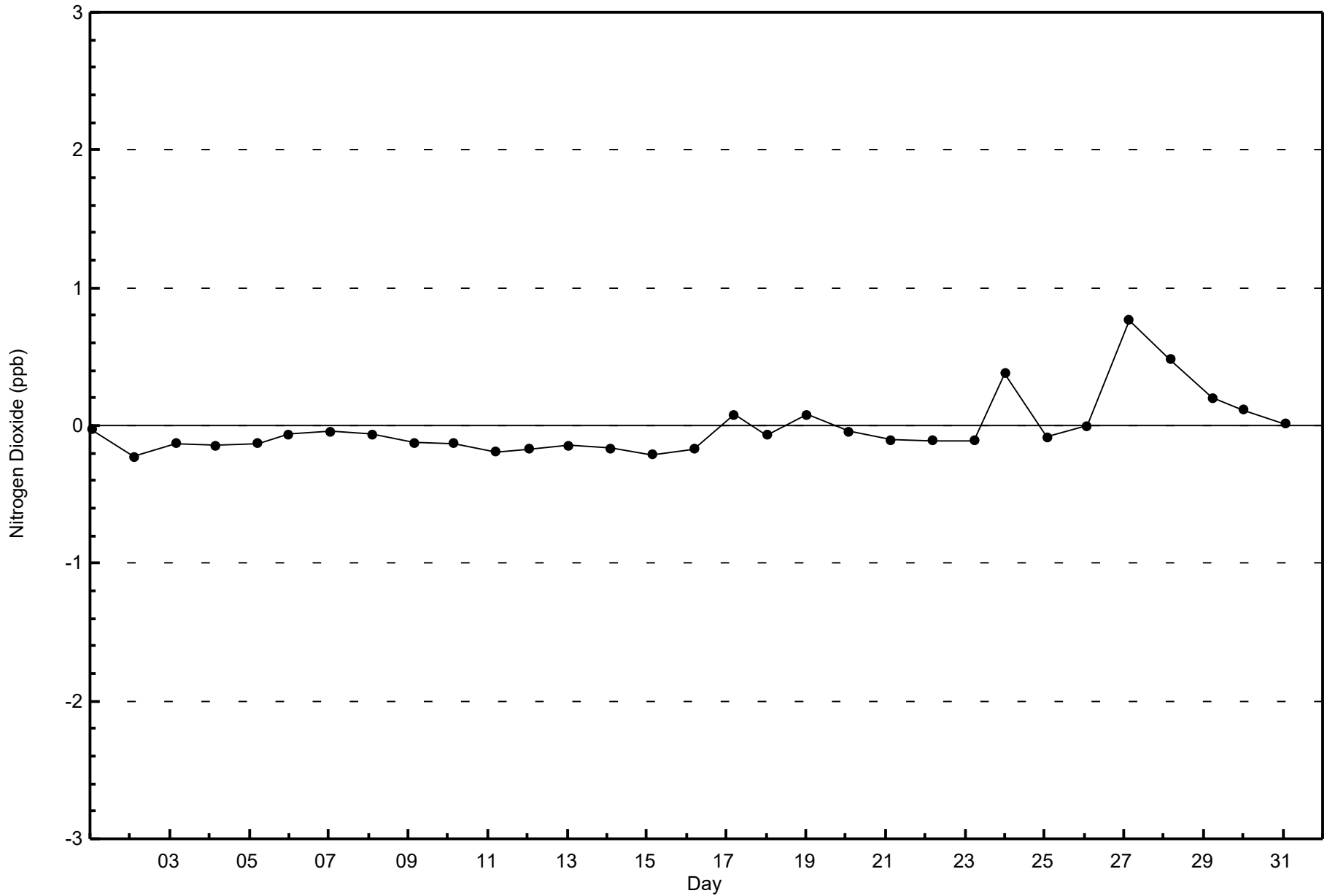
Total Number of Hours: 744

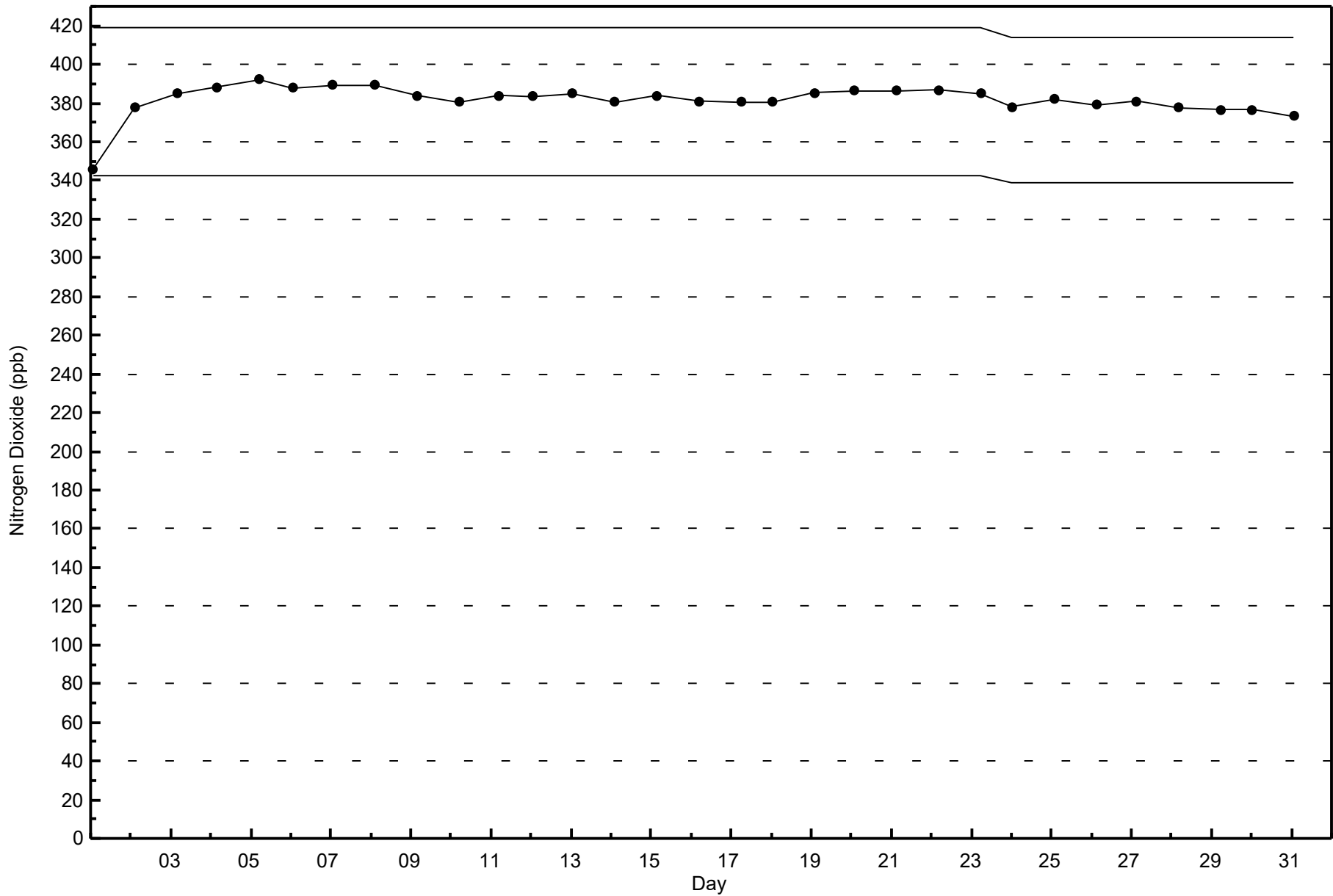


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Barge Landing









Wood Buffalo Environmental Association
Summary of Hour Averages

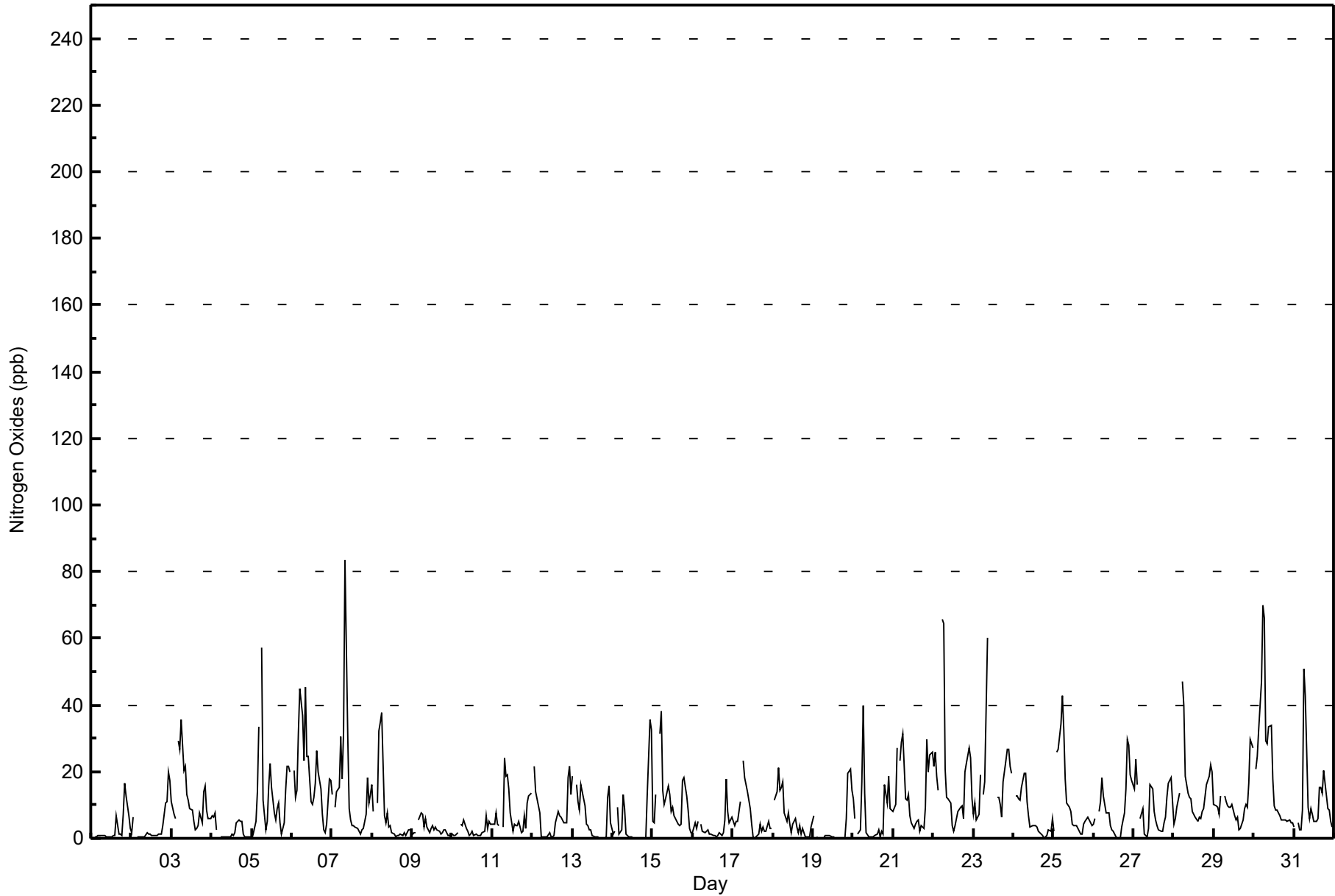
Nitrogen Oxides (NO_x) - ppb
Barge Landing - August 2023

Maximum Value: 83.3 ppb on Aug 7 09:00		Maximum Daily Average: 20.8 ppb on Aug 30		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Aug 26 16:00		Minimum Daily Average: 2.3 ppb on Aug 4		Hours of Data: 708																							
Maximum Diurnal Average: 21.6 ppb at hour 7		Minimum Diurnal Average: 3.4 ppb at hour 14		Hours of Missing Data: 36																							
Monthly Average: 9.21 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.5 Q ₁ = 1.8 Median = 5.4 Q ₃ = 12.7 P ₉₀ = 21.5 P ₉₉ = 50.6		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-Aug	1.3	Z	0.5	0.5	0.7	0.7	0.6	0.7	0.7	0.6	0.5	0.4	0.4	0.7	0.9	6.8	1.2	1.1	0.8	7.3	16.4	12.6	6.9	3.0	2.8	16.4	
2-Aug	1.9	6.6	Z	0.5	0.4	0.4	0.3	0.6	0.4	1.5	1.2	1.3	0.9	0.7	0.7	1.4	1.3	1.1	4.0	10.7	10.8	20.0	17.4	3.7	20.0		
3-Aug	10.9	7.3	6.0	Z	29.1	26.7	35.6	20.3	21.5	13.1	11.5	8.9	8.6	5.0	2.4	2.9	3.8	7.6	4.7	14.1	15.7	8.7	5.9	5.9	12.0	35.6	
4-Aug	6.6	6.4	7.5	2.7	Z	0.5	0.4	0.3	0.4	0.4	0.5	0.5	1.2	0.9	1.5	4.8	5.4	5.1	5.2	1.1	0.3	0.2	0.6	0.3	2.3	7.5	
5-Aug	0.2	1.2	5.1	14.1	33.6	Z	57.2	11.3	2.4	5.1	15.8	22.5	15.4	7.7	5.4	8.9	10.8	4.6	1.2	4.8	14.4	21.5	21.6	19.9	13.3	57.2	
6-Aug	Z	20.3	12.3	14.4	31.5	45.0	36.8	23.1	45.2	24.7	24.7	10.8	10.2	12.3	16.6	26.5	20.0	14.7	7.3	2.5	1.7	4.3	18.0	17.5	19.2	45.2	
7-Aug	13.1	Z	9.5	13.9	15.3	30.6	17.8	31.9	83.3	30.2	8.8	5.4	4.0	3.8	3.4	2.9	2.1	1.2	2.4	3.0	7.1	18.1	10.4	13.0	14.4	83.3	
8-Aug	16.1	8.2	Z	10.5	32.3	34.7	37.7	6.9	4.8	7.6	3.6	3.6	1.9	1.3	0.6	0.8	1.0	1.2	0.8	1.7	1.0	1.8	2.4	2.4	8.0	37.7	
9-Aug	1.2	1.8	1.6	Z	5.5	7.5	7.1	3.5	6.1	3.5	1.8	2.9	3.6	2.4	3.3	2.4	2.0	1.1	1.5	2.3	2.3	0.8	1.0	1.5	2.9	7.5	
10-Aug	1.2	0.9	0.9	1.7	Z	4.3	3.9	5.7	3.2	2.1	1.0	1.4	2.0	0.9	1.1	0.8	0.8	0.8	1.7	2.2	6.8	3.0	5.0	4.0	2.4	6.8	
11-Aug	4.2	4.2	7.5	4.1	3.6	Z	3.5	24.3	18.7	19.1	14.8	7.5	2.3	4.4	3.8	3.8	5.0	1.5	2.0	6.7	3.1	10.5	12.7	13.5	7.9	24.3	
12-Aug	Z	21.8	14.0	11.8	7.6	0.6	0.3	0.3	0.3	0.5	1.8	0.5	0.3	1.0	4.7	8.0	6.9	6.4	5.3	4.6	4.5	18.3	21.5	13.0	6.7	21.8	
13-Aug	18.5	Z	16.0	11.0	8.6	16.0	14.1	9.9	4.2	3.6	2.4	2.5	0.8	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.3	12.1	15.8	4.7	6.2	18.5
14-Aug	1.2	2.1	Z	9.5	1.3	2.5	13.0	8.9	1.4	0.9	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	12.6	35.6	32.4	5.4	35.6	
15-Aug	5.1	4.5	13.3	Z	31.5	38.1	14.4	10.3	11.7	15.8	13.0	8.2	9.5	6.9	5.2	4.1	3.8	4.2	17.2	18.4	12.6	8.4	2.8	1.9	11.4	38.1	
16-Aug	1.9	4.5	2.8	5.1	Z	4.1	2.0	1.8	2.1	2.6	1.4	1.3	0.9	0.7	0.6	1.0	1.6	0.9	1.5	5.7	18.0	8.2	4.8	6.5	3.5	18.0	
17-Aug	5.3	4.0	5.0	5.0	10.8	Z	23.1	18.3	16.2	13.8	9.1	4.3	0.3	0.1	0.4	1.2	4.3	2.1	3.3	2.1	2.1	5.1	3.1	3.0	6.2	23.1	
18-Aug	Z	11.5	14.0	21.2	14.2	15.0	16.9	7.8	5.3	7.5	4.2	1.9	4.2	5.9	3.3	1.9	3.8	1.2	2.9	0.5	0.3	0.4	0.4	3.6	6.4	21.2	
19-Aug	6.9	Z	0.3	0.1	0.0	0.0	0.1	0.7	0.7	0.8	0.7	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	6.0	19.4	20.8	14.4	3.2	20.8	
20-Aug	11.8	5.8	Z	1.2	2.6	16.9	39.7	13.4	1.7	0.3	0.3	0.4	0.6	0.9	1.2	2.5	0.4	2.0	1.4	16.2	10.4	18.4	8.9	8.7	7.2	39.7	
21-Aug	8.2	10.1	27.2	Z	23.2	28.6	31.5	11.9	11.2	13.0	6.8	4.7	2.8	4.2	5.1	5.5	2.0	4.0	2.8	9.3	29.5	19.8	25.0	25.8	13.6	31.5	
22-Aug	21.5	25.7	18.7	14.4	Z	65.8	64.5	20.9	12.2	11.9	10.8	3.8	2.3	3.9	5.9	8.0	9.3	9.6	6.0	19.8	22.3	27.1	24.2	12.1	18.3	65.8	
23-Aug	7.1	10.6	5.7	7.2	19.3	Z	13.1	16.9	60.0	C	C	C	C	C	12.3	12.4	10.1	6.4	17.0	23.3	26.5	26.7	21.4	19.4	17.5	60.0	
24-Aug	Z	12.7	12.8	11.9	11.3	15.3	19.6	19.3	11.2	6.6	3.2	3.7	3.9	4.0	3.5	2.1	1.6	1.0	0.2	0.3	0.8	2.3	2.0	6.1	6.8	19.6	
25-Aug	2.1	Z	25.7	26.8	34.3	42.7	32.8	17.7	10.7	9.5	8.0	4.2	3.6	3.7	3.6	2.0	1.3	1.1	4.2	5.1	6.2	5.6	4.8	4.0	11.3	42.7	
26-Aug	4.3	5.8	Z	8.0	11.1	18.4	12.7	7.5	7.6	7.8	3.7	2.7	2.0	0.3	0.1	0.0	0.0	3.6	7.6	14.8	29.5	27.9	19.1	17.5	9.2	29.5	
27-Aug	14.7	23.9	16.0	Z	6.1	8.9	1.2	0.7	0.5	3.1	16.0	14.8	8.0	5.3	3.7	2.5	2.1	2.1	4.7	6.2	12.2	16.3	18.1	11.2	8.6	23.9	
28-Aug	4.3	5.7	9.3	13.7	Z	47.2	39.8	18.7	13.5	12.2	12.0	8.2	7.4	6.3	5.0	6.4	6.0	8.1	9.0	16.0	17.3	18.5	22.2	20.1	14.2	47.2	
29-Aug	10.3	9.8	9.3	7.3	12.6	Z	12.5	10.9	9.6	9.4	9.3	10.4	6.9	5.4	6.3	2.4	2.8	5.3	8.7	10.4	9.5	16.6	29.5	27.0	10.5	29.5	
30-Aug	Z	20.8	24.8	32.6	47.2	70.1	66.0	29.4	28.3	33.5	33.9	17.7	9.7	8.5	8.6	6.7	5.4	5.7	5.7	5.5	5.1	5.5	4.5	4.5	20.8	70.1	
31-Aug	3.6	Z	4.9	2.6	2.3	8.4	50.8	42.9	9.3	5.7	9.0	7.2	4.9	5.2	6.0	15.0	15.4	13.6	20.2	12.6	9.1	8.6	5.3	3.2	11.5	50.8	
		7.1	9.4	10.4	9.7	15.2	21.1	21.6	12.8	13.0	8.9	7.7	5.4	4.0	3.4	3.7	4.6	4.2	3.8	4.7	7.1	9.7	11.9	12.7	10.9	Diurnal Average	
		21.5	25.7	27.2	32.6	47.2	70.1	66.0	42.9	83.3	33.5	33.9	22.5	15.4	12.3	16.6	26.5	20.0	14.7	20.2	23.3	29.5	27.9	35.6	32.4	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Barge Landing - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	628	88.70	88.70
21 - 40	66	9.32	98.02
41 - 80	13	1.84	99.86
81 - 159	1	0.14	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
Barge Landing - August 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	13	16	10	9	20	51	62	67	53	70	53	46	27	34	49	625
21 - 40	7	3	1	2	2	6	4	16	5	8	3	0	2	0	5	2	66
11 - 80	0	0	0	0	0	0	4	4	2	2	0	0	1	0	0	0	13
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	52	16	17	12	11	26	59	82	74	63	73	53	49	27	40	51	705

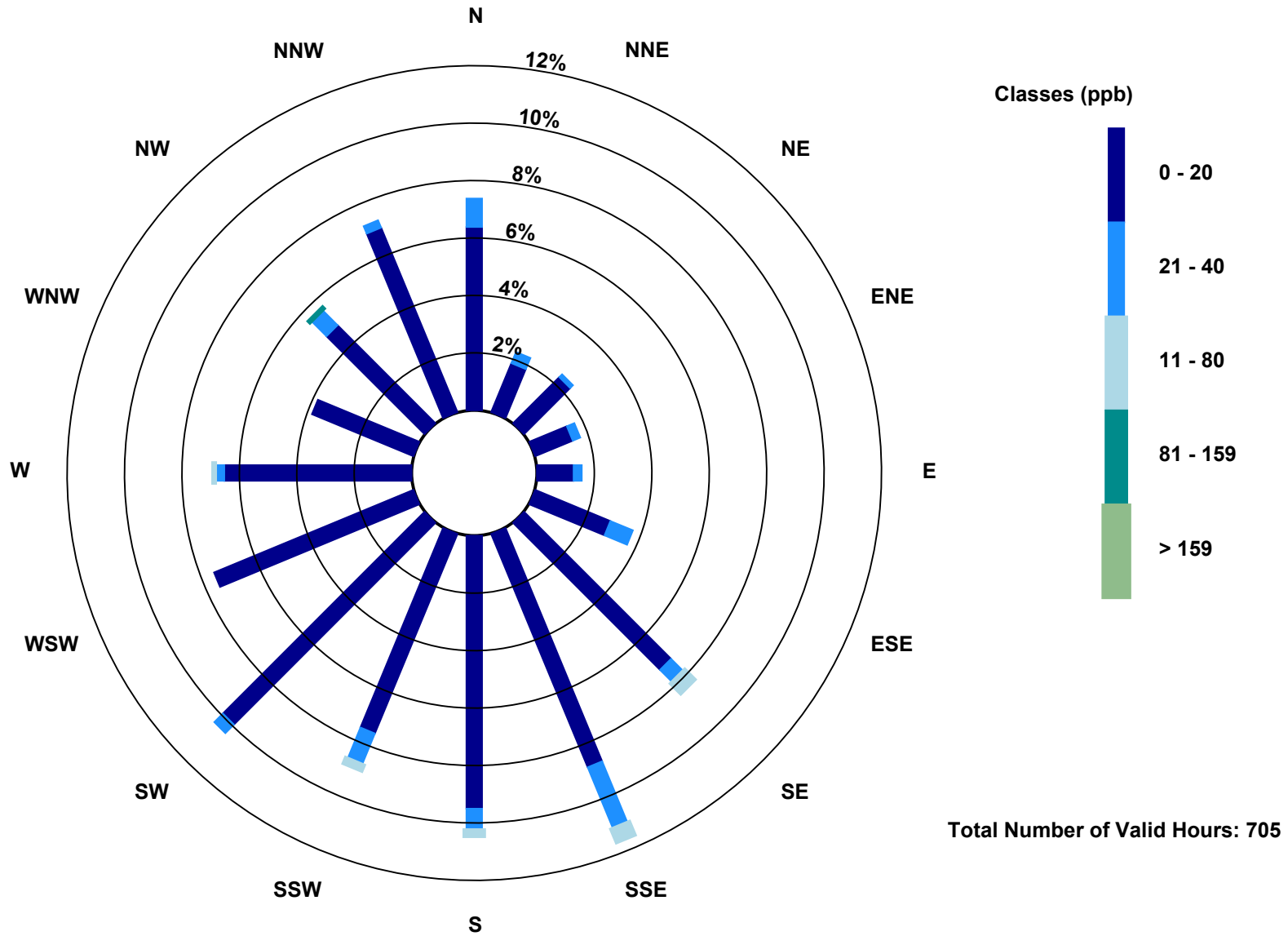
Total Number of Valid Hours: 705

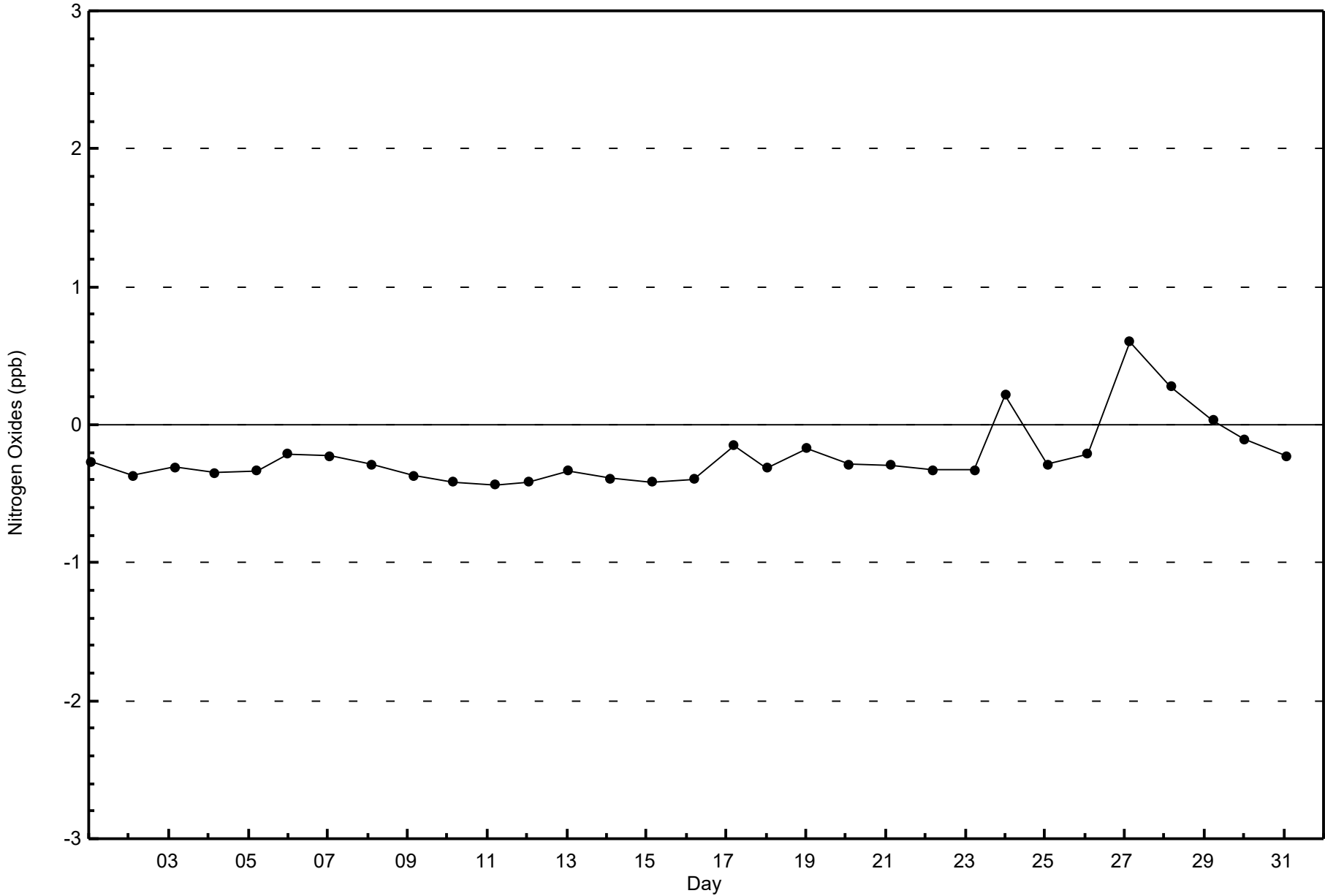
Total Number of Hours: 744

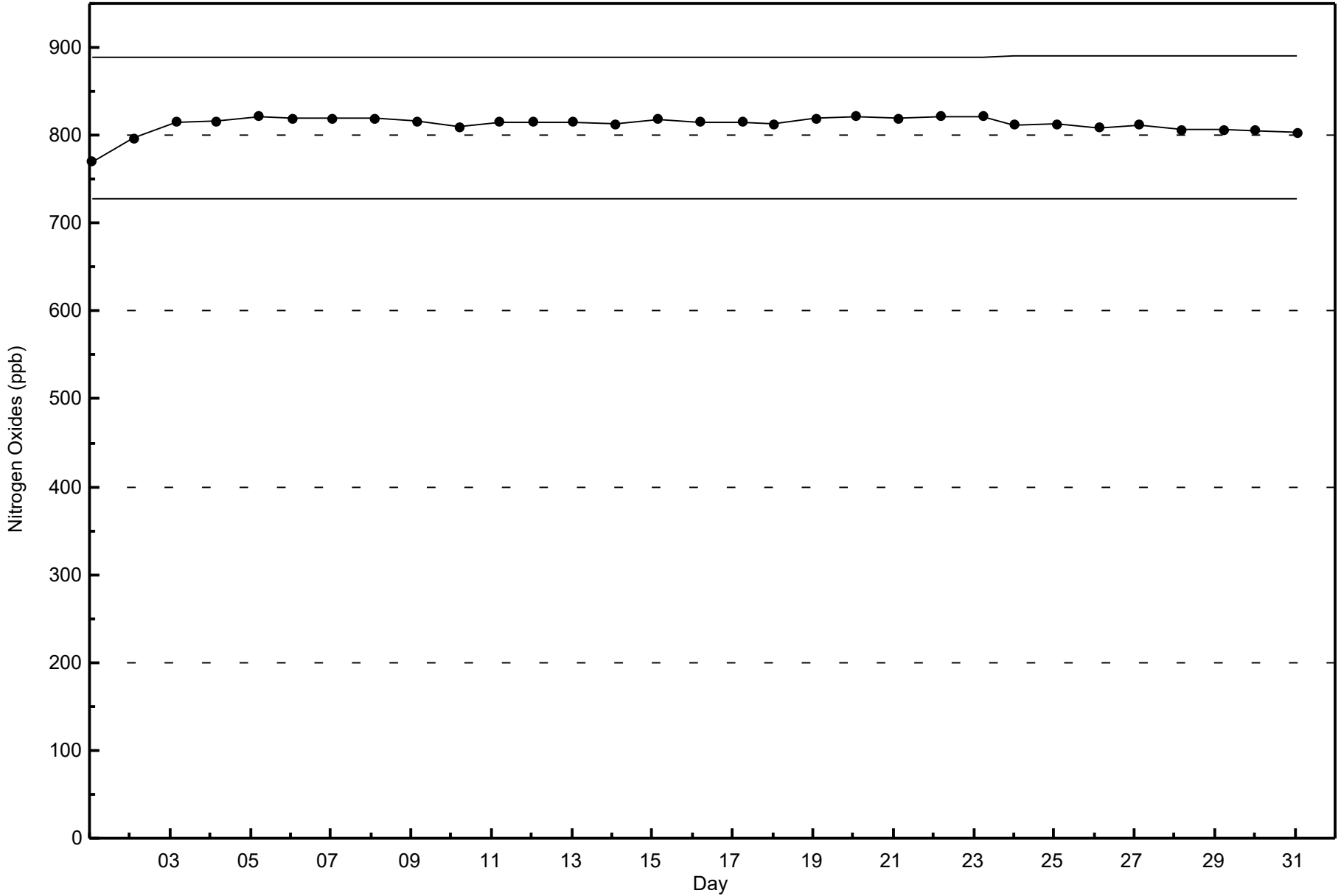


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Barge Landing





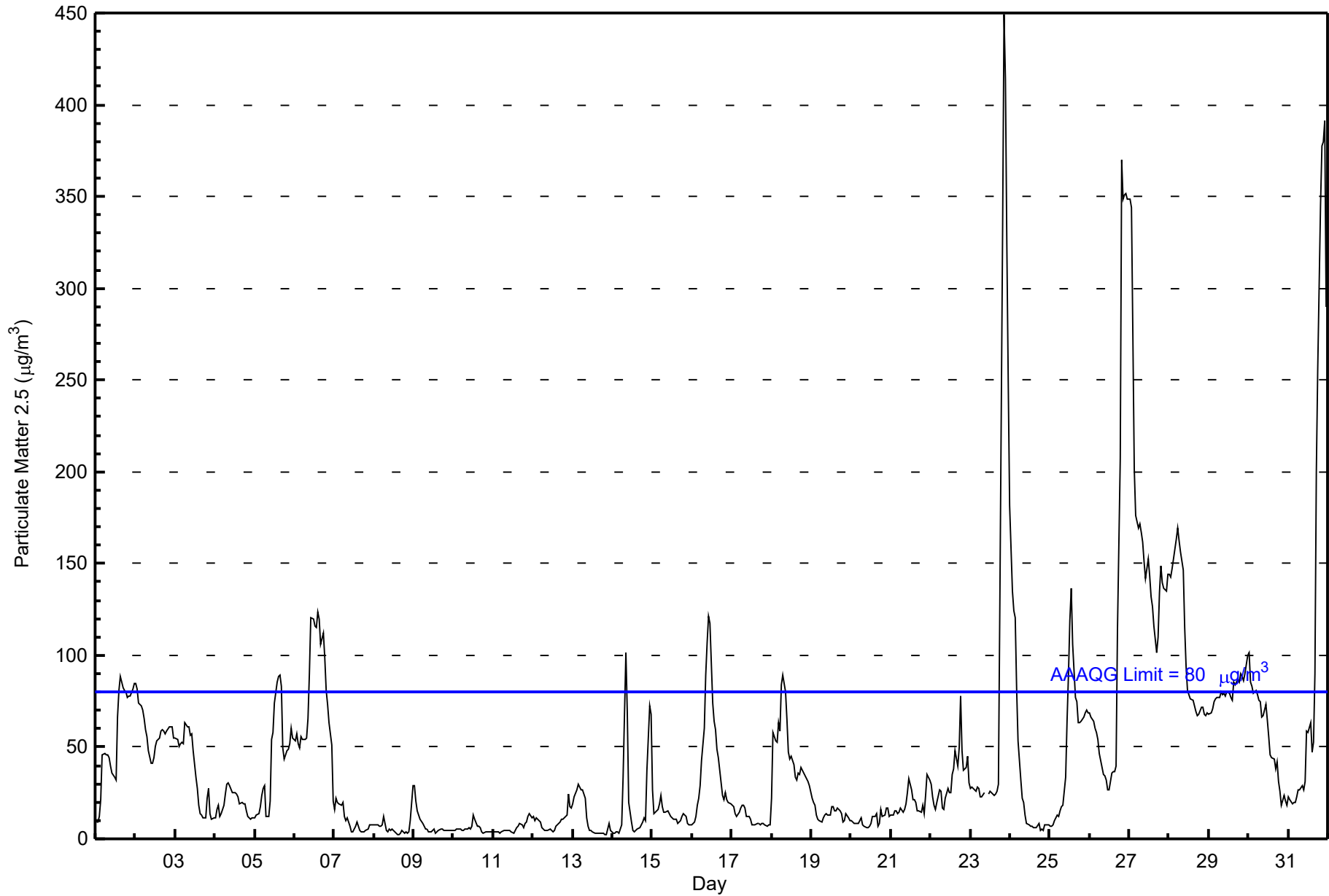




Summary of Hour Averages

Barge Landing - August 2023

Number of Exceedences (AAAQO):		1-hr: 112		24-hr: 17		Hours in Service:		744																			
Maximum Value: 449.3 µg/m ³ on Aug 23 21:00		Maximum Daily Average: 167.8 µg/m ³ on Aug 27				Hours of Data:		742																			
Minimum Value: 2.2 µg/m ³ on Aug 8 16:00		Minimum Daily Average: 5.5 µg/m ³ on Aug 10				Hours of Missing Data:		2																			
Maximum Diurnal Average: 67.0 µg/m ³ at hour 22		Minimum Diurnal Average: 35.9 µg/m ³ at hour 17				Hours of Calibration:		2																			
Monthly Average: 45.32 µg/m ³		Percentiles: P ₁ = 2.9 P ₁₀ = 4.8 Q ₁ = 9.2 Median = 22.2 Q ₃ = 60.9 P ₉₀ = 100.1 P ₉₉ = 349.9				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-Aug	9.4	9.2	12.3	21.3	46.1	46.8	45.4	45.7	44.2	39.9	35.6	33.4	32.3	66.3	81.0	88.1	82.0	80.5	80.4	77.0	77.5	77.9	81.2	84.6	54.1	88.1	
2-Aug	84.9	81.8	73.8	72.2	69.9	65.5	59.2	55.5	48.3	40.9	41.3	43.9	50.1	53.3	55.2	58.4	59.3	58.6	57.1	58.5	60.9	61.2	60.9	54.9	59.4	84.9	
3-Aug	55.1	54.3	50.2	51.6	52.5	51.8	63.5	61.3	60.9	56.5	57.4	47.8	33.7	27.7	18.0	13.8	12.9	11.6	11.3	22.1	27.7	13.9	10.9	11.7	36.6	63.5	
4-Aug	11.4	15.7	18.4	12.3	13.8	18.3	24.3	30.0	30.5	28.7	25.5	25.2	25.0	24.3	23.2	19.1	19.5	18.8	18.7	15.1	12.1	11.0	11.1	11.5	19.3	30.5	
5-Aug	11.5	12.6	13.6	17.2	23.9	27.6	29.3	12.2	12.2	20.5	54.3	57.9	73.7	25.0	85.6	88.4	89.6	82.9	49.3	43.1	48.3	48.7	51.6	60.0	54.9	44.5	89.6
6-Aug	53.5	57.5	52.2	49.3	55.7	54.4	54.3	55.0	65.5	90.1	120.4	119.4	116.1	115.1	123.9	119.5	106.3	111.8	98.3	80.7	73.2	63.7	51.4	20.2	79.5	123.9	
7-Aug	15.9	22.0	19.8	19.1	18.6	19.7	12.1	10.3	11.2	7.0	3.9	3.9	5.0	7.2	9.2	4.9	3.8	3.5	4.0	4.6	5.6	7.6	7.6	7.8	9.8	22.0	
8-Aug	7.4	7.4	7.5	6.5	7.1	7.8	11.9	4.2	3.9	5.2	4.3	5.1	4.5	3.0	2.3	2.2	3.2	4.4	2.9	3.8	3.3	3.6	10.1	28.8	6.3	28.8	
9-Aug	29.0	20.8	15.4	12.7	10.8	8.8	7.2	5.3	5.1	4.1	3.9	4.4	5.6	3.4	3.5	4.3	5.1	5.0	4.8	4.8	4.8	4.8	4.7	4.8	7.6	29.0	
10-Aug	4.7	4.9	5.4	5.5	5.1	4.8	4.8	5.1	5.5	5.8	5.6	6.6	12.7	10.4	7.0	6.8	6.1	3.6	3.4	3.7	4.2	3.9	3.9	3.7	5.5	12.7	
11-Aug	3.8	4.0	4.1	3.6	3.4	3.6	4.3	4.4	4.2	4.4	4.3	3.8	3.2	4.3	5.9	6.8	8.5	8.0	5.9	8.4	9.4	12.3	13.8	11.7	6.1	13.8	
12-Aug	12.1	10.0	11.6	10.4	9.5	6.4	5.1	4.5	4.2	4.4	5.0	4.2	4.0	4.9	7.0	8.1	8.9	10.6	10.9	11.1	12.7	24.8	17.3	16.7	9.4	24.8	
13-Aug	18.8	23.1	26.7	29.6	27.9	26.9	26.5	22.1	11.4	6.5	4.7	4.6	3.6	3.2	3.1	2.7	2.9	2.7	2.9	2.4	2.5	5.5	8.6	4.9	11.4	29.6	
14-Aug	2.9	3.1	3.8	3.7	3.4	7.8	33.9	67.9	101.8	68.6	20.1	8.8	4.5	4.1	4.5	5.6	6.1	7.8	9.3	11.4	9.6	37.1	72.2	68.2	23.6	101.8	
15-Aug	26.9	13.7	14.3	15.7	19.4	23.6	17.4	14.4	14.7	15.1	13.5	11.9	11.2	10.3	11.0	8.3	8.9	9.7	12.6	13.9	12.2	8.5	7.7	8.0	13.4	26.9	
16-Aug	7.8	9.2	12.0	18.0	22.1	28.6	42.4	60.4	89.1	106.9	121.3	117.3	74.3	64.3	59.4	49.0	44.2	30.2	23.7	21.2	25.2	21.7	19.8	19.3	45.3	121.3	
17-Aug	18.3	17.5	13.7	11.9	14.6	16.8	18.3	18.2	16.7	12.5	12.4	10.5	7.7	7.9	7.5	8.3	8.2	7.9	8.0	8.4	7.5	7.0	7.5	7.7	11.5	18.3	
18-Aug	21.9	58.3	53.5	52.5	63.4	58.9	84.1	89.2	79.9	65.0	46.9	43.7	45.0	40.6	33.5	31.8	35.8	35.4	38.6	36.1	34.6	32.9	31.1	29.0	47.6	89.2	
19-Aug	22.4	19.9	18.5	13.0	10.7	10.0	9.2	11.6	13.1	13.9	13.3	13.3	17.5	17.3	15.0	15.2	16.5	15.5	13.6	9.3	10.3	13.8	11.5	9.9	13.9	22.4	
20-Aug	9.7	9.0	8.7	8.5	8.2	10.0	11.5	7.8	6.8	6.3	6.2	6.7	8.6	12.3	12.5	13.5	7.2	8.5	15.7	12.6	13.2	16.8	16.5	12.3	10.4	16.8	
21-Aug	13.2	13.1	15.1	15.4	13.5	14.1	17.0	14.2	15.9	18.9	24.9	32.8	26.6	21.3	21.4	20.1	15.6	15.6	14.4	18.1	13.6	23.9	34.8	32.4	19.4	34.8	
22-Aug	29.9	23.1	17.9	16.1	19.7	26.8	25.9	16.7	16.3	22.2	27.7	25.0	24.9	35.1	38.2	48.2	39.7	49.9	77.8	48.4	37.3	38.8	45.3	30.8	32.6	77.8	
23-Aug	27.1	28.5	27.8	26.2	28.4	27.1	23.1	22.5	25.4	C	C	24.8	26.3	25.4	23.9	24.7	25.7	29.6	126.6	332.6	449.3	414.1	324.0	249.2	105.1	449.3	
24-Aug	181.9	135.2	124.0	120.9	81.5	53.7	31.8	22.3	20.0	13.0	8.1	7.3	6.6	7.0	6.4	6.5	5.8	8.2	4.6	5.3	4.4	7.6	7.9	7.7	36.6	181.9	
25-Aug	6.8	6.7	7.8	9.6	12.8	12.2	15.5	17.3	18.1	33.6	64.3	89.5	118.6	136.7	105.7	77.0	74.9	63.2	63.4	64.1	66.3	68.9	70.3	68.8	53.0	136.7	
26-Aug	68.5	66.5	63.7	60.6	57.7	54.1	46.8	39.1	35.1	34.0	32.0	26.7	26.7	35.5	36.4	36.4	39.7	113.3	207.7	369.6	348.4	350.9	351.5	348.2	118.7	369.6	
27-Aug	348.5	344.1	273.9	201.6	176.4	169.3	171.9	167.1	162.0	151.3	142.1	152.2	143.5	131.7	126.5	116.1	101.1	110.0	134.0	148.9	139.6	136.2	134.7	144.2	167.8	348.5	
28-Aug	144.2	142.8	147.6	158.2	163.1	169.3	162.7	156.4	146.3	115.5	93.7	80.7	78.5	76.1	75.4	72.8	69.5	67.0	67.5	71.4	71.4	67.5	66.8	68.3	105.5	169.3	
29-Aug	68.2	69.0	70.9	74.8	76.5	77.4	77.1	80.4	78.7	79.6	77.9	80.1	79.4	76.7	75.6	85.1	83.7	86.6	85.6	89.6	88.5	86.5	89.9	100.3	80.8	100.3	
30-Aug	101.1	85.1	83.0	79.0	80.8	78.3	75.3	74.5	66.2	67.0	73.0	65.1	55.5	45.6	44.3	43.7	38.0	42.3	31.5	26.2	18.1	23.3	20.9	18.4	55.7	101.1	
31-Aug	22.7	21.1	19.4	20.0	19.7	22.6	26.6	26.7	28.6	26.9	31.2	59.0	58.0	63.0	47.0	52.8	90.0	200.0	256.0	345.4	377.3	379.6	391.2	289.5	119.8	391.2	
46.4 44.8 41.5 39.3 39.2 38.8 39.9 39.4 40.1 38.8 39.2 39.2 38.2 39.3 37.8 36.8 35.9 40.9 49.5 63.6 66.7 67.0 66.0 59.0																								Diurnal Average			
348.5 344.1 273.9 201.6 176.4 169.3 171.9 167.1 162.0 151.3 142.1 152.2 143.5 136.7 126.5 119.5 106.3 200.0 256.0 369.6 449.3 414.1 391.2 348.2																								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}) - $\mu\text{g}/\text{m}^3$
Barge Landing - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	100	13.48	13.48
6 - 15	196	26.42	39.89
16 - 25	104	14.02	53.91
26 - 80	233	31.40	85.31
> 81.0	109	14.69	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 - August 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	4	6	10	2	3	11	20	2	1	3	11	8	6	3	2	8	100
6 - 15	10	4	0	4	7	9	13	17	17	20	24	19	16	5	17	14	196
16 - 25	3	0	1	1	0	4	8	12	24	14	9	5	6	7	5	4	103
26 - 80	19	4	3	5	2	3	15	47	19	17	26	17	14	9	9	22	231
> 81.0	18	2	3	0	0	0	5	11	16	12	4	7	11	4	8	8	109
Totals	54	16	17	12	12	27	61	89	77	66	74	56	53	28	41	56	739

Total Number of Valid Hours: 739

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

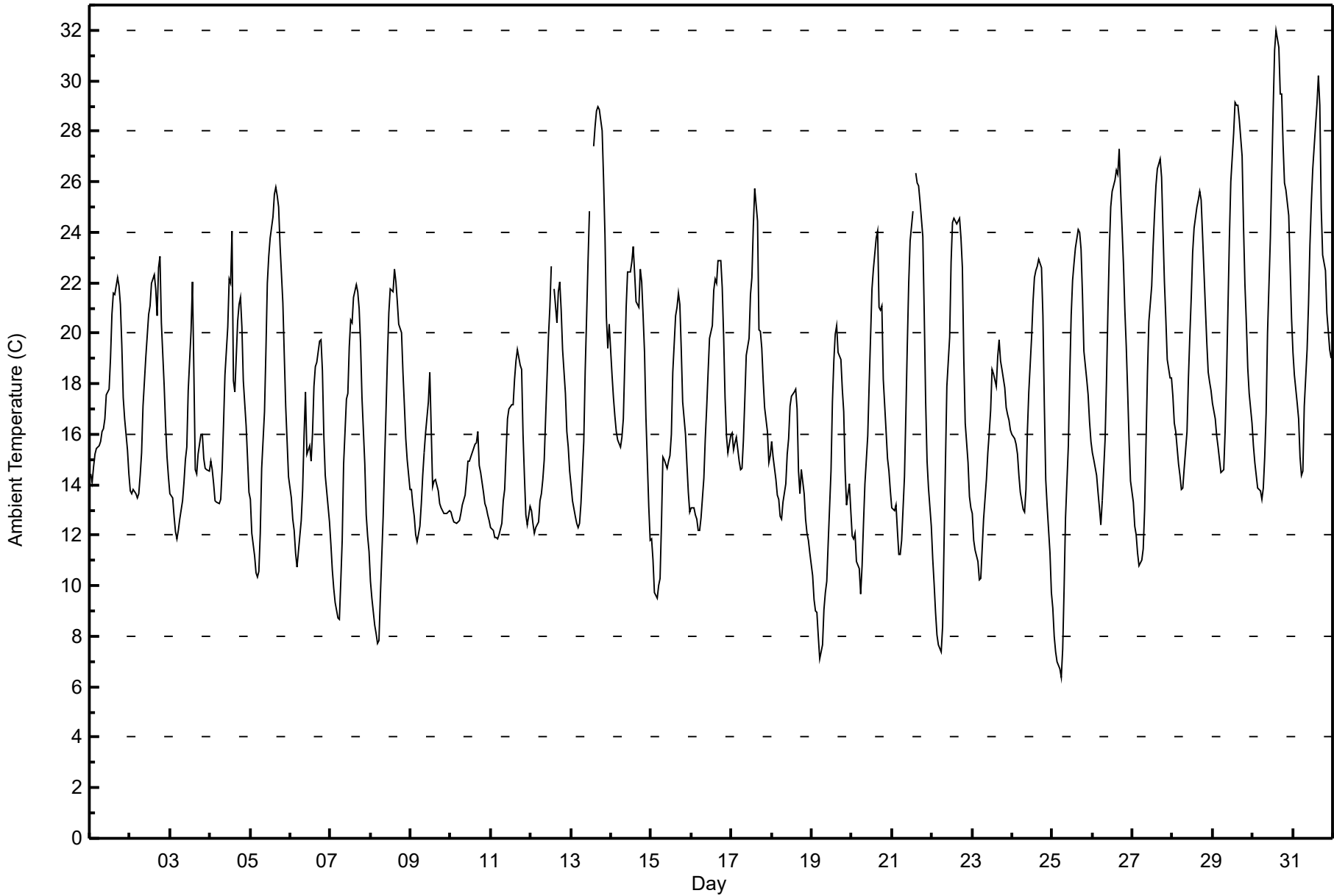
Ambient Temperature (AT) - C
Barge Landing - August 2023

Maximum Value: 32.0 C on Aug 30 15:00		Maximum Daily Average: 22.1 C on Aug 30		Hours in Service: 744																							
Minimum Value: 6.3 C on Aug 25 06:00		Minimum Daily Average: 13.3 C on Aug 19		Hours of Data: 741																							
Maximum Diurnal Average: 22.6 C at hour 15		Minimum Diurnal Average: 11.8 C at hour 6		Hours of Missing Data: 3																							
Monthly Average: 17.09 C		Percentiles: P ₁ = 7.7 P ₁₀ = 11.8 Q ₁ = 13.4 Median = 16.1 Q ₃ = 20.7 P ₉₀ = 23.9 P ₉₉ = 29.1		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-Aug	14.4	14.1	14.7	15.2	15.4	15.5	15.7	16.1	16.2	16.6	17.6	17.8	19.0	20.8	21.6	21.5	22.2	21.9	21.2	19.5	17.4	16.6	15.4	14.4	17.5	22.2	
2-Aug	13.8	13.6	13.8	13.6	13.5	13.6	14.3	15.3	17.1	19.1	19.9	20.8	21.1	22.0	22.3	21.8	20.7	22.6	23.1	20.4	17.9	16.3	15.1	14.3	17.8	23.1	
3-Aug	13.6	13.5	12.8	12.1	11.9	12.2	12.6	13.4	14.1	15.0	15.5	17.8	20.1	22.0	18.5	14.6	14.4	15.2	16.0	16.0	15.1	14.7	14.6	14.6	15.0	22.0	
4-Aug	14.9	14.6	14.0	13.3	13.3	13.3	13.4	14.6	16.4	18.3	20.3	22.1	22.0	24.0	18.1	17.7	20.5	21.1	21.4	20.2	18.1	16.3	15.0	13.7	17.4	24.0	
5-Aug	13.4	12.1	11.2	10.5	10.3	10.6	12.1	14.7	16.9	19.3	22.0	23.0	23.8	24.6	25.5	25.8	25.4	25.0	23.5	21.2	19.1	17.1	15.7	14.3	18.2	25.8	
6-Aug	13.5	12.6	12.2	11.3	10.7	11.4	12.6	13.8	15.9	17.7	15.2	15.5	14.9	16.0	17.9	18.7	18.9	19.7	19.7	18.5	15.9	14.4	13.2	12.6	15.1	19.7	
7-Aug	11.6	10.7	9.9	9.4	8.7	8.7	10.2	11.8	14.8	17.4	17.6	19.5	20.5	20.4	21.4	21.9	21.7	21.0	19.6	17.5	14.8	12.8	12.0	11.3	15.2	21.9	
8-Aug	10.2	9.5	8.5	8.1	7.7	7.9	9.6	12.8	14.9	16.9	19.0	20.8	21.8	21.7	22.5	22.0	21.3	20.4	20.0	18.5	17.2	15.9	15.0	13.8	15.7	22.5	
9-Aug	13.8	13.2	12.7	12.0	11.7	12.3	13.3	14.4	15.3	16.1	17.3	18.5	16.2	13.9	14.2	14.2	13.8	13.3	13.1	13.0	12.9	12.9	12.9	13.0	13.9	18.5	
10-Aug	12.9	12.7	12.5	12.5	12.5	12.6	12.8	13.2	13.6	14.2	15.0	15.0	15.1	15.3	15.6	15.7	16.1	14.8	14.5	13.7	13.2	13.1	12.8	12.6	13.8	16.1	
11-Aug	12.3	12.2	11.9	11.9	11.9	12.0	12.4	13.4	13.8	15.3	16.6	17.0	17.2	17.2	18.2	18.9	19.4	18.7	18.6	16.0	14.3	12.8	12.4	13.1	14.9	19.4	
12-Aug	13.0	12.4	12.1	12.3	12.5	13.4	13.7	14.2	15.0	16.7	19.9	21.0	22.6	DF	21.7	20.4	21.7	22.1	20.9	19.3	17.6	16.1	15.5	14.5	16.9	22.6	
13-Aug	14.0	13.3	12.8	12.5	12.3	12.5	13.2	15.7	18.5	20.7	22.8	24.8	DF	27.4	28.2	28.8	29.0	28.9	28.0	26.1	23.9	20.6	19.4	20.3	20.6	29.0	
14-Aug	18.3	17.4	16.7	16.1	15.8	15.5	15.9	16.6	18.8	21.0	22.4	22.4	22.8	23.4	22.4	21.3	21.1	22.5	22.0	20.7	19.2	16.7	13.2	11.8	18.9	23.4	
15-Aug	11.9	11.0	9.7	9.5	10.0	10.3	12.5	15.1	15.0	14.7	14.9	15.2	16.0	18.5	20.7	21.0	21.6	21.2	19.4	17.3	16.0	14.8	13.7	12.9	15.1	21.6	
16-Aug	13.1	13.1	12.8	12.6	12.2	12.2	12.7	14.3	15.8	17.0	18.5	19.8	20.3	21.7	22.2	22.0	22.9	22.9	21.8	19.9	17.5	15.9	15.3	15.9	17.2	22.9	
17-Aug	16.1	15.4	15.7	15.9	14.9	14.6	14.7	15.8	17.4	19.1	19.8	21.5	22.2	24.2	25.7	24.4	20.1	20.1	19.4	18.1	17.1	16.1	14.9	15.1	18.3	25.7	
18-Aug	15.7	15.1	14.2	13.6	13.5	12.7	12.7	13.3	14.0	15.2	15.8	17.1	17.5	17.7	17.8	17.0	14.6	13.6	14.6	13.6	12.6	12.1	11.8	11.3	14.5	17.8	
19-Aug	10.4	9.4	9.0	9.0	8.0	7.1	7.7	9.0	9.7	10.2	11.7	14.5	17.3	18.9	20.0	20.3	19.2	19.0	17.8	16.9	14.5	13.2	14.1	13.0	13.3	20.3	
20-Aug	12.0	11.8	12.1	11.0	10.7	9.7	10.8	12.5	14.0	15.9	18.0	19.9	21.8	22.5	23.7	24.1	21.0	20.9	21.1	18.2	16.1	15.0	14.5	13.8	16.3	24.1	
21-Aug	13.1	13.0	13.2	12.2	11.3	11.3	11.8	14.3	16.8	19.5	22.0	23.6	24.8	DF	26.4	26.0	25.8	25.2	23.8	20.7	17.3	14.9	13.9	12.4	18.0	26.4	
22-Aug	11.1	10.0	9.0	8.1	7.7	7.4	8.4	11.6	14.8	17.9	19.9	22.8	24.4	24.6	24.4	24.3	24.6	23.7	22.6	18.9	16.4	14.9	13.5	13.1	16.4	24.6	
23-Aug	12.9	11.8	11.4	11.0	10.2	10.3	11.4	12.7	14.2	15.3	16.0	17.0	18.6	18.4	17.9	19.1	19.8	18.9	18.6	17.8	17.1	16.8	16.6	16.2	15.4	19.8	
24-Aug	16.0	15.8	15.6	15.2	14.4	13.7	13.0	12.9	13.8	16.1	17.7	19.9	21.3	22.2	22.5	22.7	22.9	22.6	20.7	17.2	14.2	13.2	11.3	9.7	16.9	22.9	
25-Aug	9.1	8.0	7.4	7.0	6.7	6.3	7.5	9.9	12.7	15.6	18.3	20.7	22.1	22.8	23.4	24.1	24.0	23.3	21.5	19.3	18.2	17.6	16.5	15.7	15.7	24.1	
26-Aug	15.3	15.0	14.4	13.7	13.1	12.4	13.4	15.8	18.1	20.9	23.3	25.0	25.6	26.0	26.5	26.3	27.3	25.7	22.8	20.9	19.5	17.7	15.7	14.2	19.5	27.3	
27-Aug	13.3	12.4	12.0	11.3	10.8	11.0	11.5	13.0	15.7	18.4	20.5	21.9	23.4	24.7	25.9	26.5	26.9	26.2	24.1	22.1	20.6	18.9	18.2	18.3	18.6	26.9	
28-Aug	17.5	16.4	16.1	14.8	14.4	13.8	13.9	14.7	16.1	18.2	19.9	21.4	23.2	24.2	25.0	25.3	25.6	25.3	23.9	21.1	19.6	18.4	18.1	17.7	19.4	25.6	
29-Aug	17.2	16.6	16.0	15.5	15.0	14.5	14.6	16.2	18.4	21.0	23.8	26.0	27.9	29.1	29.0	29.0	28.5	27.0	24.2	21.9	20.4	18.6	17.6	16.4	21.0	29.1	
30-Aug	15.5	14.9	14.4	13.9	13.8	13.4	13.9	15.1	16.8	20.0	23.8	26.4	28.9	31.2	32.0	31.3	29.5	29.5	27.5	26.0	25.7	24.7	22.6	20.6	22.1	32.0	
31-Aug	19.2	18.3	17.2	16.6	15.1	14.4	14.5	17.1	19.4	21.2	23.5	25.2	26.5	28.2	29.1	30.2	29.0	24.9	23.1	22.5	20.8	20.1	19.3	19.0	21.4	30.2	
		13.8	13.2	12.8	12.3	11.9	11.8	12.5	14.0	15.6	17.4	19.0	20.4	21.3	22.2	22.6	22.5	22.2	21.8	20.9	19.1	17.4	16.1	15.2	14.5	Diurnal Average	
		19.2	18.3	17.2	16.6	15.8	15.5	15.9	17.1	19.4	21.2	23.8	26.4	28.9	31.2	32.0	31.3	29.5	29.5	28.0	26.1	25.7	24.7	22.6	20.6	Diurnal Maximum	
DF - DAS Failure																											



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Barge Landing - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	35	4.72	4.72
10 - 20	497	67.07	71.79
> 20	209	28.21	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

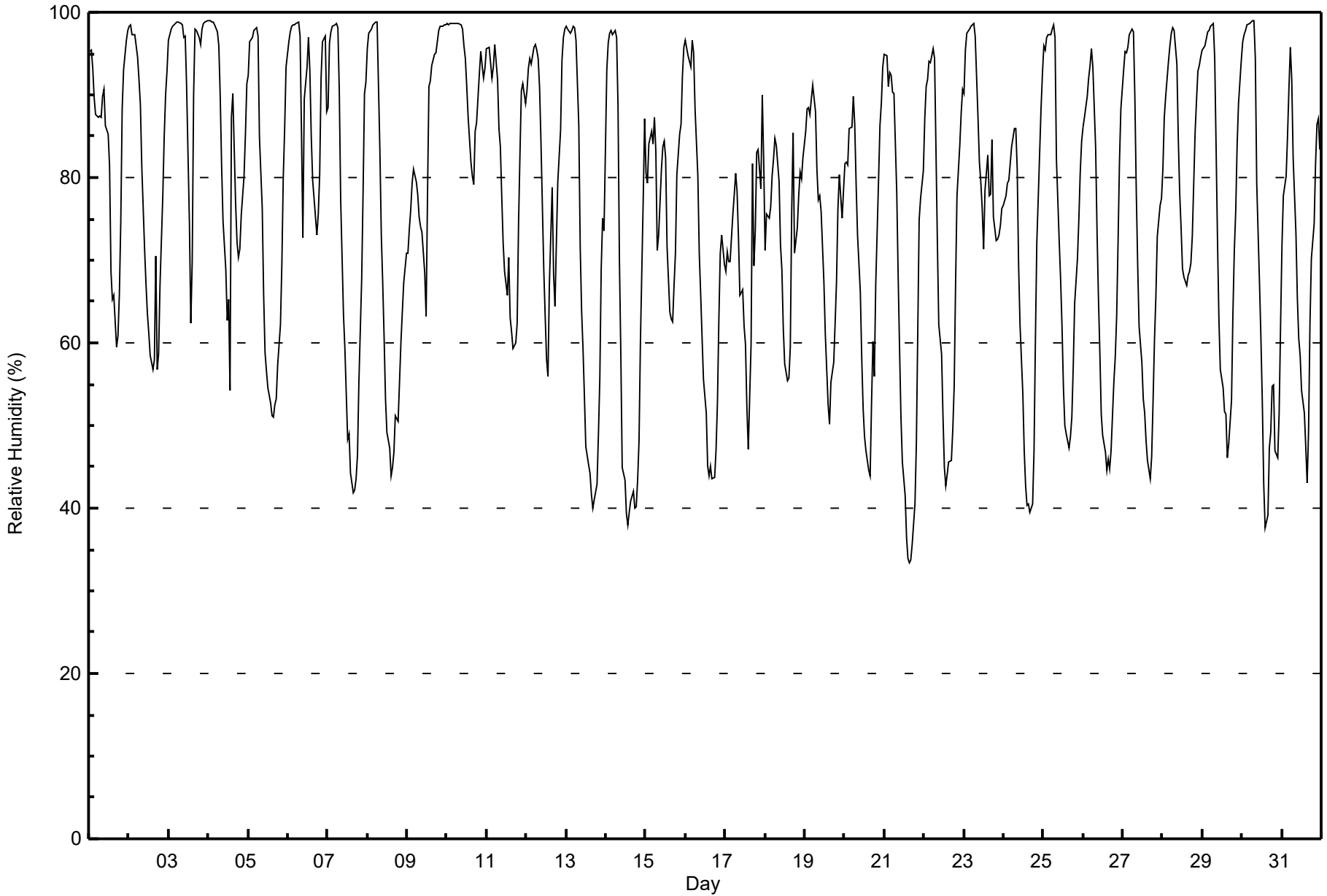
Barge Landing - August 2023

Maximum Value: 99.1 % on Aug 4 01:00 Maximum Daily Average: 93.7 % on Aug 3																						Hours in Service:	744																								
Minimum Value: 33.3 % on Aug 21 16:00 Minimum Daily Average: 64.4 % on Aug 21																						Hours of Data:	744																								
Maximum Diurnal Average: 94.0 % at hour 6 Minimum Diurnal Average: 56.3 % at hour 15																						Hours of Missing Data:	0																								
Monthly Average: 76.08 % Percentiles: P₁ = 39.2 P₁₀ = 47.9 Q₁ = 62.0 Median = 79.1 Q₃ = 93.1 P₉₀ = 97.8 P₉₉ = 98.8																						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-Aug	95.3	95.4	93.3	89.7	87.6	87.3	87.5	87.2	89.8	90.7	86.2	85.3	81.4	68.6	65.3	65.8	59.5	60.9	65.9	74.6	88.3	93.1	96.6	97.8	83.0	97.8																					
2-Aug	98.3	98.5	97.3	97.2	96.0	94.6	91.9	88.7	81.4	71.3	67.1	63.5	61.2	58.4	56.8	58.0	70.5	56.8	58.6	67.0	77.8	84.9	90.0	92.9	78.3	98.5																					
3-Aug	96.5	98.0	98.3	98.5	98.7	98.8	98.8	98.6	98.5	96.9	97.1	91.0	74.5	62.3	69.8	90.0	98.0	97.9	96.9	96.2	98.0	98.6	98.9	99.0	93.7	99.0																					
4-Aug	99.1	99.0	98.8	98.9	98.5	97.6	95.9	89.8	81.3	74.8	68.8	62.7	65.3	54.2	87.3	90.1	76.8	72.2	70.3	71.3	75.4	80.2	85.2	91.4	82.7	99.1																					
5-Aug	92.3	96.4	96.9	97.8	98.1	98.1	97.2	85.0	76.2	65.8	58.9	56.6	54.6	52.7	51.1	51.0	52.6	53.1	57.3	62.2	69.4	80.0	86.0	93.4	74.3	98.1																					
6-Aug	96.5	97.7	98.4	98.5	98.5	98.7	98.8	97.2	85.6	72.7	89.5	93.4	96.9	92.8	84.9	79.7	77.5	73.0	75.5	80.3	92.0	96.5	97.0	88.0	90.0	98.8																					
7-Aug	88.6	96.2	97.7	98.3	98.5	98.7	98.1	90.6	77.3	63.4	59.3	53.7	48.3	48.9	44.2	41.9	42.3	43.5	46.5	55.2	67.9	78.3	90.2	91.6	71.6	98.7																					
8-Aug	95.6	97.4	98.0	98.5	98.7	98.9	98.8	83.3	73.0	67.3	60.7	53.2	49.2	47.2	43.8	44.8	46.7	51.2	50.5	55.2	59.9	63.8	67.3	70.8	69.7	98.9																					
9-Aug	70.8	73.8	76.1	79.4	81.1	79.6	78.0	75.3	74.0	73.5	68.5	63.2	77.9	91.1	91.8	93.5	94.8	95.1	96.5	97.7	98.2	98.4	98.5	98.5	84.4	98.5																					
10-Aug	98.6	98.5	98.6	98.6	98.6	98.7	98.7	98.7	98.5	98.0	95.9	94.4	91.1	87.2	81.9	80.1	79.2	85.6	86.7	92.5	95.3	93.6	92.1	93.3	93.1	98.7																					
11-Aug	95.6	95.7	93.9	92.1	93.5	96.1	91.8	86.0	83.7	77.6	72.0	68.6	65.8	70.4	63.1	61.3	59.4	60.0	62.5	74.6	82.8	90.6	91.4	89.0	79.9	96.1																					
12-Aug	90.6	93.2	94.4	93.7	95.7	96.0	95.5	94.4	90.9	84.2	68.8	63.2	57.9	55.9	67.0	78.8	68.3	64.3	72.1	79.5	85.8	94.2	97.0	98.0	82.5	98.0																					
13-Aug	98.3	97.9	97.5	97.8	98.3	98.2	96.7	86.3	71.7	64.0	59.3	53.6	47.4	45.3	44.3	41.7	40.0	40.9	42.9	48.7	55.6	68.9	75.1	73.5	68.5	98.3																					
14-Aug	93.0	96.3	97.5	97.8	97.3	97.9	97.0	88.7	70.1	58.6	44.9	43.5	39.3	38.0	39.4	40.8	42.1	40.1	40.1	43.5	48.2	60.1	77.4	87.1	65.8	97.9																					
15-Aug	80.6	79.3	84.1	85.6	84.1	87.2	83.2	71.1	73.1	81.0	83.8	84.4	82.3	71.6	63.7	62.9	62.5	66.9	70.8	80.4	85.3	86.5	92.4	95.8	79.1	95.8																					
16-Aug	96.6	94.7	94.1	93.3	96.6	95.2	88.3	80.2	70.9	65.9	60.7	55.6	51.6	45.0	43.9	45.2	43.5	43.8	47.1	52.9	62.9	70.8	73.1	69.4	68.4	96.6																					
17-Aug	68.7	71.0	69.9	69.9	75.7	78.0	80.5	78.2	72.7	65.8	66.4	62.0	59.9	52.2	47.2	59.8	81.7	69.4	73.6	83.0	83.4	78.7	89.9	82.0	71.6	89.9																					
18-Aug	71.1	75.5	75.1	76.4	80.2	82.2	84.8	83.8	79.5	71.9	68.9	61.8	57.4	55.3	55.8	59.4	76.0	85.4	70.8	73.9	77.8	80.7	79.8	82.4	73.6	85.4																					
19-Aug	85.6	88.2	88.5	87.6	89.6	91.2	88.0	81.1	77.3	77.7	75.8	67.3	60.9	56.9	52.6	50.2	55.2	57.6	62.4	67.5	76.3	80.4	75.2	78.4	73.8	91.2																					
20-Aug	81.6	81.8	81.5	86.0	86.0	89.9	86.5	79.1	73.1	66.1	58.2	52.1	48.7	46.9	44.5	43.9	52.8	60.2	55.9	67.1	79.6	86.2	89.1	93.4	70.4	93.4																					
21-Aug	94.9	94.8	90.9	92.7	92.4	90.4	90.1	78.2	68.2	59.3	51.0	45.6	41.6	36.5	33.8	33.3	33.7	35.7	40.6	47.9	61.4	74.9	77.5	80.9	64.4	94.9																					
22-Aug	87.1	91.0	91.8	94.0	94.0	95.7	94.5	83.4	72.2	62.2	58.7	51.1	44.9	42.7	44.0	45.6	45.8	49.4	54.7	67.1	77.8	83.9	87.8	90.7	71.3	95.7																					
23-Aug	90.2	95.4	97.4	98.0	98.3	98.5	98.7	97.2	87.2	81.9	79.5	76.2	71.3	78.4	82.7	77.8	77.9	84.6	75.3	72.3	72.6	73.1	74.2	76.2	84.0	98.7																					
24-Aug	76.5	77.8	79.4	79.7	81.7	83.8	85.9	85.9	81.0	69.3	62.3	53.9	46.9	42.7	40.3	40.4	39.5	40.5	47.0	60.5	72.2	77.5	88.3	92.6	66.9	92.6																					
25-Aug	96.0	95.5	97.0	97.3	97.3	97.9	98.5	97.0	82.2	72.1	67.7	61.9	54.6	50.0	48.9	47.3	48.6	51.0	57.1	64.7	70.1	74.9	80.7	84.4	74.7	98.5																					
26-Aug	86.1	87.2	89.8	92.1	93.5	95.6	93.4	83.6	73.4	65.4	58.9	51.3	48.9	46.8	44.5	46.0	44.7	46.9	55.2	58.3	63.3	72.3	81.9	88.4	69.5	95.6																					
27-Aug	93.0	95.3	95.1	95.8	97.3	97.9	97.6	89.7	78.3	69.5	62.1	57.6	53.2	51.5	48.1	45.8	43.5	46.2	53.1	60.3	65.7	72.8	76.6	77.4	71.8	97.9																					
28-Aug	81.1	87.3	89.8	94.1	96.0	97.5	98.1	97.7	93.7	84.8	78.2	73.9	69.0	67.9	66.9	68.1	68.7	69.7	72.8	85.5	89.3	92.8	93.6	94.6	83.8	98.1																					
29-Aug	95.4	95.9	96.8	97.6	97.9	98.2	98.6	94.4	83.5	72.3	62.9	56.9	54.5	51.6	51.4	46.0	47.8	53.1	63.5	71.1	75.9	83.9	89.0	94.2	76.3	98.6																					
30-Aug	96.4	97.3	97.8	98.5	98.7	98.8	99.0	99.0	94.3	79.4	67.1	60.5	52.8	42.9	37.6	39.1	47.3	49.1	54.7	55.0	46.9	46.2	51.6	61.9	69.7	99.0																					
31-Aug	71.7	77.7	80.1	85.1	90.9	95.8	91.9	82.3	73.3	65.4	60.5	58.4	54.2	51.6	47.4	43.0	49.4	62.3	70.1	74.4	81.6	86.4	87.1	83.4	71.8	95.8																					
																						89.1	91.0	91.5	92.3	93.2	94.0	93.0	87.5	80.2	73.2	68.4	63.8	60.1	56.9	56.3	57.1	58.9	60.2	62.8	69.0	75.4	80.8	84.9	86.8	Diurnal Average	
																						99.1	99.0	98.8	98.9	98.7	98.9	99.0	99.0	98.5	98.0	97.1	94.4	96.9	92.8	91.8	93.5	98.0	97.9	96.9	97.7	98.2	98.6	98.9	99.0	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Barge Landing - August 2023



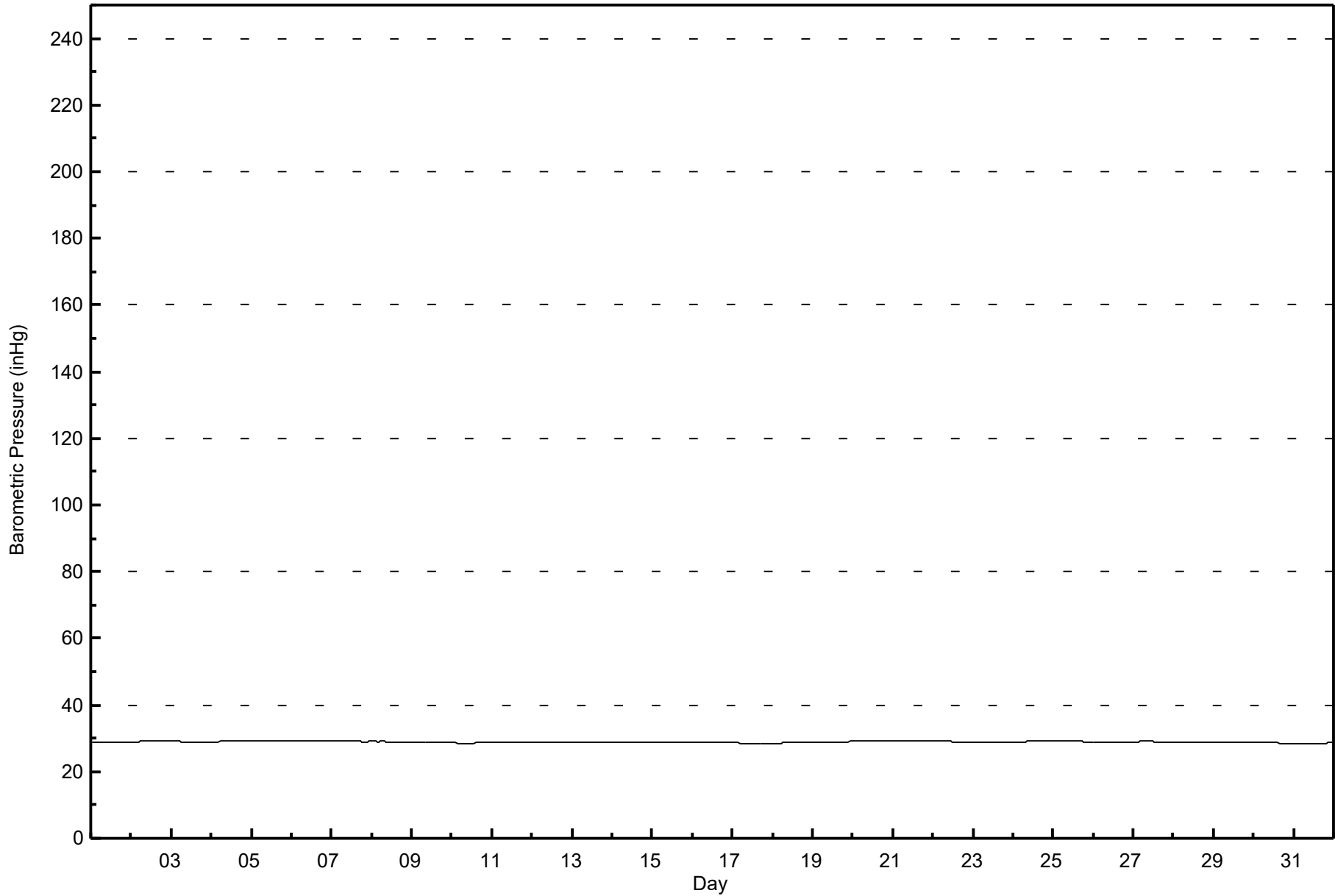


Maximum Value: 29.2 inHg on Aug 5 11:00 Maximum Daily Average: 29.2 inHg on Aug 5																						Hours in Service:	744				
Minimum Value: 28.5 inHg on Aug 17 19:00 Minimum Daily Average: 28.5 inHg on Aug 17																						Hours of Data:	744				
Maximum Diurnal Average: 28.9 inHg at hour 8 Minimum Diurnal Average: 28.9 inHg at hour 19																						Hours of Missing Data:	0				
Monthly Average: 28.90 inHg Percentiles: P ₁ = 28.5 P ₁₀ = 28.6 Q ₁ = 28.8 Median = 28.9 Q ₃ = 29.0 P ₉₀ = 29.1 P ₉₉ = 29.2																						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-Aug	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	29.0	29.0	29.0	29.0	29.0	28.9	29.0	
2-Aug	29.0	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
3-Aug	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	29.0	29.0	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0
4-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.0	29.0	29.0	29.1	29.0	29.1	29.0	29.1	29.1	29.1	29.1	29.1	29.1	29.0	29.1
5-Aug	29.1	29.1	29.1	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	29.1	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
6-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2
7-Aug	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	29.0	29.0	29.0	29.1
8-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	29.0
9-Aug	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	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.9
10-Aug	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	28.7	28.7	28.7	28.7	28.6	28.7
11-Aug	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	28.8	28.8	28.8
12-Aug	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	29.0	29.0	29.0	29.0	29.0	28.9	29.0
13-Aug	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	28.8	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
14-Aug	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	28.9	28.9	28.9	29.0	28.9	28.9	29.0
15-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.8	28.9
16-Aug	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.7	28.7	28.7	28.8	28.9	28.9
17-Aug	28.7	28.7	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.7
18-Aug	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.8	28.9	28.9
19-Aug	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	29.0	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-Aug	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	29.0	29.0	29.1	29.1	29.1	29.1	29.1	29.1
21-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1
22-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
23-Aug	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
24-Aug	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	29.1	29.1	29.2
25-Aug	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	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1
26-Aug	29.0	29.0	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0
27-Aug	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	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	29.0
28-Aug	28.9	28.9	28.9	28.9	28.9	28.9	28.9	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	28.9
29-Aug	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	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.9
30-Aug	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	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.8
31-Aug	28.6	28.6	28.6	28.6	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.5	28.5	28.5	28.5	28.5	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.7
28.9																						Diurnal Average					
29.2																						Diurnal Maximum					



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Barge Landing - August 2023





Maximum Speed: 19 km/h on Aug 13 17:00	Maximum Daily Speed Average: 12.2 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 3 16:00	Minimum Daily Speed Average: 0.3 km/h on Aug 11	Hours of Data: 741
Maximum Diurnal Speed Average: 4.4 km/h at hour 14	Minimum Diurnal Speed Average: 0.1 km/h at hour 20	Hours of Missing Data: 3
Monthly Average Velocity: 2.2 km/h 205.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 8 Q ₃ = 11 P ₉₀ = 14 P ₉₉ = 18	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-Aug	WSW9	WSW7	WSW11	W14	WSW11	W8	WSW9	WSW7	SW7	SW8	WSW11	WSW10	WSW8	WNW14	WNW12	NNW15	NW15	WNW12	W9	NW10	N6	W4	NW4	W6	W8.1	WNW15
2-Aug	W5	WSW6	WNW6	NW7	WSW8	W5	WNW7	W5	NNW6	W5	SW6	SW5	SW7	SW7	SW6	SW7	SSW5	SE2	UO	ENE5	ENE8	ENE8	ENE6	NNE4	WSW2.3	ENE8
3-Aug	NNW5	N3	N4	E5	ENE7	ESE4	E6	SE3	ESE4	SW2	S3	SSE9	SE8	SSE8	WSW7	ESE1	S2	SSE7	S7	S6	SSE5	SSE4	ESE3	SW6	SSE2.7	SSE9
4-Aug	NW7	WNW8	WNW8	WNW8	W6	W7	WSW6	WSW9	WSW8	SW8	SW8	SSW8	SE8	SSW10	ESE4	S12	S6	SW7	SW7	W6	WNW6	W6	WSW6	WSW6	WSW5.1	S12
5-Aug	WNW7	W5	SW7	SSW6	S6	S7	SSW6	SW4	SW4	WNW3	N5	NW8	NW5	W5	N5	NE7	NE9	NE10	NE12	NE11	NNE12	NNE4	NNW2	W3	N1.6	NE12
6-Aug	NNW4	W4	WSW3	SW5	SW6	SSW4	SSW3	NNE4	SE7	NE5	NNE8	NNE7	N1	NW4	W4	NW5	W4	W4	W3	NW6	NNW9	NNW9	N8	NE7	NNW2.2	NNW9
7-Aug	NW6	NNW8	NW6	WNW3	NNW5	NW5	NW4	NW2	NW4	NW7	WNW6	N8	NE12	N11	NNE13	NNE14	NE17	NE16	NNE16	NNE11	NNE10	N7	N6	NNE4	N7.0	NE17
8-Aug	NNW3	NW6	N4	NNE5	ENE5	E3	ESE4	SE6	SSW5	W4	NW6	ENE7	E10	E11	E14	ESE13	ESE14	ESE15	ESE16	ESE14	ESE14	SE13	SE10	SE13	ESE6.4	ESE16
9-Aug	SE14	SE14	SE12	SE11	SE9	SE10	SE10	SE10	SE10	SE13	SE15	SSE15	SSE17	SE17	SE14	SE13	ESE14	ESE15	SE10	SE11	SE11	ESE13	SE12	SE9	SE12.2	SE17
10-Aug	SE10	SE12	SE9	SE7	SE8	SE9	ESE7	ESE9	ESE9	ESE8	E9	ENE10	E12	E11	E11	E10	E12	ENE13	NE11	NE11	NNE6	NE10	NE7	NNE6	E7.8	ENE13
11-Aug	NE6	N4	NE7	NE10	NE11	NW7	NNW8	N7	NNW7	N5	NNW4	NW5	WSW8	WSW9	SW9	SSW8	SSW9	SW8	SSW6	SSE8	SSE8	SE8	SE9	SE8	SW0.3	NE11
12-Aug	SSE7	ESE7	SE6	S5	SW5	WSW6	W7	W6	WSW6	WSW5	WSW6	SW7	SW8	SW8	SSW2	ENE5	W1	W5	SW3	SW6	SW4	SSW7	SSW6	SSW6	SW4.1	SW8
13-Aug	SSW8	SSW8	S8	SSE8	SE10	SSE10	SSE10	SSE11	SSW13	SSW17	SSW16	SSW17	SW19	SW17	SW17	SW18	WSW19	SW16	WSW14	SW11	SW10	SW8	SSW6	WNW9	SSW10.7	WSW19
14-Aug	WNW1	S9	SSE5	WSW4	NNW9	NNW10	SSW4	SW8	WSW12	W11	WNW14	W15	W18	W17	W17	W17	WSW18	WSW15	W14	W13	W12	NNW9	SW4	SSW6	W9.2	W18
15-Aug	SW7	SW4	SSW7	SSW6	SSE8	SSE10	SSE9	SSW10	SE7	ESE3	S3	SE10	SE4	SSE7	SSE3	SW5	ESE6	NNW3	N15	N18	NNW16	NNW13	NW8	NNW6	S0.6	N18
16-Aug	W4	WSW7	NW5	NW7	W5	WNW7	WNW7	WNW4	WNW8	W7	W7	WSW9	WSW10	W10	WSW10	SSW11	SSW13	SW14	SW12	SSW10	S11	SSE11	SSE13	S13	SW6.3	SW14
17-Aug	S11	S12	S13	S10	SSE10	SSE9	SSE8	S6	S10	SSW8	SSW6	WSW8	WSW11	SW7	S3	ENE4	S5	S5	ESE5	NW5	NNW10	NNW7	NW9	NNW11	SSW3.7	S13
18-Aug	N14	N16	N14	N13	N14	N14	N12	NNW10	N12	N12	N12	NW12	NNW9	N10	NNW11	NNW12	NNW14	NNW11	N11	NNW12	NNW10	NNW10	NNW9	WNW6	NNW11.3	N16
19-Aug	NW6	WSW5	W8	W7	W8	WSW8	SW7	SW9	SW9	SW11	SW11	SW11	SW10	SW11	SW13	WSW13	WSW14	SW13	SW10	SSW8	SSW9	S9	SSW10	S10	SW8.6	WSW14
20-Aug	S8	SSW8	W2	SSW10	SSW9	S8	SSW7	SSW8	SW7	WSW5	WSW5	W4	NNW4	NW4	NW4	WNW7	WNW5	N4	NNW1	SE4	SW5	S4	SSW3	SW1	SW3.4	SSW10
21-Aug	NNW3	S8	S6	SSE6	SSE8	S9	SSE8	S9	S10	S9	S7	SSW7	SSW9	S9	S10	SSW10	S12	SSW10	S9	S9	SSE6	SE7	SE6	SE6	S7.4	S12
22-Aug	ESE5	ESE6	ESE7	SE7	S5	SE6	SE7	SSE6	S9	C	C	S11	S11	SSW7	SW8	WSW9	WSW6	SW4	W3	SW4	SSE5	SSE5	SSE1	N5	S4.1	S11
23-Aug	N3	NNW4	NNW4	NW3	WSW3	NNW4	NNW4	WNW1	W4	SW4	SW5	SW5	NW4	W2	SW4	WNW3	NW3	NNW8	N12	N14	N15	N15	N13	NNW12	NNW4.7	N15
24-Aug	NNW14	N14	NNW12	N14	N13	N14	N16	N15	N17	N19	N18	N17	NNW17	NNW14	NNW13	NNW11	NNW11	NNW10	NNW9	NNW10	NW5	NW5	WSW4	WSW4	NNW12.1	N19
25-Aug	WSW8	WSW7	SSW5	S7	SSW7	SSE9	SSE9	S9	S10	S10	S12	S14	SSW14	SSW14	SSW14	SSW15	SSW15	S13	S11	SSE13	SSE14	SSE13	SSE13	SSE12	S10.3	SSW15
26-Aug	SSE12	SSE11	S10	S10	SSE9	SSE10	SSE9	S11	SSW11	S13	SSW15	SSW16	SW14	SW14	WSW12	WSW10	W10	N16	N17	N15	N14	NNW9	NW7	W3	SW4.3	N17
27-Aug	W2	SW1	SW7	SW8	WSW6	NW6	WSW6	WSW4	SW3	S6	SW7	SSW8	SSW10	SSW11	S12	SSW10	SSW11	SSW11	S11	S11	S9	S9	S8	SSW8	SSW6.9	S12
28-Aug	SSW6	S9	S8	S8	SSE7	SE8	S8	SE6	SSE7	SSE7	S8	S7	SSE7	SE7	SSE8	SE7	SSE7	SSE8	SSE7	SE8	SE10	SSE12	SSE12	SSE12	SSE7.9	SSE12
29-Aug	SSE11	SSE11	SSE11	SSE12	SSE12	SSE12	SSE13	SSE12	SSE12	S11	S11	S11	S10	SSE10	SSE14	S11	S10	SSE10	SSE11	SSE10	SSE11	SE8	SSE7	SSE5	SSE10.4	SSE14
30-Aug	SSE7	SE9	SE8	SSE9	SSE9	SSE7	SSE6	SSW2	W3	W2	S5	SW5	SW6	S10	SSE9	SSE12	SSE11	SSE12	SSE11	SSE13	SSE17	SE12	SE9	SE8	SSE7.6	SSE17
31-Aug	ENE7	ESE9	SE9	SW7	WSW4	SW6	S8	S7	NW2	WNW3	SW4	SW7	SW6	WNW4	NNW4	NNW6	N13	N14	N7	N5	NNW7	NW7	NW8	WSW4	WNW1.8	N14

SW1.1SSW2.3SSW2.1SSW2.7	S2.5SSW2.3	S2.9SSW3.2SSW3.1	SW2.7	SW3.3	SW4.2	SW4.2	SW4.4	SW3.3	SW2.9	SW2.6	SW1.7SSW0.6	ESE0.1	E0.6	ESE1.2	SSE1.3	SSW1.6	Diurnal Average												
NNW14	N16	N14	W14	N14	N14	N16	N15	N17	N19	N18	SSW17	SW19	SE17	W17	SW18	WSW19	N16	N17	N18	SSE17	N15	SSE13	SE13	Diurnal Maximum					

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

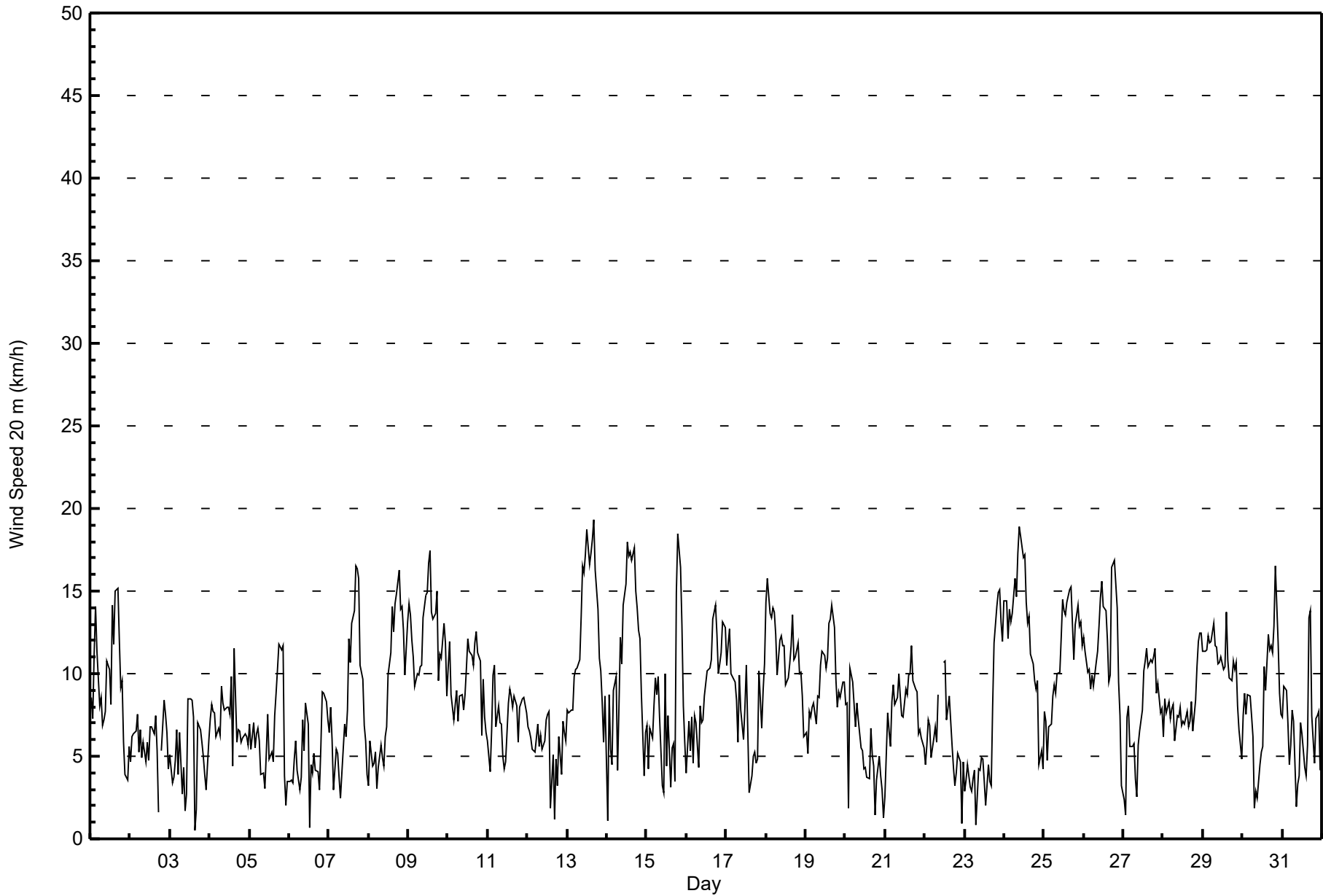
Wind Speed 20 m (WS20m) - km/h
Barge Landing - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Aug 26 18:00 Minimum Value: 0 km/h on Aug 28 21:00 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: 741 Hours of Missing Data: 3 Hours of Calibration: 2 Percent Operational Time: 99.9							
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-Aug	2	2	3	3	4	2	2	2	2	3	3	3	2	5	4	4	4	4	3	3	3	1	1	1	5
2-Aug	1	2	2	1	2	1	3	1	2	2	2	3	2	2	3	3	4	2	UO	1	1	1	2	2	4
3-Aug	2	1	2	1	1	2	1	1	2	2	1	2	3	4	7	5	4	3	2	2	2	1	2	2	7
4-Aug	1	1	2	1	2	2	3	2	2	2	2	3	2	4	5	3	2	2	2	2	3	2	1	5	
5-Aug	2	2	1	1	1	1	2	1	1	1	3	2	2	2	2	2	3	2	2	2	2	2	1	1	3
6-Aug	1	1	1	1	1	2	2	3	2	5	6	3	2	1	1	1	1	1	1	1	1	1	2	3	6
7-Aug	2	1	1	1	2	1	1	1	1	2	2	4	4	4	5	5	5	4	4	3	2	1	2	1	5
8-Aug	1	1	2	1	2	1	2	2	2	2	3	4	3	4	4	3	3	4	3	3	3	2	1	2	4
9-Aug	3	2	2	2	1	2	2	2	2	3	4	5	4	3	3	3	3	3	2	2	1	2	2	2	5
10-Aug	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	1	2	2	2	3
11-Aug	2	2	2	2	3	2	2	2	2	2	2	2	3	3	2	3	3	3	1	1	1	1	1	1	3
12-Aug	1	1	1	1	1	2	2	2	1	2	2	3	3	3	6	2	1	1	1	1	1	1	1	2	6
13-Aug	1	2	1	1	1	2	2	3	4	4	5	5	5	4	6	5	5	5	4	2	1	2	1	4	6
14-Aug	4	3	2	3	2	2	2	2	2	4	5	6	5	5	5	4	4	4	4	3	2	4	1	2	6
15-Aug	3	2	1	2	1	1	2	2	3	2	2	2	3	3	2	2	2	5	4	5	4	3	2	1	5
16-Aug	2	2	1	2	2	2	2	2	2	2	3	3	3	4	3	4	4	4	3	2	1	1	2	2	4
17-Aug	2	2	2	2	1	2	2	2	4	3	2	3	3	2	3	4	5	2	3	4	3	3	2	2	5
18-Aug	3	4	4	4	4	4	4	3	5	4	4	4	3	3	4	3	5	4	3	4	3	3	2	2	5
19-Aug	2	2	3	2	3	2	2	2	2	3	3	3	3	3	4	3	4	4	2	1	1	1	2	1	4
20-Aug	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	4	3	2	1	2	1	1	1	2	4
21-Aug	2	4	3	2	2	2	1	2	2	2	2	2	3	3	4	3	4	3	2	1	1	1	1	1	4
22-Aug	2	2	2	1	1	1	1	2	2	C	C	4	3	3	3	2	2	1	1	1	1	1	1	3	4
23-Aug	1	2	1	2	2	3	2	1	2	1	1	1	1	2	1	1	1	1	3	4	4	4	3	4	
24-Aug	4	4	4	5	4	3	4	4	5	6	6	5	6	4	4	3	3	3	2	1	1	2	1	1	6
25-Aug	1	2	1	1	1	1	2	2	2	3	4	4	4	4	4	4	4	4	2	2	2	2	2	1	4
26-Aug	2	1	2	2	1	1	2	3	3	3	5	5	4	5	4	3	3	9	5	5	4	2	1	2	9
27-Aug	1	2	2	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	2	2	2	2	1	2	3
28-Aug	1	2	1	2	1	1	2	1	1	2	2	2	2	1	2	1	1	2	2	2	0	1	1	1	2
29-Aug	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	3
30-Aug	1	1	1	1	1	1	1	1	1	1	3	2	2	4	3	4	3	3	2	2	3	3	2	2	4
31-Aug	2	1	3	2	2	2	2	2	2	1	2	2	2	2	2	3	5	4	3	2	1	2	2	4	5
																		Diurnal Maximum							
C - Calibration																		UO - Unstable Operation							



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Barge Landing - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Barge Landing - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	168	22.67	22.67
6 - 11	414	55.87	78.54
12 - 19	159	21.46	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: 741

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Barge Landing - August 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	12	5	1	4	2	9	4	9	9	10	22	11	27	9	19	15	168
6 - 11	10	7	12	7	7	9	44	57	58	44	44	36	17	14	20	28	414
12 - 19	32	4	4	1	3	9	13	23	10	12	10	9	9	5	2	13	159
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	54	16	17	12	12	27	61	89	77	66	76	56	53	28	41	56	741

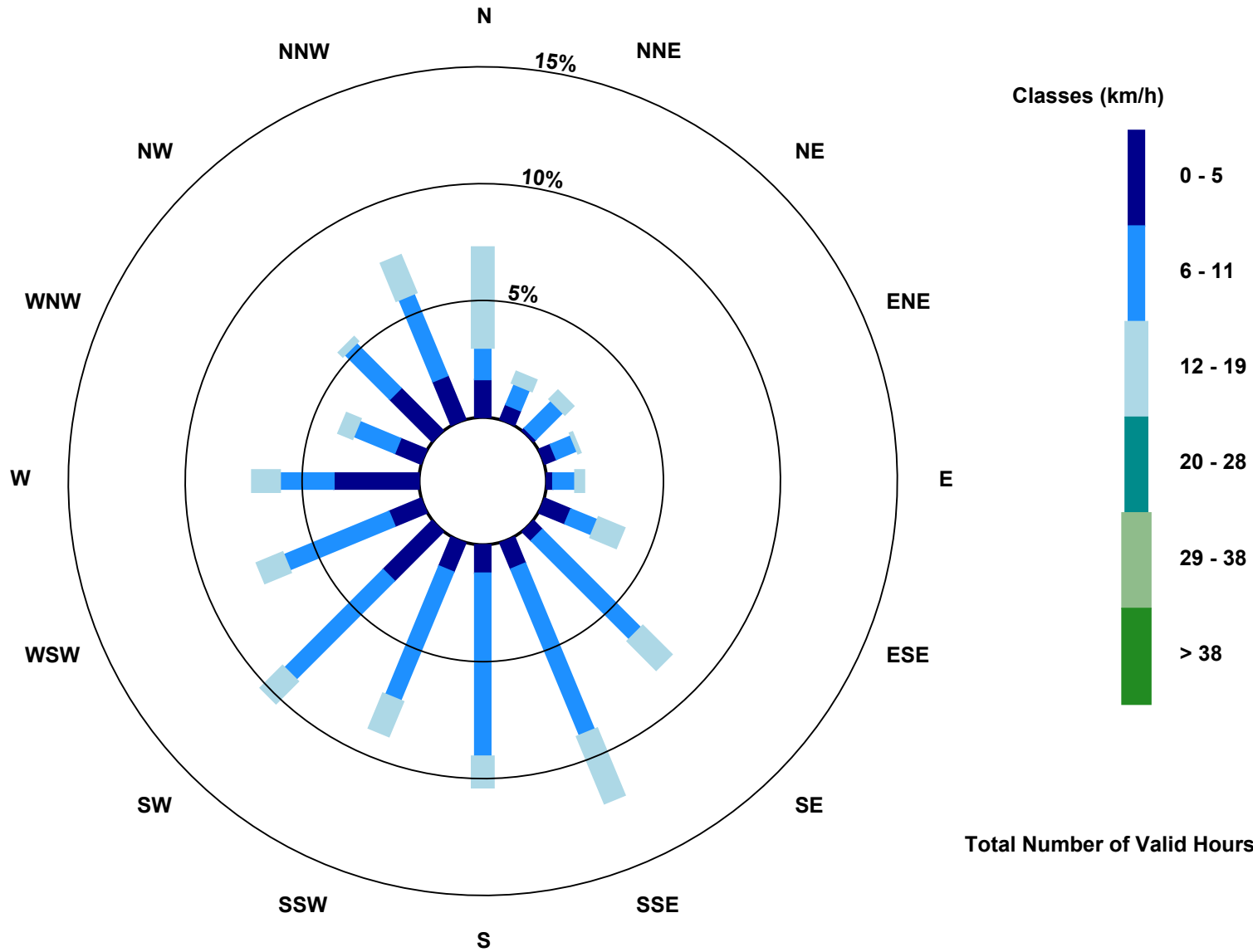
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

Direction of Maximum Speed: 243 deg on Aug 13 17:00																				Hours in Service: 744					
Direction of Maximum Daily Speed Average: 133.1 deg on Aug 9																				Hours of Data: 741					
Direction of Minimum Speed: 105 deg on Aug 3 16:00										Direction of Minimum Daily Speed Average: 0.3 deg on Aug 11										Hours of Missing Data: 3					
Monthly Average Direction: 205.3 deg																				Percent Operational Time: 99.9					
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-Aug	243	253	256	260	244	277	250	250	228	233	239	247	255	282	294	330	304	296	277	320	359	269	315	269	272.8
2-Aug	275	245	286	305	255	266	293	269	334	264	235	220	232	217	233	221	197	128	UO	69	77	75	72	31	256.3
3-Aug	341	8	353	99	78	121	96	146	102	231	178	152	145	159	258	105	186	158	170	177	166	147	112	235	147.9
4-Aug	306	298	297	286	281	263	249	245	246	233	228	208	139	212	106	169	174	221	229	277	287	267	251	251	243.0
5-Aug	300	262	236	211	175	180	202	222	236	297	9	308	307	261	357	50	45	38	55	39	33	15	333	274	350.3
6-Aug	330	265	256	222	216	208	193	32	140	37	31	33	3	316	274	319	268	280	269	323	338	344	6	36	330.8
7-Aug	324	330	323	302	328	324	318	308	313	323	284	352	36	5	17	23	40	40	30	17	33	7	7	23	6.6
8-Aug	345	324	3	23	65	84	111	144	212	272	319	72	83	92	93	107	105	109	120	121	116	127	135	135	105.7
9-Aug	132	132	138	142	136	138	142	146	130	125	132	151	161	129	133	126	113	118	139	129	126	121	127	133	133.1
10-Aug	134	135	140	136	136	134	119	119	119	107	87	68	85	85	96	89	82	77	50	37	20	45	49	21	91.5
11-Aug	37	4	34	45	43	326	330	355	343	355	338	311	238	239	233	208	203	215	210	160	148	132	140	125	228.0
12-Aug	152	114	137	189	215	251	263	260	256	243	245	231	217	223	200	70	262	264	219	225	217	205	200	204	216.9
13-Aug	193	198	190	157	144	165	151	167	192	195	197	212	234	225	233	243	236	246	227	225	227	194	289	211.7	
14-Aug	299	187	168	239	329	333	212	220	249	271	283	276	263	267	262	257	256	264	276	268	342	222	200	200	263.6
15-Aug	230	224	209	195	167	157	151	161	158	104	180	142	135	158	152	222	118	328	2	350	340	336	326	339	183.7
16-Aug	276	252	319	318	276	283	288	290	301	277	276	254	251	267	245	204	208	215	215	199	173	164	164	173	232.7
17-Aug	173	180	181	181	166	162	160	187	180	210	213	249	255	233	173	58	169	172	102	315	345	338	317	338	199.9
18-Aug	354	2	5	353	2	357	0	337	1	4	352	321	347	357	331	341	340	336	350	342	341	344	341	301	348.5
19-Aug	317	257	269	267	259	257	222	228	229	220	228	226	216	229	227	252	246	236	227	204	199	189	192	182	230.2
20-Aug	187	204	261	199	196	183	197	211	228	253	256	261	338	310	310	303	303	358	346	129	219	173	209	224	225.8
21-Aug	335	179	169	156	168	177	167	182	183	179	187	200	206	189	172	199	179	195	187	171	155	135	136	125	177.0
22-Aug	119	110	117	137	173	144	140	153	169	C	C	177	182	209	231	239	256	232	267	216	156	148	154	356	175.8
23-Aug	349	333	342	319	244	339	332	292	280	228	231	214	309	262	233	299	324	332	358	351	353	3	359	348	333.7
24-Aug	347	349	348	354	353	358	359	2	3	7	6	2	348	346	344	322	319	320	328	334	347	318	317	251	347.9
25-Aug	241	240	213	184	196	157	153	170	174	177	178	183	206	206	206	195	198	188	169	161	164	166	160	154	183.0
26-Aug	160	168	174	174	168	165	168	180	194	179	196	210	218	234	250	243	271	354	0	359	355	343	326	270	217.0
27-Aug	271	227	218	232	257	307	237	243	224	184	214	195	201	205	189	198	207	205	188	186	181	179	186	210	205.1
28-Aug	200	183	173	176	164	144	174	137	158	167	173	172	162	142	153	143	150	156	160	125	135	151	159	164	158.8
29-Aug	161	161	162	165	161	160	161	162	166	172	175	172	176	168	152	189	179	164	156	150	166	128	152	167	163.8
30-Aug	162	145	139	150	149	148	154	202	268	270	190	225	226	185	154	156	157	155	153	161	153	143	134	141	158.9
31-Aug	67	120	144	227	237	233	183	184	317	283	216	231	235	287	332	335	351	357	6	11	327	323	326	244	300.1
216.4 196.1 196.3 201.0 188.7 191.6 182.5 192.9 205.6 217.4 222.7 216.3 216.9 220.4 219.4 221.3 219.7 222.8 208.8 113.4 98.2 116.8 151.4 191.6																									
Diurnal Average																									
C - Calibration 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 - August 2023

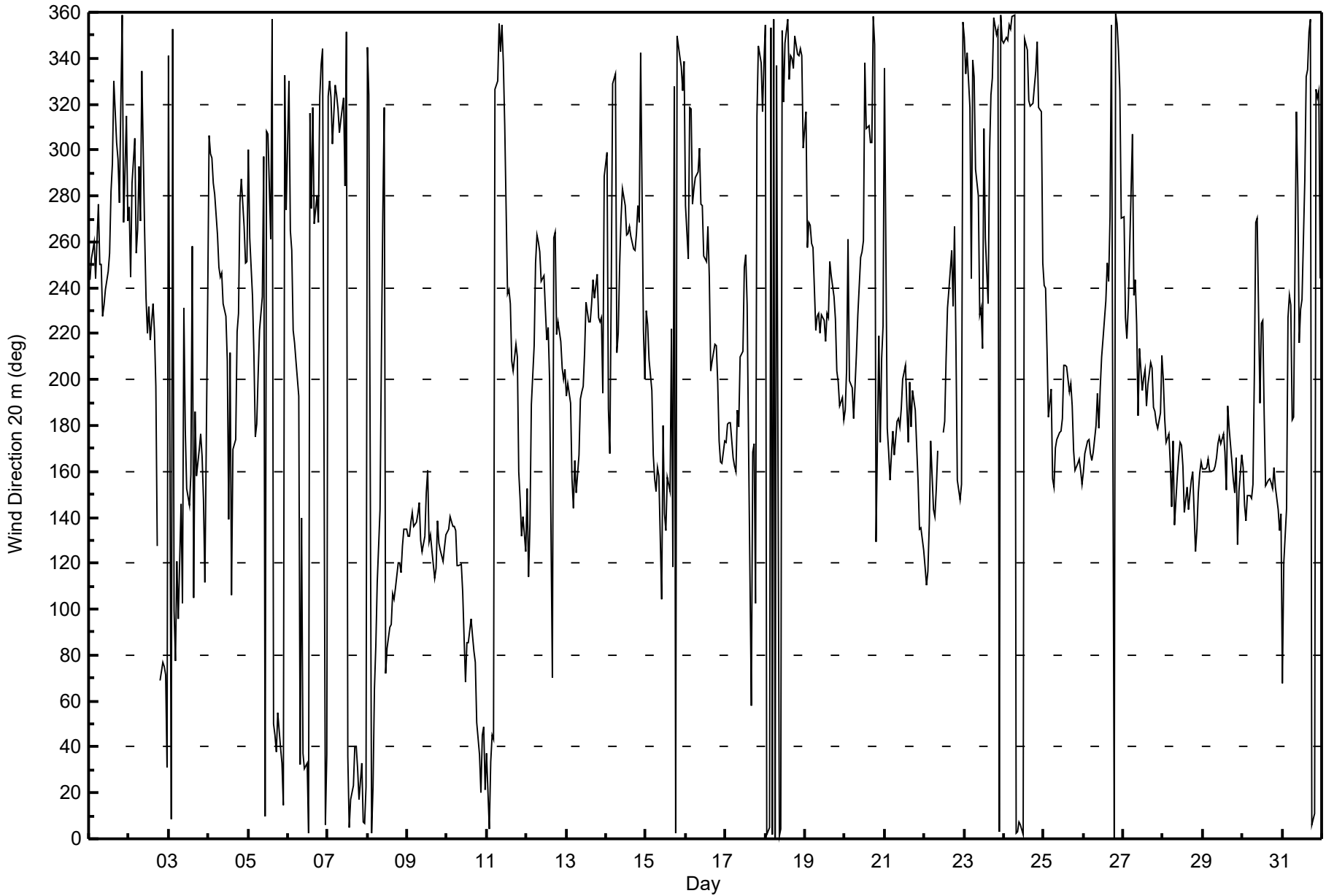
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 99 deg on Aug 20 03:00	Hours of Data: 741
Minimum Value: 3 deg on Aug 25 01:00	Hours of Missing Data: 3
Percentiles: P ₁ = 5 P ₁₀ = 10 Q ₁ = 14 Median = 20 Q ₃ = 29 P ₉₀ = 45 P ₉₉ = 88	Hours of Calibration: 2
	Percent Operational Time: 99.9

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-Aug	15	16	16	12	21	25	13	26	20	24	17	17	26	21	24	17	19	20	17	37	37	24	41	16	41
2-Aug	13	11	37	16	12	24	16	29	24	43	35	62	28	34	36	27	56	53	UO	11	11	11	17	35	62
3-Aug	23	50	45	23	14	33	11	35	38	74	41	18	27	36	73	92	90	34	25	25	16	42	49	27	92
4-Aug	16	14	12	15	28	21	25	15	20	23	26	33	33	36	88	16	38	21	19	32	29	24	28	18	88
5-Aug	21	35	10	19	11	14	18	30	29	51	57	30	51	40	54	33	28	21	13	11	7	27	49	7	57
6-Aug	24	32	42	10	10	27	42	52	19	52	47	28	92	33	44	15	27	29	23	7	9	6	20	19	92
7-Aug	23	14	17	44	24	16	29	27	32	26	32	49	23	30	31	24	19	19	19	18	12	17	31	40	49
8-Aug	47	28	26	23	71	45	26	44	53	53	46	50	34	21	21	20	21	18	11	8	9	8	8	9	71
9-Aug	10	10	10	9	9	11	12	14	13	13	17	19	18	13	11	16	12	13	14	10	8	9	11	12	19
10-Aug	12	13	12	13	14	14	14	11	11	15	16	16	20	14	17	21	17	14	17	20	20	12	22	19	22
11-Aug	23	31	20	18	18	18	19	23	16	30	52	46	28	19	25	42	30	26	21	16	8	5	6	11	52
12-Aug	24	14	13	19	23	19	15	19	17	28	42	46	40	35	94	53	92	25	22	8	18	9	15	20	94
13-Aug	18	15	14	13	10	12	12	19	21	19	23	22	21	21	20	21	18	17	15	15	8	14	15	28	28
14-Aug	88	21	26	57	23	16	58	14	14	21	19	20	17	18	18	14	15	15	16	15	12	23	36	15	88
15-Aug	22	31	14	21	17	8	12	15	50	74	81	13	47	26	90	46	30	80	21	20	17	13	14	16	90
16-Aug	20	17	35	18	21	17	16	31	21	37	34	31	27	30	28	26	23	19	16	17	9	6	9	11	37
17-Aug	12	16	12	16	12	11	11	20	20	31	27	26	23	32	81	68	59	60	67	50	34	41	17	17	81
18-Aug	22	19	19	19	20	21	21	20	27	24	24	20	34	30	21	23	20	19	20	19	17	15	22	20	34
19-Aug	20	19	20	20	18	16	25	19	15	17	17	21	26	24	22	20	15	16	17	14	11	12	13	10	26
20-Aug	15	23	99	19	22	15	19	19	23	28	34	45	55	59	63	44	39	28	85	51	16	24	64	73	99
21-Aug	79	18	39	19	20	12	12	19	20	23	31	38	35	42	32	32	29	24	14	7	8	10	6	11	79
22-Aug	23	17	11	12	17	8	7	21	22	C	C	30	30	45	43	27	23	22	22	33	14	20	86	51	86
23-Aug	40	48	17	37	51	18	25	86	38	25	22	32	29	41	18	29	35	13	18	16	18	17	18	17	86
24-Aug	17	19	18	19	20	16	17	18	17	20	18	21	22	27	25	22	19	18	13	6	6	44	8	18	44
25-Aug	3	8	26	10	11	12	8	15	18	24	22	22	21	20	22	22	18	18	13	7	8	8	7	8	26
26-Aug	7	8	9	9	10	7	10	19	21	20	22	20	18	21	18	19	23	36	18	19	17	17	11	64	64
27-Aug	31	84	18	8	14	26	27	32	47	30	30	33	28	27	25	24	18	16	13	11	13	10	20	22	84
28-Aug	19	14	18	14	16	9	11	9	11	17	19	20	20	17	15	11	12	16	13	6	8	5	5	6	20
29-Aug	6	6	7	7	7	6	7	12	14	18	19	20	26	24	13	22	18	11	5	5	7	10	11	10	26
30-Aug	5	5	11	10	6	6	23	42	36	69	72	44	40	32	29	15	12	14	9	10	15	26	25	13	72
31-Aug	33	27	22	24	28	30	21	19	71	54	58	40	30	60	61	41	28	26	29	38	13	22	13	78	78
	88	84	99	57	71	45	58	86	71	74	81	62	92	60	94	92	92	80	85	51	37	44	86	78	

Diurnal Maximum

C - Calibration

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS11 LOWER CAMP AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
AUGUST 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	704	34	40	99.19	83.3	0	7.2	0
H2S (ppb) Average	703	36	41	99.33	16.4	2	2.9	0
THC (ppm) Average	704	34	40	99.19	3.5	-	2.7	-
CH4(ppm) Average	704	34	40	99.19	3.4	-	2.5	-
NMHC(ppm) Average	704	34	40	99.19	0.276	-	0.13	-
Temperature (C) Average	744	0	0	100	30.2	-	22.3	-
Relative Humidity (%) Average	716	0	28	96.24	100	-	94.1	-
Barometric Pressure (inHg) Average	744	0	0	100	29.4	-	29.3	-
Wind Speed 10 m (km/h) Average	370	0	374	49.73	19	-	11	-
Wind Direction 10 m (deg) Average	370	0	374	49.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
AUGUST 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	704	2.08	6.2	-	0	0	0.1	0.4	1.2	5.2	83.3
H2S (ppb) Average	703	0.85	1.4	-	0	0	0.2	0.4	1	2	16.4
THC (ppm) Average	704	2.26	0.3	-	1.9	2	2.1	2.2	2.4	2.6	3.5
CH4(ppm) Average	704	2.21	0.2	-	1.9	2	2	2.1	2.3	2.5	3.4
NMHC(ppm) Average	704	0.048	0.049	-	0	0	0	0	0.1	0.1	0.276
Temperature 2 m (C) Average	744	17.57	4.3	-	8.2	12.7	14.4	16.8	20.4	23.8	30.2
Relative Humidity (%) Average	716	77.59	17.3	-	35.3	50.7	65.4	80.6	92.9	98.6	100
Barometric Pressure (inHg) Average	744	29.08	0.2	-	28.6	28.8	29	29.1	29.2	29.3	29.4
Wind Speed 10 m (km/h) Average	370	6.5	4	-	0	2	4	6	8	12	19
Wind Direction 10 m (deg) Average	370	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - LOWER CAMP (AMS11)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, SO2, THC/NMHC/CH4	02 Aug 2023 08:00	02 Aug 2023 11:00	4	Station power failure
H2S, SO2, THC/NMHC/CH4	02 Aug 2023 14:00	02 Aug 2023 14:00	1	Station power failure
SO2, THC/NMHC/CH4	29 Aug 2023 15:00	29 Aug 2023 15:00	1	Maintenance - sample manifold cleaned
Relative Humidity	03 Aug 2023 05:00	30 Aug 2023 08:00	28	Sensor operated out of range
Wind Speed, Wind Direction	01 Aug 2023 01:00	16 Aug 2023 09:00	369	Cross-arm misaligned
Wind Speed, Wind Direction	16 Aug 2023 10:00	16 Aug 2023 13:00	4	Maintenance - re-aligned wind cross-arm
Wind Speed, Wind Direction	22 Aug 2023 23:00	22 Aug 2023 23:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

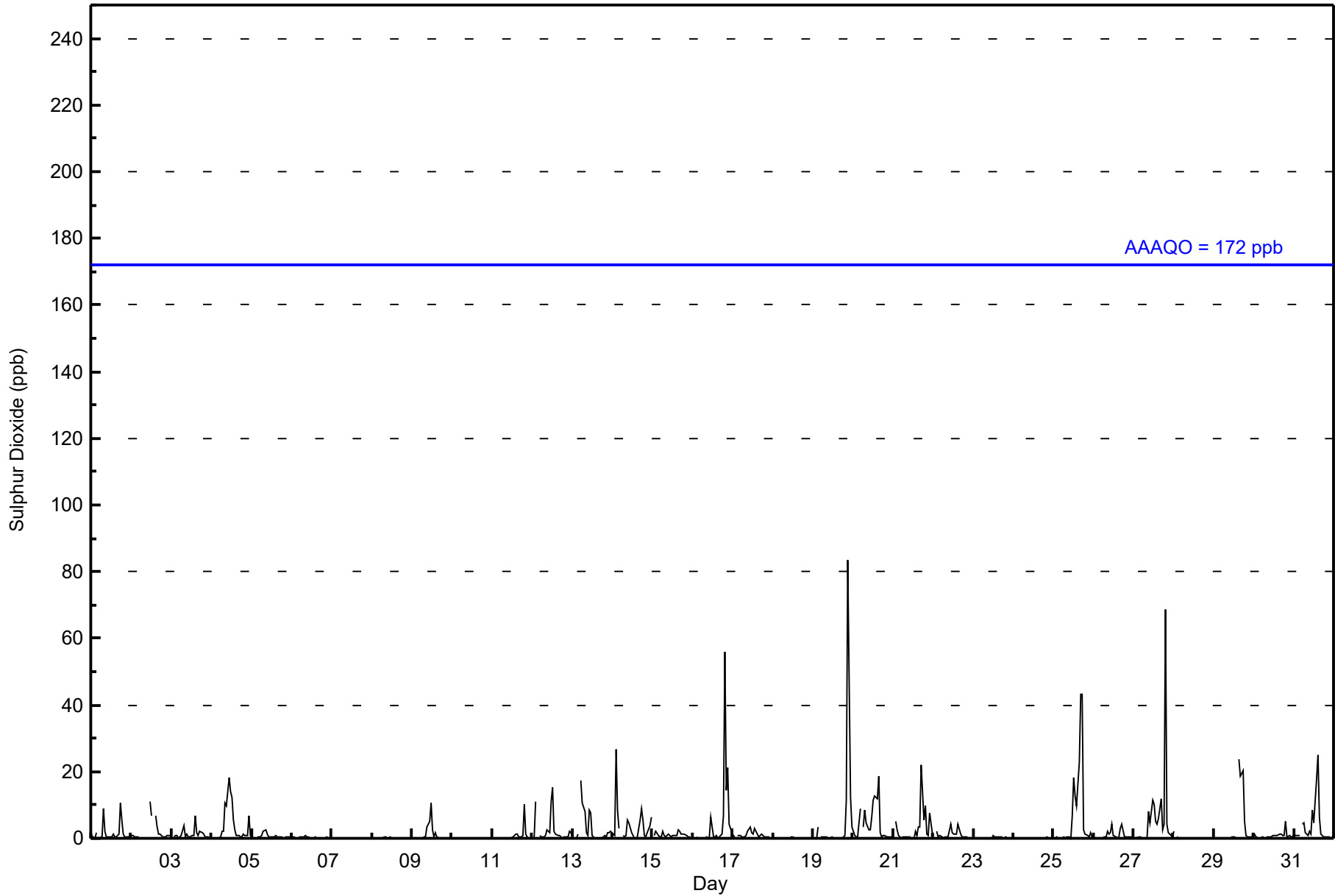
Lower Camp - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 83.3 ppb on Aug 19 22:00		Maximum Daily Average: 7.2 ppb on Aug 25																	Hours of Data: 704																														
Minimum Value: 0.0 ppb on Aug 7 14:00		Minimum Daily Average: 0.0 ppb on Aug 10																	Hours of Missing Data: 40																														
Maximum Diurnal Average: 5.3 ppb at hour 20		Minimum Diurnal Average: 0.5 ppb at hour 2																	Hours of Calibration: 34																														
Monthly Average: 2.08 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.4 Q ₃ = 1.2 P ₉₀ = 5.2 P ₉₉ = 23.6																	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-Aug	0.8	0.2	0.1	1.5	Z	0.4	0.4	8.7	2.0	0.6	0.5	0.5	0.4	1.4	0.5	0.4	1.3	10.7	5.7	1.1	0.5	0.3	0.3	0.7	1.7	10.7																							
2-Aug	0.7	0.8	0.4	0.3	0.3	Z	0.3	PF	PF	PF	PF	11.1	7.0	PF	6.8	3.5	1.2	1.1	0.7	0.5	0.4	0.9	0.8	0.7	2.1	11.1																							
3-Aug	Z	0.3	0.7	0.8	0.2	0.6	0.9	3.8	0.5	1.1	0.5	0.5	0.8	0.8	6.6	1.5	0.8	2.2	1.8	1.4	0.4	0.2	0.3	0.2	1.2	6.6																							
4-Aug	0.1	Z	0.1	0.1	0.1	0.5	2.0	2.2	10.8	9.8	18.3	14.1	12.4	5.6	2.4	1.0	0.8	0.5	0.4	1.1	0.8	1.0	6.8	0.8	4.0	18.3																							
5-Aug	0.4	0.3	Z	0.5	0.4	0.5	0.7	2.3	2.5	1.4	0.5	0.4	0.4	0.4	0.6	0.4	0.3	0.4	0.3	0.2	0.2	0.3	0.6	0.3	0.6	2.5																							
6-Aug	0.3	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.7	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.0	0.0	0.2	0.7																							
7-Aug	0.1	0.1	0.1	0.2	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2																							
8-Aug	0.3	0.1	0.1	0.1	0.1	Z	0.2	0.3	0.3	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.3																							
9-Aug	Z	0.1	0.0	0.1	0.0	0.0	0.0	0.5	0.4	3.5	5.1	10.5	2.6	0.2	1.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	10.5																							
10-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	0.0	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-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	1.1	1.1	0.6	0.4	0.9	10.1	1.5	0.3	0.1	0.0	0.8	10.1																							
12-Aug	0.1	0.2	11.1	Z	1.0	0.4	0.2	0.4	0.8	2.4	1.8	11.0	15.1	2.3	1.4	0.7	0.8	0.3	0.2	0.5	0.2	0.6	2.3	1.8	2.4	15.1																							
13-Aug	0.4	0.2	0.0	1.1	Z	17.3	10.6	8.2	1.9	0.8	8.3	7.8	0.7	0.2	0.2	0.1	0.2	0.2	0.3	0.8	0.3	1.6	1.7	1.9	2.8	17.3																							
14-Aug	1.3	0.7	26.8	8.6	2.9	Z	0.7	0.5	1.0	5.7	4.8	1.8	0.8	0.1	0.1	0.3	5.5	8.7	5.5	1.0	0.4	1.9	3.8	6.5	3.9	26.8																							
15-Aug	Z	1.0	2.2	0.8	0.4	0.6	2.0	0.9	0.6	1.1	0.7	0.3	0.7	1.0	0.8	2.5	2.1	1.2	1.4	1.2	0.7	0.4	0.2	0.2	1.0	2.5																							
16-Aug	0.1	Z	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	6.4	0.5	0.3	0.7	0.1	0.3	1.2	6.9	56.1	14.2	21.1	4.3	1.6	5.0	56.1																							
17-Aug	0.8	0.4	Z	1.0	0.9	0.5	0.4	0.5	0.8	1.9	3.3	1.8	1.3	3.1	2.2	0.4	0.8	1.4	0.7	0.4	0.3	0.2	0.1	0.1	1.0	3.3																							
18-Aug	0.1	0.1	0.1	Z	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.3																							
19-Aug	0.0	0.1	0.2	3.2	Z	0.5	0.4	0.4	0.3	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.5	1.0	11.3	83.3	12.2	3.3	5.1	83.3																						
20-Aug	2.2	0.8	0.6	0.5	9.0	Z	3.4	8.7	4.7	2.5	2.3	6.4	11.4	12.9	12.0	18.7	1.7	0.4	0.8	0.7	0.5	0.6	0.6	0.4	4.4	18.7																							
21-Aug	Z	4.9	2.4	0.8	0.3	0.2	0.4	0.5	0.3	0.4	0.3	0.2	0.2	2.0	0.9	3.6	3.6	22.1	5.6	9.7	1.4	0.6	7.8	1.2	3.0	22.1																							
22-Aug	0.7	Z	2.3	0.4	0.8	0.4	0.2	0.2	0.3	0.4	4.1	1.6	1.4	1.4	4.4	1.1	0.3	0.4	0.3	0.4	0.2	0.2	0.1	1.0	4.4																								
23-Aug	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.8	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8																							
24-Aug	0.2	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2																							
25-Aug	0.0	0.1	0.4	0.1	Z	0.2	0.2	0.2	0.3	0.4	0.1	6.6	18.1	12.6	9.7	22.9	43.4	43.4	2.7	1.3	0.8	0.5	1.6	0.4	7.2	43.4																							
26-Aug	0.3	0.2	0.1	0.1	0.1	Z	0.4	0.5	2.2	1.2	1.8	4.4	0.8	0.4	0.2	0.6	3.0	4.2	0.5	0.6	0.4	0.4	0.3	0.3	1.0	4.4																							
27-Aug	Z	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.5	8.0	4.8	11.3	10.2	5.1	4.1	5.8	11.7	2.7	4.3	68.5	4.3	1.5	0.8	0.6	6.3	68.5																							
28-Aug	2.3	Z	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	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	0.2	2.3																							
29-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	M	23.6	18.4	20.2	5.2	0.8	0.5	0.4	0.5	0.5	3.2	23.6																							
30-Aug	1.1	0.6	0.6	Z	0.3	0.2	0.1	0.1	0.3	0.4	0.6	1.0	0.7	1.0	0.8	1.2	1.3	0.9	0.7	5.1	0.6	0.8	0.5	0.3	0.8	5.1																							
31-Aug	1.3	0.8	0.7	0.7	Z	4.4	4.5	1.8	0.7	2.0	1.4	8.6	4.6	17.9	24.9	6.6	1.3	0.9	0.6	0.5	0.4	0.3	0.2	0.2	3.7	24.9																							
																								0.5	0.5	1.9	0.8	0.7	1.1	0.9	1.4	1.1	1.5	2.1	3.6	3.1	2.4	2.7	3.2	3.3	4.0	1.5	5.3	1.3	3.8	1.5	0.7	Diurnal Average	
																								2.3	4.9	26.8	8.6	9.0	17.3	10.6	8.7	10.8	9.8	18.3	14.1	18.1	17.9	24.9	23.6	43.4	43.4	6.9	68.5	14.2	83.3	12.2	6.5	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				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
Lower Camp - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Lower Camp - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	667	94.74	94.74
11 - 20	26	3.69	98.44
21 - 60	9	1.28	99.72
61 - 110	2	0.28	100.00
111 - 172	0	0.00	100.00
> 172	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Lower Camp - August 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	2	2	1	1	10	77	56	9	2	8	18	18	32	44	23	27	330
11 - 20	0	0	0	1	1	0	0	3	2	2	0	0	1	0	1	3	14
21 - 60	1	0	0	0	0	0	0	3	4	0	0	0	0	0	0	0	8
61 - 110	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
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	3	2	1	2	11	77	56	16	9	10	18	18	33	44	24	30	354

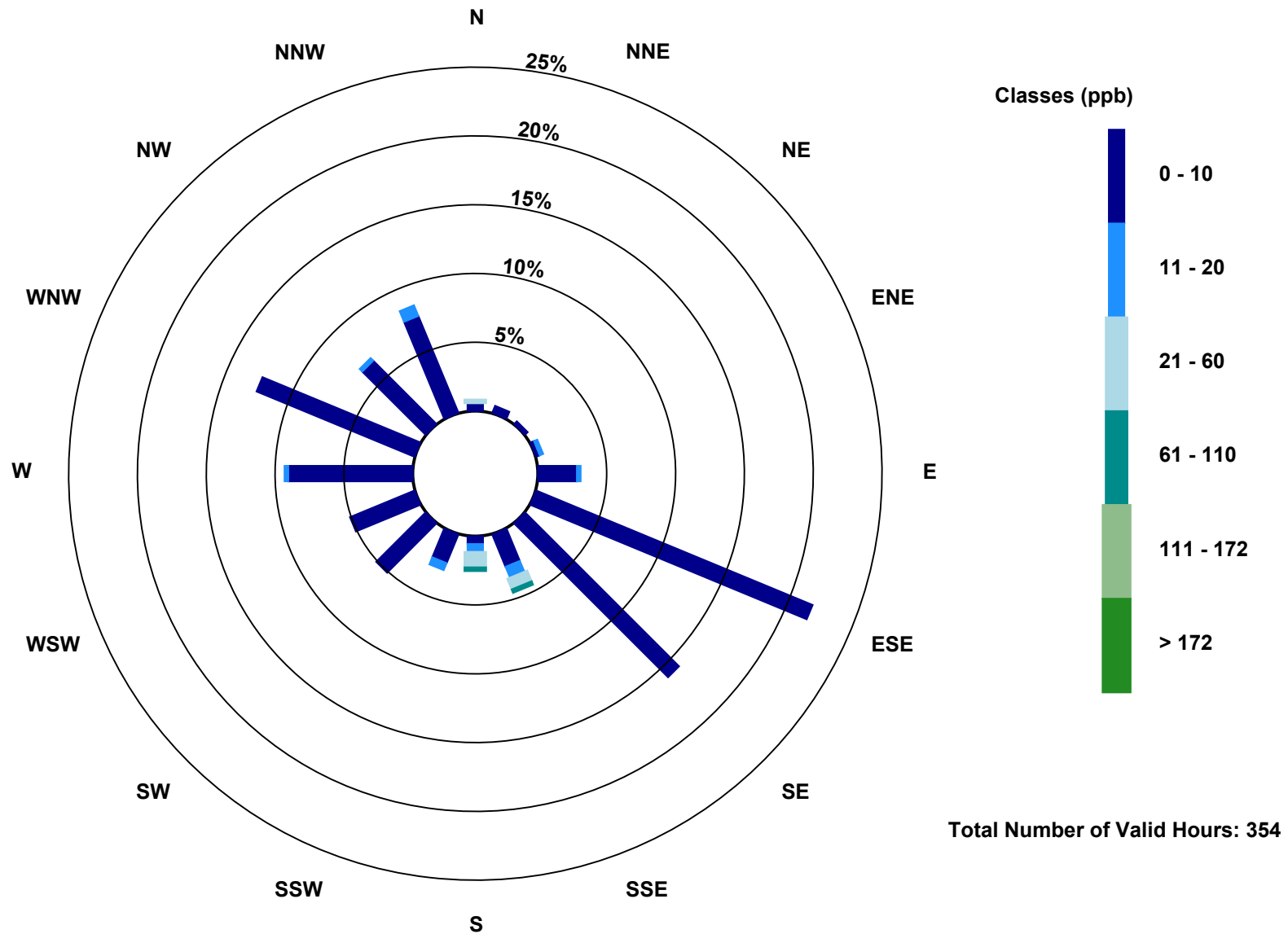
Total Number of Valid Hours: 354

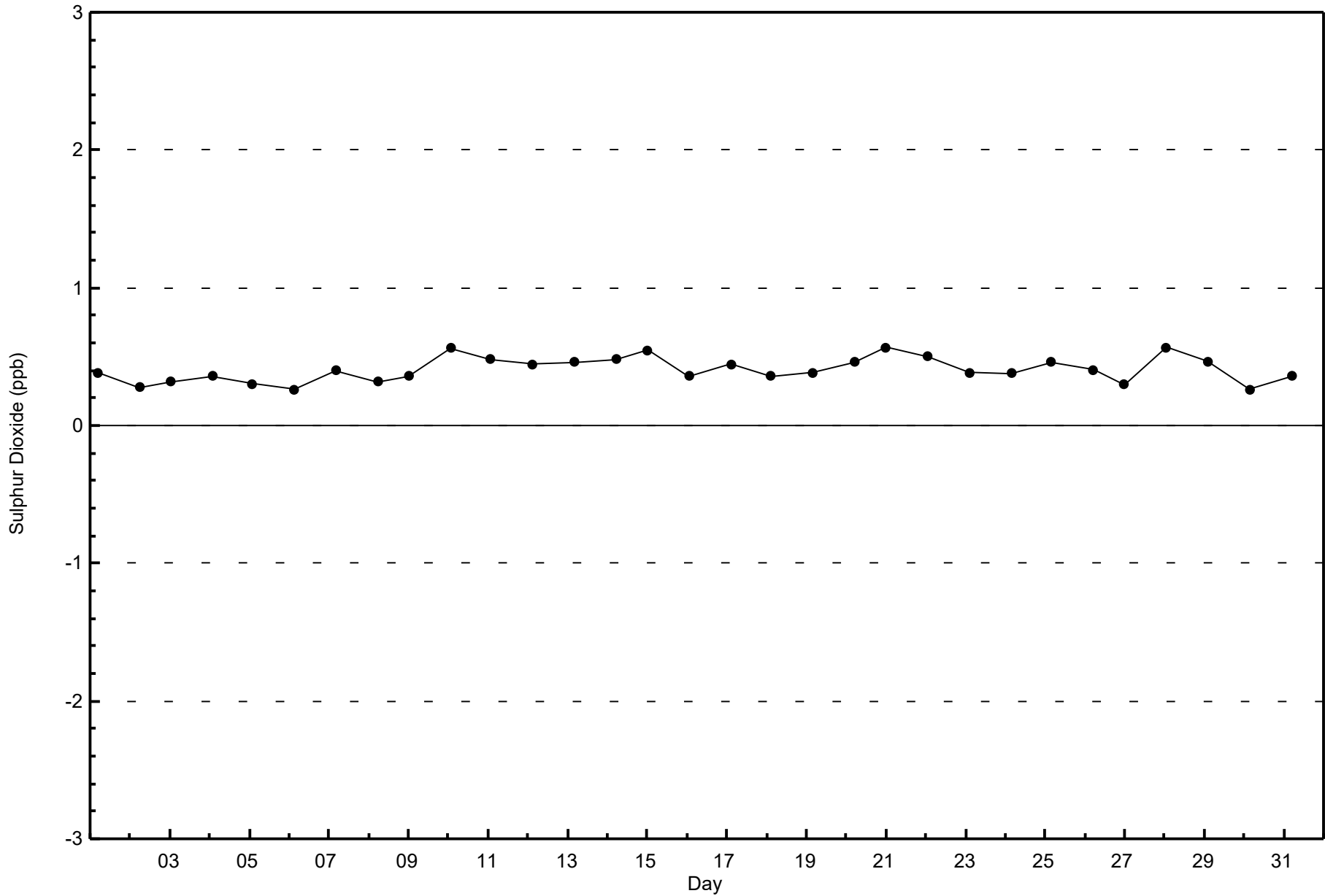
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Lower Camp

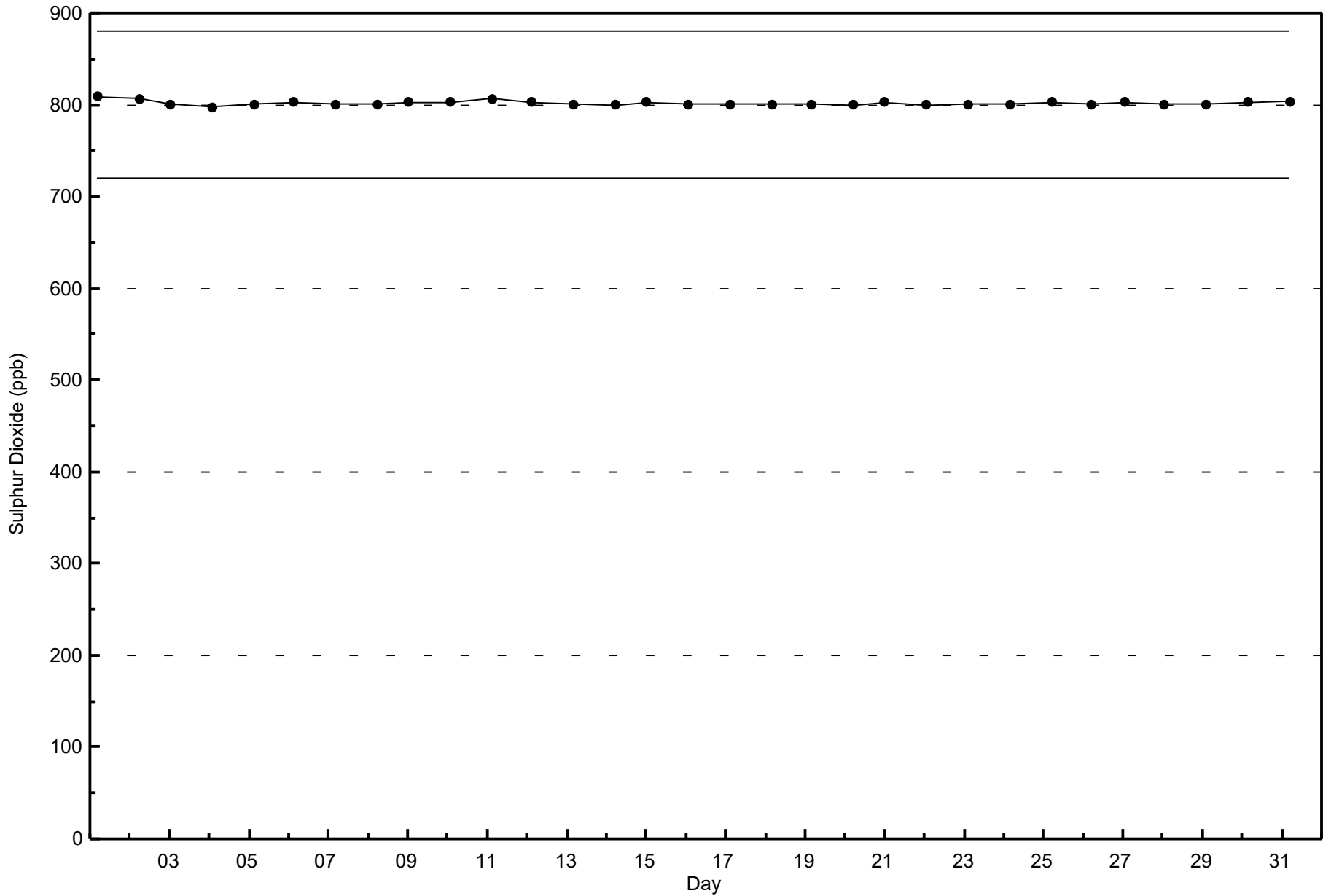






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Lower Camp - August 2023



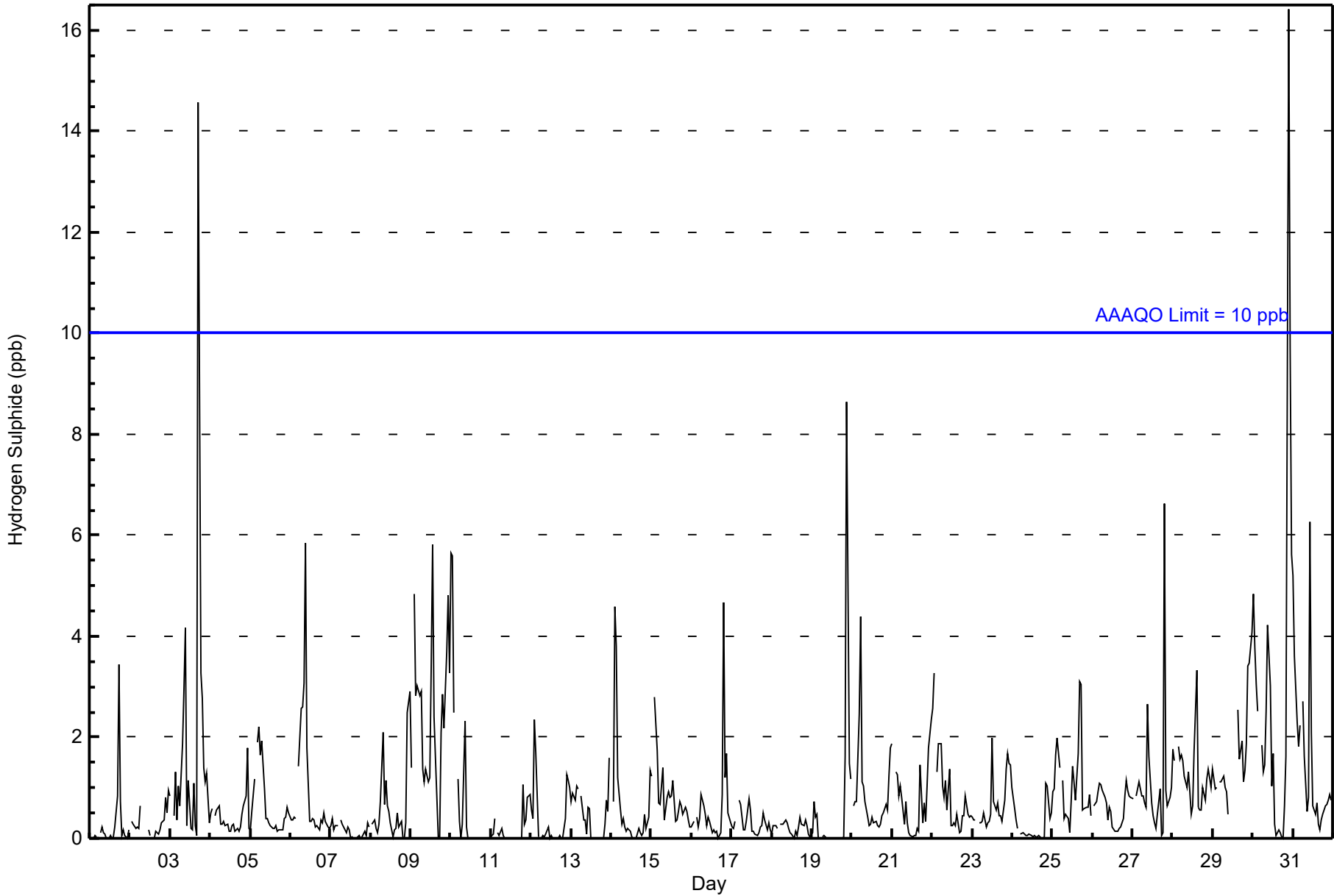


Number of Exceedences (AAAQO):	1-hr: 2	24-hr: 0	Hours in Service:	744
Maximum Value: 16.4 ppb on Aug 30 22:00	Maximum Daily Average: 2.9 ppb on Aug 30		Hours of Data:	703
Minimum Value: 0.0 ppb on Aug 1 01:00	Minimum Daily Average: 0.2 ppb on Aug 7		Hours of Missing Data:	41
Maximum Diurnal Average: 1.6 ppb at hour 22	Minimum Diurnal Average: 0.4 ppb at hour 17		Hours of Calibration:	36
Monthly Average: 0.85 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.2 Median = 0.4 Q ₃ = 1.0 P ₉₀ = 2.0 P ₉₉ = 5.8		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-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.8	3.4	0.7	0.1	0.2	0.1	0.0	0.2	0.3	0.4	0.8	0.5	0.9	0.3	3.4
2-Aug	Z	0.3	0.3	0.2	0.2	0.2	0.6	PF	PF	PF	PF	0.2	0.1	PF	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.8	0.5	0.9	0.3	0.9	0.3	0.9	0.3	0.9
3-Aug	0.8	Z	0.4	1.3	0.4	1.0	0.7	1.9	3.0	4.2	0.3	1.2	0.2	0.2	1.1	0.3	0.0	14.6	3.3	2.8	1.4	1.1	1.3	0.3	1.8	14.6	1.8	14.6	1.8	
4-Aug	0.5	0.6	Z	0.4	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.3	0.3	0.1	0.2	0.1	0.2	0.5	0.6	0.8	1.8	0.2	0.4	1.8	0.4	1.8	0.4	1.8
5-Aug	0.2	0.5	1.2	Z	1.9	2.2	1.6	1.9	1.0	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.1	0.2	0.2	0.2	0.4	0.4	0.6	0.5	0.7	2.2	0.7	2.2	0.7	2.2
6-Aug	0.4	0.4	0.4	0.4	Z	1.4	2.6	2.6	3.1	5.9	1.8	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.4	0.3	0.5	0.3	0.2	0.2	1.0	5.9	1.0	5.9	1.0	5.9
7-Aug	0.3	0.4	0.2	0.2	0.2	Z	0.4	0.3	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.2	0.4	0.2	0.4	0.2	0.4
8-Aug	Z	0.3	0.4	0.2	0.1	0.3	0.7	2.1	0.7	1.1	0.6	0.5	0.3	0.0	0.2	0.2	0.5	0.2	0.3	0.0	0.0	0.3	2.5	2.9	0.6	2.9	0.6	2.9	0.6	2.9
9-Aug	1.4	Z	4.8	2.8	3.0	2.8	2.9	1.4	1.1	1.4	1.1	1.2	3.4	5.8	2.4	1.6	0.0	0.0	2.1	2.9	2.2	3.7	4.8	3.3	2.4	5.8	2.4	5.8	2.4	5.8
10-Aug	5.6	5.6	2.5	Z	1.2	0.3	0.0	0.3	2.3	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	0.8	5.6	0.8	5.6	0.8	5.6
11-Aug	0.0	0.1	0.4	Z	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	0.0	1.1	0.3	0.4	0.8	0.9	0.2	1.1	0.2	1.1	0.2	1.1
12-Aug	0.6	0.4	2.3	1.7	0.0	Z	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.3	1.2	1.0	0.4	2.3	0.4	2.3	0.4	2.3
13-Aug	0.7	0.9	0.7	1.0	1.0	Z	0.9	0.4	0.4	0.1	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.5	1.6	0.5	1.6	0.5	1.6	0.5	1.6	
14-Aug	Z	0.7	4.6	3.8	1.2	0.6	0.3	0.4	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.5	0.2	0.4	1.3	0.7	4.6	0.7	4.6	0.7	4.6
15-Aug	1.2	Z	2.8	1.7	0.7	0.7	1.0	1.4	0.4	0.8	0.9	0.8	0.9	1.2	0.3	0.4	0.5	0.7	0.6	0.5	0.6	0.5	0.4	0.2	0.8	2.8	0.8	2.8	0.8	2.8
16-Aug	0.2	0.3	Z	0.4	0.2	0.4	0.9	0.7	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.9	4.7	1.2	1.7	0.5	0.3	0.6	4.7	0.6	4.7	0.6	4.7
17-Aug	0.2	0.2	0.3	Z	0.8	0.7	0.4	0.2	0.2	0.3	0.8	0.6	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.5	0.4	0.2	0.3	0.2	0.3	0.8	0.3	0.8	0.3	0.8
18-Aug	0.1	0.2	0.3	0.2	Z	0.3	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.4	0.3	0.2	0.4	0.2	0.1	0.0	0.2	0.4	0.2	0.4	0.2	0.4
19-Aug	0.1	0.7	0.4	0.5	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	1.6	8.6	1.5	1.2	0.6	8.6	0.6	8.6	0.6	8.6
20-Aug	Z	0.6	0.7	0.7	2.5	4.4	1.1	1.0	0.7	0.4	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.7	0.6	1.2	1.8	0.9	4.4	0.9	4.4	0.9	4.4
21-Aug	1.9	Z	1.3	1.2	0.8	1.0	0.8	0.3	0.7	0.3	0.1	0.1	0.0	0.0	0.1	0.2	0.1	1.5	0.3	0.7	0.3	1.0	1.8	2.3	0.7	2.3	0.7	2.3	0.7	2.3
22-Aug	2.6	3.3	Z	1.3	1.9	1.9	1.0	0.8	1.1	0.6	1.4	0.2	0.2	0.3	0.2	0.5	0.1	0.1	0.4	0.5	0.8	0.5	0.4	0.4	0.9	3.3	0.9	3.3	0.9	3.3
23-Aug	0.4	0.4	0.3	Z	0.3	0.3	0.3	0.5	0.2	0.3	0.3	0.5	2.0	0.7	0.6	0.7	0.5	0.4	0.3	0.7	1.4	1.7	1.5	1.5	0.7	2.0	0.7	2.0	0.7	2.0
24-Aug	1.0	0.6	0.4	0.2	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	1.1	1.0	0.4	0.5	0.3	1.1	0.3	1.1	0.3	1.1
25-Aug	0.9	1.0	1.7	2.0	1.4	Z	1.1	0.4	0.5	0.4	0.1	0.7	1.4	1.1	0.8	1.7	3.1	3.0	0.6	0.6	0.6	0.9	0.4	1.1	3.1	1.1	3.1	1.1	3.1	
26-Aug	Z	0.6	0.7	0.9	1.1	1.1	1.0	0.8	0.7	0.4	0.6	0.5	0.2	0.1	0.1	0.1	0.2	0.2	0.4	0.8	1.2	1.0	0.8	0.8	0.6	1.2	0.6	1.2	0.6	1.2
27-Aug	0.8	Z	0.8	1.0	1.1	0.8	0.9	0.7	0.6	2.6	1.6	0.7	0.4	0.3	0.2	0.5	1.0	0.1	0.1	6.6	0.9	0.7	0.8	1.0	1.1	6.6	1.1	6.6	1.1	6.6
28-Aug	1.8	1.5	Z	1.8	1.6	1.7	1.6	1.2	1.0	1.3	0.9	0.5	0.7	1.7	3.3	0.6	0.6	0.6	1.0	0.8	1.2	1.4	1.2	1.0	1.3	3.3	1.3	3.3	1.3	3.3
29-Aug	1.4	1.0	1.0	Z	1.1	1.1	1.2	1.0	0.9	0.5	C	C	C	C	C	2.5	1.6	1.9	1.1	1.3	1.9	3.4	3.5	4.1	1.7	4.1	1.7	4.1	1.7	4.1
30-Aug	4.8	3.8	3.0	2.5	Z	1.8	1.3	1.5	2.5	4.2	3.0	1.0	1.7	0.3	0.1	0.2	0.1	0.0	0.0	0.6	1.6	16.4	9.7	5.6	2.9	16.4	2.9	16.4	2.9	16.4
31-Aug	5.2	3.6	2.3	1.8	2.2	Z	2.7	1.6	0.5	0.8	6.3	2.1	0.6	0.5	0.7	0.3	0.2	0.4	0.5	0.6	0.7	0.8	0.9	0.7	1.6	6.3	1.6	6.3	1.6	6.3

1.3	1.1	1.3	1.1	0.9	1.1	0.9	0.8	0.8	0.9	0.8	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.9	0.5	0.9	0.8	1.6	1.3	1.2	Diurnal Average	
5.6	5.6	4.8	3.8	3.0	4.4	2.9	2.6	3.1	5.9	6.3	2.1	3.4	5.8	3.3	2.5	3.1	14.6	3.3	6.6	2.2	16.4	9.7	5.6	Diurnal Maximum		

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
Lower Camp - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	648	92.18	92.18
3 - 4	38	5.41	97.58
5 - 7	13	1.85	99.43
8 - 11	2	0.28	99.72
> 11	2	0.28	100.00

Total Number of Valid Hours: 703

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Lower Camp - August 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	3	2	1	2	11	66	49	12	6	9	17	19	31	41	24	29	322
3 - 4	0	0	0	1	1	5	2	2	2	0	0	0	3	2	0	1	19
5 - 7	0	0	0	0	0	1	1	3	0	0	1	0	0	0	0	0	6
8 - 11	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
> 11	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Totals	3	2	1	3	12	73	53	17	9	9	18	19	34	43	24	30	350

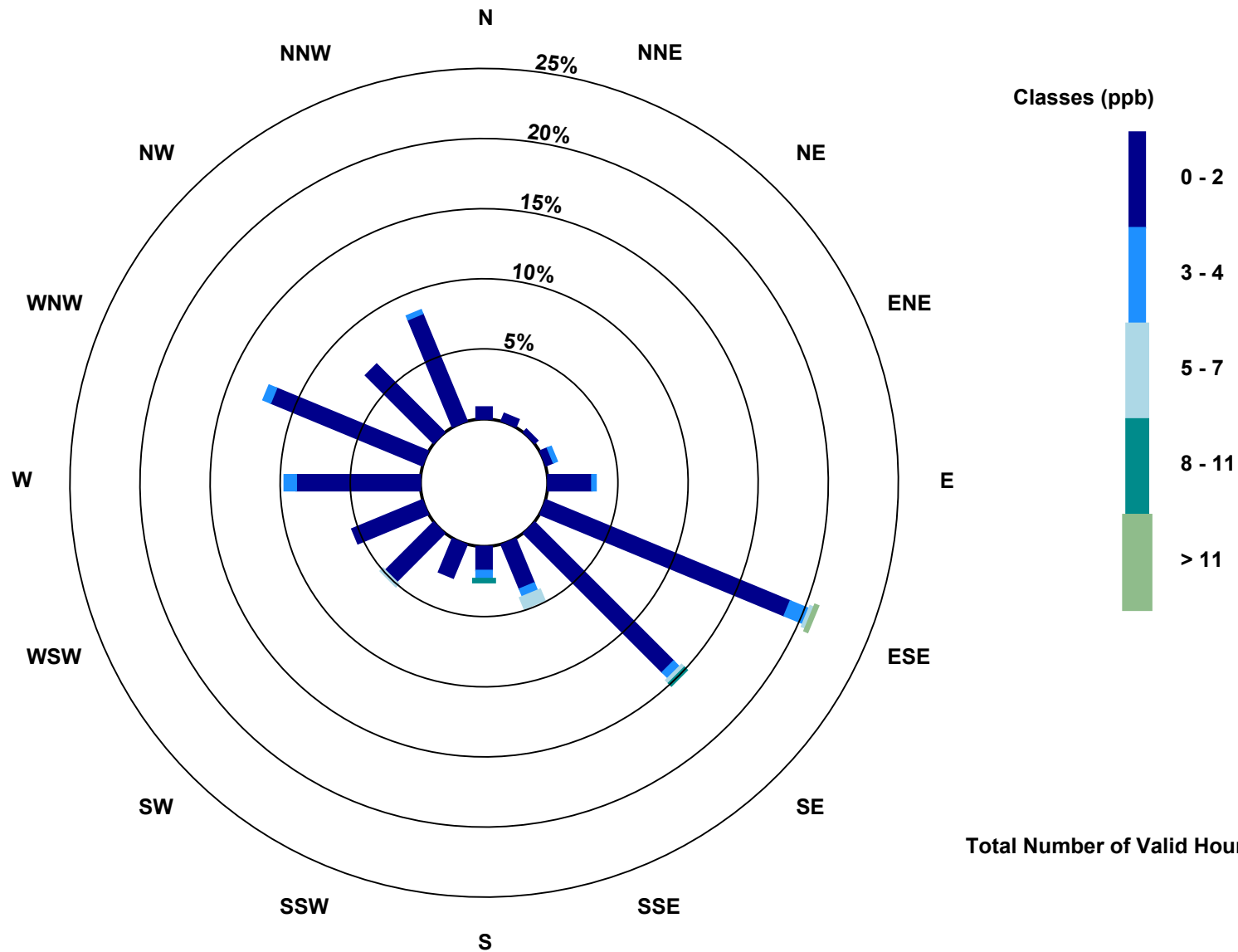
Total Number of Valid Hours: 350

Total Number of Hours: 744

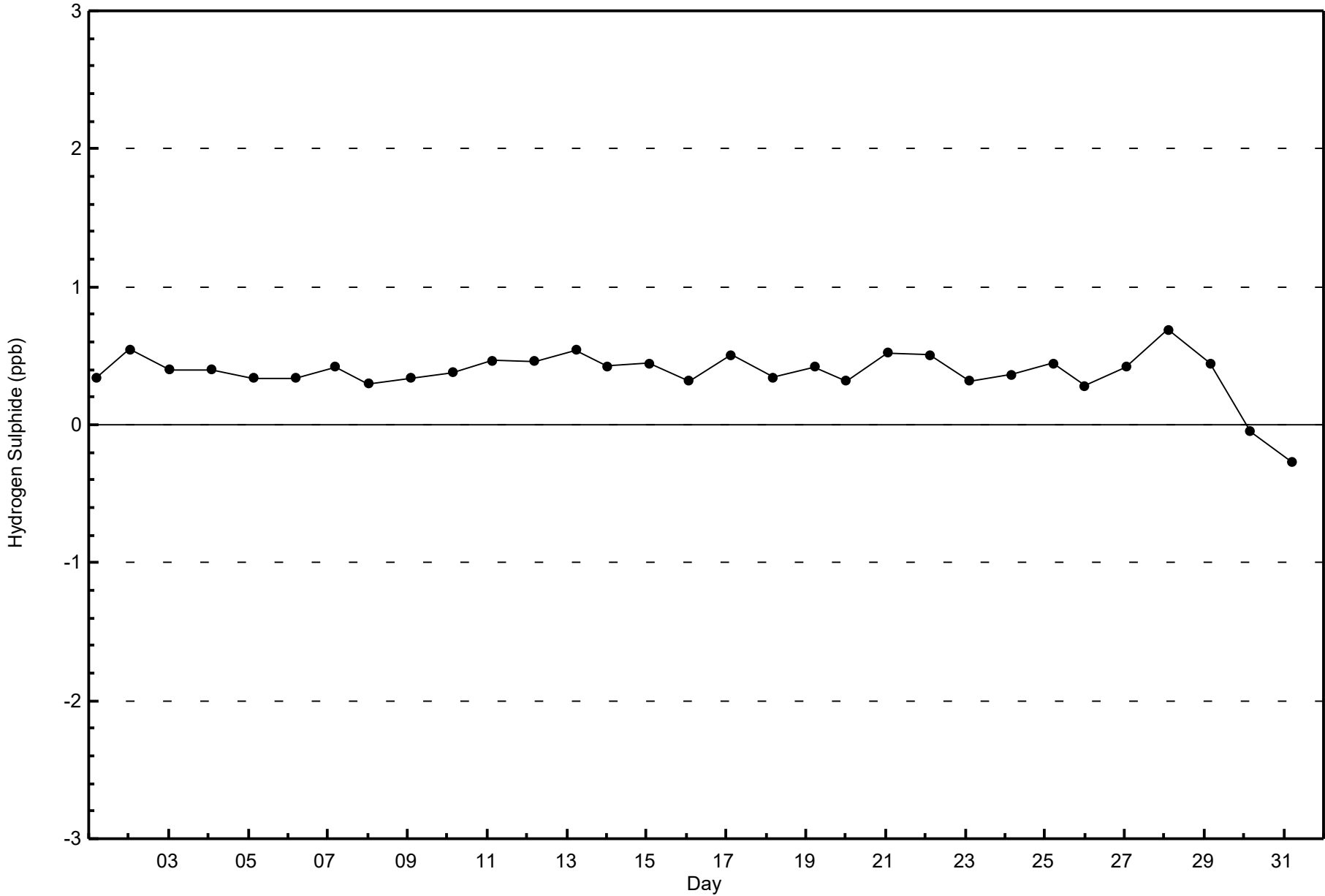


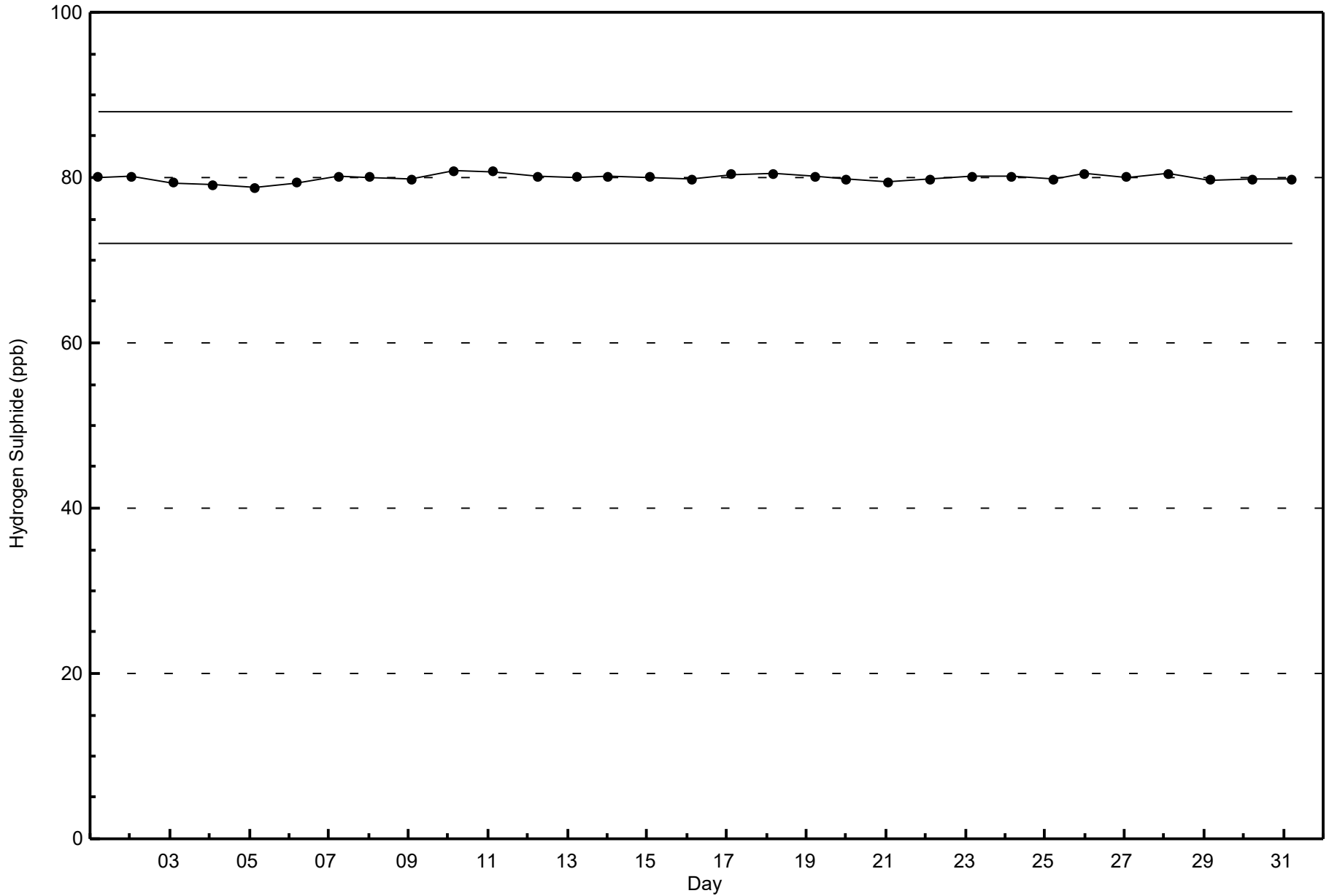
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Lower Camp



Total Number of Valid Hours: 350

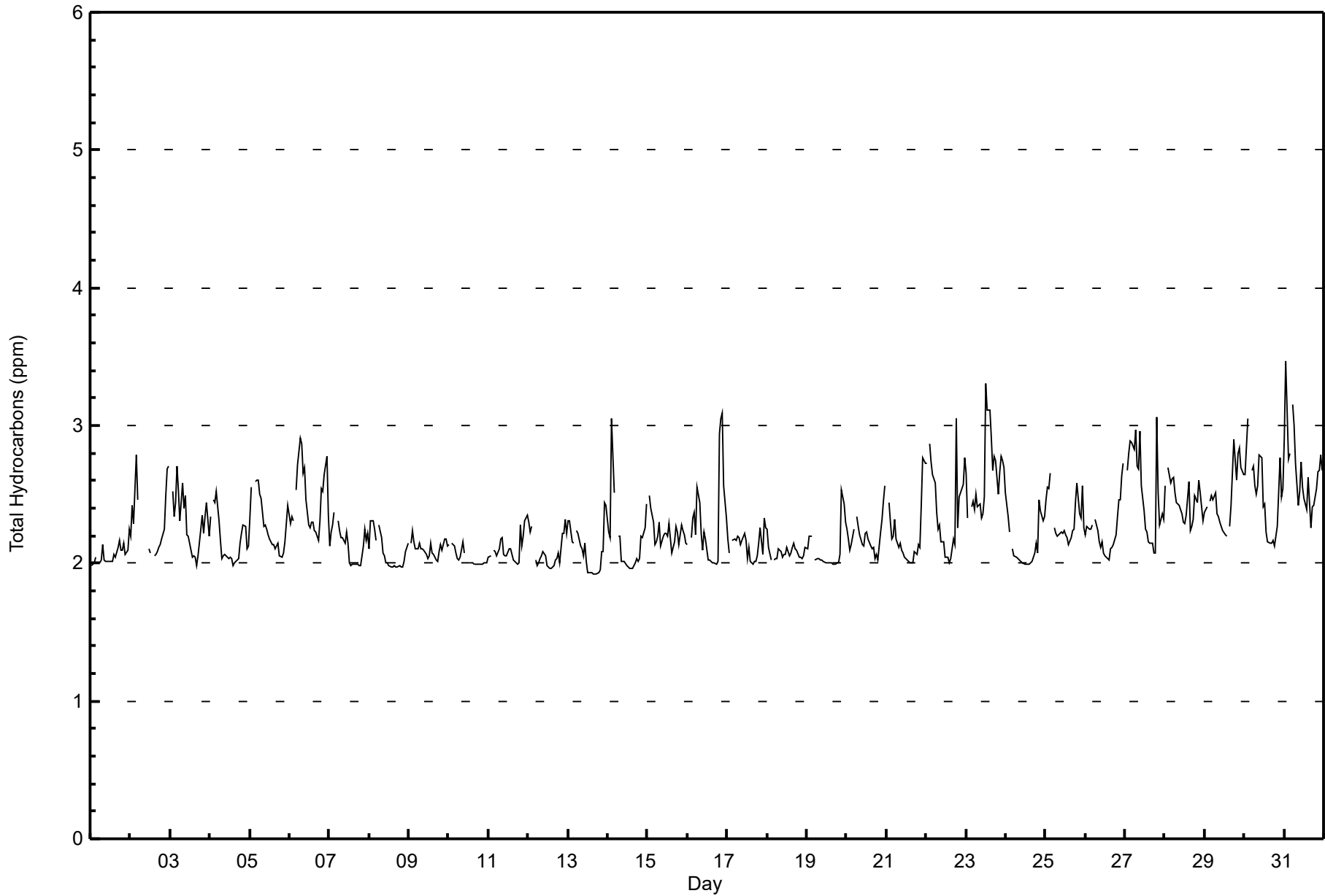






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Lower Camp - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Lower Camp - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	165	23.44	23.44
2.1 - 3.0	531	75.43	98.86
3.1 - 10.0	8	1.14	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Lower Camp - August 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	1	0	1	0	5	3	1	1	2	12	11	1	5	4	13	61
2.1 - 3.0	2	1	1	1	11	72	53	12	8	7	6	7	30	37	20	17	285
3.1 - 10.0	0	0	0	0	0	0	0	3	0	1	0	0	2	2	0	0	8
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	3	2	1	2	11	77	56	16	9	10	18	18	33	44	24	30	354

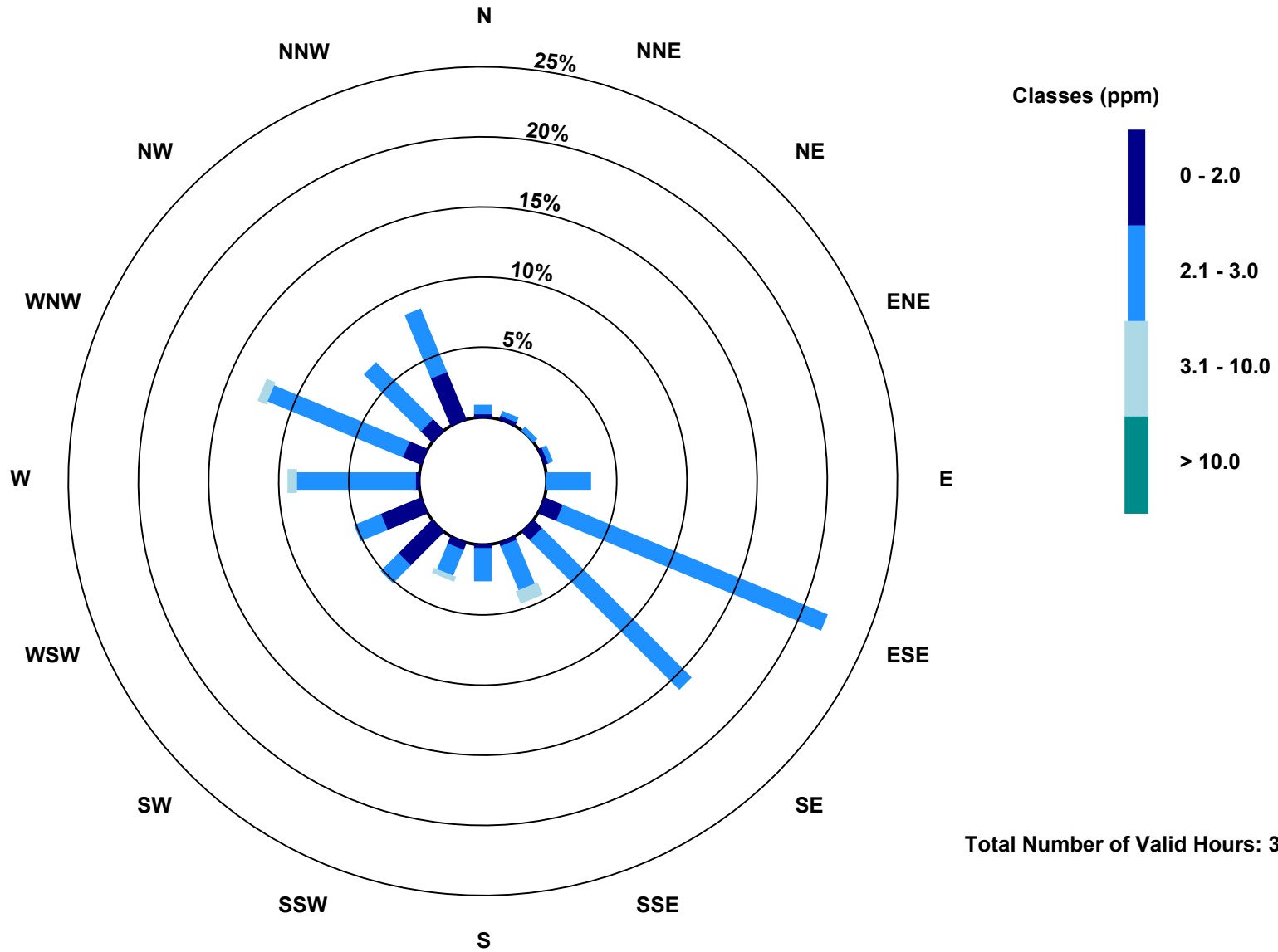
Total Number of Valid Hours: 354

Total Number of Hours: 744

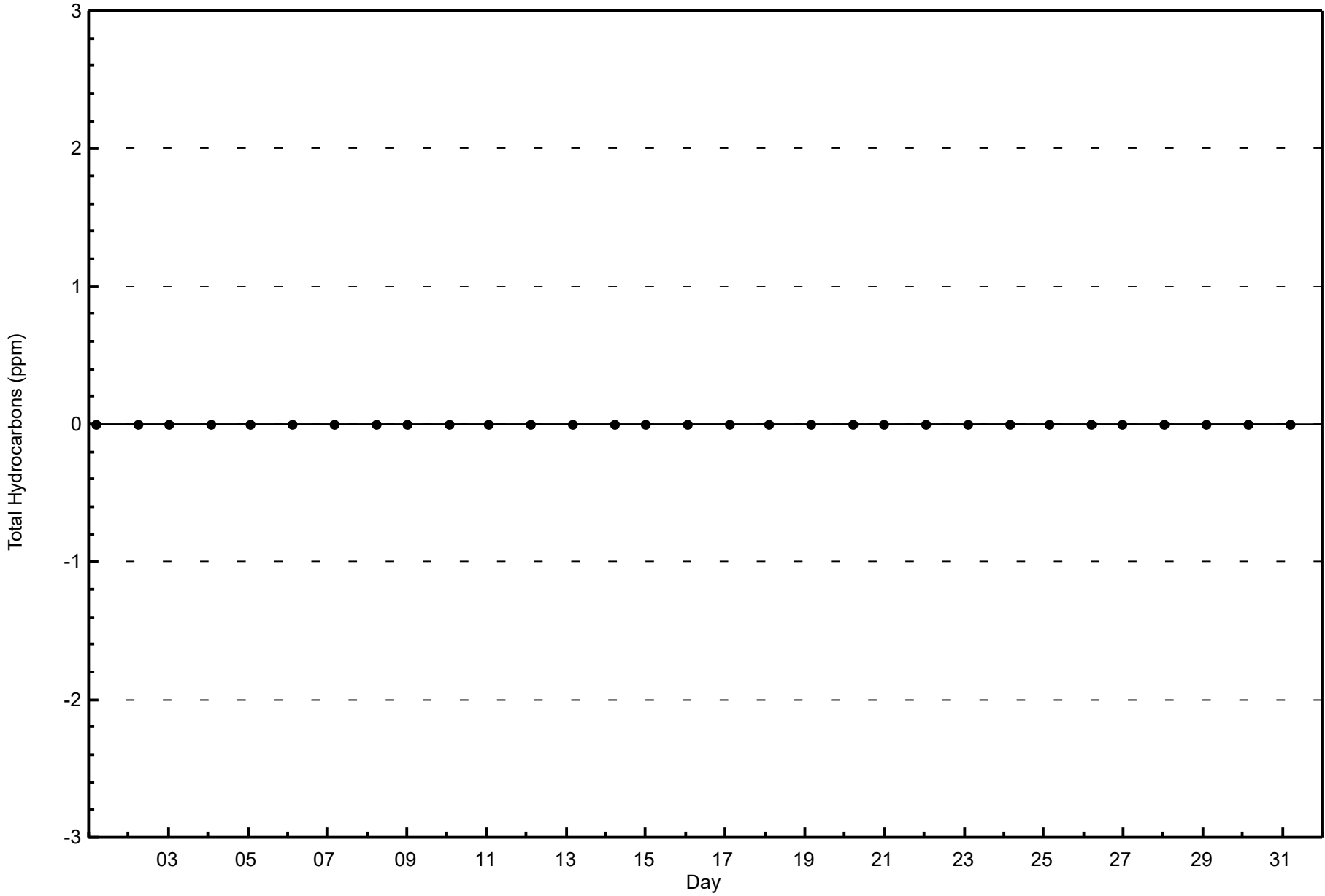


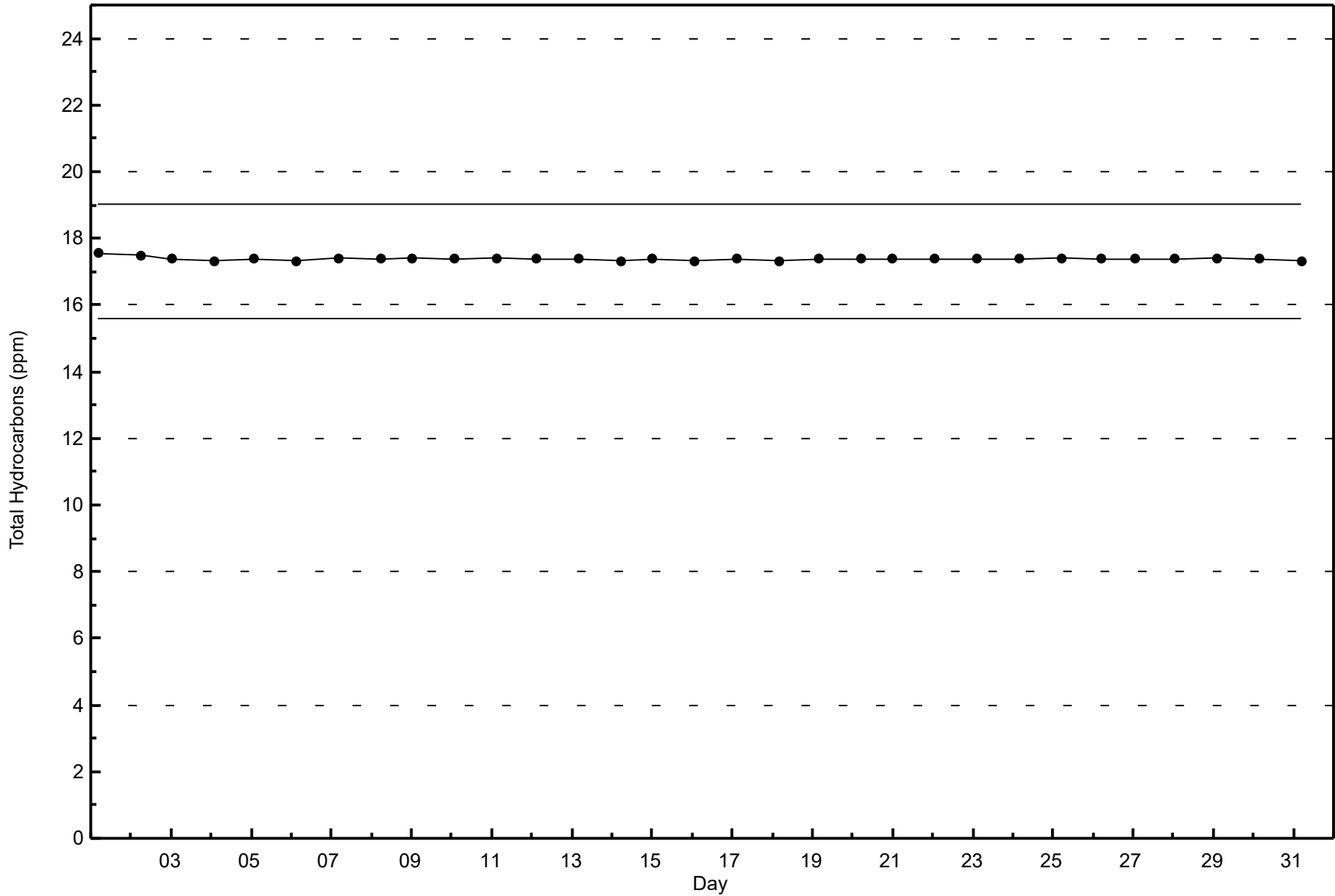
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Lower Camp



Total Number of Valid Hours: 354







Wood Buffalo Environmental Association

Summary of Hour Averages

Methane (CH₄) - ppm

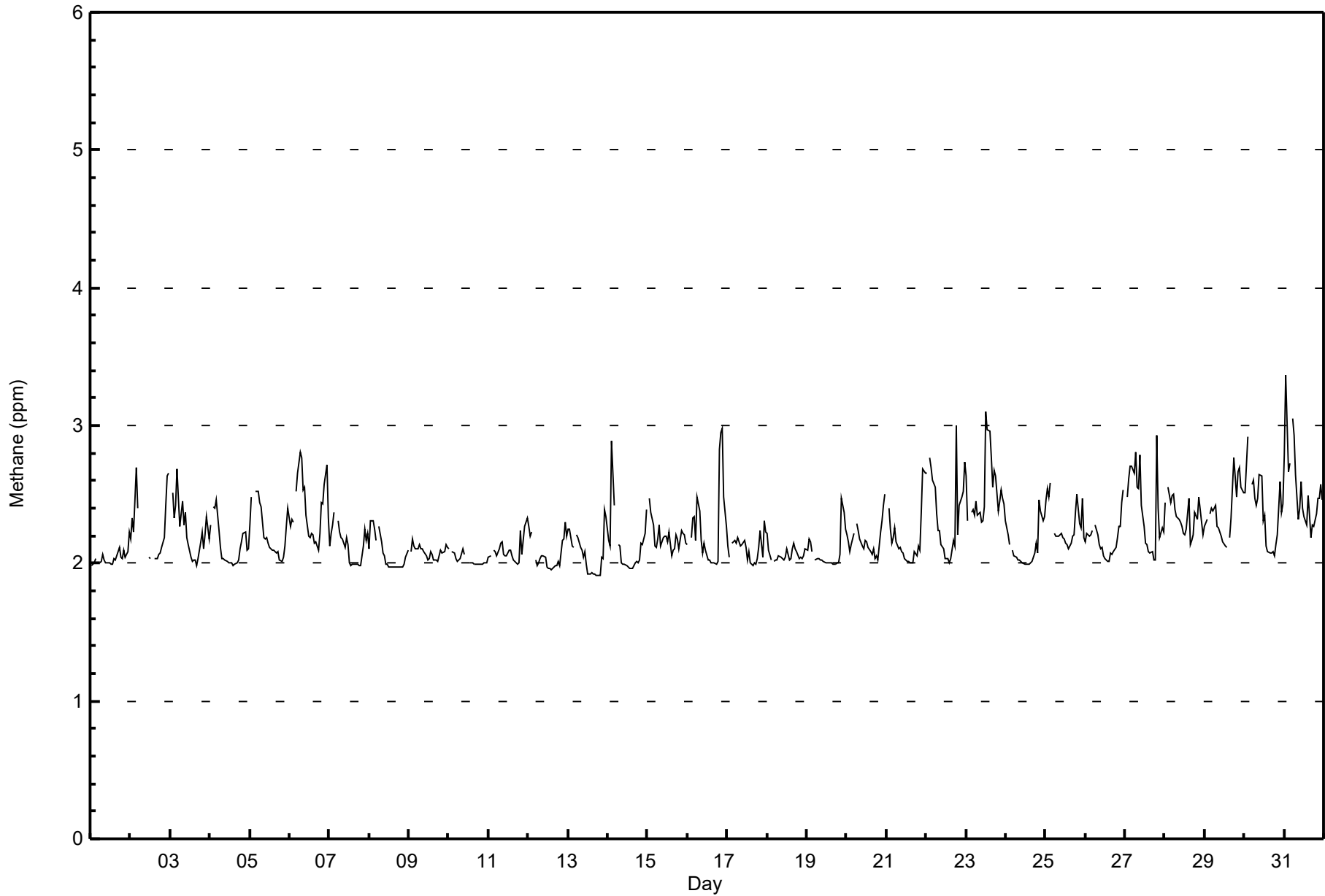
Lower Camp - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																												
Maximum Value: 3.4 ppm on Aug 31 02:00		Maximum Daily Average: 2.5 ppm on Aug 31		Hours of Data: 704														704																														
Minimum Value: 1.9 ppm on Aug 13 19:00		Minimum Daily Average: 2.0 ppm on Aug 10		Hours of Missing Data: 40														40																														
Maximum Diurnal Average: 2.3 ppm at hour 4		Minimum Diurnal Average: 2.1 ppm at hour 16		Hours of Calibration: 34														34																														
Monthly Average: 2.21 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 = 2.9		Percent Operational Time: 99.2														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-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.1	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	2.2	2.2	2.0	2.2																						
2-Aug	2.2	2.3	2.2	2.7	2.4	Z	2.4	PF	PF	PF	PF	2.0	2.0	PF	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.4	2.6	2.7	2.3	2.7																						
3-Aug	Z	2.5	2.3	2.4	2.7	2.5	2.3	2.5	2.3	2.4	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.7																						
4-Aug	2.3	Z	2.4	2.4	2.5	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	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.5																						
5-Aug	2.3	2.5	Z	2.5	2.5	2.5	2.4	2.4	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.4	2.2	2.5																							
6-Aug	2.3	2.3	2.3	Z	2.5	2.7	2.8	2.8	2.5	2.6	2.4	2.2	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.4	2.4	2.6	2.7	2.3	2.4	2.8																						
7-Aug	2.1	2.2	2.3	2.4	Z	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.2	2.2	2.1	2.4	2.4																						
8-Aug	2.1	2.3	2.3	2.3	2.2	Z	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3																						
9-Aug	Z	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2																						
10-Aug	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1																						
11-Aug	2.0	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.2	2.1	2.2	2.3	2.3	2.1	2.3																						
12-Aug	2.3	2.2	2.2	Z	2.0	2.0	2.0	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	2.2	2.2	2.3	2.2	2.1	2.3																						
13-Aug	2.2	2.3	2.1	2.1	Z	2.2	2.2	2.1	2.1	2.0	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.4	2.3	2.1	2.4																						
14-Aug	2.2	2.1	2.9	2.7	2.4	Z	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	2.1	2.1	2.2	2.4	2.1	2.9																							
15-Aug	Z	2.5	2.4	2.3	2.1	2.1	2.2	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.5																						
16-Aug	2.1	Z	2.2	2.3	2.3	2.2	2.5	2.4	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.8	2.9	3.0	2.5	2.3	2.3	3.0																						
17-Aug	2.1	2.0	Z	2.1	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.2	2.0	2.3	2.2	2.1	2.3	2.3																						
18-Aug	2.2	2.1	2.0	Z	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.1	2.2																						
19-Aug	2.1	2.2	2.2	2.1	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	2.5	2.4	2.3	2.1	2.5	2.5																						
20-Aug	2.2	2.2	2.1	2.1	2.2	Z	2.3	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.2	2.3	2.4	2.5	2.2	2.5																						
21-Aug	Z	2.4	2.3	2.1	2.2	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.4	2.7	2.7	2.2	2.7	2.7																						
22-Aug	2.7	Z	2.8	2.7	2.6	2.6	2.4	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.1	3.0	2.2	2.4	2.5	2.5	2.7	2.4	3.0																						
23-Aug	2.6	2.3	Z	2.4	2.4	2.4	2.5	2.3	2.4	2.3	2.3	2.4	3.1	3.0	3.0	2.8	2.6	2.7	2.6	2.4	2.5	2.5	2.5	2.4	2.5	3.1																						
24-Aug	2.3	2.2	2.1	Z	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.1	2.5	2.4	2.3	2.3	2.1	2.5	2.5																						
25-Aug	2.5	2.5	2.5	2.6	Z	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	2.4	2.5	2.3	2.3	2.5	2.2	2.3	2.6																						
26-Aug	2.2	2.2	2.2	2.2	2.2	Z	2.3	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	2.3	2.3	2.4	2.5	2.2	2.5																						
27-Aug	Z	2.5	2.6	2.7	2.7	2.7	2.8	2.6	2.5	2.8	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.9	2.4	2.2	2.3	2.2	2.4	2.9																						
28-Aug	2.4	Z	2.6	2.4	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.5	2.1	2.2	2.2	2.4	2.3	2.5	2.4	2.3	2.2	2.3	2.6																						
29-Aug	2.3	2.3	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	M	2.2	2.3	2.8	2.6	2.5	2.7	2.7	2.6	2.5	2.4	2.8																						
30-Aug	2.5	2.7	2.9	Z	2.6	2.6	2.5	2.4	2.5	2.6	2.6	2.3	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.6	2.4	2.4	2.4	2.9																						
31-Aug	2.8	3.4	2.7	2.7	Z	3.1	2.9	2.6	2.3	2.4	2.6	2.4	2.3	2.3	2.5	2.3	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.5	2.5	3.4																						
																								2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	Diurnal Average
																								2.8	3.4	2.9	2.7	2.7	3.1	2.9	2.8	2.5	2.8	2.6	2.4	3.1	3.0	3.0	2.8	2.6	2.8	3.0	2.9	2.9	3.0	2.7	2.7	Diurnal Maximum
Z - zerospan			C - Calibration			M - Maintenance			PF - Power Failure																																							



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Lower Camp - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Lower Camp - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	199	28.27	28.27
2.1 - 3.0	502	71.31	99.57
3.1 - 10.0	3	0.43	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Lower Camp - August 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	1	0	1	0	5	4	2	1	4	13	11	1	6	6	15	71
2.1 - 3.0	2	1	1	1	11	72	52	14	8	5	5	7	31	37	18	15	280
3.1 - 10.0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	3	2	1	2	11	77	56	16	9	10	18	18	33	44	24	30	354

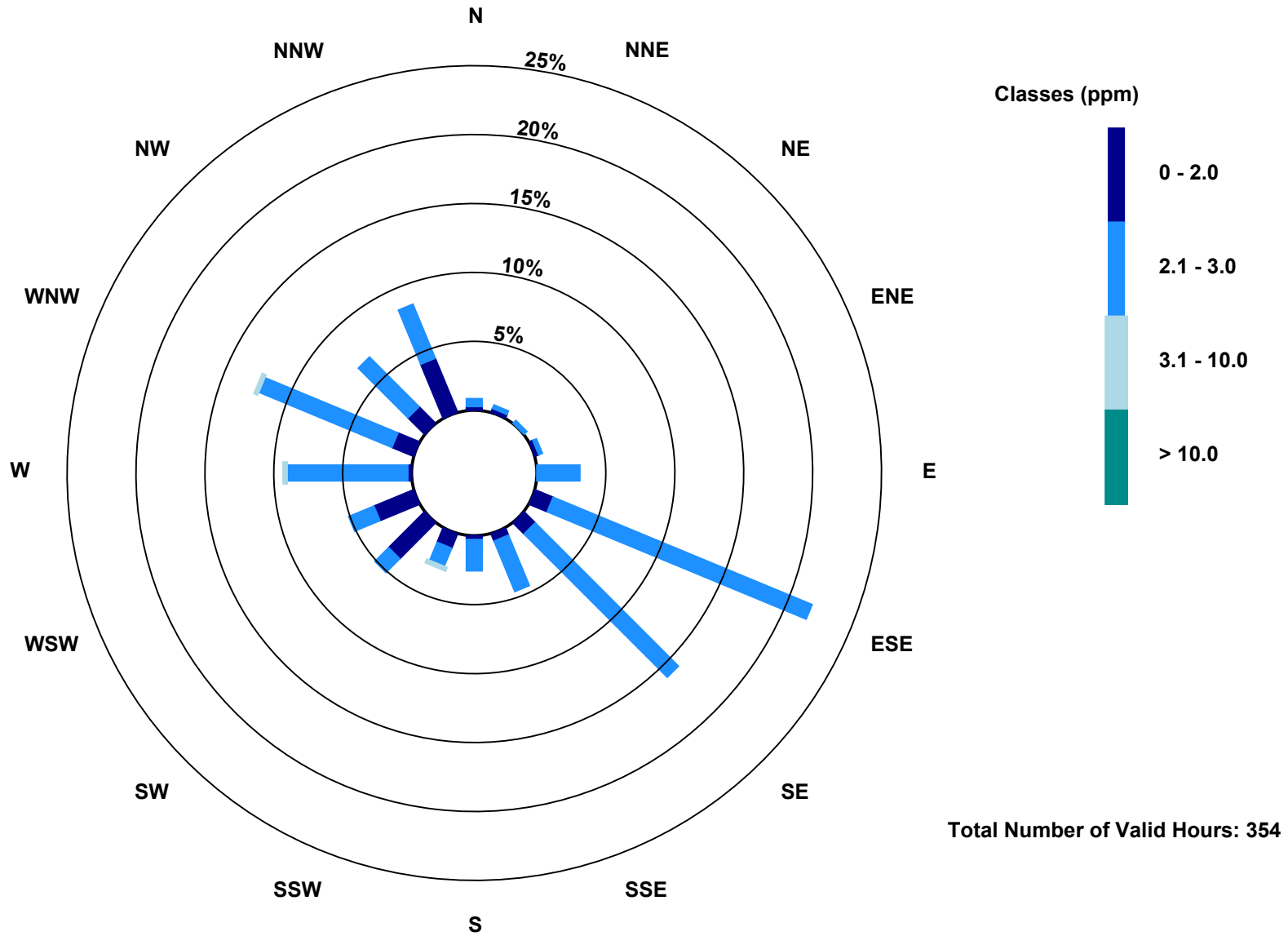
Total Number of Valid Hours: 354

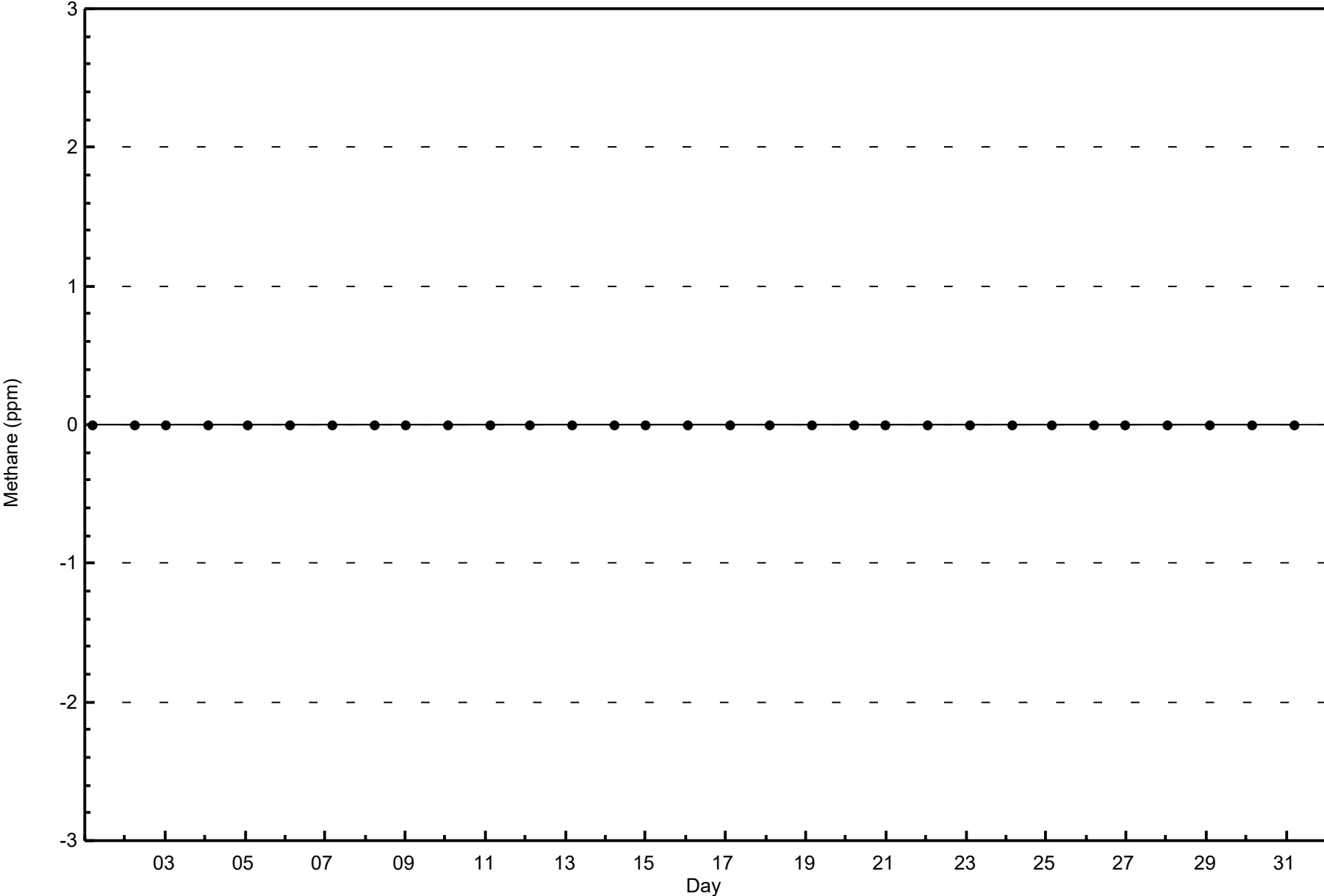
Total Number of Hours: 744

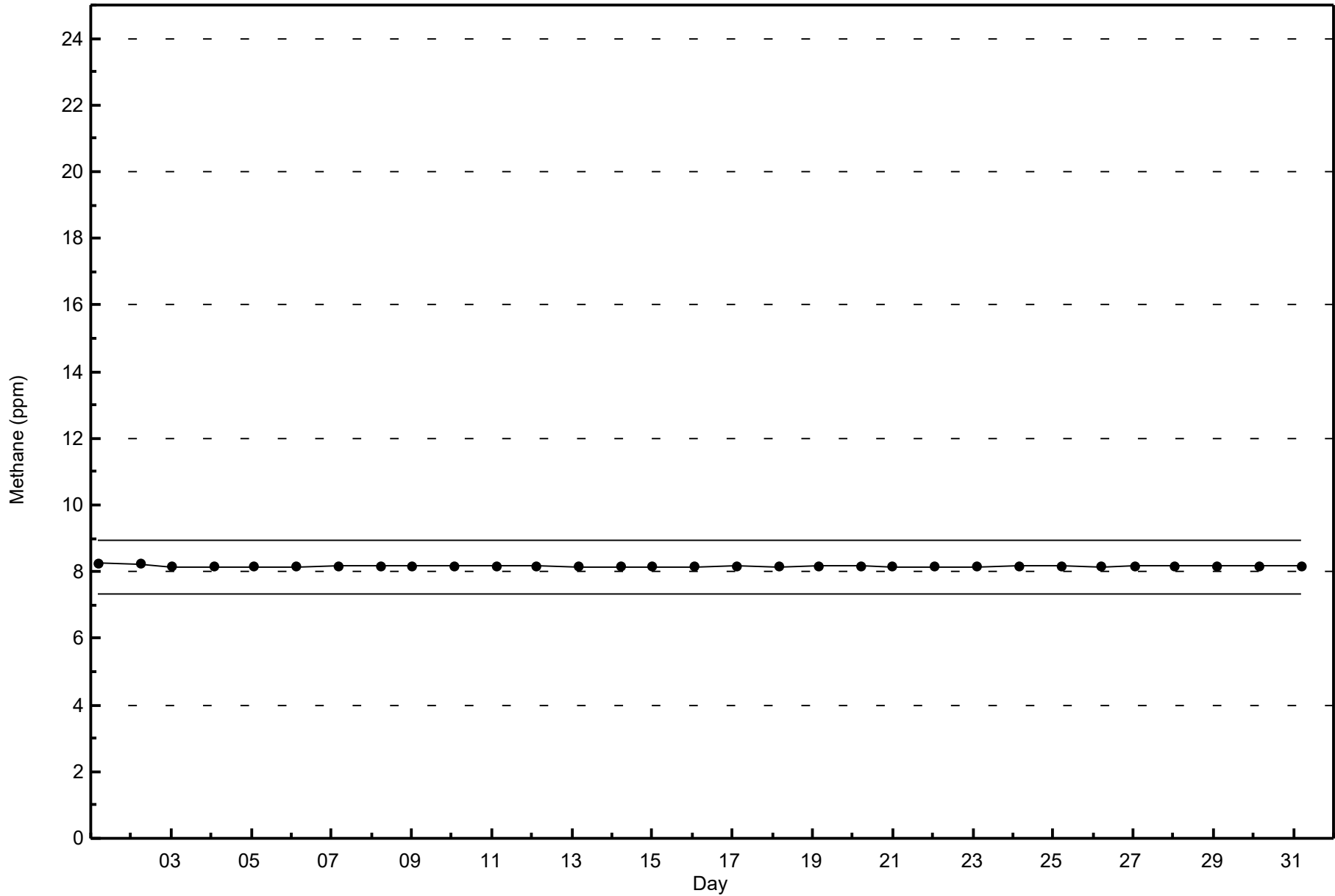


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Lower Camp





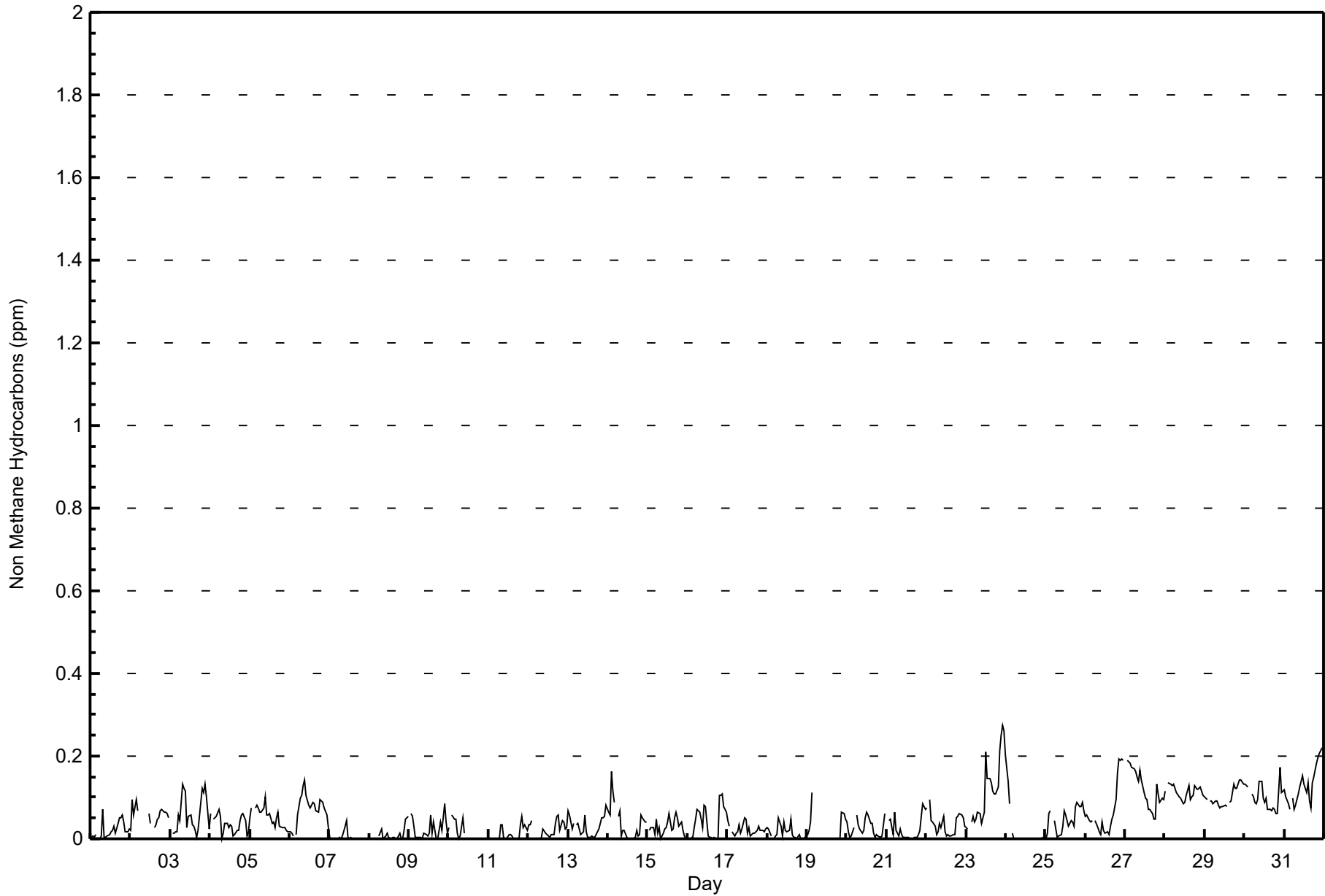




Summary of Hour Averages

Lower Camp - August 2023

Maximum Value: 0.276 ppm on Aug 23 23:00		Maximum Daily Average: 0.130 ppm on Aug 31		Hours in Service:	744																					
Minimum Value: 0.000 ppm on Aug 7 03:00		Minimum Daily Average: 0.004 ppm on Aug 7		Hours of Data:	704																					
Maximum Diurnal Average: 0.072 ppm at hour 22		Minimum Diurnal Average: 0.031 ppm at hour 17		Hours of Missing Data:	40																					
Monthly Average: 0.048 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.1 P ₉₀ = 0.1 P ₉₉ = 0.2		Hours of Calibration:	34																					
				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-Aug	0.002	0.005	0.005	0.009	Z	0.001	0.007	0.072	0.004	0.005	0.007	0.012	0.017	0.022	0.030	0.015	0.038	0.051	0.051	0.057	0.042	0.018	0.017	0.023	0.022	0.072
2-Aug	0.022	0.093	0.059	0.094	0.068	Z	0.072	PF	PF	PF	PF	0.061	0.038	PF	0.028	0.033	0.047	0.050	0.067	0.070	0.065	0.064	0.060	0.050	0.058	0.094
3-Aug	Z	0.015	0.012	0.018	0.016	0.058	0.043	0.132	0.122	0.116	0.026	0.056	0.058	0.033	0.030	0.022	0.003	0.020	0.087	0.122	0.112	0.133	0.102	0.024	0.059	0.133
4-Aug	0.062	Z	0.049	0.049	0.056	0.072	0.055	0.001	0.013	0.036	0.037	0.028	0.035	0.032	0.007	0.011	0.021	0.020	0.043	0.058	0.061	0.044	0.007	0.018	0.035	0.072
5-Aug	0.052	0.074	Z	0.074	0.083	0.074	0.065	0.066	0.075	0.103	0.059	0.057	0.060	0.037	0.041	0.029	0.051	0.065	0.032	0.027	0.029	0.026	0.019	0.016	0.053	0.103
6-Aug	0.017	0.013	0.005	Z	0.012	0.058	0.097	0.106	0.128	0.142	0.107	0.081	0.076	0.081	0.090	0.085	0.069	0.065	0.094	0.093	0.089	0.074	0.056	0.029	0.072	0.142
7-Aug	0.002	0.002	0.000	0.001	Z	0.000	0.002	0.001	0.008	0.031	0.045	0.005	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.004	0.045
8-Aug	0.000	0.000	0.000	0.001	0.000	Z	0.007	0.025	0.000	0.003	0.006	0.013	0.004	0.000	0.004	0.005	0.001	0.001	0.012	0.000	0.000	0.020	0.048	0.053	0.009	0.053
9-Aug	Z	0.061	0.053	0.029	0.002	0.002	0.004	0.002	0.000	0.013	0.009	0.008	0.014	0.058	0.014	0.040	0.000	0.000	0.022	0.041	0.019	0.086	0.042	0.013	0.023	0.086
10-Aug	0.026	Z	0.058	0.049	0.048	0.014	0.000	0.006	0.050	0.015	C	C	C	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.013	0.058
11-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.035	0.033	0.002	0.001	0.000	0.010	0.011	0.007	0.001	0.000	0.000	0.000	0.036	0.054	0.026	0.035	0.021	0.012	0.054
12-Aug	0.032	0.032	0.044	Z	0.000	0.000	0.000	0.001	0.004	0.025	0.012	0.012	0.008	0.005	0.012	0.012	0.038	0.053	0.059	0.019	0.045	0.040	0.022	0.026	0.022	0.059
13-Aug	0.067	0.056	0.022	0.038	Z	0.033	0.038	0.011	0.012	0.016	0.059	0.018	0.003	0.004	0.006	0.005	0.004	0.012	0.023	0.037	0.050	0.051	0.056	0.081	0.030	0.081
14-Aug	0.064	0.058	0.163	0.117	0.088	Z	0.055	0.066	0.008	0.021	0.021	0.003	0.001	0.000	0.001	0.001	0.003	0.020	0.008	0.012	0.057	0.051	0.041	0.039	0.039	0.163
15-Aug	Z	0.020	0.026	0.028	0.009	0.049	0.012	0.028	0.001	0.013	0.022	0.027	0.041	0.059	0.021	0.024	0.051	0.063	0.051	0.031	0.040	0.020	0.005	0.000	0.028	0.063
16-Aug	0.003	Z	0.003	0.005	0.028	0.047	0.073	0.064	0.047	0.028	0.082	0.079	0.006	0.002	0.002	0.001	0.005	0.001	0.000	0.106	0.106	0.107	0.078	0.065	0.041	0.107
17-Aug	0.044	0.031	Z	0.015	0.007	0.012	0.016	0.035	0.014	0.025	0.052	0.046	0.014	0.027	0.007	0.012	0.013	0.019	0.022	0.029	0.019	0.020	0.016	0.024	0.023	0.052
18-Aug	0.029	0.024	0.006	Z	0.001	0.006	0.009	0.049	0.032	0.006	0.040	0.020	0.018	0.022	0.048	0.011	0.002	0.002	0.001	0.010	0.001	0.001	0.000	0.004	0.015	0.049
19-Aug	0.009	0.020	0.041	0.111	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	0.064	0.061	0.047	0.015	0.111
20-Aug	0.042	0.018	0.004	0.007	0.025	Z	0.057	0.034	0.025	0.014	0.021	0.052	0.064	0.058	0.037	0.037	0.012	0.002	0.009	0.006	0.004	0.008	0.032	0.060	0.027	0.064
21-Aug	Z	0.045	0.047	0.029	0.011	0.063	0.020	0.005	0.025	0.009	0.004	0.004	0.003	0.002	0.000	0.000	0.000	0.003	0.003	0.012	0.020	0.053	0.083	0.071	0.022	0.083
22-Aug	0.074	Z	0.095	0.044	0.041	0.030	0.009	0.016	0.037	0.028	0.056	0.017	0.007	0.009	0.007	0.007	0.012	0.012	0.051	0.055	0.060	0.057	0.049	0.031	0.035	0.095
23-Aug	0.028	0.023	Z	0.041	0.054	0.039	0.047	0.064	0.062	0.037	0.051	0.065	0.209	0.144	0.146	0.136	0.116	0.108	0.110	0.126	0.213	0.252	0.276	0.261	0.113	0.276
24-Aug	0.203	0.139	0.086	Z	0.015	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	0.000	0.000	0.001	0.001	0.002	0.003	0.020	0.203
25-Aug	0.001	0.013	0.061	0.069	Z	0.043	0.025	0.005	0.006	0.010	0.032	0.068	0.056	0.045	0.032	0.044	0.041	0.032	0.079	0.090	0.077	0.077	0.088	0.067	0.046	0.090
26-Aug	0.053	0.057	0.045	0.041	0.045	Z	0.043	0.026	0.018	0.009	0.040	0.022	0.015	0.019	0.010	0.032	0.048	0.056	0.096	0.159	0.194	0.189	0.193	0.189	0.069	0.194
27-Aug	Z	0.191	0.185	0.183	0.173	0.168	0.162	0.149	0.140	0.167	0.142	0.113	0.099	0.095	0.070	0.072	0.060	0.047	0.048	0.134	0.110	0.088	0.100	0.096	0.121	0.191
28-Aug	0.114	Z	0.137	0.134	0.128	0.132	0.122	0.111	0.103	0.099	0.091	0.086	0.087	0.105	0.128	0.095	0.101	0.107	0.129	0.118	0.122	0.127	0.115	0.104	0.113	0.137
29-Aug	0.103	0.095	Z	0.092	0.091	0.084	0.090	0.092	0.083	0.076	0.078	0.078	0.082	0.079	M	0.087	0.093	0.131	0.122	0.123	0.134	0.141	0.141	0.134	0.101	0.141
30-Aug	0.133	0.129	0.125	Z	0.109	0.102	0.090	0.085	0.097	0.139	0.140	0.097	0.089	0.098	0.070	0.071	0.069	0.076	0.071	0.060	0.062	0.174	0.113	0.115	0.101	0.174
31-Aug	0.119	0.102	0.084	0.073	Z	0.099	0.072	0.082	0.108	0.124	0.139	0.152	0.131	0.113	0.135	0.090	0.074	0.136	0.150	0.182	0.196	0.206	0.213	0.219	0.130	0.219
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan																										
C - Calibration																										
M - Maintenance																										
PF - Power Failure																										





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	164	23.30	23.30
0.006 - 0.05	287	40.77	64.06
0.06 - 0.1	226	32.10	96.16
> 0.1	27	3.84	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp - August 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	0	0	0	0	0	8	3	2	1	3	11	7	5	12	3	10	65
0.006 - 0.05	1	1	0	1	4	26	15	3	5	5	4	8	13	15	8	11	120
0.06 - 0.1	2	1	0	1	7	40	38	11	3	2	2	2	10	8	8	8	143
> 0.1	0	0	1	0	0	3	0	0	0	0	1	1	5	9	5	1	26
Totals	3	2	1	2	11	77	56	16	9	10	18	18	33	44	24	30	354

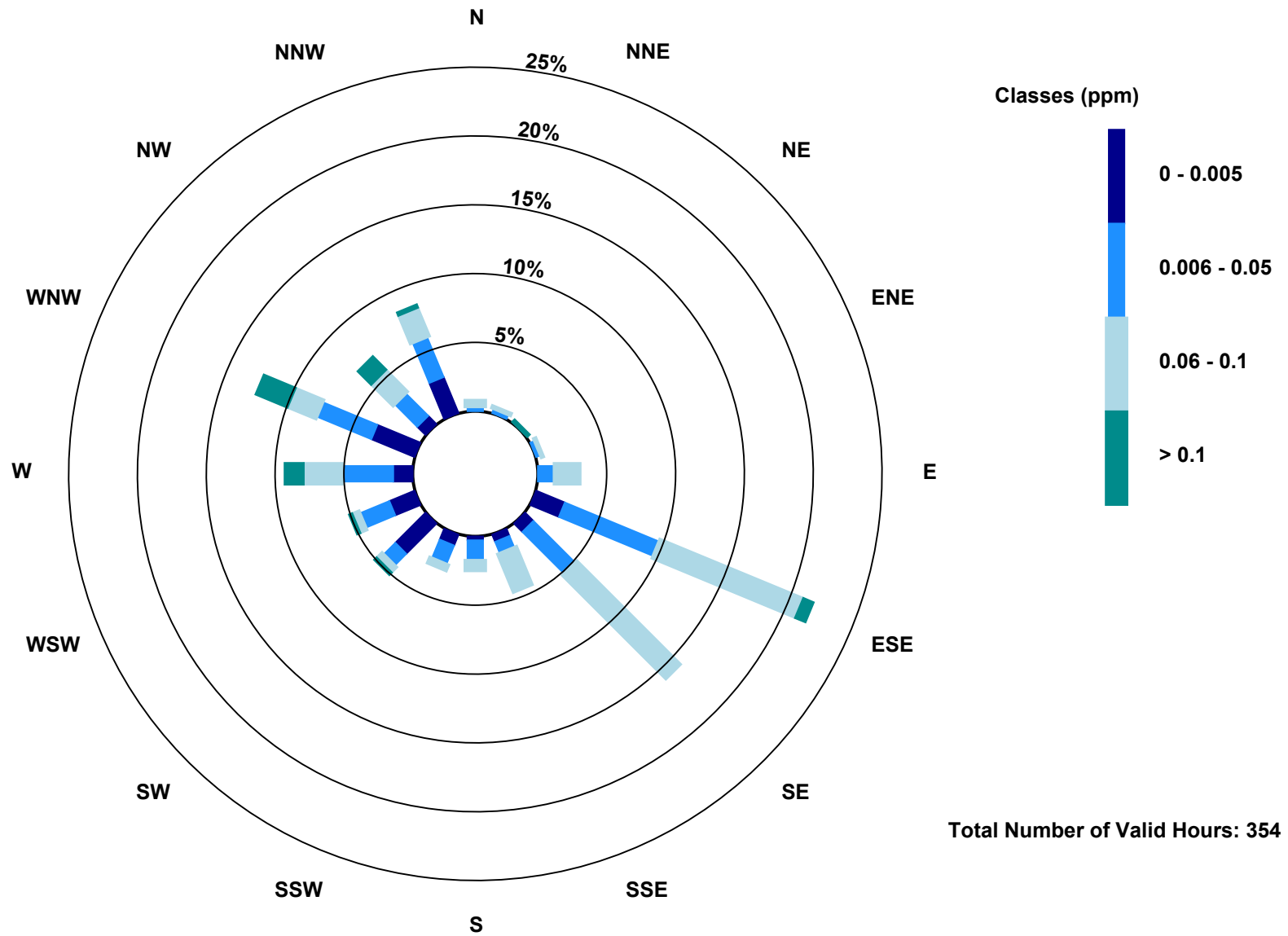
Total Number of Valid Hours: 354

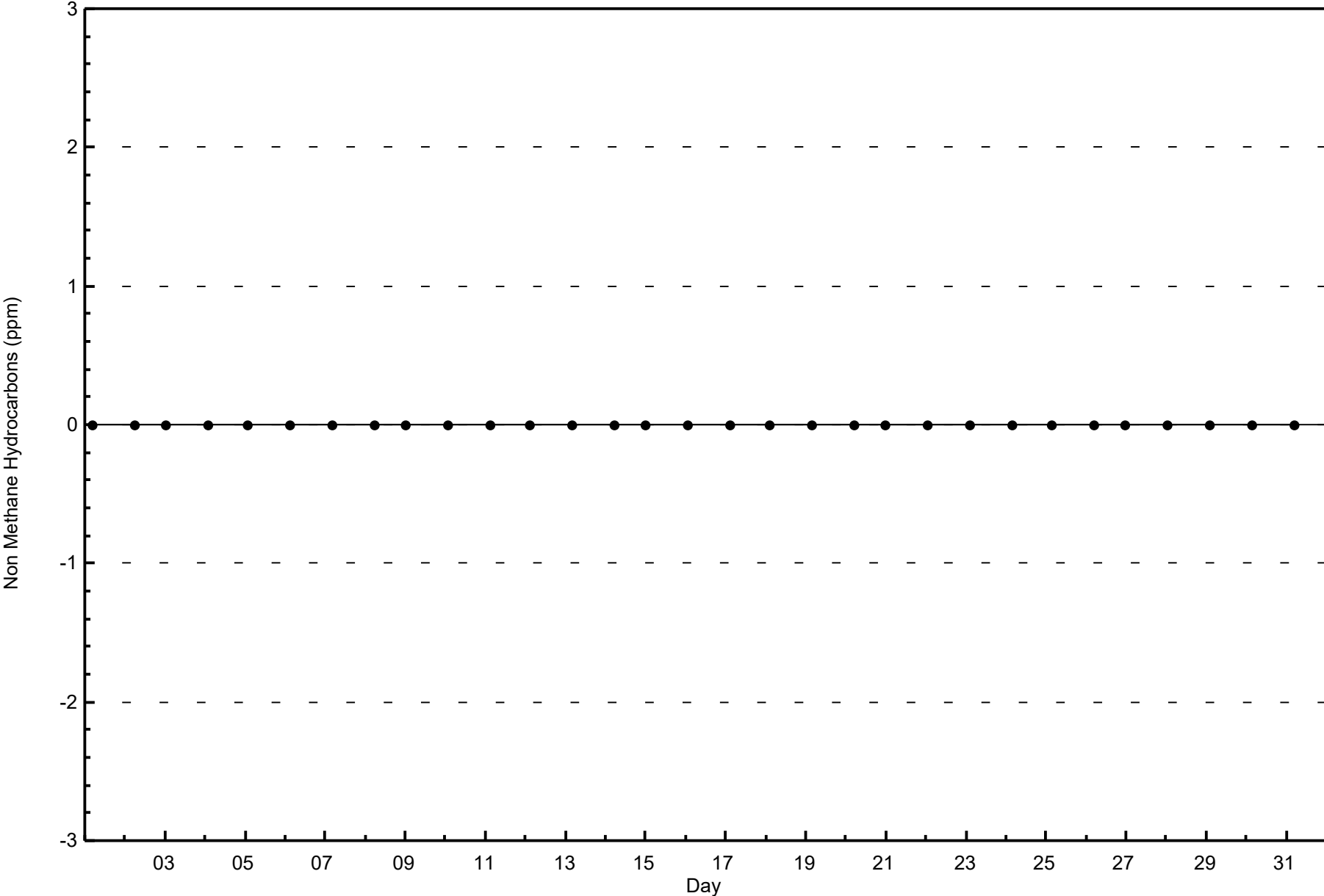
Total Number of Hours: 744

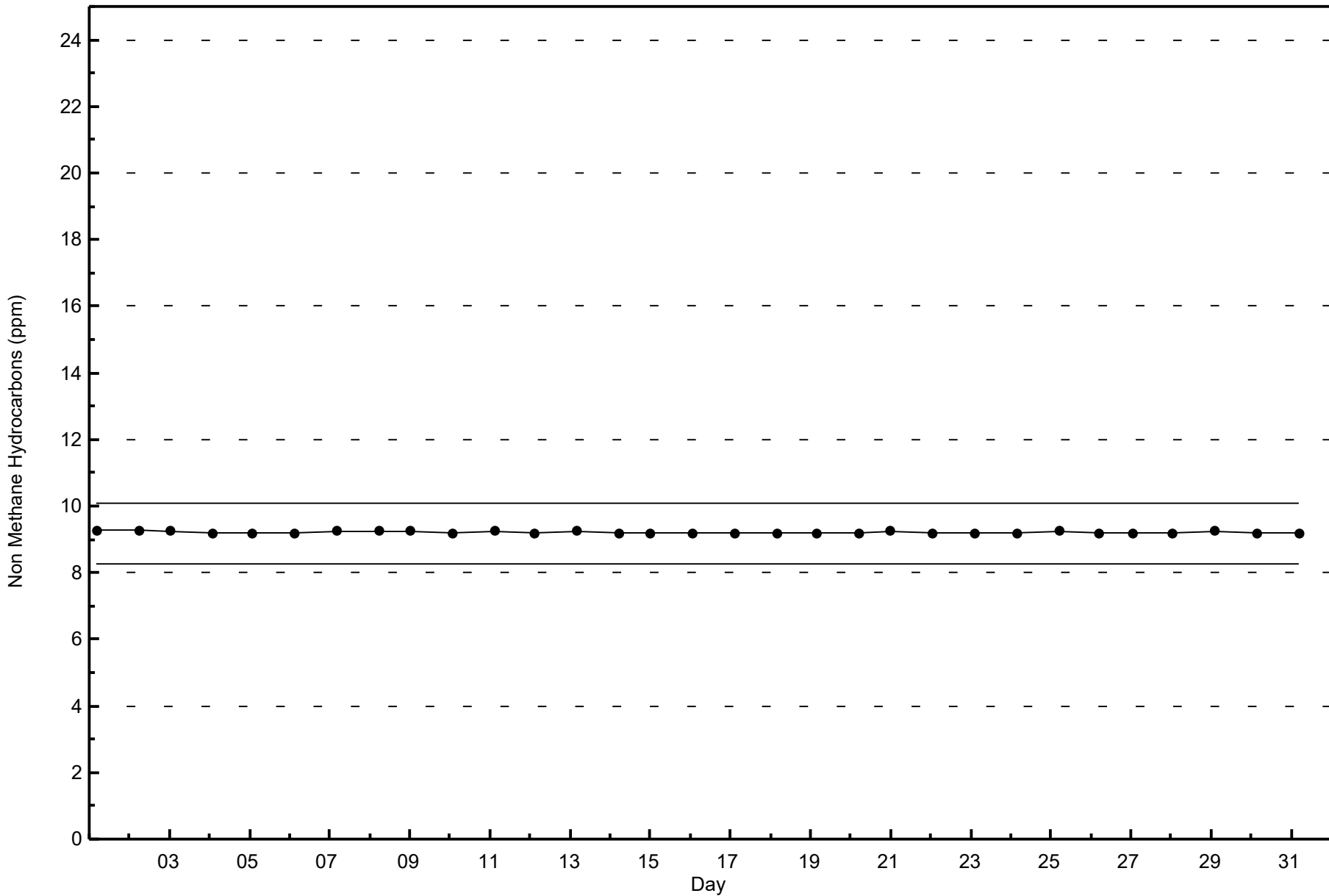


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Lower Camp









Wood Buffalo Environmental Association

Summary of Hour Averages

Ambient Temperature (AT) - C

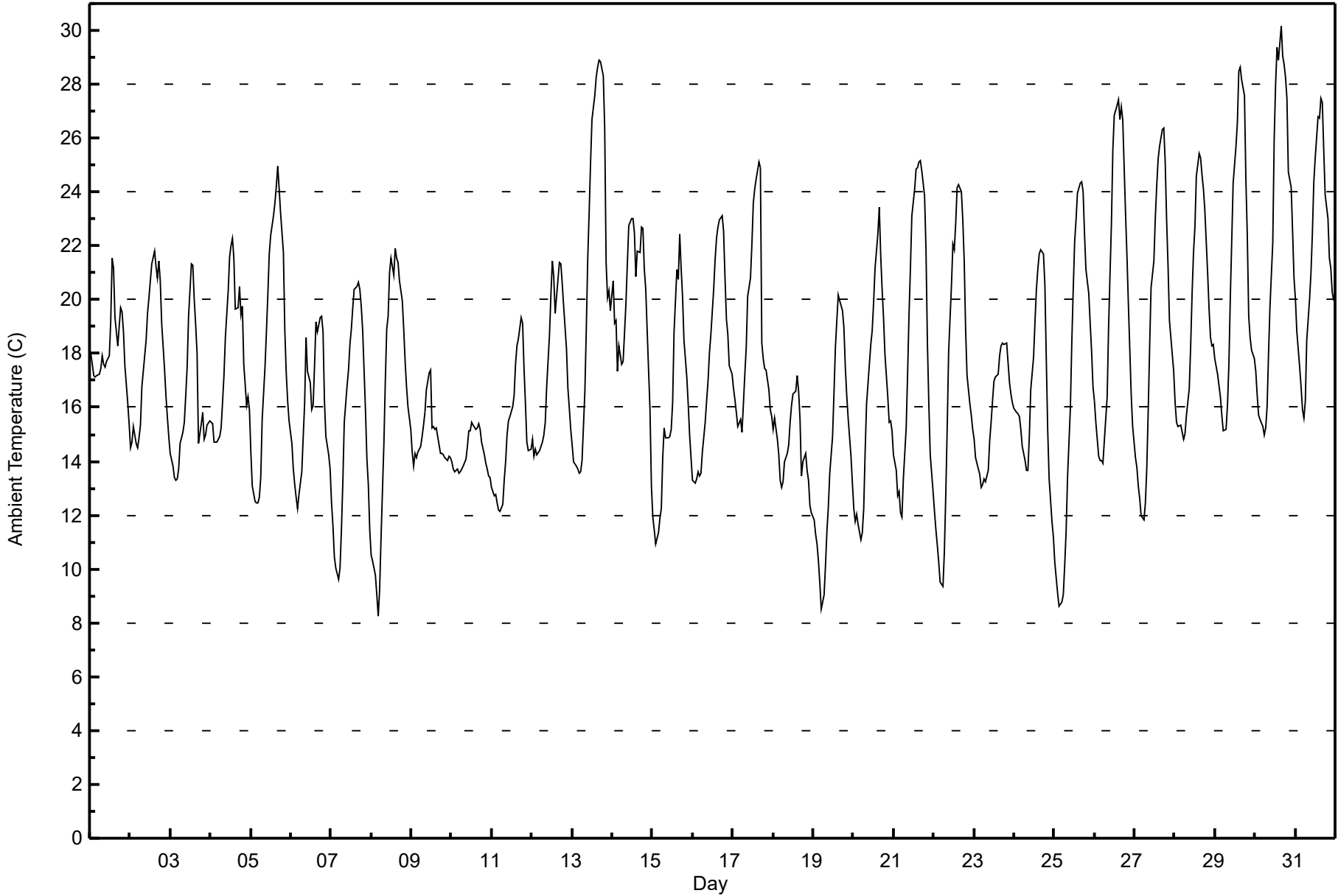
Lower Camp - August 2023

Maximum Value: 30.2 C on Aug 30 16:00		Maximum Daily Average: 22.3 C on Aug 30		Hours in Service: 744																							
Minimum Value: 8.2 C on Aug 8 05:00		Minimum Daily Average: 14.3 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 22.3 C at hour 16		Minimum Diurnal Average: 13.2 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 17.57 C		Percentiles: P ₁ = 9.2 P ₁₀ = 12.7 Q ₁ = 14.4 Median = 16.8 Q ₃ = 20.4 P ₉₀ = 23.8 P ₉₉ = 28.6		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-Aug	18.0	17.6	17.2	17.1	17.2	17.2	17.4	17.9	17.6	17.5	17.7	17.9	19.2	21.5	21.2	19.4	18.3	19.0	19.7	19.5	18.8	17.5	16.2	15.4	18.2	21.5	
2-Aug	14.5	14.7	15.3	14.6	14.5	14.9	15.3	16.7	17.3	18.5	19.5	20.0	20.7	21.3	21.8	21.2	20.8	21.5	20.7	19.1	17.5	16.4	15.7	14.9	17.8	21.8	
3-Aug	14.3	13.8	13.4	13.3	13.4	13.7	14.7	15.1	15.5	16.4	17.5	19.4	21.3	21.3	20.0	19.1	18.0	14.7	15.4	15.8	14.8	15.0	15.3	15.5	16.1	21.3	
4-Aug	15.4	15.4	14.7	14.7	14.7	14.9	15.2	16.2	17.2	18.6	20.3	21.6	22.0	22.3	21.5	19.7	19.7	20.5	19.4	19.8	17.6	16.1	16.4	15.9	17.9	22.3	
5-Aug	14.4	13.1	12.5	12.5	12.5	12.6	13.4	15.5	17.5	18.8	20.2	21.7	22.4	23.1	23.6	24.2	24.9	24.1	23.2	21.7	18.9	17.3	16.3	15.5	18.3	24.9	
6-Aug	14.7	13.7	13.1	12.7	12.3	12.7	13.6	14.9	16.1	18.6	17.3	16.9	15.9	16.1	17.6	19.2	18.8	19.3	19.4	18.8	16.3	14.9	14.3	13.7	15.9	19.4	
7-Aug	12.5	11.6	10.5	10.1	9.6	10.0	11.5	13.2	15.4	16.8	17.4	18.4	18.9	19.7	20.4	20.5	20.7	20.4	19.8	18.8	15.9	14.1	13.1	11.5	15.4	20.7	
8-Aug	10.5	10.3	9.8	9.0	8.2	9.3	11.2	14.7	17.0	18.9	19.4	21.0	21.5	20.9	21.9	21.5	21.4	20.7	20.0	18.9	17.7	16.8	16.1	15.2	16.3	21.9	
9-Aug	14.3	13.8	14.3	14.1	14.3	14.5	14.9	15.3	15.8	16.7	17.3	17.4	15.3	15.3	15.2	15.2	14.6	14.3	14.3	14.2	14.1	14.0	14.2	14.2	14.9	17.4	
10-Aug	14.0	13.7	13.6	13.7	13.6	13.6	13.7	13.8	14.1	14.6	15.1	15.1	15.4	15.4	15.2	15.2	15.4	15.2	14.7	14.2	13.9	13.7	13.4	13.4	14.3	15.4	
11-Aug	13.0	12.7	12.8	12.5	12.2	12.1	12.4	13.3	14.0	15.0	15.5	15.7	16.0	16.4	17.6	18.3	18.6	19.3	19.1	17.4	16.1	14.7	14.4	14.4	15.1	19.3	
12-Aug	14.8	14.2	14.5	14.2	14.4	14.6	14.7	15.0	15.5	16.8	18.7	20.2	21.5	20.8	19.5	20.8	21.4	21.3	20.6	19.8	18.2	16.7	16.0	15.2	17.5	21.5	
13-Aug	14.6	14.0	13.8	13.7	13.5	13.6	14.0	16.6	18.9	21.5	23.2	25.1	26.7	27.6	28.3	28.6	28.9	28.8	28.3	26.4	21.4	20.1	20.4	19.6	21.1	28.9	
14-Aug	20.7	19.1	19.2	17.3	18.3	17.6	17.7	18.7	19.9	21.3	22.7	23.0	23.0	22.5	20.8	21.8	21.8	22.7	22.6	21.1	20.4	18.9	15.9	13.1	20.0	23.0	
15-Aug	11.9	11.5	10.9	11.4	11.9	12.2	14.1	15.2	14.9	14.8	14.9	15.2	16.2	18.8	21.1	20.8	22.4	21.2	20.1	18.5	17.1	16.1	15.0	14.1	15.9	22.4	
16-Aug	13.3	13.2	13.4	13.6	13.4	13.5	14.4	15.5	16.3	17.0	18.0	18.7	20.4	21.5	22.3	22.7	23.0	23.1	22.5	20.8	19.3	18.7	17.6	17.2	17.9	23.1	
17-Aug	16.7	16.3	15.8	15.3	15.6	15.1	16.1	17.2	18.2	20.1	20.8	22.1	23.6	24.1	24.5	25.1	24.9	18.4	17.8	17.4	17.4	16.7	15.9	15.7	18.8	25.1	
18-Aug	15.2	15.6	14.8	14.3	13.3	13.0	13.2	14.0	14.3	14.6	15.4	16.1	16.5	16.6	17.2	16.6	15.6	13.4	14.0	14.3	13.7	13.3	12.3	12.1	14.6	17.2	
19-Aug	11.8	11.3	10.9	10.3	9.5	8.5	9.1	10.1	11.4	12.3	13.6	14.9	16.6	18.3	19.2	20.2	20.0	19.6	19.0	17.5	16.5	15.6	14.2	13.2	14.3	20.2	
20-Aug	12.3	11.8	12.0	11.7	11.1	11.4	12.3	14.3	16.1	17.6	18.3	18.8	19.9	21.2	22.4	23.4	21.7	20.4	19.3	18.0	16.4	15.4	15.5	15.2	16.5	23.4	
21-Aug	14.2	13.6	12.7	12.9	12.1	11.9	13.4	15.2	17.2	19.4	21.2	23.1	24.1	24.9	24.9	25.1	25.2	24.8	23.8	21.9	18.4	16.1	14.2	12.9	18.5	25.2	
22-Aug	12.1	11.4	10.9	10.2	9.5	9.4	10.7	12.8	15.3	18.1	20.6	22.1	21.9	22.9	24.2	24.3	24.0	23.0	21.5	18.9	17.2	16.1	15.7	15.2	17.0	24.3	
23-Aug	14.8	14.1	13.9	13.5	13.0	13.2	13.4	13.3	13.7	14.8	15.5	16.2	17.0	17.1	17.2	17.9	18.3	18.4	18.4	18.4	17.7	16.9	16.5	16.2	15.8	18.4	
24-Aug	16.0	15.8	15.7	15.7	15.2	14.6	14.0	13.7	13.7	14.9	16.6	17.8	19.2	20.4	21.1	21.7	21.8	21.7	20.5	17.8	15.1	13.3	11.8	11.2	16.6	21.8	
25-Aug	10.3	9.7	9.1	8.6	8.8	9.0	10.1	11.4	13.4	16.0	18.4	20.3	22.1	23.0	24.0	24.3	24.4	24.0	22.4	21.1	20.3	19.1	18.1	16.7	16.9	24.4	
26-Aug	16.3	15.5	14.2	14.1	14.0	13.9	14.8	16.4	18.9	20.9	22.8	25.6	26.8	27.2	27.4	26.7	27.1	26.7	23.2	21.6	19.8	18.1	16.5	15.3	20.2	27.4	
27-Aug	14.1	13.7	13.1	12.6	12.0	11.8	12.4	13.7	15.8	18.2	20.4	21.5	23.0	24.2	25.2	25.7	26.3	26.4	25.1	23.0	21.3	19.2	18.0	17.3	18.9	26.4	
28-Aug	16.2	15.4	15.3	15.4	15.1	14.8	15.0	15.7	16.7	18.3	20.2	21.8	22.7	24.6	25.4	25.3	24.6	24.1	23.3	21.0	19.6	18.6	18.3	18.4	19.4	25.4	
29-Aug	17.8	17.2	16.8	16.4	15.7	15.1	15.2	16.1	17.6	20.1	22.2	24.3	25.7	26.6	28.5	28.6	28.1	27.6	24.5	22.4	19.4	18.6	18.1	17.8	20.9	28.6	
30-Aug	17.3	16.4	15.7	15.5	15.3	15.0	15.2	16.0	18.0	19.7	22.1	26.0	28.0	29.3	28.9	30.2	29.0	28.8	28.2	27.5	24.8	24.2	22.5	20.8	22.3	30.2	
31-Aug	20.0	18.8	17.5	16.8	15.9	15.6	16.2	18.5	20.0	21.0	22.5	24.4	25.3	26.8	26.8	27.5	27.3	25.6	23.9	23.0	21.5	21.2	20.3	20.0	21.5	27.5	
		14.7	14.2	13.8	13.5	13.2	13.2	13.9	15.0	16.2	17.7	18.9	20.1	20.9	21.7	22.1	22.3	22.2	21.6	20.8	19.6	18.0	16.9	16.1	15.4	Diurnal Average	
		20.7	19.1	19.2	17.3	18.3	17.6	17.7	18.7	20.0	21.5	23.2	26.0	28.0	29.3	28.9	30.2	29.0	28.8	28.3	27.5	24.8	24.2	22.5	20.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Lower Camp - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Lower Camp - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	15	2.02	2.02
10 - 20	521	70.03	72.04
> 20	208	27.96	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

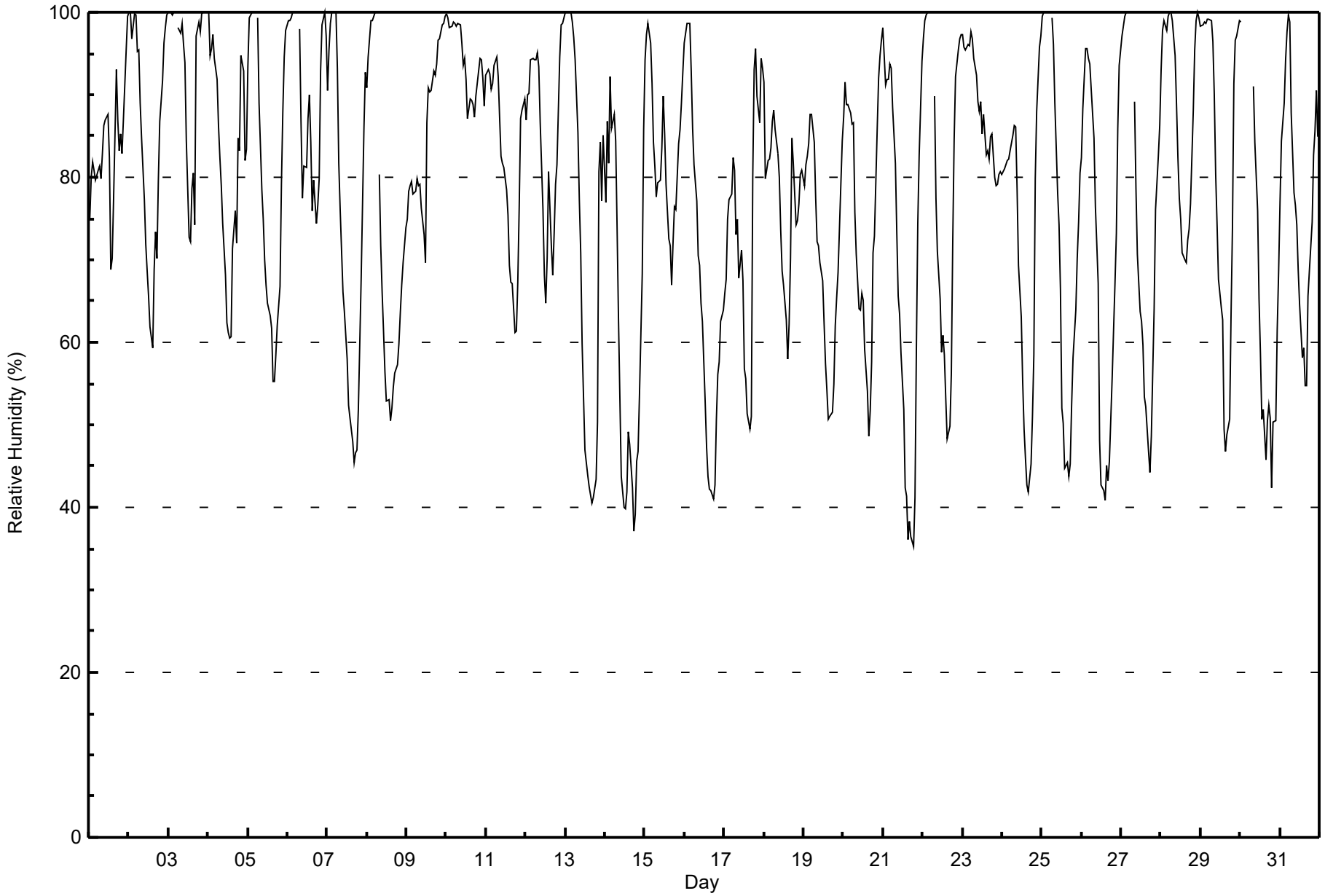
Relative Humidity (RH) - %
Lower Camp - August 2023

Maximum Value: 100.0 % on Aug 2 01:00		Maximum Daily Average: 94.1 % on Aug 10		Hours in Service: 744																																												
Minimum Value: 35.3 % on Aug 21 19:00		Minimum Daily Average: 61.1 % on Aug 14		Hours of Data: 716																																												
Maximum Diurnal Average: 93.4 % at hour 4		Minimum Diurnal Average: 59.1 % at hour 16		Hours of Missing Data: 28																																												
Monthly Average: 77.59 %		Percentiles: P ₁ = 40.1 P ₁₀ = 50.7 Q ₁ = 65.4 Median = 80.6 Q ₃ = 92.9 P ₉₀ = 98.6 P ₉₉ = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 96.2																																												
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-Aug	75.1	79.9	81.8	80.8	79.7	80.8	81.3	79.8	82.9	86.2	87.0	87.7	82.3	68.7	70.2	77.5	93.0	86.9	83.2	85.3	83.0	87.0	95.4	99.5	83.1	99.5																						
2-Aug	100.0	100.0	96.9	99.9	99.7	95.3	95.5	89.0	84.7	77.4	71.9	68.6	65.6	61.9	59.3	68.7	73.4	70.2	79.7	86.7	91.6	96.3	98.1	99.6	84.6	100.0																						
3-Aug	100.0	100.0	99.6	100.0	OR	OR	98.2	97.5	98.6	96.1	93.9	84.4	72.8	72.2	78.7	80.5	74.2	97.1	98.9	97.6	99.8	100.0	OR	100.0	92.4	100.0																						
4-Aug	100.0	94.7	95.6	97.3	94.4	91.8	86.2	82.4	79.0	74.4	68.1	62.4	61.2	60.5	60.7	71.4	75.9	72.1	84.8	83.2	94.7	92.9	82.0	83.4	81.2	100.0																						
5-Aug	93.3	99.3	100.0	OR	OR	OR	99.3	89.1	78.4	75.0	70.0	67.0	64.8	63.3	61.7	55.2	55.2	58.5	62.1	66.8	79.2	88.0	94.5	97.8	77.1	100.0																						
6-Aug	98.9	99.0	99.3	100.0	100.0	OR	OR	97.9	86.8	77.4	81.4	81.1	87.1	90.0	84.2	75.9	79.7	74.4	76.6	79.8	92.9	98.4	100.0	97.2	89.0	100.0																						
7-Aug	90.5	95.4	98.7	100.0	OR	100.0	93.3	81.6	76.1	66.1	63.7	60.9	57.9	52.4	50.9	48.0	45.4	46.6	47.0	51.9	67.6	76.7	86.0	92.6	71.7	100.0																						
8-Aug	90.8	94.5	99.0	98.9	99.5	100.0	OR	80.3	71.6	66.0	61.4	56.4	52.8	53.1	50.5	52.1	54.7	56.2	57.3	59.8	63.6	67.0	69.6	73.9	70.8	100.0																						
9-Aug	75.0	78.3	79.0	79.5	77.9	78.3	79.8	78.9	79.1	76.2	73.1	69.6	86.5	90.9	90.4	90.5	92.9	92.5	93.7	96.6	96.7	98.4	98.7	99.5	85.5	99.5																						
10-Aug	99.9	99.3	98.1	98.3	98.8	98.6	98.4	98.6	98.4	96.2	93.6	94.4	91.8	87.2	89.5	89.3	88.8	87.3	89.8	92.9	94.4	94.3	92.0	88.6	94.1	99.9																						
11-Aug	92.4	93.1	92.5	90.7	91.3	93.6	94.5	92.3	87.3	82.5	81.6	81.1	78.5	75.4	69.3	67.2	67.2	61.1	61.3	67.2	76.2	87.2	88.1	89.5	81.7	94.5																						
12-Aug	86.9	90.1	90.1	94.3	94.5	94.3	94.2	95.1	93.4	86.8	76.1	68.2	64.8	70.2	80.6	71.7	68.1	73.2	79.1	81.5	94.6	98.4	98.6	99.3	85.2	99.3																						
13-Aug	100.0	100.0	100.0	100.0	98.8	96.9	94.2	85.5	77.3	70.9	59.8	53.5	47.0	43.9	42.6	41.6	40.5	41.1	43.4	50.3	80.8	84.2	77.1	85.0	71.4	100.0																						
14-Aug	76.9	86.8	81.8	92.2	85.9	87.6	84.3	73.8	63.0	53.2	43.7	40.0	39.9	41.8	49.1	47.6	42.3	37.2	39.2	45.6	46.8	53.6	68.4	85.7	61.1	92.2																						
15-Aug	94.2	97.3	98.6	96.4	91.4	84.3	81.3	77.6	79.2	79.7	83.6	89.8	85.3	79.1	72.6	71.6	66.9	72.1	76.5	76.2	84.1	85.7	89.0	92.7	83.5	98.6																						
16-Aug	96.3	98.6	98.6	98.7	92.8	85.9	81.5	77.1	70.6	69.3	64.8	62.5	52.6	47.2	43.8	42.2	42.1	41.0	42.7	50.6	56.1	57.6	62.5	64.0	66.6	98.7																						
17-Aug	65.9	67.6	74.9	77.2	77.9	82.4	80.9	73.0	74.9	67.7	71.1	67.5	56.7	55.5	51.3	49.5	51.1	80.0	93.0	95.7	89.8	86.6	94.4	93.1	74.1	95.7																						
18-Aug	91.5	79.8	82.0	82.2	83.6	86.8	88.2	85.8	82.8	80.0	73.5	68.6	67.0	62.8	57.9	62.1	70.2	84.8	81.7	74.3	74.8	76.7	80.3	80.9	77.4	91.5																						
19-Aug	79.0	81.5	82.6	84.0	87.6	87.7	84.2	77.5	72.1	71.6	69.7	67.5	62.4	57.5	54.2	50.8	51.1	51.5	54.9	62.1	65.4	68.6	79.2	84.4	70.3	87.7																						
20-Aug	87.3	91.6	88.8	88.9	87.8	86.5	86.6	75.8	70.8	64.1	63.9	65.9	65.1	59.2	54.0	48.6	51.7	57.6	70.8	72.8	85.9	92.0	94.7	96.7	75.3	96.7																						
21-Aug	98.1	91.1	91.9	91.8	93.7	93.2	88.4	81.8	73.2	65.7	63.3	58.6	51.9	42.4	41.3	36.1	38.3	36.4	35.3	41.2	59.2	74.3	82.7	94.1	67.7	98.1																						
22-Aug	96.8	99.0	99.7	100.0	OR	OR	OR	89.9	77.4	71.1	65.3	58.9	60.8	58.5	53.2	48.3	49.8	56.3	72.3	84.6	92.2	95.4	96.8	97.3	77.3	100.0																						
23-Aug	97.2	95.8	95.5	96.1	95.9	97.6	96.9	94.3	92.3	89.2	88.0	89.1	85.2	87.7	82.7	83.2	82.2	84.9	85.3	80.0	78.9	79.2	80.4	80.7	88.3	97.6																						
24-Aug	80.4	81.0	81.6	82.0	82.1	83.2	85.1	86.3	86.1	78.7	69.3	63.0	55.3	49.5	45.9	42.7	41.8	45.2	51.0	58.4	79.8	88.0	95.8	97.1	71.2	97.1																						
25-Aug	99.4	100.0	OR	OR	OR	OR	99.2	96.1	89.0	78.1	74.3	66.4	52.1	50.2	44.7	45.4	43.7	45.2	52.3	58.2	63.9	70.1	74.6	80.5	69.2	100.0																						
26-Aug	82.4	88.4	95.6	95.6	94.5	93.7	90.7	84.8	76.5	71.8	67.1	48.1	42.7	42.0	40.9	45.1	43.2	45.5	55.8	61.6	67.1	73.3	85.9	93.6	70.2	95.6																						
27-Aug	97.1	98.3	99.5	100.0	OR	OR	OR	OR	89.2	78.6	70.7	63.7	62.5	59.6	53.4	52.2	46.8	44.3	48.7	56.4	64.0	76.2	82.5	86.2	71.5	100.0																						
28-Aug	93.0	97.8	99.0	97.8	99.5	100.0	100.0	99.0	94.8	88.7	82.4	77.4	74.8	70.8	70.0	69.7	72.4	73.8	76.7	88.1	95.5	99.0	100.0	99.3	88.3	100.0																						
29-Aug	98.3	98.5	98.8	98.7	99.1	99.2	99.0	96.4	90.1	80.3	74.2	67.6	64.2	62.7	49.5	46.8	48.8	50.6	63.4	74.0	91.4	96.6	97.2	99.1	81.0	99.2																						
30-Aug	98.8	OR	OR	OR	OR	OR	OR	OR	91.1	84.2	76.0	65.3	58.6	50.7	51.9	45.8	50.5	52.3	50.9	42.4	50.3	50.5	61.6	68.4	--	98.8																						
31-Aug	77.0	84.4	88.9	94.2	97.7	99.6	98.9	87.8	78.1	76.5	74.2	68.8	64.5	58.2	59.3	54.7	54.7	65.6	68.7	74.6	82.7	85.6	90.5	85.0	77.9	99.6																						
																								90.7	92.0	92.7	93.4	91.8	91.5	90.8	86.4	82.1	76.8	72.8	68.5	65.0	62.1	60.1	59.1	59.9	62.6	67.0	70.9	78.8	83.2	86.6	89.8	Diurnal Average
																								100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	98.6	96.2	93.9	94.4	91.8	90.9	90.4	90.5	93.0	97.1	98.9	97.6	99.8	100.0	100.0	100.0	Diurnal Maximum
OR - Out of Range																																																



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Lower Camp - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Barometric Pressure (BP) - inHg

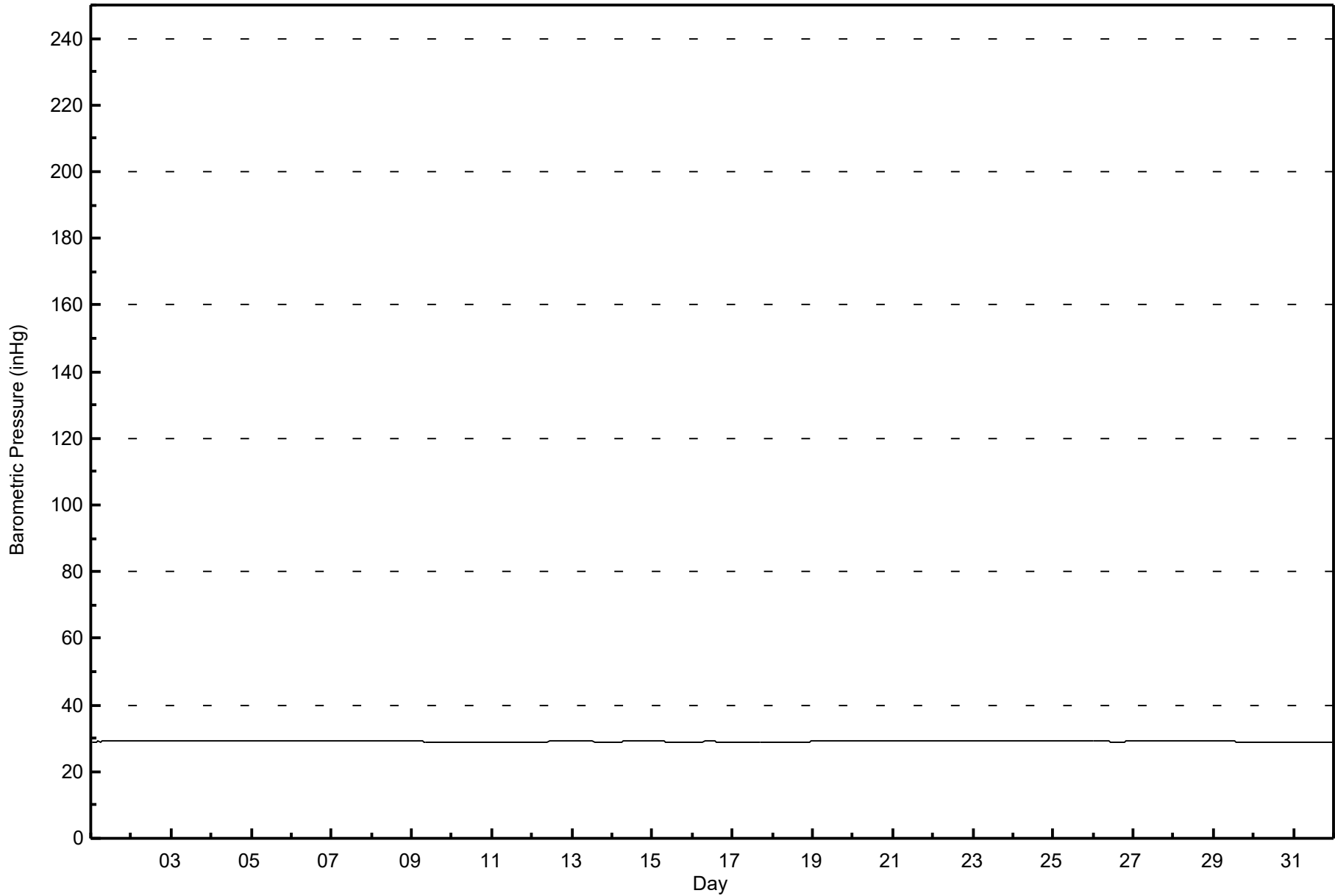
Lower Camp - August 2023

Maximum Value: 29.4 inHg on Aug 5 11:00 Maximum Daily Average: 29.3 inHg on Aug 5																				Hours in Service:	744						
Minimum Value: 28.6 inHg on Aug 17 19:00 Minimum Daily Average: 28.7 inHg on Aug 17																				Hours of Data:	744						
Maximum Diurnal Average: 29.1 inHg at hour 8 Minimum Diurnal Average: 29.1 inHg at hour 19																				Hours of Missing Data:	0						
Monthly Average: 29.08 inHg Percentiles: P ₁ = 28.7 P ₁₀ = 28.8 Q ₁ = 29.0 Median = 29.1 Q ₃ = 29.2 P ₉₀ = 29.3 P ₉₉ = 29.4																				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-Aug	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	29.1	29.1	29.1	29.2	29.1	29.2	
2-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2
3-Aug	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
4-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.2	29.3	29.3
5-Aug	29.3	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	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.4	29.4	29.3	29.4
6-Aug	29.4	29.4	29.4	29.4	29.4	29.3	29.3	29.3	29.3	29.3	29.3	29.4	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	29.4
7-Aug	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	29.2	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
8-Aug	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	29.1	29.2
9-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	29.0	29.1
10-Aug	28.8	28.8	28.8	28.8	28.8	28.8	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	28.9	28.9	28.9	28.9	28.8	28.8	28.9
11-Aug	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.0	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
12-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.0	29.2
13-Aug	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	29.0	29.0	29.0	29.0	29.1	29.2
14-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1
15-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.0	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	28.9	28.9	28.9	28.9	29.0	29.1
16-Aug	28.9	29.0	29.0	29.0	29.0	29.0	29.0	29.0	29.1	29.1	29.1	29.1	29.0	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	
17-Aug	28.9	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	28.6	28.6	28.7	28.6	28.6	28.7	28.7	28.7	28.7	28.7	28.7	28.9	
18-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	29.0	29.0	29.0	29.0	29.0	28.9	29.0	
19-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	29.2	29.2	29.2	29.2	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	
20-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	29.3	29.2	
21-Aug	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	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.2	29.3	
22-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
23-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	
24-Aug	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	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	29.2	29.3	
25-Aug	29.3	29.3	29.3	29.3	29.3	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	29.2	29.3	
26-Aug	29.2	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
27-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.2	
28-Aug	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	29.1	29.1	29.1	29.1	29.1	29.1	
29-Aug	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	28.9	28.9	28.9	28.9	28.9	28.9	28.9	29.0	
30-Aug	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	28.8	28.8	28.7	28.8	28.8	28.7	28.8	28.7	28.8	28.9	
31-Aug	28.7	28.8	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.8	28.8	28.8	28.8	28.8	28.7	28.8	
																								Diurnal Average	29.1		
																								Diurnal Maximum	29.4		



Wood Buffalo Environmental Association
Hourly Averages

Barometric Pressure (BP) - inHg
Lower Camp - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Lower Camp - August 2023

Maximum Speed: 19 km/h on Aug 19 17:00	Maximum Daily Speed Average: 9.7 km/h on Aug 19	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 17 12:00	Minimum Daily Speed Average: 1.0 km/h on Aug 22	Hours of Data: 370
Maximum Diurnal Speed Average: 4.6 km/h at hour 17	Minimum Diurnal Speed Average: 0.1 km/h at hour 2	Hours of Missing Data: 374
Monthly Average Velocity: 1.0 km/h 207.3 deg	Percentiles: P ₁ = 0 P ₁₀ = 2 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 12 P ₉₉ = 16	Percent Operational Time: 49.7

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-Aug	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	---	---
2-Aug	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	---	---
3-Aug	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	---	---
4-Aug	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	---	---
5-Aug	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	---	---
6-Aug	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	---	---
7-Aug	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	---	---
8-Aug	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	---	---
9-Aug	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	---	---
10-Aug	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	---	---
11-Aug	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	---	---
12-Aug	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	---	---
13-Aug	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	---	---
14-Aug	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	---	---
15-Aug	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	---	---
16-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	WSW13	WSW11	SW12	SW12	SSW11	SSE1	SSE5	SSE7	SSE8	SE8	SE8	---	WSW13	
17-Aug	SE7	SE7	E7	ESE8	ESE8	ESE6	ESE7	SE7	SE5	SE4	ESE6	NNW0	WSW13	W11	WSW11	SW8	WNW9	WNW2	SSE1	WSW3	NW7	WNW2	WNW4	W5	SSW2.0	WSW13	
18-Aug	WNW4	NW10	NW8	NNW8	NNW5	NNW7	N12	NNW15	NNW13	NNW10	NNW14	NW12	WNW11	NNW9	NW10	WNW10	WNW12	WNW8	WNW9	NNW6	WNW10	WNW10	WNW8	WNW7	NNW8.9	NNW15	
19-Aug	WNW8	WNW8	W10	WSW9	WSW10	W9	WSW8	SW11	SW11	WSW12	WSW14	SW13	WSW14	SW15	SW16	SW18	WSW19	SW18	SW12	SW8	SSW8	S3	ENE3	E4	WSW9.7	WSW19	
20-Aug	SE6	ESE8	ESE8	E3	SSW6	SSE3	SE4	SSE4	ESE5	W5	WNW6	NNW9	NNW11	NNW9	NNW8	NW6	WNW11	WNW5	SW1	SE2	W3	WSW1	WNW1	W2	NNW1.0	NNW11	
21-Aug	ESE2	SE2	SE4	SE6	ESE5	ESE6	ESE6	ESE6	ESE7	ESE7	ESE7	ESE10	ESE9	SE7	ESE7	SSE7	SE6	S8	SSE7	SSE6	SE4	SE1	W1	NW1	SE5.1	ESE10	
22-Aug	W1	W1	W1	W1	SW1	WSW1	ESE3	ESE6	ESE7	ESE7	ESE6	ESE6	NNE4	ENE3	ESE6	S4	WNW4	WNW6	WNW3	NNW1	NW1	WSW1	UO	W4	ESE1.0	ESE7	
23-Aug	W4	W4	W5	W5	W5	W3	W5	WNW7	WNW5	NW5	NW4	NNW6	WNW4	WNW5	W4	NW3	WNW5	W4	W6	NW8	NW8	WNW8	NW7	NW8	WNW5.0	NW8	
24-Aug	NW9	NW8	NW10	NNW11	NNW12	NNW12	NNW14	NNW14	NNW13	NNW16	NNW16	NNW16	NNW15	NW15	NW13	NW11	NW9	WNW10	WNW8	W3	WNW2	W2	W0	W1	NNW9.5	NNW16	
25-Aug	ESE1	E2	E1	E3	SE4	SE4	ESE6	SE6	ESE10	ESE7	ESE9	SE7	SSW11	S8	SSW9	S10	S8	S7	SE5	SE6	SE8	SE8	SE8	SE8	SE8	SSE5.6	SSW11
26-Aug	SE8	E7	E10	ESE9	ESE10	ESE9	ESE9	ESE9	ESE8	ESE9	SE9	SSW12	SW15	WSW14	WSW14	W10	WSW13	WNW12	NNW15	NNW10	NW8	W5	W1	WNW1	S2.0	SW15	
27-Aug	W1	WNW2	SW1	W1	WNW0	NE1	WNW2	NNE2	E3	ESE4	ESE5	E4	ESE7	SE6	SE7	SE6	S7	SSW10	SSW7	SSE5	SE4	ESE4	SE5	SE4	SE2.8	SSW10	
28-Aug	E0	ESE3	ESE4	ESE5	ESE5	ESE5	SE5	ESE7	ESE6	ESE6	ESE6	ESE6	ESE7	SE6	ESE6	ESE6	SE6	SE6	SE5	SE2	N1	ESE5	ESE6	ESE9	ESE5.0	ESE9	
29-Aug	SE5	ESE7	SE6	SE7	SE6	SE5	SE8	ESE8	ESE7	ESE9	ESE7	ESE7	ESE10	ESE10	SSE7	SSE7	SSE6	SSE5	SE5	SSE3	ESE2	ESE5	SE1	SE4	SE5.9	ESE10	
30-Aug	SSE3	WNW1	WNW2	ENE3	ESE3	ESE4	ESE5	ESE6	ESE1	NNW2	E3	SE2	ESE6	SE7	ESE9	SE7	SE8	SE7	SE8	SSE8	SE7	ESE8	SE4	SE4	SE4.3	ESE9	
31-Aug	SW2	W4	S1	W1	W1	SSW2	ESE3	SE4	SW7	WNW0	ESE5	ESE7	NW3	W5	N4	NNW4	NNW4	NW8	WNW8	W7	WNW5	W4	WNW5	W6	WNW2.0	NW8	

S0.8 SW0.1 E0.5 E0.9 SSE1.3 SE1.0 ESE1.8 ESE2.0 ESE1.7 E1.1 E1.8 ESE0.7 WSW1.9 WSW2.7 SW3.1 SW4.2 WSW4.0 WSW4.5 SW2.4 SW1.5 WSW1.1 S1.1 S0.6 S1.1	Diurnal Average
NW9 NW10 E10 NNW11 NNW12 NNW12 NNW14 NNW15 NNW13 NNW16 NNW16 NNW16 SW15 SW15 SW16 SW18 WSW19 SW18 NNW15 NNW10 WNW10 WNW10 SE8 ESE9	Diurnal Maximum

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



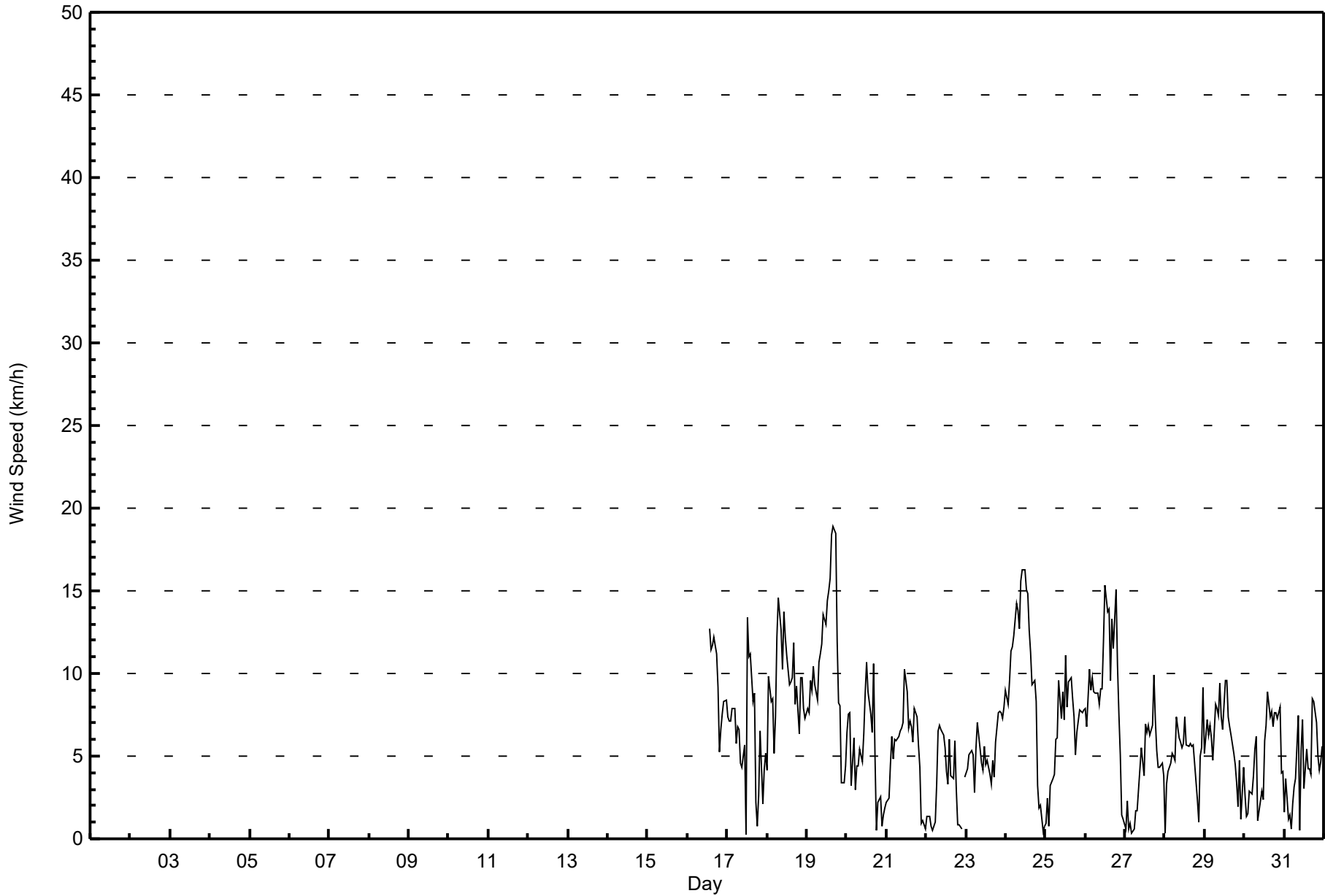
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Lower Camp - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 8 km/h on Aug 17 17:00	Hours in Service: 744 Hours of Data: 370 Hours of Missing Data: 374 Hours of Calibration: 0 Percent Operational Time: 49.7
Minimum Value: 1 km/h on Aug 23 05:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 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-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
2-Aug	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	--
3-Aug	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	--
4-Aug	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	--
5-Aug	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	--
6-Aug	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	--
7-Aug	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	--
8-Aug	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	--
9-Aug	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	--
10-Aug	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	--
11-Aug	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	--
12-Aug	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	--
13-Aug	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	--
14-Aug	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	--
15-Aug	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	--
16-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	4	4	4	4	4	3	2	2	2	2	3	4	
17-Aug	2	2	3	2	2	2	2	2	2	2	3	3	3	3	3	3	8	5	2	2	2	1	1	1	8	
18-Aug	2	3	3	2	2	2	3	3	3	3	3	3	3	3	2	3	2	2	2	3	2	2	1	3	3	
19-Aug	2	2	4	3	3	3	3	2	3	3	3	3	4	4	5	4	4	4	2	2	2	2	2	1	5	
20-Aug	2	2	3	3	2	2	2	2	2	4	2	2	2	2	2	2	5	1	1	1	2	1	1	2	5	
21-Aug	1	1	1	2	2	1	2	2	1	2	2	4	3	3	3	3	2	3	2	2	1	1	1	1	4	
22-Aug	1	1	1	1	1	1	2	2	2	2	2	2	2	3	2	2	2	2	2	1	1	1	UO	1	3	
23-Aug	2	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	
24-Aug	2	2	3	3	3	3	3	3	3	5	4	4	4	4	3	2	2	1	1	1	1	1	1	1	5	
25-Aug	1	1	1	1	2	1	3	2	4	2	2	3	4	3	4	4	3	3	1	2	2	2	2	2	4	
26-Aug	2	2	2	3	2	2	2	2	2	2	3	4	4	4	3	3	3	4	5	3	2	1	1	1	5	
27-Aug	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	2	3	3	2	1	2	1	1	1	3	
28-Aug	1	1	1	1	1	1	2	3	2	1	1	1	2	1	1	1	1	1	2	1	1	2	2	2	3	
29-Aug	2	2	2	2	2	2	2	2	2	2	2	1	2	3	3	3	2	2	1	2	2	2	2	2	3	
30-Aug	2	1	1	1	1	1	2	2	1	1	1	1	2	2	3	2	3	2	3	3	2	3	2	2	3	
31-Aug	1	2	2	1	1	1	1	1	3	2	2	2	2	2	1	1	1	5	3	3	2	1	2	1	5	
Diurnal Maximum																										
2 3 4 3 3 3 3 3 3 4 5 4 4 4 4 4 5 8 5 5 3 3 3 2 3																										

M - Maintenance UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	151	40.81	40.81
6 - 11	181	48.92	89.73
12 - 19	38	10.27	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: 370

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Lower Camp - August 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	2	1	3	9	22	26	8	3	1	4	5	30	23	6	6	151
6 - 11	0	0	0	0	3	58	32	10	6	8	5	5	7	19	16	12	181
12 - 19	1	0	0	0	0	0	0	0	0	1	9	9	0	2	2	14	38
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	3	2	1	3	12	80	58	18	9	10	18	19	37	44	24	32	370

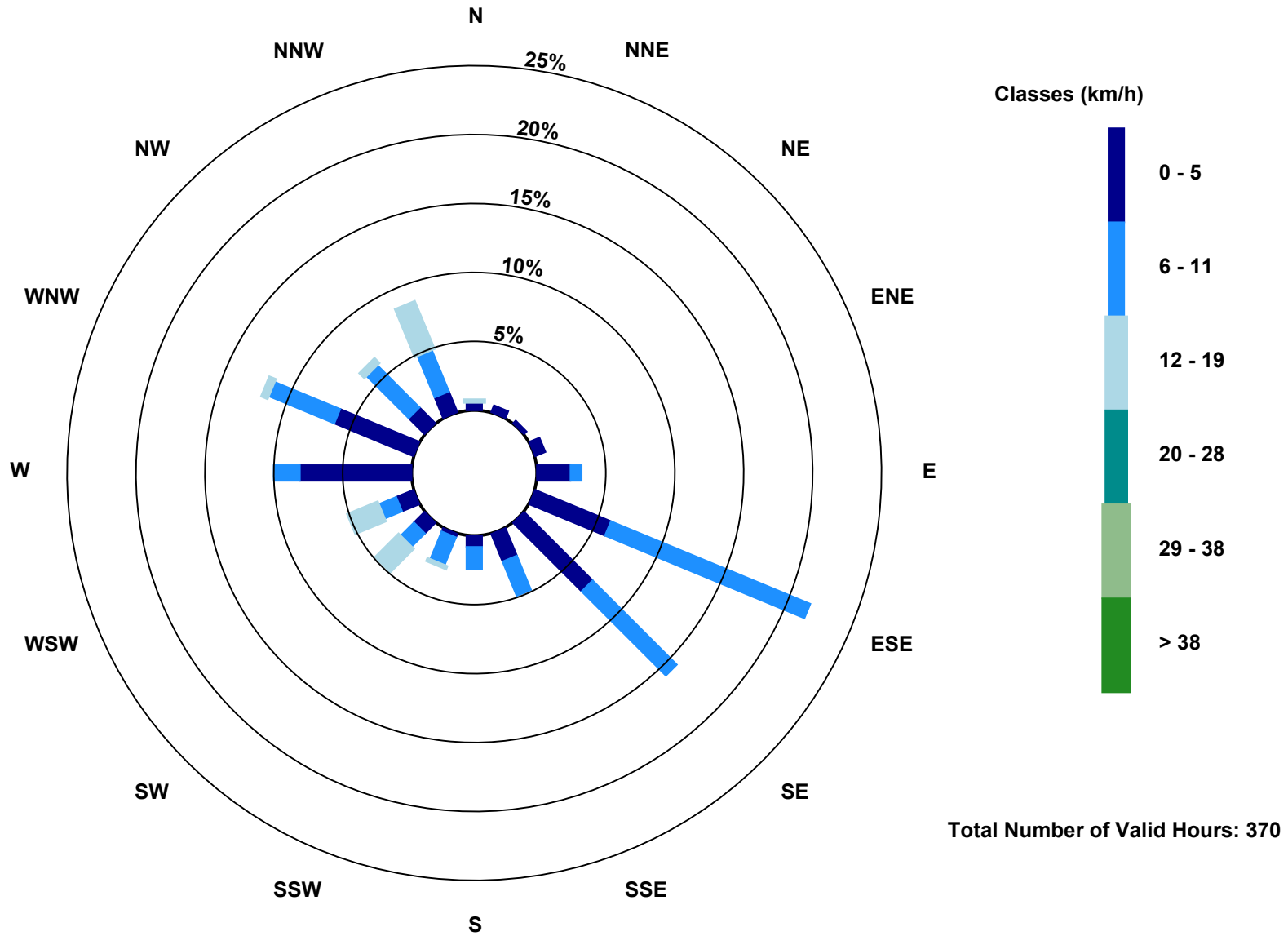
Total Number of Valid Hours: 370

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Lower Camp





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Lower Camp - August 2023

Direction of Maximum Speed: 238 deg on Aug 19 17:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 237.6 deg on Aug 19	Hours of Data: 370
Direction of Minimum Speed: 344 deg on Aug 17 12:00	Direction of Minimum Daily Speed Average: 1.0 deg on Aug 22
Direction of Minimum Speed: 344 deg on Aug 17 12:00	Hours of Missing Data: 374
Monthly Average Direction: 207.3 deg	Percent Operational Time: 49.7

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-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
2-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
3-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
4-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
5-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	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-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
12-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
13-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
14-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
15-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
16-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	250	246	235	217	204	202	161	156	158	137	136	--
17-Aug	132	138	87	120	120	123	118	141	141	142	104	344	243	268	240	235	293	303	161	248	308	284	282	271	193.6
18-Aug	283	313	320	334	330	340	350	345	342	328	336	321	299	332	318	282	294	293	297	327	298	300	286	286	316.9
19-Aug	287	294	277	253	247	260	246	233	228	244	239	229	238	231	229	234	238	235	218	219	199	177	68	101	237.6
20-Aug	125	122	120	83	194	163	139	154	109	275	303	344	348	341	333	317	298	302	235	129	281	255	296	269	327.1
21-Aug	114	138	131	124	122	123	120	120	118	115	113	107	115	135	123	160	142	170	165	158	127	144	280	313	130.6
22-Aug	278	269	265	273	219	249	106	108	115	118	108	117	33	66	122	184	291	300	296	328	308	245	UO	268	116.4
23-Aug	274	261	262	264	265	277	280	300	283	309	305	340	290	284	278	308	296	268	265	311	306	300	307	305	291.2
24-Aug	309	312	324	334	330	335	338	336	332	338	340	339	337	326	320	308	307	291	287	271	285	271	265	275	324.7
25-Aug	104	95	81	100	128	141	123	127	114	116	114	146	197	179	204	180	171	184	139	143	145	141	140	130	148.1
26-Aug	130	88	101	115	118	121	117	115	115	115	124	202	225	238	245	262	253	283	346	328	312	273	275	287	190.9
27-Aug	272	283	235	259	294	41	291	15	82	120	111	85	112	128	131	146	185	208	202	158	128	115	128	135	144.7
28-Aug	97	111	120	119	119	122	131	111	116	118	119	119	118	124	120	122	127	132	126	140	354	117	121	122	120.5
29-Aug	129	123	124	126	131	132	126	119	122	113	115	118	112	113	150	168	166	165	136	148	119	119	129	127	128.5
30-Aug	160	288	283	75	113	120	119	115	121	348	91	131	116	125	116	145	136	128	135	151	127	123	125	124	126.0
31-Aug	233	259	173	264	271	195	113	125	236	298	116	114	317	274	0	346	330	307	295	281	299	281	301	267	284.6

183.0	230.2	94.2	100.2	153.9	131.0	103.2	104.0	119.6	96.1	86.1	103.2	240.3	246.8	229.8	228.8	243.5	239.3	235.3	217.2	245.0	186.7	175.9	176.2	
Diurnal Average																								

M - Maintenance 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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 108 deg on Aug 30 09:00	Hours of Data: 370
Minimum Value: 11 deg on Aug 23 03:00	Hours of Missing Data: 374
Percentiles: P ₁ = 11 P ₁₀ = 17 Q ₁ = 21 Median = 30 Q ₃ = 45 P ₉₀ = 71 P ₉₉ = 95	Hours of Calibration: 0
	Percent Operational Time: 49.7

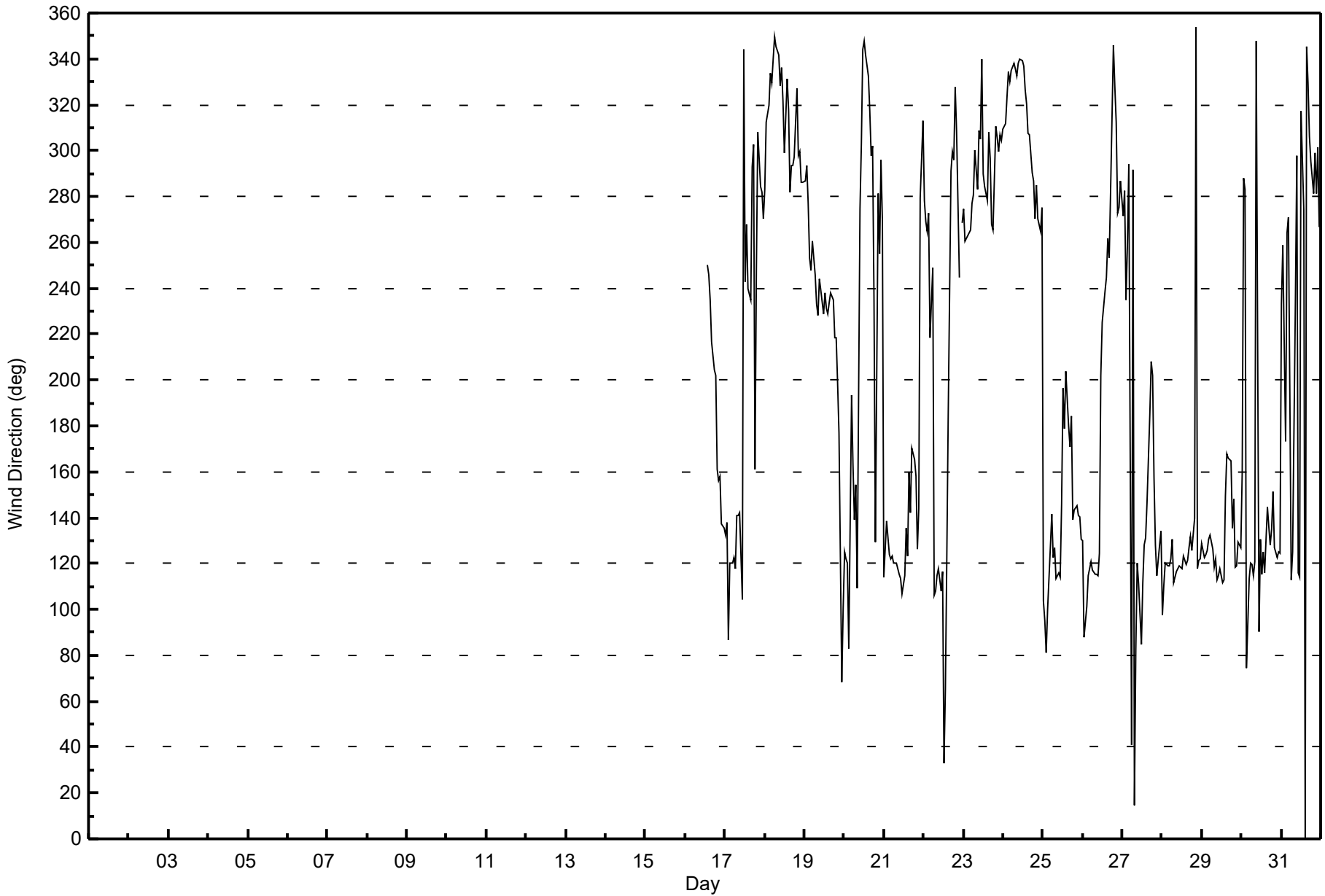
Day	Hourly Period Ending At (MST)																								Daily Maximum	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	
2-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--
3-Aug	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	--
4-Aug	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	--
5-Aug	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	--
6-Aug	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	--
7-Aug	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	--
8-Aug	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	--
9-Aug	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	--
10-Aug	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	--
11-Aug	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	--
12-Aug	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	--
13-Aug	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	--
14-Aug	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	--
15-Aug	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	--
16-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	25	25	25	23	24	26	26	28	31	23	26	31	
17-Aug	29	32	49	26	28	37	34	33	49	57	39	94	22	22	21	21	34	99	91	80	23	79	20	18	99	
18-Aug	26	17	21	26	32	24	19	19	22	19	20	24	19	22	22	14	16	18	14	32	17	13	18	18	32	
19-Aug	14	21	21	20	22	24	23	18	16	16	16	19	17	18	18	15	14	14	18	17	24	85	67	43	85	
20-Aug	24	27	33	94	31	76	62	59	35	71	44	15	11	17	22	24	22	28	84	59	33	89	30	71	94	
21-Aug	80	62	33	32	47	31	48	39	30	32	27	19	32	46	47	44	44	38	29	28	25	84	77	85	85	
22-Aug	38	28	43	86	76	48	64	25	26	37	34	50	62	62	45	70	80	24	21	57	79	85	UO	22	86	
23-Aug	27	18	11	11	16	29	20	16	19	20	25	13	34	12	17	27	30	16	11	20	15	14	20	18	34	
24-Aug	14	19	21	20	20	20	19	20	19	21	19	24	20	19	19	22	14	11	14	23	31	87	83	87	87	
25-Aug	94	64	69	46	56	38	52	50	33	32	26	46	31	42	37	40	35	34	21	22	27	25	25	21	94	
26-Aug	25	42	16	25	20	22	26	27	29	24	36	30	21	17	15	27	14	26	22	21	16	16	64	71	71	
27-Aug	72	40	89	84	88	77	49	55	50	37	35	51	35	41	39	43	41	22	22	27	54	35	41	43	89	
28-Aug	93	55	42	34	23	37	42	32	34	28	35	27	20	23	18	17	29	30	41	64	86	32	38	20	93	
29-Aug	51	36	48	36	40	57	32	40	45	23	29	32	19	19	40	40	33	30	31	54	78	36	99	62	99	
30-Aug	55	39	45	50	39	36	37	25	108	65	62	88	21	32	24	35	34	26	27	37	24	27	65	62	108	
31-Aug	87	31	80	70	92	64	56	45	40	98	41	23	64	49	14	19	26	25	34	35	24	35	34	27	98	
94 64 89 94 92 77 64 59 108 98 62 94 64 62 47 70 80 99 91 80 86 89 99 85																										
Diurnal Maximum																										

M - Maintenance UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Lower Camp - August 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS13 FORT MCKAY SOUTH AUGUST 2023

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

November 30, 2023
Revision 01

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT McKAY SOUTH (AMS13)
AUGUST 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	24.6	0	5.5	0
TRS(ppb) Average	708	36	36	100	3.7	0	1.1	0
THC(ppm) Average	708	36	36	100	4	-	2.9	-
NMHC(ppm) Average	708	36	36	100	0.618	-	0.18	-
CH4(ppm) Average	708	36	36	100	4	-	2.7	-
O3(ppb) Average	709	35	35	100	68.2	0	24	-
NO2(ppb) Average	707	37	37	100	23.8	0	8.9	-
NO(ppb) Average	707	37	37	100	113.3	-	27.9	-
NOX(ppb) Average	707	37	37	100	113.8	-	33.2	-
PM2.5(ug/m3) Average	742	2	2	100	448.3	130	167.2	16
ET(C) Average	744	0	0	100	31.6	-	20.9	-
RH(%) Average	744	0	0	100	98.8	-	93.4	-
WS(km/h) Average	743	0	1	99.87	19	-	12	-
WD(deg) Average	743	0	1	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
AUGUST 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	1.07	2.6	-	0.1	0.2	0.3	0.5	0.7	1.7	24.6
TRS(ppb) Average	708	0.6	0.4	-	0.2	0.3	0.4	0.5	0.7	1	3.7
THC(ppm) Average	708	2.23	0.3	-	1.9	2	2	2.1	2.3	2.6	4
NMHC(ppm) Average	708	0.032	0.101	-	0	0	0	0	0	0.1	0.618
CH4(ppm) Average	708	2.2	0.2	-	1.9	2	2	2.1	2.3	2.5	4
O3(ppb) Average	709	16.42	11.7	-	0.9	2.9	6.7	14.9	24.2	31.3	68.2
NO2(ppb) Average	707	4.05	4.4	-	0	0.3	0.7	2.6	5.5	10.4	23.8
NO(ppb) Average	707	3.01	10.1	-	0	0	0	0.1	1.5	6.5	113.3
NOX(ppb) Average	707	7.06	11.6	-	0	0.3	0.8	3.2	8.8	17.7	113.8
PM2.5(ug/m3) Average	742	46.05	60.7	-	1.8	5.4	9.6	21.3	64.6	104.4	448.3
Temperature 2 m (C) Average	744	16.56	5.3	-	3.4	10.1	12.9	15.8	20.4	23.6	31.6
Relative Humidity (%) Average	744	76.36	17.8	-	32.6	48.4	62.7	78.9	92.9	97.2	98.8
Wind Speed 10 m (km/h) Average	743	5.9	4	-	0	2	3	5	8	11	19
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT MCKAY SOUTH (AMS13)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	30 Aug 2023 00:00	30 Aug 2023 00:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association

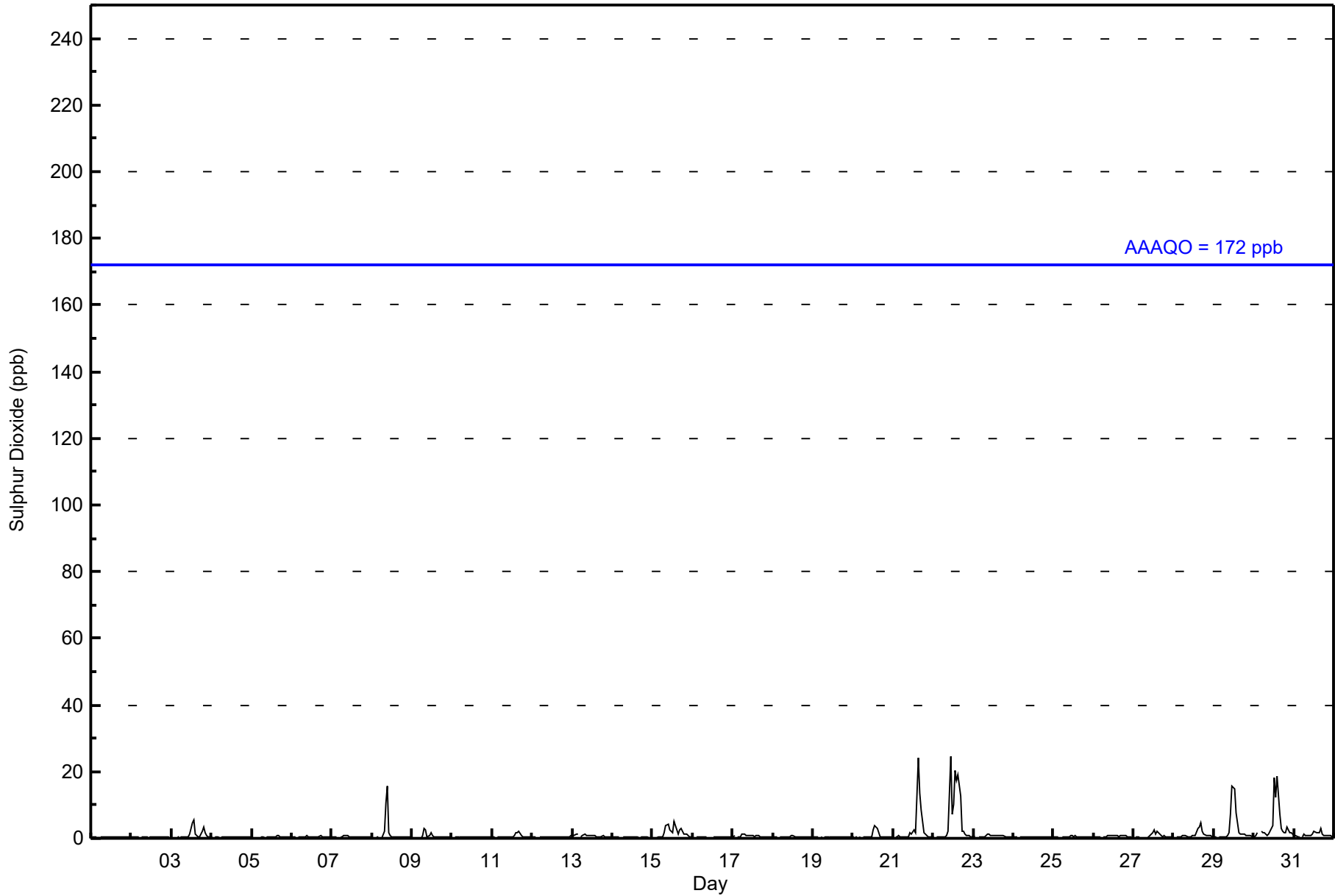
Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 24.6 ppb on Aug 22 11:00	Maximum Daily Average: 5.5 ppb on Aug 22		Hours of Data:	710
Minimum Value: 0.1 ppb on Aug 5 04:00	Minimum Daily Average: 0.3 ppb on Aug 2		Hours of Missing Data:	34
Maximum Diurnal Average: 2.5 ppb at hour 15	Minimum Diurnal Average: 0.4 ppb at hour 4		Hours of Calibration:	34
Monthly Average: 1.07 ppb	Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 1.7 P ₉₉ = 15.8		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-Aug	0.3	0.3	0.3	0.3	Z	0.3	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	0.3	0.3	0.4	0.5																								
2-Aug	0.3	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.4																							
3-Aug	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	1.1	4.8	5.5	1.4	0.7	0.5	0.5	2.3	3.3	1.7	0.9	0.6	0.5	1.2	5.5																							
4-Aug	0.4	Z	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.4																							
5-Aug	0.2	0.2	Z	0.1	0.1	0.1	0.6	0.4	0.2	0.2	0.3	0.3	0.5	0.5	0.7	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.8																							
6-Aug	0.4	0.3	0.4	Z	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.5	0.5	0.6																							
7-Aug	0.4	0.4	0.4	0.4	Z	0.6	0.6	0.8	0.8	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.5	0.8																							
8-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.2	2.0	10.4	15.5	1.6	0.8	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.5	15.5																							
9-Aug	Z	0.2	0.1	0.1	0.1	0.1	0.6	3.0	2.5	0.6	0.8	1.8	0.9	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.6	3.0																							
10-Aug	0.3	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	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.5																							
11-Aug	0.3	0.3	Z	0.3	0.2	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.8	1.6	1.7	2.3	0.9	0.6	0.5	0.5	0.4	0.4	0.4	0.6	2.3																							
12-Aug	0.4	0.4	0.3	Z	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.6	0.7	0.4	0.7																						
13-Aug	0.8	1.0	1.1	1.1	Z	0.6	1.0	1.3	0.8	0.7	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.7	1.3																							
14-Aug	0.5	0.5	0.6	0.6	0.3	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.6	0.6																						
15-Aug	Z	0.2	0.2	0.3	0.5	0.5	0.5	1.7	4.0	4.2	2.4	2.0	1.7	4.9	2.6	1.3	2.6	3.2	2.0	1.4	1.2	0.8	0.6	0.5	1.7	4.9																							
16-Aug	0.5	Z	0.5	0.4	0.4	0.4	0.3	0.4	0.3	C	C	C	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5																						
17-Aug	0.5	0.7	Z	0.5	0.6	1.3	1.2	1.1	0.9	0.7	0.7	0.8	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.7	1.3																							
18-Aug	0.5	0.4	0.4	Z	0.3	0.3	0.3	0.4	0.3	0.4	0.6	0.8	0.7	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	0.8																						
19-Aug	0.2	0.3	0.3	0.2	Z	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	0.4	0.4	0.4	0.3	0.4	0.4																						
20-Aug	0.4	0.2	0.2	0.2	0.2	Z	0.5	0.4	0.4	0.3	0.3	0.5	2.6	4.0	2.8	1.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.8	4.0																							
21-Aug	Z	0.5	0.6	0.7	0.6	0.5	0.4	0.4	0.4	0.6	1.6	1.5	2.4	1.7	12.5	24.1	13.5	8.3	1.9	1.1	0.6	0.5	0.4	0.4	3.3	24.1																							
22-Aug	0.4	Z	0.5	0.5	0.4	0.3	0.3	0.6	0.7	2.0	24.6	7.1	10.1	20.5	17.4	19.3	12.8	2.2	2.1	1.4	0.9	0.7	0.6	0.6	5.5	24.6																							
23-Aug	0.7	0.6	Z	0.4	0.3	0.3	0.4	0.5	1.1	1.4	0.9	0.7	0.8	0.7	0.7	0.9	0.9	0.8	0.7	0.6	0.6	0.6	0.5	0.5	0.7	1.4	1.4																						
24-Aug	0.5	0.5	0.4	Z	0.4	0.4	0.4	0.4	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	0.3	0.3	0.4	0.5	0.5																						
25-Aug	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.4	0.5	0.5	0.8	0.8	0.6	0.7	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.8	0.8																						
26-Aug	0.4	0.3	0.3	0.4	0.4	Z	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.7	0.8	0.7	0.6	0.5	0.4	0.4	0.6	0.8	0.8																						
27-Aug	Z	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.7	1.8	2.6	1.4	1.9	1.6	1.0	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	2.6	2.6																						
28-Aug	0.4	Z	0.4	0.4	0.5	0.6	0.7	0.7	0.6	0.5	0.5	0.7	0.8	1.0	2.8	3.5	4.7	2.1	1.3	1.0	0.8	0.8	0.7	0.6	1.1	4.7	4.7																						
29-Aug	0.6	0.5	Z	0.5	0.4	0.4	0.4	0.5	0.7	1.9	7.1	15.8	14.7	7.7	4.6	1.8	1.3	1.2	1.2	1.0	0.9	0.9	0.8	0.5	2.8	15.8	15.8																						
30-Aug	0.6	1.0	1.6	Z	2.2	1.7	1.6	1.5	0.8	1.4	2.8	4.0	18.1	12.4	18.5	7.1	2.9	2.1	1.7	1.7	3.4	1.5	1.5	1.1	4.0	18.5	18.5																						
31-Aug	0.8	0.7	0.6	0.6	Z	0.5	1.2	1.0	0.9	0.7	0.9	1.1	2.3	1.8	1.6	1.7	3.1	1.4	0.9	0.8	0.8	0.7	0.7	0.6	1.1	3.1	3.1																						
																								0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	1.0	1.2	1.8	1.6	2.3	2.3	2.5	2.4	1.8	1.0	0.8	0.7	0.6	0.5	0.5	0.4	Diurnal Average	
																								0.8	1.0	1.6	1.1	2.2	1.7	1.6	3.0	10.4	15.5	24.6	15.8	18.1	20.5	18.5	24.1	13.5	8.3	2.3	3.3	3.4	1.5	1.5	1.1	Diurnal Maximum	

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	696	98.03	98.03
11 - 20	11	1.55	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
Fort McKay South - August 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	50	23	14	10	11	10	44	48	84	73	73	70	57	38	46	44	695
11 - 20	0	0	0	0	0	0	4	3	3	0	1	0	0	0	0	0	11
21 - 60	0	0	0	0	0	1	0	0	2	0	0	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	50	23	14	10	11	11	48	51	89	73	74	70	57	38	46	44	709

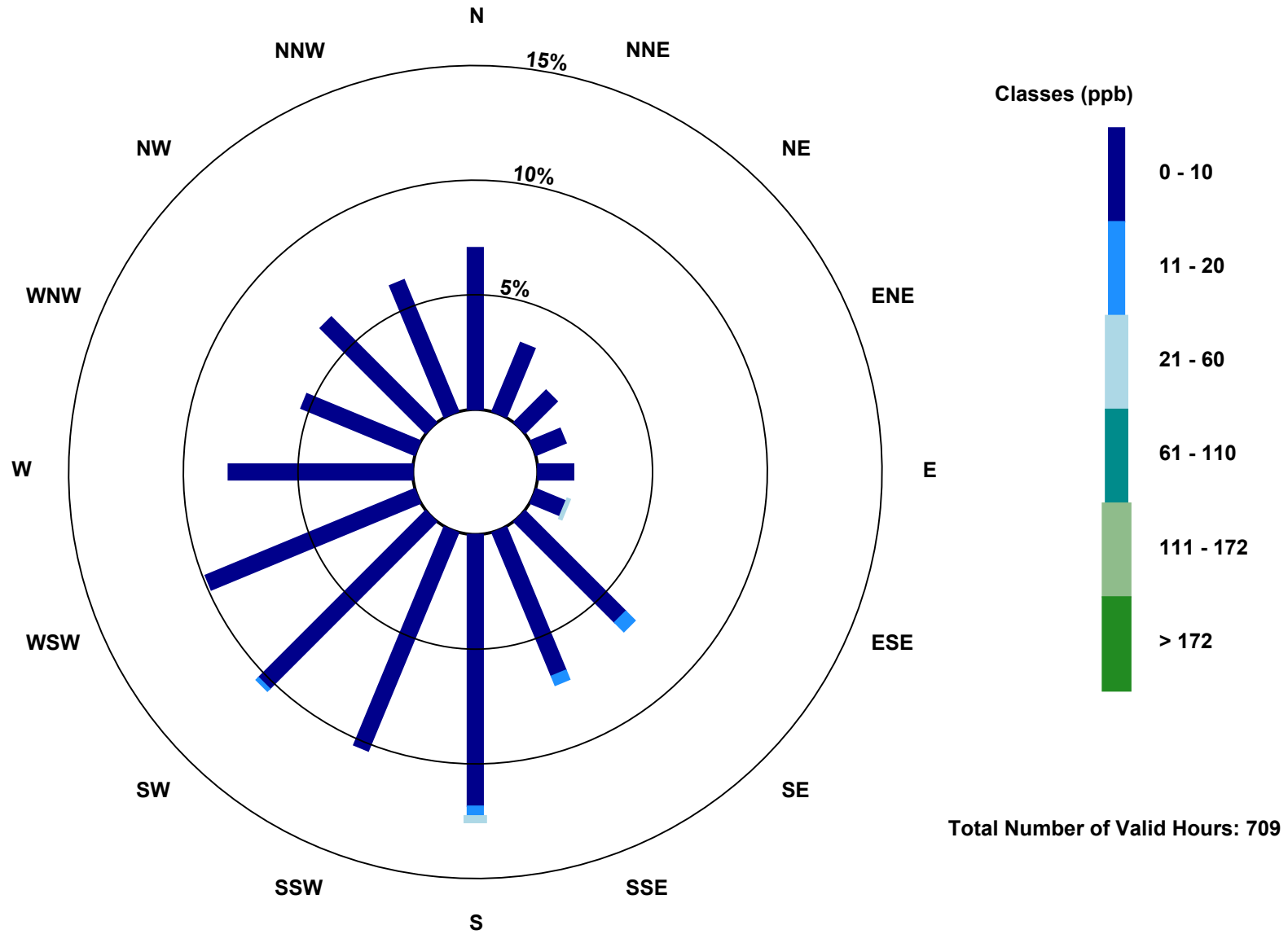
Total Number of Valid Hours: 709

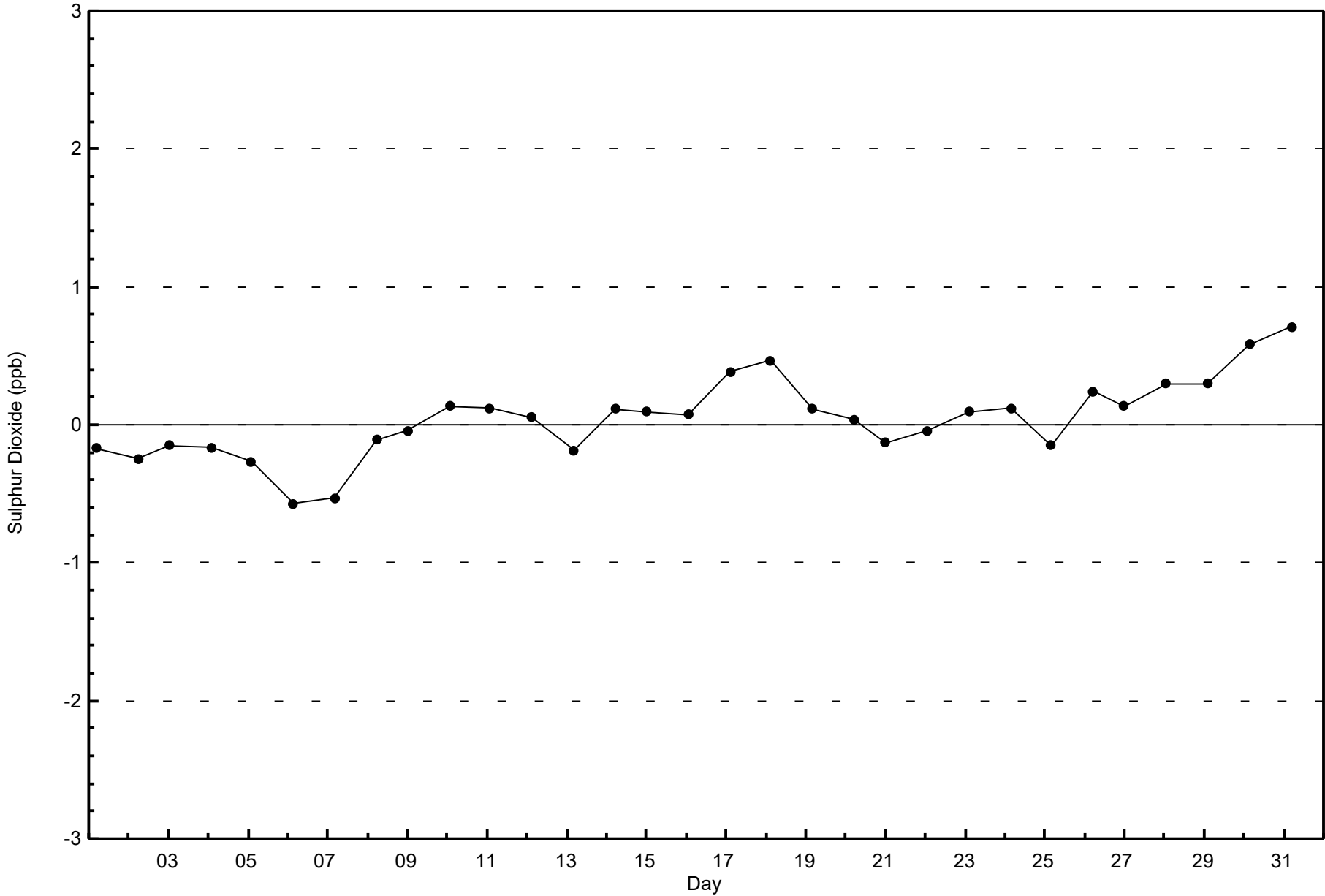
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Fort McKay South

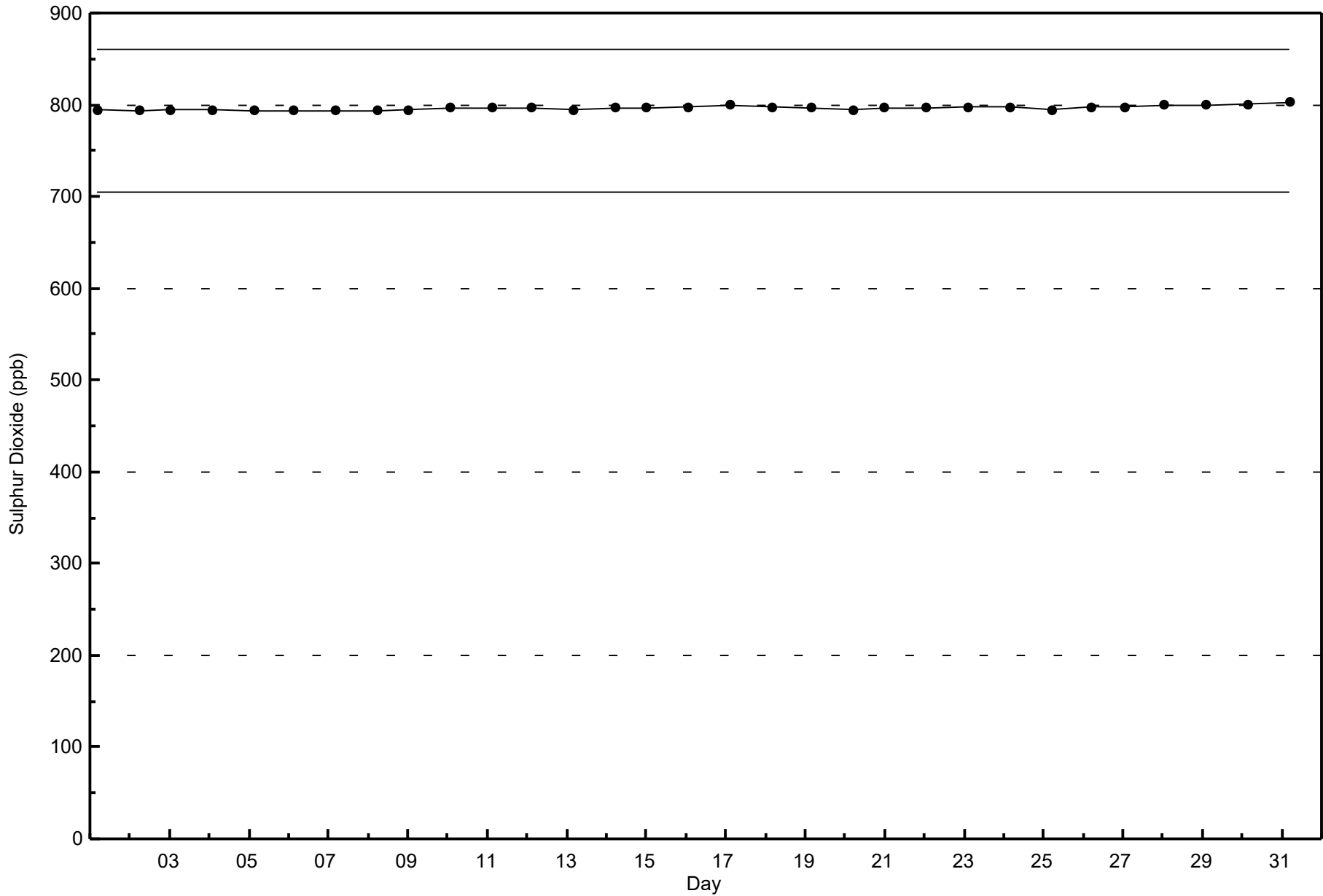






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Fort McKay South - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Total Reduced Sulphur (TRS) - ppb

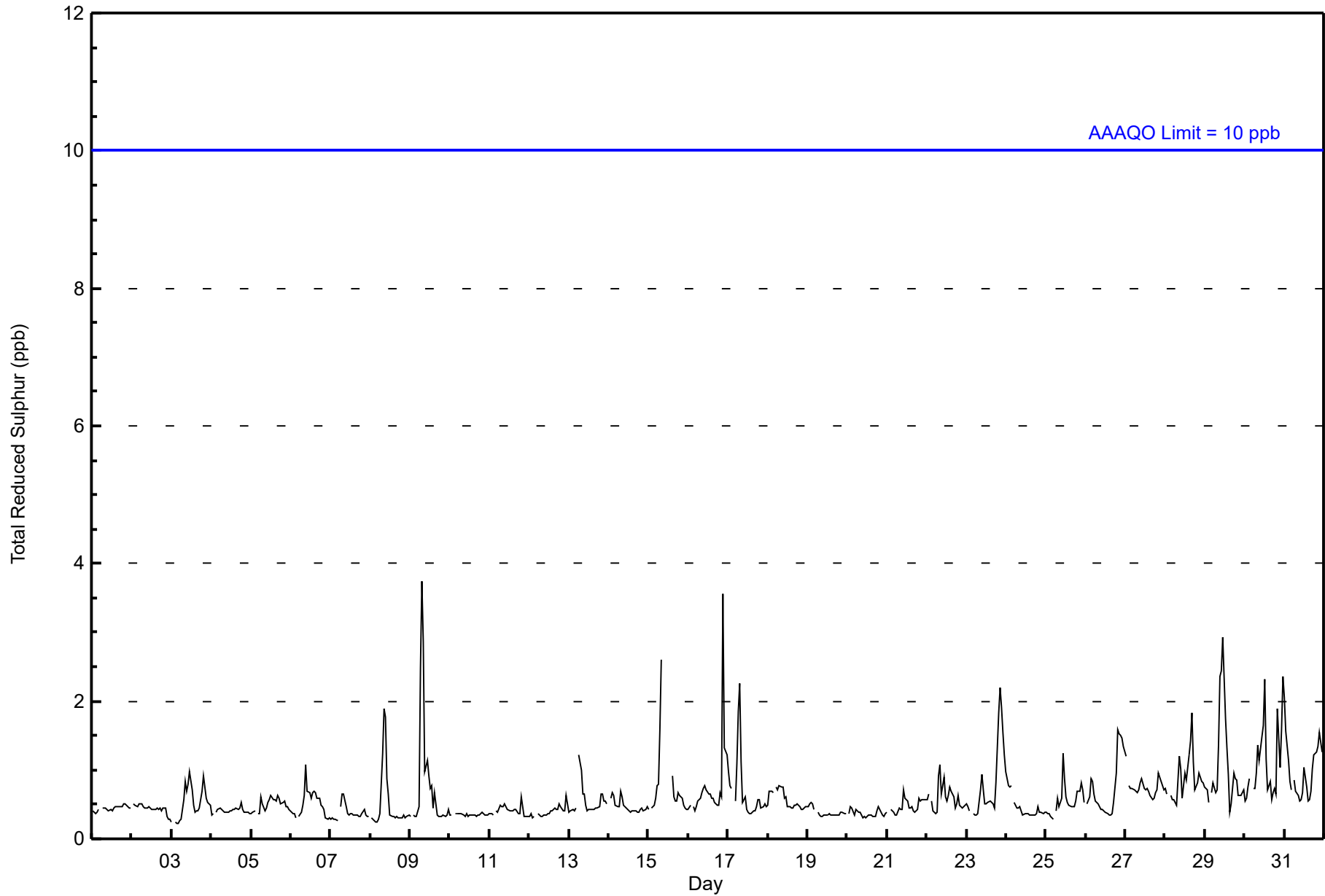
Fort McKay South - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744								
Maximum Value: 3.7 ppb on Aug 9 08:00		Maximum Daily Average: 1.1 ppb on Aug 30														Hours of Data: 708												
Minimum Value: 0.2 ppb on Aug 3 04:00		Minimum Daily Average: 0.3 ppb on Aug 10														Hours of Missing Data: 36												
Maximum Diurnal Average: 0.8 ppb at hour 9		Minimum Diurnal Average: 0.5 ppb at hour 5														Hours of Calibration: 36												
Monthly Average: 0.60 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.5 Q ₃ = 0.7 P ₉₀ = 1.0 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-Aug	0.4	0.4	0.4	0.4	0.4	Z	0.4	0.5	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	0.4	0.5	0.5	
2-Aug	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5
3-Aug	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.6	0.8	0.7	0.8	1.0	0.7	0.5	0.4	0.4	0.4	0.4	0.7	0.9	0.8	0.6	0.5	0.5	0.5	0.5	1.0	1.0
4-Aug	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	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
5-Aug	0.4	0.4	0.4	Z	0.4	0.4	0.4	0.6	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.6	0.6
6-Aug	0.4	0.4	0.4	0.3	Z	0.3	0.4	0.5	0.6	1.1	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.5	0.5	1.1	1.1
7-Aug	0.3	0.3	0.3	0.3	0.3	Z	0.5	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.7	0.7
8-Aug	Z	0.3	0.3	0.2	0.2	0.3	0.4	1.2	1.9	1.8	0.9	0.6	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	0.5	1.9
9-Aug	0.3	Z	0.4	0.3	0.3	0.5	2.5	3.7	2.9	1.0	1.1	0.9	0.7	0.8	0.5	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.8	3.7
10-Aug	0.3	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
11-Aug	0.4	0.4	0.3	Z	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	0.4	0.6	0.5	0.3	0.3	0.3	0.4	0.4	0.6	0.6
12-Aug	0.3	0.4	0.3	0.3	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.6	0.5	0.4	0.4	0.6	0.6
13-Aug	0.4	0.4	0.4	0.4	0.5	Z	1.2	1.0	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.7	0.5	0.5	0.5	0.5	0.5	1.2	1.2
14-Aug	Z	0.6	0.7	0.6	0.5	0.5	0.5	0.7	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	0.5	0.7
15-Aug	0.4	Z	0.5	0.5	0.6	0.8	0.8	1.6	2.6	C	C	C	C	C	0.9	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.8	2.6	
16-Aug	0.4	0.5	Z	0.5	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.7	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.7	0.6	3.5	1.3	1.2	0.8	0.8	3.5	3.5
17-Aug	1.0	0.8	0.7	Z	0.6	1.1	1.9	2.3	1.1	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.7	0.7	2.3	2.3
18-Aug	0.5	0.7	0.7	0.7	Z	0.7	0.7	0.8	0.8	0.8	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.8	0.8
19-Aug	0.5	0.5	0.5	0.5	0.4	Z	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
20-Aug	Z	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5
21-Aug	0.4	Z	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.7	0.6	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.7	0.7
22-Aug	0.6	0.6	Z	0.6	0.4	0.4	0.4	0.9	1.1	0.7	0.9	0.6	0.5	0.6	0.8	0.7	0.6	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	1.1	1.1
23-Aug	0.5	0.5	0.4	Z	0.3	0.3	0.3	0.4	0.7	0.9	0.7	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.8	1.8	2.2	1.9	1.6	1.2	0.8	0.8	2.2	2.2
24-Aug	1.0	0.8	0.8	0.8	Z	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	1.0	1.0
25-Aug	0.4	0.4	0.4	0.3	0.3	Z	0.4	0.6	0.5	0.6	1.2	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.8	0.7	0.5	0.6	0.6	1.2	1.2
26-Aug	Z	0.5	0.6	0.9	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.5	1.0	1.6	1.5	1.5	1.5	1.3	0.7	0.7	1.6	1.6
27-Aug	1.2	Z	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.7	1.0	0.9	0.8	0.7	0.8	0.8	1.2	1.2
28-Aug	0.7	0.7	Z	0.6	0.6	0.6	0.5	0.5	1.2	1.0	0.6	0.8	1.0	0.9	1.2	1.4	1.8	1.1	0.7	0.8	1.0	0.9	0.8	0.8	0.9	0.9	1.8	1.8
29-Aug	0.7	0.7	0.5	Z	0.7	0.8	0.7	0.7	1.4	2.4	2.4	2.9	1.7	1.3	0.9	0.4	0.5	0.9	0.9	0.8	0.6	0.6	0.6	0.7	1.0	1.0	2.9	2.9
30-Aug	0.5	0.6	0.7	0.9	Z	0.7	0.7	1.0	1.4	1.1	1.5	1.7	2.3	1.2	0.7	0.8	0.6	0.7	0.7	0.7	1.9	1.0	1.6	2.4	1.1	1.1	2.4	2.4
31-Aug	2.0	1.6	1.1	0.8	0.7	Z	0.9	0.7	0.6	0.6	0.6	0.7	1.0	0.7	0.5	0.6	0.7	1.0	1.2	1.3	1.3	1.5	1.4	1.3	1.0	1.0	2.0	2.0
																								Diurnal Average				
																								Diurnal Maximum				
																								Diurnal Average				
																								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

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	99.29	99.29
3 - 4	5	0.71	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 McKay South - August 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	50	23	14	10	11	11	43	48	88	67	73	73	60	40	46	45	702
3 - 4	0	0	0	0	0	0	3	1	0	1	0	0	0	0	0	0	5
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	50	23	14	10	11	11	46	49	88	68	73	73	60	40	46	45	707

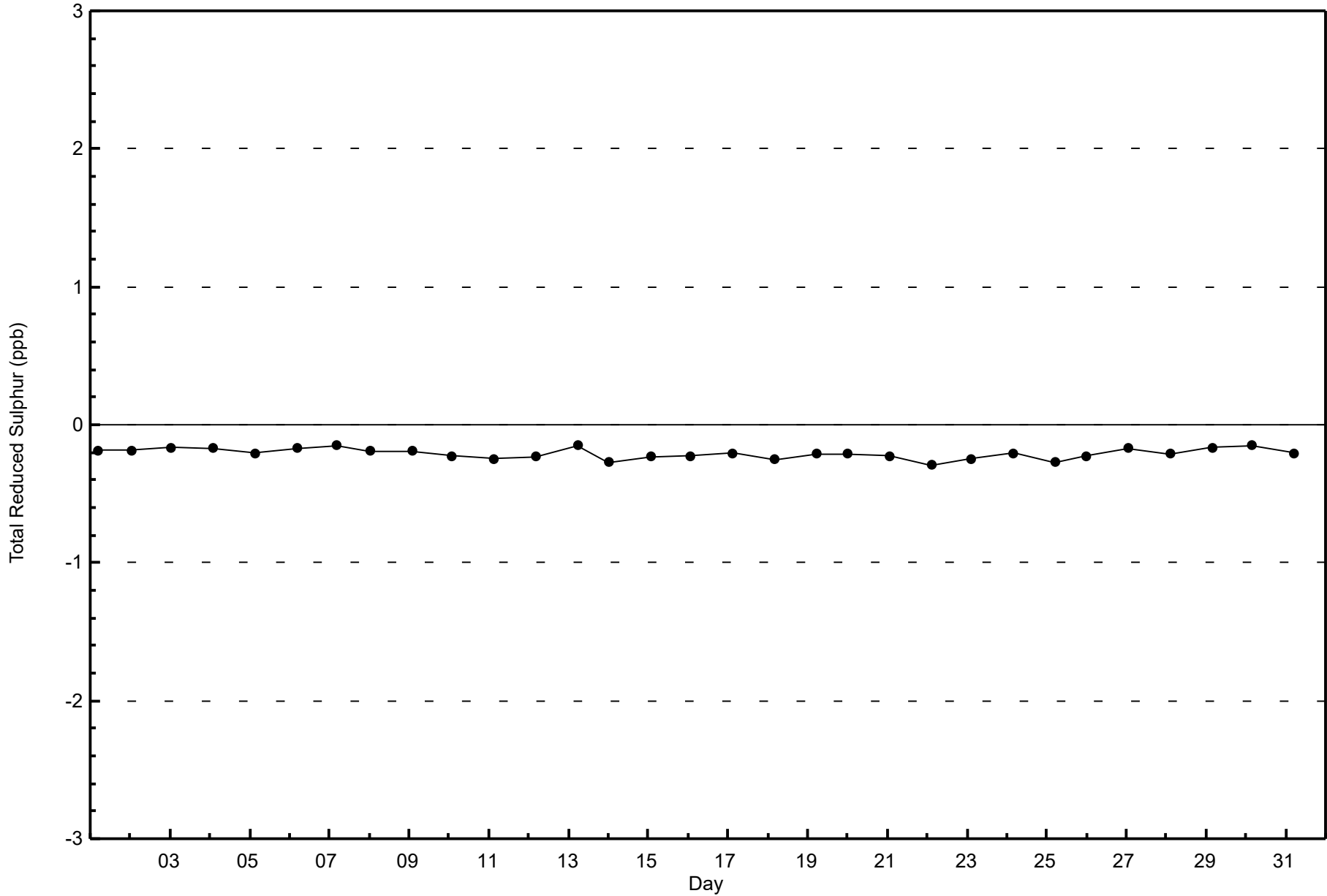
Total Number of Valid Hours: 707

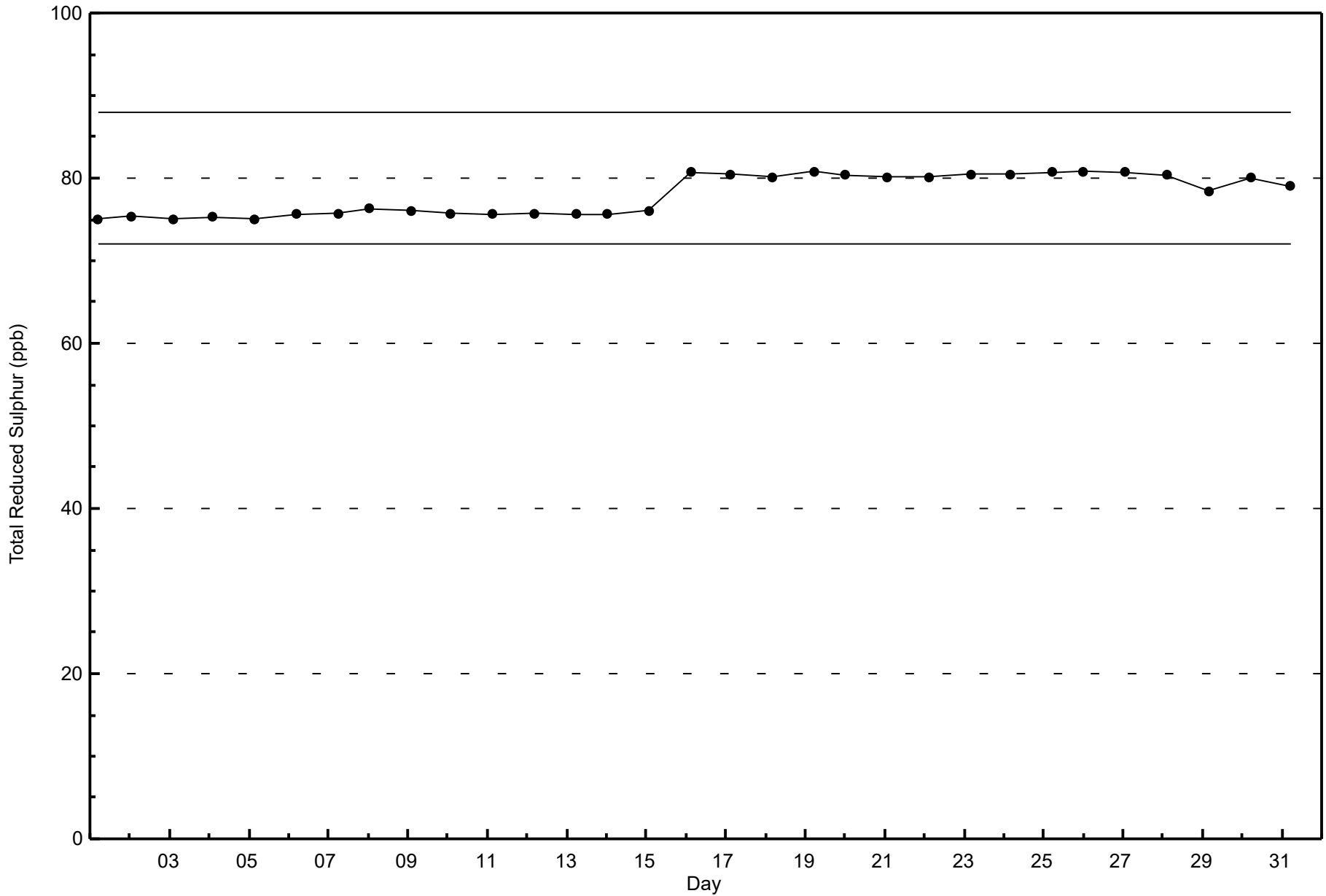
Total Number of Hours: 744



Wood Buffalo Environmental Association
Zero Responses

Total Reduced Sulphur (TRS) - ppb
Fort McKay South - August 2023

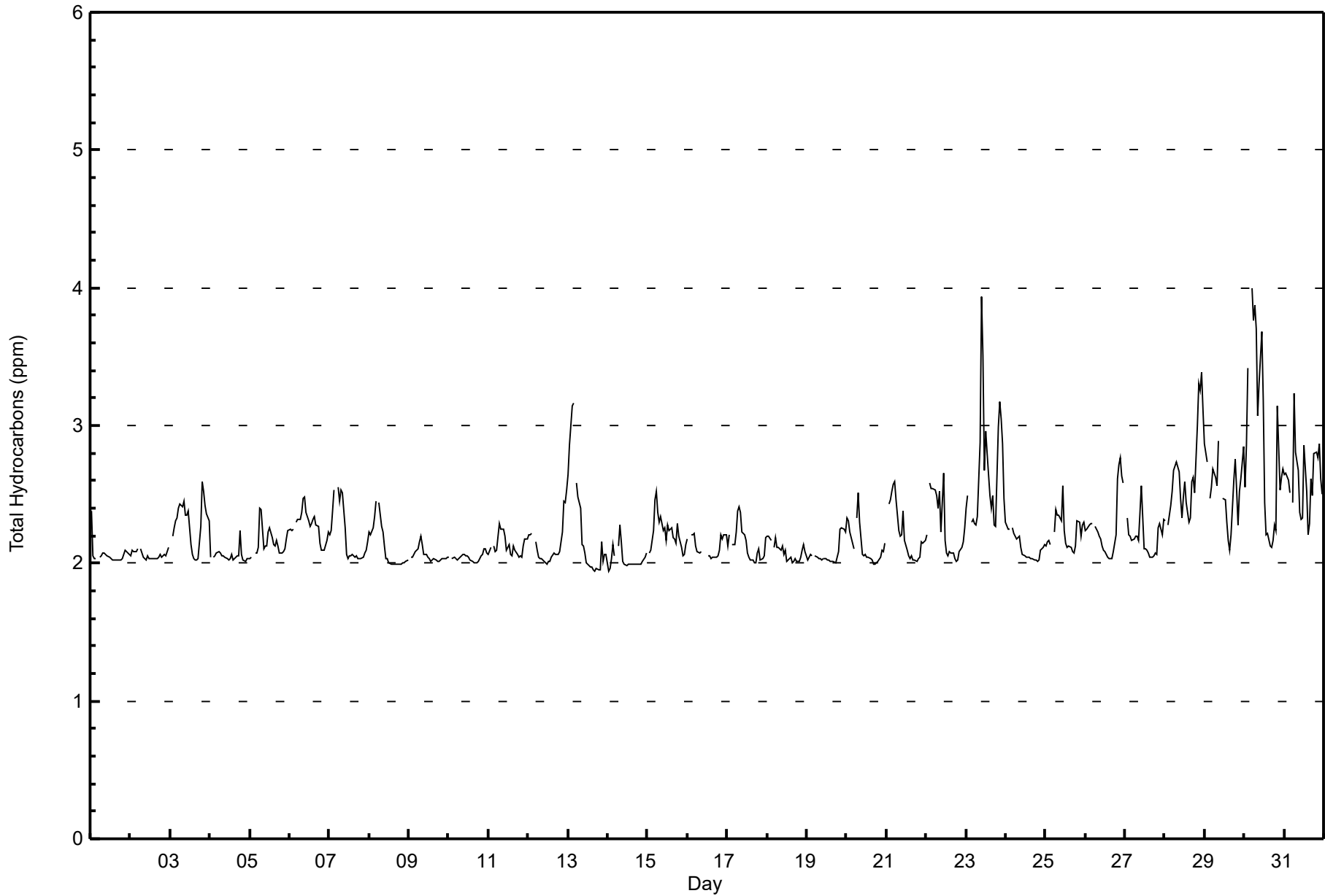






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Fort McKay South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Fort McKay South - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	199	28.11	28.11
2.1 - 3.0	489	69.07	97.18
3.1 - 10.0	20	2.82	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
Fort McKay South - August 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	10	7	6	4	5	5	23	4	9	14	26	21	26	14	12	13	199
2.1 - 3.0	38	15	7	6	4	6	23	47	76	55	45	49	29	23	34	31	488
3.1 - 10.0	2	1	1	0	2	0	0	0	4	4	3	0	2	1	0	0	20
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	50	23	14	10	11	11	46	51	89	73	74	70	57	38	46	44	707

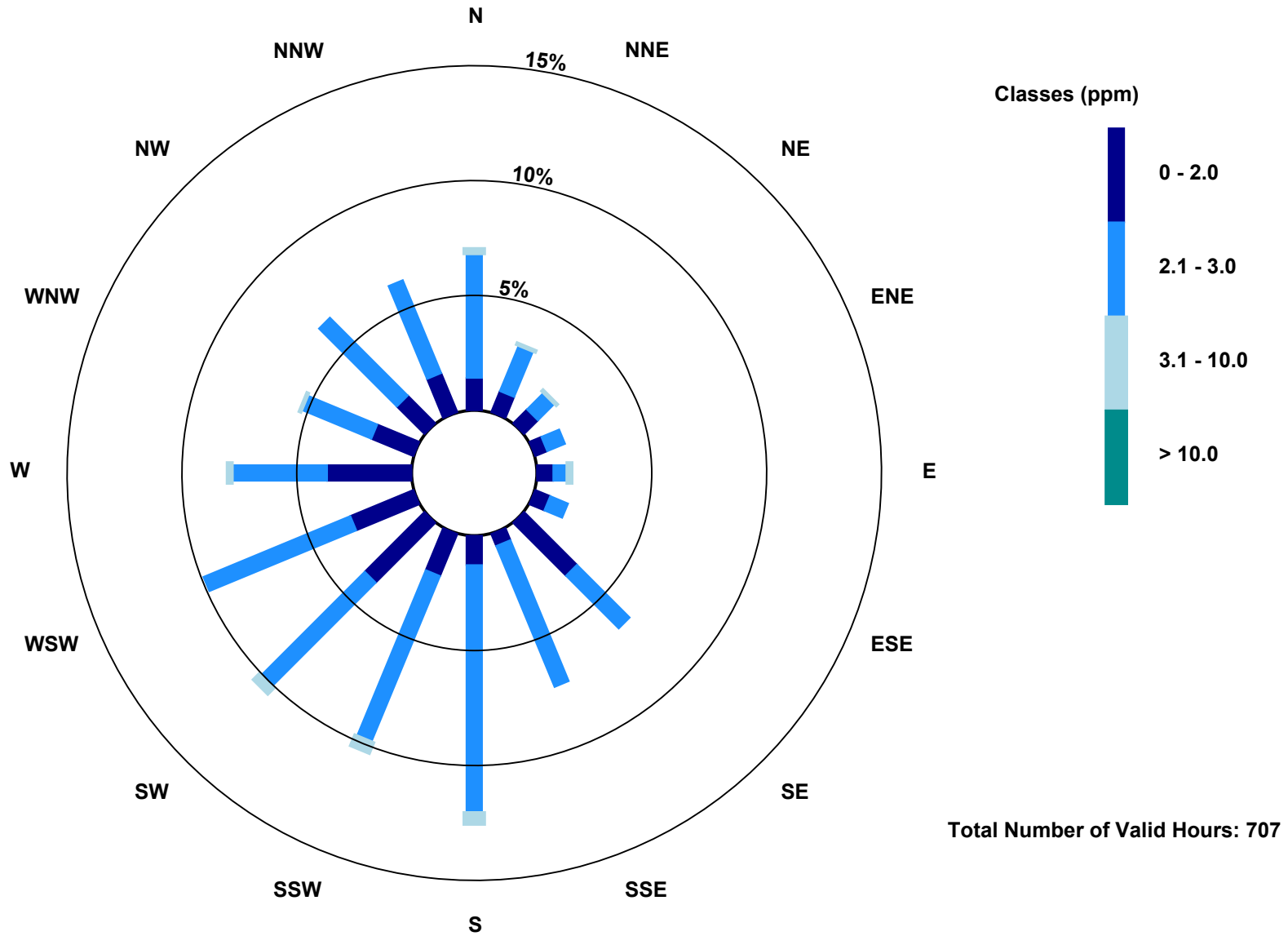
Total Number of Valid Hours: 707

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

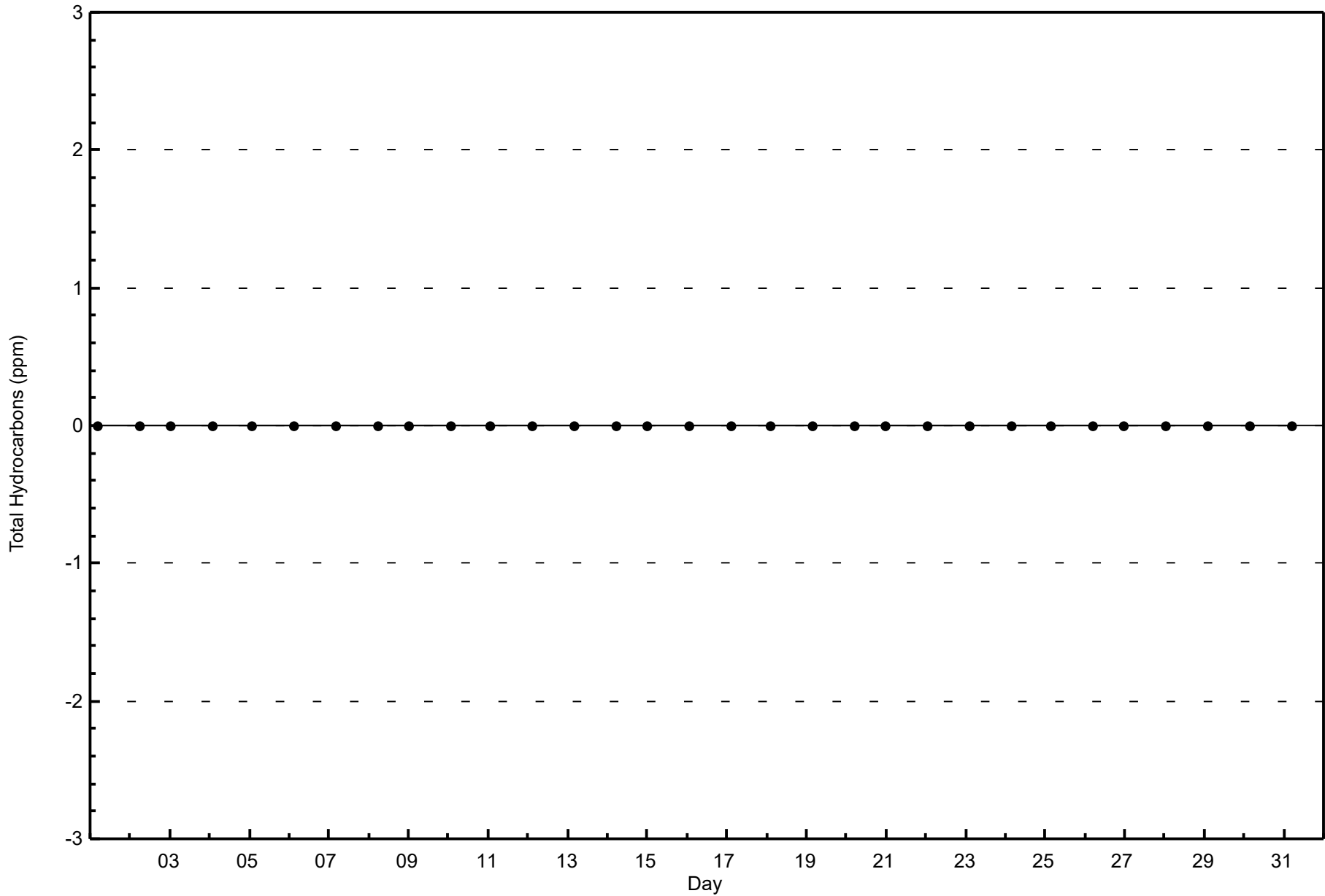
Total Hydrocarbons (THC) - ppm
Fort McKay South

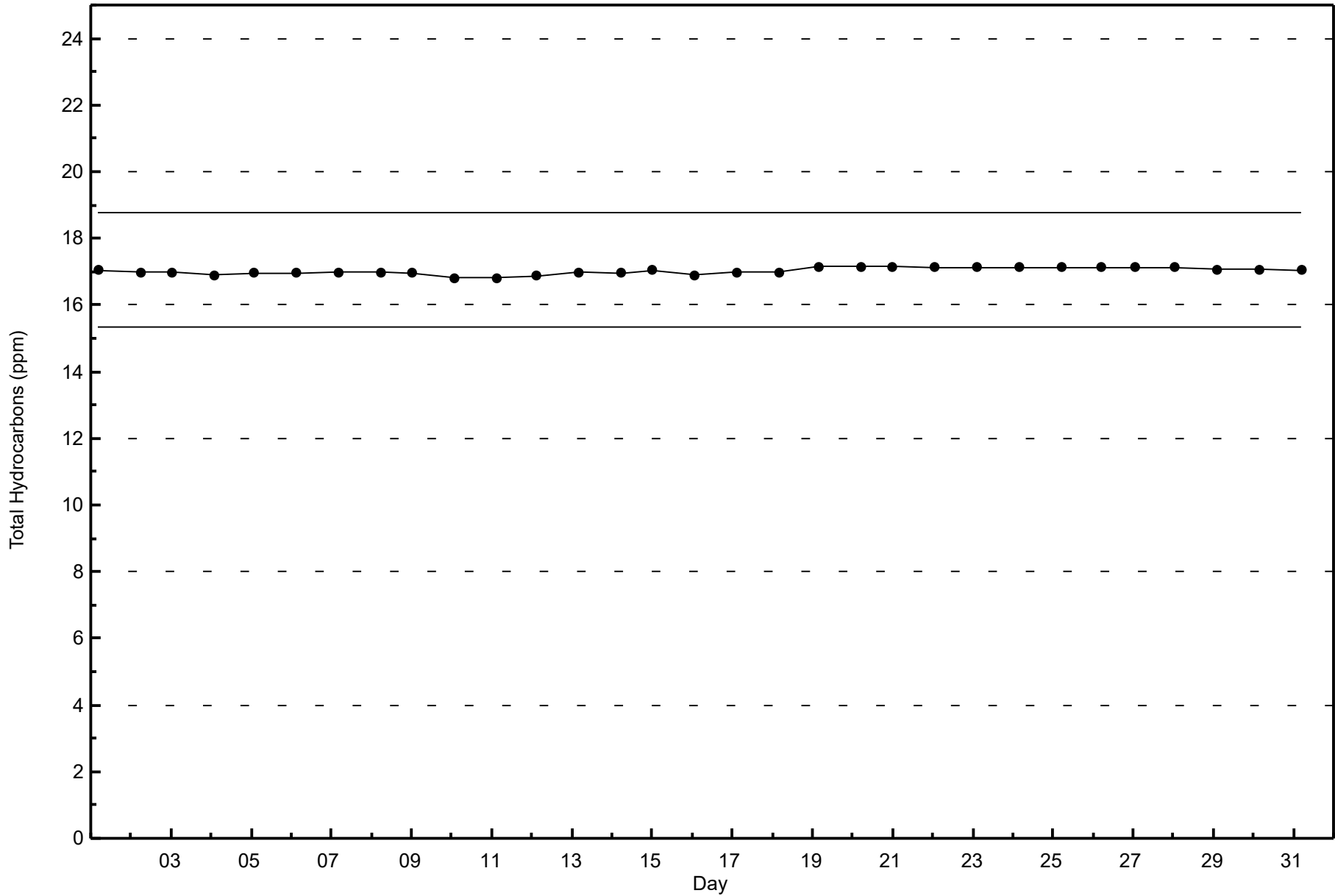




Wood Buffalo Environmental Association
Zero Responses

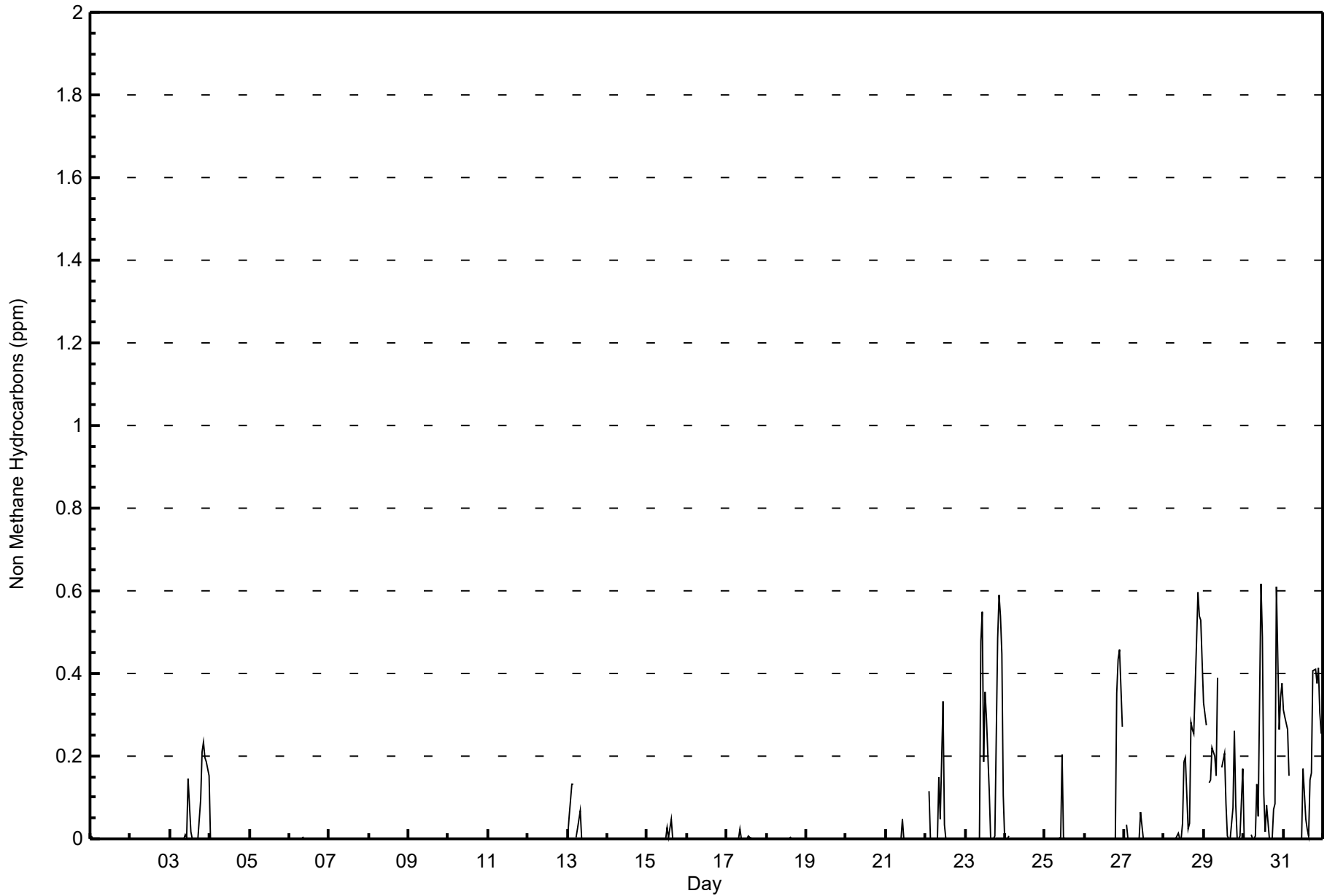
Total Hydrocarbons (THC) - ppm
Fort McKay South - August 2023







Maximum Value: 0.618 ppm on Aug 30 11:00																				Maximum Daily Average: 0.180 ppm on Aug 23					Hours in Service:	744																							
Minimum Value: 0.000 ppm on Aug 1 02:00																				Minimum Daily Average: 0.000 ppm on Aug 2					Hours of Data:	708																							
Maximum Diurnal Average: 0.092 ppm at hour 21																				Minimum Diurnal Average: 0.002 ppm at hour 16					Hours of Missing Data:	36																							
Monthly Average: 0.032 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 = 0.5					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-Aug	0.008	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	0.008	0.008															
2-Aug	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																
3-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.003	0.147	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.094	0.211	0.234	0.198	0.186	0.153	0.054	0.234	0.000	0.000	0.000	0.000	0.000																	
4-Aug	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																	
5-Aug	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																	
6-Aug	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003																	
7-Aug	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																	
8-Aug	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																	
9-Aug	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																	
10-Aug	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																	
11-Aug	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																	
12-Aug	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																	
13-Aug	0.002	0.051	0.134	0.132	Z	0.005	0.024	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	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																	
15-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.005	0.048	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	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																	
17-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.006	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																	
18-Aug	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	0.005	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																	
19-Aug	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																	
20-Aug	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																	
21-Aug	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	Z	0.115	0.000	0.000	0.000	0.000	0.000	0.148	0.047	0.331	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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-Aug	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.477	0.551	0.185	0.356	0.290	0.115	0.000	0.000	0.000	0.000	0.008	0.484	0.589	0.540	0.446	0.106	0.180	0.589	0.000	0.000	0.000	0.000	0.000																	
24-Aug	0.000	0.000	0.006	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																	
25-Aug	0.000	0.000	0.000	0.000	Z	0.000	0.000	0.000	0.000	0.005	0.203	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	0.000	0.000																	
26-Aug	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	0.352	0.433	0.458	0.365	0.272	0.082	0.458	0.000	0.000	0.000	0.000																		
27-Aug	Z	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.064	0.000	0.000	0.000	0.000																		
28-Aug	0.000	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000	0.037	0.188	0.198	0.024	0.038	0.282	0.264	0.253	0.477	0.595	0.540	0.527	0.426	0.168	0.595	0.000	0.000	0.000	0.000	0.000																		
29-Aug	0.328	0.274	Z	0.134	0.142	0.222	0.200	0.153	0.390	C	C	0.172	0.207	0.086	0.008	0.000	0.000	0.076	0.260	0.083	0.000	0.000	0.006	0.170	0.139	0.390	0.000	0.000	0.000	0.000	0.000																		
30-Aug	0.000	0.000	0.000	Z	0.009	0.000	0.000	0.007	0.132	0.056	0.618	0.489	0.108	0.016	0.083	0.000	0.000	0.000	0.072	0.086	0.610	0.264	0.342	0.376	0.142	0.618	0.000	0.000	0.000	0.000	0.000																		
31-Aug	0.311	0.294	0.266	0.153	Z	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.169	0.046	0.022	0.008	0.141	0.161	0.408	0.411	0.375	0.413	0.306	0.254	0.163	0.413	0.000	0.000	0.000	0.000	0.000																		
																								Diurnal Average		0.025	0.025	0.020	0.016	0.006	0.009	0.007	0.007	0.023	0.020	0.063	0.036	0.035	0.021	0.010	0.002	0.014	0.016	0.035	0.068	0.092	0.078	0.070	0.057
																								Diurnal Maximum		0.328	0.294	0.266	0.153	0.142	0.222	0.200	0.153	0.390	0.477	0.618	0.489	0.356	0.290	0.115	0.038	0.282	0.264	0.408	0.484	0.610	0.540	0.527	0.426
Z - zerospan																								C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	601	84.89	84.89
0.006 - 0.05	26	3.67	88.56
0.06 - 0.1	22	3.11	91.67
> 0.1	59	8.33	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



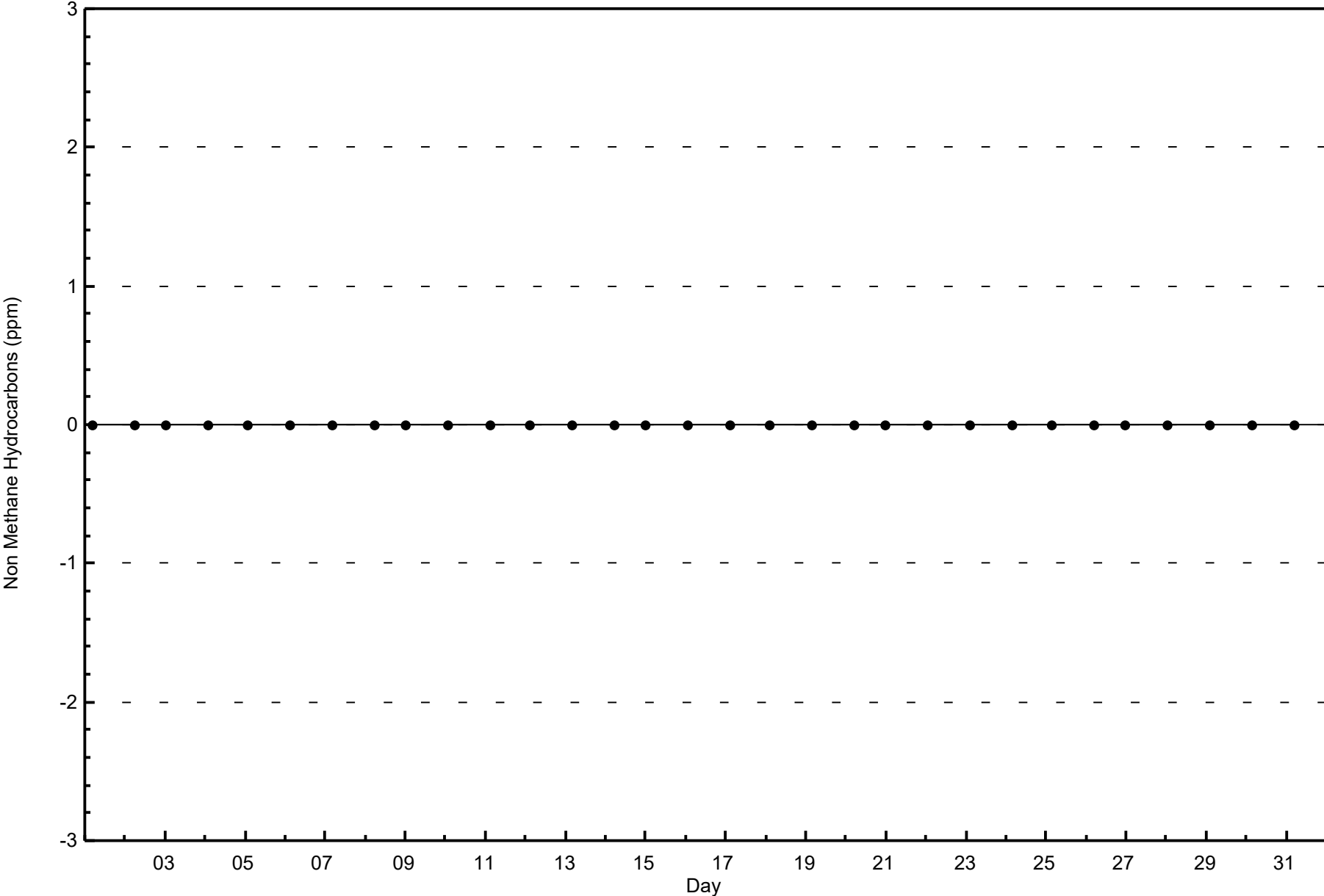
**Wood Buffalo Environmental Association
Frequency Distribution**

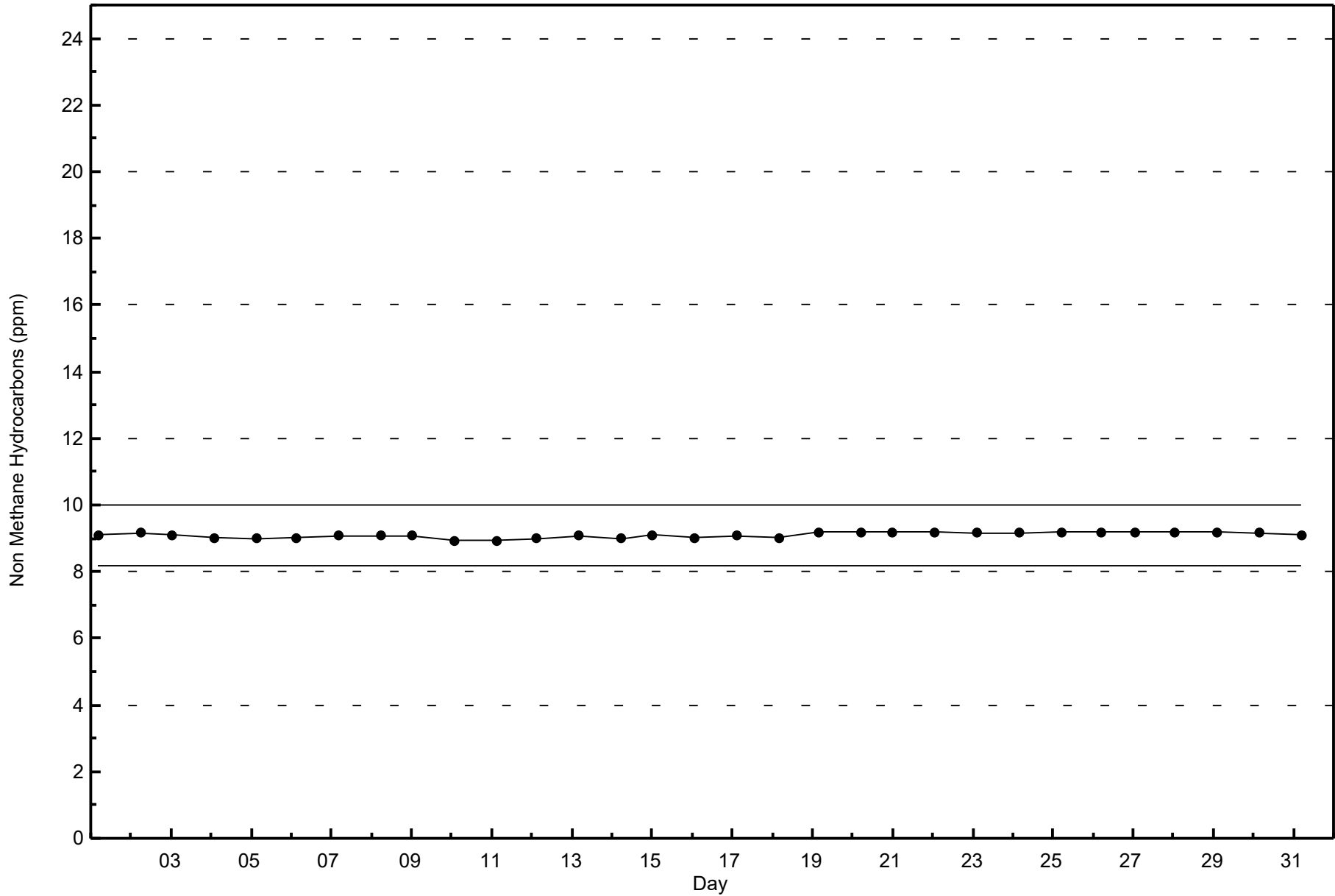
**Non Methane Hydrocarbons (NMHC) - ppm
Fort McKay South - August 2023**

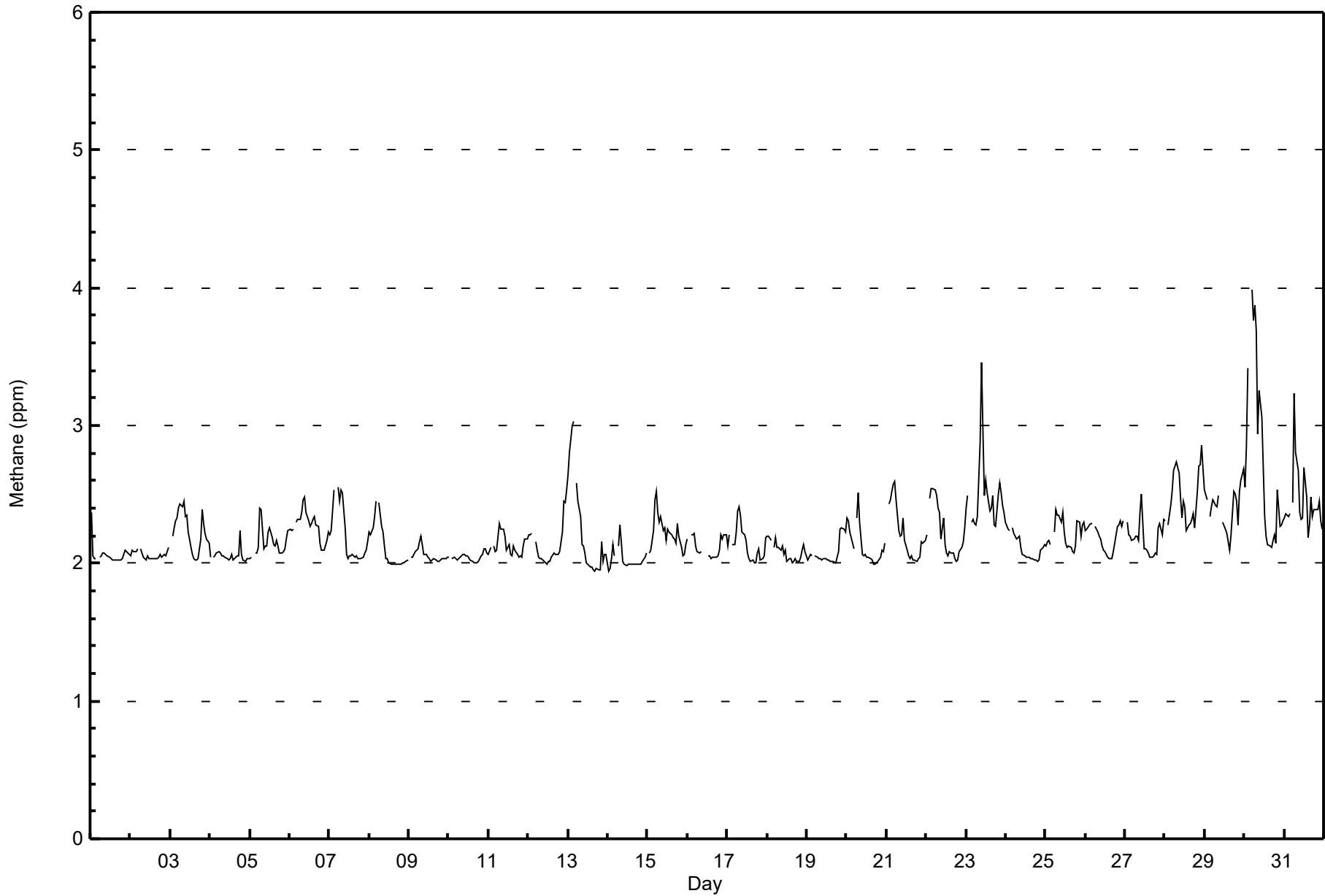
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	39	20	12	10	9	9	34	34	72	67	62	63	54	34	42	40	601
0.006 - 0.05	2	1	1	0	0	0	5	8	2	2	2	1	0	0	1	1	26
0.06 - 0.1	1	2	1	0	0	0	4	2	7	0	4	0	1	0	0	0	22
> 0.1	8	0	0	0	2	2	3	7	8	4	6	6	2	4	3	3	58
Totals	50	23	14	10	11	11	46	51	89	73	74	70	57	38	46	44	707

Total Number of Valid Hours: 707

Total Number of Hours: 744









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Fort McKay South - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	199	28.11	28.11
2.1 - 3.0	500	70.62	98.73
3.1 - 10.0	9	1.27	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



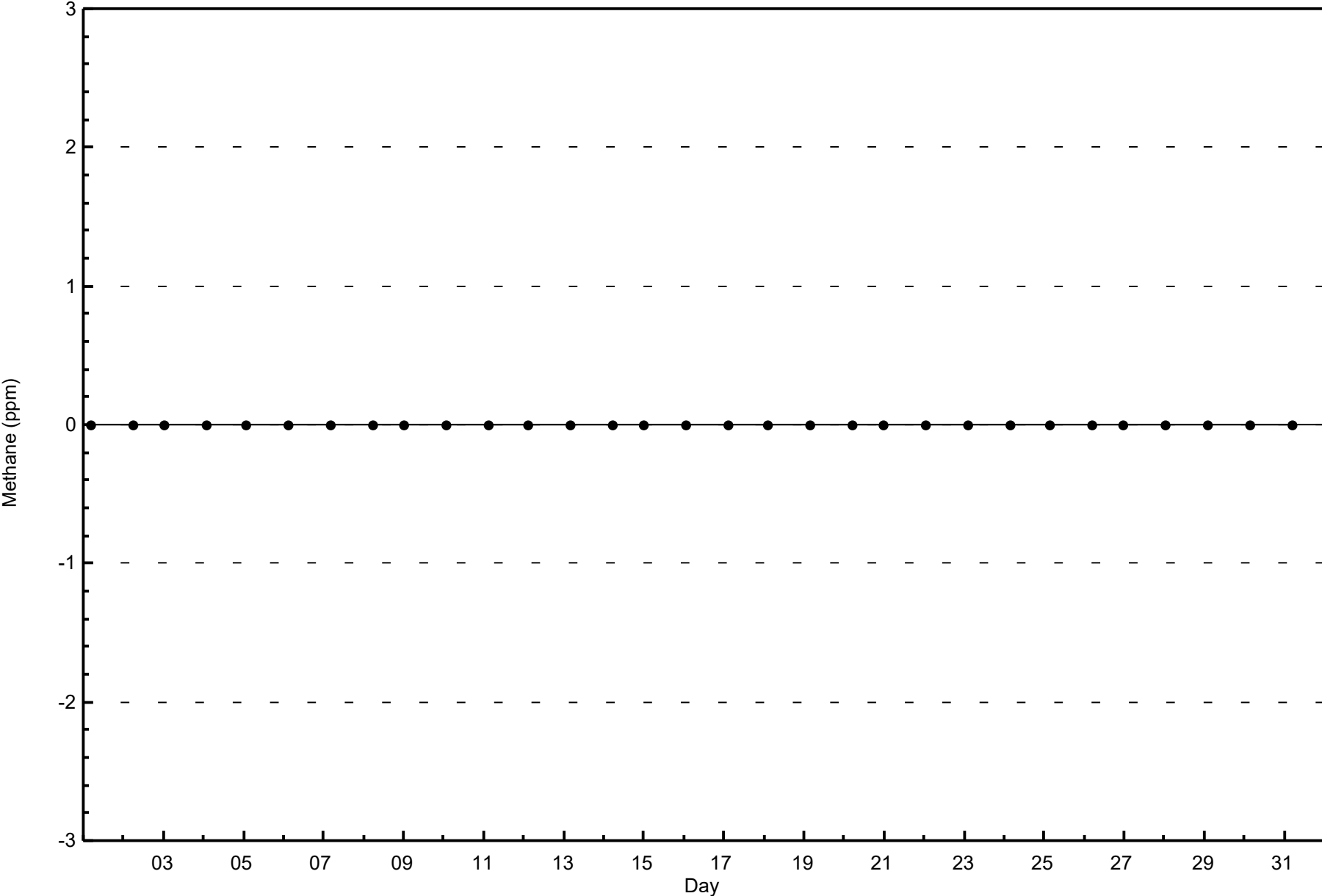
**Wood Buffalo Environmental Association
Frequency Distribution**

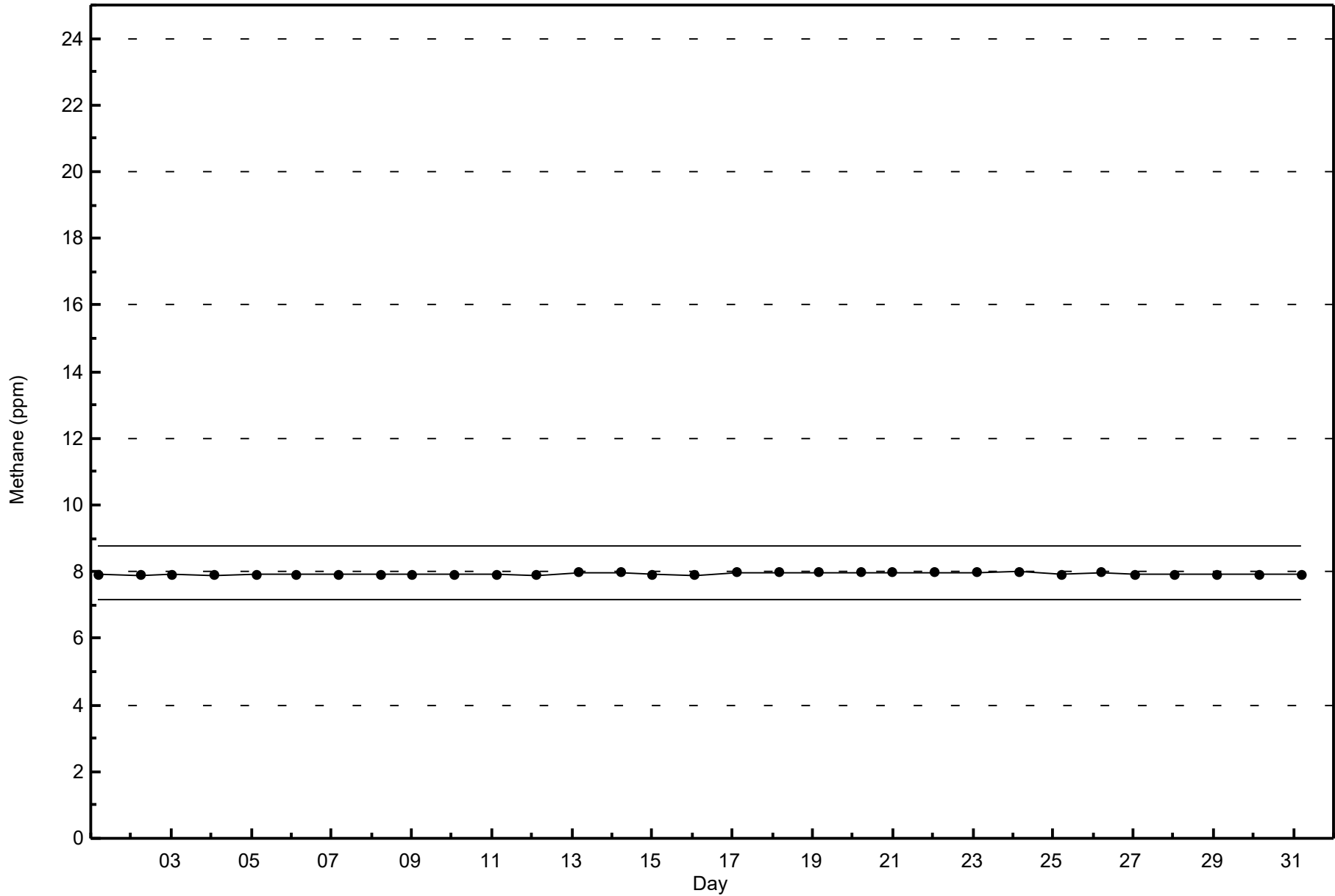
**Methane (CH₄) - ppm
Fort McKay South - August 2023**

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	10	7	6	4	5	5	23	4	9	14	26	21	26	14	12	13	199
2.1 - 3.0	39	15	8	6	5	6	23	47	79	57	47	49	29	24	34	31	499
3.1 - 10.0	1	1	0	0	1	0	0	0	1	2	1	0	2	0	0	0	9
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	50	23	14	10	11	11	46	51	89	73	74	70	57	38	46	44	707

Total Number of Valid Hours: 707

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

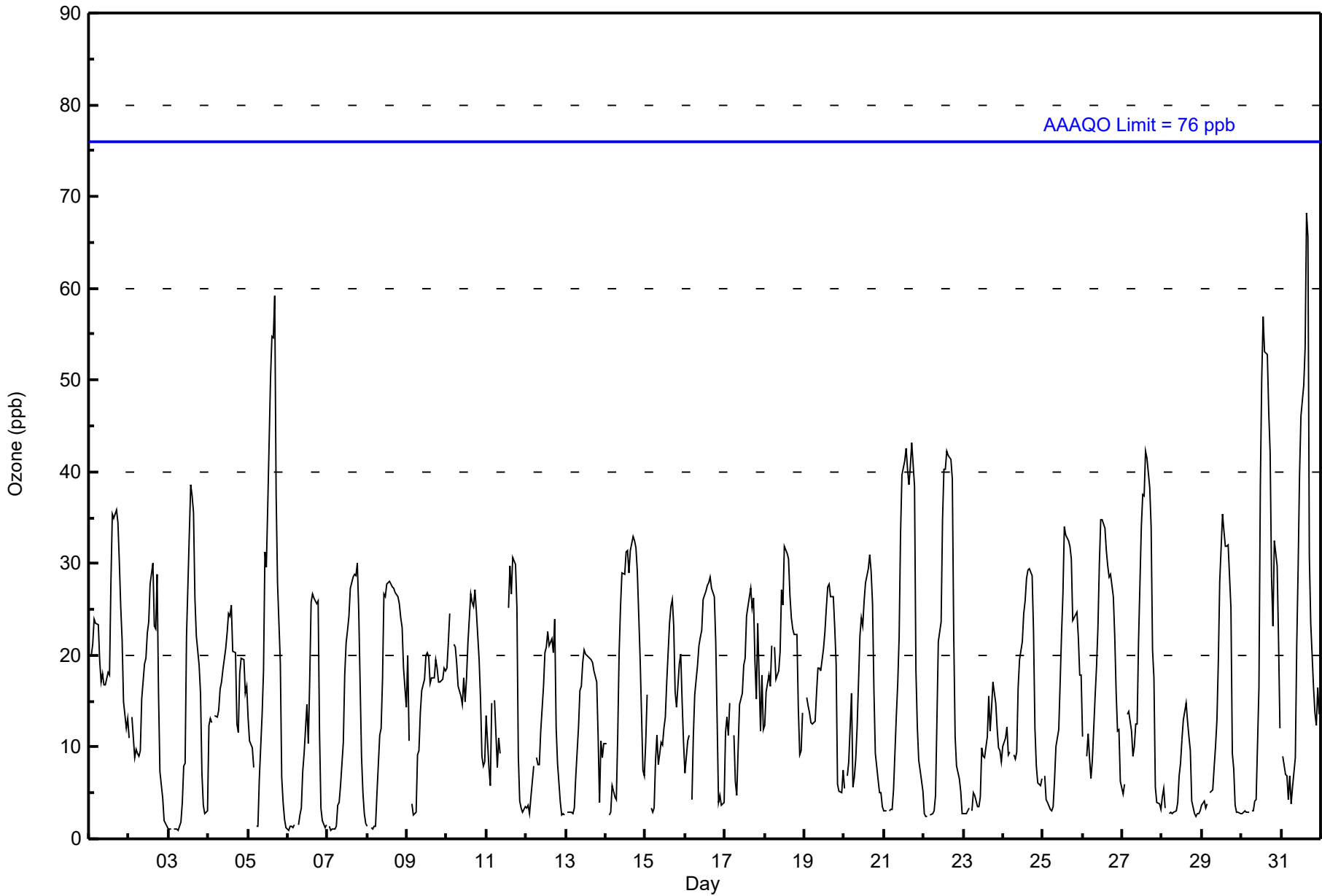
Fort McKay South - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 68.2 ppb on Aug 31 16:00	Maximum Daily Average: 24.0 ppb on Aug 31		Hours of Data:	709
Minimum Value: 0.9 ppb on Aug 7 03:00	Minimum Daily Average: 6.0 ppb on Aug 28		Hours of Missing Data:	35
Maximum Diurnal Average: 30.8 ppb at hour 16	Minimum Diurnal Average: 7.2 ppb at hour 6		Hours of Calibration:	35
Monthly Average: 16.42 ppb	Percentiles: P ₁ = 1.1 P ₁₀ = 2.9 Q ₁ = 6.7 Median = 14.9 Q ₃ = 24.2 P ₉₀ = 31.3 P ₉₉ = 53.1		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-Aug	Z	20.0	21.2	23.9	23.4	23.4	19.4	17.2	18.0	16.8	16.8	18.1	17.9	27.9	35.3	34.9	35.8	34.4	30.2	25.4	21.6	15.0	12.1	13.1	22.7	35.8
2-Aug	11.0	Z	13.3	8.9	9.7	9.3	9.0	9.5	15.3	19.1	19.6	22.4	23.7	27.7	30.1	23.1	22.8	28.9	15.8	7.3	4.5	1.9	1.6	1.4	14.6	30.1
3-Aug	1.1	1.0	Z	1.1	1.0	1.1	0.9	1.8	4.0	7.9	8.2	22.2	33.2	38.6	37.4	35.6	26.3	22.2	18.9	15.9	7.1	3.6	2.7	3.1	12.8	38.6
4-Aug	12.4	13.1	12.7	Z	13.4	13.3	14.1	16.3	17.1	18.5	20.8	22.4	24.5	24.3	25.5	20.4	20.2	12.5	11.6	17.9	19.7	19.5	15.9	16.7	17.5	25.5
5-Aug	13.1	10.7	10.0	7.7	Z	1.3	1.4	6.5	13.6	18.3	31.3	29.6	36.2	50.1	54.8	54.6	59.1	37.7	27.9	19.3	6.7	4.0	2.1	1.2	21.6	59.1
6-Aug	1.0	1.4	1.4	1.1	1.5	Z	1.5	2.6	3.4	7.4	9.4	14.6	10.4	17.3	25.8	26.7	26.2	25.6	25.9	11.5	3.4	2.0	1.3	1.5	9.7	26.7
7-Aug	Z	1.4	0.9	1.1	1.0	1.3	3.6	4.0	5.8	10.6	17.8	21.4	22.7	24.3	27.4	28.6	28.9	28.7	30.0	24.9	9.1	5.0	2.8	1.7	13.2	30.0
8-Aug	1.3	Z	1.2	1.1	1.3	1.3	4.9	11.3	12.0	17.3	26.7	26.5	27.8	28.1	27.8	27.4	27.3	26.9	26.4	25.7	24.2	23.1	18.6	14.4	17.5	28.1
9-Aug	20.0	10.7	Z	3.8	2.6	2.9	9.2	9.7	13.7	16.2	17.4	20.0	20.3	19.8	16.9	17.6	17.6	19.6	18.7	17.0	17.1	17.3	18.6	18.3	15.0	20.3
10-Aug	18.6	21.4	24.5	Z	21.2	20.9	19.1	16.6	15.6	14.7	17.6	14.9	17.5	21.4	26.6	25.7	25.3	27.2	24.8	19.5	15.3	9.0	7.9	8.4	18.9	27.2
11-Aug	13.4	7.7	5.9	14.8	Z	15.1	7.8	11.0	9.3	C	C	C	C	25.2	29.7	26.8	30.6	29.9	25.2	9.0	4.1	3.4	2.8	3.5	14.5	30.6
12-Aug	3.4	3.7	2.8	4.6	8.0	Z	8.9	8.1	8.1	11.7	16.6	20.3	20.9	22.5	21.0	21.8	20.3	24.0	12.3	8.2	4.0	2.6	2.7	2.7	11.3	24.0
13-Aug	Z	2.9	2.9	3.0	2.8	3.4	6.7	12.2	16.2	16.7	19.2	20.7	20.2	19.8	19.7	19.5	19.2	18.4	17.1	11.1	4.0	10.7	8.8	10.3	12.4	20.7
14-Aug	10.3	Z	2.5	2.9	5.8	4.6	4.2	11.3	20.3	25.3	28.9	28.8	31.3	31.5	28.9	31.4	32.9	32.4	31.8	29.1	24.5	19.6	7.5	6.9	19.7	32.9
15-Aug	10.6	15.8	Z	3.3	2.9	3.3	8.5	11.3	8.1	10.6	10.2	12.1	13.3	17.1	23.4	25.4	26.1	23.1	16.0	14.3	19.1	20.1	15.0	10.6	13.9	26.1
16-Aug	7.2	10.8	11.2	Z	4.2	11.1	15.7	18.9	21.1	22.0	22.8	26.0	27.0	27.6	27.9	28.6	27.3	26.4	21.5	13.0	3.9	4.8	3.6	3.9	16.8	28.6
17-Aug	11.7	13.3	11.2	14.7	Z	11.4	6.2	4.8	9.7	14.7	15.8	19.0	19.7	24.3	25.3	27.3	25.2	26.2	19.4	15.3	23.5	11.8	17.8	11.9	16.5	27.3
18-Aug	12.3	16.0	17.8	16.6	21.1	Z	20.9	17.4	18.3	20.5	27.2	25.5	32.0	31.1	30.5	26.5	24.2	22.9	22.3	22.3	14.2	9.2	9.7	13.7	20.5	32.0
19-Aug	Z	15.5	14.5	13.8	12.7	12.6	12.8	15.8	18.6	18.6	18.4	20.7	22.6	25.2	27.4	27.8	26.3	26.4	23.1	19.0	5.9	5.2	5.0	7.5	17.2	27.8
20-Aug	5.5	Z	6.8	8.3	15.8	5.7	6.7	8.7	12.2	22.1	24.2	23.1	25.9	27.9	29.5	30.9	29.2	25.6	16.1	9.3	6.3	5.0	5.0	3.5	15.4	30.9
21-Aug	3.1	3.0	Z	3.1	3.2	3.3	5.4	13.4	17.0	21.9	33.1	39.7	41.2	42.5	40.3	38.5	40.6	43.2	38.4	18.3	12.3	8.5	7.5	5.1	21.0	43.2
22-Aug	2.8	2.5	2.4	Z	2.5	2.7	3.0	4.7	12.9	21.5	23.7	34.8	40.3	40.3	42.3	41.9	41.3	39.3	22.2	11.1	7.9	6.6	5.2	2.8	18.0	42.3
23-Aug	2.7	2.7	2.7	3.4	Z	3.1	5.0	4.7	3.5	4.6	9.9	9.1	8.8	11.1	15.6	11.8	14.3	17.0	14.7	12.1	9.9	9.7	8.4	8.2	17.0	17.0
24-Aug	10.1	11.0	12.1	9.2	9.5	Z	9.1	8.6	9.5	16.4	19.5	21.6	24.5	25.9	28.4	29.2	29.4	28.7	22.6	12.1	7.9	6.2	5.7	6.5	15.8	29.4
25-Aug	Z	6.9	4.3	3.9	3.2	3.1	3.5	6.4	10.0	11.8	16.9	22.3	26.8	34.0	33.0	32.5	31.9	30.5	23.9	24.2	24.7	21.9	17.8	17.9	17.9	34.0
26-Aug	11.1	Z	8.9	11.5	8.8	6.6	8.5	15.5	18.8	23.0	29.9	34.8	34.7	33.9	31.4	29.7	28.6	28.9	26.5	22.1	15.9	11.8	11.9	6.3	20.0	34.8
27-Aug	4.9	5.9	Z	13.6	13.8	11.7	9.0	10.1	12.5	12.6	21.6	34.1	37.5	37.4	42.2	41.5	38.3	34.1	20.6	17.5	5.7	4.0	3.8	3.2	18.9	42.2
28-Aug	4.5	5.4	3.4	Z	2.8	2.9	2.8	2.9	3.0	3.9	6.8	8.3	10.8	12.9	14.9	12.8	11.1	9.7	4.2	2.7	2.5	2.8	2.8	3.1	6.0	14.9
29-Aug	3.7	4.1	3.4	3.8	Z	5.1	5.3	7.7	10.0	13.0	19.3	28.0	35.4	33.6	31.8	31.9	32.1	25.2	9.3	7.6	3.6	2.8	2.8	2.8	14.0	35.4
30-Aug	2.8	3.0	3.0	3.0	2.8	Z	3.0	3.0	4.1	4.3	16.4	38.5	50.3	57.0	53.1	52.8	46.6	42.1	28.6	23.2	32.5	29.7	21.7	12.1	23.2	57.0
31-Aug	Z	9.0	7.1	6.9	4.2	6.8	3.8	5.6	8.9	21.0	29.6	39.6	46.0	49.4	53.5	68.2	65.6	30.8	23.6	16.5	13.7	12.4	16.5	13.6	24.0	68.2

7.9	8.4	8.0	7.3	7.7	7.2	7.7	9.6	11.9	15.4	19.7	24.0	26.8	29.3	30.7	30.8	29.9	27.3	21.7	16.3	12.2	10.0	8.6	7.6	Diurnal Average	
20.0	21.4	24.5	23.9	23.4	23.4	20.9	18.9	21.1	25.3	33.1	39.7	50.3	57.0	54.8	68.2	65.6	43.2	38.4	29.1	32.5	29.7	21.7	18.3	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 - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	471	66.43	66.43
21 - 50	229	32.30	98.73
51 - 82	9	1.27	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 - August 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	5	5	6	3	7	29	33	53	51	60	59	43	30	29	27	470
21 - 50	19	13	9	4	8	3	18	12	38	20	14	13	18	10	14	16	229
51 - 82	0	4	0	0	0	0	2	2	0	0	0	0	0	0	1	0	9
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	49	22	14	10	11	10	49	47	91	71	74	72	61	40	44	43	708

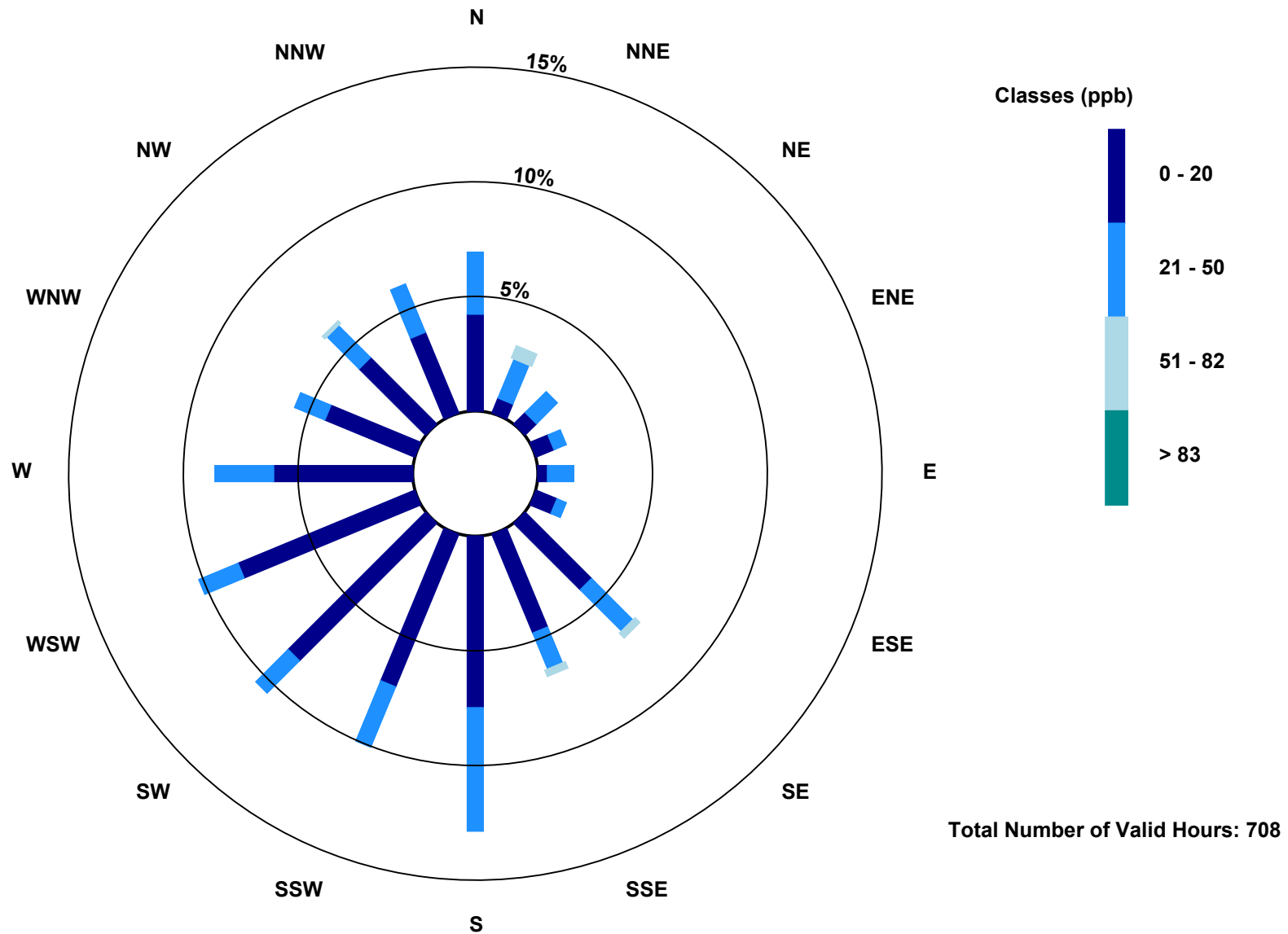
Total Number of Valid Hours: 708

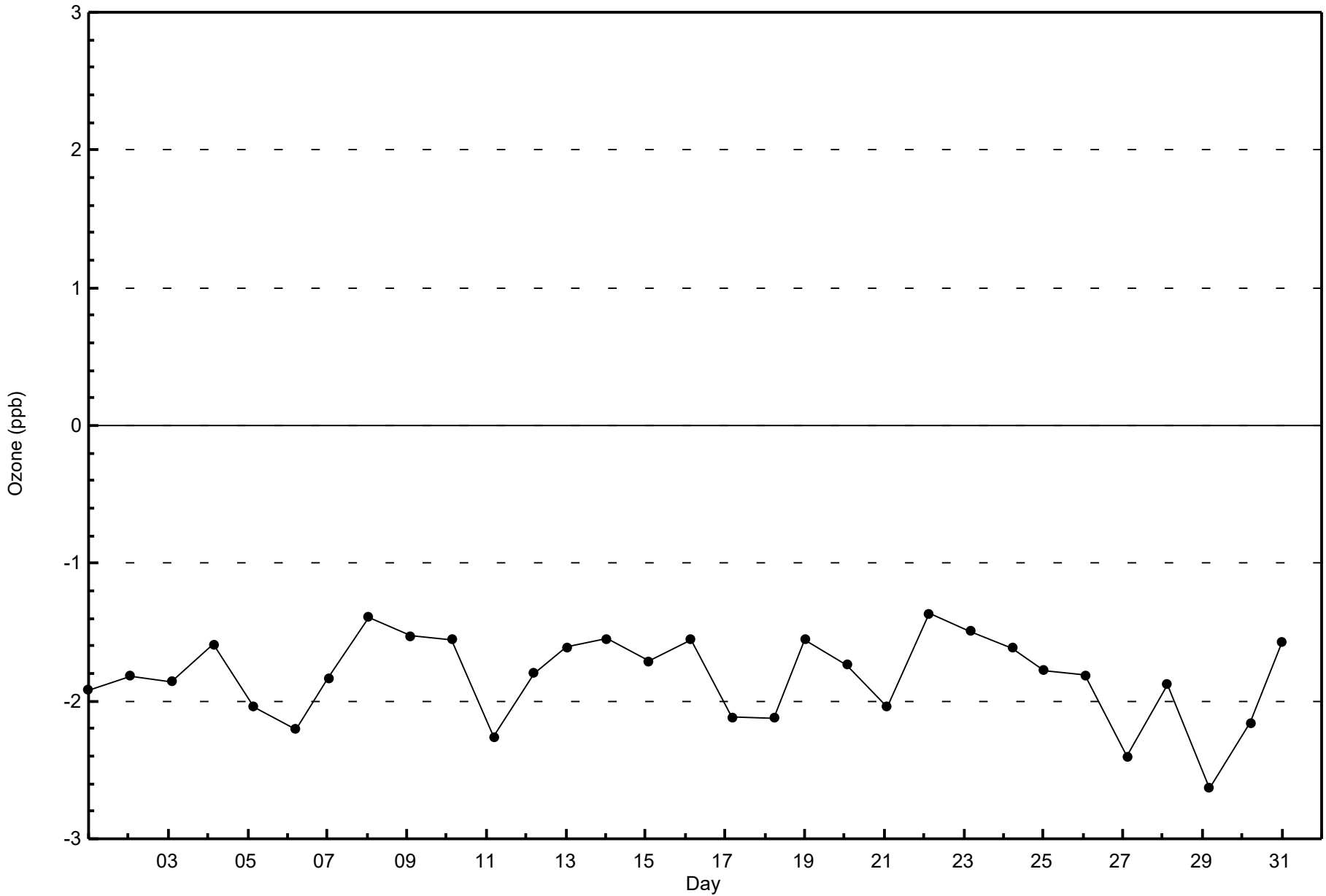
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Fort McKay South

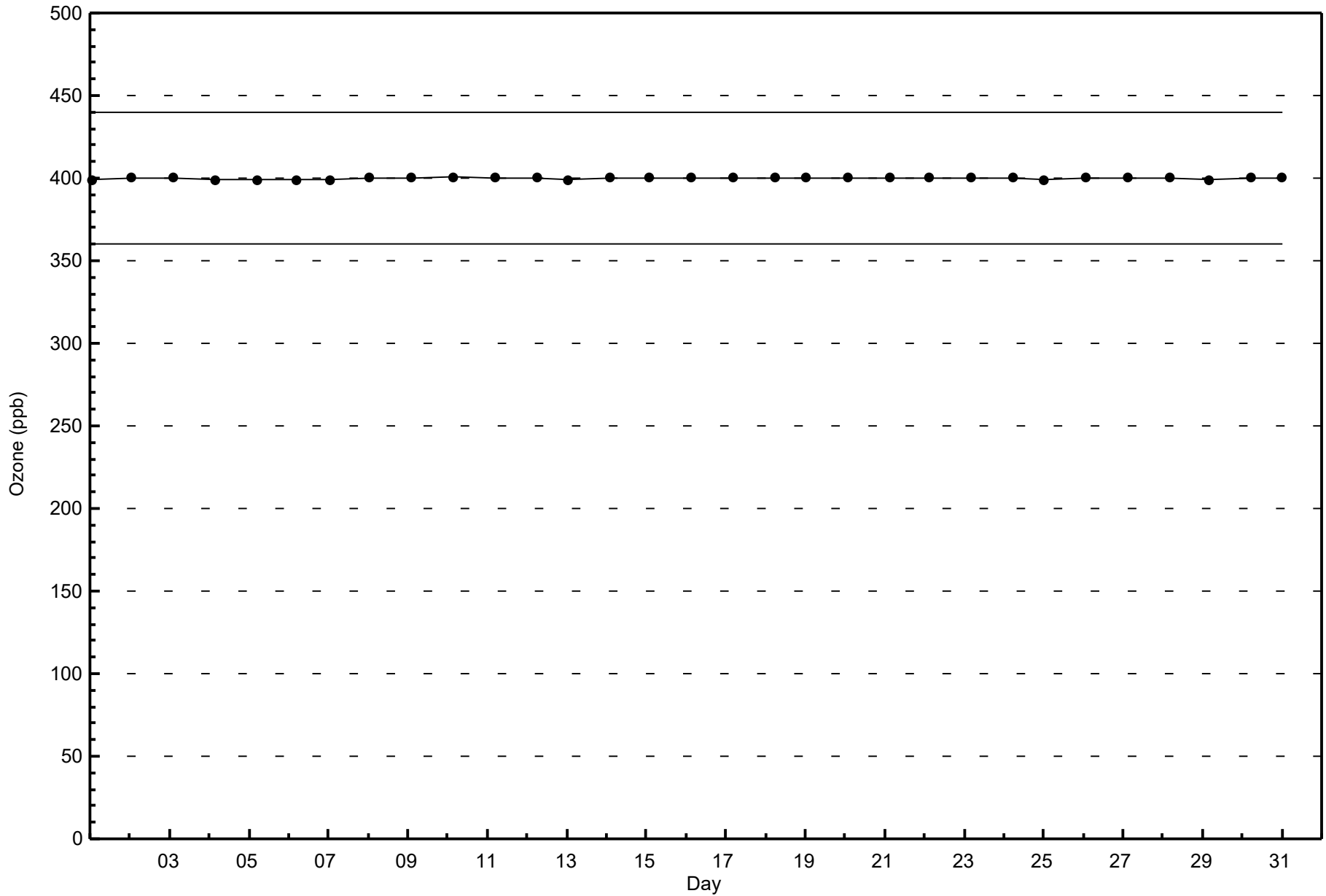


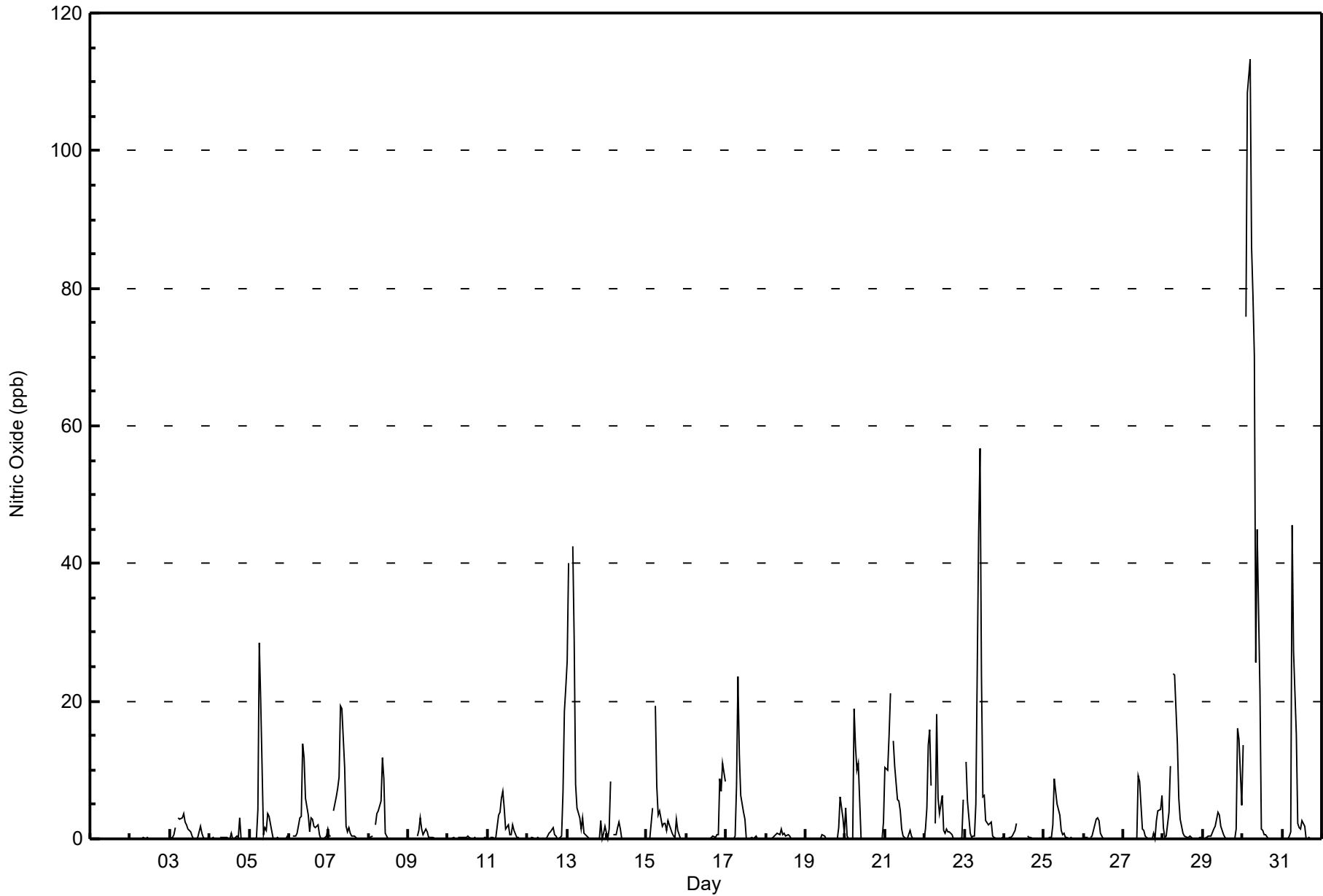




Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Fort McKay South - August 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Fort McKay South - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	683	96.61	96.61
21 - 40	13	1.84	98.44
41 - 80	8	1.13	99.58
81 - 159	3	0.42	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



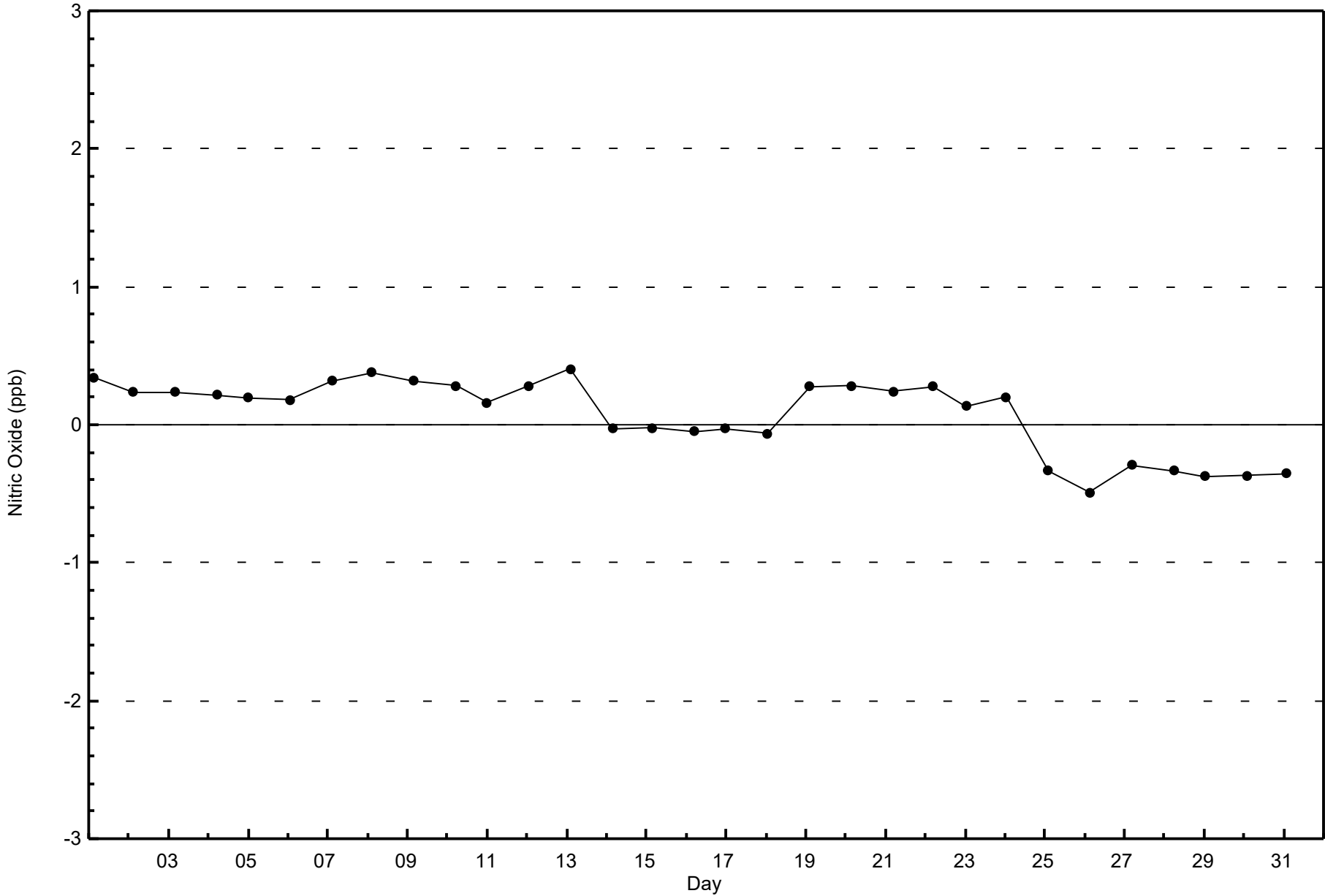
**Wood Buffalo Environmental Association
Frequency Distribution**

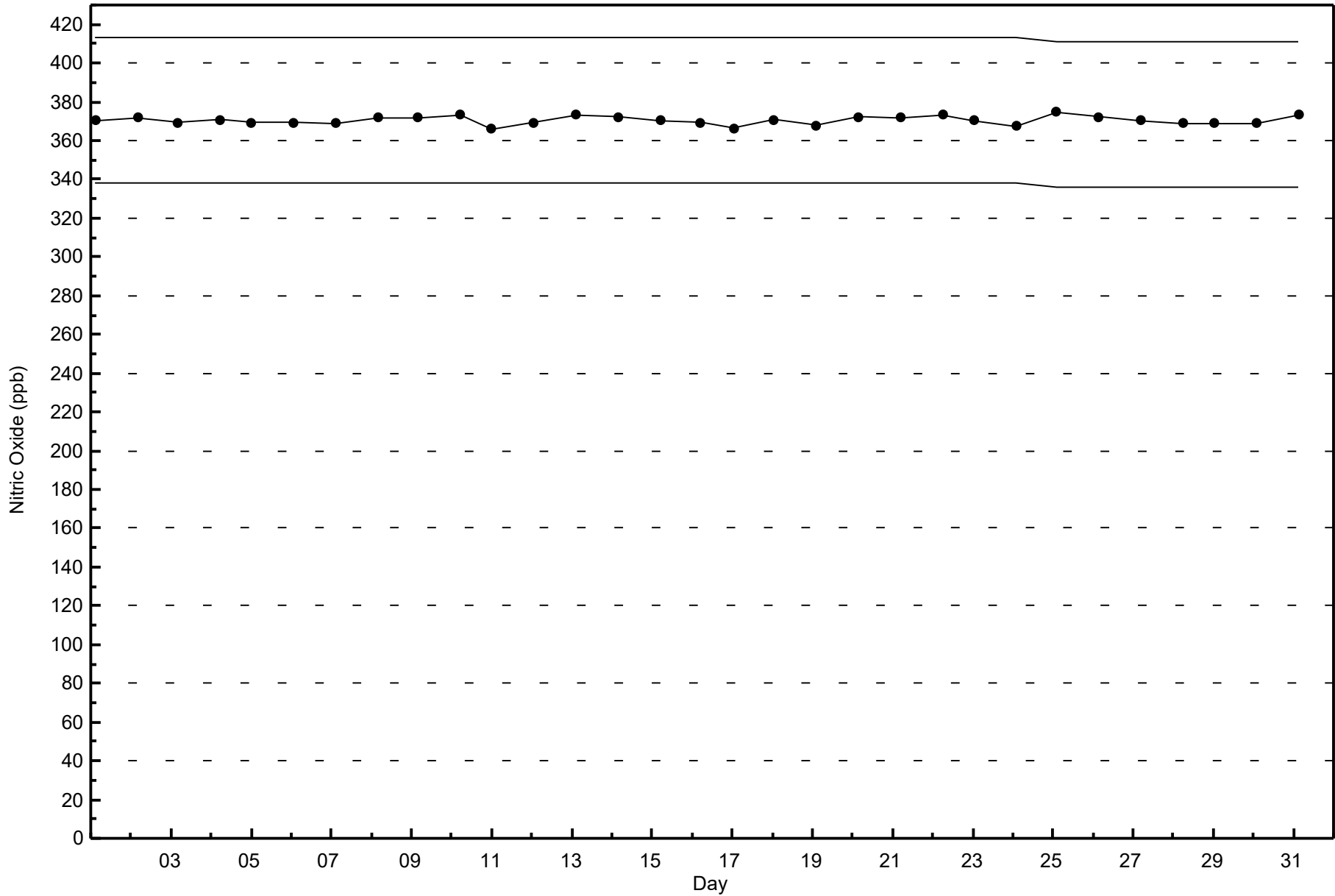
**Nitric Oxide (NO) - ppb
Fort McKay South - August 2023**

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	22	13	10	10	11	49	48	87	65	67	75	54	41	42	47	682
21 - 40	0	0	1	0	1	0	0	2	3	3	1	0	0	1	1	0	13
41 - 80	1	1	0	0	0	0	0	0	1	0	2	0	3	0	0	0	8
81 - 159	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	23	14	10	11	11	49	50	91	71	70	75	57	42	43	47	706

Total Number of Valid Hours: 706

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

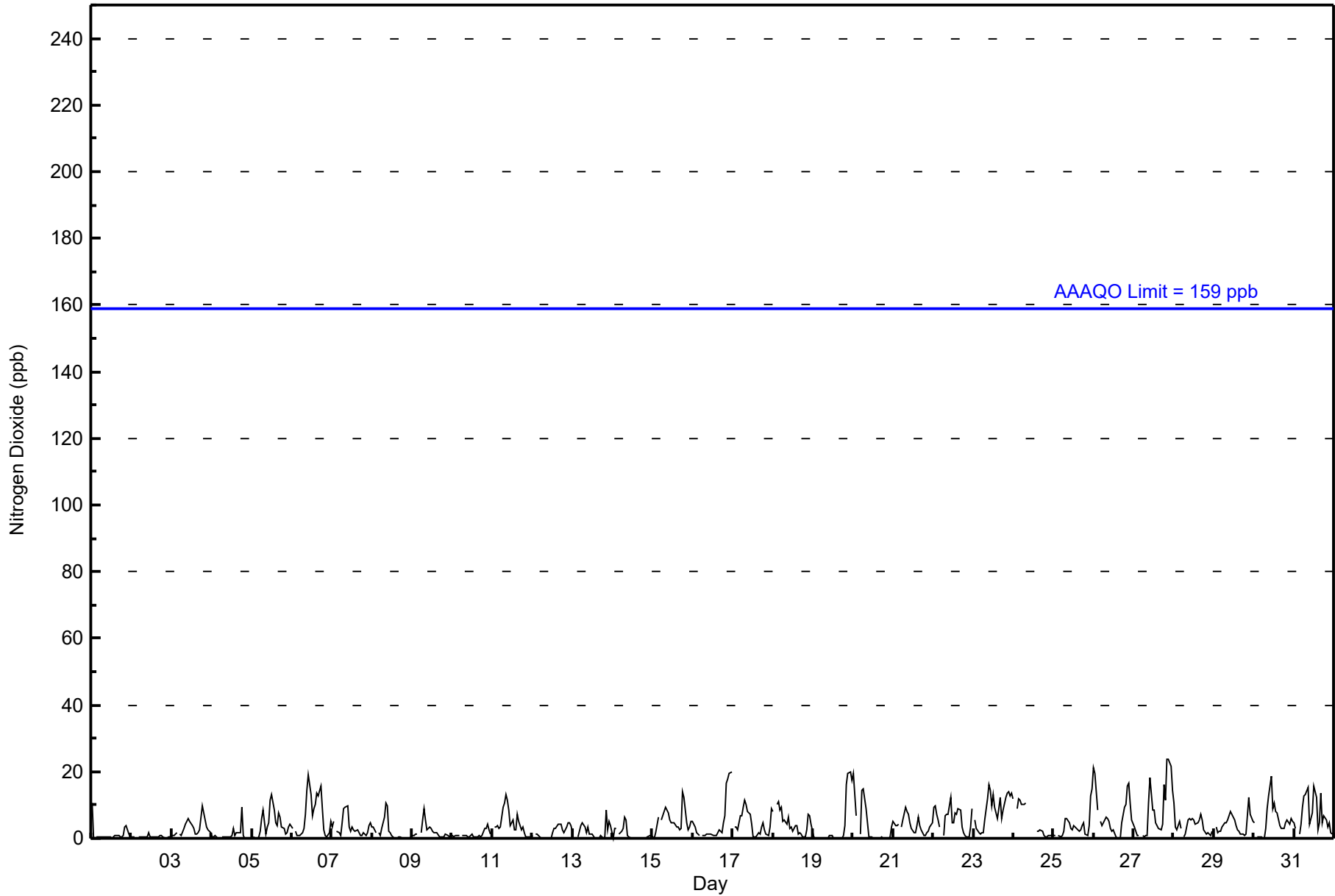
Nitrogen Dioxide (NO₂) - ppb Fort McKay South - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																												
Maximum Value: 23.8 ppb on Aug 27 22:00		Maximum Daily Average: 8.9 ppb on Aug 23																	707																														
Minimum Value: 0.0 ppb on Aug 4 21:00		Minimum Daily Average: 0.5 ppb on Aug 2																	37																														
Maximum Diurnal Average: 5.7 ppb at hour 9		Minimum Diurnal Average: 2.4 ppb at hour 5																	37																														
Monthly Average: 4.05 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.7 Median = 2.6 Q ₃ = 5.5 P ₉₀ = 10.4 P ₉₉ = 19.5																	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-Aug	10.5	0.2	Z	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.5	0.7	0.8	0.7	0.6	0.5	0.7	3.2	3.8	1.2	0.5	1.2	10.5																							
2-Aug	0.3	0.4	0.4	Z	0.5	0.3	0.4	0.3	0.6	0.5	1.5	0.5	0.6	0.6	0.6	0.4	0.6	0.9	0.7	0.3	0.2	0.1	0.3	0.4	0.5	1.5																							
3-Aug	0.7	0.8	1.2	1.5	Z	1.3	0.7	3.0	4.4	5.2	5.9	5.1	4.0	2.8	1.3	1.4	1.5	2.4	9.8	7.7	5.4	3.2	2.7	1.8	3.2	9.8																							
4-Aug	0.4	0.6	0.7	0.3	0.2	Z	0.3	0.3	0.4	0.4	0.4	0.3	0.9	3.1	0.7	1.6	1.8	1.8	9.4	1.0	0.0	0.0	0.1	0.1	1.1	9.4																							
5-Aug	Z	0.3	0.2	0.2	0.6	2.3	5.9	8.6	1.1	3.3	4.8	11.5	13.0	8.3	4.5	4.0	7.8	6.3	3.3	2.8	1.2	1.7	3.2	4.3	4.3	13.0																							
6-Aug	2.8	Z	2.1	0.8	1.0	0.9	1.9	3.0	7.4	14.4	18.9	13.1	6.6	9.1	10.1	13.7	12.7	15.6	8.9	2.5	0.7	0.6	1.8	4.9	6.7	18.9																							
7-Aug	3.3	5.1	Z	2.1	1.9	1.0	4.8	9.1	9.4	9.6	3.2	2.3	3.3	2.6	2.3	2.4	1.9	0.8	0.8	1.7	0.9	1.5	4.0	4.8	3.4	9.6																							
8-Aug	3.3	3.2	1.9	Z	1.6	0.9	2.8	6.4	10.8	9.6	2.0	1.9	1.0	0.2	0.0	0.0	0.5	0.4	0.1	0.0	0.0	0.1	0.4	2.0	10.8																								
9-Aug	0.8	0.7	1.3	1.4	Z	1.8	5.3	9.0	5.4	2.5	3.6	2.8	2.2	1.9	1.7	1.7	0.6	0.6	0.6	0.6	1.1	0.8	0.5	1.1	2.1	9.0																							
10-Aug	1.0	0.6	1.0	0.9	1.0	Z	1.0	0.9	0.8	0.6	0.5	0.8	1.2	0.6	0.5	0.5	0.9	0.4	0.7	2.8	2.8	4.1	2.6	1.4	1.2	4.1																							
11-Aug	Z	3.4	3.4	3.7	3.1	3.4	9.4	10.5	13.2	11.5	8.5	3.7	5.7	2.7	2.5	7.2	5.1	2.5	3.4	1.8	0.6	0.5	0.4	0.6	4.6	13.2																							
12-Aug	0.7	Z	1.4	1.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.6	2.8	3.1	4.1	4.2	4.1	2.4	1.9	3.5	4.7	4.7	3.9	2.0	4.7																							
13-Aug	2.2	2.3	Z	0.6	2.1	3.7	4.5	3.5	1.7	3.2	1.4	1.3	1.1	0.1	0.1	0.0	0.0	0.7	0.0	0.6	8.4	2.5	5.0	3.8	2.1	8.4																							
14-Aug	0.2	3.1	3.1	Z	1.2	2.3	2.9	6.5	5.5	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.9	0.8	1.3	6.5																						
15-Aug	0.5	0.2	1.5	6.5	Z	5.6	6.6	8.0	9.3	7.6	5.6	4.7	4.6	4.5	3.6	3.3	2.4	2.8	13.8	12.1	4.7	2.7	3.2	5.2	5.2	13.8																							
16-Aug	5.2	3.3	1.9	1.2	0.7	Z	0.8	0.9	1.1	1.2	1.4	1.3	0.9	0.9	0.7	1.8	2.4	1.8	4.6	6.8	16.4	17.6	19.5	19.8	4.9	19.8																							
17-Aug	Z	3.2	3.5	2.6	6.6	6.8	9.4	11.6	10.0	7.9	7.0	4.4	0.4	0.3	0.3	1.6	1.2	3.5	4.5	2.7	1.1	0.7	3.5	8.9	4.4	11.6																							
18-Aug	7.9	Z	10.1	11.2	8.3	9.5	5.2	5.5	4.4	6.4	3.0	3.6	2.1	4.0	3.9	1.1	1.7	1.4	0.5	0.6	2.7	7.0	6.8	4.4	4.8	11.2																							
19-Aug	0.6	0.2	Z	0.2	0.1	0.1	0.0	0.1	0.1	0.1	1.0	0.8	0.2	0.2	0.2	0.1	0.0	0.0	0.9	3.9	16.0	19.4	20.1	17.5	3.6	20.1																							
20-Aug	19.4	13.1	6.9	Z	1.1	14.5	14.7	11.9	9.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.6	0.2	0.1	0.1	0.2	0.6	3.4	4.2	19.4																							
21-Aug	5.1	3.7	4.0	4.2	Z	3.5	5.5	9.3	8.2	7.0	4.6	2.9	1.6	1.5	3.7	6.4	4.0	2.6	0.7	0.7	1.5	2.3	3.2	4.7	4.0	9.3																							
22-Aug	9.5	9.9	7.4	5.6	3.3	Z	0.9	6.6	7.2	7.4	12.2	4.6	4.5	7.7	7.3	8.9	8.3	3.4	1.5	0.9	0.6	0.6	3.4	9.1	5.7	12.2																							
23-Aug	Z	5.5	3.0	1.9	1.3	1.5	1.5	5.7	11.9	16.1	14.5	9.6	13.1	9.5	6.0	8.8	12.4	6.0	8.6	12.4	13.7	14.1	12.8	13.7	8.9	16.1																							
24-Aug	11.9	Z	8.8	12.0	11.3	10.3	10.3	10.7	C	C	C	C	C	C	2.0	2.2	2.6	2.3	0.9	0.5	0.5	0.7	1.0	1.3	--	12.0																							
25-Aug	0.8	0.7	Z	0.9	0.4	0.9	2.3	6.1	5.8	4.7	3.1	2.5	3.9	3.3	2.9	2.1	2.7	3.8	4.8	1.4	0.8	3.7	12.9	14.8	3.7	14.8																							
26-Aug	21.1	19.6	8.6	Z	5.1	3.9	4.6	6.3	5.9	5.2	2.8	2.3	2.5	0.5	0.2	0.1	0.0	4.5	9.2	10.3	15.5	16.7	10.8	5.3	7.0	21.1																							
27-Aug	3.6	2.0	1.0	0.7	Z	0.7	0.4	0.8	0.8	10.5	18.3	8.6	8.3	4.6	4.0	2.8	2.4	4.1	16.3	11.6	23.7	23.8	21.6	14.4	8.0	23.8																							
28-Aug	10.5	3.4	2.7	4.9	2.9	Z	0.5	1.1	5.3	6.0	5.4	6.1	5.3	4.4	4.5	5.3	7.3	5.3	2.5	1.1	1.5	1.2	0.8	2.2	3.9	10.5																							
29-Aug	Z	3.2	1.5	2.2	2.2	3.5	4.6	4.8	5.7	6.7	8.2	7.3	5.4	3.7	2.5	2.0	1.3	1.1	1.0	1.1	6.6	12.1	7.4	5.2	4.3	12.1																							
30-Aug	4.5	Z	0.4	0.4	0.5	0.2	0.2	2.9	8.7	12.9	18.6	9.1	10.5	8.2	7.6	4.0	3.1	2.8	3.1	4.5	5.3	4.3	5.8	5.0	5.3	18.6																							
31-Aug	4.7	3.1	Z	1.2	4.1	9.3	12.6	13.2	15.1	4.4	5.9	7.8	15.5	12.4	2.4	4.7	13.5	4.8	6.7	5.7	3.4	4.6	1.5	1.2	6.9	15.5																							
																								5.1	3.5	3.1	2.7	2.4	3.4	3.9	5.4	5.7	5.5	5.4	4.0	4.0	3.4	2.6	3.0	3.3	2.8	3.9	3.3	4.6	5.0	5.2	5.3	Diurnal Average	
																								21.1	19.6	10.1	12.0	11.3	14.5	14.7	13.2	15.1	16.1	18.9	13.1	15.5	12.4	10.1	13.7	13.5	15.6	16.3	12.4	23.7	23.8	21.6	19.8	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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort McKay South - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.43	99.43
21 - 40	4	0.57	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 South - August 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	42	23	14	10	11	11	49	50	90	68	70	75	57	42	43	47	702
21 - 40	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	4
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	42	23	14	10	11	11	49	50	91	71	70	75	57	42	43	47	706

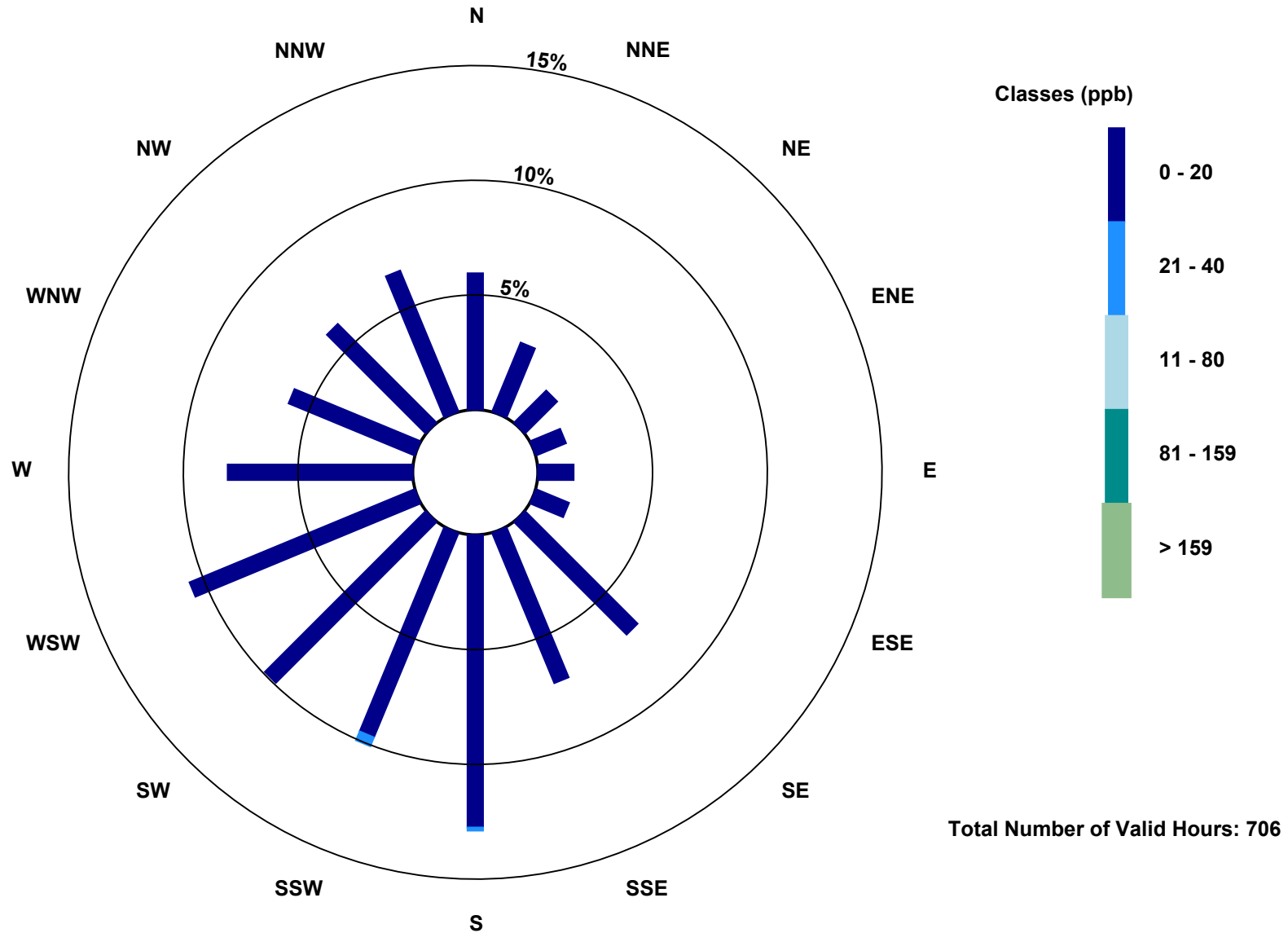
Total Number of Valid Hours: 706

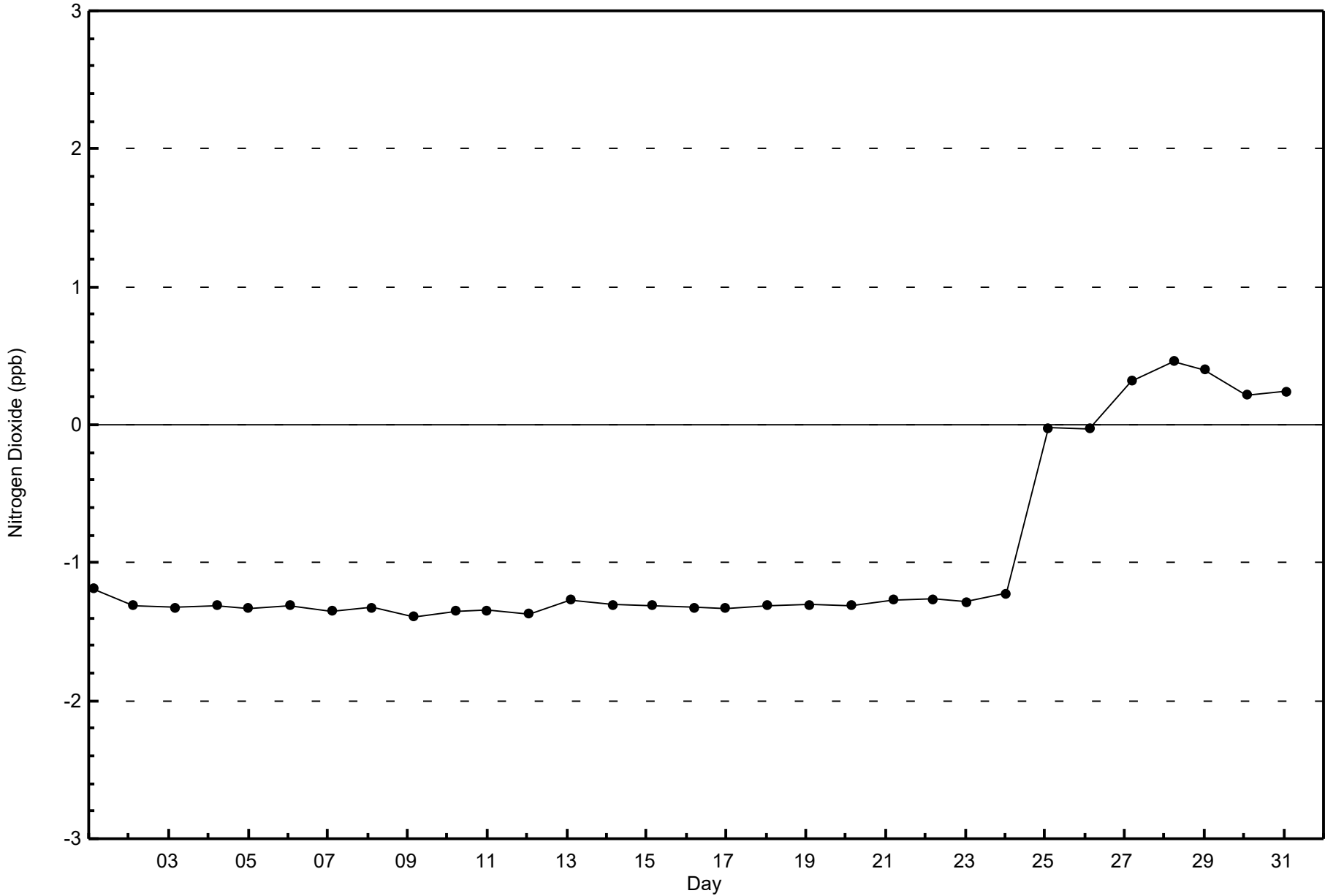
Total Number of Hours: 744

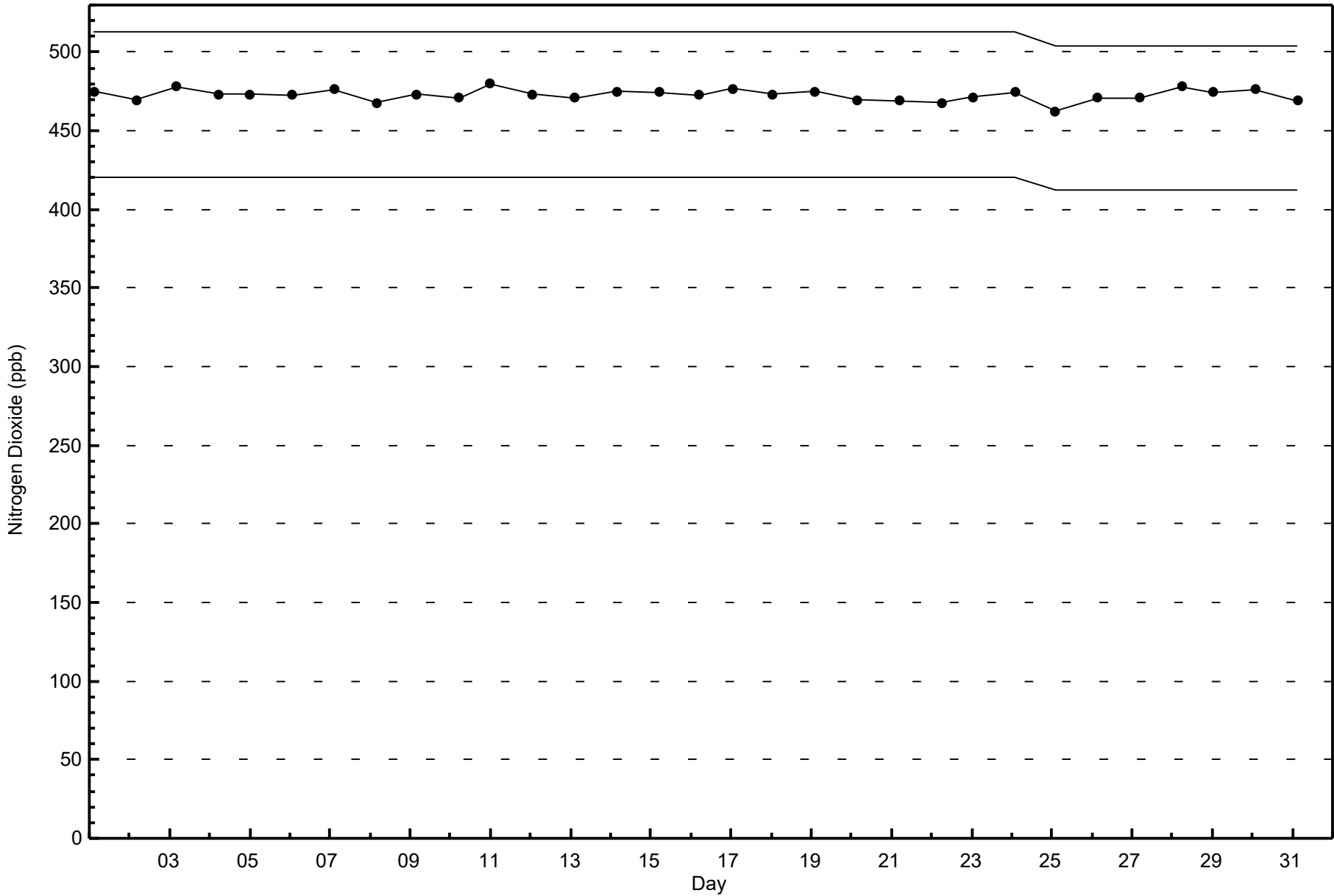


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Fort McKay South









Wood Buffalo Environmental Association
Summary of Hour Averages

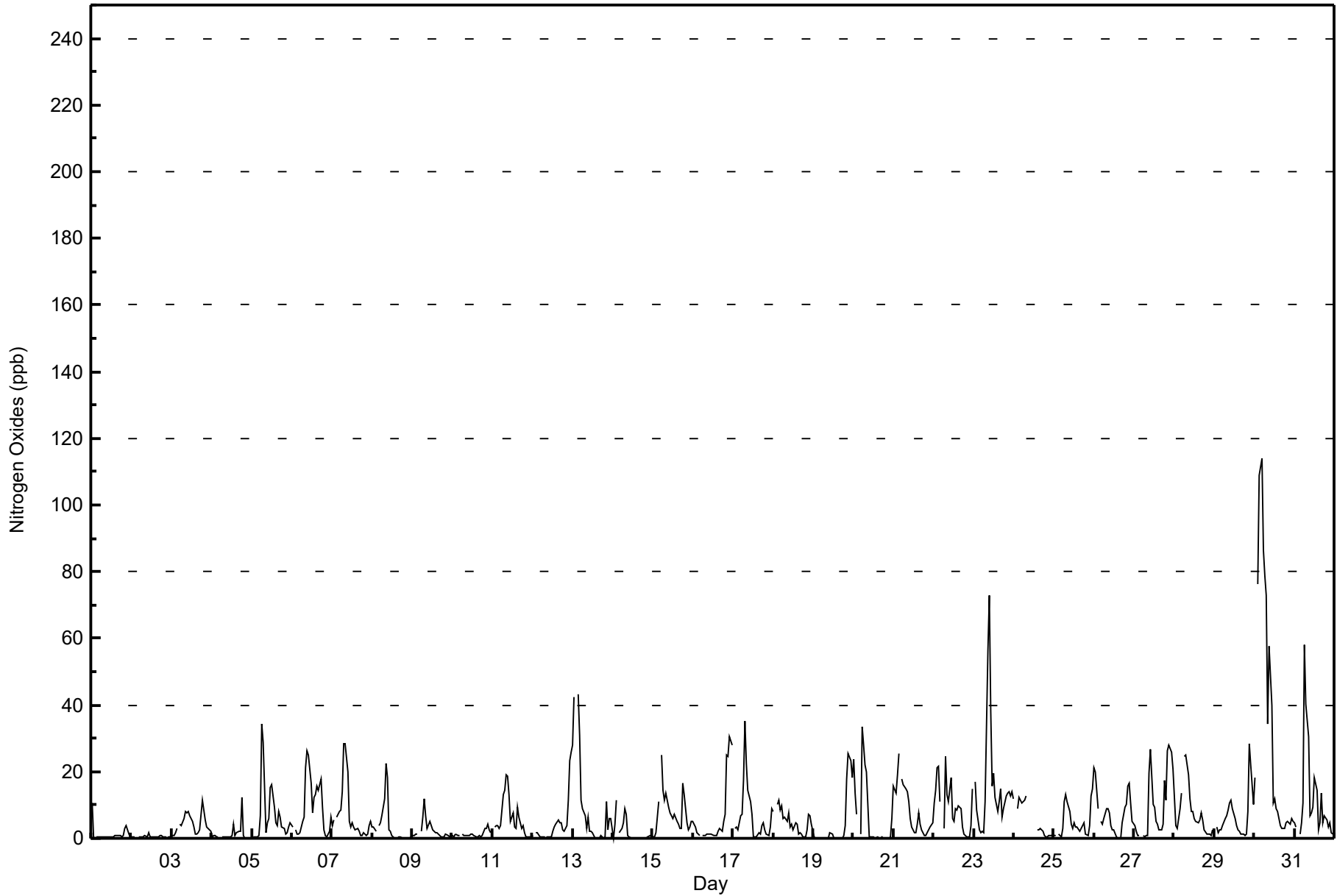
Nitrogen Oxides (NO_x) - ppb
Fort McKay South - August 2023

Maximum Value: 113.8 ppb on Aug 30 05:00 Maximum Daily Average: 33.2 ppb on Aug 30																					Hours in Service:	744					
Minimum Value: 0.0 ppb on Aug 8 15:00 Minimum Daily Average: 0.5 ppb on Aug 2																					Hours of Data:	707					
Maximum Diurnal Average: 14.0 ppb at hour 8 Minimum Diurnal Average: 3.0 ppb at hour 15																					Hours of Missing Data:	37					
Monthly Average: 7.06 ppb Percentiles: P ₁ = 0.0 P ₁₀ = 0.3 Q ₁ = 0.8 Median = 3.2 Q ₃ = 8.8 P ₉₀ = 17.7 P ₉₉ = 58.1																					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-Aug	10.6	0.2	Z	0.5	0.5	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.7	0.8	0.7	0.6	0.5	0.7	3.2	3.8	1.2	0.5	1.2	10.6	
2-Aug	0.3	0.4	0.4	Z	0.5	0.3	0.5	0.4	0.8	0.5	1.8	0.5	0.6	0.6	0.6	0.4	0.6	0.9	0.7	0.3	0.2	0.1	0.3	0.4	0.5	1.8	
3-Aug	0.7	1.0	1.9	3.1	Z	4.3	3.6	6.0	8.1	7.5	8.0	6.6	5.0	3.2	1.3	1.4	1.5	2.7	11.6	8.4	5.5	3.2	2.8	2.0	4.3	11.6	
4-Aug	0.4	0.7	0.8	0.4	0.3	Z	0.4	0.4	0.6	0.6	0.5	0.3	0.9	4.0	0.7	1.7	2.1	2.0	12.4	1.0	0.0	0.0	0.1	0.1	1.3	12.4	
5-Aug	Z	0.3	0.3	0.3	0.8	6.6	34.4	28.7	1.8	4.8	6.1	15.1	16.2	9.2	4.5	4.0	7.9	6.5	3.3	2.8	1.2	1.7	3.2	4.7	7.1	34.4	
6-Aug	3.4	Z	2.4	1.1	1.3	1.8	5.0	6.3	21.2	26.2	24.8	16.6	7.6	12.2	12.9	15.6	14.4	17.6	9.5	2.5	0.7	0.6	2.1	6.4	9.2	26.2	
7-Aug	3.8	5.6	Z	6.2	8.0	8.3	13.8	28.3	28.2	19.9	5.0	3.4	4.8	3.4	2.7	2.9	2.0	0.8	0.8	1.7	0.9	1.5	4.0	4.9	7.0	28.3	
8-Aug	3.5	3.4	2.3	Z	3.7	4.6	6.8	12.0	22.5	18.3	2.7	2.3	1.0	0.2	0.0	0.0	0.5	0.4	0.1	0.0	0.0	0.1	0.4	3.7	22.5	22.5	
9-Aug	0.8	0.7	1.3	1.4	Z	2.2	6.5	12.0	6.7	3.1	5.0	3.8	2.4	2.0	1.8	1.9	0.6	0.6	0.6	0.6	1.1	0.8	0.5	1.2	2.5	12.0	
10-Aug	1.0	0.6	1.1	1.0	1.0	Z	1.1	1.0	0.9	0.8	0.7	1.1	1.5	0.7	0.6	0.6	1.0	0.5	0.8	2.9	2.8	4.2	2.7	1.6	1.3	4.2	
11-Aug	Z	3.5	3.6	3.8	3.2	3.6	13.0	14.4	19.0	18.5	13.1	5.1	7.8	3.2	3.0	9.3	6.4	2.8	3.6	1.8	0.6	0.5	0.4	0.6	6.1	19.0	
12-Aug	0.7	Z	1.6	1.6	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	2.0	3.6	4.1	5.7	4.9	4.5	2.4	1.9	3.8	11.5	23.2	25.8	4.3	25.8	
13-Aug	28.0	42.4	Z	43.1	30.9	11.6	8.9	6.6	3.1	6.2	2.3	2.0	1.5	0.1	0.1	0.0	0.0	0.7	0.0	0.6	11.0	2.5	5.8	5.7	9.3	43.1	
14-Aug	0.2	4.4	11.5	Z	1.8	3.0	4.5	8.9	7.0	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.9	0.8	2.0	11.5
15-Aug	0.5	0.2	1.5	11.0	Z	25.0	14.4	11.5	13.4	9.5	7.8	6.9	5.8	7.1	4.9	4.1	2.8	3.0	16.6	13.3	4.7	2.7	3.2	5.2	7.6	25.0	
16-Aug	5.2	3.3	1.9	1.2	0.7	Z	0.8	0.9	1.1	1.2	1.4	1.3	0.9	0.9	0.7	2.0	2.9	2.1	5.2	7.3	25.2	24.6	30.5	28.1	6.5	30.5	
17-Aug	Z	3.2	3.5	2.6	6.7	7.3	17.2	35.3	22.3	14.2	10.8	7.2	0.4	0.3	0.3	1.9	1.2	3.7	4.8	2.7	1.1	0.7	3.5	9.0	7.0	35.3	
18-Aug	8.0	Z	10.2	11.3	8.4	9.9	5.8	6.3	5.1	7.7	3.6	4.4	2.4	4.6	4.3	1.1	1.7	1.4	0.5	0.6	2.7	7.0	6.8	4.4	5.1	11.3	
19-Aug	0.6	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.6	1.3	0.2	0.2	0.2	0.1	0.0	0.0	0.9	3.9	17.6	25.5	23.2	18.4	4.1	25.5	
20-Aug	23.9	13.6	7.0	Z	1.1	33.4	28.1	21.9	20.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.6	0.2	0.1	0.1	0.2	0.6	5.8	6.9	33.4	
21-Aug	15.5	13.7	19.1	25.4	Z	17.8	16.1	14.9	13.8	11.1	6.0	3.4	1.6	1.5	4.3	7.7	4.4	2.6	0.7	0.7	1.5	2.3	3.2	4.7	8.3	25.4	
22-Aug	10.8	14.5	21.1	21.5	11.0	Z	3.1	24.7	13.1	11.1	18.4	5.8	5.3	9.1	8.3	9.9	8.9	3.4	1.5	0.9	0.6	0.6	3.7	14.8	9.7	24.7	
23-Aug	Z	16.8	8.5	2.7	1.6	2.0	1.9	10.9	56.2	72.9	38.3	15.6	19.5	12.1	8.0	11.1	14.8	6.4	8.8	12.5	13.7	14.1	12.8	13.9	16.3	72.9	
24-Aug	11.9	Z	8.9	12.1	11.5	10.7	11.4	12.9	C	C	C	C	C	C	2.3	2.4	2.8	2.3	0.9	0.5	0.5	0.7	1.0	1.3	--	12.9	
25-Aug	0.8	0.7	Z	1.1	0.5	2.9	11.1	13.1	10.8	8.2	4.3	3.1	4.7	3.5	3.2	2.2	2.8	3.9	4.8	1.4	0.8	3.7	12.9	14.8	5.0	14.8	
26-Aug	21.2	19.8	8.8	Z	5.3	4.3	5.8	9.1	9.0	7.8	3.7	2.7	2.5	0.5	0.2	0.1	0.0	4.5	9.2	10.3	15.5	16.7	10.8	5.3	7.5	21.2	
27-Aug	3.6	2.0	1.0	0.7	Z	0.7	0.4	0.8	0.9	19.7	26.6	10.0	9.4	5.0	4.1	2.8	2.4	4.1	17.2	11.6	26.4	27.8	25.9	20.7	9.7	27.8	
28-Aug	12.2	3.7	3.1	8.8	13.4	Z	24.5	24.9	19.2	11.9	8.2	7.9	6.1	4.9	4.7	5.5	7.7	5.5	2.5	1.1	1.5	1.2	0.9	2.4	7.9	24.9	
29-Aug	Z	3.4	1.8	2.6	2.7	3.8	6.1	6.7	8.6	10.5	11.6	9.1	6.0	3.9	2.5	2.0	1.3	1.1	1.0	1.1	7.9	28.2	21.9	10.0	6.7	28.2	
30-Aug	18.2	Z	76.3	108.8	113.8	86.3	79.0	73.1	34.4	57.8	40.0	10.5	11.7	8.8	8.2	4.0	3.1	2.8	3.1	4.5	5.3	4.3	5.8	5.0	33.2	113.8	
31-Aug	4.7	3.2	Z	1.3	4.5	10.4	58.1	40.4	30.3	6.6	7.6	9.2	18.1	14.2	2.4	4.7	13.7	4.8	6.7	5.7	3.4	4.6	1.5	1.2	11.2	58.1	
7.3 6.2 8.0 10.5 9.0 10.1 12.4 14.0 12.6 11.9 8.7 5.2 4.9 4.0 3.0 3.4 3.7 3.0 4.2 3.3 5.2 6.3 6.9 7.1																								Diurnal Average			
28.0 42.4 76.3 108.8 113.8 86.3 79.0 73.1 56.2 72.9 40.0 16.6 19.5 14.2 12.9 15.6 14.8 17.6 17.2 13.3 26.4 28.2 30.5 28.1																								Diurnal Maximum			
Z - zerospan C - Calibration																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Fort McKay South - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	651	92.08	92.08
21 - 40	44	6.22	98.30
41 - 80	9	1.27	99.58
81 - 159	3	0.42	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 South - August 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	20	12	9	10	10	48	47	79	55	62	75	53	41	41	47	650
21 - 40	0	2	2	1	1	1	1	3	11	12	6	0	1	1	2	0	44
11 - 80	1	1	0	0	0	0	0	0	1	1	2	0	3	0	0	0	9
81 - 159	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	42	23	14	10	11	11	49	50	91	71	70	75	57	42	43	47	706

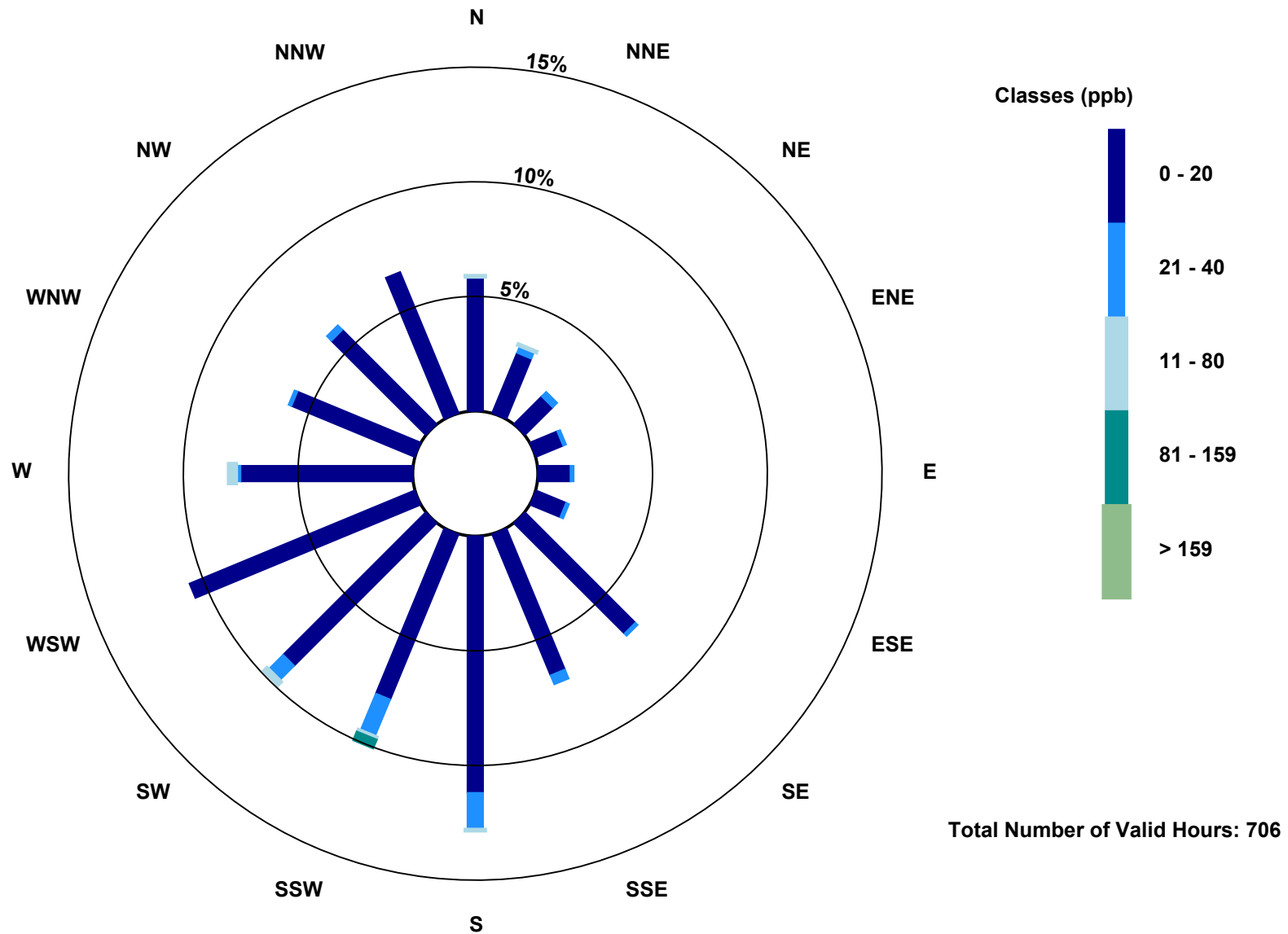
Total Number of Valid Hours: 706

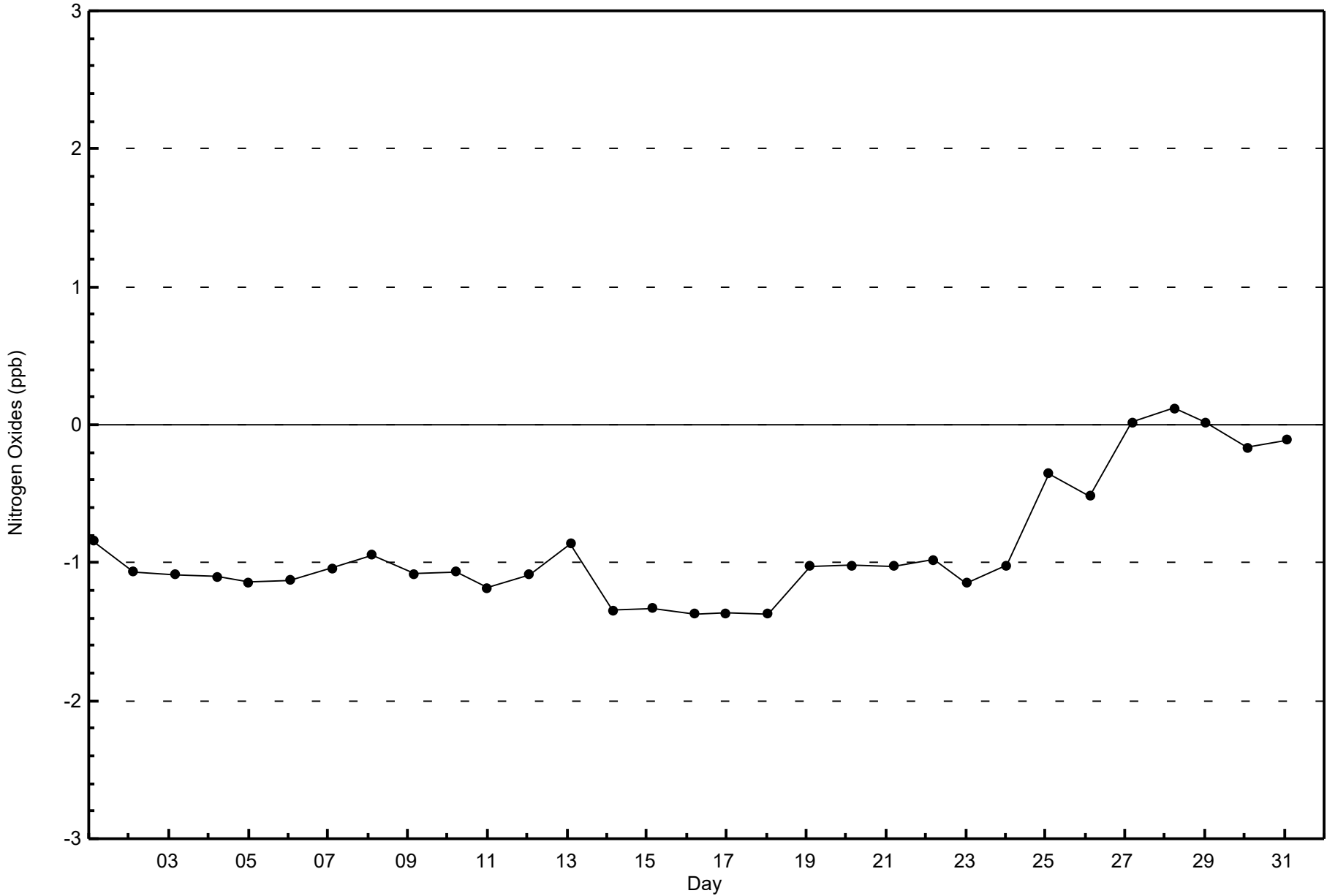
Total Number of Hours: 744

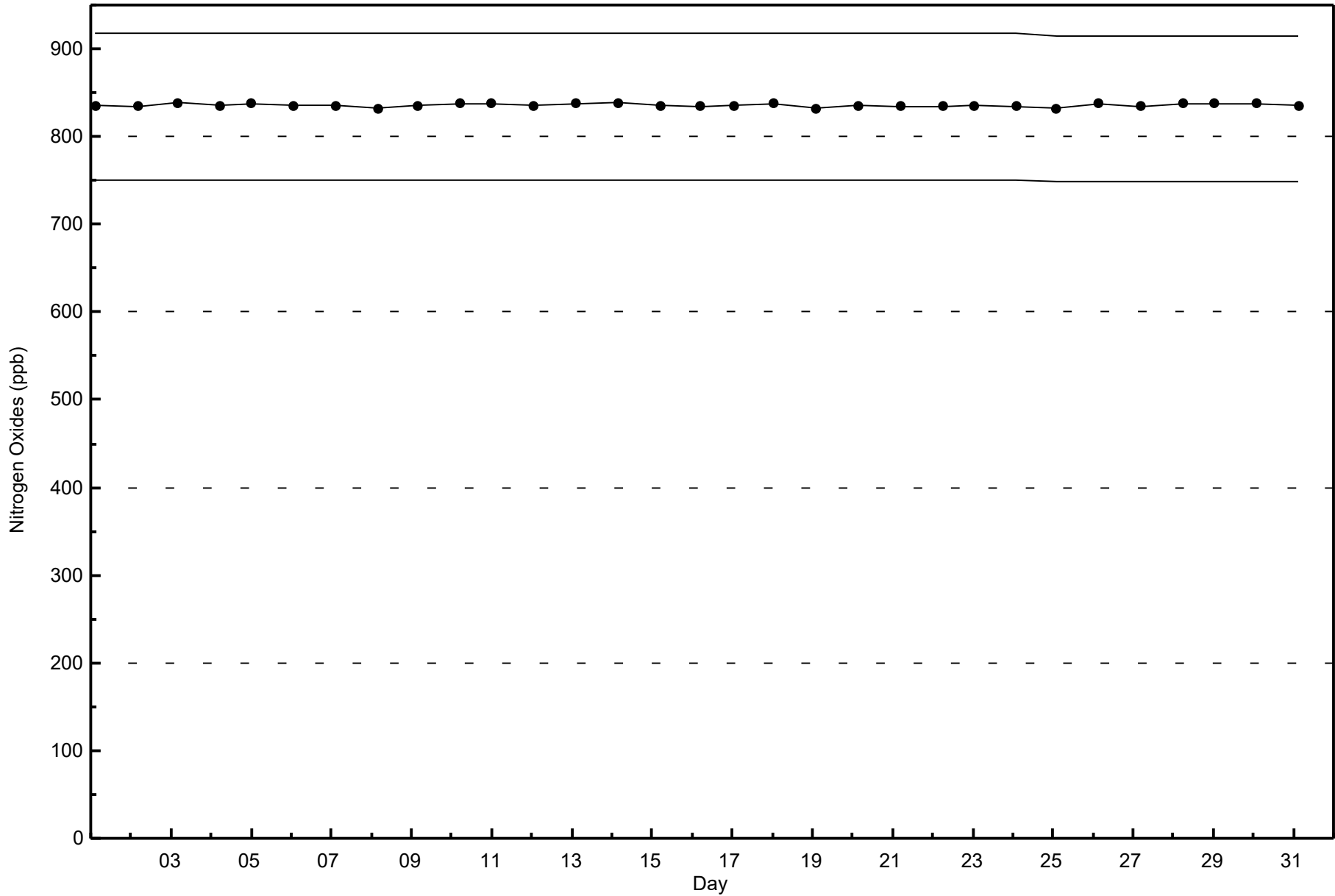


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Fort McKay South





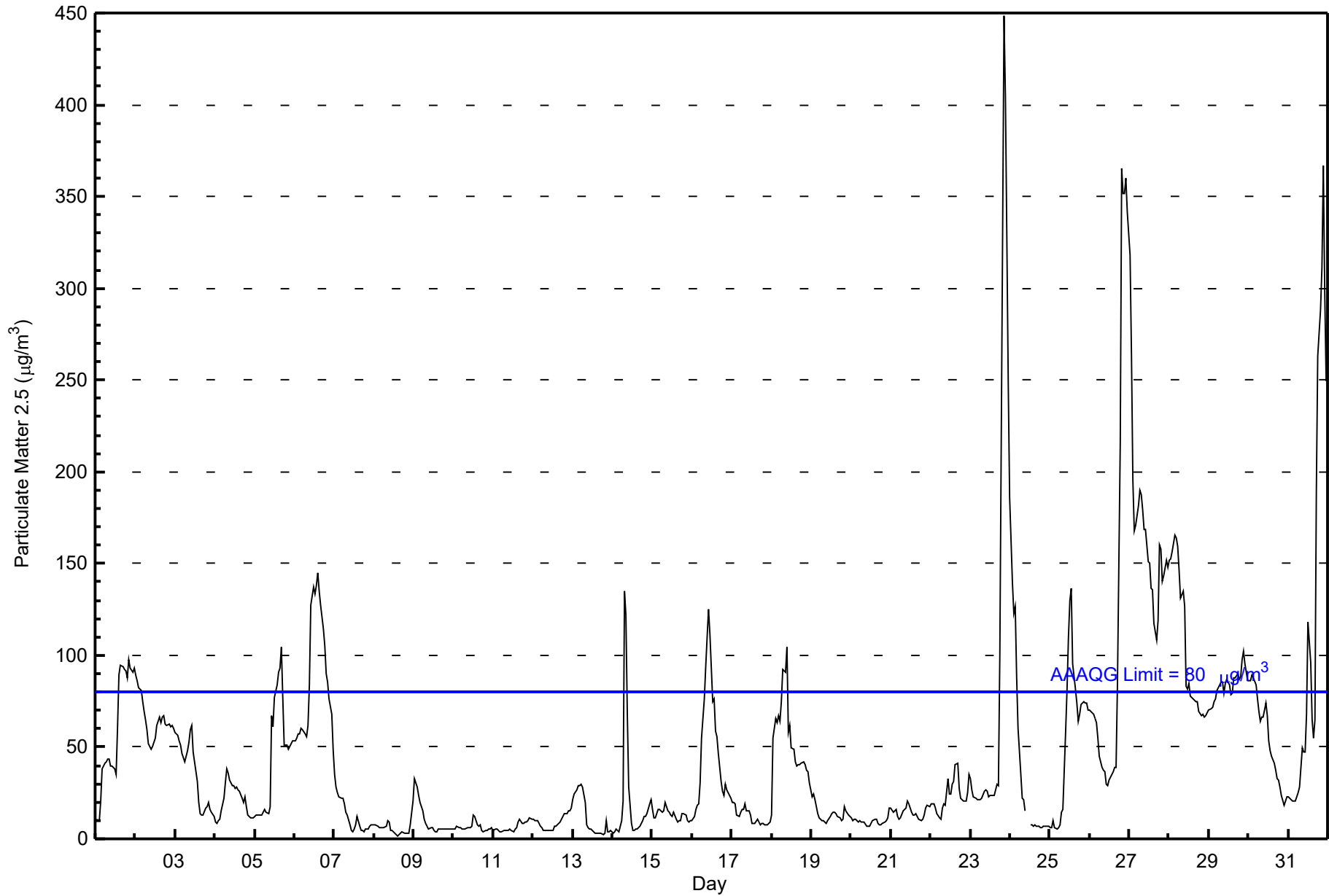




Number of Exceedences (AAAQO):	1-hr: 130	24-hr: 16	Hours in Service:	744
Maximum Value: 448.3 µg/m ³ on Aug 23 21:00	Maximum Daily Average: 167.2 µg/m ³ on Aug 27		Hours of Data:	742
Minimum Value: 1.8 µg/m ³ on Aug 8 15:00	Minimum Daily Average: 5.8 µg/m ³ on Aug 8		Hours of Missing Data:	2
Maximum Diurnal Average: 66.6 µg/m ³ at hour 21	Minimum Diurnal Average: 37.9 µg/m ³ at hour 7		Hours of Calibration:	2
Monthly Average: 46.05 µg/m ³	Percentiles: P ₁ = 3.0 P ₁₀ = 5.4 Q ₁ = 9.6 Median = 21.3 Q ₃ = 64.6 P ₉₀ = 104.4 P ₉₉ = 337.1		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-Aug	10.7	10.1	9.9	20.8	38.1	41.4	42.1	43.8	43.4	39.6	39.7	38.1	34.8	60.6	89.4	94.4	93.8	92.4	91.4	87.5	97.3	93.3	91.1	93.2	58.2	97.3																						
2-Aug	89.6	86.5	82.2	81.1	74.6	69.8	64.6	59.8	52.1	48.6	50.3	53.0	55.1	61.5	66.0	63.5	66.1	66.8	62.5	62.0	62.6	61.3	62.0	60.5	65.1	89.6																						
3-Aug	58.1	56.3	53.4	51.3	46.7	44.5	41.8	47.9	52.9	59.8	61.6	47.6	36.4	31.5	20.1	13.8	12.7	12.7	16.9	17.6	19.5	15.7	14.7	12.2	35.2	61.6																						
4-Aug	8.9	8.3	9.9	10.9	15.1	21.9	30.7	38.1	36.0	32.2	28.8	28.7	27.5	28.0	26.4	25.7	21.9	19.9	23.1	17.2	12.6	11.7	11.7	11.7	21.1	38.1																						
5-Aug	12.2	13.1	13.0	13.3	12.8	14.2	15.8	14.5	13.8	17.2	67.2	60.9	77.1	84.2	90.9	93.1	104.2	77.1	50.8	51.0	49.1	50.5	51.8	53.3	45.9	104.2																						
6-Aug	53.3	55.1	57.2	57.3	60.3	59.8	57.2	55.8	61.5	83.7	127.6	137.3	133.6	137.7	144.7	135.3	127.6	114.2	104.9	89.9	85.3	76.5	68.2	48.0	88.8	144.7																						
7-Aug	34.8	27.9	25.3	23.2	22.1	21.8	18.7	14.6	13.1	7.5	4.7	4.0	5.3	7.6	12.5	6.9	4.9	4.3	4.1	5.0	5.6	6.7	7.8	8.0	12.4	34.8																						
8-Aug	7.5	7.6	6.9	6.5	6.2	6.3	6.0	7.1	10.2	9.1	4.6	4.8	4.1	2.6	1.8	2.0	2.9	3.9	3.0	2.7	2.7	3.2	7.5	20.6	5.8	20.6																						
9-Aug	32.7	30.7	28.5	23.8	19.5	15.5	10.4	8.0	6.6	5.6	6.2	6.1	4.3	3.9	3.8	5.0	5.4	5.6	5.2	5.3	5.6	5.4	5.6	5.6	10.6	32.7																						
10-Aug	5.5	5.6	6.5	6.2	5.7	5.4	5.4	5.5	5.8	6.3	6.2	6.5	12.7	12.4	7.5	7.1	7.7	4.4	4.1	4.3	4.9	5.5	5.3	6.0	6.4	12.7																						
11-Aug	4.5	5.4	5.5	4.8	4.1	3.9	4.5	4.8	4.9	4.8	5.0	4.7	4.2	5.0	6.2	9.0	10.5	8.4	8.5	8.8	9.1	10.2	11.1	10.9	6.6	11.1																						
12-Aug	10.5	9.9	10.2	9.7	6.7	5.7	4.6	4.3	4.3	4.3	4.4	4.3	4.9	7.0	6.9	8.7	9.0	10.4	12.0	13.5	13.9	14.9	15.4	17.0	8.9	17.0																						
13-Aug	21.2	24.4	26.6	29.1	29.0	29.5	28.0	20.2	7.8	6.0	5.1	5.1	4.4	3.4	3.4	3.2	2.9	3.3	2.6	3.3	10.3	4.1	4.0	4.7	11.7	29.5																						
14-Aug	3.2	3.6	5.1	4.8	4.0	9.6	20.4	135.0	121.8	68.9	27.9	8.5	4.8	4.4	5.0	5.6	6.8	8.7	9.8	12.5	12.5	13.4	19.1	21.0	22.3	135.0																						
15-Aug	16.3	11.4	11.4	15.9	16.2	15.2	14.7	15.3	19.8	15.3	14.2	13.0	12.0	14.2	10.6	9.1	9.7	10.2	13.5	14.1	13.0	10.3	9.4	9.5	13.1	19.8																						
16-Aug	9.6	12.0	16.3	18.0	19.4	30.9	54.8	76.1	93.8	110.2	125.1	111.6	74.8	76.6	58.4	55.6	46.6	31.5	26.1	24.0	29.6	26.8	25.5	22.5	49.0	125.1																						
17-Aug	19.8	19.8	18.8	13.2	12.3	14.8	15.9	16.0	18.8	15.1	15.5	12.6	8.5	8.5	8.1	10.7	9.3	7.6	8.0	8.6	7.6	7.7	8.1	8.9	12.3	19.8																						
18-Aug	13.2	54.8	65.9	63.3	66.8	64.2	74.9	92.4	90.4	104.4	57.8	61.9	49.3	49.0	42.1	39.8	40.2	40.2	41.2	42.2	40.2	37.5	36.5	30.7	54.1	104.4																						
19-Aug	23.1	24.3	21.4	17.9	13.9	11.3	10.2	9.8	9.2	8.1	9.6	12.3	13.7	14.6	14.5	13.8	11.9	11.1	10.1	10.4	17.3	15.4	12.8	12.3	13.7	24.3																						
20-Aug	11.3	10.2	10.7	10.4	9.3	9.9	9.5	9.1	9.0	6.7	6.7	6.9	8.1	9.9	10.6	10.6	8.1	7.8	7.4	8.1	9.1	9.6	11.6	16.4	9.5	16.4																						
21-Aug	16.7	14.8	15.3	16.2	12.4	10.8	11.6	15.5	15.8	17.0	20.7	18.7	14.3	13.0	13.1	14.0	11.9	10.7	9.6	10.8	13.3	17.1	18.4	17.7	14.6	20.7																						
22-Aug	19.2	19.1	19.3	16.5	13.7	11.5	10.5	16.6	19.2	18.2	33.1	24.1	24.5	29.7	31.5	40.4	41.4	27.1	22.4	21.2	20.9	20.5	25.1	34.9	23.4	41.4																						
23-Aug	33.0	26.7	22.6	21.8	21.3	21.7	21.2	22.5	26.2	26.8	25.7	23.2	23.9	23.4	26.5	29.8	28.8	100.1	330.5	448.3	404.1	327.7	249.6	96.2	448.3																							
24-Aug	186.1	139.8	122.5	126.5	88.2	60.0	35.1	22.5	21.5	15.2	C	C	7.7	7.6	6.9	7.4	7.2	6.9	5.9	6.0	6.7	7.1	7.0	6.8	40.9	186.1																						
25-Aug	6.2	6.3	9.9	5.8	5.6	5.8	7.8	14.4	16.2	58.9	81.9	109.8	129.9	136.3	95.7	81.7	73.9	64.4	67.6	72.9	74.6	73.8	70.0	56.0	136.3																							
26-Aug	70.1	69.7	67.5	65.7	63.0	55.0	45.2	38.8	37.3	36.2	29.5	29.3	31.8	34.8	36.7	38.5	38.8	84.3	215.6	365.0	351.9	351.8	359.9	341.7	119.1	365.0																						
27-Aug	318.0	264.2	195.3	168.1	171.0	181.9	189.7	187.9	179.5	168.3	168.4	151.3	150.4	136.6	135.6	117.7	108.6	119.2	160.5	157.8	140.7	143.1	151.7	148.1	167.2	318.0																						
28-Aug	151.5	152.6	156.5	165.2	164.2	159.6	146.7	131.4	134.7	126.8	83.4	81.5	84.4	78.0	76.6	75.3	74.6	74.7	69.7	66.8	68.0	66.5	67.2	68.8	105.2	165.2																						
29-Aug	70.2	70.7	71.5	74.9	76.5	80.9	83.6	85.3	85.7	79.7	84.7	86.7	84.3	78.4	79.5	88.0	88.1	90.3	87.0	88.7	97.3	102.4	95.2	86.2	84.0	102.4																						
30-Aug	86.2	86.4	89.1	88.0	83.9	76.3	69.6	64.0	66.0	66.2	74.0	67.3	53.3	47.8	44.8	40.8	37.4	33.2	32.0	28.2	24.0	18.4	20.8	23.1	55.0	89.1																						
31-Aug	23.1	22.0	20.9	20.5	20.4	22.7	25.1	28.1	49.9	47.5	47.1	67.7	118.0	96.5	64.8	54.9	64.6	188.7	262.9	288.4	311.0	367.0	298.0	249.2	115.0	367.0																						
																								46.0	43.5	41.1	40.3	38.8	38.1	37.9	42.1	42.8	42.4	43.9	42.9	41.9	42.1	39.9	38.7	38.0	40.9	49.6	62.1	66.6	66.2	62.1	57.1	Diurnal Average
																								318.0	264.2	195.3	168.1	171.0	181.9	189.7	187.9	179.5	168.3	168.4	151.3	150.4	137.7	144.7	135.3	127.6	188.7	262.9	365.0	448.3	404.1	359.9	341.7	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}) - $\mu\text{g}/\text{m}^3$
Fort McKay South - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	77	10.38	10.38
6 - 15	230	31.00	41.37
16 - 25	100	13.48	54.85
26 - 80	205	27.63	82.48
> 81.0	130	17.52	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}) - μg/m³
Fort McKay South - August 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	6	8	1	2	3	4	13	1	2	3	11	4	5	3	3	8	77
6 - 15	14	2	9	6	5	3	13	19	18	24	30	31	22	13	11	10	230
16 - 25	3	0	1	0	0	0	5	12	17	14	13	17	8	4	4	2	100
26 - 80	8	8	2	0	3	3	14	10	39	17	15	17	21	13	15	20	205
> 81.0	18	5	1	2	0	1	5	9	18	17	9	8	6	10	13	7	129
Totals	49	23	14	10	11	11	50	51	94	75	78	77	62	43	46	47	741

Total Number of Valid Hours: 741

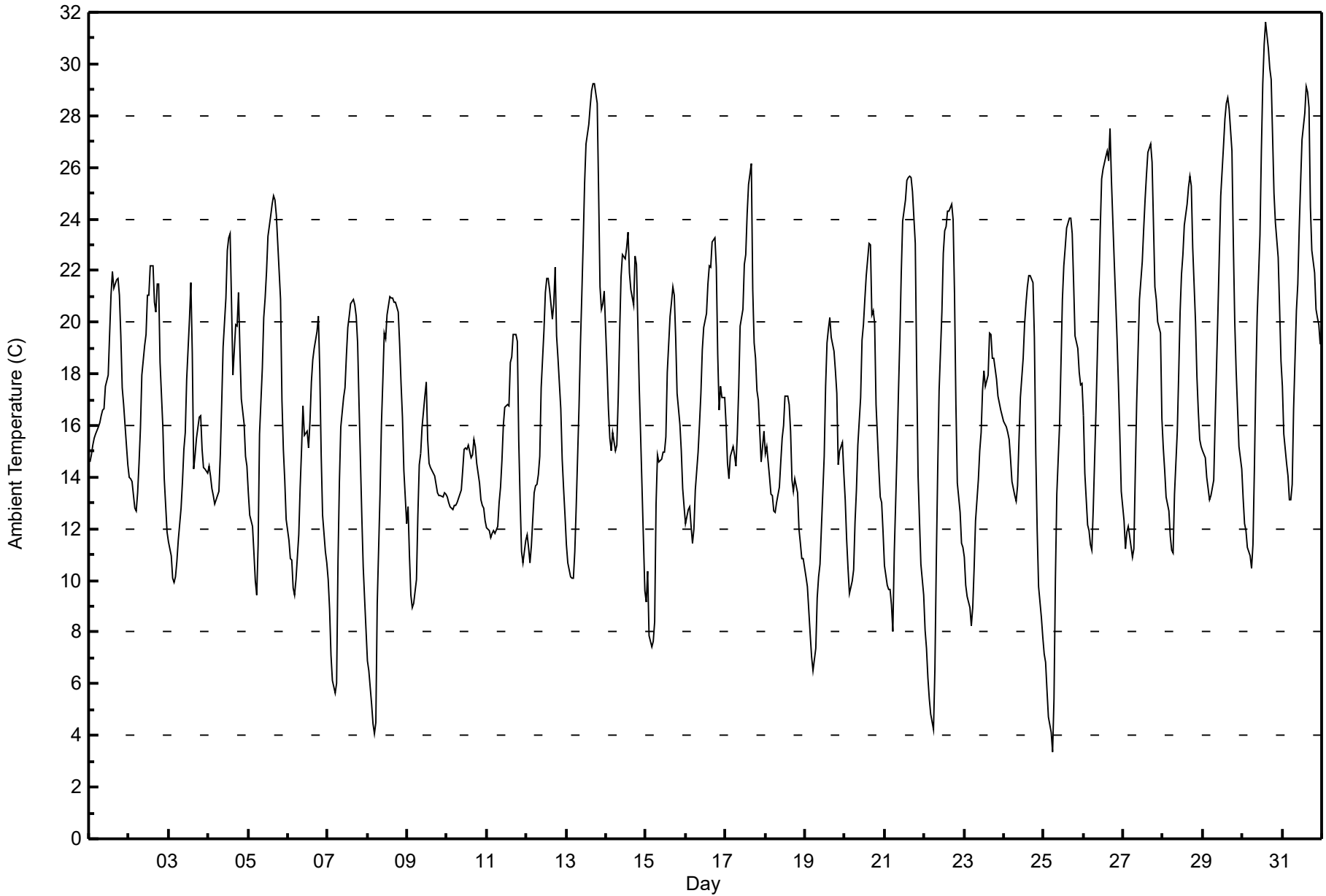
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Fort McKay South - August 2023

Maximum Value: 31.6 C on Aug 30 15:00		Maximum Daily Average: 20.9 C on Aug 30		Hours in Service: 744																							
Minimum Value: 3.4 C on Aug 25 06:00		Minimum Daily Average: 13.3 C on Aug 9		Hours of Data: 744																							
Maximum Diurnal Average: 22.4 C at hour 15		Minimum Diurnal Average: 10.7 C at hour 5		Hours of Missing Data: 0																							
Monthly Average: 16.56 C		Percentiles: P ₁ = 5.0 P ₁₀ = 10.1 Q ₁ = 12.9 Median = 15.8 Q ₃ = 20.4 P ₉₀ = 23.6 P ₉₉ = 29.2		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-Aug	14.6	14.8	15.2	15.5	15.7	15.9	16.1	16.4	16.6	16.7	17.5	17.9	19.5	21.1	21.9	21.3	21.7	21.7	21.0	19.5	17.5	16.8	15.2	14.5	17.7	21.9	
2-Aug	14.0	13.9	13.8	12.8	12.7	13.4	14.5	15.9	18.0	19.1	19.5	21.0	21.0	22.2	22.2	20.8	20.4	21.5	21.5	18.4	16.0	13.9	12.9	11.9	17.1	22.2	
3-Aug	11.5	11.0	10.1	9.9	10.1	10.7	11.6	12.8	13.8	15.1	15.7	17.8	20.1	21.6	18.8	14.3	14.9	15.5	16.3	16.4	15.1	14.4	14.3	14.1	14.4	21.6	
4-Aug	14.4	14.0	13.6	13.3	13.0	13.3	13.4	14.9	16.9	19.0	20.9	22.8	23.3	23.4	20.8	18.0	19.9	19.9	21.1	19.0	17.1	16.1	14.8	14.4	17.4	23.4	
5-Aug	13.4	12.5	12.1	11.1	10.0	9.4	11.4	15.7	18.2	20.2	20.9	22.0	23.3	24.1	24.5	24.9	24.7	24.1	23.0	20.9	17.0	15.1	13.9	12.4	17.7	24.9	
6-Aug	11.5	10.8	10.8	9.7	9.4	10.0	11.8	13.6	15.1	16.8	15.6	15.8	15.1	16.2	17.7	18.6	19.0	19.6	20.2	18.1	14.8	12.6	11.1	10.7	14.4	20.2	
7-Aug	10.0	8.9	7.1	6.1	5.7	6.0	10.7	13.9	15.9	17.1	17.4	18.7	19.8	20.2	20.7	20.9	20.7	20.2	19.2	16.9	12.5	10.5	9.3	8.1	14.0	20.9	
8-Aug	6.9	6.5	5.2	4.5	4.1	4.5	9.1	13.4	16.1	17.7	19.6	19.4	20.3	21.0	20.9	21.0	20.8	20.8	20.4	19.2	17.6	16.3	14.2	12.2	14.6	21.0	
9-Aug	12.9	11.0	9.5	8.9	9.1	10.0	12.5	14.5	14.9	15.9	17.1	17.7	15.5	14.5	14.4	14.2	14.0	13.7	13.4	13.3	13.3	13.2	13.4	13.3	13.3	17.7	
10-Aug	13.3	13.0	12.9	12.7	12.9	12.9	13.0	13.2	13.5	14.3	15.1	15.1	15.1	15.3	14.8	14.8	15.4	15.2	14.5	13.8	13.1	12.9	12.8	12.3	13.8	15.4	
11-Aug	12.0	12.0	11.7	11.8	11.9	11.8	12.1	13.0	13.6	14.7	16.0	16.7	16.8	16.7	18.4	18.6	19.5	19.5	19.2	15.4	13.1	11.1	10.7	11.6	14.5	19.5	
12-Aug	11.8	11.3	10.7	11.4	13.4	13.7	13.7	14.1	14.8	17.5	19.7	21.1	21.7	21.7	21.3	20.1	20.7	22.1	19.5	18.6	16.7	14.7	13.6	12.5	16.5	22.1	
13-Aug	11.4	10.7	10.2	10.1	10.1	11.1	12.9	16.7	19.1	21.1	23.1	25.4	26.9	27.7	28.4	29.0	29.2	29.2	28.5	25.0	21.3	20.5	20.7	21.2	20.4	29.2	
14-Aug	18.3	16.7	15.5	15.0	15.7	15.0	15.2	17.1	19.6	21.7	22.6	22.5	22.9	23.5	21.9	21.3	20.7	22.6	22.2	19.9	17.5	15.6	11.5	9.6	18.5	23.5	
15-Aug	9.2	10.4	7.9	7.5	7.6	8.4	13.0	14.9	14.6	14.7	15.0	15.0	15.6	18.1	20.2	20.8	21.4	21.1	19.4	17.3	16.0	15.0	13.5	12.9	14.5	21.4	
16-Aug	12.2	12.7	12.9	12.1	11.4	12.0	13.5	15.0	16.0	17.2	18.9	19.8	20.4	21.5	22.2	22.1	23.1	23.3	22.1	18.8	16.6	17.5	17.1	17.1	17.3	23.3	
17-Aug	16.0	14.5	14.0	14.8	15.2	14.9	14.4	15.7	17.5	19.9	20.5	22.2	22.6	24.2	25.3	26.1	21.2	19.2	18.6	17.3	17.0	14.6	15.2	15.8	18.2	26.1	
18-Aug	14.9	15.2	14.0	13.3	13.3	12.7	12.6	13.0	13.6	14.6	15.5	16.0	17.1	17.1	16.8	15.8	13.9	13.5	13.9	13.4	12.0	11.5	10.8	10.9	14.0	17.1	
19-Aug	10.1	9.8	8.9	7.9	7.1	6.5	7.4	9.3	10.1	10.6	12.0	14.8	17.5	19.2	19.7	20.2	19.4	18.9	18.1	17.2	14.5	15.0	15.4	14.2	13.5	20.2	
20-Aug	13.1	11.6	10.5	9.5	10.0	10.4	12.2	13.5	15.2	17.1	19.3	19.9	20.9	21.8	23.0	23.0	20.3	20.5	20.0	16.8	14.3	13.2	13.0	11.9	15.9	23.0	
21-Aug	10.6	9.8	9.6	9.7	9.0	8.0	11.1	15.0	17.3	19.4	21.9	23.9	24.7	25.5	25.6	25.7	25.6	25.1	23.1	18.1	14.0	12.3	10.6	9.4	16.9	25.7	
22-Aug	8.1	7.4	6.2	5.4	4.9	4.2	6.6	10.7	14.3	17.4	20.4	22.7	23.6	23.7	24.3	24.3	24.6	24.0	21.1	16.8	13.8	12.6	11.4	11.3	15.0	24.6	
23-Aug	10.9	9.8	9.4	8.9	8.3	9.0	10.4	12.3	13.9	15.0	15.8	17.4	18.1	17.5	17.9	19.6	19.5	18.6	18.6	17.8	17.2	16.8	16.6	16.4	14.8	19.6	
24-Aug	16.1	16.0	15.7	15.5	14.7	13.8	13.3	13.1	13.6	15.4	17.1	18.6	19.9	20.7	21.4	21.8	21.8	21.6	19.4	14.9	11.9	9.8	8.6	7.8	15.9	21.8	
25-Aug	7.1	6.8	5.7	4.7	4.1	3.4	5.4	10.0	13.4	16.1	18.4	20.9	22.2	22.9	23.7	24.0	24.0	23.5	21.5	19.5	19.0	18.1	17.6	17.6	15.4	24.0	
26-Aug	16.4	14.2	12.2	11.9	11.4	11.2	12.7	16.7	18.9	21.1	23.6	25.6	25.9	26.4	26.6	26.3	27.5	25.5	22.3	20.9	19.4	17.6	15.6	13.4	19.3	27.5	
27-Aug	12.3	11.3	11.9	12.1	11.7	10.9	11.2	14.2	16.9	18.9	20.9	22.3	23.6	24.7	25.7	26.5	26.9	26.2	23.8	21.4	20.9	20.0	19.6	16.3	18.8	26.9	
28-Aug	15.1	14.3	13.2	12.7	11.7	11.2	11.1	13.3	15.8	18.0	20.4	21.9	22.6	23.7	24.6	25.2	25.6	25.3	22.9	20.0	17.9	16.5	15.5	15.2	18.1	25.6	
29-Aug	15.0	14.8	14.0	13.6	13.1	13.3	13.9	16.2	18.3	20.4	22.7	24.9	26.8	27.9	28.5	28.7	28.2	26.6	23.0	20.0	18.1	16.7	15.2	14.3	19.8	28.7	
30-Aug	13.2	12.2	11.9	11.3	11.0	10.5	11.4	14.3	17.6	20.3	23.4	26.6	29.2	30.7	31.6	30.6	29.8	29.4	27.2	25.0	23.9	22.5	20.6	18.5	20.9	31.6	
31-Aug	17.5	15.7	14.5	14.0	13.1	13.1	13.7	16.7	20.4	21.5	23.6	25.4	27.1	28.1	29.1	28.9	28.3	24.4	22.8	21.9	20.5	20.2	19.9	19.2	20.8	29.1	
		12.7	12.0	11.3	10.9	10.7	10.7	12.0	14.2	15.9	17.6	19.0	20.4	21.3	22.0	22.4	22.2	22.0	21.7	20.6	18.4	16.4	15.3	14.3	13.6	Diurnal Average	
		18.3	16.7	15.7	15.5	15.7	15.9	16.1	17.1	20.4	21.7	23.6	26.6	29.2	30.7	31.6	30.6	29.8	29.4	28.5	25.0	23.9	22.5	20.7	21.2	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Fort McKay South - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	65	8.74	8.74
10 - 20	473	63.58	72.31
> 20	206	27.69	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

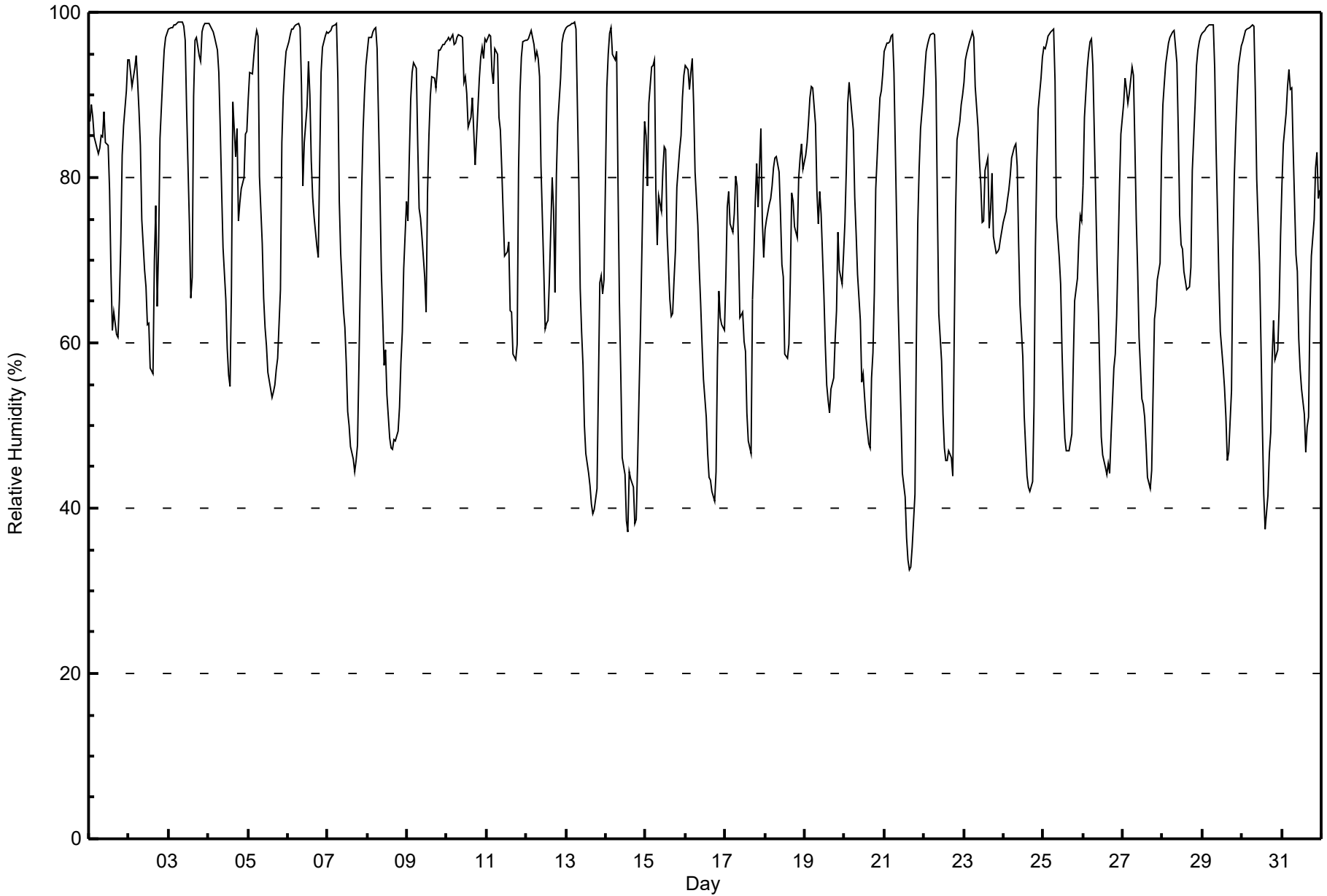
Fort McKay South - August 2023

Maximum Value: 98.8 % on Aug 3 08:00 Maximum Daily Average: 93.4 % on Aug 3																						Hours in Service:	744																							
Minimum Value: 32.6 % on Aug 21 16:00 Minimum Daily Average: 65.3 % on Aug 14																						Hours of Data:	744																							
Maximum Diurnal Average: 93.5 % at hour 5 Minimum Diurnal Average: 56.2 % at hour 15																						Hours of Missing Data:	0																							
Monthly Average: 76.36 % Percentiles: P ₁ = 38.3 P ₁₀ = 48.4 Q ₁ = 62.7 Median = 78.9 Q ₃ = 92.9 P ₉₀ = 97.2 P ₉₉ = 98.7																						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-Aug	86.8	88.8	87.4	84.9	84.2	82.9	83.5	85.1	84.9	87.9	84.3	84.0	78.5	68.5	61.5	63.7	61.1	60.7	65.0	72.0	82.7	86.3	90.6	94.3	79.6	94.3																				
2-Aug	94.3	92.7	91.1	93.2	94.7	91.6	88.2	83.9	74.9	68.8	66.8	62.1	62.3	57.0	56.3	70.1	76.6	64.5	71.8	84.7	92.2	95.5	97.0	97.5	80.3	97.5																				
3-Aug	98.0	98.1	98.2	98.4	98.6	98.7	98.7	98.8	98.8	98.4	96.6	88.3	74.4	65.4	68.0	89.9	96.6	97.0	94.7	94.0	97.7	98.3	98.6	98.7	93.4	98.8																				
4-Aug	98.7	98.3	98.1	97.7	96.9	95.5	92.7	86.1	78.4	71.6	65.3	59.4	56.1	54.7	66.4	89.2	82.5	85.9	74.8	76.9	78.6	80.1	85.2	85.6	81.4	98.7																				
5-Aug	89.4	92.8	92.6	94.7	96.6	97.8	97.2	80.2	72.0	65.4	61.9	59.6	56.4	54.5	53.4	54.0	55.0	56.8	58.1	66.4	84.2	89.8	93.1	95.3	75.7	97.8																				
6-Aug	96.5	97.2	98.0	98.0	98.3	98.5	98.7	98.2	91.2	79.0	84.2	88.7	94.1	90.1	82.1	77.6	75.2	71.7	70.4	81.6	92.7	95.8	97.2	97.7	89.7	98.7																				
7-Aug	97.5	97.6	97.8	98.3	98.5	98.6	91.9	77.2	70.8	63.9	61.9	57.4	51.8	50.0	47.5	45.9	44.5	45.7	47.7	57.2	78.7	85.8	90.2	93.6	72.9	98.6																				
8-Aug	95.3	96.9	97.0	97.6	97.9	98.2	95.6	78.8	68.8	63.2	57.3	59.2	53.8	48.5	47.3	47.0	48.3	48.1	49.3	52.2	57.7	61.4	69.0	77.1	69.4	98.2																				
9-Aug	74.7	82.6	89.4	92.7	93.9	93.2	84.1	76.3	75.0	72.8	68.0	63.8	78.2	85.1	89.8	92.2	92.0	90.9	93.0	95.5	95.5	96.1	96.0	96.5	86.1	96.5																				
10-Aug	96.7	96.9	96.5	97.2	96.1	96.2	96.9	97.4	97.1	96.9	91.5	92.2	90.2	86.1	87.4	89.6	85.6	81.4	85.0	92.0	94.5	95.8	94.4	96.7	92.9	97.4																				
11-Aug	96.5	97.2	97.2	92.9	91.4	95.6	95.0	87.3	85.8	81.1	75.8	70.5	71.0	72.1	63.9	63.7	58.7	58.0	59.8	81.0	90.3	94.5	96.4	96.6	82.2	97.2																				
12-Aug	96.7	96.7	97.3	97.9	96.1	94.4	95.2	94.4	92.2	81.3	68.7	61.7	62.4	62.7	67.7	80.0	76.0	66.1	80.3	86.5	92.1	96.3	97.3	97.9	84.9	97.9																				
13-Aug	98.1	98.3	98.5	98.6	98.7	98.8	98.0	79.4	66.6	61.4	57.3	50.0	46.6	44.2	42.7	40.6	39.3	39.8	42.3	54.8	67.2	68.1	65.9	67.7	67.6	98.8																				
14-Aug	90.8	95.0	97.4	98.1	95.0	94.3	95.3	79.1	64.9	55.9	46.2	44.0	38.5	37.2	44.4	43.6	42.5	38.1	38.7	45.7	53.8	61.4	80.2	86.7	65.3	98.1																				
15-Aug	85.0	79.0	88.9	93.4	93.6	94.2	78.6	71.8	77.9	75.9	80.8	83.8	83.4	73.4	65.3	63.3	63.6	67.6	71.3	78.9	83.5	85.0	89.6	92.3	80.0	94.2																				
16-Aug	93.6	93.0	90.7	92.8	94.3	88.9	80.7	74.2	68.9	64.7	59.8	55.6	51.1	46.6	43.7	43.4	42.0	40.9	44.4	58.2	66.3	63.0	62.2	61.5	65.8	94.3																				
17-Aug	68.0	76.4	78.2	74.4	73.4	75.6	80.1	78.9	71.7	63.0	63.7	60.1	58.9	51.5	48.1	46.6	65.3	70.7	77.1	81.7	76.4	85.9	74.9	70.4	69.6	85.9																				
18-Aug	73.8	74.8	76.8	77.5	78.9	81.2	82.3	82.5	80.6	75.6	69.5	68.0	58.6	58.1	59.8	67.5	78.2	77.1	74.1	72.6	80.0	82.3	84.0	81.1	74.8	84.0																				
19-Aug	82.8	84.2	86.8	89.7	91.1	90.8	86.4	78.4	74.4	78.3	75.5	65.8	59.6	55.0	53.1	51.6	54.5	55.8	60.3	63.9	73.5	68.7	67.1	70.6	71.6	91.1																				
20-Aug	74.6	81.0	89.0	91.5	87.6	85.8	77.7	73.1	68.2	62.6	55.2	56.3	53.6	51.0	47.8	47.3	55.7	58.7	66.2	78.7	86.3	89.6	90.6	92.5	71.7	92.5																				
21-Aug	95.2	96.3	96.3	96.4	97.1	97.3	92.6	73.9	64.5	57.9	51.4	44.2	41.3	36.5	33.7	32.6	32.8	35.3	41.7	60.1	74.4	81.2	85.9	89.9	67.0	97.3																				
22-Aug	92.9	95.3	96.0	96.7	97.4	97.4	97.3	91.5	76.8	63.6	57.8	51.4	47.4	45.7	45.8	47.0	46.2	43.8	60.3	75.7	84.5	86.8	88.9	89.9	74.0	97.4																				
23-Aug	91.6	94.3	95.0	96.4	97.0	97.7	96.9	91.1	86.1	82.3	79.2	74.6	74.8	80.9	82.4	73.8	76.1	80.5	72.9	70.9	71.0	71.4	72.5	73.6	82.6	97.7																				
24-Aug	74.6	75.9	77.4	78.4	80.1	82.4	83.8	84.1	81.3	72.1	64.6	58.4	51.2	47.5	43.9	42.6	42.0	43.2	52.4	71.6	81.9	88.2	92.1	94.6	69.3	94.6																				
25-Aug	95.7	95.6	96.3	97.2	97.6	97.7	98.0	91.6	75.3	70.4	67.2	59.0	52.9	48.4	47.0	46.9	48.0	49.0	57.5	65.1	67.8	72.5	75.4	74.8	72.8	98.0																				
26-Aug	79.0	87.3	93.2	95.2	96.5	96.8	93.6	78.0	69.5	63.6	56.2	48.7	46.4	44.9	44.1	45.5	44.2	48.8	57.0	58.7	63.2	70.7	78.6	85.3	68.5	96.8																				
27-Aug	88.9	92.0	90.7	88.9	90.2	93.4	92.3	84.1	74.8	68.6	60.6	53.2	52.5	51.1	47.6	43.7	42.4	44.6	53.8	62.9	64.3	67.6	69.6	82.6	69.2	93.4																				
28-Aug	88.8	91.4	93.8	96.3	96.9	97.3	97.6	97.8	93.8	85.6	75.5	71.9	71.3	68.7	66.5	66.6	66.8	69.2	80.8	88.7	93.5	95.4	96.5	97.1	85.3	97.8																				
29-Aug	97.4	97.8	98.1	98.3	98.5	98.5	98.5	93.3	83.3	75.8	67.6	61.4	57.2	54.5	51.1	45.7	46.8	54.2	71.2	80.2	85.6	90.0	93.6	95.9	78.9	98.5																				
30-Aug	96.4	97.1	97.8	97.9	98.2	98.3	98.5	98.4	90.3	79.9	69.5	60.1	50.2	41.7	37.5	41.5	46.6	49.2	58.2	62.8	58.0	59.2	64.2	72.8	71.8	98.5																				
31-Aug	79.1	84.1	87.8	91.0	93.0	90.6	90.9	83.5	70.7	68.6	60.5	56.9	54.5	51.3	46.8	49.8	51.0	63.8	70.6	75.0	81.2	83.1	77.5	78.4	72.5	93.0																				
89.3																						91.1	92.6	93.3	93.5	93.5	91.5	84.8	78.4	72.8	67.8	63.5	60.6	57.5	56.2	58.1	59.2	59.9	64.5	72.4	79.0	82.1	84.3	86.6	Diurnal Average	
98.7																						98.3	98.5	98.6	98.7	98.8	98.7	98.8	98.8	98.4	96.6	92.2	94.1	90.1	89.8	92.2	96.6	97.0	94.7	95.5	97.7	98.3	98.6	98.7	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Fort McKay South - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort McKay South - August 2023

Maximum Speed: 19 km/h on Aug 24 10:00	Maximum Daily Speed Average: 11.0 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 20 11:00	Minimum Daily Speed Average: 0.2 km/h on Aug 15	Hours of Data: 743
Maximum Diurnal Speed Average: 2.6 km/h at hour 14	Minimum Diurnal Speed Average: 1.0 km/h at hour 19	Hours of Missing Data: 1
Monthly Average Velocity: 1.5 km/h 230.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 3 Median = 5 Q ₃ = 8 P ₉₀ = 11 P ₉₉ = 16	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-Aug	WSW4	W10	W10	W8	W9	W9	WSW6	W7	SW7	SW8	SW8	WSW6	WSW6	WNW7	NW10	NNW13	NW9	NW7	NW6	NW6	NW4	WNW4	W2	WNW5	W6.0	NNW13
2-Aug	W5	WSW7	W6	NW1	W7	W6	NW3	WNW5	NNW6	NW2	WSW4	SW5	NNE2	SW2	WSW5	W2	NNW2	NNE3	NNW1	W1	W2	WSW2	W2	WNW2	W2.6	WSW7
3-Aug	WNW2	WSW2	WSW2	W2	NW2	W2	WNW1	NW1	NNW2	SE1	ESE3	SE7	SE8	SE8	WNW3	WNW1	N3	S4	SSE6	SSE2	SW1	WSW1	WSW1	WSW3	S1.0	SE8
4-Aug	NW6	WNW7	WNW6	W6	W7	W7	WSW9	WSW11	WSW7	WSW6	SW6	SSW7	SSW8	SSW9	S1	SE3	S5	S2	WSW5	W6	W5	W7	WSW6	W7	WSW5.1	WSW11
5-Aug	WNW3	W2	WSW1	S3	SSE3	SSE4	S3	W2	ENE1	NE3	N8	NNE7	E4	SSE6	SE6	NNE4	NNE7	NNE6	NNE6	N4	NW3	WSW2	WSW2	SSW2	NE1.1	N8
6-Aug	W2	W2	W1	SSW1	S3	SSW2	S2	N5	S4	ENE2	NNE8	NNE6	NW1	N4	NNE5	N3	WNW3	NNW3	NW2	WNW2	W2	WNW3	NW2	NW5	NNW1.5	NNE8
7-Aug	NW3	NW2	SW2	WSW3	W1	SW3	WSW2	NNE3	NE2	NE4	NNE5	N7	NNE11	N12	N11	NNE13	NNE12	NNE11	NNE10	N7	WNW4	NW4	NW3	W2	N4.5	NNE13
8-Aug	WSW3	WNW1	WSW2	WSW3	W2	WSW1	WNW1	ENE2	ESE5	SE6	E6	NNE7	NE7	E7	ENE8	E6	SE6	SE11	SE10	SE10	SE7	SE7	SE5	SE4	ESE3.5	SE11
9-Aug	SE5	SE3	S2	W2	SW2	SSW3	SSE6	SSE6	SE6	SE6	SSE11	SSE15	SSE14	SE10	SE10	SE7	SE7	SE8	ESE6	SE6	SE7	SE7	SE9	SE7	SE6.5	SSE15
10-Aug	SE7	SE7	SE8	ESE4	SE7	SE7	ESE5	ESE4	E4	ENE4	E5	NE6	ENE7	ENE6	E6	NE5	NE6	ENE6	NNE6	N7	NNW5	NNW4	NNW4	N4	ENE3.6	SE8
11-Aug	NW4	NW3	NNW4	NNW5	N7	NW4	NNW5	NNW7	NNW6	N6	NNW4	NNE4	SW6	WSW7	SW5	SSW5	SSW7	SW5	SSW4	SW3	SW2	WSW3	SSW3	S1	WNW2.0	NNW7
12-Aug	SSW3	SW1	SW3	SW4	WSW8	WSW9	W8	W7	W7	W7	WSW9	SW7	SSW5	S7	SW5	N10	NW2	WSW2	WSW3	WSW3	WSW3	SW3	SSE2	SSW2	WSW3.6	N10
13-Aug	SSW2	SW2	SW2	SW2	S3	S4	SSE6	S11	S14	S16	S16	SSW15	SW12	SW13	SW14	SW14	SW10	SW7	SSW5	SW5	SW5	SW6	WNW9	SSW7.6	S16	
14-Aug	WNW3	S2	WNW1	N2	NNW5	NNW4	SSW3	WSW7	WSW6	WNW7	WNW8	WNW8	W11	WSW12	WSW11	W8	WSW8	W9	W7	W5	W6	WNW5	SW3	S3	W5.2	WSW12
15-Aug	SW5	SW3	SSE4	SSE4	SSW2	SSW2	SSE5	SSE8	SE3	SSE5	S3	SE7	SE3	SSE8	SSE6	ESE4	E4	NNW1	N14	N16	NNW13	NNW10	NW7	WNW5	ESE0.2	N16
16-Aug	WSW2	W5	WNW3	NW2	SSW2	W5	WNW5	WNW6	NW8	WNW7	W4	WNW6	NW8	W9	WSW8	SSW10	SSW11	SSW10	SSW8	SSW6	S7	SSW10	S9	S9	SW4.6	SSW11
17-Aug	SSE7	SSE4	S7	S7	SSE7	S7	S4	SSE2	S8	SSW6	S7	WSW7	W8	W6	W3	E5	SSW7	SSE2	N2	WNW4	NNW9	W2	NW5	NW6	SSW2.6	NNW9
18-Aug	NNW7	N10	N9	NNW11	NNW13	NNW13	NNW12	NNW10	NNW9	N10	N12	NW8	NNW10	N9	NNW6	WNW6	NNW11	NNW10	NNW8	NNW9	NNW6	NW5	NW5	WNW6	NNW8.6	NNW13
19-Aug	WNW5	WSW7	WSW7	WSW8	WSW9	WSW8	WSW9	WSW8	WSW6	SW5	SW7	WSW12	SW11	SW11	WSW9	WSW10	SW10	SW8	SSW6	SSW5	SW5	SSW8	SSW8	SSW9	SW7.5	WSW12
20-Aug	SSW6	WNW1	N4	SW5	SW7	SW9	S5	SSW5	SW5	WSW5	ENE0	NE6	NE7	NE6	NE5	NW5	NW5	NW1	SW1	SW2	SW2	SSW2	WNW2	SSW2	WSW1.3	SW9
21-Aug	WNW2	SSW4	SSE4	NW3	SW2	S5	S4	S9	SSE9	S9	SSE7	SSE8	SSE10	S9	SSE9	S11	S10	S9	S7	SSW3	WSW3	WSW1	SW3	WSW1	S5.2	S11
22-Aug	WSW2	WSW2	SW3	SW3	SW2	SW2	SSW2	SE3	SE6	SE6	ESE5	SSE10	SSE11	S6	S6	S4	SW1	W4	W3	SSW3	WSW3	SSW2	WSW2	NW2	S2.7	SSE11
23-Aug	SW2	SW1	WSW2	SSW1	SW2	NNW3	NW3	WSW1	W1	W2	WNW1	NW1	N2	WSW2	W3	NNW3	NNW4	NNW5	N11	N15	N17	N15	N13	N15	NNW4.2	N17
24-Aug	N16	N15	NNW14	N16	N14	NNW12	NNW16	N18	N18	N19	N17	N18	N17	N14	N12	NNW11	N9	NNW8	NW5	W2	WSW2	WSW2	SW2	SSW2	N11.0	N19
25-Aug	SW1	S3	S3	SSW2	SW3	SSW3	SSW4	SSE6	S8	S11	S13	S13	SSW11	SSW12	SSW12	S15	S13	S12	S7	S8	S10	S10	S11	S9	S8.2	S15
26-Aug	S6	SE2	S6	S7	S5	S4	S6	S9	SSW10	S13	S15	SSW13	SW11	SW9	WSW8	WSW6	W7	N11	N12	N15	N10	NNW7	NW2	WSW3	SW3.4	S15
27-Aug	WSW3	SW4	WSW6	WSW7	W3	WNW1	SSW1	ENE1	SSW2	SE5	S6	S7	S9	S11	S12	S11	SSW10	SSW9	S8	S7	SSW7	SSW5	SSW4	NW2	SSW5.2	S12
28-Aug	SSE2	S3	SW2	SSW2	S2	SSW3	S3	SW1	S4	SSE6	SSE6	SSE6	ESE6	SE6	SE7	SSE5	SSE6	SSE5	SW2	SW2	SSW3	S3	SSW4	S6	SSE3.5	SE7
29-Aug	S5	S4	S5	S5	S5	SSE6	SSE6	SSE7	SSE9	SE7	SE9	SE8	SE9	SE12	SSE9	S11	S11	S6	SSW1	SW2	SW2	SW2	SW2	UO	SSE5.6	SE12
30-Aug	SSW2	SSW3	SW2	SSW2	SSW2	SSW2	W1	N2	NE2	NNE4	E4	E5	SE7	SSE10	SSE8	SE12	SSE8	SSE10	S6	S9	S11	S6	S4	SW2	SSE4.0	SE12
31-Aug	NNW4	SW2	SSW4	W3	WSW3	SSW3	S4	SSE5	SSW1	NE4	ESE3	S4	SW3	NE1	NW3	NNE6	NNE9	N13	NNW7	WNW3	WNW5	WNW5	NW6	WSW4	NNW1.5	N13

WSW1.7	WSW1.9	WSW1.9	WSW1.9	WSW2.3	WSW2.4	SW1.8	SW1.6	SSW1.6	S1.4	S1.9	S2.0	SSW1.9	SSW2.6	SSW2.2	SSW1.3	SW1.6	SW1.0	WNW1.0	WNW1.4	W1.9	WSW1.9	WSW1.9	WSW1.9	Diurnal Average
N16	N15	NNW14	N16	N14	NNW13	NNW16	N18	N18	N19	N17	N18	N17	N14	SW14	S15	SW14	N13	N14	N16	N17	N15	N13	N15	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

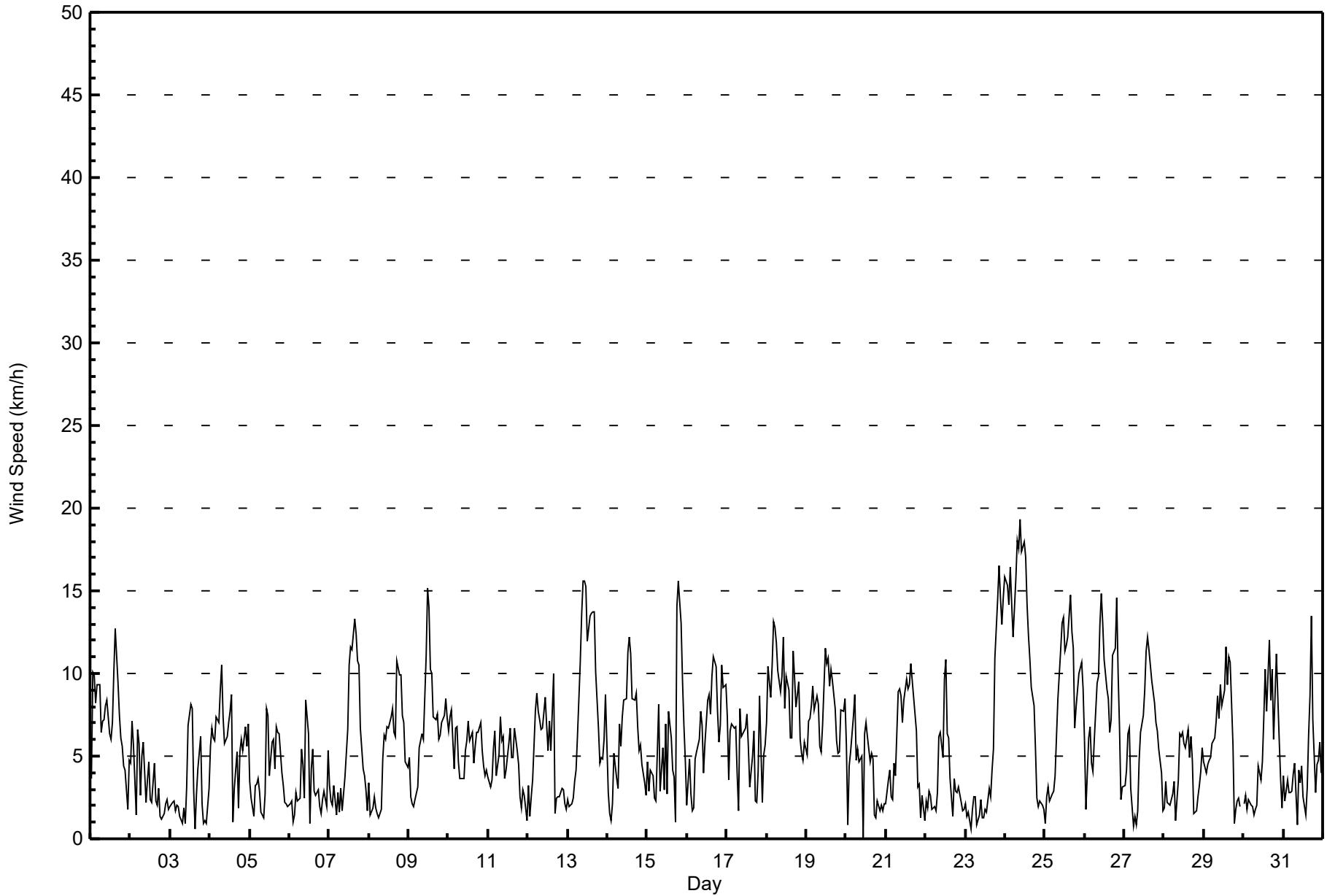
Wind Speed (WS) - km/h
Fort McKay South - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Aug 6 11:00 Minimum Value: 0 km/h on Aug 28 21:00 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: 743 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9											
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-Aug	2	3	3	3	4	4	2	3	3	3	3	2	3	4	3	4	3	2	4	2	1	1	2	4	4
2-Aug	2	3	3	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	3
3-Aug	1	1	1	1	1	2	1	1	2	1	1	2	3	2	5	5	3	2	2	1	1	1	1	1	5
4-Aug	1	2	2	2	2	2	3	3	3	2	3	3	2	3	3	2	2	1	2	2	2	2	3	3	3
5-Aug	2	2	1	1	1	1	1	1	1	2	3	2	2	3	2	3	2	2	2	2	1	1	1	1	3
6-Aug	1	2	2	1	1	1	1	4	1	3	7	3	2	2	2	1	1	1	1	1	1	1	1	1	7
7-Aug	1	1	1	2	2	1	1	1	1	1	2	4	3	3	3	4	4	3	3	3	1	1	1	1	4
8-Aug	2	1	1	1	1	1	1	1	2	3	2	2	3	3	3	3	2	3	3	3	2	2	1	2	3
9-Aug	1	1	1	1	1	1	2	1	2	2	4	4	3	3	3	3	2	2	2	2	2	2	2	2	4
10-Aug	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	1	3	3
11-Aug	1	2	2	2	2	1	1	2	1	2	2	3	2	2	2	2	3	2	1	1	1	1	1	1	3
12-Aug	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	1	1	1	2	1	2	1	1	3
13-Aug	1	1	1	1	1	1	3	3	3	4	4	4	4	5	4	4	4	4	3	1	1	1	1	5	5
14-Aug	4	2	1	3	2	1	1	2	2	3	3	4	4	5	4	3	4	3	2	1	1	2	1	2	5
15-Aug	2	2	1	1	1	1	2	2	3	2	1	3	1	3	2	2	2	3	4	4	3	2	1	2	4
16-Aug	1	1	1	1	1	2	2	2	2	2	2	3	3	4	3	4	4	3	2	1	1	2	2	2	4
17-Aug	2	2	2	2	2	1	2	1	3	3	2	3	3	3	2	4	5	2	2	2	6	1	2	2	6
18-Aug	3	2	2	2	3	3	3	2	3	3	3	3	4	3	2	2	4	3	2	3	1	1	1	2	4
19-Aug	1	2	2	2	2	3	3	2	3	3	3	4	4	4	4	4	4	3	2	1	1	2	2	2	4
20-Aug	2	1	3	2	2	2	2	2	2	2	2	2	2	2	2	3	2	1	1	1	1	2	1	2	3
21-Aug	1	1	2	1	1	2	2	2	2	2	2	3	3	3	4	4	4	2	2	1	1	1	1	1	4
22-Aug	1	1	1	1	1	1	1	1	1	2	2	4	3	2	3	2	2	1	1	1	1	1	1	2	4
23-Aug	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	3	3	4
24-Aug	3	3	3	4	4	3	4	4	4	5	4	5	4	4	3	3	2	1	1	1	1	0	1	1	5
25-Aug	1	1	1	1	1	1	2	1	2	3	3	3	3	4	4	4	3	3	1	1	2	2	2	2	4
26-Aug	1	1	1	1	2	1	2	3	3	3	4	4	4	4	3	3	3	7	3	4	3	1	2	1	7
27-Aug	1	1	1	1	2	1	1	1	1	1	2	3	3	3	4	3	3	2	1	1	2	1	2	1	4
28-Aug	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	0	1	1	1	2
29-Aug	1	1	1	1	1	1	2	1	1	2	2	2	2	3	2	3	2	2	1	1	1	1	1	1	3
30-Aug	1	1	1	1	1	1	1	1	2	1	1	2	3	3	2	3	2	3	1	4	4	2	1	1	4
31-Aug	2	1	1	2	2	3	2	1	2	2	2	2	2	2	2	2	4	4	3	1	1	3	2	3	4
														Diurnal Maximum											
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Fort McKay South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	376	50.61	50.61
6 - 11	307	41.32	91.92
12 - 19	60	8.08	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: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Fort McKay South - August 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	8	8	6	7	8	11	17	36	49	55	42	34	31	34	19	376
6 - 11	16	13	6	4	4	3	37	32	47	22	18	33	28	12	12	20	307
12 - 19	24	2	0	0	0	0	2	2	11	4	5	2	0	0	0	8	60
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	51	23	14	10	11	11	50	51	94	75	78	77	62	43	46	47	743

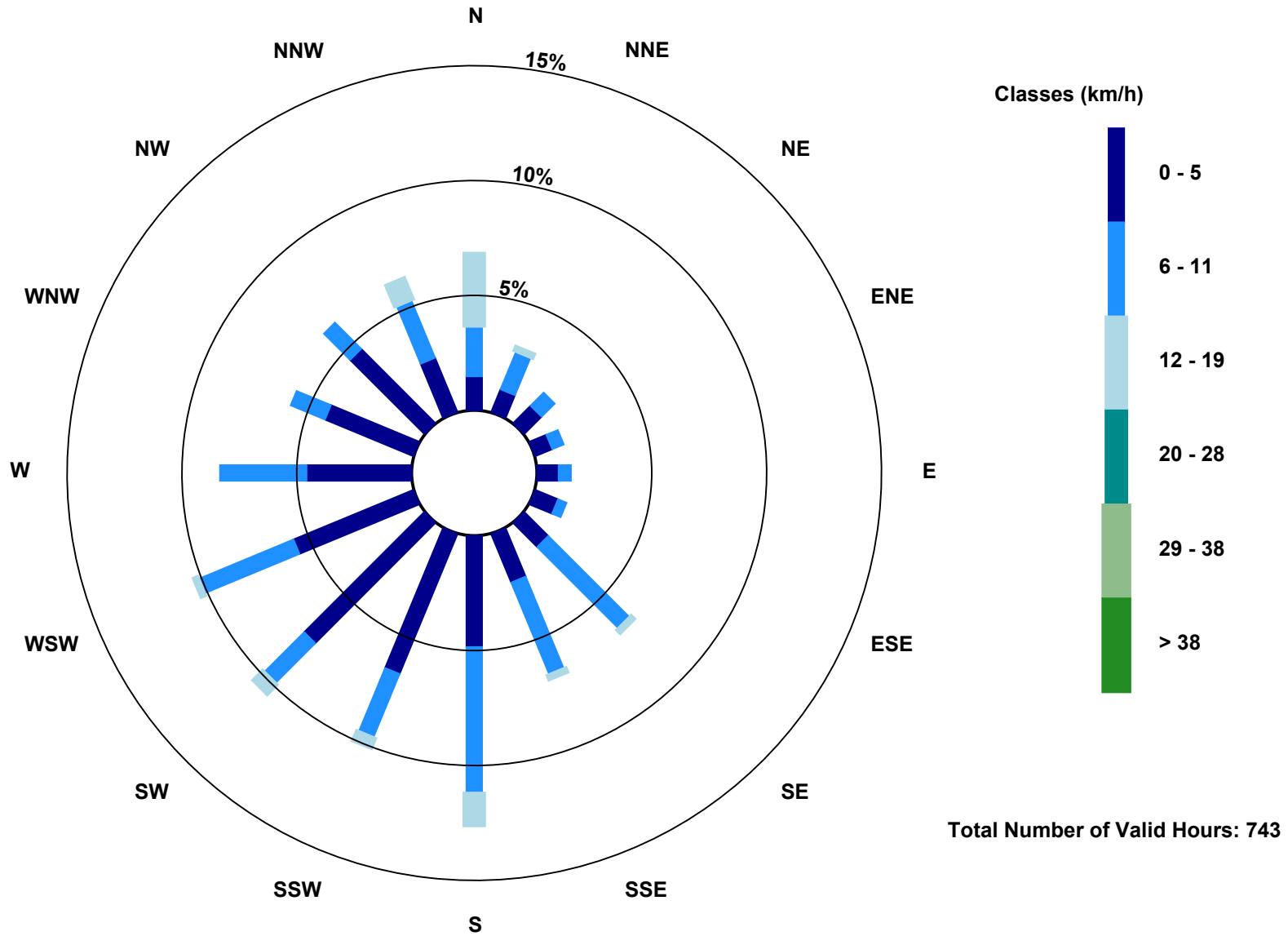
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Fort McKay South





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Fort McKay South - August 2023

Direction of Maximum Speed: 5 deg on Aug 24 10:00																				Hours in Service: 744					
Direction of Maximum Daily Speed Average: 353.1 deg on Aug 24																				Hours of Data: 743					
Direction of Minimum Speed: 57 deg on Aug 20 11:00										Direction of Minimum Daily Speed Average: 0.2 deg on Aug 15										Hours of Missing Data: 1					
Monthly Average Direction: 230.9 deg																				Percent Operational Time: 99.9					
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-Aug	253	259	260	267	260	270	254	263	233	231	231	239	250	299	310	343	322	316	310	312	308	300	268	284	277.4
2-Aug	259	258	275	309	259	271	305	288	341	323	239	218	24	216	255	271	336	30	341	263	268	252	265	289	276.7
3-Aug	284	254	249	275	315	281	297	309	342	141	115	135	143	133	298	287	357	175	168	160	226	238	240	258	183.0
4-Aug	304	286	293	260	264	263	256	251	240	251	217	212	213	196	174	141	178	177	243	265	275	267	252	276	247.7
5-Aug	299	272	243	169	158	164	174	260	58	52	10	12	80	148	126	33	32	21	17	355	309	241	254	208	34.8
6-Aug	261	265	265	204	173	194	172	355	187	58	12	13	323	1	17	8	290	346	318	294	273	285	304	323	333.5
7-Aug	306	308	232	244	274	223	240	29	46	43	12	8	15	8	7	12	16	22	22	352	301	307	319	275	1.0
8-Aug	252	289	252	246	269	254	303	75	111	144	100	26	53	80	68	95	124	136	134	136	139	141	138	127	117.0
9-Aug	142	144	177	259	228	199	160	149	136	135	147	155	163	138	140	129	125	138	123	124	133	128	136	137	143.7
10-Aug	131	137	146	115	132	132	111	107	90	62	91	45	58	61	92	45	49	70	30	9	348	346	328	349	75.9
11-Aug	317	318	339	347	357	321	329	345	347	353	348	26	234	250	233	192	209	215	199	219	232	245	202	175	291.5
12-Aug	208	228	232	214	250	255	261	261	260	267	248	214	198	169	220	9	319	254	246	244	254	215	158	213	242.3
13-Aug	199	214	218	216	191	169	156	176	187	181	185	202	223	233	226	225	223	225	233	206	216	221	236	303	209.8
14-Aug	295	181	296	0	331	327	202	239	252	297	294	285	271	257	247	275	255	278	263	281	260	294	215	177	269.7
15-Aug	231	215	159	161	206	196	159	162	137	154	191	145	140	147	154	106	80	340	357	352	342	334	312	300	115.2
16-Aug	247	263	290	323	199	268	284	289	322	293	265	296	306	266	246	203	202	211	201	192	190	192	191	184	235.9
17-Aug	163	152	177	189	168	173	169	159	186	195	177	247	275	278	264	93	192	168	9	288	329	274	310	321	209.9
18-Aug	338	352	354	344	346	342	347	340	344	353	4	326	347	359	340	285	334	332	339	339	329	321	307	293	340.2
19-Aug	286	258	255	252	253	250	251	242	251	225	216	238	219	222	238	242	235	233	210	206	214	213	211	208	234.4
20-Aug	210	295	358	224	222	219	182	201	233	257	57	38	37	35	41	307	312	325	225	236	224	192	291	210	251.4
21-Aug	286	205	159	314	236	187	179	172	168	178	151	157	165	175	159	172	171	181	189	210	240	247	232	247	178.3
22-Aug	252	242	223	219	232	234	210	143	133	141	121	152	155	183	191	184	222	275	260	208	240	210	245	311	184.1
23-Aug	234	231	245	213	223	341	307	248	275	267	286	309	1	249	270	327	333	333	351	356	359	360	358	359	343.1
24-Aug	354	352	345	355	354	344	348	358	1	5	6	355	1	4	357	344	2	345	313	278	249	238	216	213	353.1
25-Aug	230	191	178	210	235	202	195	166	173	177	177	173	202	193	196	187	189	184	181	181	183	179	183	190	185.5
26-Aug	181	144	174	177	189	188	180	184	202	181	189	200	223	226	246	254	263	355	7	352	354	340	318	241	222.4
27-Aug	239	223	245	250	271	295	198	77	210	135	169	189	182	186	179	187	199	195	186	185	203	208	212	320	197.0
28-Aug	152	177	225	207	187	213	173	222	175	158	158	148	122	143	144	147	160	159	235	232	199	184	195	186	167.5
29-Aug	184	179	180	190	188	168	162	158	154	131	133	130	134	144	152	187	174	177	199	223	224	227	232	UO	163.0
30-Aug	212	193	233	201	204	212	263	359	51	30	100	82	145	152	152	144	161	156	169	183	176	180	185	219	160.8
31-Aug	341	223	208	276	239	203	180	166	204	43	121	172	233	40	305	28	12	354	337	291	300	300	315	252	316.0
257.4 254.9 246.1 254.4 252.7 244.1 230.3 228.4 206.7 185.0 170.3 186.6 196.1 191.8 207.6 204.8 219.4 235.1 295.5 290.7 270.6 248.7 241.2 256.7																									
Diurnal Average																									
UO - Unstable Operation																									
All monthly, daily, and diurnal averages have been calculated using vector methods																									



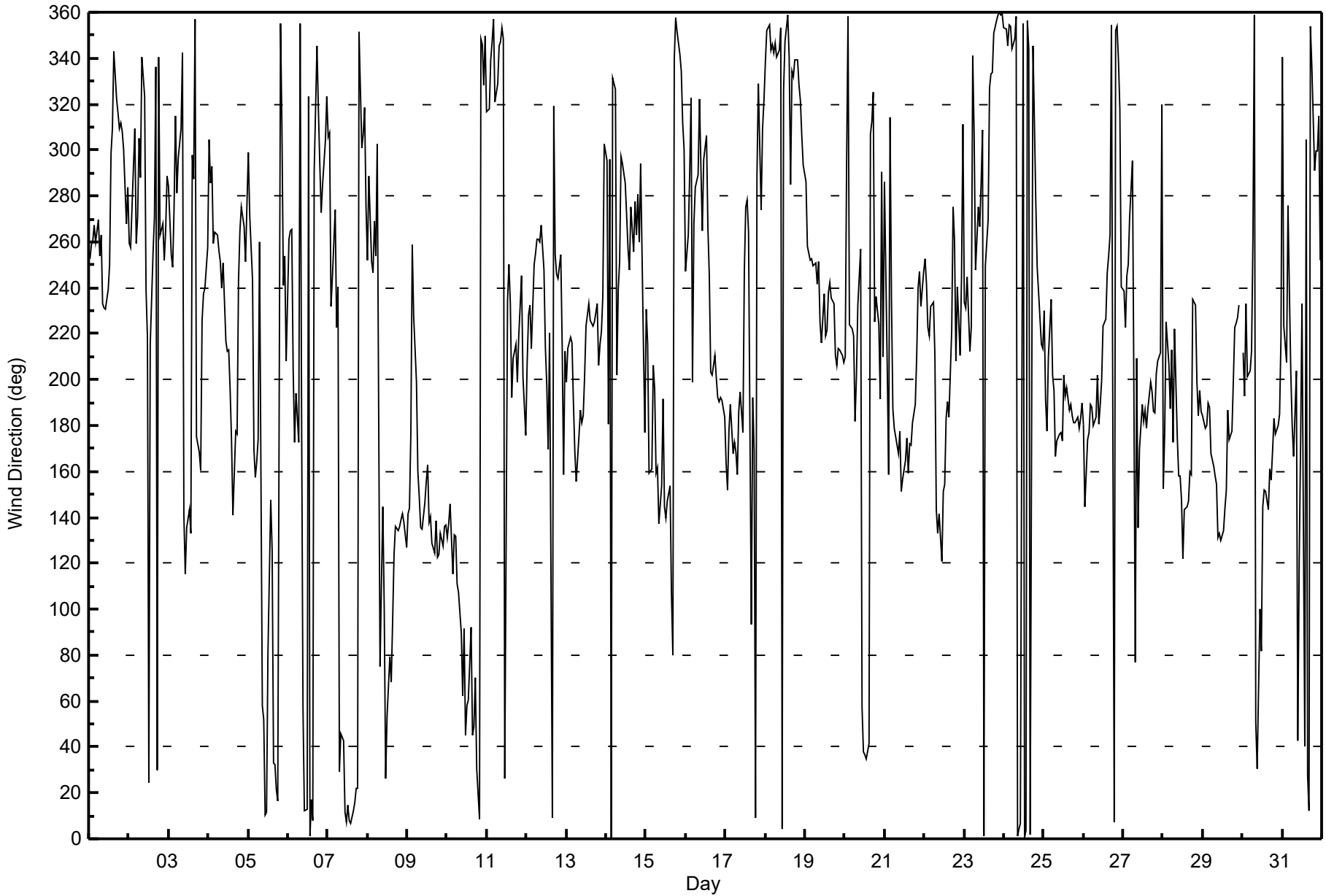
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Fort McKay South - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 103 deg on Aug 20 11:00	Hours of Data: 743
Minimum Value: 6 deg on Aug 25 19:00	Hours of Missing Data: 1
Percentiles: P ₁ = 10 P ₁₀ = 16 Q ₁ = 20 Median = 28 Q ₃ = 44 P ₉₀ = 66 P ₉₉ = 96	Hours of Calibration: 0
	Percent Operational Time: 99.9

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-Aug	34	23	22	29	28	36	27	30	26	28	27	31	43	41	34	20	28	24	21	29	25	27	60	27	60
2-Aug	25	29	46	85	30	34	63	43	35	86	61	66	73	98	52	61	67	31	48	18	33	37	33	45	98
3-Aug	34	29	33	45	24	51	26	88	62	89	27	24	39	27	75	100	78	37	24	73	88	76	72	38	100
4-Aug	21	21	20	21	20	23	21	19	29	44	50	44	31	23	101	89	26	68	31	19	23	21	65	41	101
5-Aug	52	75	97	43	19	17	32	89	91	77	23	25	68	73	42	67	27	25	19	35	19	41	19	46	97
6-Aug	33	49	76	44	26	39	77	23	43	70	38	24	97	59	39	46	47	46	26	29	21	23	79	18	97
7-Aug	17	48	30	16	44	18	84	38	79	40	33	42	28	23	27	24	25	25	21	28	11	13	17	36	84
8-Aug	25	49	39	37	46	55	67	68	33	45	56	37	47	43	39	41	33	20	20	16	16	15	18	21	68
9-Aug	21	30	41	20	16	15	19	19	20	22	17	16	17	17	17	25	22	21	21	20	16	18	18	19	41
10-Aug	23	21	20	33	19	23	26	33	31	31	31	25	30	31	29	31	30	31	22	17	17	22	25	25	33
11-Aug	23	28	19	19	19	21	22	20	25	25	49	64	32	32	54	44	39	39	28	24	28	12	28	61	64
12-Aug	35	50	32	38	18	18	21	20	24	39	34	43	67	27	53	23	77	53	36	60	44	58	44	39	77
13-Aug	31	30	23	23	33	20	34	24	17	18	18	23	33	30	29	25	28	27	28	17	12	13	12	37	37
14-Aug	77	90	78	90	42	38	55	24	30	35	31	39	31	31	29	33	31	36	31	20	20	42	39	49	90
15-Aug	38	70	16	16	23	31	31	15	62	44	52	21	52	25	41	44	43	94	16	17	16	15	19	20	94
16-Aug	54	20	58	64	57	25	24	29	27	39	73	58	38	49	50	29	25	26	18	9	8	11	13	13	73
17-Aug	15	55	21	19	18	11	34	61	27	64	30	44	45	64	72	57	75	86	81	47	48	72	38	22	86
18-Aug	29	15	15	14	15	16	16	17	18	20	25	39	29	25	36	21	16	17	16	14	16	13	23	20	39
19-Aug	23	16	19	16	18	28	28	25	47	46	29	28	29	32	37	34	28	27	21	19	16	19	19	18	47
20-Aug	28	84	56	41	21	19	43	35	50	52	103	36	33	41	55	65	30	66	78	34	34	67	62	62	103
21-Aug	57	21	31	39	41	24	15	11	17	24	34	39	31	34	36	28	24	21	11	32	12	49	32	55	57
22-Aug	40	46	33	32	40	27	43	31	21	29	54	31	28	48	47	60	92	23	22	26	29	47	55	60	92
23-Aug	36	65	56	80	54	15	49	71	78	44	84	91	56	51	41	36	17	15	16	16	16	16	17	17	91
24-Aug	17	16	17	19	18	17	17	18	17	19	21	21	22	25	27	28	30	25	16	23	33	45	26	34	45
25-Aug	59	33	28	27	23	28	26	14	19	17	18	20	29	24	26	20	18	14	6	6	9	10	16	15	59
26-Aug	14	78	11	11	22	22	16	20	25	21	21	25	28	33	40	42	36	33	17	17	16	13	84	14	84
27-Aug	16	24	24	12	55	83	67	74	75	33	37	30	25	27	20	21	24	17	10	8	16	18	53	67	83
28-Aug	54	23	33	40	31	15	23	49	22	17	26	23	24	26	14	16	13	15	52	38	19	19	13	11	54
29-Aug	16	13	12	11	13	10	11	12	15	21	15	25	25	17	31	15	13	11	65	52	20	18	30	UO	65
30-Aug	21	28	28	29	27	22	45	31	61	22	47	37	37	23	33	19	15	12	16	12	16	25	47	75	75
31-Aug	53	56	39	72	48	73	28	33	98	48	69	66	84	97	83	30	18	17	29	45	20	25	30	55	98
	77	90	97	90	57	83	84	89	98	89	103	91	97	98	101	100	92	94	81	73	88	76	84	75	
	Diurnal Maximum																								

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS14
ANZAC
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
AUGUST 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	693	36	51	97.98	5.9	0	1.1	0
TRS(ppb) Average	688	38	56	97.58	1.4	0	0.6	0
THC(ppm) Average	693	36	51	97.98	2.9	-	2.6	-
NMHC(ppm) Average	693	36	51	97.98	0.411	-	0.209	-
CH4(ppm) Average	693	36	51	97.98	2.7	-	2.4	-
NO2(ppb) Average	692	35	52	97.72	9.3	0	3.3	-
NO(ppb) Average	692	35	52	97.72	14.8	-	1.3	-
NOX(ppb) Average	692	35	52	97.72	21.2	-	3.8	-
O3(ppb) Average	693	33	51	97.58	51.8	0	31.6	-
PM2.5(ug/m3) Average	732	2	12	98.66	381.8	63	191.3	12
AT 2m(C) Average	744	0	0	100	29.7	-	20.5	-
RH(%) Average	723	0	21	97.18	100	-	98.2	-
WS(km/h) Average	693	8	51	94.22	21	-	16	-
WD(deg) Average	693	8	51	94.22	-	-	-	-
Leaf Wetness (% of range) Average	744	0	0	100	64	-	20.4	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
AUGUST 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	693	0.32	0.5	-	0	0	0	0.2	0.3	0.8	5.9
TRS(ppb) Average	688	0.21	0.2	-	0	0.1	0.1	0.2	0.2	0.4	1.4
THC(ppm) Average	693	2.15	0.2	-	2	2	2.1	2.1	2.2	2.3	2.9
NMHC (ppm) Average	693	0.018	0.063	-	0	0	0	0	0	0	0.411
CH4(ppm) Average	693	2.13	0.1	-	2	2	2.1	2.1	2.2	2.3	2.7
NO2(ppb) Average	692	1.36	1.4	-	0.1	0.3	0.5	0.8	1.6	3.1	9.3
NO(ppb) Average	692	0.24	0.8	-	0	0	0	0.1	0.2	0.4	14.8
NOX(ppb) Average	692	1.6	1.8	-	0.2	0.4	0.6	0.9	1.8	3.9	21.2
O3(ppb) Average	693	22.23	9.6	-	0	9	15.5	22.2	29.7	35	51.8
PM2.5(ug/m3) Average	732	38.35	59	-	1.7	4	6.9	16.9	51.5	73.4	381.8
Temperature 2 m (C) Average	744	16.41	4.9	-	4	10.7	12.8	16.1	19.9	23.1	29.7
Relative Humidity (%) Average	723	74.64	17.8	-	34.7	48.3	60.3	76.1	90.6	97.7	100
Wind Speed 20 m (km/h) Average	693	10.1	4	-	0	5	7	10	13	16	21
Wind Direction 20 m (deg) Average	693	231.8	-	-	-	-	-	-	-	-	-
Leaf Wetness (% of range) Average	744	5.51	12.1	-	0	0	0	0	2.6	24	64

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
AUGUST 2023

OPERATIONAL NOTES				
Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	04 Aug 2023 08:00	04 Aug 2023 08:00	1	Maintenance - reinitiated daily QA check
O3, SO2, TRS, THC/NMHC/CH4	15 Aug 2023 10:00	15 Aug 2023 11:00	2	Maintenance - sample manifold cleaned
SO2, THC/NMHC/CH4	14 Aug 2023 09:00	14 Aug 2023 09:00	1	Maintenance - reinitiated daily QA check
O3	14 Aug 2023 10:00	14 Aug 2023 10:00	1	Maintenance - reinitiated daily QA check
NO2, TRS	14 Aug 2023 12:00	14 Aug 2023 12:00	1	Maintenance - reinitiated daily QA check
SO2	16 Aug 2023 13:00	16 Aug 2023 15:00	2	Maintenance - WBEA internal audit
TRS	16 Aug 2023 11:00	16 Aug 2023 13:00	3	Maintenance - WBEA internal audit
PM2.5	16 Aug 2023 14:00	16 Aug 2023 14:00	1	Maintenance - WBEA internal audit
NO2	17 Aug 2023 10:00	17 Aug 2023 14:00	5	Maintenance - WBEA internal audit
O3	17 Aug 2023 14:00	17 Aug 2023 17:00	4	Maintenance - WBEA internal audit
NO2, O3, PM2.5, SO2, TRS	25 Aug 2023 19:00	25 Aug 2023 19:00	1	Station power failure
THC/NMHC/CH4	25 Aug 2023 19:00	25 Aug 2023 20:00	2	Station power failure
SO2	27 Aug 2023 08:00	27 Aug 2023 08:00	1	Maintenance - reinitiated daily QA check
SO2, TRS, THC/NMHC/CH4	28 Aug 2023 09:00	28 Aug 2023 10:00	1	Maintenance - reinitiated daily QA check
NO2, O3	28 Aug 2023 12:00	28 Aug 2023 13:00	2	Maintenance - reinitiated daily QA check
O3	28 Aug 2023 10:00	28 Aug 2023 11:00	2	Maintenance - reinitiated daily QA check
NO2, O3, TRS	30 Aug 2023 02:00	30 Aug 2023 09:00	8	Station power failure
SO2, THC/NMHC/CH4	30 Aug 2023 03:00	30 Aug 2023 09:00	7	Station power failure
TRS	30 Aug 2023 10:00	30 Aug 2023 10:00	1	Maintenance - reinitiated daily QA check
Relative Humidity	03 Aug 2023 06:00	30 Aug 2023 07:00	21	Sensor operated out of range

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ANZAC (AMS14)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	11 Aug 2023 19:00	11 Aug 2023 20:00	2	Flat line in sensor output signal
Wind Speed, Wind Direction	21 Aug 2023 15:00	22 Aug 2023 10:00	20	Maintenance - wind speed sensor wire replacement
Wind Speed, Wind Direction	22 Aug 2023 16:00	23 Aug 2023 10:00	19	Sensor Failure - wind speed sensor non-operational
Wind Speed, Wind Direction	23 Aug 2023 11:00	23 Aug 2023 12:00	2	Maintenance - wind speed sensor replaced



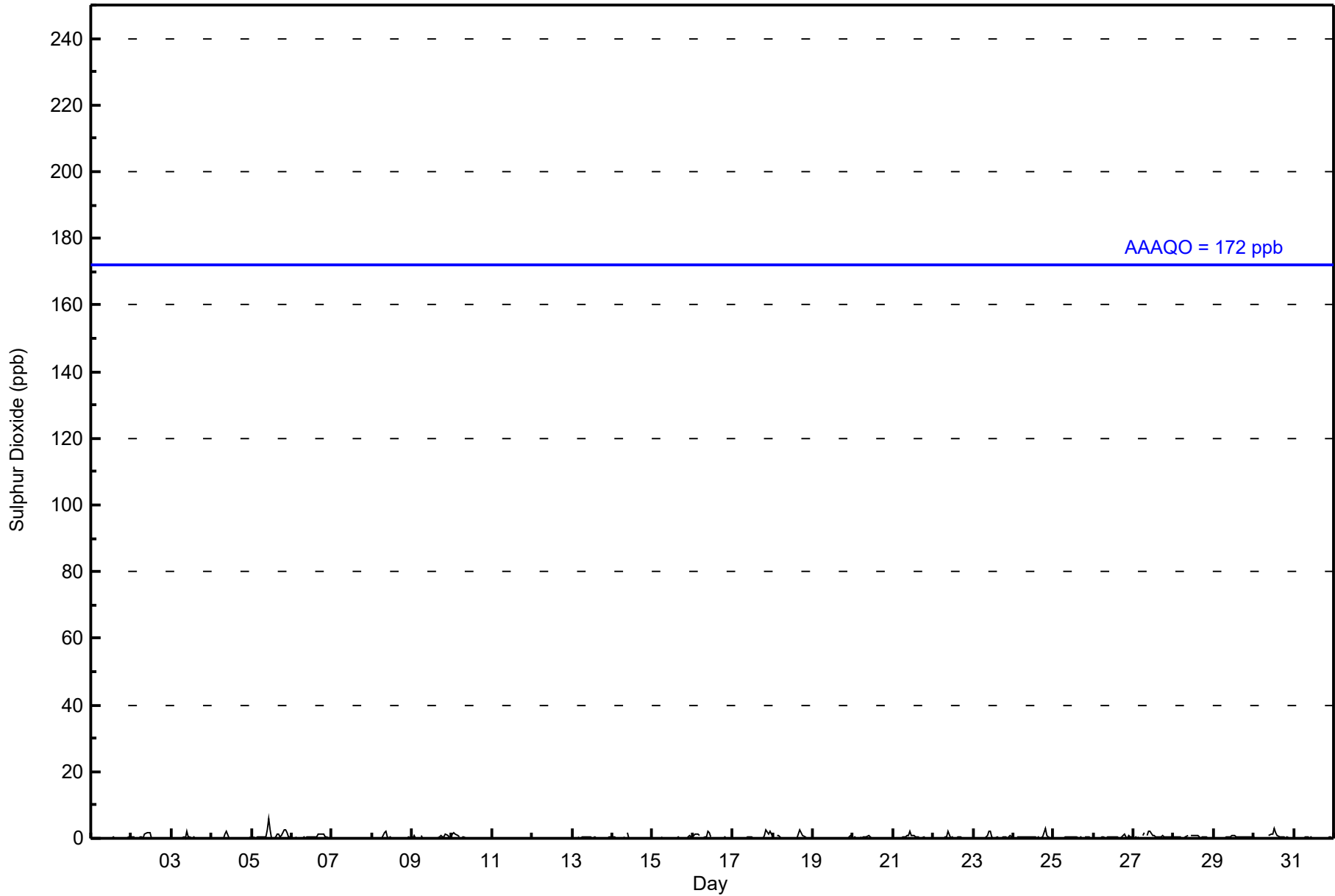
Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744						
Maximum Value: 5.9 ppb on Aug 5 11:00		Maximum Daily Average: 1.1 ppb on Aug 5		Hours of Data: 693														693								
Minimum Value: 0.0 ppb on Aug 3 01:00		Minimum Daily Average: 0.0 ppb on Aug 11		Hours of Missing Data: 51														51								
Maximum Diurnal Average: 0.8 ppb at hour 10		Minimum Diurnal Average: 0.2 ppb at hour 5		Hours of Calibration: 36														36								
Monthly Average: 0.32 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.8 P ₉₉ = 2.4		Percent Operational Time: 98.0														98.0								
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-Aug	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2
2-Aug	0.2	0.3	0.3	Z	0.2	0.2	0.3	0.2	1.2	1.7	1.9	1.7	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4	1.9
3-Aug	0.0	0.1	0.0	0.1	Z	0.0	0.0	0.3	0.2	2.1	0.4	0.4	0.2	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	2.1	
4-Aug	0.0	0.0	0.0	0.0	0.2	Z	0.1	0.0	1.2	2.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.3	2.1
5-Aug	Z	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.6	2.5	5.9	2.4	0.2	0.2	0.4	1.2	1.2	0.3	1.0	2.7	2.6	1.7	0.6	0.3	1.1	5.9
6-Aug	0.4	Z	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.5	0.5	0.6	1.2	1.2	1.3	1.1	0.5	0.2	0.1	0.1	0.4	1.3
7-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1
8-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.1	1.6	2.1	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.5	0.1	0.2	2.1
9-Aug	0.0	0.9	0.1	0.2	Z	0.7	0.1	0.0	0.0	C	C	C	C	C	0.0	0.1	0.4	0.8	0.2	0.5	1.2	0.7	0.2	0.1	0.3	1.2
10-Aug	1.1	1.7	1.2	0.7	0.4	Z	0.4	0.5	0.2	0.2	0.2	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7
11-Aug	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
12-Aug	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	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.2
13-Aug	0.0	0.0	Z	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.3	0.5	0.2	0.5
14-Aug	0.6	0.2	0.0	Z	0.1	0.0	0.2	M	1.8	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	0.1	1.8
15-Aug	0.0	0.0	0.0	0.0	Z	0.3	0.0	0.0	0.0	M	M	0.0	0.0	0.0	0.2	0.4	0.1	0.0	0.0	0.0	0.0	0.3	0.8	0.4	0.1	0.8
16-Aug	0.5	1.2	1.3	1.1	0.7	Z	0.2	0.2	0.4	2.0	1.6	0.4	M	M	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.5	2.0
17-Aug	Z	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.9	2.4	1.4	2.3	1.3	0.4	2.4
18-Aug	0.3	Z	0.7	0.7	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.2	1.1	2.4	1.7	1.0	0.3	0.1	0.1	0.0	0.0	0.4	2.4
19-Aug	0.2	0.1	Z	0.1	0.2	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.7	0.5	0.1	0.7
20-Aug	0.2	0.4	0.2	Z	0.3	0.2	0.2	0.3	0.5	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.2	0.6
21-Aug	0.2	0.1	0.1	0.2	Z	0.0	0.2	0.4	0.7	0.7	2.0	1.1	0.7	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.4	2.0
22-Aug	0.1	0.1	0.0	0.0	0.1	Z	0.2	0.4	0.5	2.0	0.1	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.2	2.0
23-Aug	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.7	2.1	2.0	0.3	0.1	0.2	0.2	0.1	0.2	0.3	0.3	0.2	0.4	0.8	0.6	0.4	0.4	2.1
24-Aug	0.4	Z	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	1.9	2.9	1.0	0.3	0.0	0.0	0.5	2.9
25-Aug	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.4	0.6	0.4	0.3	0.5	0.5	0.3	0.3	0.2	0.2	0.1	PF	0.5	0.3	0.2	0.1	0.1	0.3	0.6
26-Aug	0.0	0.0	0.0	Z	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.6	0.3	0.2	0.3	0.2	0.0	0.5	1.4	0.4	0.2	0.7	0.5	0.3	0.3	1.4
27-Aug	0.2	0.3	0.2	0.3	Z	1.1	1.6	M	1.1	2.1	1.9	0.7	0.9	0.6	0.5	0.5	0.5	0.7	0.5	0.4	0.3	0.2	0.4	0.5	0.7	2.1
28-Aug	0.5	0.5	0.3	0.5	0.4	Z	0.2	0.3	0.7	M	0.8	0.8	0.7	0.9	0.7	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.4	0.9
29-Aug	Z	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.9	0.8	0.4	0.4	0.5	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.9
30-Aug	0.3	Z	PF	PF	PF	PF	PF	PF	PF	0.9	1.1	1.3	3.1	1.7	0.8	0.5	0.4	0.6	0.5	0.2	0.3	0.2	0.2	0.2	--	3.1
31-Aug	0.3	0.1	Z	0.2	0.2	0.1	0.1	0.5	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.0	0.4	0.3	0.1	0.2	0.5
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 1.1		
																								0.3 1.7		
																								0.2 1.3		
																								0.2 1.1		
																								0.2 0.7		
																								0.2 1.1		
																								0.2 1.6		
																								0.2 1.6		
																								0.3 2.1		
																								0.4 2.5		
																								0.8 5.9		
																								0.7 2.4		
																								0.4 3.1		
																								0.3 1.7		
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																								0.3 1.9		
																								0.4 2.9		
																								0.4 2.6		
																								0.3 1.7		
																								0.3 2.3		
																								0.2 1.3		

Z - zerospan C - Calibration M - Maintenance 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
Anzac - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	693	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: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Anzac - August 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	17	10	9	6	21	46	44	24	32	35	48	110	131	55	33	23	644
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	17	10	9	6	21	46	44	24	32	35	48	110	131	55	33	23	644

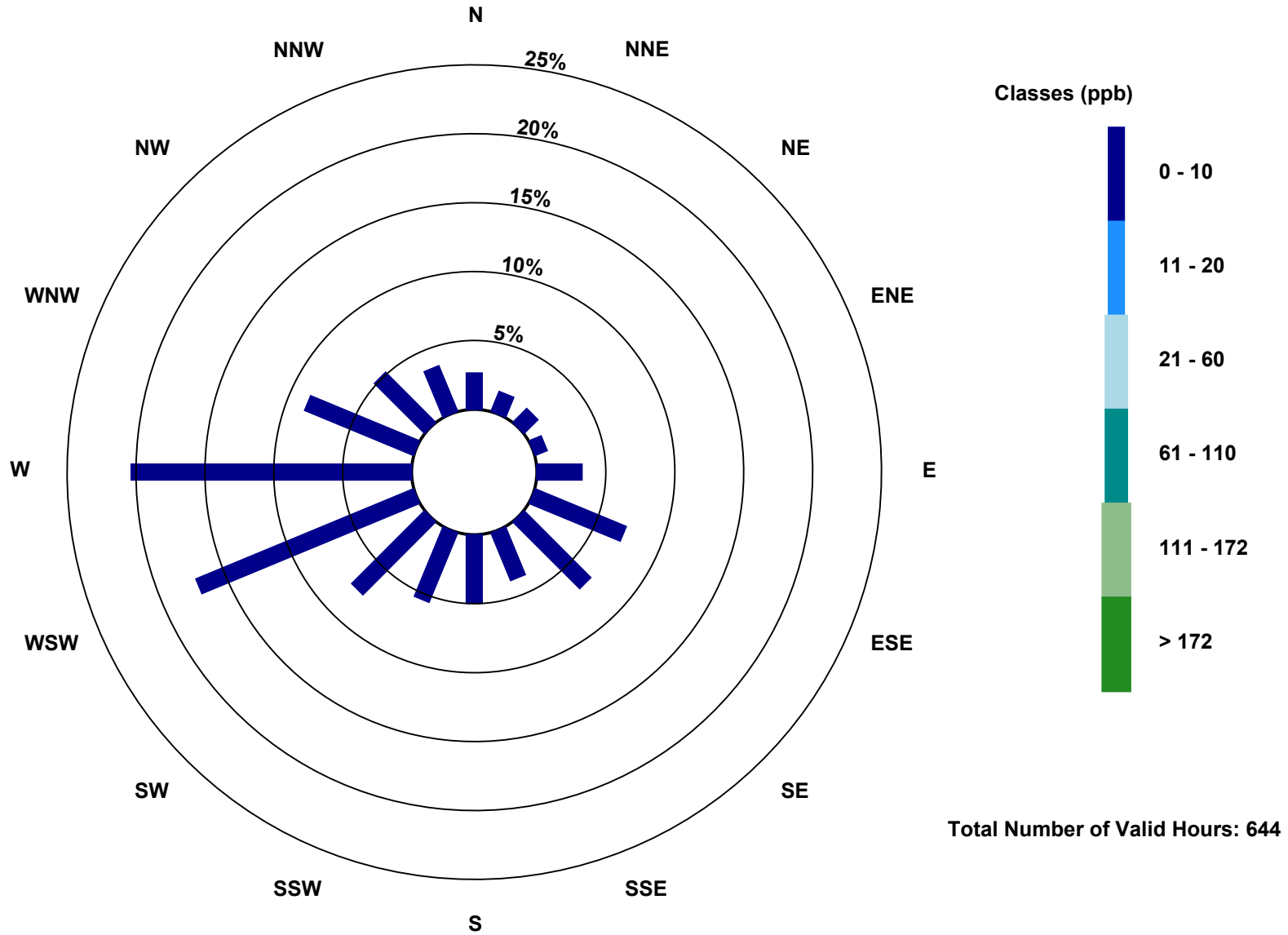
Total Number of Valid Hours: 644

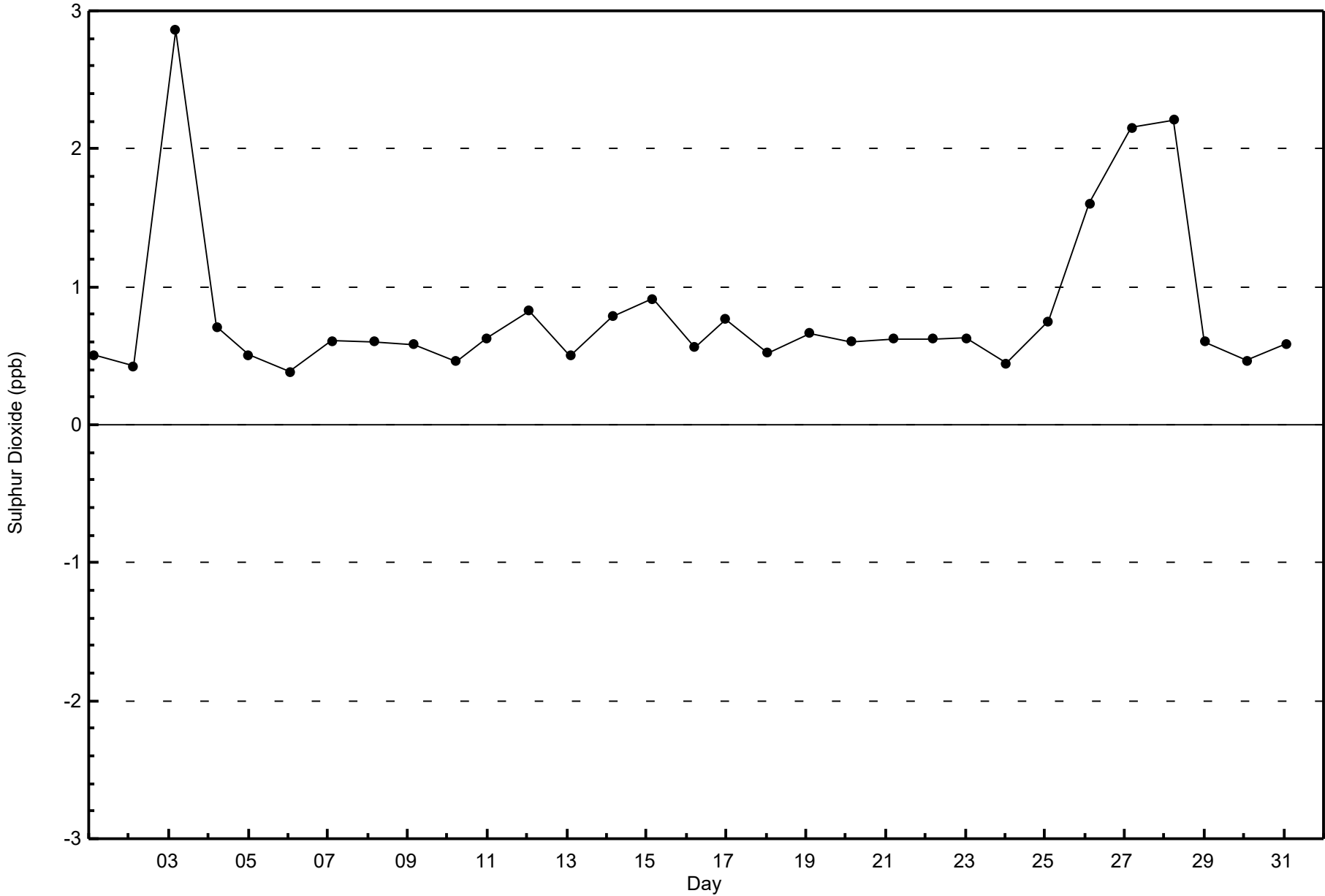
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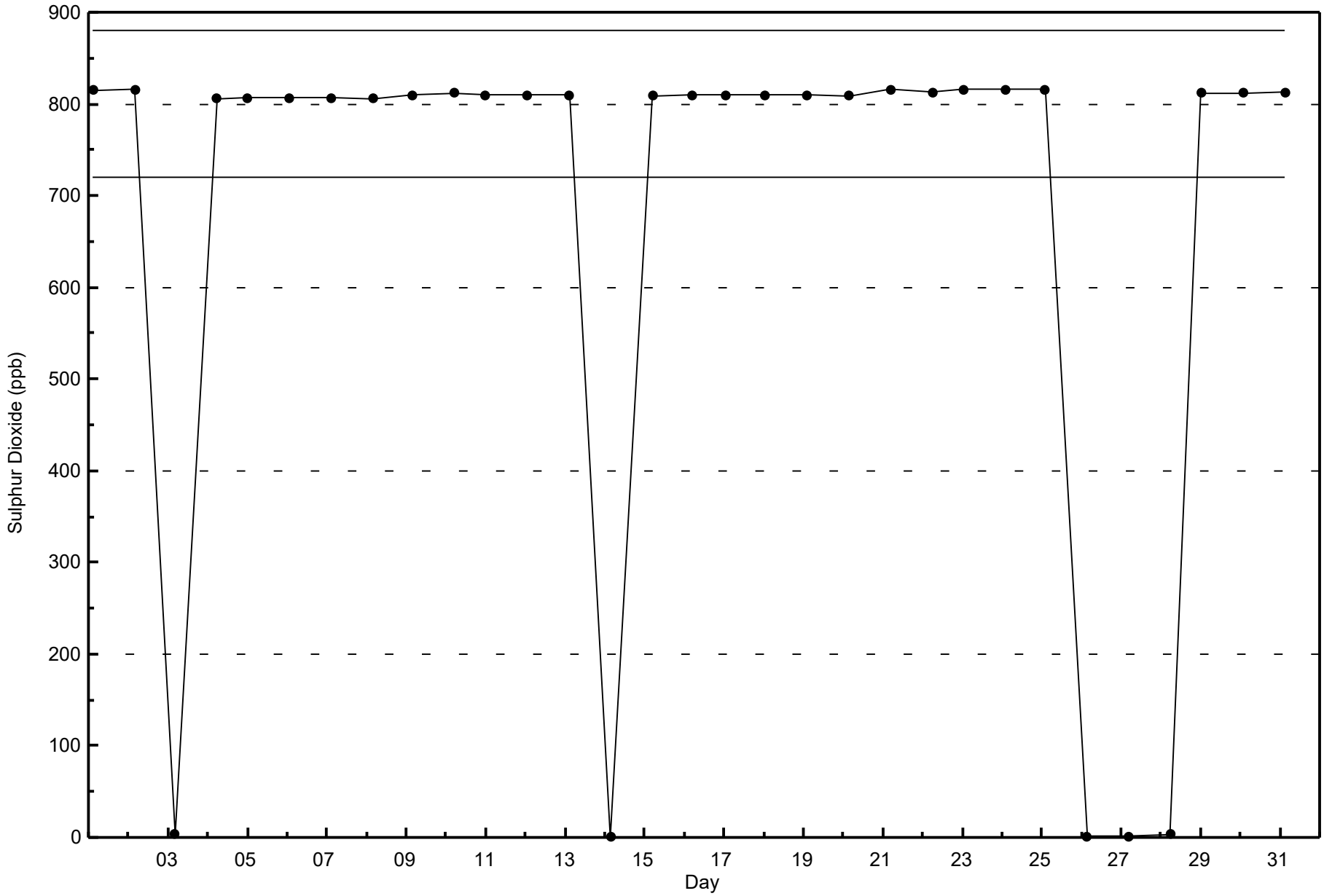


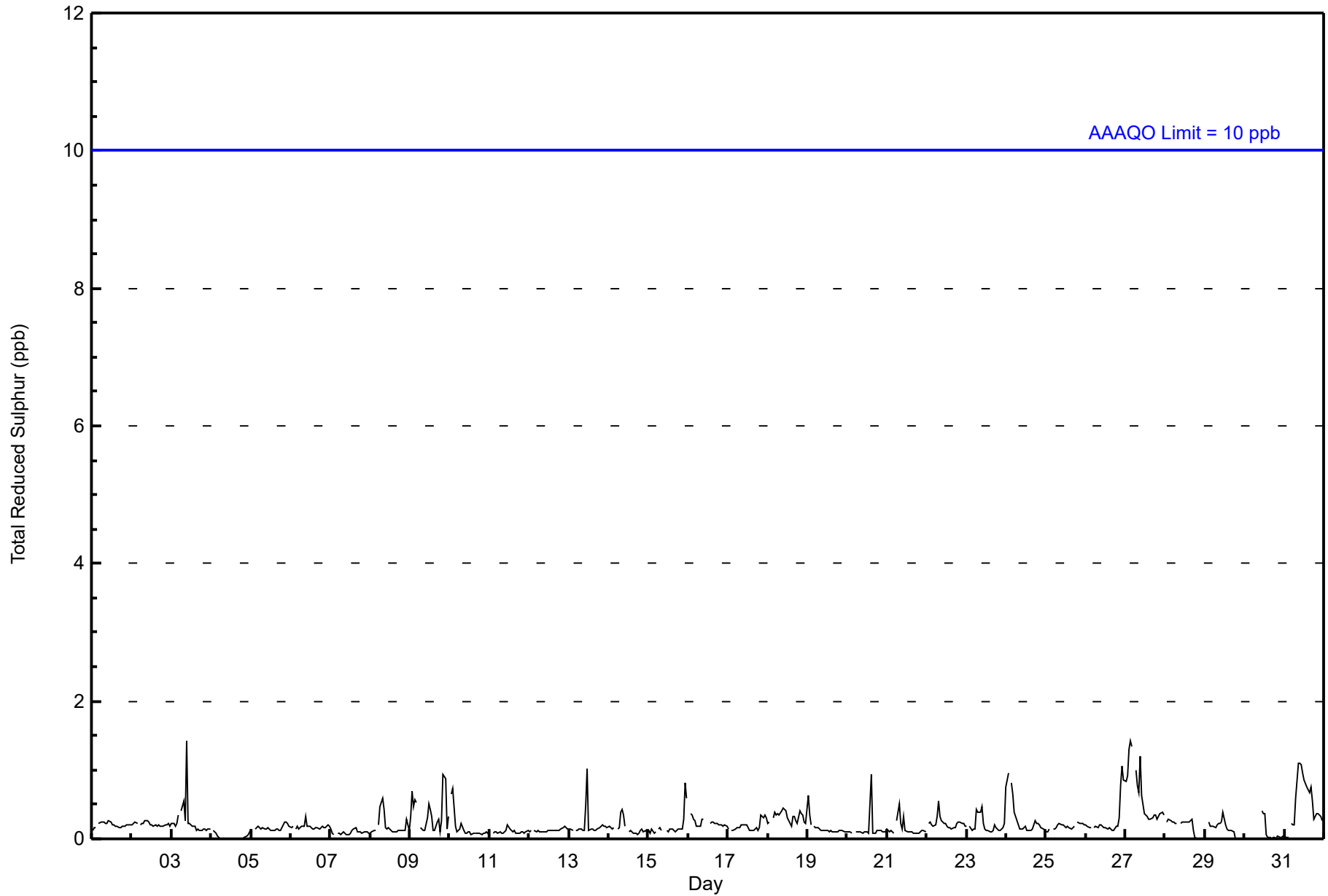
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Anzac











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	688	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: 688

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Reduced Sulphur (TRS) - ppb
Anzac - August 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	17	10	9	6	21	47	47	25	33	34	45	111	126	53	32	23	639
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	17	10	9	6	21	47	47	25	33	34	45	111	126	53	32	23	639

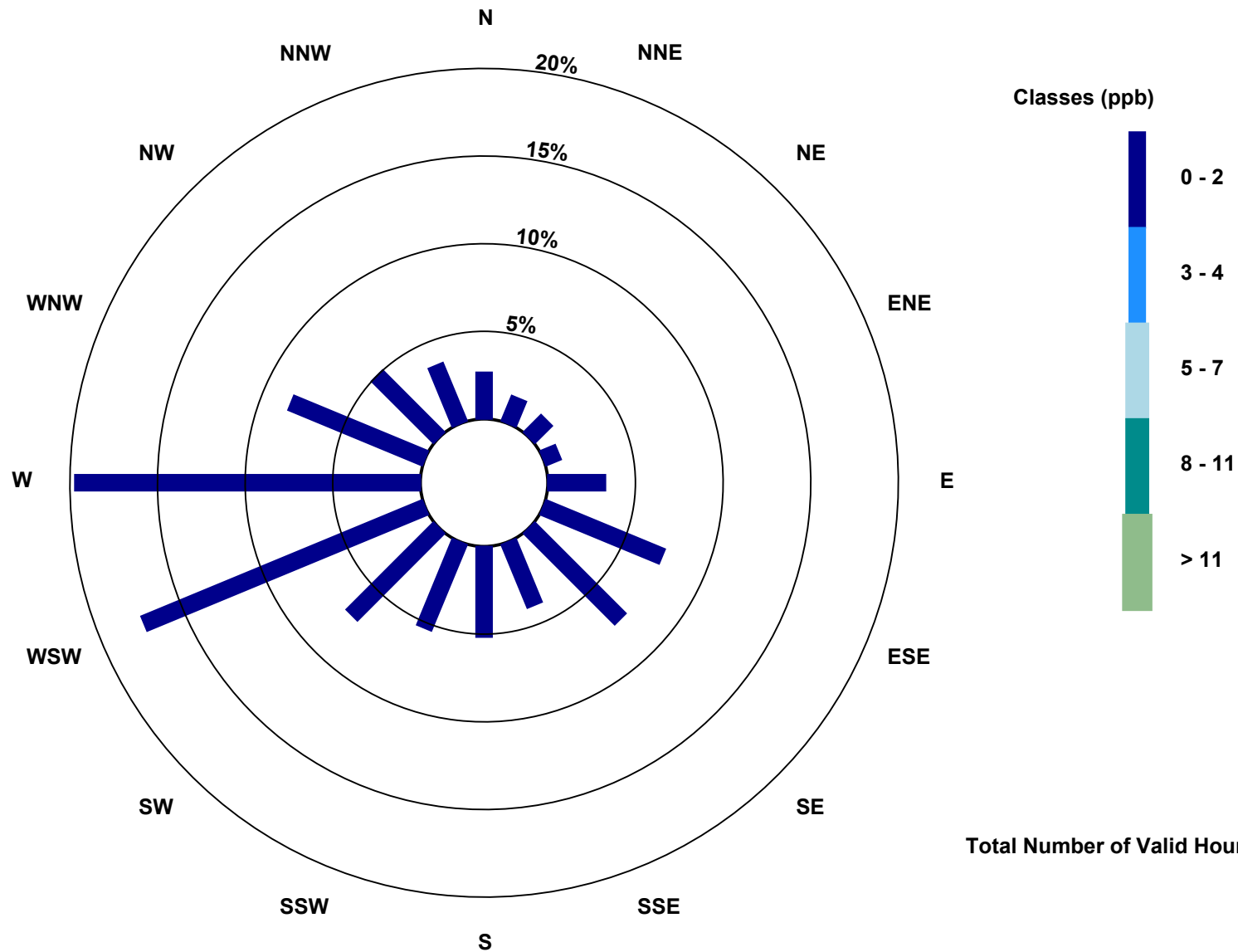
Total Number of Valid Hours: 639

Total Number of Hours: 744

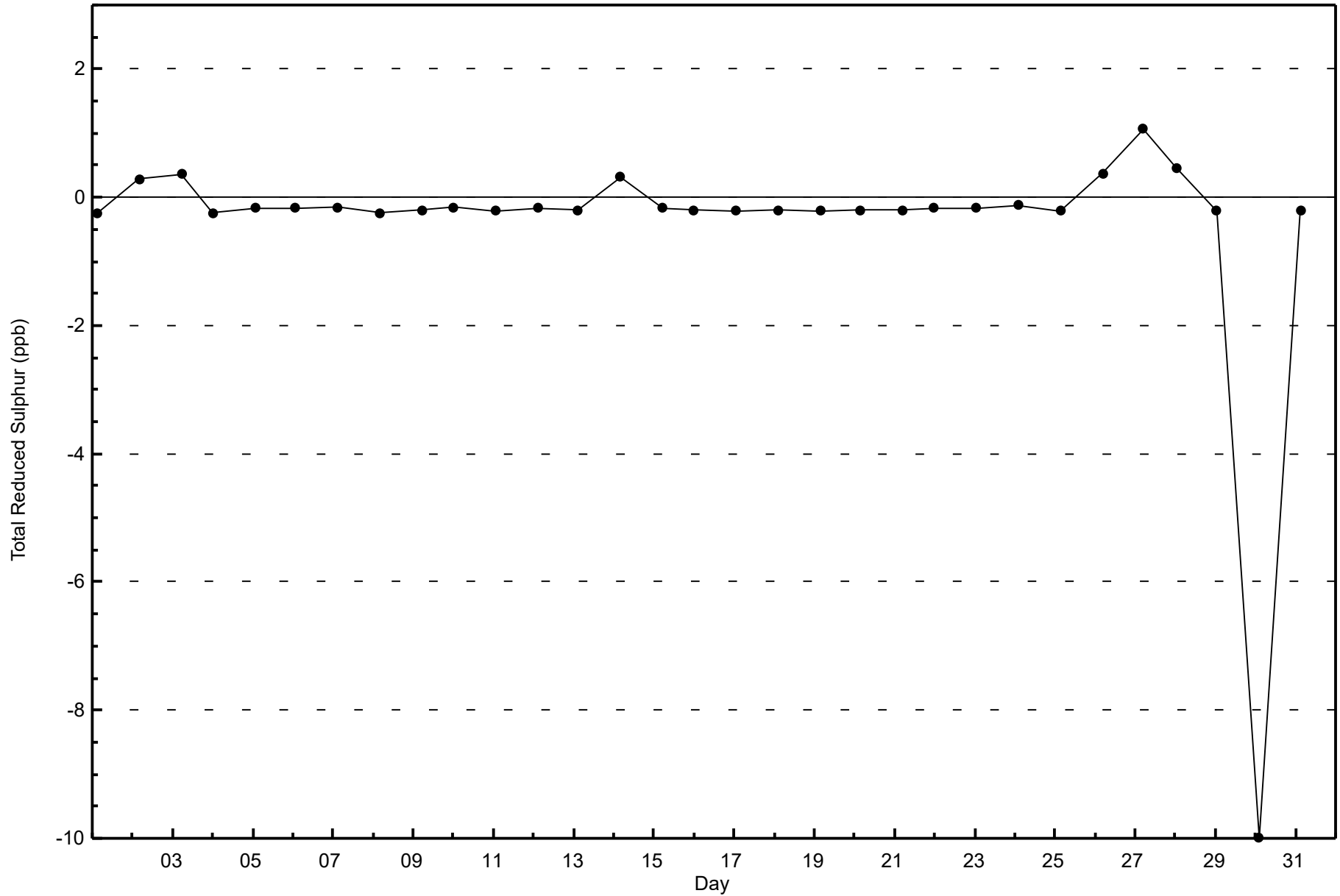


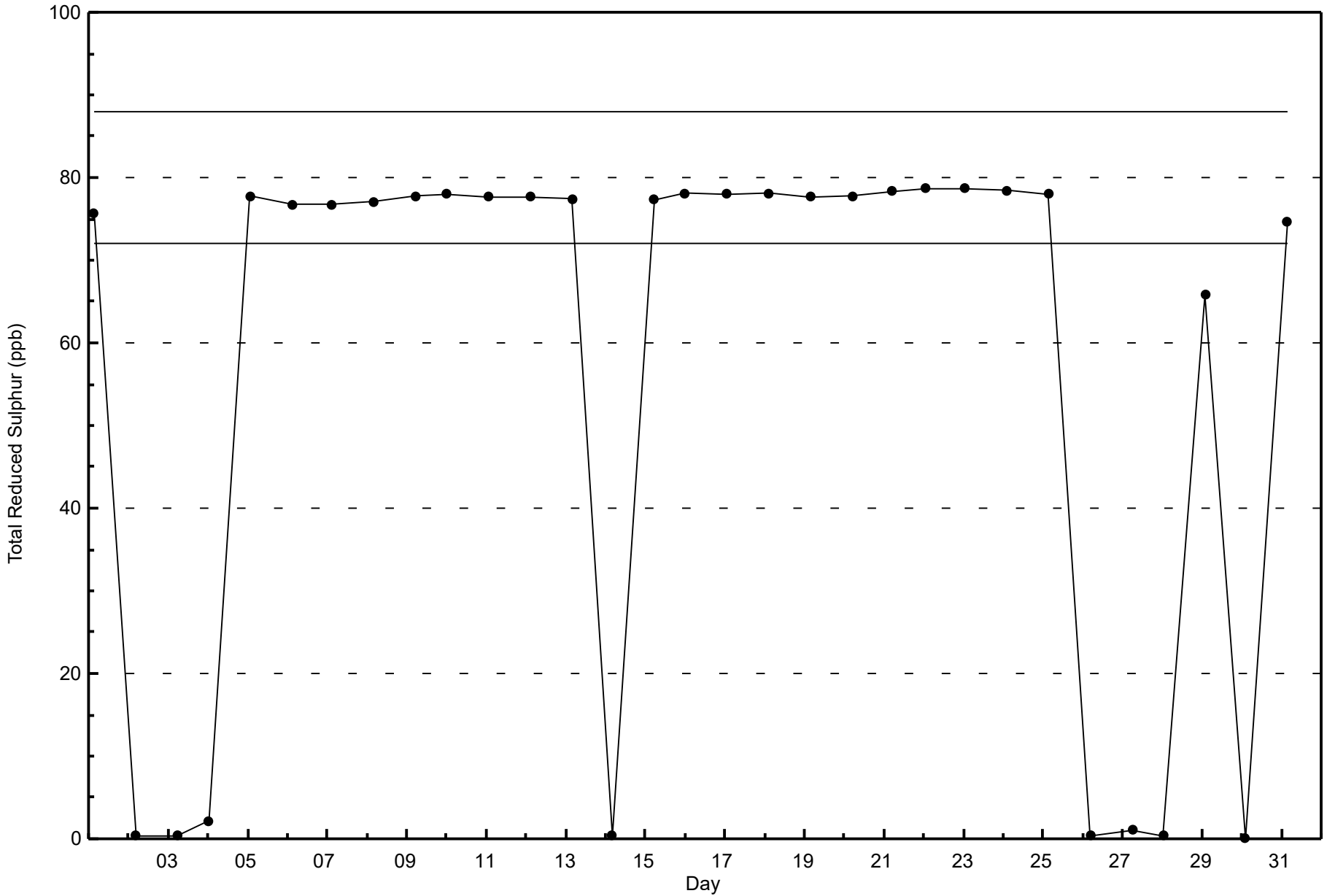
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Anzac



Total Number of Valid Hours: 639

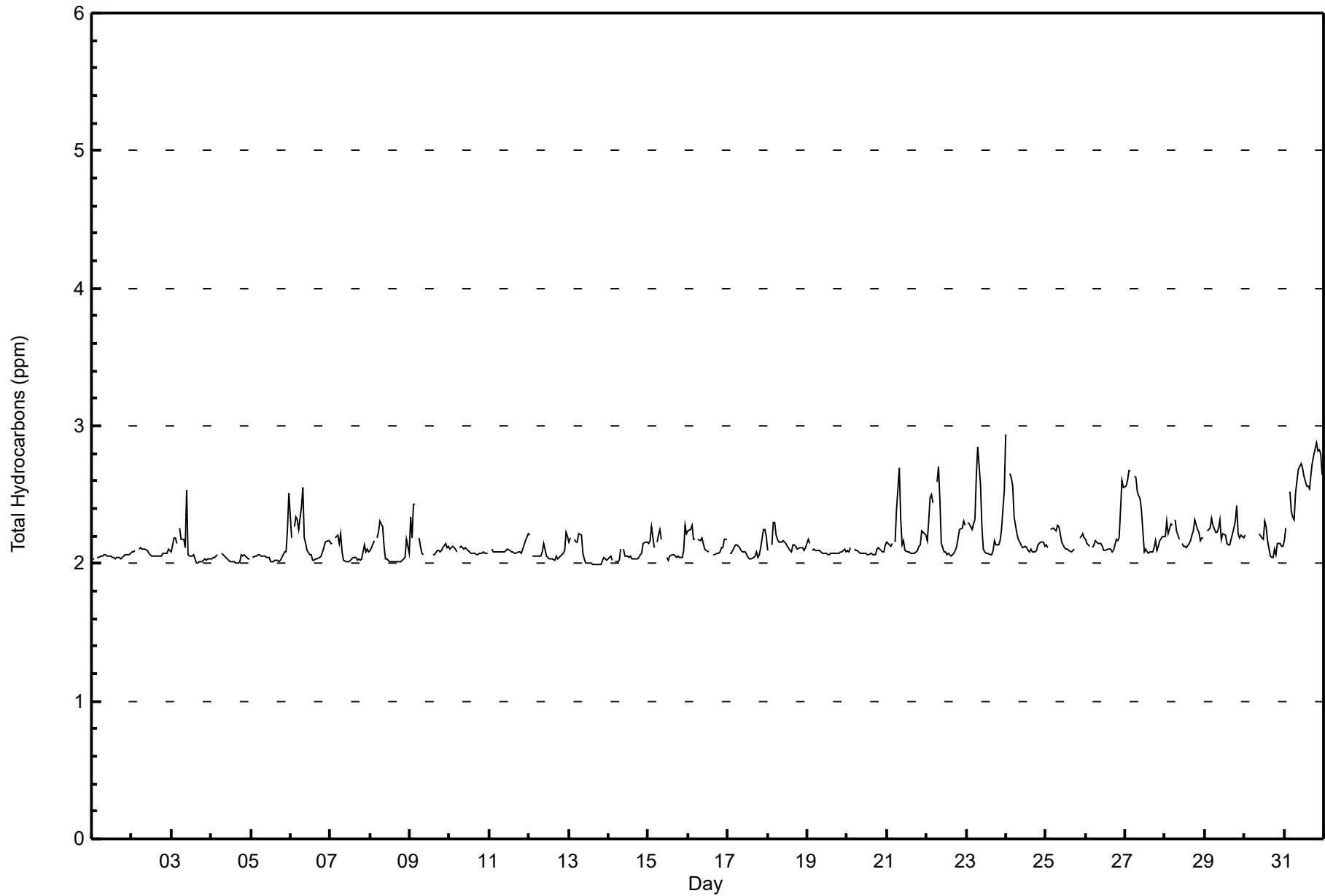






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Anzac - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	125	18.04	18.04
2.1 - 3.0	568	81.96	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Total Hydrocarbons (THC) - ppm
Anzac - August 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	1	2	2	7	6	2	1	1	4	12	21	35	13	6	7	125
2.1 - 3.0	12	9	7	4	14	40	42	22	31	31	36	89	97	42	27	16	519
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	17	10	9	6	21	46	44	23	32	35	48	110	132	55	33	23	644

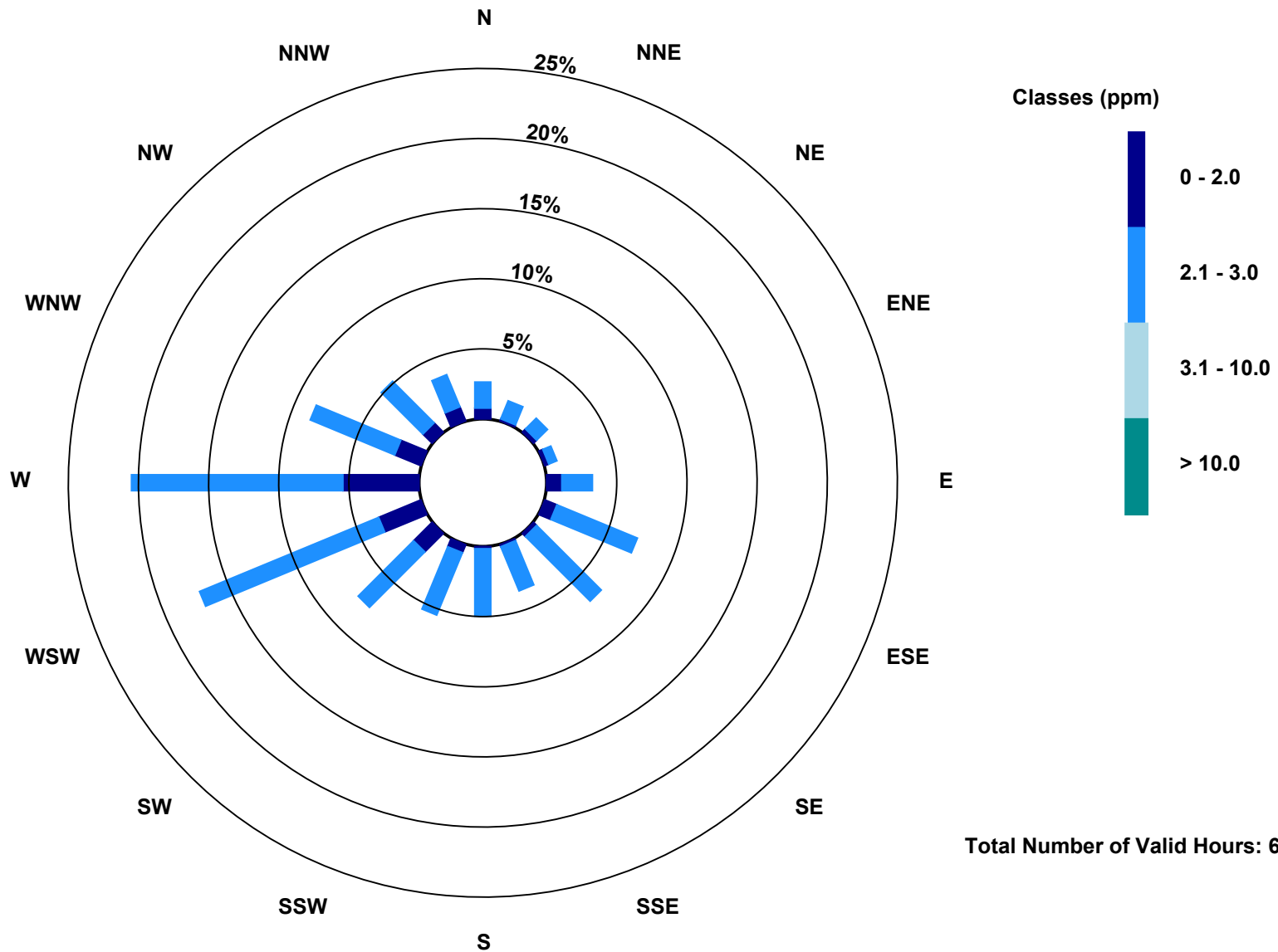
Total Number of Valid Hours: 644

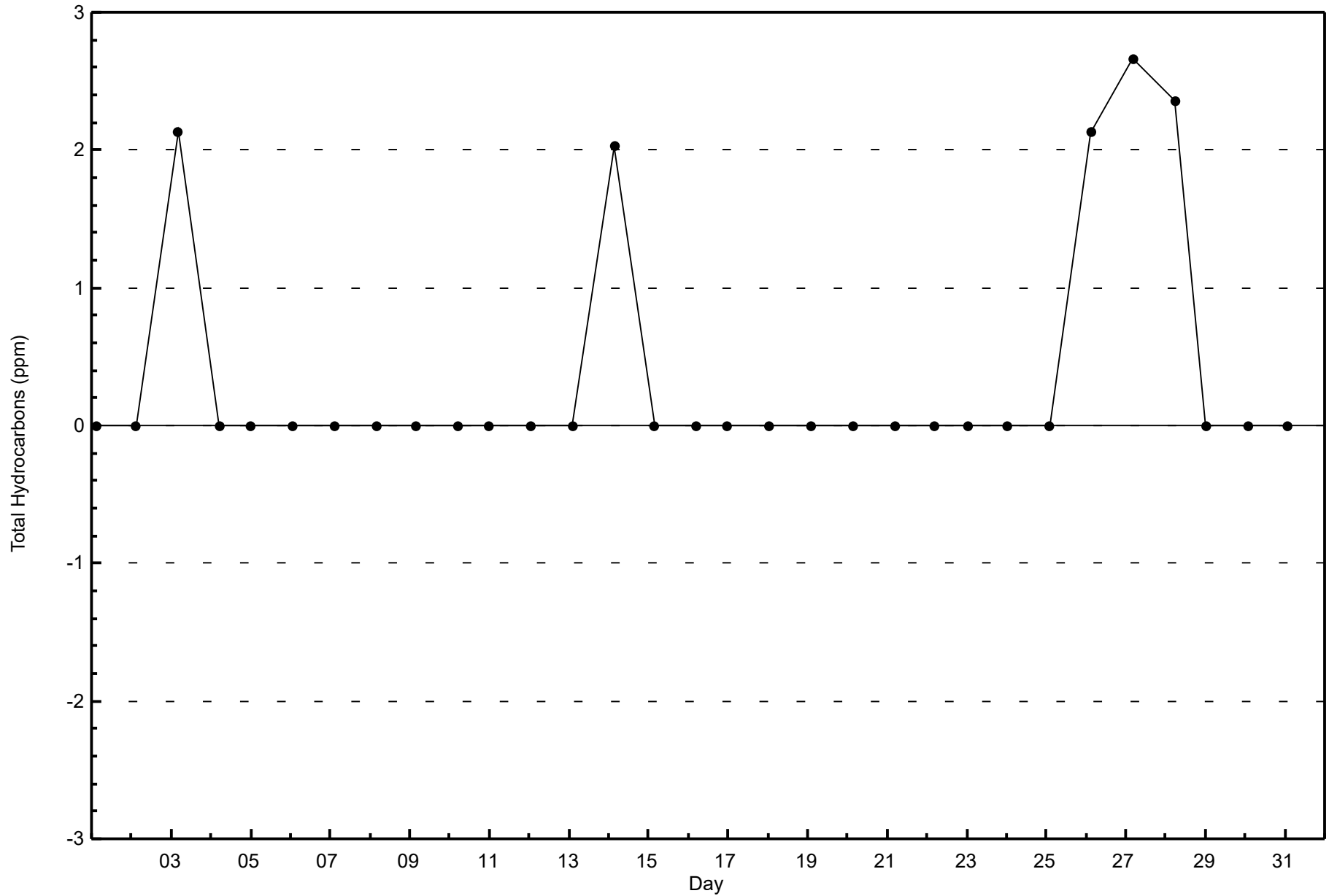
Total Number of Hours: 744

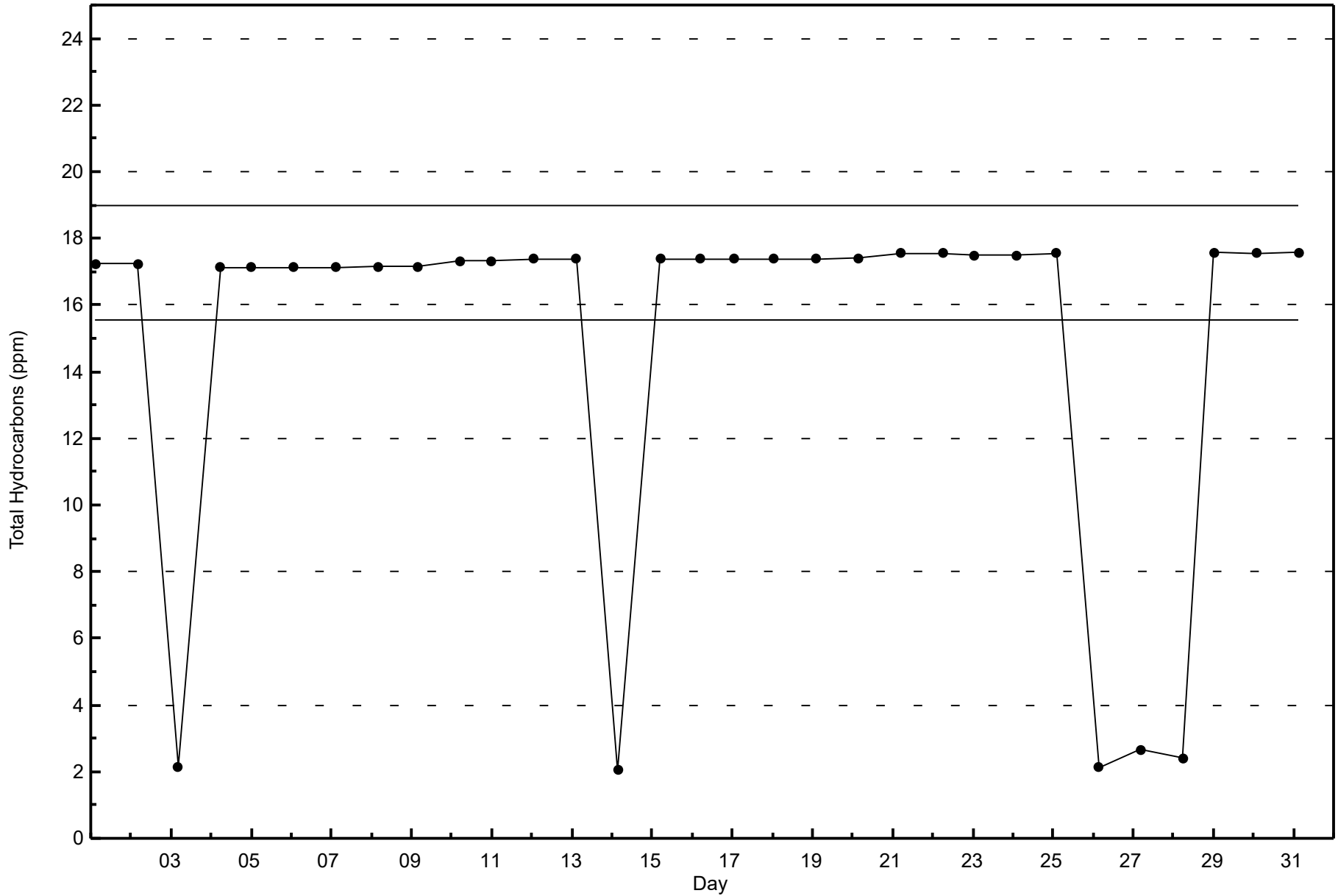


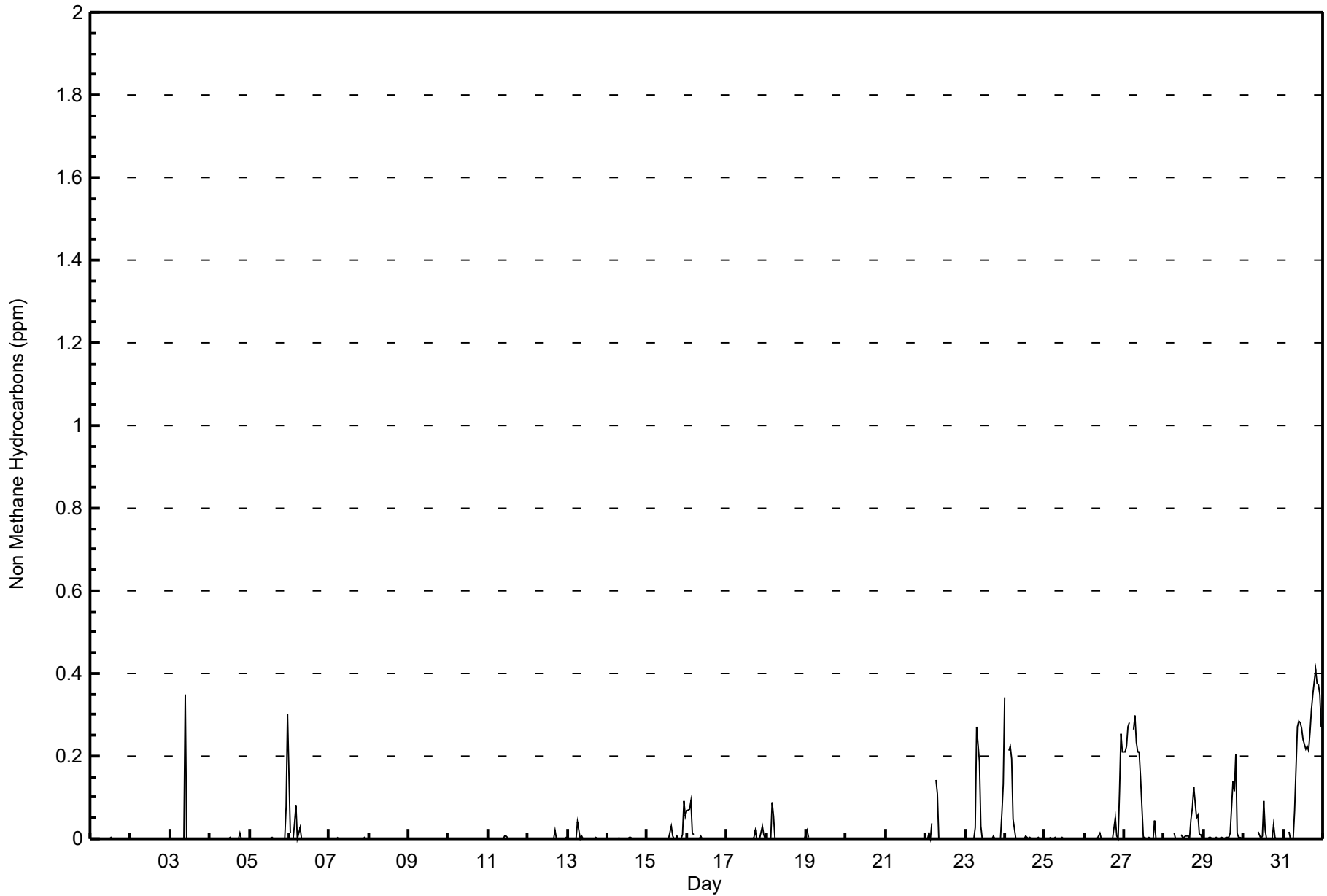
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Anzac











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Anzac - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	591	85.28	85.28
0.006 - 0.05	45	6.49	91.77
0.06 - 0.1	20	2.89	94.66
> 0.1	37	5.34	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Anzac - August 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	17	10	9	5	20	38	36	22	30	31	46	77	115	42	30	22	550
0.006 - 0.05	0	0	0	0	1	5	4	0	1	4	2	11	7	5	0	1	41
0.06 - 0.1	0	0	0	1	0	3	2	1	0	0	0	2	1	5	3	0	18
> 0.1	0	0	0	0	0	0	2	0	1	0	0	20	9	3	0	0	35
Totals	17	10	9	6	21	46	44	23	32	35	48	110	132	55	33	23	644

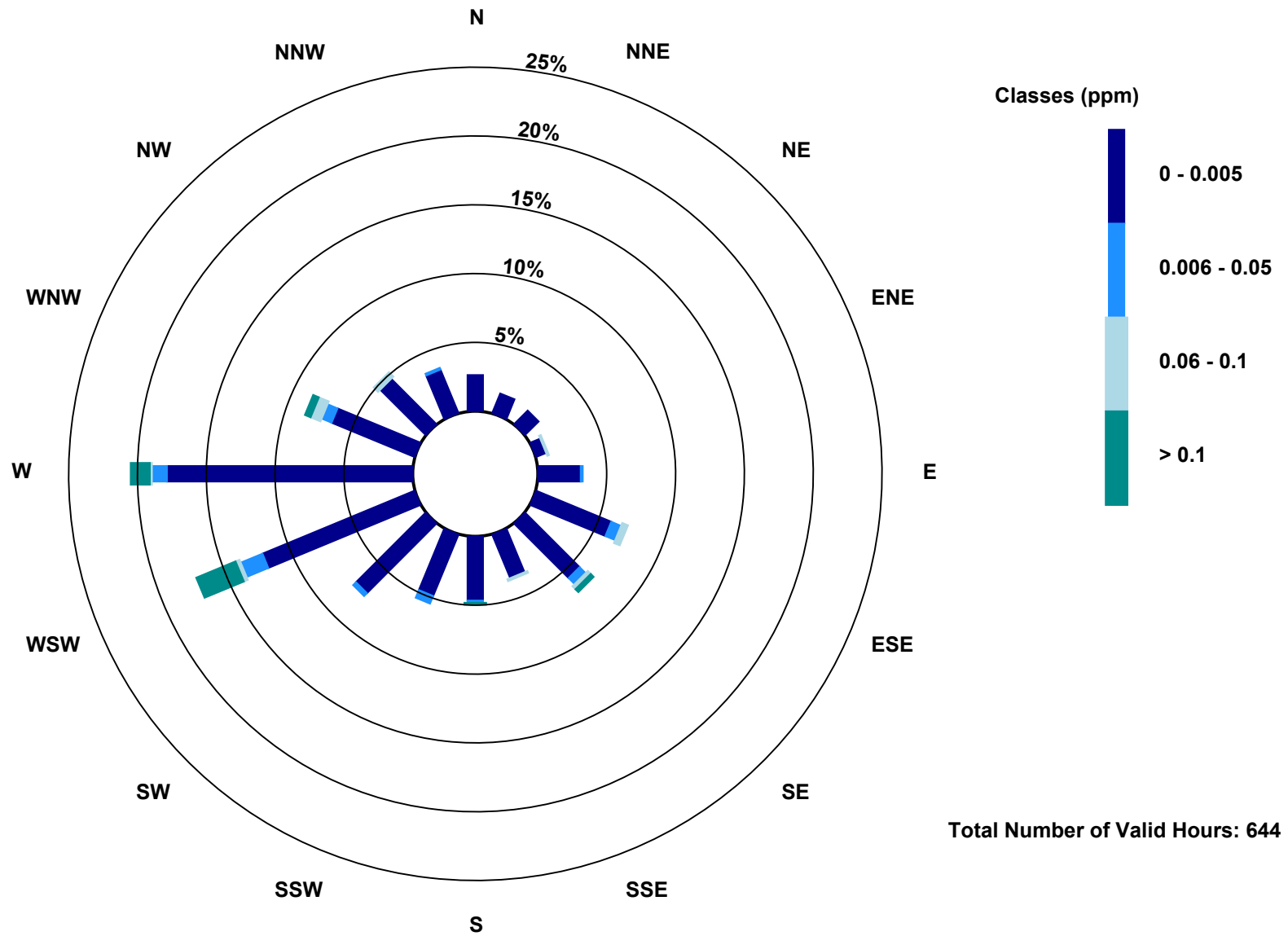
Total Number of Valid Hours: 644

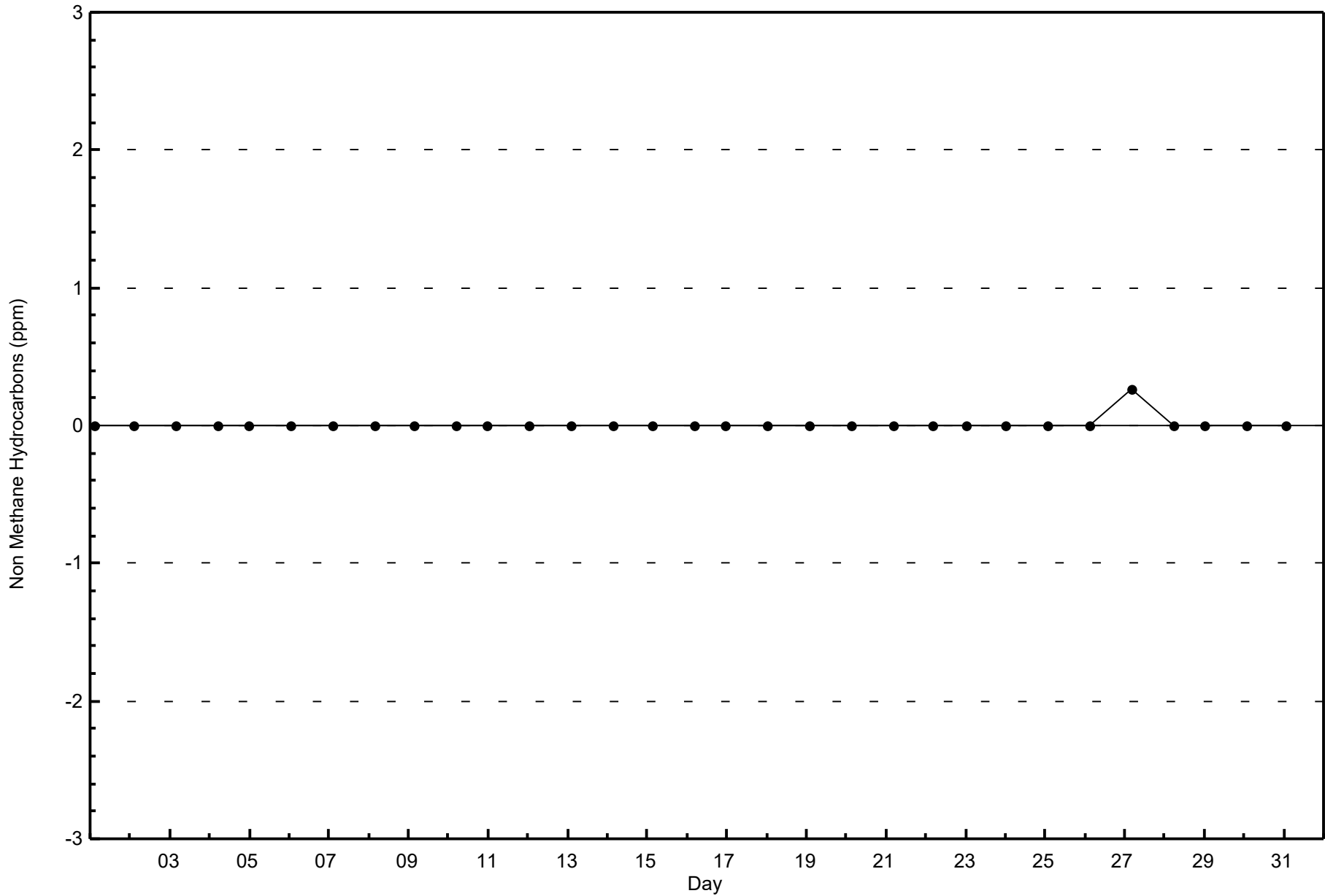
Total Number of Hours: 744

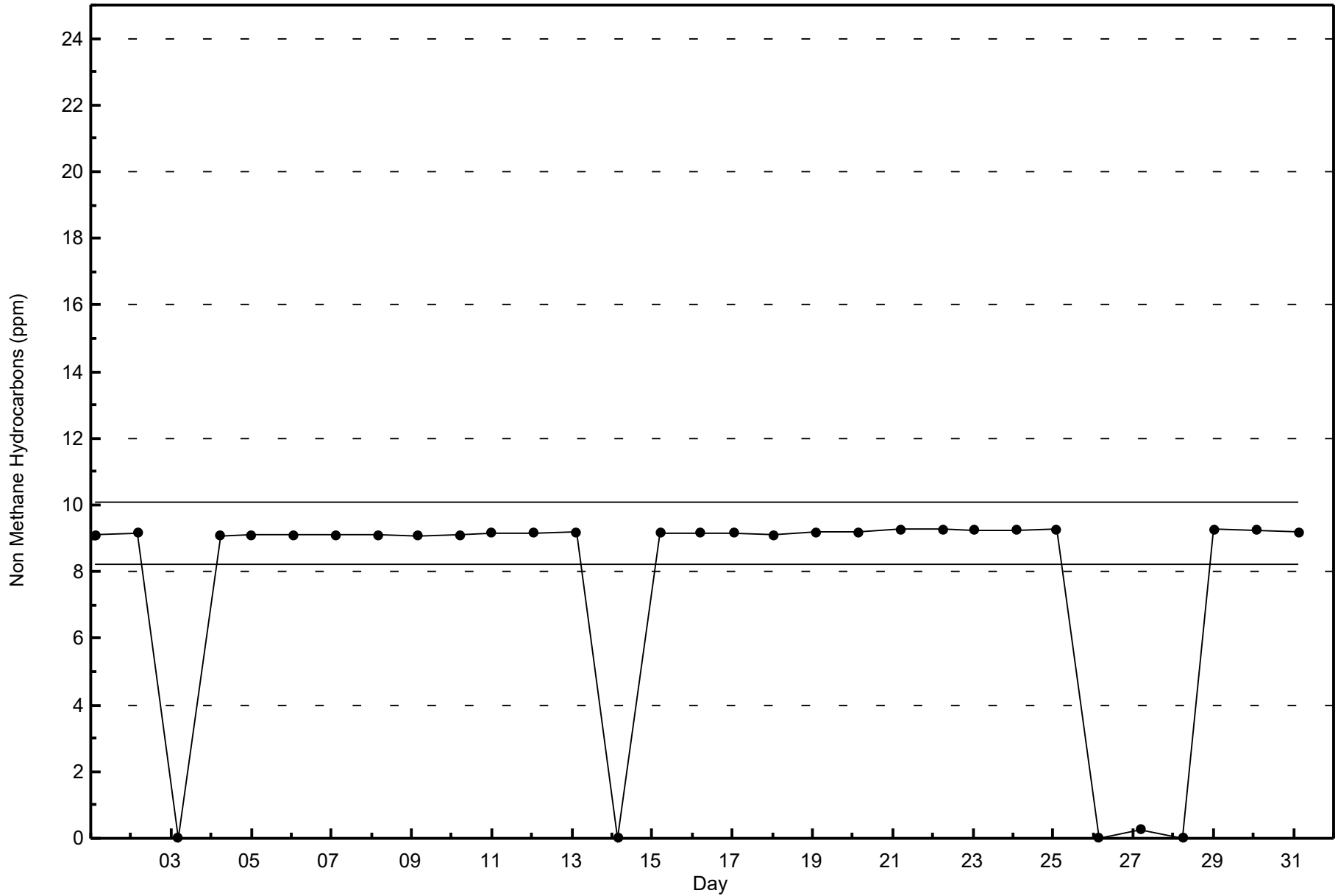


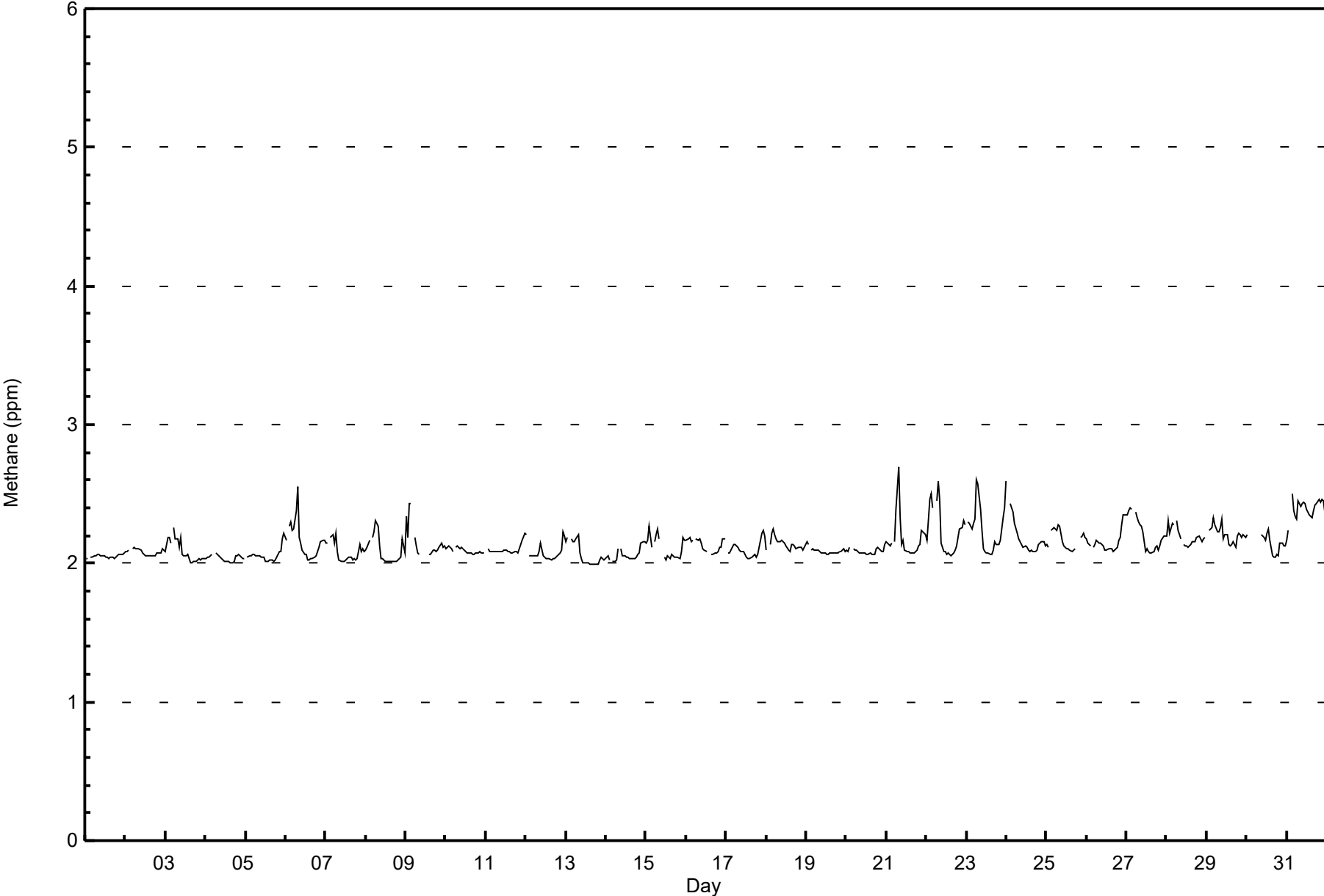
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Anzac











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Anzac - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	129	18.61	18.61
2.1 - 3.0	564	81.39	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Anzac - August 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	1	2	2	7	6	2	1	1	4	12	23	37	13	6	7	129
2.1 - 3.0	12	9	7	4	14	40	42	22	31	31	36	87	95	42	27	16	515
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	17	10	9	6	21	46	44	23	32	35	48	110	132	55	33	23	644

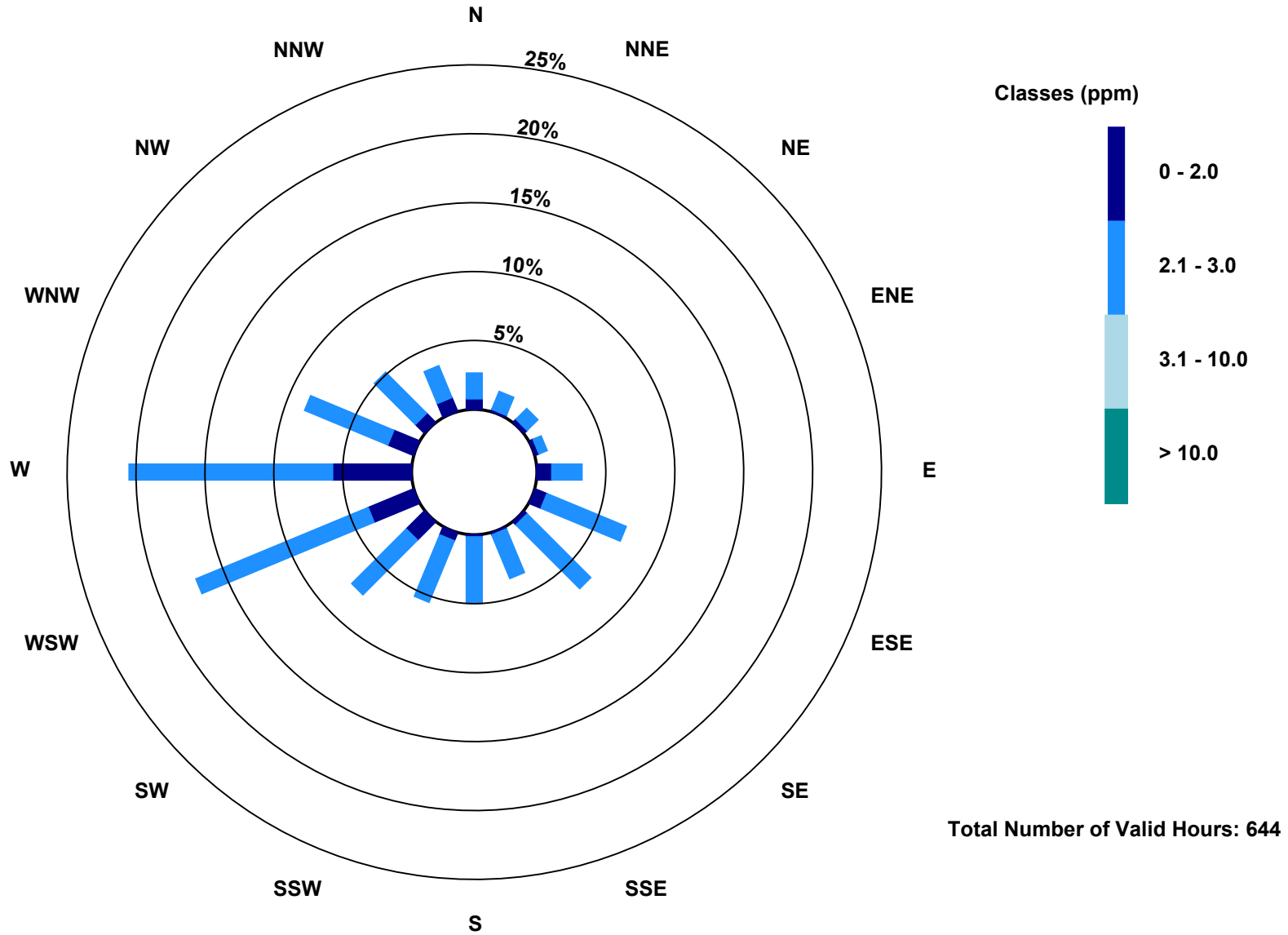
Total Number of Valid Hours: 644

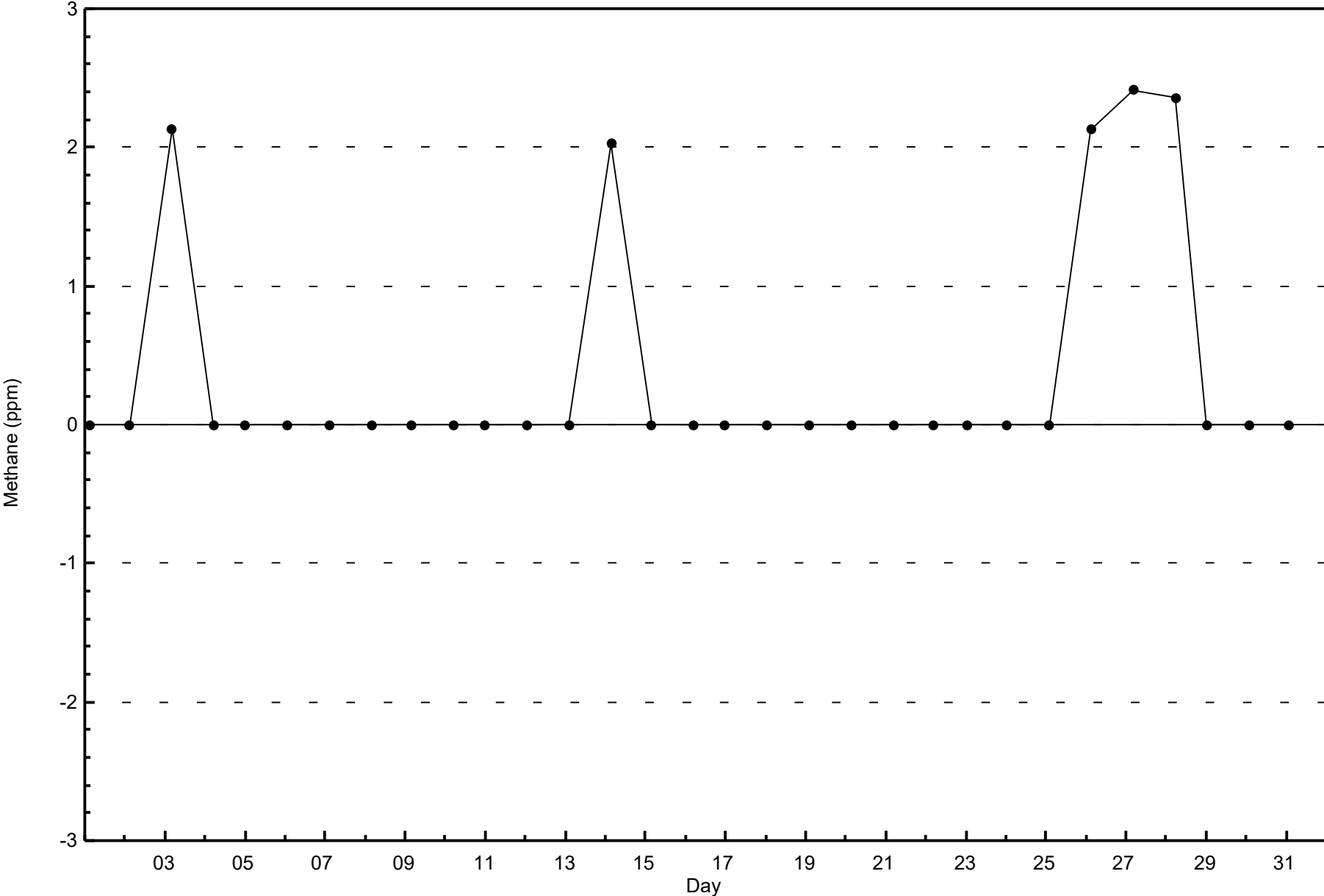
Total Number of Hours: 744

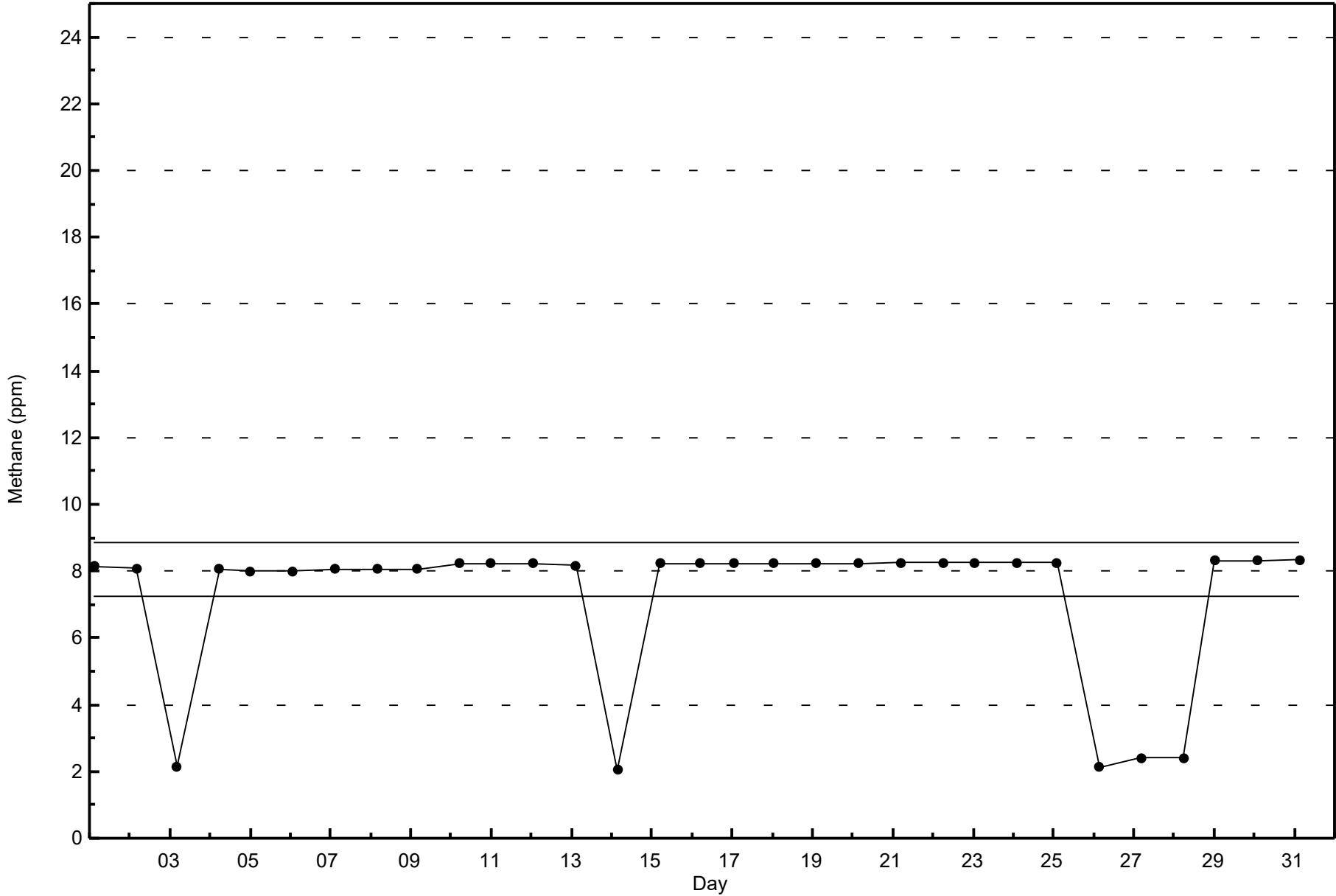


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Anzac









Wood Buffalo Environmental Association
Summary of Hour Averages

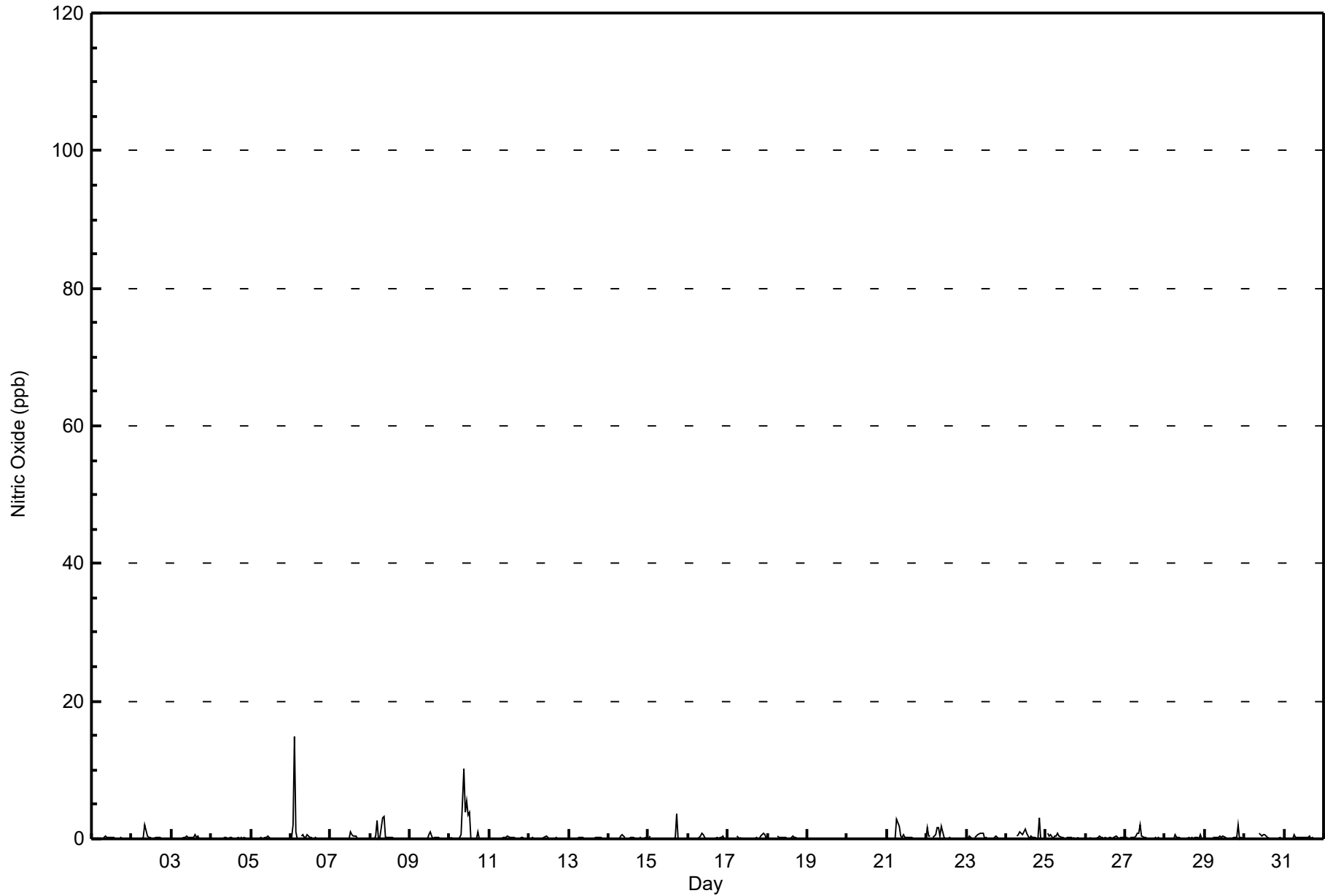
Nitric Oxide (NO) - ppb
Anzac - August 2023

Maximum Value: 14.8 ppb on Aug 6 03:00		Maximum Daily Average: 1.3 ppb on Aug 10		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Aug 15 05:00		Minimum Daily Average: 0.0 ppb on Aug 19		Hours of Data: 692																							
Maximum Diurnal Average: 0.8 ppb at hour 9		Minimum Diurnal Average: 0.0 ppb at hour 24		Hours of Missing Data: 52																							
Monthly Average: 0.24 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 = 3.4		Hours of Calibration: 35																							
				Percent Operational Time: 97.7																							
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-Aug	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
2-Aug	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	2.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.2	2.0	
3-Aug	0.0	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.2	0.1	0.1	0.1	0.6	0.1	0.4	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.6	
4-Aug	0.1	0.1	0.1	Z	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	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.2	
5-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.1	0.0	0.1	0.2	0.5	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	0.5	
6-Aug	0.1	2.1	14.8	1.0	0.1	Z	0.3	0.6	0.2	0.2	0.6	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	0.9	14.8	
7-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	1.0	0.6	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	
8-Aug	0.0	Z	0.0	0.3	2.6	0.1	0.2	3.0	3.3	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	3.3	
9-Aug	0.0	0.0	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.5	1.1	0.4	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	1.1	
10-Aug	0.0	0.3	0.1	Z	0.0	0.0	0.1	0.6	10.3	3.8	5.5	3.4	4.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	10.3	
11-Aug	0.0	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.3	0.1	0.3	0.4	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	0.4	
12-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3		
13-Aug	Z	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.3	
14-Aug	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.5	0.6	0.3	0.1	Z	M	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.2	0.1	0.6	
15-Aug	0.0	0.4	Z	0.0	0.0	0.0	0.1	C	C	C	C	C	0.0	0.0	0.0	0.1	0.1	3.7	0.0	0.1	0.0	0.0	0.0	0.0	0.3	3.7	
16-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	0.9	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.0	0.0	0.2	0.9	
17-Aug	0.0	0.0	0.0	0.0	Z	0.4	0.1	0.1	0.2	M	M	M	M	M	0.1	0.1	0.1	0.1	0.1	0.0	0.4	0.8	0.5	0.0	0.2	0.8	
18-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.4	
19-Aug	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	
20-Aug	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	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	
21-Aug	0.0	0.0	Z	0.0	0.0	0.1	2.8	1.9	0.4	0.2	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.3	2.8	
22-Aug	1.6	0.3	0.5	Z	0.1	0.5	1.7	1.6	0.3	1.8	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	0.4	1.8	
23-Aug	0.0	0.0	0.3	0.0	Z	0.3	0.3	0.7	0.8	0.8	0.8	0.1	0.2	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.8	
24-Aug	0.1	0.0	0.0	0.1	0.1	Z	0.4	0.5	0.9	0.8	0.6	1.3	0.9	0.4	0.0	0.4	0.1	0.1	0.1	0.0	3.0	0.1	0.0	0.0	0.4	3.0	
25-Aug	Z	0.9	0.5	0.6	0.1	0.3	0.4	0.9	0.5	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	PF	0.2	0.1	0.1	0.1	0.1	0.3	0.9	
26-Aug	0.1	Z	0.1	0.0	0.0	0.0	0.1	0.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.4	
27-Aug	0.2	0.1	Z	0.1	0.2	0.2	0.5	0.8	0.8	1.9	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.1	0.1	0.3	1.9	
28-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.6	0.1	0.1	0.1	0.1	M	M	0.1	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.6	0.1	0.1	0.2	0.6	
29-Aug	0.1	0.0	0.0	0.1	Z	0.3	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.1	2.1	0.1	0.2	0.0	0.2	2.1	
30-Aug	0.1	PF	PF	PF	PF	PF	PF	PF	PF	0.7	0.3	0.5	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.1	--	0.7	
31-Aug	Z	0.1	0.1	0.1	0.0	0.0	0.7	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.7	
		0.1	0.2	0.7	0.1	0.2	0.1	0.3	0.5	0.8	0.5	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.0	Diurnal Average	
		1.6	2.1	14.8	1.0	2.6	0.5	2.8	3.0	10.3	3.8	5.5	3.4	4.0	0.6	0.6	0.4	0.4	3.7	0.4	0.2	3.0	0.8	0.5	0.2	Diurnal Maximum	
Z - zerospan		C - Calibration					M - Maintenance					PF - Power Failure															



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Anzac - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	692	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: 692

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Anzac - August 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	9	9	6	21	48	46	24	34	35	44	110	131	54	32	24	643
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	16	9	9	6	21	48	46	24	34	35	44	110	131	54	32	24	643

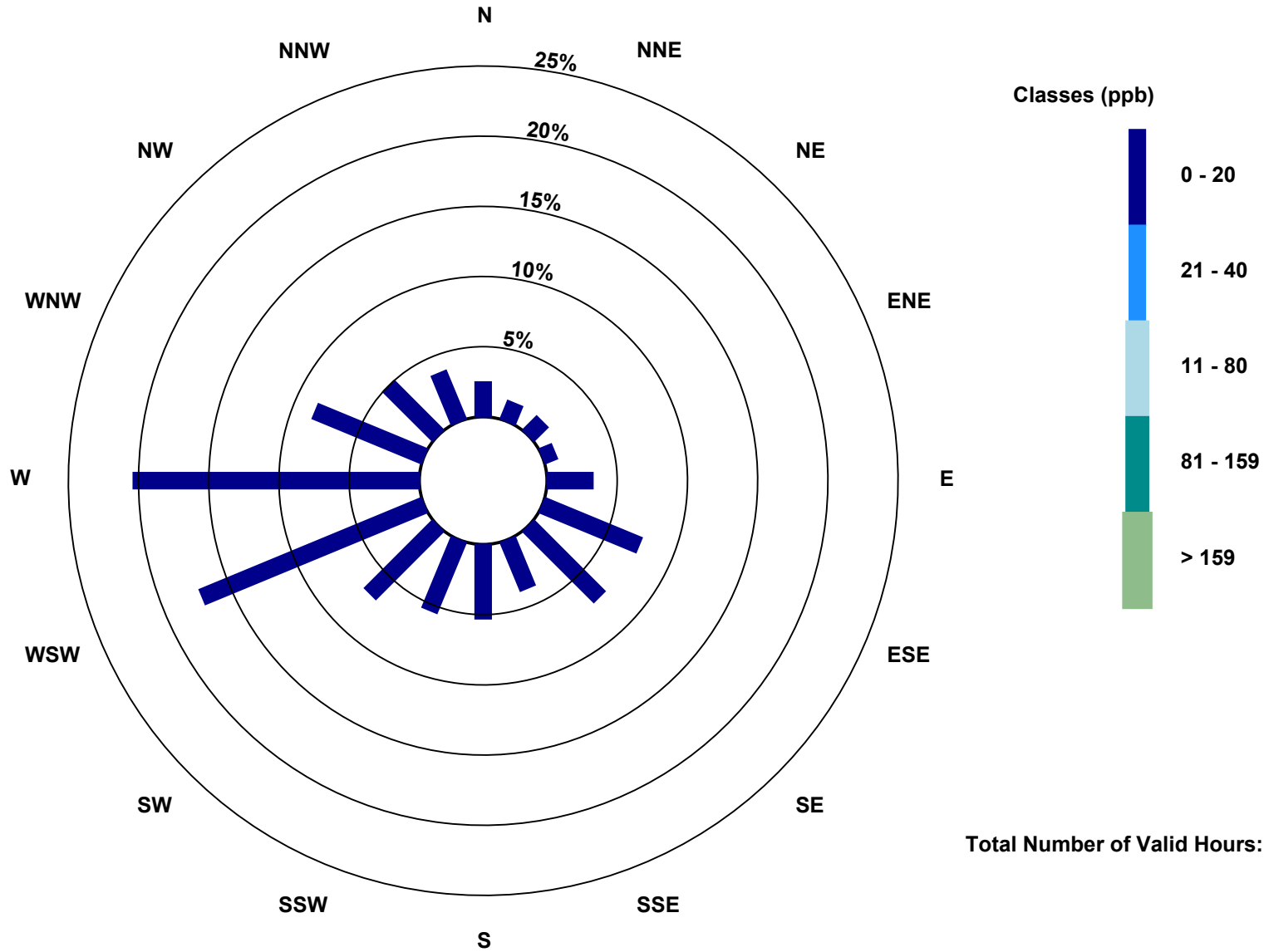
Total Number of Valid Hours: 643

Total Number of Hours: 744

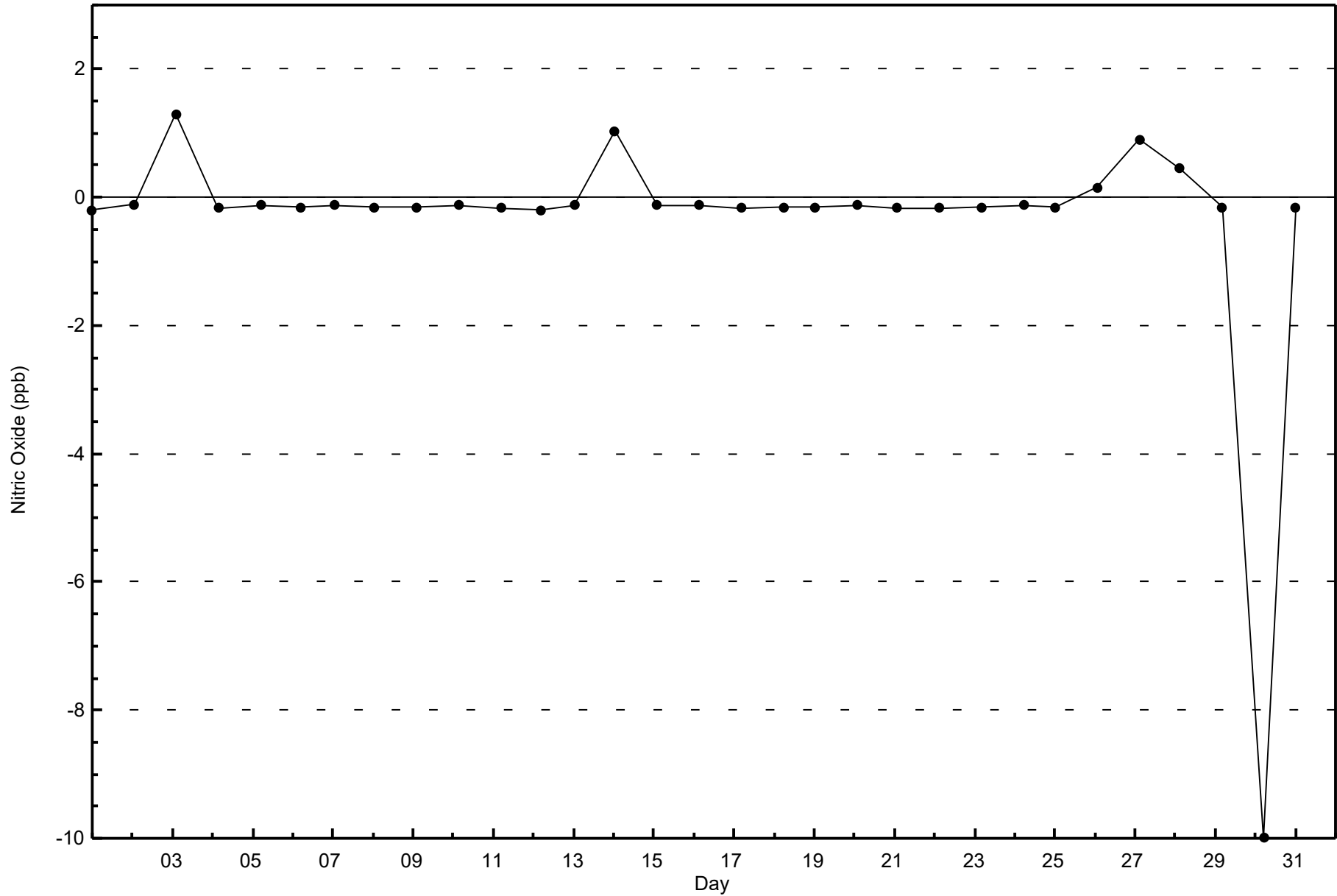


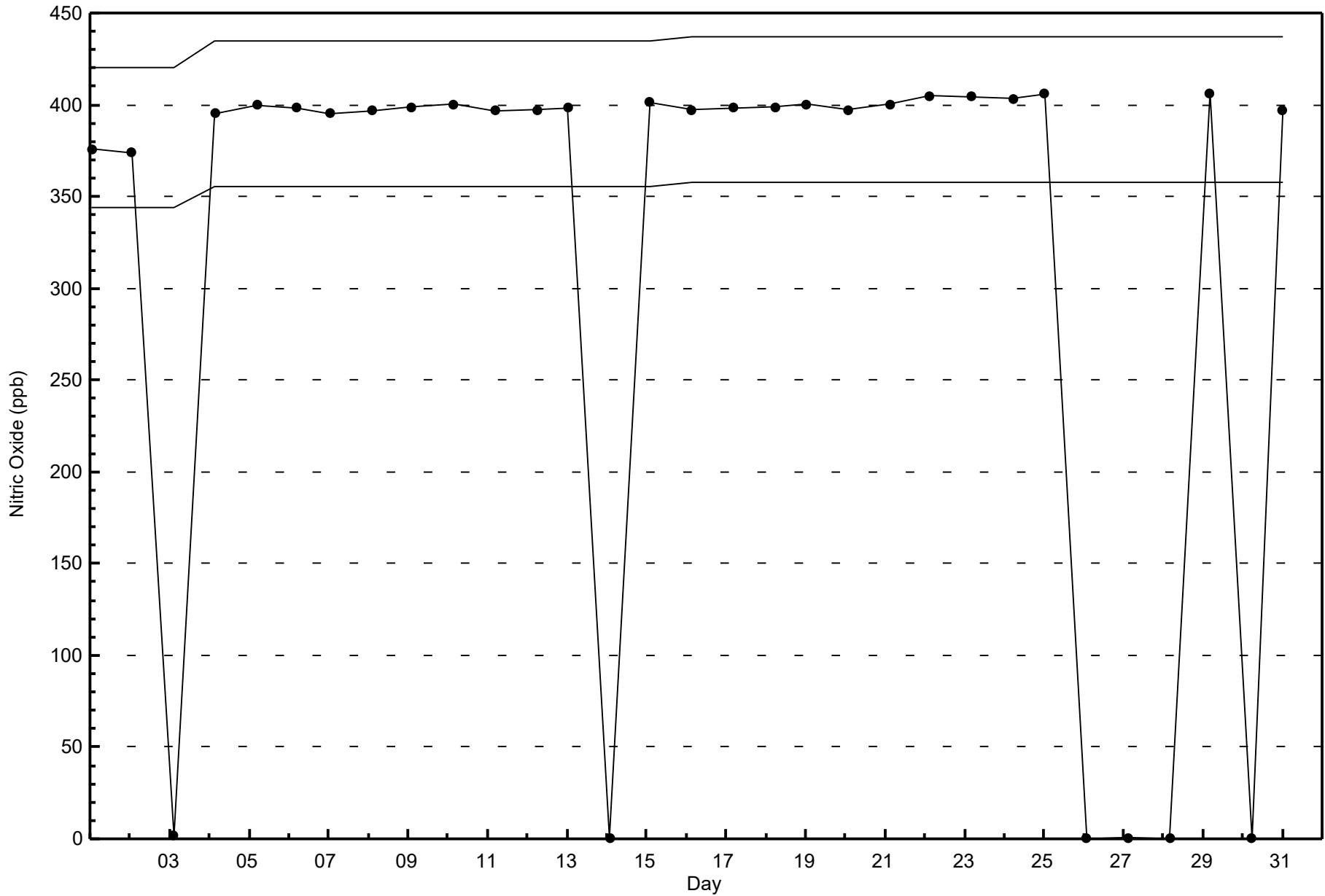
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Anzac



Total Number of Valid Hours: 643







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

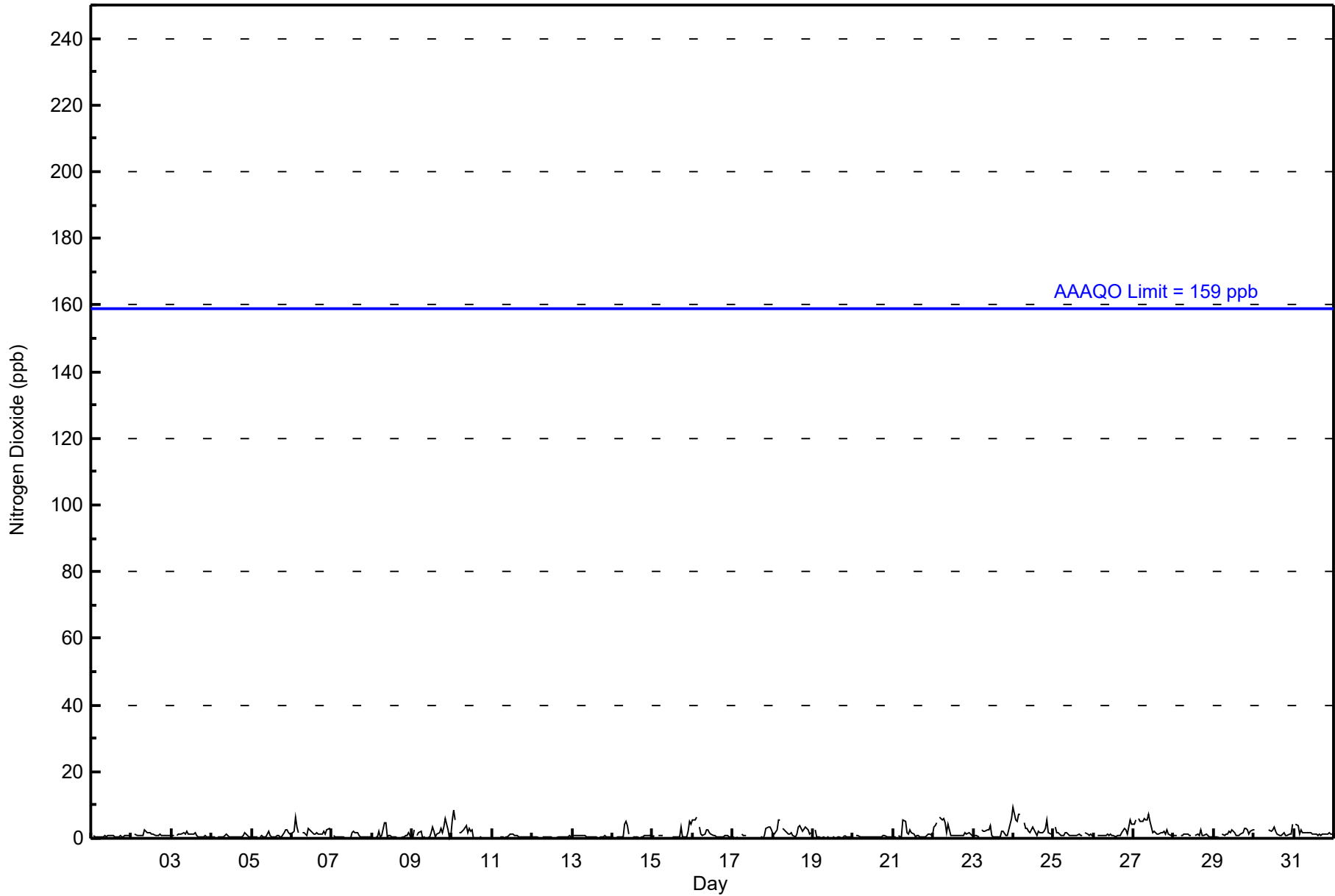
Anzac - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 9.3 ppb on Aug 24 01:00		Maximum Daily Average: 3.3 ppb on Aug 24		Minimum Value: 0.1 ppb on Aug 17 16:00		Minimum Daily Average: 0.4 ppb on Aug 19		Hours of Data: 692																		
Maximum Diurnal Average: 2.1 ppb at hour 2		Minimum Diurnal Average: 0.7 ppb at hour 15		Hours of Missing Data: 52		Hours of Calibration: 35		Percent Operational Time: 97.7																		
Monthly Average: 1.36 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.8 Q ₃ = 1.6 P ₉₀ = 3.1 P ₉₉ = 6.2																								
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-Aug	Z	0.7	0.6	0.5	0.5	0.6	0.6	0.6	1.0	0.6	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.8	0.6	0.6	0.8	0.8	0.8	0.8	0.7	1.0
2-Aug	0.8	Z	1.3	0.9	0.9	0.8	0.8	1.0	2.5	1.9	1.6	1.6	1.1	1.1	1.0	1.0	1.0	1.1	0.8	0.9	0.8	0.8	0.7	0.7	1.1	2.5
3-Aug	0.8	0.9	Z	0.8	1.1	1.2	1.4	1.8	1.1	2.3	1.4	1.2	1.1	1.1	1.6	0.8	0.4	0.6	0.5	0.5	0.7	0.6	0.5	0.4	1.0	2.3
4-Aug	0.3	0.4	0.4	Z	0.6	0.5	0.6	0.5	0.9	1.1	0.6	0.6	0.6	0.5	0.4	0.4	0.5	0.4	0.6	0.8	1.6	0.7	0.5	0.5	0.6	1.6
5-Aug	0.5	0.5	0.5	0.6	Z	0.6	0.7	0.5	0.6	1.2	2.0	0.9	0.5	0.5	0.5	0.7	0.8	0.4	0.6	1.7	2.6	2.5	1.6	1.2	1.0	2.6
6-Aug	1.5	2.0	6.4	3.2	1.5	Z	1.9	1.6	1.4	1.0	3.0	2.3	1.5	1.2	1.2	1.7	1.2	1.2	1.2	2.0	1.3	2.6	3.1	2.1	2.0	6.4
7-Aug	Z	0.8	0.6	0.6	0.6	0.5	0.4	0.4	0.2	0.2	0.2	0.2	1.5	2.0	1.7	1.6	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.7	2.0
8-Aug	0.3	Z	0.5	0.6	2.0	0.4	0.7	4.6	4.8	0.6	0.7	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.3	0.5	0.7	0.7	1.5	0.2	0.9	4.8
9-Aug	0.2	2.5	Z	0.7	1.8	2.2	0.2	0.3	0.2	0.2	0.5	1.9	3.4	2.0	0.5	1.1	1.7	2.8	1.7	3.2	6.0	2.4	0.2	0.7	1.6	6.0
10-Aug	5.5	8.4	5.5	Z	1.6	1.7	2.1	2.5	3.7	1.8	2.9	2.3	2.7	0.2	0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.2	0.2	0.2	1.9	8.4
11-Aug	0.2	0.2	0.2	0.2	Z	0.4	0.3	0.2	0.4	0.5	0.7	1.3	1.3	0.8	0.7	0.7	0.4	0.4	0.5	0.4	0.5	0.4	0.6	0.6	0.5	1.3
12-Aug	0.5	0.4	0.4	0.3	0.2	Z	0.5	0.4	0.5	0.4	0.6	0.4	0.2	0.2	0.2	0.3	0.6	0.4	0.3	0.4	0.6	0.6	1.0	0.6	0.4	1.0
13-Aug	Z	0.9	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.4	0.5	0.9	0.4	0.5	0.6	0.6	0.5	0.9
14-Aug	0.6	Z	0.2	0.3	0.4	0.4	0.3	4.1	5.1	4.0	1.3	M	0.5	0.5	0.4	0.4	0.2	0.3	0.6	0.9	0.7	0.9	0.9	1.3	1.1	5.1
15-Aug	0.6	0.8	Z	0.8	0.7	0.7	0.8	C	C	C	C	C	0.5	0.5	0.5	0.6	0.5	3.6	0.6	0.5	0.4	2.1	5.0	4.4	1.3	5.0
16-Aug	5.4	5.5	6.2	Z	3.6	1.4	1.0	1.2	2.5	2.4	1.8	1.2	0.9	0.8	0.6	0.5	0.4	0.6	0.5	1.0	0.7	1.0	0.5	0.4	1.7	6.2
17-Aug	0.4	0.2	0.2	0.3	Z	1.2	1.0	0.8	0.8	M	M	M	M	M	0.2	0.1	0.2	0.6	0.2	0.9	3.1	3.5	3.4	2.7	1.1	3.5
18-Aug	1.4	1.4	2.4	5.6	5.3	Z	3.1	2.7	1.7	1.3	1.4	1.7	0.9	0.5	1.2	3.6	3.7	3.0	2.3	3.2	2.8	2.7	1.3	1.6	2.4	5.6
19-Aug	Z	2.5	0.5	0.4	0.4	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.7	0.5	0.4	0.5	0.3	0.4	2.5
20-Aug	0.4	Z	0.8	0.9	0.5	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.7	0.7	0.6	0.4	0.4	0.5	0.5	0.9
21-Aug	0.6	0.6	Z	0.7	0.5	0.5	5.6	5.0	1.7	1.2	2.4	1.5	1.1	0.6	0.7	0.7	0.3	0.4	0.5	0.5	0.8	1.3	1.3	0.9	1.3	5.6
22-Aug	3.6	3.8	4.5	Z	6.3	5.3	6.0	4.5	1.5	4.3	0.9	0.9	0.9	0.8	0.8	0.7	0.8	0.9	0.9	1.6	1.2	1.5	1.4	1.0	2.4	6.3
23-Aug	0.9	0.7	0.9	0.5	Z	2.5	2.0	2.3	2.4	2.7	3.8	0.7	0.5	0.4	0.4	0.6	2.1	2.0	1.0	0.7	2.4	4.3	5.9	1.7	5.9	
24-Aug	9.3	5.4	5.2	7.3	7.1	Z	4.8	2.9	3.0	2.0	1.9	3.3	2.4	1.6	0.7	2.0	1.5	1.7	2.0	2.8	5.7	1.7	1.4	1.3	3.3	9.3
25-Aug	Z	3.2	1.7	1.5	0.7	0.8	0.9	1.7	1.5	0.9	0.8	0.8	0.8	1.0	1.0	1.2	0.8	0.9	PF	1.5	1.1	0.8	1.1	0.7	1.2	3.2
26-Aug	0.8	Z	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.0	1.1	0.8	0.8	0.6	0.7	0.8	0.7	1.7	2.9	2.6	1.4	3.3	5.7	4.2	1.5	5.7
27-Aug	4.4	5.6	Z	6.0	5.2	5.0	6.0	5.5	5.7	7.2	5.1	1.8	2.2	1.7	1.4	1.3	1.5	1.7	2.0	1.3	2.7	1.1	1.0	1.1	3.3	7.2
28-Aug	1.0	0.7	0.8	Z	0.8	0.9	1.2	1.1	1.2	1.0	1.0	M	M	0.9	1.2	0.9	2.5	0.7	0.7	1.1	0.9	0.6	0.4	0.4	1.0	2.5
29-Aug	0.4	0.6	0.6	0.2	Z	1.3	0.9	1.3	1.4	2.1	1.5	2.6	1.7	1.0	0.9	1.0	1.3	1.7	2.8	3.0	2.4	1.3	2.2	2.4	1.5	3.0
30-Aug	2.4	PF	PF	PF	PF	PF	PF	PF	PF	2.4	2.2	2.7	3.4	2.0	1.2	0.7	0.8	1.1	1.5	1.0	1.0	1.1	1.3	4.4	--	4.4
31-Aug	Z	4.2	4.0	1.4	2.5	1.5	1.8	1.9	1.5	1.6	1.5	1.3	1.1	1.1	1.0	1.1	0.9	1.2	1.3	1.4	1.1	1.5	1.3	1.2	1.6	4.2
																								Diurnal Average		
																								Diurnal Maximum		
																								1.7 2.1 1.8 1.4 1.9 1.3 1.6 1.8 1.7 1.6 1.5 1.3 1.2 0.9 0.7 0.8 0.8 1.1 1.0 1.2 1.4 1.3 1.5 1.4		
																								9.3 8.4 6.4 7.3 7.1 5.3 6.0 5.5 5.7 7.2 5.1 3.3 3.4 2.0 1.7 3.6 3.7 3.6 2.9 3.2 6.0 3.5 5.7 5.9		
Z - zerospan C - Calibration M - Maintenance PF - Power Failure																										
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Anzac - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	692	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: 692

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Anzac - August 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	9	9	6	21	48	46	24	34	35	44	110	131	54	32	24	643
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	16	9	9	6	21	48	46	24	34	35	44	110	131	54	32	24	643

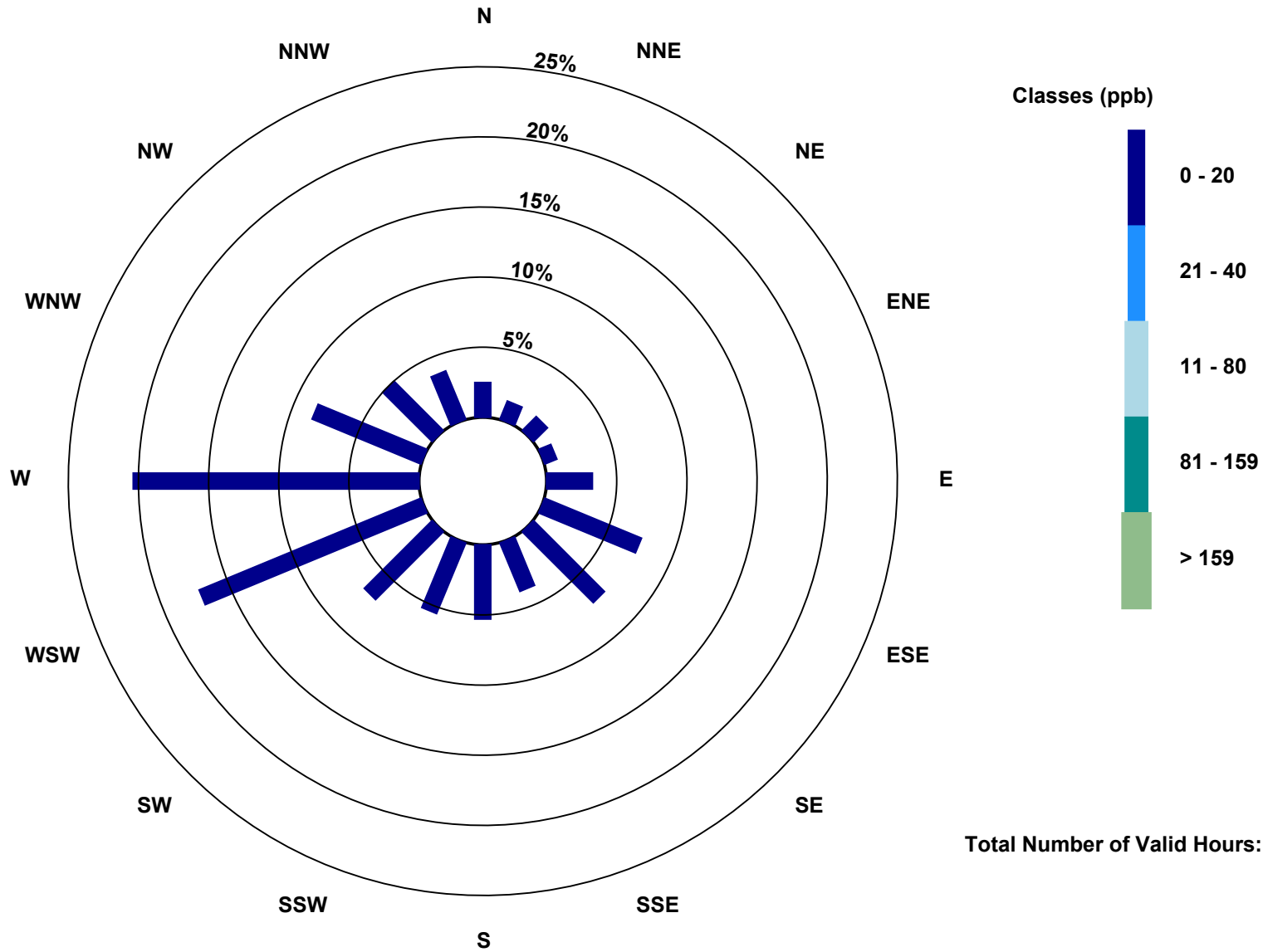
Total Number of Valid Hours: 643

Total Number of Hours: 744

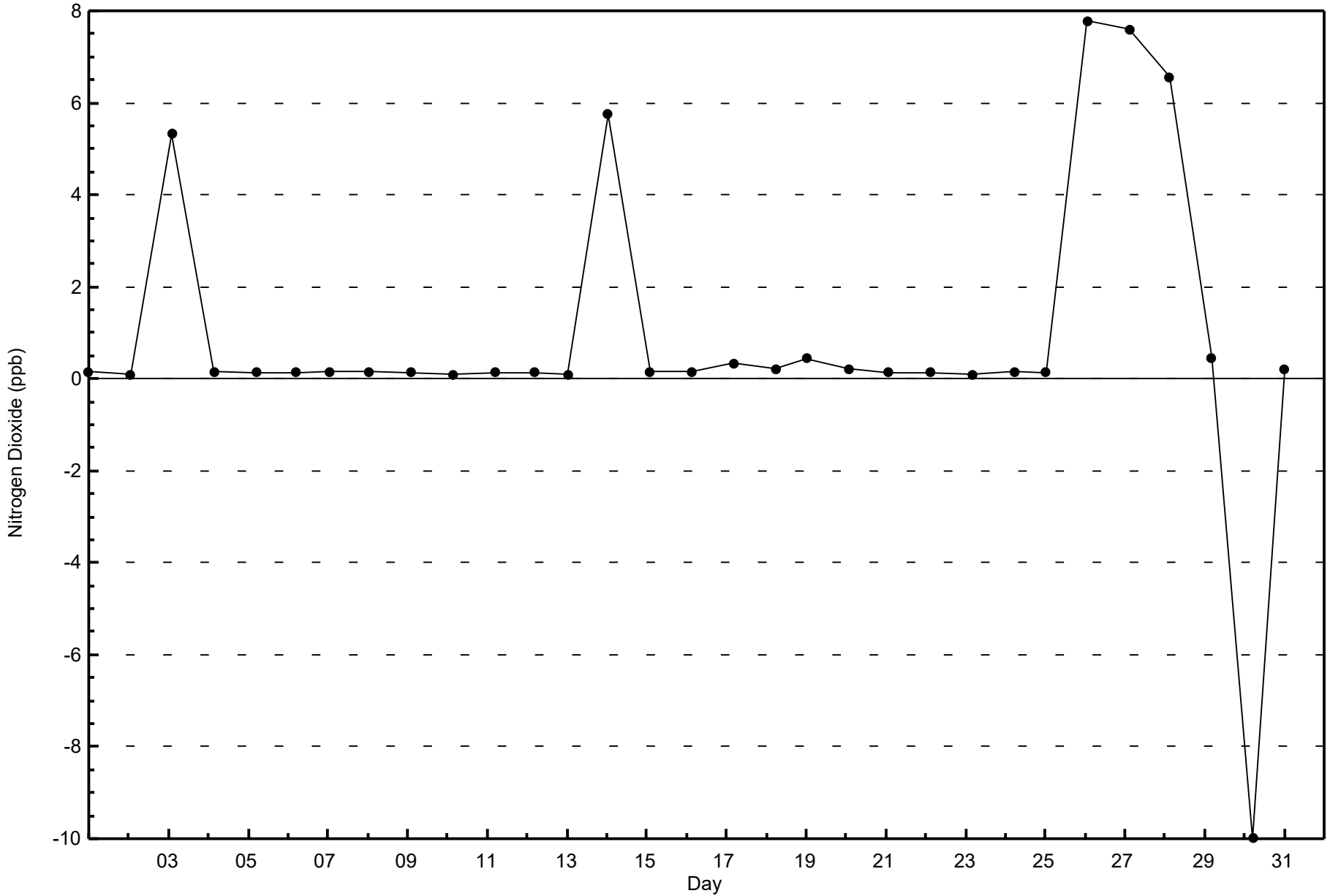


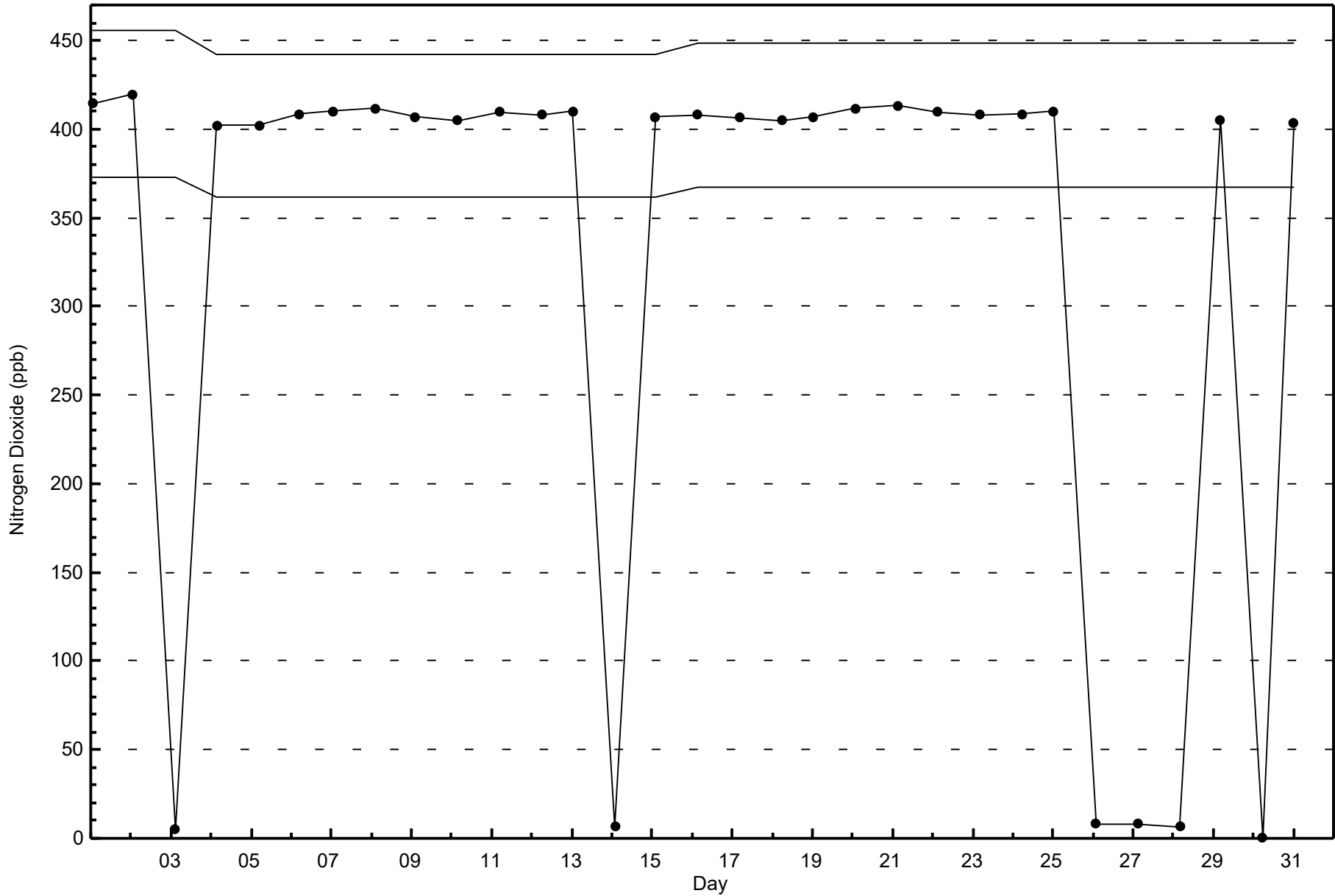
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Anzac



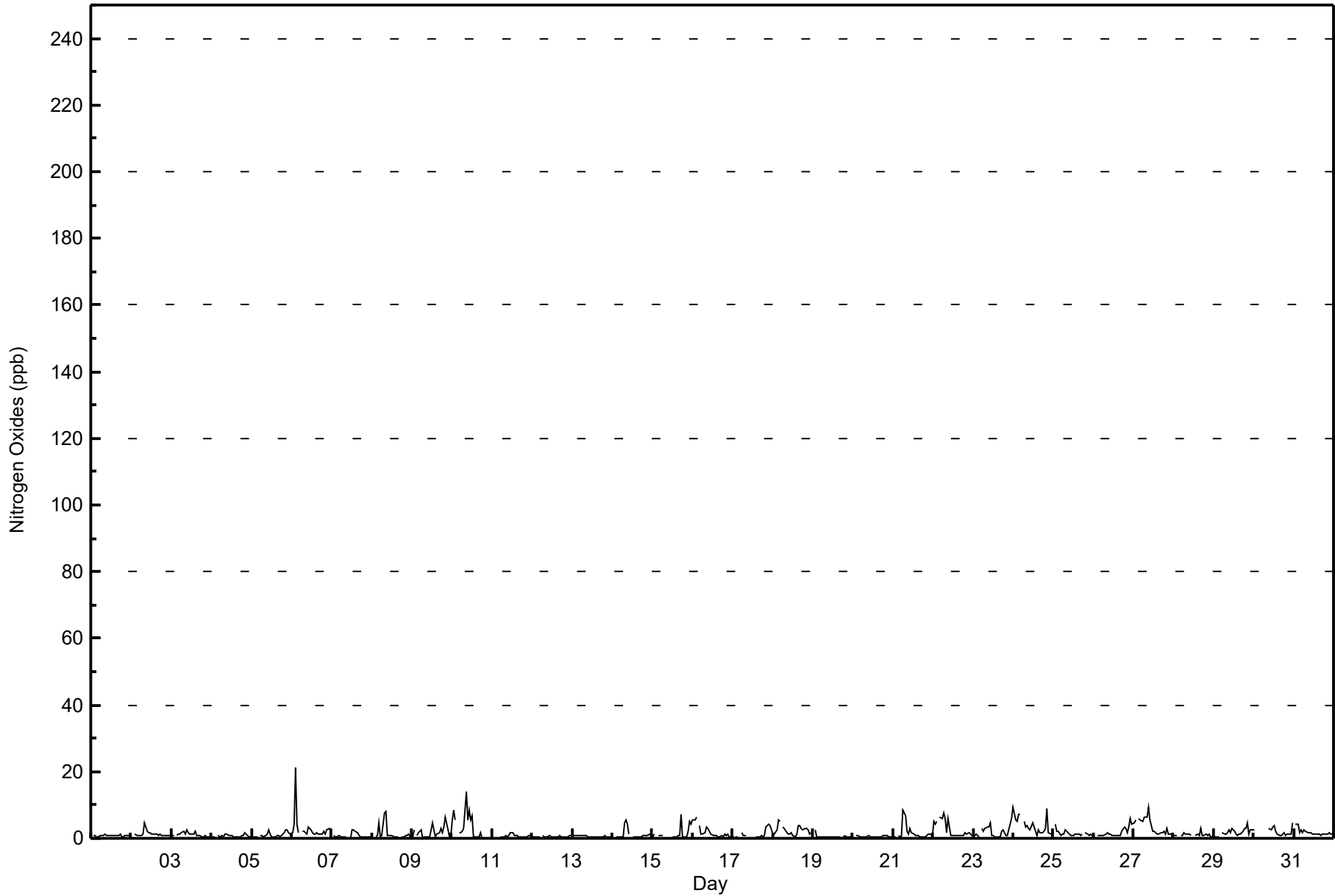
Total Number of Valid Hours: 643







Maximum Value: 21.2 ppb on Aug 6 03:00		Maximum Daily Average: 3.8 ppb on Aug 24		Hours in Service: 744																											
Minimum Value: 0.2 ppb on Aug 19 18:00		Minimum Daily Average: 0.4 ppb on Aug 19		Hours of Data: 692																											
Maximum Diurnal Average: 2.5 ppb at hour 9		Minimum Diurnal Average: 0.8 ppb at hour 15		Hours of Missing Data: 52																											
Monthly Average: 1.60 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 0.9 Q ₃ = 1.8 P ₉₀ = 3.9 P ₉₉ = 8.4		Hours of Calibration: 35																											
				Percent Operational Time: 97.7																											
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-Aug	Z	0.8	0.7	0.6	0.6	0.7	0.7	0.8	1.4	0.8	0.8	0.8	0.8	0.7	0.6	0.7	1.1	0.6	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.3	4.5	1.1	2.7
2-Aug	0.8	Z	1.3	0.9	0.9	0.9	0.9	1.1	4.5	2.2	1.8	1.7	1.2	1.2	1.1	1.1	1.1	1.3	0.9	1.0	0.9	0.8	0.8	0.7	1.1	2.7	1.1	2.7	1.1	2.7	
3-Aug	0.8	1.0	Z	0.9	1.2	1.3	1.5	2.0	1.3	2.7	1.6	1.3	1.2	1.2	2.2	0.9	0.8	0.7	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.7	1.7	0.5	0.5	0.5	0.5
4-Aug	0.4	0.5	0.5	Z	0.7	0.6	0.7	0.6	1.1	1.3	0.7	0.7	0.7	0.6	0.5	0.5	0.6	0.5	0.8	0.9	1.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5-Aug	0.5	0.5	0.5	0.6	Z	0.6	0.8	0.5	0.7	1.4	2.5	1.1	0.6	0.6	0.6	0.8	0.9	0.5	0.7	1.8	2.7	2.6	1.7	1.3	2.9	21.2	0.8	2.6	1.4	8.1	
6-Aug	1.6	4.1	21.2	4.2	1.6	Z	2.2	2.2	1.6	1.2	3.6	2.5	1.6	1.3	1.3	1.8	1.3	1.3	1.3	2.1	1.3	2.6	3.1	2.1	2.9	21.2	0.8	2.6	1.4	8.1	
7-Aug	Z	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.2	0.2	0.2	0.2	2.5	2.6	2.0	1.9	0.7	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.8	2.6	1.4	8.1	1.7	6.1	
8-Aug	0.3	Z	0.5	0.9	4.6	0.5	0.9	7.6	8.1	0.9	1.0	1.0	0.7	0.6	0.4	0.2	0.2	0.2	0.3	0.5	0.7	0.8	1.5	0.2	1.4	8.1	1.7	6.1	3.1	14.0	
9-Aug	0.2	2.5	Z	0.7	1.8	2.3	0.2	0.3	0.2	0.3	0.6	2.4	4.5	2.4	0.6	1.3	1.9	3.1	1.8	3.3	6.1	2.4	0.2	0.7	1.7	6.1	3.1	14.0	0.6	1.7	
10-Aug	5.5	8.7	5.6	Z	1.6	1.7	2.2	3.1	14.0	5.6	8.4	5.7	6.7	0.2	0.2	0.2	0.2	1.6	0.2	0.2	0.2	0.2	0.2	0.2	3.1	14.0	0.6	1.7	0.5	1.0	
11-Aug	0.2	0.2	0.2	0.2	Z	0.5	0.4	0.3	0.7	0.6	1.0	1.7	1.5	0.9	0.8	0.8	0.5	0.5	0.6	0.5	0.6	0.5	0.7	0.7	0.6	1.7	0.6	1.7	0.5	1.0	
12-Aug	0.6	0.5	0.5	0.4	0.3	Z	0.6	0.5	0.6	0.5	0.9	0.5	0.3	0.3	0.3	0.4	0.8	0.5	0.4	0.4	0.6	0.6	1.0	0.7	0.5	1.0	0.6	1.0	0.6	1.0	
13-Aug	Z	1.0	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.6	1.0	0.5	0.5	0.6	0.6	0.6	0.6	1.0	0.6	1.0	0.6	1.0	
14-Aug	0.6	Z	0.3	0.4	0.4	0.4	0.4	4.6	5.7	4.3	1.4	M	0.6	0.6	0.5	0.2	0.4	0.7	1.0	0.7	0.9	1.1	1.5	1.2	5.7	1.2	5.7	1.1	1.5		
15-Aug	0.6	1.2	Z	0.8	0.7	0.7	0.9	C	C	C	C	C	0.5	0.5	0.5	0.7	0.6	7.3	0.6	0.6	0.4	2.1	5.0	4.4	1.6	7.3	1.6	7.3	0.6	1.0	
16-Aug	5.4	5.5	6.2	Z	3.6	1.4	1.1	1.5	3.4	3.0	2.0	1.3	1.0	0.9	0.7	0.6	0.5	0.7	0.6	1.2	0.9	1.4	0.5	0.4	1.9	6.2	1.9	6.2	0.6	1.0	
17-Aug	0.4	0.2	0.2	0.3	Z	1.6	1.1	0.9	1.0	M	M	M	M	M	0.3	0.2	0.3	0.7	0.3	0.9	3.5	4.3	3.9	2.7	1.3	4.3	1.3	4.3	0.6	1.0	
18-Aug	1.4	1.4	2.4	5.6	5.3	Z	3.4	3.0	1.8	1.4	1.5	1.8	1.0	0.6	1.3	4.0	3.9	3.1	2.4	3.2	2.8	2.7	1.3	1.6	2.5	5.6	2.5	5.6	0.6	1.0	
19-Aug	Z	2.5	0.5	0.4	0.4	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.7	0.5	0.4	0.5	0.3	0.4	2.5	0.4	2.5	0.6	1.0	
20-Aug	0.4	Z	0.8	0.9	0.5	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.4	0.4	0.4	0.5	0.3	0.4	0.8	0.8	0.7	0.4	0.4	0.5	0.6	0.9	0.6	0.9	0.6	1.0	
21-Aug	0.6	0.6	Z	0.7	0.5	0.6	8.4	6.9	2.1	1.4	2.9	1.7	1.2	0.8	0.8	0.8	0.4	0.4	0.6	0.6	0.8	1.4	1.4	0.9	1.6	8.4	1.6	8.4	0.6	1.0	
22-Aug	5.2	4.1	5.0	Z	6.4	5.8	7.7	6.1	1.8	6.1	1.0	1.0	1.0	0.9	0.9	0.8	0.9	1.0	1.0	1.7	1.3	1.6	1.5	1.0	2.8	7.7	2.8	7.7	0.6	1.0	
23-Aug	0.9	0.7	1.2	0.5	Z	2.8	2.3	3.0	3.2	3.5	4.6	0.8	0.7	0.4	0.4	0.6	2.2	2.4	1.0	0.7	2.4	4.3	5.9	1.9	5.9	1.9	5.9	0.6	1.0		
24-Aug	9.4	5.4	5.2	7.4	7.2	Z	5.2	3.4	3.9	2.8	2.5	4.6	3.3	2.0	0.7	2.4	1.6	1.8	2.1	2.8	8.7	1.8	1.4	1.3	3.8	9.4	3.8	9.4	0.6	1.0	
25-Aug	Z	4.1	2.2	2.1	0.8	1.1	1.3	2.6	2.0	1.1	0.9	0.9	0.9	1.1	1.1	1.4	0.9	1.1	PF	1.7	1.2	0.9	1.2	0.8	1.4	4.1	1.4	4.1	0.6	1.0	
26-Aug	0.9	Z	0.9	0.8	0.9	0.9	1.0	1.2	1.5	1.1	1.2	0.9	0.9	0.7	0.8	0.9	0.8	1.9	3.3	2.8	1.5	3.5	5.8	4.3	1.7	5.8	1.7	5.8	0.6	1.0	
27-Aug	4.6	5.7	Z	6.1	5.4	5.2	6.5	6.3	6.5	9.1	5.6	1.9	2.3	1.8	1.5	1.4	1.6	1.8	2.2	1.4	2.9	1.1	1.1	1.2	3.6	9.1	3.6	9.1	0.6	1.0	
28-Aug	1.0	0.7	0.8	Z	0.8	0.9	1.8	1.2	1.3	1.1	1.1	M	M	1.0	1.4	1.0	2.8	0.8	0.9	1.3	1.0	1.2	0.5	0.5	1.1	2.8	1.1	2.8	0.6	1.0	
29-Aug	0.5	0.6	0.6	0.3	Z	1.6	1.1	1.5	1.6	2.4	1.7	3.0	1.9	1.1	1.0	1.1	1.4	2.0	2.9	3.1	4.5	1.4	2.4	2.4	1.7	4.5	1.7	4.5	0.6	1.0	
30-Aug	2.5	PF	PF	PF	PF	PF	PF	PF	PF	3.1	2.5	3.2	3.9	2.3	1.3	0.8	0.9	1.2	1.6	1.0	1.1	1.3	1.4	4.5	--	4.5	--	4.5	0.6	1.0	
31-Aug	Z	4.3	4.1	1.5	2.5	1.5	2.5	2.1	1.6	1.8	1.7	1.4	1.2	1.2	1.1	1.4	1.0	1.3	1.4	1.5	1.2	1.6	1.4	1.2	1.8	4.3	1.8	4.3	0.6	1.0	
		1.8	2.3	2.5	1.5	2.0	1.4	1.9	2.3	2.5	2.1	1.9	1.6	1.5	1.0	0.8	1.0	0.9	1.3	1.1	1.3	1.7	1.4	1.5	1.4	Diurnal Average					
		9.4	8.7	21.2	7.4	7.2	5.8	8.4	7.6	14.0	9.1	8.4	5.7	6.7	2.6	2.2	4.0	3.9	7.3	3.3	3.3	8.7	4.3	5.8	5.9	Diurnal Maximum					
Z - zerospan		C - Calibration				M - Maintenance				PF - Power Failure																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	691	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: 692

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Anzac - August 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	9	9	6	21	48	46	24	34	35	43	110	131	54	32	24	642
21 - 40	0	0	0	0	0	0	0	0	0	0	1	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	16	9	9	6	21	48	46	24	34	35	44	110	131	54	32	24	643

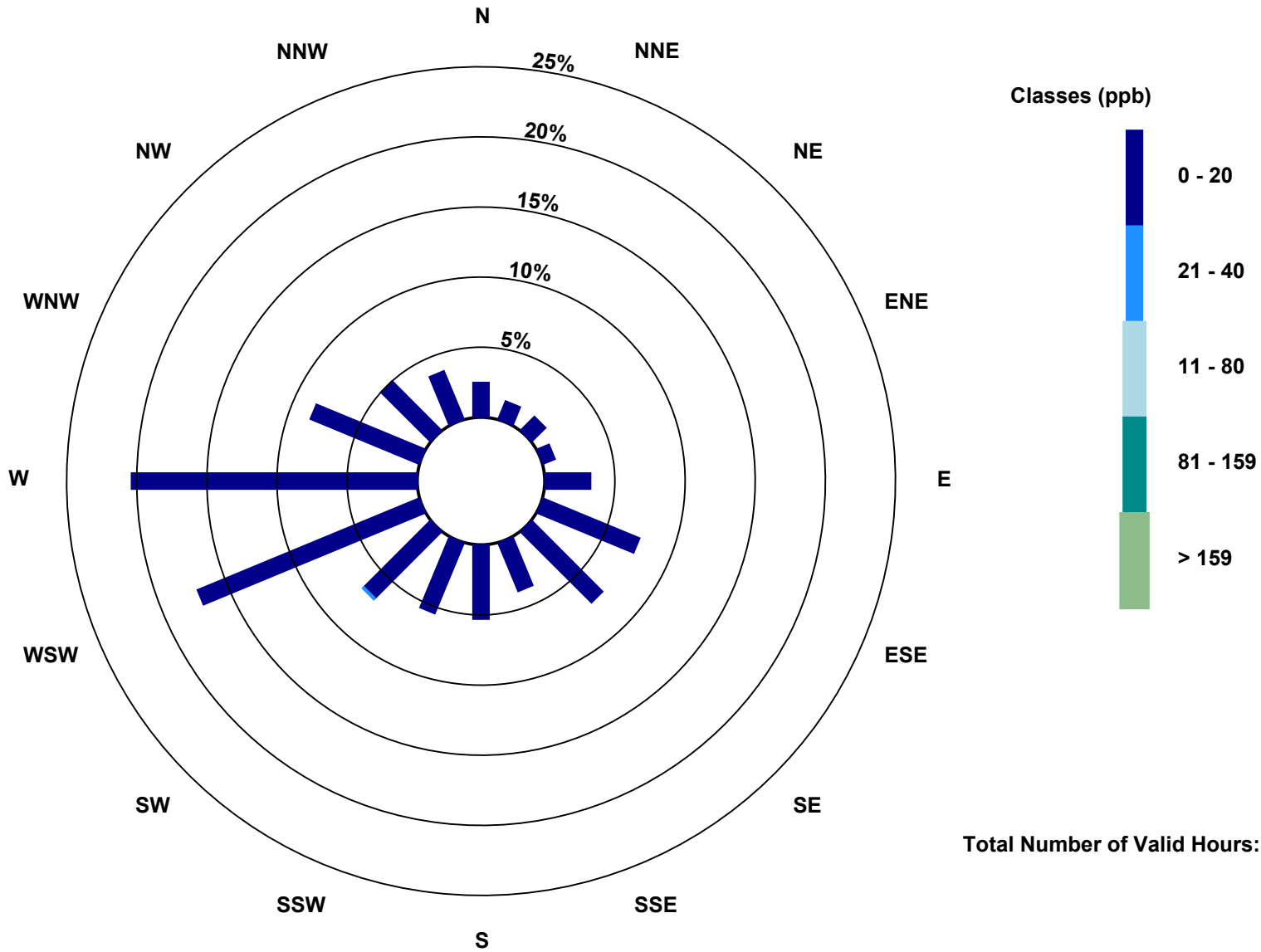
Total Number of Valid Hours: 643

Total Number of Hours: 744

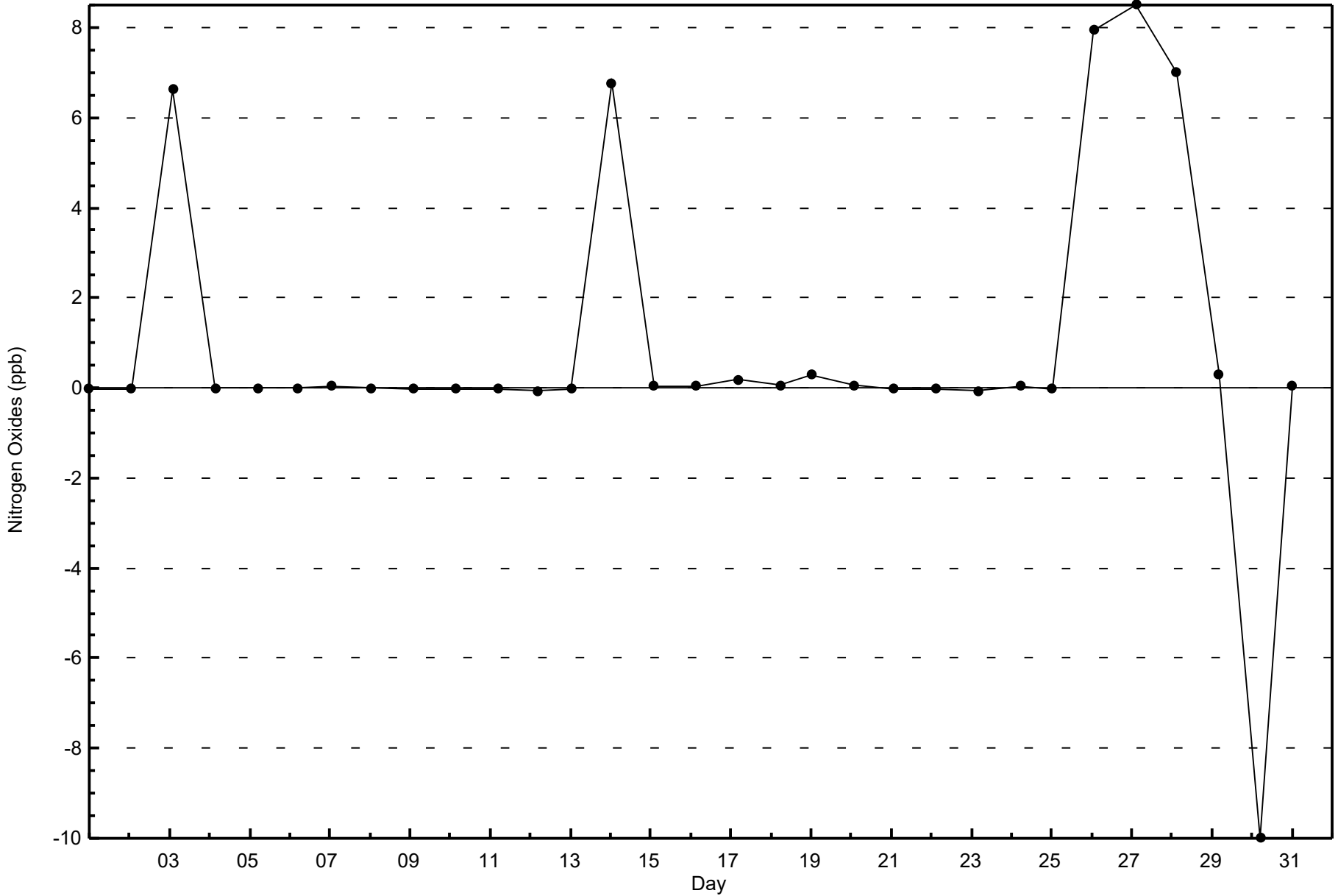


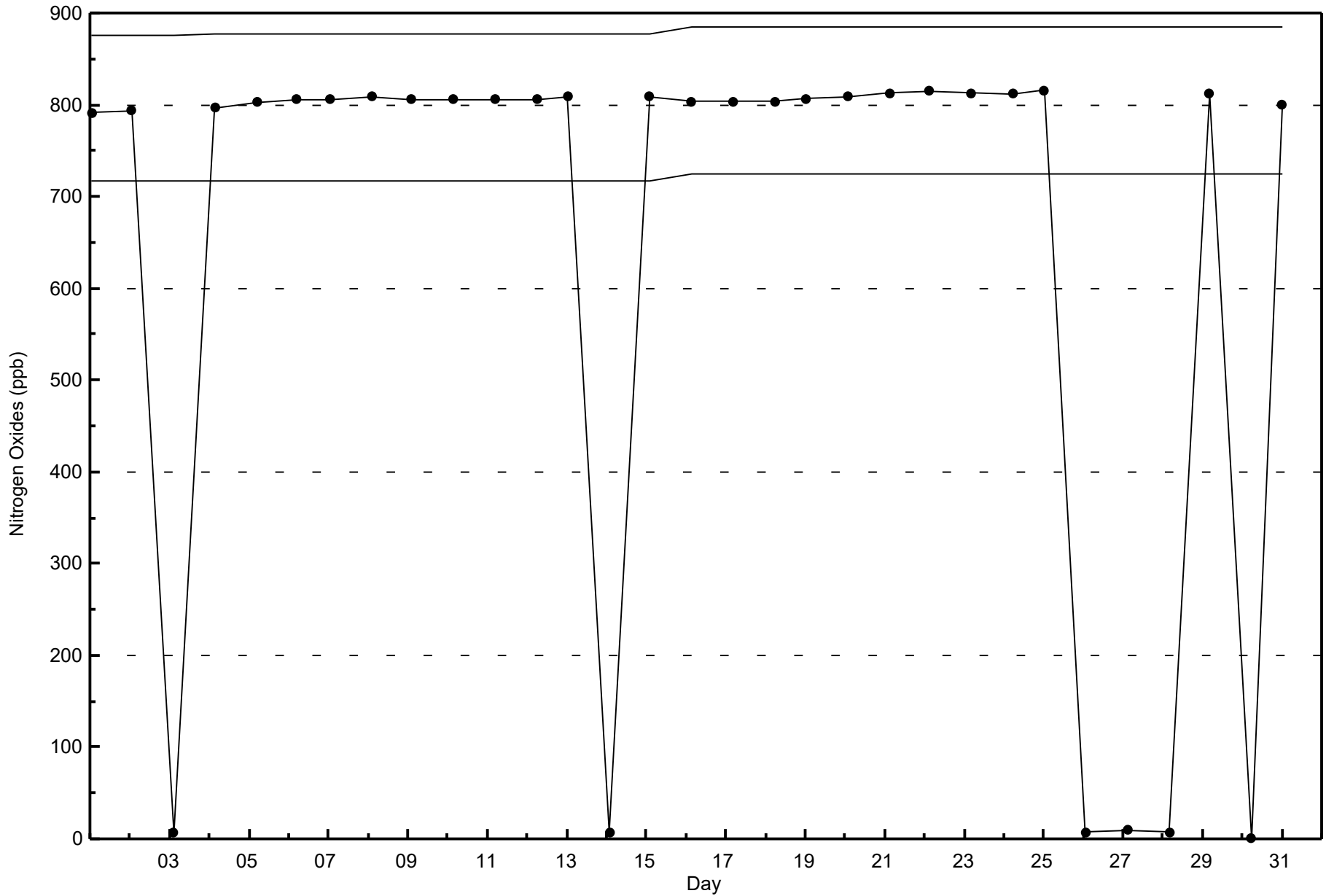
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Anzac



Total Number of Valid Hours: 643







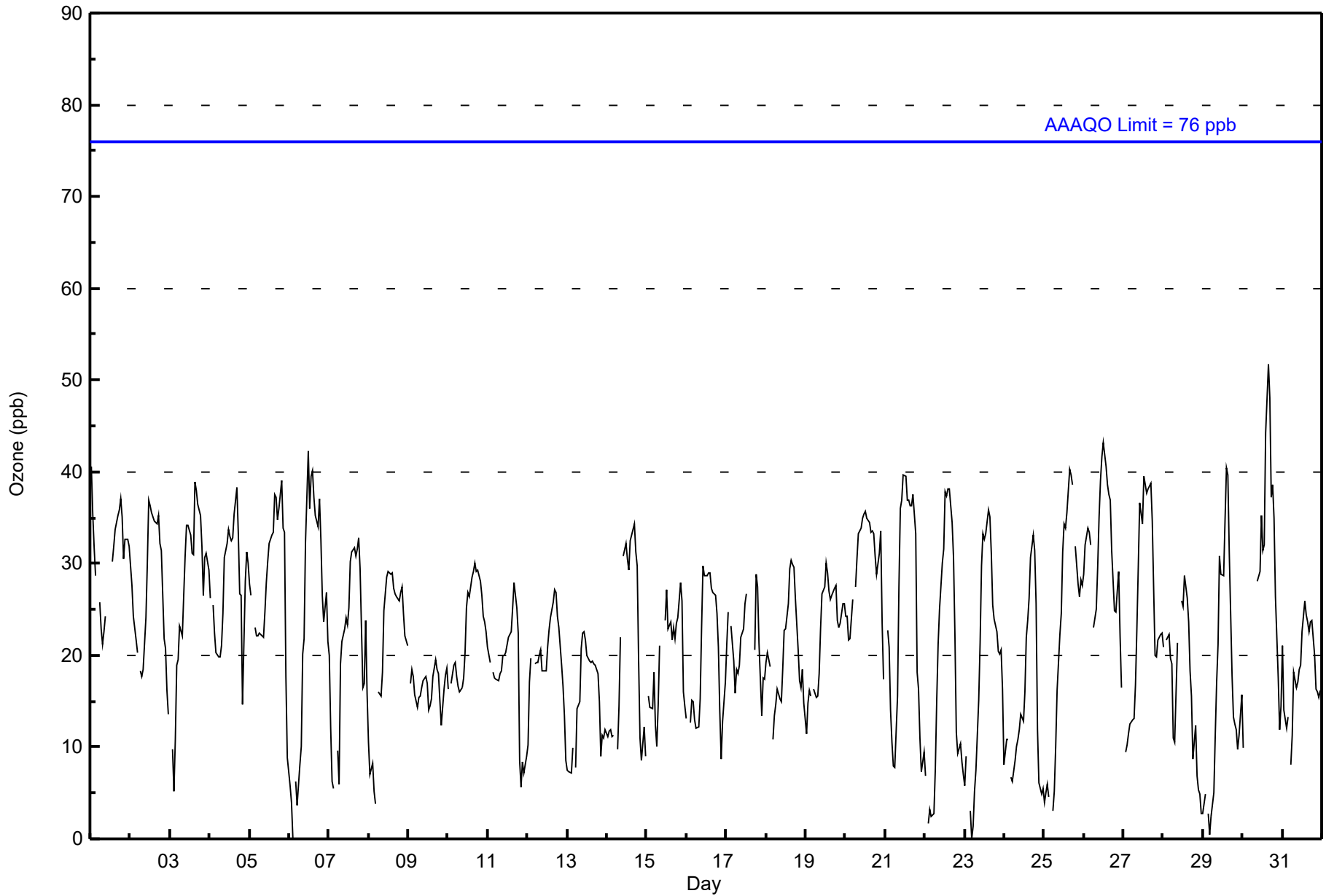
Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

Anzac - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744						
Maximum Value: 51.8 ppb on Aug 30 16:00		Maximum Daily Average: 31.6 ppb on Aug 26																	Hours of Data:	693							
Minimum Value: 0.0 ppb on Aug 6 03:00		Minimum Daily Average: 15.1 ppb on Aug 24																	Hours of Missing Data:	51							
Maximum Diurnal Average: 31.9 ppb at hour 16		Minimum Diurnal Average: 12.5 ppb at hour 6																	Hours of Calibration:	33							
Monthly Average: 22.23 ppb		Percentiles: P ₁ = 2.7 P ₁₀ = 9.0 Q ₁ = 15.5 Median = 22.2 Q ₃ = 29.7 P ₉₀ = 35.0 P ₉₉ = 40.6																	Percent Operational Time:	97.6							
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-Aug	40.6	35.4	31.7	28.7	Z	25.8	22.8	21.2	22.6	24.3	C	C	C	30.1	31.9	33.7	35.2	35.9	37.0	35.0	30.5	32.6	32.6	31.8	31.0	40.6	
2-Aug	29.8	27.6	24.3	21.6	20.3	Z	18.4	17.6	18.5	24.2	30.0	37.0	36.3	35.5	34.6	34.5	34.3	35.2	32.2	31.4	21.9	20.7	16.2	13.6	26.8	37.0	
3-Aug	Z	9.7	5.2	10.9	19.0	19.5	23.2	22.0	26.6	30.8	34.2	34.2	33.1	31.2	31.0	38.9	38.0	36.4	35.2	31.8	26.5	30.7	31.0	29.2	27.3	38.9	
4-Aug	26.2	Z	25.5	22.5	20.3	19.8	19.8	21.0	24.5	30.7	32.2	33.6	32.9	32.5	32.8	35.4	38.2	33.3	26.7	26.5	14.7	28.1	31.3	30.0	27.8	38.2	
5-Aug	27.8	26.6	Z	23.0	22.2	22.1	22.4	22.3	22.0	24.7	27.9	30.2	32.9	33.1	33.4	37.6	37.3	34.8	36.0	39.1	33.8	33.5	17.7	8.9	28.2	39.1	
6-Aug	5.8	3.9	0.0	Z	6.3	3.6	8.1	10.1	20.2	21.8	32.4	42.3	36.1	39.5	40.1	37.2	35.2	34.0	37.1	32.7	26.5	23.6	26.8	21.6	23.7	42.3	
7-Aug	19.9	12.1	6.2	5.5	Z	9.6	5.9	19.1	21.5	22.9	24.1	23.3	25.2	30.2	31.2	31.7	30.8	31.6	32.8	29.4	16.5	17.0	23.8	15.8	21.1	32.8	
8-Aug	10.5	7.0	8.2	5.1	3.8	Z	16.0	15.5	18.2	24.9	26.8	28.6	29.2	28.8	29.0	27.3	26.7	26.4	25.9	26.8	27.4	24.6	22.1	21.0	20.9	29.2	
9-Aug	Z	16.9	18.5	17.7	15.6	14.4	15.3	15.6	16.5	17.3	17.7	16.9	14.1	14.6	15.2	17.6	19.5	18.4	17.9	15.1	12.4	16.3	17.8	18.6	16.5	19.5	
10-Aug	16.4	Z	16.9	19.0	19.3	17.8	16.6	16.1	16.4	17.6	20.2	25.1	26.9	26.3	28.5	29.1	30.0	29.1	29.4	28.1	26.6	24.3	23.6	22.6	22.9	30.0	
11-Aug	20.9	19.1	Z	18.2	17.5	17.3	17.2	17.9	18.2	20.0	19.9	20.3	21.9	22.2	22.6	25.2	27.9	25.1	22.4	8.6	5.6	8.4	7.2	9.0	17.9	27.9	
12-Aug	10.3	17.1	19.7	Z	19.0	19.2	19.2	20.0	20.6	18.3	18.2	18.3	21.0	22.7	24.1	25.8	27.2	26.9	24.3	23.1	19.0	16.6	13.4	8.6	19.7	27.2	
13-Aug	7.4	7.3	7.2	9.9	Z	7.7	14.2	15.0	20.7	22.5	22.6	21.7	19.9	19.3	19.2	19.4	19.1	19.0	18.0	14.9	9.1	11.4	11.0	11.9	15.1	22.6	
14-Aug	11.2	11.7	11.9	11.2	11.3	Z	9.8	14.5	22.0	M	30.8	32.2	30.5	29.2	32.5	33.2	34.3	31.2	29.7	19.5	11.0	8.5	12.3	9.0	20.3	34.3	
15-Aug	Z	15.5	14.3	14.1	18.1	12.4	10.0	14.7	21.0	M	M	23.8	27.2	22.8	23.6	21.7	23.0	21.8	23.6	24.1	27.9	26.0	16.0	14.5	19.8	27.9	
16-Aug	13.1	Z	12.6	15.1	15.0	12.9	12.0	12.1	15.2	23.0	29.7	28.7	28.7	28.9	28.9	27.3	26.8	26.6	24.5	20.8	13.9	8.7	12.8	17.1	19.8	29.7	
17-Aug	21.3	24.7	Z	23.1	19.4	15.8	18.4	18.0	18.8	22.0	23.0	25.6	26.7	M	M	M	M	20.6	28.8	27.4	21.3	13.4	17.6	17.4	21.2	28.8	
18-Aug	19.2	20.2	18.7	Z	10.9	13.4	14.6	16.3	15.2	14.9	18.6	22.7	22.9	25.6	29.4	30.4	29.9	29.6	26.3	20.6	17.3	16.4	18.4	14.8	20.3	30.4	
19-Aug	11.4	14.8	16.2	15.6	Z	16.4	15.4	15.6	18.0	22.9	26.8	27.5	30.0	28.9	27.0	26.1	26.5	27.3	27.6	23.8	23.0	23.5	25.6	25.6	22.4	30.0	
20-Aug	24.2	24.3	21.6	21.8	26.0	Z	27.5	30.5	33.2	33.8	34.9	35.4	35.7	34.9	34.4	33.5	33.6	33.3	30.8	28.8	31.0	33.5	23.4	17.4	29.7	35.7	
21-Aug	Z	22.7	20.8	14.0	10.6	8.0	7.8	15.6	27.4	36.0	36.9	39.6	39.5	36.9	37.0	36.3	36.3	37.5	33.3	18.2	16.4	11.0	7.3	9.5	24.3	39.6	
22-Aug	6.9	Z	1.6	3.2	2.5	2.8	7.6	15.1	21.2	25.0	30.0	31.6	37.9	37.4	38.1	38.1	34.5	30.7	22.3	11.7	9.4	10.4	8.4	7.0	18.8	38.1	
23-Aug	5.8	9.0	Z	3.1	0.0	1.4	5.3	7.5	15.1	21.3	29.7	33.3	32.6	33.2	35.8	35.1	31.0	25.4	24.0	22.6	20.4	20.1	20.6	16.4	19.5	35.8	
24-Aug	8.1	10.8	10.8	Z	6.6	6.3	8.5	10.0	10.8	11.9	13.6	12.8	16.0	22.0	23.9	26.3	30.7	33.0	31.4	25.6	11.8	6.2	4.8	5.5	15.1	33.0	
25-Aug	4.0	5.0	6.0	4.6	Z	3.0	5.1	10.0	16.1	22.2	24.6	31.2	34.4	33.9	35.6	40.3	39.7	38.6	PF	31.8	27.7	26.4	28.2	27.6	22.6	40.3	
26-Aug	28.8	32.0	33.8	33.4	32.1	Z	23.1	25.0	29.5	35.2	39.1	41.7	43.1	40.6	38.7	37.5	36.9	31.4	24.9	24.7	26.9	29.1	22.2	16.5	31.6	43.1	
27-Aug	Z	9.5	10.3	11.4	12.5	13.0	13.2	16.7	22.9	29.7	36.7	34.4	39.4	38.6	37.6	38.1	38.7	34.6	27.2	19.9	19.8	21.7	22.3	22.4	24.8	39.4	
28-Aug	20.8	Z	21.7	22.3	19.7	19.0	10.9	10.5	21.4	M	M	25.9	25.4	28.6	26.2	23.7	18.3	15.5	8.7	12.3	6.8	5.3	4.9	2.8	16.7	28.6	
29-Aug	2.8	5.0	Z	2.7	0.4	2.4	5.0	11.3	17.1	21.1	30.8	28.8	28.7	34.8	40.4	39.6	31.2	17.8	13.2	12.6	11.8	9.8	11.4	15.7	17.1	40.4	
30-Aug	9.9	PF	PF	PF	PF	PF	PF	PF	PF	28.1	29.2	35.2	31.5	32.0	44.3	51.8	48.1	37.2	38.7	35.0	26.3	17.5	11.9	14.6	--	51.8	
31-Aug	21.0	14.0	12.1	13.3	Z	8.1	11.3	18.1	16.5	17.2	18.5	18.9	22.6	25.9	24.4	23.7	22.5	23.6	23.8	20.0	16.3	16.0	15.3	16.1	18.2	25.9	
		16.3	16.1	15.0	15.0	14.5	12.5	14.2	16.5	20.3	23.7	27.1	28.7	29.4	30.0	31.0	31.9	31.4	29.1	27.1	23.9	19.7	19.1	18.0	16.5	Diurnal Average	
		40.6	35.4	33.8	33.4	32.1	25.8	27.5	30.5	33.2	36.0	39.1	42.3	43.1	40.6	44.3	51.8	48.1	38.6	38.7	39.1	33.8	33.5	32.6	31.8	Diurnal Maximum	
Z - zerospan		C - Calibration					M - Maintenance					PF - Power Failure															
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr 76 ppb																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ozone (O₃) - ppb
Anzac - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	301	43.43	43.43
21 - 50	391	56.42	99.86
51 - 82	1	0.14	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Anzac - August 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	3	0	0	5	30	33	16	18	19	20	45	36	24	16	8	275
21 - 50	15	7	9	6	16	18	12	12	13	16	28	62	95	28	17	14	368
51 - 82	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	17	10	9	6	21	48	46	28	31	35	48	107	131	52	33	22	644

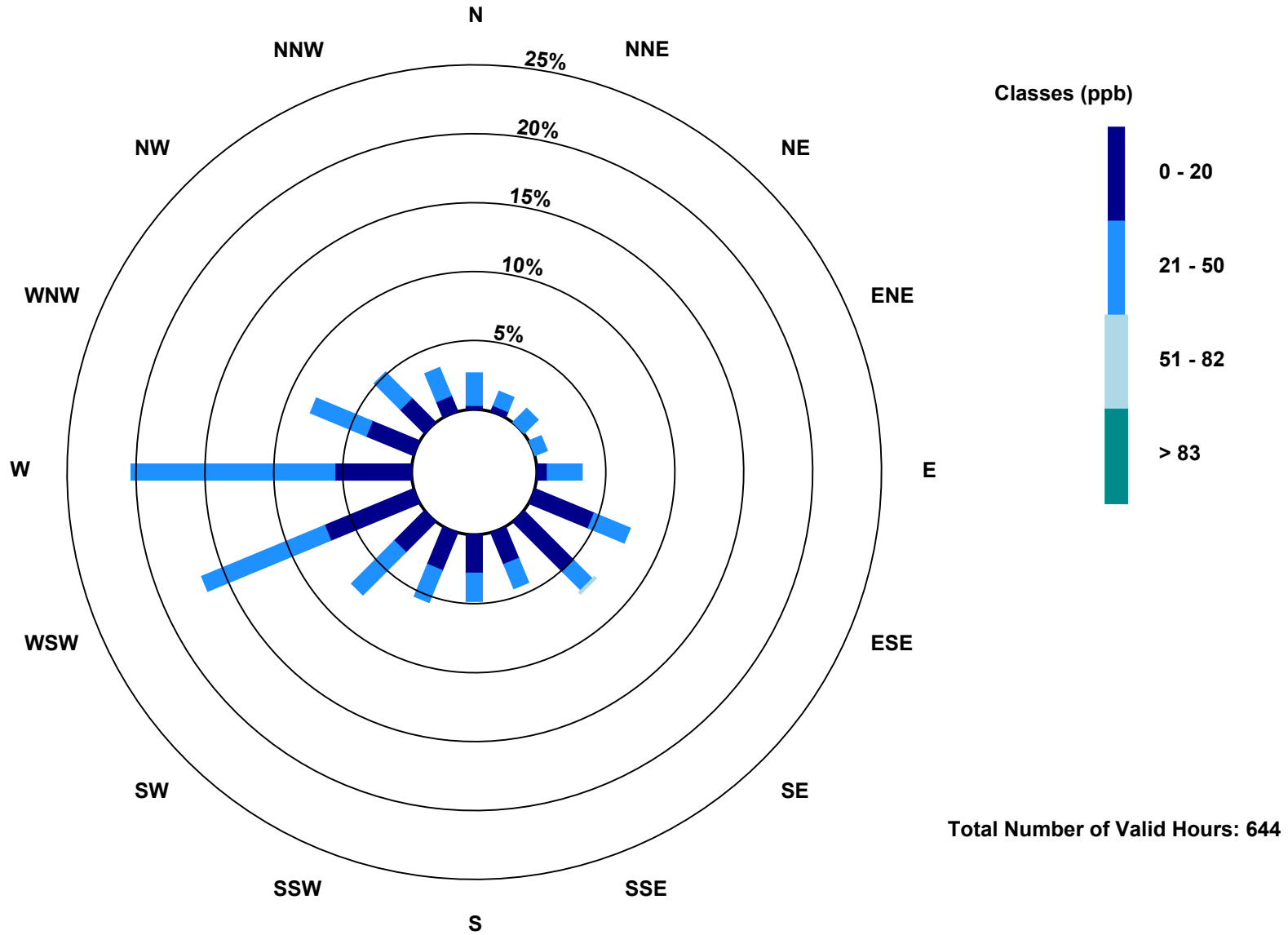
Total Number of Valid Hours: 644

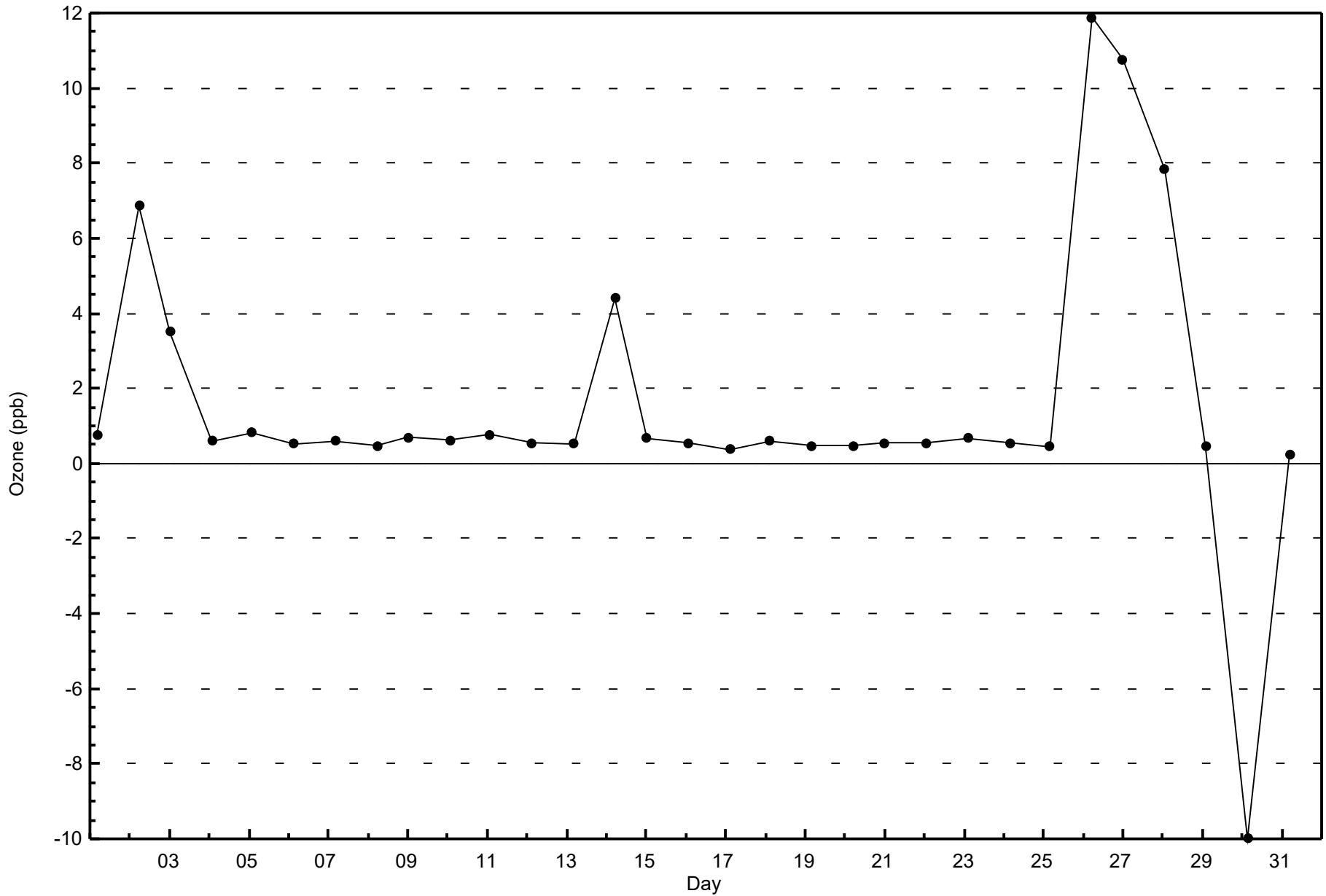
Total Number of Hours: 744

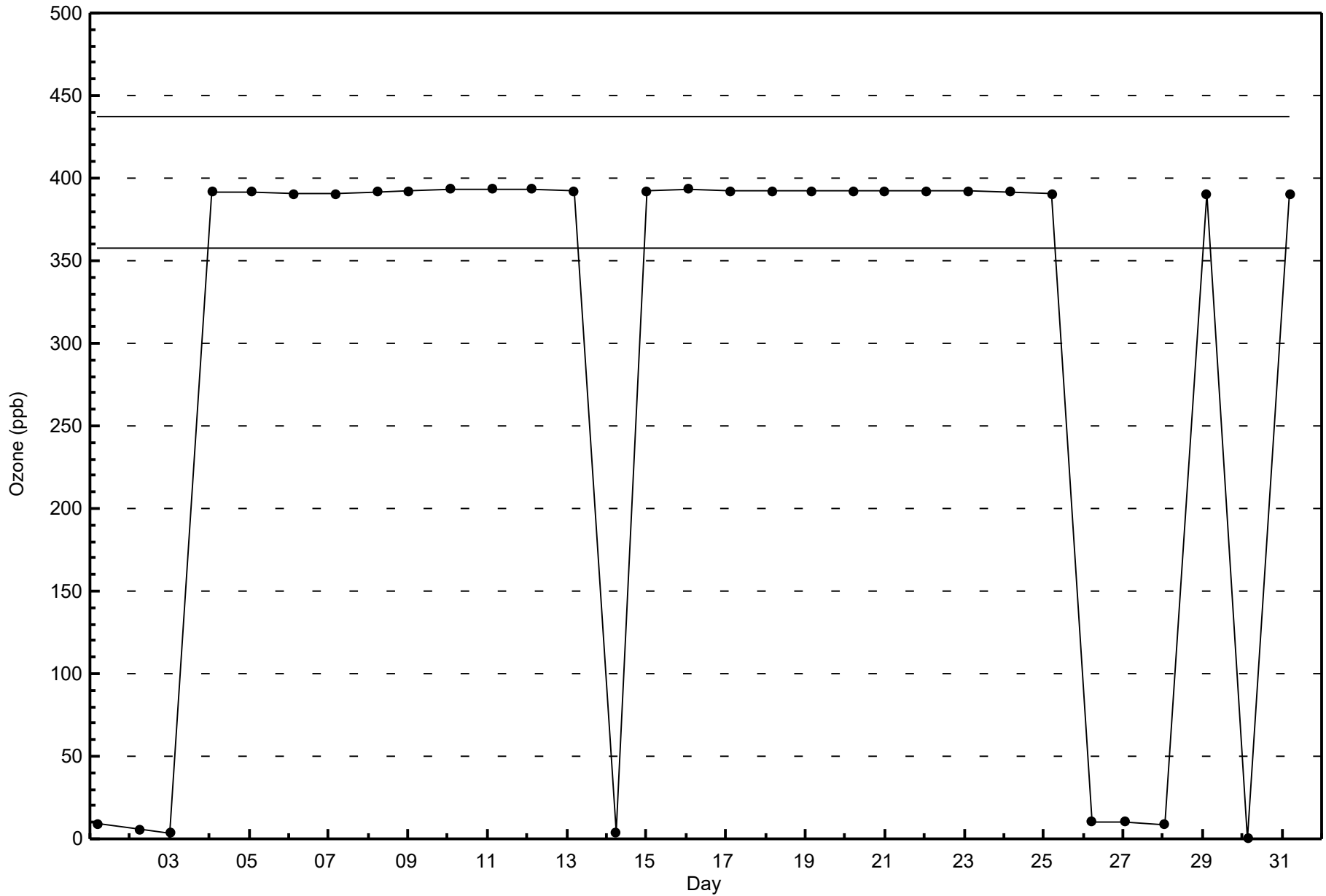


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Anzac









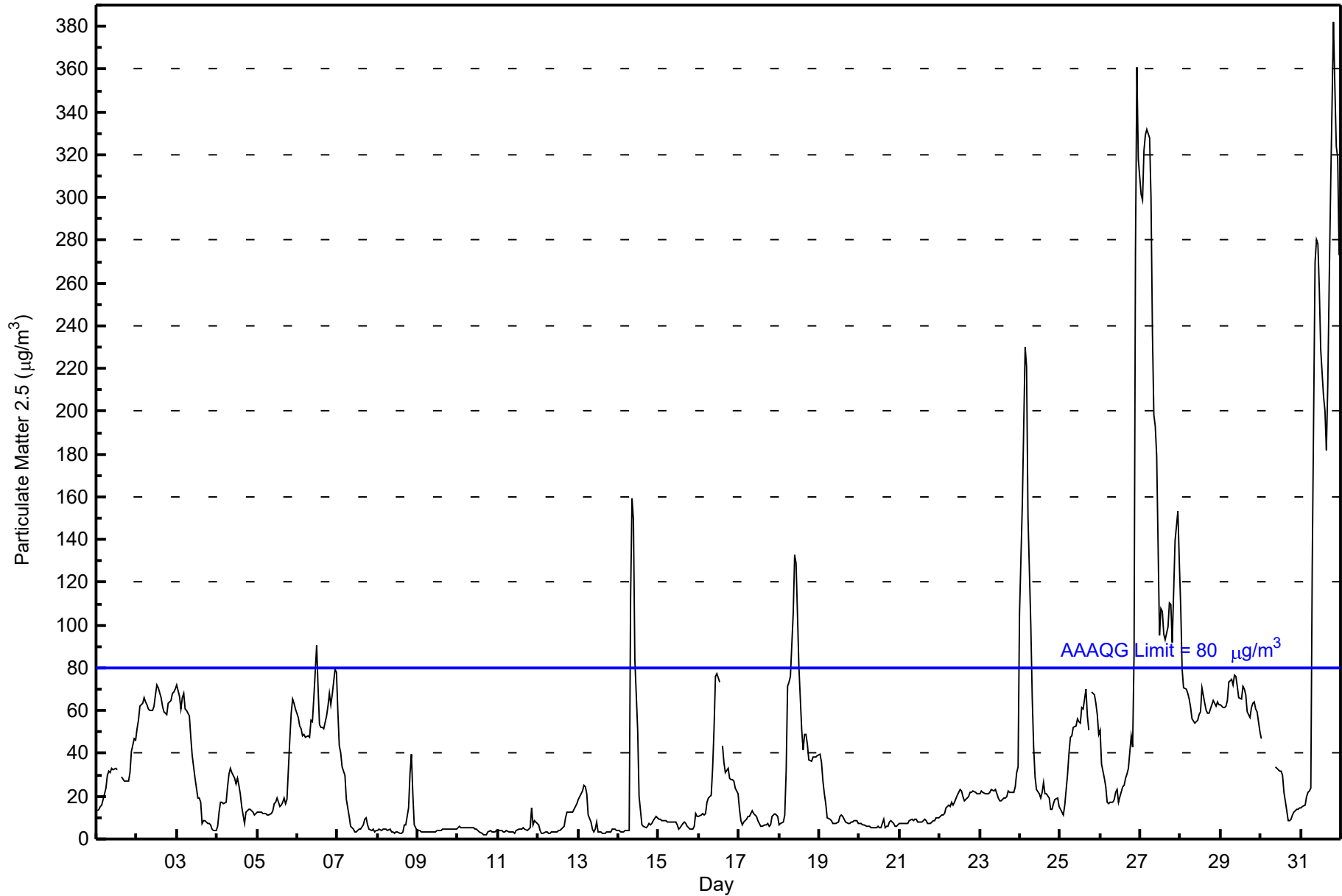
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Summary of Hour Averages

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

Anzac - August 2023

Number of Exceedences (AAAQO):		1-hr: 63		24-hr: 12		Hours in Service:		744																			
Maximum Value: 381.8 µg/m ³ on Aug 31 20:00		Maximum Daily Average: 191.3 µg/m ³ on Aug 31				Hours of Data:		732																			
Minimum Value: 1.7 µg/m ³ on Aug 10 17:00		Minimum Daily Average: 4.0 µg/m ³ on Aug 9				Hours of Missing Data:		12																			
Maximum Diurnal Average: 49.7 µg/m ³ at hour 23		Minimum Diurnal Average: 29.5 µg/m ³ at hour 16				Hours of Calibration:		2																			
Monthly Average: 38.35 µg/m ³		Percentiles: P ₁ = 2.8 P ₁₀ = 4.0 Q ₁ = 6.9 Median = 16.9 Q ₃ = 51.5 P ₉₀ = 73.4 P ₉₉ = 320.9				Percent Operational Time:		98.7																			
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-Aug	12.9	14.1	15.3	15.6	18.3	23.6	29.5	31.9	31.2	33.1	32.4	32.8	32.7	C	C	29.3	27.1	27.1	27.2	27.2	30.9	41.0	46.9	46.5	28.5	46.9	
2-Aug	51.4	55.5	62.4	63.4	65.8	64.0	62.6	61.0	60.4	60.2	62.0	67.3	71.9	71.0	66.1	62.3	59.7	59.1	58.3	63.4	64.9	68.3	69.0	69.9	63.3	71.9	
3-Aug	71.9	66.6	61.0	65.8	68.3	60.7	60.3	57.4	47.8	39.2	33.5	28.3	19.1	19.1	17.0	7.2	8.3	8.6	7.2	7.2	6.3	4.6	3.9	4.1	32.2	71.9	
4-Aug	6.1	12.4	17.1	17.4	16.5	17.1	24.4	30.5	33.3	30.9	28.7	25.9	28.5	25.0	21.3	15.0	7.3	12.7	13.5	14.1	14.2	12.6	11.3	12.1	18.7	33.3	
5-Aug	12.6	12.6	12.3	12.2	12.1	11.8	11.5	11.5	12.2	13.2	16.3	17.4	19.4	15.5	15.7	17.4	19.2	16.6	18.7	46.1	58.9	65.4	63.4	60.5	23.9	65.4	
6-Aug	57.1	52.8	51.3	48.2	49.0	47.3	48.0	47.5	55.6	54.9	66.4	90.4	70.5	53.3	52.3	52.2	51.8	57.4	62.2	68.1	62.9	67.6	79.3	77.9	59.3	90.4	
7-Aug	59.8	43.8	40.1	34.0	29.7	18.5	14.8	10.5	6.2	4.3	3.6	3.1	4.0	4.8	4.6	6.8	9.5	10.1	6.4	4.5	4.2	4.4	3.6	4.0	14.0	59.8	
8-Aug	4.1	4.4	4.3	4.3	4.9	4.5	4.3	4.5	3.5	3.4	3.0	3.3	3.1	2.8	2.7	3.1	6.5	6.9	14.5	30.2	39.4	21.1	6.8	4.3	7.9	39.4	
9-Aug	3.9	3.9	3.6	3.5	3.6	3.5	3.2	3.3	3.2	3.5	3.6	3.7	3.7	4.0	4.2	4.6	4.9	4.5	4.6	4.7	4.8	4.8	4.8	4.7	4.0	4.9	
10-Aug	5.1	5.8	5.3	5.0	5.1	5.1	5.3	5.2	5.3	5.6	4.8	4.5	4.1	3.3	2.8	2.1	1.7	1.9	3.4	3.7	3.1	3.4	3.6	3.9	4.1	5.8	
11-Aug	4.0	4.0	3.8	3.6	3.4	3.6	3.4	3.4	3.3	3.2	2.7	3.7	4.5	4.9	4.9	5.3	4.4	4.2	4.6	5.5	14.3	6.4	8.7	7.4	4.9	14.3	
12-Aug	6.8	4.1	2.9	2.9	3.1	3.0	3.0	2.8	3.0	3.1	3.4	3.5	3.8	4.1	4.5	5.9	10.1	12.3	12.4	12.5	12.8	13.8	15.1	16.4	6.9	16.4	
13-Aug	18.5	20.1	22.4	24.8	24.2	21.3	11.4	7.9	4.4	3.4	4.7	8.0	3.1	3.0	2.9	2.9	2.9	3.3	3.2	3.2	4.4	4.5	4.4	4.1	8.9	24.8	
14-Aug	3.8	3.5	3.2	3.4	3.7	3.7	4.1	13.2	159.0	149.4	83.7	50.6	20.1	13.0	6.7	5.8	5.3	5.7	7.0	6.7	7.5	8.8	10.7	9.8	28.7	159.0	
15-Aug	9.1	9.0	8.8	8.6	8.4	8.1	8.0	7.9	7.7	8.2	7.9	6.6	4.9	5.0	7.1	8.2	7.2	6.1	5.6	4.9	4.7	6.1	12.1	10.8	7.5	12.1	
16-Aug	10.8	11.5	12.2	11.5	11.8	16.9	19.2	20.4	33.0	51.8	76.0	77.4	73.7	M	43.8	35.7	31.0	32.7	28.1	27.9	27.8	26.9	23.7	21.0	31.5	77.4	
17-Aug	14.0	8.7	6.8	7.9	9.2	10.3	10.5	11.6	13.2	12.1	10.6	8.5	7.0	6.0	6.2	6.6	6.8	7.2	6.2	6.9	10.8	12.0	11.3	10.3	9.2	14.0	
18-Aug	6.9	7.3	8.1	11.3	31.8	71.4	73.2	76.0	106.0	132.6	129.0	105.3	80.6	51.1	41.4	49.0	49.0	44.0	37.1	36.5	38.3	38.2	38.3	38.7	54.2	132.6	
19-Aug	39.5	35.6	27.0	21.4	16.2	9.9	9.0	8.4	7.5	7.1	7.2	8.0	10.6	11.2	10.6	9.0	8.1	7.5	7.3	7.8	8.0	8.8	8.3	7.2	12.6	39.5	
20-Aug	7.5	7.0	6.8	6.4	5.9	5.9	5.8	5.5	5.2	5.5	5.4	5.6	5.2	5.0	9.2	5.6	5.6	5.8	7.7	8.8	7.6	6.0	6.2	6.6	6.3	9.2	
21-Aug	7.0	7.1	7.2	7.3	7.3	7.5	8.3	9.0	8.4	9.3	9.5	7.7	7.7	7.7	8.8	9.1	8.5	7.6	7.3	8.1	8.3	8.9	9.6	9.9	8.2	9.9	
22-Aug	10.3	11.3	11.0	11.9	14.8	15.8	15.2	16.9	15.7	17.3	20.8	21.9	23.0	22.2	19.7	17.9	19.1	19.7	21.8	21.7	22.2	22.0	21.1	21.0	18.1	23.0	
23-Aug	21.1	22.4	22.0	21.1	21.4	20.9	21.7	22.8	22.6	23.1	20.9	19.3	17.6	17.8	19.5	19.2	19.7	22.2	21.9	22.0	22.0	24.5	31.2	33.9	22.1	33.9	
24-Aug	105.2	156.8	193.4	230.0	220.8	150.6	99.5	65.8	43.3	28.9	23.0	21.2	19.3	22.1	26.3	20.8	21.0	19.0	13.9	14.1	16.7	18.8	19.3	15.4	65.2	230.0	
25-Aug	14.1	12.6	11.3	16.0	30.5	40.7	47.5	48.3	52.5	52.8	56.5	54.7	54.4	61.8	60.6	70.3	57.8	51.2	PF	68.8	67.7	63.1	58.1	49.1	47.9	70.3	
26-Aug	50.9	35.1	28.3	24.2	17.2	16.6	17.4	17.0	18.4	21.6	22.8	17.1	19.6	24.2	25.3	28.3	30.1	33.3	48.1	42.9	85.9	274.3	360.9	317.8	65.7	360.9	
27-Aug	301.6	298.8	321.9	329.3	332.1	328.1	299.5	236.7	198.5	193.3	178.9	95.5	107.6	106.5	95.8	93.5	99.1	110.3	109.7	92.1	115.4	139.7	153.3	129.6	186.1	332.1	
28-Aug	108.3	79.2	70.7	70.3	67.8	65.3	61.4	56.4	54.1	54.5	55.7	58.2	59.7	70.4	63.2	60.2	58.6	58.8	60.7	64.5	63.4	62.3	64.1	63.0	64.6	108.3	
29-Aug	62.7	61.7	61.7	62.3	64.9	73.4	74.7	72.4	76.9	75.8	71.5	65.8	65.3	71.5	70.1	67.6	59.2	57.0	61.4	63.1	63.9	61.1	59.6	50.2	65.6	76.9	
30-Aug	46.9	PF	PF	PF	PF	PF	PF	PF	PF	PF	33.9	32.5	31.9	31.7	29.7	21.9	13.0	8.7	8.6	9.5	11.2	12.3	13.6	14.1	14.5	--	46.9
31-Aug	14.3	15.3	15.7	19.7	21.6	22.7	24.1	27.6	269.9	280.3	278.6	257.0	229.0	207.1	200.2	181.6	213.2	260.2	304.0	381.8	351.4	324.0	318.6	272.7	191.3	381.8	
37.0 36.1 37.3 38.8 39.7 38.4 36.0 39.8 45.4 45.7 43.7 38.9 35.7 32.5 31.2 29.5 29.7 31.7 33.1 38.1 40.5 46.4 49.7 45.1																								Diurnal Average			
301.6 298.8 321.9 329.3 332.1 328.1 299.5 236.7 269.9 280.3 278.6 257.0 229.0 207.1 200.2 181.6 213.2 260.2 304.0 381.8 351.4 324.0 360.9 317.8																								Diurnal Maximum			
C - Calibration M - Maintenance PF - Power Failure																											
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 - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	142	19.40	19.40
6 - 15	209	28.55	47.95
16 - 25	107	14.62	62.57
26 - 80	211	28.83	91.39
> 81.0	63	8.61	100.00

Total Number of Valid Hours: 732

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Anzac - August 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	8	1	2	2	12	26	18	2	1	2	10	18	19	4	7	9	141
6 - 15	1	0	0	0	3	7	10	7	13	15	25	35	45	16	8	4	189
16 - 25	1	3	2	0	0	2	1	2	8	8	6	8	17	10	4	5	77
26 - 80	7	5	5	4	6	15	18	17	12	8	8	31	43	17	11	4	211
> 81.0	0	1	0	0	0	0	2	0	2	4	1	24	15	9	3	2	63
Totals	17	10	9	6	21	50	49	28	36	37	50	116	139	56	33	24	681

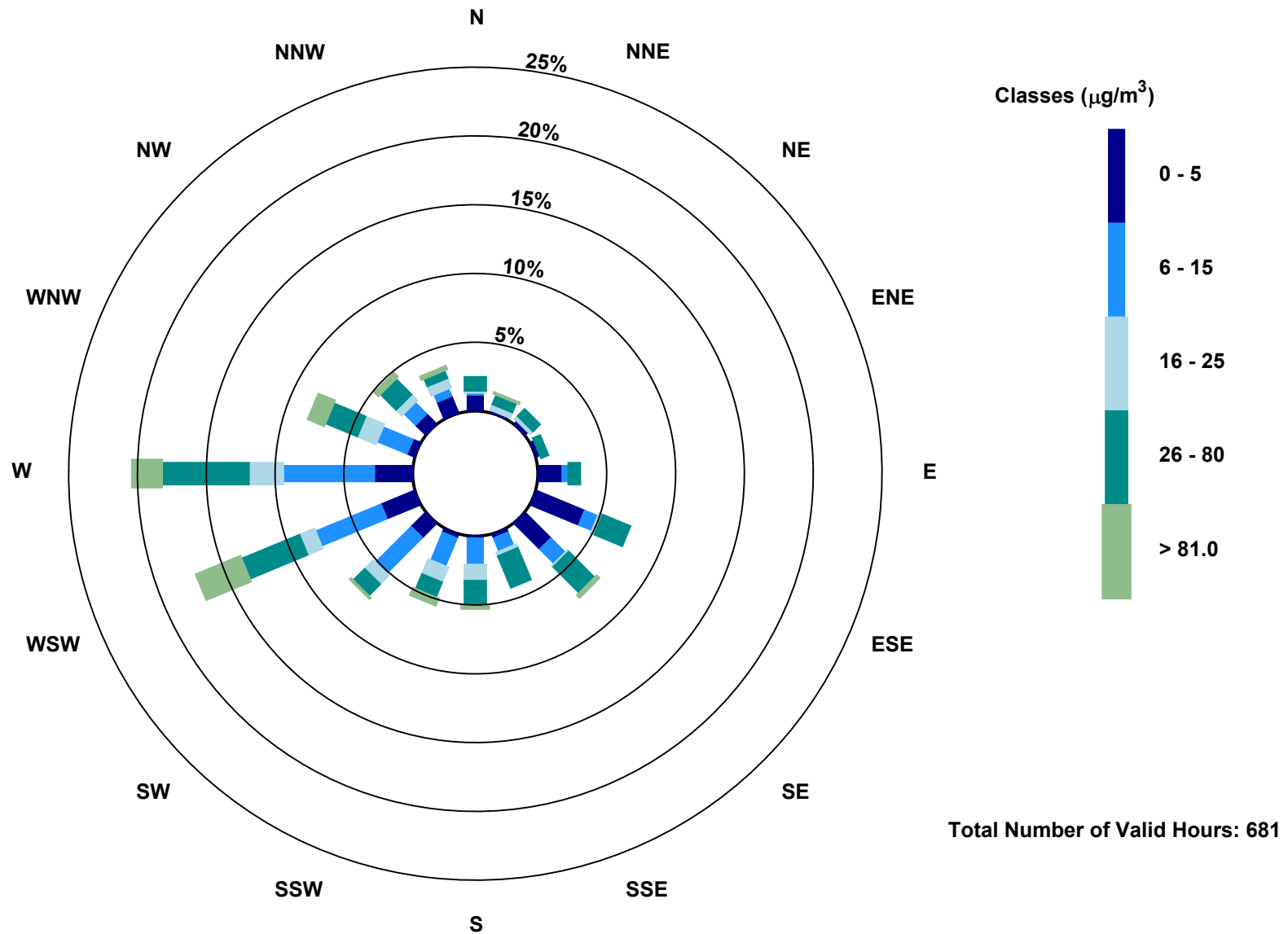
Total Number of Valid Hours: 681

Total Number of Hours: 744



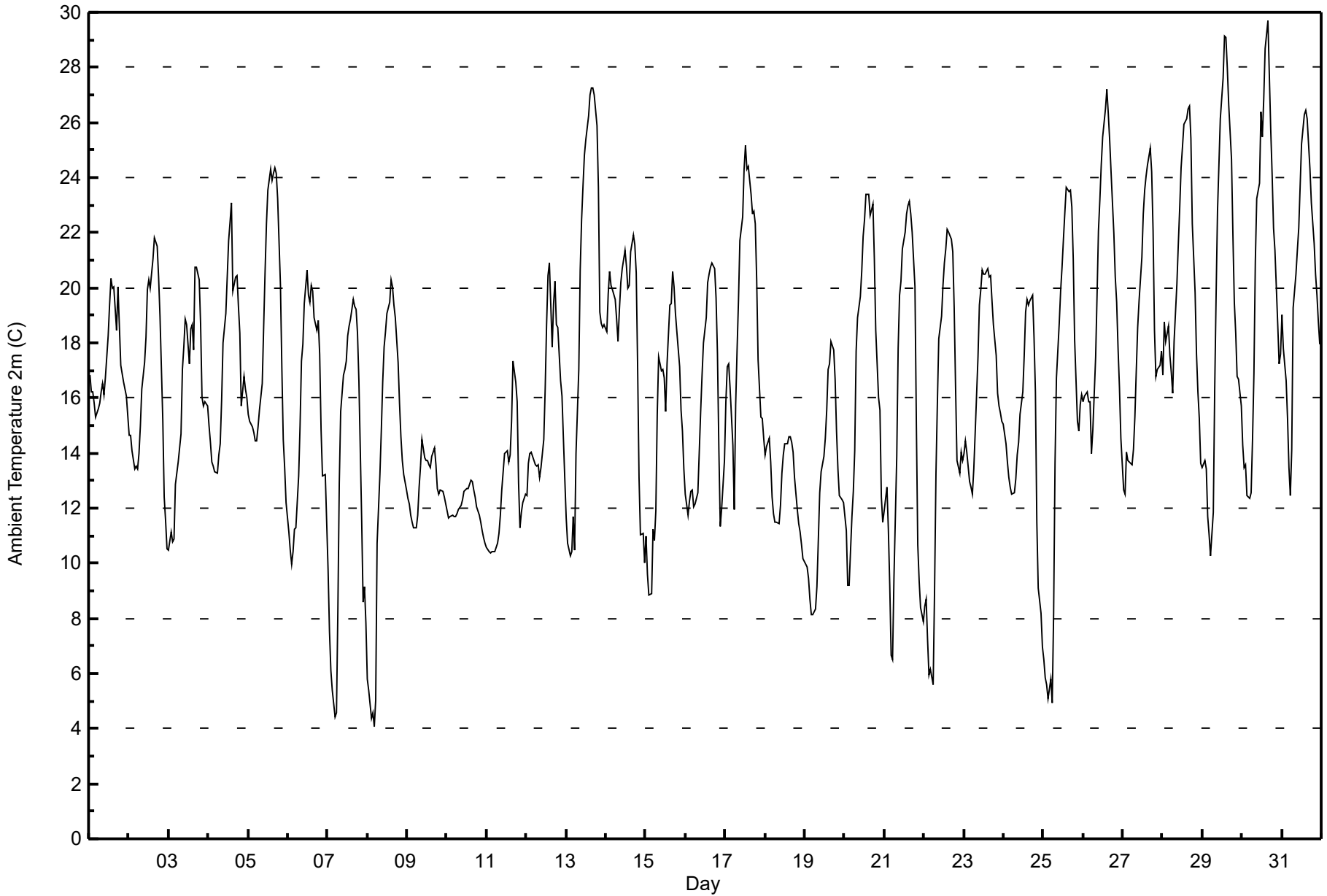
Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Maximum Value: 29.7 C on Aug 30 16:00		Maximum Daily Average: 20.5 C on Aug 31		Hours in Service: 744																																													
Minimum Value: 4.0 C on Aug 8 05:00		Minimum Daily Average: 12.0 C on Aug 10		Hours of Data: 744																																													
Maximum Diurnal Average: 21.4 C at hour 15		Minimum Diurnal Average: 11.5 C at hour 6		Hours of Missing Data: 0																																													
Monthly Average: 16.41 C		Percentiles: P ₁ = 5.2 P ₁₀ = 10.7 Q ₁ = 12.8 Median = 16.1 Q ₃ = 19.9 P ₉₀ = 23.1 P ₉₉ = 27.3		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-Aug	16.8	16.2	16.2	15.8	15.3	15.6	15.8	16.2	16.5	16.1	16.7	18.2	19.4	20.3	20.0	20.0	18.5	20.0	18.6	17.2	16.9	16.6	16.1	15.4	17.3	20.3																							
2-Aug	14.7	14.6	14.1	13.4	13.5	13.4	14.0	15.0	16.3	17.3	18.2	19.9	20.3	20.0	21.0	21.8	21.7	21.5	20.4	19.0	15.2	12.4	11.6	10.5	16.7	21.8																							
3-Aug	10.5	11.1	10.8	10.9	12.8	13.2	13.7	14.7	17.1	17.9	18.9	18.7	17.2	18.5	18.7	17.8	20.8	20.7	20.3	18.7	16.0	15.7	15.9	15.7	16.1	20.8																							
4-Aug	15.0	14.4	13.7	13.5	13.3	13.3	14.0	14.4	15.9	18.0	19.1	20.4	21.7	22.4	23.1	19.9	20.4	20.5	19.3	18.4	15.7	16.8	16.3	16.0	17.3	23.1																							
5-Aug	15.4	15.1	14.9	14.8	14.4	14.4	15.0	15.5	16.5	18.6	20.5	22.3	23.5	24.3	23.9	24.1	24.4	24.2	23.2	20.1	17.1	14.5	13.5	12.2	18.4	24.4																							
6-Aug	11.1	10.5	10.0	10.4	11.2	11.3	13.2	15.0	17.3	17.9	19.4	20.6	19.7	19.5	20.1	19.9	18.9	18.5	18.8	17.6	14.9	13.2	13.2	11.5	15.6	20.6																							
7-Aug	9.7	7.5	6.1	5.4	4.4	4.6	8.4	12.9	15.5	16.8	17.0	17.3	18.3	18.6	18.9	19.6	19.3	19.2	18.3	16.6	11.6	8.6	9.2	7.8	13.0	19.6																							
8-Aug	5.8	5.4	4.4	4.6	4.0	5.0	10.7	13.2	14.8	16.6	17.8	18.4	19.1	19.5	20.3	20.0	19.4	18.9	17.3	15.8	14.6	13.7	13.2	12.7	13.5	20.3																							
9-Aug	12.3	12.2	11.8	11.5	11.3	11.3	11.7	12.7	13.5	14.5	13.9	13.7	13.7	13.6	13.5	13.9	14.2	13.6	12.7	12.5	12.6	12.6	12.4	12.2	12.8	14.5																							
10-Aug	11.9	11.7	11.7	11.8	11.7	11.7	11.8	12.0	12.1	12.3	12.6	12.6	12.7	12.7	13.0	12.9	12.6	12.4	12.1	11.7	11.5	11.2	10.9	10.7	12.0	13.0																							
11-Aug	10.6	10.4	10.4	10.4	10.4	10.4	10.7	11.1	11.7	12.7	13.3	14.0	14.1	13.7	13.9	15.2	17.4	16.6	15.8	12.9	11.3	11.8	12.2	12.5	12.6	17.4																							
12-Aug	12.4	13.6	14.0	14.0	13.7	13.6	13.5	13.6	13.1	13.5	14.5	16.3	18.7	20.5	20.9	17.8	19.4	20.2	18.7	18.6	16.6	16.1	14.5	13.1	15.9	20.9																							
13-Aug	11.7	10.7	10.3	10.4	11.7	10.5	14.0	17.0	20.7	22.5	23.7	24.8	25.4	26.2	27.0	27.2	27.3	27.0	25.9	23.6	19.1	18.7	18.5	18.6	19.7	27.3																							
14-Aug	18.4	19.8	20.6	20.1	19.9	19.6	18.9	18.1	19.2	20.2	20.7	21.3	20.8	20.0	20.1	21.3	21.9	21.6	20.5	17.2	13.1	11.0	11.1	10.0	18.6	21.9																							
15-Aug	11.0	9.6	8.9	8.9	11.2	10.8	11.9	15.4	17.5	17.0	17.0	16.8	15.5	17.2	19.4	19.4	20.6	20.0	19.1	18.4	17.1	15.6	14.8	13.4	15.3	20.6																							
16-Aug	12.5	11.7	12.2	12.6	12.7	12.1	12.2	12.6	14.0	15.5	16.8	18.0	18.9	20.2	20.5	20.8	20.9	20.7	19.6	17.6	14.1	11.4	12.0	13.7	15.6	20.9																							
17-Aug	15.9	17.2	17.3	16.4	14.3	12.0	15.7	17.7	19.5	21.7	22.6	24.3	25.2	24.3	24.4	23.4	22.7	22.8	22.3	20.3	17.4	15.3	15.3	14.5	19.3	25.2																							
18-Aug	13.9	14.2	14.5	13.7	12.4	11.8	11.5	11.5	11.5	12.1	13.3	13.9	14.3	14.4	14.6	14.6	14.4	14.1	13.1	11.9	11.5	11.1	10.7	10.2	12.9	14.6																							
19-Aug	10.0	9.9	9.5	8.7	8.1	8.2	8.4	9.2	10.8	12.6	13.3	13.9	14.6	15.6	17.0	17.2	18.1	17.7	16.7	14.8	13.4	12.4	12.3	12.2	12.7	18.1																							
20-Aug	11.7	11.2	9.2	9.2	11.7	12.6	14.1	17.7	18.9	19.7	20.6	21.9	22.5	23.4	23.4	22.6	22.8	23.1	21.0	18.4	16.0	15.6	12.4	11.5	17.1	23.4																							
21-Aug	11.9	12.8	11.2	9.2	6.6	6.5	9.5	13.9	17.8	19.7	20.2	21.4	22.0	22.7	23.0	23.1	22.7	22.0	20.0	15.0	10.7	9.3	8.4	7.9	15.3	23.1																							
22-Aug	8.4	8.7	7.2	6.0	6.2	5.6	9.1	13.3	15.8	18.2	19.0	20.1	20.9	21.4	22.1	22.0	21.8	21.3	19.3	16.4	13.7	13.3	14.0	13.7	14.9	22.1																							
23-Aug	14.0	14.4	14.0	12.9	12.8	12.5	13.4	14.8	17.5	19.4	19.9	20.6	20.5	20.7	20.4	20.4	19.5	18.7	17.5	16.2	15.7	16.2	15.4	15.1	17.0	20.7																							
24-Aug	15.1	14.3	13.7	13.1	12.8	12.5	12.6	13.1	13.9	14.4	15.4	16.2	17.6	19.1	19.6	19.4	19.5	19.7	18.2	16.2	11.5	9.1	8.2	6.9	14.7	19.7																							
25-Aug	6.5	5.8	5.6	5.1	5.8	5.0	8.2	13.6	16.7	18.7	19.9	20.7	21.7	22.7	23.6	23.5	23.5	22.9	21.1	18.1	15.2	14.8	15.8	16.1	15.4	23.6																							
26-Aug	15.9	16.1	16.2	15.8	15.9	14.0	14.9	17.5	19.7	22.1	23.2	24.5	25.5	26.5	27.2	26.3	25.4	24.2	21.9	20.4	19.5	17.8	16.4	14.6	20.1	27.2																							
27-Aug	12.7	12.5	14.0	13.7	13.7	13.6	14.1	15.3	17.0	18.5	19.5	21.1	22.7	23.5	24.1	24.5	25.1	24.2	22.0	18.5	16.8	17.0	17.2	17.7	18.3	25.1																							
28-Aug	16.8	18.8	18.1	18.6	17.5	16.9	16.2	18.0	20.1	21.6	22.9	24.3	25.1	25.9	26.1	26.5	26.6	25.4	22.3	19.8	17.6	16.2	15.3	13.6	20.4	26.6																							
29-Aug	13.5	13.7	13.4	11.7	11.0	10.3	11.8	16.3	19.7	22.8	24.5	26.1	27.6	29.2	29.1	28.0	26.7	24.6	21.9	19.5	18.4	16.8	16.7	15.7	19.5	29.2																							
30-Aug	14.3	13.5	13.6	12.4	12.3	12.6	14.5	16.9	20.9	23.2	23.8	26.4	25.5	26.9	28.7	29.7	27.7	25.7	24.1	22.2	21.4	18.7	17.2	17.6	20.4	29.7																							
31-Aug	19.0	17.8	16.6	15.2	13.5	12.4	14.1	19.3	20.5	21.3	22.2	23.7	25.2	26.3	26.5	26.1	25.2	24.3	23.1	21.6	20.5	19.7	18.8	18.0	20.5	26.5																							
																								12.9	12.8	12.4	11.9	11.8	11.5	12.8	14.8	16.5	17.8	18.7	19.8	20.3	21.0	21.4	21.3	20.9	19.6	17.6	15.4	14.3	13.9	13.3	Diurnal Average		
																								19.0	19.8	20.6	20.1	19.9	19.6	18.9	19.3	20.9	23.2	24.5	26.4	27.6	29.2	29.1	29.7	27.7	27.0	25.9	23.6	21.4	19.7	18.8	18.6	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Anzac - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	54	7.26	7.26
10 - 20	507	68.15	75.40
> 20	183	24.60	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

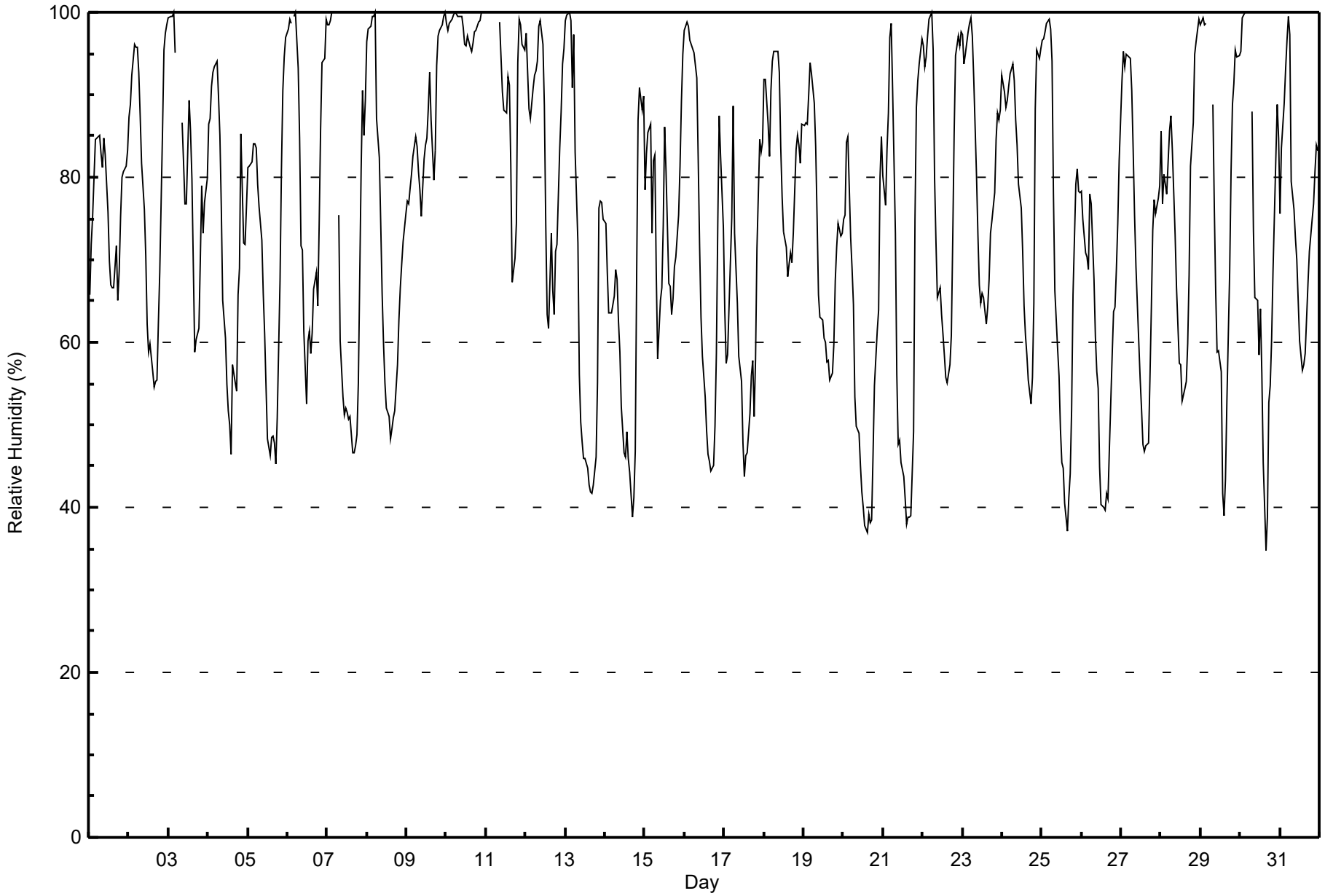
Relative Humidity (RH) - %
Anzac - August 2023

Maximum Value: 100.0 % on Aug 3 04:00																						Maximum Daily Average: 98.2 % on Aug 10																						Hours in Service: 744			
Minimum Value: 34.7 % on Aug 30 16:00																						Minimum Daily Average: 57.8 % on Aug 20																						Hours of Data: 723			
Maximum Diurnal Average: 91.3 % at hour 6																						Minimum Diurnal Average: 55.9 % at hour 17																						Hours of Missing Data: 21			
Monthly Average: 74.64 %																						Percentiles: P ₁ = 38.8 P ₁₀ = 48.3 Q ₁ = 60.3 Median = 76.1 Q ₃ = 90.6 P ₉₀ = 97.7 P ₉₉ = 100.0																						Hours of Calibration: 0			
																																												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-Aug	65.7	71.9	75.3	79.9	84.7	84.9	85.0	82.9	81.2	84.7	82.8	75.8	69.9	66.9	66.6	66.6	71.6	65.1	68.6	75.2	79.9	80.7	81.4	83.3	76.3	85.0																					
2-Aug	87.3	88.9	92.4	96.1	95.7	95.8	92.8	87.5	81.8	76.1	70.6	62.3	58.8	59.8	56.5	54.6	55.3	55.5	62.1	68.4	85.8	95.4	97.4	98.5	78.1	98.5																					
3-Aug	99.4	99.5	99.5	100.0	95.1	OR	OR	OR	86.5	81.8	76.8	76.7	89.3	85.6	79.8	69.3	58.7	60.3	61.7	70.0	79.0	73.3	77.0	79.8	80.9	100.0																					
4-Aug	86.4	87.2	91.0	92.8	93.4	94.1	89.9	85.1	76.5	65.1	60.6	54.9	51.7	50.0	46.5	57.2	55.1	54.1	65.7	69.0	85.3	72.0	71.8	76.4	72.2	94.1																					
5-Aug	81.2	81.4	81.9	84.0	84.1	83.5	79.1	76.5	72.4	66.0	61.1	54.5	48.3	46.2	48.5	48.7	47.8	45.3	50.9	67.5	80.9	90.4	94.6	96.9	69.7	96.9																					
6-Aug	97.9	99.2	98.7	OR	99.5	100.0	93.2	84.8	71.8	71.2	61.3	52.6	60.2	61.4	58.6	61.2	66.4	68.5	64.4	74.4	85.7	93.9	94.4	99.1	79.1	100.0																					
7-Aug	98.5	98.5	99.1	100.0	100.0	OR	OR	75.5	60.2	53.4	51.2	52.0	51.5	50.6	51.0	46.6	46.6	47.4	48.8	55.0	81.1	90.6	85.1	89.3	69.6	100.0																					
8-Aug	96.5	98.0	98.4	99.5	99.4	100.0	87.1	82.3	74.5	65.9	59.8	55.0	52.0	51.0	48.4	49.5	50.8	51.7	57.3	62.7	66.7	69.5	72.1	75.7	71.8	100.0																					
9-Aug	77.0	76.8	78.6	80.3	82.6	84.9	83.7	80.8	78.4	75.3	82.2	83.9	84.8	88.3	92.7	87.0	79.7	83.2	93.6	97.2	97.8	98.5	99.6	100.0	86.1	100.0																					
10-Aug	98.7	97.9	98.7	99.2	99.7	99.9	99.9	99.5	99.6	99.5	98.2	96.1	95.9	97.2	95.7	95.3	96.3	97.6	97.8	98.8	99.0	100.0	OR	OR	98.2	100.0																					
11-Aug	OR	OR	OR	OR	OR	OR	OR	OR	98.8	94.7	90.3	88.2	87.8	92.2	91.2	81.5	67.3	70.2	74.5	93.9	99.2	98.4	96.1	95.4	--	99.2																					
12-Aug	97.4	92.8	88.2	87.1	90.9	92.4	92.8	94.1	98.3	99.0	96.1	88.7	74.3	63.5	61.7	73.2	66.3	63.4	71.0	71.9	83.5	88.0	93.8	95.7	84.3	99.0																					
13-Aug	98.9	99.6	100.0	98.9	90.8	97.3	83.1	72.0	56.1	50.3	47.9	45.9	46.0	44.8	42.8	41.9	41.7	42.8	46.0	55.1	76.2	77.2	76.9	74.9	67.0	100.0																					
14-Aug	74.5	68.5	63.6	63.6	63.6	65.6	68.9	67.6	62.6	58.8	52.1	46.6	46.2	49.2	45.9	44.2	38.8	41.3	46.8	68.4	86.9	90.9	88.1	89.9	62.2	90.9																					
15-Aug	78.4	82.9	85.4	86.5	73.2	82.1	82.8	68.5	58.0	65.1	66.6	74.0	86.1	80.6	67.1	66.7	63.4	65.3	69.2	70.4	75.4	81.4	89.2	94.9	75.6	94.9																					
16-Aug	97.7	98.7	98.2	96.6	96.1	95.5	95.0	92.1	82.2	71.8	63.0	58.3	53.4	49.3	46.4	45.6	44.4	45.0	49.9	58.6	74.4	87.4	82.6	73.9	73.2	98.7																					
17-Aug	63.9	57.5	58.5	64.0	75.0	88.6	73.3	68.9	64.8	58.3	55.2	47.8	43.7	46.2	46.7	51.3	55.9	57.7	51.0	58.0	71.4	84.6	83.0	84.2	62.9	88.6																					
18-Aug	91.8	91.9	86.4	82.6	90.6	94.1	95.3	95.2	95.3	92.6	83.7	77.6	73.4	71.5	67.9	69.5	70.8	69.6	73.3	83.4	85.0	83.9	81.6	86.4	83.1	95.3																					
19-Aug	86.4	86.7	86.5	90.0	93.8	92.5	89.0	83.8	75.0	65.8	63.0	62.7	60.6	60.1	57.7	57.8	55.5	56.3	59.9	67.5	71.5	74.5	72.8	73.1	72.6	93.8																					
20-Aug	75.0	75.4	84.2	85.0	72.8	68.9	64.6	53.4	49.9	48.9	45.0	41.8	40.1	37.7	37.0	39.2	38.1	38.5	46.3	54.8	61.3	64.0	80.0	85.0	57.8	85.0																					
21-Aug	80.1	76.7	83.4	87.8	97.0	98.6	90.7	73.2	56.2	47.7	48.1	45.5	43.8	41.1	38.0	38.8	38.8	39.0	49.2	74.9	88.5	91.7	93.8	96.8	67.5	98.6																					
22-Aug	96.0	93.5	94.7	97.1	99.2	99.9	95.4	80.1	72.3	65.5	66.6	63.5	61.0	58.6	55.8	55.1	57.4	60.9	72.5	85.2	94.7	97.1	96.0	97.6	79.8	99.9																					
23-Aug	97.3	93.8	94.8	97.7	98.6	99.4	97.1	92.0	80.1	73.0	66.9	64.8	65.9	65.4	62.1	64.2	67.7	73.2	74.7	78.2	84.5	87.9	86.9	88.1	81.4	99.4																					
24-Aug	92.3	90.3	88.5	89.3	91.0	92.6	93.8	91.7	86.9	83.9	79.2	76.3	71.1	64.4	60.8	58.5	55.4	52.6	55.8	64.8	88.2	95.5	94.4	95.7	79.7	95.7																					
25-Aug	96.6	96.7	97.7	98.6	99.2	97.9	94.0	77.9	66.2	59.2	55.9	49.5	45.4	44.8	40.5	37.2	41.2	44.1	51.8	65.8	79.1	81.0	78.2	78.2	69.9	99.2																					
26-Aug	78.3	74.8	70.9	70.3	68.9	78.0	76.8	67.6	60.7	56.5	54.5	45.0	40.4	40.0	39.7	41.8	40.9	47.0	58.4	63.7	64.2	68.8	74.4	82.0	61.0	82.0																					
27-Aug	91.7	95.2	93.3	94.9	94.8	94.4	90.5	83.4	75.5	69.2	64.6	55.5	51.8	47.7	46.8	47.5	47.9	55.6	64.1	73.5	77.3	75.6	77.5	79.0	72.8	95.2																					
28-Aug	85.5	76.8	80.3	77.9	81.9	85.6	87.5	83.4	73.1	66.6	62.0	57.5	57.3	52.9	54.4	55.2	59.8	68.1	81.3	86.6	94.9	96.5	97.7	99.2	75.9	99.2																					
29-Aug	98.5	99.3	98.5	98.7	OR	99.6	OR	88.8	76.6	66.3	58.8	58.9	56.4	41.7	39.0	43.4	52.8	68.4	80.7	88.9	91.4	95.5	94.6	94.8	76.9	99.6																					
30-Aug	95.2	99.3	99.6	100.0	OR	OR	OR	88.0	73.6	65.3	65.2	58.5	64.1	56.3	45.5	34.7	38.8	52.7	54.7	60.4	68.6	82.2	88.8	84.7	70.3	100.0																					
31-Aug	75.7	83.6	89.0	93.1	96.6	99.5	97.3	79.6	76.1	72.8	69.9	65.1	60.2	56.7	57.3	58.7	62.9	67.2	71.0	75.0	76.8	80.8	83.9	83.1	76.3	99.5																					
																						88.0	87.8	88.5	89.4	89.6	91.3	87.6	81.2	74.9	70.0	66.4	62.4	61.0	58.8	56.4	56.2	55.9	58.3	63.7	72.2	81.8	85.4	86.1	87.7	Diurnal Average	
																						99.4	99.6	100.0	100.0	100.0	100.0	99.9	99.5	99.6	99.5	98.2	96.1	95.9	97.2	95.7	95.3	96.3	97.6	97.8	98.8	99.2	100.0	99.6	100.0	Diurnal Maximum	
OR - Out of Range																																															



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Anzac - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Anzac - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	16	2.21	2.21
40 - 60	160	22.13	24.34
60 - 80	227	31.40	55.74
80 - 100	312	43.15	98.89

Total Number of Valid Hours: 723

Total Number of Hours: 744



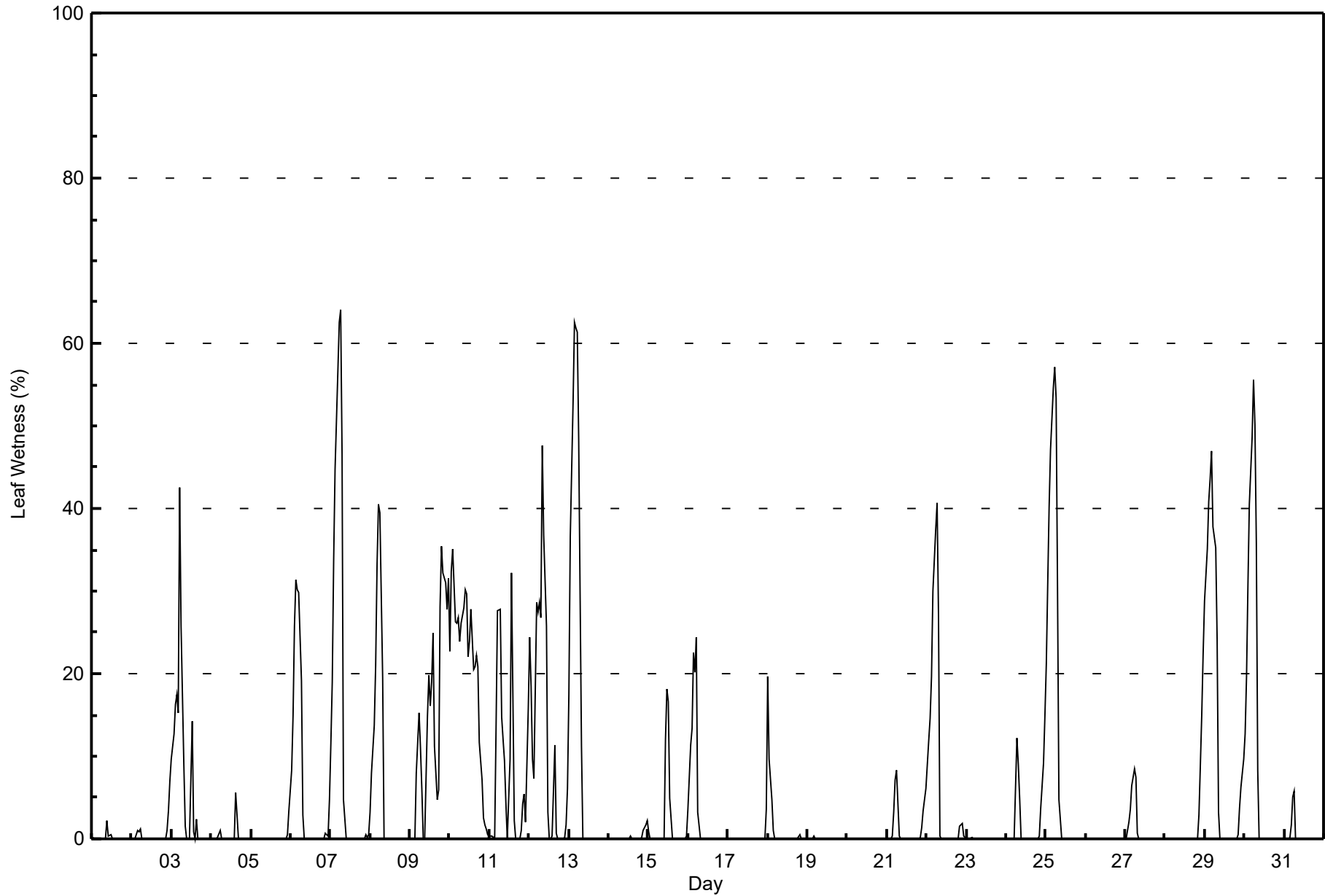
Wood Buffalo Environmental Association

Summary of Hour Averages

Leaf Wetness (LW) - %

Anzac - August 2023

Maximum Value: 64.0 % on Aug 7 07:00																				Maximum Daily Average: 20.4 % on Aug 10					Hours in Service: 744				
Minimum Value: 0.0 % on Aug 1 02:00																				Minimum Daily Average: 0.0 % on Aug 20					Hours of Data: 744				
Maximum Diurnal Average: 18.4 % at hour 6																				Minimum Diurnal Average: 0.9 % at hour 18					Hours of Missing Data: 0				
Monthly Average: 5.51 %																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 2.6 P ₉₀ = 24.0 P ₉₉ = 55.1					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-Aug	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.4	0.4	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	0.1	0.6	2.2	
2-Aug	0.0	0.0	0.0	1.0	0.9	1.2	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	1.0	3.4	7.0	0.6	7.0	0.6	7.0	
3-Aug	9.7	12.6	16.2	17.5	15.3	42.6	25.7	8.9	1.6	0.0	0.0	0.0	14.2	0.8	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	42.6	
4-Aug	0.0	0.0	0.0	0.0	0.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	5.6		
5-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4	0.2	3.4	0.2	3.4	
6-Aug	8.4	14.9	25.8	31.4	30.2	29.8	19.2	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4	4.7	7.0	31.4	7.0	31.4	
7-Aug	11.6	19.0	33.7	44.7	56.6	62.6	64.0	46.6	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.4	14.4	64.0	14.4	64.0	
8-Aug	3.3	8.0	13.7	21.0	33.2	40.5	39.6	19.4	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	7.4	40.5	7.4	40.5
9-Aug	0.0	0.0	0.0	0.0	7.9	15.2	10.9	5.9	0.0	0.0	14.8	19.8	16.1	19.0	25.0	11.1	4.7	5.9	28.1	35.4	32.3	31.1	27.8	31.6	14.3	35.4	14.3	35.4	
10-Aug	22.7	32.4	35.1	26.2	26.1	26.7	23.9	26.0	27.9	30.1	29.6	22.1	23.9	27.7	20.5	20.9	22.2	20.9	11.7	7.2	2.5	1.7	1.1	0.6	20.4	35.1	20.4	35.1	
11-Aug	0.4	0.4	0.2	0.2	13.6	27.6	27.7	14.8	12.1	9.4	4.4	0.0	9.7	32.3	17.5	2.1	0.0	0.0	0.0	1.0	4.2	5.4	2.0	15.8	8.4	32.3	8.4	32.3	
12-Aug	24.5	18.5	9.7	7.2	28.7	27.5	28.6	26.8	47.6	36.9	25.8	3.1	0.0	0.0	0.3	11.4	0.7	0.0	0.0	0.0	0.0	0.2	1.7	6.1	12.7	47.6	12.7	47.6	
13-Aug	17.4	36.6	52.9	62.5	61.9	61.4	48.5	11.2	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	14.7	62.5	14.7	62.5	
14-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	1.7	2.2	0.2	2.2	0.2	2.2	
15-Aug	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	18.2	16.7	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2	18.2	2.2	18.2	
16-Aug	3.6	11.3	13.4	22.5	20.1	24.4	3.1	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	4.1	24.4	4.1	24.4	
17-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.1	3.5	0.1	3.5	
18-Aug	19.7	9.7	4.7	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	0.5	0.0	0.0	0.0	0.0	1.5	19.7	1.5	19.7	
19-Aug	0.0	0.0	0.0	0.0	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	0.4	0.4	0.0	0.4
20-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.4	3.2	7.0	8.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	3.4	6.0	1.3	8.3	1.3	8.3		
22-Aug	8.9	11.8	14.7	19.6	30.0	37.4	40.7	26.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.8	0.4	0.2	8.1	40.7	8.1	40.7		
23-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2
24-Aug	0.0	0.0	0.0	0.0	0.0	0.0	12.1	9.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.7	9.2	14.9	2.3	14.9	2.3	14.9		
25-Aug	21.2	30.9	40.1	47.1	54.6	57.1	53.5	30.4	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	57.1	14.2	57.1		
26-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	1.1	2.1	3.5	6.4	8.4	7.4	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	0.0	0.0	1.2	8.4	1.2	8.4		
28-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	8.8	15.0	22.4	2.0	22.4	2.0	22.4		
29-Aug	28.9	35.1	40.9	43.6	46.9	37.8	35.2	24.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.8	6.2	9.6	13.2	46.9	13.2	46.9		
30-Aug	12.7	19.6	30.7	40.5	48.6	55.6	50.1	35.7	8.3	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	12.6	55.6	12.6	55.6		
31-Aug	0.0	0.0	0.0	0.1	1.6	5.2	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.7	0.5	5.7		
																								Diurnal Average					
																								Diurnal Maximum					
6.3 8.4 10.8 12.6 15.7 18.4 16.3 9.3 3.7 2.5 2.8 2.1 2.6 2.7 2.0 1.7 0.9 0.9 1.3 1.4 1.4 2.0 2.4 4.2																													
28.9 36.6 52.9 62.5 61.9 62.6 64.0 46.6 47.6 36.9 29.6 22.1 23.9 32.3 25.0 20.9 22.2 20.9 28.1 35.4 32.3 31.1 27.8 31.6																													





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Leaf Wetness (LW) - %
Anzac - August 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	511	68.68	68.68
0.4 - 0.5	15	2.02	70.70
0.6 - 0.7	4	0.54	71.24
0.8 - 1.4	14	1.88	73.12
1.5 - 10	70	9.41	82.53
> 10	130	17.47	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

Anzac - August 2023

Maximum Speed: 21 km/h on Aug 15 21:00	Maximum Daily Speed Average: 15.4 km/h on Aug 1	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 6 09:00	Minimum Daily Speed Average: 4.2 km/h on Aug 6	Hours of Data: 693
Maximum Diurnal Speed Average: 6.0 km/h at hour 12	Minimum Diurnal Speed Average: 2.4 km/h at hour 20	Hours of Missing Data: 51
Monthly Average Velocity: 4.4 km/h 250.6 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 13 P ₉₀ = 16 P ₉₉ = 19	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-Aug	WSW14	WSW18	WSW19	WSW21	W20	W20	W19	WSW19	W19	W18	WSW14	WSW15	W15	W14	WNNW14	WSW17	W14	W15	WNNW16	WNNW9	WSW10	W12	W13	W13	W15.4	WSW21	
2-Aug	W11	W12	W10	W9	WSW10	W11	W10	WNNW9	W9	WSW8	W8	W10	W11	NW10	W9	WSW8	W6	W4	NNE5	NE6	E5	ENE5	E4	ESE3	W5.8	W12	
3-Aug	ESE4	SSE6	SE6	ESE7	SSE8	SSE6	E8	SSW4	ESE4	SE8	ESE9	SE13	SE11	SSE12	SSW10	SSW4	SW11	WSW10	W10	W10	WSW7	SW9	WSW12	W14	S4.4	W14	
4-Aug	W17	W20	W17	W17	WNNW14	WNNW14	WNNW16	WNNW14	W12	W14	W14	W14	W14	W14	W12	NW17	WNNW8	WNNW8	W6	WNNW7	WSW6	WSW10	W10	W14	W12.6	W20	
5-Aug	W14	WSW13	W14	W13	W13	W15	W17	W17	W16	W13	W12	W13	W13	WNNW13	NW12	NW12	WNNW10	WNNW12	NW5	N8	N8	N8	ESE2	S4	W9.7	W17	
6-Aug	SSW5	SW4	SW4	WSW4	WSW3	N3	S3	SSW3	S0	N9	NE9	NNE6	NE16	NE14	ENE9	ENE6	NE10	NNE7	N7	N8	NW7	WNNW11	WNNW11	N8	N4.2	NE16	
7-Aug	NNE7	NNE4	W2	W2	WNNW1	NNE4	NW3	WNNW6	WNNW4	N6	N9	N9	WNNW10	WNNW11	WNNW14	WNNW16	WNNW12	WNNW12	N11	N8	WNNW7	N6	NNE8	E4	NNW6.6	NNW16	
8-Aug	SE2	SSE4	ESE6	SE5	ESE6	SE7	SE7	SE8	SE12	ESE12	ESE11	ESE11	ESE11	E12	E12	E15	E18	ESE16	E13	E12	E13	ESE12	SE12	SE12	ESE10.1	E18	
9-Aug	SE10	ESE10	SE11	SE11	ESE11	SE10	SE10	SE12	SE14	SE16	SE16	SE17	ESE14	ESE15	E12	ESE13	ESE13	ESE13	ESE13	ESE13	ESE13	ESE16	ESE17	SE15	ESE16	ESE13.2	SE17
10-Aug	ESE16	ESE14	ESE16	ESE15	ESE15	ESE15	ESE15	ESE15	ESE15	E14	E16	E16	E16	E15	E17	E15	E15	ENE14	ENE12	NE10	NE10	N9	N9	N9	E11.9	E17	
11-Aug	WNNW9	WNNW9	WNNW9	WNNW10	NW9	NW9	NW9	WNNW8	NW8	NW8	WNNW9	WNNW9	W8	W6	WNNW7	NW7	WSW9	WSW4	UO	UO	SE4	SSE7	SSE6	S7	WNNW5.1	NNW10	
12-Aug	SSW5	WSW11	WSW10	WSW13	W15	W13	W12	W12	W17	W15	W13	W12	WNNW13	W12	NW10	NW13	W11	WNNW13	WNNW9	W9	W8	W7	W9	WSW7	W10.6	W17	
13-Aug	SW7	SW6	SSW6	SSW7	SSW8	SSW7	SSW7	SSW6	SW10	SW14	SW18	SW19	WSW19	WSW21	WSW19	WSW20	WSW18	SW16	SW14	SW8	SSW7	SW7	SSW8	SW8	SW11.4	WSW21	
14-Aug	SW9	WSW11	WSW12	WSW13	WSW14	W18	W18	WNNW12	W10	W14	W16	W16	W15	W16	W16	W15	W15	WNNW13	WSW8	WSW5	WSW5	WSW7	WSW8	WSW9	W11.8	W18	
15-Aug	SW8	SW8	SW9	SW7	SSW7	SSW5	S4	S6	SSE10	SE9	S10	SW14	S6	SSE7	WSW14	WSW12	WSW12	WSW12	WSW11	WSW13	W21	WNNW17	NW16	NW12	WSW7.6	W21	
16-Aug	WNNW12	WNNW9	WNNW9	WSW8	W8	W9	W10	W10	W13	W13	W14	W13	W14	W12	W11	W12	W12	WSW13	SW10	SSW9	S8	S8	S9	S9	WSW8.8	W14	
17-Aug	S11	SSW16	S15	S12	SSW6	SSW3	SW8	SW7	WSW8	W12	W13	W15	WSW15	W14	WNNW17	WNNW13	W8	WSW7	W14	WNNW11	NW4	WSW7	W7	NW10	WSW8.1	WNNW17	
18-Aug	W5	W9	W10	WNNW11	WNNW11	WNNW11	WNNW12	NW15	NW15	NW12	WNNW13	NW17	WNNW18	NW17	NW17	NW16	WNNW13	WNNW13	NW15	NW14	NW13	NW14	WNNW13	NW9	NW12.4	WNNW18	
19-Aug	WNNW9	WNNW12	WNNW11	WNNW12	W12	WSW15	WSW15	W16	WSW14	WSW14	W17	WSW16	WSW17	W17	W14	W13	WSW13	W13	WSW12	SW9	SW10	SW8	SW8	SW9	W12.1	W17	
20-Aug	SSW8	SW7	SW7	SW8	SW8	SW10	SW7	WSW7	WSW11	W14	W14	WSW13	W14	W12	W10	W8	NW8	W4	S4	S5	SSW8	SW8	SW4	S4	WSW7.4	W14	
21-Aug	SSW7	SW7	SSW7	SSW5	SSE4	SSE4	S6	S3	SE1	SSE3	SSE8	C	C	C	M	M	M	M	M	M	M	M	M	M	---	SSE8	
22-Aug	M	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	---	---	
23-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	NE7	NE7	NNE8	NNE8	N8	WNNW11	WNNW10	WNNW8	WNNW7	NW9	NW8	W6	NNW11	
24-Aug	WSW6	W7	W8	WNNW10	WNNW9	WNNW11	WNNW9	WNNW11	WNNW13	WNNW14	WNNW15	W12	W13	WNNW15	WNNW16	WNNW17	WNNW16	W13	W11	WSW7	WSW7	WSW7	SW8	SW8	W10.5	WNNW17	
25-Aug	SW8	SSW7	S6	S6	S7	S6	S5	SSE5	SSE4	WSW5	WSW8	WSW9	W10	SSW9	SSW13	SSW10	S11	S9	SSE8	SSE9	SSE9	SSE10	SSE11	SSW6.5	SSW13		
26-Aug	SSE10	SSE11	S11	S12	S13	S7	S5	S7	SSW8	SSW7	WSW10	WSW14	WSW15	SW16	SW14	WSW15	WSW12	WSW7	WSW6	WSW8	WNNW13	WNNW11	WNNW10	W8	SW7.9	SW16	
27-Aug	WSW7	WSW9	WSW9	WSW10	WSW10	W10	W11	W8	W8	WSW7	WSW8	W6	WSW7	W8	W6	WNNW2	SE5	SE5	SSW6	SSW6	SSW6	S8	S9	SSW8	WSW6.1	W11	
28-Aug	SW9	SW8	WSW8	WSW10	WSW11	WSW11	WSW5	WSW5	SW8	WSW9	WSW5	SW3	W2	WSW7	W7	W5	SW2	SE5	SE6	SE7	SSE5	SE7	SE7	SE6	SW4.6	WSW11	
29-Aug	SSE7	SSE8	S7	SSE4	SSE6	S6	SE3	SE7	SE7	ESE5	ESE8	ESE9	ESE10	SSW7	SW8	SW6	W3	ESE4	ESE7	SE7	SE7	SE7	SE8	SE8	SE5.4	ESE10	
30-Aug	SE7	ESE6	ESE6	ESE6	ESE8	SE9	SE8	SE10	ESE12	ESE10	ESE8	E8	ENE7	ESE13	SE18	SE18	SE10	SE6	ESE3	SE7	SE9	SE8	ESE7	ESE9	ESE8.6	SE18	
31-Aug	ESE10	ESE8	SSE6	SW8	WSW2	WNNW2	SSW4	WSW8	WSW12	WSW11	WSW12	WSW12	W10	WSW11	WSW13	W14	WSW13	WSW12	WSW12	WSW16	WSW16	WSW16	W15	W15	WSW9.1	WSW16	

SW4.4 SW5.3 SW5.2 SW5.3 SW5.0	WSW4.9 WSW4.9 WSW4.6 WSW5.0	WSW4.8 WSW5.0	WSW6.0 W5.4 W5.4 W5.6 W5.7 W5.0 W4.4 W3.5 W2.4	WSW2.4 WSW3.0 WSW2.9	SW3.5	Diurnal Average
W17 W20	WSW19 WSW21 W20 W20	W19 WSW19 W19 W18	SW18 SW19	WSW19 WSW21 WSW19 WSW20 WSW18	SW16 WNNW16 WSW16 W21 WNNW17 NW16 ESE16	Diurnal Maximum

C - Calibration M - Maintenance AF - Analyzer 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 (WS) - km/h
Anzac - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Aug 12 16:00	Hours in Service: 744 Hours of Data: 693 Hours of Missing Data: 51 Hours of Calibration: 8 Percent Operational Time: 94.2
Minimum Value: 1 km/h on Aug 8 01:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 4 P ₉₀ = 4 P ₉₉ = 6	

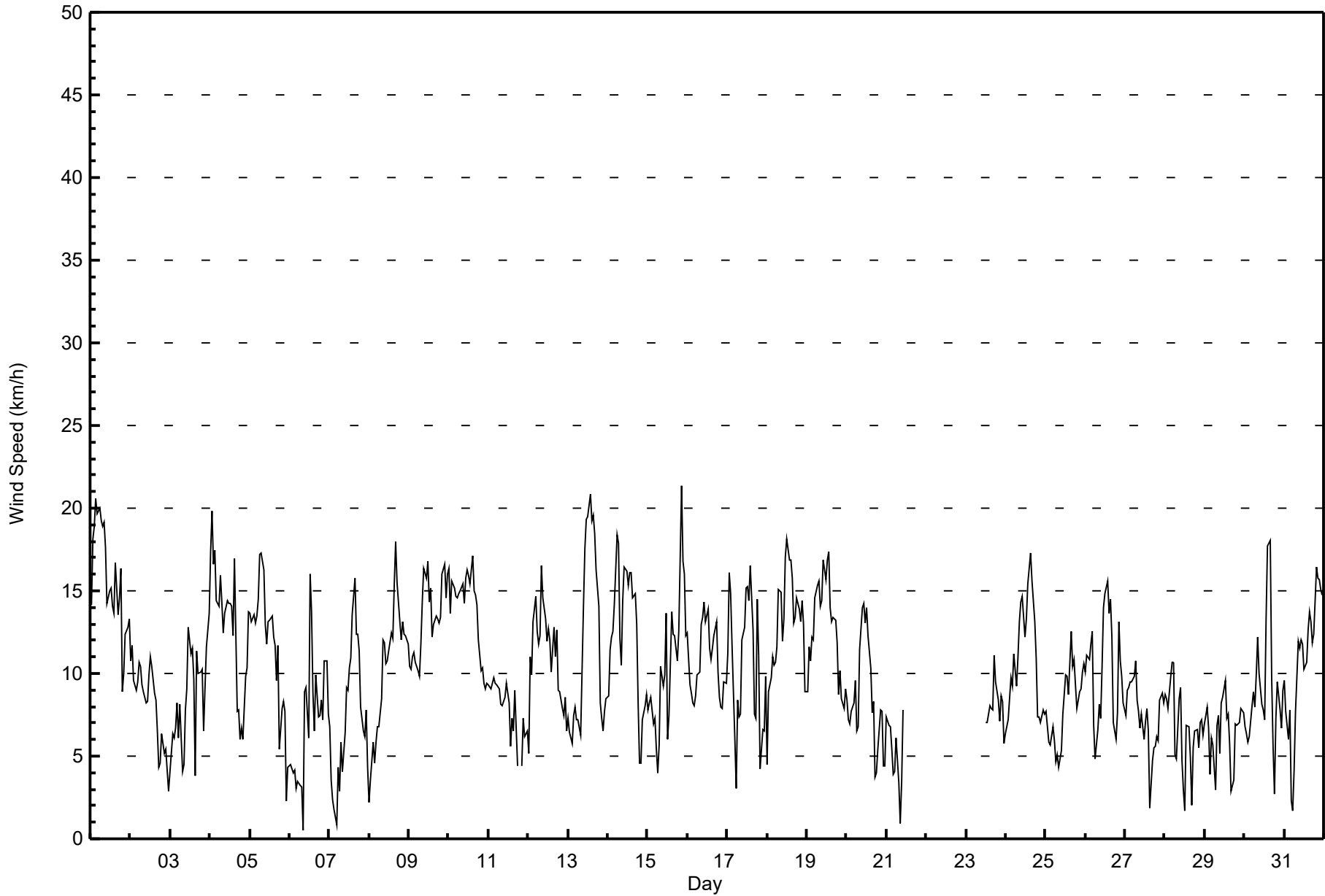
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	5	5	5	6	6	5	5	5	5	5	4	4	4	4	5	5	4	5	5	3	3	3	4	3	6
2-Aug	3	3	3	2	2	3	3	2	2	2	2	3	3	3	3	2	2	2	1	1	1	1	1	1	3
3-Aug	1	1	1	1	2	2	4	3	2	2	3	4	5	3	4	4	3	3	5	3	3	3	4	5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

C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Anzac - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Anzac - August 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	80	11.54	11.54
6 - 11	352	50.79	62.34
12 - 19	254	36.65	98.99
20 - 28	7	1.01	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 693

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Anzac - August 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	3	0	1	3	7	8	8	10	9	5	10	8	1	3	3	80
6 - 11	16	7	7	3	2	23	33	19	23	26	37	54	48	26	14	14	352
12 - 19	0	0	2	2	16	25	11	1	4	2	8	49	81	30	16	7	254
20 - 28	0	0	0	0	0	0	0	0	0	0	0	3	4	0	0	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	17	10	9	6	21	55	52	28	37	37	50	116	141	57	33	24	693

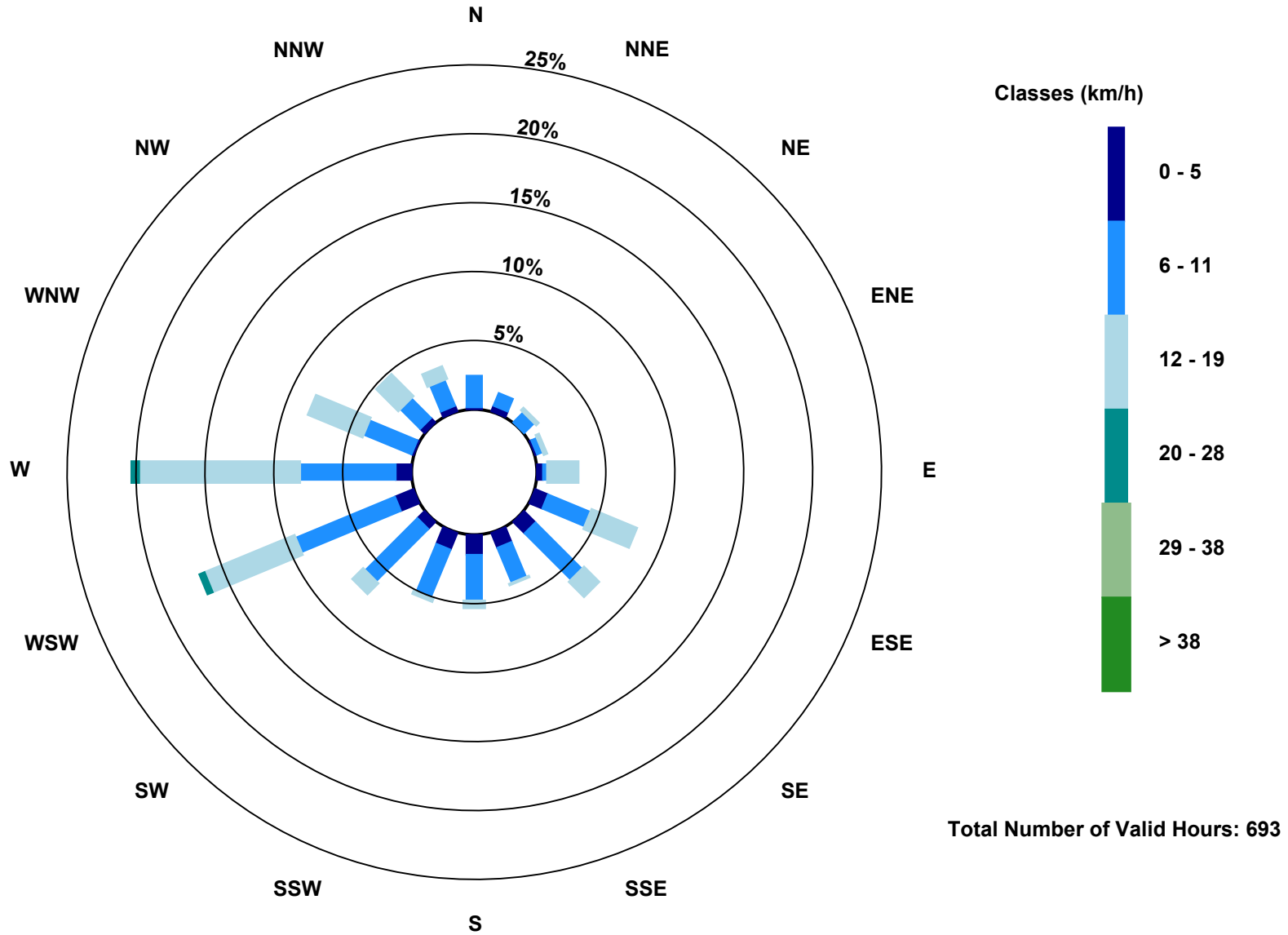
Total Number of Valid Hours: 693

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Anzac





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

Anzac - August 2023

Direction of Maximum Speed: 271 deg on Aug 15 21:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 262.4 deg on Aug 1																						Hours of Data: 693			
Direction of Minimum Speed: 173 deg on Aug 6 09:00											Direction of Minimum Daily Speed Average: 4.2 deg on Aug 6											Hours of Missing Data: 51			
Monthly Average Direction: 250.6 deg																						Percent Operational Time: 94.2			
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-Aug	242	245	250	255	262	261	260	258	262	267	254	255	265	277	286	256	259	274	282	284	251	268	271	277	262.4
2-Aug	275	275	260	278	250	270	275	286	261	257	260	261	266	305	271	256	271	278	13	41	84	64	101	103	274.2
3-Aug	108	150	136	112	157	156	81	197	120	131	118	124	134	147	197	212	226	252	259	274	247	226	255	260	184.1
4-Aug	268	265	276	279	287	285	283	283	272	278	281	277	277	271	276	310	296	290	272	297	246	257	261	265	277.5
5-Aug	266	255	259	264	266	265	262	265	268	270	272	267	275	285	315	325	302	297	321	4	4	10	109	189	280.1
6-Aug	202	215	228	255	249	2	176	200	173	11	40	24	35	40	58	69	37	16	356	350	324	334	337	0	11.2
7-Aug	25	20	271	270	334	13	316	301	347	9	351	356	333	336	341	328	341	339	352	353	339	355	33	83	346.9
8-Aug	127	149	118	130	115	127	129	133	128	104	110	110	109	101	99	95	100	103	95	95	99	111	127	131	110.3
9-Aug	127	121	128	126	120	128	129	127	134	127	125	124	120	113	98	106	114	110	106	109	116	123	125	121	119.8
10-Aug	121	119	119	113	110	109	112	111	102	91	95	89	91	86	81	90	86	69	60	48	38	11	4	350	89.1
11-Aug	338	340	334	329	324	318	320	327	316	314	302	286	260	281	293	311	254	248	UO	UO	138	148	154	177	303.4
12-Aug	212	253	253	254	263	265	261	275	260	259	272	274	283	265	304	306	279	283	287	281	264	261	259	254	269.2
13-Aug	233	230	196	194	205	200	211	194	214	220	221	227	237	240	239	243	238	235	232	222	195	216	210	224	225.3
14-Aug	217	258	257	239	242	264	280	297	268	271	275	277	272	264	280	270	279	285	258	255	237	255	238	244	265.3
15-Aug	231	229	227	216	210	192	185	173	164	142	188	225	180	167	238	251	250	241	248	253	271	283	312	309	237.1
16-Aug	287	290	283	253	268	279	277	278	266	267	277	266	267	266	270	267	261	241	216	206	189	171	171	172	256.0
17-Aug	186	194	189	183	194	208	215	227	243	272	266	259	253	274	300	293	279	246	268	303	311	256	280	304	252.2
18-Aug	272	266	277	287	301	301	300	313	325	324	339	326	328	322	317	304	301	303	323	317	318	316	331	314	312.8
19-Aug	289	295	296	287	274	256	254	270	257	254	262	257	255	264	263	268	255	264	247	225	222	230	230	219	259.5
20-Aug	211	214	218	226	228	224	236	238	251	259	260	255	264	260	270	280	311	270	175	170	205	233	222	186	242.8
21-Aug	197	218	205	198	163	157	183	180	124	168	151	C	C	C	M	M	M	M	M	M	M	M	M	M	--
22-Aug	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
23-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	37	47	21	33	1	335	344	342	333	312	306	265	--
24-Aug	252	275	280	284	283	286	287	289	297	299	299	278	274	290	302	284	285	274	271	254	247	238	235	233	279.6
25-Aug	222	211	181	171	173	182	171	152	159	240	254	257	259	260	209	192	192	185	177	167	147	153	166	166	193.2
26-Aug	166	165	175	173	176	171	174	172	195	212	245	238	240	230	235	243	251	245	237	250	303	282	282	268	225.4
27-Aug	257	254	258	257	253	260	263	264	260	239	248	265	241	260	259	296	135	135	211	203	197	184	189	201	238.6
28-Aug	221	236	237	250	245	244	246	252	233	244	247	230	274	248	264	260	235	141	141	140	148	136	140	145	220.6
29-Aug	156	152	175	165	149	175	143	145	145	119	113	113	109	192	215	235	259	110	116	127	138	135	132	134	145.7
30-Aug	132	116	115	116	123	129	129	124	120	105	103	99	75	107	124	146	134	133	114	124	127	131	119	121	121.0
31-Aug	118	121	168	225	258	336	210	241	251	257	251	244	270	254	258	259	255	253	254	249	252	250	261	266	248.4
222.5 231.5 230.4 236.1 236.0 245.9 247.5 250.2 242.3 254.7 257.1 254.6 265.0 264.7 275.0 272.0 265.0 264.8 265.5 265.5 240.5 242.7 240.8 231.0																									
Diurnal Average																									
C - Calibration M - Maintenance AF - Analyzer 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
Anzac - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 88 deg on Aug 6 09:00	Hours of Data: 693
Minimum Value: 5 deg on Aug 28 23:00	Hours of Missing Data: 51
Percentiles: P ₁ = 6 P ₁₀ = 11 Q ₁ = 14 Median = 18 Q ₃ = 21 P ₉₀ = 30 P ₉₉ = 68	Hours of Calibration: 8
	Percent Operational Time: 94.2

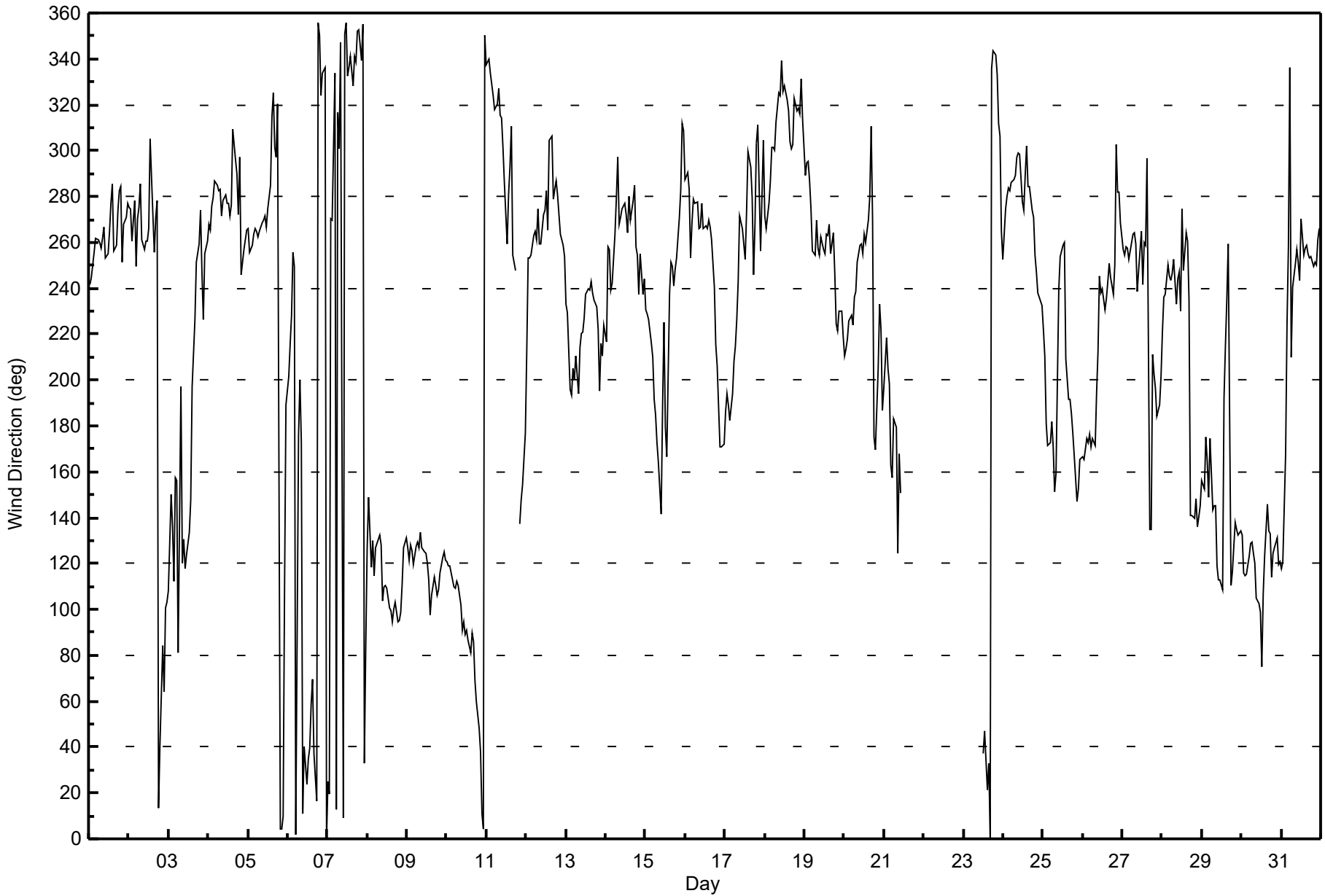
Day	Hourly Period Ending At (MST)																								Daily Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	21	17	20	17	18	18	18	18	18	18	18	18	20	19	20	20	18	20	18	18	18	17	17	16	21
2-Aug	17	16	15	14	16	16	18	20	22	21	22	31	20	29	29	22	27	53	22	15	17	10	30	26	53
3-Aug	22	16	17	16	19	23	41	59	37	22	25	18	17	16	27	80	27	23	21	17	26	19	17	18	80
4-Aug	18	18	18	17	17	15	16	18	18	22	24	21	24	21	27	15	24	16	16	14	19	18	19	15	27
5-Aug	14	14	13	14	14	14	12	13	13	13	18	18	23	26	31	27	33	22	37	9	9	8	53	12	53
6-Aug	15	9	8	12	52	12	63	22	88	16	25	31	16	17	33	33	14	15	16	11	14	6	7	15	88
7-Aug	9	22	53	68	78	5	42	25	47	47	37	42	37	25	22	24	33	23	21	12	6	10	23	32	78
8-Aug	40	32	22	34	26	19	15	21	19	26	27	27	29	23	32	23	18	19	15	14	14	14	12	11	40
9-Aug	12	12	12	13	14	15	16	16	15	16	15	15	17	16	15	16	15	17	15	15	16	14	14	15	17
10-Aug	15	16	16	15	16	16	14	16	15	16	16	17	18	17	19	18	18	17	17	17	15	16	14	12	19
11-Aug	11	12	11	13	13	12	14	16	16	22	23	24	19	22	17	22	23	29	UO	UO	18	7	8	22	29
12-Aug	18	17	18	17	18	17	18	18	17	16	17	18	21	20	43	21	19	19	16	15	14	13	8	18	43
13-Aug	7	12	15	12	17	16	18	21	28	21	20	20	22	19	21	20	20	20	18	18	13	17	12	12	28
14-Aug	12	26	18	16	18	19	16	22	15	15	17	18	17	19	26	18	20	19	22	26	27	18	9	9	27
15-Aug	12	11	7	9	12	12	17	18	16	14	30	18	32	27	22	19	20	17	19	18	16	18	13	16	32
16-Aug	13	17	15	21	30	14	15	16	16	18	22	22	24	26	21	20	21	20	19	15	15	11	11	13	30
17-Aug	18	19	18	19	32	48	16	17	24	19	20	18	20	20	16	15	20	21	17	33	60	18	20	24	60
18-Aug	42	18	18	16	14	13	14	14	14	16	17	16	18	17	18	16	14	13	14	12	14	13	12	17	42
19-Aug	16	14	14	14	17	18	17	19	17	20	19	21	19	19	20	20	19	18	18	15	16	13	17	16	21
20-Aug	16	17	15	14	14	17	20	42	20	17	19	21	19	24	27	31	24	71	64	50	29	30	46	37	71
21-Aug	13	11	12	20	19	39	12	40	88	46	25	C	C	C	M	M	M	M	M	M	M	M	M	M	88
22-Aug	M	M	M	M	M	M	M	M	M	M	C	C	C	C	C	AF	AF	AF	AF	AF	AF	AF	AF	AF	--
23-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	25	23	19	17	27	13	13	12	13	6	16	20	27
24-Aug	17	14	14	12	14	14	14	14	15	17	15	18	18	18	16	17	15	14	16	9	10	8	8	18	18
25-Aug	8	9	11	15	12	13	21	19	46	30	23	22	20	19	42	21	28	21	18	16	13	14	17	17	46
26-Aug	15	17	18	15	17	20	26	21	23	29	24	19	18	20	23	18	19	19	14	15	21	20	14	10	29
27-Aug	11	10	16	12	12	12	13	16	18	21	23	35	33	23	26	81	26	29	24	15	21	12	13	11	81
28-Aug	10	14	15	12	9	11	18	20	17	16	22	41	68	15	21	19	48	21	8	5	7	5	5	8	68
29-Aug	9	10	13	34	11	16	21	8	7	13	12	17	20	45	27	19	27	41	8	9	5	6	7	6	45
30-Aug	7	8	10	9	6	8	13	10	13	18	17	22	19	19	16	20	16	23	79	18	12	9	8	7	79
31-Aug	9	9	29	31	60	56	55	45	19	18	17	15	24	21	20	19	17	17	18	17	17	16	14	15	60
Diurnal Maximum																									
42 32 53 68 78 56 63 59 88 47 37 42 68 45 43 81 48 71 79 50 60 30 53 37																									

C - Calibration M - Maintenance AF - Analyzer Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Anzac - August 2023





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS17
WAPASU
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
AUGUST 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	0	5.3	0
H2S (ppb) Average	708	36	36	100	3.7	0	0.5	0
THC (ppm) Average	709	35	35	100	3.4	-	2.6	-
O3 (ppb) Average	677	34	67	95.56	77.2	1	36.2	-
NO2 (ppb) Average	707	37	37	100	26.1	0	6.2	-
NO (ppb) Average	707	37	37	100	18.2	-	1.9	-
NOX (ppb) Average	707	37	37	100	32.1	-	7.6	-
PM2.5 (ug/m3) Average	741	2	3	99.87	478.1	114	140	17
Temperature 2 m (C) Average	744	0	0	100	31.2	-	23.8	-
Relative Humidity (%) Average	744	0	0	100	100	-	92.7	-
Wind Speed 10 m (km/h) Average	743	0	1	99.87	20	-	15	-
Wind Direction 10 m (deg) Average	743	0	1	99.87	-	-	-	-
Precipitation (mm) Total	744	0	0	100	11.9	-	18.1	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
AUGUST 2023

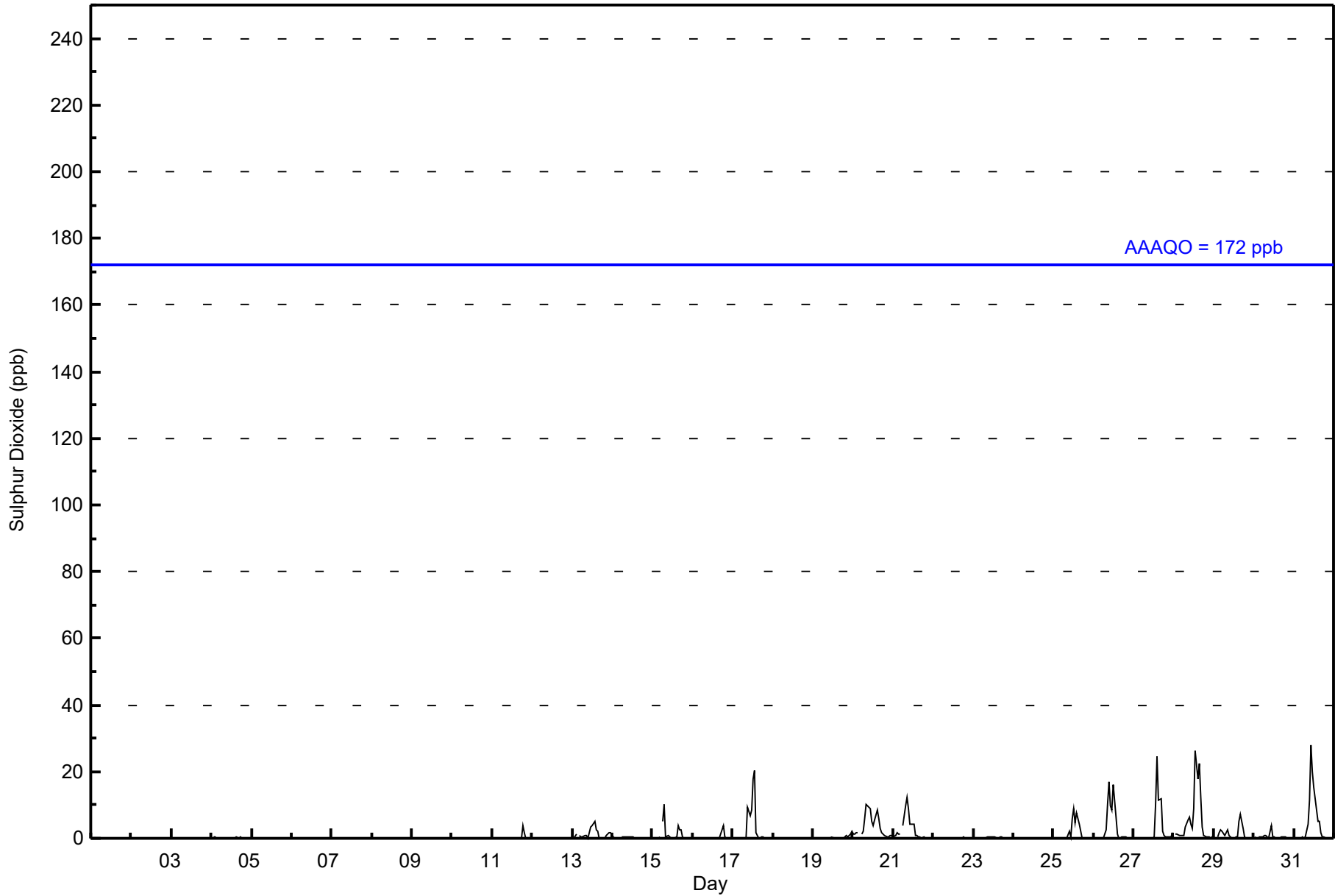
MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	709	1.02	3.2	-	0	0	0	0	0.3	2.4	28
H2S (ppb) Average	708	0.2	0.2	-	0	0	0.1	0.2	0.3	0.4	3.7
THC (ppm) Average	709	2.35	0.2	-	2.1	2.2	2.2	2.3	2.4	2.6	3.4
O3 (ppb) Average	677	25.71	11.1	-	3.6	10.7	18.1	25.3	32.6	39.8	77.2
NO2 (ppb) Average	707	2.46	2.7	-	0.2	0.4	0.8	1.5	3.2	5.3	26.1
NO (ppb) Average	707	0.47	1.2	-	0	0	0.1	0.2	0.4	0.8	18.2
NOX (ppb) Average	707	2.92	3.5	-	0.3	0.5	1	1.8	3.6	6.2	32.1
PM2.5 (ug/m3) Average	741	43.71	57.6	-	2.2	4.2	8.8	22.2	60.5	110.5	478.1
Temperature 2 m (C) Average	744	15.89	5	-	3.1	9.9	12.3	15.5	19.3	22.2	31.2
Relative Humidity (%) Average	744	75.4	17.7	-	31.2	49.8	61.8	77.4	92	96.8	100
Wind Speed 10 m (km/h) Average	743	7.6	3	-	0	4	5	7	10	12	20
Wind Direction 10 m (deg) Average	743	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	44.89	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WAPASU (AMS17)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
O3	30 Aug 2023 06:00	31 Aug 2023 11:00	30	Analyzer Failure - inconsistent response
O3	31 Aug 2023 12:00	31 Aug 2023 14:00	3	Maintenance - replaced sample pump
PM2.5	05 Aug 2023 21:00	05 Aug 2023 21:00	1	DAS Failure - data not recorded
Wind Speed, Wind Direction	22 Aug 2023 20:00	22 Aug 2023 20:00	1	Flat line in sensor output signal





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Wapasu - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	693	97.74	97.74
11 - 20	12	1.69	99.44
21 - 60	4	0.56	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
Wapasu - August 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	58	20	16	13	12	39	89	108	75	44	43	40	28	35	27	45	692
11 - 20	0	0	0	0	0	0	0	1	0	4	2	3	1	1	0	0	12
21 - 60	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	4
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	58	20	16	13	12	39	89	109	76	50	46	43	29	36	27	45	708

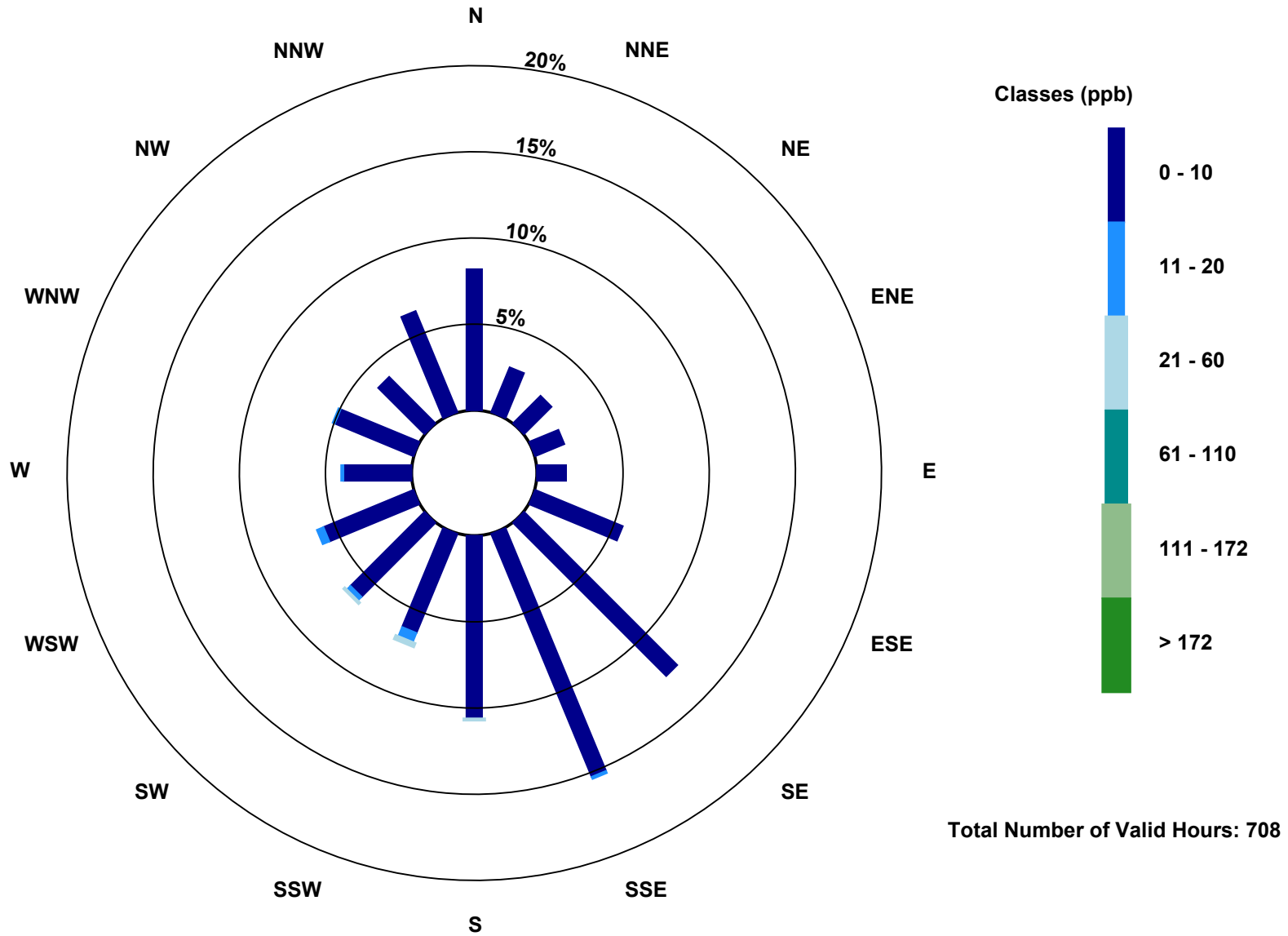
Total Number of Valid Hours: 708

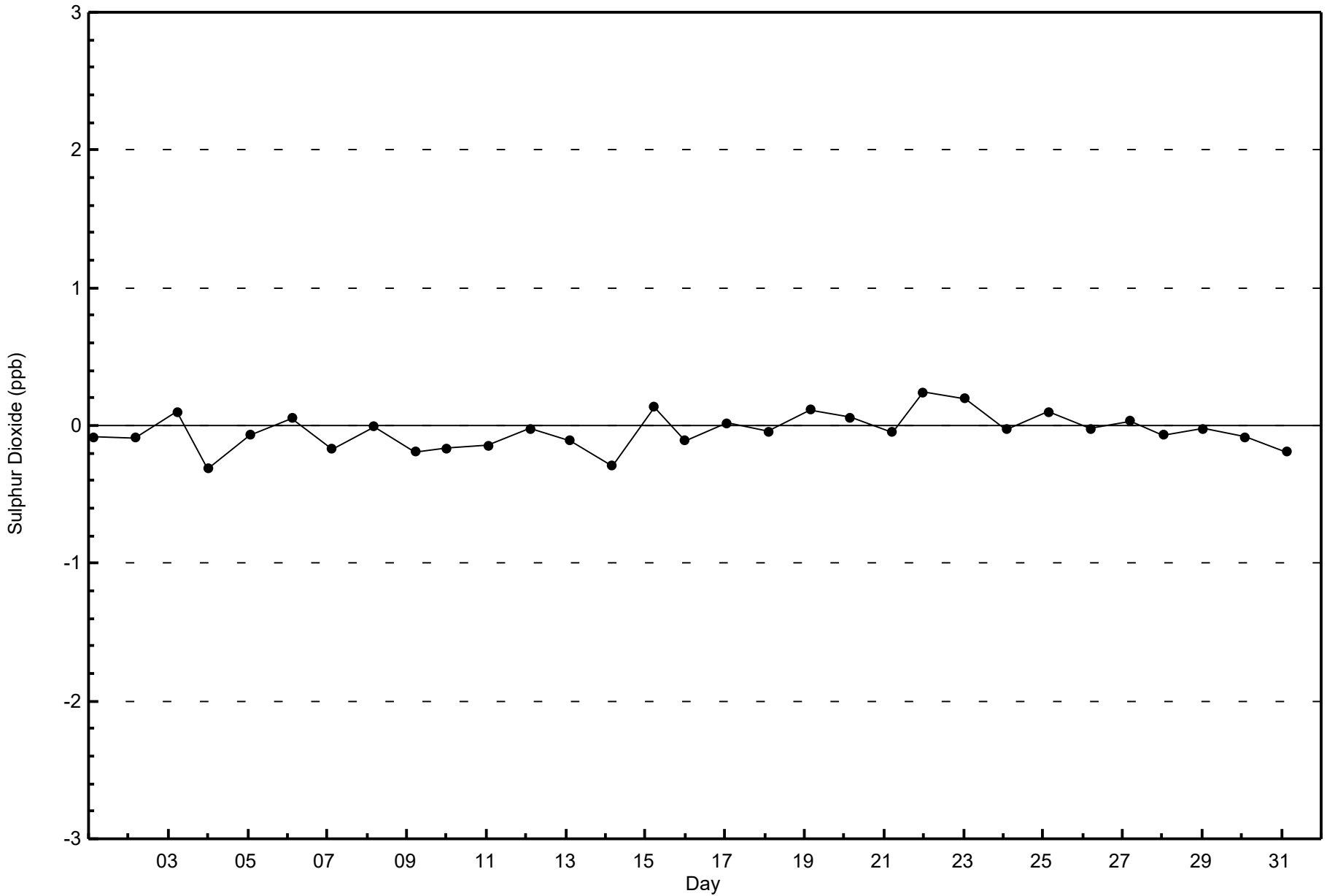
Total Number of Hours: 744

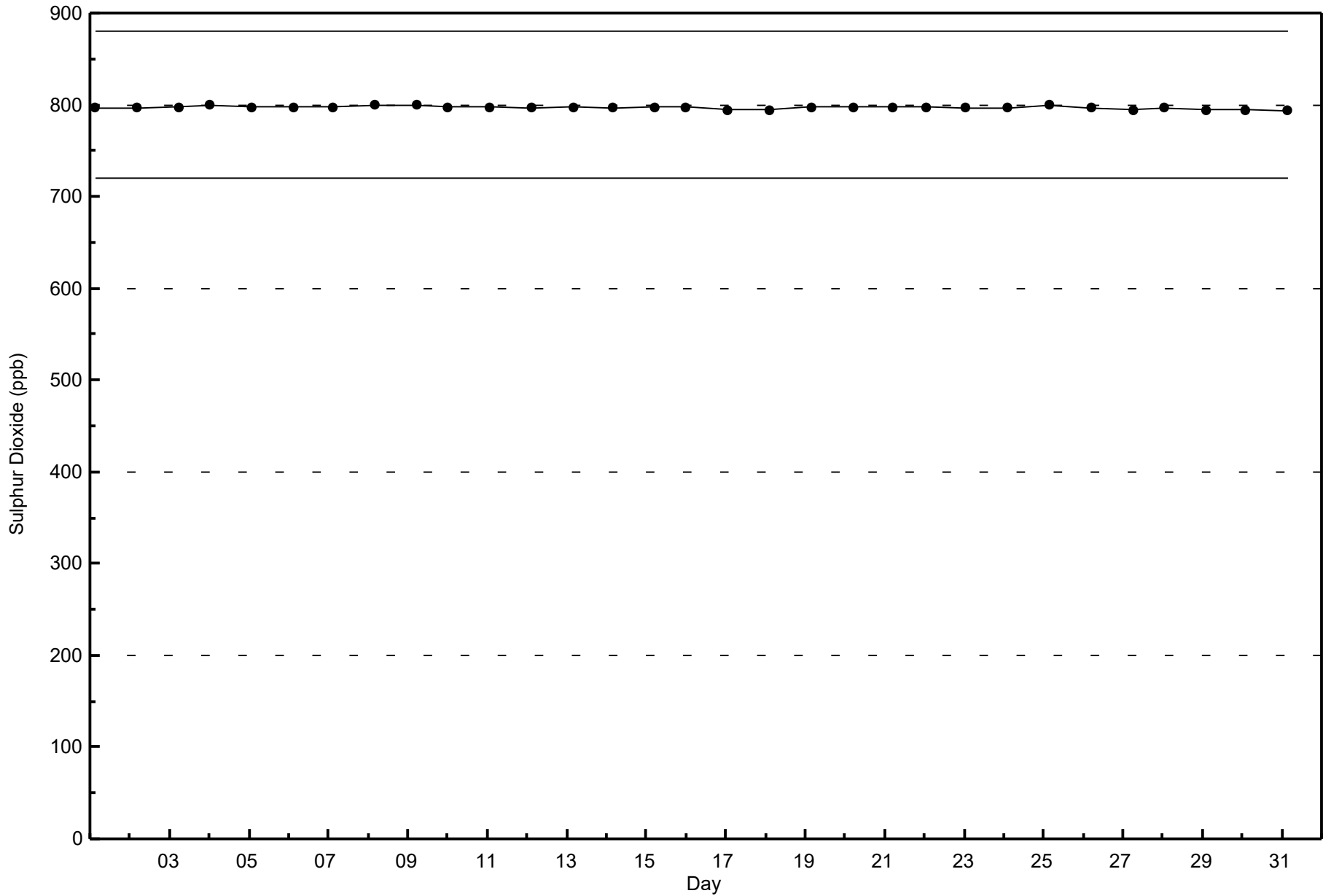


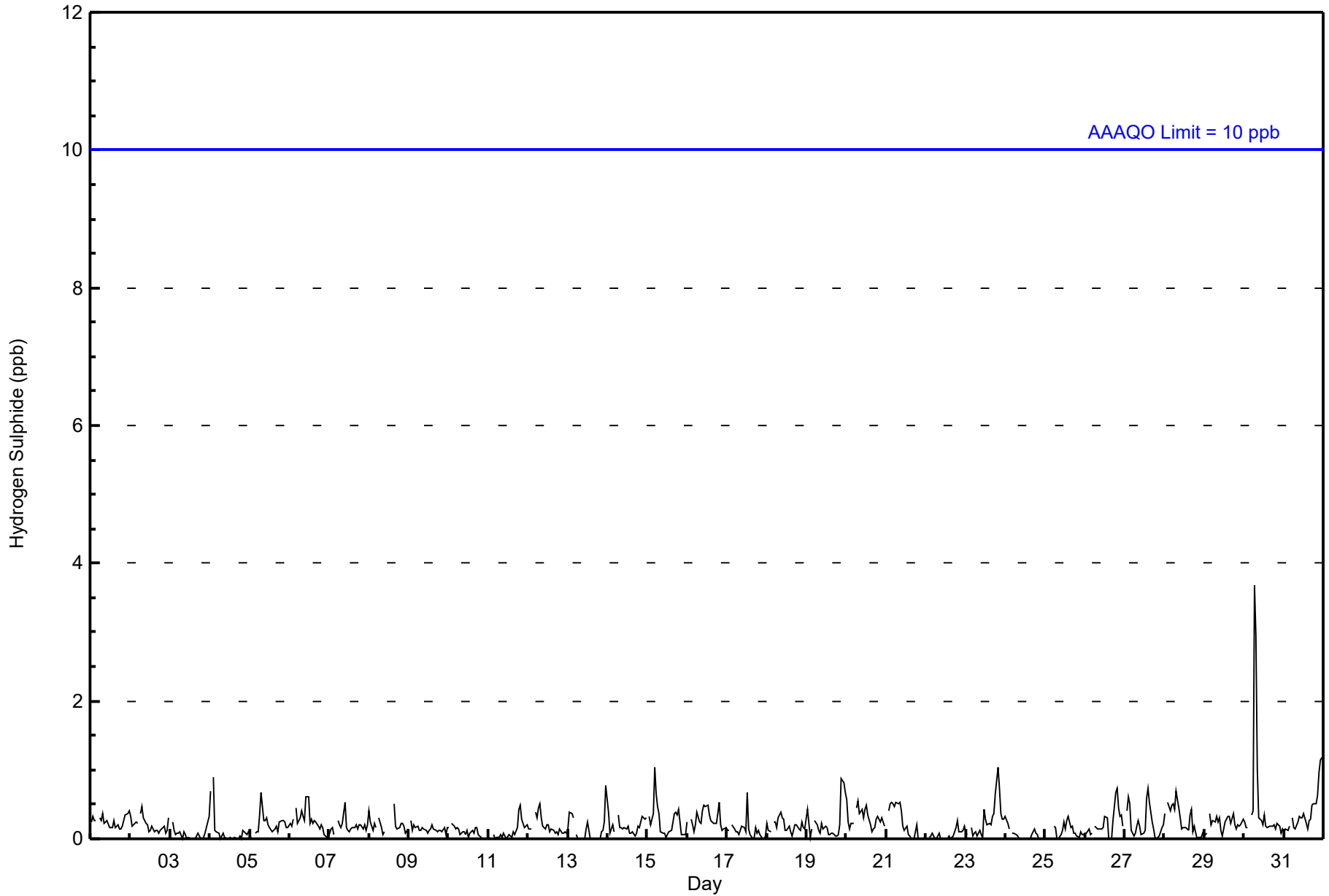
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Wapasu











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Wapasu - August 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 - August 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	58	20	16	13	11	35	87	109	79	50	47	44	29	36	27	44	705
3 - 4	0	0	0	0	0	0	2	0	0	0	0	0	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	58	20	16	13	11	35	89	109	79	50	47	44	29	36	27	44	707

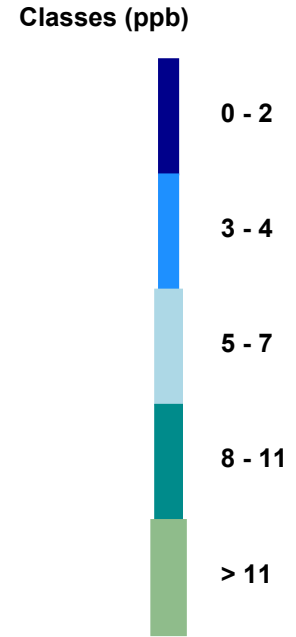
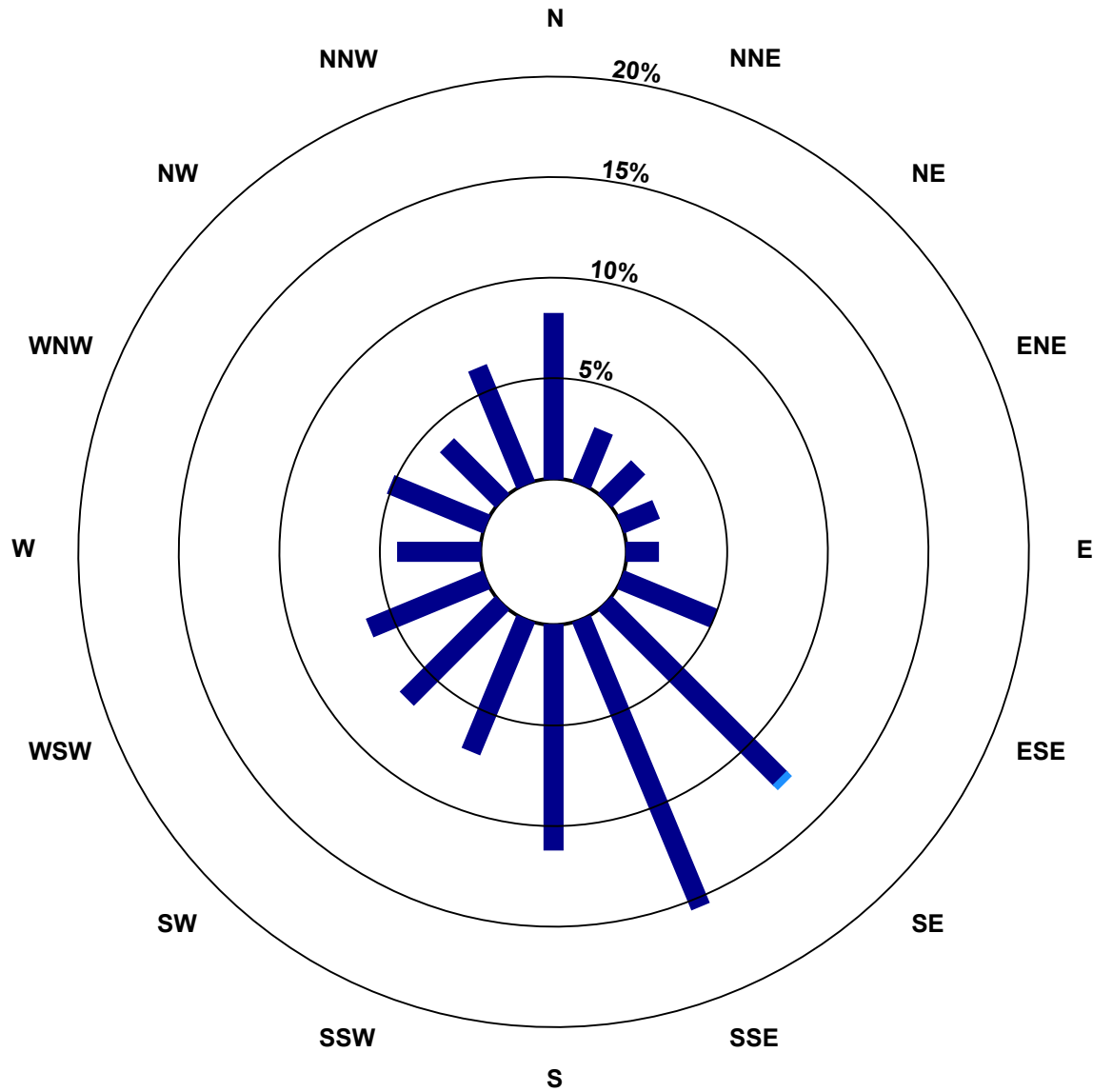
Total Number of Valid Hours: 707

Total Number of Hours: 744

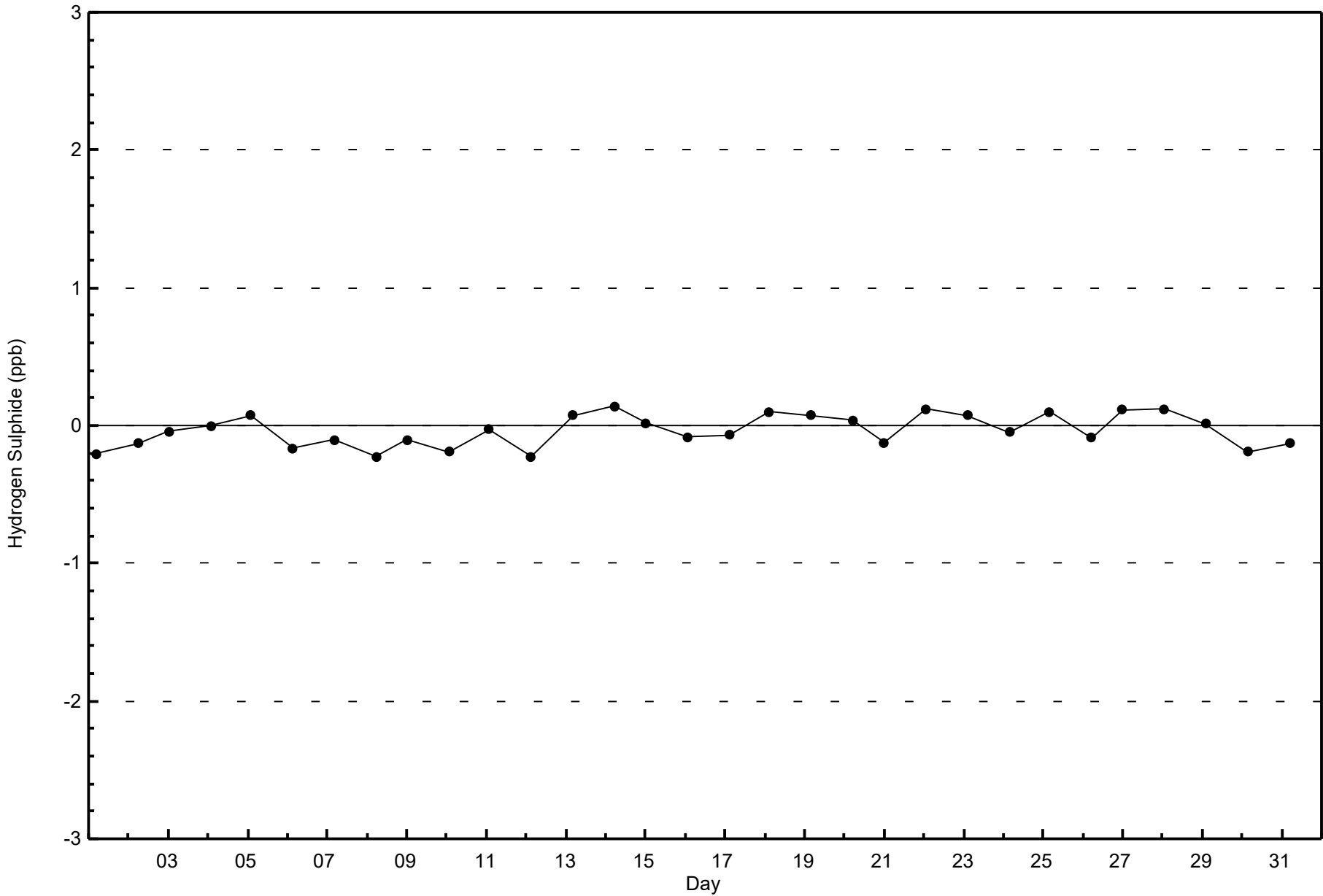


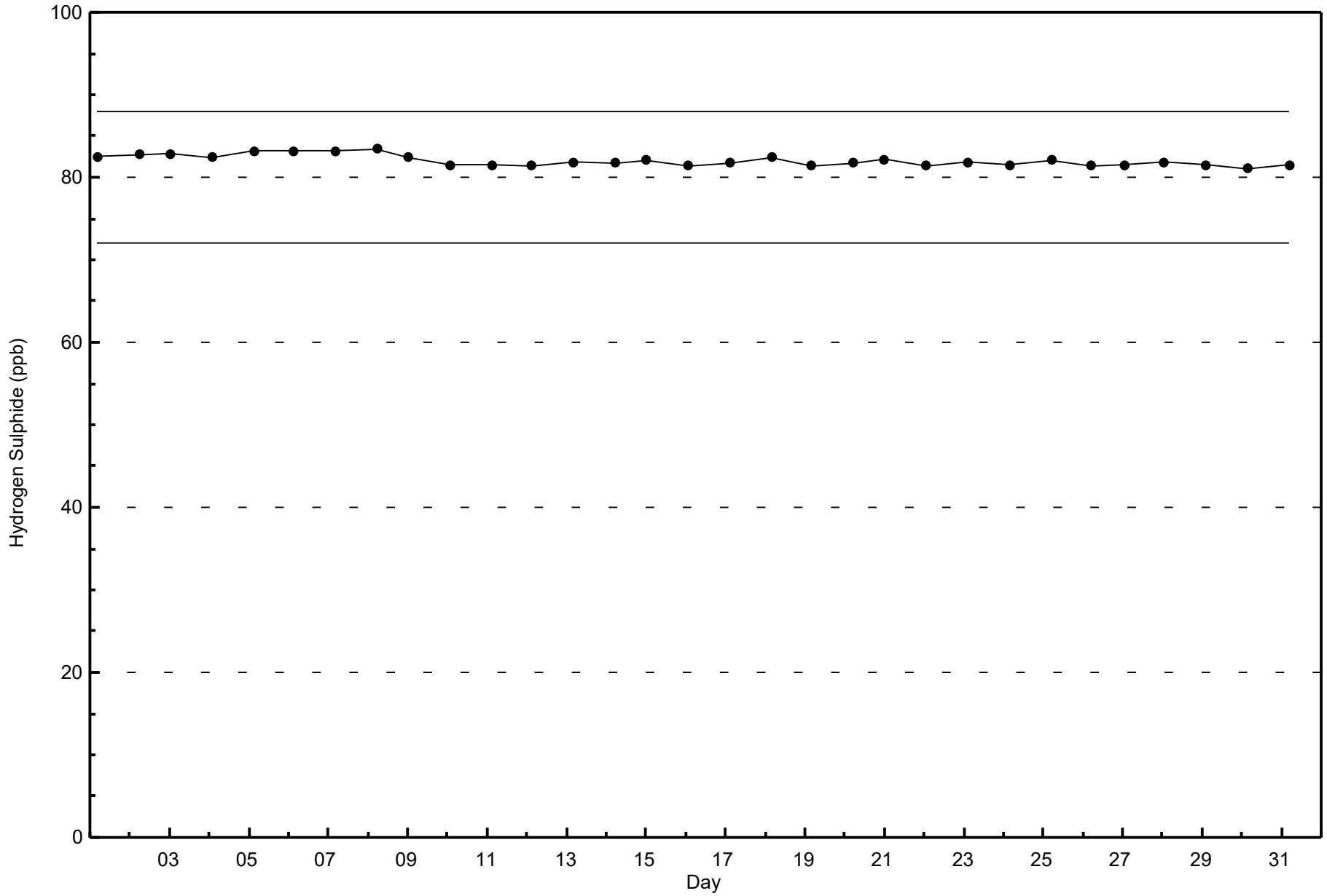
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Wapasu



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

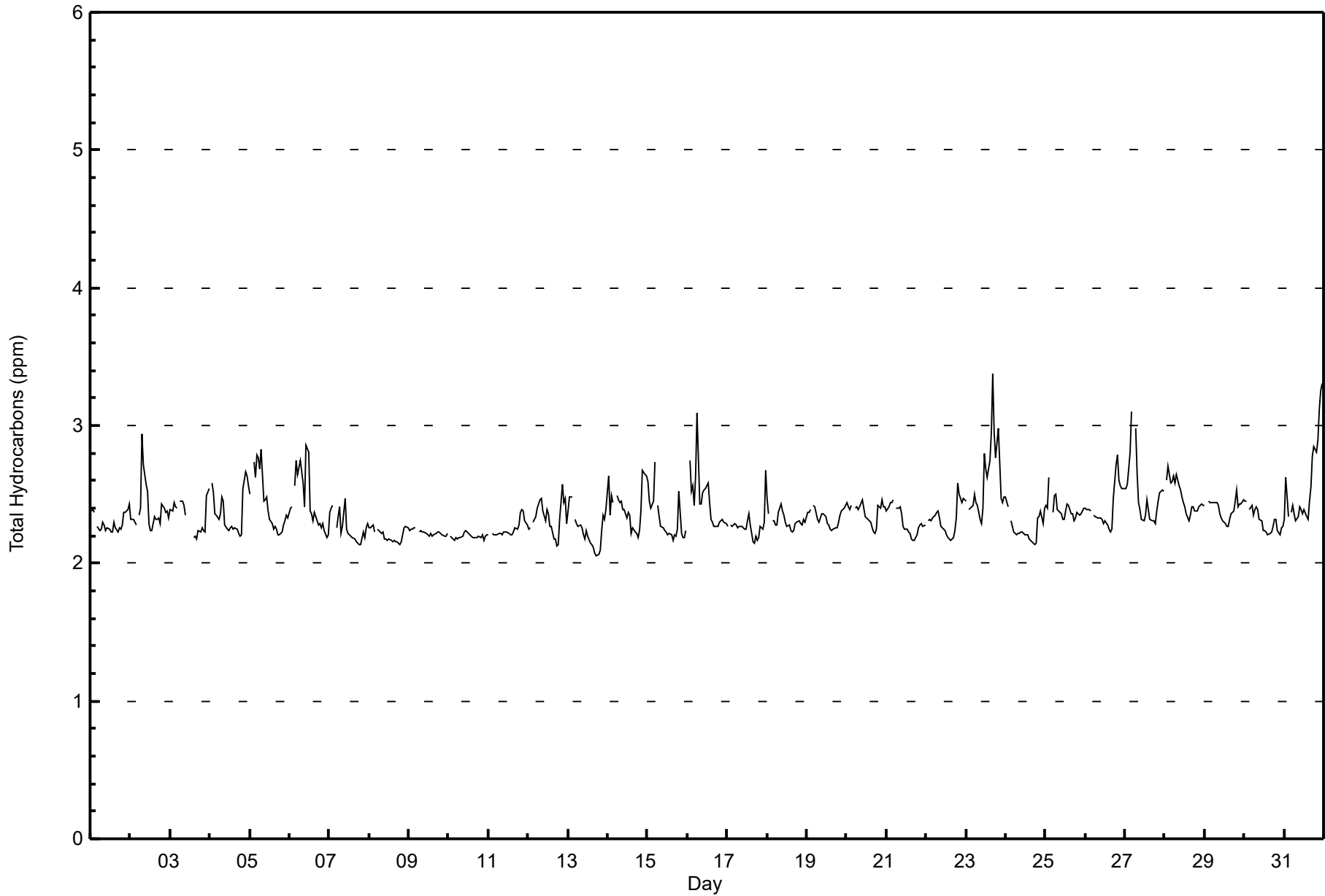
Total Hydrocarbons (THC) - ppm
Wapasu - August 2023

Maximum Value: 3.4 ppm on Aug 23 17:00																				Maximum Daily Average: 2.6 ppm on Aug 23					Hours in Service: 744	
Minimum Value: 2.1 ppm on Aug 13 18:00																				Minimum Daily Average: 2.2 ppm on Aug 10					Hours of Data: 709	
Maximum Diurnal Average: 2.4 ppm at hour 5																				Minimum Diurnal Average: 2.3 ppm at hour 16					Hours of Missing Data: 35	
Monthly Average: 2.35 ppm																				Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 3.0					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-Aug	2.4	2.4	2.4	Z	2.3	2.2	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4
2-Aug	2.3	2.3	2.3	2.3	Z	2.3	2.4	2.9	2.7	2.6	2.5	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.9
3-Aug	2.4	2.4	2.4	2.4	2.4	Z	2.5	2.4	2.4	2.3	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.2	2.5	2.5	2.3	2.5
4-Aug	Z	2.6	2.5	2.4	2.4	2.3	2.4	2.5	2.4	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.5	2.7	2.6	2.6	2.4	2.7
5-Aug	2.5	Z	2.7	2.6	2.8	2.8	2.7	2.8	2.5	2.5	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.8
6-Aug	2.4	2.4	Z	2.6	2.7	2.6	2.7	2.7	2.6	2.4	2.9	2.8	2.4	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.4	2.9
7-Aug	2.4	2.4	2.4	Z	2.3	2.3	2.4	2.2	2.3	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.3	2.5
8-Aug	2.3	2.3	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	2.1	2.2	2.2	2.3	2.3	2.3	2.2	2.3
9-Aug	2.2	2.2	2.2	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
10-Aug	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
11-Aug	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	2.3	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.2	2.4
12-Aug	2.2	2.3	Z	2.3	2.3	2.4	2.4	2.5	2.5	2.4	2.3	2.4	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.3	2.6	2.4	2.5	2.3	2.3	2.6
13-Aug	2.4	2.5	2.5	Z	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.4	2.3	2.4	2.2	2.5	2.5
14-Aug	2.6	2.3	2.5	2.4	Z	2.5	2.5	2.4	2.5	2.4	2.4	2.3	2.4	2.3	2.2	2.3	2.2	2.2	2.2	2.2	2.4	2.7	2.6	2.6	2.4	2.7
15-Aug	2.6	2.5	2.4	2.4	2.7	Z	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.5	2.2	2.2	2.2	2.2	2.3	2.7
16-Aug	Z	2.8	2.5	2.6	2.4	2.6	3.1	2.4	2.4	2.5	2.5	2.5	2.6	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	3.1
17-Aug	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	2.4	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.3	2.7	2.3	2.7
18-Aug	2.5	2.4	Z	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	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	2.5
19-Aug	2.4	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.4
20-Aug	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.4	2.4	2.5	2.4	2.4	2.4	2.5
21-Aug	2.4	2.4	2.4	2.4	2.5	Z	2.4	2.4	2.4	2.4	2.3	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	2.5
22-Aug	Z	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6	2.5	2.4	2.5	2.5	2.3	2.6
23-Aug	2.4	Z	2.4	2.4	2.4	2.5	2.4	2.4	2.3	2.3	2.4	2.8	2.7	2.6	2.7	2.9	3.4	2.9	2.8	3.0	2.7	2.5	2.4	2.5	2.6	3.4
24-Aug	2.5	2.4	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	2.1	2.1	2.3	2.3	2.4	2.3	2.4	2.3	2.5
25-Aug	2.4	2.4	2.6	Z	2.4	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.3	2.4	2.4	2.4	2.4	2.6
26-Aug	2.4	2.4	2.4	2.4	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.5	2.7	2.8	2.6	2.6	2.5	2.5	2.4	2.8
27-Aug	2.5	2.6	2.7	2.8	3.1	Z	3.0	2.7	2.4	2.4	2.3	2.3	2.3	2.5	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.5	3.1
28-Aug	Z	2.6	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	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	2.5	2.7
29-Aug	2.4	Z	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	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.5	2.4	2.5
30-Aug	2.5	2.5	Z	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	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.5
31-Aug	2.3	2.6	2.3	Z	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.4	2.6	2.8	2.8	2.8	2.9	3.1	3.3	3.3	2.6	3.3
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 2.3 2.4 2.4 2.4 2.4 2.4																								Diurnal Average		
2.6 2.8 2.7 2.8 3.1 2.8 3.1 2.9 2.7 2.6 2.9 2.8 2.7 2.6 2.7 2.9 3.4 2.9 2.8 3.0 2.9 3.1 3.3 3.3																								Diurnal Maximum		
Z - zerospan C - Calibration																										



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Wapasu - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Wapasu - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	703	99.15	99.15
3.1 - 10.0	6	0.85	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
Wapasu - August 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	55	20	16	13	12	39	89	108	76	50	46	43	28	35	27	45	702
3.1 - 10.0	3	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	58	20	16	13	12	39	89	109	76	50	46	43	29	36	27	45	708

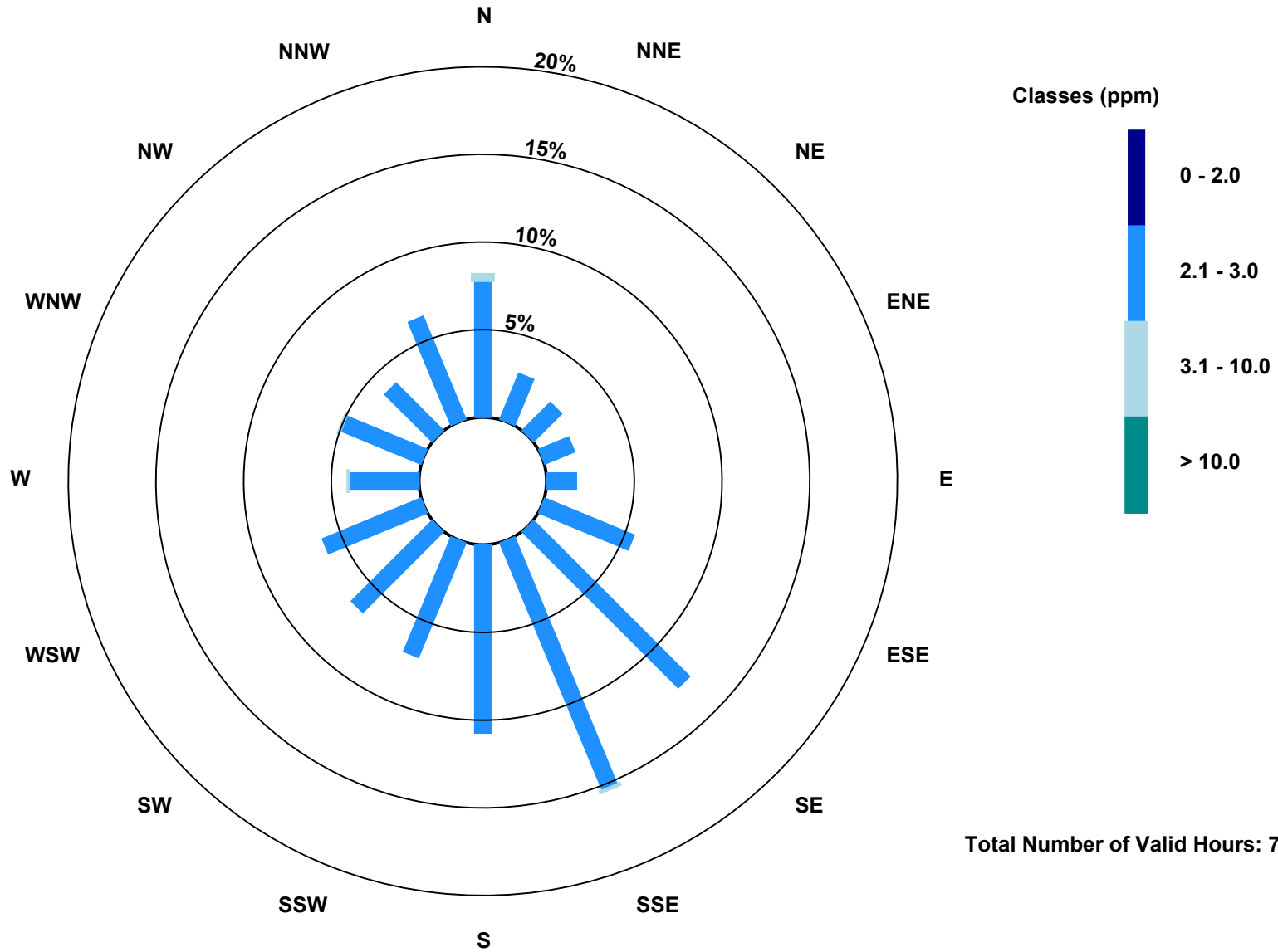
Total Number of Valid Hours: 708

Total Number of Hours: 744

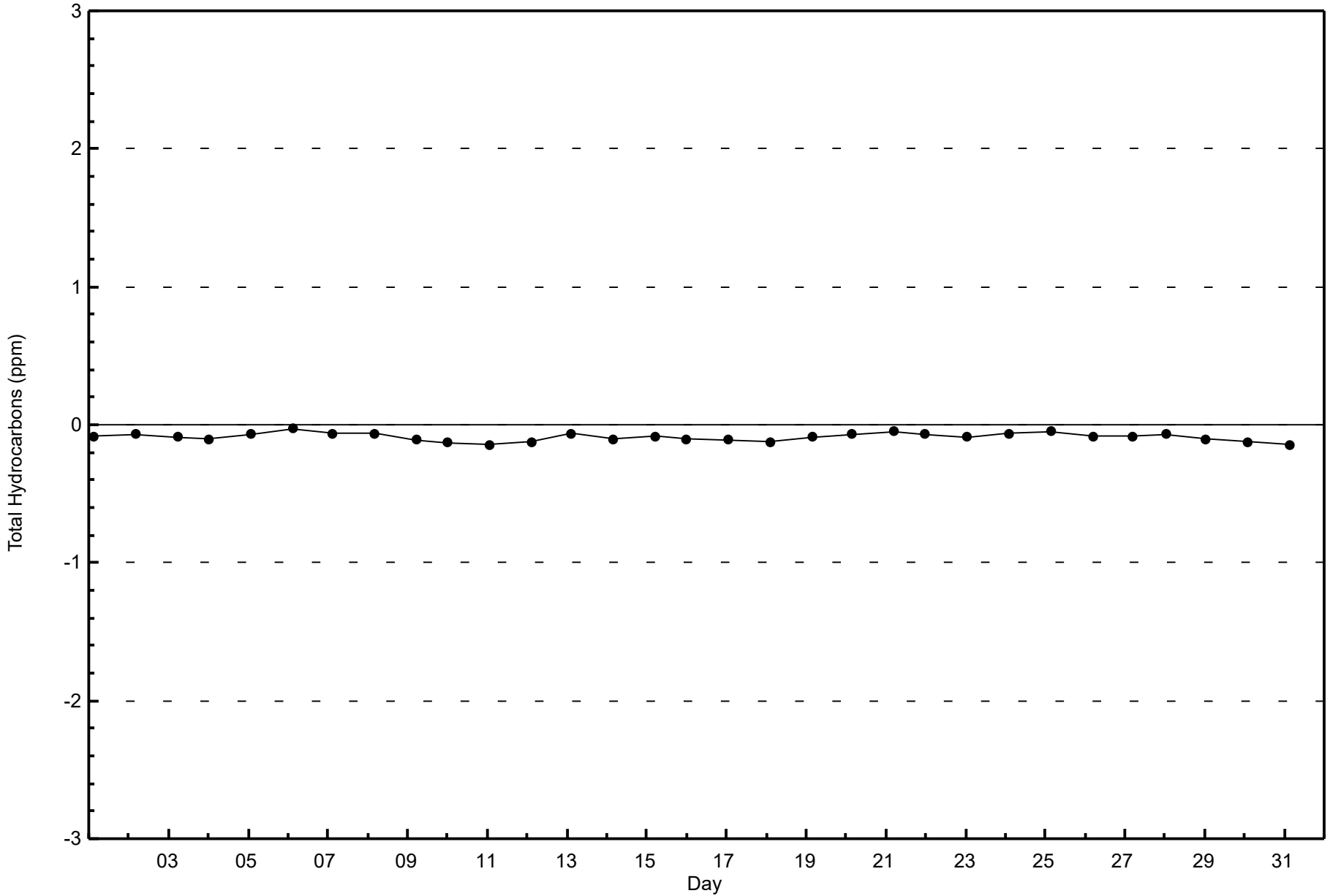


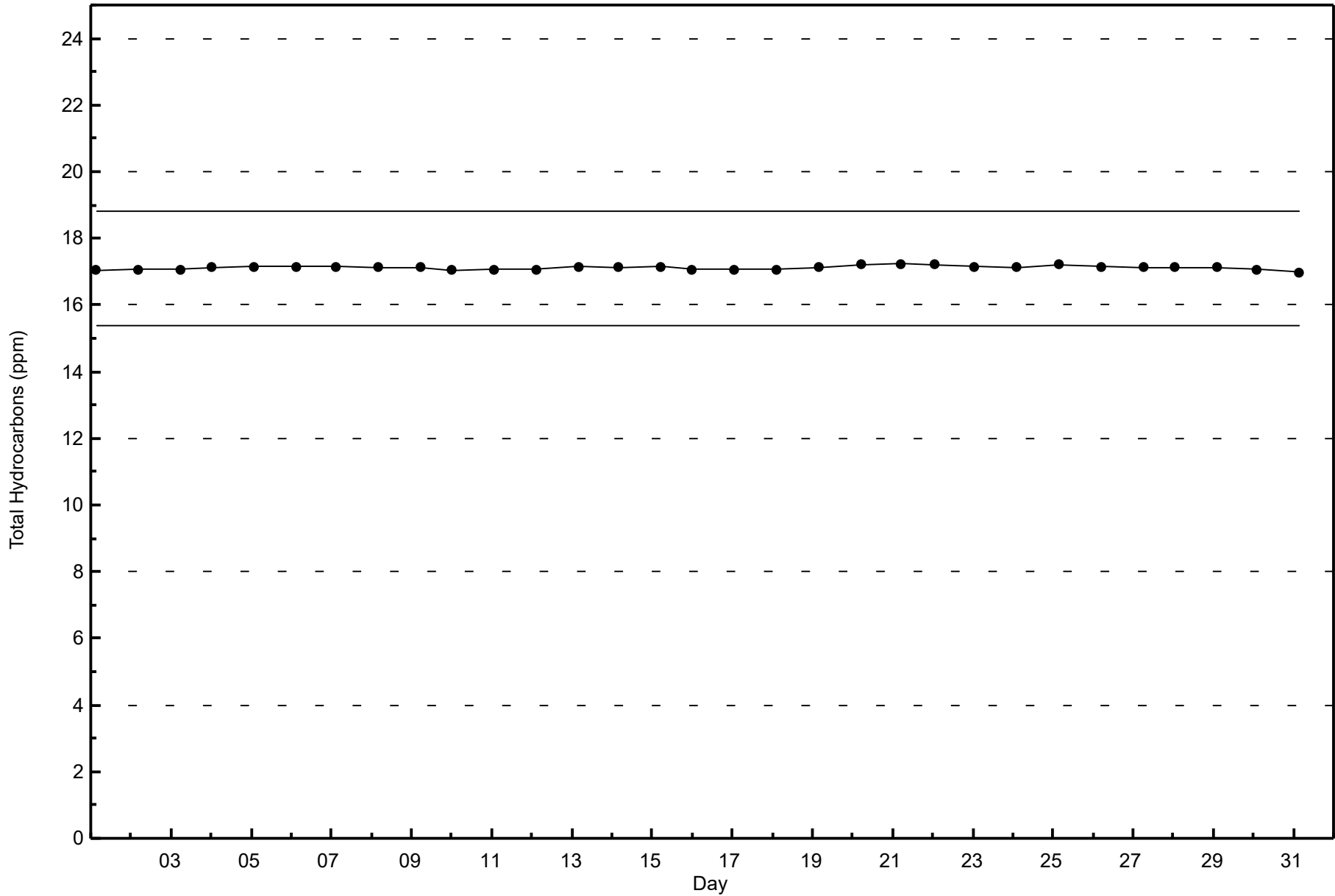
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Wapasu



Total Number of Valid Hours: 708







Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

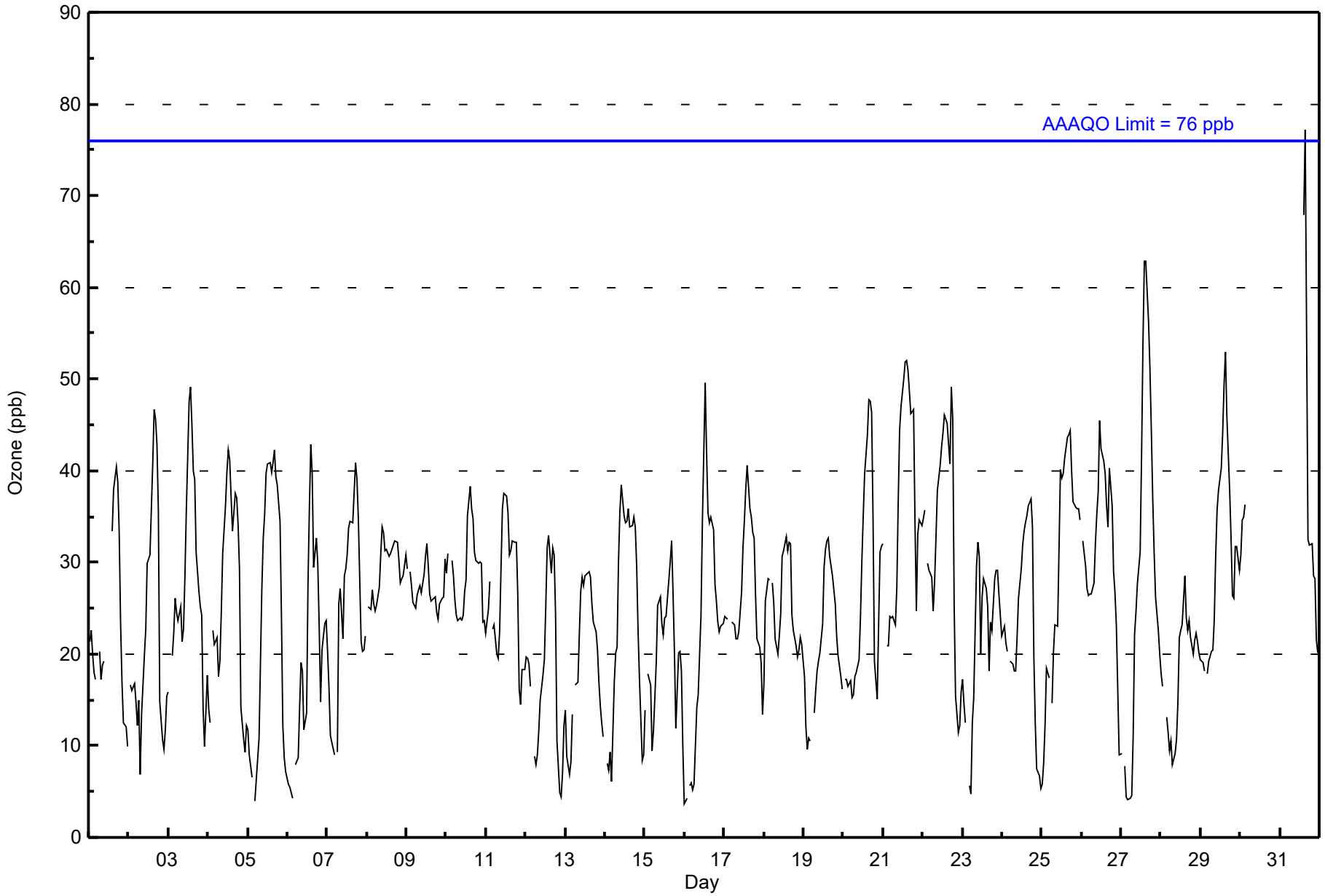
Wapasu - August 2023

Number of Exceedences (AAAQO):	1-hr: 1	24-hr: 0	Hours in Service:	744
Maximum Value: 77.2 ppb on Aug 31 16:00	Maximum Daily Average: 36.2 ppb on Aug 21		Hours of Data:	677
Minimum Value: 3.6 ppb on Aug 16 01:00	Minimum Daily Average: 17.7 ppb on Aug 12		Hours of Missing Data:	67
Maximum Diurnal Average: 38.6 ppb at hour 15	Minimum Diurnal Average: 16.7 ppb at hour 5		Hours of Calibration:	34
Monthly Average: 25.71 ppb	Percentiles: P ₁ = 4.4 P ₁₀ = 10.7 Q ₁ = 18.1 Median = 25.3 Q ₃ = 32.6 P ₉₀ = 39.8 P ₉₉ = 53.1		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-Aug	21.4	22.5	20.0	18.1	17.2	Z	20.3	17.3	18.7	19.2	C	C	C	C	33.4	38.0	40.4	38.7	33.3	23.3	16.9	12.5	12.1	9.9	22.8	40.4
2-Aug	Z	16.6	16.0	16.8	14.8	12.3	14.9	6.8	13.4	19.8	22.7	29.9	30.3	30.8	40.8	46.7	45.7	42.8	35.7	14.8	10.6	9.6	11.7	15.4	22.6	46.7
3-Aug	15.9	Z	19.9	22.3	26.0	24.6	23.6	25.2	21.3	22.7	28.5	35.7	47.6	49.1	45.0	39.9	39.1	31.2	26.9	25.2	24.2	14.1	10.0	17.7	27.6	49.1
4-Aug	14.0	12.6	Z	22.6	21.1	21.8	17.6	19.3	24.5	31.0	36.2	39.8	42.3	41.3	37.2	33.3	37.5	37.1	34.1	29.3	14.3	10.6	9.3	12.2	26.0	42.3
5-Aug	11.8	9.0	6.5	Z	4.0	6.3	8.5	10.9	27.2	32.7	35.2	39.7	40.8	40.9	39.7	40.9	42.2	39.4	38.4	34.4	24.2	12.1	8.7	7.1	24.4	42.2
6-Aug	5.7	5.5	4.8	4.3	Z	8.0	8.7	14.2	19.1	18.2	11.7	13.7	27.8	35.9	42.9	39.7	29.4	32.6	29.8	23.0	14.8	20.4	23.4	23.6	19.9	42.9
7-Aug	20.3	16.3	11.1	10.3	9.0	Z	9.3	25.4	27.2	21.7	28.6	29.3	30.7	33.8	34.5	34.3	37.6	40.8	39.1	34.9	21.3	20.3	20.4	21.9	25.1	40.8
8-Aug	Z	25.2	24.9	27.0	25.5	24.7	25.3	27.3	30.9	33.9	33.3	31.2	31.5	30.7	31.0	31.4	31.9	32.4	32.2	30.2	27.8	28.3	28.5	30.8	29.4	33.9
9-Aug	29.3	Z	29.0	27.5	25.6	25.0	26.5	27.0	27.5	26.8	28.7	30.6	32.0	29.6	26.6	25.7	26.1	26.2	24.5	23.8	25.5	26.1	26.3	30.4	27.2	32.0
10-Aug	28.8	31.0	Z	30.2	28.6	25.9	24.3	23.7	23.9	23.6	24.2	26.8	28.0	35.1	38.4	35.9	34.8	31.2	30.2	29.9	30.1	29.9	23.5	23.7	28.8	38.4
11-Aug	22.2	24.9	27.9	Z	22.7	23.2	20.0	19.5	22.5	29.2	35.9	37.6	37.2	35.5	30.8	31.3	32.3	32.2	32.1	26.4	16.1	14.5	18.3	18.2	26.5	37.6
12-Aug	19.7	19.6	18.9	16.4	Z	8.9	7.9	9.0	11.5	14.9	17.7	19.3	25.1	31.6	32.9	28.8	31.5	30.9	24.5	10.5	4.9	4.4	7.0	12.2	17.7	32.9
13-Aug	13.9	8.8	6.9	8.3	13.4	Z	16.6	16.9	22.2	26.8	28.4	27.5	28.5	28.8	28.9	28.3	25.5	23.5	22.4	20.4	16.9	14.3	12.5	11.0	19.6	28.9
14-Aug	Z	8.1	7.3	9.3	6.1	16.9	20.2	20.8	30.1	35.6	38.4	35.1	34.3	34.5	35.8	33.9	34.0	35.0	33.9	29.6	22.5	17.2	8.4	9.0	24.2	38.4
15-Aug	13.9	Z	17.8	16.6	9.5	11.5	15.2	19.0	25.3	26.3	23.4	22.2	23.9	24.1	28.1	30.0	32.3	26.7	20.3	12.0	20.2	20.2	18.1	10.0	20.3	32.3
16-Aug	3.6	4.2	Z	5.6	5.9	5.1	5.7	14.1	15.5	20.0	24.3	34.4	49.6	41.9	35.3	34.4	34.9	33.5	27.6	25.8	23.5	22.5	23.0	23.3	22.3	49.6
17-Aug	24.1	24.0	23.7	Z	23.4	23.4	23.2	21.7	21.7	22.5	26.6	31.6	34.5	37.9	40.6	35.9	34.9	33.3	32.7	26.4	21.7	20.7	19.1	13.4	26.8	40.6
18-Aug	16.8	25.8	28.3	28.1	Z	27.8	25.6	21.7	19.9	21.9	24.5	30.7	31.3	32.7	31.3	32.2	32.0	24.3	22.5	20.9	19.7	20.4	21.8	21.0	25.3	32.7
19-Aug	17.5	12.1	9.6	10.8	10.6	Z	13.5	16.0	18.1	19.1	20.2	23.3	29.4	31.5	32.3	32.6	30.7	28.5	27.1	25.4	22.0	19.8	17.5	16.1	21.0	32.6
20-Aug	Z	17.3	17.3	16.5	17.1	15.2	15.6	17.6	18.1	19.3	23.9	30.0	35.1	39.6	43.9	47.7	47.5	46.4	34.9	19.2	15.1	23.2	31.1	31.7	27.1	47.7
21-Aug	32.1	Z	21.0	20.9	24.1	24.0	24.1	23.1	27.2	36.4	44.4	47.0	50.0	51.8	52.0	51.0	48.7	46.2	46.7	34.5	24.7	33.2	34.6	34.1	36.2	52.0
22-Aug	34.7	35.8	Z	29.9	29.1	28.4	24.6	27.8	32.7	37.9	40.6	42.5	44.1	46.0	45.7	45.2	40.7	49.1	45.7	25.5	15.5	11.5	12.2	15.9	33.1	49.1
23-Aug	17.3	14.6	12.5	Z	5.6	4.7	12.5	15.2	29.7	32.2	30.7	19.9	26.2	28.2	27.2	25.1	18.1	23.5	22.6	28.2	29.1	29.2	26.5	24.2	21.9	32.2
24-Aug	21.9	23.1	21.2	20.2	Z	19.2	18.9	18.1	18.1	21.9	26.1	29.3	31.9	33.4	34.3	35.0	36.1	37.0	33.9	19.7	12.4	7.5	6.8	5.4	23.1	37.0
25-Aug	5.8	8.1	12.1	18.5	17.4	Z	14.7	20.1	23.1	23.0	31.6	40.1	39.3	39.7	41.3	43.6	43.9	44.3	39.9	36.5	36.0	35.8	35.9	34.6	29.8	44.3
26-Aug	Z	32.3	29.6	27.2	26.4	26.5	26.6	27.8	32.0	35.2	37.7	45.5	42.4	41.0	39.7	36.2	33.9	40.3	36.1	29.0	26.6	23.0	16.0	9.0	31.3	45.5
27-Aug	9.1	Z	7.7	4.4	4.1	4.3	4.5	11.0	22.1	24.6	27.6	31.2	41.5	53.9	62.8	62.8	56.2	51.1	44.4	37.0	31.1	26.2	22.5	20.0	28.7	62.8
28-Aug	17.9	16.4	Z	13.1	11.5	9.4	10.5	8.0	9.1	10.7	14.8	21.8	22.6	23.1	28.6	23.9	22.6	23.7	21.8	19.9	21.6	22.3	21.4	20.1	18.0	28.6
29-Aug	19.4	19.1	18.1	Z	17.9	19.2	20.3	20.4	23.8	30.7	35.8	37.9	40.2	44.0	49.4	52.9	46.0	37.8	32.6	26.4	26.1	31.7	31.7	29.1	30.9	52.9
30-Aug	30.8	34.6	35.0	36.3	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	36.3
31-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	67.9	77.2	55.4	32.4	31.8	32.0	28.5	28.2	21.5	20.1	--	77.2

18.7	18.7	17.9	18.5	16.7	17.4	17.2	18.8	22.6	25.4	28.6	31.6	34.9	36.7	38.6	38.5	36.7	35.1	31.9	25.8	21.5	20.3	19.3	19.0	Diurnal Average	
34.7	35.8	35.0	36.3	29.1	28.4	26.6	27.8	32.7	37.9	44.4	47.0	50.0	53.9	67.9	77.2	56.2	51.1	46.7	37.0	36.0	35.8	35.9	34.6	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Wapasu - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	224	33.09	33.09
21 - 50	441	65.14	98.23
51 - 82	12	1.77	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 677

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Wapasu - August 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	12	8	7	8	8	17	29	44	26	9	13	9	5	12	8	9	224
21 - 50	45	12	8	7	3	21	55	51	50	34	26	32	22	23	18	33	440
51 - 82	0	0	0	0	0	0	0	0	1	2	5	1	0	0	1	2	12
> 83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	57	20	15	15	11	38	84	95	77	45	44	42	27	35	27	44	676

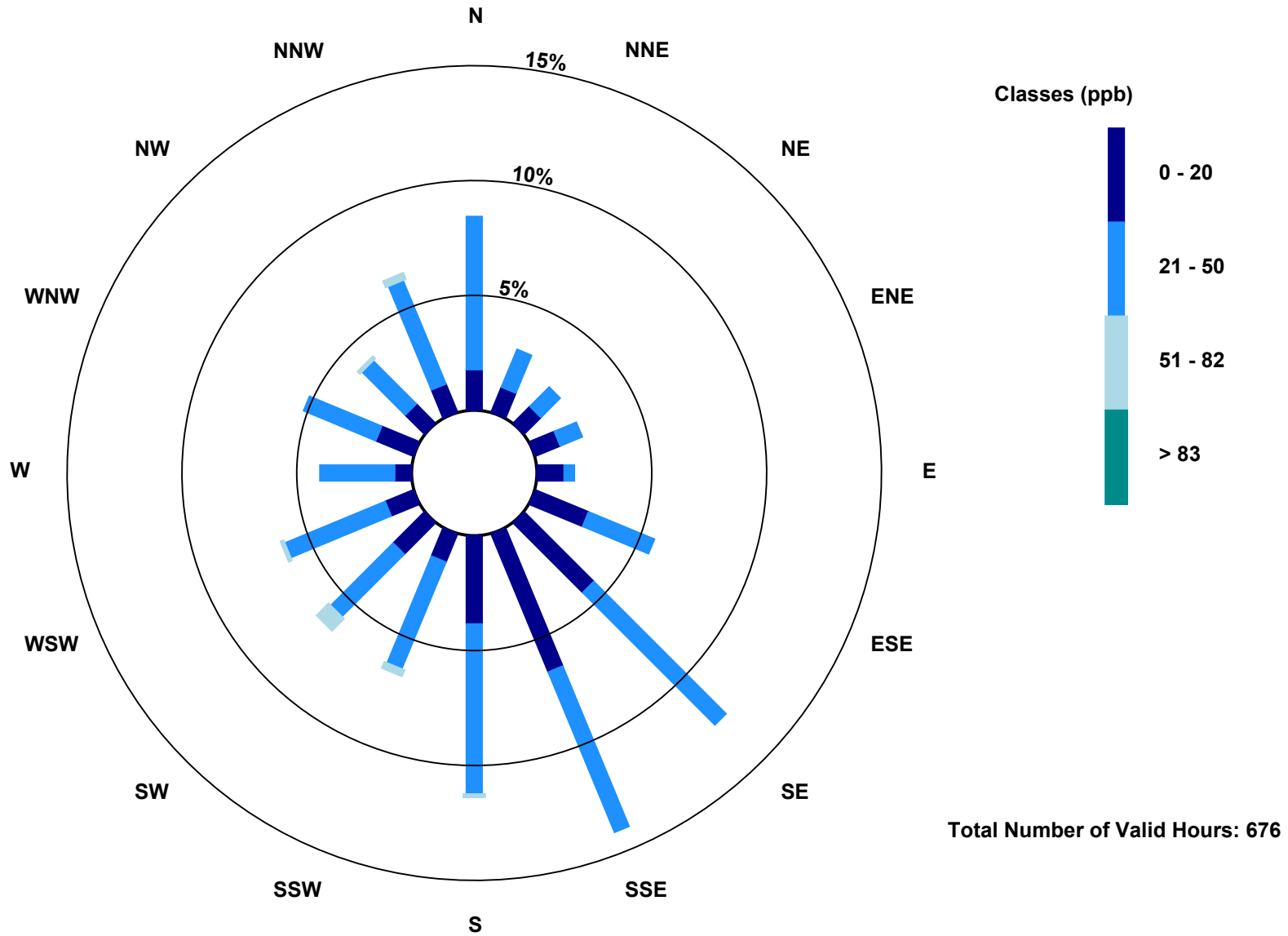
Total Number of Valid Hours: 676

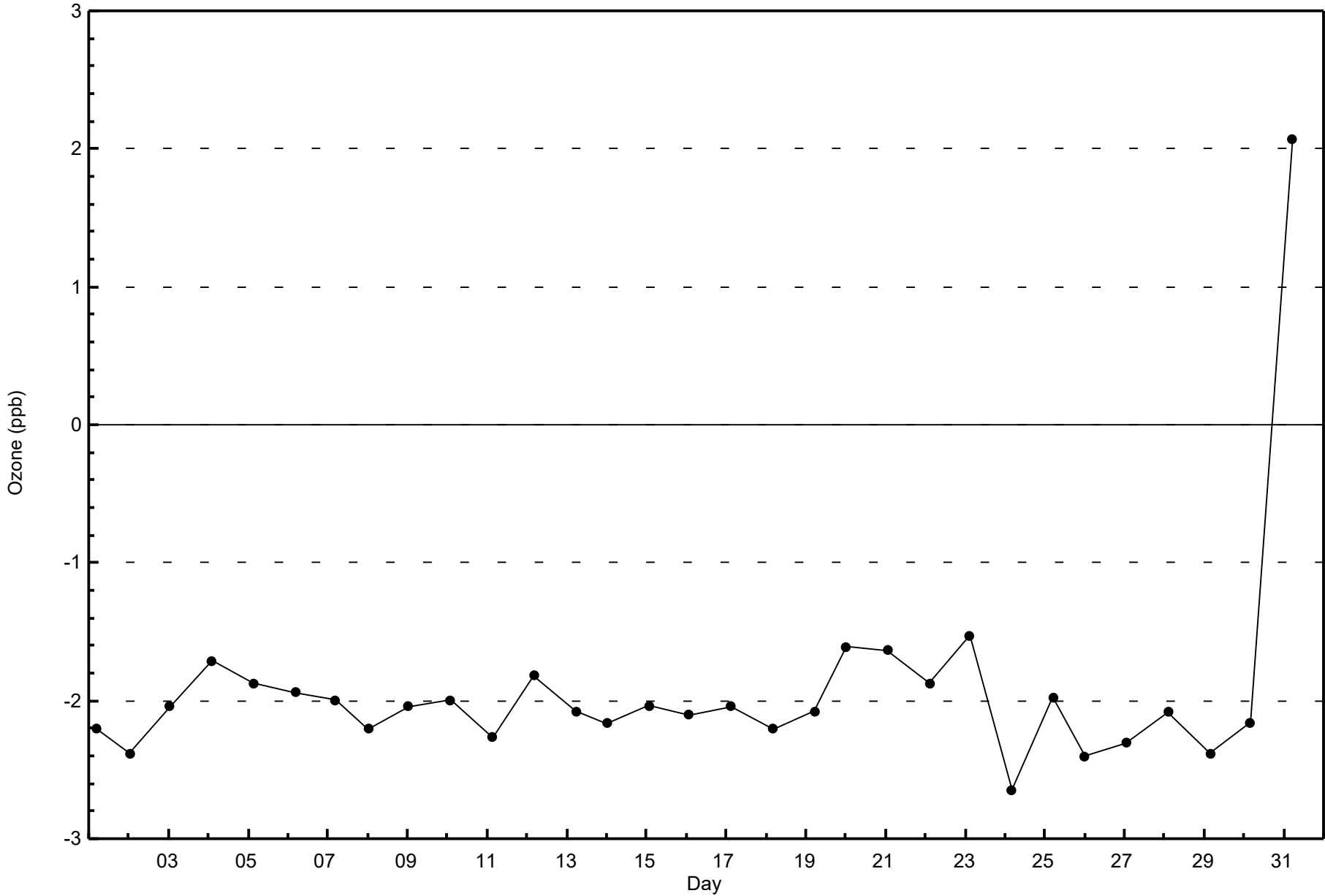
Total Number of Hours: 744

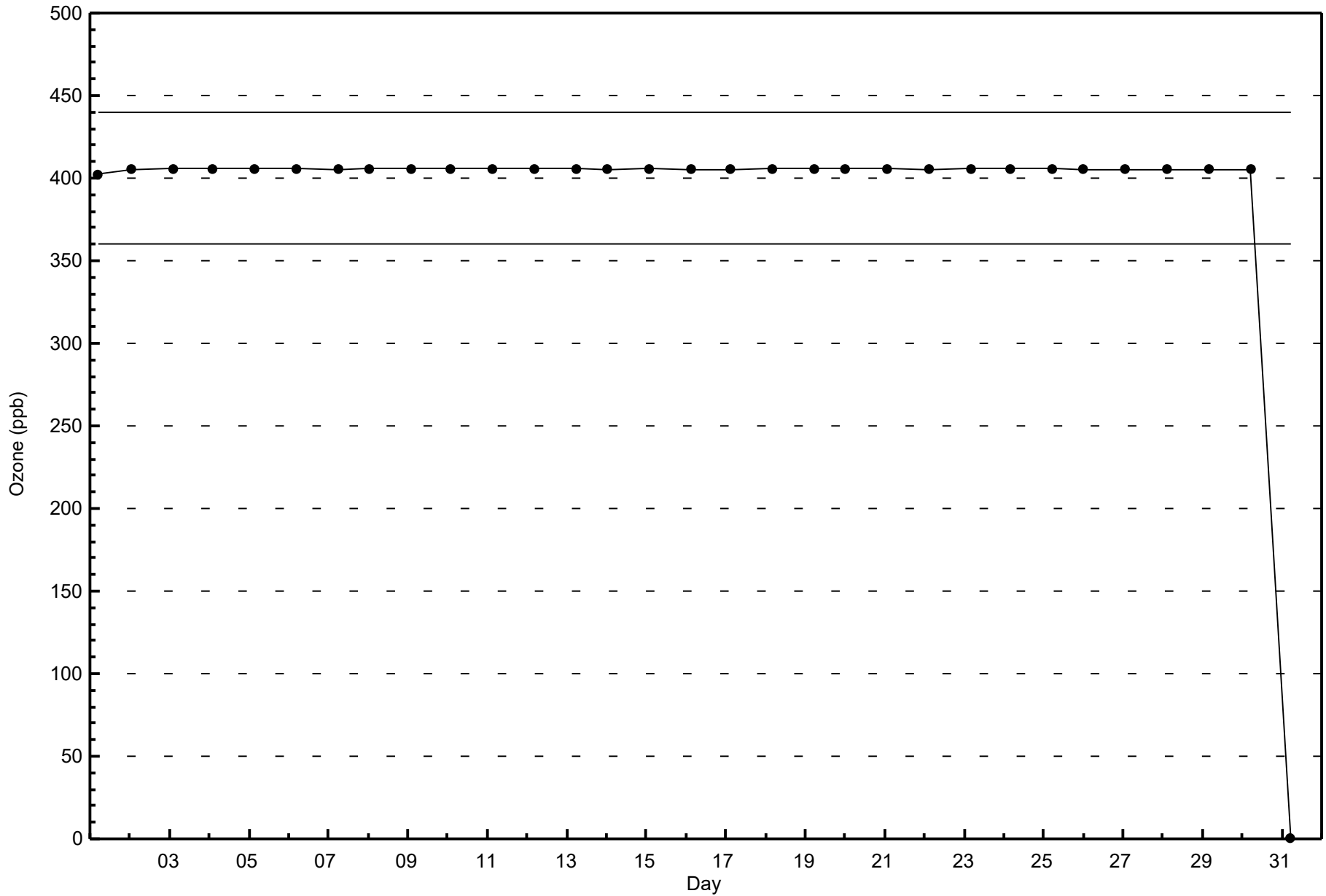


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Wapasu



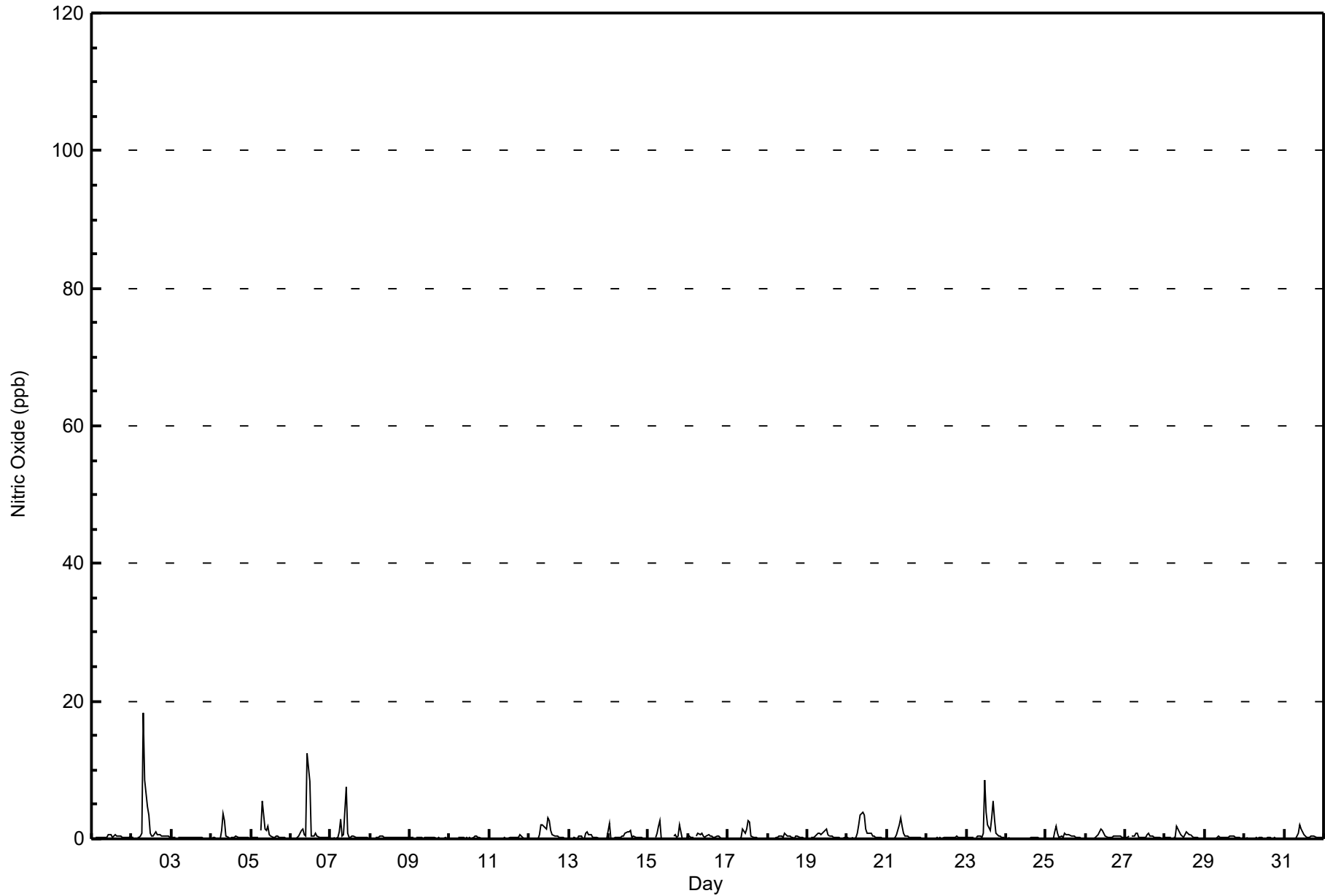






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Wapasu - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Wapasu - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Wapasu - August 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	58	21	15	15	11	39	88	106	77	50	47	45	29	37	26	42	706
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	58	21	15	15	11	39	88	106	77	50	47	45	29	37	26	42	706

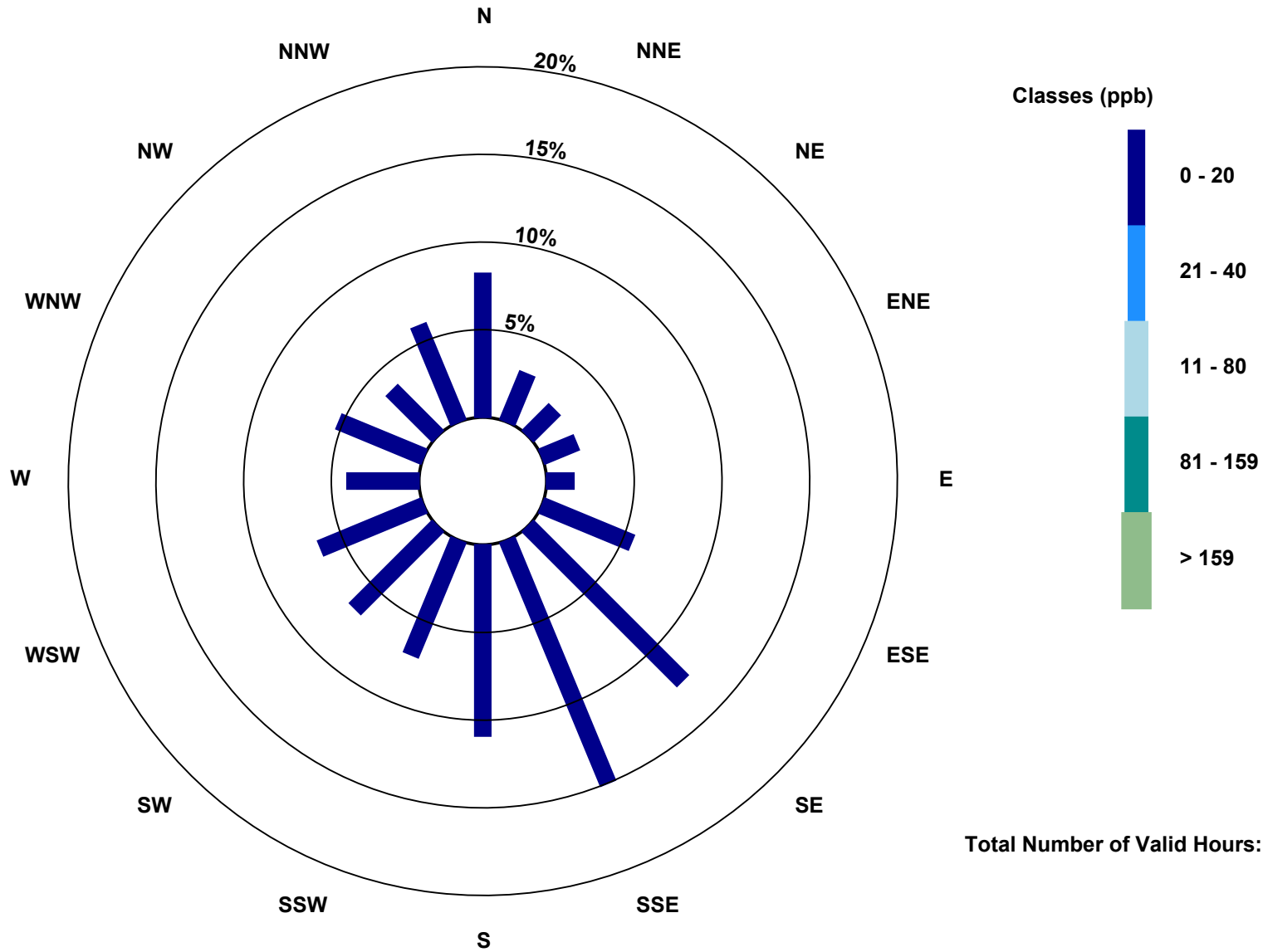
Total Number of Valid Hours: 706

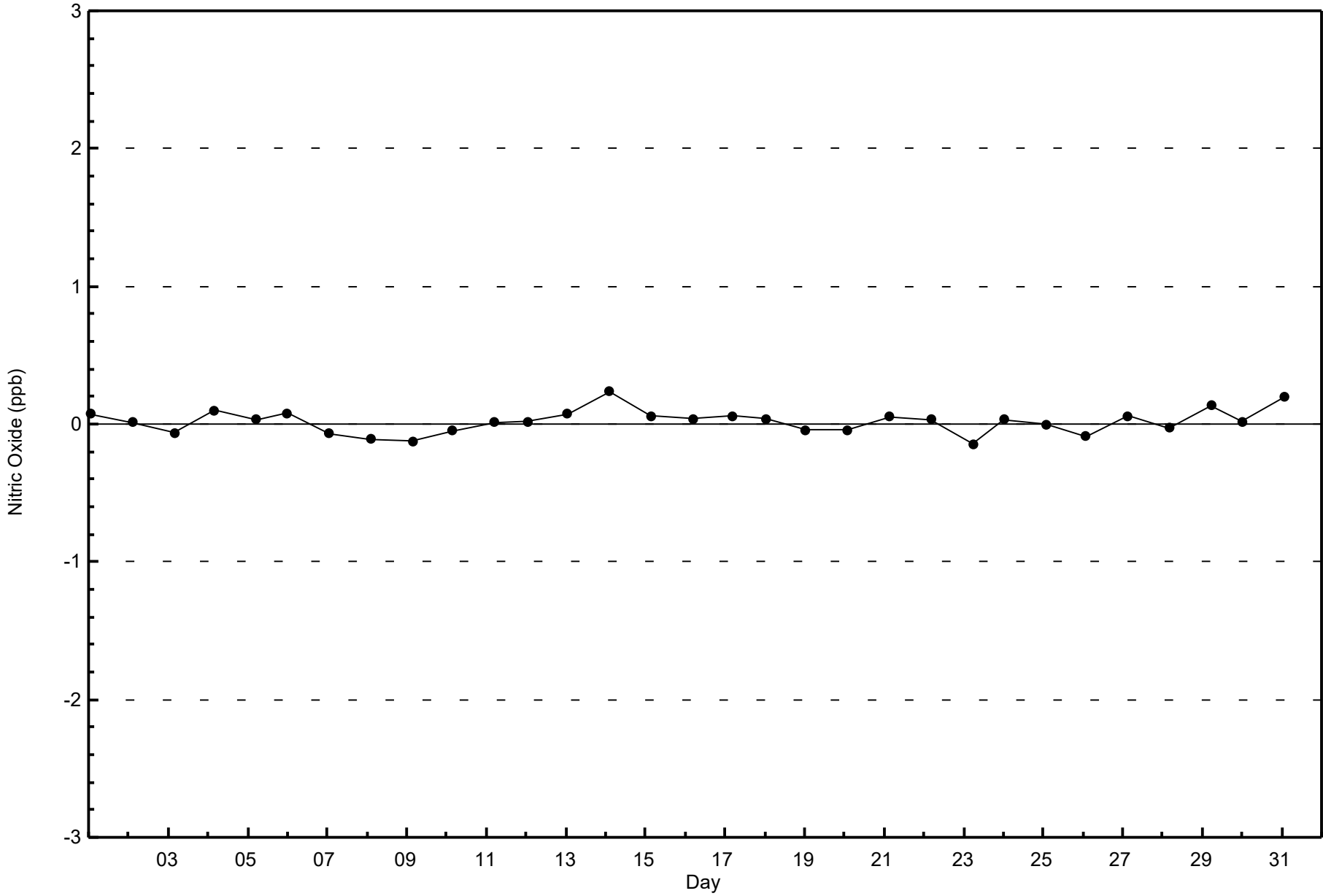
Total Number of Hours: 744

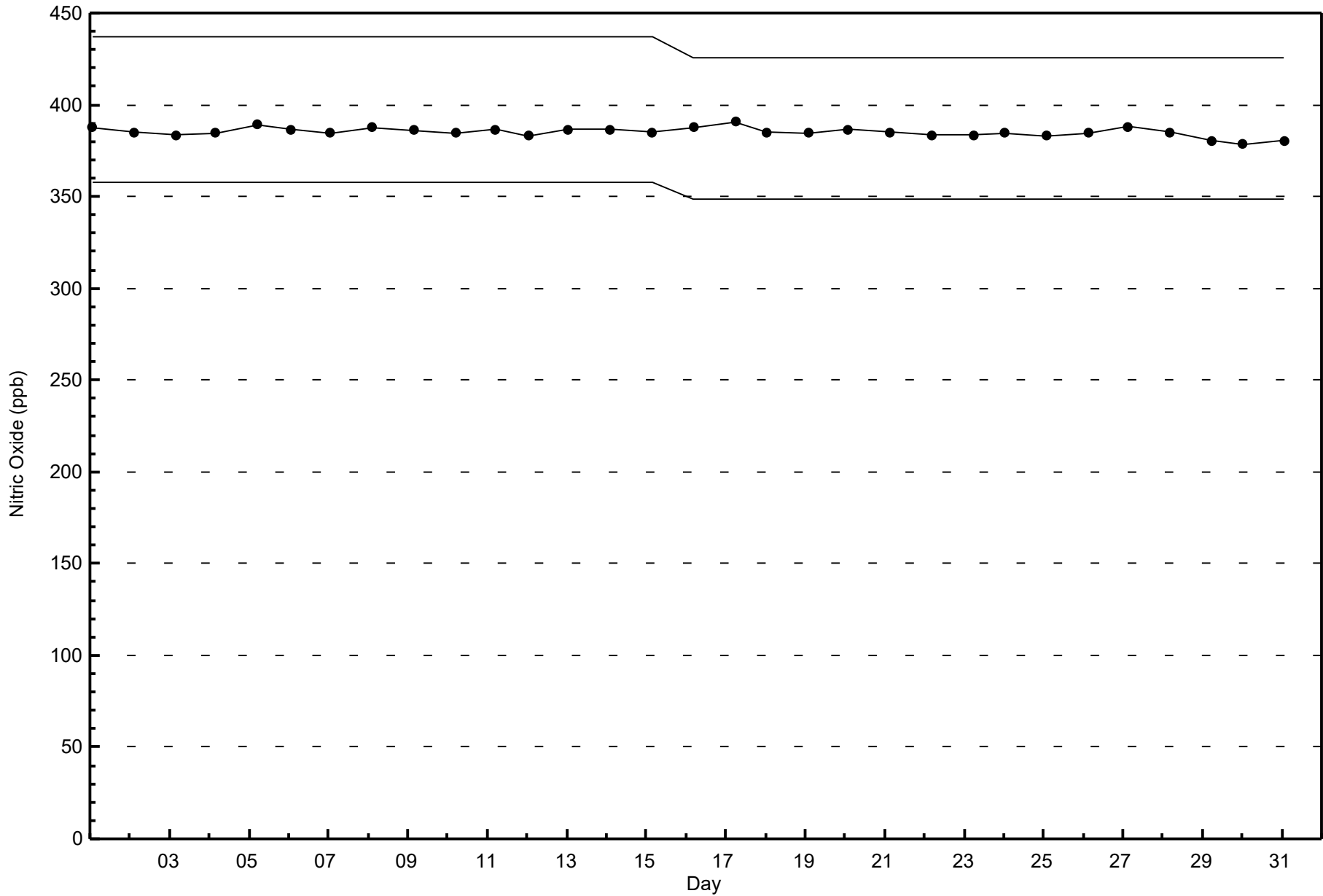


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Wapasu









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

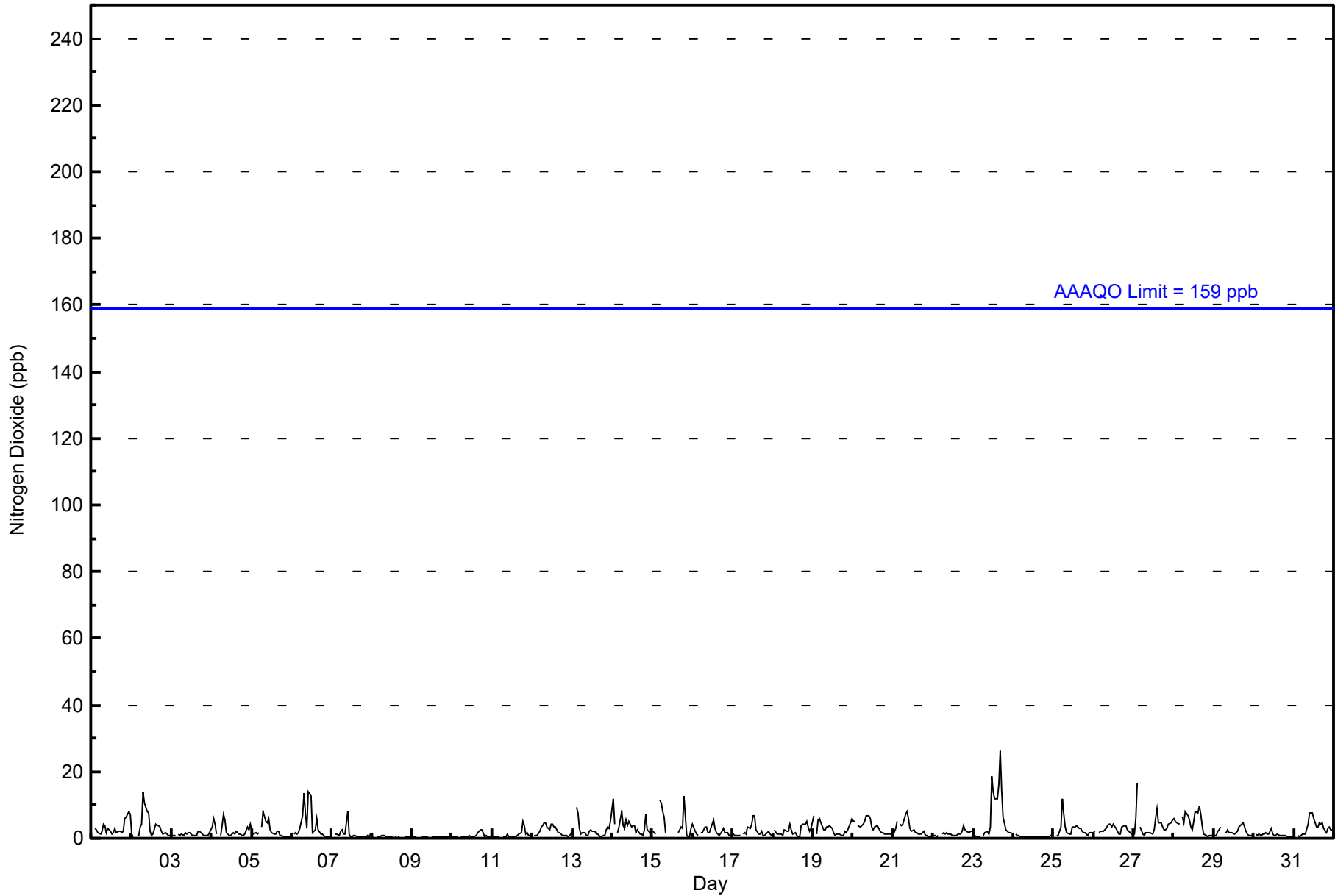
Wapasu - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 26.1 ppb on Aug 23 17:00		Maximum Daily Average: 6.2 ppb on Aug 23		Minimum Value: 0.2 ppb on Aug 7 00:00		Minimum Daily Average: 0.3 ppb on Aug 9		Hours of Data: 707																																									
Maximum Diurnal Average: 3.7 ppb at hour 8		Minimum Diurnal Average: 1.6 ppb at hour 23		Hours of Missing Data: 37		Hours of Calibration: 37		Percent Operational Time: 100.0																																									
Monthly Average: 2.46 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.4 Q ₁ = 0.8 Median = 1.5 Q ₃ = 3.2 P ₉₀ = 5.3 P ₉₉ = 13.8																																															
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-Aug	3.4	Z	3.1	2.6	1.6	1.1	2.1	4.1	3.7	1.7	2.8	2.0	1.4	1.5	3.1	1.8	2.0	2.2	1.7	2.1	6.0	6.2	7.9	7.0	3.1	7.9																							
2-Aug	1.3	0.6	Z	0.9	0.8	3.5	4.1	13.9	10.4	8.0	7.5	2.3	0.9	1.1	4.1	3.9	4.0	3.2	2.1	1.4	1.9	1.2	0.8	0.8	3.4	13.9																							
3-Aug	0.7	0.8	0.9	Z	1.2	1.0	1.2	1.0	1.7	1.1	1.5	1.5	1.0	0.9	0.8	0.8	2.2	2.0	1.4	1.0	1.0	0.8	0.9	2.5	1.2	2.5																							
4-Aug	3.6	6.0	4.2	1.3	Z	0.8	4.0	7.3	5.3	1.5	0.8	0.8	1.1	1.8	1.3	2.0	1.3	1.2	0.9	0.7	1.3	3.4	2.4	4.3	2.5	7.3																							
5-Aug	2.2	1.4	1.6	1.1	1.6	Z	3.2	8.0	4.9	4.7	6.0	2.4	1.5	1.2	1.1	2.0	2.1	1.0	0.8	0.6	0.6	0.6	0.5	0.5	2.2	8.0																							
6-Aug	Z	1.2	1.5	1.2	1.8	3.0	6.7	13.7	7.6	2.9	13.9	12.9	1.8	2.1	2.7	5.8	2.4	1.1	1.1	0.8	0.6	0.5	0.3	0.2	3.7	13.9																							
7-Aug	0.2	Z	1.3	1.3	1.0	2.2	2.7	1.1	1.3	8.2	1.4	0.6	0.6	0.7	0.7	0.3	0.4	0.4	0.3	0.3	0.3	0.7	0.2	1.2	1.2	8.2																							
8-Aug	0.7	0.5	Z	0.4	0.4	0.4	1.0	0.9	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.4	1.0																							
9-Aug	0.3	0.3	0.3	Z	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.5																							
10-Aug	0.4	0.4	0.4	0.5	Z	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.7	1.7	2.2	2.4	2.4	0.6	1.0	0.4	0.4	0.5	0.8	2.4																							
11-Aug	0.4	0.4	0.4	0.5	0.5	Z	0.4	0.4	0.4	1.2	0.6	0.5	0.6	0.5	0.6	0.9	1.3	1.6	5.2	4.0	1.2	1.7	0.9	0.7	1.1	5.2																							
12-Aug	Z	0.7	0.7	0.7	2.1	3.3	4.0	4.7	4.5	3.2	2.5	4.4	4.3	3.2	3.6	1.8	1.8	1.4	1.0	0.9	1.0	0.6	0.9	1.4	2.3	4.7																							
13-Aug	2.9	Z	9.3	7.5	3.1	1.1	1.7	1.5	0.8	0.9	2.2	2.7	2.1	2.0	1.3	1.3	0.8	0.6	0.7	1.0	2.6	3.6	3.0	4.9	2.5	9.3																							
14-Aug	11.8	4.1	Z	1.8	3.6	7.9	3.9	3.1	5.3	3.8	4.9	3.5	3.8	3.9	1.5	2.7	1.3	1.3	0.8	2.7	7.2	2.7	1.7	2.1	3.7	11.8																							
15-Aug	2.3	1.8	1.4	Z	11.3	10.6	8.2	6.2	1.5	C	C	C	C	C	C	1.9	2.7	3.5	2.8	12.5	1.0	0.4	0.5	3.0	--	12.5																							
16-Aug	4.2	2.1	1.1	0.7	Z	1.5	1.7	3.6	3.6	1.7	1.5	3.0	5.3	2.9	1.7	1.2	1.0	2.0	3.0	1.6	1.7	1.8	1.0	0.9	2.1	5.3																							
17-Aug	1.1	1.0	0.8	0.8	0.7	Z	1.2	1.5	1.1	3.2	3.0	4.1	6.8	6.8	2.7	1.2	1.3	2.0	0.8	0.9	1.1	2.1	1.3	1.0	2.0	6.8																							
18-Aug	Z	2.4	1.4	1.4	1.2	1.1	1.0	2.6	2.3	2.0	4.3	2.4	1.4	1.7	0.9	0.4	0.6	3.7	4.4	4.1	5.1	3.4	2.1	2.9	2.3	5.1																							
19-Aug	6.6	Z	1.4	5.7	5.9	4.5	2.5	2.7	3.2	3.4	3.7	2.9	1.5	1.0	1.1	1.2	1.4	0.8	1.0	2.1	1.6	2.4	4.5	6.1	2.9	6.6																							
20-Aug	5.0	4.9	Z	4.0	3.6	4.0	4.1	5.2	6.9	6.9	5.8	3.6	2.7	3.2	3.8	3.0	2.2	1.7	1.7	1.2	1.2	1.3	1.3	1.2	3.4	6.9																							
21-Aug	1.0	2.9	5.1	Z	4.2	3.8	4.4	7.1	7.9	5.8	3.1	2.3	2.4	1.9	1.8	1.4	1.1	1.2	2.0	0.9	0.8	0.6	0.6	0.8	2.7	7.9																							
22-Aug	0.7	0.7	0.6	0.8	Z	1.3	1.7	1.4	1.8	1.3	1.2	1.0	1.0	0.9	0.9	1.2	1.1	2.2	3.7	2.7	2.1	1.7	2.0	2.3	1.5	3.7																							
23-Aug	1.4	1.0	0.6	0.5	0.4	Z	0.9	1.6	2.2	1.3	3.5	18.7	13.8	12.0	11.7	16.2	26.1	14.3	6.5	2.7	2.0	1.5	1.6	1.7	6.2	26.1																							
24-Aug	Z	1.3	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.6	0.9	1.8	0.6	1.8																							
25-Aug	1.6	Z	0.9	1.0	3.5	12.0	7.2	3.2	1.7	1.3	1.4	3.6	3.3	3.4	3.7	2.9	3.1	2.1	1.9	1.6	1.0	1.8	1.8	1.9	2.9	12.0																							
26-Aug	1.8	2.0	Z	1.6	2.0	2.0	2.2	3.1	4.0	4.4	4.3	3.3	4.2	2.9	2.0	1.1	1.4	3.3	3.9	4.0	2.6	2.2	1.7	1.1	2.7	4.4																							
27-Aug	1.1	6.1	16.6	Z	3.5	1.3	0.9	1.8	1.6	1.7	1.5	1.3	2.4	5.9	8.7	4.5	4.5	3.3	2.6	2.5	3.1	4.1	4.7	5.5	3.9	16.6																							
28-Aug	5.8	5.2	4.5	4.1	Z	6.4	4.7	7.9	6.6	5.4	3.6	2.5	4.9	7.9	7.7	9.8	7.4	3.7	1.1	0.7	0.6	0.7	0.8	1.0	4.5	9.8																							
29-Aug	1.0	1.0	2.0	2.5	3.3	Z	1.7	1.9	2.5	1.5	1.7	1.5	1.1	1.6	2.1	3.4	3.8	4.6	3.3	2.0	1.1	0.8	0.8	0.8	2.0	4.6																							
30-Aug	Z	1.1	1.0	1.1	1.0	1.2	1.2	1.5	1.1	1.3	2.9	1.1	0.9	0.7	1.2	0.8	1.0	1.0	0.9	0.8	0.6	0.6	0.6	0.5	1.0	2.9																							
31-Aug	0.5	Z	0.7	0.6	0.7	1.1	1.4	1.2	4.4	7.8	7.5	7.5	6.1	3.2	3.6	4.8	4.3	4.6	2.9	1.6	2.9	3.3	2.5	2.4	3.3	7.8																							
																								2.4	2.0	2.4	1.7	2.3	2.9	2.6	3.7	3.2	2.9	3.2	3.1	2.6	2.5	2.6	2.8	2.4	2.0	1.9	1.7	1.7	1.6	2.0	Diurnal Average		
																								11.8	6.1	16.6	7.5	11.3	12.0	8.2	13.9	10.4	8.2	13.9	18.7	13.8	12.0	11.7	16.2	26.1	14.3	6.5	12.5	7.2	6.2	7.9	7.0	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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Wapasu - August 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

Nitrogen Dioxide (NO₂) - ppb
Wapasu - August 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	58	21	15	15	11	39	88	106	77	50	47	45	29	36	26	42	705
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	58	21	15	15	11	39	88	106	77	50	47	45	29	37	26	42	706

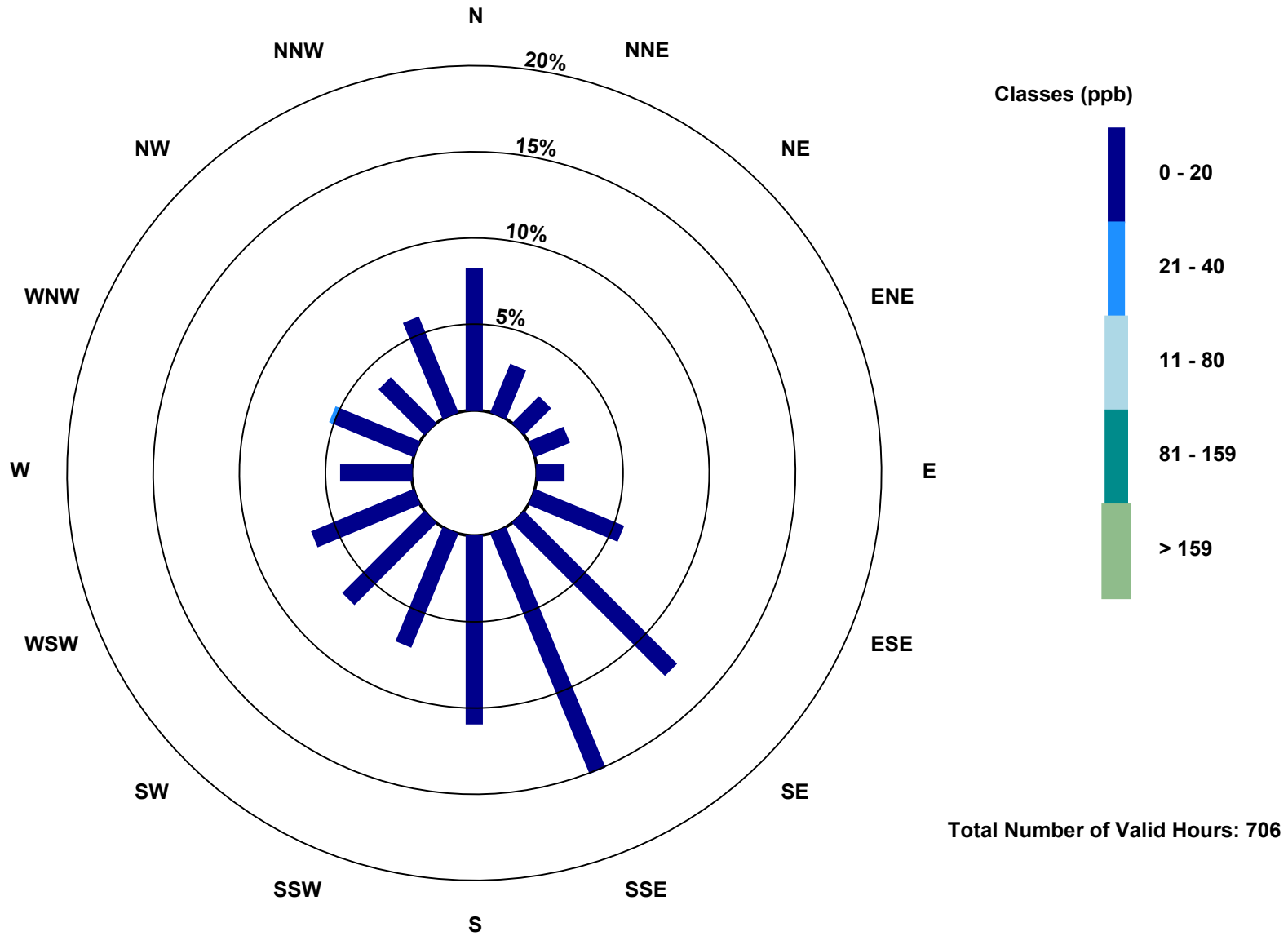
Total Number of Valid Hours: 706

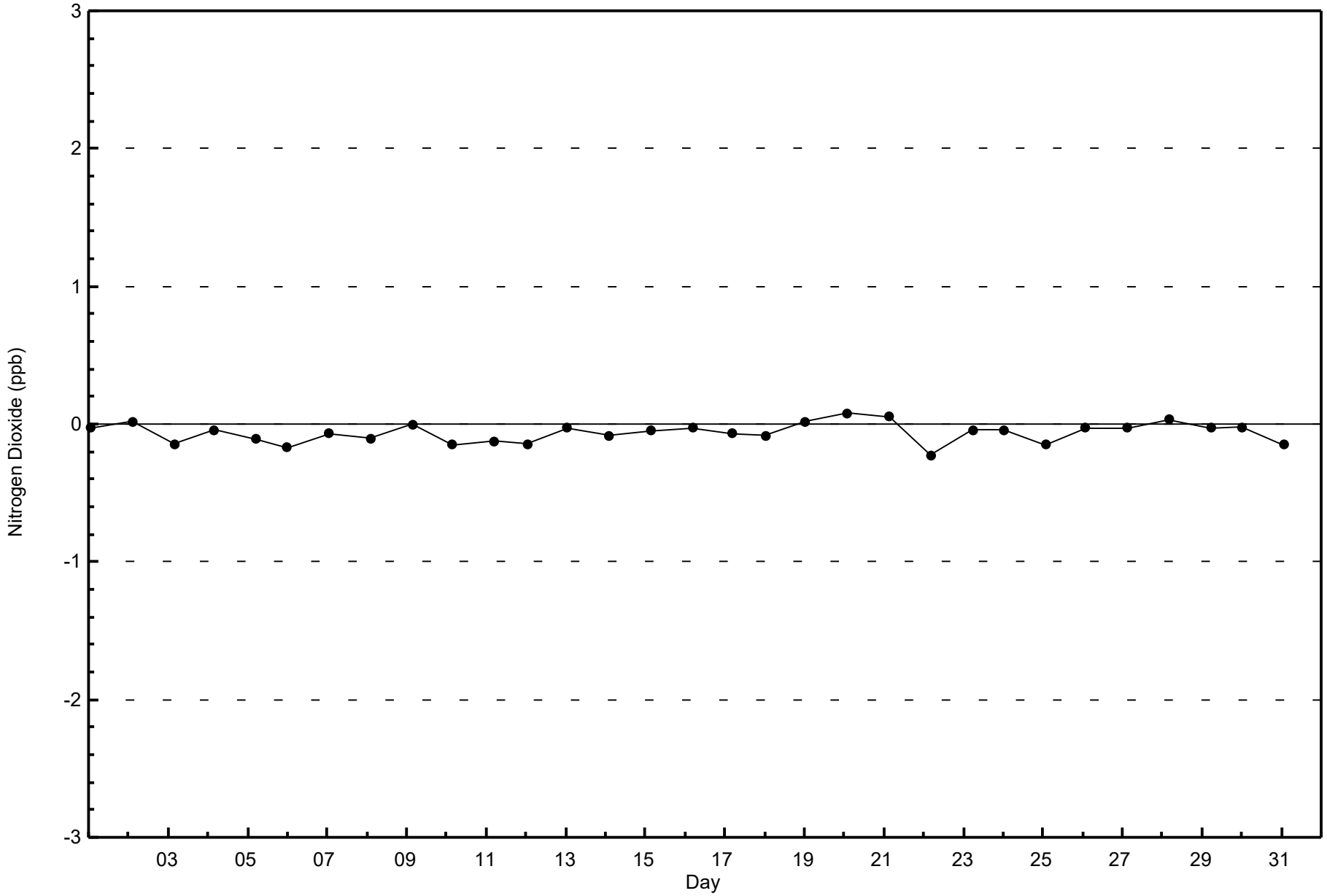
Total Number of Hours: 744

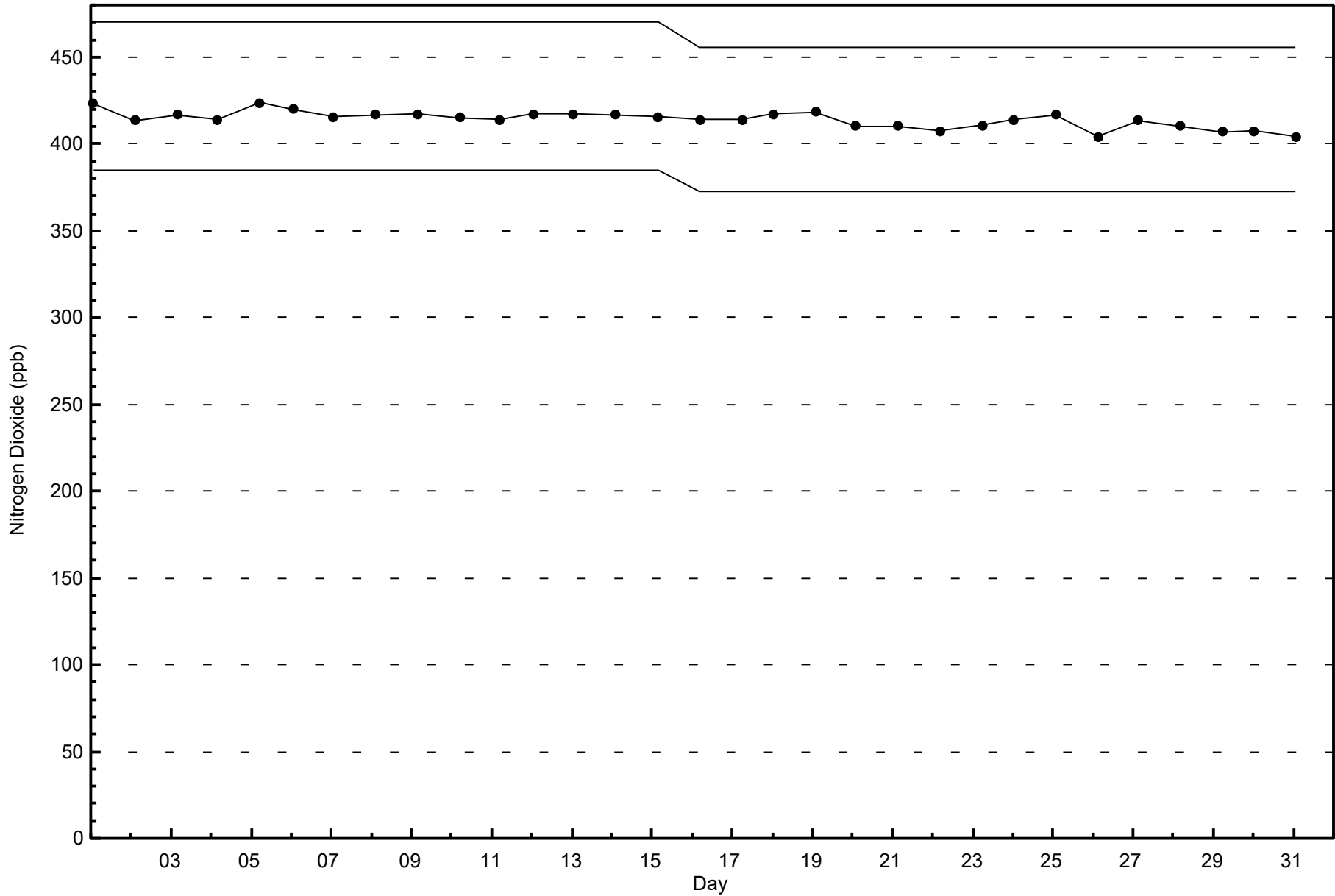


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Wapasu





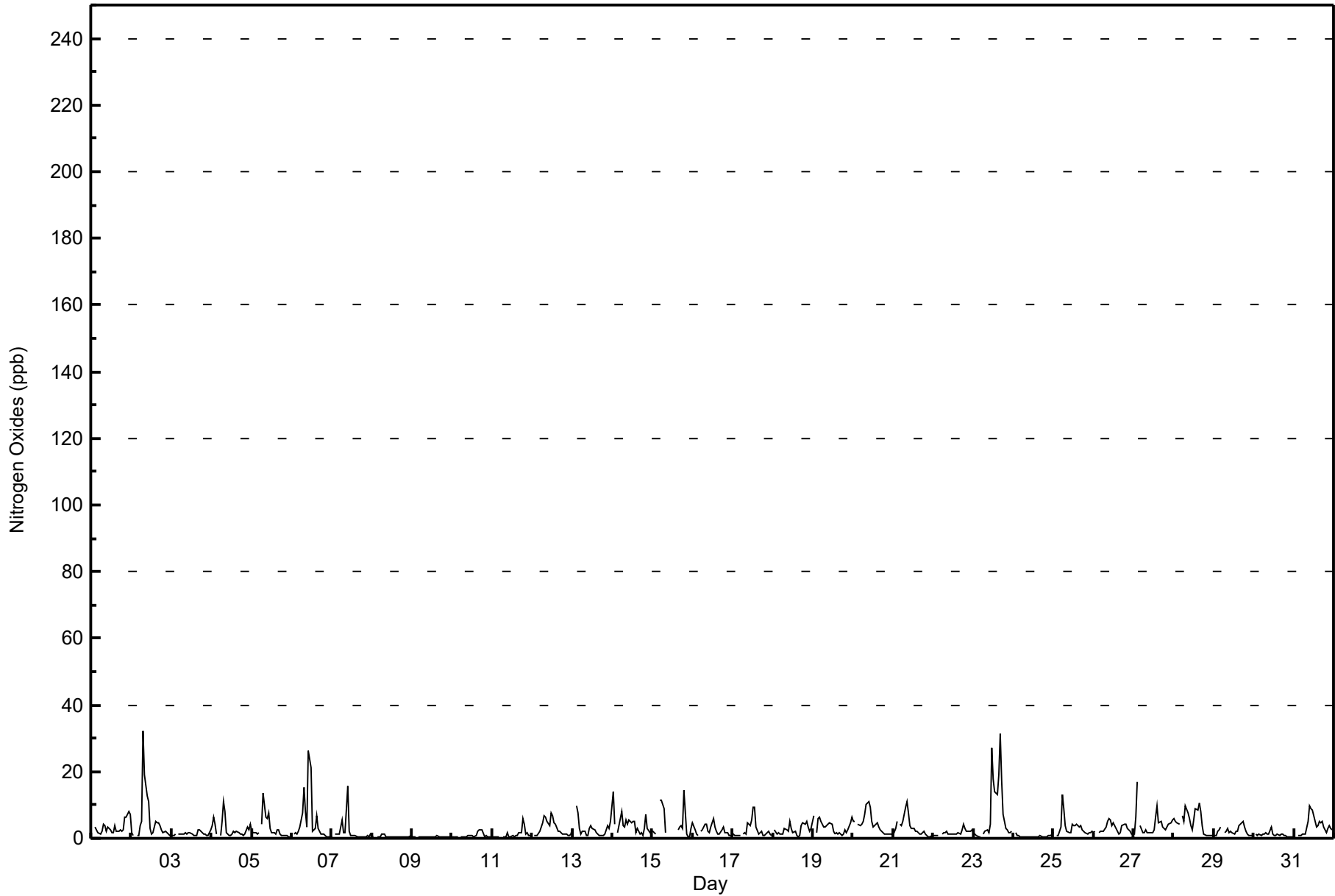




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Wapasu - August 2023

Maximum Value: 32.1 ppb on Aug 2 08:00		Maximum Daily Average: 7.6 ppb on Aug 23		Hours in Service: 744																							
Minimum Value: 0.3 ppb on Aug 7 01:00		Minimum Daily Average: 0.4 ppb on Aug 9		Hours of Data: 707																							
Maximum Diurnal Average: 5.1 ppb at hour 8		Minimum Diurnal Average: 1.7 ppb at hour 23		Hours of Missing Data: 37																							
Monthly Average: 2.92 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 0.5 Q ₁ = 1.0 Median = 1.8 Q ₃ = 3.6 P ₉₀ = 6.2 P ₉₉ = 17.6		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-Aug	3.6	Z	3.3	2.7	1.7	1.2	2.3	4.3	3.9	1.9	3.4	2.6	1.6	1.8	3.7	2.1	2.3	2.5	2.0	2.4	6.3	6.5	8.2	7.3	3.4	8.2	
2-Aug	1.5	0.8	Z	1.1	1.0	4.0	4.9	32.1	18.9	12.6	10.9	3.1	1.2	1.5	5.0	4.6	4.6	3.7	2.5	1.8	2.3	1.5	1.1	1.0	5.3	32.1	
3-Aug	1.0	1.0	1.1	Z	1.4	1.2	1.3	1.2	1.8	1.2	1.7	1.7	1.2	1.0	1.0	1.0	2.4	2.3	1.6	1.1	1.1	0.9	0.9	2.5	1.4	2.5	
4-Aug	3.6	6.2	4.3	1.3	Z	0.9	5.2	10.9	7.9	1.9	0.9	0.9	1.3	2.0	1.5	2.3	1.5	1.4	1.1	0.9	1.5	3.5	2.5	4.4	3.0	10.9	
5-Aug	2.3	1.6	1.8	1.3	1.9	Z	4.4	13.5	6.3	5.9	7.8	2.9	1.8	1.5	1.3	2.4	2.6	1.3	1.0	0.8	0.8	0.7	0.5	0.5	2.8	13.5	
6-Aug	Z	1.3	1.6	1.3	1.9	3.4	7.8	15.2	8.2	3.4	26.3	21.3	2.2	2.5	3.1	6.6	2.9	1.4	1.3	1.1	0.8	0.6	0.4	0.3	5.0	26.3	
7-Aug	0.3	Z	1.4	1.4	1.1	3.3	5.5	1.6	1.9	15.8	2.3	0.8	0.8	1.0	1.0	0.5	0.6	0.6	0.6	0.6	0.5	0.8	0.4	1.3	1.9	15.8	
8-Aug	0.8	0.6	Z	0.5	0.5	0.5	1.3	1.2	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	0.4	0.5	0.7	0.6	1.3	
9-Aug	0.5	0.4	0.4	Z	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.7	
10-Aug	0.5	0.5	0.5	0.5	Z	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.7	0.6	0.8	2.1	2.6	2.7	2.6	0.6	1.0	0.5	0.5	0.5	0.9	2.7	
11-Aug	0.4	0.4	0.4	0.5	0.5	Z	0.5	0.4	0.4	1.5	0.6	0.6	0.7	0.6	0.7	1.1	1.5	1.8	5.9	4.3	1.3	1.7	1.0	0.7	1.2	5.9	
12-Aug	Z	0.8	0.7	0.7	2.1	3.4	4.7	6.8	6.5	4.9	4.0	7.5	6.9	4.5	4.2	2.2	2.2	1.8	1.2	1.2	1.2	0.7	0.9	1.4	3.1	7.5	
13-Aug	3.0	Z	9.5	7.6	3.1	1.1	2.0	2.0	0.9	1.0	3.0	3.7	2.8	2.6	1.6	1.5	0.9	0.7	0.8	1.1	2.6	3.6	3.0	4.9	2.7	9.5	
14-Aug	14.1	4.1	Z	1.9	3.7	8.1	4.0	3.3	5.7	4.2	5.7	4.5	4.9	5.2	1.8	3.0	1.5	1.5	1.0	2.9	7.4	2.8	1.8	2.2	4.1	14.1	
15-Aug	2.3	1.8	1.4	Z	11.6	11.4	10.0	8.9	1.6	C	C	C	C	C	C	2.4	3.2	3.7	3.2	14.5	1.1	0.4	0.5	3.1	--	14.5	
16-Aug	4.7	2.4	1.2	0.8	Z	1.9	2.4	4.2	4.4	2.1	1.7	3.4	5.9	3.3	2.0	1.4	1.2	2.4	3.4	1.8	1.7	1.8	1.0	0.9	2.4	5.9	
17-Aug	1.1	1.0	0.8	0.8	0.7	Z	1.2	1.6	1.2	4.6	3.8	5.6	9.4	9.2	3.2	1.4	1.6	2.2	0.9	1.0	1.1	2.2	1.4	1.0	2.5	9.4	
18-Aug	Z	2.5	1.5	1.5	1.3	1.2	1.2	3.0	2.7	2.3	5.1	3.0	1.8	2.2	1.1	0.6	0.7	4.0	4.8	4.3	5.2	3.5	2.2	3.0	2.6	5.2	
19-Aug	6.7	Z	1.5	5.8	6.1	4.9	3.2	3.5	3.8	4.2	4.7	4.3	2.1	1.3	1.5	1.5	1.7	1.0	1.1	2.3	1.7	2.5	4.7	6.2	3.3	6.7	
20-Aug	5.2	5.0	Z	4.1	3.7	4.3	5.0	7.1	10.3	10.9	9.3	5.1	3.5	3.9	4.5	3.5	2.5	2.0	1.9	1.4	1.4	1.4	1.4	1.2	4.3	10.9	
21-Aug	1.0	2.9	5.1	Z	4.2	3.9	5.0	9.2	10.9	7.7	3.8	2.8	2.9	2.2	2.1	1.6	1.3	1.4	2.2	1.1	0.9	0.6	0.6	0.8	3.2	10.9	
22-Aug	0.7	0.7	0.6	0.8	Z	1.3	1.8	1.5	2.0	1.4	1.3	1.1	1.2	1.1	1.1	1.5	1.4	2.4	4.1	3.0	2.3	1.9	2.2	2.5	1.7	4.1	
23-Aug	1.6	1.2	0.8	0.6	0.6	Z	1.1	2.0	2.5	1.6	4.2	27.2	17.7	14.0	13.0	19.2	31.6	17.2	7.2	3.1	2.4	1.7	1.8	2.0	7.6	31.6	
24-Aug	Z	1.5	1.0	0.7	0.5	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	0.5	0.5	0.4	0.6	0.9	1.8	0.6	1.8	
25-Aug	1.6	Z	0.9	1.0	3.5	13.1	9.1	3.9	2.0	1.7	1.6	4.3	3.9	4.0	4.3	3.3	3.6	2.4	2.1	1.8	1.1	1.9	1.9	2.0	3.3	13.1	
26-Aug	1.9	2.0	Z	1.7	2.0	2.0	2.3	3.6	5.1	5.8	5.5	4.0	4.7	3.1	2.2	1.2	1.6	3.6	4.3	4.4	3.0	2.6	2.0	1.3	3.0	5.8	
27-Aug	1.3	6.4	17.0	Z	3.9	1.7	1.7	2.6	1.8	1.9	1.7	1.5	2.7	6.5	9.6	4.8	4.9	3.6	2.8	2.7	3.3	4.2	4.8	5.6	4.2	17.0	
28-Aug	6.0	5.3	4.7	4.3	Z	6.6	5.0	9.7	7.7	6.1	3.9	2.7	5.4	8.9	8.3	10.4	7.8	4.0	1.3	0.8	0.7	0.7	0.8	1.0	4.9	10.4	
29-Aug	1.0	1.0	2.0	2.5	3.3	Z	1.8	2.1	2.8	1.6	1.9	1.7	1.3	1.9	2.3	3.7	4.2	5.0	3.6	2.2	1.3	0.9	0.9	0.9	2.2	5.0	
30-Aug	Z	1.2	1.0	1.1	1.0	1.2	1.3	1.6	1.2	1.4	3.2	1.2	0.9	0.8	1.3	0.9	1.1	1.1	1.0	0.9	0.6	0.6	0.6	0.5	1.1	3.2	
31-Aug	0.5	Z	0.7	0.6	0.7	1.1	1.4	1.2	5.2	9.9	9.0	8.6	6.6	3.4	3.8	5.0	4.7	5.1	3.2	1.8	3.1	3.6	2.8	2.7	3.7	9.9	
		2.6	2.1	2.5	1.8	2.4	3.2	3.2	5.1	4.2	4.0	4.3	4.3	3.3	3.1	2.9	3.0	3.2	2.7	2.3	2.2	1.9	1.8	1.7	2.1	Diurnal Average	
		14.1	6.4	17.0	7.6	11.6	13.1	10.0	32.1	18.9	15.8	26.3	27.2	17.7	14.0	13.0	19.2	31.6	17.2	7.2	14.5	7.4	6.5	8.2	7.3	Diurnal Maximum	
Z - zerospan		C - Calibration																									





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Wapasu - August 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	57	21	15	14	11	39	88	106	77	50	47	44	29	35	26	42	701
21 - 40	1	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	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	58	21	15	15	11	39	88	106	77	50	47	45	29	37	26	42	706

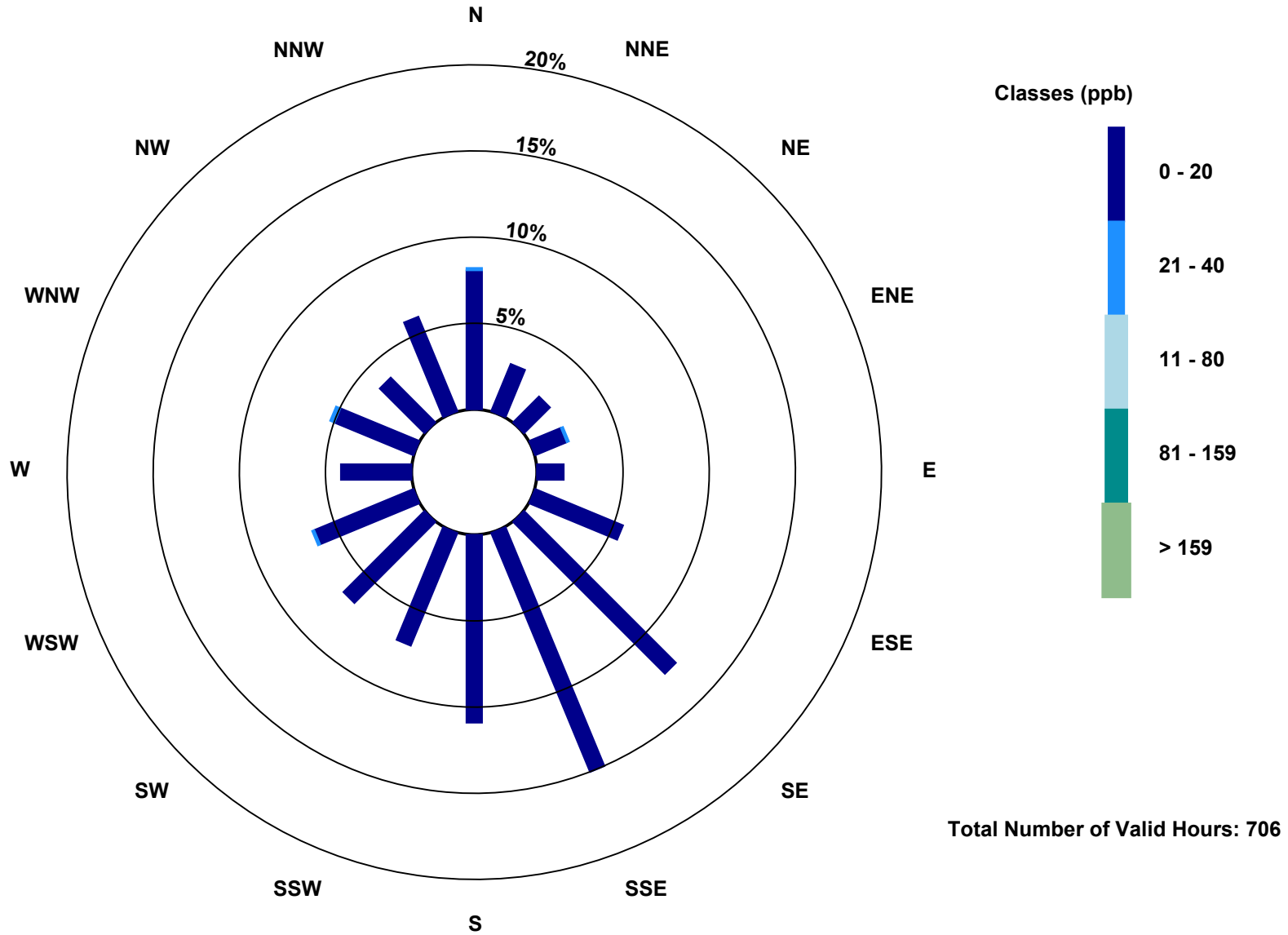
Total Number of Valid Hours: 706

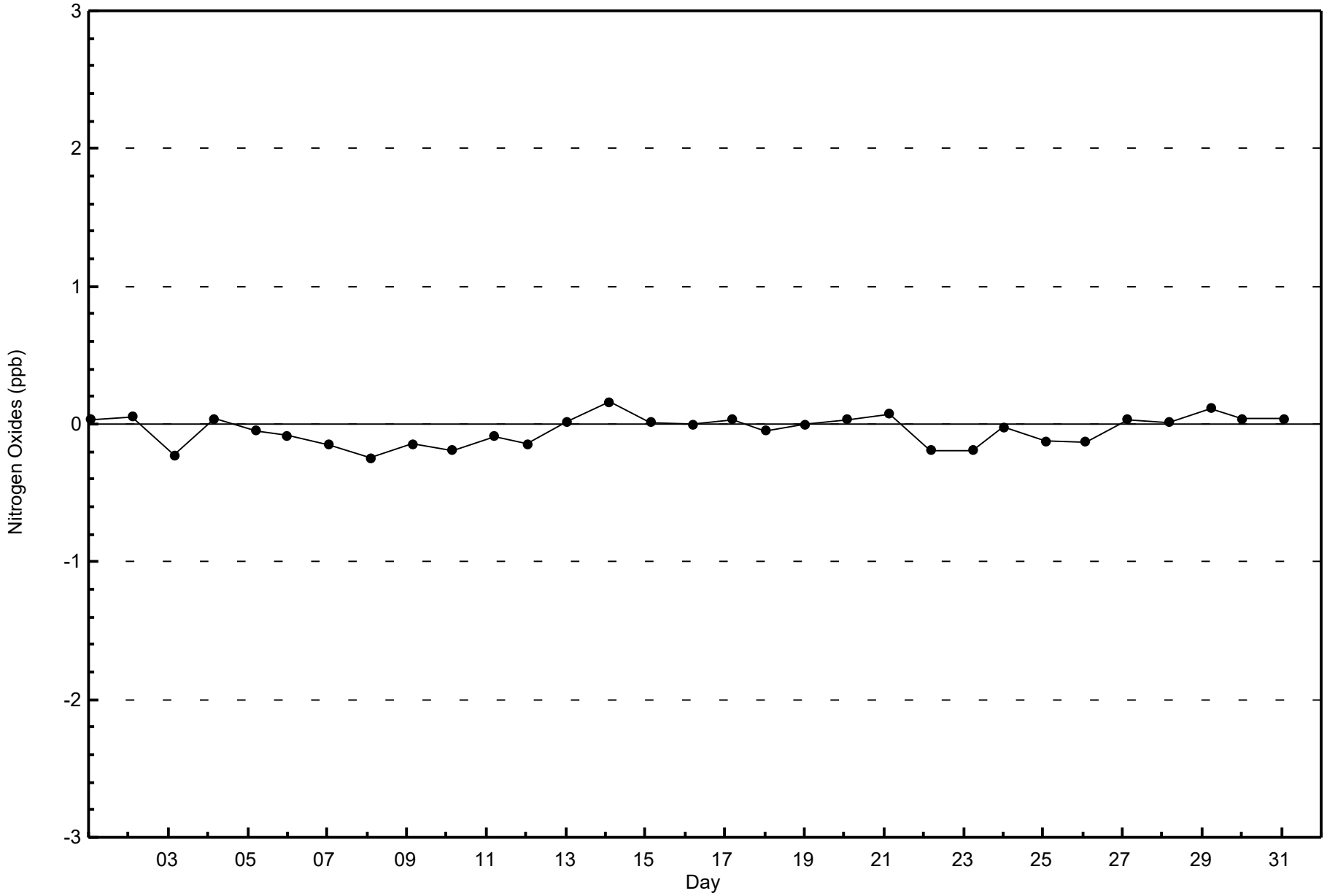
Total Number of Hours: 744

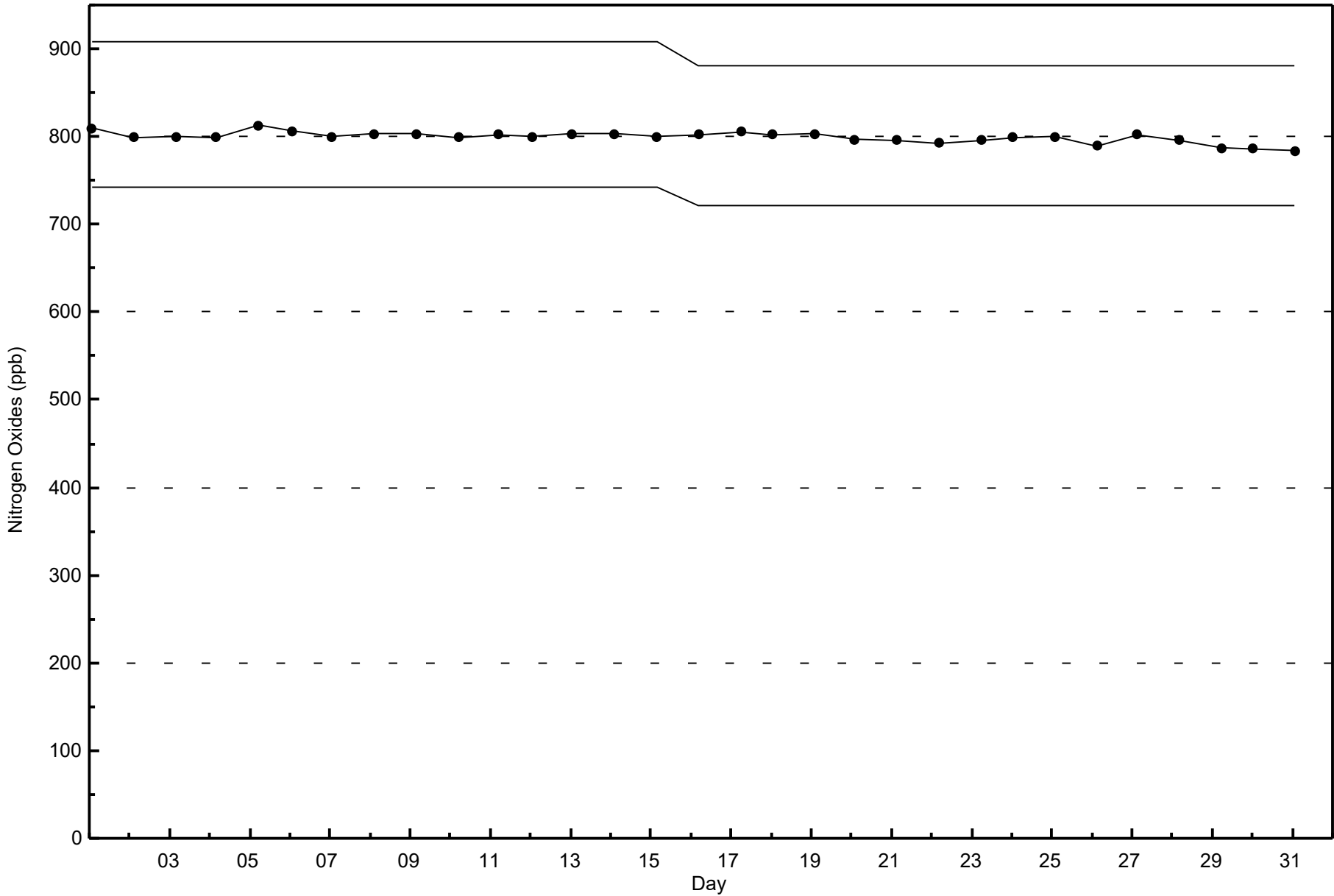


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Wapasu









Wood Buffalo Environmental Association

Summary of Hour Averages

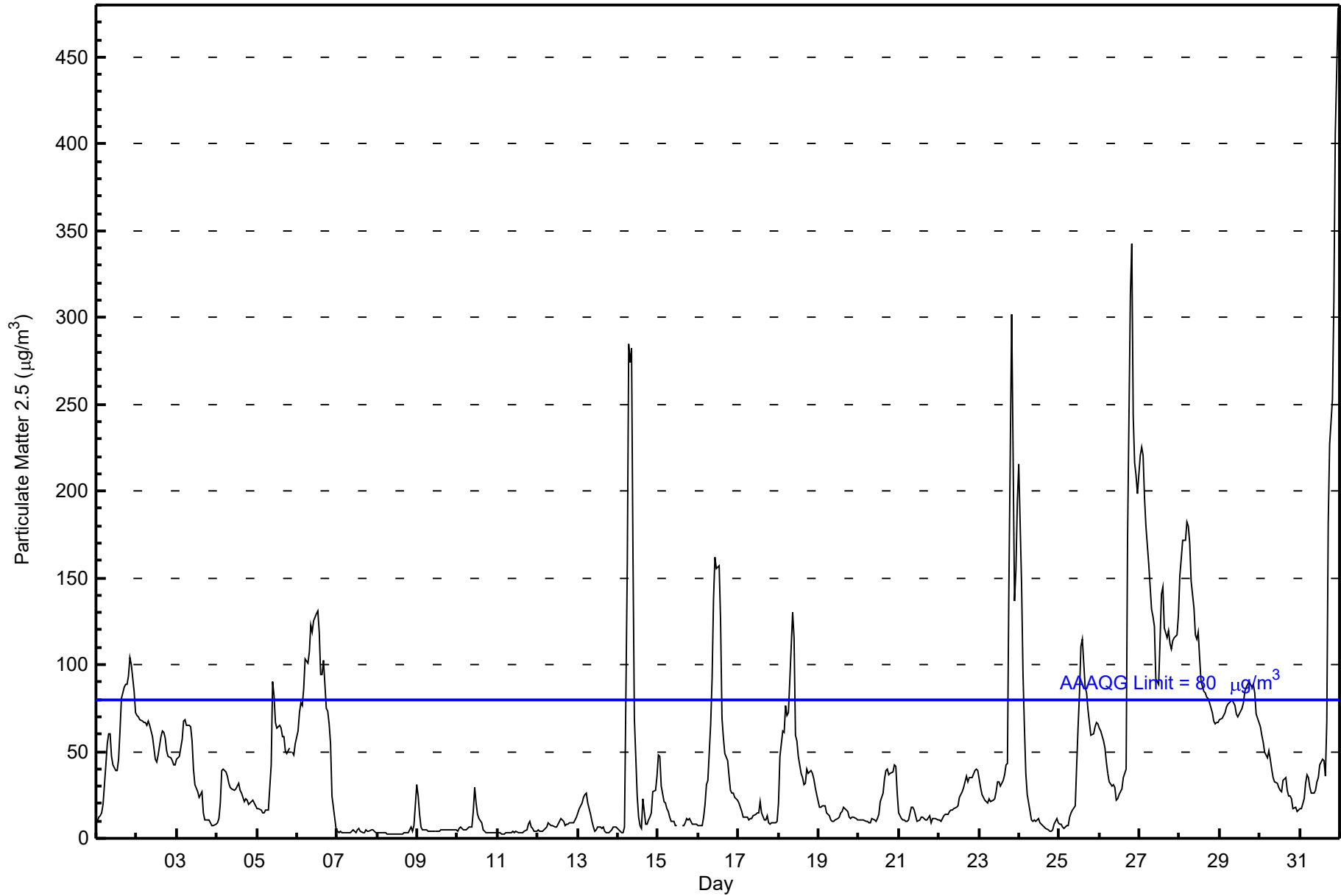
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Wapasu - August 2023

Number of Exceedences (AAAQO):	1-hr: 114	24-hr: 17	Hours in Service:	744
Maximum Value: 478.1 µg/m ³ on Sep 1 00:00	Maximum Daily Average: 140.0 µg/m ³ on Aug 27		Hours of Data:	741
Minimum Value: 2.2 µg/m ³ on Aug 8 14:00	Minimum Daily Average: 3.9 µg/m ³ on Aug 7		Hours of Missing Data:	3
Maximum Diurnal Average: 57.1 µg/m ³ at hour 20	Minimum Diurnal Average: 36.6 µg/m ³ at hour 16		Hours of Calibration:	2
Monthly Average: 43.71 µg/m ³	Percentiles: P ₁ = 2.6 P ₁₀ = 4.2 Q ₁ = 8.8 Median = 22.2 Q ₃ = 60.5 P ₉₀ = 110.5 P ₉₉ = 284.0		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-Aug	10.1	12.2	13.4	15.0	19.9	42.1	54.2	60.5	59.9	47.5	42.7	39.3	39.2	45.3	61.5	80.5	87.1	88.3	88.4	93.3	104.4	99.8	84.7	72.7	56.7	104.4
2-Aug	70.8	69.9	68.4	67.2	66.8	66.6	64.9	67.7	64.8	58.6	51.7	45.3	44.0	48.4	58.7	61.7	61.3	57.5	50.6	46.8	46.7	44.9	42.0	42.6	57.0	70.8
3-Aug	45.3	47.3	51.7	57.1	67.9	68.2	65.5	65.4	64.6	55.9	40.1	30.8	27.1	23.3	25.4	27.1	14.3	10.8	10.4	10.2	9.0	7.7	7.6	8.3	35.0	68.2
4-Aug	9.2	11.6	20.1	38.9	39.6	37.9	36.0	31.7	29.4	28.4	27.9	28.7	30.3	32.1	28.0	26.4	21.5	22.6	22.2	19.6	20.1	21.8	20.3	19.0	26.0	39.6
5-Aug	17.3	17.1	16.4	14.7	14.4	16.2	16.1	16.3	41.9	90.0	82.2	66.8	63.4	64.8	63.8	58.3	58.3	50.7	48.7	51.8	DF	49.4	48.3	54.2	44.4	90.0
6-Aug	62.0	72.3	78.4	76.6	86.3	103.0	101.2	107.1	122.6	118.9	125.6	129.3	131.3	118.5	94.3	94.6	102.9	74.8	73.3	65.8	54.8	24.4	11.1	4.9	84.7	131.3
7-Aug	3.8	3.5	3.7	3.6	3.4	3.3	3.3	3.4	3.4	4.6	3.8	3.5	4.6	6.0	4.1	3.2	3.5	4.6	4.4	4.4	4.5	4.6	3.7	3.6	3.9	6.0
8-Aug	3.5	3.6	3.4	3.3	3.2	3.1	2.6	2.4	2.7	2.7	2.5	2.6	2.5	2.2	2.5	2.5	3.1	2.9	3.4	4.5	6.5	4.1	7.1	30.8	4.5	30.8
9-Aug	24.7	13.5	6.8	4.8	4.9	4.7	3.8	3.7	4.0	4.0	4.2	4.4	4.3	4.2	4.5	5.3	5.3	5.0	5.1	5.1	5.0	4.9	4.8	4.6	5.9	24.7
10-Aug	4.5	5.6	6.5	5.2	4.6	4.9	5.6	6.7	6.7	15.4	29.5	20.6	13.9	11.3	8.8	4.5	3.7	3.6	3.6	3.6	3.5	3.4	3.5	3.3	7.6	29.5
11-Aug	3.4	3.1	2.5	2.2	2.8	3.2	3.4	3.6	3.5	3.8	3.6	3.9	3.5	3.2	3.2	3.6	4.0	4.6	7.9	9.4	6.4	5.9	4.2	3.8	4.1	9.4
12-Aug	4.5	4.3	4.1	4.3	5.3	6.8	8.7	7.8	7.4	7.0	6.7	6.7	8.3	9.7	11.0	9.4	7.7	8.5	8.3	8.6	8.8	9.4	10.5	11.9	7.7	11.9
13-Aug	14.6	16.9	20.2	23.3	25.2	25.8	20.4	13.8	9.6	6.7	4.4	5.2	6.4	6.1	6.1	6.1	4.4	3.5	3.6	4.2	5.0	6.1	6.8	6.9	10.5	25.8
14-Aug	5.3	3.9	3.3	3.1	6.7	158.8	284.9	274.5	282.5	164.2	68.8	24.4	12.1	7.2	6.0	23.0	8.3	8.4	10.2	11.9	14.3	26.4	27.6	35.6	61.3	284.9
15-Aug	47.8	47.2	30.4	21.0	20.2	17.0	15.3	12.4	9.6	9.5	7.5	7.4	C	C	7.3	7.4	9.0	11.1	10.9	11.0	8.5	7.8	8.0	7.9	15.2	47.8
16-Aug	7.6	7.7	7.7	12.0	19.8	31.2	33.4	65.6	91.8	137.5	162.1	155.0	157.4	125.5	68.8	57.7	48.8	44.6	35.4	27.9	26.2	25.7	23.6	22.0	58.1	162.1
17-Aug	20.2	17.8	15.3	12.6	12.5	12.0	10.7	11.3	11.8	13.3	14.1	14.4	14.5	20.8	14.9	10.5	10.6	13.1	8.6	8.0	9.2	9.1	9.1	9.8	12.7	20.8
18-Aug	20.7	47.0	62.0	61.0	76.4	70.5	72.7	91.3	130.5	115.6	59.3	56.4	47.4	37.8	35.2	31.2	32.1	39.9	37.1	38.7	37.2	34.4	29.3	24.9	53.7	130.5
19-Aug	17.9	18.0	18.7	18.8	18.6	14.6	12.7	10.4	10.1	9.9	10.4	11.3	12.6	14.5	15.4	17.7	16.8	15.4	12.0	11.7	12.2	12.1	11.6	10.7	13.9	18.8
20-Aug	10.3	10.4	10.4	10.2	9.7	9.5	8.6	9.0	11.3	10.4	9.8	11.2	13.5	20.9	25.7	34.0	39.2	39.8	36.9	37.4	38.4	42.2	41.7	26.1	21.5	42.2
21-Aug	14.7	11.5	10.9	10.5	9.8	9.5	10.8	17.5	17.6	16.5	12.6	10.0	10.8	11.8	12.3	11.8	10.6	10.8	13.1	9.3	11.7	11.4	11.5	10.4	12.0	17.6
22-Aug	10.4	10.1	11.3	13.3	14.1	13.9	15.7	16.4	16.4	17.0	18.0	18.6	23.7	24.9	26.7	29.3	35.6	32.7	35.3	35.0	35.1	39.4	40.1	38.7	23.8	40.1
23-Aug	34.2	29.3	25.1	22.3	20.9	20.2	22.8	21.0	22.0	22.7	27.0	32.8	32.5	30.0	33.0	36.2	42.1	43.2	143.0	302.2	221.2	136.4	155.0	193.5	69.5	302.2
24-Aug	215.6	146.4	95.3	64.2	37.7	24.9	15.1	10.7	10.0	10.2	9.5	11.2	9.0	7.8	7.1	6.2	5.5	4.6	4.1	4.3	5.1	7.8	11.2	8.8	30.5	215.6
25-Aug	8.5	8.0	6.7	5.5	6.9	7.5	11.9	14.6	16.3	18.8	42.7	64.1	83.9	110.5	114.6	86.7	84.1	73.9	66.4	59.0	60.5	64.4	66.9	66.2	47.9	114.6
26-Aug	63.5	62.2	55.9	51.9	43.8	37.6	32.3	29.7	31.1	29.1	22.0	23.0	25.5	28.5	35.3	37.8	39.7	172.5	313.4	342.3	243.0	216.8	209.3	198.4	97.7	342.3
27-Aug	220.2	225.3	220.4	196.3	180.1	158.1	144.9	132.2	127.5	122.2	92.1	88.4	114.1	140.7	144.8	121.4	115.5	119.6	112.2	108.9	114.1	115.6	117.3	128.9	140.0	225.3
28-Aug	151.4	161.0	172.0	172.0	182.3	179.8	169.7	148.0	132.7	117.1	114.8	118.9	104.3	90.2	84.9	83.9	81.5	80.9	78.1	72.1	67.8	65.9	66.5	66.3	115.1	182.3
29-Aug	68.0	69.0	71.1	72.7	75.4	77.5	78.8	79.4	78.1	76.7	71.4	69.8	73.0	74.9	78.1	84.8	87.2	90.5	88.4	86.8	88.3	84.1	71.2	66.6	77.6	90.5
30-Aug	64.5	59.4	55.6	50.0	46.2	50.2	45.7	39.6	35.4	32.7	32.1	28.9	27.6	26.8	33.0	34.7	27.5	24.3	24.0	22.9	16.8	17.7	15.8	16.4	34.5	64.5
31-Aug	17.1	17.4	22.7	31.4	36.6	35.1	28.9	26.4	26.4	27.9	32.3	35.0	42.2	45.5	44.6	35.9	67.4	181.1	227.4	252.9	308.8	406.0	441.7	478.1	119.5	478.1
41.0 39.8 38.4 36.9 37.5 42.4 45.2 45.2 47.8 45.0 39.7 37.7 39.4 39.8 37.4 36.6 36.7 43.4 51.2 57.1 53.1 51.9 52.0 54.1																								Diurnal Average		
220.2 225.3 220.4 196.3 182.3 179.8 284.9 274.5 282.5 164.2 162.1 155.0 157.4 140.7 144.8 121.4 115.5 181.1 313.4 342.3 308.8 406.0 441.7 478.1																								Diurnal Maximum		

C - Calibration DF - DAS 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}) - $\mu\text{g}/\text{m}^3$
Wapasu - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	120	16.19	16.19
6 - 15	193	26.05	42.24
16 - 25	81	10.93	53.17
26 - 80	233	31.44	84.62
> 81.0	114	15.38	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
Wapasu - August 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	8	3	9	8	7	20	34	10	4	4	3	4	0	0	1	5	120
6 - 15	10	8	1	1	0	6	27	33	25	13	25	18	10	6	5	5	193
16 - 25	0	1	3	0	1	2	12	18	15	5	8	6	1	3	1	5	81
26 - 80	15	3	1	1	3	11	21	38	26	16	9	13	15	21	19	20	232
> 81.0	26	6	2	4	1	1	4	17	12	12	3	4	3	7	2	10	114
Totals	59	21	16	14	12	40	98	116	82	50	48	45	29	37	28	45	740

Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

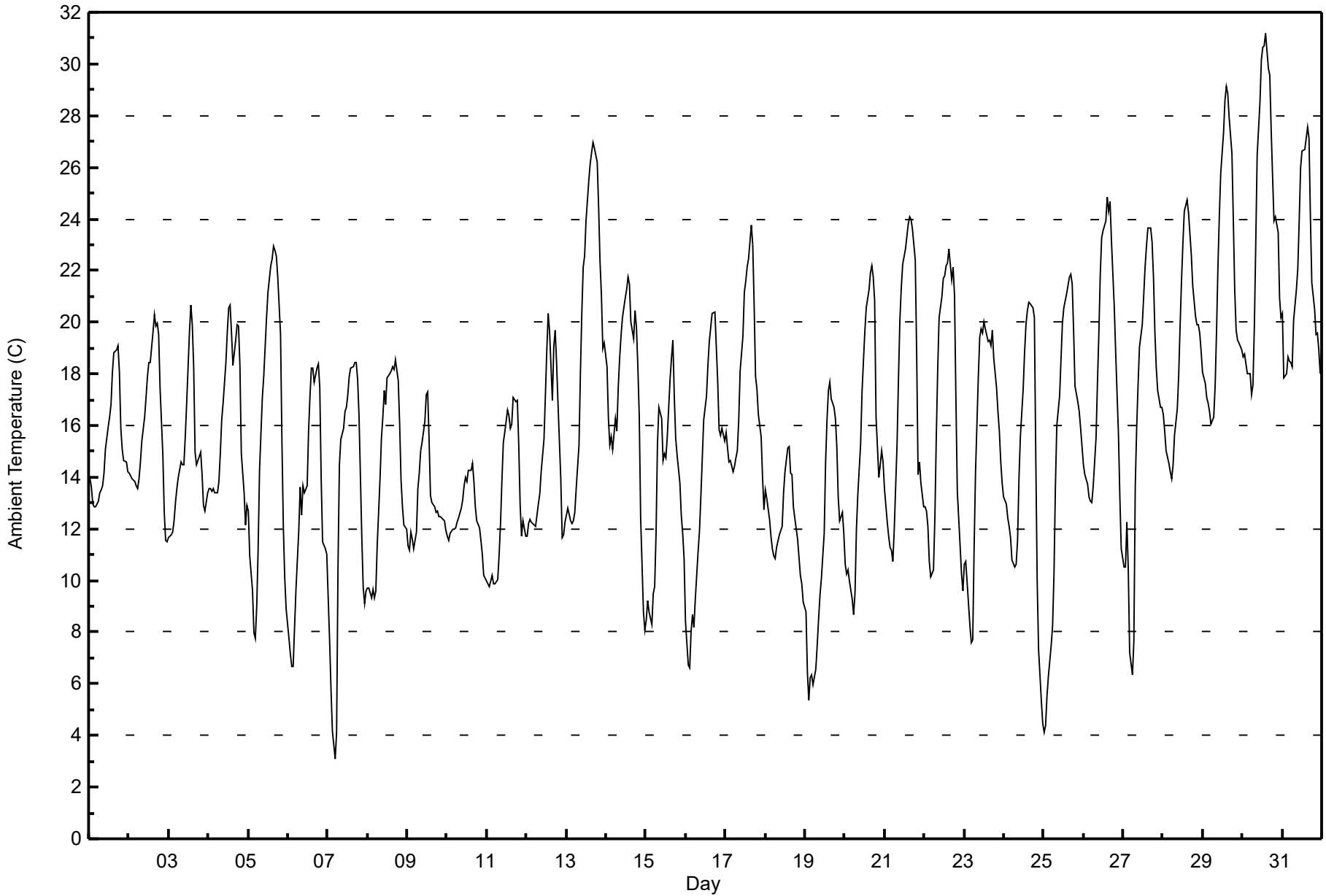
Ambient Temperature (AT) - C
Wapasu - August 2023

Maximum Value: 31.2 C on Aug 30 15:00		Maximum Daily Average: 23.8 C on Aug 30		Hours in Service: 744																							
Minimum Value: 3.1 C on Aug 7 05:00		Minimum Daily Average: 11.4 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 20.8 C at hour 15		Minimum Diurnal Average: 11.2 C at hour 5		Hours of Missing Data: 0																							
Monthly Average: 15.89 C		Percentiles: P ₁ = 5.4 P ₁₀ = 9.9 Q ₁ = 12.3 Median = 15.5 Q ₃ = 19.3 P ₉₀ = 22.2 P ₉₉ = 28.7		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-Aug	14.0	13.6	13.0	12.9	12.8	13.0	13.4	13.5	13.6	14.1	15.1	16.0	16.3	16.8	18.1	18.8	18.9	19.1	18.0	15.9	15.1	14.7	14.6	14.2	15.2	19.1	
2-Aug	14.2	14.1	13.9	13.9	13.6	13.6	13.9	14.6	15.4	16.3	17.1	17.9	18.4	18.4	19.7	20.3	19.8	20.0	19.5	17.4	14.9	12.6	11.6	11.5	15.9	20.3	
3-Aug	11.7	11.8	11.9	12.3	13.0	13.6	14.0	14.6	14.5	14.5	15.6	16.8	19.6	20.7	19.9	18.3	15.0	14.5	14.8	14.9	14.1	12.9	12.7	13.4	14.8	20.7	
4-Aug	13.6	13.6	13.5	13.6	13.4	13.4	13.8	14.9	16.2	16.9	18.4	19.6	20.5	20.7	19.6	18.4	19.3	19.9	19.9	18.4	14.9	13.4	12.2	12.9	16.3	20.7	
5-Aug	12.7	11.0	9.6	8.0	7.7	9.0	11.2	14.3	17.1	17.9	19.0	20.2	21.2	22.2	22.4	23.0	22.8	22.6	21.7	19.5	15.3	12.0	10.1	8.9	15.8	23.0	
6-Aug	7.8	7.2	6.7	6.7	8.2	9.7	11.9	13.6	12.5	13.7	13.4	13.7	15.8	17.1	18.2	18.2	17.7	18.2	18.4	17.4	13.9	11.5	11.2	11.0	13.1	18.4	
7-Aug	9.3	7.7	5.8	4.2	3.1	4.1	10.5	14.5	15.5	15.9	16.5	16.7	17.2	17.9	18.2	18.3	18.4	18.5	17.8	16.4	11.6	9.7	9.1	9.6	12.8	18.5	
8-Aug	9.7	9.7	9.4	9.6	9.3	9.6	11.4	13.9	15.5	16.3	17.4	16.8	17.9	18.0	18.1	18.3	18.2	18.6	17.7	16.0	13.9	12.9	12.2	12.0	14.3	18.6	
9-Aug	11.3	11.2	11.9	11.6	11.2	11.9	13.6	14.1	15.0	15.3	16.2	17.2	17.3	15.5	13.3	13.0	12.8	12.6	12.7	12.5	12.4	12.4	12.3	12.0	13.3	17.3	
10-Aug	11.7	11.6	11.8	12.0	12.0	12.0	12.3	12.4	12.8	13.1	13.7	14.0	13.8	14.2	14.3	14.5	13.8	12.8	12.3	12.0	11.5	11.0	10.2	10.1	12.5	14.5	
11-Aug	10.0	9.8	10.0	10.2	9.9	9.9	10.0	11.0	12.2	13.9	15.4	15.7	16.6	16.4	15.9	16.0	17.1	16.9	17.0	15.2	12.9	11.7	12.3	11.7	13.2	17.1	
12-Aug	11.7	12.2	12.3	12.3	12.1	12.1	12.5	13.0	13.3	14.2	15.5	17.1	18.9	20.3	19.6	17.0	19.1	19.7	18.5	16.9	13.9	11.6	11.8	12.3	14.9	20.3	
13-Aug	12.5	12.8	12.3	12.2	12.3	12.6	13.6	15.3	18.0	20.4	22.1	22.6	23.9	25.5	26.1	26.6	27.0	26.7	26.2	24.5	22.3	21.1	19.0	19.2	19.8	27.0	
14-Aug	18.3	16.3	15.2	15.6	15.1	16.3	15.8	17.5	18.6	19.5	20.2	20.9	21.3	21.8	21.5	20.0	19.4	20.4	19.8	18.3	16.4	12.4	8.8	8.1	17.4	21.8	
15-Aug	8.4	9.2	8.8	8.3	9.5	9.8	11.8	15.3	16.7	16.3	14.6	14.9	14.8	15.6	17.8	18.6	19.3	17.1	15.5	14.9	13.8	12.5	11.8	10.8	13.6	19.3	
16-Aug	8.4	6.7	6.6	8.0	8.7	8.2	9.3	11.1	11.9	13.3	14.7	16.2	17.2	18.3	19.3	19.8	20.4	20.4	19.0	17.7	15.8	15.6	15.9	15.4	14.1	20.4	
17-Aug	15.7	15.2	14.6	14.6	14.2	14.4	14.8	15.0	16.2	18.1	19.5	21.1	21.6	22.1	22.5	23.8	23.0	20.7	17.9	17.4	16.4	15.6	14.0	12.8	17.5	23.8	
18-Aug	13.5	13.2	12.4	11.7	11.2	11.0	10.8	11.3	11.8	11.9	12.1	13.4	14.2	15.1	15.2	14.1	14.1	12.9	12.4	11.6	10.9	10.2	9.9	9.1	12.2	15.2	
19-Aug	8.8	6.4	5.4	6.2	6.3	6.0	6.6	7.5	8.5	9.4	10.1	11.8	14.6	16.2	17.4	17.7	17.0	16.7	16.3	15.2	13.2	12.3	12.6	11.8	11.4	17.7	
20-Aug	10.7	10.2	10.4	10.0	9.3	8.7	9.5	12.0	13.4	15.3	17.3	18.5	19.6	20.5	21.3	21.9	22.2	21.7	20.8	16.3	14.0	14.5	15.0	14.6	15.3	22.2	
21-Aug	13.5	12.3	11.7	11.3	11.2	10.7	12.0	15.3	17.8	20.0	21.3	22.2	22.8	23.3	23.8	24.1	24.0	23.6	22.4	18.7	14.1	14.6	13.8	12.8	17.4	24.1	
22-Aug	12.8	12.7	12.1	10.7	10.2	10.4	12.5	15.6	18.2	20.2	21.0	21.7	21.8	22.2	22.3	22.8	21.7	22.1	21.0	17.0	13.4	11.4	10.2	9.6	16.4	22.8	
23-Aug	10.6	10.7	9.9	8.3	7.6	7.7	11.3	14.2	17.9	19.4	19.7	19.6	20.0	19.8	19.3	19.3	19.1	19.7	18.6	17.4	16.5	15.8	14.6	13.8	15.5	20.0	
24-Aug	13.2	13.0	12.4	12.1	11.7	10.8	10.5	10.6	11.6	13.9	15.6	17.4	18.8	19.9	20.4	20.8	20.7	20.6	20.2	14.8	10.0	7.3	5.3	4.4	14.0	20.8	
25-Aug	4.1	4.4	5.5	6.3	7.5	8.3	10.2	13.6	16.0	17.1	18.6	20.0	20.6	20.8	21.1	21.7	21.9	21.5	19.7	17.5	16.9	16.6	15.9	15.2	15.0	21.9	
26-Aug	14.5	14.1	13.7	13.2	13.1	13.0	13.7	15.5	17.6	19.5	21.8	23.3	23.5	23.9	24.8	24.3	24.7	23.1	20.6	18.9	17.3	15.7	13.3	11.2	18.1	24.8	
27-Aug	10.5	10.5	12.3	10.5	7.2	6.3	7.6	13.7	15.9	17.6	19.0	19.9	21.0	22.1	23.0	23.6	23.7	23.1	21.7	19.6	18.2	17.4	16.7	16.7	16.6	23.7	
28-Aug	16.4	15.8	15.0	14.5	14.2	13.9	14.5	15.6	16.6	18.0	19.8	21.6	23.1	24.3	24.7	24.3	23.4	22.6	21.4	20.2	19.9	19.9	19.6	18.9	19.1	24.7	
29-Aug	18.1	17.6	17.1	16.9	16.5	16.1	16.3	17.5	19.7	22.1	24.1	25.7	27.3	28.6	29.1	28.8	27.9	26.5	23.9	21.2	19.7	19.3	19.2	18.9	21.6	29.1	
30-Aug	18.6	18.8	18.4	18.0	18.0	17.2	17.6	19.9	23.0	26.5	28.5	30.1	30.7	30.7	31.2	29.8	29.5	27.5	25.7	23.9	24.1	23.5	21.0	20.2	23.8	31.2	
31-Aug	20.4	17.8	18.0	18.7	18.5	18.4	18.3	20.1	21.3	22.0	23.9	26.0	26.6	26.7	27.1	27.5	27.1	24.1	21.5	20.5	19.5	19.6	18.9	18.0	21.7	27.5	
		12.5	12.0	11.7	11.4	11.2	11.3	12.4	14.2	15.6	16.9	18.0	19.0	19.9	20.5	20.8	20.8	20.6	20.1	19.1	17.4	15.4	14.2	13.4	12.9	Diurnal Average	
		20.4	18.8	18.4	18.7	18.5	18.4	18.3	20.1	23.0	26.5	28.5	30.1	30.7	30.7	31.2	29.8	29.5	27.5	26.2	24.5	24.1	23.5	21.0	20.2	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Wapasu - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Wapasu - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	80	10.75	10.75
10 - 20	519	69.76	80.51
> 20	145	19.49	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

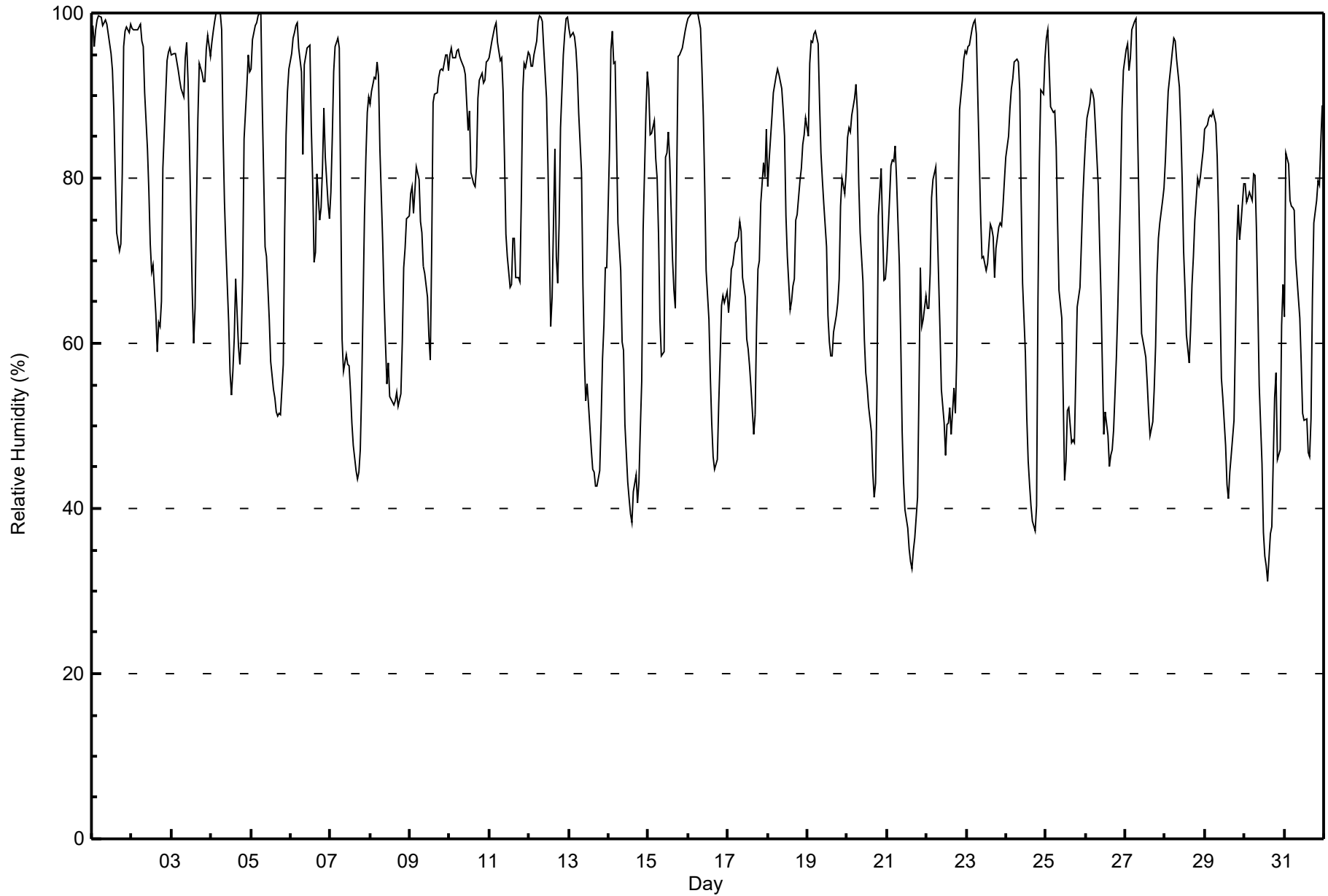
Relative Humidity (RH) - %
Wapasu - August 2023

Maximum Value: 100.0 % on Aug 4 04:00		Maximum Daily Average: 92.7 % on Aug 1		Hours in Service: 744																																												
Minimum Value: 31.2 % on Aug 30 15:00		Minimum Daily Average: 57.4 % on Aug 30		Hours of Data: 744																																												
Maximum Diurnal Average: 91.7 % at hour 5		Minimum Diurnal Average: 56.7 % at hour 15		Hours of Missing Data: 0																																												
Monthly Average: 75.40 %		Percentiles: P ₁ = 36.7 P ₁₀ = 49.8 Q ₁ = 61.8 Median = 77.4 Q ₃ = 92.0 P ₉₀ = 96.8 P ₉₉ = 100.0		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-Aug	98.5	96.0	98.0	99.1	99.7	99.5	98.6	98.9	99.2	98.7	97.5	95.2	93.1	88.1	80.4	73.5	71.3	72.0	80.5	95.9	97.8	98.3	97.7	98.6	92.7	99.7																						
2-Aug	98.2	97.9	98.0	98.0	98.3	98.7	96.7	96.0	90.4	83.6	78.5	72.1	68.7	69.5	63.5	58.9	62.6	62.0	65.1	81.2	90.1	94.2	95.2	95.7	83.9	98.7																						
3-Aug	95.0	95.0	95.1	94.1	93.1	91.8	90.9	89.8	94.6	96.5	91.7	84.0	66.1	60.0	64.2	76.4	87.2	93.9	92.7	91.7	91.8	95.6	97.4	94.8	88.5	97.4																						
4-Aug	96.5	97.8	99.0	100.0	100.0	100.0	98.0	85.2	77.1	71.6	62.6	56.4	53.7	56.6	60.6	67.8	59.7	57.4	60.5	68.1	84.7	91.3	94.8	92.9	78.8	100.0																						
5-Aug	93.2	96.8	98.5	98.8	99.6	100.0	99.8	88.7	71.7	70.6	66.8	62.8	57.8	54.4	53.3	51.8	51.2	51.6	51.4	57.5	73.9	85.3	90.4	93.2	75.8	100.0																						
6-Aug	95.2	97.0	97.7	98.5	98.7	95.8	92.8	82.8	93.7	94.8	95.8	96.2	86.3	79.6	69.8	71.1	80.4	74.8	76.4	81.2	88.5	82.6	77.0	75.2	86.8	98.7																						
7-Aug	78.3	84.9	92.8	95.9	97.0	95.8	78.4	60.5	56.6	58.6	57.5	57.4	54.2	50.4	47.7	44.7	43.6	44.4	47.1	54.6	75.4	82.5	88.1	89.8	68.2	97.0																						
8-Aug	89.1	90.5	92.1	92.0	94.1	92.4	83.5	72.4	65.5	60.0	55.1	57.6	53.5	52.9	52.5	53.1	54.0	52.4	53.8	60.1	69.1	71.5	75.0	75.5	69.5	94.1																						
9-Aug	78.1	79.0	75.8	78.5	81.4	79.9	74.8	73.3	69.3	68.5	65.6	60.9	58.0	71.3	89.2	90.2	90.4	92.2	93.0	93.2	93.1	94.9	94.9	93.1	80.8	94.9																						
10-Aug	94.9	95.8	94.6	94.6	95.5	95.7	94.8	94.2	93.4	92.6	89.2	85.8	88.1	80.7	79.4	78.9	81.3	89.7	91.8	92.7	91.5	91.9	94.1	94.2	90.6	95.8																						
11-Aug	94.6	96.7	97.4	98.3	98.9	96.4	94.3	94.5	90.4	82.4	73.2	70.5	66.8	67.2	72.7	72.7	68.0	67.9	67.5	77.4	90.3	94.0	93.4	95.3	84.2	98.9																						
12-Aug	94.8	93.6	93.5	94.9	96.6	98.9	99.6	99.4	99.0	95.8	89.6	81.8	71.5	62.0	65.6	83.6	70.6	67.2	74.7	86.2	95.0	97.5	99.3	99.5	87.9	99.6																						
13-Aug	98.2	97.1	97.6	97.1	95.6	92.7	87.8	80.6	67.1	58.3	53.1	55.1	52.5	47.1	44.7	44.4	42.6	42.8	44.5	50.6	58.1	62.2	69.2	69.1	67.0	98.2																						
14-Aug	83.5	95.7	97.8	93.9	94.0	74.5	71.7	68.9	60.1	59.2	50.2	43.3	41.1	39.4	38.2	42.1	44.1	40.7	43.3	49.6	55.5	73.8	87.8	92.9	64.2	97.8																						
15-Aug	90.8	85.3	85.4	87.0	82.3	80.0	73.2	62.8	58.4	59.0	82.5	83.0	85.7	82.1	70.2	66.5	64.3	80.4	94.8	94.8	95.8	96.9	97.7	98.6	81.6	98.6																						
16-Aug	99.3	99.9	100.0	100.0	100.0	100.0	100.0	98.2	93.2	87.5	79.0	68.8	62.8	56.0	50.3	46.3	44.7	46.0	52.8	58.3	64.6	65.7	64.9	66.3	75.2	100.0																						
17-Aug	63.7	65.7	69.0	69.5	72.3	72.4	73.0	74.8	73.6	67.9	65.6	60.5	59.3	57.4	54.7	49.0	51.4	61.8	68.9	70.0	77.0	81.8	80.2	85.9	67.7	85.9																						
18-Aug	79.0	82.2	87.5	90.4	91.4	92.4	93.3	92.6	90.9	88.3	85.1	75.4	70.5	64.1	65.0	66.9	67.8	75.0	75.5	79.7	81.2	84.1	85.3	87.4	81.3	93.3																						
19-Aug	85.1	93.9	96.7	96.5	97.4	97.8	96.4	89.2	83.0	79.8	77.0	71.8	63.4	60.1	58.4	58.5	61.4	63.3	64.8	67.8	76.7	80.0	78.2	80.7	78.2	97.8																						
20-Aug	84.9	86.1	85.5	87.6	89.6	91.3	88.2	79.3	73.4	67.4	60.6	56.5	54.8	52.4	49.3	44.5	41.4	43.0	54.0	75.4	81.3	74.1	67.6	67.9	69.0	91.3																						
21-Aug	70.0	77.5	81.5	82.2	82.0	83.9	79.8	69.5	60.2	49.3	43.2	39.9	37.7	35.1	33.6	32.7	34.8	36.5	41.4	54.3	69.2	62.0	62.9	65.7	57.7	83.9																						
22-Aug	64.3	64.2	68.4	77.7	79.9	81.4	74.8	68.2	61.6	54.4	50.4	46.5	50.2	50.3	52.2	49.0	54.6	51.5	58.5	77.4	88.2	91.9	94.4	95.4	66.9	95.4																						
23-Aug	95.1	95.9	96.2	98.1	98.8	99.2	97.5	89.9	75.7	70.3	70.5	69.6	68.9	69.6	74.4	73.9	72.9	67.9	71.6	74.1	74.6	74.2	76.7	79.6	80.6	99.2																						
24-Aug	82.6	85.0	88.5	90.9	92.0	94.1	94.5	94.0	90.5	77.3	67.2	58.8	51.0	45.8	42.8	40.4	38.6	37.3	40.4	65.4	81.8	90.7	90.2	94.6	72.3	94.6																						
25-Aug	96.9	97.9	93.5	88.7	88.0	88.1	83.7	74.8	66.5	63.1	53.7	43.3	45.7	51.8	52.2	48.0	48.3	48.0	56.1	64.5	66.9	72.0	77.4	81.4	68.8	97.9																						
26-Aug	84.8	87.3	89.0	90.7	90.4	89.5	86.2	79.2	72.2	65.8	57.1	49.0	51.7	48.8	45.1	46.4	47.1	49.5	58.3	64.3	71.5	78.7	88.4	93.0	70.2	93.0																						
27-Aug	95.6	96.3	93.0	94.6	98.0	99.1	99.3	87.1	77.7	69.1	61.1	59.3	58.4	55.3	51.7	48.8	50.6	54.5	59.7	68.3	72.7	74.6	77.3	78.9	74.2	99.3																						
28-Aug	82.1	86.6	90.5	93.8	95.4	97.0	96.7	94.4	91.1	86.3	79.7	71.2	66.6	61.1	57.6	61.7	67.2	70.5	74.9	79.9	79.2	80.1	81.9	83.4	80.4	97.0																						
29-Aug	86.0	86.4	87.3	87.6	87.5	88.2	86.6	82.5	75.5	65.6	55.7	53.4	47.7	42.8	41.2	44.4	46.5	50.7	60.7	72.4	76.8	72.6	74.6	79.3	68.8	88.2																						
30-Aug	79.3	77.0	77.7	78.3	77.3	80.5	80.4	73.8	64.9	54.9	45.4	37.2	34.2	33.1	31.2	36.9	37.7	45.6	53.5	56.5	45.9	47.2	62.2	67.1	57.4	80.5																						
31-Aug	63.3	83.1	81.7	77.3	76.5	76.5	76.2	70.4	65.5	63.1	57.7	51.5	50.7	50.8	46.8	46.3	50.8	65.4	74.6	77.2	79.6	79.1	84.5	88.8	68.2	88.8																						
																								86.8	89.2	90.3	91.1	91.7	91.1	88.4	82.8	77.5	72.9	68.3	63.7	60.3	57.9	56.7	57.1	57.6	59.9	64.6	72.3	78.6	81.3	83.8	85.6	Diurnal Average
																								99.3	99.9	100.0	100.0	100.0	100.0	100.0	99.4	99.2	98.7	97.5	96.2	93.1	88.1	89.2	90.2	90.4	93.9	94.8	95.9	97.8	98.3	99.3	99.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Wapasu - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Wapasu - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	17	2.28	2.28
40 - 60	153	20.56	22.85
60 - 80	238	31.99	54.84
80 - 100	327	43.95	98.79

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

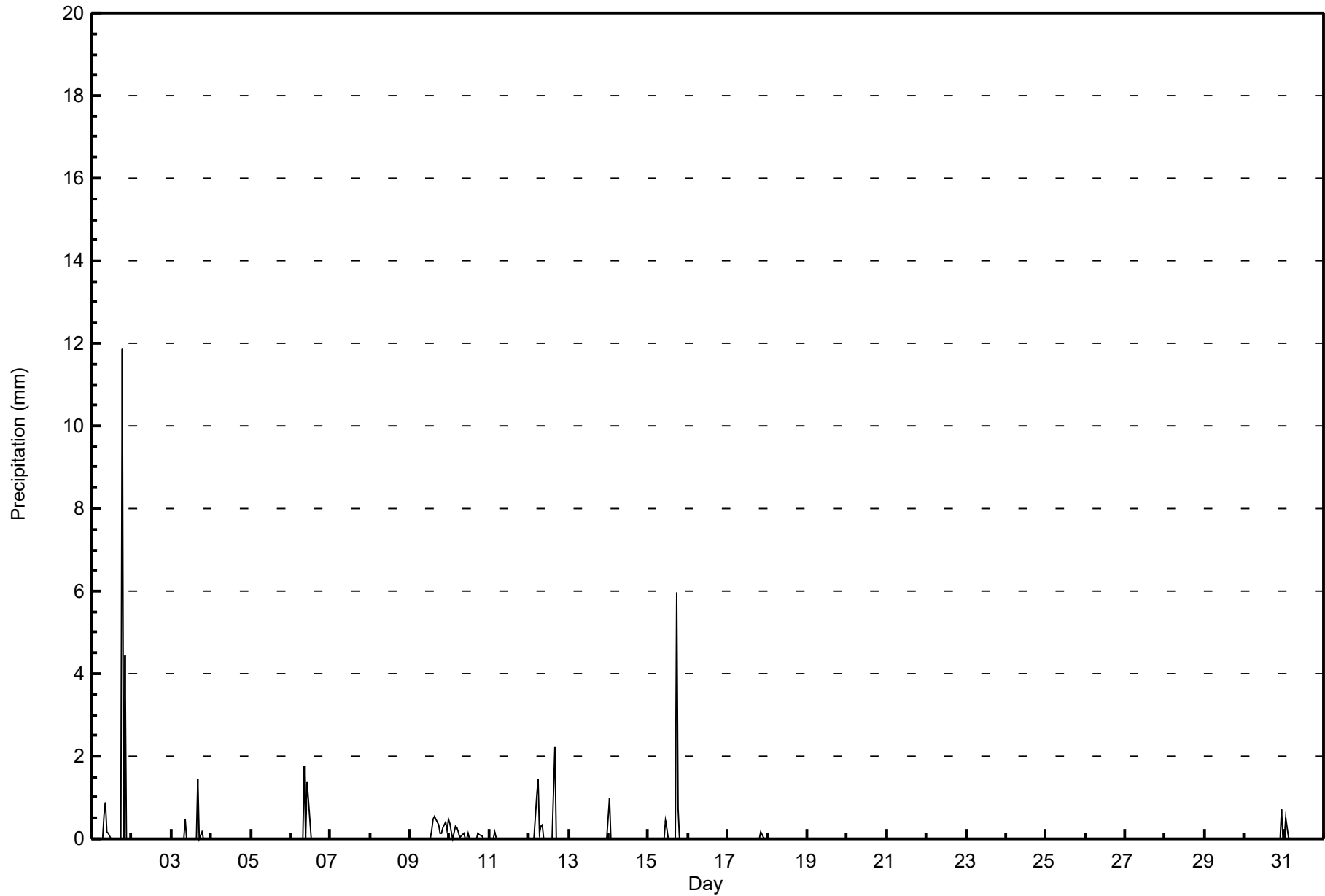
Wapasu - August 2023

Maximum Value: 11.9 mm on Aug 1 19:00		Maximum Daily Total: 18.1 mm on Aug 1		Hours in Service: 744																						
Minimum Value: 0.0 mm on Aug 1 01:00		Minimum Daily Total: 0.0 mm on Aug 2		Hours of Data: 744																						
Maximum Diurnal Total: 13.0 mm at hour 19		Minimum Diurnal Total: 0.0 mm at hour 13		Hours of Missing Data: 0																						
Monthly Total: 44.89 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 = 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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	0.0	4.5	0.0	0.0	0.0	18.1	11.9
2-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	2.1	1.5
4-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	1.4	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	3.6	1.8
7-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	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	0.5	0.4	0.3	0.1	0.1	0.3	0.4	0.2	0.5	3.6	0.5	
10-Aug	0.4	0.2	0.0	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	2.0	0.4	
11-Aug	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	0.2	0.2	
12-Aug	0.0	0.0	0.0	0.0	1.0	1.5	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	2.2	
13-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	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	1.0	
15-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	6.0	0.7	0.0	0.0	0.0	0.0	7.4	6.0	
16-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2	0.2	
18-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	
31-Aug	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	
		1.4	0.7	0.0	0.5	1.4	1.6	0.2	0.9	3.6	0.2	2.0	0.9	0.0	0.2	0.5	2.8	1.9	6.4	13.0	0.2	4.9	0.5	0.9	0.5	Diurnal Average
		1.0	0.5	0.0	0.3	1.0	1.5	0.2	0.6	1.8	0.2	1.4	0.5	0.0	0.2	0.5	2.2	1.5	6.0	11.9	0.1	4.5	0.4	0.7	0.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Wapasu - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Wapasu - August 2023

Maximum Speed: 20 km/h on Aug 10 03:00	Maximum Daily Speed Average: 14.5 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 16 03:00	Minimum Daily Speed Average: 2.0 km/h on Aug 6	Hours of Data: 743
Maximum Diurnal Speed Average: 4.4 km/h at hour 14	Minimum Diurnal Speed Average: 0.8 km/h at hour 20	Hours of Missing Data: 1
Monthly Average Velocity: 2.4 km/h 183.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 5 Median = 7 Q ₃ = 10 P ₉₀ = 12 P ₉₉ = 17	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-Aug	SSW6	SW6	SSW6	SW8	SW7	SW8	WSW8	WSW7	SW8	SW10	SW12	WSW12	WSW11	W10	WNW9	NW10	NW10	WNW5	NNW4	N7	N5	N4	NNW7	NW3	W5.4	WSW12
2-Aug	NW4	NW5	NW4	NW5	WNW3	WNW3	WNW4	WSW6	WNW6	WNW7	WNW7	NW7	NW7	WNW5	W5	WNW5	NW5	WNW4	NNW4	ENE3	E3	E4	ESE6	ESE6	WNW2.9	WNW7
3-Aug	ESE5	ESE5	SE6	SE7	SE7	SE6	SE8	SE8	S5	SSE5	SSE6	SSE7	S8	S8	SSE9	SSE10	NNE1	SSE6	SE6	SSE5	SSE6	SSE1	S3	S4	SSE5.5	SSE10
4-Aug	SW3	NW4	NNW7	NNW9	NNW9	NW7	W5	WNW6	WSW7	W9	W8	W9	W9	WNW8	WNW7	WSW8	SW10	SW8	WSW6	WSW4	SW3	SW5	SSE4	SSE3	W5.0	SW10
5-Aug	SSE4	SSE5	SE5	SE4	SSE6	SSE5	SSE4	S2	NNW9	NNW10	NNW10	NNW11	NNW11	NNW9	NW10	NNW10	N9	N9	N8	NNE5	ENE4	E3	ESE3	ESE3	N2.8	NNW11
6-Aug	SE4	SE4	SE4	SE5	SSE6	SE4	ESE3	NNE3	SE6	NE3	N4	ENE4	N4	N6	N7	NNW7	WNW6	NW7	NW6	NW3	NE5	NE5	ENE8	ENE6	NE2.0	ENE8
7-Aug	E4	ESE4	ESE2	ENE4	E5	E4	ENE2	NW4	NNW8	NNW9	N12	N10	N10	NNW13	NNW12	NNW12	N10	N11	N10	NNE5	NE4	ENE5	E6	ESE6	N5.3	NNW13
8-Aug	ESE8	ESE7	SE8	ESE10	ESE10	ESE11	SE10	SE8	SE8	ESE7	SE7	ESE8	SE12	ESE13	ESE12	SE13	ESE13	ESE12	ESE12	ESE10	SE9	SE10	SE10	SE12	ESE10.0	SE13
9-Aug	SE11	SE11	SE13	SE13	SE13	SE14	SSE14	SSE14	SSE14	SE17	SSE17	SSE18	SSE17	SSE16	SE13	SE14	SE15	SE15	SE14	SE13	SE14	SE14	SE17	SE18	SE14.5	SSE18
10-Aug	SE16	SE18	SE20	SE19	SE17	SE15	SE15	SE15	SE13	SE10	ESE10	ESE11	ESE12	ESE14	ESE14	ESE15	E13	E11	E8	ENE7	ENE6	NE3	NE4	NE4	ESE11.2	SE20
11-Aug	NE5	ENE6	ENE6	NE5	NE5	NE4	NE3	N4	NNE4	ESE5	SE7	SE7	SE6	SSE5	WSW7	WSW8	S4	SSW5	SW6	SSE4	SE4	SE6	SE7	SE7	SE2.3	WSW8
12-Aug	SE8	SE8	SSE8	SSE7	S6	SSE4	SSW5	WSW6	WSW6	W5	WNW6	WNW4	W5	WNW7	NW8	WSW3	WSW5	WNW6	W4	W2	SSE3	SE4	SE6	SSE6	SW2.5	NW8
13-Aug	SSE7	SSE7	S6	SSE7	SSE8	SSE9	S9	SSE10	S11	SSW11	SSW16	SW18	SW18	SW17	SW17	SW16	WSW14	SW15	WSW12	SW8	SSW7	SSW7	SSE6	SSW5	SSW9.4	SW18
14-Aug	SSW6	ESE5	S5	S4	NW3	NNW10	NE4	N2	WSW7	WSW10	W12	WNW12	W13	W13	W13	W10	WSW12	WSW13	WSW11	W7	WNW5	SSW2	SE4	SSE6	W5.5	WSW13
15-Aug	SSE6	SSE6	SSE6	SSE7	SSE7	SSE7	S8	S7	S8	S10	SE6	SSE8	SSE9	SSE9	S8	SSW7	SW7	N4	NNE5	NNW7	N8	N4	N4	NW3	SSE3.4	S10
16-Aug	WSW1	SSE2	SSE0	NW2	NNW3	N3	W2	W4	WNW5	WNW6	WNW8	WNW9	WNW9	W10	W10	W10	WSW12	SW14	SSW9	S7	S7	S9	S9	S9	WSW4.6	SW14
17-Aug	S11	S11	S10	S8	SSE9	SSE9	SSE9	S8	S8	S8	SSW7	SW8	WSW9	WSW9	W7	WSW5	WNW6	WSW8	S4	N3	NNW1	NNE4	NE4	N2	SSW4.5	S11
18-Aug	NNW8	N10	N9	N8	N8	N9	N8	N10	N10	N10	NNW13	NNW13	N10	NNW11	N10	N8	N10	NNW13	NNW11	NNW13	NNW13	NNW10	NNW11	NNW8	NNW10.1	NNW13
19-Aug	NNW7	NW3	WSW2	WSW5	WSW6	SW7	SW9	SW9	SW10	SW10	SW10	SW11	SW11	SW13	SW12	SW12	SW11	WSW8	WSW9	SW8	S6	S6	S7	S6	SW7.4	SW13
20-Aug	SSE7	S7	S6	S6	S7	S7	S7	SSW8	SW8	SSW6	SW4	WSW5	W5	WNW3	W5	WNW3	WNW5	NW6	N3	SE2	ESE4	SE6	SE6	SSE7	SSW3.2	SW8
21-Aug	SSE7	SSE6	SSE7	SSE7	SSE7	SSE7	SSE6	S7	SSW7	SW7	WSW8	WSW10	WSW9	SW9	SW7	WSW7	SSW6	SSW7	SSW7	SSE4	SE5	SSE6	SE6	SE7	SSW5.6	WSW10
22-Aug	SE8	SE8	SE7	SE5	SSE4	SE6	SE5	SSE6	S6	S8	SSW10	S9	S9	S9	S7	SW8	WSW3	WNW6	NW3	UO	SE3	ESE3	ESE4	ESE4	SSE4.7	SSW10
23-Aug	SE5	SE5	SE4	SE4	ESE3	SE4	E4	NE5	NE4	WNW2	W5	WNW6	NW6	NW4	NW4	WNW5	WNW4	NNW8	NNW9	N8	N7	N7	NNE5	NNE5	N2.3	NNW9
24-Aug	N6	N9	NNE8	NNE8	NNE9	NNE8	NNE9	NNE8	NNE9	NNE12	NNE13	N13	N12	N10	N10	NNW10	NNW10	NNW8	N5	NNE1	SE2	ESE3	ESE3	ESE4	N7.0	NNE13
25-Aug	SE5	SE5	S5	SE8	SE8	SE7	SE7	SSE8	S9	SSW11	SSW12	SSW14	SSW15	SSW14	SSW14	SSW13	SSW14	SSW10	S6	SSE8	S9	S8	S9	S8	S8.8	SSW15
26-Aug	S8	S7	S7	S8	S9	S8	S9	S9	SSW12	SSW13	SSW13	SW17	SW15	SW14	WSW13	WSW12	W9	NNW13	N9	N10	NNE8	NNE5	ENE3	ENE3	SW5.0	SW17
27-Aug	ENE4	N5	N7	E1	SSE5	SE5	SE5	SSE0	NNW4	W4	W6	WSW7	WSW9	SW10	SW9	SW10	SSW9	S9	S7	S6	S7	S6	SSE7	S7	SSW3.6	SW10
28-Aug	S6	SSE6	SSE7	SSE6	SSE6	SSE7	SSE7	SSE6	S6	S6	S6	S6	SSW6	SSW5	SSW5	S5	SSE5	SSE6	SSE7	SSE8	SSE9	SSE9	SSE9	S9	SSE6.3	S9
29-Aug	SSE9	SSE8	SSE8	SSE8	SSE7	SSE8	S9	S8	S8	S8	SSW10	SSW10	SSW10	SSW11	SSW10	SSW10	SSW10	SSW8	S6	SSE6	SSE6	SSE7	SSE7	SSE8	S7.8	SSW11
30-Aug	SSE8	SSE8	SSE8	SSE6	SSE7	SSE6	SE8	SE7	SSE7	SSE5	SSW4	SSW8	S9	SSE9	SSW10	SSE11	SSE12	SSE10	SSE7	SE10	SSE9	SSE11	SE9	SE3	SSE7.6	SSE12
31-Aug	SE1	SE6	SE7	SE6	SSE6	SSE6	SSE6	S5	SW6	WSW5	SSW3	W3	WNW7	WNW9	NW9	NNW10	NNW12	N12	N8	N6	N5	N10	N8	N6	NW2.1	NNW12

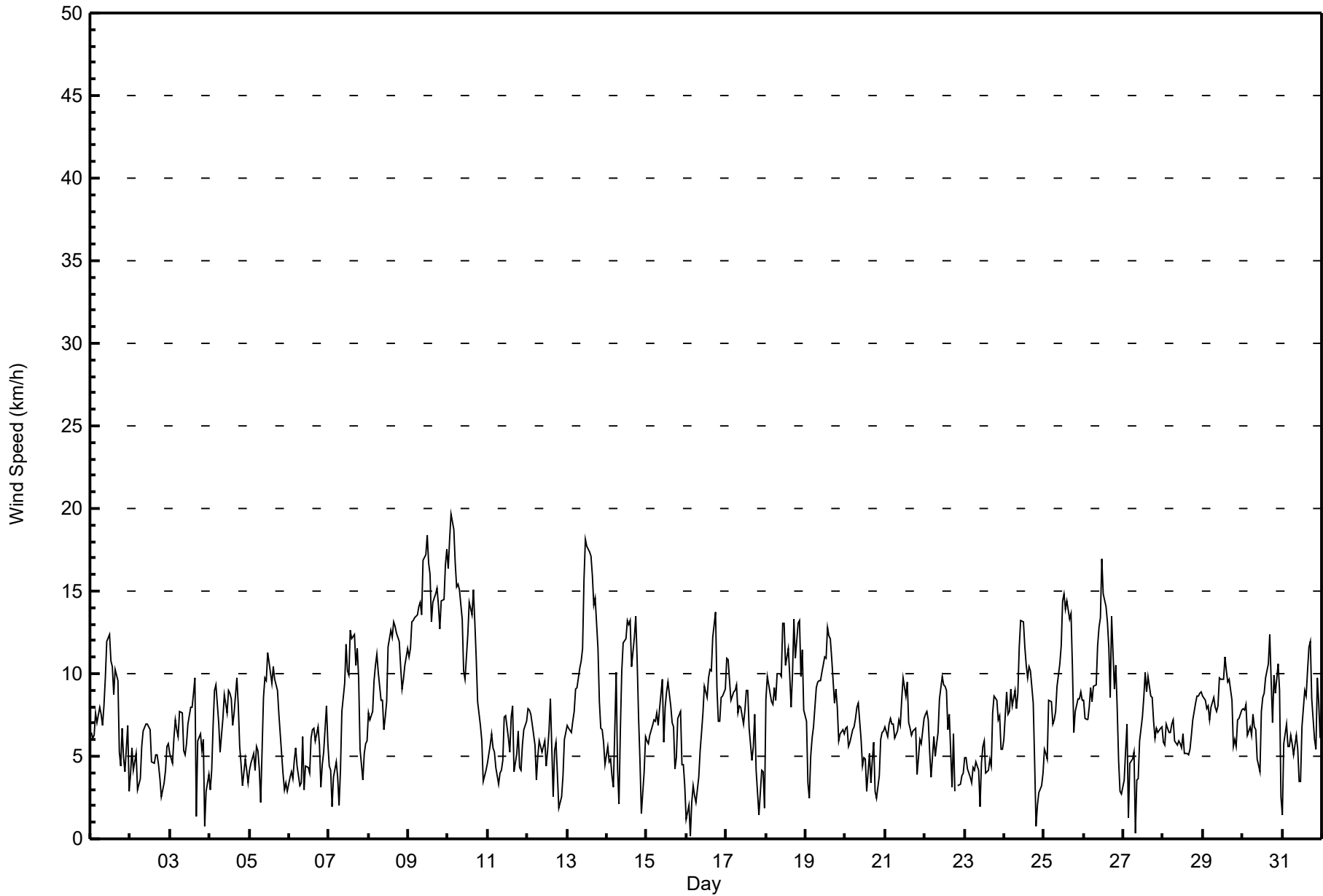
SSSE3.9	SE3.9	SSE4.0	SE4.0	SSE3.9	SE3.9	SSE4.3	S3.3	SSW3.1	SSW3.3	SW3.5	SW4.0	SW4.2	SW4.4	WSW4.1	WSW3.7	WSW3.2	WSW2.5	WSW0.9	SE0.8	SE2.0	SE2.6	SE3.4	SE3.6	Diurnal Average
SE16	SE18	SE20	SE19	SE17	SE15	SE15	SE15	SSE14	SE17	SSE17	SSE18	SW18	SW17	SW17	SW16	SE15	SE15	SE14	NNW13	SE14	SE14	SE17	SE18	Diurnal 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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	208	27.99	27.99
6 - 11	436	58.68	86.68
12 - 19	98	13.19	99.87
20 - 28	1	0.13	100.00
29 - 38	0	0.00	100.00
> 38	0	0.00	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Wapasu - August 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	16	11	16	9	8	17	27	21	11	9	3	10	13	16	15	6	208
6 - 11	40	8	0	6	3	14	44	89	71	30	31	27	12	20	13	28	436
12 - 19	3	2	0	0	1	9	26	8	0	11	14	8	4	1	0	11	98
20 - 28	0	0	0	0	0	0	1	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	59	21	16	15	12	40	98	118	82	50	48	45	29	37	28	45	743

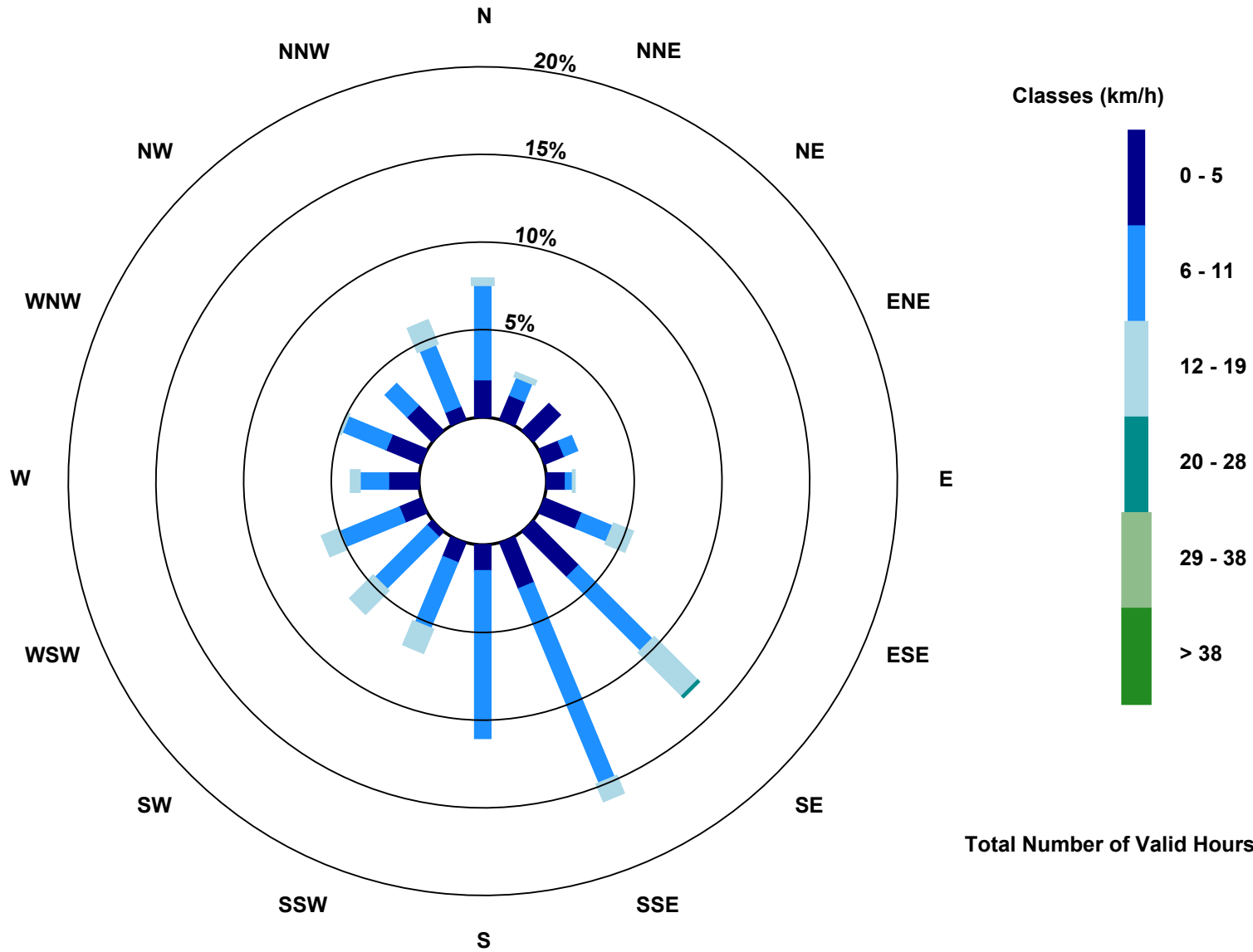
Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Wapasu





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Wapasu - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Aug 17 18:00 Minimum Value: 0 km/h on Aug 23 00:00 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: 743 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9									
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-Aug	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	2	4	2	2	1	2	1	4	
2-Aug	2	1	1	2	1	1	2	2	2	2	2	3	2	2	2	2	2	1	2	1	1	1	1	1	3	
3-Aug	1	1	2	1	1	1	2	2	2	1	2	2	3	3	3	4	4	2	2	1	2	1	1	1	4	
4-Aug	1	1	3	2	2	3	2	2	2	2	3	3	3	3	3	3	3	2	2	1	1	1	2	1	3	
5-Aug	1	1	1	2	1	1	1	1	3	3	3	3	3	3	4	4	3	3	3	1	0	1	1	1	4	
6-Aug	1	1	1	1	1	1	1	2	3	1	2	1	2	2	2	2	2	2	2	1	2	1	2	2	3	
7-Aug	1	1	1	1	1	1	1	2	3	3	4	4	4	4	4	4	4	3	3	2	1	1	1	1	4	
8-Aug	1	2	2	2	3	3	3	2	3	3	3	4	4	4	4	4	4	4	4	3	2	2	2	3	4	
9-Aug	2	2	3	3	3	3	4	4	4	5	6	6	6	6	4	4	4	4	4	3	4	4	5	5	6	
10-Aug	5	5	5	5	5	4	4	4	4	3	3	4	4	4	5	5	5	4	3	2	2	1	1	1	5	
11-Aug	1	2	2	1	1	1	1	1	1	2	3	2	2	2	2	2	2	2	2	1	1	1	2	2	3	
12-Aug	2	2	2	2	2	1	2	1	2	2	2	2	2	3	4	2	1	2	2	1	1	1	1	1	4	
13-Aug	1	1	1	1	2	2	3	3	4	4	6	5	5	5	5	5	4	4	3	3	2	2	1	2	6	
14-Aug	3	1	1	2	3	4	2	2	2	3	4	4	4	4	5	4	4	4	3	2	2	1	1	1	5	
15-Aug	1	1	1	1	1	1	2	2	3	4	2	3	3	3	3	3	3	2	1	2	3	1	1	1	4	
16-Aug	1	1	1	1	1	1	1	1	2	2	2	3	3	4	4	3	4	4	4	2	2	3	2	3	4	
17-Aug	3	3	3	3	2	3	3	3	3	3	2	3	3	3	3	3	2	6	3	2	1	2	2	2	6	
18-Aug	3	3	3	3	2	3	3	3	3	3	3	3	3	4	3	3	4	4	3	4	4	3	3	2	4	
19-Aug	2	1	1	1	1	1	2	2	2	3	3	3	4	4	4	4	4	3	2	2	2	2	2	2	4	
20-Aug	1	2	1	2	2	2	2	3	2	2	2	2	2	2	3	2	2	2	1	1	1	1	1	1	3	
21-Aug	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	3	3	2	2	1	1	1	1	1	3	
22-Aug	1	1	1	1	2	1	1	1	2	3	3	4	4	3	3	3	2	2	2	UO	1	1	1	0	4	
23-Aug	1	1	1	1	1	1	1	1	1	2	2	1	2	2	1	1	1	2	2	2	2	2	2	2	2	
24-Aug	2	3	2	2	3	3	3	3	3	4	5	4	4	4	4	4	3	2	2	1	1	1	0	1	5	
25-Aug	1	1	1	1	1	1	2	2	3	3	4	5	4	5	5	5	4	4	2	2	2	3	3	2	5	
26-Aug	2	2	2	2	3	3	3	3	4	4	5	5	4	4	4	3	3	5	3	3	3	1	1	1	5	
27-Aug	1	2	2	1	1	1	1	1	2	2	2	2	3	3	3	3	3	3	2	1	1	1	1	1	3	
28-Aug	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	3	3	
29-Aug	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	3	
30-Aug	2	2	2	1	1	1	2	1	2	1	2	3	3	4	3	4	4	3	2	3	3	3	2	3	4	
31-Aug	2	2	2	1	2	2	1	2	2	2	1	2	3	2	2	3	4	4	3	2	2	3	3	2	4	
																	Diurnal Maximum									
UO - Unstable Operation																										



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Wapasu - August 2023

Direction of Maximum Speed: 138 deg on Aug 10 03:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 142.5 deg on Aug 9	Hours of Data: 743
Direction of Minimum Speed: 153 deg on Aug 16 03:00	Hours of Missing Data: 1
Direction of Minimum Daily Speed Average: 2.0 deg on Aug 6	Percent Operational Time: 99.9
Monthly Average Direction: 183.5 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-Aug	208	215	210	221	222	234	239	239	231	227	236	240	249	260	290	306	318	296	336	351	353	3	339	326	259.9
2-Aug	323	324	305	306	302	295	295	247	294	290	285	307	304	284	271	289	317	290	337	71	101	98	108	103	302.4
3-Aug	113	113	130	138	131	127	136	142	172	151	166	166	183	172	160	155	20	157	144	163	154	166	190	191	151.5
4-Aug	222	312	327	330	332	320	267	283	254	264	259	267	275	288	290	242	227	230	244	246	220	214	152	150	268.5
5-Aug	160	149	144	137	147	148	159	188	348	345	340	335	329	323	320	338	352	359	6	32	70	98	109	121	357.6
6-Aug	126	126	129	138	147	137	121	21	131	50	358	63	7	1	351	335	292	322	305	304	40	56	60	71	42.5
7-Aug	81	107	116	78	81	84	73	319	346	348	353	349	359	342	343	344	353	353	358	18	46	72	86	122	9.1
8-Aug	113	116	126	114	116	123	129	124	126	119	135	116	127	122	122	126	122	117	120	123	128	127	127	131	123.0
9-Aug	135	136	142	140	136	138	147	150	151	145	149	148	157	158	137	132	134	135	134	135	142	145	141	142	142.5
10-Aug	144	142	138	138	136	133	134	135	134	129	122	118	119	120	113	106	99	96	96	72	75	48	43	47	121.6
11-Aug	44	71	64	50	46	42	44	2	12	102	130	146	136	161	254	253	190	196	219	161	146	142	146	145	128.4
12-Aug	145	146	150	157	177	166	198	242	253	266	295	284	277	299	320	253	258	282	260	278	161	129	146	149	217.2
13-Aug	155	160	170	161	160	159	169	165	183	195	210	216	221	230	235	230	250	236	242	225	205	206	157	196	206.5
14-Aug	212	122	176	174	305	348	49	3	256	254	273	282	276	261	265	264	250	253	249	261	289	198	130	147	259.3
15-Aug	154	165	154	155	160	151	169	170	182	188	139	155	151	154	189	212	232	353	13	342	7	5	353	315	166.4
16-Aug	241	159	153	306	340	6	263	278	283	284	300	295	283	262	264	259	237	222	211	185	179	181	181	180	242.0
17-Aug	178	173	174	177	160	164	167	169	181	187	197	224	249	254	261	251	288	239	187	354	343	24	46	358	197.6
18-Aug	341	1	359	1	3	1	5	353	353	349	339	347	350	335	6	4	355	342	344	340	342	333	333	336	348.7
19-Aug	342	304	254	249	243	223	215	218	229	228	227	220	222	234	231	232	232	243	239	221	186	181	187	180	226.7
20-Aug	168	178	176	170	173	175	179	195	230	194	224	252	273	289	269	300	296	317	7	126	103	125	143	165	195.5
21-Aug	160	166	161	157	166	158	165	181	200	223	239	240	238	231	216	238	208	211	213	167	140	152	146	139	191.8
22-Aug	141	140	133	130	149	141	141	151	174	176	196	177	176	173	170	218	252	286	311	UO	124	121	123	105	164.5
23-Aug	132	144	132	128	118	124	84	54	43	292	281	286	311	307	320	294	294	340	348	359	359	6	17	12	358.2
24-Aug	8	7	17	17	24	24	21	22	12	16	16	11	7	355	352	345	345	333	354	32	124	123	108	117	10.7
25-Aug	138	145	169	146	146	152	158	164	180	203	203	207	212	208	209	203	207	198	178	165	172	182	180	175	186.0
26-Aug	175	176	177	173	177	177	176	186	206	213	205	220	217	225	241	252	274	345	6	0	14	21	59	67	215.6
27-Aug	70	351	349	91	147	146	142	153	330	271	274	251	238	229	224	215	207	190	188	177	173	173	166	172	204.6
28-Aug	172	163	156	150	149	150	153	160	170	171	169	175	209	208	199	182	165	157	150	149	159	162	165	171	165.6
29-Aug	167	166	168	167	167	163	169	169	175	189	196	196	195	203	199	213	208	205	178	162	151	154	155	152	180.0
30-Aug	151	154	151	152	157	151	144	144	152	160	193	198	170	165	193	162	165	166	157	146	155	148	146	143	159.4
31-Aug	130	141	135	133	167	167	148	170	227	238	194	274	290	303	306	327	332	349	358	1	349	353	0	354	323.3

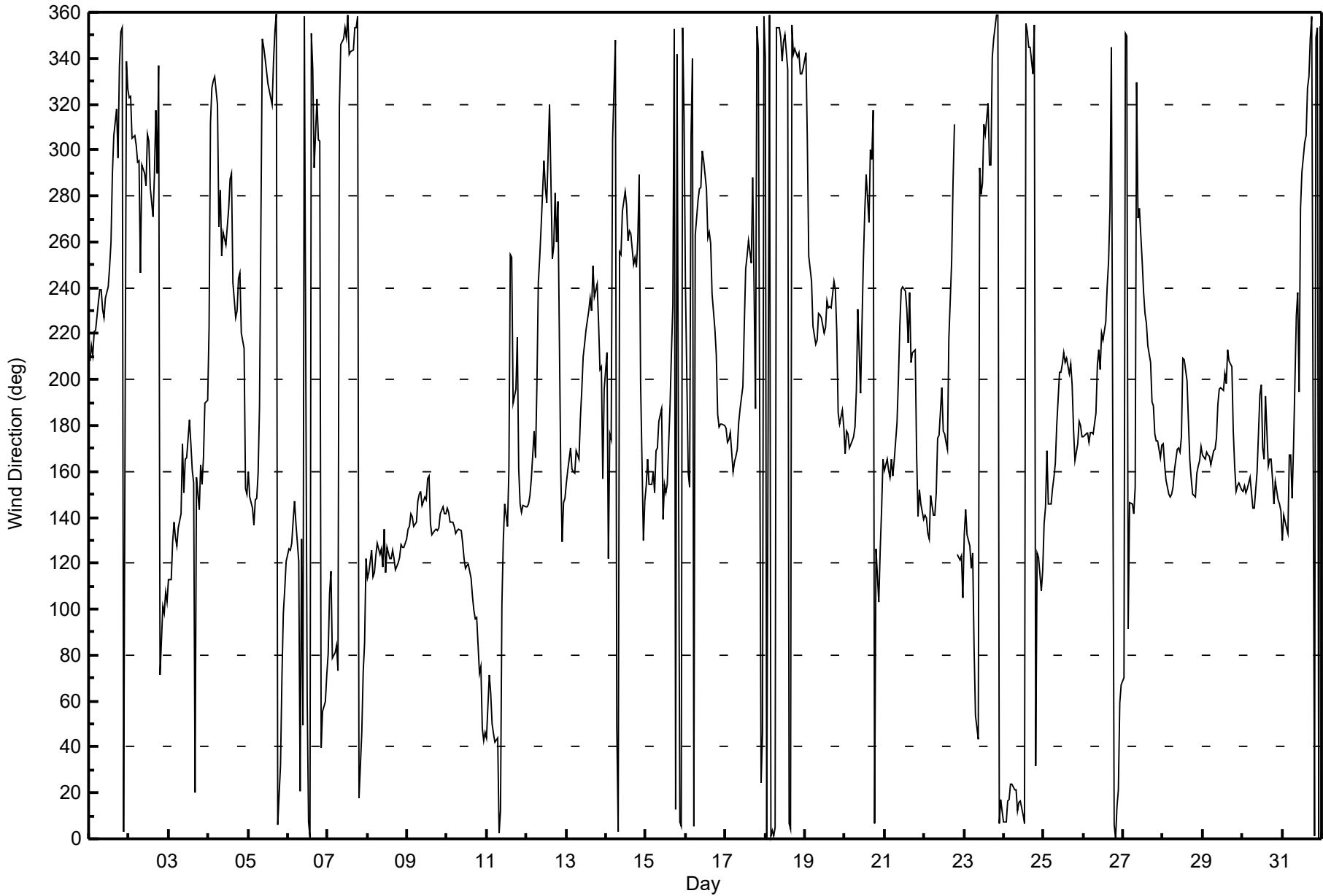
148.1 144.2 146.7 145.9 147.4 145.9 154.8 170.5 198.2 210.1 224.0 226.9 230.2 233.6 243.4 240.2 246.7 257.6 238.4 136.9 126.8 132.0 130.1 141.1
 Diurnal Average

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 - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Wapasu - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 89 deg on Aug 3 22:00 Minimum Value: 4 deg on Aug 25 01:00 Percentiles: P ₁ = 7 P ₁₀ = 14 Q ₁ = 19 Median = 25 Q ₃ = 31 P ₉₀ = 40 P ₉₉ = 80																		Hours in Service: 744 Hours of Data: 743 Hours of Missing Data: 1 Hours of Calibration: 0 Percent Operational Time: 99.9							
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-Aug	24	22	20	17	17	20	21	20	17	19	19	22	25	26	30	28	23	29	52	35	27	26	21	26	52
2-Aug	34	18	28	27	37	29	34	25	35	30	36	32	38	32	54	50	27	29	24	28	14	15	12	15	54
3-Aug	14	11	16	10	11	13	14	18	28	23	27	30	42	37	26	32	83	30	18	23	17	89	27	19	89
4-Aug	23	30	17	19	17	27	28	32	37	31	39	40	39	39	34	34	18	19	23	19	19	14	36	48	48
5-Aug	14	10	9	9	9	8	12	61	27	23	30	27	28	37	32	37	36	32	34	19	8	20	24	13	61
6-Aug	15	19	10	10	13	22	47	61	26	42	51	41	68	38	35	31	29	23	27	37	17	11	15	19	68
7-Aug	20	26	68	22	9	10	37	35	32	34	35	32	32	28	30	27	31	28	29	28	18	16	14	14	68
8-Aug	13	14	16	17	19	19	17	22	31	42	45	26	31	25	28	25	23	25	22	17	15	15	16	17	45
9-Aug	16	16	16	17	16	17	20	21	22	21	22	23	28	24	20	19	19	19	18	17	18	20	19	19	28
10-Aug	18	19	19	18	19	19	18	19	21	22	24	23	22	23	25	26	27	28	28	31	27	29	31	22	31
11-Aug	26	18	24	20	22	23	25	31	37	45	37	27	42	34	34	29	58	32	26	26	12	11	14	15	58
12-Aug	15	19	17	20	28	25	28	23	24	33	31	58	45	50	32	66	26	29	27	37	48	20	6	7	66
13-Aug	11	14	17	15	17	20	25	26	30	29	25	22	22	22	25	26	23	22	16	20	21	19	50	50	
14-Aug	56	29	29	64	72	28	39	62	31	27	29	29	29	29	31	31	25	27	25	27	42	66	18	10	72
15-Aug	7	8	8	9	17	13	20	27	29	30	24	20	20	24	35	35	39	54	30	18	30	28	23	18	54
16-Aug	68	45	81	32	17	31	27	31	28	32	34	35	37	36	33	33	24	18	22	25	24	27	28	26	81
17-Aug	28	26	27	28	20	22	24	27	29	32	30	40	36	36	45	73	30	33	53	54	75	38	31	80	80
18-Aug	19	30	28	29	29	27	29	25	25	27	19	25	29	32	37	32	31	20	22	19	20	17	16	18	37
19-Aug	15	24	31	23	19	16	15	19	19	18	17	19	27	26	28	28	20	23	20	19	21	24	25	22	31
20-Aug	18	22	21	22	21	21	23	28	22	33	60	55	61	85	58	72	46	23	26	54	16	15	9	17	85
21-Aug	12	14	13	12	13	15	16	26	25	31	35	32	36	33	46	41	43	31	23	18	15	11	9	8	46
22-Aug	11	13	10	13	59	8	16	16	30	33	32	34	35	35	41	38	52	35	23	UO	16	14	19	13	59
23-Aug	5	8	12	21	20	23	24	15	28	82	42	35	30	46	21	26	27	25	22	29	27	31	28	29	82
24-Aug	31	30	31	31	30	29	32	30	30	32	34	31	35	35	44	34	32	32	28	74	34	16	8	11	74
25-Aug	4	9	27	7	7	11	17	21	28	24	27	26	23	27	22	26	23	27	22	17	24	27	26	25	28
26-Aug	24	27	28	24	25	27	27	29	26	24	25	22	21	18	25	24	30	31	32	29	30	23	29	33	33
27-Aug	19	28	20	67	8	7	5	79	52	61	40	34	35	25	30	30	29	28	28	22	18	17	16	16	79
28-Aug	16	14	9	9	8	9	10	15	23	24	29	29	23	27	28	26	23	16	15	15	17	21	21	22	29
29-Aug	20	20	23	21	21	19	22	25	27	28	27	28	29	25	30	27	27	24	20	13	10	14	13	14	30
30-Aug	14	16	15	13	12	11	13	15	18	31	48	43	34	35	30	28	27	26	19	15	27	23	18	80	80
31-Aug	86	27	12	14	30	23	18	37	28	33	51	81	40	28	29	25	29	23	29	31	28	28	28	29	86
86 45 81 67 72 31 47 79 52 82 60 81 68 85 58 73 83 54 53 74 75 89 36 80																								Diurnal Maximum	
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS18 STONY MOUNTAIN AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
AUGUST 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	708	36	36	100	2.5	0	0.7	0
TRS(ppb) Average	708	36	36	100	1.2	0	0.5	0
THC(ppm) Average	670	34	74	94.62	2.3	-	2.2	-
NMHC(ppm) Average	670	34	74	94.62	0.173	-	0.014	-
CH4(ppm) Average	670	34	74	94.62	2.3	-	2.2	-
O3 (ppb) Average	708	36	36	100	47.8	0	33.1	-
NO2 (ppb) Average	686	35	58	96.91	3.3	0	1.5	-
NO (ppb) Average	686	35	58	96.91	1.6	-	0.2	-
NOX (ppb) Average	686	35	58	96.91	4.5	-	1.7	-
PM2.5 (ug/m3) Average	741	3	3	100	303.9	54	166.3	11
CO(ppm) Average	710	34	34	100	2.2	0	1.3	0
CO2(ppm) Average	672	35	72	95.03	475.8	0	434	0
Temperature 2 m (C) Average	744	0	0	100	30.3	-	21.8	-
Relative Humidity (%) Average	743	0	1	99.87	100	-	98.9	-
Wind Speed 20 m (km/h) Average	733	1	11	98.66	19	-	14	-
Wind Direction 20 m (deg) Average	733	1	11	98.66	-	-	-	-
Precipitation (mm) Total	744	0	0	100	5.8	-	23.7	-
Leaf Wetness (% of range) Average	744	0	0	100	53.1	-	24.2	-
Global Solar Radiation (W/m2) Average	744	0	0	100	801	-	228	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
AUGUST 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	0.21	0.3	-	0	0	0.1	0.1	0.2	0.5	2.5
TRS (ppb) Average	708	0.23	0.1	-	0	0.1	0.2	0.2	0.3	0.3	1.2
THC (ppm) Average	670	2.05	0.1	-	1.9	2	2	2	2.1	2.1	2.3
NMHC(ppm) Average	670	0.001	0.01	-	0	0	0	0	0	0	0.173
CH4(ppm) Average	670	2.05	0.1	-	1.9	2	2	2	2.1	2.1	2.3
O3 (ppb) Average	708	24.49	7.2	-	8.6	15.8	18.7	23.6	29.4	34.8	47.8
NO2 (ppb) Average	686	0.64	0.5	-	0	0.2	0.3	0.5	0.8	1.2	3.3
NO (ppb) Average	686	0.15	0.1	-	0.1	0.1	0.1	0.1	0.2	0.2	1.6
NOX (ppb) Average	686	0.79	0.5	-	0.2	0.3	0.4	0.6	1	1.4	4.5
PM2.5 (ug/m3) Average	741	32.11	45.6	-	1	4.1	7.8	17.2	36.6	65.4	303.9
CO(ppm) Average	710	0.38	0.3	-	0.1	0.2	0.2	0.3	0.4	0.6	2.2
CO2(ppm) Average	672	414.99	17.2	-	378.3	393.1	401.7	413.7	425.8	438.3	475.8
Temperature 2 m (C) Average	744	16.06	4.5	-	6.4	11	12.7	15.3	19.2	22	30.3
Relative Humidity (%) Average	743	77.06	16	-	32	52.8	65	80	90.1	97	100
Wind Speed 10 m (km/h) Average	733	9.5	3	-	0	5	7	10	12	14	19
Wind Direction 10 m (deg) Average	733	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	71.55	-	-	-	-	-	-	-
Surface Wetness (% of range) Average	744	6.28	8.9	-	0.1	0.9	1.4	1.8	7.6	20.6	53.1
Global Solar Radiation (W/m2) Average	744	143.46	192.5	-	0	0	0.1	37	241.5	457.5	801

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - STONY MOUNTAIN (AMS18)
AUGUST 2023

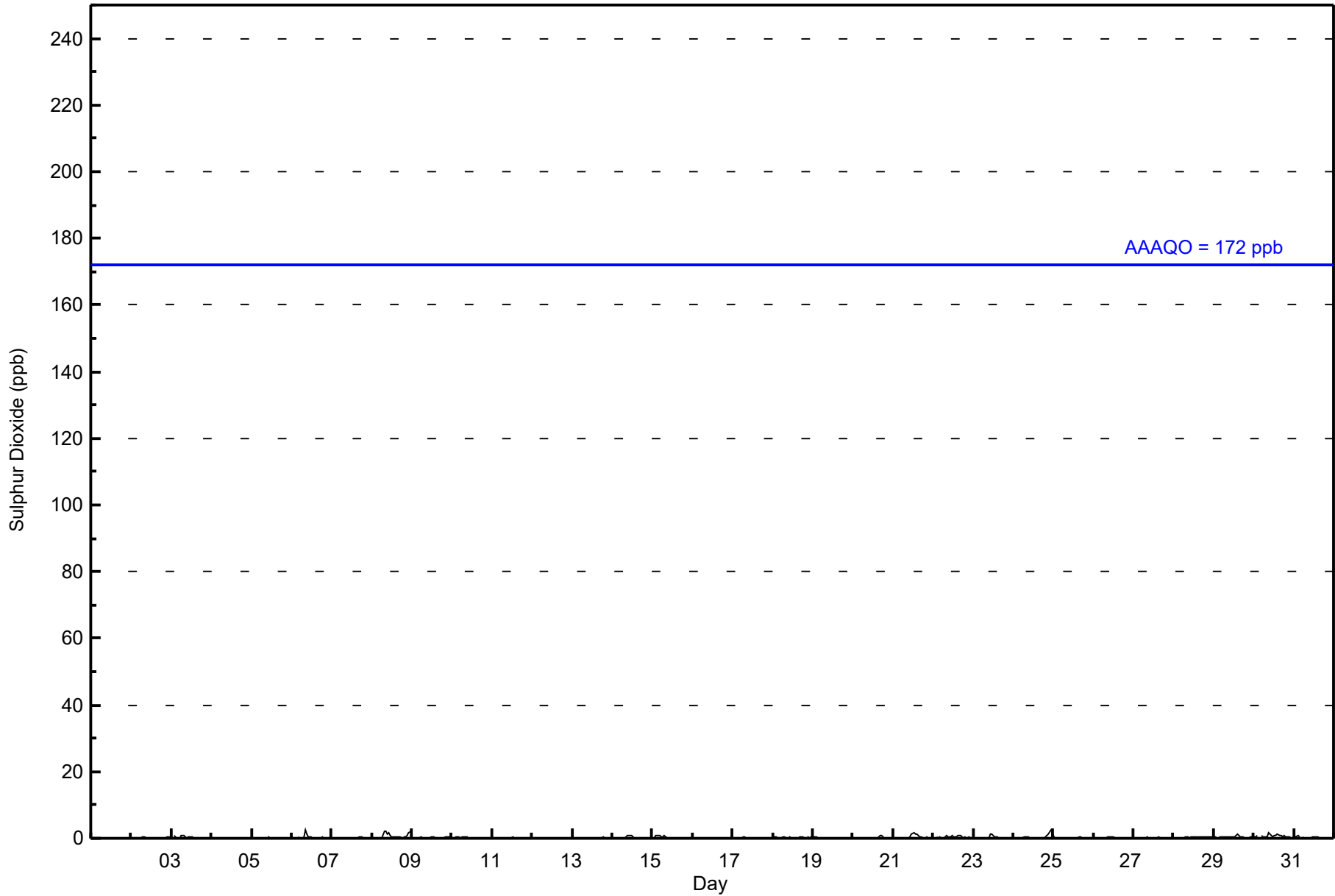
MONTHLY SUMMARY

Parameter	Period Start	Period End	Duration (Hours)	Notes
THC/NMHC/CH4	09 Aug 2023 02:00	10 Aug 2023 11:00	34	Unstable Operations - excessive baseline drift
THC/NMHC/CH4	23 Aug 2023 13:00	23 Aug 2023 14:00	2	Maintenance - replaced support gas cylinder
THC/NMHC/CH4	26 Aug 2023 12:00	26 Aug 2023 15:00	4	Maintenance - actuator replaced
NO2	29 Aug 2023 14:00	30 Aug 2023 12:00	23	Unstable Operations - station temperature fluctuation
CO2	30 Aug 2023 04:00	31 Aug 2023 11:00	32	Unstable Operations - flatline in analyzer output signal
CO2	31 Aug 2023 12:00	31 Aug 2023 16:00	5	Maintenance - analyzer replaced
Relative Humidity	11 Aug 2023 07:00	11 Aug 2023 07:00	1	Sensor operated out of range
Wind Speed, Wind Direction	25 Aug 2023 15:00	26 Aug 2023 00:00	10	Unstable Operations - inconsister sensor response



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Stony Mountain - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	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: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Stony Mountain - August 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	32	31	28	17	33	29	37	19	18	63	69	43	50	89	95	44	697
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	32	31	28	17	33	29	37	19	18	63	69	43	50	89	95	44	697

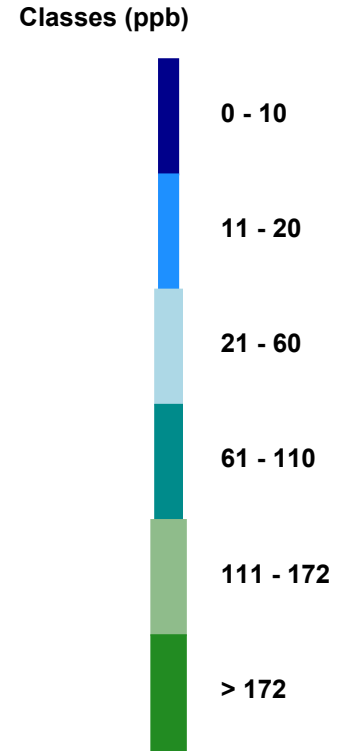
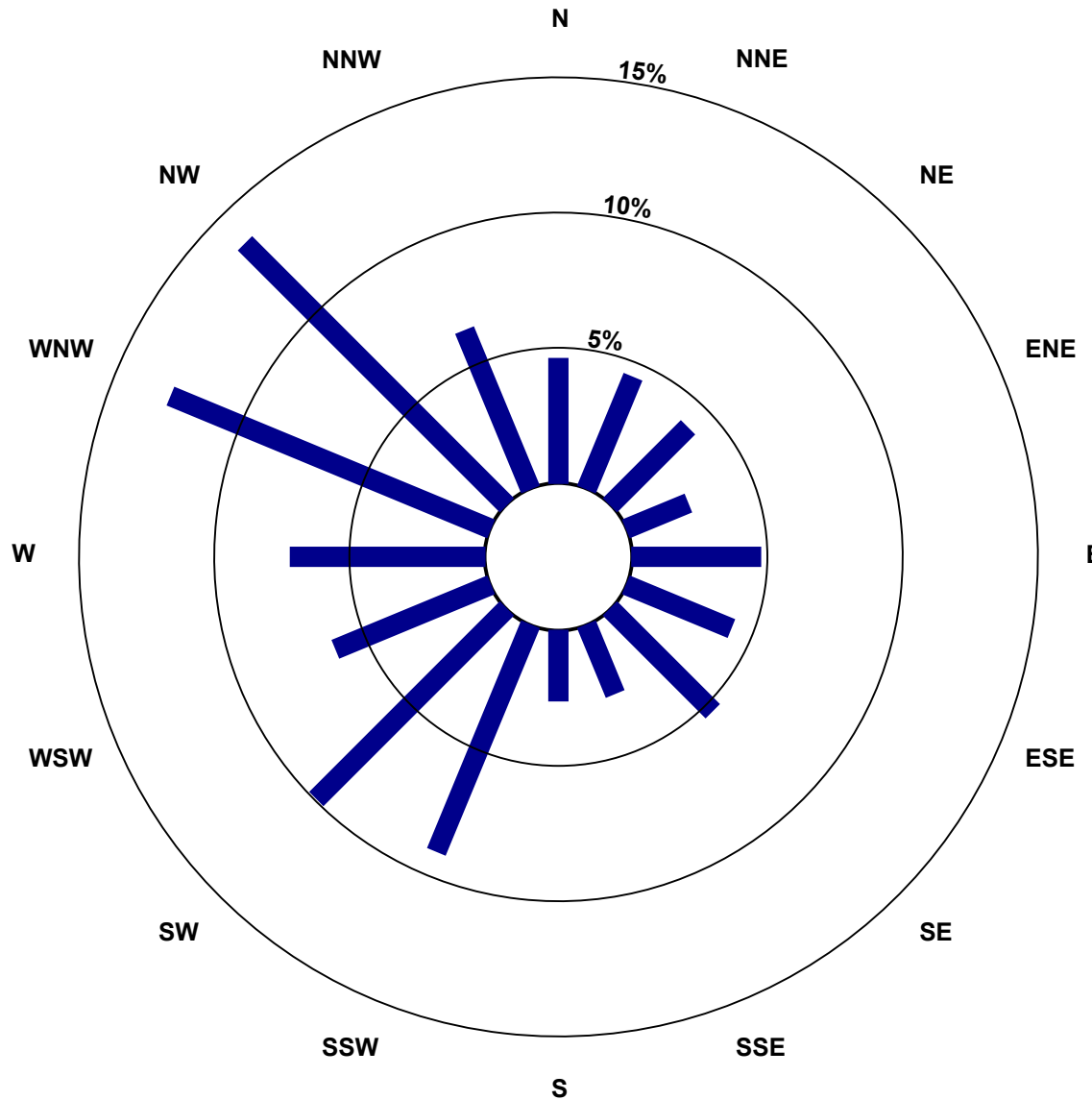
Total Number of Valid Hours: 697

Total Number of Hours: 744

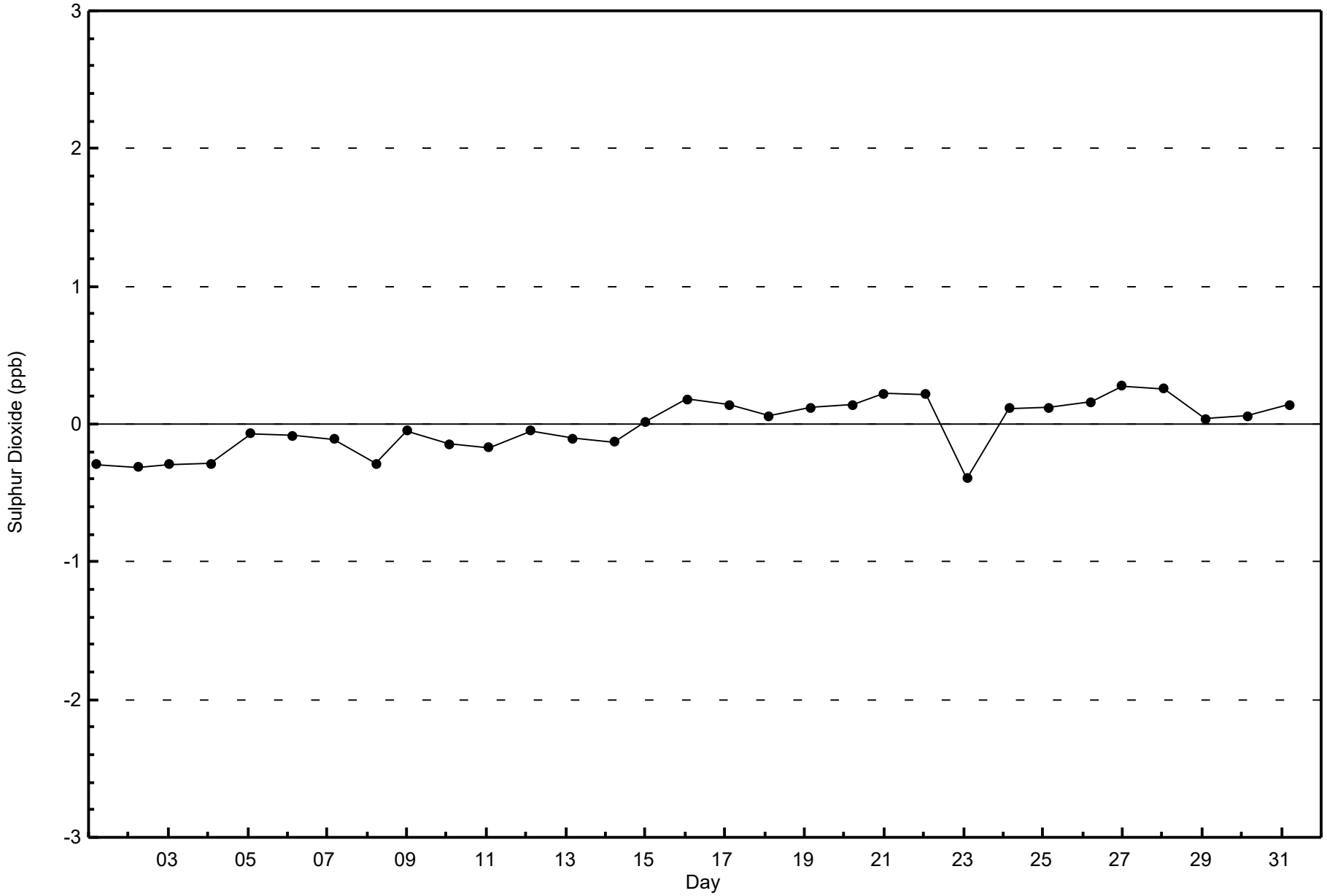


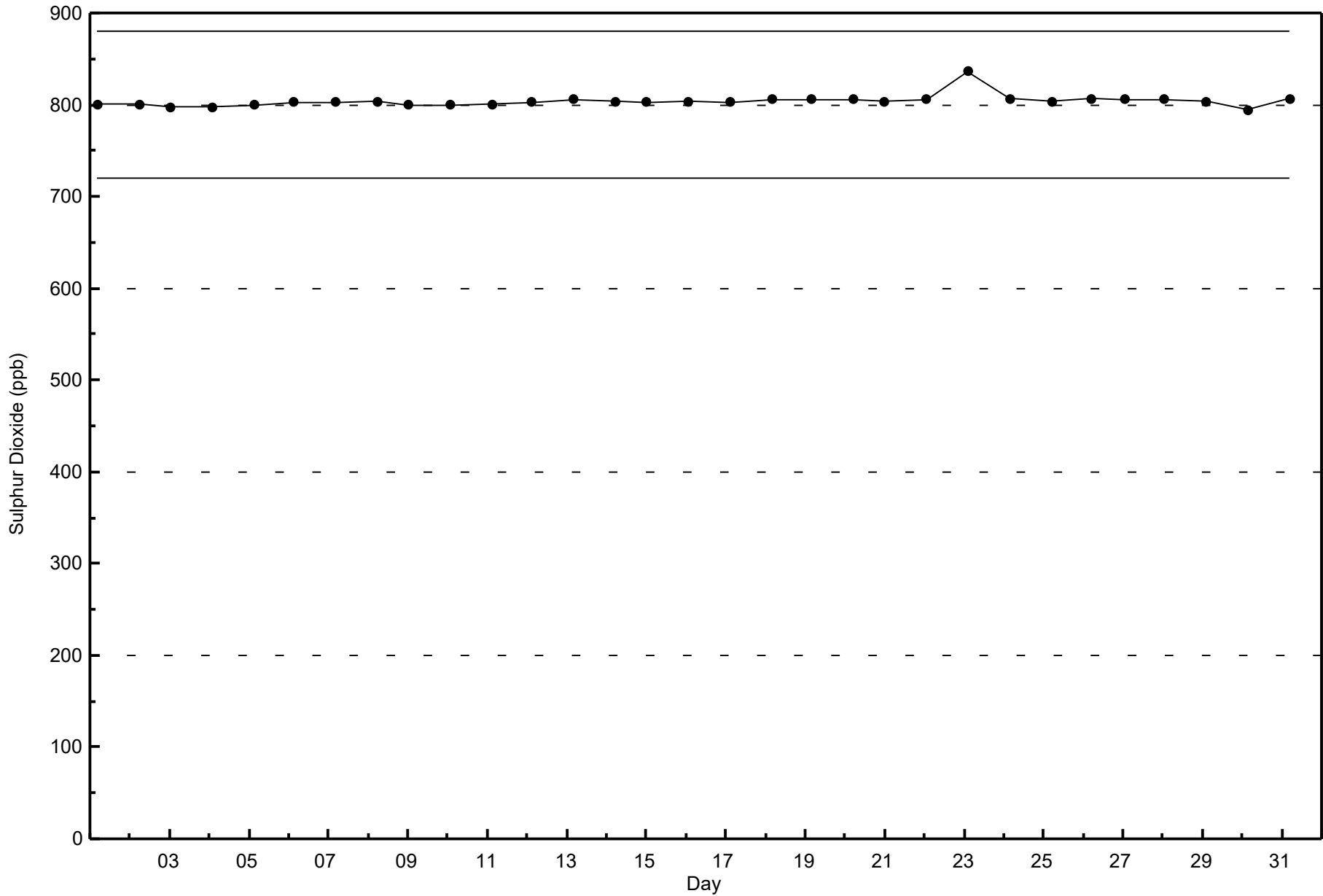
Wood Buffalo Environmental Association
Wind Rose Aug 2023

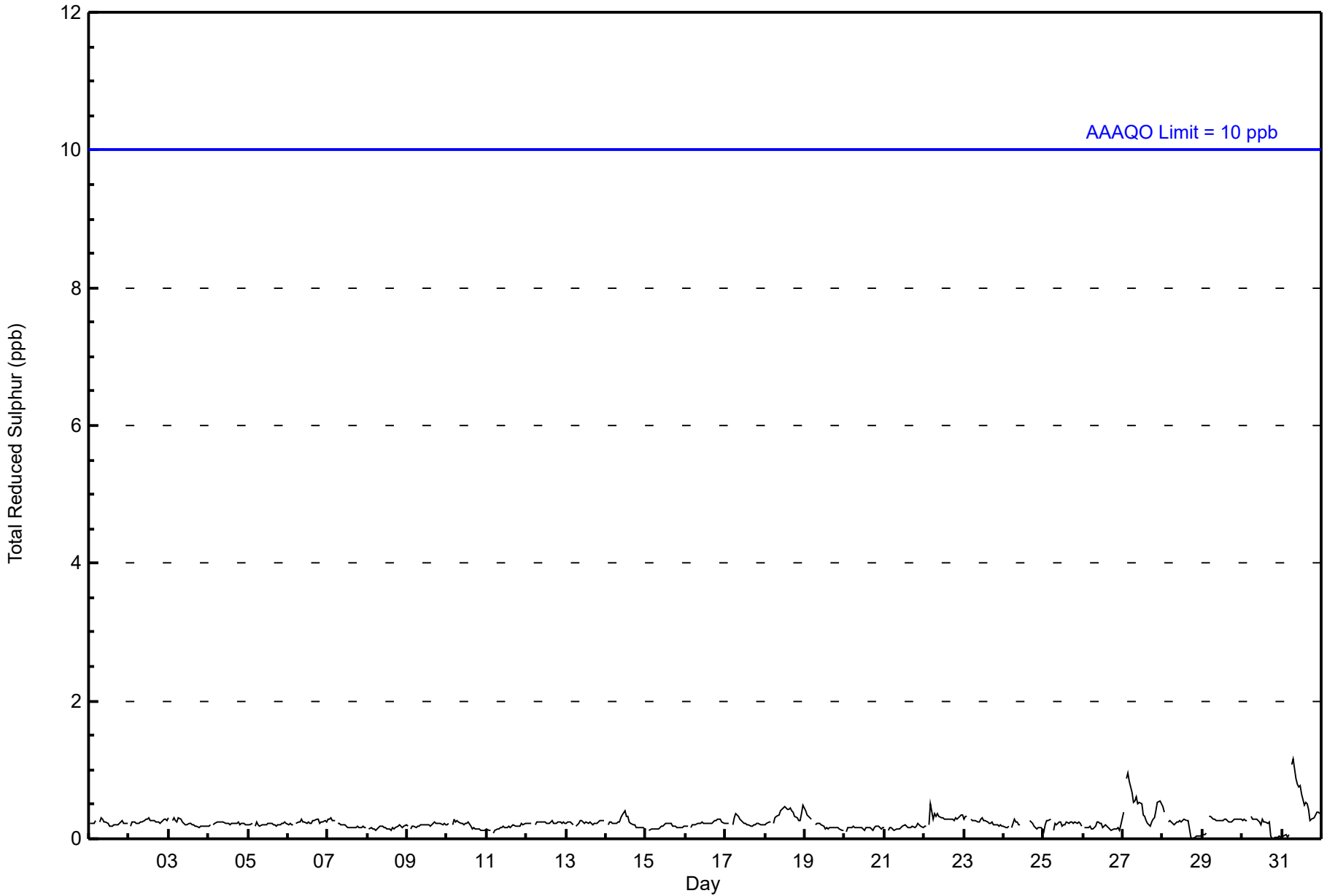
Sulphur Dioxide (SO₂) - ppb
Stony Mountain



Total Number of Valid Hours: 697









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Stony Mountain - August 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
Stony Mountain - August 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	32	29	29	18	34	31	36	17	19	65	70	40	51	89	95	43	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	32	29	29	18	34	31	36	17	19	65	70	40	51	89	95	43	698

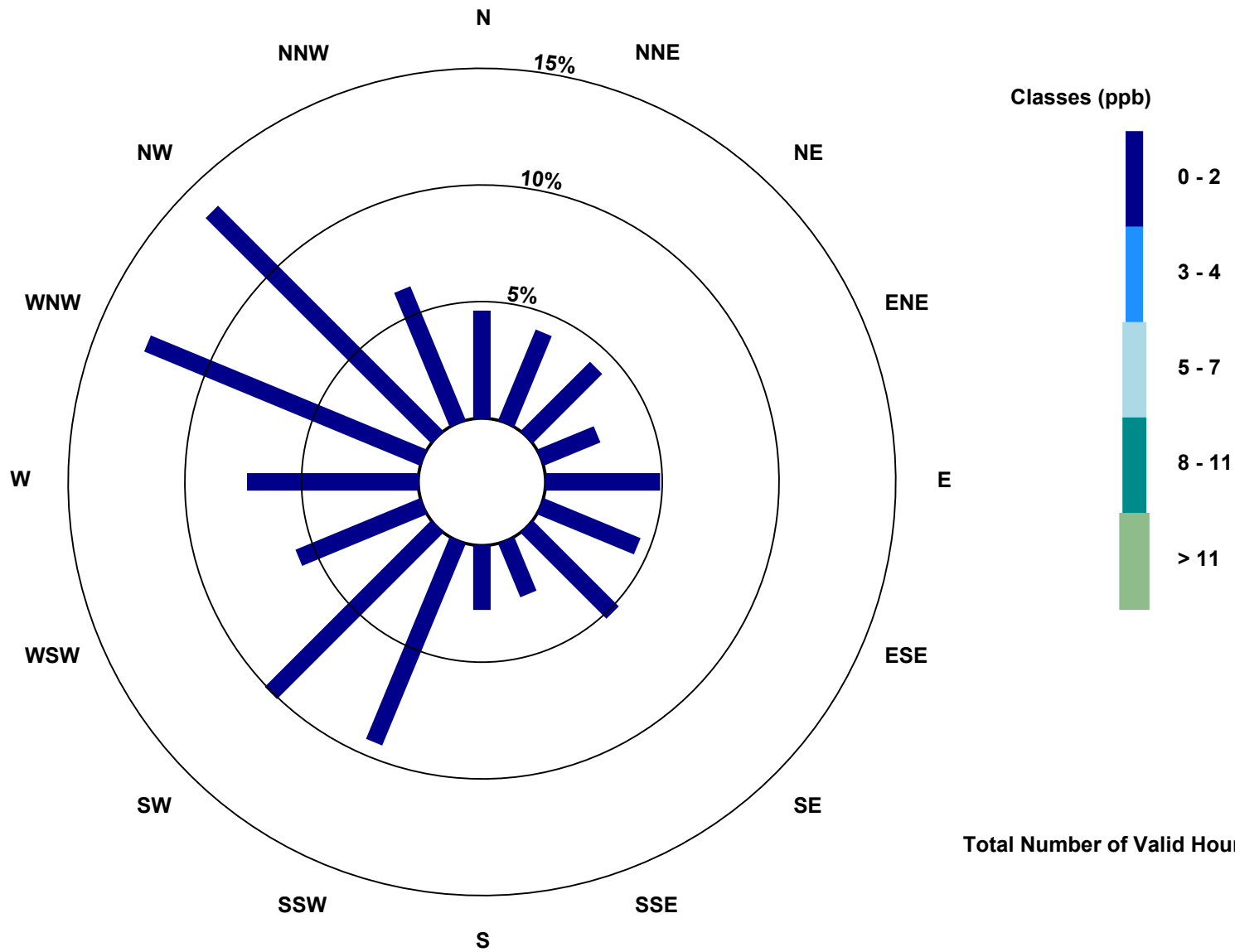
Total Number of Valid Hours: 698

Total Number of Hours: 744

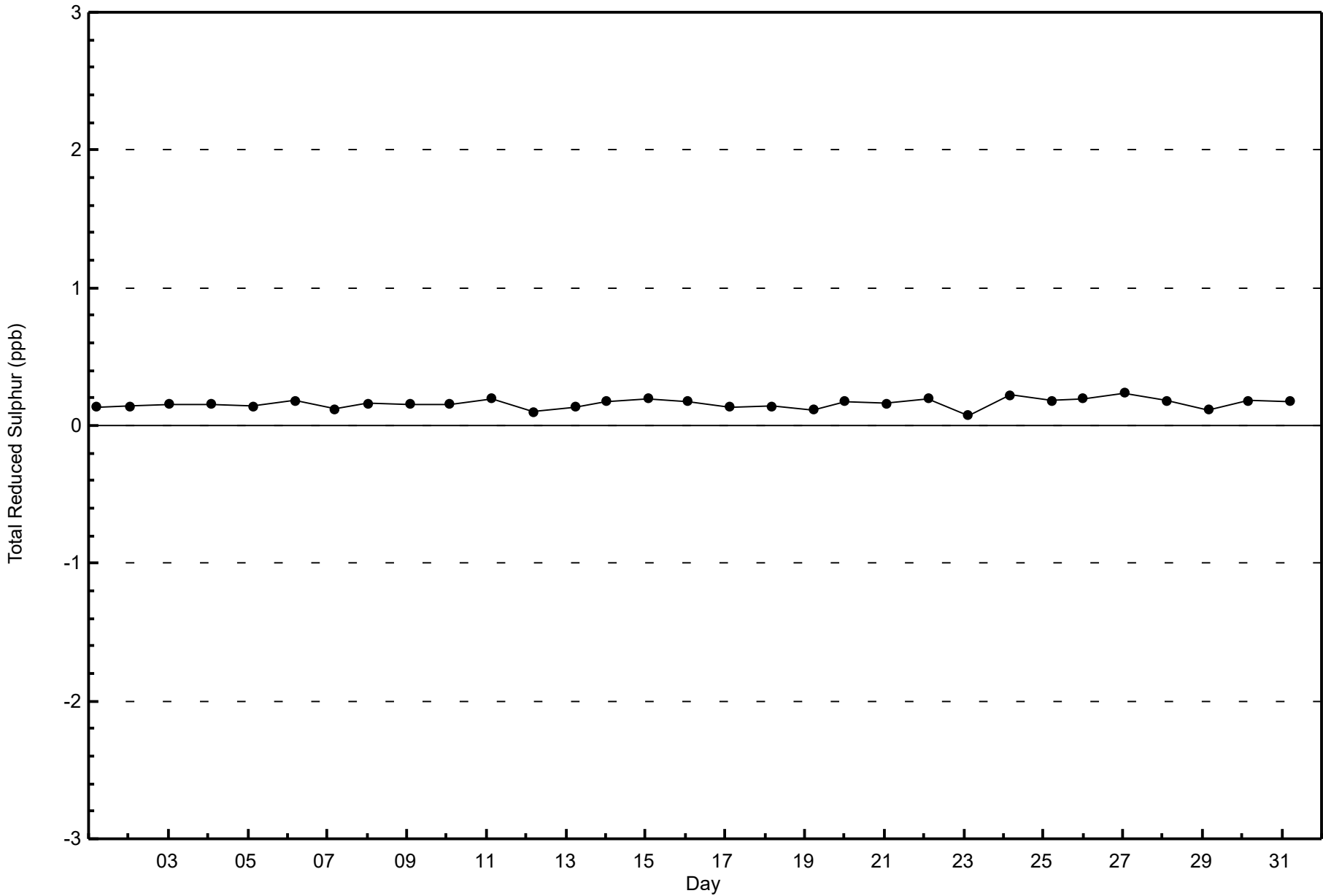


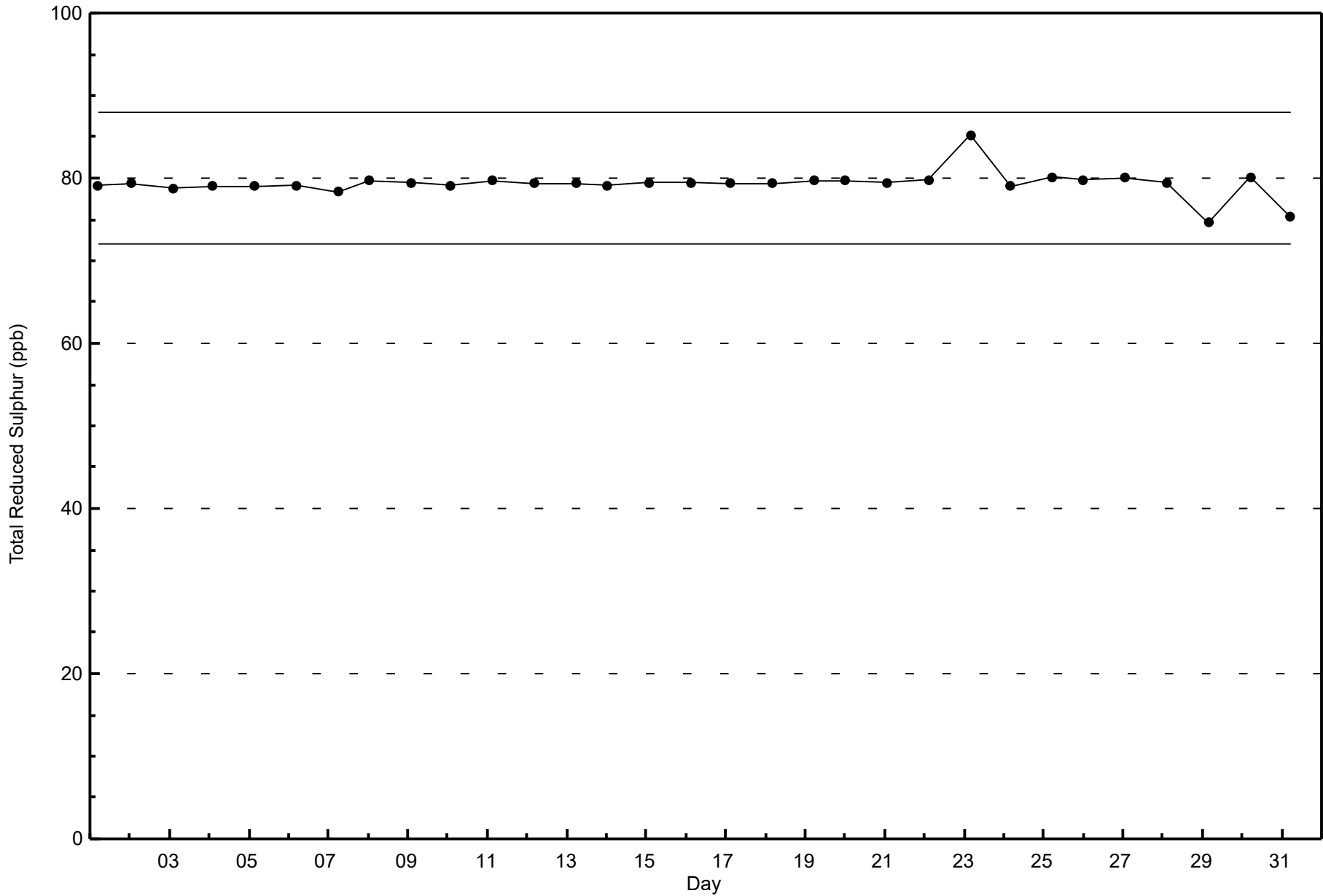
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Stony Mountain



Total Number of Valid Hours: 698



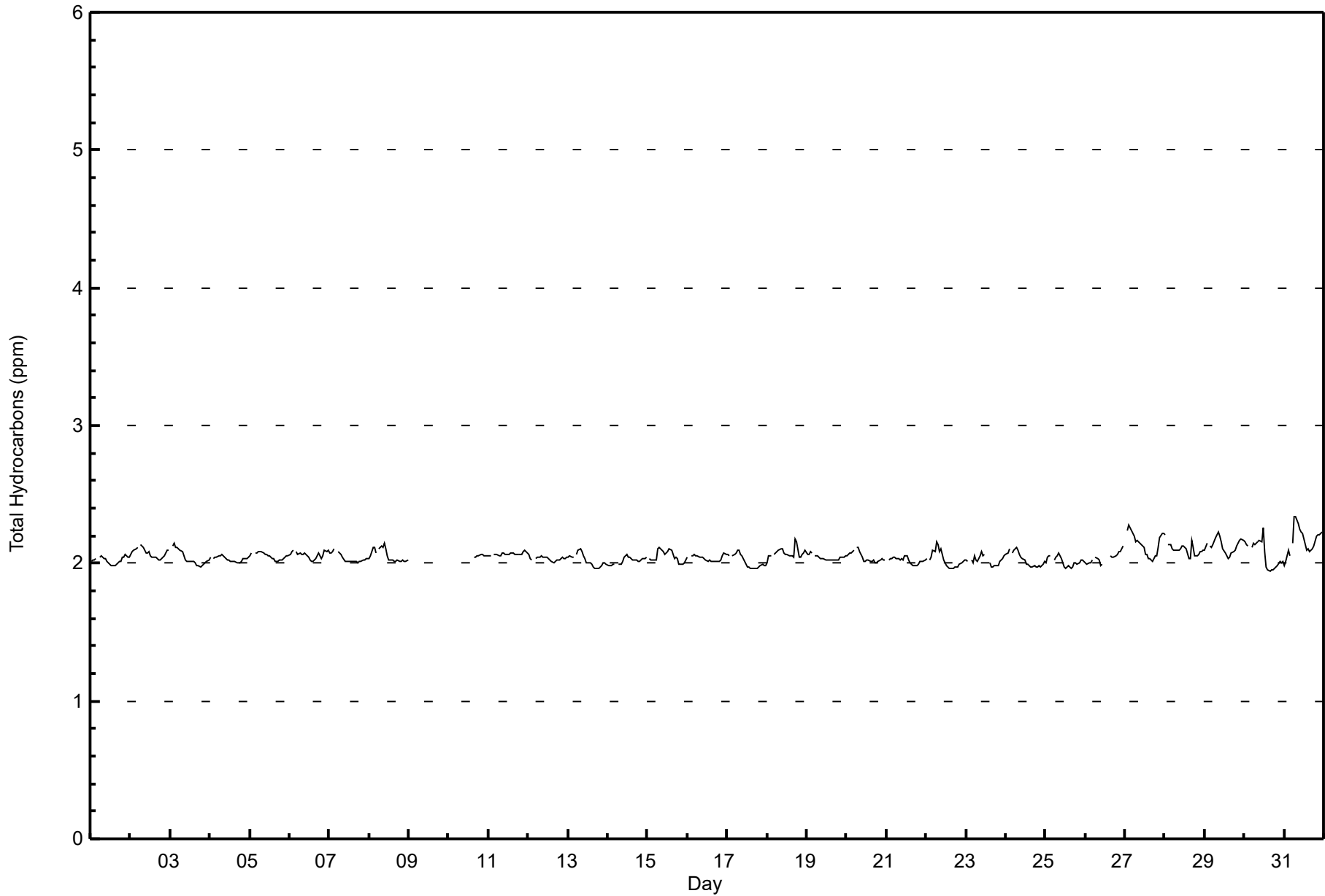




Wood Buffalo Environmental Association
Summary of Hour Averages

Total Hydrocarbons (THC) - ppm
Stony Mountain - August 2023

Maximum Value: 2.3 ppm on Aug 31 08:00		Maximum Daily Average: 2.2 ppm on Aug 31		Hours in Service: 744																								
Minimum Value: 1.9 ppm on Aug 30 16:00		Minimum Daily Average: 2.0 ppm on Aug 25		Hours of Data: 670																								
Maximum Diurnal Average: 2.1 ppm at hour 7		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 74																								
Monthly Average: 2.05 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.0 Q ₃ = 2.1 P ₉₀ = 2.1 P ₉₉ = 2.2		Hours of Calibration: 34																								
				Percent Operational Time: 94.6																								
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-Aug	2.0	2.0	2.0	2.0	Z	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	
2-Aug	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	2.0	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
3-Aug	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
4-Aug	2.0	Z	2.0	2.0	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
5-Aug	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	2.0	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
6-Aug	2.1	2.1	2.1	Z	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	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
7-Aug	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	2.0	2.0	2.0	2.1
8-Aug	2.0	2.0	2.1	2.1	2.1	Z	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	2.0	2.1
9-Aug	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	UO
10-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	C	C	C	C	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
11-Aug	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
12-Aug	2.1	2.0	2.0	Z	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
13-Aug	2.0	2.1	2.0	2.0	Z	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	2.1
14-Aug	2.0	2.0	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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
15-Aug	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	2.1	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	2.1
16-Aug	2.0	Z	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	2.1	2.1	2.1	2.1	2.1	2.1
17-Aug	2.1	2.1	Z	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	2.0	2.0	2.0	2.1
18-Aug	2.0	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	2.0	2.2	2.2	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
19-Aug	2.1	2.1	2.1	2.1	Z	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	2.1
20-Aug	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	2.0	2.0	2.1
21-Aug	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	2.0	2.0	2.0	2.0
22-Aug	2.0	Z	2.0	2.0	2.1	2.1	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	2.0	2.0	2.0	2.0	2.0	2.0	2.1
23-Aug	2.0	2.0	Z	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.1	M	M	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
24-Aug	2.1	2.1	2.1	Z	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	2.0	2.0	2.0	2.1
25-Aug	2.0	2.0	2.1	2.1	Z	2.0	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	2.1
26-Aug	2.0	2.0	2.0	2.0	2.0	Z	2.0	2.0	2.0	2.0	2.0	M	M	M	M	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
27-Aug	Z	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.3
28-Aug	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	2.0	2.0	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
29-Aug	2.1	2.1	Z	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	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
30-Aug	2.2	2.1	2.1	Z	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.1	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1
31-Aug	2.0	2.0	2.1	2.1	Z	2.1	2.3	2.3	2.3	2.3	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	2.2	2.2	2.2	2.2	2.3
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan																												
C - Calibration																												
M - Maintenance																												
UO - Unstable Operation																												





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Stony Mountain - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	374	55.82	55.82
2.1 - 3.0	296	44.18	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Stony Mountain - August 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	14	20	10	18	12	12	7	7	24	35	30	34	65	54	13	363
2.1 - 3.0	24	17	7	6	15	8	5	9	11	37	33	12	16	24	41	31	296
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	32	31	27	16	33	20	17	16	18	61	68	42	50	89	95	44	659

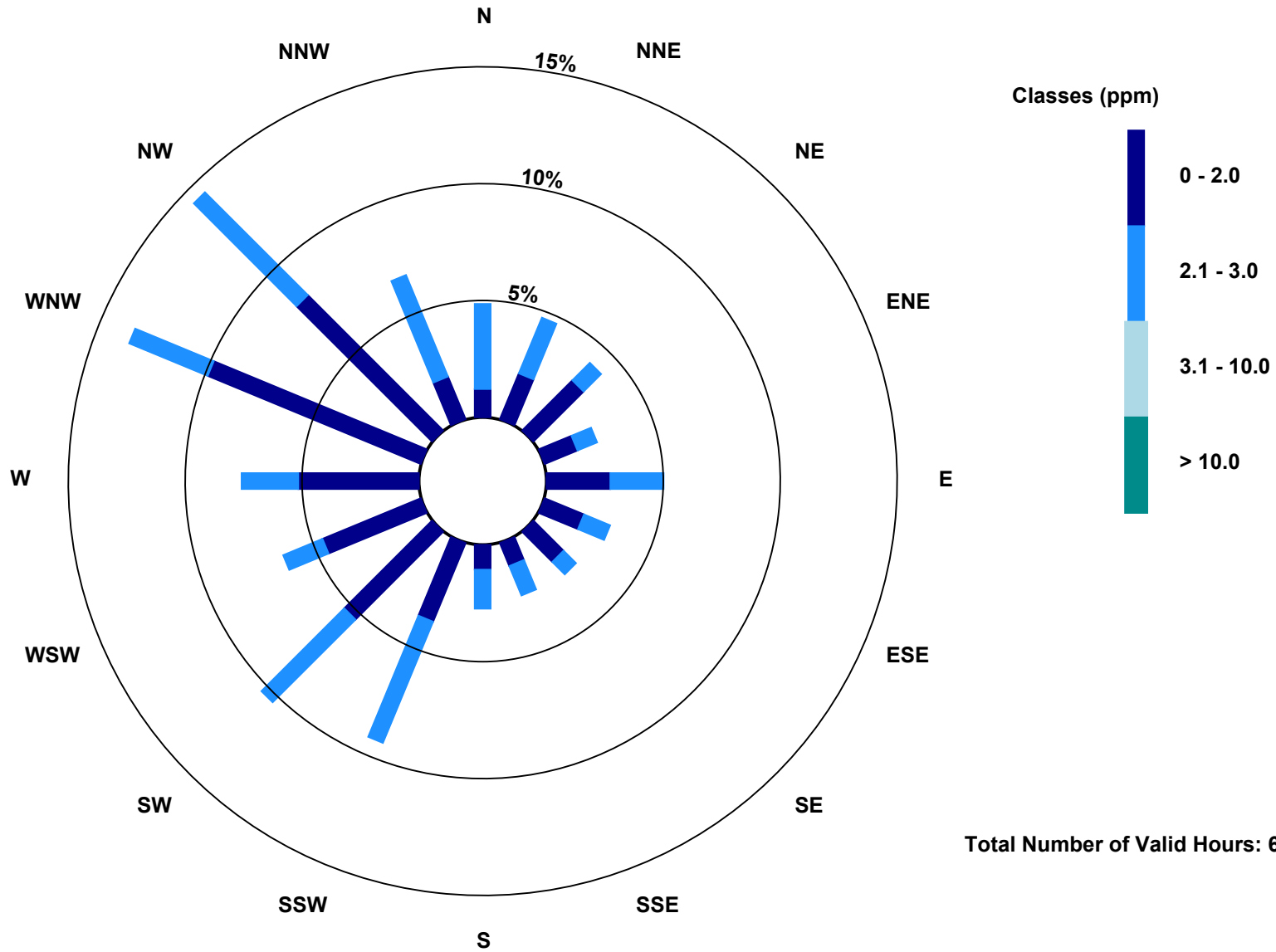
Total Number of Valid Hours: 659

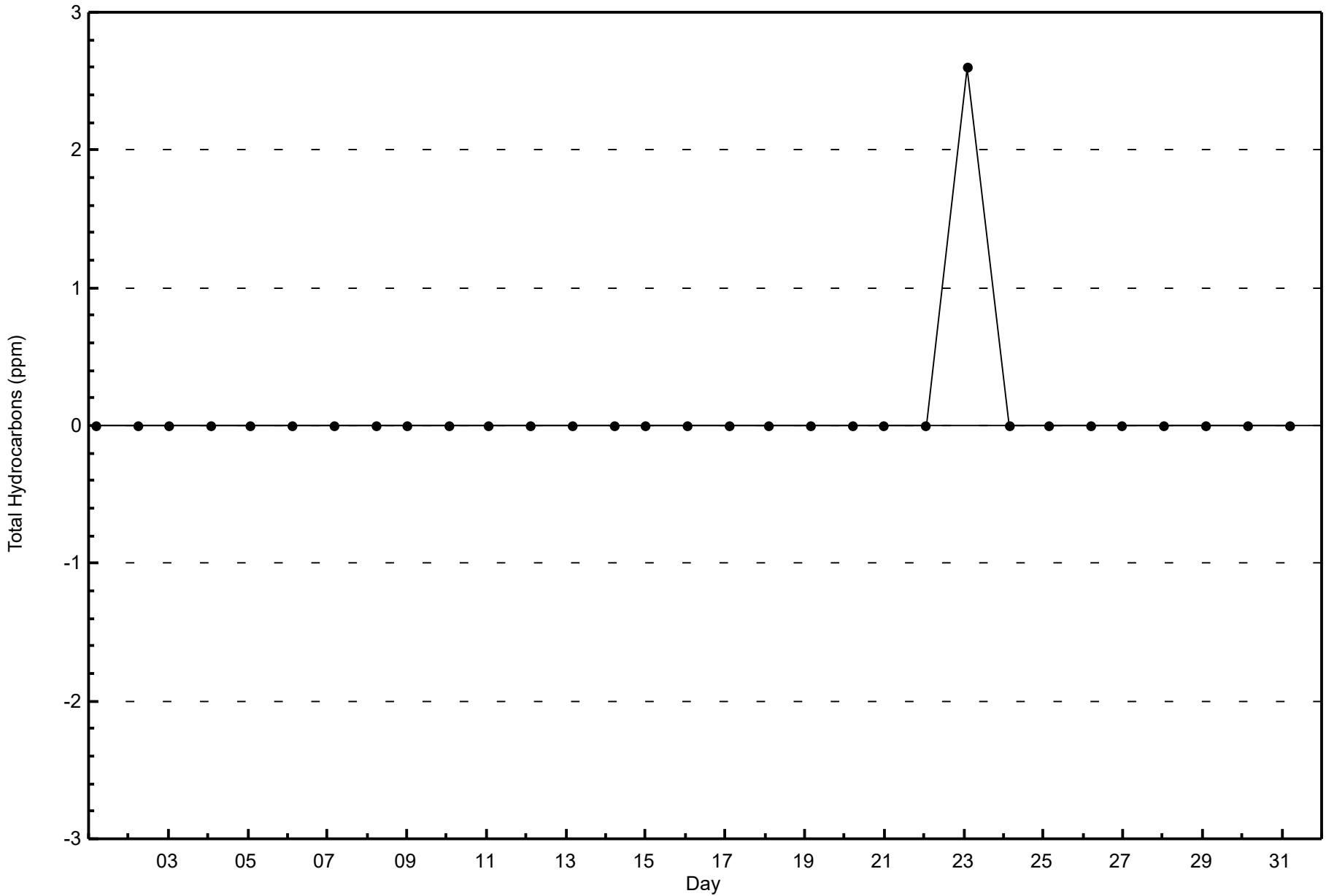
Total Number of Hours: 744

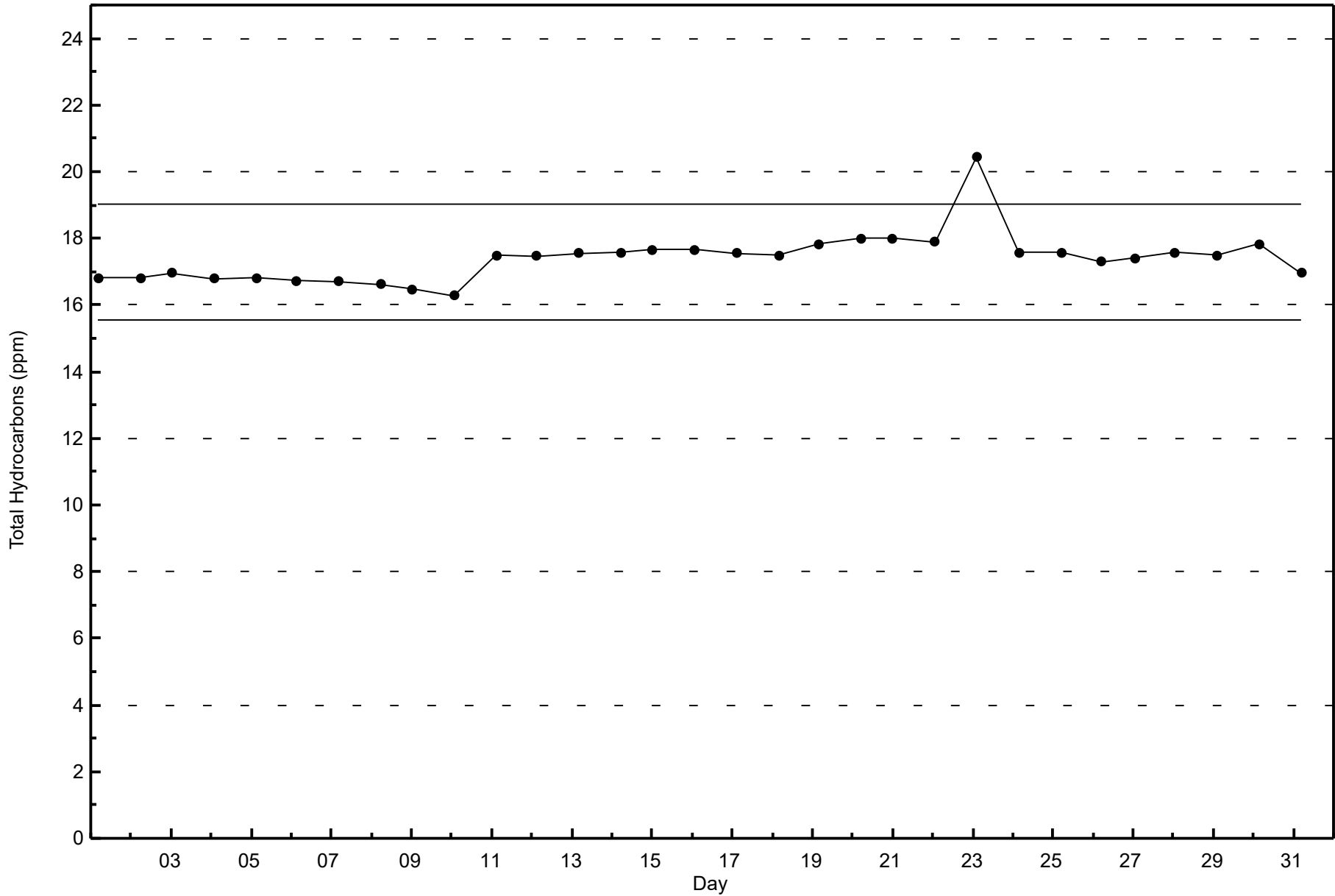


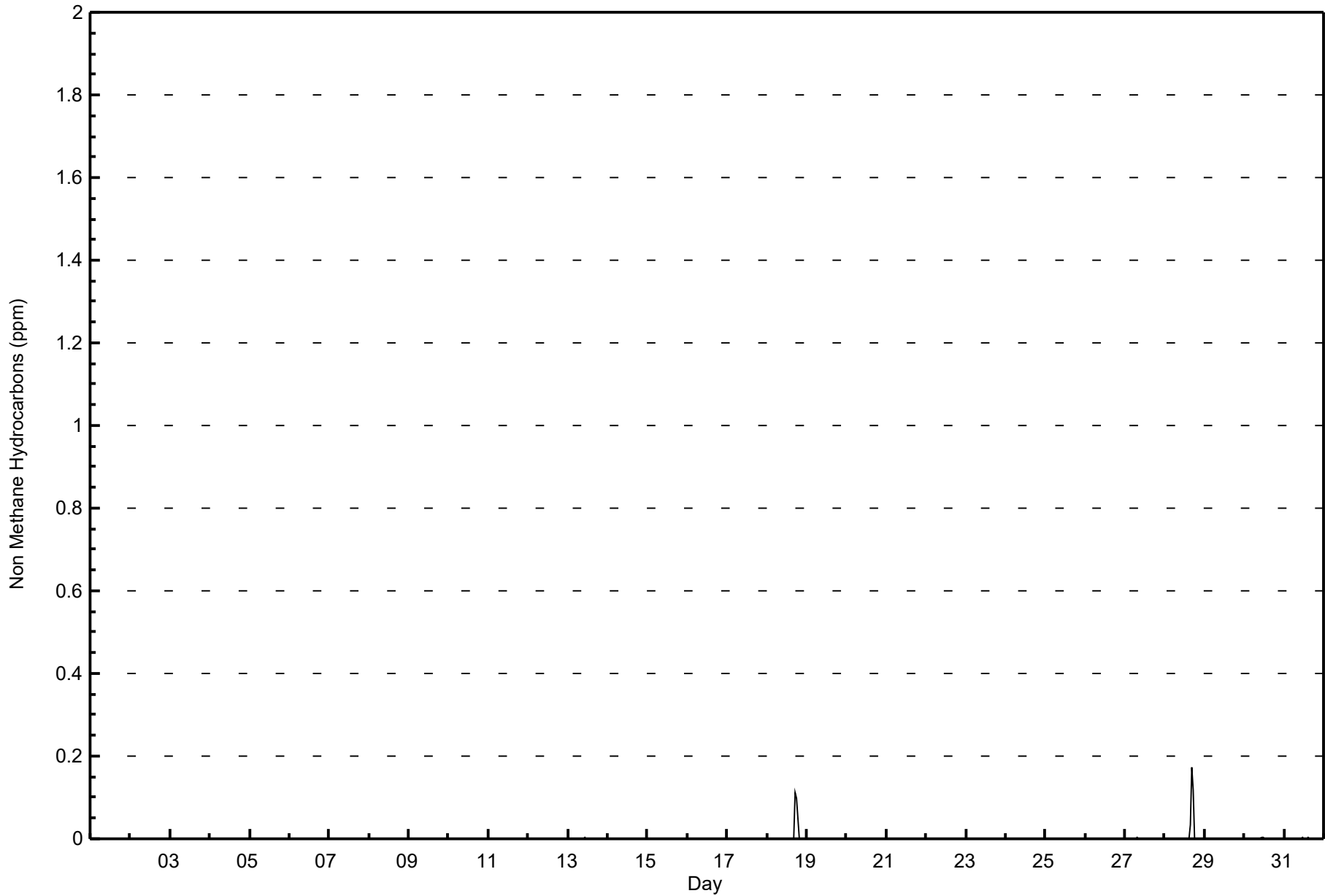
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Stony Mountain











**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	665	99.25	99.25
0.006 - 0.05	1	0.15	99.40
0.06 - 0.1	3	0.45	99.85
> 0.1	1	0.15	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 744



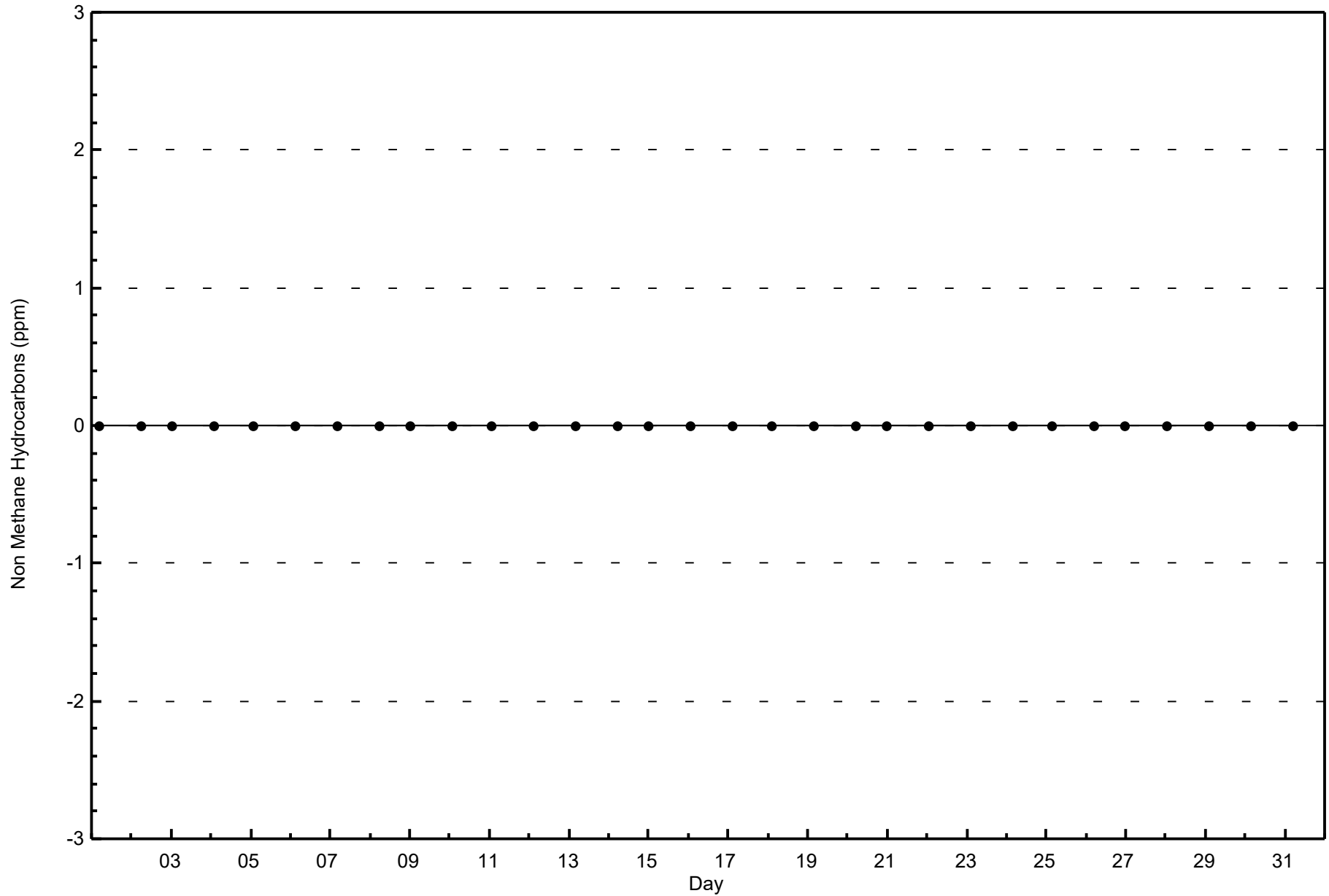
**Wood Buffalo Environmental Association
Frequency Distribution**

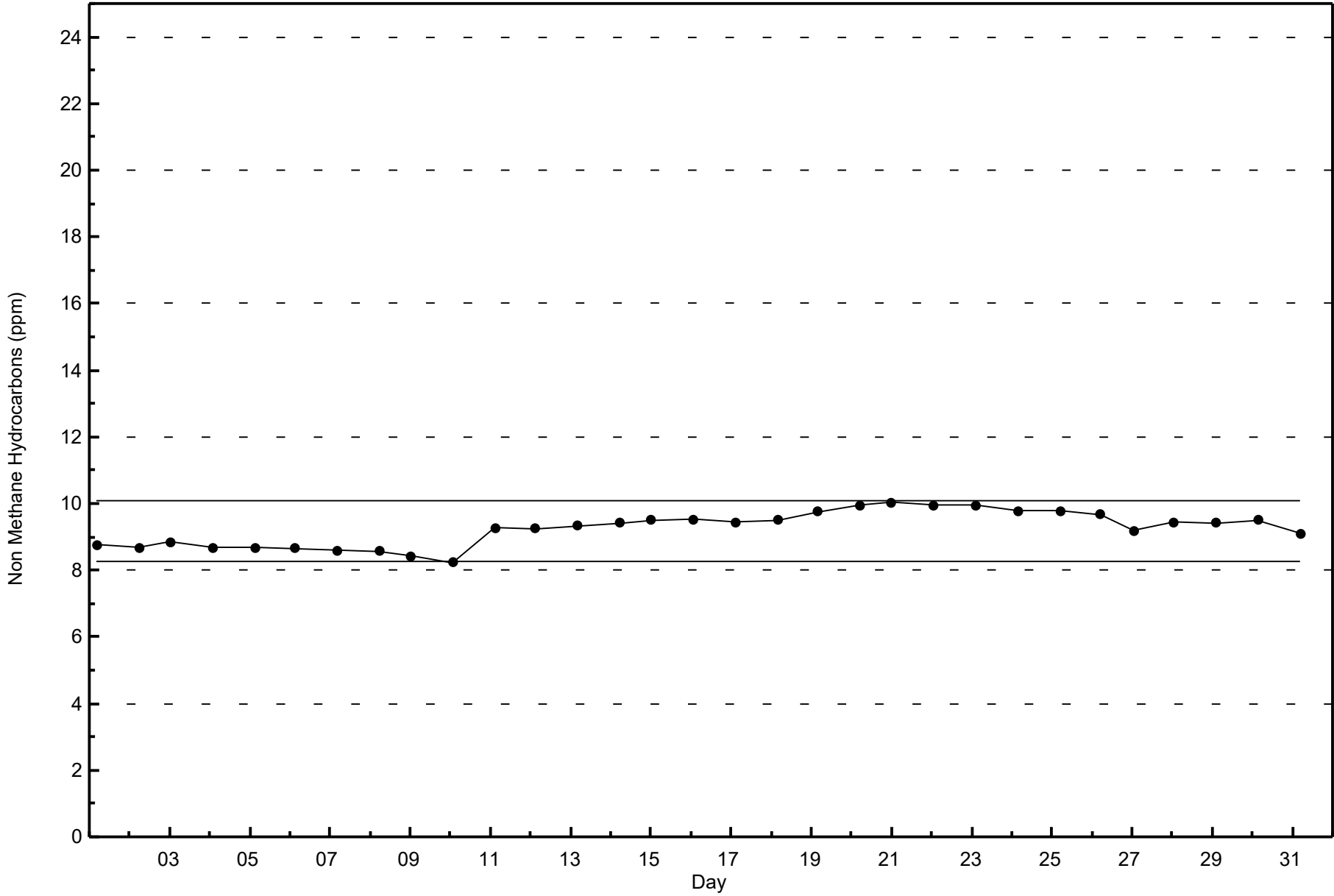
**Non Methane Hydrocarbons (NMHC) - ppm
Stony Mountain - August 2023**

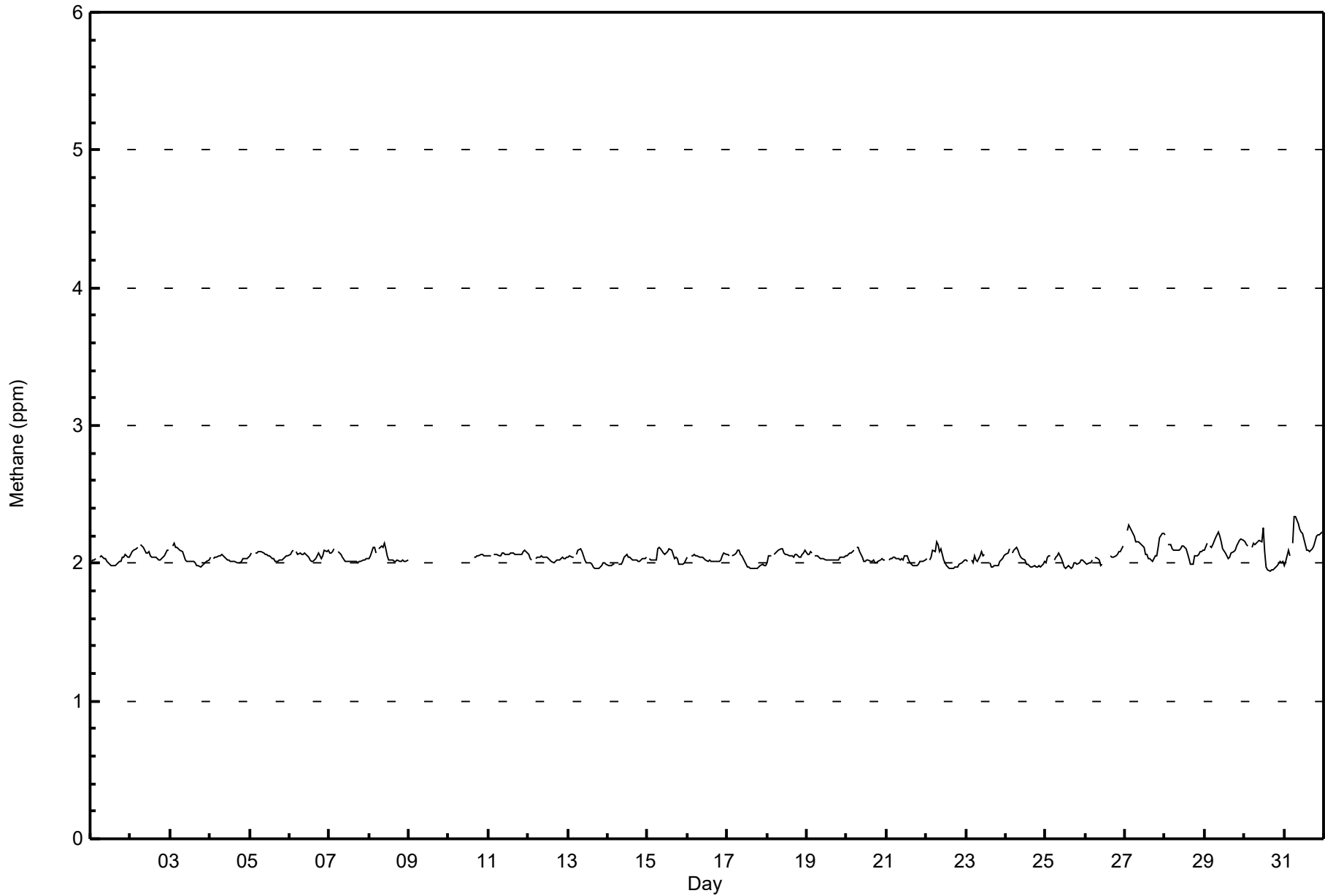
Concentration Ranges (ppm)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 0.005	31	31	27	15	33	20	17	16	18	61	67	42	50	89	94	43	654
0.006 - 0.05	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
0.06 - 0.1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	3
> 0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Totals	32	31	27	16	33	20	17	16	18	61	68	42	50	89	95	44	659

Total Number of Valid Hours: 659

Total Number of Hours: 744









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Stony Mountain - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	376	56.12	56.12
2.1 - 3.0	294	43.88	100.00
3.1 - 10.0	0	0.00	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 670

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Methane (CH₄) - ppm
Stony Mountain - August 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	14	20	10	18	12	12	7	7	24	36	30	34	65	54	13	365
2.1 - 3.0	23	17	7	6	15	8	5	9	11	37	32	12	16	24	41	31	294
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	32	31	27	16	33	20	17	16	18	61	68	42	50	89	95	44	659

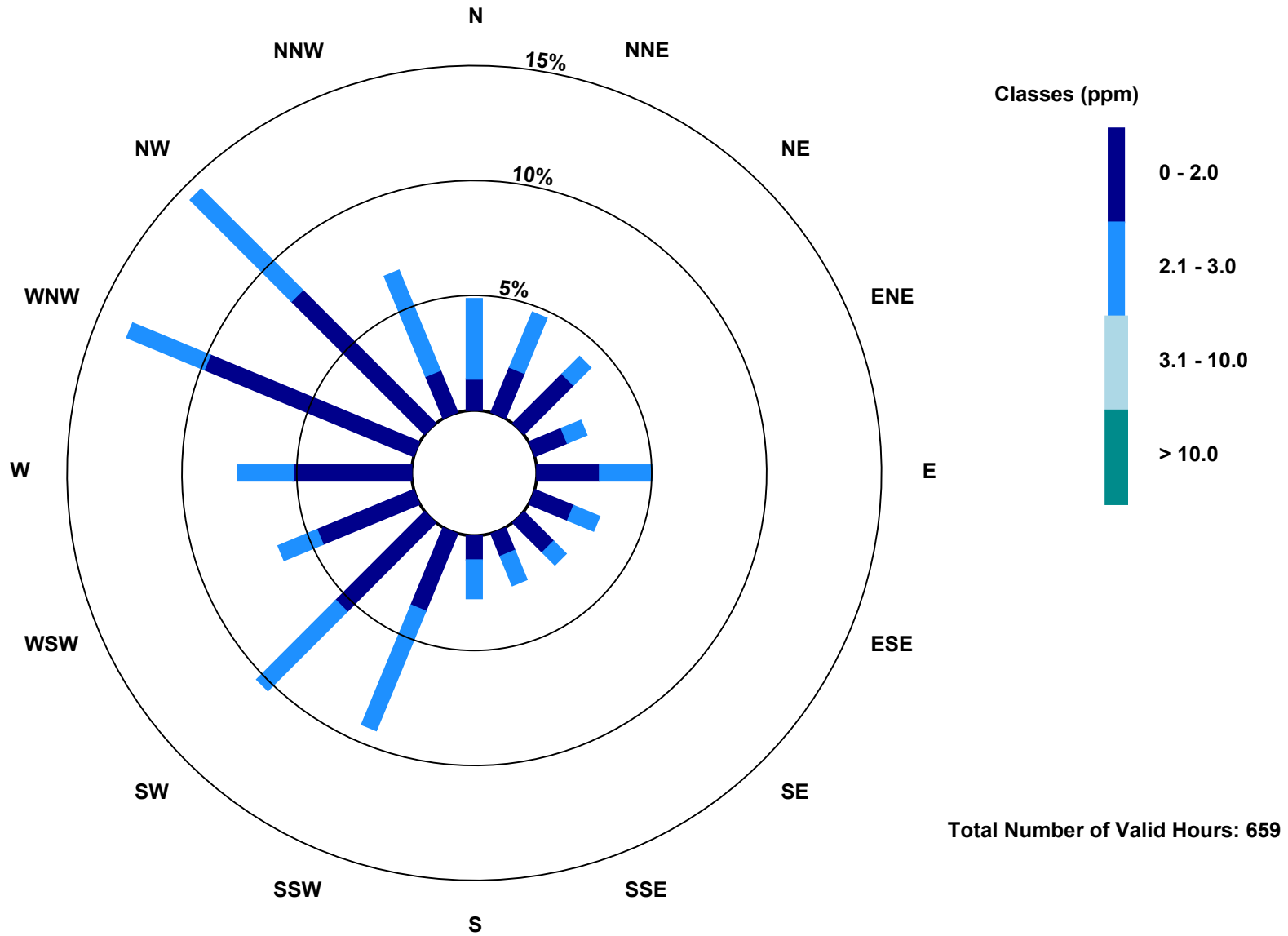
Total Number of Valid Hours: 659

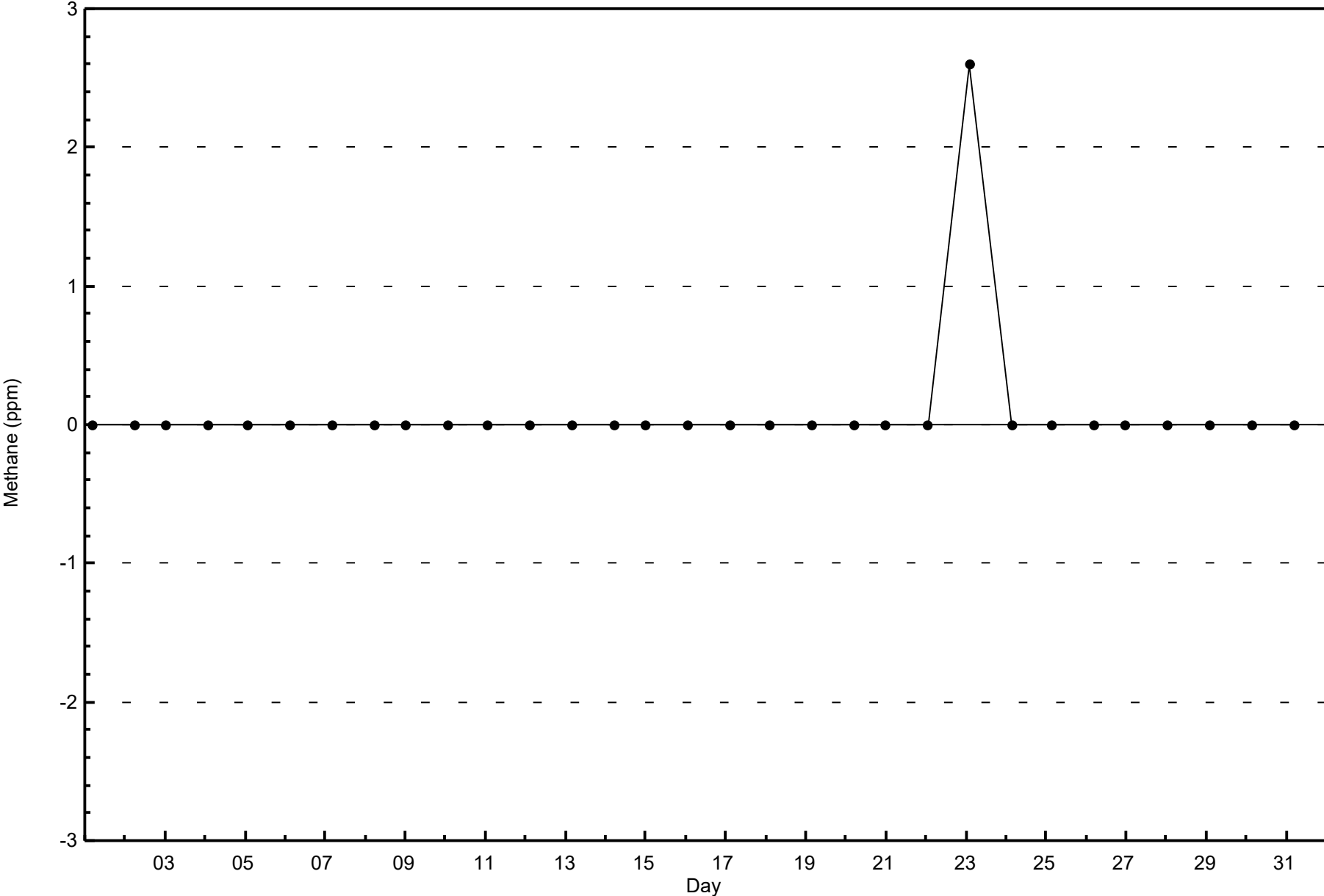
Total Number of Hours: 744

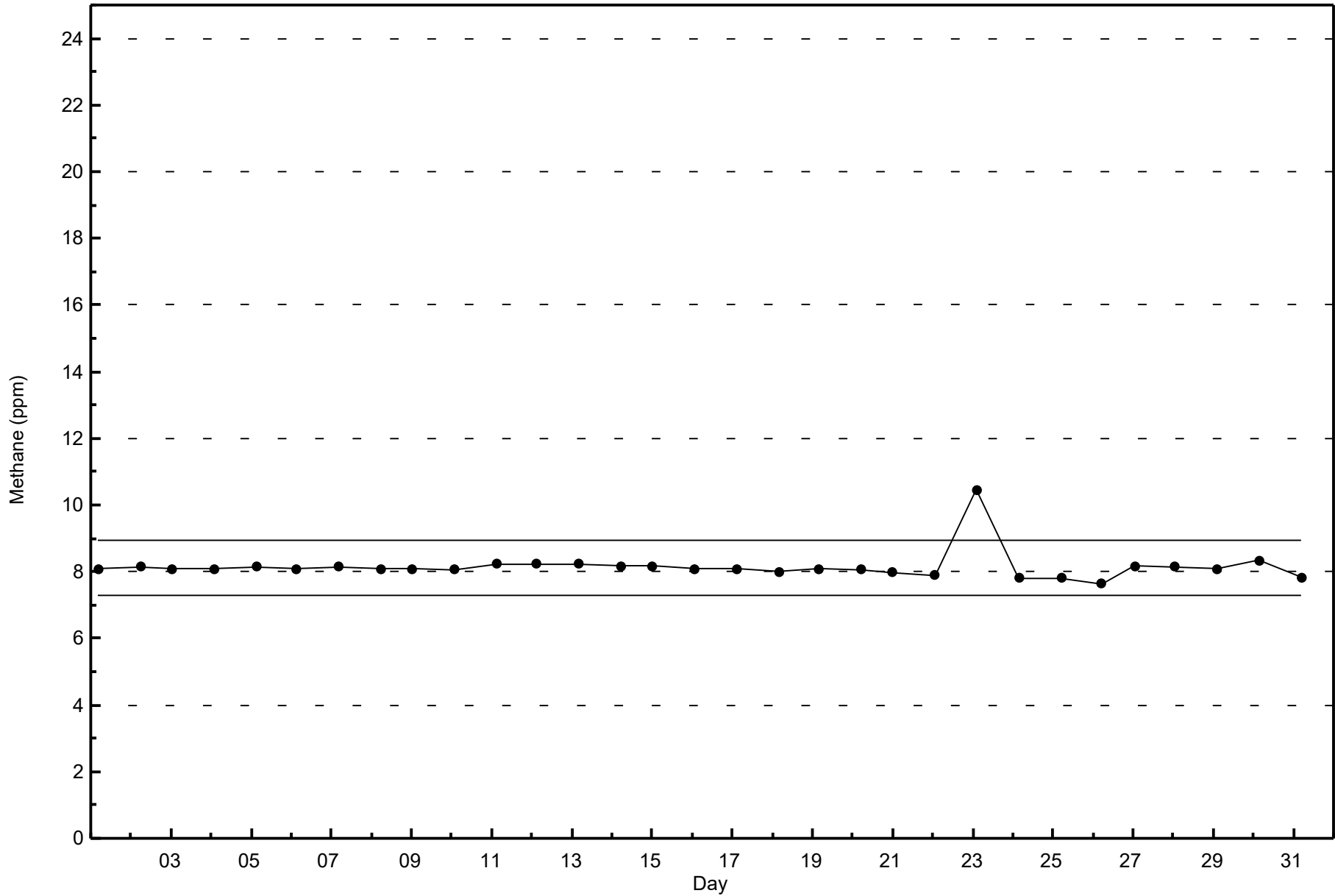


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Stony Mountain



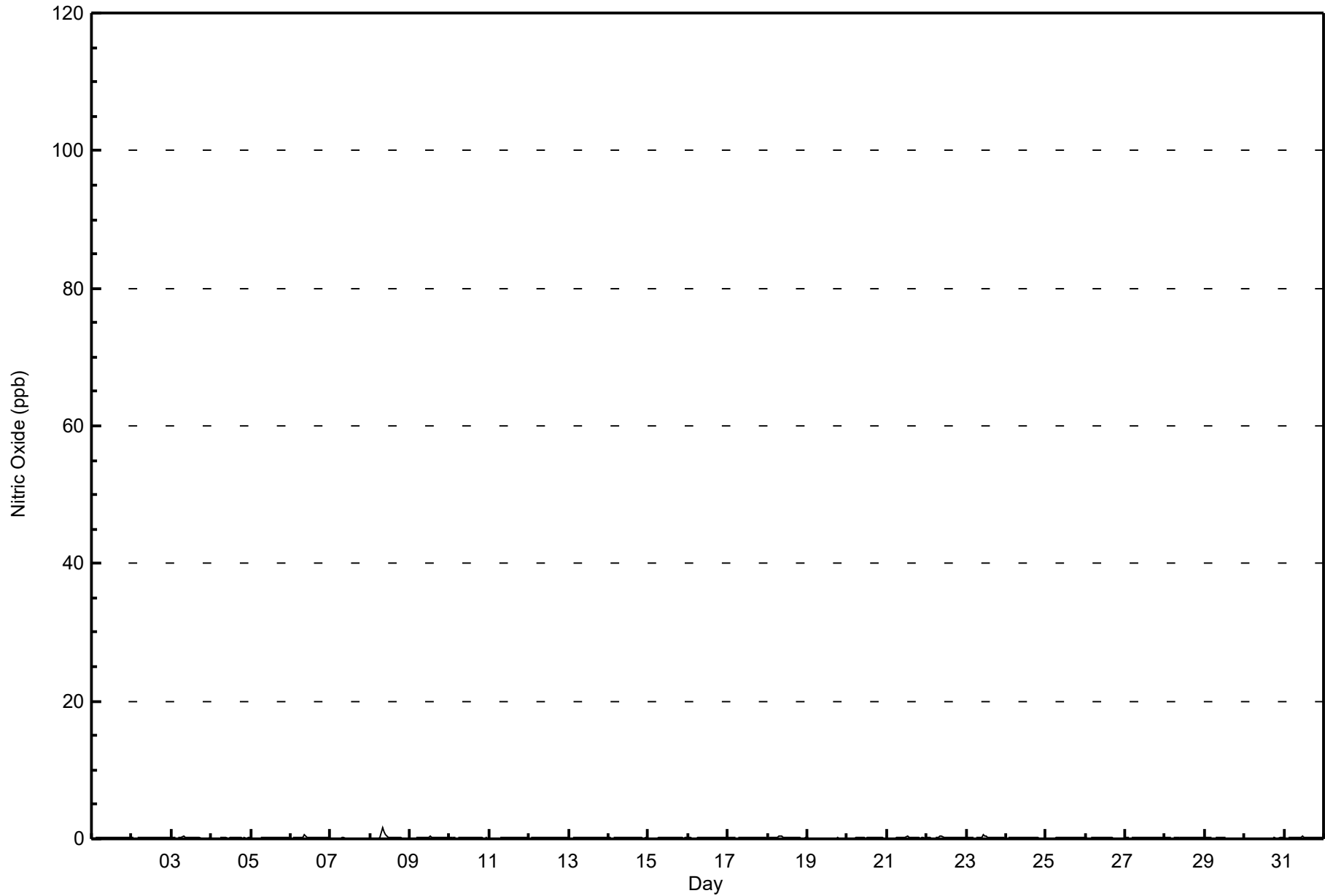






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Stony Mountain - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	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: 686

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Stony Mountain - August 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	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675
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	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675

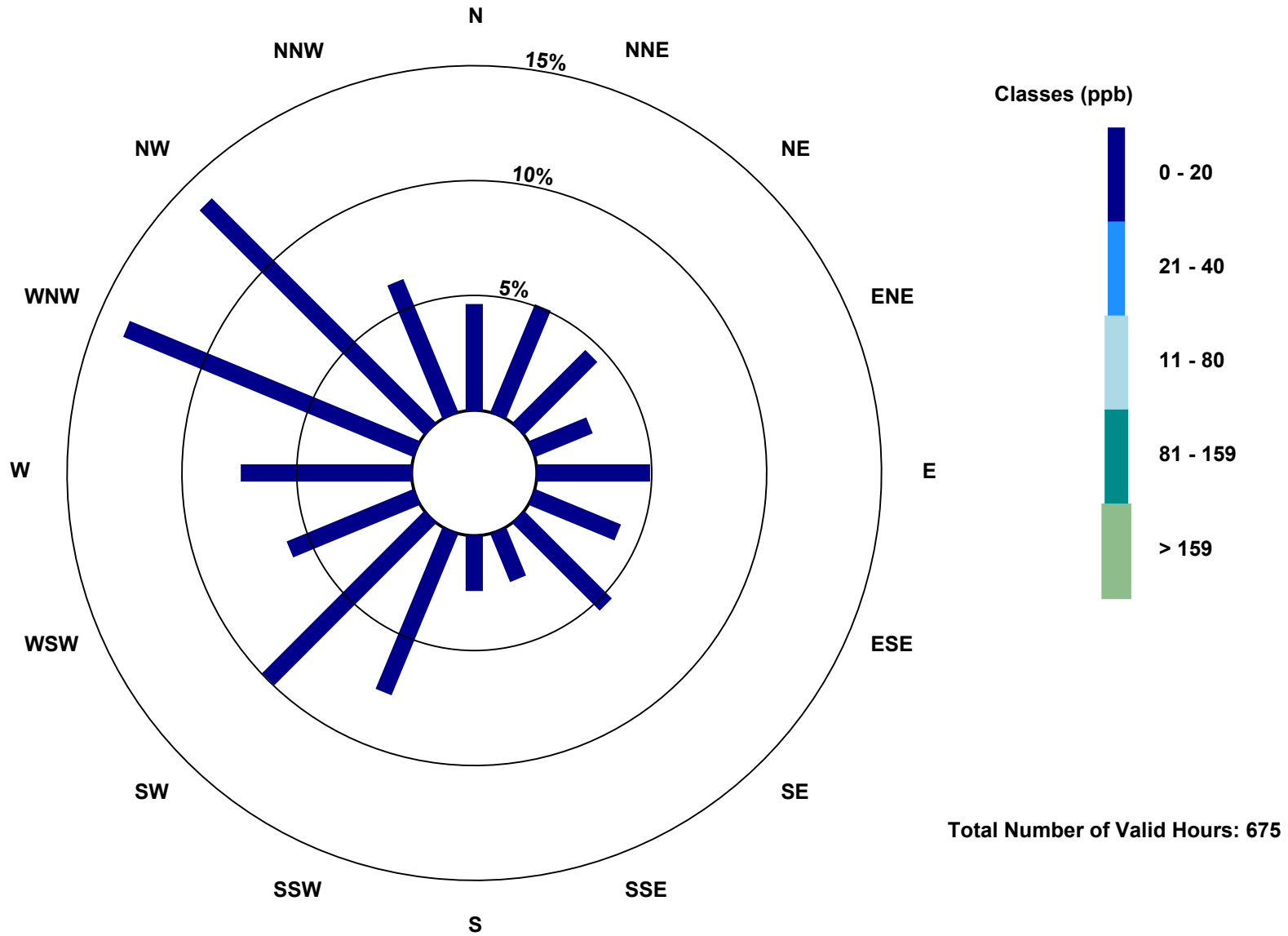
Total Number of Valid Hours: 675

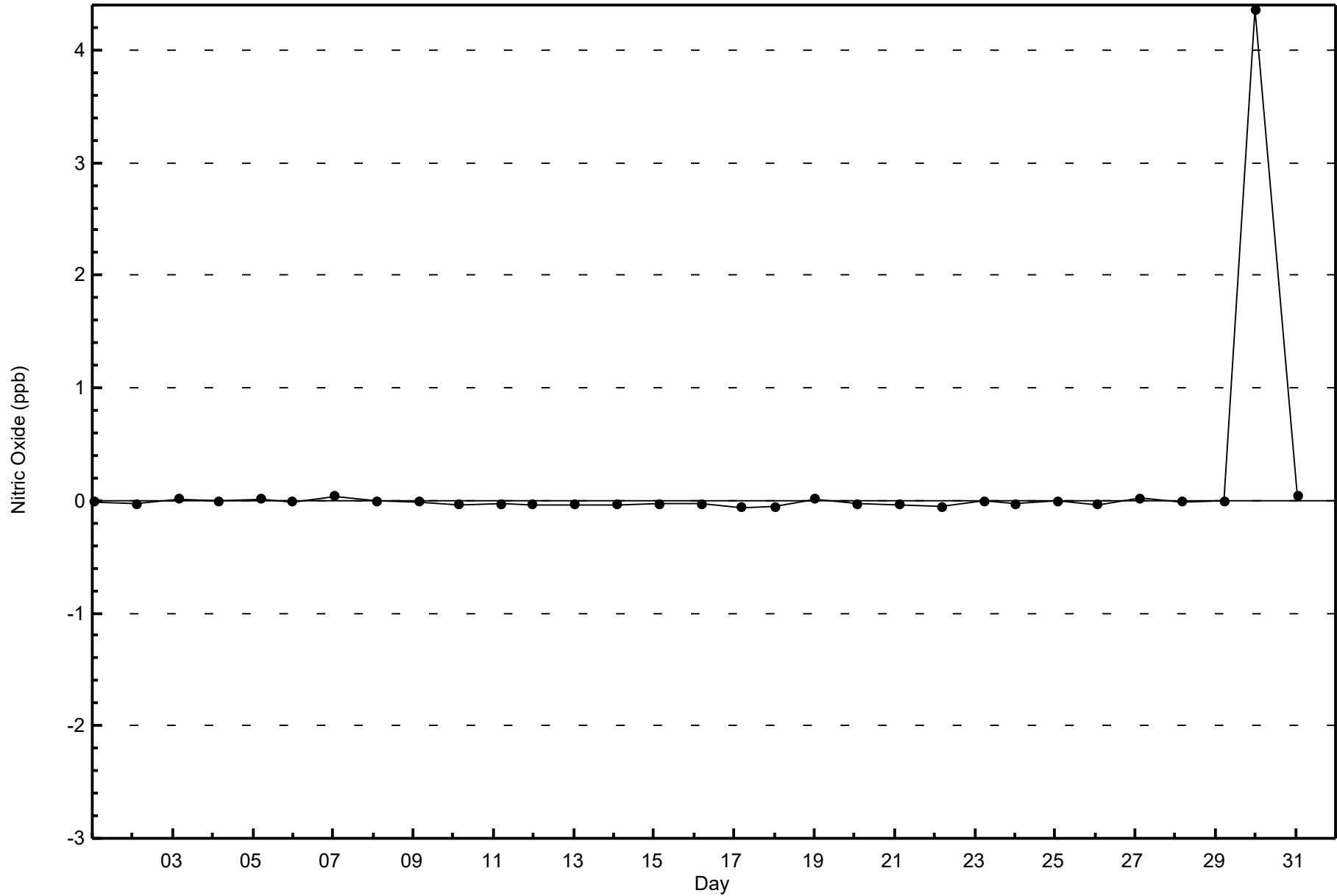
Total Number of Hours: 744

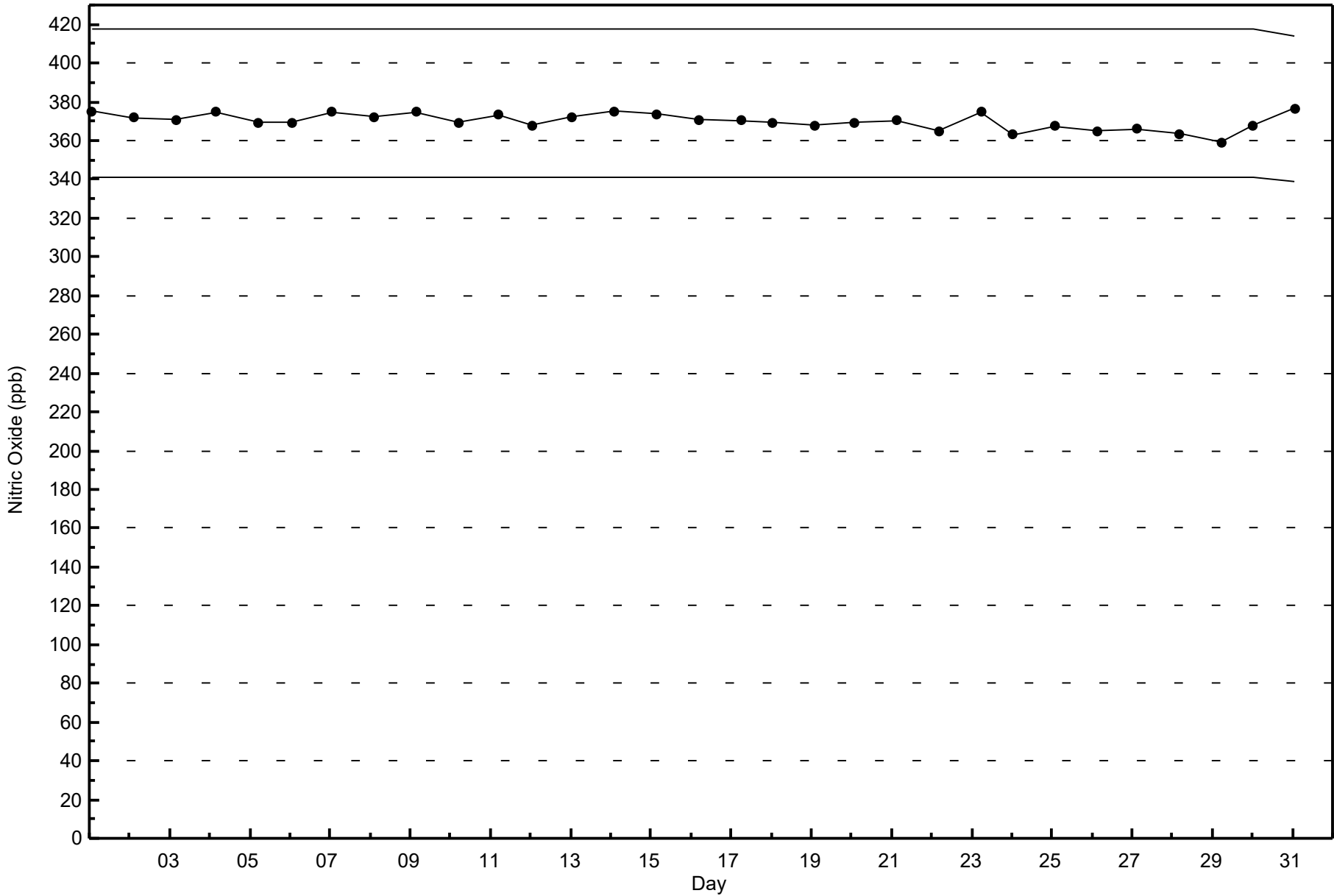


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Stony Mountain



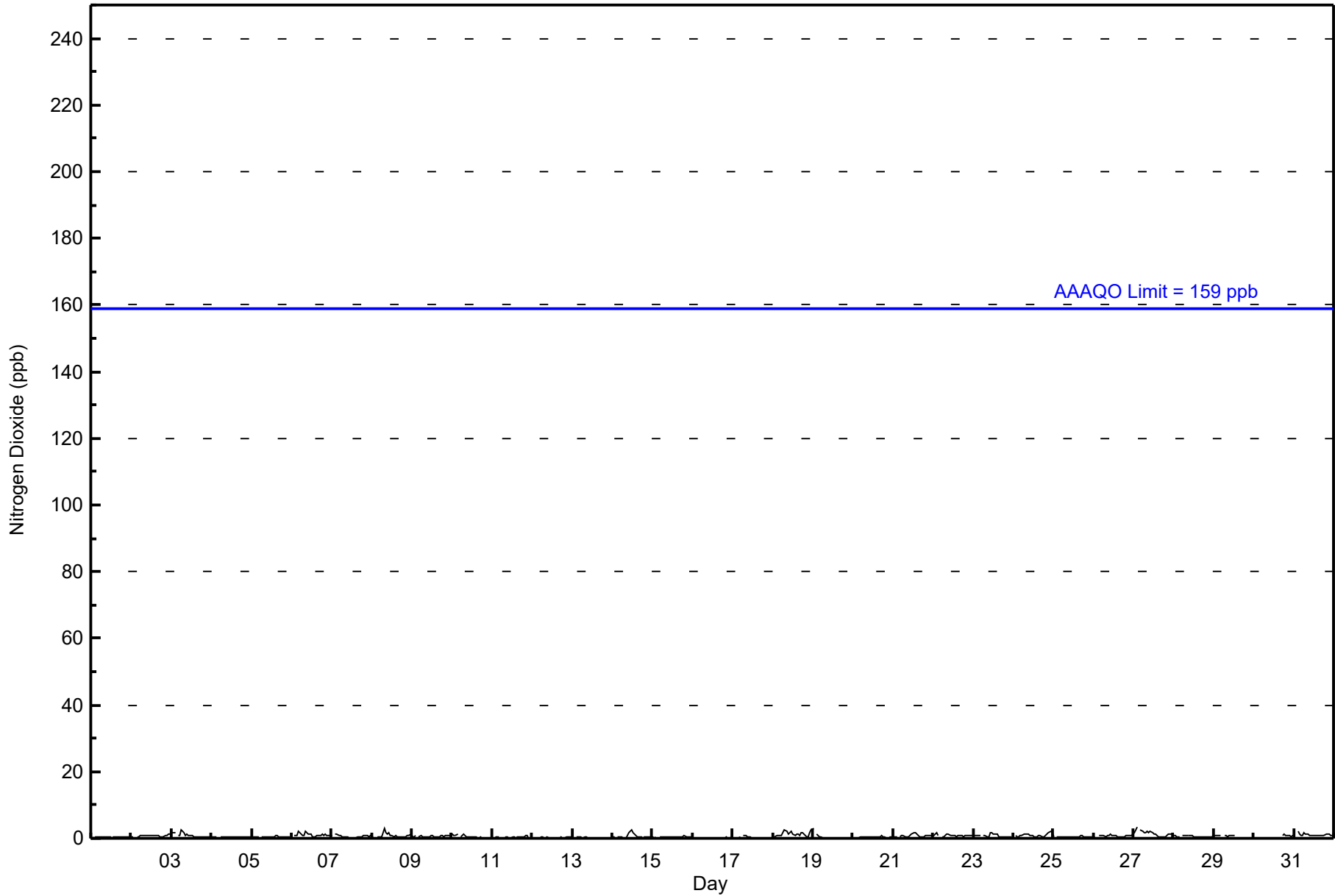






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	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: 686

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Stony Mountain - August 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	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675
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	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675

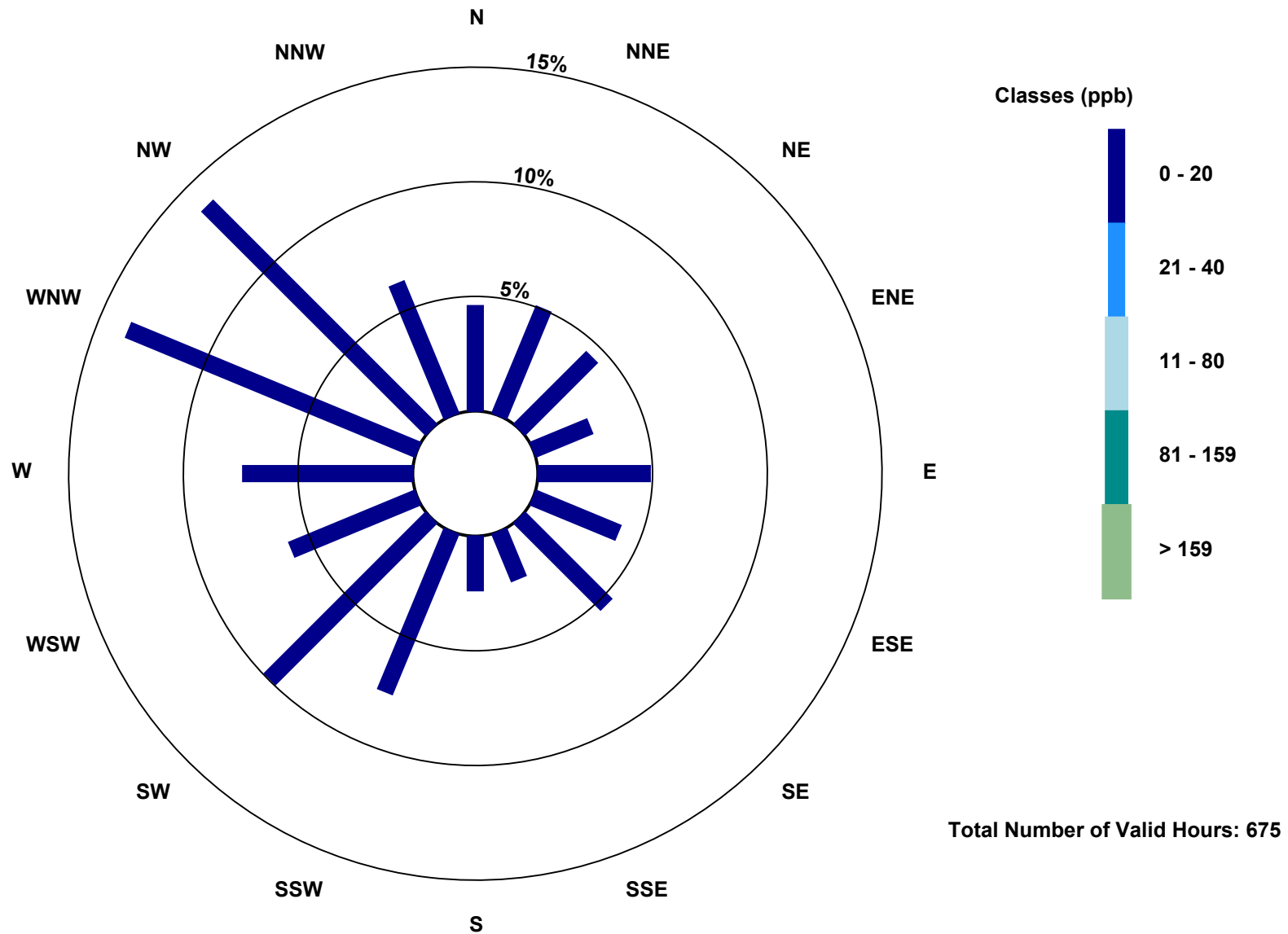
Total Number of Valid Hours: 675

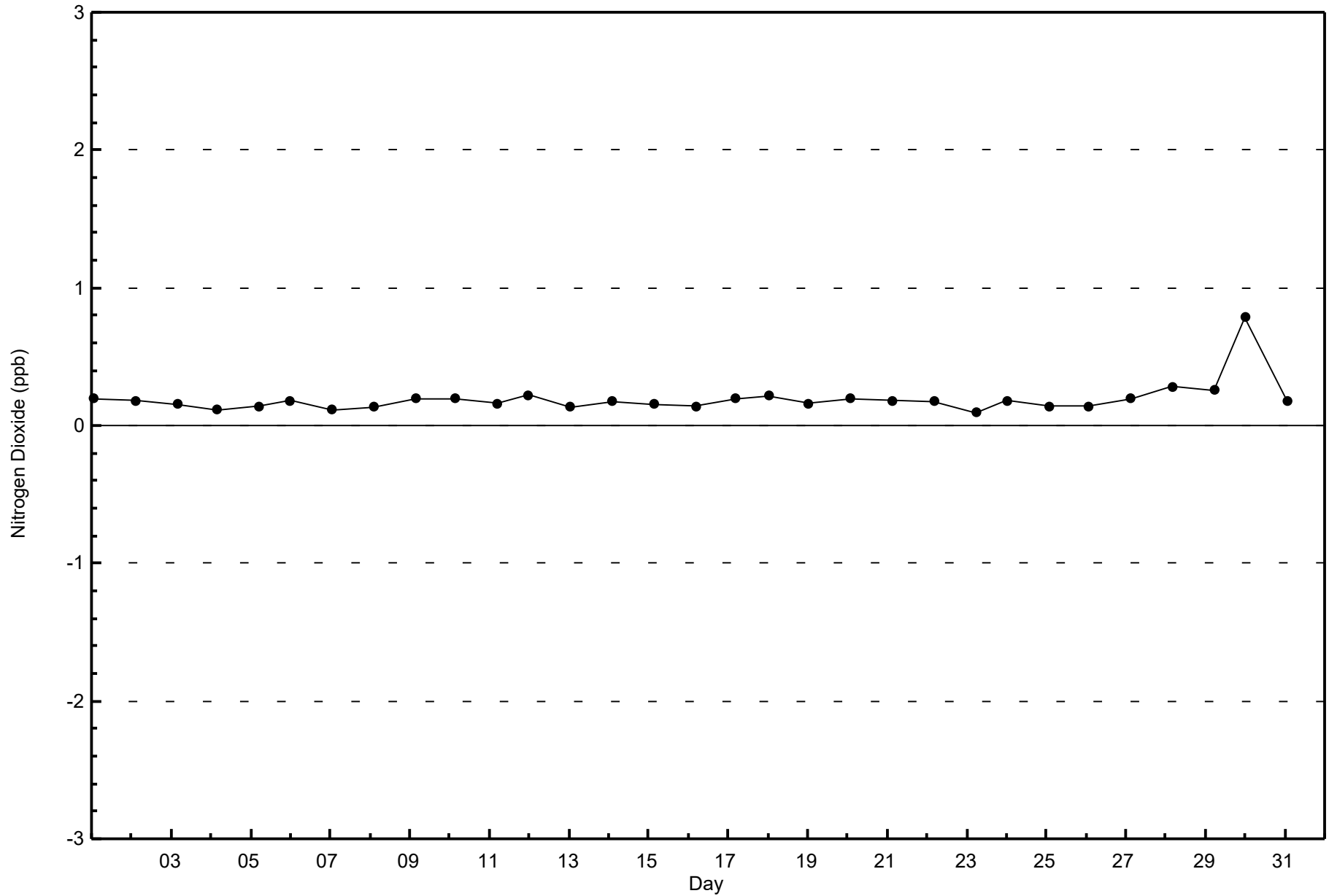
Total Number of Hours: 744

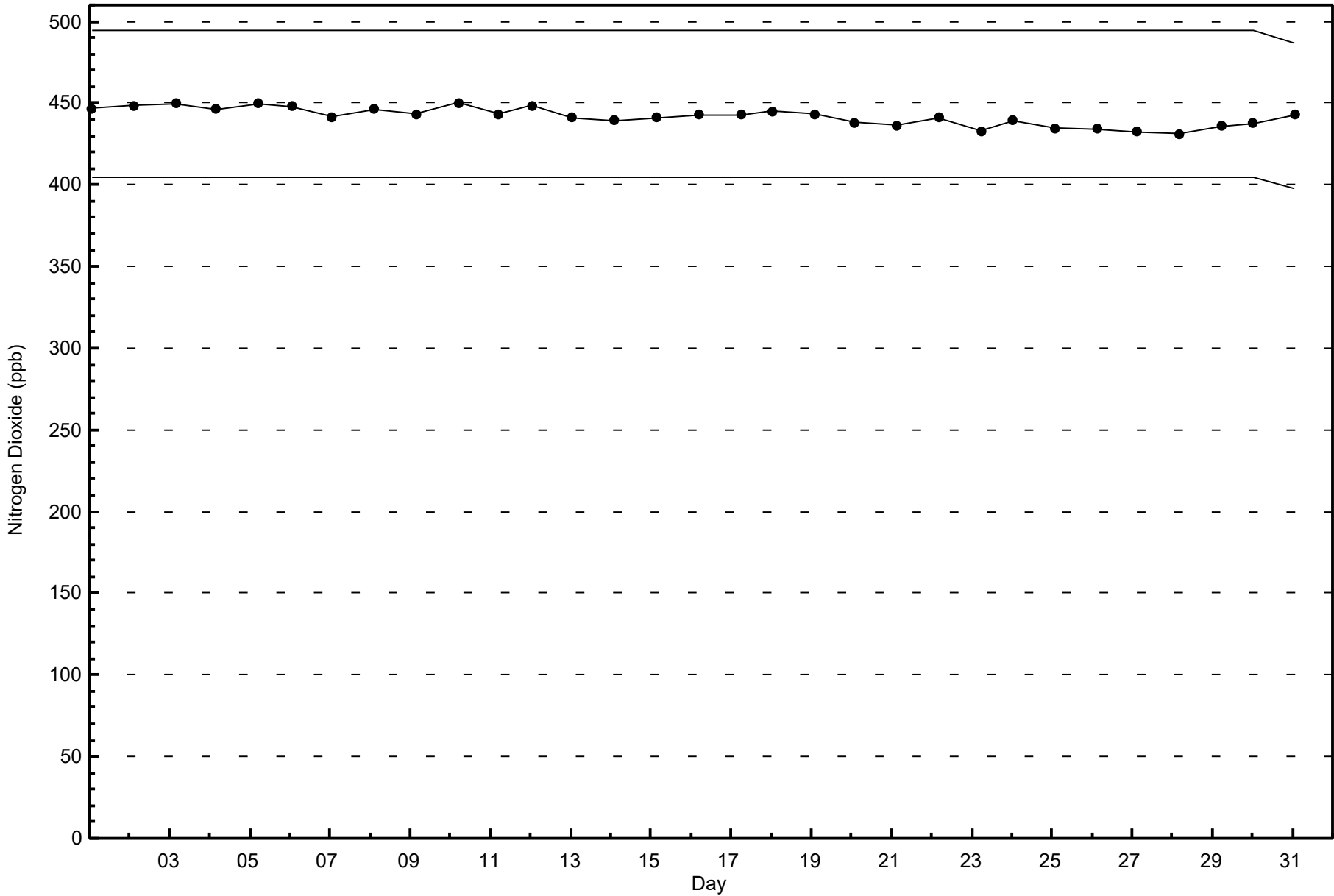


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Stony Mountain



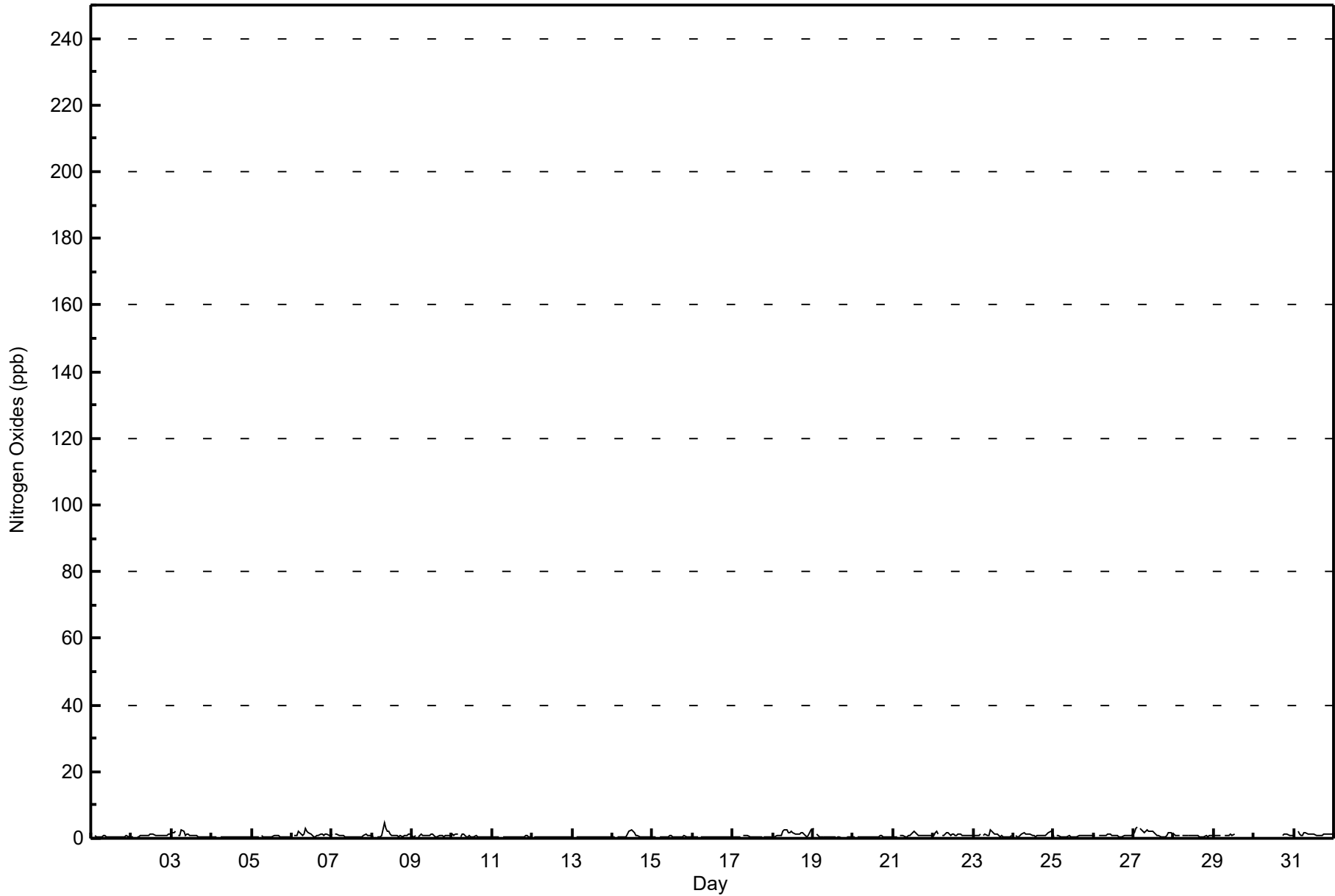






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Stony Mountain - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	686	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: 686

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Stony Mountain - August 2023**

Concentration Ranges (ppb)	Wind Direction																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Totals
0 - 20	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675
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	31	34	30	18	33	27	36	15	16	51	67	40	50	92	93	42	675

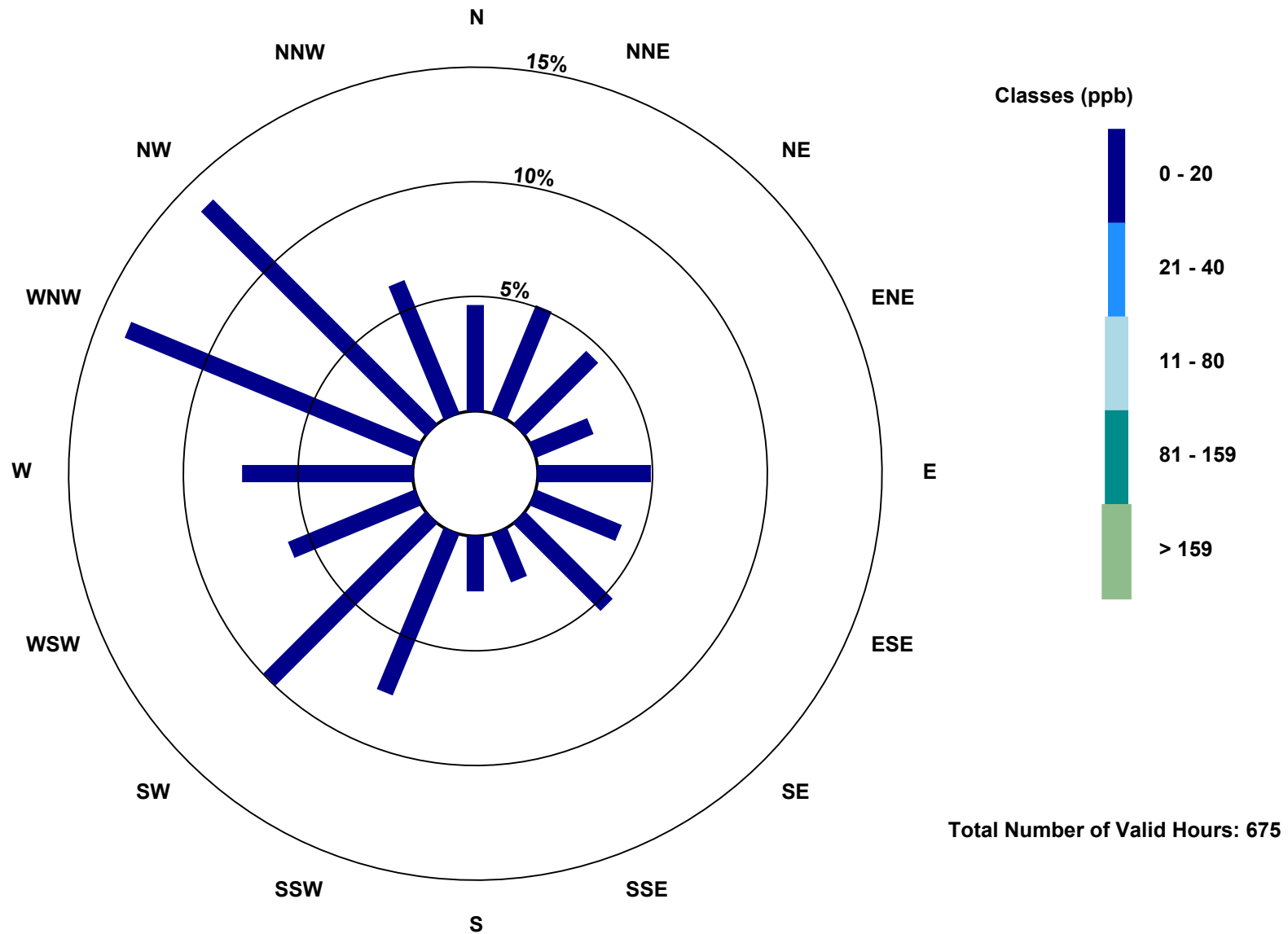
Total Number of Valid Hours: 675

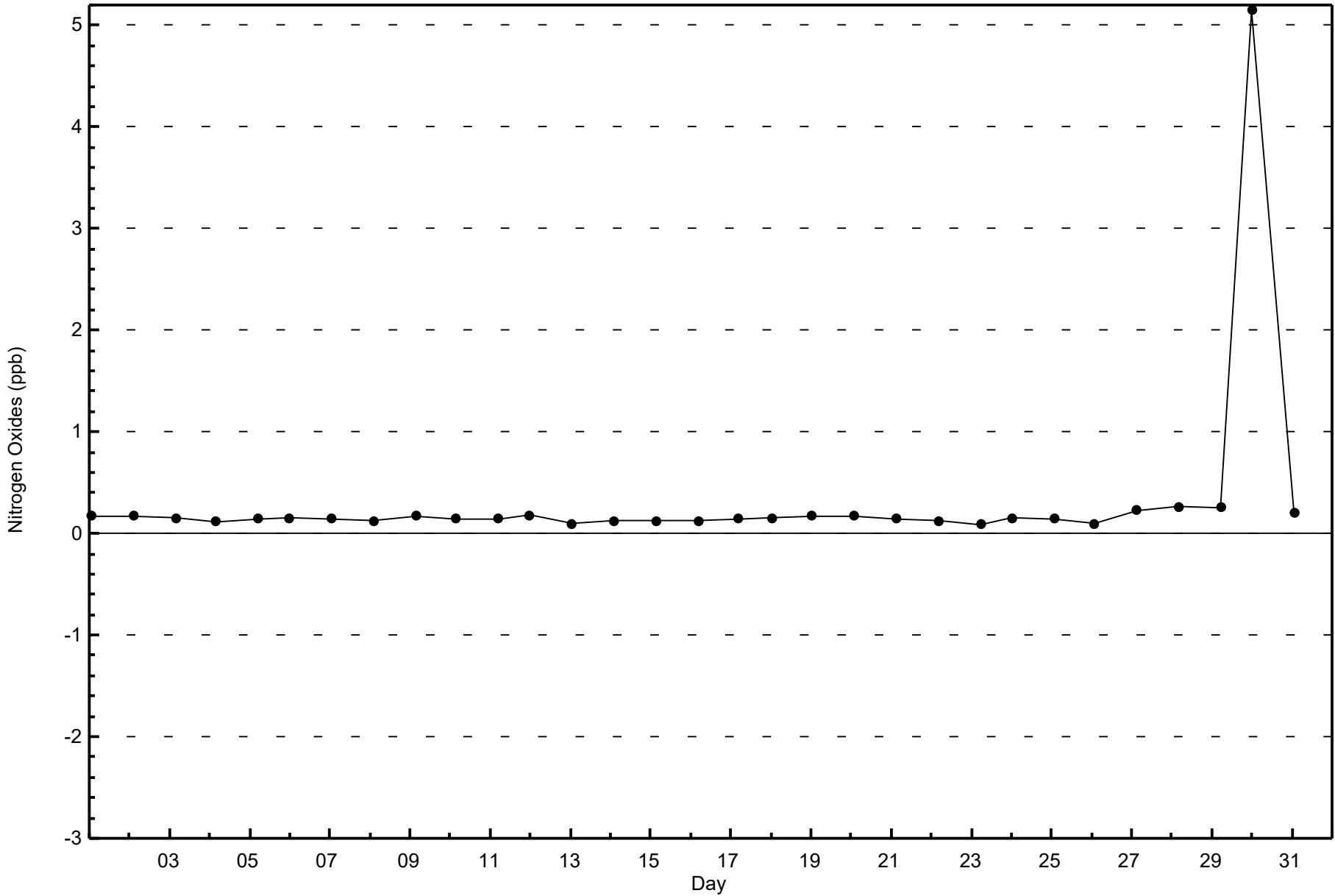
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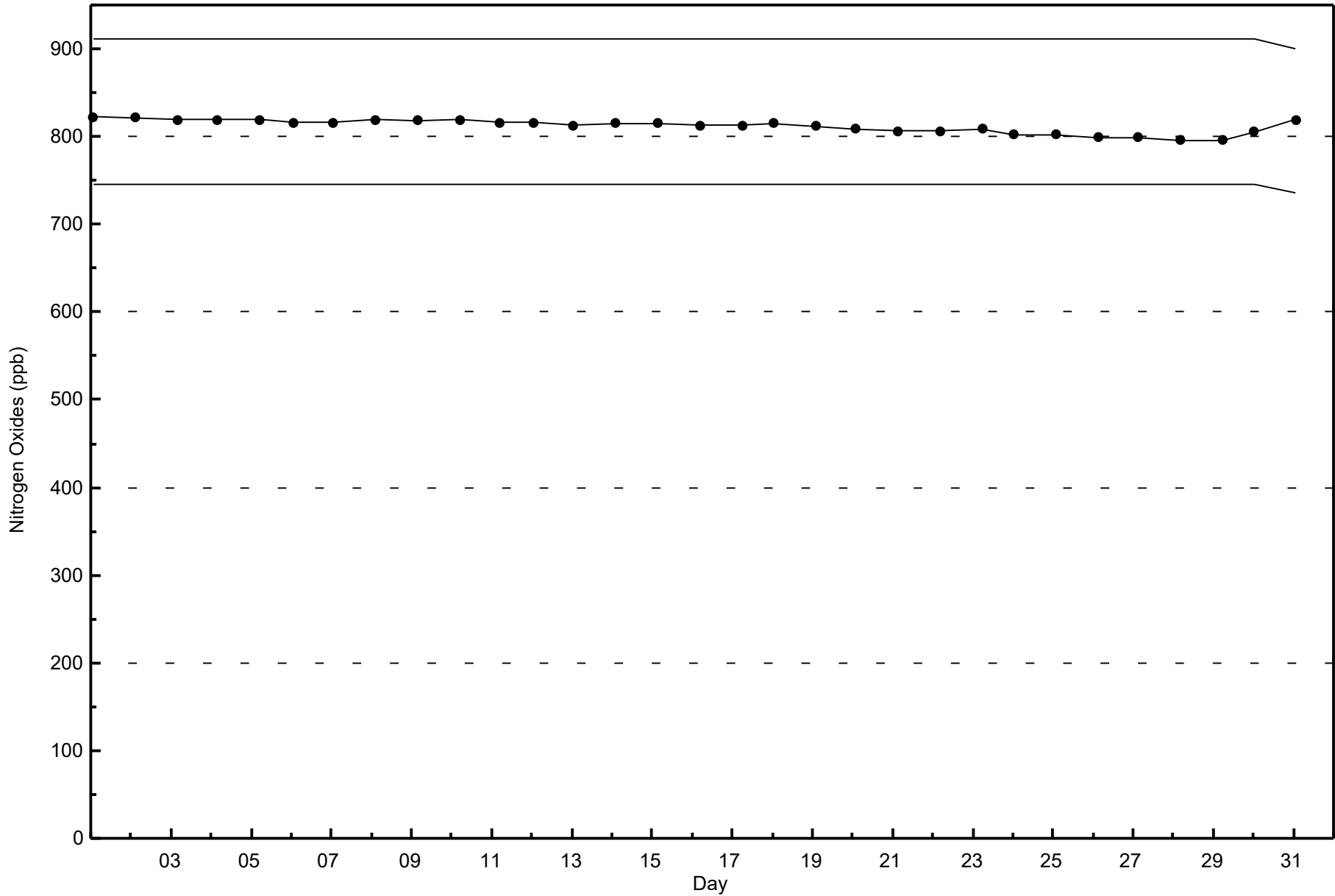


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Stony Mountain





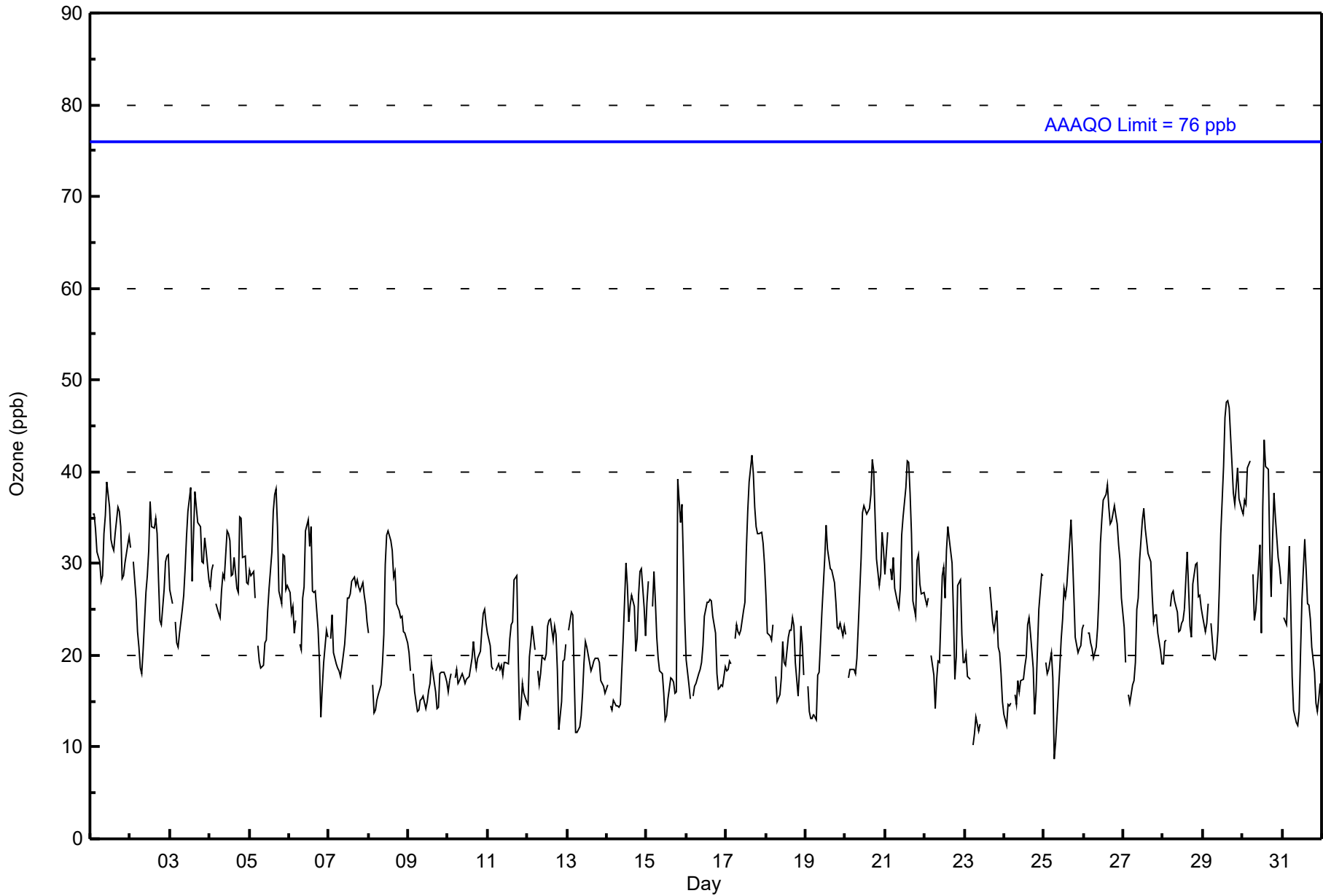




Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 47.8 ppb on Aug 29 16:00	Maximum Daily Average: 33.1 ppb on Aug 30		Hours of Data:	708
Minimum Value: 8.6 ppb on Aug 25 07:00	Minimum Daily Average: 16.5 ppb on Aug 9		Hours of Missing Data:	36
Maximum Diurnal Average: 29.9 ppb at hour 15	Minimum Diurnal Average: 18.7 ppb at hour 7		Hours of Calibration:	36
Monthly Average: 24.49 ppb	Percentiles: P ₁ = 11.9 P ₁₀ = 15.8 Q ₁ = 18.7 Median = 23.6 Q ₃ = 29.4 P ₉₀ = 34.8 P ₉₉ = 41.2		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-Aug	Z	35.3	35.3	33.7	31.3	30.2	28.1	28.8	33.3	35.2	38.9	36.2	32.7	31.9	31.5	33.3	36.1	35.7	34.0	28.4	28.7	30.1	32.0	32.9	32.8	38.9																							
2-Aug	31.7	Z	30.1	26.0	22.6	20.9	18.6	18.0	20.7	26.8	28.7	31.5	36.8	34.0	33.9	35.0	33.3	28.3	23.8	23.3	27.1	30.2	30.8	31.0	28.0	36.8																							
3-Aug	27.1	25.6	Z	23.6	21.4	20.8	22.5	25.0	26.6	29.5	32.9	35.8	38.3	28.1	33.0	37.9	36.2	34.5	34.0	30.2	30.0	32.8	31.4	28.2	29.8	38.3																							
4-Aug	27.5	29.3	29.9	Z	25.6	24.5	24.1	26.9	28.8	28.3	33.6	33.2	32.4	28.6	28.9	30.6	27.2	26.9	35.0	35.0	30.7	30.9	28.0	27.7	29.3	35.0																							
5-Aug	29.3	28.7	29.2	26.2	Z	21.0	19.4	18.6	19.0	21.3	21.7	24.9	27.3	31.3	35.7	37.6	38.2	34.1	26.9	25.6	31.0	30.8	27.2	27.6	27.5	38.2																							
6-Aug	26.9	24.5	25.4	22.5	23.8	Z	21.2	20.6	26.3	27.5	33.5	34.8	31.8	34.1	27.1	26.9	27.0	22.9	19.2	13.3	16.4	19.2	22.7	22.0	24.8	34.8																							
7-Aug	Z	21.8	24.4	20.3	19.1	18.5	18.2	17.8	18.8	21.2	23.5	26.3	26.2	26.7	28.0	28.5	27.6	28.2	27.4	27.0	27.9	26.5	25.5	23.6	24.0	28.5																							
8-Aug	22.4	Z	16.8	13.7	14.0	15.1	15.7	16.7	19.1	22.2	29.9	33.1	33.6	32.5	31.4	28.6	29.1	25.6	24.9	24.0	24.2	22.6	22.5	21.4	23.4	33.6																							
9-Aug	20.3	18.3	Z	18.0	16.0	13.9	14.0	15.2	15.2	15.5	14.2	14.9	16.2	16.9	19.3	18.1	16.1	14.2	14.3	18.0	18.2	18.1	17.7	17.1	16.5	20.3																							
10-Aug	16.1	17.2	17.9	Z	17.5	18.4	16.9	17.3	18.0	17.5	16.9	17.3	17.6	17.7	19.6	21.4	19.8	18.6	19.7	20.5	22.7	24.6	24.9	23.5	19.2	24.9																							
11-Aug	22.4	21.1	18.7	18.4	Z	18.4	19.1	18.5	18.8	17.9	19.2	19.2	19.0	21.9	23.4	23.7	28.2	28.7	19.9	13.0	14.3	17.0	15.8	15.0	19.6	28.7																							
12-Aug	14.6	19.8	21.4	23.2	20.6	Z	18.3	16.7	18.0	19.9	19.6	20.1	23.2	23.8	24.0	21.6	23.2	22.3	18.3	11.9	15.0	19.4	19.6	21.2	19.8	24.0																							
13-Aug	Z	22.8	24.7	24.4	17.8	11.6	11.6	12.2	13.4	15.9	19.2	21.5	20.9	19.2	18.4	18.7	19.4	19.7	19.2	17.2	17.0	16.7	15.9	18.1	24.7	18.1																							
14-Aug	16.8	Z	14.4	14.0	15.0	14.5	14.5	14.4	14.6	18.4	21.9	30.0	27.6	23.6	25.5	26.5	25.3	20.4	21.9	26.5	29.2	29.4	25.2	22.2	21.4	30.0																							
15-Aug	25.8	28.0	Z	25.4	29.1	25.9	22.0	19.6	18.3	17.9	15.8	13.0	13.4	15.3	17.5	17.4	17.1	15.9	16.0	39.2	34.4	36.4	30.3	23.9	22.5	39.2																							
16-Aug	19.6	16.9	15.2	Z	15.5	16.6	16.9	18.0	18.4	19.2	21.0	24.3	25.8	25.8	26.2	25.9	24.3	22.4	18.0	16.3	16.5	16.8	16.6	18.8	19.8	26.2																							
17-Aug	18.2	18.4	19.3	19.0	Z	21.8	23.3	22.5	22.3	22.7	24.8	25.7	31.4	35.7	38.8	41.7	39.8	36.1	34.0	33.3	33.2	33.4	32.2	29.8	28.6	41.7																							
18-Aug	26.5	22.5	22.1	21.7	23.4	Z	17.7	15.0	15.7	17.5	21.5	19.2	18.9	22.0	22.8	22.8	24.1	23.2	19.1	15.5	18.5	23.2	21.2	17.9	20.5	26.5																							
19-Aug	Z	16.6	13.9	13.1	13.2	13.6	12.9	17.8	18.1	21.4	24.7	30.5	34.1	31.6	30.5	29.4	29.3	27.8	25.8	23.0	22.9	23.6	22.1	23.2	22.6	34.1																							
20-Aug	22.2	Z	17.5	18.5	18.5	18.4	17.9	19.7	23.3	30.5	35.5	36.2	35.8	35.5	35.9	37.5	41.4	40.1	35.0	30.5	27.7	28.8	33.4	31.6	29.2	41.4																							
21-Aug	28.9	33.3	Z	29.4	28.3	30.7	27.2	25.7	25.1	27.3	33.1	35.0	38.2	41.2	41.0	37.7	33.3	25.9	24.2	30.4	31.0	27.8	26.7	26.9	30.8	41.2																							
22-Aug	26.1	25.4	26.2	Z	20.0	17.9	14.1	17.4	19.4	19.3	28.7	29.6	26.2	31.5	34.0	32.6	30.0	24.5	17.5	19.9	27.6	28.2	22.3	19.2	24.2	34.0																							
23-Aug	19.2	20.2	17.6	17.3	Z	10.3	11.4	13.2	11.7	12.5	C	C	C	C	C	27.4	25.6	23.7	22.8	24.8	20.8	20.3	17.9	15.0	18.4	27.4																							
24-Aug	13.5	12.4	14.7	14.5	14.8	Z	15.7	14.6	17.2	16.1	17.3	17.4	18.7	19.8	23.3	24.0	22.5	18.7	13.6	16.0	20.6	25.0	28.8	28.7	18.6	28.8																							
25-Aug	Z	19.2	18.0	18.5	20.3	17.5	8.6	10.6	13.3	18.8	21.9	23.9	27.3	26.5	27.6	32.3	34.8	31.1	26.6	21.9	20.3	20.8	21.1	22.9	21.9	34.8																							
26-Aug	23.3	Z	22.4	22.5	21.3	20.8	19.7	20.9	23.1	26.6	32.1	34.7	36.9	37.5	38.6	36.2	34.4	34.6	36.3	35.3	34.3	32.0	30.4	26.2	29.6	38.6																							
27-Aug	23.1	19.3	Z	15.8	14.9	16.7	17.2	19.2	25.0	26.3	30.4	34.9	36.0	33.9	32.5	31.1	30.2	26.5	23.7	24.4	24.4	22.4	20.5	19.0	24.7	36.0																							
28-Aug	19.0	21.5	21.6	Z	25.4	26.8	27.0	25.9	24.7	22.6	22.7	23.5	23.9	24.9	31.2	27.4	23.2	21.9	27.8	29.9	30.1	26.4	26.5	25.1	25.2	31.2																							
29-Aug	24.3	22.5	23.5	25.6	Z	23.4	19.7	19.6	20.5	22.7	27.4	33.2	40.5	45.9	47.6	47.8	47.0	40.9	37.7	36.5	38.3	40.4	37.1	35.9	33.0	47.8																							
30-Aug	35.4	36.9	36.5	40.5	41.2	Z	28.8	23.8	24.9	27.2	32.1	22.4	36.2	43.5	40.6	40.3	31.5	26.3	32.6	37.7	35.1	30.6	29.6	27.7	33.1	43.5																							
31-Aug	Z	24.1	23.3	27.6	31.8	25.3	17.7	14.0	12.6	12.4	13.9	20.3	26.1	32.6	29.2	25.6	25.5	24.0	20.9	18.2	14.8	13.9	15.3	17.0	21.1	32.6																							
																								23.2	23.1	22.3	22.0	21.6	19.8	18.7	18.8	20.1	21.9	25.2	26.8	28.4	29.1	29.9	29.9	29.1	26.6	24.9	24.8	25.3	25.8	24.9	23.8	Diurnal Average	
																								35.4	36.9	36.5	40.5	41.2	30.7	28.8	28.8	33.3	35.2	38.9	36.2	40.5	45.9	47.6	47.8	47.0	40.9	37.7	39.2	38.3	40.4	37.1	35.9	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
Stony Mountain - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	244	34.46	34.46
21 - 50	464	65.54	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
Stony Mountain - August 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	16	12	2	7	14	21	6	2	22	27	15	13	20	35	16	242
21 - 50	17	18	17	13	26	16	15	13	16	41	45	25	36	70	61	26	455
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	31	34	29	15	33	30	36	19	18	63	72	40	49	90	96	42	697

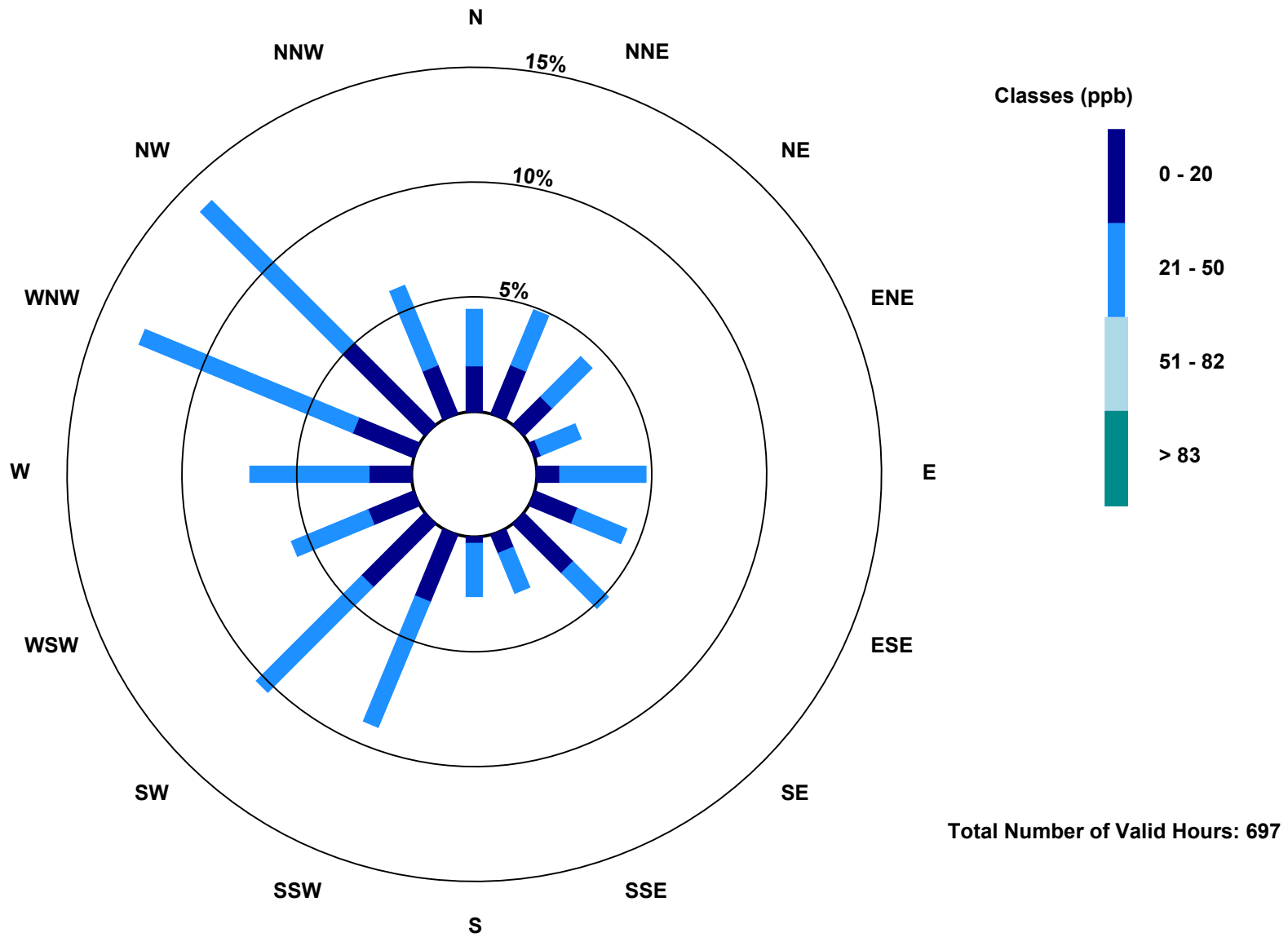
Total Number of Valid Hours: 697

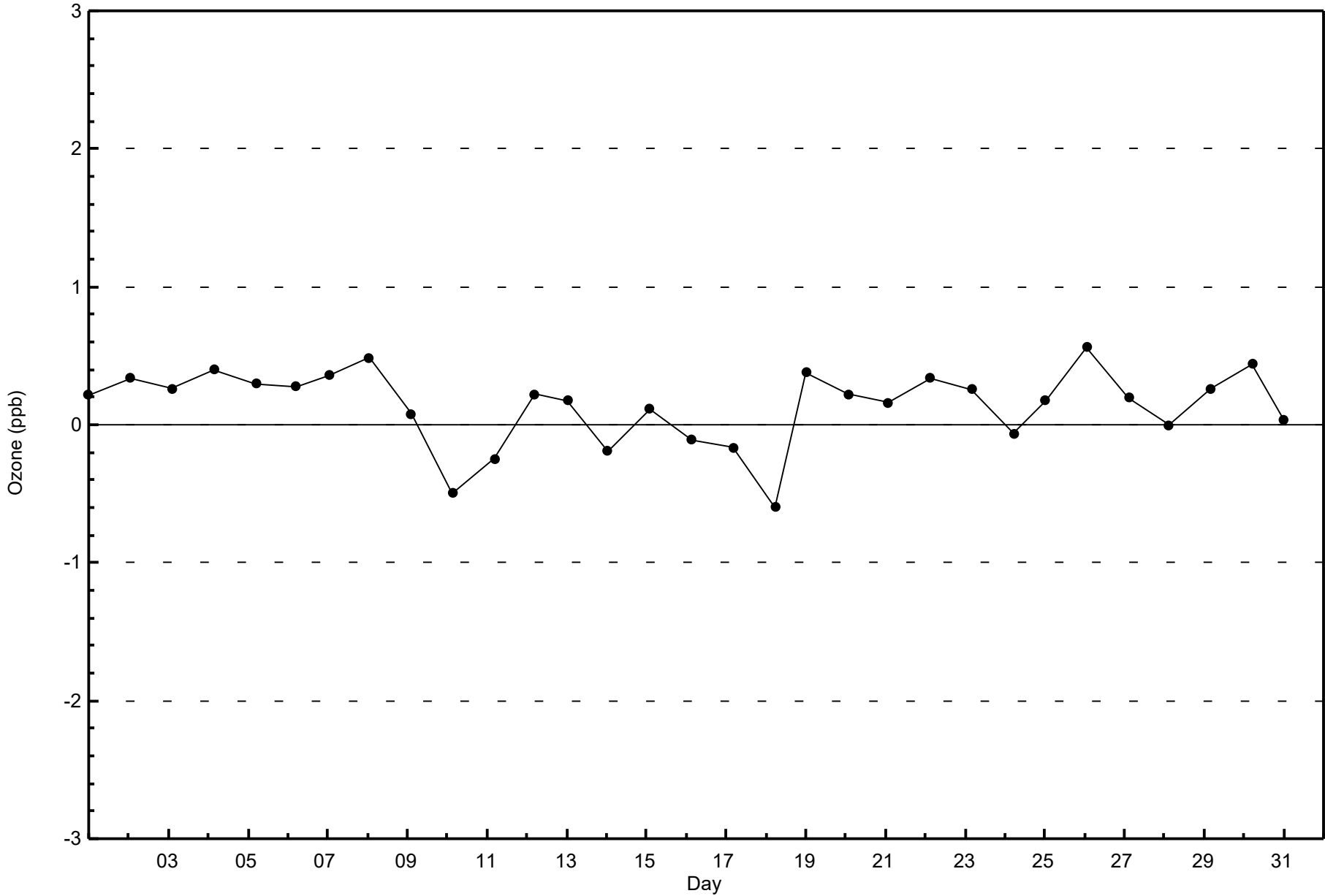
Total Number of Hours: 744

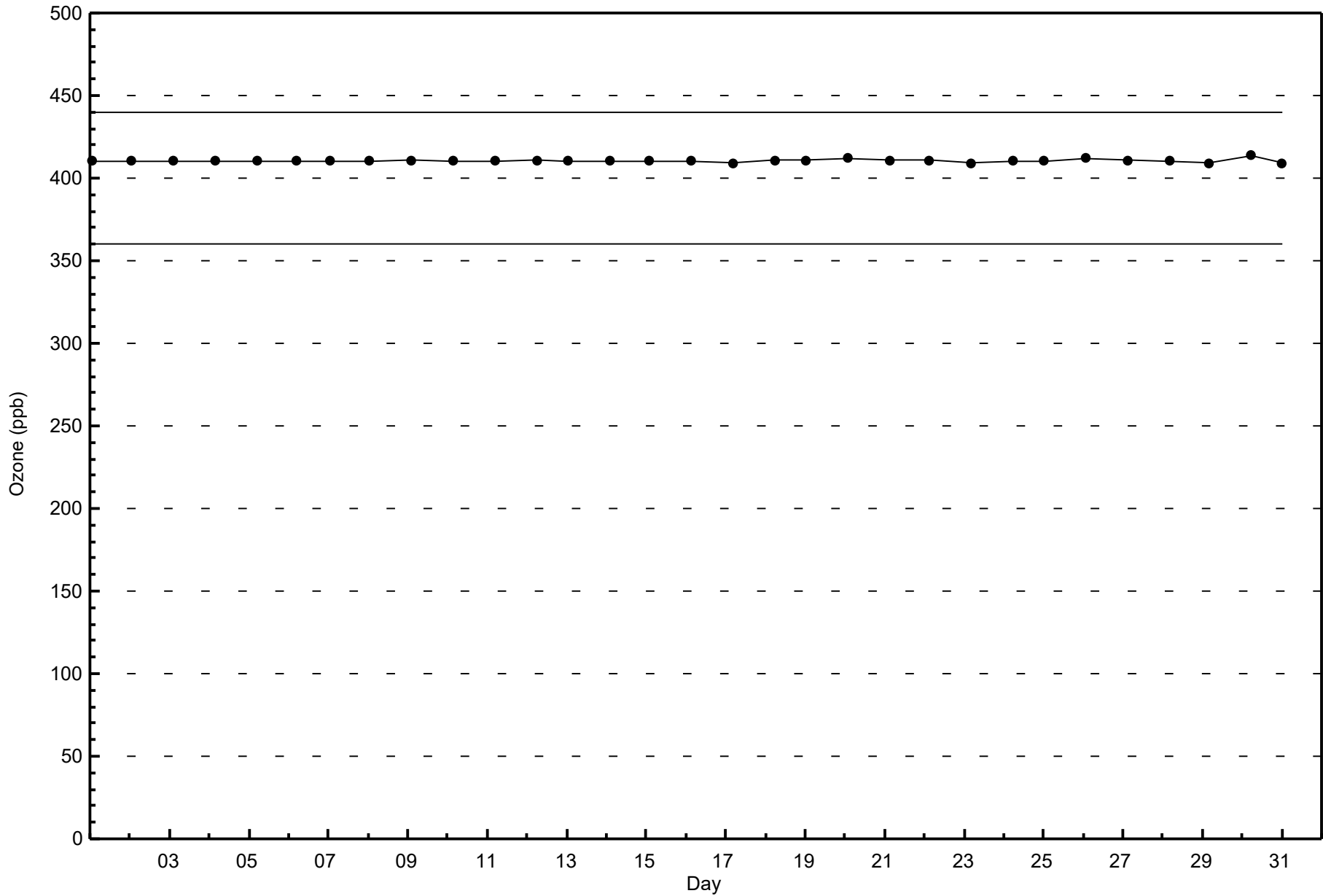


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Stony Mountain

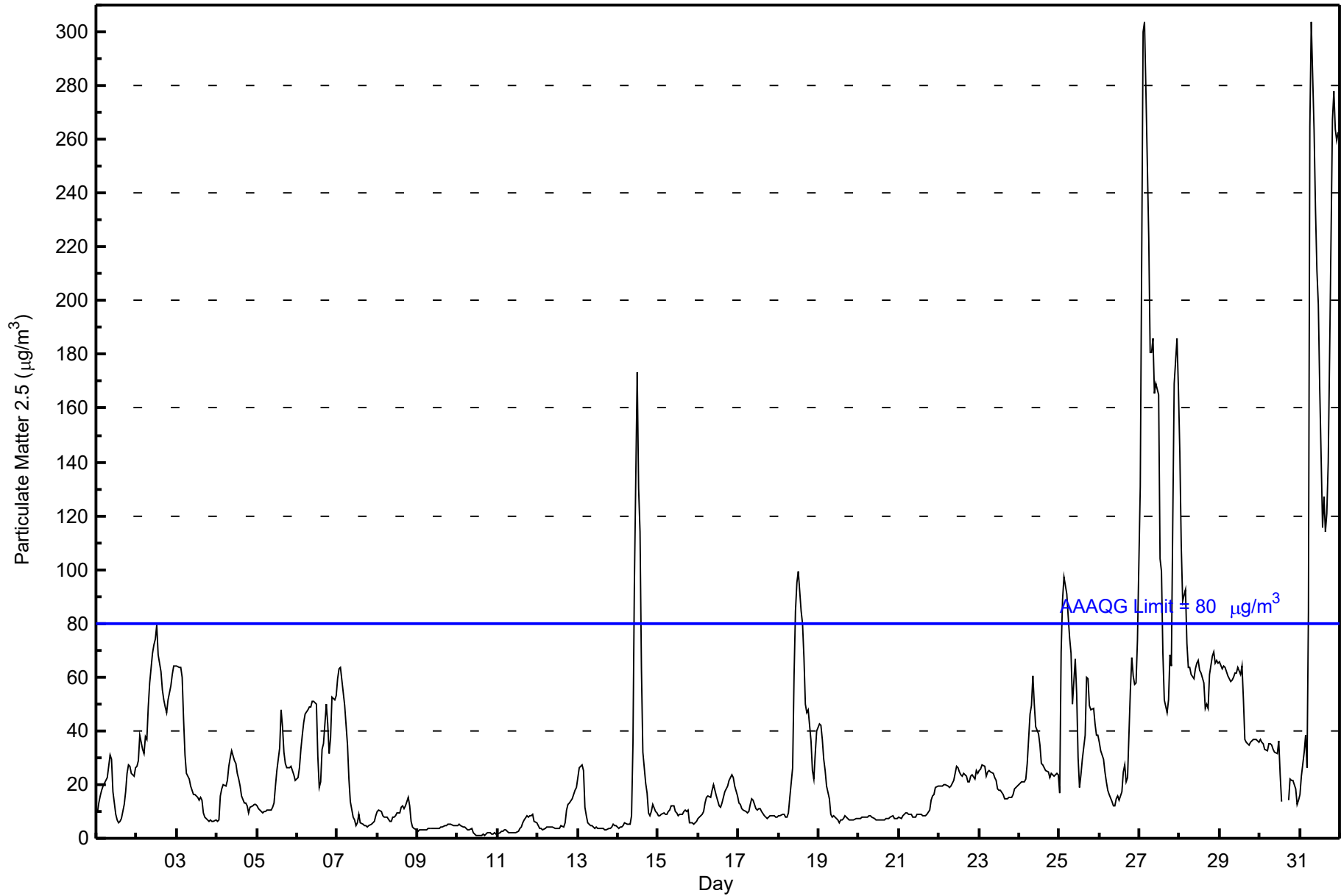








Number of Exceedences (AAAQO): 1-hr: 54 24-hr: 11 Maximum Value: 303.9 µg/m ³ on Aug 31 08:00 Minimum Value: 1.0 µg/m ³ on Aug 10 12:00 Maximum Diurnal Average: 39.0 µg/m ³ at hour 12 Monthly Average: 32.11 µg/m ³		Maximum Daily Average: 166.3 µg/m ³ on Aug 31 Minimum Daily Average: 2.5 µg/m ³ on Aug 10 Minimum Diurnal Average: 23.9 µg/m ³ at hour 17 Percentiles: P ₁ = 1.4 P ₁₀ = 4.1 Q ₁ = 7.8 Median = 17.2 Q ₃ = 36.6 P ₉₀ = 65.4 P ₉₉ = 263.5		Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 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-Aug	9.4	13.4	15.7	17.8	19.4	21.4	22.8	26.6	30.8	29.4	17.2	8.9	6.7	6.0	6.3	7.3	12.6	17.3	24.1	27.4	26.6	24.0	23.3	26.0	18.3	30.8
2-Aug	26.9	28.8	38.4	33.0	31.6	38.0	37.0	48.6	57.8	68.9	72.1	74.0	79.6	68.5	61.9	55.4	51.7	48.9	46.7	51.4	56.9	60.9	64.1	64.1	52.7	79.6
3-Aug	64.3	63.7	63.5	59.7	44.0	31.0	24.2	21.9	19.5	17.6	16.2	16.3	15.2	14.4	15.1	14.0	9.2	7.9	6.7	6.5	6.7	6.4	6.4	6.7	23.2	64.3
4-Aug	6.2	6.7	15.7	18.3	19.7	19.5	21.4	26.6	30.1	32.6	29.1	28.1	24.4	22.1	19.2	15.8	13.4	12.9	12.0	9.6	11.4	12.3	12.5	12.4	18.0	32.6
5-Aug	12.0	11.3	9.8	9.6	9.7	10.2	10.4	10.4	10.3	11.3	13.2	19.4	25.4	33.6	47.7	41.3	32.0	27.9	26.0	26.5	26.6	25.3	23.9	21.7	20.6	47.7
6-Aug	22.4	26.2	32.9	38.6	43.3	46.3	48.0	49.0	48.7	51.2	51.2	49.8	30.6	18.9	20.9	33.2	35.0	49.9	42.6	31.7	37.2	52.4	51.6	52.8	40.2	52.8
7-Aug	59.3	62.8	63.5	58.9	49.4	41.9	34.7	22.0	13.5	8.1	6.6	4.9	5.8	8.8	6.0	5.4	4.5	4.5	4.0	4.8	5.5	5.7	6.4	8.6	20.6	63.5
8-Aug	10.0	10.3	10.1	8.6	7.8	7.9	7.8	6.6	6.5	7.9	7.6	8.6	9.2	9.2	11.5	12.2	11.1	12.1	15.3	12.2	6.4	4.0	3.4	3.0	8.7	15.3
9-Aug	2.9	3.1	3.2	3.2	3.2	3.4	3.6	3.6	3.5	3.6	3.6	3.6	3.7	3.8	4.0	4.1	4.5	4.7	5.0	5.4	5.2	5.0	4.8	4.8	4.0	5.4
10-Aug	4.9	5.1	4.8	4.4	4.1	3.6	3.1	3.2	3.4	2.3	1.7	1.0	1.1	1.2	1.2	1.3	1.2	1.4	2.0	2.2	1.3	1.4	1.9	1.6	2.5	5.1
11-Aug	1.7	1.9	2.9	2.9	3.2	2.9	2.3	2.0	2.0	2.2	2.0	2.0	2.4	3.7	4.5	5.6	6.9	8.2	8.1	8.3	8.6	9.0	6.5	5.6	4.4	9.0
12-Aug	4.8	3.7	3.5	3.4	3.7	4.1	4.0	4.0	4.1	4.0	3.8	3.6	3.6	3.8	4.7	4.1	5.9	10.4	12.8	13.4	14.5	16.4	18.1	18.7	7.2	18.7
13-Aug	22.6	26.2	27.3	25.0	11.3	8.3	5.8	5.0	4.6	4.1	3.9	4.1	3.7	3.8	3.4	3.2	3.3	3.4	3.5	4.2	5.0	4.8	4.5	4.5	8.1	27.3
14-Aug	3.9	4.0	4.2	4.6	5.7	5.4	5.3	5.3	8.4	35.3	94.8	173.6	130.2	114.2	62.8	32.3	20.4	16.7	9.3	8.3	9.8	12.4	10.0	9.6	32.8	173.6
15-Aug	8.6	8.5	8.7	9.3	8.9	9.0	9.8	10.8	12.1	12.2	10.2	9.3	8.6	9.0	9.2	9.8	10.6	10.2	10.8	5.6	5.6	5.4	5.6	6.3	8.9	12.2
16-Aug	7.3	8.2	8.9	9.9	13.0	15.4	15.9	15.3	18.0	19.9	17.6	15.6	12.2	11.5	13.0	15.1	17.2	19.6	21.5	22.8	23.7	22.4	19.5	15.6	15.8	23.7
17-Aug	13.1	12.4	11.0	10.3	10.2	9.5	10.2	12.7	15.0	14.0	11.2	10.6	10.9	11.1	9.9	8.5	7.7	7.6	8.1	8.3	8.4	8.2	8.0	8.1	10.2	15.0
18-Aug	8.2	8.7	8.9	9.0	8.1	7.9	9.6	15.2	26.5	60.3	84.8	95.1	99.2	84.7	80.1	67.4	49.8	46.7	47.6	36.5	25.4	22.0	31.6	39.7	40.5	99.2
19-Aug	42.6	41.8	36.7	29.4	25.2	19.5	14.6	8.8	7.8	8.4	7.9	6.7	6.0	6.7	6.9	7.5	8.3	7.3	6.8	7.0	6.9	7.1	7.4	7.3	13.9	42.6
20-Aug	7.1	7.5	7.8	7.7	7.7	8.0	8.1	8.2	7.7	7.2	7.0	6.8	7.0	7.0	6.7	6.8	7.2	7.2	7.3	7.9	8.2	7.5	7.1	7.4	7.4	8.2
21-Aug	7.8	7.4	8.2	8.9	9.2	9.2	9.2	8.7	8.1	7.9	7.6	9.1	9.2	8.7	8.3	8.4	8.3	8.8	10.3	14.2	16.0	16.5	18.8	19.2	10.3	19.2
22-Aug	19.2	19.4	19.5	20.0	20.0	19.5	18.9	19.4	20.7	21.5	26.7	26.3	24.6	23.4	23.3	24.1	23.4	21.2	20.9	23.0	23.4	22.2	25.4	24.4	22.1	26.7
23-Aug	25.1	26.0	27.6	27.0	23.3	24.9	25.3	24.8	24.0	22.8	21.5	18.5	18.1	17.7	16.2	14.6	14.7	14.8	15.4	15.4	16.2	18.6	18.9	19.6	20.4	27.6
24-Aug	20.1	21.0	21.0	21.1	21.9	28.0	46.1	49.4	60.6	49.9	41.3	39.0	34.9	27.7	27.2	26.1	25.3	24.7	22.7	24.2	23.5	23.4	24.0	23.4	30.3	60.6
25-Aug	16.6	69.6	88.7	97.0	91.2	82.4	74.8	68.8	49.9	66.6	53.4	29.7	19.1	23.7	29.3	38.4	59.6	59.3	49.6	48.0	48.2	42.4	38.4	38.3	53.5	97.0
26-Aug	35.8	32.4	29.4	24.5	20.9	17.7	16.2	13.9	11.9	12.3	14.9	15.8	14.3	17.3	24.6	27.5	21.0	22.7	55.3	67.0	60.5	57.2	57.9	73.8	31.0	73.8
27-Aug	131.0	215.0	300.2	303.5	278.2	223.4	180.5	180.9	185.8	165.6	169.2	165.2	104.3	99.2	69.1	51.7	46.6	51.6	68.2	63.9	118.1	169.4	186.0	167.2	153.9	303.5
28-Aug	143.3	108.6	88.2	92.4	72.4	63.3	63.3	60.7	59.6	62.8	65.2	66.1	62.3	61.7	57.7	48.2	50.1	48.3	61.2	67.9	69.1	65.0	66.1	65.4	69.5	143.3
29-Aug	65.6	63.3	64.2	63.5	62.2	60.6	58.5	58.8	59.9	61.5	61.5	63.3	60.7	64.3	51.4	36.6	35.8	34.9	35.9	36.3	36.9	36.9	36.9	35.7	51.9	65.6
30-Aug	36.6	35.9	35.3	33.3	32.4	35.4	35.1	34.6	33.1	32.0	31.4	36.5	23.7	13.6	C	C	C	14.1	22.3	21.5	21.5	18.4	12.8	14.0	27.3	36.6
31-Aug	16.5	22.9	31.9	38.3	26.3	84.2	264.6	303.9	263.2	233.7	211.5	198.4	166.8	115.4	127.1	114.1	120.8	139.9	180.0	267.7	277.9	263.7	259.5	262.9	166.3	303.9
27.6 31.5 35.2 35.3 31.8 31.0 35.2 36.4 35.7 36.7 37.6 39.0 33.0 29.5 27.6 24.7 23.9 24.7 27.8 30.6 32.6 33.8 34.2 34.5																								Diurnal Average		
143.3 215.0 300.2 303.5 278.2 223.4 264.6 303.9 263.2 233.7 211.5 198.4 166.8 115.4 127.1 114.1 120.8 139.9 180.0 267.7 277.9 263.7 259.5 262.9																								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}) - $\mu\text{g}/\text{m}^3$
Stony Mountain - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	113	15.25	15.25
6 - 15	239	32.25	47.50
16 - 25	132	17.81	65.32
26 - 80	204	27.53	92.85
> 81.0	53	7.15	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
Stony Mountain - August 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	4	8	7	2	2	10	23	4	0	3	5	13	8	8	4	12	113
6 - 15	10	9	7	7	18	3	2	5	0	17	39	20	15	34	45	8	239
16 - 25	5	3	10	2	7	10	8	7	5	14	5	2	10	17	23	4	132
26 - 80	11	12	7	6	7	4	2	4	10	30	25	6	17	19	17	16	193
> 81.0	3	2	0	1	0	2	2	0	4	3	0	2	4	14	11	5	53
Totals	33	34	31	18	34	29	37	20	19	67	74	43	54	92	100	45	730

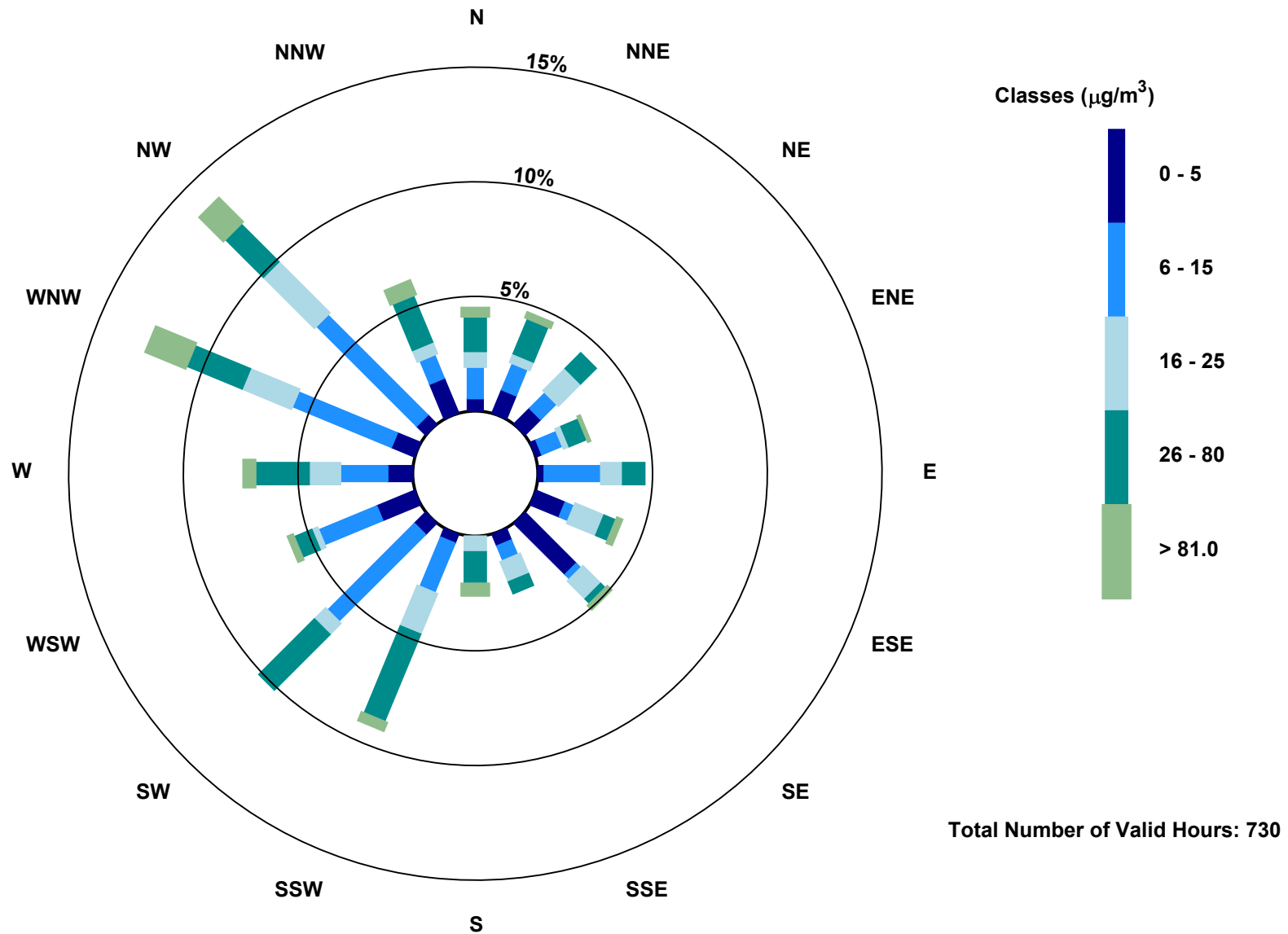
Total Number of Valid Hours: 730

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

Carbon Monoxide (CO) - ppm
Stony Mountain - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 2.2 ppm on Sep 1 00:00	Maximum Daily Average: 1.3 ppm on Aug 31
Minimum Value: 0.1 ppm on Aug 14 06:00	Hours of Data: 710
Maximum Diurnal Average: 0.4 ppm at hour 12	Hours of Missing Data: 34
Monthly Average: 0.38 ppm	Hours of Calibration: 34
Minimum Daily Average: 0.2 ppm on Aug 8	Percent Operational Time: 100.0
Minimum Diurnal Average: 0.3 ppm at hour 5	
Percentiles: P ₁ = 0.2 P ₁₀ = 0.2 Q ₁ = 0.2 Median = 0.3 Q ₃ = 0.4 P ₉₀ = 0.6 P ₉₉ = 1.8	

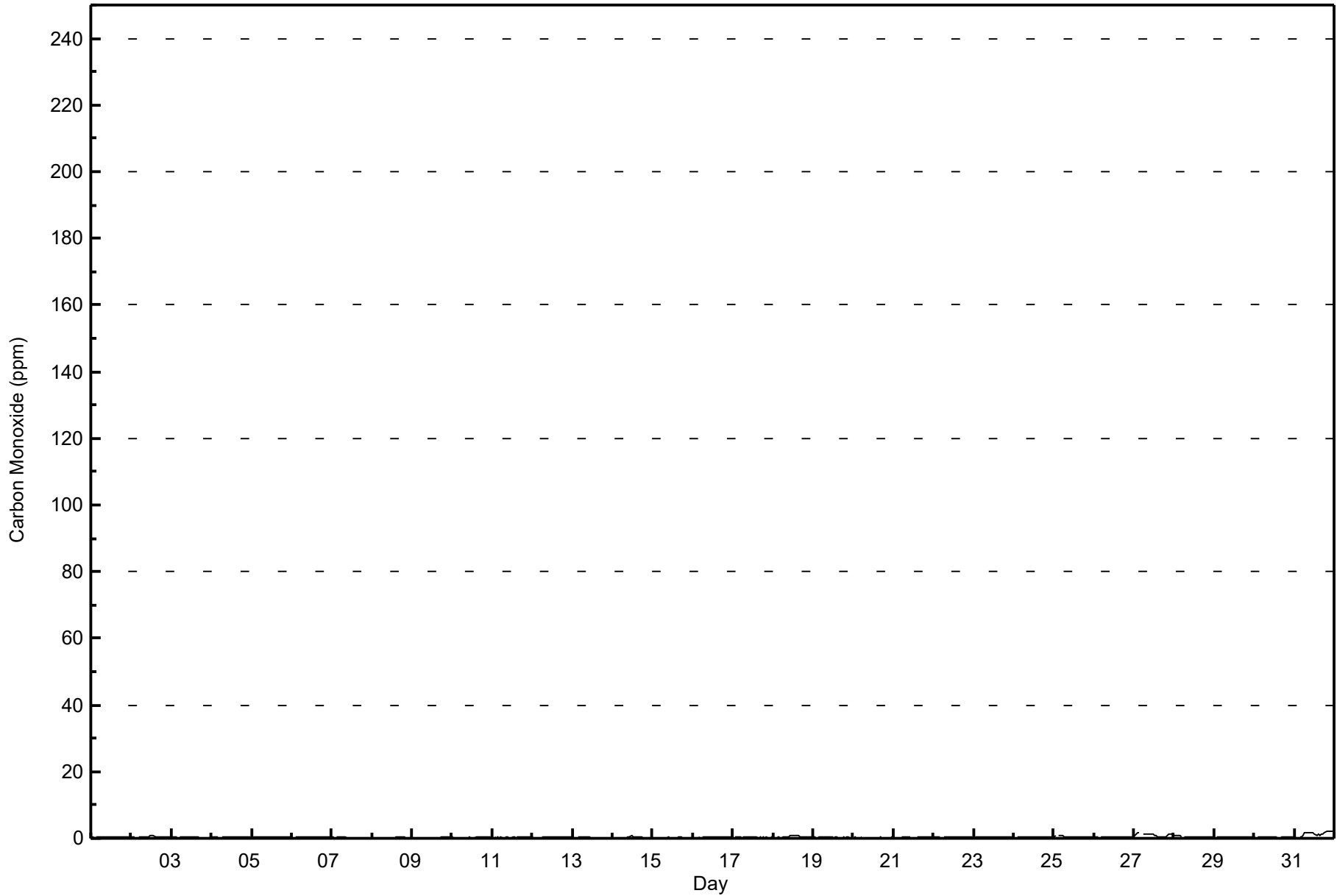
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	0.2	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4																							
2-Aug	0.4	0.4	0.5	Z	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7																						
3-Aug	0.6	0.6	0.6	0.6	Z	0.5	0.5	0.4	0.4	0.4	0.3	0.3	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	0.6																							
4-Aug	0.3	0.3	0.3	0.3	0.4	Z	0.4	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	0.3	0.3	0.3	0.3	0.4																							
5-Aug	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	0.4																							
6-Aug	0.3	Z	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5																							
7-Aug	0.4	0.4	Z	0.4	0.4	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	0.2	0.2	0.4																							
8-Aug	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	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3																							
9-Aug	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																							
10-Aug	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																							
11-Aug	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																							
12-Aug	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	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																							
13-Aug	0.3	0.4	Z	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	0.2	0.2	0.2	0.2	0.2	0.4																							
14-Aug	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7																							
15-Aug	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																							
16-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.3	0.3	0.3	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																							
17-Aug	Z	0.3	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	0.3																							
18-Aug	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.7	0.8	0.8	0.8	0.7	0.7	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.8																							
19-Aug	0.4	0.4	Z	0.4	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	0.2	0.2	0.2	0.4																							
20-Aug	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																							
21-Aug	0.2	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.3	C	C	C	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3																							
22-Aug	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.4	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	0.4	0.4																							
23-Aug	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																							
24-Aug	0.4	Z	0.4	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.5	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	0.6																							
25-Aug	0.3	0.6	Z	0.8	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.8																							
26-Aug	0.4	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6																							
27-Aug	0.9	1.4	1.8	1.8	Z	1.3	1.1	1.2	1.2	1.1	1.1	1.1	0.7	0.7	0.5	0.4	0.4	0.4	0.5	0.5	0.8	1.2	1.3	1.2	1.2	1.8																							
28-Aug	1.0	0.8	0.7	0.7	0.6	Z	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.0																							
29-Aug	Z	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6																							
30-Aug	0.5	Z	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.5																							
31-Aug	0.2	0.3	Z	0.3	0.3	0.7	1.7	1.8	1.6	1.6	1.6	1.5	1.3	1.0	1.1	1.0	1.1	1.3	1.6	2.2	2.2	2.1	2.1	2.2	2.2	2.2																							
																								0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Diurnal Average
																								1.0	1.4	1.8	1.8	0.7	1.3	1.7	1.8	1.6	1.6	1.6	1.5	1.3	1.0	1.1	1.0	1.1	1.3	1.6	2.2	2.2	2.1	2.1	2.2	2.2	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
Stony Mountain - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Monoxide (CO) - ppm
Stony Mountain - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.3	447	62.96	62.96
0.4 - 0.5	161	22.68	85.63
0.6 - 0.7	63	8.87	94.51
0.8 - 1.4	25	3.52	98.03
1.5 - 10	14	1.97	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
Stony Mountain - August 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	18	24	11	7	24	23	30	12	4	32	43	32	33	63	67	24	447
0.4 - 0.5	7	6	19	7	6	3	4	8	10	18	12	1	9	13	17	10	150
0.6 - 0.7	3	2	0	2	3	1	1	0	1	10	14	8	7	3	3	5	63
0.8 - 1.4	3	1	0	1	0	2	1	0	4	2	0	0	1	4	4	2	25
1.5 - 10	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4	2	14
> 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	31	33	30	17	33	29	36	20	19	62	69	41	50	91	95	43	699

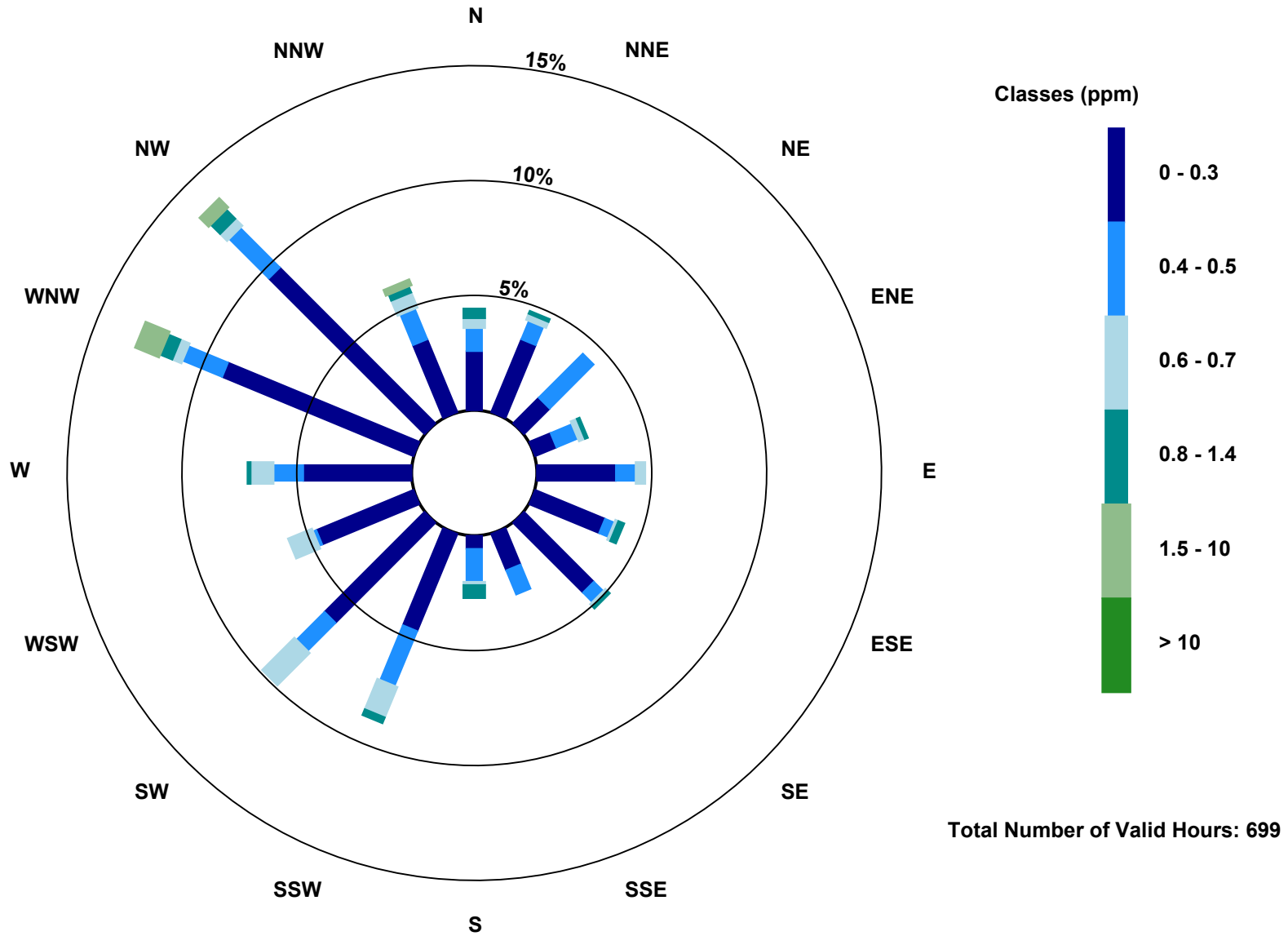
Total Number of Valid Hours: 699

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Carbon Monoxide (CO) - ppm
Stony Mountain





Wood Buffalo Environmental Association
Summary of Hour Averages

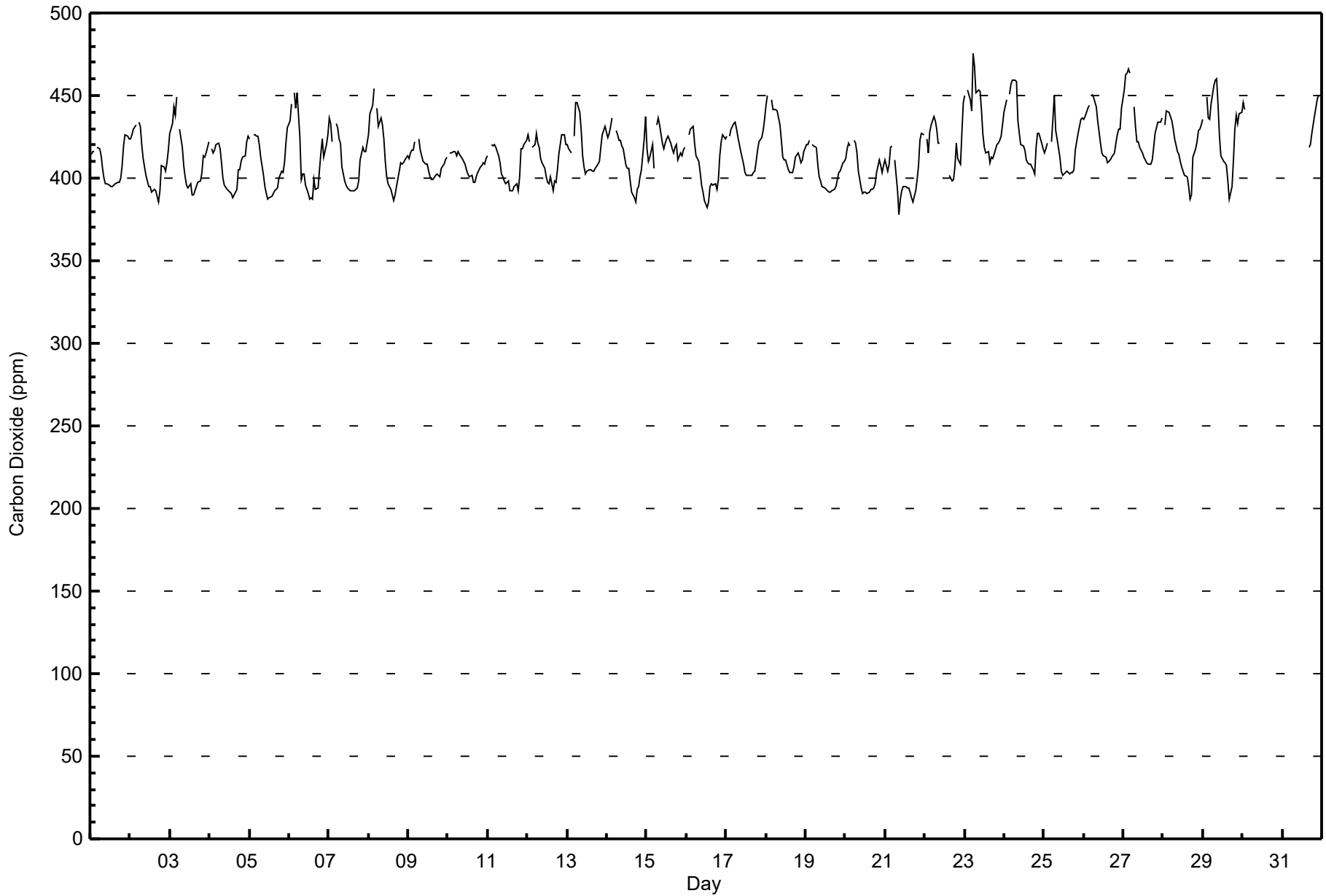
Carbon Dioxide (CO₂) - ppm
Stony Mountain - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 475.8 ppm on Aug 23 06:00 Maximum Daily Average: 434.0 ppm on Aug 23 Minimum Value: 378.3 ppm on Aug 21 09:00 Minimum Daily Average: 401.9 ppm on Aug 21 Maximum Diurnal Average: 434.8 ppm at hour 6 Minimum Diurnal Average: 398.1 ppm at hour 16 Monthly Average: 414.99 ppm Percentiles: P ₁ = 386.4 P ₁₀ = 393.1 Q ₁ = 401.7 Median = 413.7 Q ₃ = 425.8 P ₉₀ = 438.3 P ₉₉ = 459.7																								Hours in Service: 744 Hours of Data: 672 Hours of Missing Data: 72 Hours of Calibration: 35 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-Aug	414.2	415.8	416.0	Z	418.9	417.4	413.9	405.8	399.8	396.9	396.2	396.0	395.0	394.7	395.6	396.2	397.6	397.6	399.8	407.4	419.4	426.0	425.2	423.7	407.4	426.0
2-Aug	423.5	426.5	429.4	432.0	Z	434.0	431.3	420.0	411.6	401.3	398.0	394.9	395.0	391.6	392.9	392.8	389.3	385.9	392.0	407.4	406.5	404.0	409.0	416.9	408.1	434.0
3-Aug	427.3	433.3	443.4	438.1	449.2	Z	429.4	418.5	407.5	400.5	395.8	394.2	396.5	389.7	389.9	392.2	394.7	397.1	398.5	403.8	413.3	412.9	415.3	421.9	411.4	449.2
4-Aug	Z	417.8	415.2	416.7	420.5	421.5	417.9	409.0	399.8	395.7	393.3	392.7	391.2	390.6	388.5	390.1	393.1	405.4	404.9	410.1	412.8	413.8	422.3	425.6	406.5	425.6
5-Aug	423.7	Z	426.0	426.2	425.5	425.5	420.8	412.7	401.9	394.7	391.1	387.4	388.4	388.7	390.9	392.1	393.5	394.3	399.7	404.3	403.4	409.0	421.2	430.6	406.6	430.6
6-Aug	434.5	444.7	Z	451.5	442.7	451.8	424.5	399.5	402.4	402.4	396.0	391.0	387.5	388.4	386.9	398.8	393.2	393.7	405.0	415.1	423.5	412.5	420.2	425.9	412.7	451.8
7-Aug	436.6	432.7	421.9	Z	432.6	430.1	423.8	421.4	407.1	398.7	396.1	393.8	393.4	392.2	392.2	392.5	393.0	393.8	398.4	411.3	418.7	416.5	416.2	421.0	410.2	436.6
8-Aug	425.9	438.6	444.4	454.3	Z	442.1	431.7	436.6	431.8	424.0	410.2	401.2	396.7	392.8	390.1	386.4	390.1	394.9	404.5	409.6	408.2	409.6	410.9	413.4	415.1	454.3
9-Aug	411.5	415.4	416.9	416.7	422.0	Z	423.6	417.1	414.0	409.8	408.7	408.5	404.6	401.0	399.4	398.8	401.9	402.1	402.1	401.3	405.6	408.2	411.1	413.0	409.3	423.6
10-Aug	Z	415.0	414.9	415.9	416.2	413.6	416.0	414.3	411.9	410.0	408.5	405.0	402.4	400.7	402.1	397.1	397.3	401.0	403.7	406.6	408.0	409.3	408.8	411.6	408.3	416.2
11-Aug	413.4	Z	420.6	419.7	420.2	418.9	413.9	409.0	402.2	401.1	398.0	396.6	398.4	392.7	392.1	392.1	394.6	396.9	392.6	401.1	418.0	417.4	420.4	422.5	406.6	422.5
12-Aug	425.9	421.6	Z	418.5	420.5	426.9	421.0	418.5	411.9	409.3	405.9	401.2	397.8	397.0	401.0	392.7	398.6	397.2	405.0	414.6	426.4	426.6	425.9	420.5	412.4	426.9
13-Aug	420.0	417.8	415.5	Z	425.2	445.8	446.1	439.5	428.6	413.9	406.8	402.5	403.9	405.2	405.0	404.1	404.3	406.1	408.6	410.6	418.6	426.2	429.2	431.6	418.1	446.1
14-Aug	424.9	427.1	431.6	436.1	Z	428.6	426.4	423.2	423.3	419.9	418.1	407.8	406.1	405.9	398.4	391.3	388.3	385.5	392.9	395.1	401.1	404.9	423.6	437.6	412.9	437.6
15-Aug	417.8	410.1	412.4	420.5	405.6	Z	432.1	436.4	432.1	421.2	418.1	420.8	423.8	425.7	421.0	417.6	415.5	418.4	420.3	410.7	415.7	413.7	416.6	418.6	419.3	436.4
16-Aug	Z	426.5	429.5	430.7	431.3	421.1	413.2	409.9	403.3	396.0	391.7	386.5	382.5	385.2	394.9	396.2	396.0	396.6	393.0	399.1	413.2	421.7	426.5	423.5	407.3	431.3
17-Aug	425.5	Z	425.8	429.6	432.9	434.1	429.7	424.9	420.1	416.3	408.3	403.8	401.7	401.7	401.7	401.5	403.4	404.7	409.8	417.0	421.7	424.8	428.8	435.5	417.5	435.5
18-Aug	444.4	450.0	Z	447.1	441.8	441.7	441.6	440.7	432.5	422.6	412.3	411.4	410.9	405.0	403.7	403.3	403.1	406.8	412.7	415.2	412.4	409.5	411.2	416.3	421.6	450.0
19-Aug	420.3	420.6	422.8	Z	420.6	419.5	418.7	408.8	400.6	397.9	395.1	394.2	393.5	392.7	391.3	391.8	392.0	393.0	394.8	399.6	403.2	404.5	408.9	410.4	404.1	422.8
20-Aug	412.2	418.0	420.9	419.7	Z	422.9	421.5	415.4	404.3	393.8	391.0	391.6	391.2	390.3	391.5	393.4	393.6	394.3	397.0	403.4	410.9	407.7	403.2	407.8	404.2	422.9
21-Aug	411.1	404.4	408.9	418.5	419.2	Z	411.2	392.7	378.3	387.1	392.0	395.3	394.8	394.2	394.4	391.2	388.4	385.9	392.3	399.3	407.9	422.5	427.3	426.4	401.9	427.3
22-Aug	Z	423.7	414.9	427.8	432.3	437.4	434.4	429.4	421.0	420.8	C	C	C	C	C	401.9	398.5	399.2	407.0	421.0	412.1	408.6	427.8	445.4	420.2	445.4
23-Aug	450.4	Z	453.2	447.9	440.9	475.8	467.5	451.9	453.7	452.3	440.6	426.0	418.8	415.3	416.0	409.4	412.8	411.5	414.7	420.2	421.4	422.5	425.8	432.5	434.0	475.8
24-Aug	439.9	447.4	Z	450.4	456.5	459.2	459.6	458.5	434.9	426.9	420.5	419.7	416.5	411.0	409.0	408.2	408.8	405.3	402.5	418.3	427.5	426.8	421.6	417.8	428.1	459.6
25-Aug	415.1	418.2	421.1	Z	422.3	435.6	450.0	429.1	424.1	412.5	404.2	401.5	402.2	403.3	404.2	402.5	403.0	403.4	405.2	417.1	427.1	431.4	435.4	436.8	417.6	450.0
26-Aug	436.0	437.7	442.3	443.8	Z	450.7	449.3	442.9	435.1	427.8	421.1	415.2	413.6	412.6	409.6	409.8	411.1	412.7	415.1	421.4	425.9	429.6	429.6	442.1	427.6	450.7
27-Aug	453.7	462.3	463.4	465.7	463.9	Z	443.5	431.3	422.3	421.9	419.0	415.1	412.7	411.4	409.3	408.6	408.5	411.1	418.5	426.9	430.8	433.8	433.7	436.1	430.6	465.7
28-Aug	Z	432.3	440.4	439.7	437.5	434.4	429.4	423.8	416.5	414.3	410.1	406.5	403.8	401.9	400.6	395.1	387.0	389.5	412.4	418.0	422.1	429.1	429.9	431.9	417.7	440.4
29-Aug	435.2	Z	449.1	436.5	435.3	445.2	455.6	459.6	459.8	444.5	425.8	413.4	410.3	409.4	407.7	398.1	387.6	394.8	411.4	429.7	438.4	433.0	439.2	439.7	428.7	459.8
30-Aug	445.6	441.4	Z	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	445.6
31-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	418.4	420.2	427.5	438.0	443.2	447.9	450.0	450.0	--	450.0
427.5 428.0 428.0 433.5 430.6 434.8 430.9 424.2 417.0 411.5 406.2 402.6 401.2 399.7 399.3 398.1 398.6 400.0 404.7 411.8 417.2 418.8 422.5 426.2																								Diurnal Average		
453.7 462.3 463.4 465.7 463.9 475.8 467.5 459.6 459.8 452.3 440.6 426.0 423.8 425.7 421.0 417.6 418.4 420.2 427.5 438.0 443.2 447.9 450.0 450.0																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Carbon Dioxide (CO₂) - ppm
Stony Mountain - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Stony Mountain - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
400 - 420	282	41.96	41.96
420 - 440	180	26.79	68.75
440 - 460	54	8.04	76.79
460 - 480	6	0.89	77.68
480 - 500	0	0.00	77.68
> 500	0	0.00	77.68

Total Number of Valid Hours: 672

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Carbon Dioxide (CO₂) - ppm
Stony Mountain - August 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	7	16	11	7	11	13	23	11	7	14	29	21	26	28	33	18	275
420 - 440	7	7	8	3	8	7	4	2	7	25	22	12	17	22	23	2	176
440 - 460	8	3	3	1	1	0	0	0	1	13	8	1	1	4	3	7	54
460 - 480	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	2	6
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	22	26	22	11	20	20	27	14	15	53	59	34	44	54	61	29	511

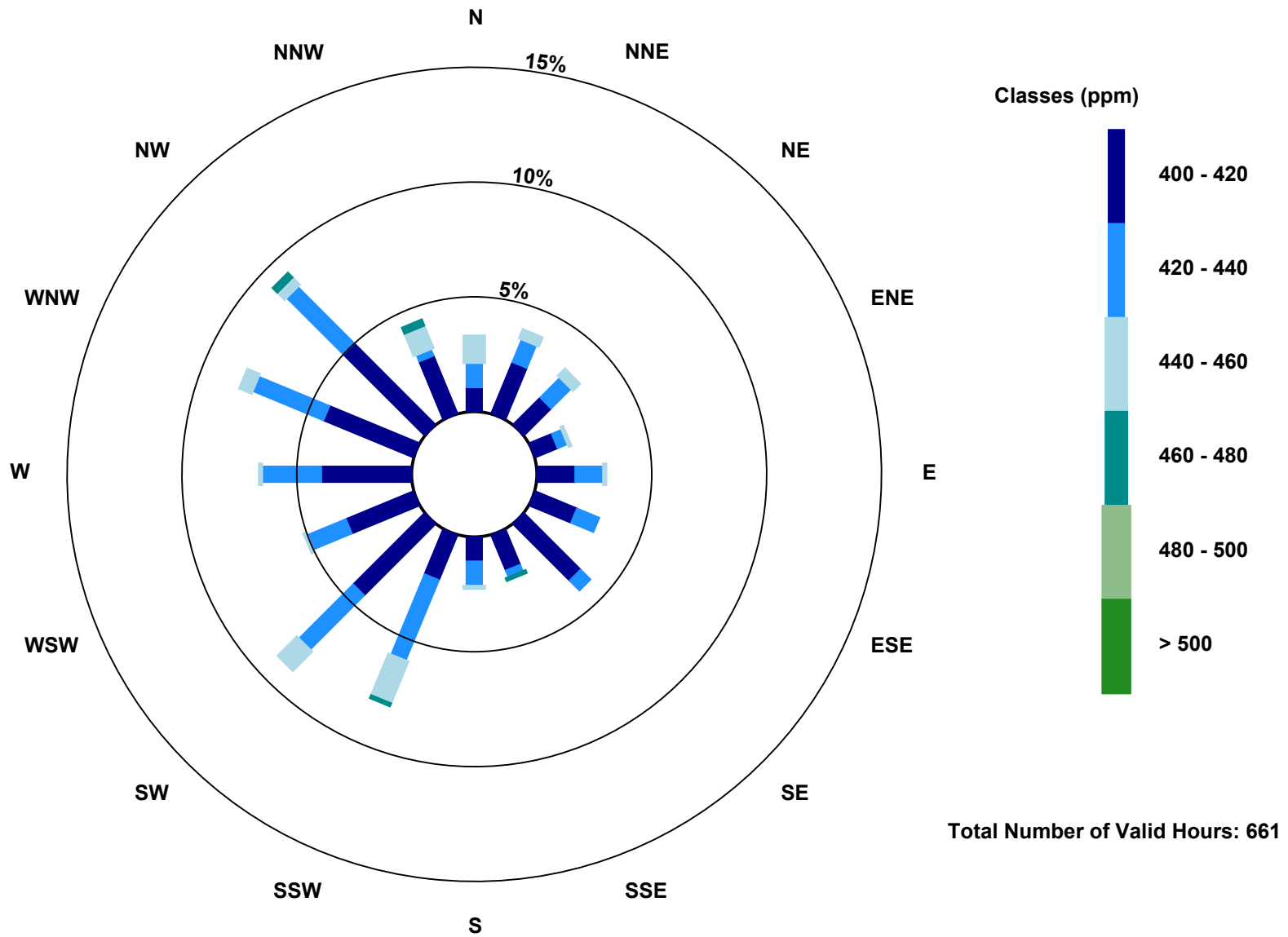
Total Number of Valid Hours: 661

Total Number of Hours: 744



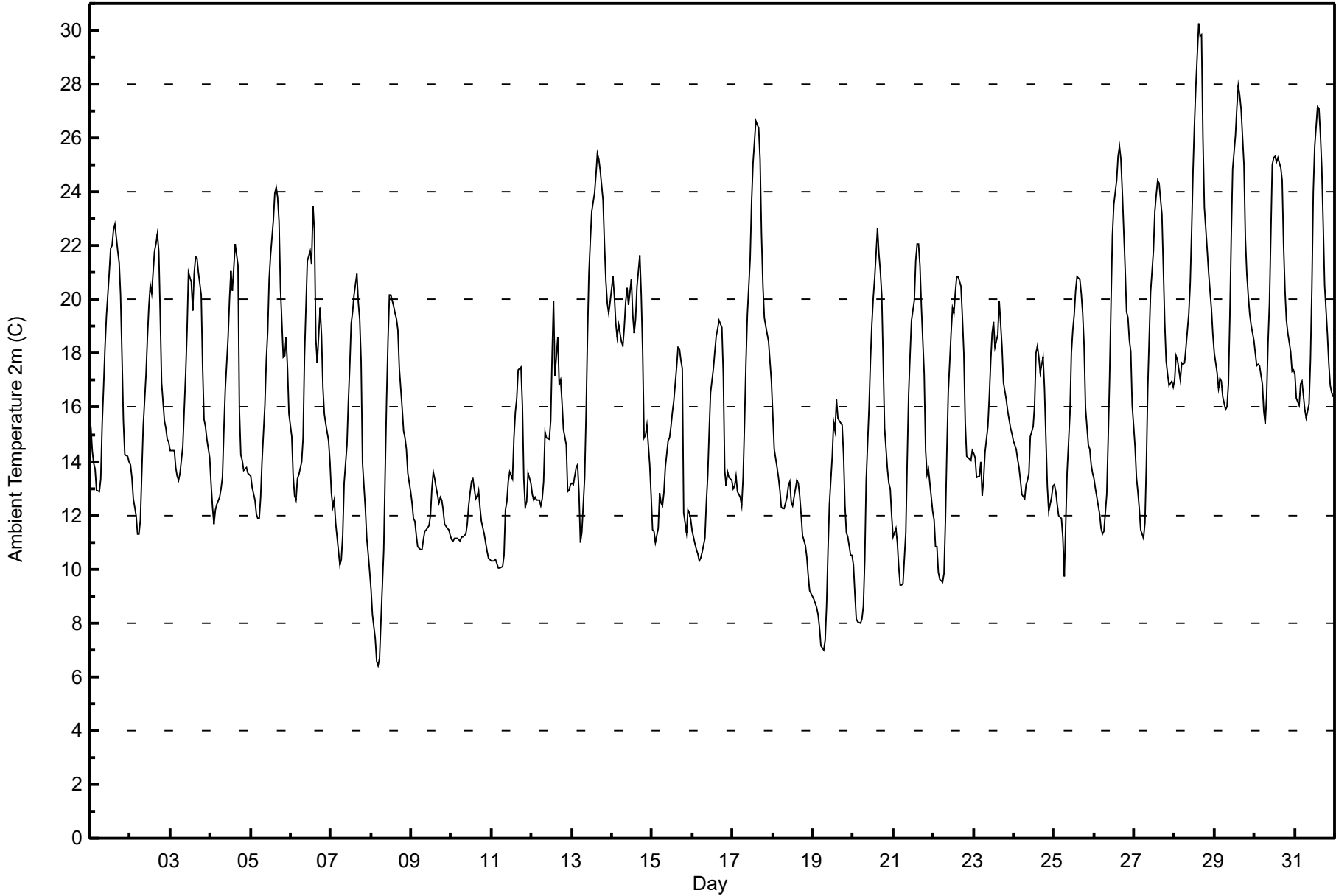
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Carbon Dioxide (CO₂) - ppm
Stony Mountain





Maximum Value: 30.3 C on Aug 28 15:00		Maximum Daily Average: 21.8 C on Aug 28		Hours in Service:	744																						
Minimum Value: 6.4 C on Aug 8 05:00		Minimum Daily Average: 11.4 C on Aug 19		Hours of Data:	744																						
Maximum Diurnal Average: 21.0 C at hour 16		Minimum Diurnal Average: 12.0 C at hour 6		Hours of Missing Data:	0																						
Monthly Average: 16.06 C		Percentiles: P ₁ = 7.9 P ₁₀ = 11.0 Q ₁ = 12.7 Median = 15.3 Q ₃ = 19.2 P ₉₀ = 22.0 P ₉₉ = 27.1		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-Aug	15.3	14.4	13.9	13.7	12.9	12.9	13.4	15.4	16.8	18.2	19.4	21.0	21.9	22.0	22.6	22.8	21.8	21.4	20.2	17.9	15.5	14.2	14.2	14.0	17.3	22.8	
2-Aug	13.9	13.4	12.6	12.0	11.3	11.3	11.8	13.5	15.3	17.2	18.6	19.8	20.6	20.2	21.8	22.0	22.4	21.8	19.5	16.9	15.5	15.3	14.8	14.7	16.5	22.4	
3-Aug	14.4	14.4	14.4	13.8	13.5	13.3	13.6	14.6	15.9	17.3	18.9	21.0	20.7	19.6	21.0	21.6	21.6	21.0	20.2	17.5	15.6	15.3	14.8	14.1	17.0	21.6	
4-Aug	13.1	12.3	11.7	12.2	12.4	12.7	13.0	13.4	15.1	16.7	18.6	20.0	21.1	20.4	21.2	22.1	21.3	15.9	14.3	14.0	13.6	13.7	13.6	13.5	15.6	22.1	
5-Aug	13.5	13.0	12.5	12.0	11.9	11.9	12.7	14.0	16.1	17.8	18.8	20.8	21.6	23.0	23.9	24.2	23.8	22.9	20.4	17.8	17.9	18.6	17.5	15.8	17.6	24.2	
6-Aug	14.9	13.5	12.7	12.6	13.4	13.5	14.0	14.9	17.9	19.7	21.4	21.8	21.4	23.5	22.5	18.5	17.7	19.7	18.7	16.8	15.7	15.4	14.7	14.0	17.0	23.5	
7-Aug	12.8	12.3	12.6	11.7	10.7	10.2	10.3	11.3	13.2	14.6	16.2	17.6	19.1	19.5	20.2	20.9	19.9	19.3	17.7	13.9	12.2	11.1	10.5	9.9	14.5	20.9	
8-Aug	9.2	8.3	7.4	6.6	6.4	6.7	8.0	10.7	13.6	16.3	18.5	20.2	20.2	19.8	19.5	19.3	18.9	17.4	16.0	15.1	14.9	14.4	13.6	12.9	13.9	20.2	
9-Aug	12.4	11.9	11.8	11.2	10.8	10.7	10.7	11.1	11.4	11.4	11.6	12.0	13.0	13.6	13.3	13.0	12.5	12.6	12.6	12.2	11.7	11.5	11.4	11.2	11.9	13.6	
10-Aug	11.1	11.0	11.1	11.1	11.1	11.0	11.2	11.2	11.3	11.7	12.4	12.8	13.2	13.3	12.6	12.7	12.9	12.3	11.8	11.3	11.0	10.7	10.4	10.3	11.6	13.3	
11-Aug	10.3	10.3	10.3	10.2	10.1	10.0	10.1	10.5	12.2	12.5	13.2	13.6	13.3	14.9	15.8	16.4	17.4	17.5	16.1	13.3	12.3	12.5	13.6	13.2	12.9	17.5	
12-Aug	12.8	12.6	12.6	12.6	12.6	12.4	12.6	13.2	15.1	14.8	14.8	15.5	17.9	20.0	17.2	18.6	16.9	17.0	16.2	15.2	14.6	12.9	12.9	13.1	14.8	20.0	
13-Aug	13.2	13.1	13.8	13.8	12.8	11.0	11.3	13.4	15.7	18.6	20.9	22.2	23.3	23.9	24.7	25.4	25.2	24.8	23.7	22.0	20.7	19.8	19.5	19.9	18.9	25.4	
14-Aug	20.9	20.1	19.1	18.6	19.1	18.5	18.3	19.0	19.9	20.4	19.8	20.8	19.4	18.7	19.3	20.5	21.6	20.2	18.1	14.9	15.0	15.3	13.9	12.7	18.5	21.6	
15-Aug	11.5	11.4	11.0	11.5	12.8	12.4	12.4	12.8	13.7	14.8	14.9	15.3	15.8	16.2	17.5	18.2	18.2	17.7	17.5	12.1	11.4	12.2	12.1	11.8	14.0	18.2	
16-Aug	11.4	11.0	10.7	10.5	10.3	10.4	10.6	11.1	12.5	13.4	15.1	16.5	17.4	18.1	18.7	18.9	19.3	18.9	17.3	13.7	13.1	13.6	13.4	13.3	14.1	19.3	
17-Aug	13.0	13.1	13.4	12.9	12.7	12.3	13.4	15.4	17.7	19.4	21.6	23.6	25.0	25.8	26.6	26.4	25.2	22.5	20.5	19.3	19.0	18.5	17.7	17.0	18.8	26.6	
18-Aug	15.7	14.5	13.7	13.4	13.0	12.3	12.3	12.2	12.7	13.1	13.2	12.5	12.3	13.0	13.3	13.2	12.7	12.0	11.2	10.9	10.5	9.8	9.2	9.1	12.3	15.7	
19-Aug	8.9	8.7	8.6	8.3	7.8	7.2	7.0	7.4	8.6	10.6	12.4	14.2	15.4	15.1	16.3	15.6	15.5	15.3	14.2	12.4	11.3	11.2	10.5	10.5	11.4	16.3	
20-Aug	10.1	9.1	8.2	8.0	8.0	8.1	8.6	10.4	13.3	16.0	17.7	19.1	20.1	20.8	22.6	21.7	21.1	20.2	17.8	15.2	13.7	13.2	13.0	12.0	14.5	22.6	
21-Aug	11.2	11.5	11.0	10.1	9.4	9.4	9.4	11.4	14.0	16.5	17.9	19.2	20.0	21.4	22.1	22.1	21.3	19.8	17.3	14.4	13.5	13.7	13.2	12.1	15.1	22.1	
22-Aug	11.8	10.8	10.8	9.9	9.6	9.5	9.8	11.8	14.4	16.6	18.8	19.7	19.5	20.3	20.8	20.9	20.5	19.3	18.0	15.4	14.2	14.1	14.0	14.4	15.2	20.9	
23-Aug	14.3	14.1	13.4	13.5	14.0	12.7	13.3	14.3	15.3	16.4	17.7	18.8	19.2	18.3	18.7	19.9	19.1	18.2	16.9	16.3	15.9	15.5	15.2	15.0	16.1	19.9	
24-Aug	14.8	14.4	14.1	13.8	13.3	12.8	12.6	13.1	13.3	13.5	14.9	15.3	16.1	18.0	18.3	17.9	17.3	17.9	16.7	14.9	13.1	12.1	12.7	13.1	14.7	18.3	
25-Aug	13.1	12.9	12.4	12.0	11.9	11.1	9.7	11.7	13.6	15.8	18.0	18.9	19.5	20.3	20.8	20.7	20.2	19.5	18.3	16.0	14.6	14.4	13.9	13.6	15.5	20.8	
26-Aug	13.3	13.0	12.3	12.1	11.5	11.3	11.4	12.8	14.8	17.1	19.8	22.4	23.5	24.4	25.3	25.7	25.2	24.0	21.2	19.6	19.3	18.5	18.1	16.1	18.0	25.7	
27-Aug	14.5	13.4	12.9	12.2	11.5	11.1	11.7	13.9	16.7	18.5	20.3	21.8	23.3	23.9	24.4	24.3	23.2	21.2	19.1	17.7	17.3	16.8	16.9	16.8	17.6	24.4	
28-Aug	17.0	17.9	17.8	17.0	17.7	17.6	17.6	18.2	19.5	20.6	22.5	24.8	26.5	27.9	30.3	29.8	29.9	26.0	23.4	21.9	21.0	20.3	19.6	18.7	21.8	30.3	
29-Aug	18.0	17.3	16.7	17.1	17.0	16.4	15.9	16.0	16.8	19.4	22.3	24.9	26.1	27.2	27.9	27.6	27.1	25.0	22.3	21.0	20.2	19.5	19.0	18.5	20.8	27.9	
30-Aug	18.0	17.6	17.6	17.5	16.9	15.9	15.4	16.4	18.4	19.9	25.0	25.2	25.3	25.1	25.3	24.9	24.4	22.0	20.3	19.2	18.7	18.1	17.3	17.4	20.1	25.3	
31-Aug	17.2	16.3	16.1	16.8	17.0	16.5	15.9	15.6	16.1	17.7	20.4	24.0	25.7	27.2	27.1	26.2	24.9	22.8	20.5	18.7	17.6	16.8	16.5	16.4	19.6	27.2	
		13.6	13.1	12.8	12.5	12.4	12.0	12.2	13.2	14.9	16.3	17.9	19.2	19.9	20.5	21.0	20.6	19.6	18.0	16.0	15.2	14.8	14.4	14.0	Diurnal Average		
		20.9	20.1	19.1	18.6	19.1	18.5	18.3	19.0	19.9	20.6	25.0	25.2	26.5	27.9	30.3	29.8	29.9	26.0	23.7	22.0	21.0	20.3	19.6	19.9	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature 2m (AT 2m) - C
Stony Mountain - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	34	4.57	4.57
10 - 20	563	75.67	80.24
> 20	147	19.76	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

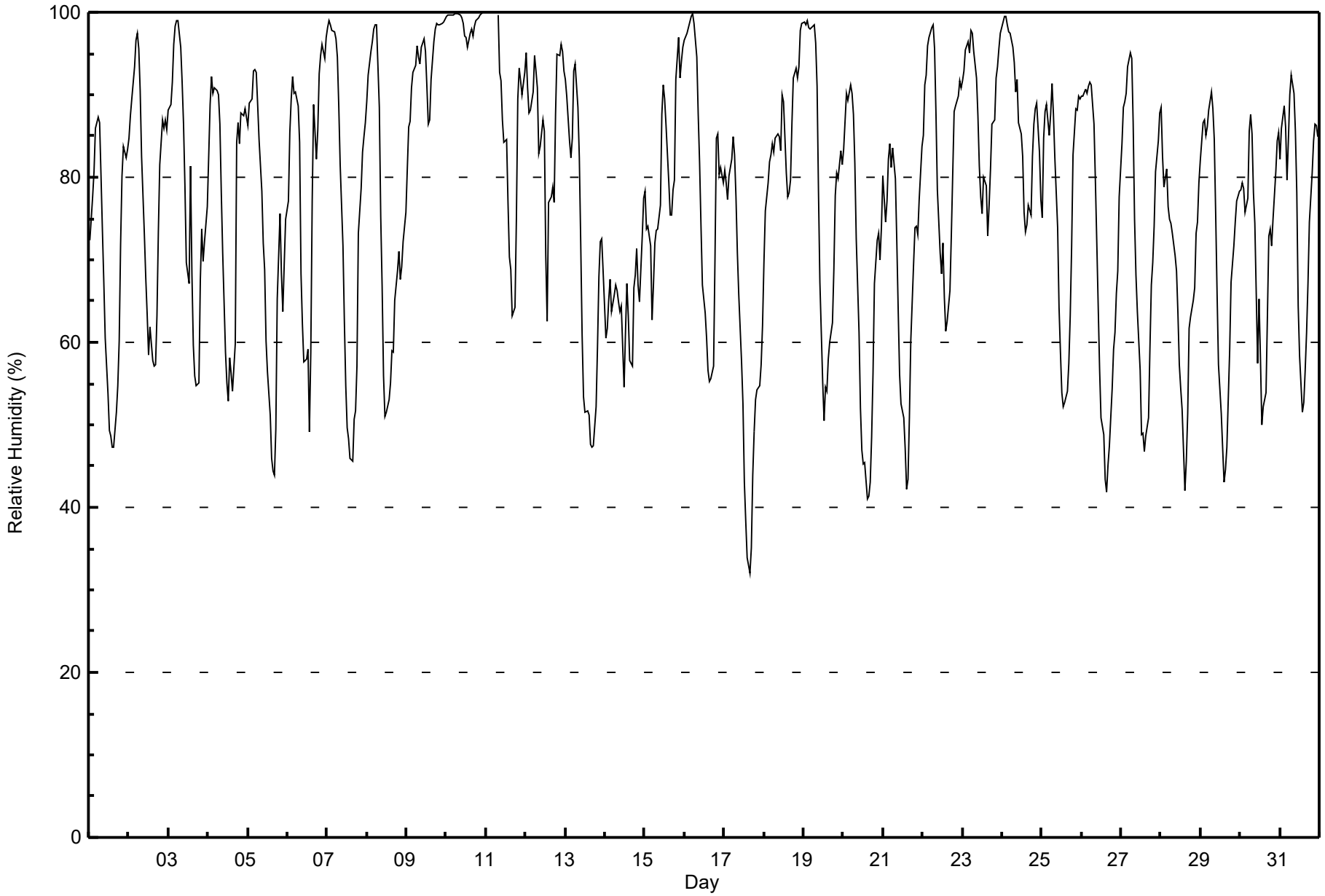
Relative Humidity (RH) - %
Stony Mountain - August 2023

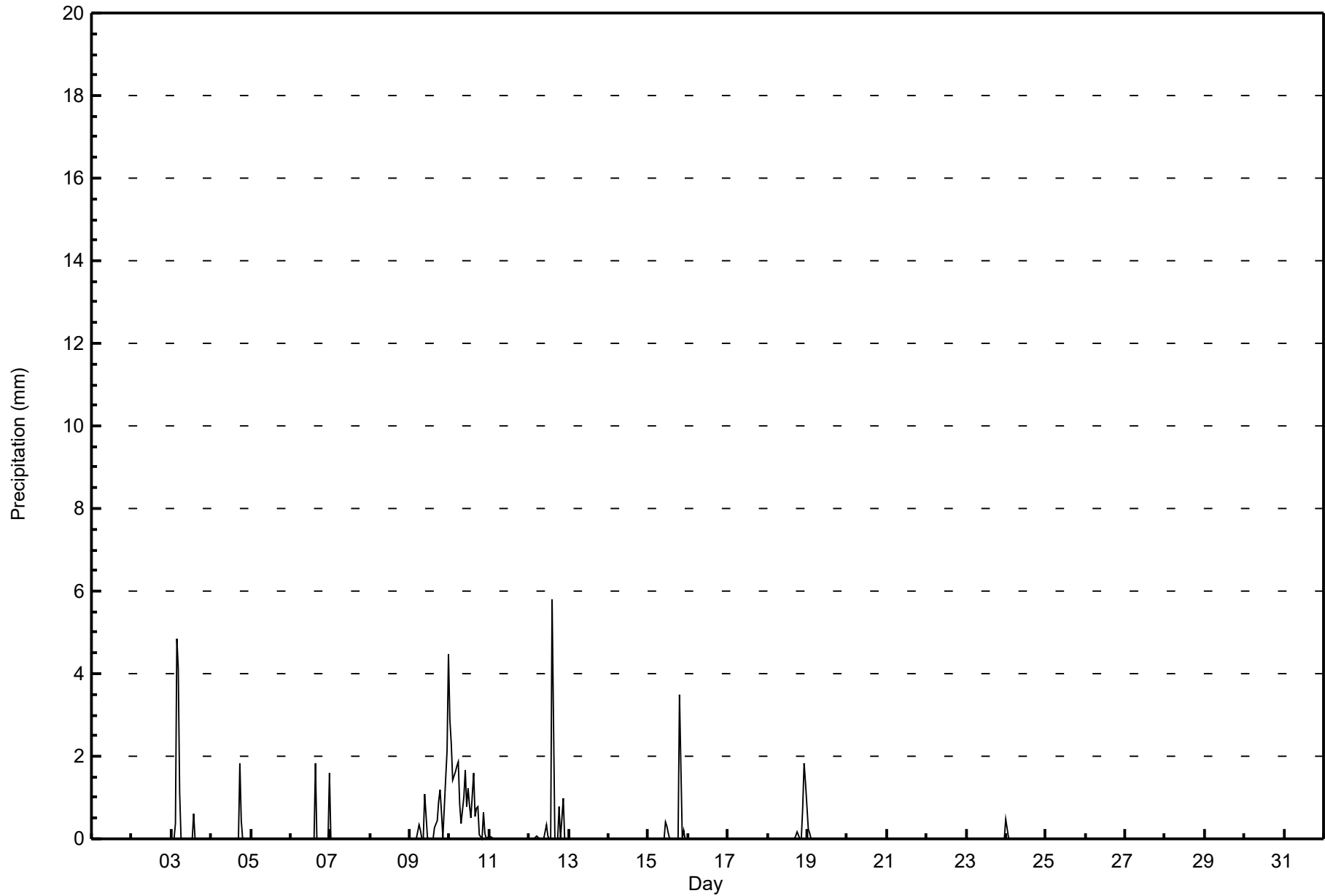
Maximum Value: 100.0 % on Aug 10 23:00		Maximum Daily Average: 98.9 % on Aug 10		Hours in Service: 744																							
Minimum Value: 32.0 % on Aug 17 16:00		Minimum Daily Average: 60.4 % on Aug 17		Hours of Data: 743																							
Maximum Diurnal Average: 90.5 % at hour 6		Minimum Diurnal Average: 58.5 % at hour 15		Hours of Missing Data: 1																							
Monthly Average: 77.06 %		Percentiles: P ₁ = 42.1 P ₁₀ = 52.8 Q ₁ = 65.0 Median = 80.0 Q ₃ = 90.1 P ₉₀ = 97.0 P ₉₉ = 100.0		Hours of Calibration: 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-Aug	72.4	74.9	77.7	80.7	85.9	87.3	86.6	80.2	73.6	67.2	60.6	53.7	49.4	48.6	47.3	47.3	51.5	54.8	60.2	71.9	80.1	83.7	82.4	83.3	69.2	87.3	
2-Aug	84.8	87.4	89.6	93.4	96.6	97.4	95.7	90.5	82.5	73.0	67.8	63.4	58.5	61.8	57.7	57.1	57.4	63.2	73.4	81.5	87.0	85.9	87.0	85.8	78.3	97.4	
3-Aug	88.1	88.9	91.5	96.1	98.3	99.0	99.0	95.8	91.5	86.4	79.1	69.7	67.0	81.4	68.3	59.6	55.9	54.7	55.1	67.4	73.7	69.8	72.1	76.4	78.5	99.0	
4-Aug	82.6	88.8	92.1	90.1	90.9	90.5	89.9	86.4	78.1	70.9	58.9	55.1	52.8	58.2	56.2	54.0	59.8	84.3	86.6	84.1	87.8	87.5	88.3	87.3	77.6	92.1	
5-Aug	86.3	89.0	89.5	92.9	93.0	92.7	88.8	84.5	78.3	72.0	68.8	60.1	56.4	51.2	46.0	44.4	43.8	49.6	65.2	75.7	68.4	63.7	69.5	74.9	71.0	93.0	
6-Aug	77.2	85.3	89.5	92.3	90.2	90.3	88.7	84.3	68.3	62.2	57.6	57.9	59.1	49.2	58.8	77.1	88.8	82.2	85.8	92.6	94.7	96.1	94.4	97.0	80.0	97.0	
7-Aug	98.1	98.9	98.4	97.9	97.6	96.8	94.6	88.6	81.6	71.7	62.5	54.8	49.6	48.3	45.9	45.6	50.7	51.7	57.1	73.2	78.7	83.1	85.0	86.7	74.9	98.9	
8-Aug	89.2	92.5	95.3	96.5	97.9	98.4	98.5	88.6	75.2	66.8	55.9	51.0	51.5	53.1	55.0	59.0	58.8	65.1	68.6	71.0	67.6	69.1	72.2	75.8	73.9	98.5	
9-Aug	80.9	86.0	86.7	90.8	92.7	93.6	95.9	94.6	93.7	95.8	96.8	95.3	91.0	86.5	86.9	91.8	96.5	98.0	98.6	98.5	98.4	98.7	98.9	99.2	93.6	99.2	
10-Aug	99.5	99.7	99.7	99.7	99.7	99.8	99.9	99.8	99.7	99.4	98.6	97.2	96.9	95.8	97.4	97.9	97.2	98.3	99.0	99.4	99.7	99.9	100.0	100.0	98.9	100.0	
11-Aug	100.0	100.0	100.0	100.0	100.0	100.0	OR	99.6	92.7	91.7	87.0	84.3	84.6	77.0	70.3	68.7	63.3	64.3	75.0	89.5	93.1	91.6	90.1	92.8	87.6	100.0	
12-Aug	95.1	90.8	87.8	88.1	90.3	94.8	92.9	90.8	82.8	83.7	87.0	85.7	70.5	62.5	76.9	77.7	78.9	77.0	87.6	95.0	94.8	96.1	95.3	92.9	86.5	96.1	
13-Aug	91.9	89.8	84.3	82.3	84.7	92.9	93.8	88.5	82.4	72.0	60.9	53.4	51.5	51.8	51.1	47.6	47.3	47.5	52.2	59.5	67.9	72.2	72.5	68.6	69.4	93.8	
14-Aug	60.4	61.6	65.1	67.6	63.7	65.7	66.9	66.2	65.0	63.8	64.4	54.6	61.3	67.2	63.2	57.8	57.1	66.6	68.2	71.3	67.0	65.0	72.8	77.4	65.0	77.4	
15-Aug	78.4	73.8	74.0	71.8	62.8	66.9	72.1	73.5	73.8	76.6	87.6	91.2	89.5	86.4	79.3	75.4	75.4	78.4	79.6	91.8	97.0	92.1	94.1	95.7	80.7	97.0	
16-Aug	96.7	97.5	98.1	98.9	99.5	99.8	98.7	94.5	87.7	81.6	74.1	67.0	63.6	60.4	56.5	55.3	55.5	57.1	70.2	84.8	85.3	80.3	81.1	79.3	80.1	99.8	
17-Aug	80.9	79.4	77.3	80.2	82.2	84.9	82.7	77.6	70.9	65.8	57.6	52.6	43.0	38.3	33.9	32.0	35.1	43.9	49.2	53.0	54.3	54.8	57.3	62.0	60.4	84.9	
18-Aug	69.7	75.9	79.3	81.9	82.7	84.1	83.1	84.8	85.2	84.9	83.2	90.1	89.2	80.5	77.6	78.1	79.7	86.5	92.0	93.3	92.0	93.5	97.7	98.7	85.2	98.7	
19-Aug	98.7	98.5	99.0	98.2	97.9	98.1	98.4	96.3	91.0	78.3	67.2	55.3	50.6	54.7	54.0	58.0	60.1	62.4	68.8	77.9	80.5	79.8	83.3	81.6	78.7	99.0	
20-Aug	83.4	86.7	90.2	89.4	91.2	90.2	87.6	81.7	72.6	61.2	52.0	47.0	45.2	45.5	41.0	41.4	43.1	48.4	56.3	67.1	72.3	73.1	70.0	73.9	67.1	91.2	
21-Aug	80.1	74.7	77.1	82.1	84.1	81.3	83.5	79.8	72.1	64.0	56.1	52.5	50.9	47.1	42.2	43.4	50.8	60.2	69.5	73.9	74.1	73.1	77.4	83.7	68.1	84.1	
22-Aug	85.1	91.3	92.4	95.9	97.0	98.1	98.5	95.5	87.7	78.4	70.8	68.4	72.1	65.4	61.3	62.6	66.2	73.1	80.5	87.9	88.7	89.8	91.6	90.9	82.9	98.5	
23-Aug	91.8	92.8	95.4	96.4	95.0	97.8	97.5	95.2	92.0	87.5	81.3	77.7	75.6	80.0	78.9	72.9	76.6	81.0	86.4	86.9	92.0	93.4	95.6	97.5	88.2	97.8	
24-Aug	98.2	99.6	99.4	98.4	97.7	97.4	95.8	93.9	90.4	91.9	86.6	85.3	82.5	75.7	73.4	74.3	76.6	75.5	82.6	86.4	88.3	89.0	83.0	77.2	87.5	99.6	
25-Aug	75.0	84.7	88.1	88.8	85.0	87.7	91.4	87.6	82.4	73.9	64.2	58.8	53.8	52.2	52.7	54.0	57.4	63.3	71.5	82.8	88.4	88.1	89.8	89.6	75.5	91.4	
26-Aug	89.8	89.8	90.8	90.2	91.1	91.6	91.2	86.5	79.5	72.1	64.4	56.8	50.9	48.8	43.3	41.8	45.0	47.5	54.4	59.2	61.2	65.9	68.6	77.6	69.1	91.6	
27-Aug	84.1	88.5	89.2	90.1	93.4	95.1	94.4	86.5	74.9	68.2	63.8	56.7	48.9	48.9	46.8	48.6	50.8	59.3	66.9	69.7	74.1	80.6	84.4	87.7	73.0	95.1	
28-Aug	88.5	82.6	78.7	81.0	76.4	75.0	74.4	73.3	70.5	68.6	63.6	57.3	54.5	51.9	42.0	45.7	51.4	61.7	63.1	65.0	66.7	73.2	74.6	79.3	67.5	88.5	
29-Aug	82.0	86.6	87.0	85.1	86.1	88.2	90.3	88.4	84.6	75.7	65.9	57.3	51.4	47.1	43.1	44.6	47.2	59.0	67.3	69.5	71.7	74.5	77.2	78.4	71.2	90.3	
30-Aug	78.5	79.3	78.7	75.8	77.5	85.6	87.7	85.3	78.2	74.5	57.4	65.3	58.1	49.9	52.3	54.0	63.1	72.9	73.7	71.7	75.0	80.7	84.4	85.4	72.7	87.7	
31-Aug	82.3	86.0	88.6	86.0	79.7	84.6	89.9	92.3	90.2	85.7	78.2	64.4	58.4	51.5	52.8	56.7	61.2	67.2	74.6	80.5	84.5	86.5	86.2	85.0	77.2	92.3	
		85.5	87.1	88.1	89.0	89.1	90.5	90.3	87.5	81.6	76.3	70.3	65.8	62.5	60.5	58.5	58.9	61.4	66.3	72.2	78.4	80.8	81.6	83.1	84.6	Diurnal Average	
		100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.7	99.4	98.6	97.2	96.9	95.8	97.4	97.9	97.2	98.3	99.0	99.4	99.7	99.9	100.0	100.0	Diurnal Maximum		
OR - Out of Range																											



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Stony Mountain - August 2023







Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Stony Mountain - August 2023

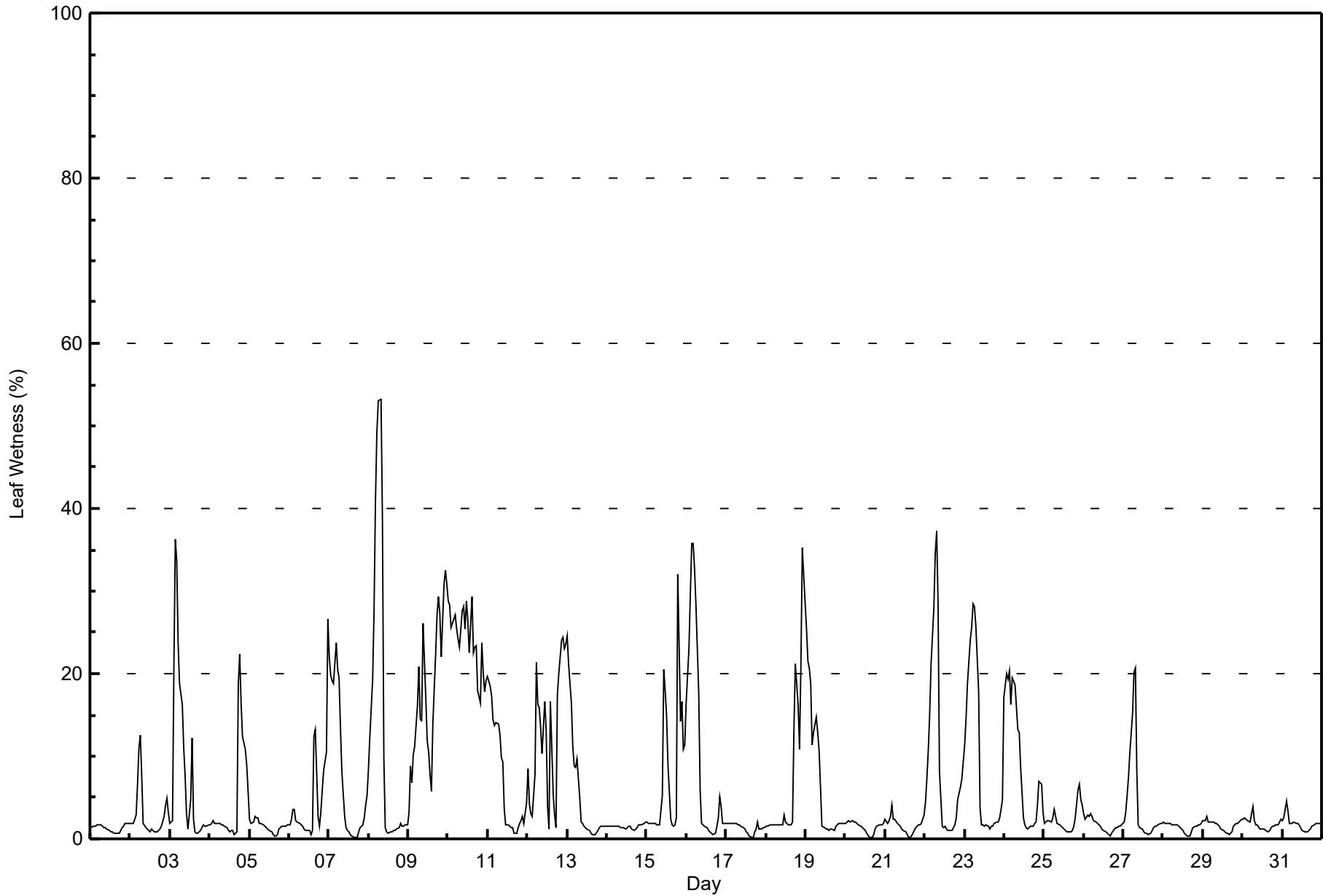
Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	699	93.95	93.95
0.4 - 0.5	8	1.08	95.03
0.6 - 0.7	4	0.54	95.56
0.8 - 1.4	15	2.02	97.58
1.5 - 10	17	2.28	99.87
> 10	0	0.00	99.87

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 53.1 % on Aug 8 08:00																			Maximum Daily Average: 24.2 % on Aug 10						Hours in Service: 744																								
Minimum Value: 0.1 % on Aug 7 18:00																			Minimum Daily Average: 1.3 % on Aug 1						Hours of Data: 744																								
Maximum Diurnal Average: 11.9 % at hour 7																			Minimum Diurnal Average: 2.4 % at hour 16						Hours of Missing Data: 0																								
Monthly Average: 6.28 %																			Percentiles: P ₁ = 0.2 P ₁₀ = 0.9 Q ₁ = 1.4 Median = 1.8 Q ₃ = 7.6 P ₉₀ = 20.6 P ₉₉ = 35.7						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-Aug	1.4	1.5	1.5	1.5	1.6	1.7	1.6	1.5	1.4	1.3	1.2	1.0	0.9	0.8	0.7	0.6	0.7	0.6	1.0	1.3	1.6	1.8	1.8	1.8	1.3	1.8																							
2-Aug	1.8	1.8	1.9	2.9	6.6	11.1	12.6	7.6	1.9	1.4	1.2	1.1	0.9	1.1	0.8	0.8	0.9	1.1	1.2	1.5	2.7	4.0	5.0	3.2	3.1	12.6																							
3-Aug	1.9	2.2	21.1	36.3	33.7	23.7	18.8	16.2	11.1	7.6	3.0	1.2	4.8	12.2	2.4	0.9	0.7	0.7	1.0	1.4	1.6	1.6	1.6	1.6	8.6	36.3																							
4-Aug	1.7	1.9	2.1	1.9	1.9	1.8	1.8	1.8	1.6	1.5	1.3	1.1	0.9	1.1	0.9	0.5	0.8	18.6	22.4	16.4	12.4	10.9	8.9	5.8	5.0	22.4																							
5-Aug	2.3	1.9	2.0	2.6	2.5	2.5	1.9	1.8	1.6	1.5	1.4	1.2	1.0	0.8	0.5	0.4	0.3	0.5	1.2	1.5	1.6	1.5	1.5	1.6	1.5	2.6																							
6-Aug	1.7	2.3	3.5	3.6	2.2	2.0	1.9	1.8	1.5	1.3	1.0	1.0	1.1	0.6	1.1	12.4	13.3	2.7	1.6	3.2	5.9	8.3	10.5	26.6	4.6	26.6																							
7-Aug	22.0	19.8	19.1	18.8	23.7	20.6	19.6	13.4	8.1	2.7	1.3	1.0	0.8	0.6	0.4	0.2	0.1	0.1	0.8	1.4	1.7	2.5	4.0	5.2	7.8	23.7																							
8-Aug	8.4	12.5	19.3	27.6	40.8	49.1	53.1	53.1	38.4	9.8	1.3	0.8	0.8	0.8	0.9	1.0	1.0	1.2	1.4	1.8	1.6	1.6	1.7	1.7	13.7	53.1																							
9-Aug	3.2	8.9	6.7	10.1	11.2	16.1	20.8	14.5	14.2	26.1	17.0	11.9	10.4	7.8	5.7	13.9	22.4	27.0	29.2	27.2	22.0	30.8	32.5	30.8	17.5	32.5																							
10-Aug	28.9	28.2	25.5	26.5	27.2	25.4	24.2	23.3	27.6	28.2	25.4	28.9	26.4	22.5	29.3	22.5	23.2	23.3	17.9	16.4	23.7	20.2	17.9	19.2	24.2	29.3																							
11-Aug	19.6	18.4	17.3	14.4	13.7	14.0	13.9	12.5	9.8	9.3	3.8	1.7	1.8	1.6	1.4	1.3	0.7	0.6	1.3	1.9	2.3	2.7	1.9	4.3	7.1	19.6																							
12-Aug	8.5	4.3	3.1	2.8	7.9	21.3	16.2	15.9	13.6	10.4	16.6	13.1	3.9	1.2	16.6	5.5	2.9	1.3	17.4	20.0	24.1	24.4	23.1	23.6	12.4	24.4																							
13-Aug	24.6	21.2	16.4	11.2	8.8	8.7	9.7	4.8	2.0	1.8	1.5	1.3	1.1	1.0	0.8	0.5	0.5	0.5	1.0	1.3	1.5	1.6	1.6	1.6	5.2	24.6																							
14-Aug	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.4	1.3	1.4	1.2	1.4	1.5	1.6	1.2	0.9	1.2	1.4	1.7	1.7	1.7	1.8	2.0	1.5	2.0																							
15-Aug	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.7	5.3	20.6	18.0	15.0	8.9	2.4	1.6	1.6	1.7	2.6	32.1	14.2	16.7	10.8	11.3	7.5	32.1																							
16-Aug	16.4	23.0	29.6	35.7	35.7	32.7	28.3	17.6	5.9	1.8	1.6	1.5	1.3	1.1	0.9	0.7	0.6	0.6	1.5	2.6	5.0	3.9	1.9	1.8	10.5	35.7																							
17-Aug	1.9	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.6	1.5	1.3	1.1	0.9	0.6	0.3	0.2	0.2	0.8	1.1	2.1	1.2	1.2	1.3	1.4	1.3	2.1																							
18-Aug	1.5	1.5	1.6	1.7	1.7	1.8	1.7	1.7	1.7	1.6	1.7	2.8	2.0	1.7	1.6	1.7	2.0	13.1	21.3	16.3	10.8	21.1	35.3	31.8	7.5	35.3																							
19-Aug	25.4	21.6	20.7	18.8	11.4	12.8	14.8	12.9	10.6	6.2	1.5	1.3	1.1	1.2	1.0	1.1	1.2	1.1	1.5	1.7	1.8	1.8	1.9	1.9	7.3	25.4																							
20-Aug	1.9	2.1	2.1	2.1	2.1	2.1	2.0	1.9	1.7	1.6	1.3	1.1	0.9	0.7	0.3	0.2	0.2	0.4	1.2	1.5	1.6	1.7	1.7	1.8	1.4	2.1																							
21-Aug	2.4	1.9	2.2	2.7	4.1	2.3	2.4	1.8	1.6	1.5	1.2	1.0	0.8	0.5	0.2	0.1	0.3	0.7	1.3	1.6	1.7	1.7	1.9	2.9	1.6	4.1																							
22-Aug	4.4	7.3	10.6	15.2	21.1	27.9	34.6	37.3	28.4	8.1	1.5	1.3	1.5	1.2	1.0	1.0	1.1	1.3	1.6	2.5	4.8	6.3	7.3	9.3	9.9	37.3																							
23-Aug	11.4	14.6	18.7	24.1	25.5	28.4	28.1	25.7	17.8	3.8	1.7	1.6	1.5	1.6	1.6	1.2	1.5	1.5	1.8	2.0	2.1	2.6	3.6	4.8	9.5	28.4																							
24-Aug	17.2	20.1	19.3	20.3	16.2	19.4	18.7	15.9	13.3	12.9	8.6	2.5	1.6	1.4	1.2	1.3	1.6	1.6	1.9	2.1	4.1	6.9	6.7	3.2	9.1	20.3																							
25-Aug	1.9	2.0	2.2	2.2	2.1	2.5	3.5	2.8	1.8	1.7	1.5	1.4	1.2	1.0	0.9	0.8	0.9	1.1	1.5	2.5	5.9	6.5	4.8	4.1	2.4	6.5																							
26-Aug	3.1	2.4	2.9	2.7	3.1	2.8	2.2	2.0	1.9	1.8	1.5	1.3	1.1	0.8	0.6	0.4	0.4	0.6	1.2	1.4	1.4	1.5	1.5	1.7	1.7	3.1																							
27-Aug	2.0	3.1	5.0	7.2	10.4	15.2	20.2	20.7	8.4	1.7	1.4	1.1	0.9	0.8	0.6	0.5	0.7	1.0	1.4	1.5	1.6	1.7	1.8	1.9	4.6	20.7																							
28-Aug	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.4	1.2	1.0	0.7	0.4	0.4	0.4	0.8	1.4	1.5	1.6	1.6	1.7	1.9	1.4	2.0																							
29-Aug	2.2	2.3	2.8	2.1	2.0	2.1	2.1	1.9	1.8	1.7	1.5	1.2	1.0	0.8	0.7	0.6	0.6	0.8	1.4	1.7	1.8	1.9	2.1	2.4	1.6	2.8																							
30-Aug	2.4	2.5	2.4	2.1	2.1	3.0	4.0	2.1	1.8	1.6	1.2	1.2	1.2	1.1	1.0	0.9	1.0	1.4	1.5	1.6	1.7	1.8	2.1	2.5	1.8	4.0																							
31-Aug	2.2	2.6	4.6	3.4	1.9	1.9	1.9	2.0	1.9	1.8	1.7	1.3	1.1	0.8	0.8	0.8	1.0	1.3	1.5	1.7	1.8	1.9	1.9	1.9	1.8	4.6																							
																								7.3	7.7	8.8	9.9	10.6	11.6	11.9	10.4	7.7	5.2	4.1	3.5	2.9	2.5	2.4	2.7	3.5	4.7	5.6	5.4	6.3	6.5	6.9	Diurnal Average		
																								28.9	28.2	29.6	36.3	40.8	49.1	53.1	53.1	38.4	28.2	25.4	28.9	26.4	22.5	29.3	22.5	23.2	27.0	29.2	32.1	24.1	30.8	35.3	31.8	Diurnal Maximum	





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Leaf Wetness (LW) - %
Stony Mountain - August 2023

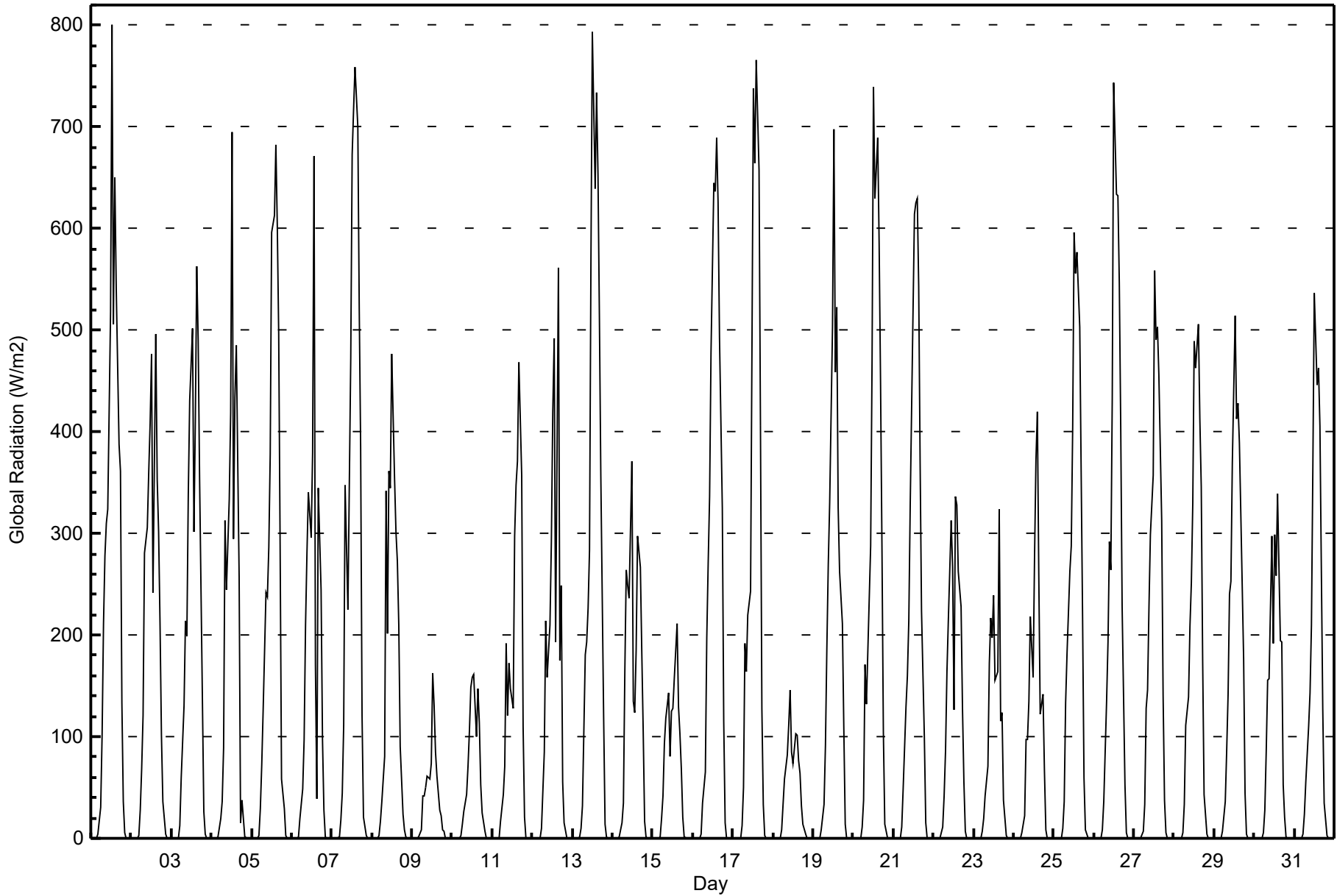
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 0.3	13	1.75	1.75
0.4 - 0.5	16	2.15	3.90
0.6 - 0.7	24	3.23	7.12
0.8 - 1.4	154	20.70	27.82
1.5 - 10	350	47.04	74.87
> 10	166	22.31	97.18

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 801.0 W/m2 on Aug 1 13:00 Maximum Daily Average: 228.0 W/m2 on Aug 7																							Hours in Service:	744																							
Minimum Value: 0.0 W/m2 on Aug 1 01:00 Minimum Daily Average: 35.1 W/m2 on Aug 9																							Hours of Data:	744																							
Maximum Diurnal Average: 464.9 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 1																							Hours of Missing Data:	0																							
Monthly Average: 143.46 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 37.0 Q ₃ = 241.5 P ₉₀ = 457.5 P ₉₉ = 726.8																							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-Aug	0.0	0.0	0.0	0.0	4.4	30.1	102.0	210.6	277.6	309.3	323.6	518.1	801.0	505.7	650.3	541.8	388.2	361.6	132.8	35.6	5.1	0.1	0.1	0.0	216.6	801.0																					
2-Aug	0.0	0.0	0.0	0.0	3.2	27.4	67.9	120.5	281.4	305.5	360.4	408.4	476.1	242.0	496.7	353.2	302.0	211.3	100.8	36.8	3.9	0.0	0.0	0.0	158.2	496.7																					
3-Aug	0.0	0.0	0.0	0.0	0.2	12.4	60.0	131.0	214.3	198.3	338.2	431.1	501.2	301.0	410.8	562.5	490.4	354.5	136.6	26.9	4.6	0.0	0.0	0.0	173.9	562.5																					
4-Aug	0.0	0.0	0.0	0.0	1.4	19.9	36.3	88.9	312.5	245.2	333.4	417.8	695.5	294.0	434.1	485.6	256.9	15.0	37.9	19.8	1.6	0.0	0.0	0.0	154.0	695.5																					
5-Aug	0.0	0.0	0.0	0.0	2.3	29.3	72.8	126.7	241.3	237.8	286.4	378.0	596.7	613.5	682.8	603.3	496.2	289.6	57.8	29.3	3.1	0.0	0.0	0.0	197.8	682.8																					
6-Aug	0.0	0.0	0.0	0.0	1.0	19.5	48.9	97.6	210.2	280.3	340.1	295.6	379.8	670.7	171.2	39.1	344.3	244.0	97.0	27.2	1.2	0.0	0.0	0.0	136.2	670.7																					
7-Aug	0.0	0.0	0.0	0.0	1.8	18.6	43.8	110.9	347.6	224.7	350.4	472.3	672.9	717.5	758.6	701.0	521.9	384.6	121.3	20.9	2.2	0.0	0.0	0.0	228.0	758.6																					
8-Aug	0.0	0.0	0.0	0.0	2.2	16.7	35.7	81.1	342.3	201.8	361.9	345.4	477.0	354.5	301.3	272.2	210.2	90.4	24.1	9.0	0.8	0.0	0.0	0.0	130.3	477.0																					
9-Aug	0.0	0.0	0.0	0.0	0.8	8.1	41.1	42.2	50.4	61.6	59.0	73.9	163.0	131.1	84.6	61.0	28.4	22.4	8.1	7.5	0.3	0.0	0.0	0.0	35.1	163.0																					
10-Aug	0.0	0.0	0.0	0.0	0.0	3.2	13.3	26.8	43.2	70.4	105.9	148.7	158.2	161.5	100.1	147.1	113.9	52.4	25.1	7.2	0.5	0.0	0.0	0.0	49.1	161.5																					
11-Aug	0.0	0.0	0.0	0.0	0.6	16.9	42.9	70.7	191.5	121.1	171.7	147.4	127.3	296.9	346.8	371.3	468.1	356.5	110.0	20.8	0.4	0.1	0.0	0.0	119.2	468.1																					
12-Aug	0.1	0.1	0.1	0.0	0.3	10.3	46.9	85.4	214.2	158.7	209.7	292.1	419.9	491.9	193.6	561.2	175.0	249.1	55.0	15.7	0.5	0.1	0.1	0.1	132.5	561.2																					
13-Aug	0.1	0.1	0.1	0.3	1.0	9.2	31.6	180.6	193.6	226.6	283.3	566.1	793.7	639.7	733.8	652.7	512.8	357.8	120.1	14.4	1.0	0.0	0.0	0.0	221.6	793.7																					
14-Aug	0.0	0.0	0.0	0.0	1.1	15.0	35.2	163.6	264.4	248.9	236.9	371.4	134.6	124.4	184.5	298.1	266.4	183.6	105.6	16.1	0.9	0.1	0.1	0.1	110.4	371.4																					
15-Aug	0.0	0.0	0.1	0.2	1.0	19.5	42.3	93.2	118.2	143.1	81.1	124.7	128.3	156.7	211.3	128.8	102.5	67.5	20.9	1.8	0.2	0.0	0.0	0.0	60.1	211.3																					
16-Aug	0.0	0.0	0.0	0.0	0.2	4.7	34.5	65.1	197.0	271.1	335.7	478.5	644.9	636.8	689.3	626.0	493.1	325.1	115.9	14.7	0.5	0.0	0.0	0.0	205.5	689.3																					
17-Aug	0.1	0.1	0.0	0.0	0.5	12.6	50.1	192.5	164.4	219.1	243.8	486.5	738.0	664.3	765.8	657.8	406.5	127.2	33.2	3.1	0.1	0.0	0.0	0.0	198.6	765.8																					
18-Aug	0.0	0.0	0.0	0.0	0.2	9.0	34.0	58.2	82.6	111.7	146.5	84.5	73.2	102.7	100.8	76.4	64.2	32.2	13.3	3.8	0.0	0.0	0.0	0.0	41.4	146.5																					
19-Aug	0.0	0.0	0.0	0.0	0.2	8.5	33.8	92.3	187.7	269.3	330.9	502.9	697.1	458.3	522.3	325.5	263.2	211.0	108.9	14.3	0.5	0.1	0.1	0.2	167.8	697.1																					
20-Aug	0.1	0.0	0.1	0.1	0.7	11.8	36.9	171.1	131.4	235.6	287.4	471.8	740.0	629.2	689.4	584.8	449.2	286.5	104.0	14.2	0.3	0.1	0.1	0.2	201.9	740.0																					
21-Aug	0.1	0.1	0.2	0.2	0.3	10.6	48.6	129.0	159.7	214.6	327.5	423.2	614.2	625.0	629.0	544.1	370.4	223.7	100.0	15.5	0.2	0.0	0.0	0.1	184.9	629.0																					
22-Aug	0.0	0.0	0.0	0.1	0.3	10.7	41.4	86.8	164.4	215.3	312.7	266.8	126.9	336.8	328.0	262.1	228.4	128.5	54.9	7.5	0.1	0.0	0.0	0.0	107.2	336.8																					
23-Aug	0.0	0.0	0.0	0.0	0.1	7.5	19.3	41.0	71.3	172.4	217.3	196.9	239.4	156.2	164.2	324.2	115.0	123.3	37.6	3.4	0.0	0.0	0.0	0.0	78.7	324.2																					
24-Aug	0.0	0.0	0.0	0.0	0.1	5.1	21.8	97.7	96.6	135.4	218.8	158.5	276.0	372.4	419.7	259.8	122.7	142.0	67.2	7.7	0.1	0.0	0.1	0.0	100.1	419.7																					
25-Aug	0.0	0.0	0.0	0.0	0.1	9.8	35.6	132.9	181.5	263.2	288.1	404.0	596.8	556.1	577.0	502.8	360.5	218.6	59.6	8.1	0.2	0.2	0.2	0.2	174.8	596.8																					
26-Aug	0.1	0.1	0.1	0.1	0.3	8.2	35.5	135.3	193.6	292.4	264.5	431.9	743.6	633.6	632.7	545.6	406.3	228.4	53.4	5.8	0.0	0.0	0.0	0.0	192.1	743.6																					
27-Aug	0.0	0.0	0.0	0.0	0.0	6.6	33.9	128.1	145.5	228.1	298.3	357.6	559.0	491.0	503.2	455.4	313.0	140.9	37.1	4.9	0.0	0.0	0.1	0.1	154.3	559.0																					
28-Aug	0.0	0.0	0.0	0.0	0.0	5.5	33.5	110.8	138.8	208.6	251.8	330.1	489.5	462.6	506.3	413.2	345.4	175.3	43.1	4.4	0.0	0.0	0.0	0.1	146.6	506.3																					
29-Aug	0.1	0.1	0.1	0.1	0.1	6.5	35.9	85.9	142.4	240.5	252.7	369.8	514.5	412.4	428.1	389.0	319.3	176.5	44.3	4.6	0.0	0.0	0.0	0.0	142.6	514.5																					
30-Aug	0.0	0.0	0.0	0.1	0.0	5.4	27.9	85.7	155.3	156.7	296.9	191.8	298.2	258.7	339.2	194.7	192.7	52.6	21.1	1.6	0.0	0.0	0.0	0.1	94.9	339.2																					
31-Aug	0.0	0.0	0.0	0.0	0.0	4.1	23.6	55.8	109.2	142.6	210.1	365.9	535.9	446.2	462.4	406.5	265.9	127.4	34.7	2.2	0.0	0.0	0.0	0.0	133.0	535.9																					
																							0.0	0.0	0.0	0.0	0.8	12.3	40.9	106.4	181.4	206.8	262.1	339.1	464.9	417.5	436.1	398.3	303.0	192.2	67.1	13.1	0.9	0.0	0.0	0.0	Diurnal Average
																							0.1	0.1	0.2	0.3	4.4	30.1	102.0	210.6	347.6	309.3	361.9	566.1	801.0	717.5	765.8	701.0	521.9	384.6	136.6	36.8	5.1	0.2	0.2	0.2	Diurnal Maximum





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Global Radiation (GR) - W/m2
Stony Mountain - August 2023

Concentration Ranges (W/m2)	Number of Hours	%	Cumulative %
0 - 20	336	45.16	45.16
21 - 100	99	13.31	58.47
101 - 300	164	22.04	80.51
301 - 600	112	15.05	95.56
601 - 900	33	4.44	100.00
> 900	0	0.00	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Speed: 19 km/h on Aug 13 12:00	Maximum Daily Speed Average: 13.1 km/h on Aug 13	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 23 09:00	Minimum Daily Speed Average: 2.2 km/h on Aug 6	Hours of Data: 733
Maximum Diurnal Speed Average: 5.4 km/h at hour 4	Minimum Diurnal Speed Average: 2.0 km/h at hour 20	Hours of Missing Data: 11
Monthly Average Velocity: 3.4 km/h 271.9 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 12 P ₉₀ = 14 P ₉₉ = 17	Percent Operational Time: 98.7

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-Aug	W16	W15	W16	W14	W14	W14	WNW15	WNW14	NW14	WNW16	WNW15	WNW16	WNW16	WNW15	WNW14	NW16	NW15	NW12	NW10	NNW8	NNW7	WNW7	WNW8	WNW9	WNW12.5	W16	
2-Aug	WNW9	WNW11	NW11	NW11	NW11	NW10	NW9	NNW5	N5	NNW3	N4	WNW2	W3	WSW3	SW3	SW3	WNW3	NNW2	NNE4	NE6	ENE9	E10	ENE9	E10	NNW3.6	NW11	
3-Aug	ESE7	E8	SSW5	WSW9	SSW7	ESE10	ESE4	SSE4	SSE4	SE3	SE6	SW5	NW4	WNW8	W10	W11	WNW11	NW10	NW9	WNW9	WNW11	WNW10	W12	W3.0	W12		
4-Aug	WNW14	WNW13	WNW13	NW13	NW11	NW10	NW10	NW11	NNW11	NW9	NW11	NW10	NW10	NW7	NW2	N2	NW6	W4	W11	WNW11	NW13	WNW10	WNW10	NW11	WNW9.4	WNW14	
5-Aug	WNW12	WNW13	WNW13	NW12	NW12	NW11	NW10	NW9	NW9	NW8	NW8	WNW9	WNW9	WNW9	WNW9	WNW9	WNW9	WNW9	WNW7	WNW8	W9	WNW10	WNW9	WNW9	WNW9.5	WNW13	
6-Aug	NW9	NNW7	N7	NNE6	NE5	ENE4	E1	S5	S4	SE4	NE3	NNW4	WNW7	NNW5	NW6	NNW4	E6	ESE7	SSE7	SW2	NNE7	NNE9	ENE6	NE5	NNE2.2	NW9	
7-Aug	ENE5	N6	NNE10	NE9	NE9	NNE8	NNE8	NNE6	NNE7	NNE9	NE9	NNE8	NNE7	NNE7	N5	NE6	ENE10	NE9	NE8	NE8	NE8	NNE8	NNE8	NNE8	NNE7.5	ENE10	
8-Aug	N8	N6	N7	N6	NNE6	NE7	E6	E6	E5	E6	E7	E8	E8	E6	ESE7	E7	E8	E8	E10	ESE11	SE13	SE11	SE11	SE11	E6.1	SE13	
9-Aug	SSE9	SSE9	SSE10	SSE10	SE9	SE9	SE11	SE12	SE12	SE12	SE11	SE12	SE11	SE12	SE13	SE12	SE11	SE10	SE11	SE14	SE12	SE11	ESE10	ESE11	SE10.8	SE14	
10-Aug	ESE12	ESE13	SE12	SE11	ESE11	ESE13	ESE12	ESE12	ESE13	ESE11	E10	E10	ENE10	NE7	NE8	NE9	NE8	NNE10	NNE10	NNE10	NNE10	NNE10	NNE11	NNE10	N10	ENE7.7	ESE13
11-Aug	N9	N10	NNW10	NNW10	NNW10	NNW10	N10	NNW9	NNW9	NNW6	NNW7	NNW6	NNW8	NNW8	NNW7	NNW7	N6	NNW5	N3	E3	SSE7	SW8	W11	WSW11	NNW6.0	W11	
12-Aug	WSW10	WSW11	WSW13	W12	WSW12	WSW8	WNW10	WNW9	WNW11	WNW11	NW10	WNW8	NW12	NW11	NW12	WNW8	WNW11	WNW9	NW7	NW5	WNW8	WNW8	WNW9	W9	WNW8.9	WSW13	
13-Aug	W9	W9	W10	WSW12	SW13	SW12	SW13	SSW13	SSW13	SSW13	SW15	SW19	WSW18	WSW18	WSW17	W15	W15	W15	WSW13	WSW12	SW12	SW14	SW14	WSW14	WSW13.1	SW19	
14-Aug	W15	W14	WSW14	WSW15	W18	W18	W18	WNW17	NW14	NNW10	NW10	NW11	NW10	WNW9	WNW8	W6	NNW5	N4	NNE4	SSE5	SSW8	W8	NW8	NNW7	WNW8.7	W18	
15-Aug	NW6	NW7	WNW5	SW11	SW11	SSW13	SSW13	SSW14	SSW15	SW12	SSW9	SW9	SW11	SW13	WSW12	WSW11	WSW11	WSW11	WSW11	WSW11	WNW11	WNW16	NW16	NW16	WSW8.9	NW16	
16-Aug	NW13	NW12	NW11	NW9	NW10	NW11	NW11	NW11	NW12	NW12	NW12	NW10	NW11	NW11	WNW9	WNW8	WNW7	WNW7	WNW4	SSW5	SSW9	SW12	SSW13	SW16	WNW7.9	SW16	
17-Aug	SSW15	SSW16	SSW17	SSW17	SSW18	SW17	SW17	SW15	WSW14	WSW11	W11	W10	W15	WNW14	WNW15	WNW14	NW13	NW11	WNW9	WNW9	WNW11	WNW12	WNW10	NW9	WSW10.1	SSW18	
18-Aug	NNW9	NNW9	N7	N8	NNW9	NNW10	NNW10	N8	N9	N11	NNE13	NNE10	N8	N9	NNW10	NNW10	NNW11	NNW8	NW8	NW9	NW13	NNW12	NNW11	NW9	NNW9.1	NNE13	
19-Aug	NW10	NW9	NW9	NNW8	NW8	NW9	NW8	NW11	WNW9	NW11	NW11	NW13	NW12	NW11	NW11	WNW10	WNW11	W9	W8	WSW9	WSW12	WSW12	WSW12	WSW13	WNW9.0	NW13	
20-Aug	WSW14	SW14	SW14	SW15	SW15	SW15	SW14	SW14	SW11	WSW12	WSW15	WSW12	WSW9	SW7	SSE6	SW6	SSW7	SW7	SW10	SW10	SW11	SW11	SW9	SW9	SW10.8	SW15	
21-Aug	SW10	SW10	WSW10	SW10	SW11	SW10	SW9	WSW7	SSW2	SE2	ENE4	E5	ENE6	E9	E5	E6	ENE6	ENE6	ENE7	ESE7	S7	SSW9	SSW10	S8	S3.1	SW11	
22-Aug	S8	S7	SSE5	ESE6	ESE7	ESE5	E5	ESE5	SE5	SE7	SE8	ESE8	E6	SE7	SE6	ESE6	ESE5	ESE6	SE4	ENE4	E6	E7	SSE6	SSW8	SE5.2	SSW8	
23-Aug	SW8	SW8	SW8	SW8	W4	SSE1	SSW6	S5	NW0	N4	E4	E7	ENE7	NE6	NE8	ENE8	ENE10	NE9	NE7	NE8	NE11	NE10	NE10	NE10	ENE3.1	NE11	
24-Aug	NE7	NE6	NE8	NNE7	NNE7	N8	N8	N9	N10	NNE10	NE11	NE9	NNE9	C	NNE10	NNE11	N8	NW6	WNW6	WNW7	WNW8	WNW8	W9	W11	N6.1	W11	
25-Aug	W11	W12	W12	W13	W11	W9	WSW7	SW7	SSW10	SSW12	SW11	SW11	SSW12	SW11	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	---	W13
26-Aug	SSW14	SSW15	SSW14	SSW15	SSW14	SSW15	SSW15	SSW16	SSW16	SSW14	SW11	SW12	SSW3	SSW10	WSW13	SSE10	NE10	SSE9	SSW8	W11	W12	W12	WNW14	NW10	SW9.2	SSW16	
27-Aug	NW8	NW8	NNW8	NNW8	NW7	NNW6	NNW6	N4	NE3	ESE2	ESE3	SE4	SE1	SSW4	S5	S8	SSW9	S10	S10	SSE13	S14	S16	S16	S14	SSW3.1	S16	
28-Aug	SSW13	SSW12	WSW11	WSW12	W13	W13	W13	W12	W9	W7	WSW7	W7	SSW4	S5	E4	ENE2	N3	SW4	SW10	SW11	SW12	SW11	WSW10	WSW10	WSW7.5	SSW13	
29-Aug	SW10	SW11	SW11	SW11	SW12	SW12	SW12	SSW12	SSW12	SSW11	SSW9	SW10	SW11	SSW11	SSW10	SW8	SW8	SSW7	SSW9	SSW10	SSW11	S10	SSW11	SSW11	SSW10.3	SSW12	
30-Aug	SSW11	SSW11	SSW10	SSW9	SSE9	S9	SSW6	S8	SSW8	SSW5	NW2	E5	SSE9	SSE9	ESE10	ESE8	E5	E6	E6	ESE7	N6	NNW6	NE6	SSE6	SSE4.4	SSW11	
31-Aug	SSW9	SE8	SSW8	W10	WNW12	WNW12	WNW15	WNW15	NW15	NW11	NW10	NW8	NW6	NW7	WNW9	WNW12	WNW13	WNW13	WNW12	WNW14	WNW15	WNW14	WNW14	WNW13	WNW10.0	WNW15	

WSW4.8	W4.6	W5.1	W5.4	W4.9	W4.2	W4.5	W4.1	W3.2	W2.5	WNW2.5	WNW2.3	WNW3.0	W2.9	WNW2.9	WNW2.6	WNW3.0	WNW2.2	W2.3	W2.0	W2.9	W4.2	W4.2	W4.1	Diurnal Average
W16	SSW16	SSW17	SSW17	W18	W18	W18	WNW17	SSW16	WNW16	WNW15	SW19	WSW18	WSW18	WSW17	NW16	W15	W15	WSW13	SE14	WNW15	WNW16	NW16	NW16	Diurnal Maximum

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



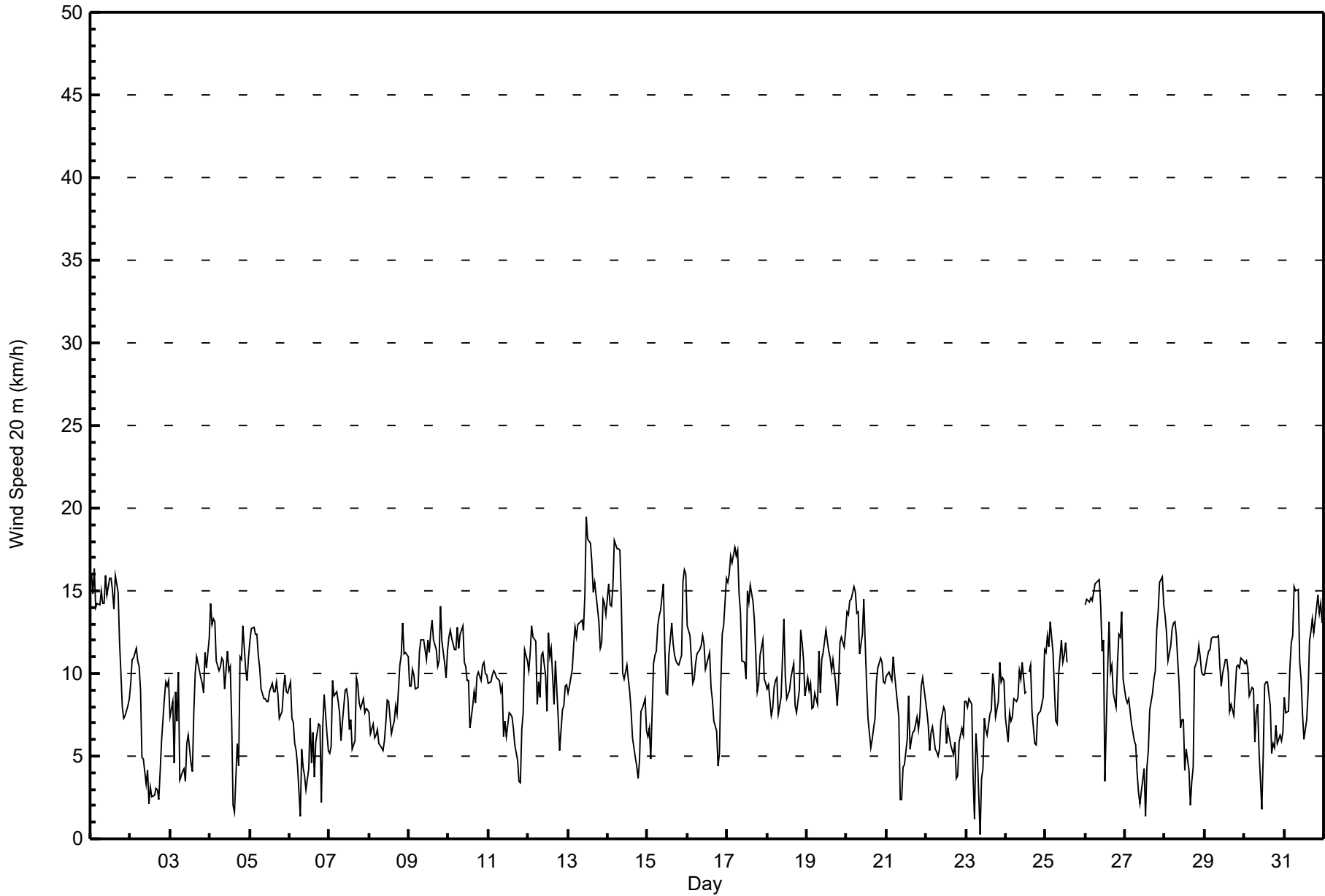
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed 20 m (WS20m) - km/h
Stony Mountain - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 7 km/h on Aug 15 20:00	Hours of Data: 733
Minimum Value: 1 km/h on Aug 14 20:00	Hours of Missing Data: 11
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 6	Hours of Calibration: 1
	Percent Operational Time: 98.7

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-Aug	5	5	5	5	5	5	5	5	5	5	6	6	6	5	6	6	5	4	3	2	2	1	2	2	6
2-Aug	3	3	3	3	2	2	2	2	2	2	2	2	2	1	2	2	1	1	1	1	2	2	2	2	3
3-Aug	1	2	3	3	2	4	3	1	1	2	2	3	3	2	3	4	5	3	3	2	2	3	3	4	5
4-Aug	4	4	4	4	3	3	3	4	4	3	4	4	4	3	1	3	3	4	3	3	4	2	2	3	4
5-Aug	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3	3	4	2	1	2	3	2	3
6-Aug	2	1	1	1	1	1	1	1	1	1	1	1	3	2	2	3	3	3	2	1	2	2	2	2	3
7-Aug	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	3
8-Aug	1	1	1	1	1	1	2	1	1	2	3	4	3	3	2	2	2	2	3	3	4	4	3	3	4
9-Aug	3	2	3	3	2	2	3	3	3	4	3	4	3	4	4	4	3	3	3	5	4	3	3	2	5
10-Aug	3	3	4	3	3	4	3	3	4	3	3	3	3	2	3	2	3	3	3	3	3	3	3	3	4
11-Aug	3	3	3	3	3	3	3	3	3	2	2	2	3	2	2	2	2	2	1	2	1	3	4	3	4
12-Aug	2	3	4	4	3	2	3	2	4	4	3	3	4	4	6	3	5	2	4	2	3	1	2	2	6
13-Aug	2	2	2	2	3	2	3	3	3	4	5	6	6	7	6	6	6	5	4	3	3	4	3	4	7
14-Aug	5	4	4	5	6	6	5	6	5	4	3	3	3	2	2	2	2	1	1	1	1	2	2	2	6
15-Aug	1	1	2	2	1	2	3	3	3	4	4	2	2	4	4	4	3	3	5	7	3	5	5	5	7
16-Aug	4	3	3	2	3	3	3	3	4	4	4	4	4	4	3	3	3	3	1	2	2	3	3	3	4
17-Aug	3	3	4	4	4	4	5	4	4	4	4	3	5	6	5	5	4	4	2	3	4	4	3	3	6
18-Aug	3	3	2	2	2	2	2	2	3	3	4	3	3	3	3	3	4	2	2	2	4	4	4	2	4
19-Aug	3	3	3	3	2	3	2	3	3	4	4	4	4	4	4	4	4	3	3	2	3	3	3	3	4
20-Aug	3	3	3	3	4	3	3	3	3	4	5	4	4	3	3	3	2	2	2	2	2	2	2	1	5
21-Aug	1	1	1	1	2	1	1	2	1	1	2	2	2	3	3	2	2	2	1	1	1	2	2	1	3
22-Aug	1	1	1	1	1	2	1	1	2	2	3	3	2	3	2	2	1	1	1	1	1	1	1	1	3
23-Aug	1	1	1	1	2	2	1	1	1	1	2	2	2	2	2	4	3	2	2	2	2	2	2	2	4
24-Aug	2	1	2	2	2	2	2	2	3	3	3	3	6	C	4	3	3	2	1	1	2	1	2	3	6
25-Aug	3	3	3	3	3	2	2	2	2	4	4	4	4	4	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	4
26-Aug	3	3	3	3	3	3	3	4	4	4	3	4	5	4	4	4	4	4	2	3	3	3	4	2	5
27-Aug	2	2	2	2	1	1	1	1	1	1	2	2	2	2	2	3	3	2	2	3	3	4	3	3	4
28-Aug	3	3	3	3	4	4	4	4	3	3	2	2	2	2	2	2	1	3	2	2	2	2	2	2	4
29-Aug	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	1	2	2	2	2	2	3
30-Aug	2	2	2	2	2	2	1	3	2	2	2	3	3	3	3	3	2	1	2	2	1	1	2	1	3
31-Aug	1	2	2	3	3	3	4	4	3	3	2	2	2	3	3	4	4	4	4	4	4	4	4	3	4
Diurnal Maximum																									

C - Calibration UO - Unstable Operation





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Stony Mountain - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	86	11.73	11.73
6 - 11	461	62.89	74.62
12 - 19	186	25.38	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: 733

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Stony Mountain - August 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	9	2	3	6	10	7	6	5	5	7	5	1	3	4	5	8	86
6 - 11	24	31	28	12	25	18	20	14	10	31	42	19	25	53	73	36	461
12 - 19	0	1	0	0	0	6	11	1	4	29	27	23	26	35	22	1	186
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	33	34	31	18	35	31	37	20	19	67	74	43	54	92	100	45	733

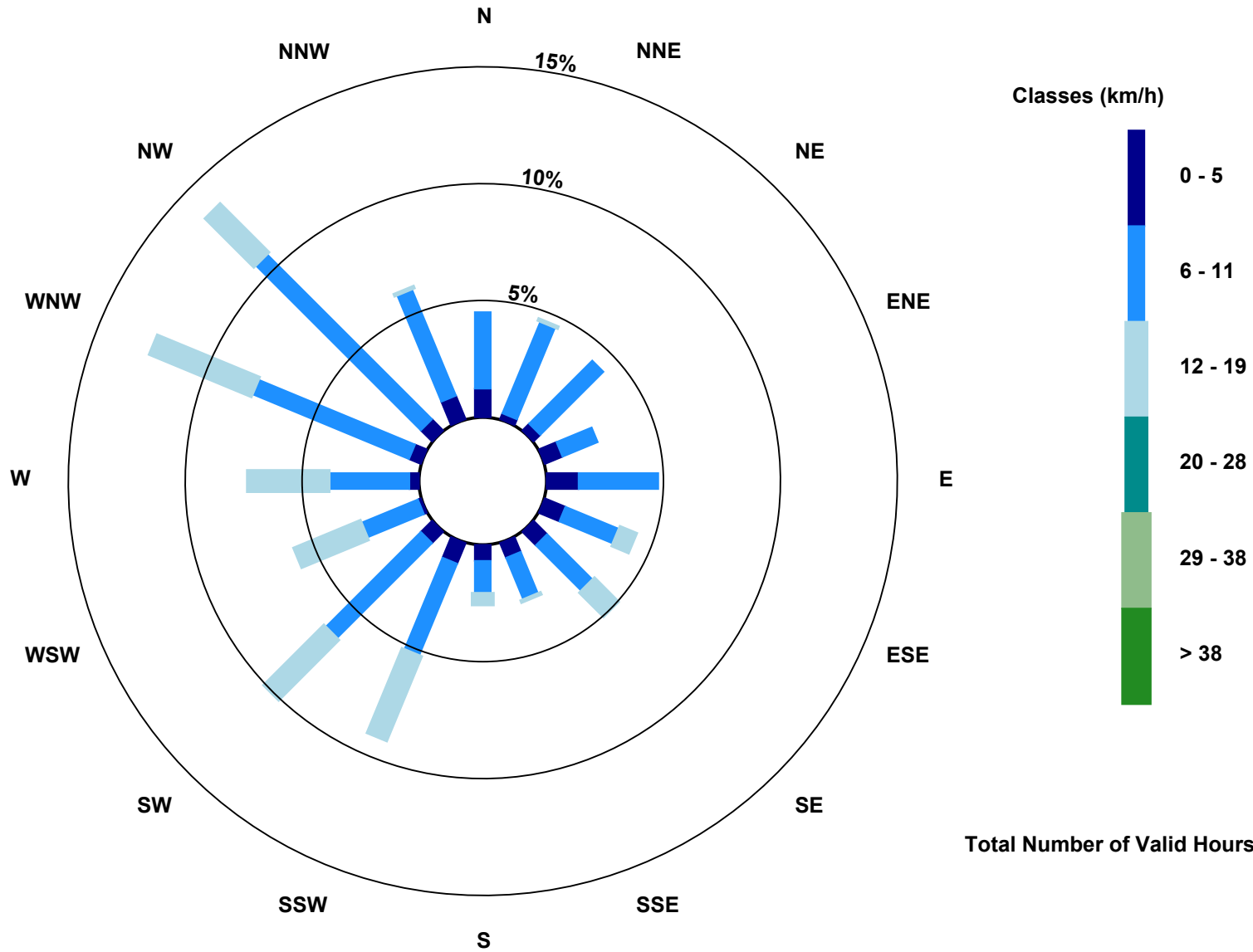
Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed 20 m (WS20m) - km/h
Stony Mountain



Total Number of Valid Hours: 733



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Stony Mountain - August 2023

Direction of Maximum Speed: 236 deg on Aug 13 12:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 240.6 deg on Aug 13	Hours of Data: 733
Direction of Minimum Speed: 326 deg on Aug 23 09:00	Hours of Missing Data: 11
Direction of Minimum Daily Speed Average: 2.2 deg on Aug 6	Percent Operational Time: 98.7
Monthly Average Direction: 271.9 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-Aug	268	272	267	270	263	271	287	299	304	300	299	302	290	286	287	308	313	310	314	329	334	298	289	295	291.7
2-Aug	283	297	306	314	312	317	326	332	0	345	352	290	273	252	221	229	302	348	20	36	63	83	72	80	336.5
3-Aug	109	91	199	242	197	114	119	168	162	139	145	143	227	321	287	281	272	285	305	320	297	295	287	277	261.4
4-Aug	296	297	297	304	315	318	322	324	332	325	324	314	316	318	322	3	317	269	277	296	309	303	301	312	309.1
5-Aug	298	299	300	305	307	312	311	320	318	318	322	318	302	301	302	302	301	299	300	285	280	286	292	313	303.7
6-Aug	325	337	360	12	56	58	91	185	171	131	53	345	288	333	306	348	92	119	165	219	26	32	62	49	23.8
7-Aug	61	11	22	34	34	24	21	20	28	33	45	30	23	26	8	44	59	50	45	42	37	26	28	15	32.5
8-Aug	9	11	356	7	24	54	89	92	97	95	89	98	85	90	105	93	87	94	97	110	125	132	135	138	91.3
9-Aug	155	166	164	158	138	141	137	140	145	143	131	124	128	133	137	136	129	124	131	133	127	130	123	112	136.1
10-Aug	108	120	127	124	117	115	109	108	103	104	94	86	71	53	34	43	35	24	19	12	26	15	12	4	75.1
11-Aug	358	353	348	345	340	343	350	340	335	337	336	327	328	330	332	343	352	344	4	88	155	227	273	255	332.6
12-Aug	238	256	252	259	254	258	283	284	294	302	305	301	318	326	309	301	289	287	319	318	294	295	293	279	286.9
13-Aug	275	278	264	247	230	231	222	213	210	211	235	236	240	245	242	260	260	259	256	243	228	229	233	248	240.6
14-Aug	265	261	248	250	273	278	281	303	317	336	326	313	307	301	292	269	344	6	16	160	212	269	311	332	287.6
15-Aug	320	312	297	225	224	219	211	209	204	202	216	206	217	225	231	254	256	248	253	310	237	283	307	318	245.0
16-Aug	323	310	308	309	314	310	308	315	314	321	324	312	325	311	298	296	286	288	283	197	213	217	213	214	293.7
17-Aug	206	201	204	204	207	218	223	226	243	249	267	271	264	291	301	301	311	319	293	283	283	298	303	310	255.4
18-Aug	334	348	6	349	341	344	348	353	359	11	21	23	358	2	348	344	344	334	321	316	323	331	330	326	346.6
19-Aug	314	323	324	332	324	317	317	307	294	311	314	309	318	310	314	299	297	280	274	247	247	250	246	249	295.9
20-Aug	242	231	228	225	227	228	227	223	226	241	245	245	247	234	152	219	209	227	219	217	224	235	234	229	229.2
21-Aug	227	234	238	233	220	230	226	237	199	127	75	83	71	83	92	83	64	75	69	110	171	206	202	189	184.7
22-Aug	189	171	158	108	116	104	96	122	126	125	138	109	94	138	142	123	123	109	124	78	86	91	159	210	128.0
23-Aug	216	217	219	214	273	156	195	181	326	8	85	90	59	46	52	58	63	53	49	52	46	48	44	48	66.4
24-Aug	52	36	34	22	17	10	4	0	9	19	36	39	19	C	21	17	2	316	290	299	290	288	278	274	358.6
25-Aug	275	277	274	278	278	268	250	225	207	213	225	216	212	218	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	-
26-Aug	208	207	203	202	202	205	206	208	209	203	220	236	210	205	248	158	55	157	209	269	279	276	293	312	219.9
27-Aug	323	326	328	334	317	327	330	352	56	111	117	127	124	199	177	169	200	186	172	160	172	185	182	179	192.0
28-Aug	192	193	254	256	261	261	265	264	275	262	257	260	193	174	101	64	352	222	230	225	227	232	240	238	240.3
29-Aug	228	218	216	220	219	216	214	212	207	207	209	215	214	201	210	228	224	210	201	200	198	190	199	196	210.3
30-Aug	194	196	193	195	162	179	195	184	196	207	324	79	149	148	116	106	91	88	97	110	356	346	46	149	154.8
31-Aug	201	144	193	280	290	295	294	301	305	306	312	305	305	310	299	293	302	294	293	295	297	298	295	298	293.2

258.7 259.9 259.8 261.9 261.6 264.6 265.1 260.7 266.3 272.4 295.5 286.5 288.1 277.5 290.1 301.6 319.6 295.8 279.1 270.1 261.2 268.9 272.7 269.2
 Diurnal Average

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



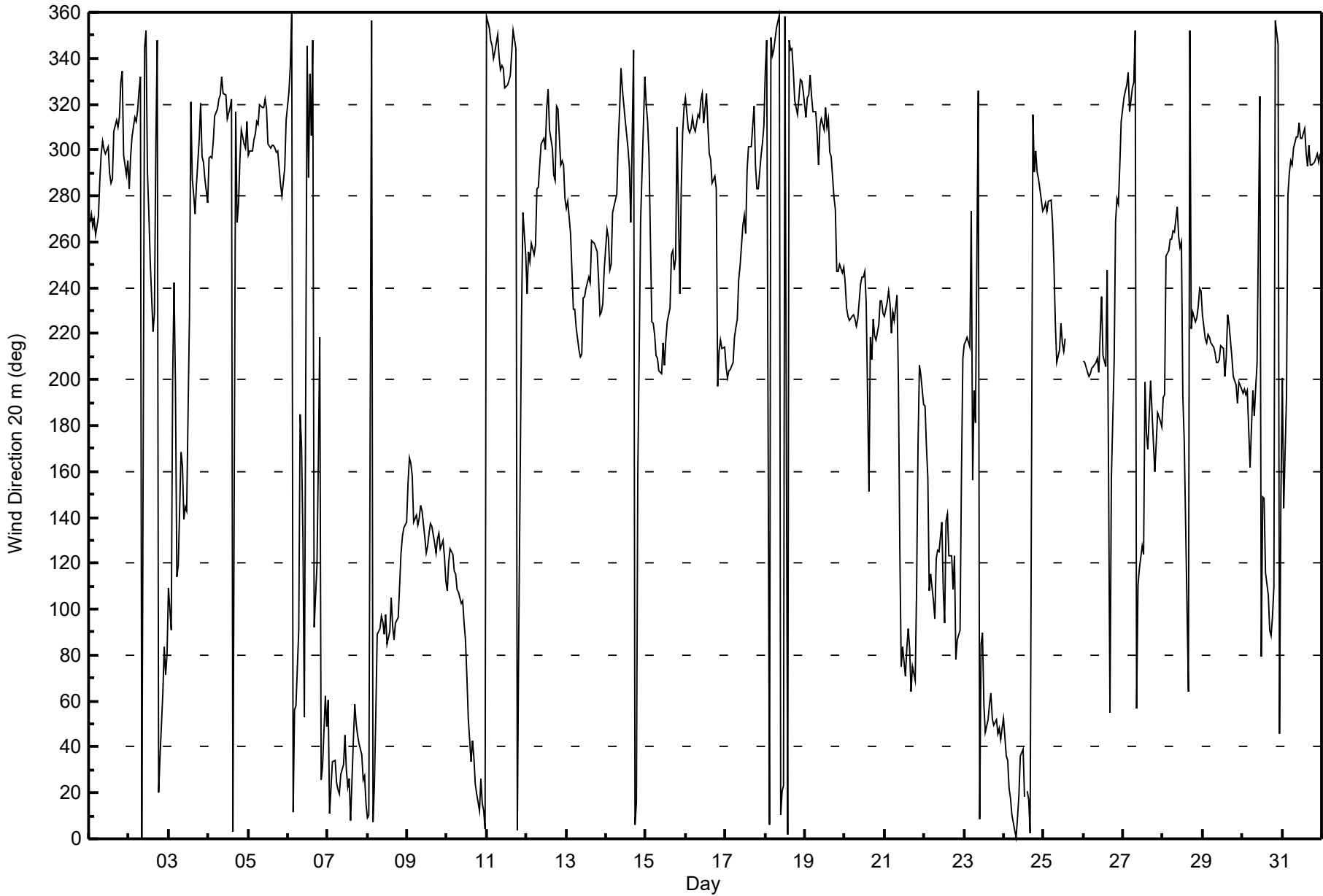
Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction 20 m (WD20m) - deg
Stony Mountain - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 104 deg on Aug 4 16:00	Hours of Data: 733
Minimum Value: 8 deg on Aug 8 03:00	Hours of Missing Data: 11
Percentiles: P ₁ = 10 P ₁₀ = 14 Q ₁ = 18 Median = 23 Q ₃ = 29 P ₉₀ = 38 P ₉₉ = 80	Hours of Calibration: 1
	Percent Operational Time: 98.7

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-Aug	31	29	28	28	28	30	30	29	29	28	31	31	37	33	37	31	27	31	28	20	20	16	16	18	37
2-Aug	24	27	21	20	18	19	21	28	28	74	60	88	65	47	73	57	40	45	13	9	16	13	15	15	88
3-Aug	16	15	63	29	35	30	71	46	44	61	42	52	71	44	38	34	34	33	25	20	18	22	26	28	71
4-Aug	23	26	26	26	24	25	26	28	25	30	29	38	38	32	80	104	43	69	23	19	21	21	24	21	104
5-Aug	22	23	22	21	20	18	20	23	24	25	23	26	29	30	32	31	27	25	16	15	17	23	20	17	32
6-Aug	15	16	13	19	28	34	75	14	23	34	50	31	35	54	26	79	39	28	21	80	15	20	25	25	80
7-Aug	23	16	14	16	14	14	16	20	27	27	28	32	53	48	65	49	24	19	15	12	13	12	10	10	65
8-Aug	9	15	8	13	14	17	19	24	32	34	40	41	30	36	25	18	18	14	16	18	20	21	21	20	41
9-Aug	24	22	23	23	19	19	19	20	22	24	23	20	23	22	24	22	19	21	22	23	22	22	21	18	24
10-Aug	17	20	21	22	19	19	18	19	20	20	18	22	21	28	29	19	23	19	19	18	23	17	18	20	29
11-Aug	22	24	21	21	22	22	24	23	24	31	26	32	25	30	27	33	40	41	28	34	9	36	30	29	41
12-Aug	21	24	24	27	26	25	25	26	29	29	26	32	27	33	34	29	26	28	38	30	19	15	17	17	38
13-Aug	18	19	19	20	17	17	16	20	23	26	30	28	30	33	33	30	30	28	22	20	20	20	26	33	
14-Aug	30	27	23	29	29	31	29	27	30	27	24	24	21	19	26	32	27	20	25	21	17	28	18	21	32
15-Aug	15	14	31	10	12	15	18	20	21	20	22	23	25	28	26	28	27	26	31	63	38	31	25	24	63
16-Aug	22	25	25	24	24	25	25	22	25	25	31	37	30	33	38	35	37	32	20	30	13	17	18	20	38
17-Aug	19	19	20	19	19	21	21	22	27	31	30	35	34	33	31	34	28	25	25	26	28	25	23	21	35
18-Aug	20	19	15	15	16	16	17	17	18	20	20	21	24	21	23	23	24	22	19	21	23	23	24	23	24
19-Aug	23	25	25	25	24	24	22	28	31	28	30	33	30	32	33	34	30	30	27	18	19	22	20	21	34
20-Aug	20	19	19	19	20	20	21	22	26	31	31	30	39	42	65	42	35	23	19	17	18	17	16	13	65
21-Aug	12	11	12	13	13	11	11	15	36	60	37	60	36	31	50	39	23	14	10	23	18	15	15	14	60
22-Aug	15	12	29	11	17	32	18	23	27	24	37	33	21	32	36	29	26	16	45	53	8	18	32	15	53
23-Aug	13	16	13	13	52	85	14	21	100	22	43	23	24	22	17	22	20	15	15	15	16	16	15	16	100
24-Aug	14	19	16	18	14	15	16	17	18	21	23	24	30	C	30	26	30	23	25	16	14	14	12	16	30
25-Aug	18	19	17	18	20	18	20	22	19	23	30	28	29	30	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	30
26-Aug	15	16	14	14	15	15	16	17	18	19	25	29	95	47	34	45	20	38	39	19	19	19	22	17	95
27-Aug	15	14	15	15	13	13	13	29	46	69	73	46	94	38	35	25	18	13	22	16	14	16	14	15	94
28-Aug	17	19	21	21	21	22	23	21	24	32	30	29	58	38	60	78	29	48	13	11	12	14	13	14	78
29-Aug	15	12	12	12	13	14	15	16	15	18	22	22	23	23	22	22	16	15	11	13	13	14	11	12	23
30-Aug	13	11	13	13	13	17	22	26	17	29	80	45	30	25	18	25	23	14	22	15	31	15	35	26	80
31-Aug	11	43	37	21	16	17	17	17	16	20	21	31	35	28	28	23	22	23	20	20	20	19	19	18	43
Diurnal Maximum																									
31 43 63 29 52 85 75 46 100 74 80 88 95 54 80 104 43 69 45 80 38 36 35 29																									

C - Calibration UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS19 FIREBAG AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
AUGUST 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	35	36	99.87	35.6	0	5.5	0
H2S (ppb) Average	707	36	37	99.87	4.2	0	0.5	0
THC (ppm) Average	652	33	92	92.07	3.2	-	2.5	-
NO2 (ppb) Average	708	36	36	100	15.3	0	4.3	-
NO (ppb) Average	708	36	36	100	4.7	-	0.6	-
NOX (ppb) Average	708	36	36	100	18.6	-	4.8	-
Temperature 2 m (C) Average	744	0	0	100	29.6	-	23	-
Relative Humidity (%) Average	732	0	12	98.39	100	-	93.6	-
Wind Speed 10 m (km/h) Average	744	0	0	100	28	-	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 - FIREBAG (AMS19)
AUGUST 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	0.78	2.4	-	0	0	0.1	0.2	0.4	1.7	35.6
H2S (ppb) Average	707	0.21	0.3	-	0	0.1	0.1	0.1	0.2	0.4	4.2
THC (ppm) Average	652	2.32	0.1	-	2.1	2.2	2.2	2.3	2.4	2.5	3.2
NO2 (ppb) Average	708	2.23	2.1	-	0.2	0.5	0.9	1.5	2.8	4.8	15.3
NO (ppb) Average	708	0.26	0.5	-	0	0	0.1	0.1	0.2	0.7	4.7
NOX (ppb) Average	708	2.49	2.4	-	0.2	0.5	0.9	1.6	3.1	5.5	18.6
Temperature 2 m (C) Average	744	15.75	4.4	-	5.2	10.6	12.5	15.3	18.6	21.5	29.6
Relative Humidity (%) Average	732	74.62	16.7	-	31.7	50.9	61.4	76.1	89.7	95.7	100
Wind Speed 10 m (km/h) Average	744	11.1	5	-	1	5	8	10	14	18	28
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

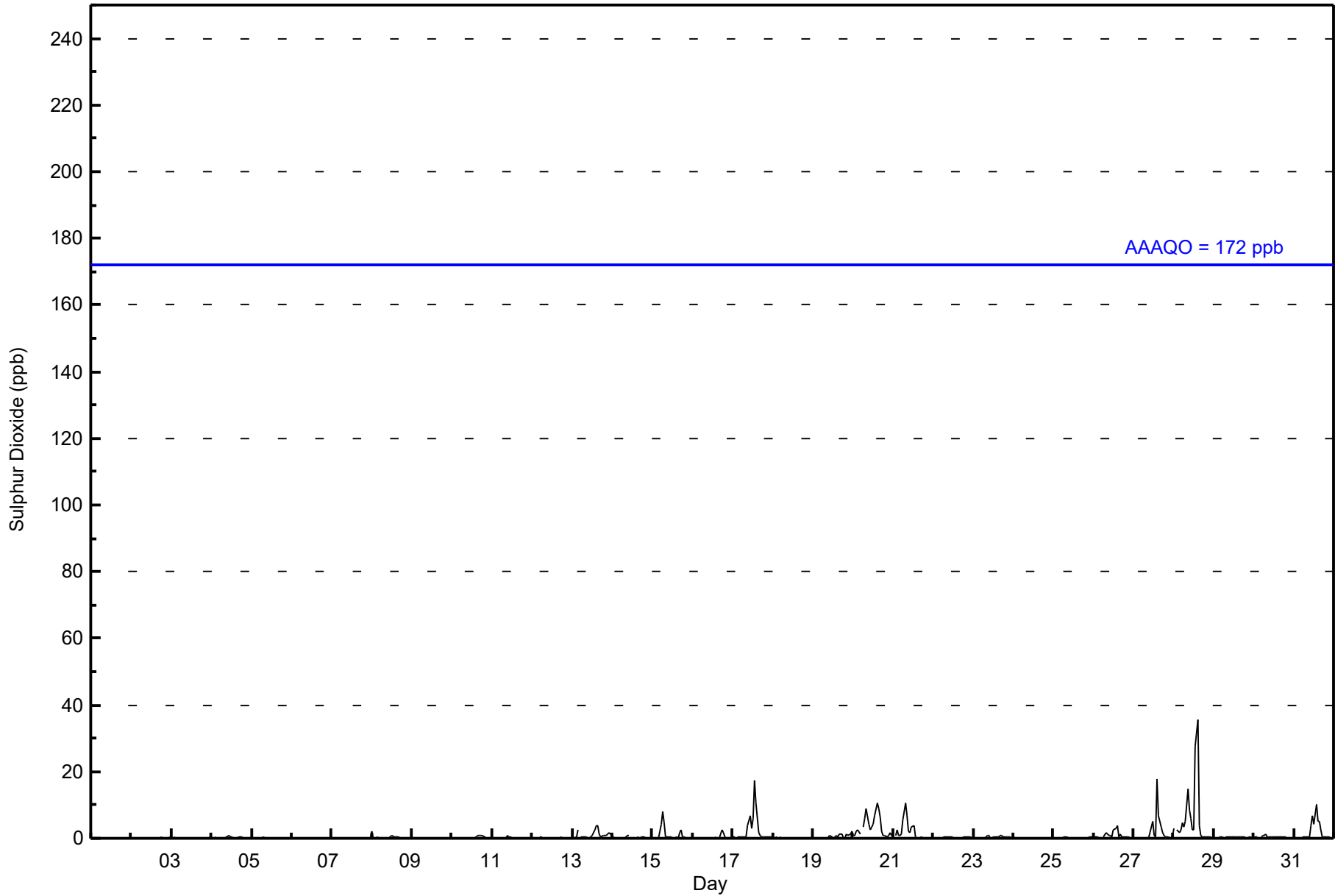
WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FIREBAG (AMS19)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S,SO2, THC	16 Aug 2023 13:00	16 Aug 2023 13:00	1	Maintenance - sample manifold cleaned
THC	26 Aug 2023 07:00	28 Aug 2023 11:00	53	Unstable Operation - flatline in analyzer output signal
THC	28 Aug 2023 12:00	28 Aug 2023 13:00	2	Maintenance - analyzer rebooted
THC	29 Aug 2023 11:00	29 Aug 2023 13:00	3	Maintenance - baseline correction
Relative Humidity	01 Aug 2023 05:00	16 Aug 2023 05:00	12	Sensor operated out of range



Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744						
Maximum Value: 35.6 ppb on Aug 28 15:00		Maximum Daily Average: 5.5 ppb on Aug 28																	Hours of Data: 708								
Minimum Value: 0.0 ppb on Aug 1 19:00		Minimum Daily Average: 0.0 ppb on Aug 6																	Hours of Missing Data: 36								
Maximum Diurnal Average: 3.1 ppb at hour 15		Minimum Diurnal Average: 0.2 ppb at hour 2																	Hours of Calibration: 35								
Monthly Average: 0.78 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 1.7 P ₉₉ = 10.4																	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-Aug	0.0	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
2-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.3	
3-Aug	Z	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	0.0	0.1	0.1	0.2	0.2	0.1	0.3	0.1	0.3	
4-Aug	0.2	Z	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.3	0.2	0.1	0.2	0.1	0.3	0.5	0.5	0.2	0.1	0.1	0.2	0.1	0.2	0.7	
5-Aug	0.1	0.1	Z	0.1	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	
6-Aug	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	
7-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
8-Aug	2.0	0.1	0.1	0.5	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.5	0.7	0.4	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	2.0	
9-Aug	Z	0.0	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	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	
10-Aug	0.1	Z	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.7	0.6	0.7	0.6	0.4	0.1	0.2	0.1	0.1	0.2	0.7	
11-Aug	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.0	0.1	0.7	0.3	0.4	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.7	
12-Aug	0.1	0.0	0.1	Z	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.3	
13-Aug	0.1	0.2	0.4	2.5	Z	0.5	0.3	0.3	0.2	0.2	0.2	0.4	1.0	2.5	3.7	4.0	1.4	0.3	0.7	0.7	1.0	1.1	1.9	1.1	1.1	4.0	
14-Aug	0.6	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.3	0.8	0.7	C	C	C	C	0.3	0.0	0.2	0.3	0.5	0.1	0.0	0.0	0.0	0.2	0.8	
15-Aug	Z	0.2	0.1	0.1	2.0	4.2	7.9	4.5	0.3	0.4	0.4	0.3	0.1	0.2	0.3	0.2	1.5	2.4	0.6	0.4	0.1	0.0	0.0	0.0	1.1	7.9	
16-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	M	0.5	0.2	0.2	0.2	2.3	1.9	0.3	0.1	0.2	0.1	0.2	0.3	2.3	
17-Aug	0.5	0.6	Z	0.5	0.5	0.4	0.4	0.4	0.6	3.7	6.9	3.1	5.8	17.2	10.7	1.5	0.8	0.5	0.3	0.2	0.3	0.2	0.2	0.3	2.4	17.2	
18-Aug	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	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	
19-Aug	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.1	0.0	0.7	0.6	0.2	0.6	0.8	0.6	1.1	1.2	0.0	0.2	1.1	0.7	1.2	1.9	0.5	1.9	
20-Aug	0.7	0.9	2.2	2.6	1.3	Z	3.4	5.9	8.8	4.4	2.5	3.2	4.4	6.8	10.6	8.7	6.2	2.2	1.0	0.7	0.5	0.9	1.8	1.1	3.5	10.6	
21-Aug	Z	1.0	2.6	1.0	1.0	1.2	5.6	10.4	6.9	2.1	1.7	3.5	3.9	0.6	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.9	10.4	
22-Aug	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.3	0.2	0.3	0.2	0.2	0.5	
23-Aug	0.1	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.7	0.7	0.1	0.1	0.3	0.2	0.2	0.5	0.7	0.8	0.4	0.5	0.4	0.2	0.3	0.2	0.3	0.8	
24-Aug	0.2	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	0.0	0.0	0.2	0.2
25-Aug	0.0	0.0	0.0	0.0	Z	0.2	0.3	0.3	0.6	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	0.4	0.5	0.2	0.6	
26-Aug	0.3	0.3	0.3	0.1	0.1	Z	0.3	1.7	1.4	0.9	0.9	0.3	2.6	3.1	3.7	0.3	1.5	0.5	0.6	0.5	0.3	0.2	0.2	0.1	0.9	3.7	
27-Aug	Z	0.1	0.1	0.0	0.0	0.0	0.2	0.2	0.2	0.2	1.6	5.1	0.8	0.6	17.9	6.6	3.6	1.6	0.9	0.6	0.4	0.3	0.2	0.8	1.8	17.9	
28-Aug	2.8	Z	2.6	1.6	2.4	4.5	3.6	5.1	14.9	8.5	5.9	2.5	2.7	27.6	35.6	3.8	0.9	0.6	0.4	0.3	0.3	0.2	0.2	0.2	5.5	35.6	
29-Aug	0.2	0.2	Z	0.2	0.3	0.3	0.2	0.4	0.5	0.6	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.6	
30-Aug	0.2	0.3	0.3	Z	0.5	0.8	0.8	1.1	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.4	1.1	
31-Aug	0.1	0.2	0.2	0.2	Z	0.3	0.3	0.4	0.5	0.5	3.8	6.9	4.1	10.0	5.1	5.2	2.4	0.6	0.4	0.4	0.3	0.2	0.2	0.1	1.8	10.0	
																								Diurnal Average			
																								Diurnal Maximum			
																								Diurnal Average			
																								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
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	701	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: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Firebag - August 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	61	32	8	12	12	22	40	49	69	85	83	54	40	38	42	54	701
11 - 20	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	5
21 - 60	0	0	0	0	0	0	0	0	0	0	1	1	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	61	32	8	12	12	22	40	49	69	85	85	56	43	38	42	54	708

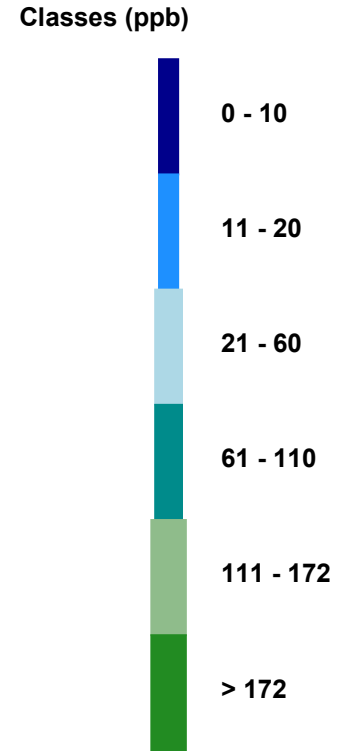
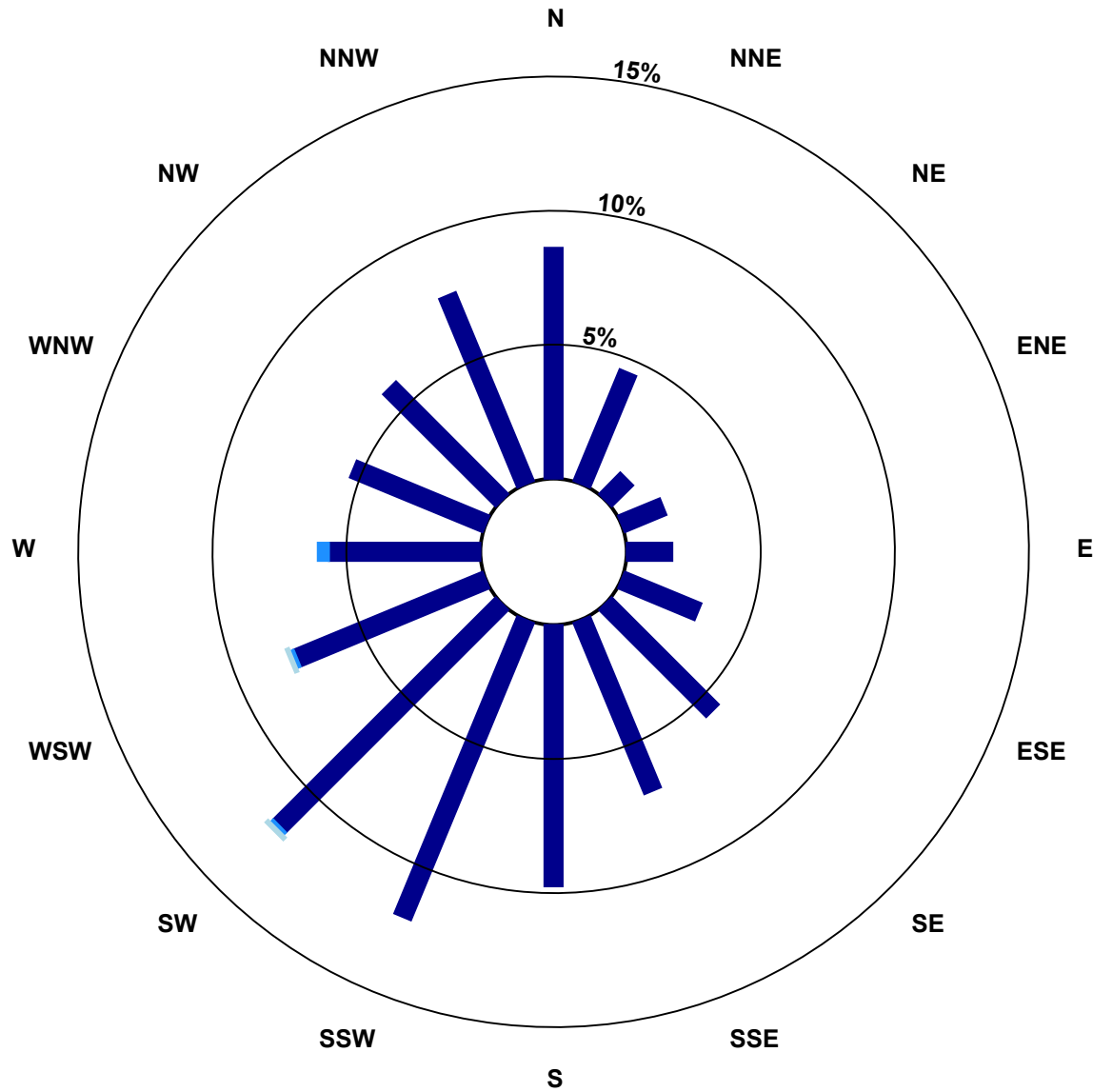
Total Number of Valid Hours: 708

Total Number of Hours: 744

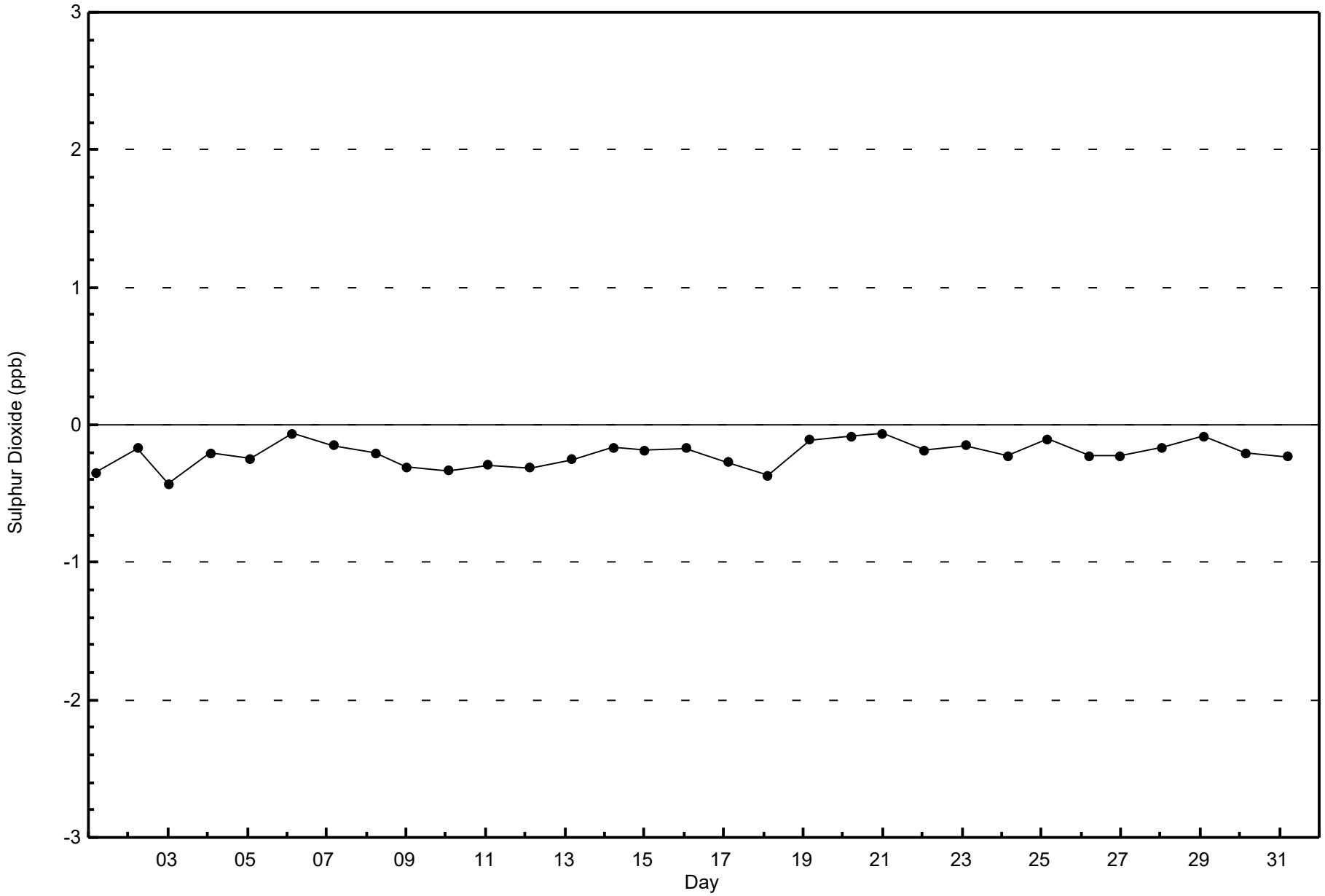


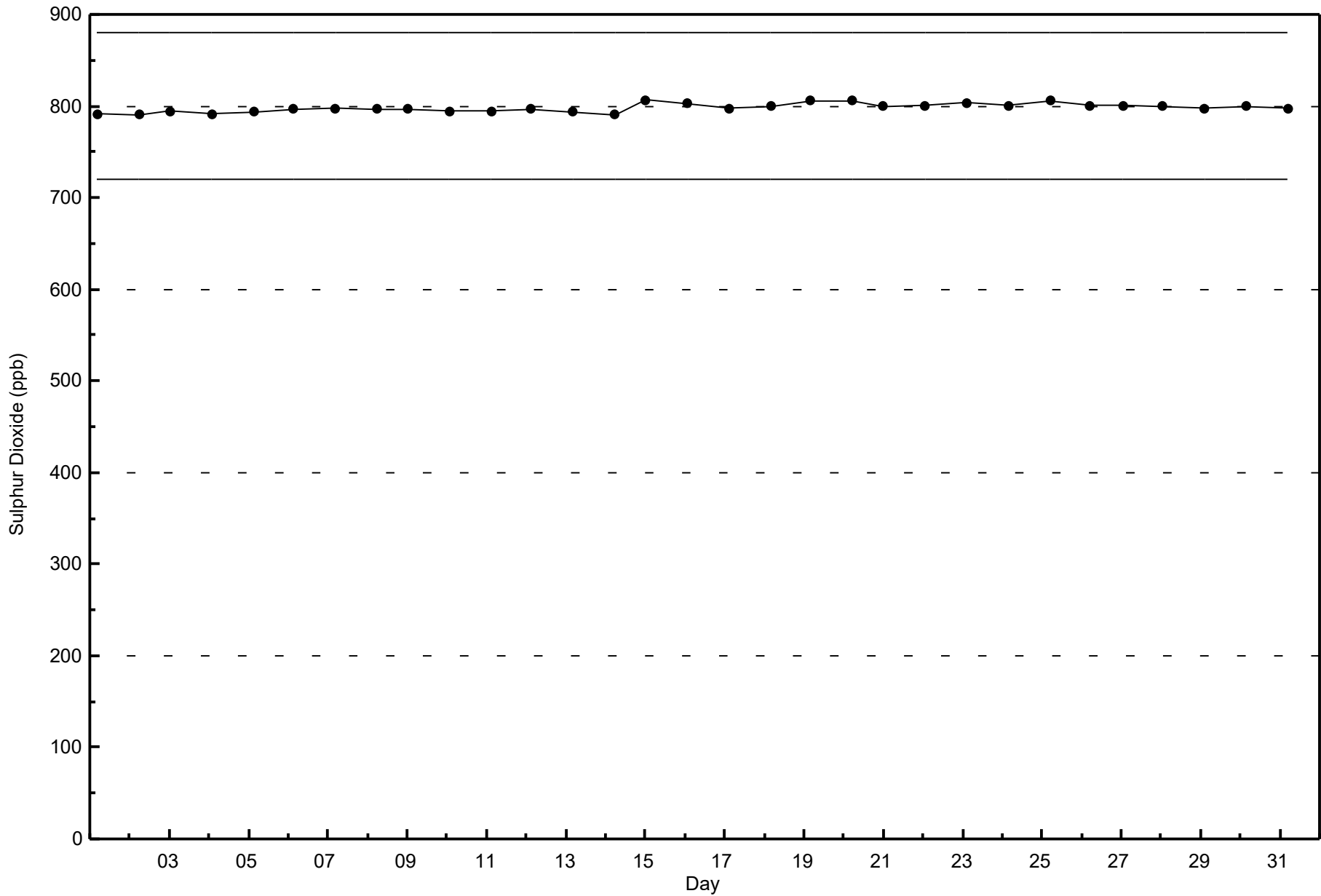
Wood Buffalo Environmental Association
Wind Rose Aug 2023

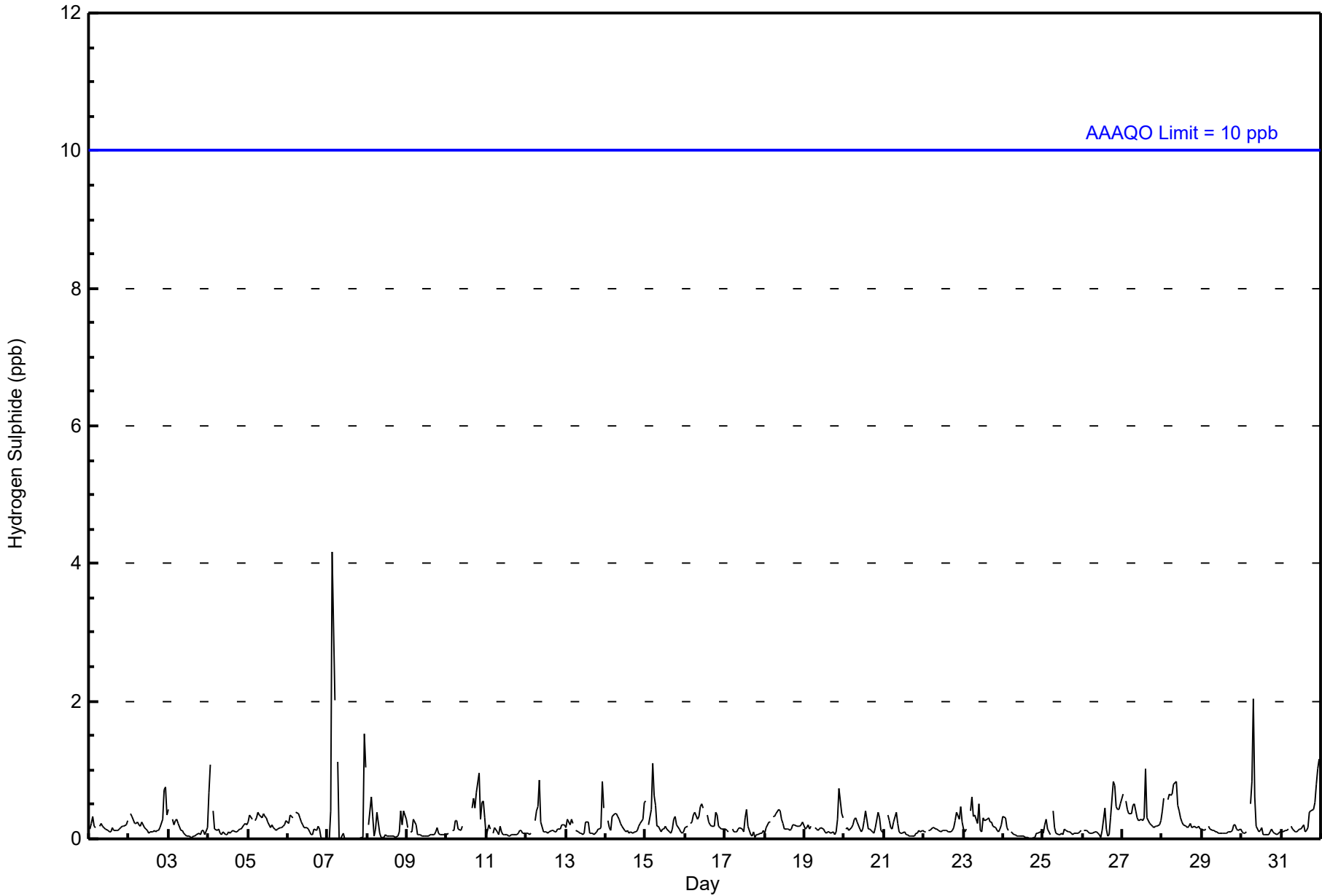
Sulphur Dioxide (SO₂) - ppb
Firebag



Total Number of Valid Hours: 708









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	706	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Firebag - August 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	63	32	8	10	12	17	41	49	70	85	83	57	45	40	42	52	706
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	63	32	8	11	12	17	41	49	70	85	83	57	45	40	42	52	707

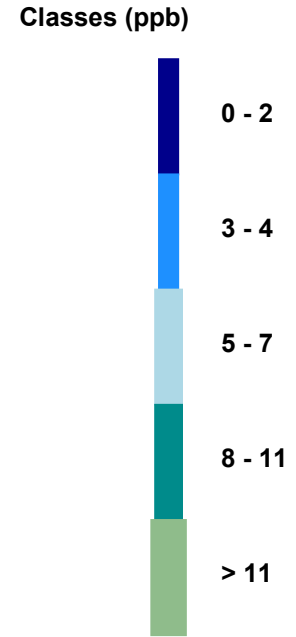
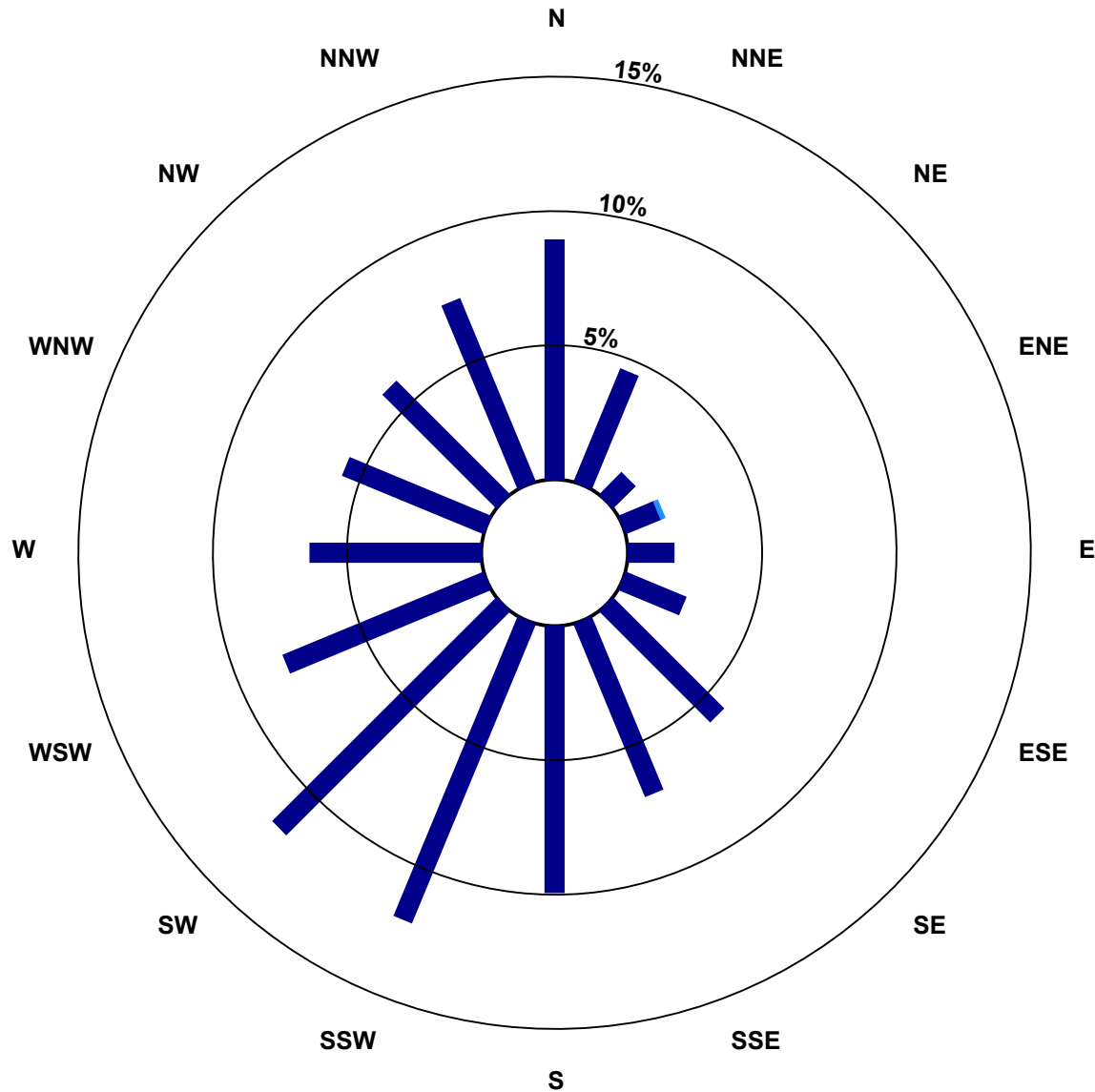
Total Number of Valid Hours: 707

Total Number of Hours: 744

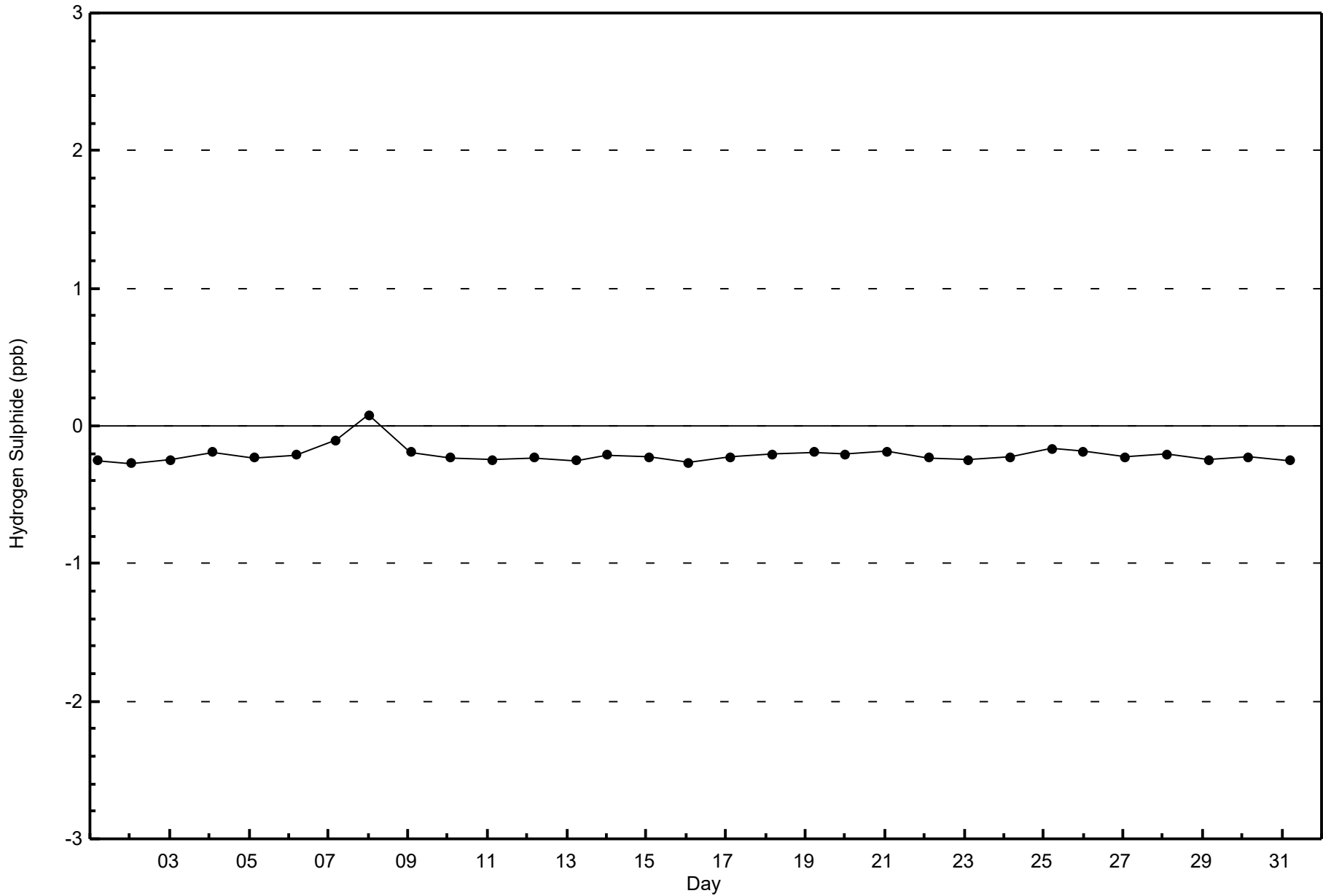


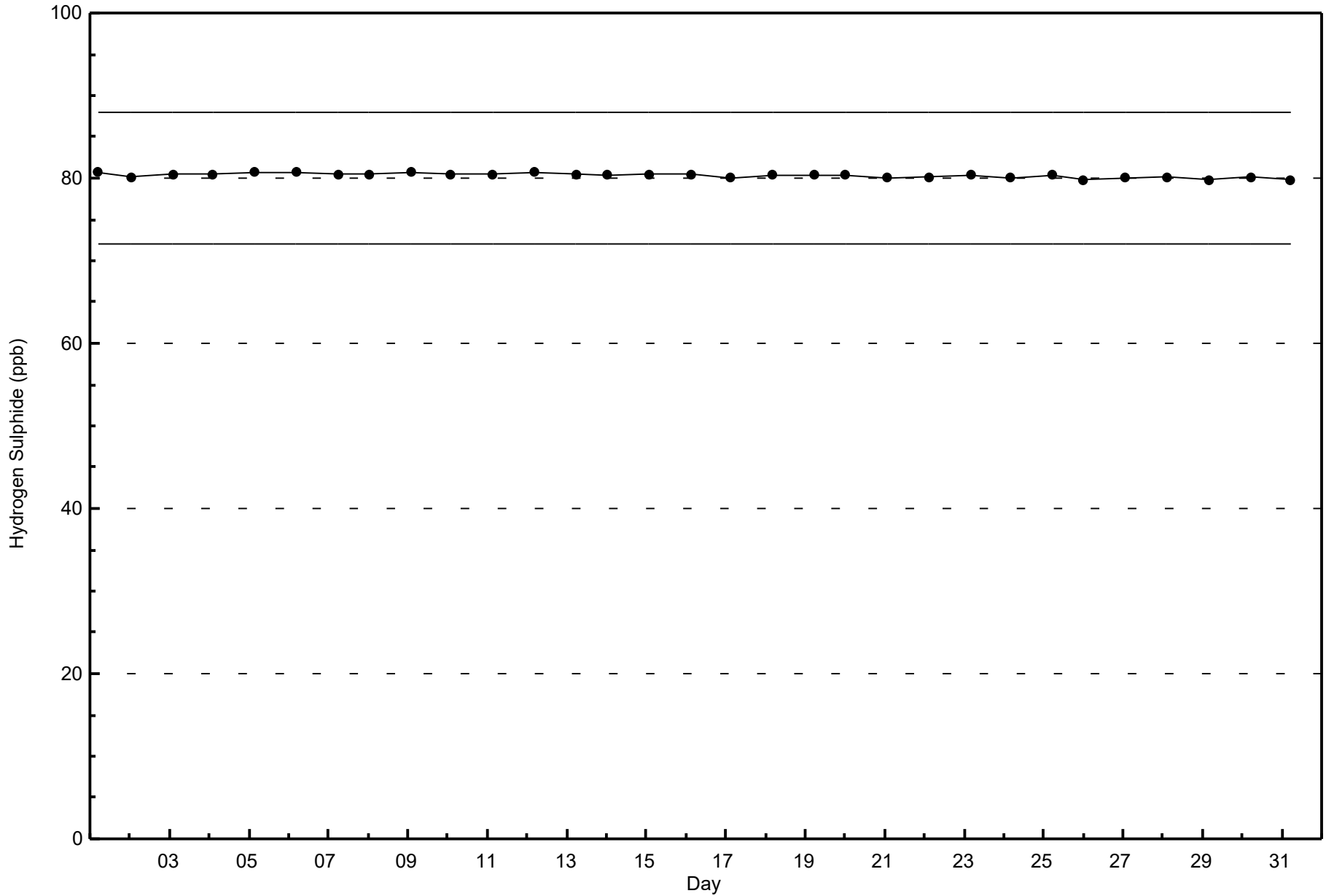
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Firebag



Total Number of Valid Hours: 707

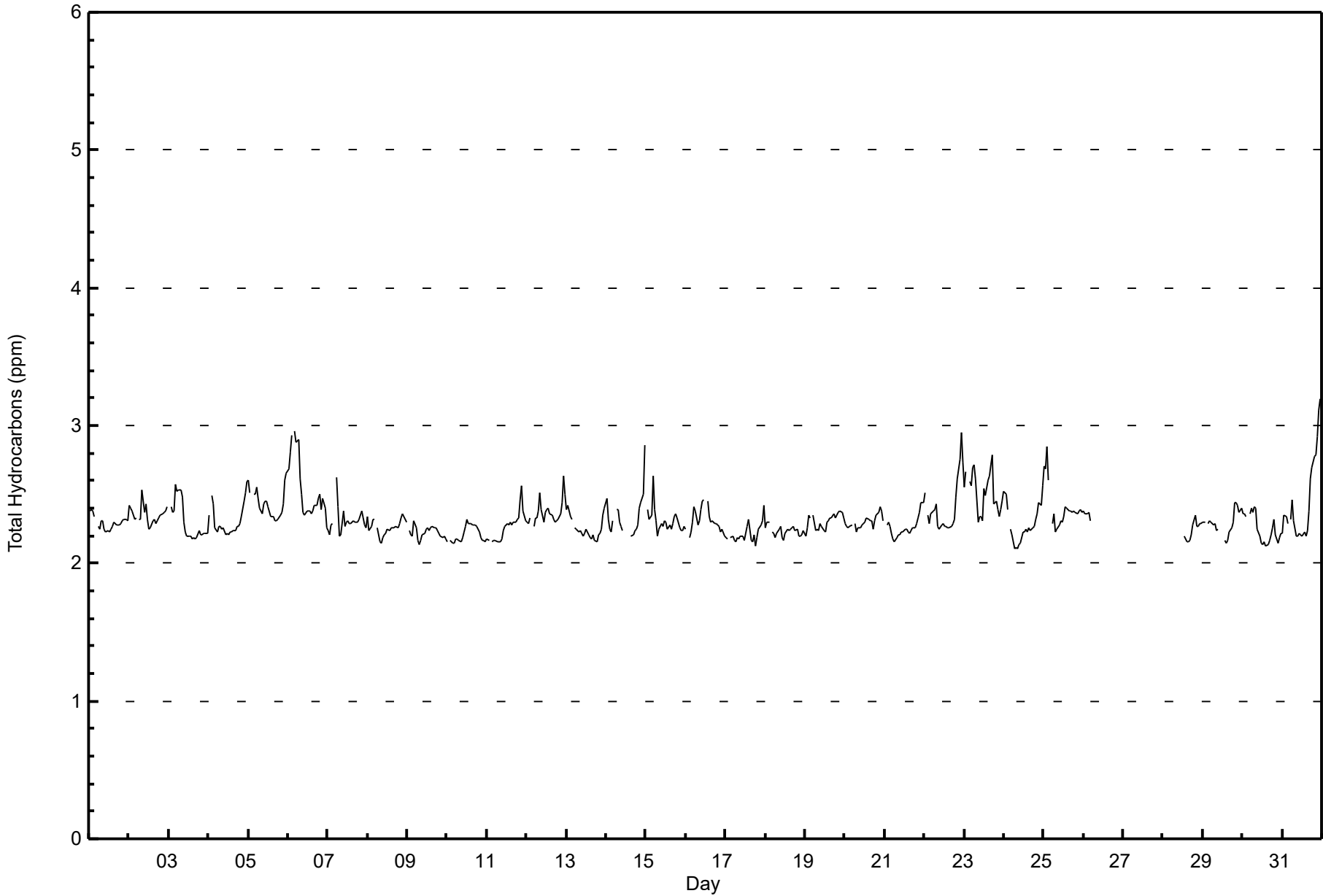






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Firebag - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Firebag - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	650	99.69	99.69
3.1 - 10.0	2	0.31	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 652

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Firebag - August 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	54	30	8	12	12	22	40	49	68	75	66	50	39	35	40	50	650
3.1 - 10.0	2	0	0	0	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	56	30	8	12	12	22	40	49	68	75	66	50	39	35	40	50	652

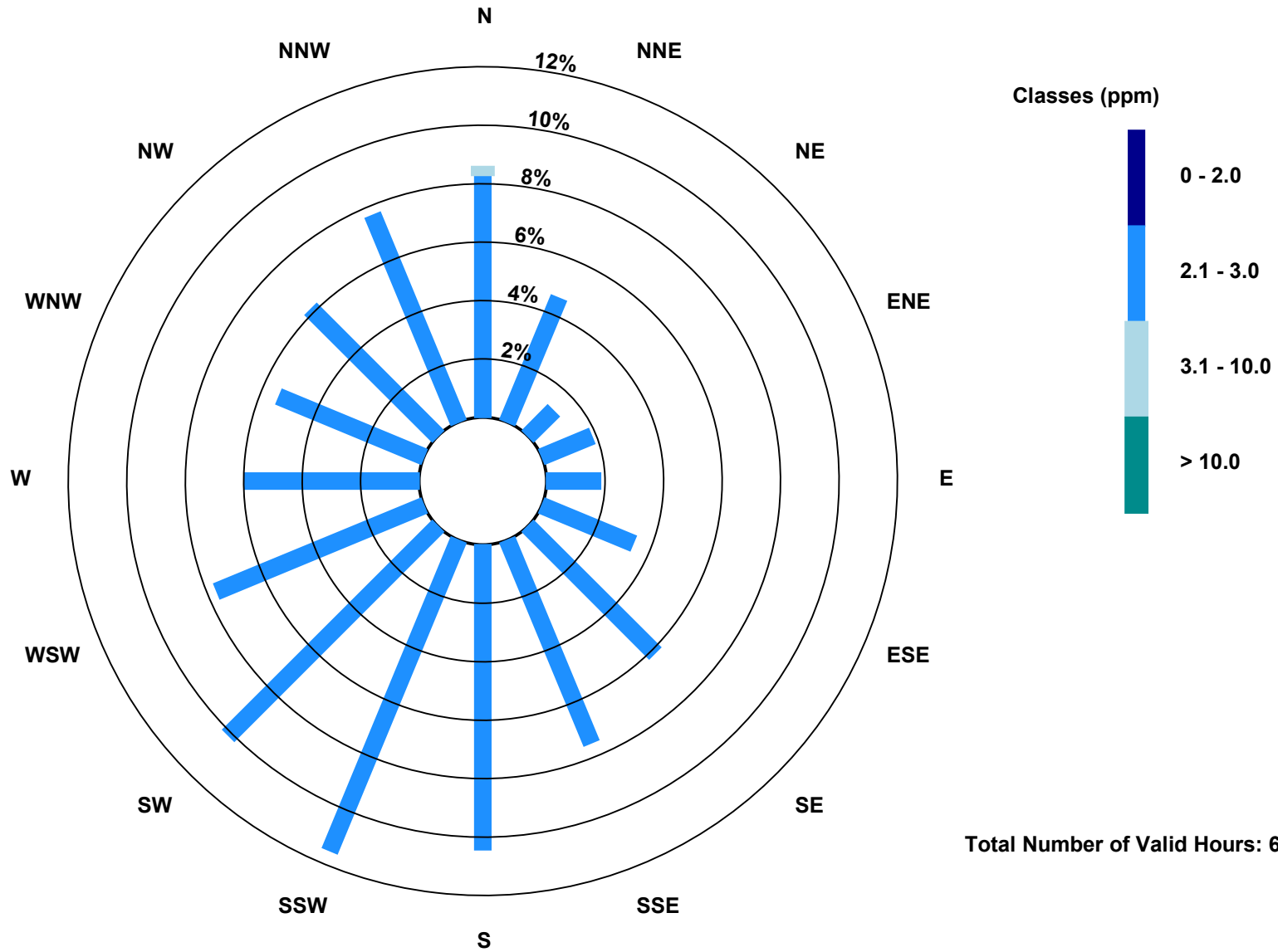
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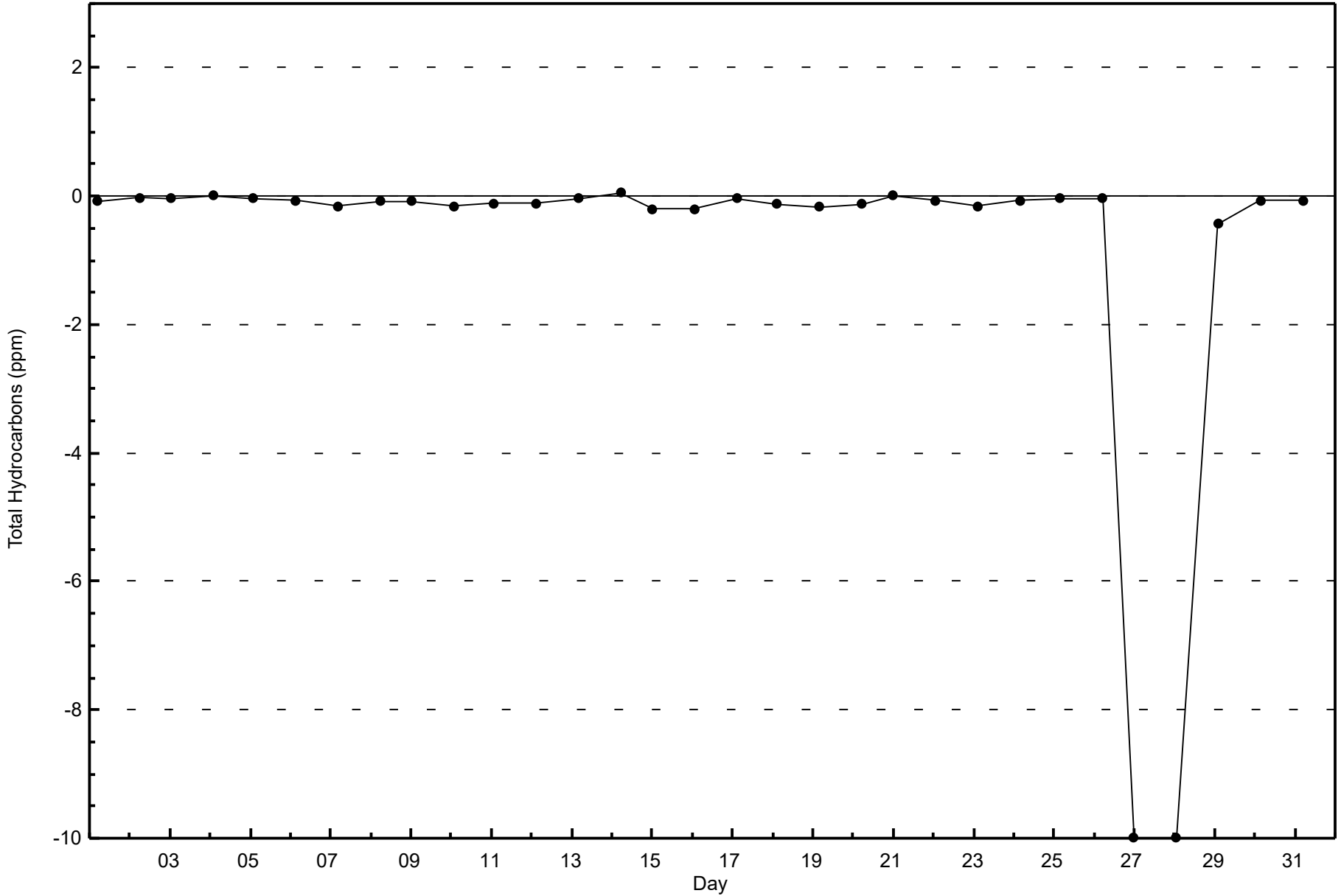
Total Number of Hours: 744

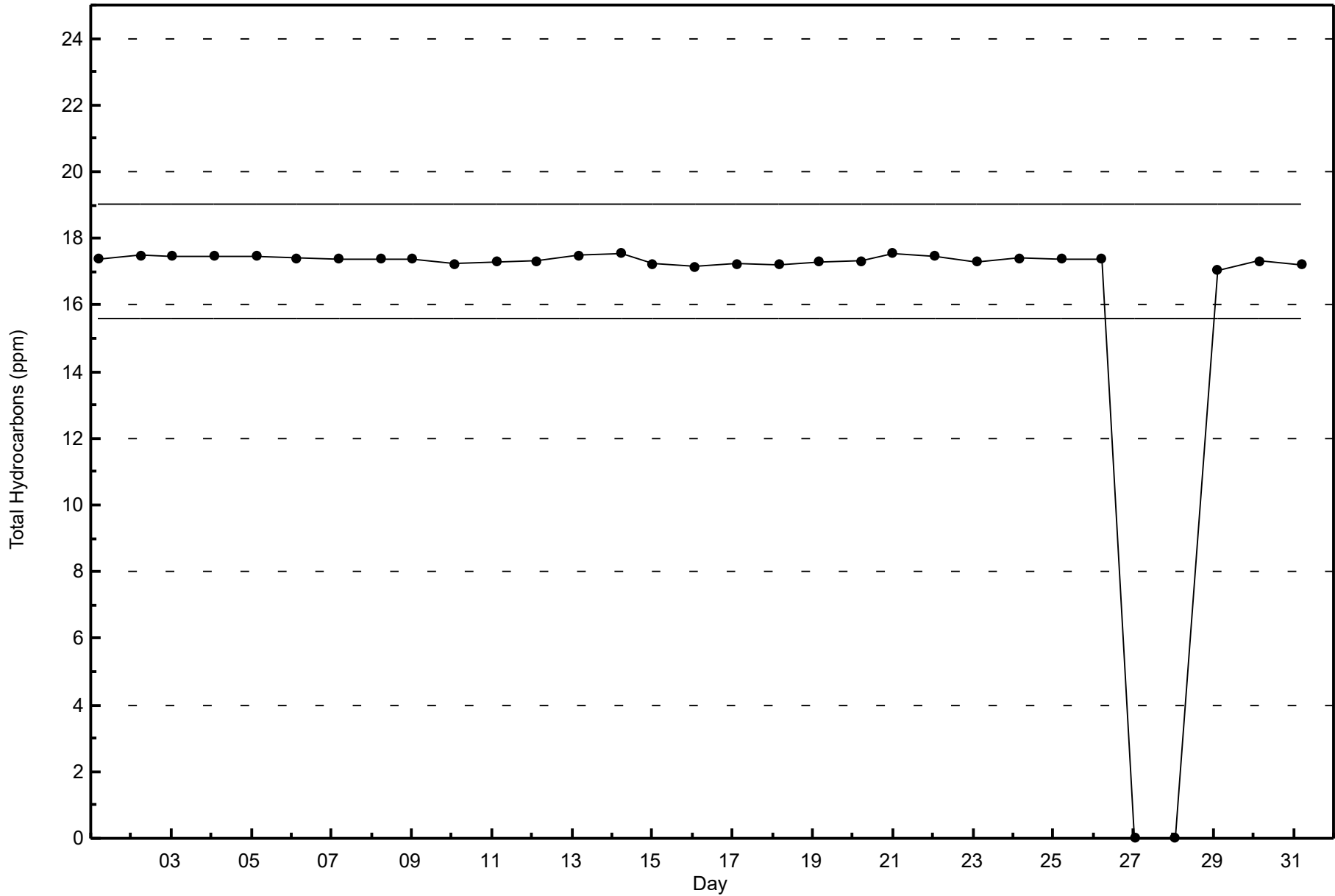


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Firebag









Wood Buffalo Environmental Association
Summary of Hour Averages

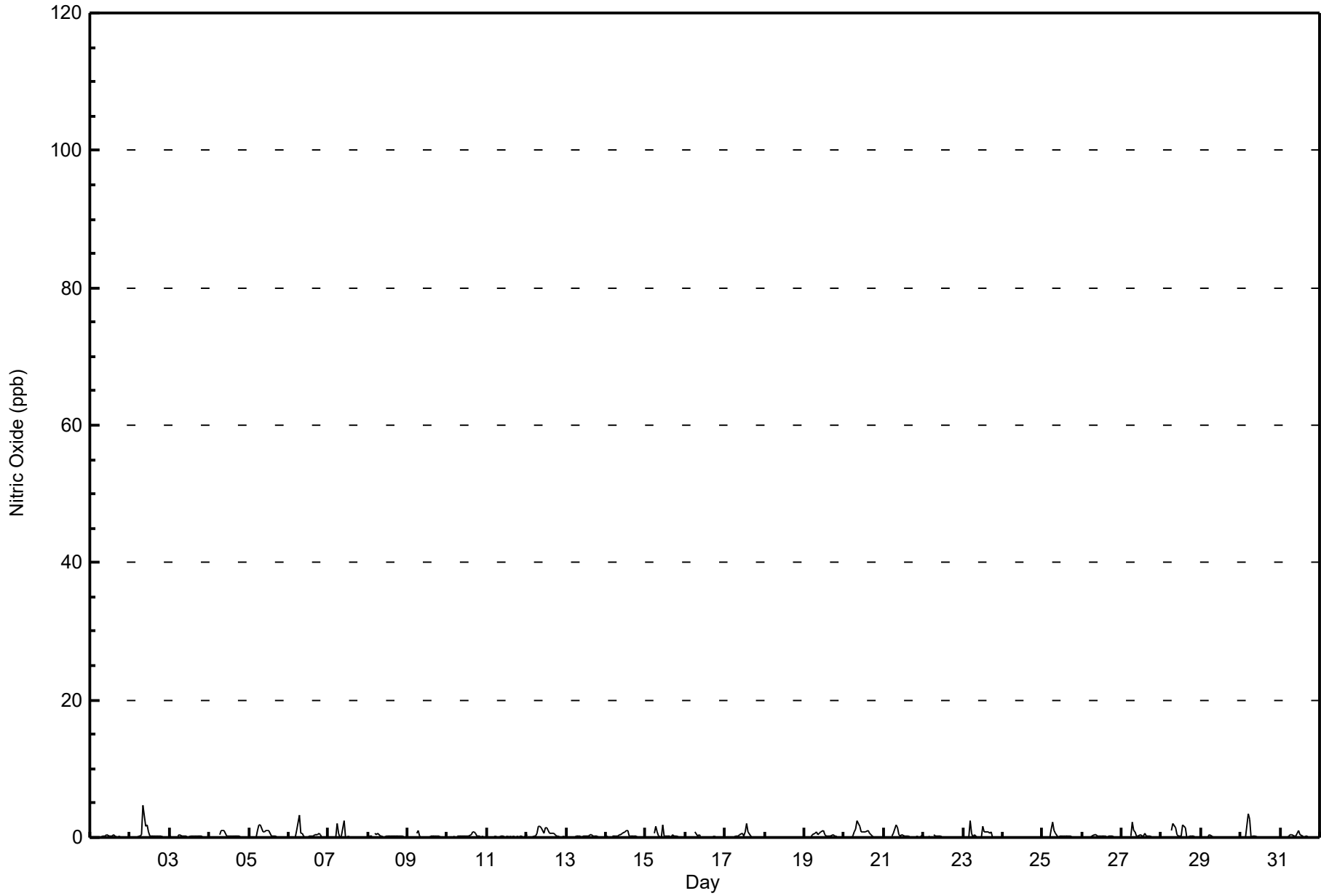
Nitric Oxide (NO) - ppb
Firebag - August 2023

Maximum Value: 4.7 ppb on Aug 2 09:00		Maximum Daily Average: 0.6 ppb on Aug 12		Hours in Service: 744																								
Minimum Value: 0.0 ppb on Aug 15 03:00		Minimum Daily Average: 0.0 ppb on Aug 18		Hours of Data: 708																								
Maximum Diurnal Average: 0.7 ppb at hour 7		Minimum Diurnal Average: 0.0 ppb at hour 3		Hours of Missing Data: 36																								
Monthly Average: 0.26 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.7 P ₉₉ = 2.3		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-Aug	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.4	
2-Aug	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.4	4.7	1.6	1.8	0.7	0.1	0.1	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.5	4.7
3-Aug	0.1	0.1	0.1	0.1	Z	0.3	0.4	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	0.0	0.0	0.0	0.0	0.1	0.4	
4-Aug	0.0	0.1	0.1	0.1	0.1	Z	0.3	1.1	1.0	0.9	0.3	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.1	
5-Aug	Z	0.0	0.0	0.0	0.1	0.9	1.9	1.8	0.9	0.8	1.0	1.1	0.9	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5	1.9	
6-Aug	0.0	Z	0.0	0.1	0.0	1.1	3.3	0.7	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.5	0.4	0.1	0.1	0.1	0.0	0.4	3.3		
7-Aug	0.0	0.0	Z	0.1	0.1	2.1	0.6	0.0	0.1	2.5	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	0.3	2.5	
8-Aug	0.1	0.2	0.1	Z	0.5	0.4	0.6	0.3	0.1	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.6	
9-Aug	0.1	0.0	0.0	0.1	Z	0.6	1.1	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	0.1	0.1	0.2	1.1	
10-Aug	0.1	0.1	0.0	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.8	0.9	0.5	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.9	
11-Aug	Z	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.3
12-Aug	0.5	Z	0.1	0.1	0.2	0.2	0.6	1.6	1.6	1.4	0.6	1.4	1.4	1.0	0.7	0.6	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.6	1.6	
13-Aug	0.1	0.1	Z	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.5	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.5	0.5	
14-Aug	0.2	0.1	0.0	Z	0.2	0.2	0.1	0.2	0.4	0.5	0.7	0.8	1.1	1.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.1	
15-Aug	0.0	0.0	0.0	0.0	Z	0.6	1.5	0.8	0.1	0.1	1.9	0.2	0.1	0.1	0.1	0.1	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.3	1.9	
16-Aug	0.1	0.0	0.0	0.0	0.1	Z	0.8	0.2	0.4	0.2	C	C	C	C	C	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	
17-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.2	0.4	0.5	0.3	0.8	2.1	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1	
18-Aug	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
19-Aug	0.0	0.0	Z	0.0	0.1	0.4	0.7	0.8	0.5	0.6	0.7	1.1	0.5	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3	1.1	
20-Aug	0.0	0.0	0.0	Z	0.0	0.3	0.8	1.3	2.4	1.6	0.9	0.8	0.8	0.8	0.9	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	2.4	
21-Aug	0.1	0.1	0.1	0.0	Z	0.1	0.7	1.8	1.4	0.4	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	1.8	
22-Aug	0.1	0.0	0.0	0.1	0.2	Z	0.4	0.3	0.1	0.2	0.3	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	0.1	0.4	0.4	
23-Aug	Z	0.0	0.0	0.0	2.4	0.6	0.1	0.3	0.1	0.1	0.1	0.0	1.6	0.7	0.8	0.7	0.5	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.4		
24-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
25-Aug	0.1	0.1	Z	0.0	0.1	1.3	2.3	1.1	0.5	0.1	0.1	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	0.3	2.3	
26-Aug	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.4	0.3	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4
27-Aug	0.1	0.1	0.0	0.0	Z	0.1	2.3	1.1	0.9	0.1	0.2	0.3	0.2	0.2	0.6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	2.3	
28-Aug	0.1	0.1	0.1	0.1	0.1	Z	1.0	2.1	1.4	0.5	0.2	0.1	0.1	1.8	1.5	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.4	2.1		
29-Aug	Z	0.0	0.0	0.0	0.0	0.5	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.5	
30-Aug	0.0	Z	0.0	0.0	3.4	2.6	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	0.1	0.0	0.0	0.3	3.4	
31-Aug	0.0	0.0	Z	0.1	0.1	0.1	0.4	0.4	0.1	0.2	0.6	1.0	0.4	0.2	0.1	0.2	0.2	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	1.0	
																								Diurnal Average				
																								Diurnal Maximum				
																								Diurnal Average				
																								Diurnal Maximum				
Z - zerospan C - Calibration																												



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Firebag - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Firebag - August 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
Firebag - August 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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708
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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708

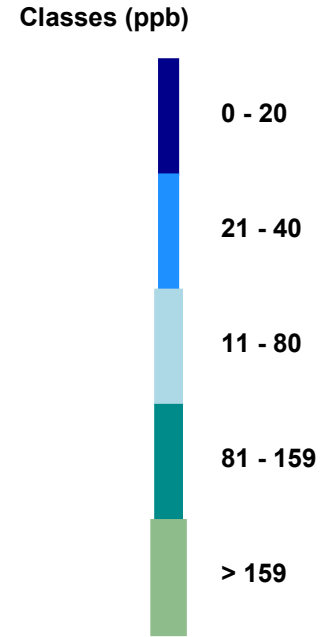
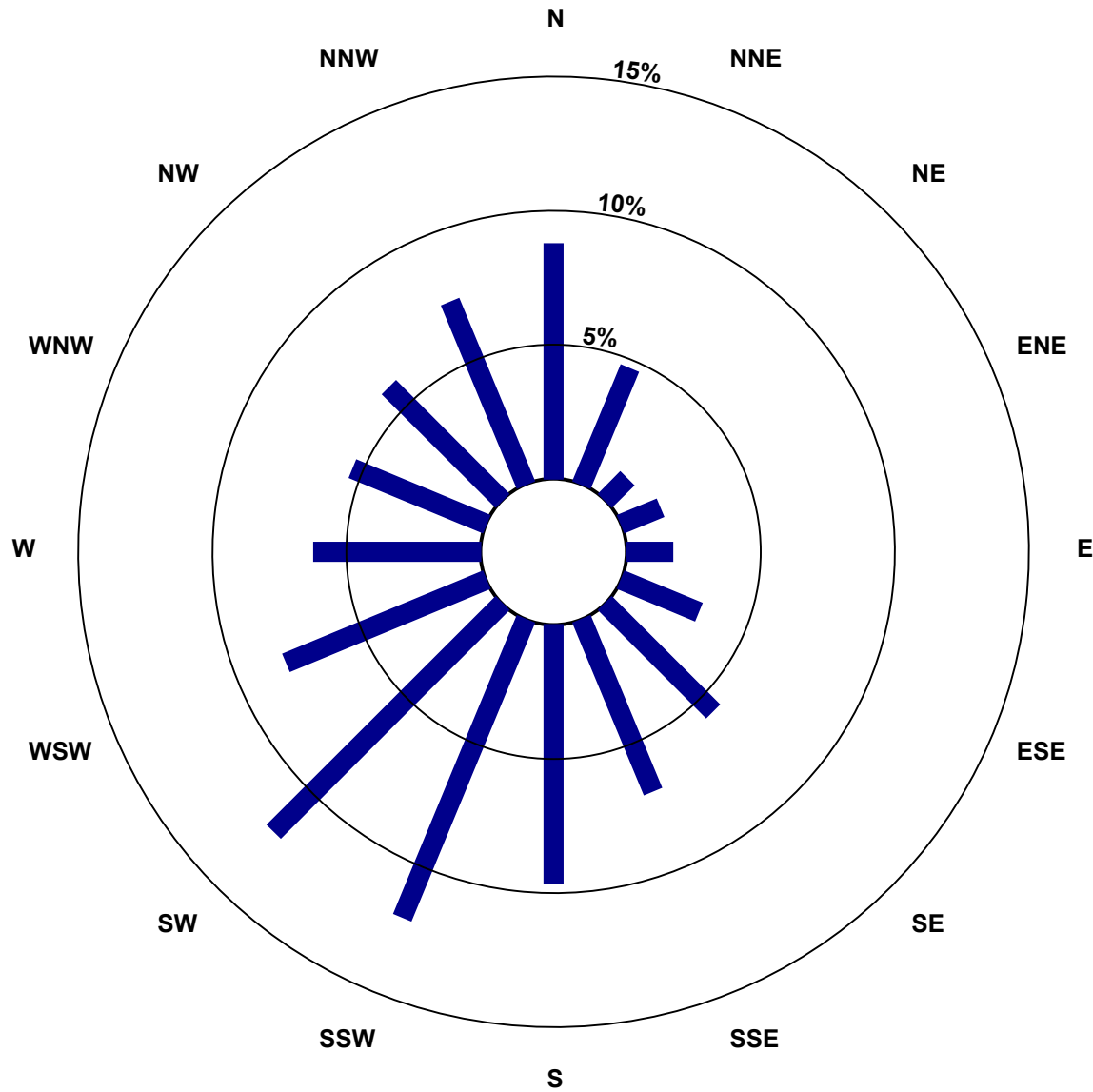
Total Number of Valid Hours: 708

Total Number of Hours: 744

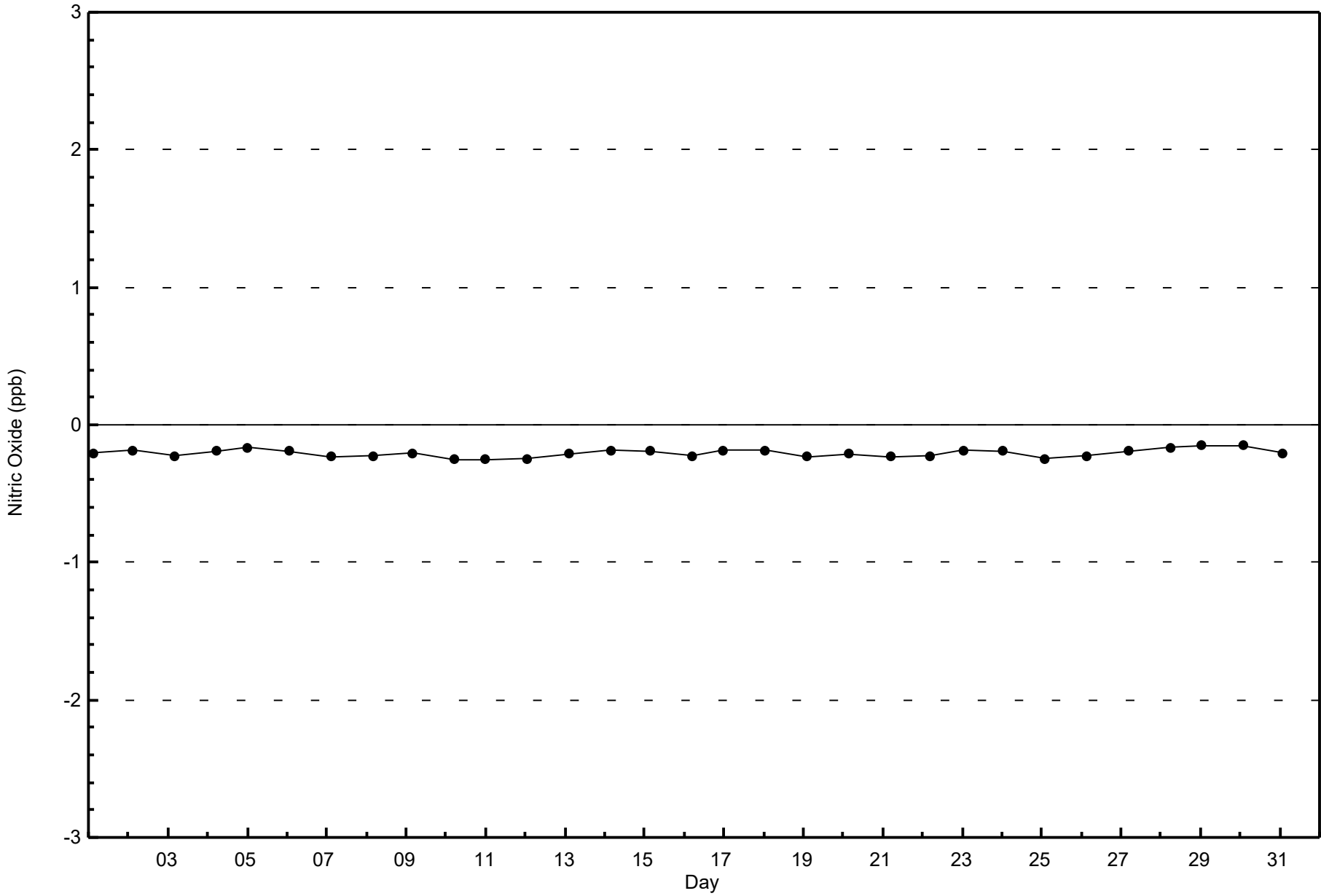


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Firebag



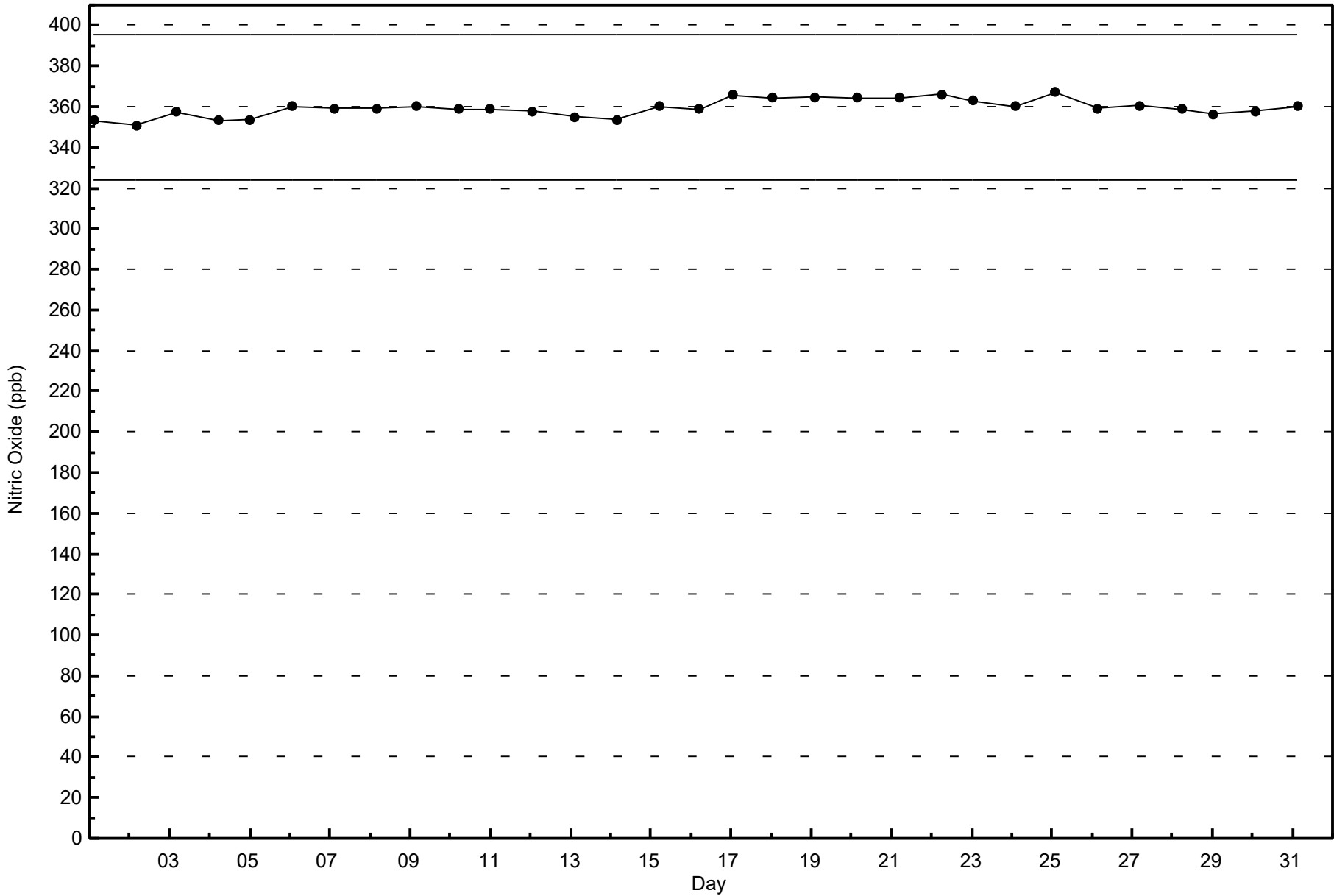
Total Number of Valid Hours: 708





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Firebag - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

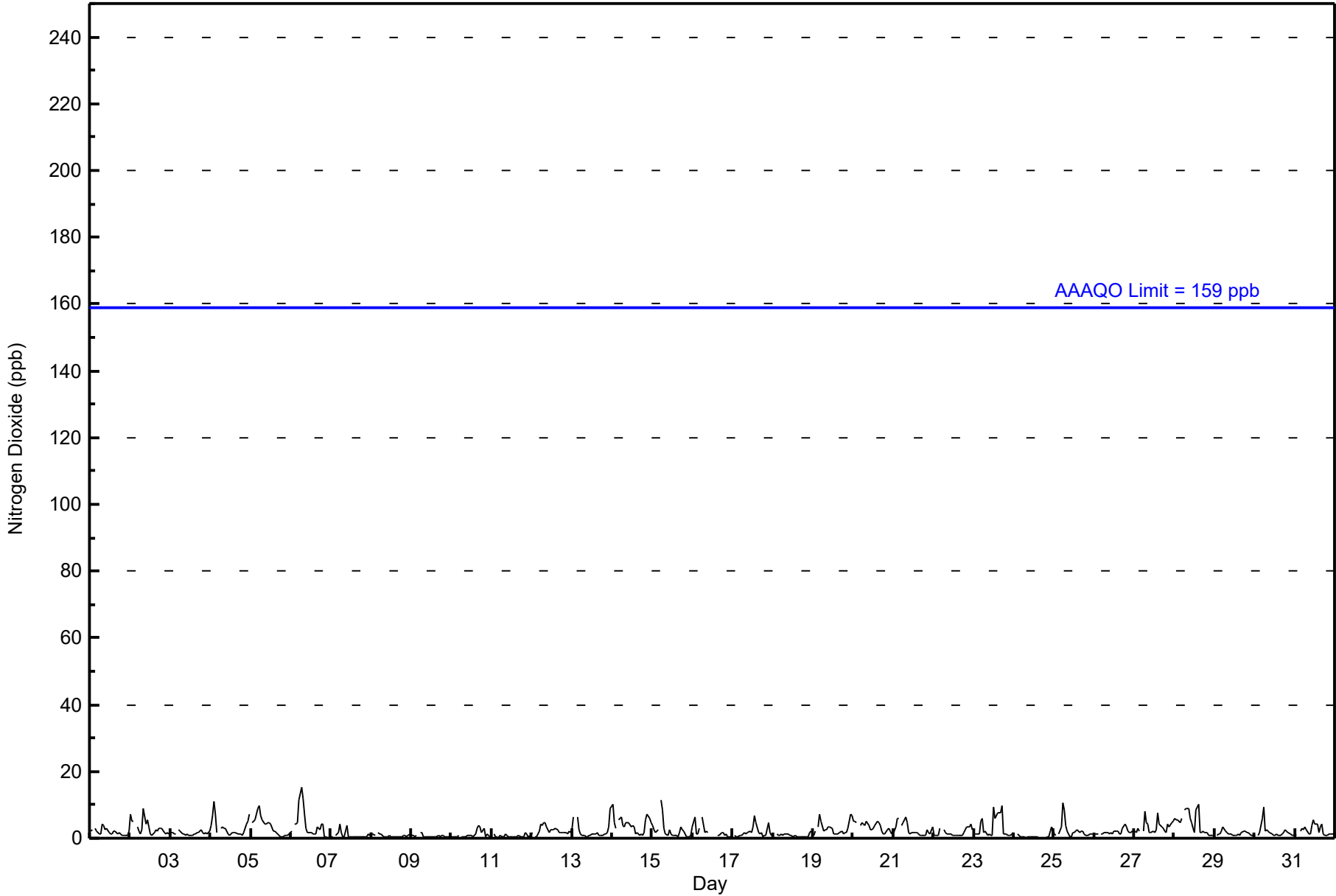
Firebag - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 15.3 ppb on Aug 6 07:00		Maximum Daily Average: 4.3 ppb on Aug 28														Hours of Data:		708																															
Minimum Value: 0.2 ppb on Aug 6 23:00		Minimum Daily Average: 0.6 ppb on Aug 11														Hours of Missing Data:		36																															
Maximum Diurnal Average: 4.2 ppb at hour 6		Minimum Diurnal Average: 1.5 ppb at hour 21														Hours of Calibration:		36																															
Monthly Average: 2.23 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.5 Q ₃ = 2.8 P ₉₀ = 4.8 P ₉₉ = 10.0														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-Aug	2.3	2.6	Z	2.9	2.0	1.3	1.4	4.1	4.0	2.4	2.8	1.6	1.4	1.1	2.2	2.0	1.3	1.5	1.4	0.8	0.7	0.7	0.7	2.0	1.9	4.1																							
2-Aug	7.3	5.2	4.9	Z	3.2	2.0	1.4	2.5	9.0	4.3	5.6	3.5	1.1	0.9	1.9	2.5	2.0	2.8	3.0	2.9	1.8	1.1	1.9	1.1	3.1	9.0																							
3-Aug	1.8	1.7	1.2	1.4	Z	2.5	2.3	1.4	1.2	1.0	1.1	0.9	0.9	0.9	1.1	1.2	1.6	1.9	2.5	1.6	1.3	1.7	1.1	2.3	1.5	2.5																							
4-Aug	3.7	6.6	11.1	7.4	1.8	Z	2.8	3.2	2.9	3.1	1.4	1.0	1.1	1.5	1.8	1.6	1.4	1.3	1.2	0.8	1.7	4.2	5.0	7.0	3.2	11.1																							
5-Aug	Z	4.5	5.4	7.4	8.8	9.6	6.6	5.4	4.1	4.3	4.8	4.8	4.2	2.0	2.2	1.8	1.1	0.7	0.6	0.6	0.7	0.8	0.8	1.4	3.6	9.6																							
6-Aug	2.2	Z	4.2	4.4	4.8	11.6	15.3	12.0	7.0	3.0	1.5	1.5	1.5	1.4	1.2	1.2	3.6	2.6	4.2	4.2	0.5	0.3	0.2	0.3	3.9	15.3																							
7-Aug	0.3	0.3	Z	0.8	1.5	4.4	1.5	0.4	0.5	3.8	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	1.2	0.8	0.9	4.4																							
8-Aug	1.7	1.2	1.0	Z	1.8	1.2	1.1	0.6	0.5	0.3	0.3	0.8	0.5	0.6	0.6	0.5	0.4	0.4	0.6	0.7	0.8	0.6	0.8	1.3	0.8	1.8																							
9-Aug	1.0	0.8	0.5	0.7	Z	1.6	1.8	0.6	0.4	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.7	0.6	0.8	0.8	0.4	0.3	0.4	0.3	0.6	1.8																							
10-Aug	0.3	0.3	0.4	0.5	0.7	Z	0.5	0.6	0.6	0.8	0.8	0.7	0.7	0.5	1.4	3.0	3.8	3.2	1.7	2.8	0.5	1.4	1.0	0.4	1.2	3.8																							
11-Aug	Z	1.2	0.3	0.3	0.2	0.8	0.6	0.3	1.3	0.8	0.4	0.3	0.4	0.3	0.4	0.4	0.7	0.4	0.6	0.5	1.6	1.3	0.6	0.7	0.6	1.6																							
12-Aug	1.8	Z	0.6	0.5	2.1	4.3	4.0	4.5	4.8	3.2	1.7	2.7	2.7	2.6	2.9	2.7	1.9	1.5	1.5	1.5	1.6	1.3	2.3	1.9	2.4	4.8																							
13-Aug	2.4	6.5	Z	6.3	2.6	1.1	0.8	0.8	0.6	0.5	0.7	1.0	1.2	1.3	1.4	1.6	1.0	0.7	0.8	1.1	1.3	1.5	3.3	9.1	2.1	9.1																							
14-Aug	10.0	4.7	2.8	Z	5.5	6.5	4.0	3.5	4.7	4.7	4.6	3.4	3.7	3.5	1.3	1.9	1.0	1.2	1.0	1.7	5.4	7.0	6.0	4.6	4.0	10.0																							
15-Aug	3.8	2.5	1.8	2.7	Z	11.3	8.4	2.8	1.1	0.7	2.6	1.1	0.9	1.0	0.8	0.6	1.8	3.4	2.5	2.2	0.6	0.3	0.4	0.7	2.3	11.3																							
16-Aug	3.2	6.3	1.3	1.4	3.0	Z	6.3	1.7	2.2	1.5	C	C	C	C	C	1.0	1.0	1.8	1.5	1.0	1.3	0.5	0.5	0.5	2.0	6.3																							
17-Aug	Z	0.8	0.6	0.6	0.7	0.8	1.2	1.5	1.3	1.6	2.3	1.6	3.4	6.6	4.6	1.7	1.3	1.7	0.5	0.7	0.9	4.7	1.8	0.7	1.8	6.6																							
18-Aug	1.0	Z	1.2	1.0	1.0	1.1	1.0	1.1	1.3	1.2	0.8	0.7	0.6	0.7	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	1.7	2.3	0.9	2.3																							
19-Aug	0.9	2.3	Z	3.5	7.1	5.0	2.1	2.7	2.6	3.4	3.4	2.8	1.4	1.1	1.3	1.3	1.7	2.3	1.3	1.7	1.8	2.8	7.0	6.8	2.9	7.1																							
20-Aug	5.1	4.9	4.8	Z	4.0	4.5	4.3	3.8	5.1	3.8	2.5	2.4	3.0	3.9	4.9	4.6	3.7	2.0	1.4	1.3	2.6	2.9	2.1	1.4	3.4	5.1																							
21-Aug	1.4	3.6	6.1	6.1	Z	3.8	4.8	6.5	4.6	1.9	1.4	1.8	1.7	1.5	1.7	1.3	0.7	0.8	0.8	1.0	2.6	1.6	1.2	3.5	2.6	6.5																							
22-Aug	0.9	0.9	1.0	1.0	2.9	Z	2.6	1.7	1.2	1.3	1.2	0.9	0.9	0.9	0.9	0.8	0.7	0.9	1.5	2.7	3.2	3.5	4.1	2.7	1.7	4.1																							
23-Aug	Z	1.2	1.2	1.3	4.9	6.1	1.8	2.0	1.0	1.3	0.7	0.7	9.3	5.9	7.6	7.7	7.7	9.7	1.2	1.1	0.9	0.8	0.9	1.4	3.3	9.7																							
24-Aug	1.9	Z	1.1	0.7	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	3.4	2.7	0.7	3.4																							
25-Aug	1.2	1.0	Z	1.1	3.5	10.7	8.3	3.9	2.2	0.5	0.6	1.5	1.5	2.2	2.4	1.9	2.1	2.0	1.4	1.0	0.9	1.1	1.4	1.3	2.3	10.7																							
26-Aug	1.4	1.4	1.3	Z	1.2	1.2	1.6	1.8	1.5	1.4	1.6	1.4	2.1	2.3	2.3	1.1	1.1	2.9	4.3	3.6	2.1	1.8	1.7	2.1	1.9	4.3																							
27-Aug	2.2	1.8	3.0	2.2	Z	2.2	8.1	4.5	4.3	1.8	1.6	2.3	1.7	2.4	7.6	4.1	3.4	3.0	2.1	1.6	4.1	3.3	4.7	5.0	3.3	8.1																							
28-Aug	5.9	5.5	5.6	4.6	6.1	Z	8.5	9.0	9.0	6.1	4.5	2.9	1.9	8.3	10.3	1.7	1.5	2.0	1.8	1.6	0.8	0.7	0.9	0.8	4.3	10.3																							
29-Aug	Z	0.9	1.3	1.4	2.1	3.2	2.3	1.6	1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.0	1.6	2.0	2.0	1.9	1.5	1.1	1.0	0.9	1.5	3.2																							
30-Aug	0.9	Z	1.0	1.5	5.8	9.3	2.1	2.4	2.2	1.8	1.4	0.9	0.9	1.1	0.8	0.8	1.3	1.6	2.7	2.0	1.6	1.1	0.9	1.0	2.0	9.3																							
31-Aug	1.3	0.7	Z	2.1	3.1	2.7	3.4	2.7	1.2	1.3	3.8	5.3	4.1	4.2	1.9	3.4	4.3	1.2	1.0	1.0	1.1	1.4	1.3	1.2	2.3	5.3																							
																								2.5	2.7	2.5	2.5	3.1	4.2	3.6	2.9	2.7	2.1	1.9	1.7	1.8	2.0	2.3	1.8	1.8	1.8	1.5	1.5	1.5	1.6	1.9	2.2	Diurnal Average	
																								10.0	6.6	11.1	7.4	8.8	11.6	15.3	12.0	9.0	6.1	5.6	5.3	9.3	8.3	10.3	7.7	7.7	9.7	4.3	4.2	5.4	7.0	7.0	9.1	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
Firebag - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Firebag - August 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
Firebag - August 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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708
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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708

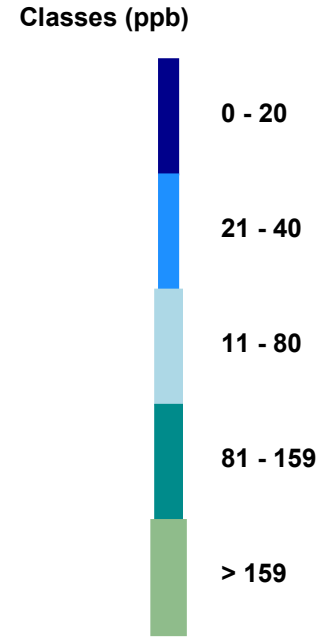
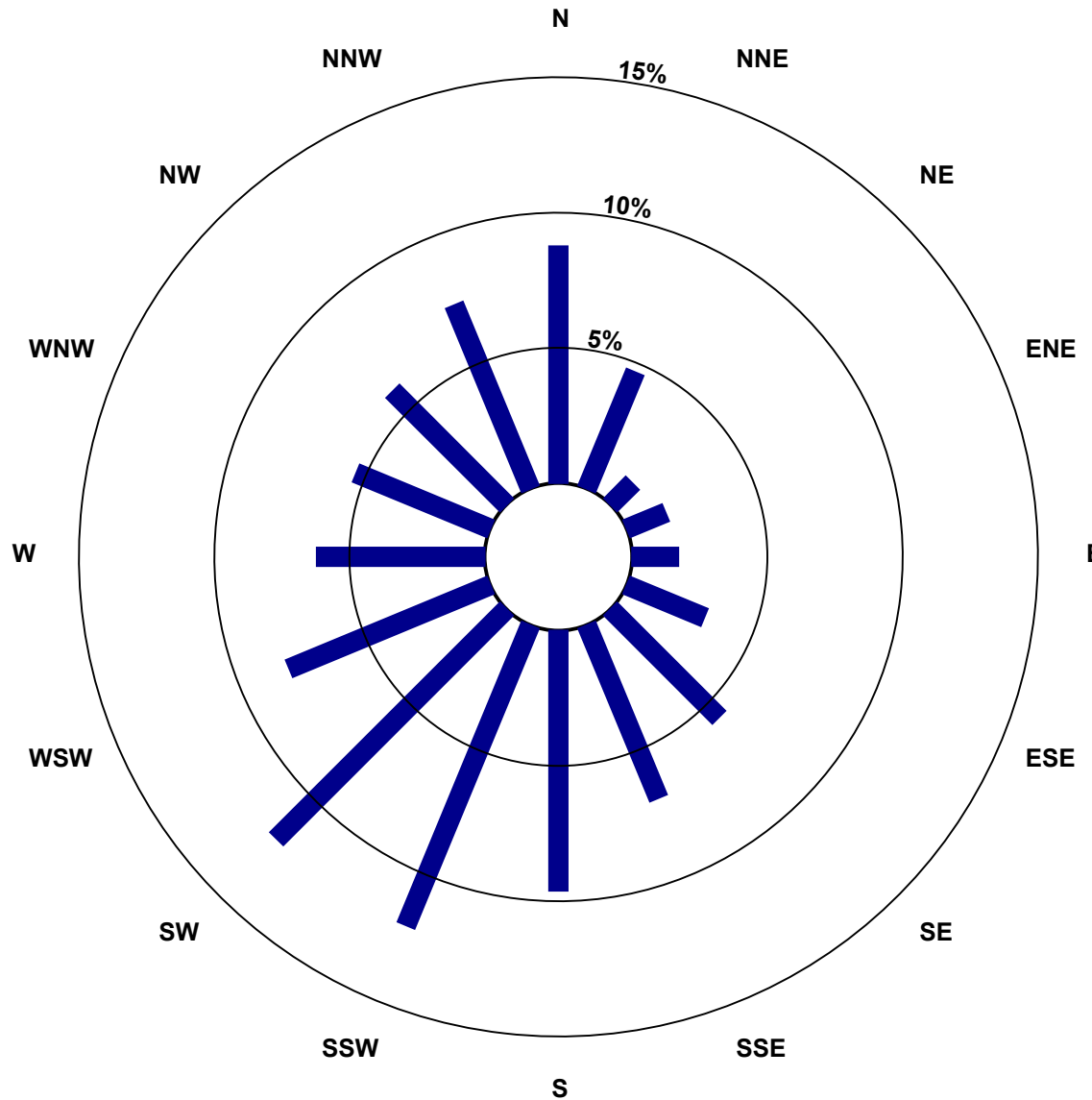
Total Number of Valid Hours: 708

Total Number of Hours: 744

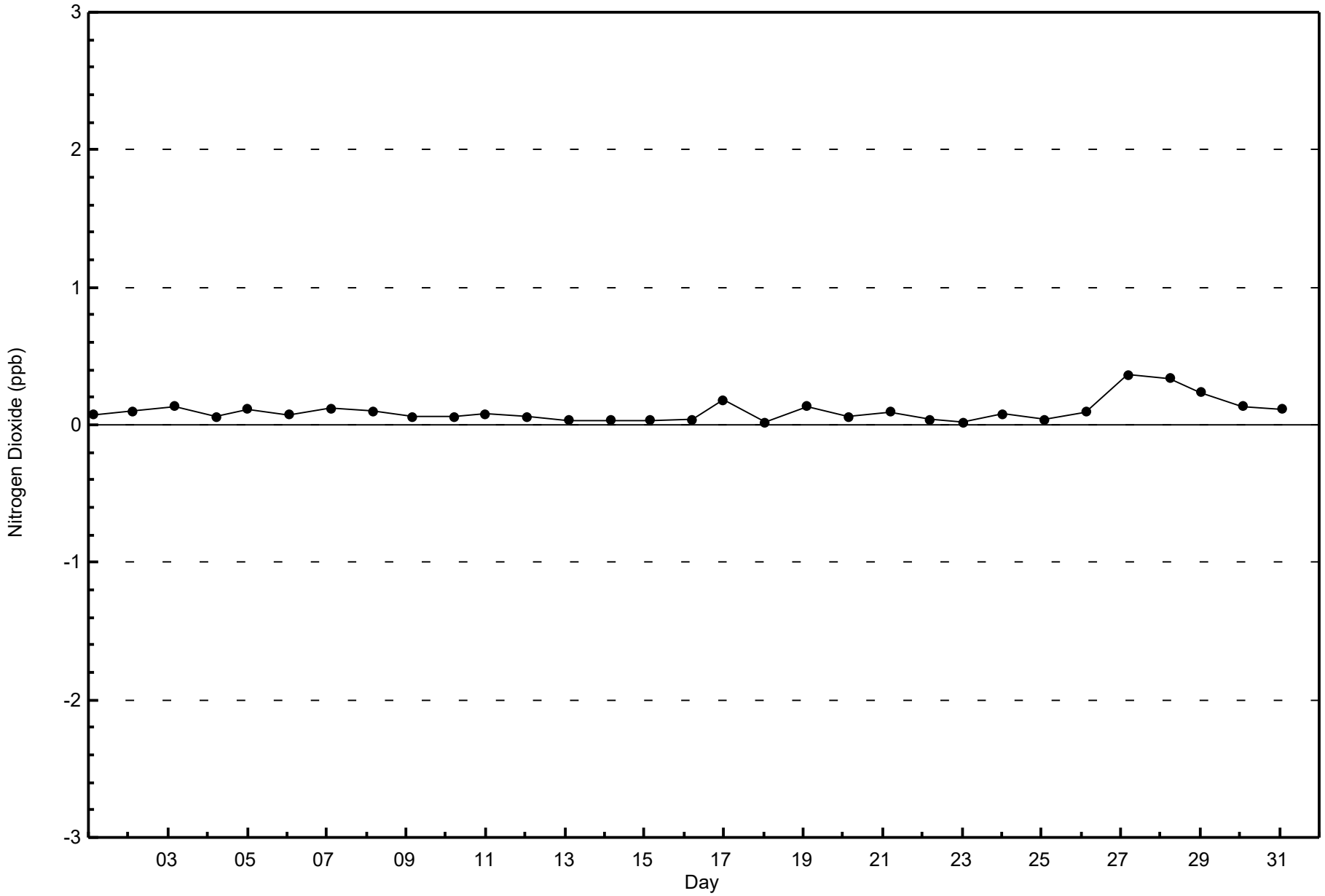


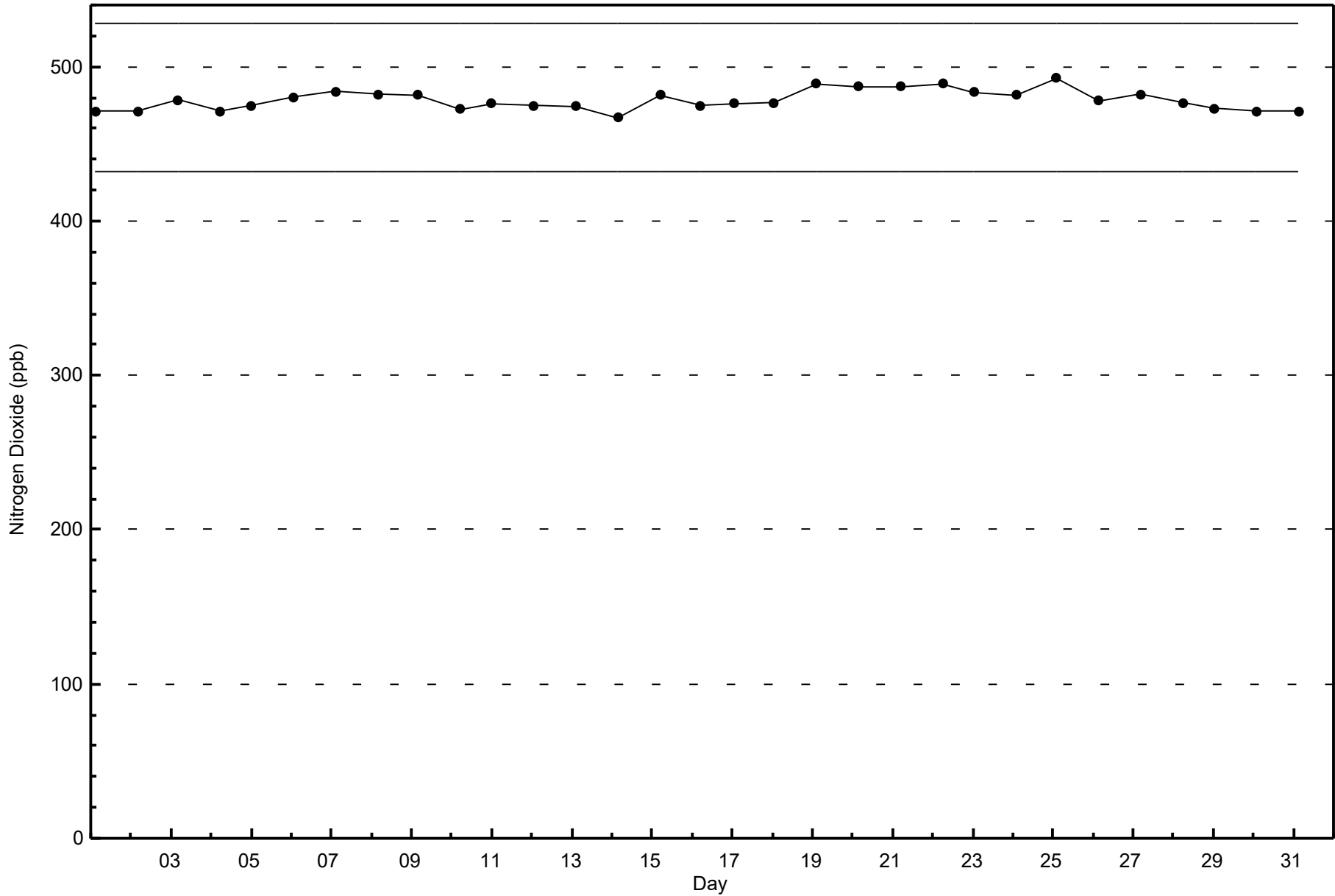
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Firebag



Total Number of Valid Hours: 708





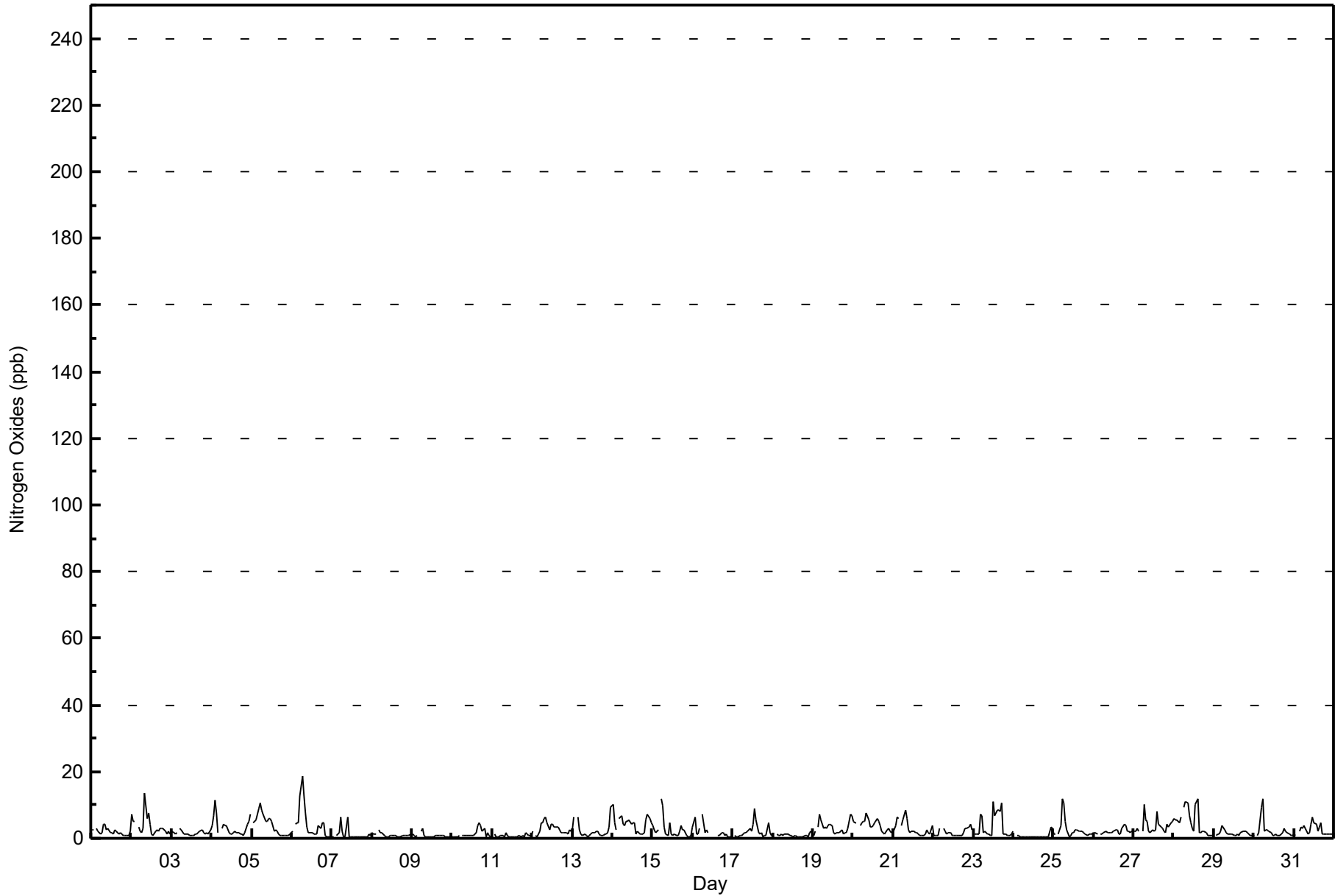


Maximum Value: 18.6 ppb on Aug 6 07:00		Maximum Daily Average: 4.8 ppb on Aug 28		Hours in Service: 744																																													
Minimum Value: 0.2 ppb on Aug 24 08:00		Minimum Daily Average: 0.7 ppb on Aug 24		Hours of Data: 708																																													
Maximum Diurnal Average: 4.7 ppb at hour 6		Minimum Diurnal Average: 1.5 ppb at hour 21		Hours of Missing Data: 36																																													
Monthly Average: 2.49 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.5 Q ₁ = 0.9 Median = 1.6 Q ₃ = 3.1 P ₉₀ = 5.5 P ₉₉ = 11.7		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-Aug	2.4	2.6	Z	3.0	2.1	1.4	1.5	4.3	4.2	2.6	3.2	1.9	1.6	1.3	2.5	2.2	1.4	1.6	1.5	0.9	0.8	0.7	0.8	2.0	2.0	4.3																							
2-Aug	7.4	5.3	5.0	Z	3.3	2.1	1.5	2.9	13.7	5.9	7.4	4.2	1.2	1.0	2.2	2.7	2.1	3.0	3.2	3.1	1.9	1.2	2.0	1.2	3.6	13.7																							
3-Aug	1.9	1.8	1.3	1.5	Z	2.8	2.7	1.5	1.3	1.1	1.2	1.0	1.0	1.0	1.2	1.3	1.7	2.1	2.7	1.7	1.4	1.7	1.1	2.3	1.6	2.8																							
4-Aug	3.7	6.7	11.2	7.5	1.9	Z	3.1	4.3	3.9	4.0	1.7	1.1	1.2	1.6	2.0	1.8	1.6	1.4	1.3	0.8	1.7	4.2	5.0	7.0	3.4	11.2																							
5-Aug	Z	4.5	5.4	7.4	8.9	10.5	8.5	7.2	5.0	5.1	5.8	5.9	5.1	2.3	2.5	2.0	1.2	0.8	0.7	0.7	0.7	0.8	0.8	1.4	4.1	10.5																							
6-Aug	2.2	Z	4.2	4.5	4.8	12.7	18.6	12.7	7.6	3.3	1.6	1.6	1.6	1.5	1.3	1.3	3.9	2.9	4.7	4.6	0.6	0.4	0.3	0.3	4.2	18.6																							
7-Aug	0.3	0.3	Z	0.9	1.6	6.5	2.1	0.4	0.6	6.3	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	1.3	0.8	1.2	6.5																							
8-Aug	1.8	1.4	1.1	Z	2.3	1.6	1.7	0.9	0.6	0.4	0.4	1.1	0.7	0.8	0.7	0.6	0.5	0.5	0.8	0.9	1.0	0.7	0.9	1.4	1.0	2.3																							
9-Aug	1.1	0.8	0.5	0.8	Z	2.2	2.9	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.7	0.7	0.8	0.7	1.0	1.0	0.5	0.4	0.5	0.4	0.8	2.9																							
10-Aug	0.4	0.4	0.4	0.6	0.9	Z	0.7	0.8	0.8	1.0	0.9	0.8	0.8	0.7	1.8	3.8	4.7	3.7	1.9	3.1	0.6	1.5	1.1	0.5	1.4	4.7																							
11-Aug	Z	1.3	0.3	0.3	0.3	0.9	0.7	0.3	1.6	1.0	0.5	0.4	0.5	0.4	0.5	0.5	0.8	0.5	0.7	0.6	1.8	1.4	0.7	0.8	0.7	1.8																							
12-Aug	2.3	Z	0.7	0.6	2.3	4.5	4.6	6.1	6.4	4.6	2.3	4.1	4.1	3.6	3.6	3.3	2.4	1.8	1.7	1.6	1.7	1.4	2.4	2.0	3.0	6.4																							
13-Aug	2.5	6.6	Z	6.4	2.6	1.2	0.9	1.1	0.7	0.6	0.9	1.2	1.5	1.6	1.9	2.1	1.2	0.8	0.9	1.2	1.4	1.5	3.3	9.2	2.2	9.2																							
14-Aug	10.2	4.8	2.8	Z	5.7	6.7	4.1	3.7	5.1	5.2	5.3	4.2	4.8	4.6	1.5	2.1	1.1	1.4	1.1	1.8	5.5	7.1	6.0	4.6	4.3	10.2																							
15-Aug	3.8	2.5	1.8	2.7	Z	11.9	9.9	3.6	1.2	0.8	4.5	1.3	1.0	1.1	0.9	0.7	2.2	3.6	2.7	2.4	0.7	0.4	0.4	0.7	2.7	11.9																							
16-Aug	3.3	6.3	1.3	1.4	3.1	Z	7.1	1.9	2.6	1.7	C	C	C	C	C	1.0	1.0	1.9	1.6	1.0	1.3	0.5	0.5	0.5	2.1	7.1																							
17-Aug	Z	0.8	0.6	0.6	0.7	0.8	1.4	1.8	1.5	2.0	2.8	1.9	4.2	8.7	5.4	1.9	1.4	1.8	0.5	0.7	0.9	4.7	1.8	0.7	2.1	8.7																							
18-Aug	1.0	Z	1.2	1.0	1.0	1.1	1.0	1.1	1.3	1.2	0.8	0.7	0.6	0.7	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	1.7	2.3	0.9	2.3																							
19-Aug	0.9	2.3	Z	3.5	7.2	5.4	2.8	3.5	3.1	4.0	4.1	3.9	1.9	1.3	1.6	1.5	1.9	2.6	1.4	1.8	1.9	2.8	7.1	6.9	3.2	7.2																							
20-Aug	5.1	4.9	4.8	Z	4.0	4.8	5.1	5.1	7.5	5.4	3.4	3.2	3.8	4.7	5.8	5.2	4.0	2.1	1.5	1.4	2.7	3.0	2.2	1.5	4.0	7.5																							
21-Aug	1.5	3.7	6.2	6.1	Z	3.9	5.5	8.3	6.0	2.3	1.7	2.2	2.0	1.6	1.8	1.4	0.8	0.9	0.9	1.1	2.7	1.7	1.3	3.8	2.9	8.3																							
22-Aug	1.0	0.9	1.0	1.1	3.1	Z	3.0	2.0	1.3	1.5	1.5	1.0	1.0	1.0	1.0	0.9	0.8	1.0	1.6	2.8	3.2	3.5	4.1	2.7	1.8	4.1																							
23-Aug	Z	1.2	1.2	1.3	7.3	6.7	1.9	2.3	1.1	1.4	0.8	0.7	10.9	6.6	8.4	8.4	8.2	10.5	1.3	1.1	0.9	0.8	0.9	1.4	3.7	10.9																							
24-Aug	1.9	Z	1.1	0.7	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	3.5	2.9	0.7	3.5																							
25-Aug	1.3	1.1	Z	1.1	3.6	12.0	10.6	5.0	2.7	0.6	0.7	1.7	1.7	2.4	2.6	2.1	2.3	2.1	1.5	1.1	1.0	1.2	1.5	1.4	2.7	12.0																							
26-Aug	1.5	1.5	1.4	Z	1.3	1.3	1.8	2.2	1.8	1.6	1.9	1.6	2.3	2.4	2.5	1.2	1.2	3.1	4.4	3.7	2.2	1.9	1.8	2.2	2.0	4.4																							
27-Aug	2.3	1.9	3.0	2.2	Z	2.3	10.4	5.6	5.2	1.9	1.8	2.6	1.9	2.6	8.2	4.3	3.6	3.1	2.2	1.7	4.2	3.4	4.8	5.1	3.7	10.4																							
28-Aug	6.0	5.6	5.7	4.7	6.2	Z	9.5	11.1	10.4	6.6	4.7	3.0	2.0	10.1	11.8	1.8	1.6	2.1	2.0	1.8	0.8	0.7	0.9	0.8	4.8	11.8																							
29-Aug	Z	0.9	1.3	1.4	2.1	3.7	2.5	1.7	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.0	1.7	2.1	2.0	1.9	1.5	1.1	1.0	0.9	1.5	3.7																							
30-Aug	0.9	Z	1.0	1.5	9.2	11.9	2.2	2.5	2.4	2.0	1.5	1.0	1.0	1.2	0.9	0.9	1.4	1.7	2.8	2.1	1.7	1.2	0.9	1.0	2.3	11.9																							
31-Aug	1.3	0.7	Z	2.2	3.2	2.8	3.8	3.1	1.3	1.5	4.4	6.3	4.5	4.4	2.0	3.6	4.5	1.2	1.1	1.1	1.2	1.4	1.4	1.3	2.5	6.3																							
																								2.6	2.7	2.6	2.5	3.4	4.7	4.3	3.5	3.3	2.5	2.3	2.0	2.2	2.4	2.6	2.0	2.0	2.0	1.6	1.6	1.5	1.7	2.0	2.3	Diurnal Average	
																								10.2	6.7	11.2	7.5	9.2	12.7	18.6	12.7	13.7	6.6	7.4	6.3	10.9	10.1	11.8	8.4	8.2	10.5	4.7	4.6	5.5	7.1	7.1	9.2	Diurnal Maximum	
Z - zerospan																								C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Firebag - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Firebag - August 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
Firebag - August 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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708
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	62	33	8	11	12	22	40	49	68	85	85	57	44	38	42	52	708

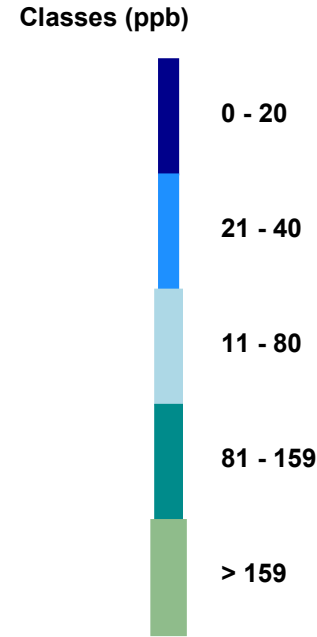
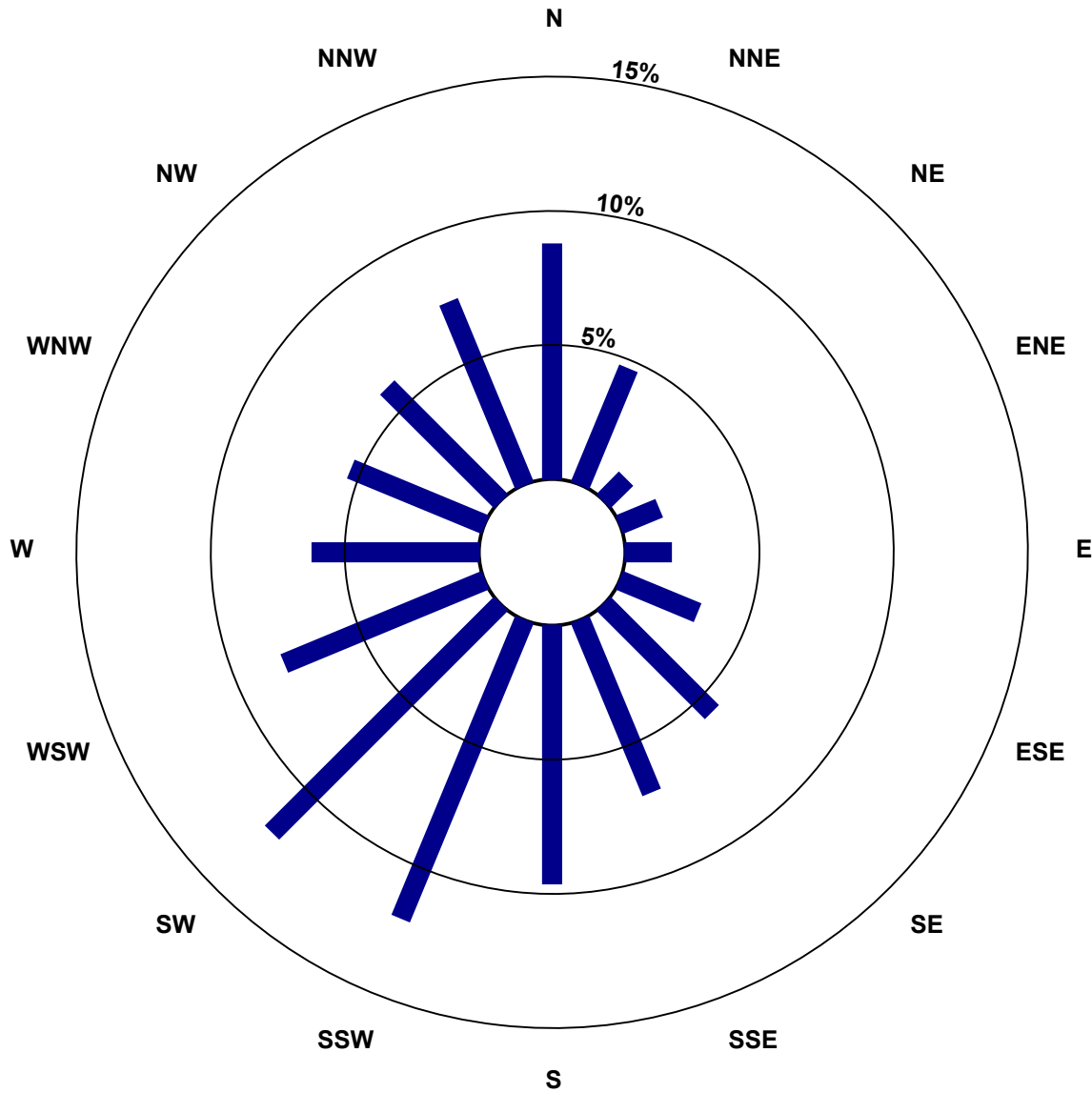
Total Number of Valid Hours: 708

Total Number of Hours: 744

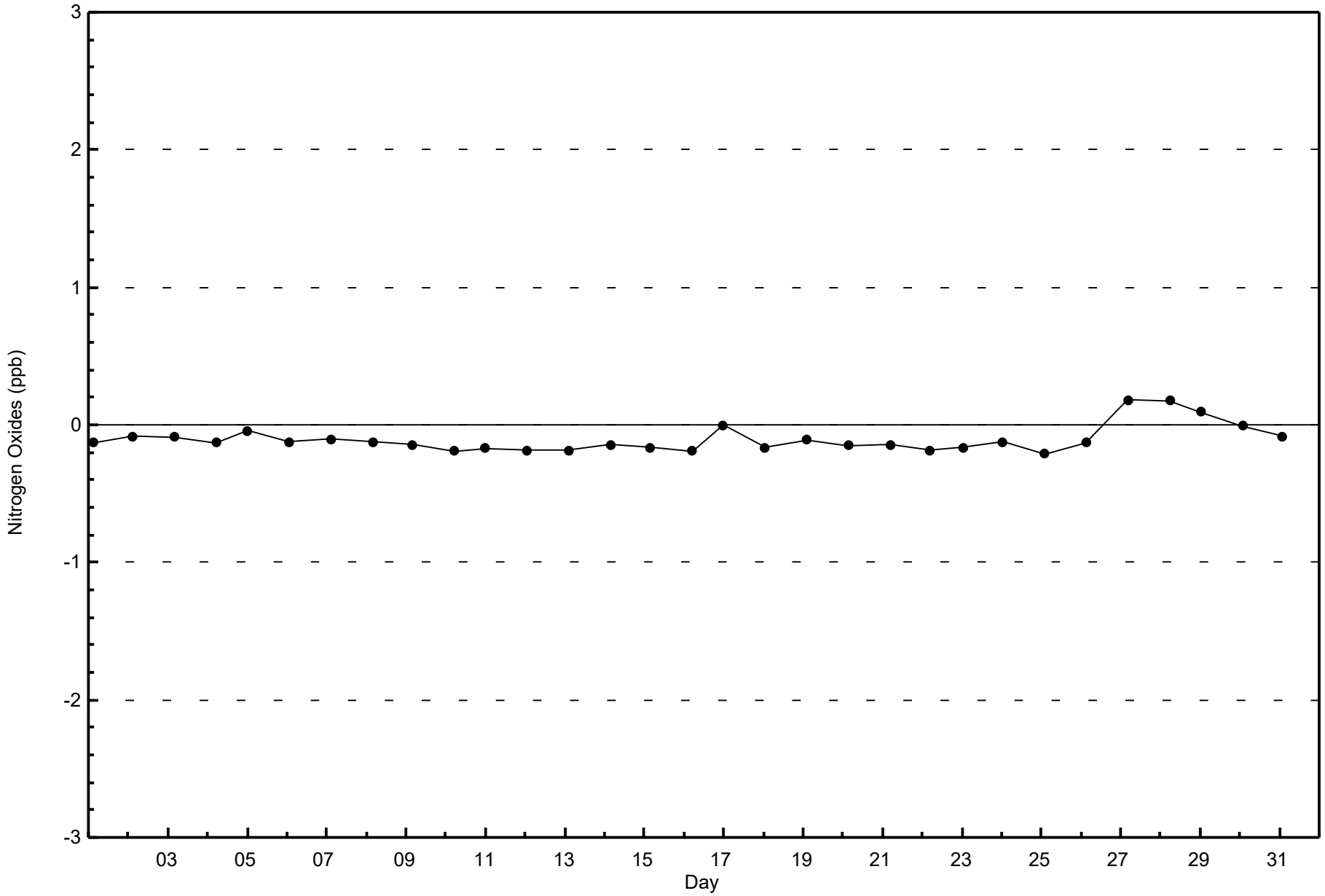


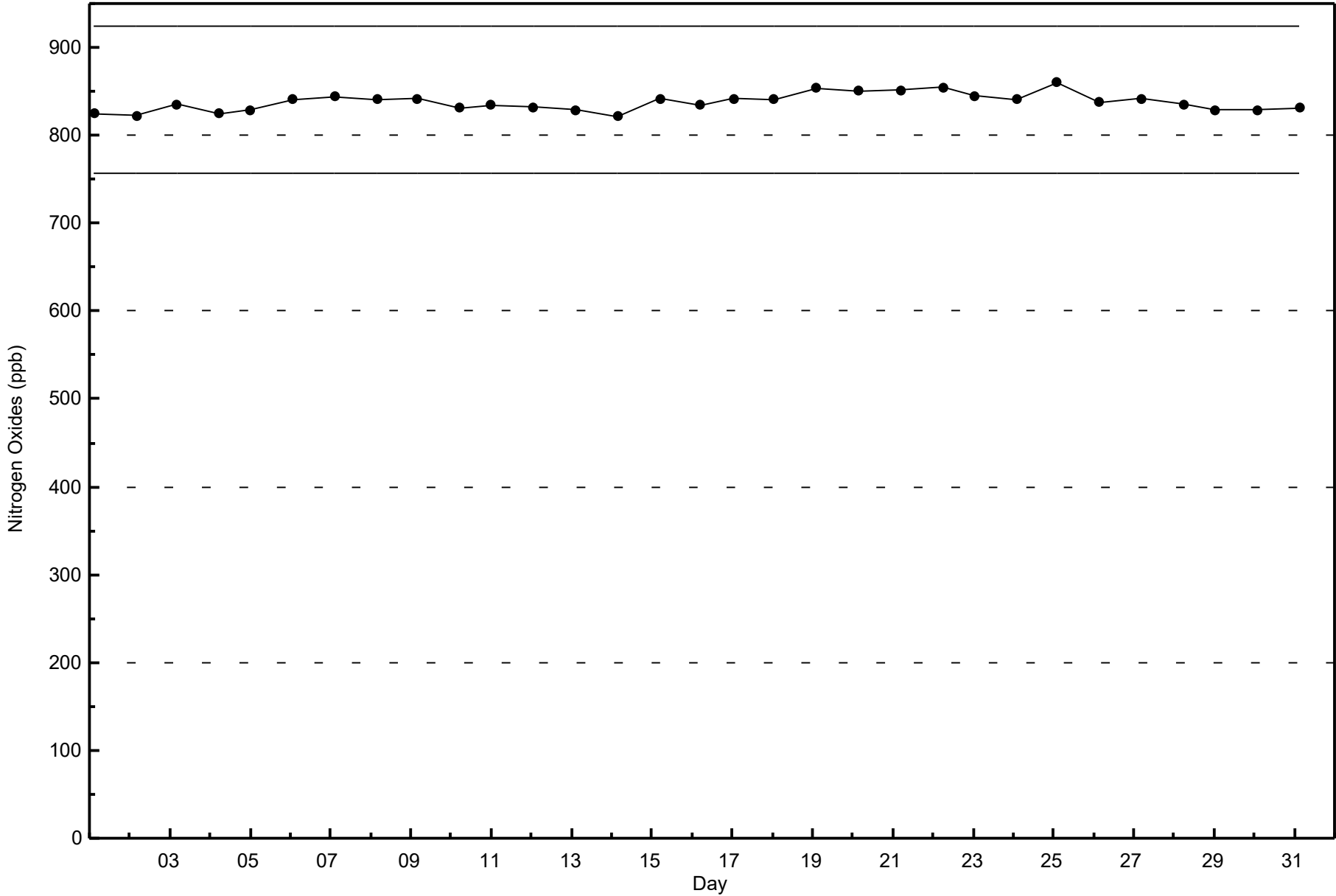
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Firebag



Total Number of Valid Hours: 708







Wood Buffalo Environmental Association
Summary of Hour Averages

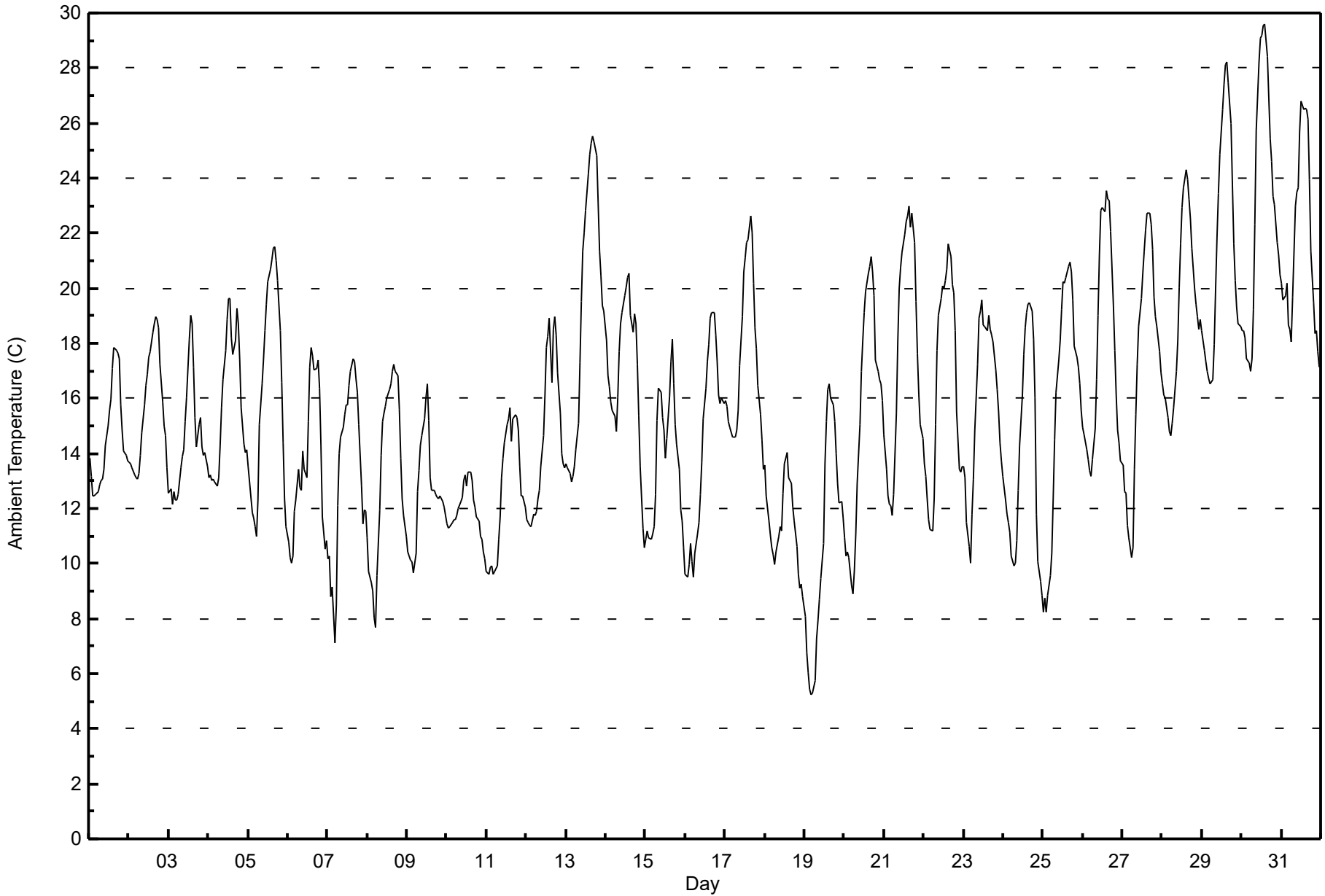
Ambient Temperature (AT) - C
Firebag - August 2023

Maximum Value: 29.6 C on Aug 30 15:00		Maximum Daily Average: 23.0 C on Aug 30		Hours in Service: 744																																												
Minimum Value: 5.2 C on Aug 19 05:00		Minimum Daily Average: 10.8 C on Aug 19		Hours of Data: 744																																												
Maximum Diurnal Average: 19.8 C at hour 15		Minimum Diurnal Average: 11.8 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 15.75 C		Percentiles: P ₁ = 7.5 P ₁₀ = 10.6 Q ₁ = 12.5 Median = 15.3 Q ₃ = 18.6 P ₉₀ = 21.5 P ₉₉ = 27.8		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-Aug	13.8	13.2	12.4	12.4	12.5	12.6	12.8	13.0	13.1	13.4	14.3	15.0	15.5	16.0	17.1	17.9	17.7	17.7	17.4	15.8	14.8	14.1	13.9	13.7	14.6	17.9																						
2-Aug	13.7	13.6	13.5	13.2	13.1	13.0	13.3	13.9	14.8	15.8	16.5	16.9	17.5	17.7	18.4	18.7	18.9	18.9	18.6	17.2	15.9	15.0	14.7	13.5	15.7	18.9																						
3-Aug	12.6	12.7	12.2	12.6	12.3	12.3	12.5	13.5	13.9	14.1	15.2	16.0	18.1	19.0	18.7	17.2	15.3	14.2	15.0	15.3	14.2	14.0	14.0	13.5	14.5	19.0																						
4-Aug	13.1	13.2	13.0	13.1	13.0	12.8	13.1	14.3	15.6	16.7	17.8	18.9	19.6	19.6	18.2	17.6	18.1	19.3	18.7	17.4	15.7	14.3	14.0	14.1	15.9	19.6																						
5-Aug	13.6	12.9	11.9	11.7	11.4	11.0	12.3	15.1	16.5	17.4	18.5	19.4	20.2	20.7	21.0	21.4	21.5	21.0	20.3	18.5	16.6	14.4	12.4	11.3	16.3	21.5																						
6-Aug	10.8	10.2	10.0	10.3	11.9	12.3	13.4	12.8	12.7	14.1	13.4	13.1	15.2	17.1	17.9	17.5	17.0	17.1	17.4	16.4	14.3	11.7	10.6	10.8	13.7	17.9																						
7-Aug	10.2	10.3	8.8	9.2	7.1	8.5	12.1	14.0	14.6	15.0	15.4	15.8	15.7	16.5	17.0	17.4	17.3	16.8	16.2	15.0	12.8	11.4	11.9	11.9	13.4	17.4																						
8-Aug	11.0	9.7	9.3	9.0	8.0	7.7	9.5	12.0	13.9	15.1	15.5	15.7	16.0	16.3	16.5	17.0	17.2	17.0	16.9	15.6	13.8	12.4	11.8	11.0	13.3	17.2																						
9-Aug	10.4	10.3	10.1	10.1	9.7	10.4	12.6	13.4	14.3	14.7	15.3	16.0	16.5	15.2	13.1	12.7	12.7	12.5	12.4	12.4	12.5	12.2	12.0	11.7	12.6	16.5																						
10-Aug	11.4	11.3	11.4	11.5	11.6	11.6	11.7	12.0	12.2	12.4	13.0	13.2	12.8	13.3	13.3	13.0	12.3	12.0	11.7	11.5	11.0	10.9	10.4	10.2	11.9	13.3																						
11-Aug	9.7	9.6	9.9	9.9	9.6	9.7	9.9	10.9	11.7	13.1	13.8	14.4	15.1	15.3	15.6	14.5	15.2	15.4	15.3	14.8	13.5	12.4	12.5	12.1	12.7	15.6																						
12-Aug	11.6	11.5	11.4	11.3	11.8	11.8	11.9	12.4	12.7	13.5	14.7	16.1	17.9	18.2	18.9	16.6	18.5	18.9	18.3	16.9	15.5	14.0	13.6	13.5	14.6	18.9																						
13-Aug	13.6	13.5	13.2	13.0	13.2	13.5	14.2	15.1	17.3	19.5	21.4	22.0	22.8	24.1	24.9	25.3	25.5	25.3	24.8	23.1	21.3	20.4	19.4	19.2	19.4	25.5																						
14-Aug	18.1	16.8	16.4	15.9	15.6	15.4	14.8	16.0	17.7	18.7	19.1	19.8	20.0	20.4	20.5	19.0	18.4	19.1	18.7	17.3	15.4	13.5	11.3	10.6	17.0	20.5																						
15-Aug	10.9	11.2	10.9	10.9	11.1	11.3	12.5	15.2	16.4	16.2	15.3	14.8	13.8	14.5	16.1	17.4	18.1	16.5	15.0	14.3	13.4	11.9	11.6	10.6	13.7	18.1																						
16-Aug	9.6	9.5	10.0	10.7	10.1	9.5	10.4	11.1	11.5	12.5	13.7	15.2	16.4	17.4	17.9	18.9	19.1	19.1	18.3	17.3	16.1	15.8	16.0	15.8	14.3	19.1																						
17-Aug	15.9	15.7	15.1	14.9	14.6	14.6	14.6	14.8	15.6	17.2	18.9	20.6	21.1	21.7	21.7	22.6	22.0	20.2	18.5	17.8	16.5	15.4	14.5	13.4	17.4	22.6																						
18-Aug	13.6	12.5	11.5	11.0	10.6	10.3	10.0	10.4	11.0	11.3	11.2	12.6	13.6	14.0	13.1	13.0	12.9	12.1	11.5	10.7	9.6	9.1	9.3	8.8	11.4	14.0																						
19-Aug	8.1	6.7	6.0	5.4	5.2	5.3	5.7	7.3	8.0	8.7	9.4	10.7	13.6	15.2	16.3	16.5	16.0	15.8	15.1	14.0	12.9	12.2	12.3	11.6	10.8	16.5																						
20-Aug	10.9	10.3	10.4	10.2	9.2	8.9	9.8	11.1	12.9	15.1	17.0	18.1	19.1	19.9	20.6	20.8	21.2	20.6	19.7	17.4	17.0	16.7	16.5	15.9	15.4	21.2																						
21-Aug	14.7	13.4	12.5	12.2	12.1	11.7	12.5	15.5	18.0	20.0	20.7	21.3	22.0	22.4	22.6	23.0	22.2	22.7	21.7	19.5	17.6	16.2	15.0	14.5	17.7	23.0																						
22-Aug	13.6	13.2	12.3	11.6	11.3	11.2	12.4	15.0	17.7	19.0	19.6	20.1	20.0	20.3	20.7	21.6	21.1	20.2	19.8	18.4	15.5	13.4	13.3	13.5	16.5	21.6																						
23-Aug	13.5	13.1	11.5	10.6	10.0	11.8	13.1	14.9	17.3	18.9	19.2	19.6	18.7	18.6	18.4	19.0	18.5	18.3	18.0	17.0	16.3	15.5	14.4	13.7	15.8	19.6																						
24-Aug	13.2	12.3	11.8	11.5	11.1	10.3	9.9	10.0	10.8	12.6	14.3	16.1	17.6	18.6	19.1	19.4	19.5	19.2	18.1	16.0	11.8	10.1	9.3	8.9	13.8	19.5																						
25-Aug	8.3	8.7	8.2	8.8	9.6	10.4	12.4	14.5	16.2	17.4	18.1	19.2	20.2	20.2	20.4	20.8	21.0	20.6	19.6	17.9	17.5	17.1	16.5	15.6	15.8	21.0																						
26-Aug	14.9	14.7	14.1	13.8	13.4	13.2	13.8	14.9	16.7	19.0	21.2	22.8	22.9	22.8	23.6	23.3	23.2	22.1	19.4	17.7	16.1	14.8	14.4	13.7	17.8	23.6																						
27-Aug	13.6	12.6	12.5	11.4	11.0	10.2	10.6	13.4	15.4	17.3	18.6	19.6	20.6	21.4	22.1	22.7	22.7	22.3	21.4	19.7	19.0	18.6	17.7	17.0	17.1	22.7																						
28-Aug	16.5	16.1	16.0	15.3	14.8	14.6	15.1	15.6	17.0	18.1	20.0	21.6	22.9	23.6	24.3	23.9	23.3	22.5	21.5	20.0	19.4	18.9	18.5	18.9	19.1	24.3																						
29-Aug	18.5	17.7	17.3	17.0	16.8	16.5	16.7	17.9	20.0	21.9	23.4	24.9	26.5	27.4	28.1	28.2	27.5	26.0	23.7	21.6	20.3	19.3	18.7	18.6	21.4	28.2																						
30-Aug	18.5	18.5	18.2	17.5	17.3	17.0	17.5	19.2	22.3	25.7	28.2	29.1	29.2	29.6	29.6	28.4	26.9	25.4	24.6	23.3	23.0	21.7	21.2	20.5	23.0	29.6																						
31-Aug	20.2	19.6	19.8	20.2	18.7	18.5	18.1	19.7	23.0	23.5	23.6	25.7	26.8	26.5	26.5	26.5	26.1	24.0	21.3	19.5	18.4	18.5	17.7	17.1	21.6	26.8																						
																								13.2	12.7	12.3	12.1	11.8	11.9	12.6	13.8	15.2	16.4	17.3	18.2	19.0	19.5	19.8	19.7	19.6	19.1	18.4	17.1	15.7	14.7	14.2	13.7	Diurnal Average
																								20.2	19.6	19.8	20.2	18.7	18.5	18.1	19.7	23.0	25.7	28.2	29.1	29.2	29.6	29.6	28.4	27.5	26.0	24.8	23.3	23.0	21.7	21.2	20.5	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Firebag - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Firebag - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	49	6.59	6.59
10 - 20	575	77.28	83.87
> 20	120	16.13	100.00

Total Number of Valid Hours: 744

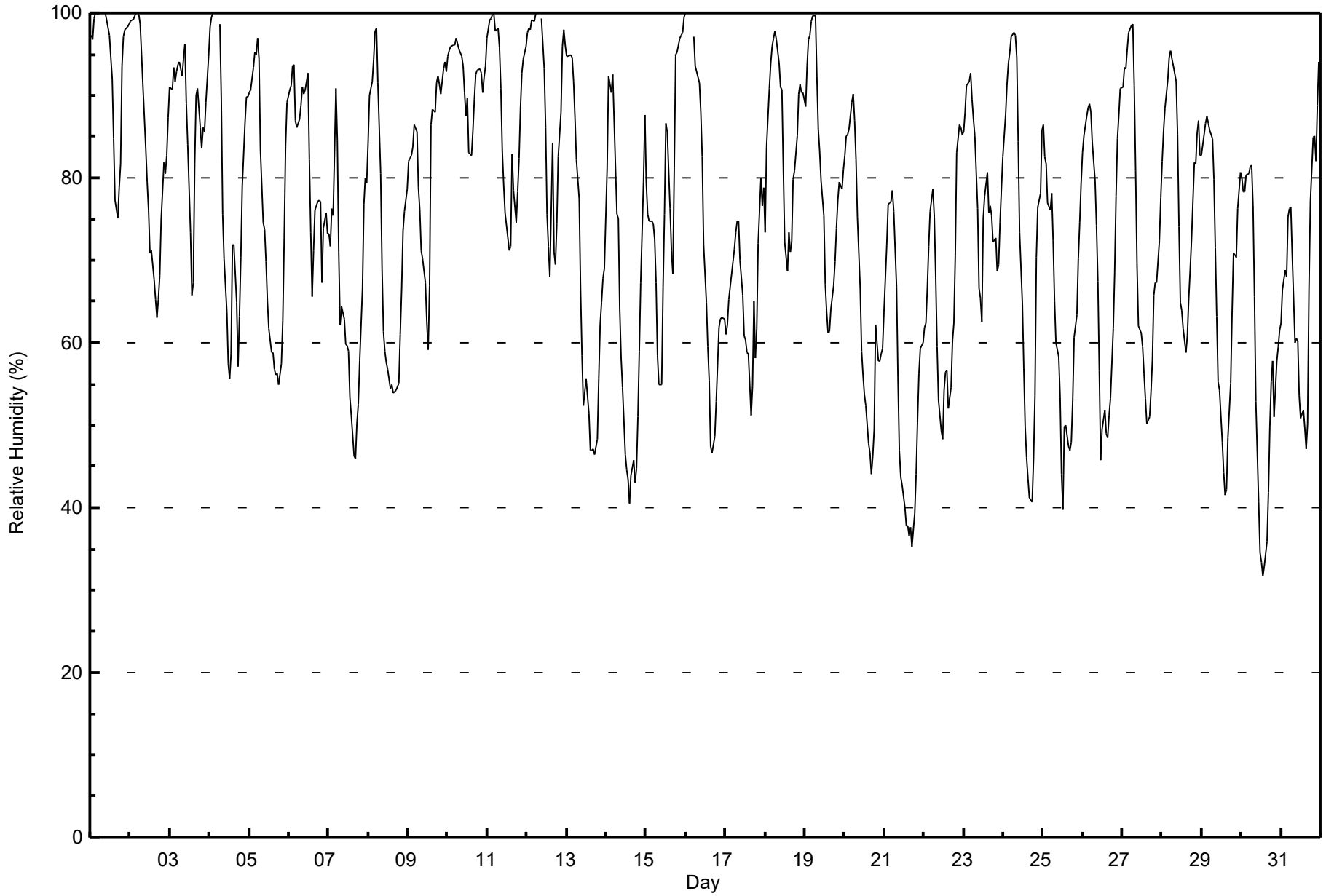
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Firebag - August 2023

Maximum Value: 100.0 % on Aug 1 04:00		Maximum Daily Average: 93.6 % on Aug 1		Hours in Service: 744																																												
Minimum Value: 31.7 % on Aug 30 14:00		Minimum Daily Average: 54.6 % on Aug 21		Hours of Data: 732																																												
Maximum Diurnal Average: 89.2 % at hour 5		Minimum Diurnal Average: 59.5 % at hour 16		Hours of Missing Data: 12																																												
Monthly Average: 74.62 %		Percentiles: P ₁ = 37.7 P ₁₀ = 50.9 Q ₁ = 61.4 Median = 76.1 Q ₃ = 89.7 P ₉₀ = 95.7 P ₉₉ = 100.0		Hours of Calibration: 0																																												
				Percent Operational Time: 98.4																																												
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-Aug	97.3	96.7	99.3	100.0	OR	OR	100.0	100.0	100.0	100.0	99.2	97.3	94.5	92.0	84.8	77.3	75.1	78.9	81.7	93.6	97.2	98.0	98.3	98.7	93.6	100.0																						
2-Aug	99.1	99.1	99.2	100.0	100.0	99.9	98.6	95.0	91.0	83.6	79.5	76.0	70.9	71.1	67.7	65.3	63.0	65.3	68.1	74.8	81.9	80.5	82.7	87.3	83.3	100.0																						
3-Aug	90.9	90.7	93.4	91.8	92.8	93.8	94.1	92.3	94.4	96.4	89.1	84.1	73.3	65.7	67.2	81.7	90.0	90.8	86.2	83.5	86.0	85.6	89.2	94.9	87.4	96.4																						
4-Aug	98.3	99.5	100.0	OR	OR	OR	98.7	89.9	75.7	70.1	63.7	57.4	55.5	58.7	71.8	71.9	64.9	57.2	63.1	70.3	78.9	86.8	89.9	89.8	76.8	100.0																						
5-Aug	90.3	90.7	93.3	95.3	94.9	96.9	94.4	83.4	74.5	73.8	69.9	65.1	61.7	58.9	58.8	56.8	56.1	56.3	54.9	57.4	62.7	72.7	83.9	89.2	74.7	96.9																						
6-Aug	90.7	91.2	93.6	93.7	86.9	86.2	87.1	88.9	91.0	90.2	90.7	92.8	82.2	73.4	65.7	71.2	76.1	77.2	77.2	77.2	67.4	74.0	75.8	73.2	82.2	93.7																						
7-Aug	73.2	71.8	76.2	75.3	90.9	84.5	71.1	62.2	64.5	62.9	59.8	59.7	59.0	53.3	51.1	46.3	46.0	50.1	52.6	57.8	66.7	76.8	80.1	79.4	65.5	90.9																						
8-Aug	84.3	90.0	91.7	94.4	97.8	98.1	91.5	80.5	69.0	61.4	58.9	57.7	56.8	54.5	55.0	53.9	54.0	54.2	55.0	61.0	66.5	73.5	75.9	78.7	71.4	98.1																						
9-Aug	82.0	82.4	82.7	83.8	86.4	85.5	78.9	76.1	71.2	70.1	67.3	62.5	59.1	67.0	86.5	88.2	87.9	91.6	92.4	91.3	90.2	93.2	94.0	92.8	81.8	94.0																						
10-Aug	94.7	95.4	96.0	96.1	96.2	96.9	96.3	95.6	94.7	93.6	90.3	87.5	89.7	83.1	82.6	85.7	89.5	92.6	93.1	93.2	92.7	90.3	92.2	93.5	92.1	96.9																						
11-Aug	96.9	99.2	99.3	99.9	99.9	97.8	98.2	95.7	90.9	83.3	79.1	75.7	72.7	71.1	71.7	82.9	78.5	74.6	78.3	82.4	88.5	92.7	94.5	95.9	87.5	99.9																						
12-Aug	97.7	98.1	98.0	99.1	99.0	100.0	OR	OR	OR	99.4	93.2	86.1	75.6	71.6	67.9	84.2	71.0	69.5	74.5	82.6	87.9	95.9	98.0	96.2	87.9	100.0																						
13-Aug	94.7	94.8	94.9	94.5	91.7	87.3	82.2	77.5	66.5	58.5	52.4	54.0	55.6	51.3	46.9	46.9	47.0	46.5	48.3	55.6	62.3	64.9	67.8	68.9	67.1	94.9																						
14-Aug	81.2	92.4	91.4	90.3	92.5	81.2	75.5	75.1	64.1	58.1	54.6	46.4	44.7	43.3	40.5	43.9	45.8	43.1	44.7	50.9	59.0	67.3	79.4	87.7	64.7	92.5																						
15-Aug	79.3	75.6	74.8	74.8	74.4	72.6	67.3	58.5	55.0	55.0	66.8	75.6	86.6	85.6	76.3	71.1	68.4	81.3	94.8	95.3	97.0	97.4	97.6	99.4	78.3	99.4																						
16-Aug	100.0	OR	OR	OR	OR	97.1	93.6	92.2	91.5	88.0	82.6	71.9	64.9	59.5	55.4	47.5	46.6	48.6	52.9	57.3	61.8	62.9	63.0	62.8	70.0	100.0																						
17-Aug	61.0	62.2	65.3	66.8	69.8	71.4	73.3	74.7	74.8	70.0	65.8	60.9	60.3	58.8	58.7	51.3	54.7	65.1	58.1	61.6	72.1	80.0	76.5	78.7	66.3	80.0																						
18-Aug	73.4	83.8	90.8	93.9	96.0	96.9	97.9	96.9	93.9	91.0	90.7	81.2	72.2	68.6	73.5	71.0	72.2	79.9	80.8	85.1	90.2	91.4	90.3	90.4	85.5	97.9																						
19-Aug	88.6	93.6	96.9	97.2	99.0	99.6	99.7	92.4	85.9	83.2	79.6	75.4	67.2	63.8	61.1	61.3	64.1	66.9	69.8	73.9	77.3	79.5	78.7	81.0	80.7	99.7																						
20-Aug	82.7	85.2	85.3	85.9	89.1	90.2	86.9	82.2	75.3	66.7	59.0	56.0	53.7	52.4	47.9	46.6	44.1	46.2	49.6	62.2	57.9	57.8	58.7	59.3	65.9	90.2																						
21-Aug	63.7	71.8	76.8	76.9	77.2	78.5	76.0	66.8	55.8	47.0	43.7	42.7	40.0	37.8	37.8	36.6	37.7	35.3	39.3	44.0	50.4	56.2	59.3	59.9	54.6	78.5																						
22-Aug	61.8	62.3	66.5	71.7	76.0	78.7	75.3	67.9	59.5	53.0	49.3	48.4	54.2	56.4	56.6	52.1	54.5	60.1	62.3	70.5	83.1	86.4	86.0	85.2	65.7	86.4																						
23-Aug	85.6	87.9	91.2	91.7	92.6	89.5	87.1	85.0	76.3	66.6	65.4	62.5	75.1	77.8	80.6	75.8	76.7	75.3	72.2	72.7	68.6	69.6	74.6	78.7	78.3	92.6																						
24-Aug	82.5	87.6	91.4	93.8	95.3	97.1	97.6	97.2	94.7	84.5	73.4	64.8	56.9	49.8	46.0	43.5	41.3	40.7	45.9	53.5	70.3	76.4	78.2	85.8	72.8	97.6																						
25-Aug	86.4	82.5	81.7	77.0	76.0	78.2	72.4	65.1	60.0	58.3	53.4	44.0	39.9	49.8	50.0	47.5	47.0	48.0	53.0	60.6	63.4	70.2	74.6	79.3	63.3	86.4																						
26-Aug	83.1	85.1	87.5	88.5	88.9	88.1	84.2	79.6	74.3	67.5	56.6	45.8	49.5	51.9	48.9	48.5	51.1	53.2	61.7	68.5	77.7	84.7	87.6	90.8	71.0	90.8																						
27-Aug	91.0	93.4	93.2	95.7	97.6	98.5	98.7	91.2	80.9	69.4	62.0	61.2	59.5	56.3	53.3	50.2	51.1	54.1	58.0	65.7	67.2	67.2	72.3	77.6	73.6	98.7																						
28-Aug	82.1	85.8	88.5	91.9	94.7	95.4	94.5	93.6	91.6	85.3	74.0	64.9	63.9	61.7	58.8	60.8	65.5	68.8	72.5	81.8	81.8	85.4	87.0	82.7	79.7	95.4																						
29-Aug	82.8	85.2	86.5	87.4	86.6	85.7	84.8	79.8	71.5	63.3	55.3	54.3	47.9	44.3	41.5	42.2	48.5	55.0	63.7	70.9	70.7	70.4	76.2	80.7	68.1	87.4																						
30-Aug	80.0	78.3	78.3	80.3	80.5	81.3	81.5	76.4	65.5	53.0	40.7	34.6	33.4	31.7	32.8	36.0	41.9	49.9	55.2	57.8	51.0	57.9	59.4	61.6	58.3	81.5																						
31-Aug	62.4	66.5	68.8	67.9	75.3	76.3	76.5	70.7	59.9	60.5	60.1	53.6	50.9	51.8	49.6	47.1	50.3	66.4	77.1	84.9	85.2	82.1	88.8	94.0	67.8	94.0																						
																								84.4	86.0	87.7	88.1	89.2	89.1	87.1	82.7	77.1	73.0	68.6	64.5	62.2	60.4	59.6	59.5	60.0	62.7	65.7	70.9	74.6	78.3	81.0	83.0	Diurnal Average
																								100.0	99.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	97.3	94.5	92.0	86.5	88.2	90.0	92.6	94.8	95.3	97.2	98.0	98.3	99.4	Diurnal Maximum
OR - Out of Range																																																





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Firebag - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	13	1.78	1.78
40 - 60	158	21.58	23.36
60 - 80	248	33.88	57.24
80 - 100	303	41.39	98.63

Total Number of Valid Hours: 732

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Firebag - August 2023

Maximum Speed: 28 km/h on Aug 9 13:00	Maximum Daily Speed Average: 18.5 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 31 12:00	Minimum Daily Speed Average: 2.9 km/h on Aug 23	Hours of Data: 744
Maximum Diurnal Speed Average: 5.6 km/h at hour 14	Minimum Diurnal Speed Average: 0.4 km/h at hour 20	Hours of Missing Data: 0
Monthly Average Velocity: 3.4 km/h 226.1 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 8 Median = 10 Q ₃ = 14 P ₉₀ = 18 P ₉₉ = 24	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-Aug	SW10	SW10	SW9	WSW11	WSW12	WSW13	W12	W10	WSW11	WSW13	WSW16	W16	W16	W15	WNW13	NW16	NW14	NW6	NW7	N11	NNW9	N8	NNW12	NNW10	W9.4	WSW16	
2-Aug	NW9	NW10	NW10	NW10	NW8	NW8	NW8	WNW8	WNW11	WNW10	WNW10	NW10	NW9	NW8	WNW5	NNW6	NW7	NW6	NW5	NNE5	ENE4	E6	ESE7	ESE5	NW5.9	WNW11	
3-Aug	ESE6	ESE6	SE8	SSE9	SE8	SE9	SE9	SSE10	S7	S7	SSW9	S10	SSE10	S12	S14	S16	SSW1	S3	S9	S9	SSW9	S6	SSW8	WSW8	S7.5	S16	
4-Aug	W6	NW8	NNW10	NNW11	NNW14	NNW14	NW9	WNW8	WNW9	W10	WNW11	WNW12	WNW12	WNW11	NW8	W10	WSW11	W10	W8	W7	W6	WSW9	W3	SE2	WNW8.0	NNW14	
5-Aug	WSW6	WS5	WSW6	WNW5	W6	WSW5	WSW4	WNW7	NNW12	N11	NNW11	NNW12	NNW13	NNW13	NNW13	NNW13	NNW12	NNW12	N13	N13	NNE10	NNE8	N5	NNW4	NNW3	NNW7.0	N13
6-Aug	NNW2	SSE1	WNW2	WSW2	SW4	WSW5	W3	NNE10	S3	N5	N9	NNE5	NNE7	NNE8	N10	NNW11	NW10	NW10	NNW9	NNW7	NNE8	NE9	NE9	ENE8	N4.6	NNW11	
7-Aug	ENE8	E6	ENE6	E5	SE2	ENE2	N2	NNE6	N12	N13	N14	N15	NNW14	N14	N14	N16	N14	NNE14	N13	NNE9	NNE7	ENE11	E9	E11	NNE8.3	N16	
8-Aug	SE9	SE9	SE9	ESE11	ESE12	SE10	SE12	SE12	SE11	SE9	ESE13	ESE14	ESE16	ESE15	ESE16	ESE16	ESE17	ESE19	SE17	SE13	SE11	SE11	SE11	SE11	ESE12.6	ESE19	
9-Aug	SE10	SE10	SSE12	SE12	SE10	SE12	SSE18	SSE20	SSE22	SSE23	SSE26	SSE28	SSE28	S28	SSE19	SE19	SE19	SE17	SE16	SE15	SSE20	SSE21	SSE21	SSE22	SSE18.5	SSE28	
10-Aug	SSE23	SSE25	SSE23	SE23	SE20	SE17	SE18	SE20	SE19	SE17	ESE18	ESE19	ESE19	ESE22	ESE23	ESE23	E21	ESE20	E19	E15	E16	E16	E14	ENE11	ESE17.7	SSE25	
11-Aug	NE9	ENE10	NE12	NE10	NNE7	NE8	NE7	NE10	E9	SE10	SE11	SE10	SSE9	S8	WSW5	WSW6	SW3	SSE8	SSE7	S8	SSE6	SSE9	S10	S11	ESE4.2	NE12	
12-Aug	S11	S10	SSE9	S8	SSW9	SW8	SW6	W7	W7	W8	WNW9	NW9	NW9	NW9	NW9	WNW8	W9	WNW10	WNW8	WNW5	WSW6	SW4	SSW5	SSW8	WSW4.8	S11	
13-Aug	SSW8	SSW10	SSW10	SSW10	SSW11	SSW13	SSW15	SSW16	SSW18	SSW19	SW24	SW26	SW24	WSW23	WSW23	WSW22	WSW19	W19	WSW17	WSW11	SW10	SW10	SW10	SW10	SW14.8	SW26	
14-Aug	WSW10	S7	SW7	WSW9	WNW8	N14	NNE7	NW3	WNW10	W15	W15	WNW19	WNW18	W17	W19	W16	W18	W21	W18	W12	WNW9	WNW7	WSW3	SSW4	W10.4	W21	
15-Aug	SW8	SW10	SW8	SSW8	SSW13	SSW10	SSW12	SSW13	SSW14	SSW15	S7	S14	SSE15	SSE14	S11	SW11	WSW9	WNW6	N7	N10	N12	N10	N8	NNW7	SW5.4	SSW15	
16-Aug	WNW6	WNW6	NW8	NW7	NW8	NNW9	NW12	NW10	NW10	WNW11	WNW11	WNW12	WNW12	W11	W12	W14	WSW15	WSW17	SW15	SSW12	SSW14	SSW16	SSW15	SSW17	W8.4	WSW17	
17-Aug	SSW20	SSW23	SSW21	SSW17	SSW15	SSW15	SSW14	SSW12	SSW9	SSW9	SSW9	SSW9	SSW11	W11	W10	WNW8	WNW7	WNW8	WSW12	NNE6	N5	NNW7	NNE7	NNW7	SW7.8	SSW23	
18-Aug	NNW10	N16	N14	N14	N13	N16	N16	N14	N16	N13	NNW16	NNW16	N16	NNW16	N14	N15	N14	N13	N16	NNW15	NNW13	NNW12	NNW14	NNW12	N14.1	N16	
19-Aug	NNW12	NW8	WNW6	W7	W8	W9	WSW10	WSW12	WSW12	WSW14	WSW14	WSW15	WSW12	WSW17	WSW17	WSW16	WSW16	WSW13	WSW11	WSW10	SW11	SW13	SW13	SW13	WSW11.0	WSW17	
20-Aug	SW13	SW13	SW10	SW11	SW12	SW12	SW12	SW12	WSW11	SW8	SW7	WSW6	W7	WSW7	W6	NW5	WNW5	NNW7	N5	NE3	ESE6	SE8	SSE9	SSW11	SW6.1	SW13	
21-Aug	SSW9	SW10	SW11	SW11	SW10	SSW10	SW10	SW9	SW9	WSW10	WSW12	W11	W8	SW10	SW9	SW8	SW8	SSW10	SSW12	S8	S8	S7	S7	SSE10	SW8.6	WSW12	
22-Aug	SSE10	SSE9	SSE8	SSE8	SSE9	SSE8	S7	SSE5	S11	S16	S17	S15	S14	S13	SSW13	SW12	SW10	SW7	WSW4	NNW2	SSE1	SSE3	SSE4	SSE6	S8.1	S17	
23-Aug	SSE5	S5	SSE4	SSE3	SE3	SE4	ESE3	ENE5	ENE6	E6	SSE8	S7	NNW6	NW5	NNW6	NNW6	NW8	NNW9	N11	N12	N13	NNE13	NNE10	NNE10	NNE2.9	N13	
24-Aug	NNE10	N13	NNE12	NNE13	NNE16	NNE14	NNE16	NNE13	N15	NNE20	NNE23	NNE19	NNE16	NNE14	N13	N12	N11	N10	NNW9	NNW6	N3	NNW4	N5	E2	N11.8	NNE23	
25-Aug	SSE3	SSE5	S6	SSW8	S7	S8	SSW10	SSW13	SSW17	SW16	SW19	SW21	SW20	SW20	SW20	SW20	SW18	SSW12	SSW12	SSW16	SSW18	SSW18	SSW18	SSW17	SSW13.8	SW21	
26-Aug	SSW15	SSW15	SSW14	SSW14	SSW17	SSW16	SSW18	SSW19	SW18	SW17	SW21	SW23	WSW22	WSW18	WSW20	W17	WNW12	NNW16	N15	N13	NNE14	NNE9	N7	N7	WSW9.2	SW23	
27-Aug	N7	NNW8	N10	NNW9	NW6	W5	WSW7	NW5	NNW6	WNW6	WNW7	W10	W9	WSW11	WSW11	SW13	SW13	SSW14	SSW13	SW12	SW14	SW14	SW13	SW11	WSW6.5	SSW14	
28-Aug	SW9	SW8	SW7	SW4	SW5	SSW5	S4	SSW4	SW9	SSW8	SSW8	SSW9	SW8	WSW9	SW6	SSW9	SSW8	S9	S9	SSE10	S13	S11	S11	SSW14	SSW7.6	SSW14	
29-Aug	SSW14	SSW13	SSW13	SSW12	SSW12	SSW12	SSW12	SSW13	SSW12	SW14	SW15	SSW14	SW13	SW13	SSW14	SW14	SW14	SW11	SW7	S8	S9	S10	S10	S10	SSW11.7	SW15	
30-Aug	S12	S11	S10	S8	S9	S8	S10	SSE8	S8	S7	SSW6	S12	S14	S14	S18	S19	S19	S11	S8	SSE11	S11	S17	S11	SSW6	S11.2	S19	
31-Aug	SSW5	SSW3	S10	S7	SSW7	S6	SSE7	S7	W5	NW6	WNW7	NW1	WNW6	NW10	NW11	NW14	NNW14	NNW15	N12	N9	NNW9	N14	N14	N11	NW4.3	NNW15	

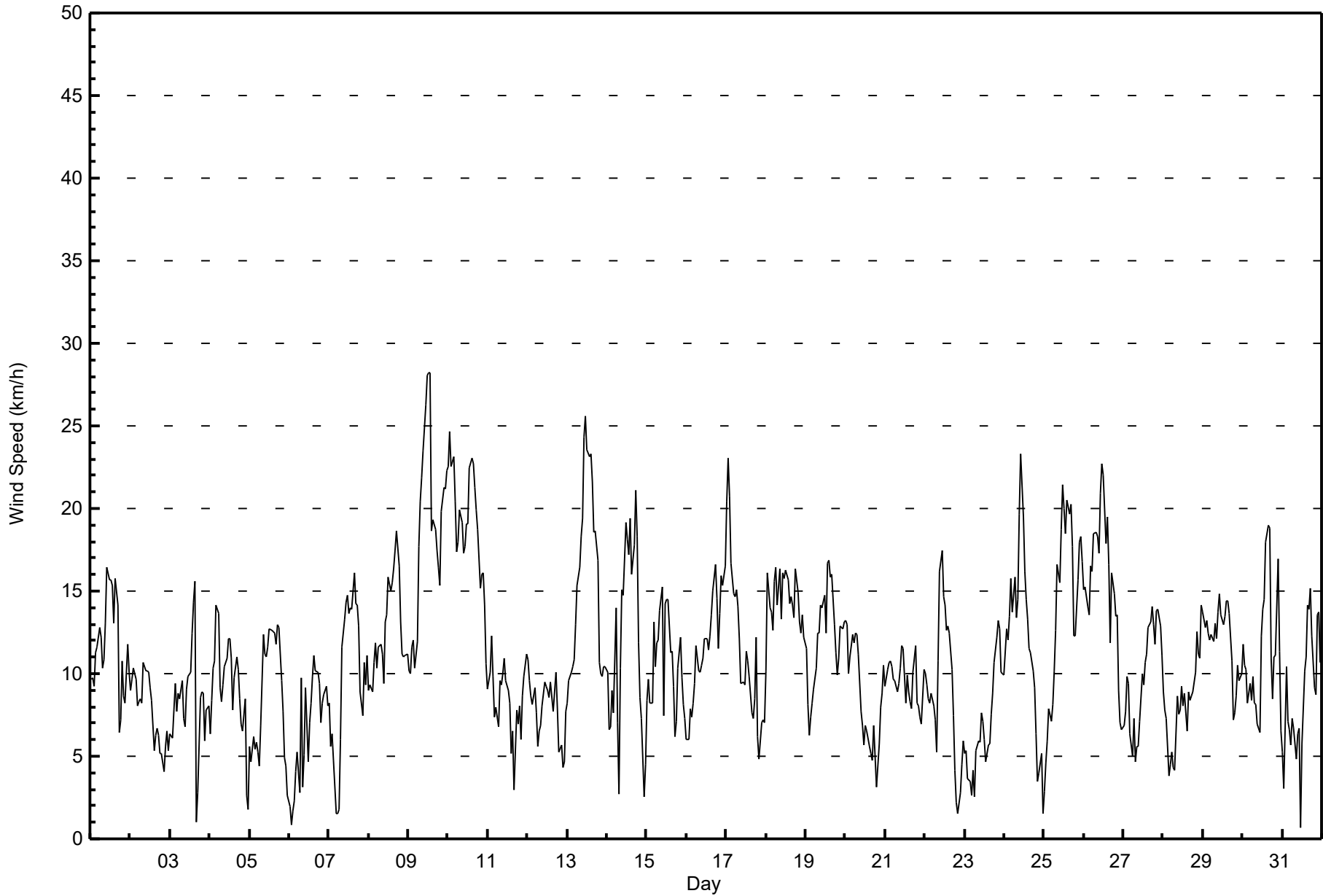
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SSE23	SSE25	SSE23	SE23	SE20	SE17	SSW18	SSE20	SSE22	SSE23	SSE26	SSE28	SSE28	S28	WSW23	ESE23	E21	W21	E19	SE15	SSE20	SSE21	SSE21	SSE22	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Firebag - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Firebag - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	75	10.08	10.08
6 - 11	364	48.92	59.01
12 - 19	262	35.22	94.22
20 - 28	43	5.78	100.00
29 - 38	0	0.00	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
Firebag - August 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	2	1	4	1	2	4	10	4	7	6	7	4	5	6	5	75
6 - 11	18	17	7	8	5	5	21	24	49	29	42	25	25	29	34	26	364
12 - 19	39	12	1	0	5	12	15	5	18	52	30	22	16	8	4	23	262
20 - 28	0	2	0	0	1	4	3	13	1	3	10	5	1	0	0	0	43
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	64	33	9	12	12	23	43	52	72	91	88	59	46	42	44	54	744

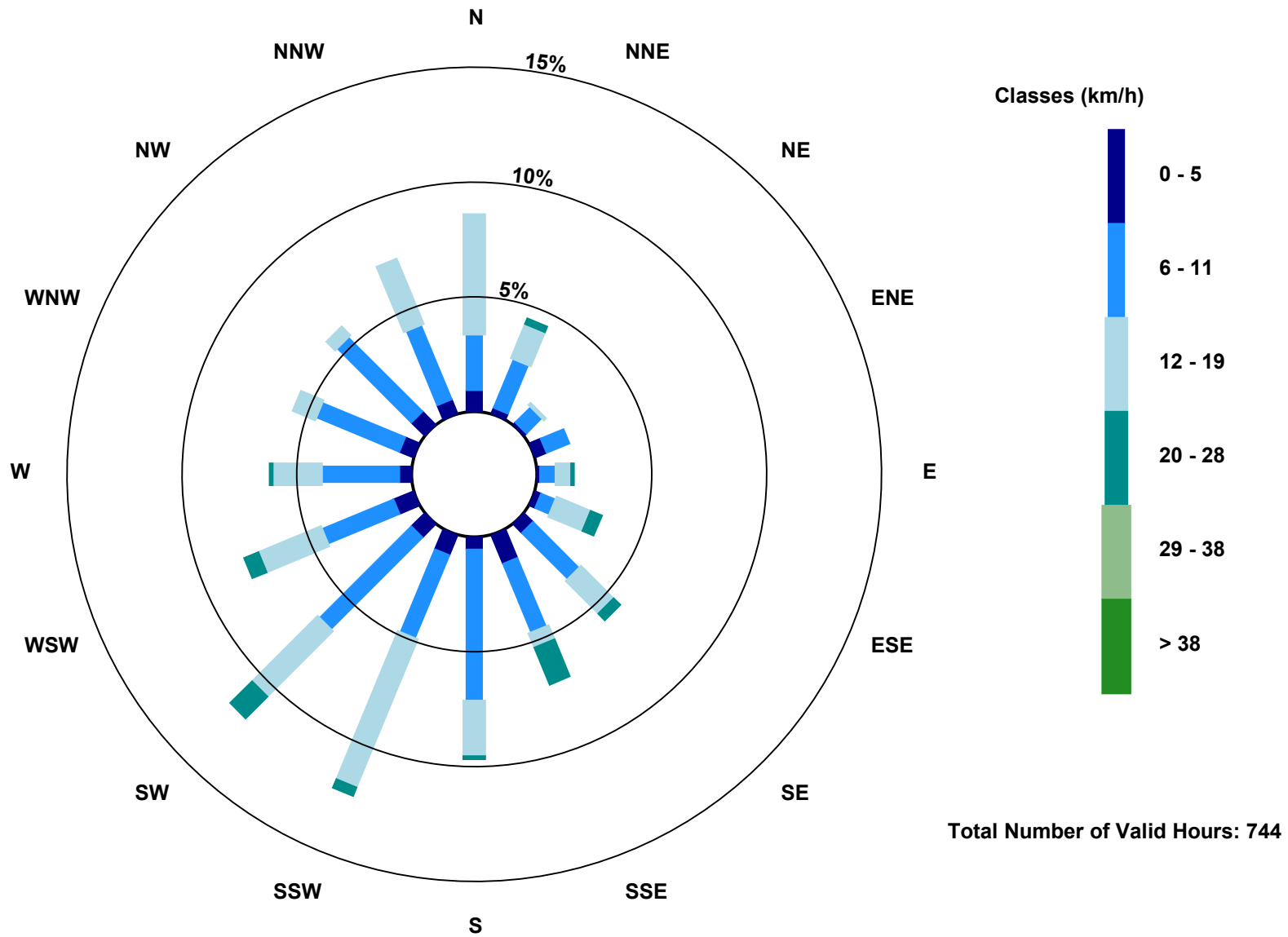
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Firebag





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Firebag - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Aug 9 14:00 Minimum Value: 0 km/h on Aug 6 04:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 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 Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	2	2	2	2	3	3	3	2	2	3	4	4	4	4	4	5	4	2	3	3	2	2	3	2	5
2-Aug	2	2	2	2	2	2	2	2	3	3	3	3	2	2	3	2	2	2	1	1	1	1	1	2	3
3-Aug	1	1	1	2	1	1	1	2	2	2	2	3	3	3	3	3	4	2	2	2	2	1	1	4	
4-Aug	1	2	2	2	3	4	2	2	2	3	4	3	4	3	3	3	3	2	2	1	1	1	3	4	
5-Aug	2	1	1	1	1	1	1	4	2	3	3	4	4	4	4	3	4	4	3	2	1	1	2	4	
6-Aug	1	2	1	0	1	1	2	3	2	2	4	2	3	3	2	3	2	2	2	2	1	1	2	4	
7-Aug	1	1	1	3	1	2	1	2	3	4	4	4	4	5	4	4	4	4	3	2	1	1	2	5	
8-Aug	2	2	2	2	2	2	2	2	3	3	4	4	3	3	4	3	4	4	4	3	2	2	2	4	
9-Aug	2	2	2	2	2	3	4	4	4	4	5	6	6	6	4	4	4	3	3	3	3	4	4	6	
10-Aug	4	4	5	5	4	3	3	4	4	4	4	4	4	5	5	5	5	5	4	4	3	3	4	5	
11-Aug	2	2	3	2	1	1	2	2	3	3	3	3	2	2	3	2	2	1	2	1	1	1	1	3	
12-Aug	2	1	1	1	2	1	2	2	2	2	3	2	3	2	3	4	3	3	2	1	1	1	1	4	
13-Aug	1	1	2	1	1	2	2	2	3	4	5	5	5	5	5	5	4	5	5	2	1	1	2	5	
14-Aug	4	5	2	2	3	4	4	2	3	4	5	5	5	5	5	5	4	6	5	3	2	2	1	6	
15-Aug	2	1	2	2	2	1	2	2	3	3	5	4	3	2	3	3	3	2	2	2	3	2	1	5	
16-Aug	1	1	1	2	2	1	2	3	2	3	3	4	4	4	4	4	4	4	4	2	2	3	2	4	
17-Aug	3	4	4	3	2	2	2	3	3	2	2	3	3	3	3	3	2	4	4	2	2	3	2	4	
18-Aug	2	4	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3	3	3	4	
19-Aug	3	1	1	1	1	1	2	3	3	3	3	3	4	4	5	4	4	3	2	2	1	2	2	5	
20-Aug	2	2	2	2	2	2	2	3	3	2	2	2	2	3	3	2	2	2	1	1	2	1	1	3	
21-Aug	1	2	2	2	2	2	1	2	2	3	3	3	3	4	4	4	3	4	3	1	1	1	1	4	
22-Aug	1	1	1	1	2	2	1	1	3	3	3	3	4	3	4	3	3	3	1	2	1	1	1	4	
23-Aug	1	1	1	1	1	1	1	1	2	2	2	2	1	2	1	2	2	2	2	2	2	3	2	3	
24-Aug	2	2	3	3	3	3	3	3	4	4	5	5	4	4	4	4	3	3	2	1	1	2	1	5	
25-Aug	1	1	1	1	1	1	2	2	2	3	4	4	4	4	4	4	4	4	3	1	2	3	3	4	
26-Aug	3	3	2	2	2	3	3	3	3	4	5	5	5	4	4	5	3	5	4	3	3	1	2	5	
27-Aug	1	2	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	1	2	2	2	3	
28-Aug	1	1	2	1	1	1	1	2	1	2	1	2	2	2	2	2	1	1	1	1	1	1	2	2	
29-Aug	1	2	2	1	1	1	1	2	2	3	3	3	3	3	3	3	3	2	1	1	1	2	1	3	
30-Aug	2	1	2	1	1	1	1	1	1	2	3	3	3	3	5	4	3	2	1	3	4	4	4	5	
31-Aug	3	3	2	3	4	3	3	1	1	2	2	1	3	3	3	3	4	3	3	1	3	3	3	4	
																	Diurnal Maximum								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Firebag - August 2023

Direction of Maximum Speed: 162 deg on Aug 9 13:00 Direction of Maximum Daily Speed Average: 151.5 deg on Aug 9	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0
Direction of Minimum Speed: 315 deg on Aug 31 12:00 Direction of Minimum Daily Speed Average: 2.9 deg on Aug 23	Percent Operational Time: 100.0
Monthly Average Direction: 226.1 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-Aug	233	235	236	241	256	257	260	265	257	249	254	262	263	273	296	308	311	312	322	356	340	352	333	327	278.8
2-Aug	324	320	311	315	319	308	308	290	296	301	297	308	304	304	292	342	317	313	319	26	58	81	114	109	315.9
3-Aug	121	116	133	153	144	128	143	151	178	184	195	182	167	178	169	179	202	190	175	184	194	182	213	243	170.2
4-Aug	266	313	328	330	338	340	305	299	291	278	282	286	299	298	310	269	254	260	261	259	270	255	269	143	292.6
5-Aug	240	229	256	282	273	250	251	314	342	353	346	327	332	330	330	339	351	9	17	14	11	332	330	330.9	
6-Aug	338	160	303	240	219	252	266	32	177	5	354	19	27	13	3	342	325	323	327	343	19	39	43	59	358.2
7-Aug	60	79	70	79	138	69	357	16	2	1	6	4	345	359	359	349	358	19	8	28	27	60	82	88	19.6
8-Aug	124	126	131	116	117	129	126	128	129	130	110	111	115	114	117	120	119	120	127	126	129	126	132	131	122.2
9-Aug	141	145	150	140	135	141	153	156	154	156	154	160	162	171	151	139	139	138	136	145	157	157	156	149	151.5
10-Aug	152	154	148	144	138	132	133	139	138	127	116	115	113	116	110	106	95	102	97	87	88	93	82	59	119.2
11-Aug	39	61	55	44	30	55	48	54	82	136	135	139	166	181	256	241	216	162	156	180	160	165	169	178	122.1
12-Aug	170	170	162	177	206	217	224	260	276	279	299	310	322	311	313	300	267	284	299	290	257	219	203	204	255.6
13-Aug	198	204	210	206	197	197	198	201	202	208	217	229	232	243	249	246	254	260	249	237	218	216	216	232	225.1
14-Aug	255	180	231	251	296	350	14	318	299	273	277	289	285	280	275	277	266	269	272	273	291	287	254	195	278.0
15-Aug	224	235	224	208	213	203	212	217	212	210	177	170	160	161	190	216	245	282	6	355	10	360	2	336	214.7
16-Aug	300	286	317	312	326	330	318	314	305	302	297	289	291	280	280	274	251	239	224	211	200	203	203	205	265.9
17-Aug	207	203	201	210	202	198	197	200	208	206	213	233	258	281	277	290	300	284	245	30	357	342	23	343	227.4
18-Aug	345	359	359	2	4	8	5	358	355	351	343	341	350	340	3	357	6	353	349	341	344	336	329	335	351.6
19-Aug	347	326	284	263	262	259	248	251	256	249	249	246	250	253	256	251	246	249	255	241	224	220	221	221	251.1
20-Aug	219	215	228	218	215	219	222	226	245	218	236	244	275	252	266	307	289	327	352	39	103	142	161	195	226.7
21-Aug	204	214	214	214	214	211	216	229	233	250	257	268	261	226	233	233	227	211	212	190	184	184	176	167	219.2
22-Aug	162	160	157	150	166	161	170	164	175	180	176	184	181	183	192	221	229	235	243	332	158	149	157	155	180.6
23-Aug	161	169	156	159	144	142	116	62	73	100	156	183	337	319	343	329	310	337	358	5	10	17	17	23	20.8
24-Aug	17	10	20	18	18	16	18	19	10	14	19	17	13	14	6	356	350	350	347	343	3	329	357	81	10.5
25-Aug	148	159	184	204	189	191	199	203	202	219	225	223	223	221	216	226	218	221	207	196	198	208	205	203	210.3
26-Aug	206	207	204	208	202	206	209	213	218	224	227	232	238	240	250	265	282	346	7	9	13	17	7	4	238.3
27-Aug	6	346	356	348	319	268	251	319	331	283	298	281	261	241	239	226	231	212	210	215	218	219	218	221	250.6
28-Aug	226	231	229	217	218	202	174	208	218	212	207	211	227	253	216	212	196	183	169	167	175	180	189	199	203.1
29-Aug	200	206	209	209	209	204	207	211	213	215	221	209	216	218	208	219	224	227	216	185	183	173	176	176	207.3
30-Aug	176	184	186	182	182	177	172	168	172	182	197	182	189	185	178	181	172	190	184	161	172	173	174	200	179.2
31-Aug	196	208	178	182	213	187	166	178	268	308	301	315	283	307	311	325	336	348	8	358	345	351	358	351	320.3

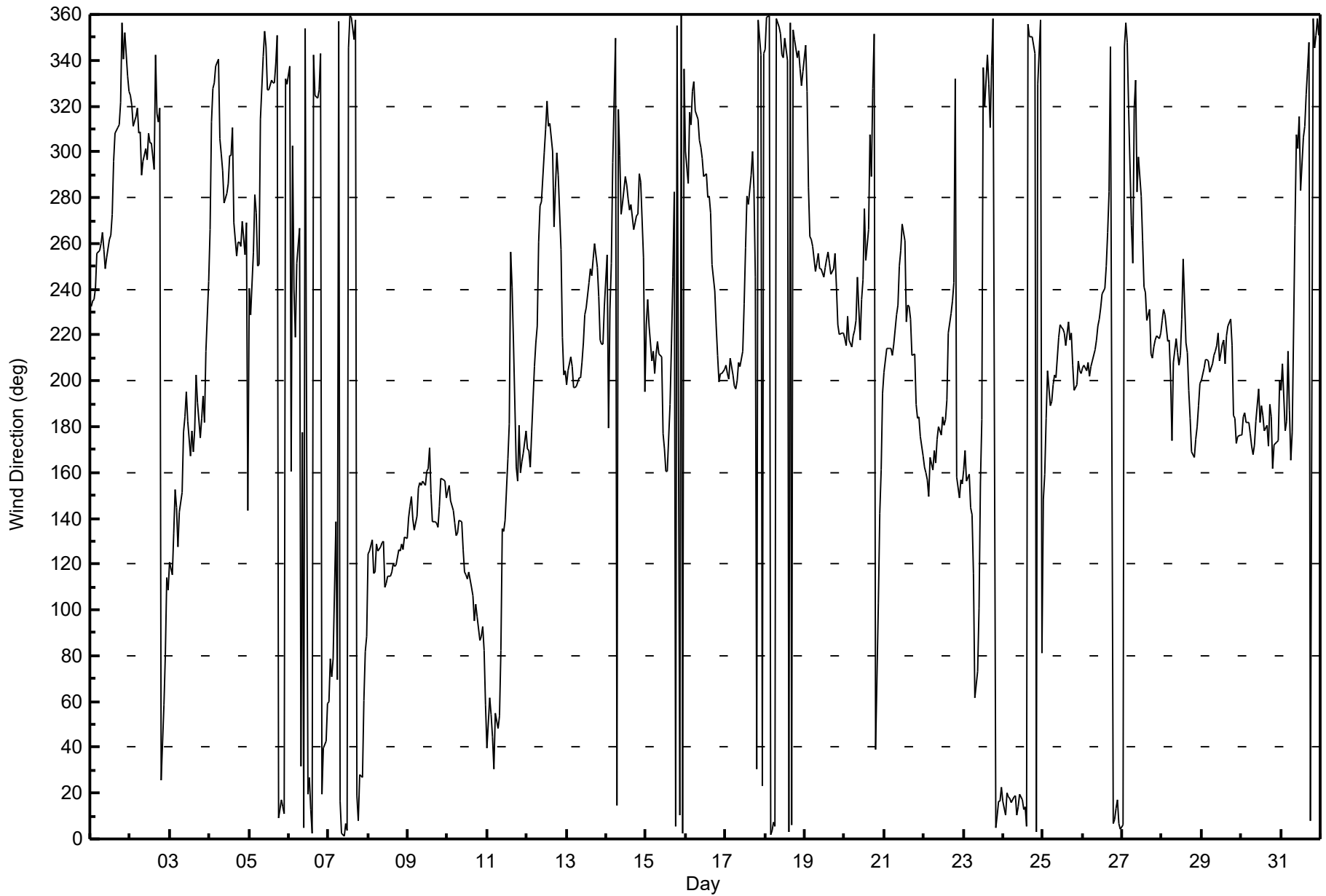
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 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Firebag - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Firebag - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 97 deg on Aug 31 12:00 Minimum Value: 3 deg on Aug 6 22:00 Percentiles: P ₁ = 5 P ₁₀ = 9 Q ₁ = 11 Median = 14 Q ₃ = 20 P ₉₀ = 28 P ₉₉ = 65																	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-Aug	14	15	13	12	14	15	16	16	14	12	14	16	16	18	23	19	15	16	24	18	14	13	14	12	24
2-Aug	13	11	13	14	19	15	14	23	22	25	22	22	27	25	64	35	20	19	19	10	30	16	12	16	64
3-Aug	14	13	20	12	13	11	14	12	23	19	14	19	27	24	15	11	95	77	13	12	14	12	17	11	95
4-Aug	14	22	12	11	15	15	19	20	23	27	27	29	28	26	25	28	17	16	15	8	13	9	73	64	73
5-Aug	25	13	12	13	12	10	15	26	17	20	24	27	25	27	22	28	25	20	16	10	5	9	22	26	28
6-Aug	55	79	39	49	12	13	49	18	70	50	15	62	30	28	24	21	13	15	13	21	9	3	5	9	79
7-Aug	7	9	9	41	54	38	38	26	22	23	23	22	22	24	25	21	22	21	17	10	9	8	13	13	54
8-Aug	24	13	13	15	12	14	13	16	21	32	22	21	18	21	18	20	19	18	16	13	12	12	13	13	32
9-Aug	13	12	11	12	13	15	12	12	13	12	14	14	13	10	14	13	13	13	12	12	11	10	11	13	15
10-Aug	11	11	12	13	12	13	13	13	14	14	14	15	13	15	14	14	13	14	14	13	11	11	17	14	17
11-Aug	11	16	12	10	12	16	13	13	18	21	19	25	22	22	40	25	62	17	19	14	12	8	8	7	62
12-Aug	9	9	11	11	12	12	17	26	21	21	20	29	28	23	27	34	30	25	15	13	23	16	11	6	34
13-Aug	4	6	8	10	6	7	8	9	11	13	13	14	14	15	15	17	19	17	15	11	10	9	9	20	20
14-Aug	35	37	11	15	38	15	21	72	20	20	23	20	20	21	22	20	16	18	17	17	19	20	49	41	72
15-Aug	12	7	11	10	8	6	10	11	11	13	38	11	10	13	28	20	33	40	14	14	14	15	14	9	40
16-Aug	17	16	14	14	15	11	11	14	15	21	24	26	27	29	25	25	19	14	11	9	8	8	9	10	29
17-Aug	10	9	12	12	9	7	7	9	11	16	19	36	23	25	26	38	17	20	19	44	49	37	17	17	49
18-Aug	10	16	14	15	15	16	15	16	16	16	15	19	20	20	17	17	16	16	14	15	14	14	12	13	20
19-Aug	12	11	17	11	14	13	12	12	14	12	13	13	25	21	22	17	13	14	12	11	9	7	9	9	25
20-Aug	9	9	12	9	8	9	10	12	15	19	36	47	39	48	50	62	52	18	15	37	15	11	15	9	62
21-Aug	9	8	9	9	9	9	10	12	12	17	22	26	38	37	32	43	21	28	14	10	9	7	9	8	43
22-Aug	9	8	9	10	12	9	8	18	11	14	13	20	21	17	20	22	20	22	34	27	57	14	9	7	57
23-Aug	7	4	18	9	21	18	46	17	25	34	18	24	41	13	13	14	12	16	15	15	13	12	13	11	46
24-Aug	12	14	13	13	13	13	12	13	13	16	15	18	22	25	24	23	17	12	4	16	42	13	61	61	61
25-Aug	20	8	7	7	4	4	7	8	8	12	13	13	15	15	13	14	12	11	9	6	9	10	9	9	20
26-Aug	10	10	10	10	8	10	10	10	13	13	14	16	14	14	15	18	21	26	15	14	12	7	10	21	26
27-Aug	9	9	9	7	14	28	9	27	29	35	30	27	31	24	20	18	17	11	10	8	8	9	9	8	35
28-Aug	9	9	10	9	12	10	12	22	10	10	9	10	13	15	18	10	9	8	12	9	8	7	10	6	22
29-Aug	6	7	8	8	8	6	8	9	9	11	11	15	18	17	17	15	13	12	14	5	6	7	7	8	18
30-Aug	7	6	6	6	6	4	10	9	10	11	27	23	17	17	18	13	10	9	9	16	29	12	16	38	38
31-Aug	32	63	12	18	20	66	22	10	38	25	22	97	55	28	21	18	17	15	17	16	11	14	15	16	97
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS20 MACKAY RIVER AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
AUGUST 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	19.6	0	3.4	0
H2S (ppb) Average	706	36	38	99.73	2.8	0	0.7	0
THC (ppm) Average	709	35	35	100	3.3	-	2.8	-
NO2 (ppb) Average	707	36	37	99.87	12.2	0	4.1	-
NO (ppb) Average	707	36	37	99.87	4.4	-	0.9	-
NOX (ppb) Average	707	36	37	99.87	14.3	-	4.5	-
Temperature 2 m (C) Average	744	0	0	100	30.3	-	21.4	-
Relative Humidity (%) Average	744	0	0	100	99.6	-	97.2	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	14	-	9	-
Wind Direction 10 m (deg) Average	742	0	2	99.73	-	-	-	-
Precipitation (mm) Total	744	0	0	100	11.4	-	19.3	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - MACKAY RIVER (AMS20)
AUGUST 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	0.43	1.4	-	0	0	0	0.1	0.2	0.7	19.6
H2S (ppb) Average	706	0.19	0.2	-	0	0.1	0.1	0.1	0.2	0.3	2.8
THC (ppm) Average	709	2.36	0.2	-	2.1	2.2	2.2	2.3	2.4	2.6	3.3
NO2 (ppb) Average	707	0.98	1.5	-	0.1	0.2	0.3	0.5	0.9	2.3	12.2
NO (ppb) Average	707	0.11	0.3	-	0	0	0	0	0.1	0.1	4.4
NOX (ppb) Average	707	1.08	1.7	-	0.1	0.2	0.3	0.5	1	2.4	14.3
Temperature 2 m (C) Average	744	15.74	5.2	-	2.5	9.7	12.1	15.2	19.6	22.6	30.3
Relative Humidity (%) Average	744	75.91	18.2	-	33.9	47.7	61.2	80.3	92.3	96.7	99.6
Wind Speed 10 m (km/h) Average	742	5.9	3	-	0	3	4	6	8	9	14
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-
Precipitation (mm) Total	744	-	-	69.77	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION -MACKAY RIVER (AMS20)
AUGUST 2023

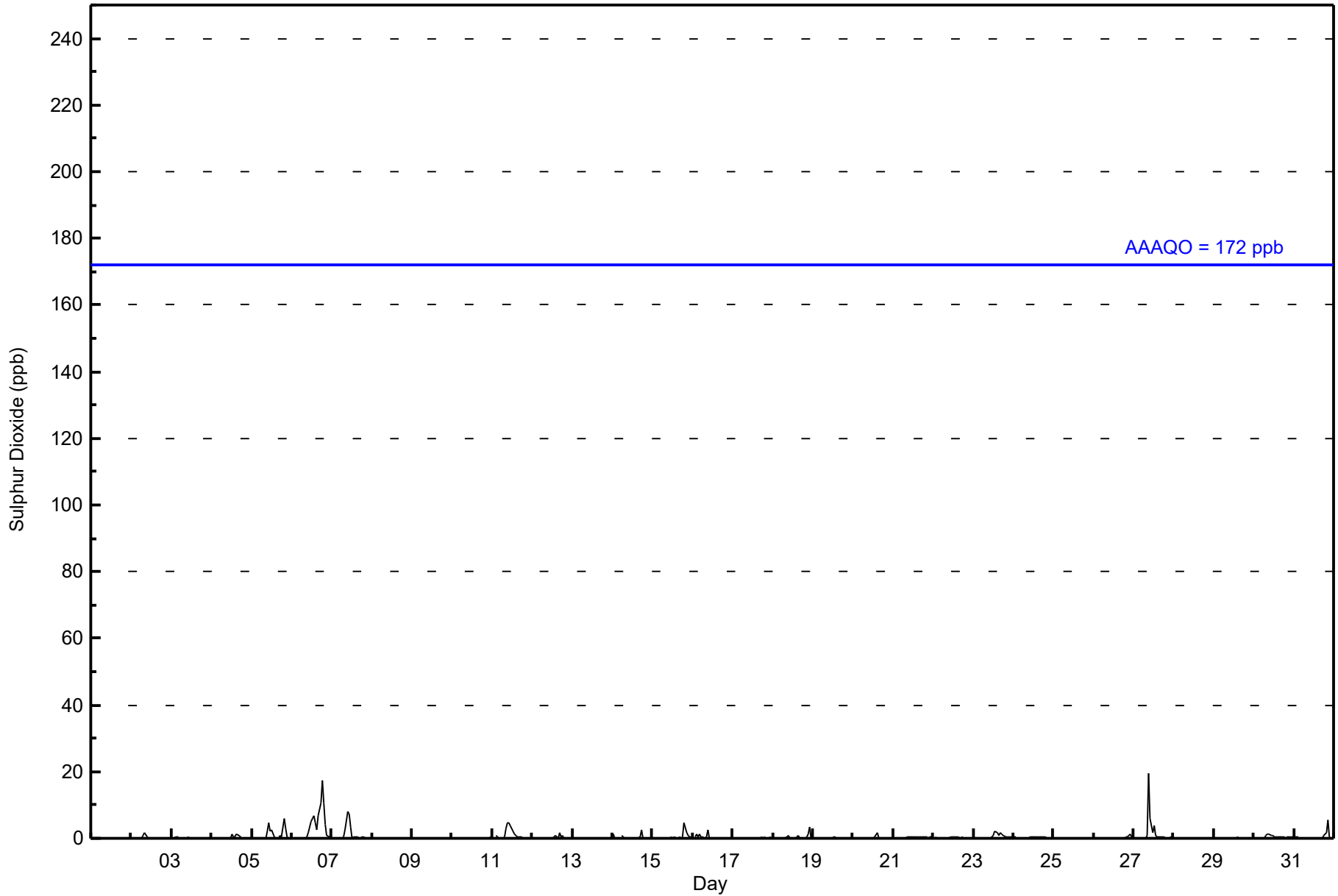
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S	08 Aug 2023 08:00	08 Aug 2023 09:00	2	Maintenance - reinitiated daily QA check
NO2	08 Aug 2023 09:00	08 Aug 2023 09:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	06 Aug 2023 23:00	06 Aug 2023 23:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	07 Aug 2023 07:00	07 Aug 2023 07:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Mackay River - August 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
Mackay River - August 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	27	45	20	13	18	60	64	47	92	54	54	75	67	28	20	19	703
11 - 20	0	3	0	0	0	0	0	0	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	27	48	20	13	18	60	64	47	93	54	54	75	67	28	20	19	707

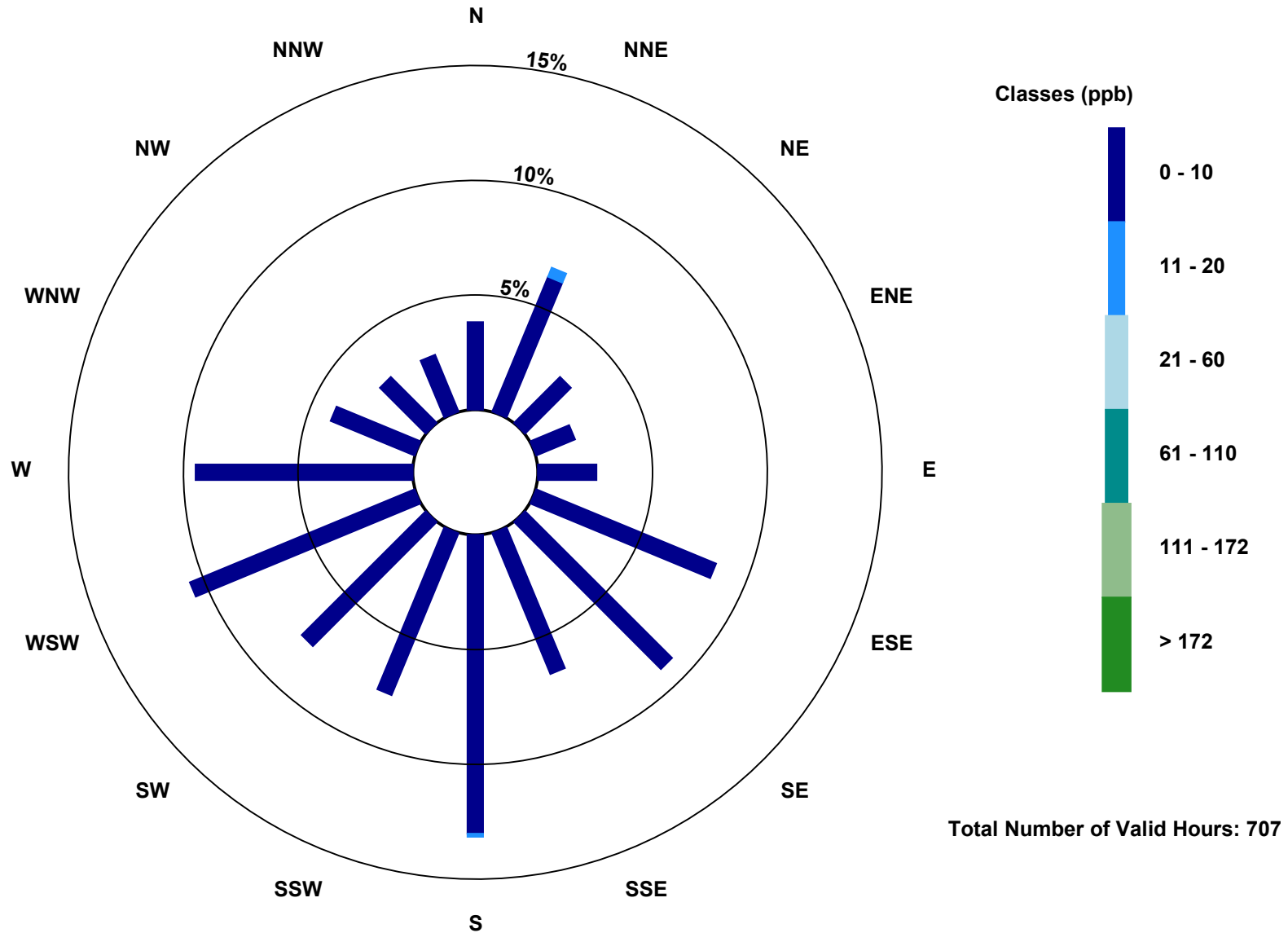
Total Number of Valid Hours: 707

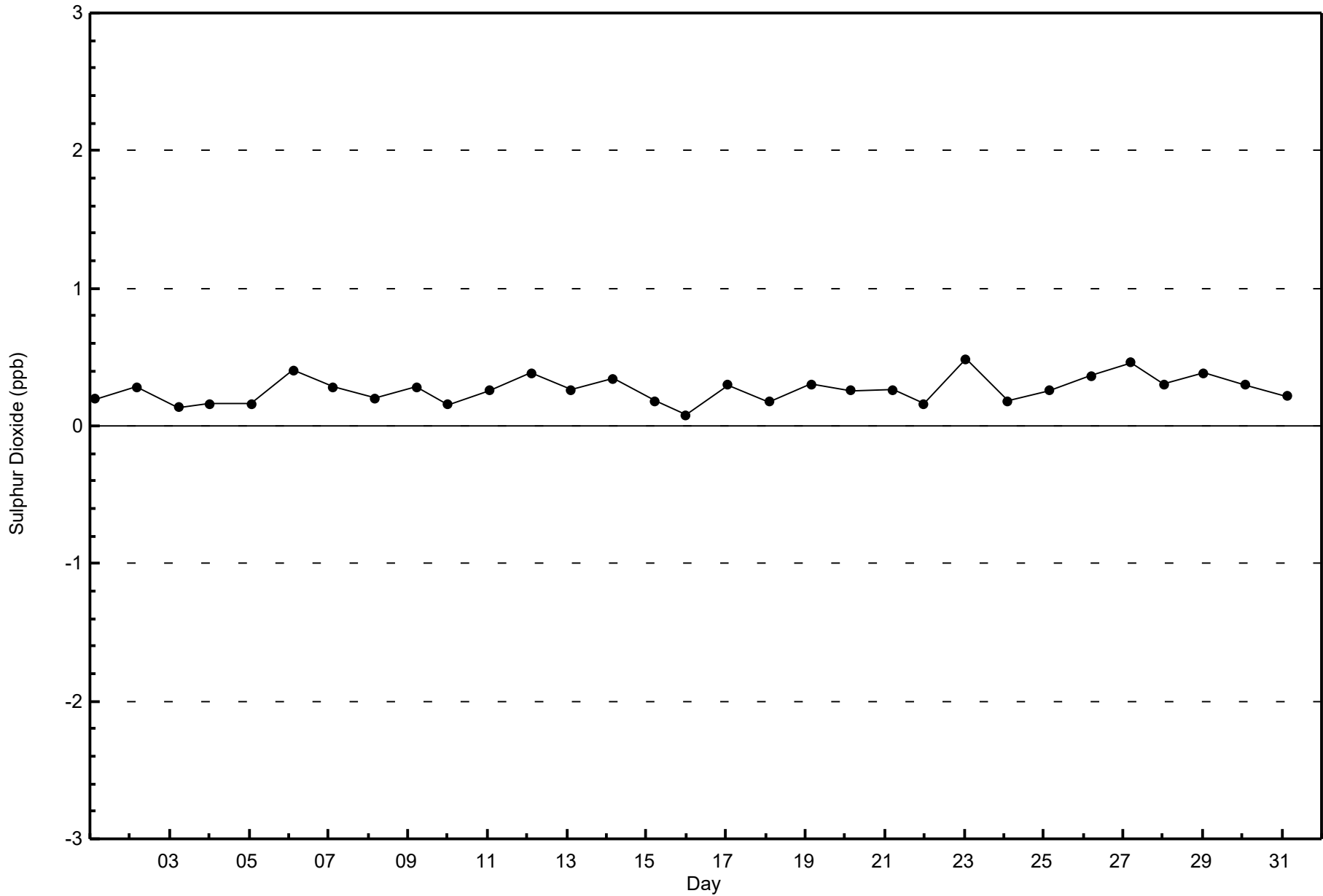
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Mackay River

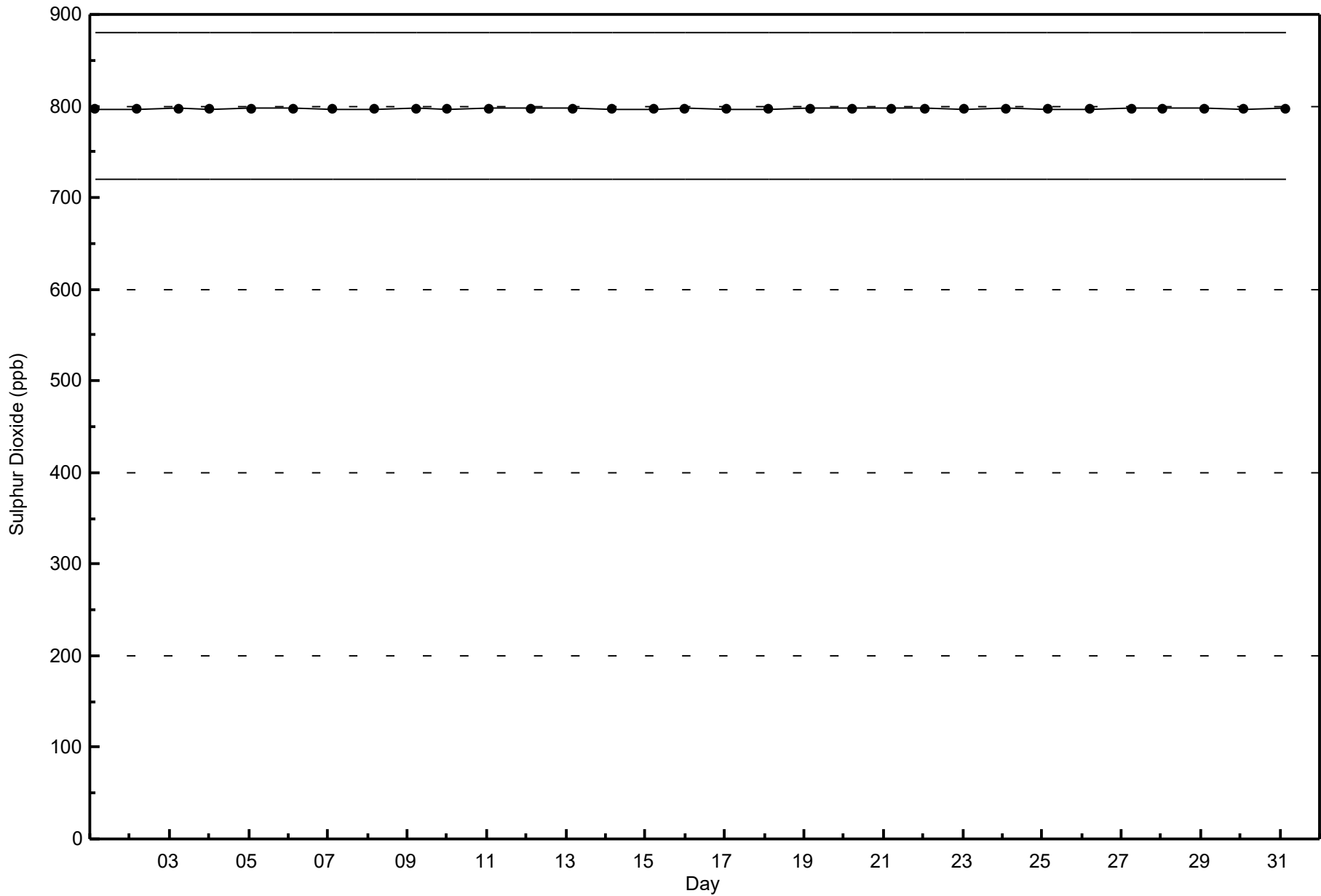






Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Mackay River - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

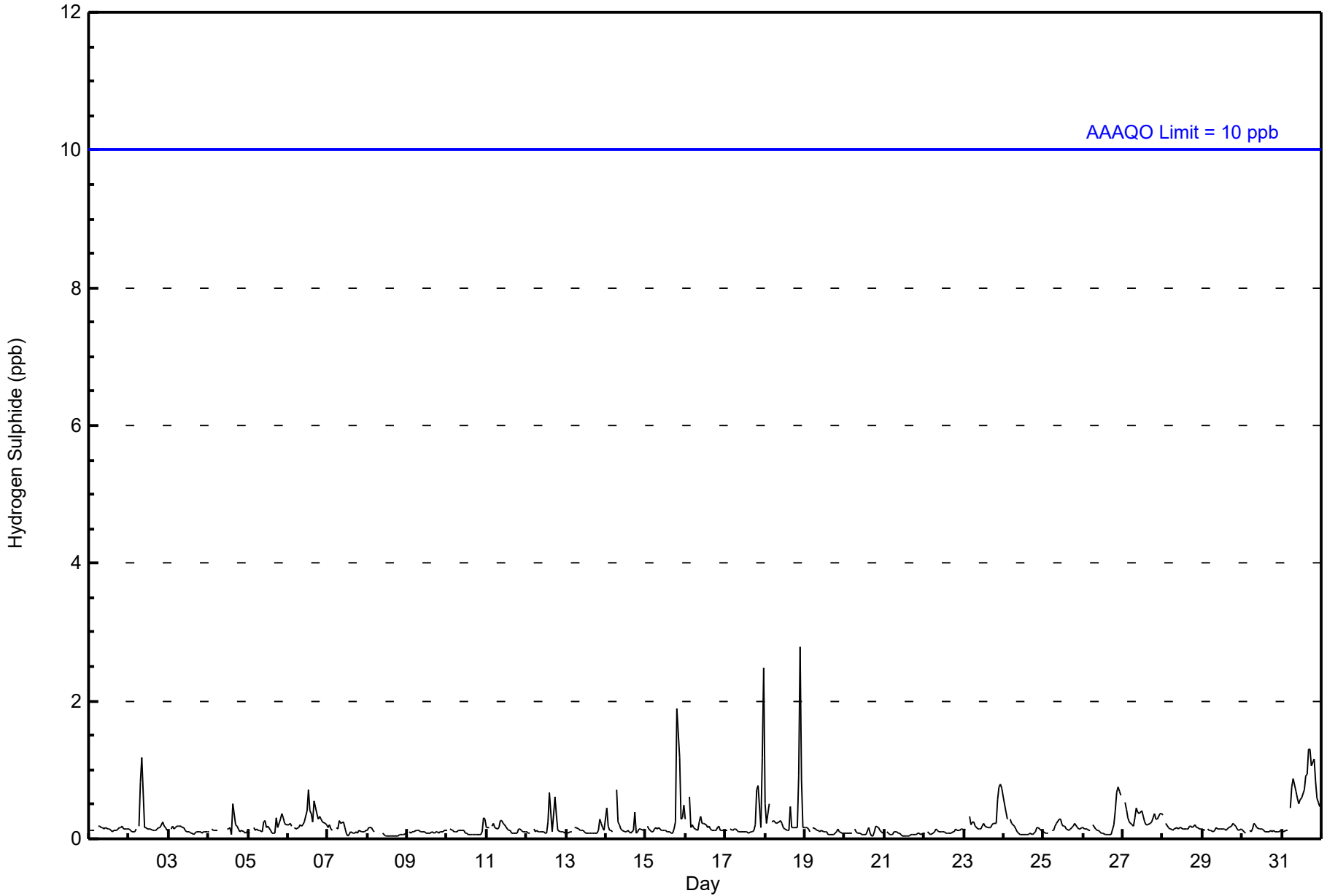
Hydrogen Sulphide (H₂S) - ppb
Mackay River - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 2.8 ppb on Aug 18 22:00 Minimum Value: 0.0 ppb on Aug 8 18:00 Maximum Diurnal Average: 0.3 ppb at hour 21 Monthly Average: 0.19 ppb		Maximum Daily Average: 0.7 ppb on Aug 31 Minimum Daily Average: 0.1 ppb on Aug 21 Minimum Diurnal Average: 0.1 ppb at hour 4 Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 1.2		Hours in Service: 744 Hours of Data: 706 Hours of Missing Data: 38 Hours of Calibration: 36 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-Aug	0.1	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2			
2-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.8	1.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	1.2
3-Aug	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	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
4-Aug	0.1	Z	0.1	0.1	0.1	0.1	C	C	C	C	C	0.1	0.1	0.2	0.1	0.5	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	0.5
5-Aug	0.1	0.1	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4
6-Aug	0.2	0.2	0.2	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.4	0.4	0.2	0.5	0.4	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	0.7
7-Aug	0.2	0.2	0.1	0.1	Z	0.2	0.1	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
8-Aug	0.1	0.2	0.2	0.1	0.1	Z	0.1	M	M	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
9-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3
11-Aug	0.2	0.2	Z	0.2	0.2	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
12-Aug	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	0.7	0.1	0.3	0.6	0.3	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
13-Aug	0.1	0.1	0.1	0.1	Z	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	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3
14-Aug	0.4	0.2	0.1	0.1	0.1	Z	0.7	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	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
15-Aug	Z	0.2	0.1	0.1	0.1	0.1	0.2	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	1.9	1.2	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	1.9	
16-Aug	0.3	Z	0.6	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	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	0.6	
17-Aug	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	0.2	0.7	0.8	0.2	1.2	2.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.5	
18-Aug	0.5	0.2	0.5	Z	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.5	0.2	0.2	0.2	0.2	0.2	0.9	2.8	0.9	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	2.8	
19-Aug	0.2	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
20-Aug	0.1	0.1	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	0.2	0.1	0.0	0.0	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	
21-Aug	Z	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	0.1	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-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
23-Aug	0.1	0.1	Z	0.3	0.2	0.2	0.2	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	0.6	0.8	0.8	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.8	
24-Aug	0.6	0.4	0.3	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	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6	
25-Aug	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	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	0.2	0.3	
26-Aug	0.2	0.1	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	0.2	0.4	0.7	0.8	0.7	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8	
27-Aug	Z	0.5	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5		
28-Aug	0.4	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	0.1	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	0.4	
29-Aug	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	0.2	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	0.2	
30-Aug	0.1	0.1	0.1	Z	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	0.1	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	
31-Aug	0.1	0.1	0.1	0.1	Z	0.5	0.8	0.9	0.7	0.6	0.5	0.6	0.6	0.7	0.9	0.9	1.3	1.3	1.1	1.2	0.8	0.6	0.5	0.5	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.3	
																								Diurnal Average										
																								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
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Mackay River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	705	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: 706

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Mackay River - August 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	25	49	21	13	19	61	66	48	95	51	52	71	70	26	18	18	703
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	25	49	21	13	19	61	66	48	95	51	52	71	70	26	19	18	704

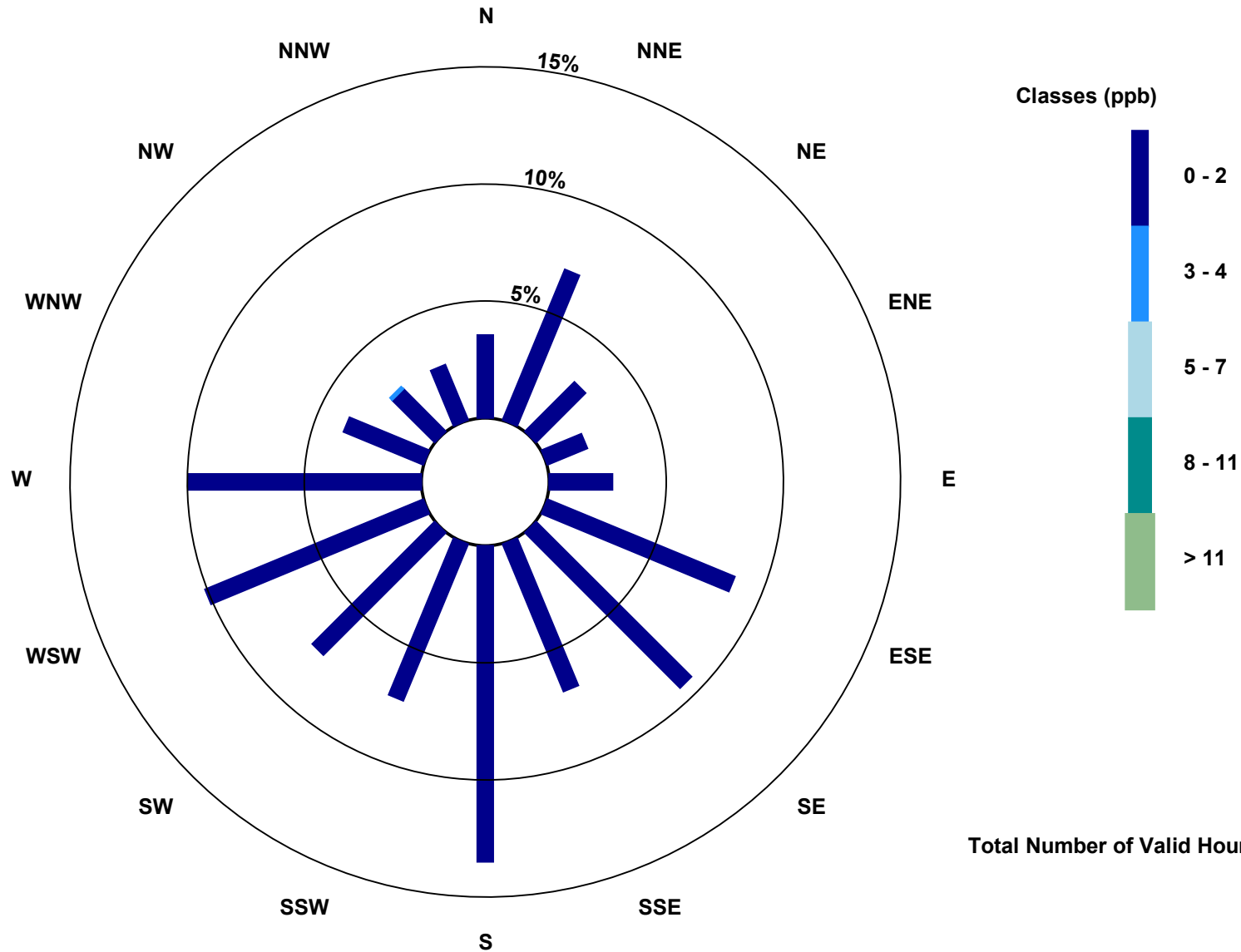
Total Number of Valid Hours: 704

Total Number of Hours: 744

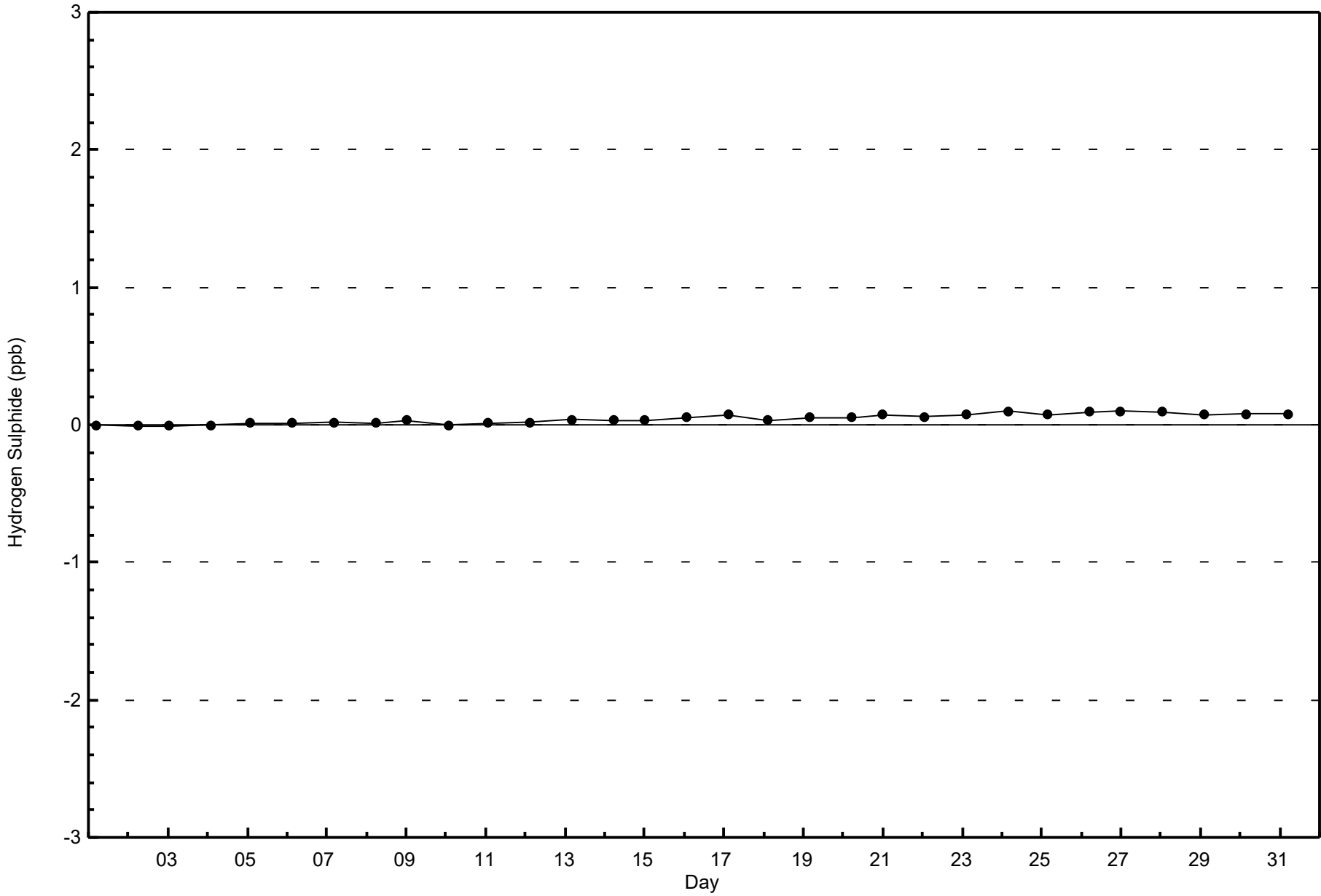


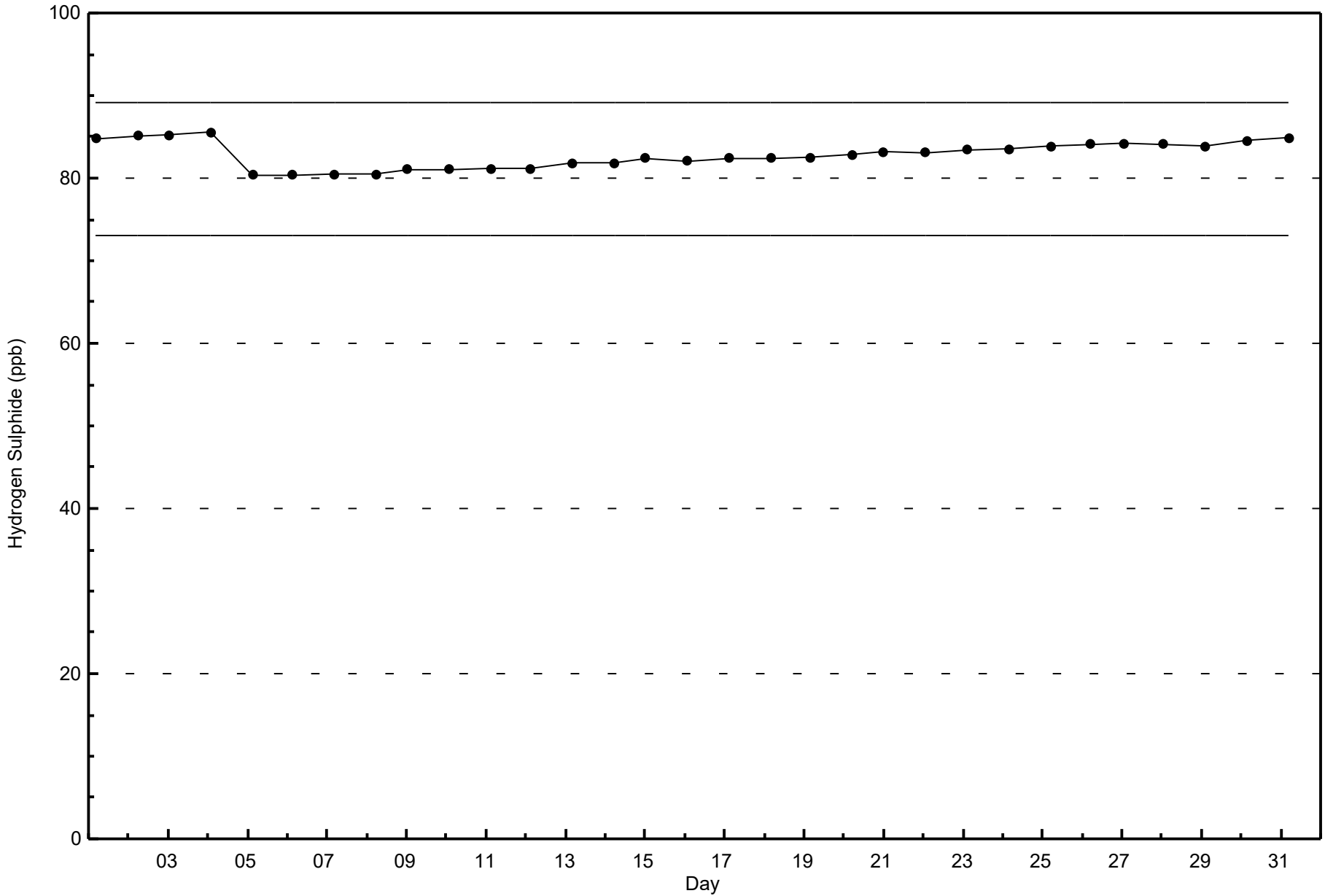
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Mackay River



Total Number of Valid Hours: 704







Wood Buffalo Environmental Association
Summary of Hour Averages

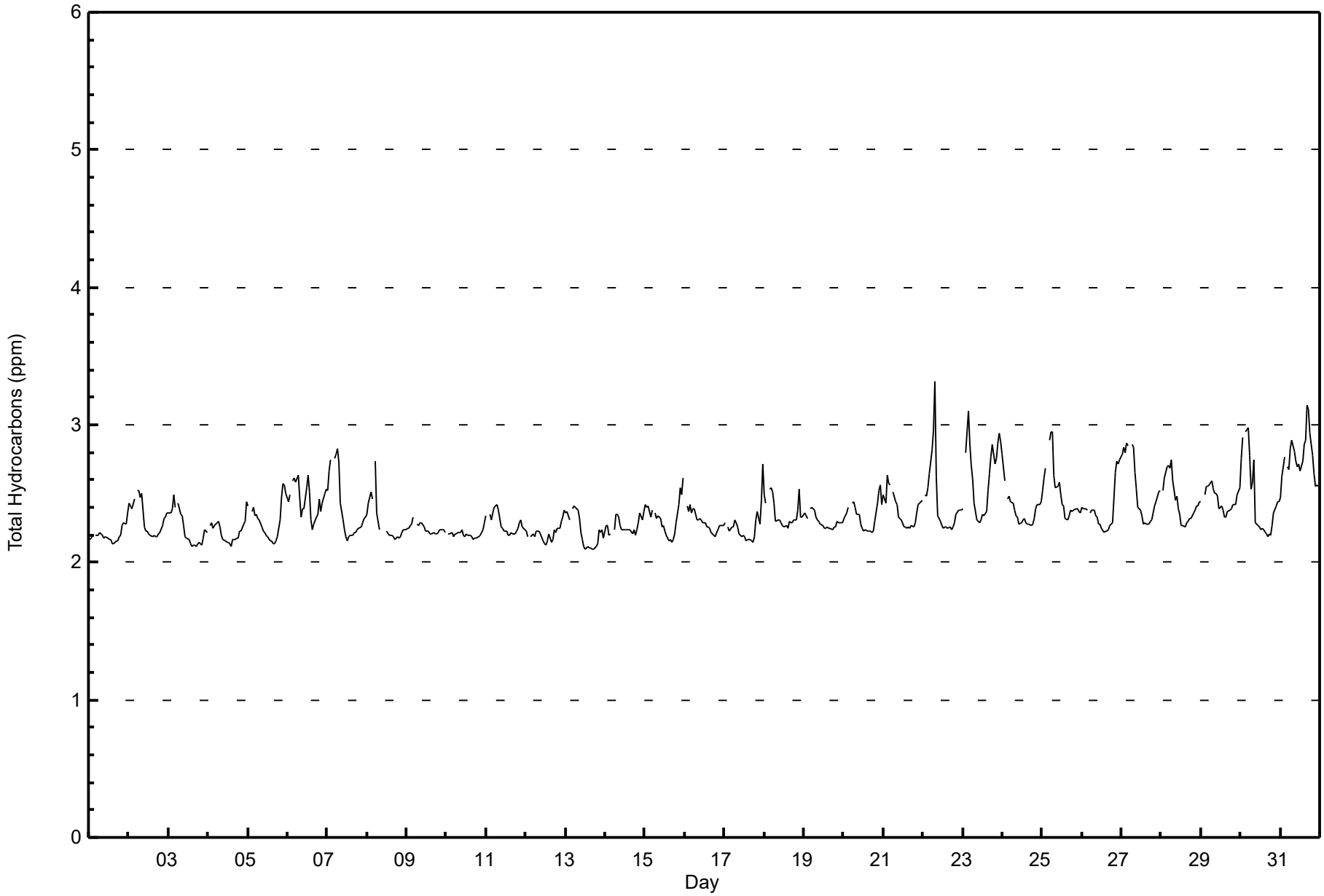
Total Hydrocarbons (THC) - ppm
Mackay River - August 2023

Maximum Value: 3.3 ppm on Aug 22 08:00		Maximum Daily Average: 2.8 ppm on Aug 31		Hours in Service: 744																																													
Minimum Value: 2.1 ppm on Aug 13 13:00		Minimum Daily Average: 2.2 ppm on Aug 1		Hours of Data: 709																																													
Maximum Diurnal Average: 2.5 ppm at hour 5		Minimum Diurnal Average: 2.2 ppm at hour 15		Hours of Missing Data: 35																																													
Monthly Average: 2.36 ppm		Percentiles: P ₁ = 2.1 P ₁₀ = 2.2 Q ₁ = 2.2 Median = 2.3 Q ₃ = 2.4 P ₉₀ = 2.6 P ₉₉ = 2.9		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-Aug	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	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.2	2.4																							
2-Aug	2.4	2.4	2.4	2.5	Z	2.5	2.5	2.5	2.5	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	2.4	2.3	2.5																							
3-Aug	2.4	2.4	2.4	2.5	2.4	Z	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.5																							
4-Aug	Z	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.4																							
5-Aug	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.2	2.3	2.5	2.6	2.6	2.5	2.3	2.6																							
6-Aug	2.4	2.5	Z	2.6	2.6	2.6	2.6	2.5	2.3	2.4	2.4	2.5	2.6	2.5	2.3	2.2	2.3	2.3	2.4	2.5	2.4	2.4	2.5	2.5	2.5	2.6																							
7-Aug	2.5	2.7	2.7	Z	2.8	2.8	2.8	2.7	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.8																							
8-Aug	2.4	2.4	2.5	2.5	Z	2.7	2.4	2.2	C	C	C	C	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.7																							
9-Aug	2.3	2.2	2.3	2.3	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	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3																							
10-Aug	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	2.3	2.2	2.3																							
11-Aug	2.3	Z	2.3	2.3	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	2.2	2.2	2.3	2.3	2.3	2.2	2.3	2.4																							
12-Aug	2.2	2.2	Z	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.2	2.4																							
13-Aug	2.4	2.4	2.3	Z	2.4	2.4	2.4	2.4	2.3	2.2	2.2	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	2.4																							
14-Aug	2.3	2.3	2.2	Z	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.3	2.4	2.3	2.4																							
15-Aug	2.4	2.4	2.4	2.3	2.4	Z	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.3	2.6																						
16-Aug	Z	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	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.4																						
17-Aug	2.3	Z	2.3	2.2	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	2.1	2.2	2.3	2.4	2.3	2.5	2.7	2.3	2.7																							
18-Aug	2.5	2.4	Z	2.5	2.5	2.5	2.4	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	2.4	2.5	2.3	2.3	2.4	2.5																							
19-Aug	2.4	2.3	2.3	Z	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	2.3	2.3	2.3	2.3	2.3	2.3	2.4																							
20-Aug	2.3	2.3	2.4	2.4	Z	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.6	2.4	2.3	2.6																							
21-Aug	2.5	2.4	2.6	2.6	2.6	Z	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.6																							
22-Aug	Z	2.5	2.5	2.5	2.6	2.8	3.0	3.3	2.6	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.4	2.4	3.3																							
23-Aug	2.4	Z	2.8	3.1	2.9	2.7	2.6	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.5	2.6	2.8	2.9	2.7	2.8	2.9	2.9	2.9	2.9	2.9	3.1																							
24-Aug	2.8	2.6	Z	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	2.3	2.4	2.4	2.4	2.4	2.4	2.8																							
25-Aug	2.5	2.6	2.7	Z	2.9	2.9	2.9	2.6	2.5	2.5	2.6	2.5	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	2.9																							
26-Aug	2.4	2.4	2.4	2.4	Z	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.5	2.6	2.7	2.7	2.7	2.4	2.7																							
27-Aug	2.8	2.8	2.8	2.9	2.9	Z	2.9	2.8	2.7	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.9																							
28-Aug	Z	2.5	2.6	2.7	2.7	2.7	2.8	2.6	2.4	2.5	2.4	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	2.8																							
29-Aug	2.4	Z	2.5	2.5	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	2.6																							
30-Aug	2.8	2.9	Z	2.9	3.0	2.8	2.5	2.6	2.7	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.5	3.0																							
31-Aug	2.5	2.6	2.8	Z	2.7	2.7	2.8	2.9	2.8	2.7	2.7	2.7	2.7	2.7	2.9	2.9	3.1	3.1	2.9	2.8	2.6	2.6	2.6	2.5	2.8	3.1																							
																								2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	Diurnal Average		
																								2.8	2.9	2.8	3.1	3.0	2.9	3.0	3.3	2.8	2.7	2.7	2.7	2.7	2.7	2.9	2.9	3.1	3.1	2.9	2.8	2.8	2.9	2.9	2.9	Diurnal Maximum	
Z - zerospan C - Calibration																																																	



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Mackay River - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	705	99.44	99.44
3.1 - 10.0	4	0.56	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 - August 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	27	48	20	13	18	60	64	46	93	54	54	75	65	28	20	18	703
3.1 - 10.0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	1	4
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	27	48	20	13	18	60	64	47	93	54	54	75	67	28	20	19	707

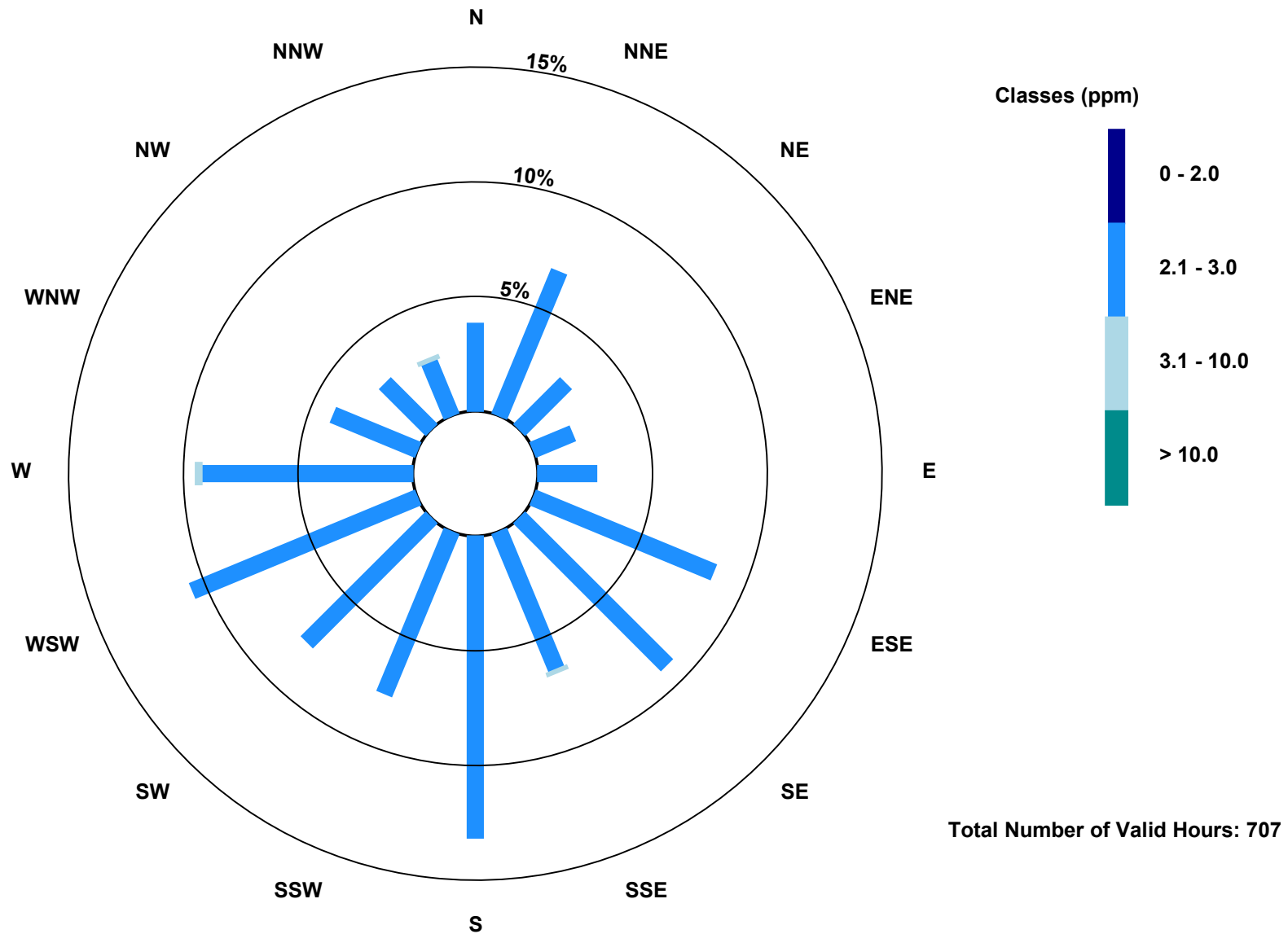
Total Number of Valid Hours: 707

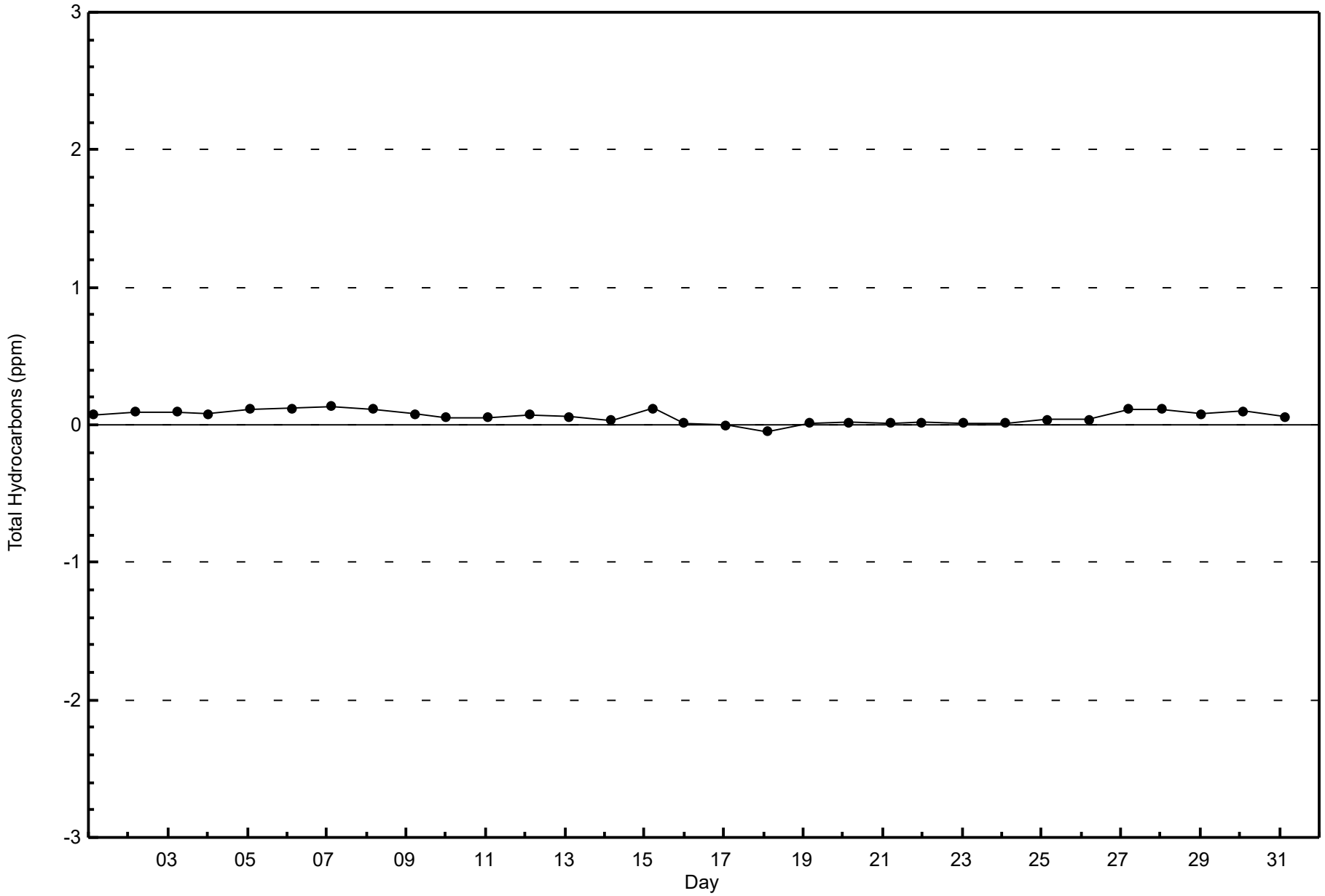
Total Number of Hours: 744

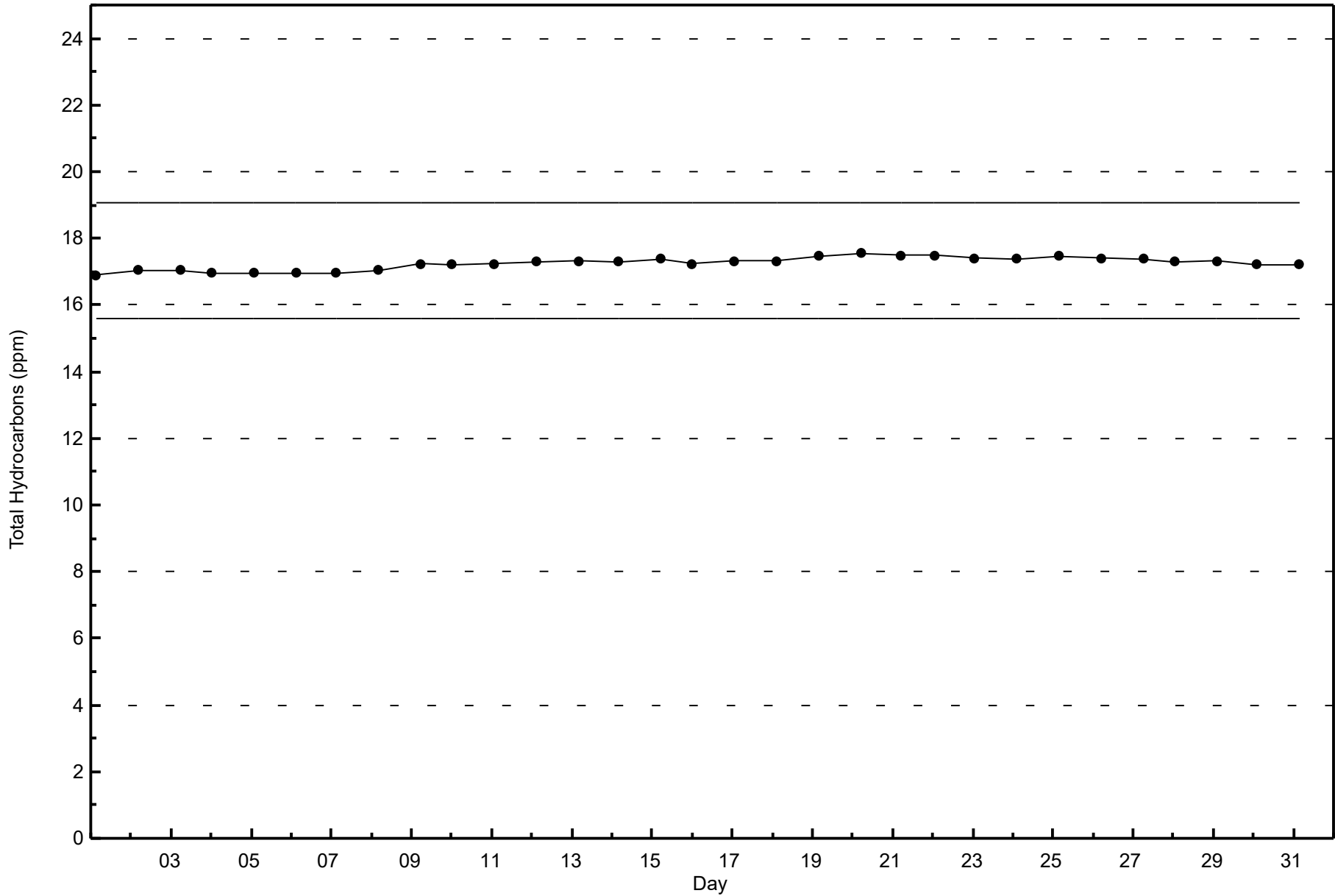


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Mackay River



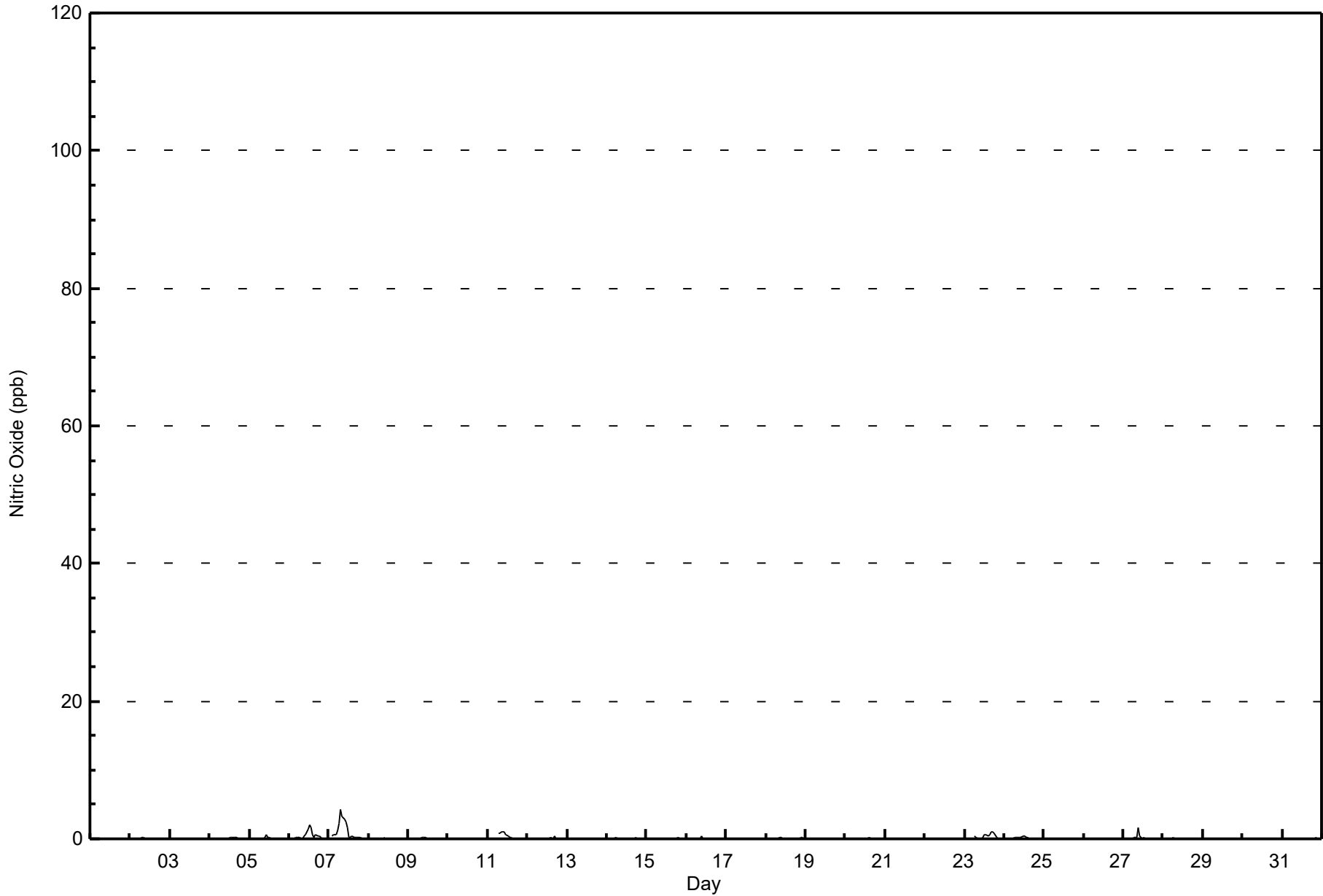






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Mackay River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Mackay River - August 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	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705
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	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705

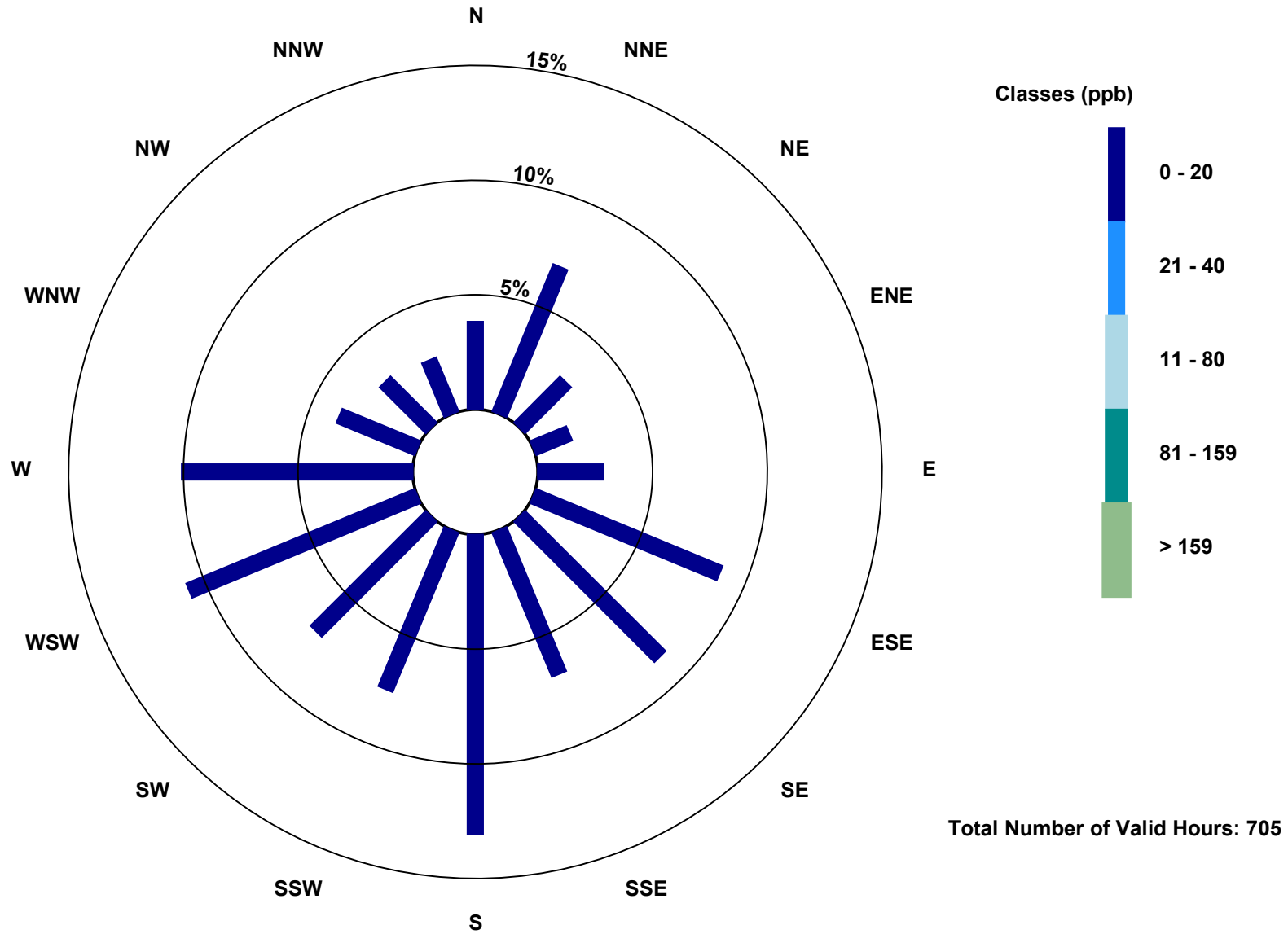
Total Number of Valid Hours: 705

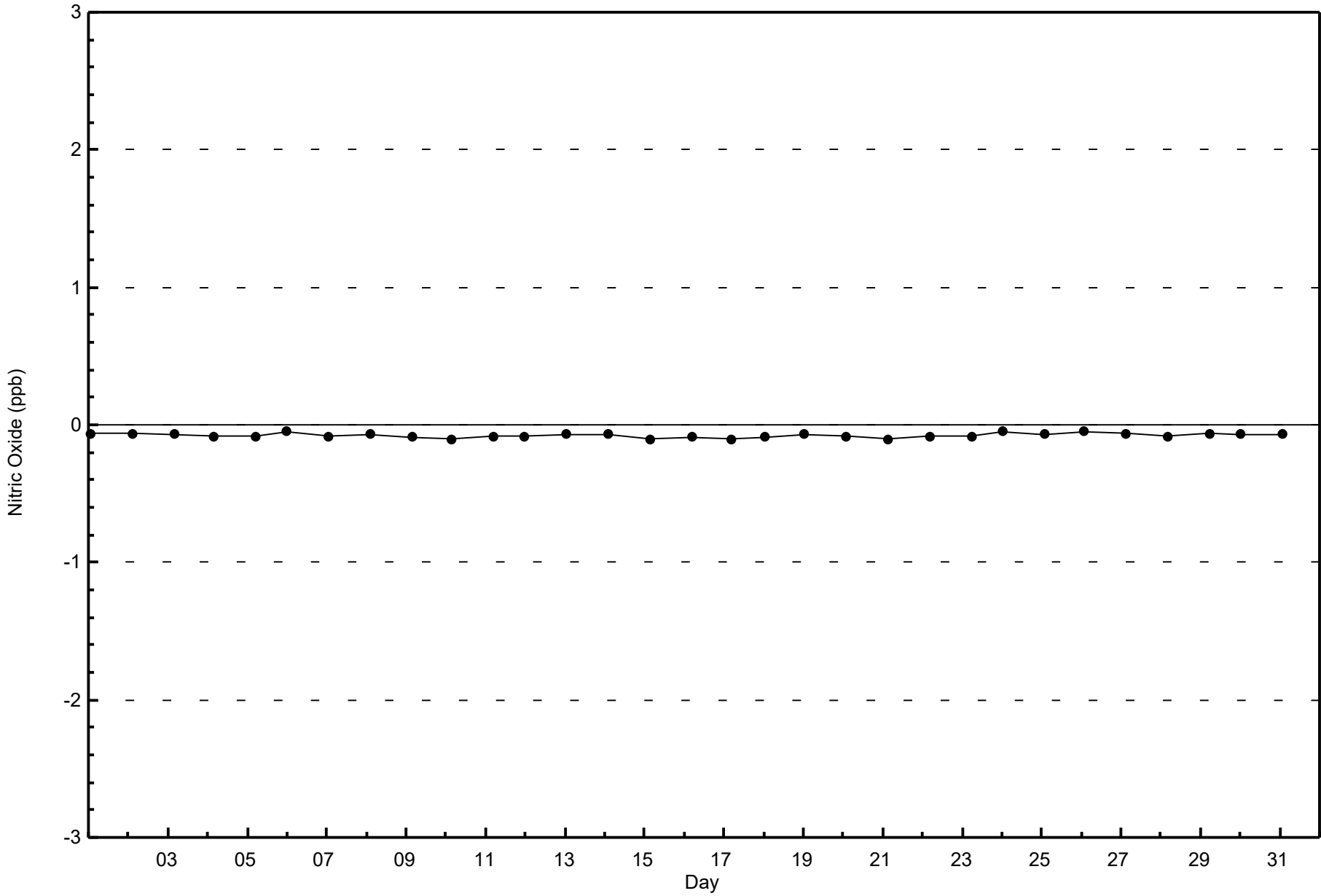
Total Number of Hours: 744

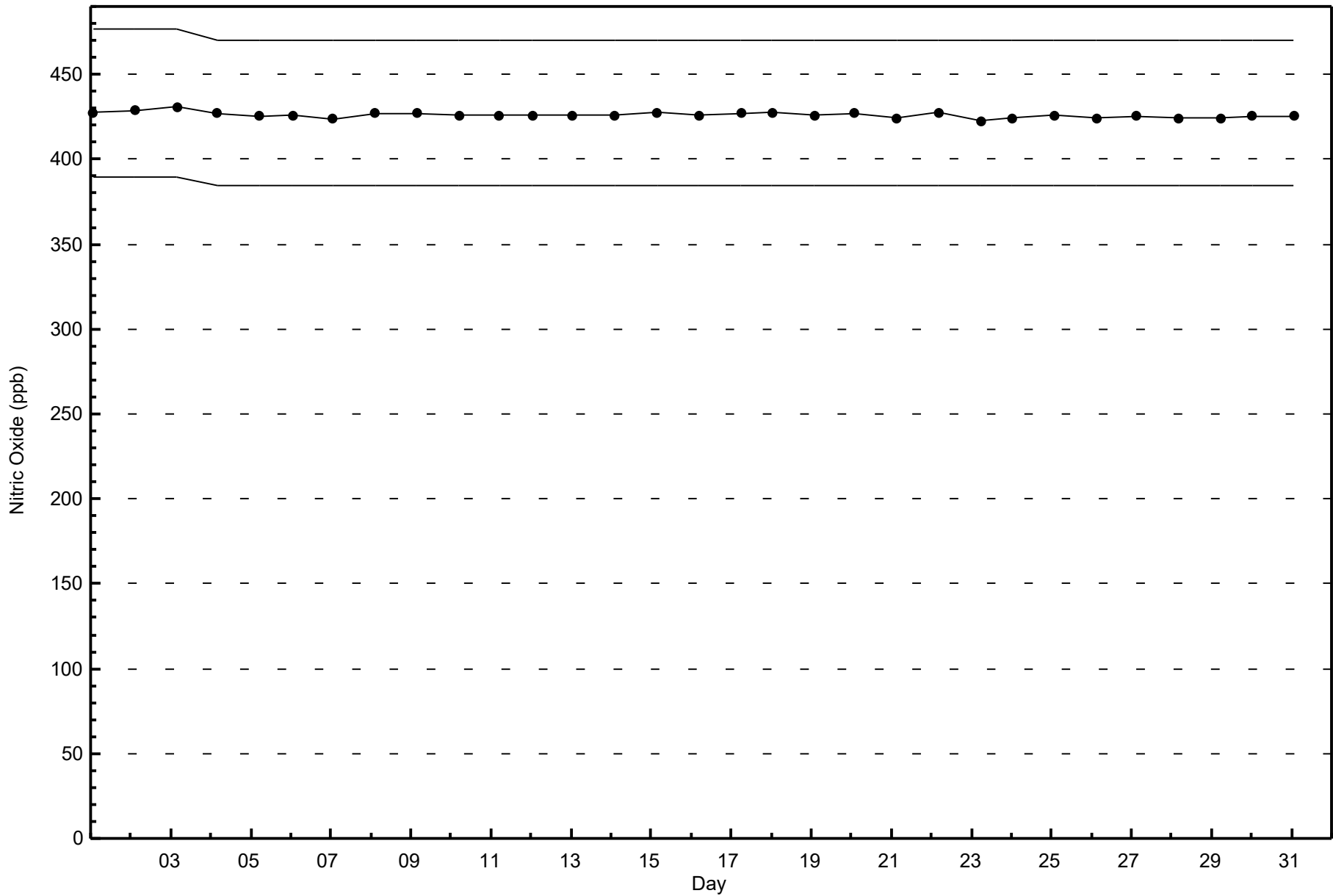


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Mackay River









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

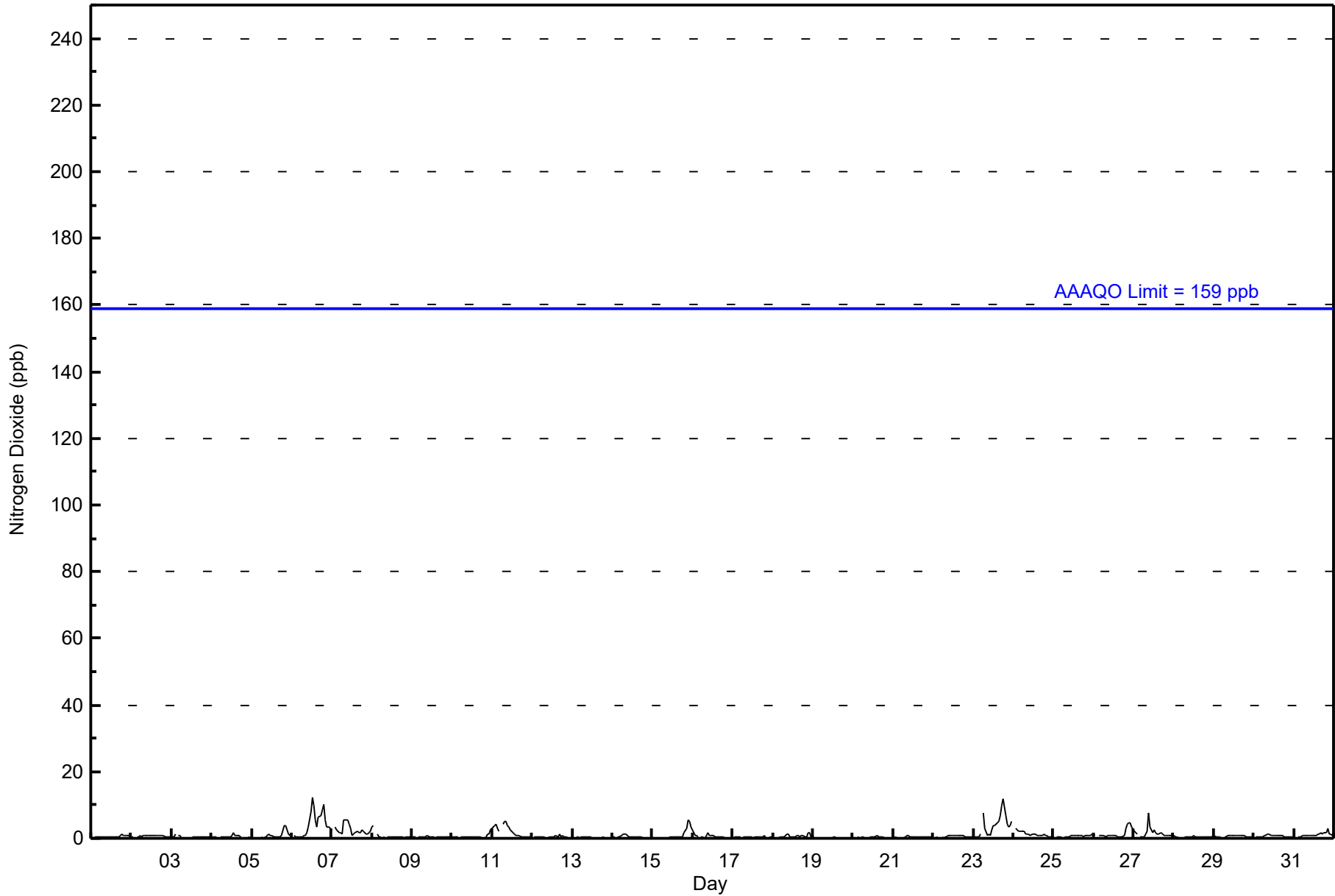
Mackay River - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 12.2 ppb on Aug 6 13:00		Maximum Daily Average: 4.1 ppb on Aug 6																	Hours of Data:	707																													
Minimum Value: 0.1 ppb on Aug 5 03:00		Minimum Daily Average: 0.2 ppb on Aug 19																	Hours of Missing Data:	37																													
Maximum Diurnal Average: 1.3 ppb at hour 20		Minimum Diurnal Average: 0.5 ppb at hour 6																	Hours of Calibration:	36																													
Monthly Average: 0.98 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.5 Q ₃ = 0.9 P ₉₀ = 2.3 P ₉₉ = 7.8																	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-Aug	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.8	1.1	1.0	0.9	0.8	0.7	0.6	0.6	1.1																								
2-Aug	0.6	0.5	Z	0.3	0.5	0.8	0.4	0.8	1.0	0.7	0.8	0.9	0.9	0.9	1.0	0.9	1.0	0.9	0.8	0.6	0.5	0.4	0.4	0.7	1.0																								
3-Aug	0.3	0.5	1.1	Z	1.0	0.7	0.6	C	C	C	C	C	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.1																								
4-Aug	0.3	0.4	0.4	0.3	Z	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.7	1.5	0.7	0.9	0.7	0.3	0.2	0.2	0.2	0.3	0.2	0.4	1.5																								
5-Aug	0.2	0.2	0.1	0.2	0.1	Z	0.3	0.2	0.3	0.8	1.3	0.8	0.9	0.5	0.4	0.4	0.6	1.0	3.7	4.0	2.4	1.2	0.7	0.9	4.0																								
6-Aug	Z	0.8	0.6	0.6	0.5	0.4	0.3	0.9	0.9	1.9	3.3	7.9	12.2	9.6	5.6	3.3	6.3	6.6	8.4	10.0	5.3	3.2	3.2	2.4	4.1	12.2																							
7-Aug	2.5	Z	3.6	2.5	1.8	1.5	1.1	5.6	5.4	5.3	4.2	2.8	1.0	1.1	1.9	2.0	1.9	1.7	2.4	2.0	1.4	1.2	1.9	2.0	2.5	5.6																							
8-Aug	3.2	3.7	Z	1.2	0.5	0.3	0.2	0.4	M	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.6	0.6	0.7	3.7																							
9-Aug	0.6	0.5	0.5	Z	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.5	0.5	0.4	0.2	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.5	0.7	0.7																						
10-Aug	0.4	0.4	0.3	0.5	Z	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.5	1.1	1.3	2.4	0.5	2.4																							
11-Aug	3.0	4.0	4.4	3.0	2.0	Z	4.2	5.1	4.9	4.0	3.4	2.6	1.8	1.2	1.0	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	2.1	5.1																							
12-Aug	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.4	1.0	0.4	1.1	0.5	0.7	0.4	0.3	0.2	0.2	0.2	0.4	1.1																							
13-Aug	0.3	Z	0.4	0.3	0.2	0.3	0.3	0.3	0.3	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	0.2	0.2	0.3	0.4																							
14-Aug	0.4	0.3	Z	0.3	0.3	0.8	1.4	1.4	1.4	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.4																							
15-Aug	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	1.7	3.0	5.7	5.1	3.5	1.0	5.7																							
16-Aug	2.6	0.7	0.9	0.4	Z	0.5	0.3	0.2	0.7	1.7	1.0	0.9	0.7	0.5	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.6	2.6																							
17-Aug	0.2	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.2	0.2	0.5	0.3	0.3	0.7																							
18-Aug	Z	0.2	0.2	0.2	0.3	0.4	0.5	0.5	1.2	1.4	0.6	0.4	0.4	0.5	0.7	0.8	0.6	1.0	0.7	0.5	0.6	1.7	1.7	0.3	0.7	1.7																							
19-Aug	0.3	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3																							
20-Aug	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.4	0.7	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.3	0.7																							
21-Aug	0.2	0.3	0.2	Z	0.2	0.1	0.1	0.5	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.7																							
22-Aug	0.2	0.2	0.3	0.2	Z	0.3	0.2	0.4	0.5	0.8	1.0	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.6	0.5	0.4	0.4	0.4	0.6	1.0																							
23-Aug	0.4	0.4	0.4	0.4	1.1	Z	7.8	3.1	0.9	1.2	0.7	2.4	3.8	3.7	4.5	5.2	6.9	9.8	12.0	6.7	4.4	3.2	3.7	5.1	3.8	12.0																							
24-Aug	Z	3.0	2.4	2.0	2.2	2.3	2.0	1.2	1.3	1.3	0.9	1.4	1.3	1.4	0.9	0.7	0.7	0.8	1.1	0.9	0.7	0.5	0.4	0.4	1.3	3.0																							
25-Aug	0.4	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.6	0.7	0.9	1.0	1.0	1.1	0.6	1.1																							
26-Aug	1.1	1.0	Z	0.9	0.8	0.7	0.7	0.6	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.7	2.9	4.4	4.8	4.6	3.3	1.4	4.8																							
27-Aug	2.3	1.9	1.2	Z	0.6	0.3	0.3	1.2	2.1	7.5	3.4	1.9	2.4	1.5	1.1	1.2	1.5	1.1	1.0	0.9	0.8	0.9	1.0	1.0	1.6	7.5																							
28-Aug	0.8	0.5	0.4	0.2	Z	0.2	0.2	0.3	0.6	0.5	0.5	0.5	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.8																							
29-Aug	0.7	0.5	0.5	0.4	0.6	Z	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	1.0	0.8	0.8	0.7	0.5	0.6	0.5	0.6	0.7	1.0																							
30-Aug	Z	0.5	0.3	0.3	0.3	0.3	0.7	0.9	1.1	1.2	1.0	1.0	0.9	0.8	0.7	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.7	1.2																							
31-Aug	0.6	Z	0.6	0.5	0.5	0.8	1.0	1.0	0.8	0.7	0.7	0.8	0.8	0.9	1.2	1.3	1.5	1.4	1.5	1.8	2.8	1.3	1.1	1.0	1.1	2.8																							
																								0.9	0.9	0.8	0.6	0.6	0.5	0.9	1.0	1.0	1.2	1.0	1.1	1.2	1.0	0.9	0.9	1.0	1.1	1.3	1.3	1.2	1.1	1.1	1.0	Diurnal Average	
																								3.2	4.0	4.4	3.0	2.2	2.3	7.8	5.6	5.4	7.5	4.2	7.9	12.2	9.6	5.6	5.2	6.9	9.8	12.0	10.0	5.3	5.7	5.1	5.1	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
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Mackay River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



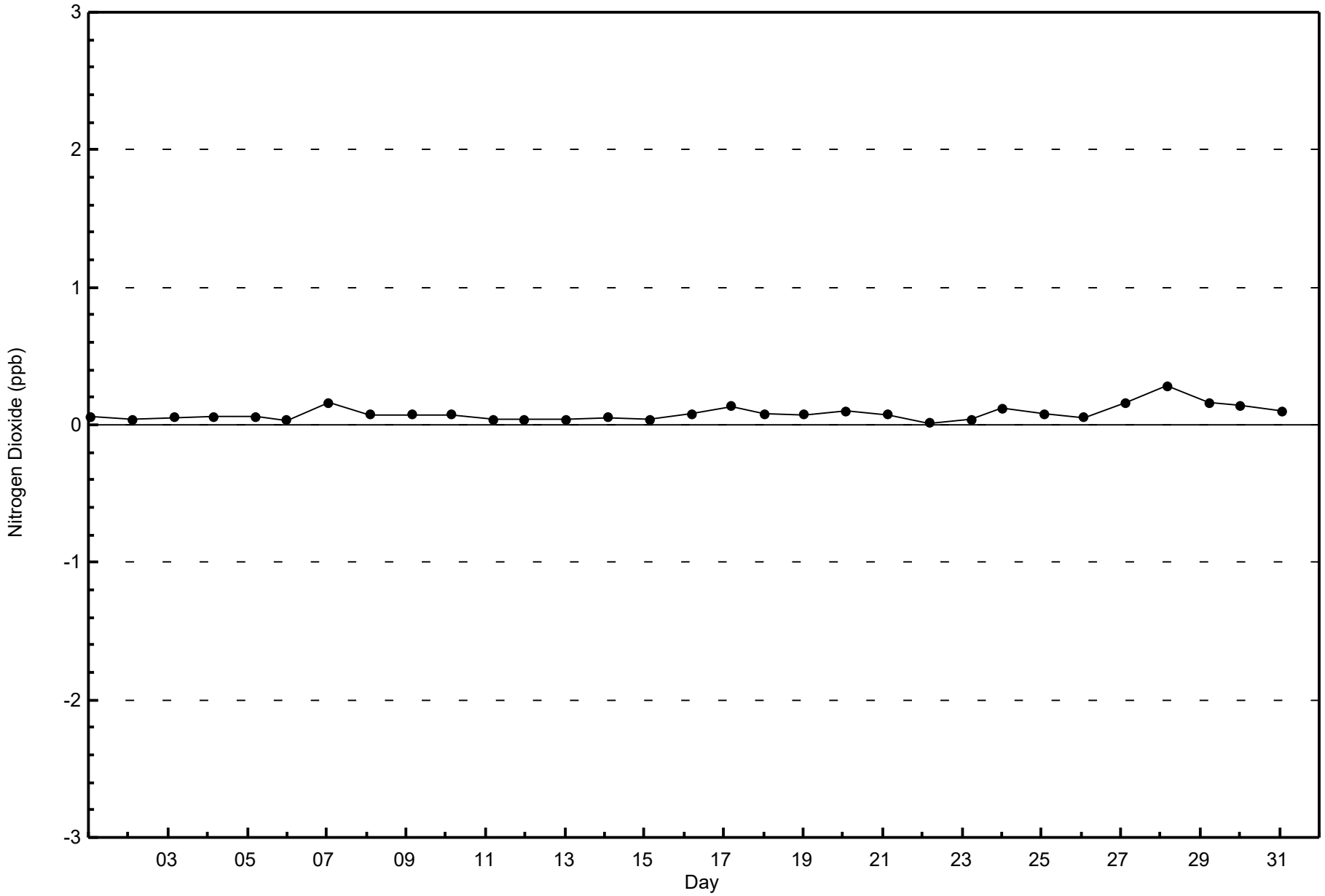
**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Mackay River - August 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	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705
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	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705

Total Number of Valid Hours: 705

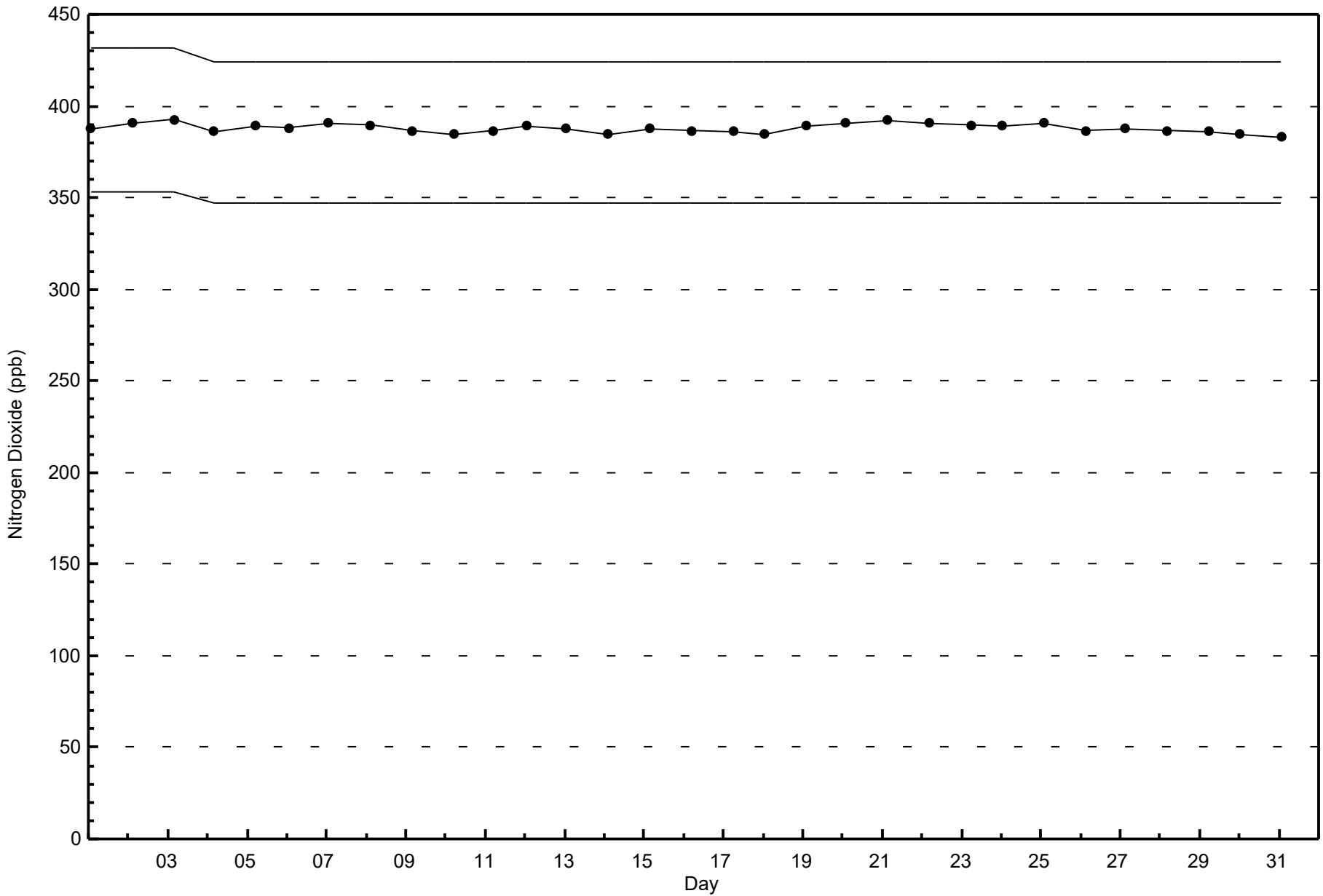
Total Number of Hours: 744





Wood Buffalo Environmental Association
Span Responses

Nitrogen Dioxide (NO₂) - ppb
Mackay River - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

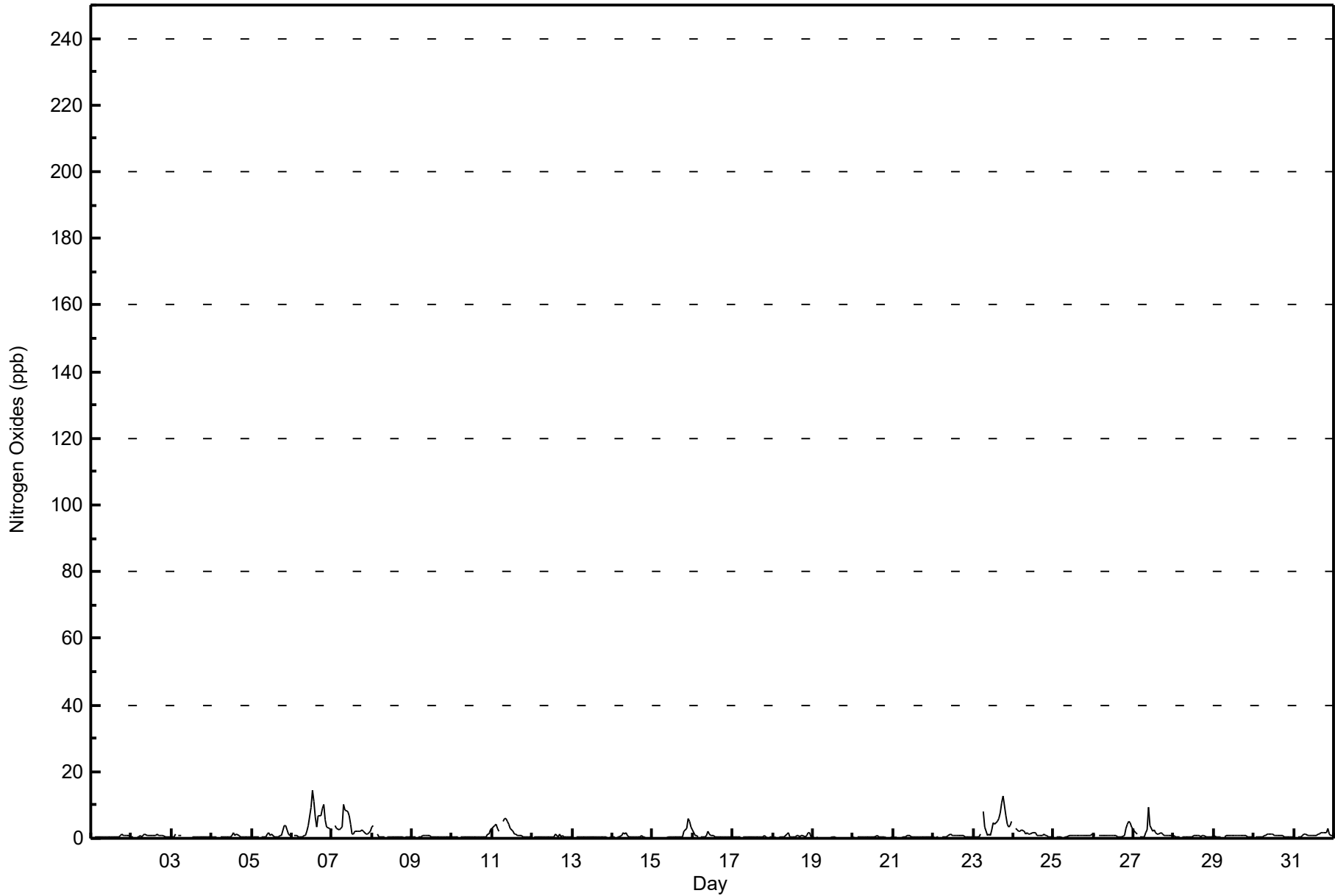
Nitrogen Oxides (NO_x) - ppb
Mackay River - August 2023

Maximum Value: 14.3 ppb on Aug 6 13:00		Maximum Daily Average: 4.5 ppb on Aug 6		Hours in Service: 744																							
Minimum Value: 0.1 ppb on Aug 19 07:00		Minimum Daily Average: 0.2 ppb on Aug 19		Hours of Data: 707																							
Maximum Diurnal Average: 1.5 ppb at hour 10		Minimum Diurnal Average: 0.6 ppb at hour 6		Hours of Missing Data: 37																							
Monthly Average: 1.08 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.2 Q ₁ = 0.3 Median = 0.5 Q ₃ = 1.0 P ₉₀ = 2.4 P ₉₉ = 9.1		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-Aug	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.8	1.1	1.0	0.9	0.8	0.7	0.6	0.6	1.1	
2-Aug	0.6	0.5	Z	0.4	0.5	0.9	0.5	1.0	1.3	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.0	1.0	0.9	0.8	0.6	0.5	0.4	0.4	0.8	1.3	
3-Aug	0.4	0.6	1.1	Z	1.1	0.8	0.7	C	C	C	C	C	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.1	
4-Aug	0.3	0.4	0.4	0.3	Z	0.5	0.4	0.4	0.5	0.5	0.6	0.4	0.8	1.7	0.8	1.1	0.8	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	1.7	
5-Aug	0.3	0.2	0.2	0.3	0.2	Z	0.3	0.3	0.3	1.1	1.8	1.0	1.2	0.5	0.4	0.4	0.4	0.7	1.0	3.8	4.0	2.4	1.2	0.7	1.0	4.0	
6-Aug	Z	0.8	0.7	0.7	0.6	0.5	0.5	1.0	1.0	2.3	3.9	9.3	14.3	11.1	6.2	3.5	6.8	7.0	8.8	10.3	5.4	3.2	3.2	2.5	4.5	14.3	
7-Aug	2.6	Z	4.0	3.0	2.4	2.8	3.4	10.0	8.6	8.2	6.7	4.4	1.2	1.2	2.2	2.3	2.1	1.9	2.6	2.1	1.4	1.2	1.9	2.0	3.4	10.0	
8-Aug	3.2	3.8	Z	1.3	0.5	0.4	0.3	0.5	M	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.6	0.6	0.7	3.8
9-Aug	0.6	0.5	0.5	Z	0.5	0.5	0.7	0.7	0.7	0.8	0.7	0.6	0.6	0.5	0.3	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.8	0.8
10-Aug	0.4	0.4	0.4	0.5	Z	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.5	1.1	1.3	2.4	0.6	2.4
11-Aug	3.0	4.0	4.4	3.0	2.0	Z	4.9	6.0	6.0	5.0	4.3	3.1	2.1	1.4	1.1	0.8	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.4	2.4	6.0	
12-Aug	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	0.5	1.1	0.4	1.4	0.6	0.8	0.4	0.3	0.3	0.3	0.3	0.4	1.4	
13-Aug	0.3	Z	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.4	
14-Aug	0.5	0.3	Z	0.3	0.3	1.0	1.5	1.5	1.5	0.8	0.5	0.3	0.3	0.3	0.3	0.4	0.7	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.5	
15-Aug	0.2	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	1.9	3.1	5.8	5.2	3.6	1.1	5.8	
16-Aug	2.7	0.7	0.9	0.4	Z	0.6	0.3	0.3	0.8	2.0	1.1	1.0	0.8	0.6	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.7	2.7	
17-Aug	0.2	0.3	0.3	0.3	0.3	Z	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.7	0.2	0.2	0.5	0.3	0.4	0.7	
18-Aug	Z	0.2	0.2	0.2	0.3	0.4	0.5	0.5	1.3	1.6	0.6	0.4	0.4	0.5	0.7	0.8	0.6	1.0	0.7	0.5	0.6	1.8	1.8	0.3	0.7	1.8	
19-Aug	0.3	Z	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	
20-Aug	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.8	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.8	
21-Aug	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.6	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.8	
22-Aug	0.2	0.2	0.3	0.2	Z	0.3	0.2	0.4	0.5	0.8	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.6	0.5	0.4	0.4	0.4	0.6	1.1	
23-Aug	0.4	0.4	0.4	0.5	1.1	Z	8.2	3.3	1.0	1.3	0.8	2.7	4.5	4.3	4.9	5.9	7.8	10.8	12.7	6.8	4.4	3.2	3.7	5.1	4.1	12.7	
24-Aug	Z	3.0	2.4	2.0	2.2	2.4	2.1	1.4	1.5	1.4	1.1	1.8	1.6	1.6	1.0	0.8	0.8	0.9	1.1	0.9	0.7	0.5	0.4	0.4	1.4	3.0	
25-Aug	0.4	Z	0.4	0.3	0.3	0.2	0.2	0.3	0.6	0.7	0.8	0.9	0.9	0.8	0.8	0.7	0.8	0.7	0.6	0.7	0.9	1.0	1.0	1.1	0.7	1.1	
26-Aug	1.1	1.0	Z	0.9	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.5	0.7	2.9	4.4	4.9	4.6	3.3	1.4	4.9	
27-Aug	2.3	1.9	1.2	Z	0.6	0.4	0.4	1.5	2.4	9.2	3.8	2.0	2.5	1.6	1.2	1.3	1.6	1.2	1.0	0.9	0.8	0.9	1.0	1.0	1.8	9.2	
28-Aug	0.8	0.5	0.4	0.3	Z	0.3	0.3	0.4	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.5	0.6	0.8
29-Aug	0.7	0.5	0.5	0.5	0.6	Z	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	0.9	0.8	0.8	0.6	0.6	0.5	0.5	0.6	0.7	1.0
30-Aug	Z	0.5	0.4	0.4	0.4	0.4	0.7	1.0	1.2	1.3	1.1	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.7	1.3	
31-Aug	0.6	Z	0.6	0.5	0.5	0.8	1.1	1.1	0.9	0.8	0.8	0.9	0.9	1.0	1.3	1.4	1.6	1.5	1.6	1.9	3.0	1.4	1.1	1.0	1.1	3.0	
																								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
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Mackay River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



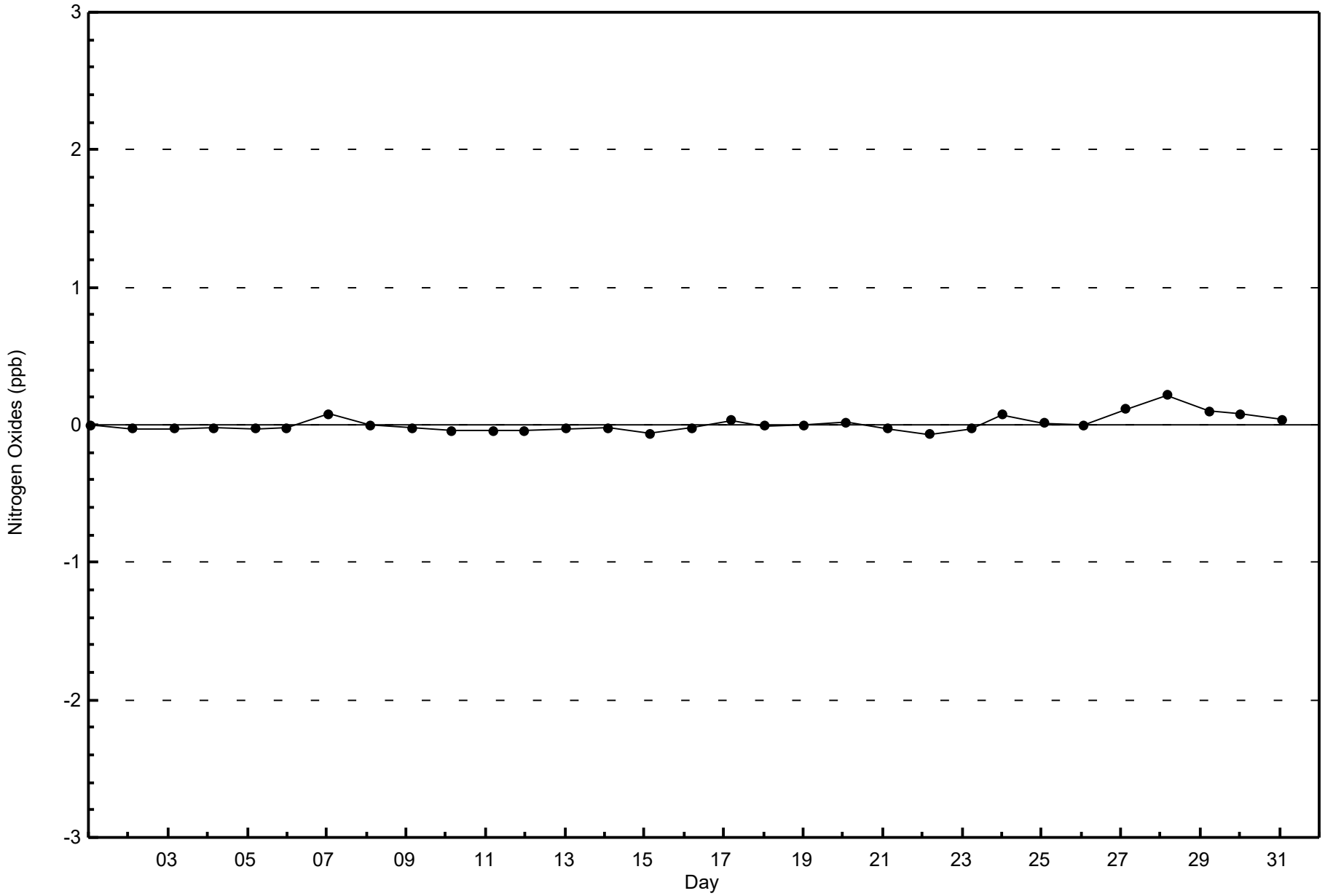
**Wood Buffalo Environmental Association
Frequency Distribution**

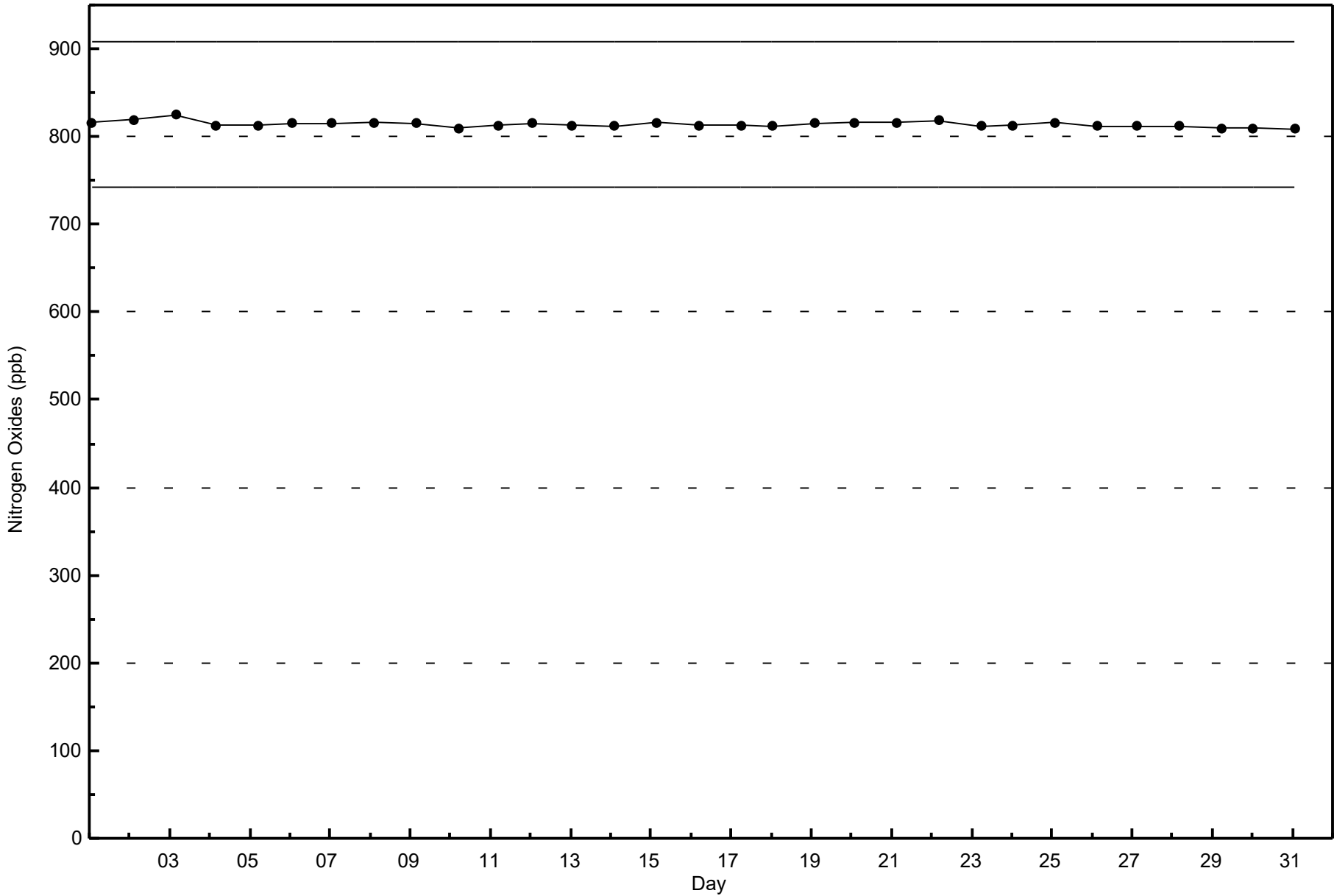
**Nitrogen Oxides (NO_x) - ppb
Mackay River - August 2023**

Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 20	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705
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	27	49	20	12	20	62	61	48	92	53	50	76	71	26	20	18	705

Total Number of Valid Hours: 705

Total Number of Hours: 744







Wood Buffalo Environmental Association
Summary of Hour Averages

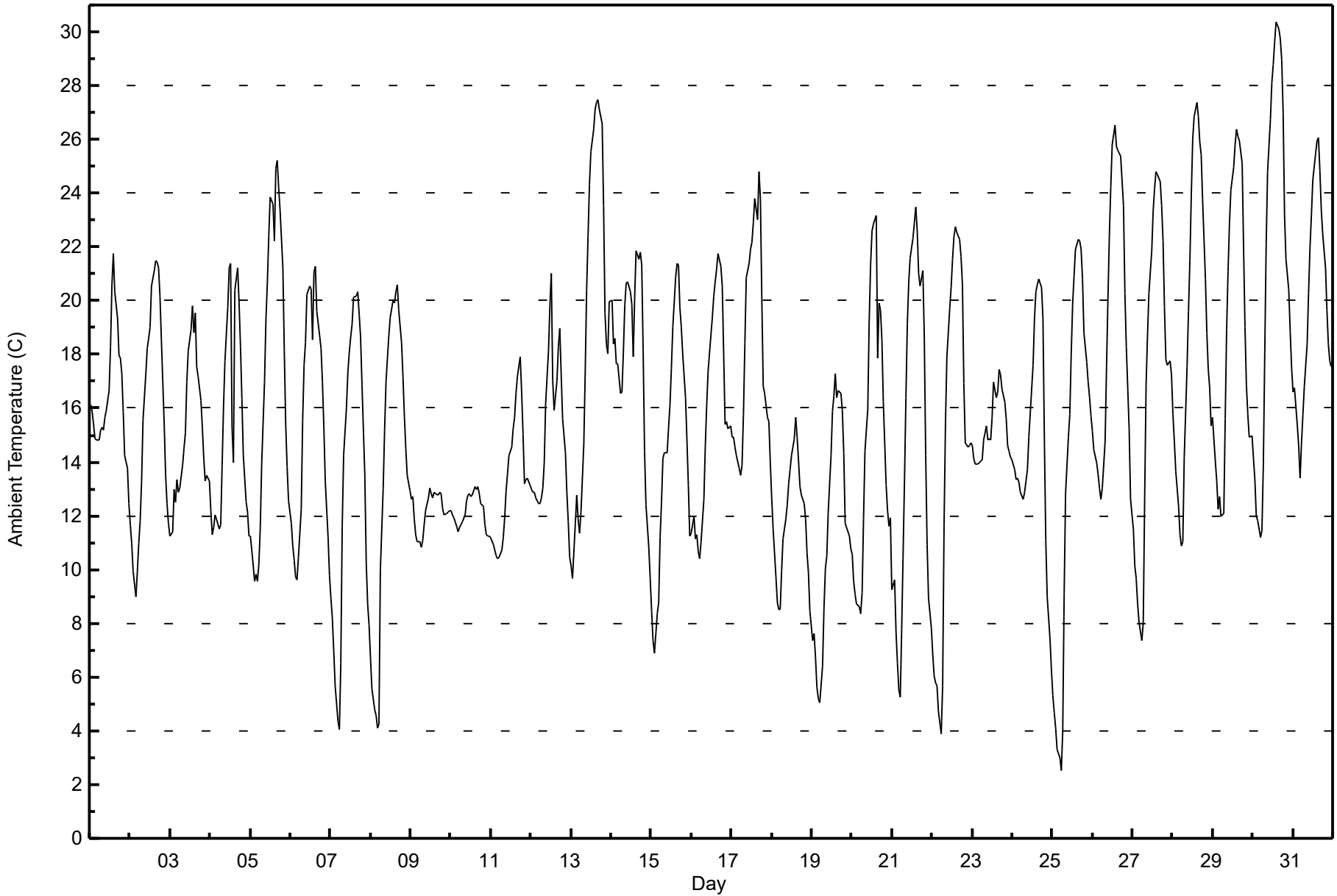
Ambient Temperature (AT) - C
Mackay River - August 2023

Maximum Value: 30.3 C on Aug 30 15:00		Maximum Daily Average: 21.4 C on Aug 30		Hours in Service:	744																																											
Minimum Value: 2.5 C on Aug 25 06:00		Minimum Daily Average: 11.4 C on Aug 19		Hours of Data:	744																																											
Maximum Diurnal Average: 21.2 C at hour 16		Minimum Diurnal Average: 10.2 C at hour 6		Hours of Missing Data:	0																																											
Monthly Average: 15.74 C		Percentiles: P ₁ = 4.2 P ₁₀ = 9.7 Q ₁ = 12.1 Median = 15.2 Q ₃ = 19.6 P ₉₀ = 22.6 P ₉₉ = 27.5		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-Aug	16.1	15.8	15.4	14.9	14.8	14.8	15.2	15.3	15.2	15.6	15.9	16.7	18.3	20.6	21.8	20.3	19.3	17.9	17.9	17.3	15.9	14.2	13.8	12.4	16.5	21.8																						
2-Aug	11.6	11.0	9.9	9.0	9.9	11.0	11.8	13.3	15.6	17.3	18.2	18.6	19.0	20.5	21.1	21.5	21.4	21.2	20.2	18.5	15.4	13.5	12.5	11.7	15.6	21.5																						
3-Aug	11.2	11.4	13.0	12.5	13.4	12.9	13.0	13.9	14.5	15.1	17.0	18.1	18.9	19.8	18.8	19.5	17.5	17.2	16.3	15.3	14.2	13.3	13.5	13.3	15.1	19.8																						
4-Aug	12.2	11.3	11.6	12.0	11.9	11.5	11.7	13.8	16.1	17.8	19.8	21.2	21.4	15.3	14.0	20.4	21.2	19.9	18.3	16.3	14.2	12.5	12.1	11.2	15.3	21.4																						
5-Aug	11.2	10.7	9.5	9.8	9.5	10.2	11.6	13.9	17.0	19.3	20.7	22.4	23.9	23.6	22.2	24.9	25.2	24.2	23.4	21.2	18.2	15.4	13.8	12.6	17.3	25.2																						
6-Aug	11.7	10.9	10.3	9.7	9.6	10.5	12.3	15.5	17.6	18.5	20.2	20.5	20.4	18.6	21.1	21.3	19.6	18.7	18.2	16.9	15.3	13.3	11.2	9.7	15.5	21.3																						
7-Aug	8.9	8.2	7.0	5.7	4.3	4.0	6.5	11.6	14.2	16.0	17.3	18.1	18.7	19.1	20.1	20.2	20.3	19.5	18.7	16.9	13.5	10.3	8.7	7.9	13.2	20.3																						
8-Aug	6.7	5.6	4.8	4.6	4.1	4.3	10.0	13.1	15.2	17.0	17.9	18.7	19.4	20.0	19.9	20.3	20.6	19.7	18.4	17.2	15.7	14.5	13.5	12.9	13.9	20.6																						
9-Aug	12.6	12.7	11.9	11.3	11.0	11.1	10.8	11.1	11.6	12.2	12.7	13.0	12.8	12.7	12.9	12.8	12.8	12.9	12.8	12.3	12.0	12.1	12.1	12.2	12.2	13.0																						
10-Aug	12.2	12.1	11.9	11.6	11.4	11.5	11.7	11.8	12.0	12.6	12.8	12.8	12.7	12.8	13.1	13.0	13.1	12.8	12.5	12.3	11.7	11.3	11.3	11.2	12.2	13.1																						
11-Aug	11.2	11.0	10.7	10.5	10.4	10.5	10.7	11.2	11.9	12.9	13.6	14.3	14.5	15.3	15.7	16.6	17.2	17.9	16.6	15.0	13.2	13.4	13.4	13.1	13.4	17.9																						
12-Aug	13.0	12.9	12.9	12.7	12.4	12.5	12.7	13.0	14.0	16.2	18.1	19.8	21.0	17.0	15.9	17.0	18.3	19.0	17.2	15.6	14.3	12.9	11.8	10.4	15.0	21.0																						
13-Aug	10.2	9.7	11.7	12.8	11.9	11.3	12.1	14.6	17.4	20.4	22.4	24.3	25.5	26.4	27.1	27.4	27.5	27.1	26.6	23.5	19.5	18.4	18.0	20.0	19.4	27.5																						
14-Aug	20.0	18.4	18.6	17.7	17.7	16.6	16.6	18.1	19.8	20.7	20.7	20.4	19.9	17.9	20.1	21.9	21.5	21.8	21.3	18.2	14.4	12.4	10.8	9.6	18.1	21.9																						
15-Aug	8.5	7.4	6.9	8.4	8.8	11.2	12.5	14.2	14.3	14.3	15.3	16.1	17.5	19.0	20.9	21.4	21.3	19.8	19.0	18.0	16.4	14.8	13.2	11.3	14.6	21.4																						
16-Aug	11.4	12.0	11.1	11.3	10.7	10.4	11.0	12.6	14.6	16.1	17.4	18.1	19.4	20.2	20.7	21.2	21.8	21.3	20.6	18.0	15.4	15.5	15.2	15.4	15.9	21.8																						
17-Aug	14.9	14.9	14.5	14.2	13.8	13.5	13.9	15.7	18.4	20.9	21.4	21.9	22.2	22.9	23.8	23.0	24.8	23.8	20.1	16.8	16.5	15.6	15.5	14.0	18.2	24.8																						
18-Aug	12.7	11.5	9.7	8.8	8.5	8.5	9.9	11.2	11.9	12.4	13.2	13.7	14.3	14.9	15.7	14.9	14.0	13.1	12.8	12.5	11.9	10.6	9.9	8.5	11.9	15.7																						
19-Aug	7.4	7.6	6.7	5.6	5.2	5.0	6.4	8.6	10.0	10.5	12.2	14.3	15.9	16.4	17.3	16.4	16.6	16.6	15.9	14.3	11.7	11.6	11.3	10.8	11.4	17.3																						
20-Aug	10.6	9.6	9.1	8.7	8.6	8.4	9.2	11.9	14.4	16.0	19.2	21.3	22.6	22.9	23.2	17.9	19.9	19.7	18.5	16.3	13.1	12.2	11.6	11.9	14.9	23.2																						
21-Aug	9.2	9.6	7.7	6.5	5.5	5.3	7.8	13.3	16.4	19.1	20.7	21.6	22.3	22.9	23.5	22.6	21.0	20.6	21.1	18.7	14.2	10.9	8.9	7.8	14.9	23.5																						
22-Aug	6.8	6.0	5.8	5.7	4.7	3.9	5.7	11.6	15.5	17.9	19.7	20.5	21.5	22.4	22.8	22.5	22.3	21.6	20.6	16.9	14.7	14.5	14.6	14.7	14.7	22.8																						
23-Aug	14.6	14.1	13.9	13.9	14.0	14.1	14.8	15.3	14.8	14.9	14.8	15.7	17.0	16.4	16.6	17.4	17.2	16.7	16.2	15.6	14.6	14.4	14.2	15.2	17.4	23.5																						
24-Aug	14.1	13.7	13.3	13.4	13.2	12.9	12.6	12.9	13.3	13.7	14.9	16.7	17.6	19.3	20.4	20.6	20.8	20.5	19.4	14.8	11.1	9.0	7.4	6.3	14.7	20.8																						
25-Aug	5.3	4.7	4.1	3.3	3.0	2.5	4.0	9.1	12.8	14.9	15.8	18.0	19.9	20.9	21.9	22.3	22.2	21.9	20.8	18.8	17.7	17.0	16.4	15.7	13.9	22.3																						
26-Aug	15.1	14.5	14.0	13.5	13.0	12.6	13.0	14.8	17.6	20.1	22.4	24.2	25.8	26.5	25.7	25.6	25.5	25.4	23.5	20.3	18.3	16.8	15.3	12.6	19.0	26.5																						
27-Aug	11.5	10.2	9.7	8.7	8.1	7.4	8.0	12.7	16.8	18.7	20.3	21.8	23.4	24.2	24.8	24.7	24.4	23.6	22.2	19.8	17.8	17.6	17.8	17.3	17.1	24.8																						
28-Aug	15.8	14.8	13.6	12.3	11.3	10.9	11.0	14.2	17.5	19.6	21.5	23.9	26.0	26.9	27.4	26.8	25.9	25.4	23.7	20.8	18.8	17.4	16.8	15.3	19.1	27.4																						
29-Aug	15.7	14.0	13.3	12.2	12.7	12.0	12.1	15.6	18.9	21.0	22.9	24.1	25.0	25.8	26.4	26.1	25.9	25.1	21.9	19.0	16.9	15.7	14.9	14.9	18.8	26.4																						
30-Aug	14.1	13.3	12.0	11.8	11.2	11.5	13.9	18.1	22.1	24.8	26.7	28.1	28.8	29.6	30.3	30.1	29.7	29.0	27.0	23.2	21.6	20.4	18.9	17.5	21.4	30.3																						
31-Aug	16.6	16.8	15.4	14.6	13.4	14.7	15.8	16.8	18.4	20.3	21.9	23.1	24.5	25.5	25.9	26.1	24.9	23.4	22.5	21.2	19.6	18.4	17.7	17.5	19.8	26.1																						
																								12.0	11.5	11.0	10.6	10.3	10.2	11.2	13.5	15.5	17.0	18.3	19.4	20.3	20.5	21.0	21.2	21.1	20.6	19.5	17.5	15.4	14.2	13.4	12.7	Diurnal Average
																								20.0	18.4	18.6	17.7	17.7	16.6	16.6	18.1	22.1	24.8	26.7	28.1	28.8	29.6	30.3	30.1	29.7	29.0	27.0	23.5	21.6	20.4	18.9	20.0	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Mackay River - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Mackay River - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	85	11.42	11.42
10 - 20	489	65.73	77.15
> 20	170	22.85	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

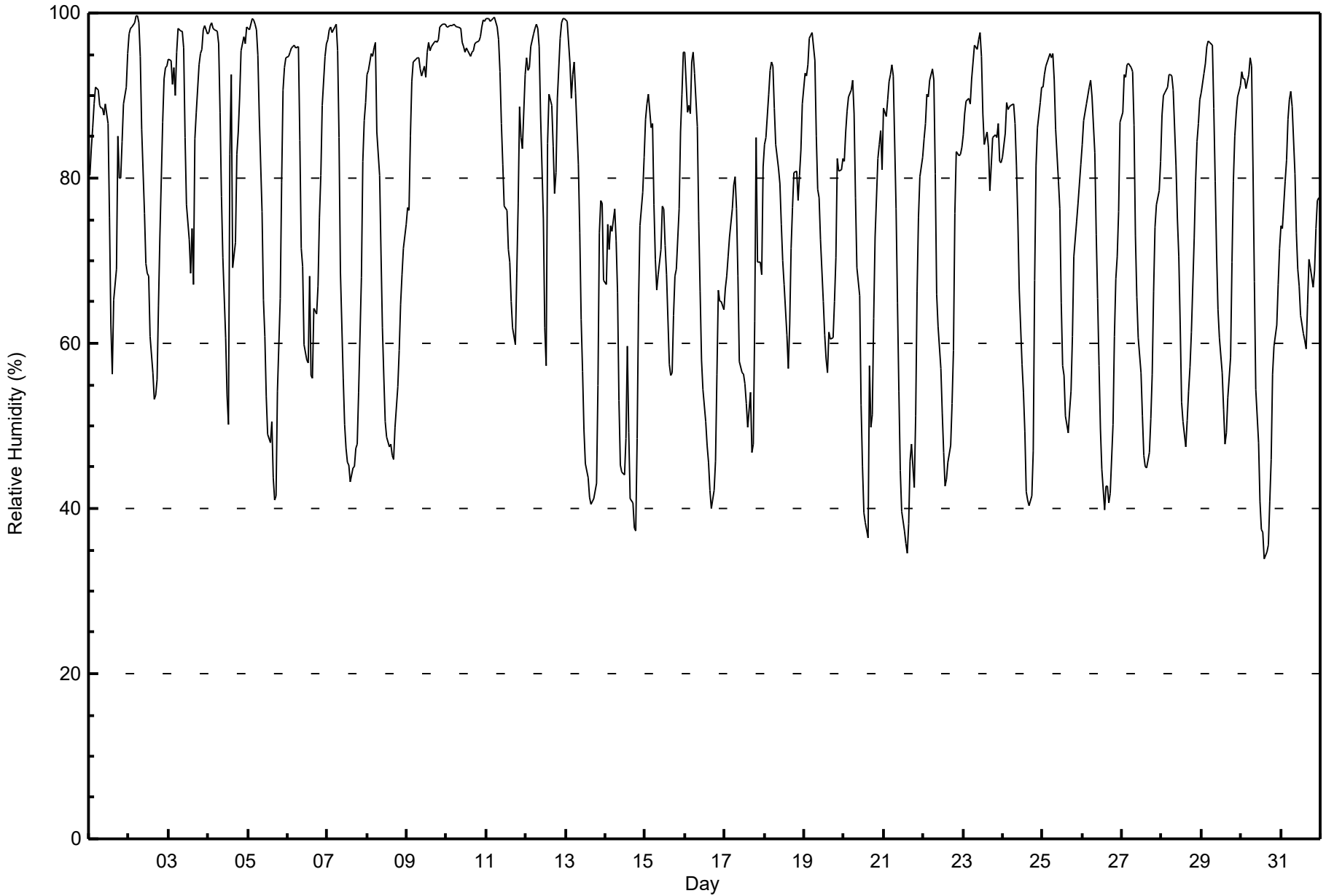
Relative Humidity (RH) - %
Mackay River - August 2023

Maximum Value: 99.6 % on Aug 2 06:00																						Maximum Daily Average: 97.2 % on Aug 10																						Hours in Service: 744			
Minimum Value: 33.9 % on Aug 30 15:00																						Minimum Daily Average: 59.3 % on Aug 14																						Hours of Data: 744			
Maximum Diurnal Average: 93.2 % at hour 6																						Minimum Diurnal Average: 56.3 % at hour 16																						Hours of Missing Data: 0			
Monthly Average: 75.91 %																						Percentiles: P ₁ = 37.2 P ₁₀ = 47.7 Q ₁ = 61.2 Median = 80.3 Q ₃ = 92.3 P ₉₀ = 96.7 P ₉₉ = 99.3																						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-Aug	80.3	83.5	86.1	89.0	91.0	90.7	88.7	88.5	88.4	87.6	88.9	86.6	75.3	62.3	56.3	65.2	68.9	85.1	80.0	80.0	84.3	89.1	91.0	95.1	82.6	95.1																					
2-Aug	97.5	98.2	98.3	98.8	99.6	99.6	98.7	94.8	85.9	75.8	69.6	68.5	68.2	60.8	56.4	53.2	53.7	55.6	64.5	72.9	86.9	92.0	93.4	93.6	80.7	99.6																					
3-Aug	94.3	94.3	91.4	93.4	90.1	95.2	98.2	97.8	97.7	95.7	84.9	76.8	72.5	68.5	73.9	67.0	84.8	88.1	93.7	95.1	95.7	98.0	98.5	97.4	89.3	98.5																					
4-Aug	97.7	98.5	98.8	98.1	98.0	97.8	96.3	87.9	77.8	70.4	60.7	53.8	50.2	82.9	92.6	69.1	72.2	82.9	85.6	89.8	95.4	97.1	96.3	98.3	85.3	98.8																					
5-Aug	98.1	98.0	99.3	99.1	98.6	98.0	94.9	87.7	76.0	65.2	60.9	53.5	48.9	48.0	50.5	43.6	41.0	41.5	54.2	65.3	79.6	90.7	93.4	94.6	74.2	99.3																					
6-Aug	94.7	95.3	95.7	95.9	96.1	95.7	95.9	84.5	71.5	69.3	59.8	58.0	57.6	68.2	56.2	55.7	64.3	63.6	66.9	75.2	80.3	88.8	94.8	96.3	78.3	96.3																					
7-Aug	96.9	98.0	98.2	97.6	98.3	98.7	95.5	84.9	68.6	55.8	50.3	47.2	45.6	45.3	43.2	44.8	45.1	47.3	47.7	54.1	68.0	82.0	86.9	89.2	70.4	98.7																					
8-Aug	92.6	93.0	95.1	94.8	95.8	96.4	85.7	80.4	70.8	61.9	56.0	50.5	48.7	47.4	47.7	46.4	45.9	49.8	54.8	59.2	64.7	68.4	71.6	74.5	68.8	96.4																					
9-Aug	76.5	76.2	85.1	91.6	94.1	94.4	94.5	94.5	93.3	92.4	93.5	92.2	95.2	96.5	95.4	96.0	96.5	96.7	96.5	96.8	98.2	98.7	98.7	98.7	93.4	98.7																					
10-Aug	98.3	98.4	98.4	98.5	98.6	98.5	98.3	98.3	98.1	96.5	96.0	95.3	95.8	95.4	94.7	95.3	95.5	96.2	96.5	96.7	97.2	98.4	99.1	99.0	97.2	99.1																					
11-Aug	99.4	99.3	99.0	99.2	99.3	99.5	98.2	96.8	93.0	86.6	81.6	76.6	76.1	71.3	69.8	65.0	61.8	59.8	68.5	76.9	88.6	84.9	83.6	92.5	84.5	99.5																					
12-Aug	94.5	93.1	93.4	96.0	97.5	98.1	98.6	98.2	96.0	87.6	75.0	61.9	57.2	84.2	90.1	88.8	83.8	78.2	80.6	89.7	97.0	98.9	99.3	99.4	89.0	99.4																					
13-Aug	99.1	99.0	93.9	89.6	92.6	94.0	90.4	81.7	73.4	62.9	56.7	49.5	45.5	43.7	41.4	40.6	40.8	41.2	43.0	55.0	73.4	77.3	76.9	67.6	67.9	99.1																					
14-Aug	67.1	74.4	71.4	74.3	73.5	76.2	72.3	66.1	53.0	45.2	44.4	44.0	48.5	59.7	49.1	41.3	40.6	37.6	37.2	48.4	64.9	74.2	78.3	82.6	59.3	82.6																					
15-Aug	87.0	89.1	90.1	86.2	86.6	76.7	70.2	66.4	68.3	71.3	76.6	76.3	71.9	68.3	57.5	56.2	56.4	63.4	68.1	69.0	76.3	85.5	90.2	95.3	75.1	95.3																					
16-Aug	95.2	87.9	88.9	87.8	94.1	95.2	92.8	86.2	74.8	66.3	57.9	54.5	50.5	47.6	45.6	42.2	40.1	42.2	45.7	56.3	66.4	65.1	65.1	64.1	67.2	95.2																					
17-Aug	66.5	68.2	70.5	72.8	76.3	79.1	80.2	76.3	68.1	57.7	56.4	56.3	55.1	52.7	49.8	54.1	46.7	47.8	62.6	84.8	69.9	69.9	68.3	81.3	65.5	84.8																					
18-Aug	84.0	84.8	90.2	93.1	94.0	93.6	88.5	84.0	81.2	79.3	74.4	70.0	67.0	61.0	57.0	62.4	71.6	76.4	80.6	80.8	77.3	80.3	83.3	89.0	79.3	94.0																					
19-Aug	92.8	92.3	93.8	97.0	97.4	97.6	94.3	85.1	78.7	77.7	72.6	65.1	61.1	58.1	56.4	61.3	60.5	60.7	65.1	70.3	82.3	80.9	81.1	82.3	77.7	97.6																					
20-Aug	82.1	85.5	88.1	89.9	90.7	91.9	87.8	77.7	69.2	65.7	52.6	45.1	39.4	38.3	36.4	57.4	49.9	51.3	63.1	72.8	82.4	84.1	85.7	81.0	69.5	91.9																					
21-Aug	88.5	87.5	89.4	91.6	92.5	93.8	92.3	76.2	64.8	54.3	44.6	39.7	37.2	35.7	34.6	38.2	45.7	47.9	42.6	51.2	66.2	75.3	80.2	82.5	64.7	93.8																					
22-Aug	84.8	86.6	90.1	89.8	91.8	93.2	91.9	80.6	65.9	62.1	57.0	51.5	46.7	42.7	43.6	45.6	47.6	52.8	59.1	75.7	83.3	82.7	82.9	83.7	70.5	93.2																					
23-Aug	85.3	87.8	89.3	89.7	89.0	92.1	94.1	96.1	95.6	96.8	97.6	94.8	87.8	84.0	85.5	83.8	78.5	81.4	84.9	85.2	85.0	86.7	82.0	81.8	88.1	97.6																					
24-Aug	82.6	85.4	89.2	88.4	88.6	88.7	89.0	86.6	81.5	74.9	66.4	57.5	54.0	49.3	42.0	41.0	40.4	41.5	46.9	67.7	81.5	86.0	89.2	91.0	71.2	91.0																					
25-Aug	91.1	92.5	93.6	94.0	95.1	94.5	95.1	91.8	86.0	79.7	76.3	64.8	57.3	56.0	51.2	49.2	51.9	54.2	60.9	70.5	74.7	77.0	79.4	81.7	75.8	95.1																					
26-Aug	84.2	86.9	89.0	90.0	91.0	91.9	89.8	83.0	73.3	65.5	57.3	49.6	44.8	39.9	42.7	42.6	40.6	41.8	50.2	60.8	67.9	70.5	76.0	86.8	67.3	91.9																					
27-Aug	88.0	92.6	92.3	93.7	94.0	93.4	92.9	86.4	73.1	65.5	60.6	56.4	51.1	46.5	45.1	45.0	46.8	50.8	56.2	66.2	74.1	76.7	78.4	82.0	71.2	94.0																					
28-Aug	87.7	90.0	90.3	91.0	92.5	92.6	92.3	90.6	81.5	75.1	70.5	62.3	52.8	50.5	47.5	50.7	54.3	57.1	61.3	72.7	79.7	84.4	86.6	89.6	75.1	92.6																					
29-Aug	90.4	92.7	93.9	95.9	96.5	96.5	96.0	88.6	79.6	70.9	64.1	60.6	56.4	52.1	47.8	49.1	53.4	58.3	69.8	79.6	85.0	87.8	89.8	91.3	76.9	96.5																					
30-Aug	92.9	92.1	92.0	90.8	92.6	94.7	93.5	81.4	67.5	54.4	48.0	40.9	37.5	37.2	33.9	34.8	35.7	40.9	45.9	56.3	59.6	62.3	67.2	71.5	63.5	94.7																					
31-Aug	74.2	73.9	79.6	82.3	87.1	89.5	90.5	88.6	80.5	73.4	69.0	66.9	63.4	61.3	60.4	59.4	64.7	70.2	69.2	66.8	68.8	73.9	77.3	77.6	73.7	90.5																					
																						88.5	89.5	90.8	91.6	92.7	93.2	91.5	86.0	78.5	72.4	67.1	62.1	58.7	58.6	56.6	56.3	57.4	60.1	64.6	72.3	79.2	82.8	84.7	86.8	Diurnal Average	
																						99.4	99.3	99.3	99.2	99.6	99.6	98.7	98.3	98.1	96.8	97.6	95.3	95.8	96.5	95.4	96.0	96.5	96.7	96.5	96.8	98.2	98.9	99.3	99.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Mackay River - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Mackay River - August 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	16	2.15	2.15
40 - 60	158	21.24	23.39
60 - 80	193	25.94	49.33
80 - 100	377	50.67	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Precipitation (PC) - mm

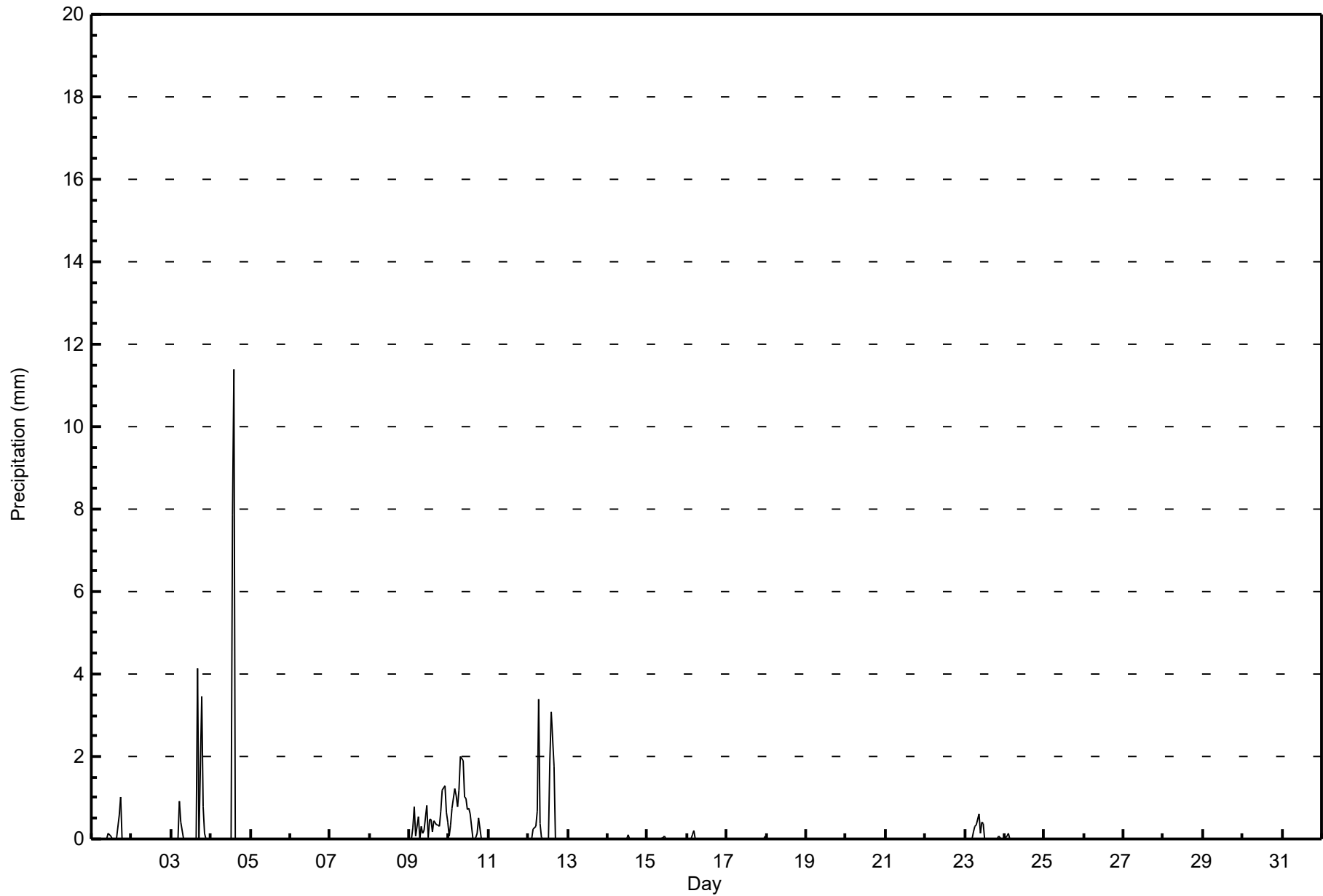
Mackay River - August 2023

Maximum Value: 11.4 mm on Aug 4 15:00		Maximum Daily Total: 19.3 mm on Aug 4		Hours in Service: 744																							
Minimum Value: 0.0 mm on Aug 1 01:00		Minimum Daily Total: 0.0 mm on Aug 2		Hours of Data: 744																							
Maximum Diurnal Total: 14.6 mm at hour 15		Minimum Diurnal Total: 0.1 mm at hour 1		Hours of Missing Data: 0																							
Monthly Total: 69.77 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 = 1.9		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-Aug	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	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.0	
2-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	3.5	0.8	0.1	0.0	0.0	0.0	9.8	4.1		
4-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.3	11.4		
5-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.3	0.8	0.1	0.6	0.0	0.3	0.1	0.2	0.8	0.1	0.5	0.5	0.2	0.4	0.4	0.3	0.3	0.7	1.2	1.3	0.7	0.4	10.0	1.3	
10-Aug	0.1	0.4	0.8	1.2	1.1	0.8	1.2	2.0	1.9	1.0	1.0	0.7	0.7	0.6	0.0	0.0	0.1	0.2	0.5	0.0	0.0	0.0	0.0	14.0	2.0		
11-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.2	0.3	0.7	3.4	0.4	0.0	0.0	0.0	0.0	1.9	3.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	3.4		
13-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	
15-Aug	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	0.0	0.1	0.1	0.1	
16-Aug	0.0	0.0	0.0	0.1	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	0.3	0.2		
17-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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		
18-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.6	0.2	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	2.4	0.6		
24-Aug	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	0.2	0.1		
25-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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-Aug	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	1.2	2.4	1.7	3.1	5.3	3.0	2.7	1.4	2.4	1.2	1.3	10.8	14.6	2.2	5.1	1.5	4.3	1.5	1.4	1.3	0.7	0.5	Diurnal Average	
		0.1	0.4	0.8	1.2	1.1	0.9	3.4	2.0	1.9	1.0	1.0	0.7	0.7	7.9	11.4	1.8	4.1	1.0	3.5	0.8	1.2	1.3	0.7	0.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Precipitation (PC) - mm
Mackay River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Precipitation (PC) - mm
Mackay River - August 2023

Concentration Ranges (mm)	Number of Hours	%	Cumulative %
0 - 0.3	702	94.35	94.35
0.4 - 0.5	9	1.21	95.56
0.6 - 0.7	9	1.21	96.77
0.8 - 1.4	14	1.88	98.66
1.5 - 10	9	1.21	99.87
> 10	1	0.13	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

Mackay River - August 2023

Maximum Speed: 14 km/h on Aug 24 11:00	Maximum Daily Speed Average: 9.1 km/h on Aug 9	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 27 08:00	Minimum Daily Speed Average: 0.7 km/h on Aug 11	Hours of Data: 742
Maximum Diurnal Speed Average: 2.7 km/h at hour 15	Minimum Diurnal Speed Average: 0.3 km/h at hour 19	Hours of Missing Data: 2
Monthly Average Velocity: 1.5 km/h 200.4 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 9 P ₉₉ = 13	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-Aug	WSW8	WSW8	W7	W7	WSW7	WSW9	WSW9	W8	WSW7	WSW8	WSW8	W9	W10	W9	W9	W9	WSW8	W5	W5	W5	WSW4	W4	W5	W3	W6.9	W10
2-Aug	WSW3	SW3	SSW1	SW2	W3	WNW3	W3	NW3	WSW3	W4	SW4	SW5	SW6	WSW6	WSW5	W4	SSW6	SE1	ENE5	E3	ESE1	ESE2	SE3	ESE4	SW1.9	SW6
3-Aug	SE4	SE4	SE5	SE4	SE4	SE3	SE4	SE3	SE4	SSE7	S6	S7	SSE7	SSE10	SSE11	S8	SW4	E2	ENE3	S6	SSW6	SW4	WSW5	W5	SSE4.0	SSE11
4-Aug	W6	W5	W5	WNW6	W5	W5	WSW5	WSW5	WSW6	SW6	W7	W8	WNW7	N8	N1	WNW2	WNW2	SSE1	SW1	W4	SW3	WSW3	WSW3	WSW3	W3.9	W8
5-Aug	W3	WSW3	WSW2	WSW3	WSW3	WSW4	WSW4	WSW4	W4	NW5	W5	NW7	NW7	NW6	SW8	WSW6	W7	NW7	NNE6	NNE5	ENE2	E1	SE1	SE2	WNW2.6	SW8
6-Aug	SE2	SE2	SE2	SSE3	SE3	SE3	SE1	S4	SE2	ENE6	E6	NE9	NE11	NE9	ENE5	NE8	NE10	NNE9	NNE8	NNE5	NE2	E1	UO	NNE2	ENE3.7	NE11
7-Aug	NNE2	NE1	SSE1	SSE1	SSW1	SSW1	UO	N3	NNE5	NE6	N10	NNE8	N9	NNE7	NNE8	NE8	NNE9	NNE8	NE9	NE6	NE4	NE2	NE3	NE2	NNE4.5	N10
8-Aug	ENE1	ESE2	SE3	SE4	E2	E2	E5	ESE9	ESE9	E9	ESE10	ESE10	ESE10	ESE10	E10	E10	ESE12	ESE13	ESE12	ESE11	ESE10	ESE9	ESE8	ESE8	ESE7.7	ESE13
9-Aug	ESE8	ESE7	ESE6	ESE5	ESE6	ESE7	ESE8	ESE8	ESE8	ESE9	ESE9	ESE11	ESE12	ESE13	ESE13	ESE13	ESE12	ESE10	ESE10	ESE10	ESE9	ESE9	ESE9	ESE9	ESE9.1	ESE13
10-Aug	ESE8	ESE9	ESE9	ESE10	ESE9	ESE10	ESE10	ESE10	ESE10	E9	E9	E10	E7	E9	E8	E7	ENE8	ENE7	ENE7	NE6	NE6	NNE4	NNE5	NNE4	E7.1	ESE10
11-Aug	N4	NNE5	N5	N5	NW4	NNW5	N6	NNE6	NNE6	NNE4	N3	WNW2	SW2	S2	SSE4	SW4	S3	SSE3	SSE4	SE4	ESE3	SE4	SSE4	SSW5	NNE0.7	NNE6
12-Aug	SW5	SW5	WSW5	WSW4	SW4	WSW4	WSW5	WSW6	WSW6	W6	W7	W8	W8	NW4	SSW3	SSW2	W4	NW5	WNW7	WSW3	S2	S3	SSW3	S3	WSW4.1	W8
13-Aug	SSW5	S5	S7	S7	S8	S8	S9	S8	SSW8	SSW10	SSW11	SW11	SW12	SW11	WSW11	WSW11	WSW11	WSW11	WSW8	SW3	S3	SSW4	S6	SSW7	SSW7.3	SW12
14-Aug	W6	SW4	SW6	WSW6	W8	WNW9	WNW5	W7	W8	WNW11	W9	W9	WSW7	W5	WSW6	W8	W7	NW6	W9	W4	WSW3	W3	SW3	SW3	W5.8	WNW11
15-Aug	SW3	SSW3	SSW4	SSE4	SSE5	S7	S8	S9	SSE7	S7	SSW8	S7	SSW7	SW7	SW9	WSW8	WSW9	WSW5	W5	WNW8	NNW8	NNW7	NNW4	WSW2	SW4.0	SW9
16-Aug	SW2	WNW4	NW3	WNW5	WNW4	W3	WNW6	W5	WNW5	WNW7	W7	WNW8	W8	WSW8	WSW8	SW8	SW8	SW9	SW7	S4	S5	S6	S7	SSE7	WSW4.5	SW9
17-Aug	S9	S9	S9	S10	S9	S9	S6	SSW6	WSW5	WSW7	W7	WSW8	W9	W8	W7	WSW5	SW9	W7	NW6	WNW3	NNW5	N4	NW6	NNE1	SW4.5	S10
18-Aug	SW3	NW2	NE2	NNW3	NNW4	NNW4	NNW6	NNW7	N8	NNW8	N9	NNW9	NNW9	NNW9	NW6	NW5	NNE4	N6	NNW6	NNW5	NW8	NW10	WNW6	WNW5	NNW5.5	NW10
19-Aug	WNW6	WNW7	W5	W4	WSW5	WSW6	WSW6	WSW7	WSW8	WSW8	WSW8	W9	W7	WNW8	WSW7	SW6	SW6	SW6	SW5	SSW5	S5	S6	S8	SSW7	WSW5.6	W9
20-Aug	SSW6	S7	S7	S7	S8	S6	S6	SSW6	SSW6	S7	SW7	WSW7	W7	SW7	W7	NNW12	NNW10	ENE2	SE3	SE3	SE3	SE3	S4	S6	SSW3.5	NNW12
21-Aug	SSE4	S6	SSE3	SSE4	SE3	SSE3	S4	SSW4	SW4	SSW5	S7	SSE9	SSE8	SE7	SE7	ESE7	ESE5	ESE5	ESE6	ESE6	ESE4	SE3	SE3	SE3	SSE4.3	SSE9
22-Aug	SE3	SE3	SSE5	SE3	SE2	ESE1	SE4	SSE4	SSE5	S6	SSE8	SE7	ENE5	SSE5	SSE3	E3	E4	NNE3	NE3	ESE1	SE2	ESE3	ESE4	SE3	SE3.1	SSE8
23-Aug	SE3	SE1	N2	NNW1	E2	ENE3	NE3	NE3	N5	N6	N5	N6	NNE4	N6	NNE5	NNE6	NNE7	NNE6	NNE6	NNE8	NNE8	NNE8	NNE10	NNE9	NNE4.7	NNE10
24-Aug	NNE11	NNE11	NNE11	NNE11	NNE13	NNE13	NNE13	NNE13	NNE13	NNE13	N14	N13	N12	N10	N9	N9	N8	NNE7	NNE5	ESE2	SE2	SE3	SE4	SE3	NNE8.2	N14
25-Aug	SE3	SSE4	SE3	SSE2	SSE3	SE3	SSE4	S4	S6	S9	SSW9	SSW9	SW9	SSW10	SSW10	SSW10	SSW9	S9	S7	S5	S7	S9	S8	S9	S6.3	SSW10
26-Aug	S9	S8	S9	S10	S9	S9	S9	S9	SSW8	SSW8	SSW10	SW10	SW10	WSW10	W8	WSW8	WSW7	WSW6	WNW4	NNE9	NNE7	NNE6	NNE4	NW1	SW4.7	SW10
27-Aug	SSE2	SW2	SW2	SW2	SSW1	SSE1	S1	SSW0	SE2	S5	SSW6	SSW6	SSW5	SSW7	SSW7	SW7	SW8	SSW7	SSW6	S5	S5	S7	S8	S7	SSW4.2	S8
28-Aug	S4	SSW4	SW3	SW3	S3	S3	SE3	SSW4	SW4	SW4	SSW5	SW6	WSW6	W5	WSW5	SW3	SSW4	S6	S6	S5	S6	S5	S6	S6	SSW4.1	S6
29-Aug	S6	S5	S5	S5	S6	S5	SSE5	SSE6	S7	S5	S6	S6	S7	S7	S7	S7	S5	S4	SSE4	SSE4	SSE4	SE5	SE6	SE6	S5.5	S7
30-Aug	SE5	SE5	SE4	SE5	SE4	SE6	SE6	SE5	SSE5	SSE5	SE8	SSE7	S8	SSE7	SSE7	SSE11	SSE10	SSE6	SSE4	ESE5	SE4	SE5	SE4	SE4	SSE5.6	SSE11
31-Aug	SE5	SE5	SSE4	SSE4	SSW3	SSW5	SW5	WSW5	W6	WSW5	WSW6	WSW5	WSW7	WSW7	WSW7	W8	W8	W7	WNW7	WNW9	WNW9	WNW7	W5	W5	WSW4.5	WNW9

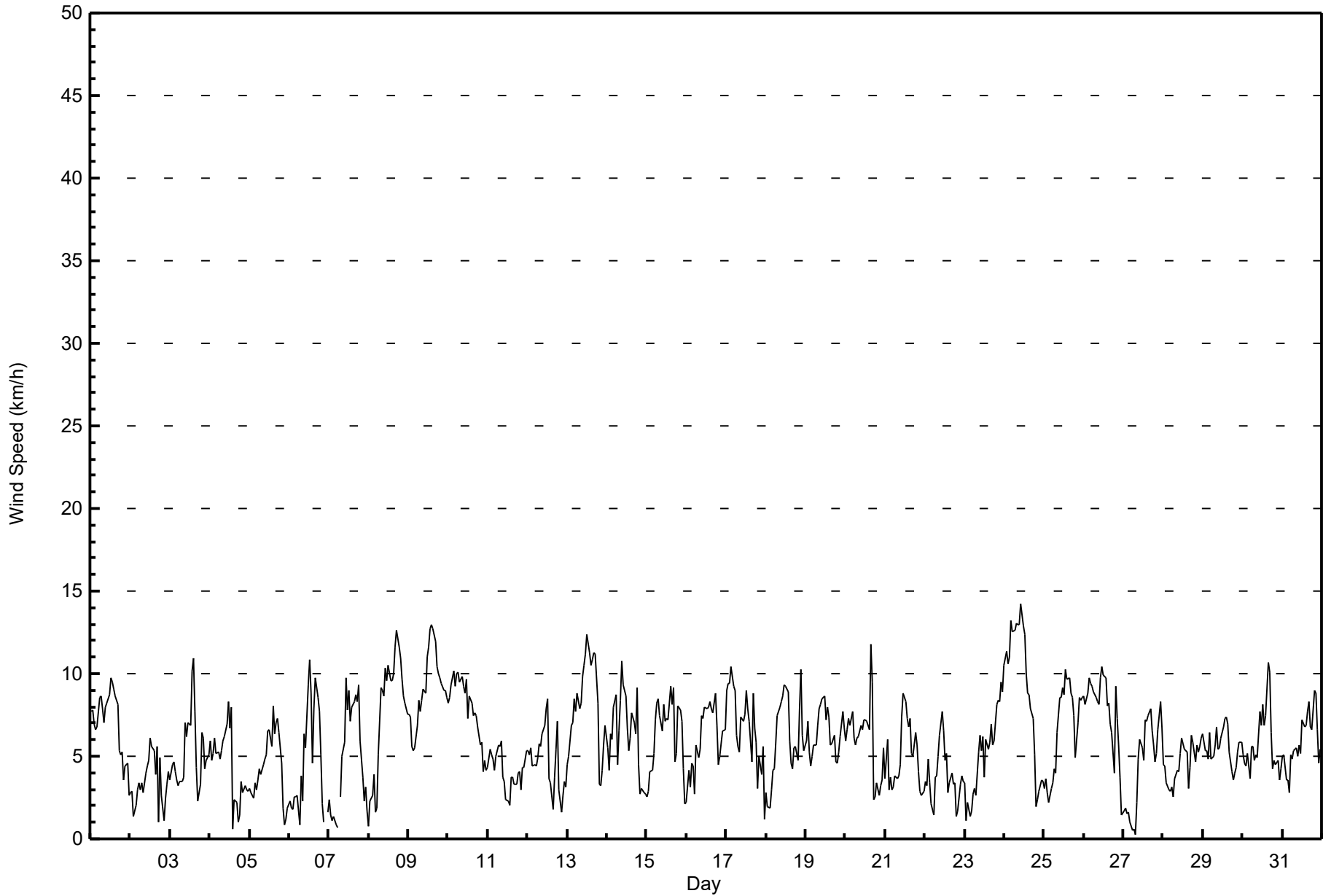
S2.0	S2.0	S2.1	S2.0	SSW1.9	S1.7	S1.7	SSW1.7	SSW1.7	SSW1.8	SW2.3	SW2.3	WSW2.4	SW1.8	SW2.7	SW1.9	SW1.7	SW0.6	E0.3	ESE0.6	SE1.0	SSE1.1	S1.7	S2.0	Diurnal Average	
NNE11	NNE11	NNE11	NNE11	NNE13	NNE13	NNE13	NNE13	NNE13	NNE13	NNE13	N14	N13	N12	ESE13	ESE13	ESE13	ESE12	ESE13	ESE12	ESE11	ESE10	NW10	NNE10	NNE9	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
Mackay River - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	344	46.36	46.36
6 - 11	379	51.08	97.44
12 - 19	19	2.56	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: 742

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Mackay River - August 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	10	9	9	16	61	36	28	25	30	33	31	12	9	8	344
6 - 11	14	27	11	4	11	41	8	16	72	29	23	45	41	16	11	10	379
12 - 19	3	6	0	0	0	8	0	0	0	0	1	0	0	0	0	1	19
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	27	50	21	13	20	65	69	52	100	54	54	78	72	28	20	19	742

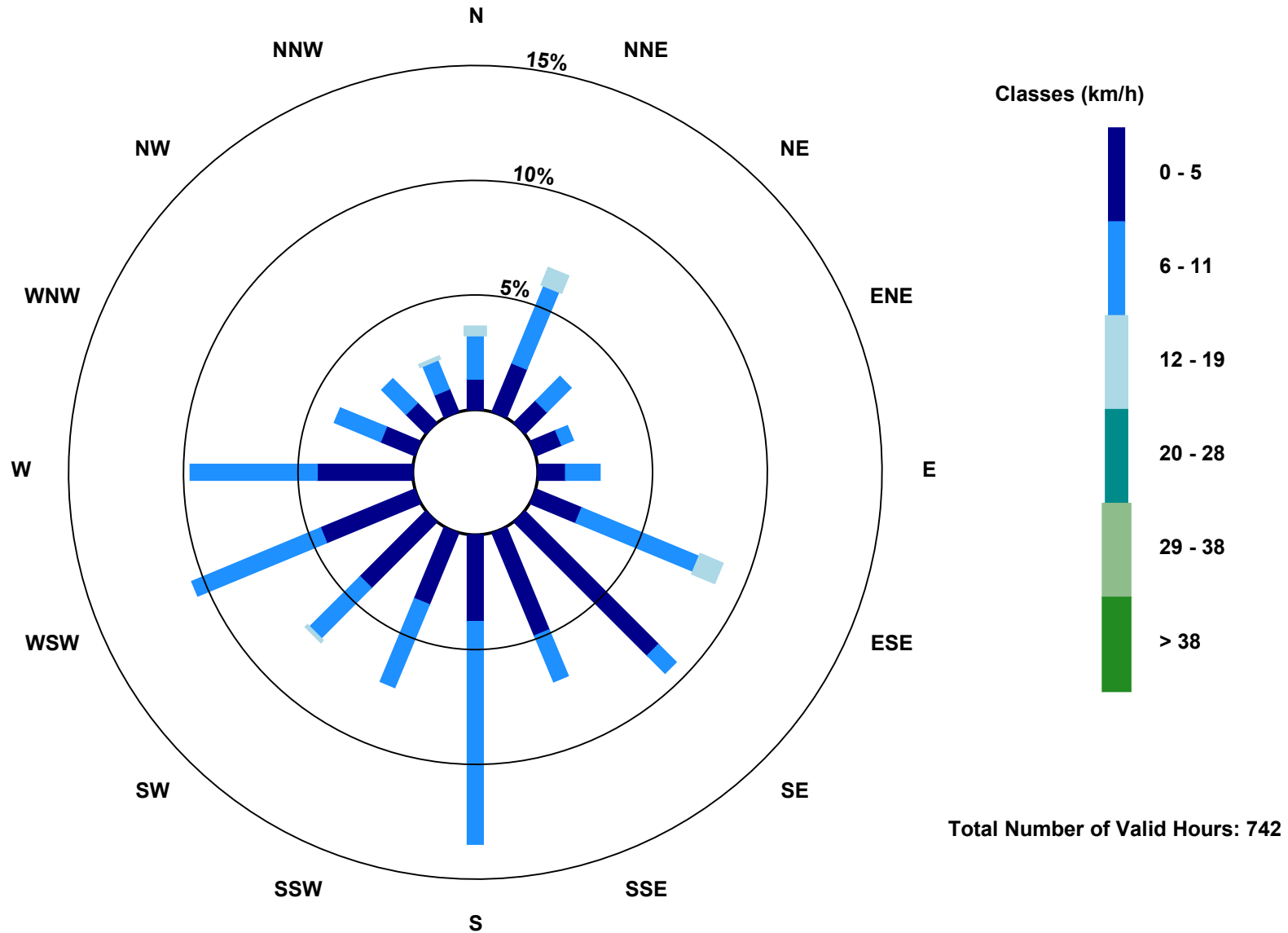
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Mackay River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Mackay River - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 7 km/h on Aug 4 14:00 Minimum Value: 0 km/h on Aug 24 21:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 3 P ₉₉ = 5																	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-Aug	3	3	3	2	3	3	3	3	3	3	3	4	4	4	4	4	3	3	3	2	1	2	2	1	4
2-Aug	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	2	1	1	1	1	1	3
3-Aug	1	1	1	1	1	1	1	1	2	2	2	3	2	4	4	3	4	2	2	3	2	1	2	2	4
4-Aug	2	2	2	2	2	2	2	2	2	2	3	4	3	7	5	2	2	1	2	2	1	1	1	1	7
5-Aug	1	1	1	1	1	1	1	1	2	2	2	3	3	4	3	3	3	3	2	1	1	1	1	1	4
6-Aug	0	1	1	0	0	1	1	1	1	2	2	3	4	3	3	3	3	3	2	2	1	1	UO	1	4
7-Aug	1	1	1	0	1	1	UO	1	2	2	3	3	3	4	3	4	4	3	3	2	2	1	1	1	4
8-Aug	1	1	1	1	1	1	2	2	2	3	3	4	4	3	3	3	4	3	4	3	3	2	2	2	4
9-Aug	2	2	1	1	1	2	2	2	2	2	2	3	3	3	3	4	3	3	3	3	3	2	2	2	4
10-Aug	2	2	2	3	2	3	2	2	3	3	3	3	3	3	3	3	3	3	2	3	2	1	1	1	3
11-Aug	1	1	1	1	1	1	2	2	2	1	1	1	1	1	2	2	2	2	1	1	1	1	1	2	2
12-Aug	2	2	2	2	2	2	2	2	2	3	3	3	3	4	3	4	2	2	3	1	1	1	1	1	4
13-Aug	1	1	2	2	2	2	2	2	3	3	4	5	5	5	5	5	5	5	4	1	1	1	1	2	5
14-Aug	3	1	2	2	3	3	2	3	4	5	4	3	3	3	3	3	3	2	4	3	1	1	1	1	5
15-Aug	1	1	1	1	2	2	2	3	2	2	3	2	3	3	4	3	4	2	2	3	3	2	1	1	4
16-Aug	1	1	1	2	1	1	2	2	2	3	3	3	3	3	3	3	3	3	3	1	1	1	2	2	3
17-Aug	3	3	3	3	2	2	2	2	2	3	3	3	4	3	3	2	4	4	3	3	2	1	1	2	4
18-Aug	1	1	1	1	1	1	2	2	2	3	3	3	3	3	2	2	2	2	2	1	3	3	3	2	3
19-Aug	2	3	2	2	2	2	2	3	3	3	3	4	3	3	3	2	2	2	1	1	1	1	2	2	4
20-Aug	2	2	2	1	2	2	2	2	2	2	3	3	3	3	5	4	3	2	2	2	1	1	1	1	5
21-Aug	2	1	1	2	1	1	1	2	1	2	3	3	3	3	3	3	2	2	1	1	1	1	1	0	3
22-Aug	1	1	1	1	1	1	2	2	2	2	3	2	3	2	2	2	2	2	2	1	1	1	1	1	3
23-Aug	1	1	1	1	1	2	1	1	2	2	2	1	2	2	2	2	2	2	2	3	3	3	3	3	3
24-Aug	3	4	3	3	4	4	4	4	4	4	4	4	4	3	3	3	3	2	2	0	0	1	1	0	4
25-Aug	0	1	1	1	1	1	1	1	3	3	3	3	3	4	4	4	3	3	3	1	2	2	2	2	4
26-Aug	2	2	2	2	2	2	2	3	3	3	4	4	4	4	3	3	3	3	3	3	2	2	2	1	4
27-Aug	1	0	1	1	1	1	1	1	1	2	2	3	2	3	3	3	3	2	2	1	1	1	2	2	3
28-Aug	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	1	1	2	1	1	1	1	1	1	2
29-Aug	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	2	2	1	1	0	1	1	1	1	3
30-Aug	1	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	3	2	2	1	1	1	1	1	3
31-Aug	1	1	1	2	1	1	2	2	2	2	2	2	2	3	3	3	4	3	3	3	3	2	2	2	4
Diurnal Maximum																									
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Mackay River - August 2023

Direction of Maximum Speed: 10 deg on Aug 24 11:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 112.8 deg on Aug 9	Hours of Data: 742
Direction of Minimum Speed: 213 deg on Aug 27 08:00	Direction of Minimum Daily Speed Average: 0.7 deg on Aug 11
Direction of Minimum Speed: 213 deg on Aug 27 08:00	Hours of Missing Data: 2
Monthly Average Direction: 200.4 deg	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-Aug	248	258	259	260	254	253	251	263	251	245	254	265	275	274	259	260	240	266	273	277	242	262	276	266	259.2
2-Aug	251	221	207	229	280	285	278	315	254	272	233	233	231	257	243	259	209	142	74	79	121	123	135	120	235.0
3-Aug	124	130	135	127	133	135	145	133	127	156	182	189	167	160	152	184	230	98	70	184	199	228	258	267	166.2
4-Aug	278	272	271	285	272	268	252	255	256	232	260	274	284	357	2	302	298	161	218	262	236	245	247	253	269.3
5-Aug	261	245	239	253	237	244	256	258	265	313	279	323	326	320	219	248	278	324	30	30	64	92	125	128	285.2
6-Aug	131	139	133	151	130	138	131	179	138	57	93	45	40	53	70	42	40	31	29	20	40	79	UO	25	58.3
7-Aug	30	44	167	153	197	205	UO	351	15	49	7	28	3	18	16	53	32	31	43	34	35	54	46	39	29.2
8-Aug	61	118	127	124	99	80	98	109	108	101	102	114	114	110	100	97	108	104	105	106	109	114	111	112	107.0
9-Aug	114	116	121	119	110	108	105	108	112	111	106	112	112	114	114	116	117	116	118	115	111	107	110	110	112.8
10-Aug	111	111	114	109	108	107	107	106	108	100	96	95	86	91	86	83	64	59	63	44	48	22	21	15	89.5
11-Aug	0	12	5	357	324	334	358	22	16	14	356	287	218	170	163	218	178	168	157	127	122	142	156	193	27.7
12-Aug	231	234	240	241	235	239	249	254	242	262	271	267	273	323	206	213	270	307	286	255	185	184	203	184	251.9
13-Aug	200	179	191	180	180	175	179	187	196	203	208	224	232	231	246	246	250	238	247	224	191	199	190	211	213.2
14-Aug	276	232	220	238	266	306	295	266	275	288	273	269	254	280	251	266	279	308	280	274	256	271	228	228	269.8
15-Aug	227	200	203	164	166	181	183	179	165	182	201	177	205	218	224	250	238	251	277	301	338	340	331	253	217.6
16-Aug	236	282	305	284	286	276	282	269	289	298	271	289	263	249	240	228	232	224	221	191	177	172	172	168	246.0
17-Aug	184	182	181	187	186	187	182	210	250	240	265	254	265	271	264	244	235	275	325	300	330	350	312	21	233.8
18-Aug	228	312	43	332	331	338	342	339	353	347	352	344	329	342	324	313	20	350	344	333	312	311	295	284	332.7
19-Aug	282	285	277	260	254	256	252	245	244	244	239	260	270	285	256	227	235	227	215	208	183	183	189	197	242.3
20-Aug	203	182	179	181	183	181	181	192	192	178	232	245	260	225	259	327	343	74	134	143	138	134	169	183	204.0
21-Aug	166	181	157	167	133	156	174	202	222	192	184	165	147	135	138	106	109	110	111	117	122	137	137	146	148.2
22-Aug	145	142	152	132	142	111	132	150	168	171	155	133	74	152	159	91	84	29	40	121	124	117	119	129	131.2
23-Aug	136	133	353	344	100	61	39	37	352	350	355	6	32	10	14	16	20	28	29	24	28	22	24	30	21.5
24-Aug	25	18	18	18	12	14	12	12	14	13	10	11	6	352	1	351	10	25	33	122	143	145	143	130	15.3
25-Aug	132	156	130	150	155	135	160	171	179	189	194	208	214	197	211	196	201	191	183	170	178	186	186	186	186.5
26-Aug	186	183	182	183	188	185	185	190	203	204	206	214	232	249	260	255	258	258	303	26	18	21	23	325	214.7
27-Aug	159	228	216	232	207	160	175	213	131	175	194	204	196	194	211	214	214	208	197	181	174	176	185	186	194.5
28-Aug	183	212	220	214	178	175	139	210	222	228	211	214	239	263	252	224	204	187	186	183	180	181	180	175	203.1
29-Aug	176	171	169	172	174	171	164	168	182	173	179	174	188	173	190	184	170	171	165	159	150	146	145	143	170.2
30-Aug	141	137	143	146	133	144	143	136	148	152	127	164	174	162	166	149	162	159	148	120	130	127	138	143	147.9
31-Aug	145	143	155	156	200	209	230	251	264	247	255	256	254	256	249	263	265	262	290	297	294	292	276	276	255.5

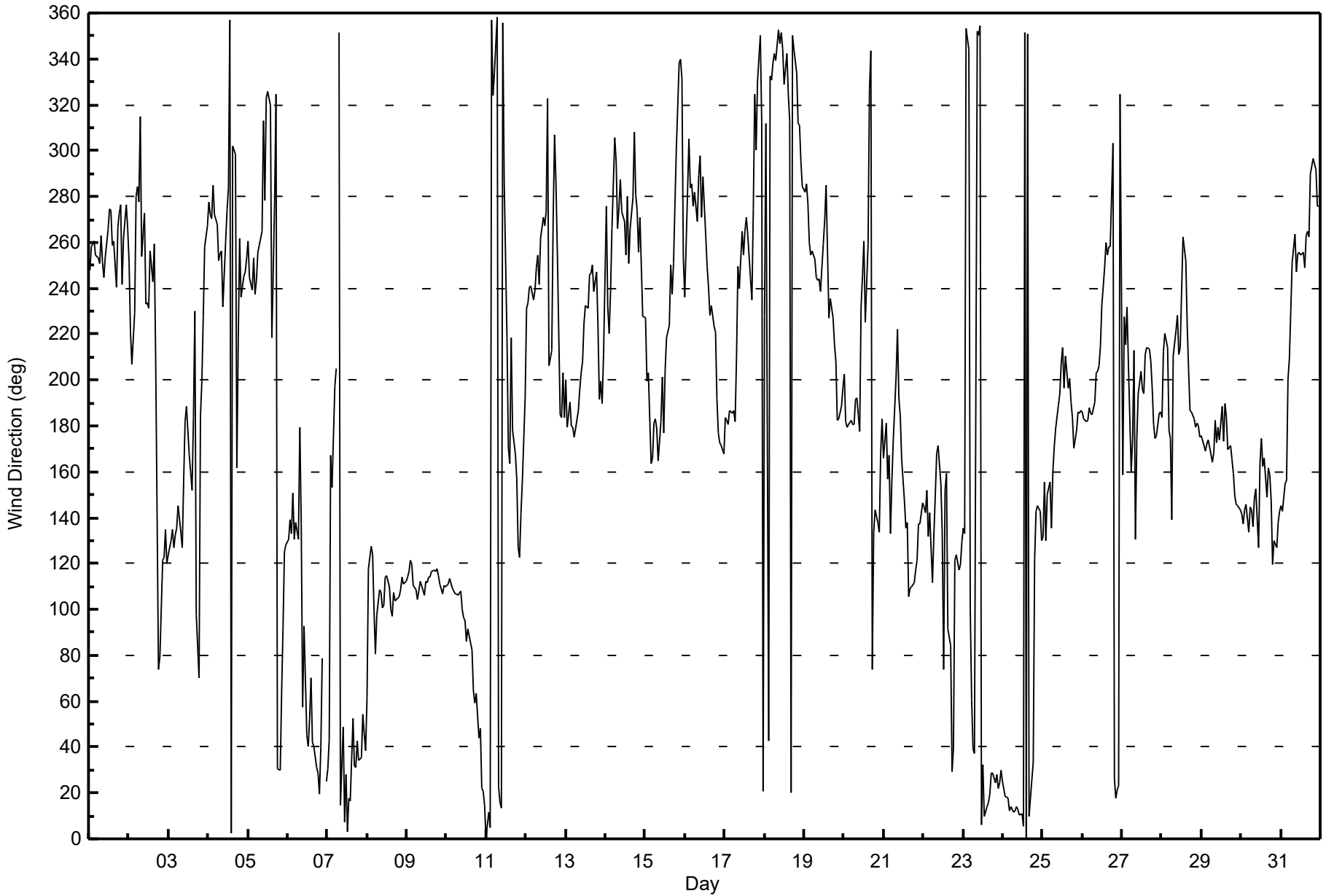
184.9 183.8 181.6 184.6 192.1 191.1 186.0 200.4 209.3 211.5 220.6 229.9 243.1 233.3 217.4 225.4 228.4 221.4 82.3 109.8 133.9 154.5 169.1 173.0
 Diurnal Average

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
Mackay River - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Mackay River - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 97 deg on Aug 2 18:00	Hours of Data: 742
Minimum Value: 4 deg on Aug 29 21:00	Hours of Missing Data: 2
Percentiles: P ₁ = 8 P ₁₀ = 17 Q ₁ = 22 Median = 32 Q ₃ = 45 P ₉₀ = 54 P ₉₉ = 86	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-Aug	53	48	45	45	50	48	47	44	55	46	47	46	46	45	50	47	46	46	45	37	45	44	38	67	67
2-Aug	47	34	62	47	42	34	37	40	70	59	58	48	43	67	63	60	38	97	31	26	51	23	22	14	97
3-Aug	22	19	18	31	36	48	42	31	24	27	38	35	35	27	27	33	64	93	59	50	22	29	44	43	93
4-Aug	30	35	40	24	37	48	48	41	47	41	54	49	49	53	93	71	72	70	79	40	32	29	34	36	93
5-Aug	41	27	33	49	40	60	52	56	55	50	46	53	51	62	36	48	45	31	31	23	44	20	16	19	62
6-Aug	24	28	15	14	14	17	63	30	45	41	41	29	32	36	69	34	25	28	25	28	66	56	UO	36	69
7-Aug	20	62	5	42	69	69	UO	29	30	43	33	46	41	51	53	43	38	36	27	19	24	43	24	70	70
8-Aug	70	31	44	17	61	38	19	24	26	32	33	39	35	41	32	33	26	25	23	18	19	19	17	18	70
9-Aug	18	20	17	19	17	18	17	19	19	18	19	21	21	22	21	21	21	21	21	21	20	19	19	19	22
10-Aug	18	18	19	19	19	19	19	19	20	23	26	29	33	32	32	34	32	27	32	29	28	24	25	24	34
11-Aug	25	24	26	25	20	22	32	24	26	37	59	78	77	75	51	63	75	87	35	20	16	25	28	29	87
12-Aug	34	50	52	48	46	45	44	47	47	46	50	48	42	92	76	80	56	31	25	29	35	31	22	25	92
13-Aug	22	19	17	16	18	19	23	25	28	31	34	42	44	45	50	51	53	43	51	40	22	18	17	28	53
14-Aug	46	39	27	46	47	32	44	46	45	36	43	42	50	42	53	50	39	33	39	36	28	25	18	20	53
15-Aug	24	21	18	24	21	18	22	25	26	37	28	28	36	39	43	48	47	56	37	26	29	22	25	41	56
16-Aug	64	34	44	34	29	49	35	49	49	42	48	47	49	53	45	50	54	40	38	21	15	17	22	26	64
17-Aug	23	23	24	20	21	21	26	39	59	55	51	51	45	49	52	56	44	57	35	57	23	35	18	82	82
18-Aug	35	65	42	24	18	21	22	22	29	28	29	26	27	29	42	40	36	32	27	23	21	20	30	32	65
19-Aug	29	27	38	48	50	45	53	45	44	44	44	46	50	48	55	36	41	35	35	22	15	17	18	20	55
20-Aug	21	19	18	17	18	22	21	27	29	29	47	48	50	39	58	27	26	56	13	12	25	19	18	16	58
21-Aug	19	17	43	23	22	29	25	40	59	46	42	39	46	48	50	29	18	18	15	15	17	15	14	15	59
22-Aug	13	11	11	18	13	40	32	20	29	34	33	47	62	62	77	65	40	41	38	41	39	19	15	14	77
23-Aug	21	84	51	64	54	64	24	19	24	26	24	26	29	25	26	26	29	27	25	24	23	24	25	84	
24-Aug	26	27	26	25	26	27	27	26	28	27	29	29	30	37	41	35	38	32	23	20	12	10	7	14	41
25-Aug	13	31	21	41	24	17	17	22	26	25	32	35	37	35	37	35	33	26	22	25	24	23	21	20	41
26-Aug	20	22	21	20	20	19	19	24	30	33	34	34	41	46	50	47	54	50	54	26	24	21	17	36	54
27-Aug	18	37	47	23	50	90	87	95	38	41	42	56	58	38	46	38	36	29	23	18	13	15	17	17	95
28-Aug	20	23	28	27	30	31	33	30	43	35	38	39	50	50	56	51	26	21	19	14	14	17	16	14	56
29-Aug	14	15	16	15	14	16	18	16	24	32	33	32	34	33	31	27	24	20	18	9	4	6	8	9	34
30-Aug	11	11	12	6	8	7	15	20	29	43	30	36	34	39	36	28	28	31	26	16	20	19	27	17	43
31-Aug	13	13	25	44	39	29	43	51	45	49	53	54	48	47	53	51	48	46	35	26	26	24	41	36	54
	70	84	62	64	69	90	87	95	70	59	59	78	77	92	93	80	75	97	79	57	66	56	44	82	

Diurnal Maximum

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS21
CONKLIN
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
AUGUST 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	35	36	99.87	2.8	0	0.6	0
TRS(ppb) Average	707	36	37	99.87	1.3	0	0.8	0
THC(ppm) Average	708	35	36	99.87	4.5	-	2.7	-
NMHC(ppm) Average	708	35	36	99.87	0.012	-	0.001	-
CH4(ppm) Average	708	35	36	99.87	4.5	-	2.7	-
O3 (ppb) Average	705	35	39	99.46	50.1	0	32.8	-
NO2 (ppb) Average	707	35	37	99.73	15	0	4.5	-
NO (ppb) Average	707	35	37	99.73	29	-	4.5	-
NOX (ppb) Average	707	35	37	99.73	35.3	-	9	-
PM2.5 (ug/m3) Average	733	1	11	98.66	288.7	66	160	12
Temperature 2 m (C) Average	744	0	0	100	29.1	-	20.5	-
Relative Humidity (%) Average	744	0	0	100	98.9	-	96.5	-
Wind Speed 10 m (km/h) Average	740	1	4	99.6	17	-	10	-
Wind Direction 10 m (deg) Average	740	1	4	99.6	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS21)
AUGUST 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	0.21	0.3	-	0	0	0	0.1	0.3	0.4	2.8
TRS (ppb) Average	707	0.43	0.1	-	0.2	0.3	0.4	0.4	0.5	0.5	1.3
THC (ppm) Average	708	2.21	0.3	-	1.9	2	2	2.1	2.2	2.6	4.5
NMHC(ppm) Average	708	0	0.001	-	0	0	0	0	0	0	0.012
CH4(ppm) Average	708	2.21	0.3	-	1.9	2	2	2.1	2.2	2.6	4.5
O3 (ppb) Average	705	21.63	11.6	-	2.2	4.8	12.6	21.2	30.9	37.5	50.1
NO2 (ppb) Average	707	1.84	1.9	-	0	0.4	0.6	1.2	2.4	4.2	15
NO (ppb) Average	707	1.14	2.8	-	0	0	0	0.2	0.8	3.1	29
NOX (ppb) Average	707	2.98	4.1	-	0	0.4	0.7	1.4	3.3	7.4	35.3
PM2.5 (ug/m3) Average	733	35.47	46.4	-	1	4.4	9	19.8	42.4	73.9	288.7
Temperature 2 m (C) Average	744	15.65	5.4	-	1.1	9.1	12	15	19.7	22.6	29.1
Relative Humidity (%) Average	744	77.32	18.8	-	31.7	48.3	61.1	81.9	95	97.3	98.9
Wind Speed 10 m (km/h) Average	740	5.2	3	-	0	1	3	5	7	10	17
Wind Direction 10 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CONKLIN (AMS 21)
AUGUST 2023

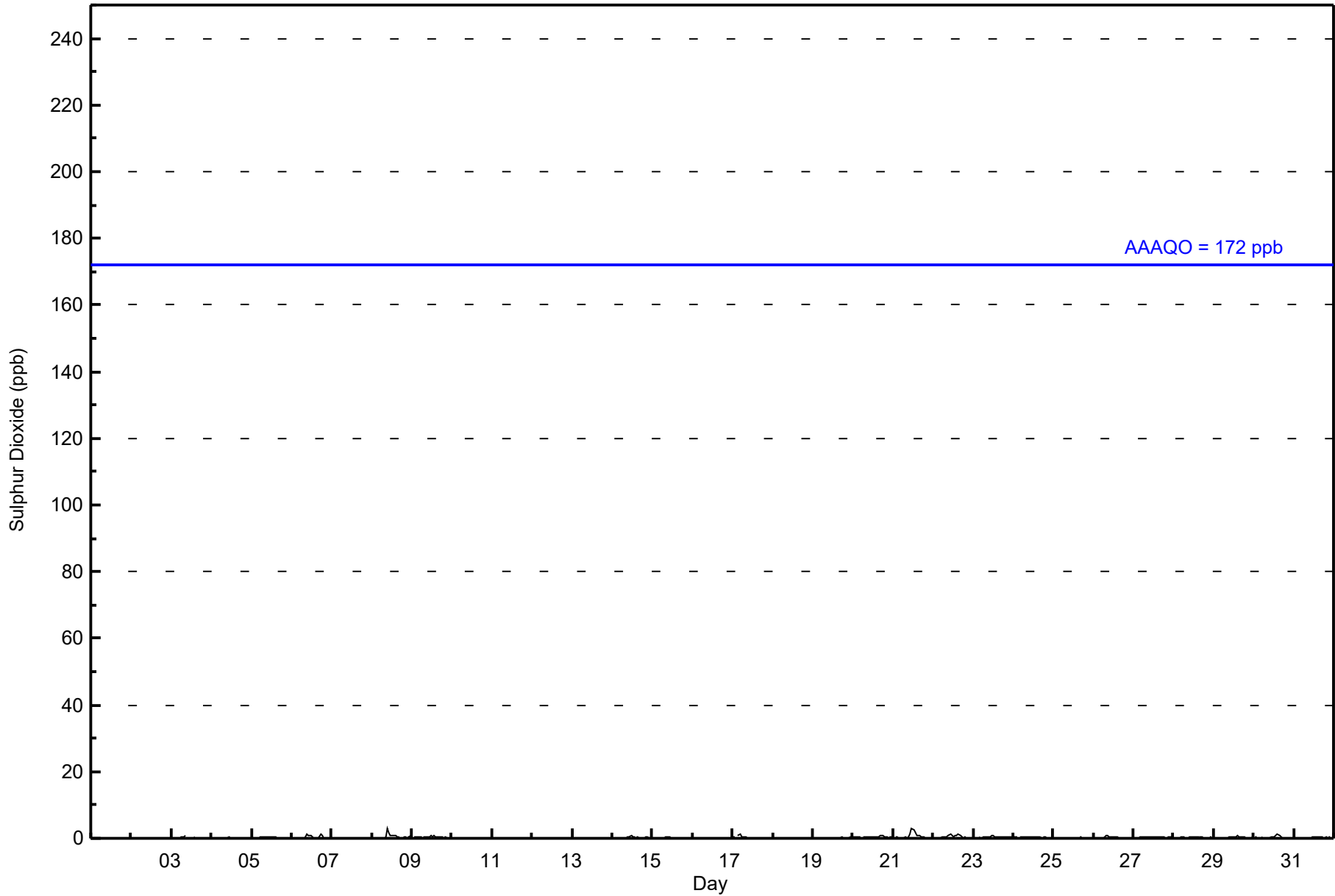
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL GASEOUS ANALYZERS	17 Aug 2023 12:00	17 Aug 2023 12:00	1	Maintenance - sample manifold cleaned
O3	16 Aug 2023 08:00	16 Aug 2023 08:00	1	Maintenance - reinitiated daily QA check
PM2.5	18 Aug 2023 03:00	18 Aug 2023 11:00	9	Analyzer Failure - inconsistent response
PM2.5	18 Aug 2023 12:00	18 Aug 2023 12:00	1	Maintenance - analyzer replaced
Wind Speed, Wind Direction	02 Aug 2023 19:00	02 Aug 2023 19:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Aug 2023 21:00	22 Aug 2023 21:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	29 Aug 2023 21:00	29 Aug 2023 21:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Conklin - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	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: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Conklin - August 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	16	5	13	9	38	59	56	60	51	65	49	31	73	79	56	704
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	16	5	13	9	38	59	56	60	51	65	49	31	73	79	56	704

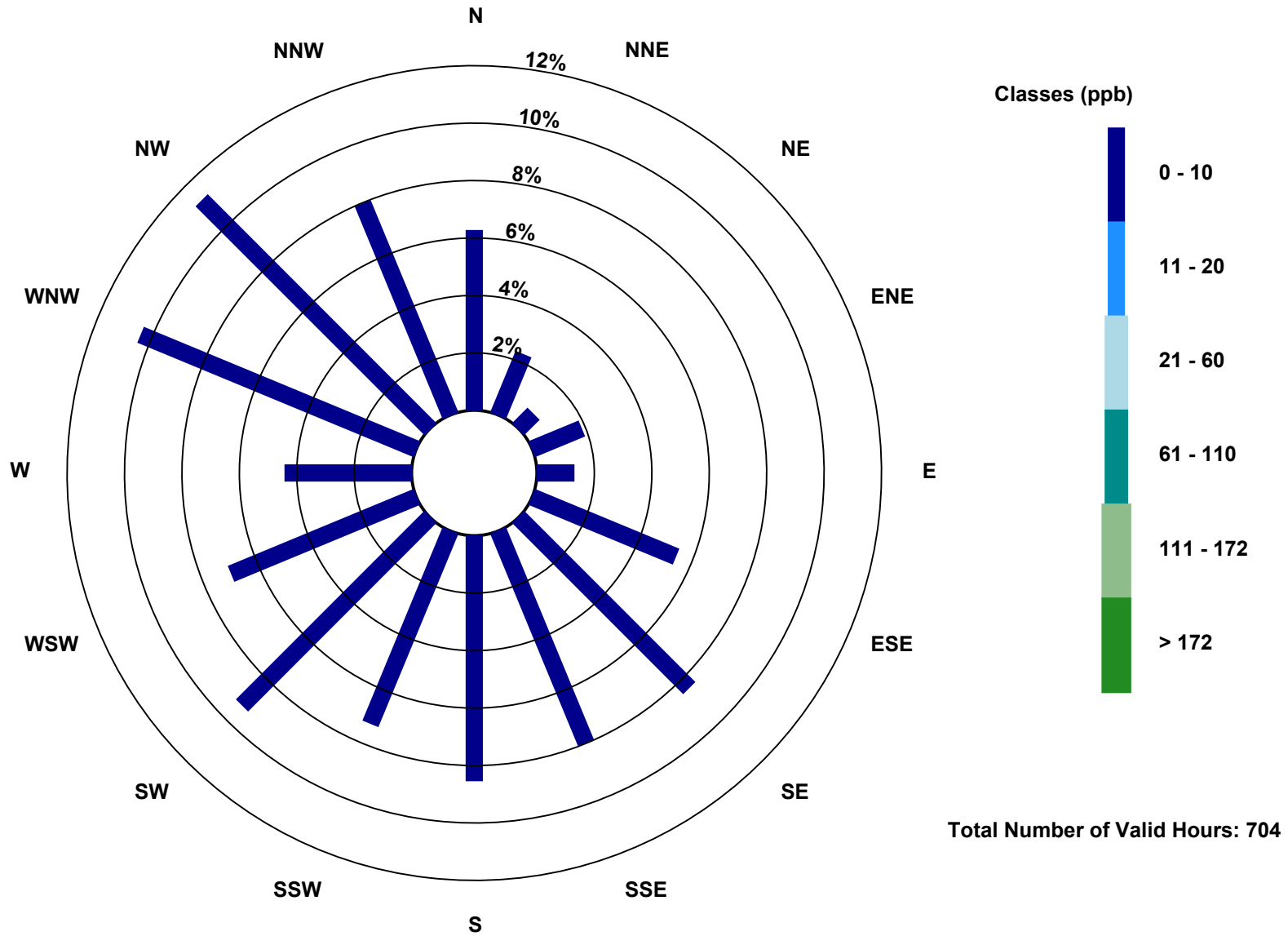
Total Number of Valid Hours: 704

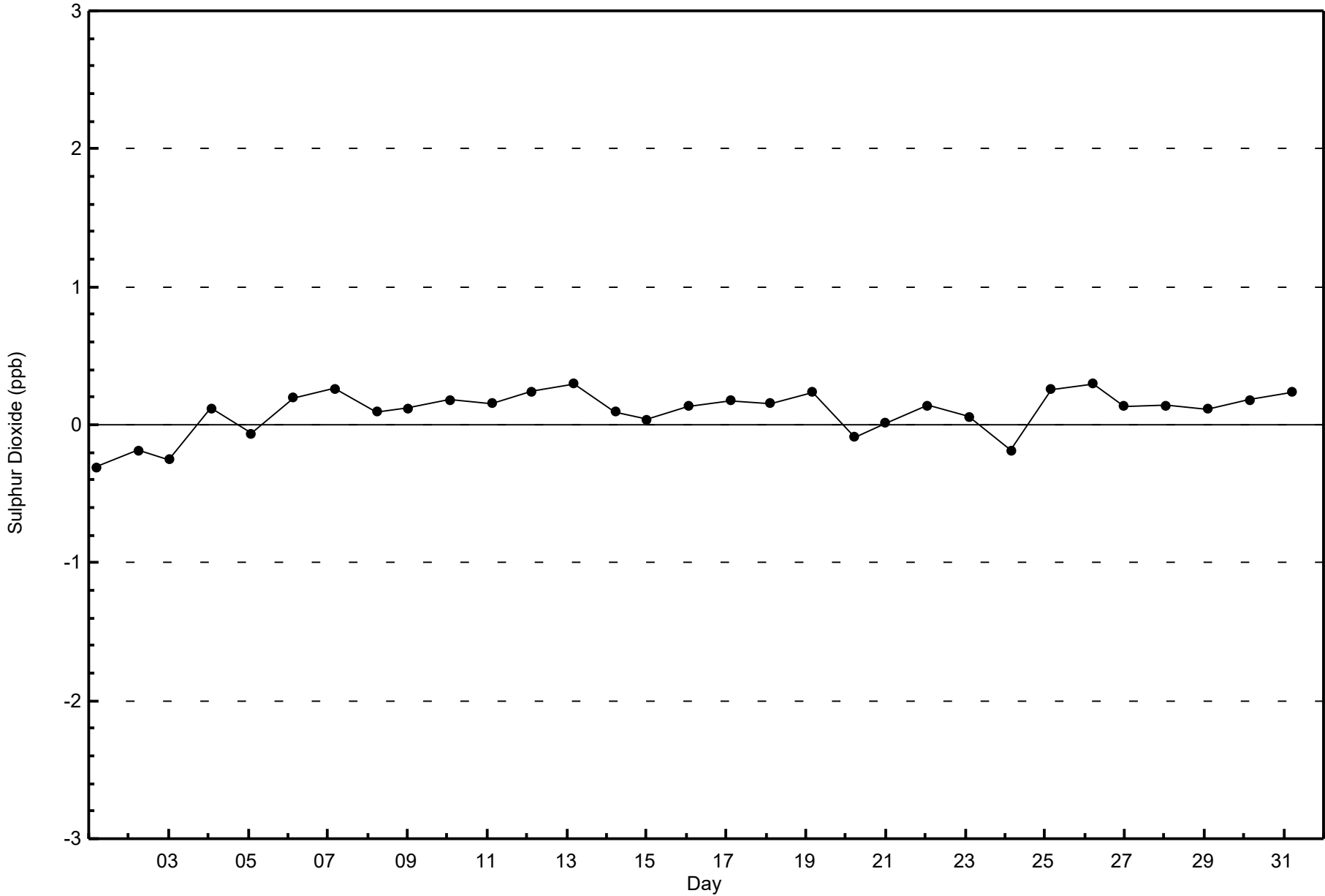
Total Number of Hours: 744

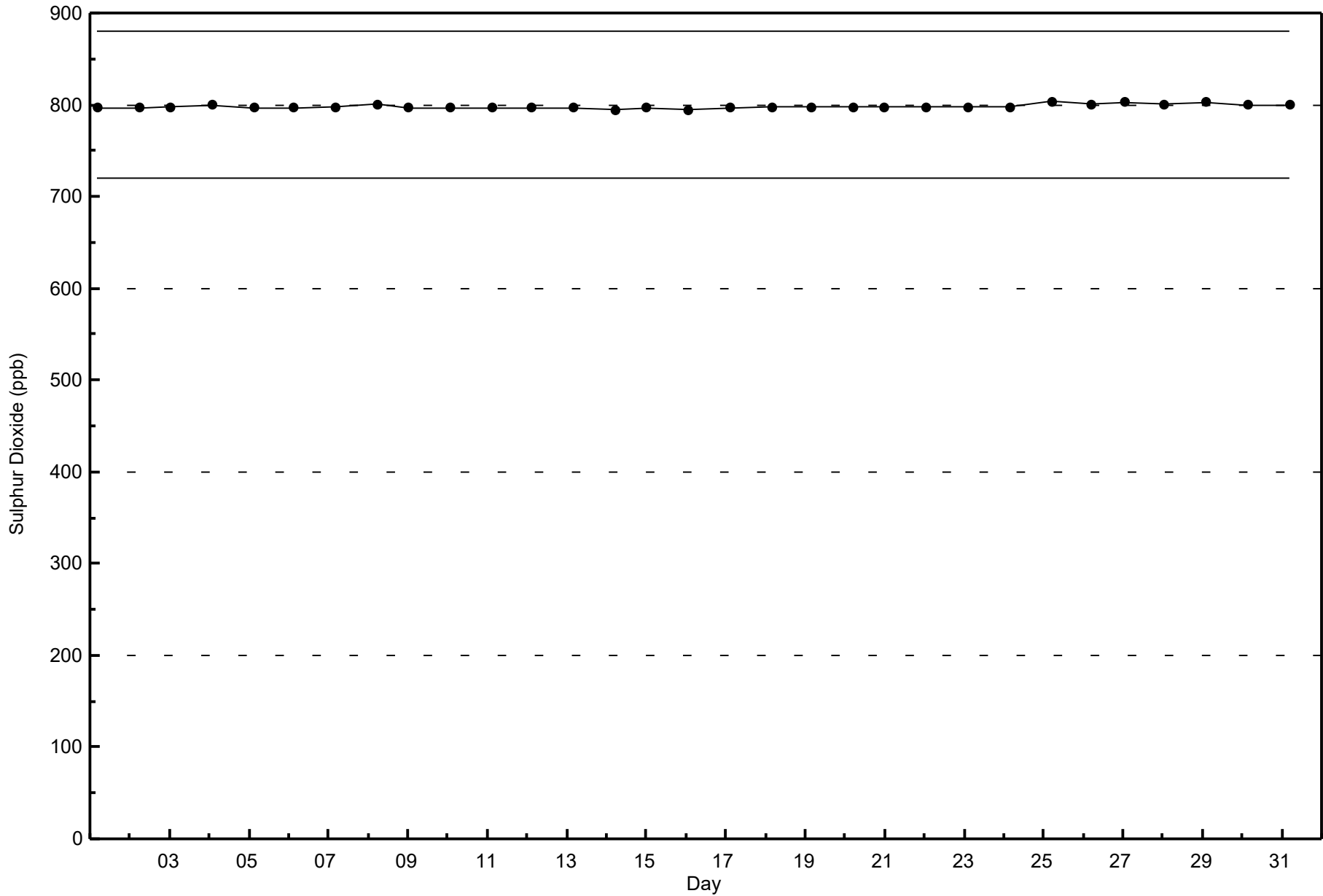


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Conklin







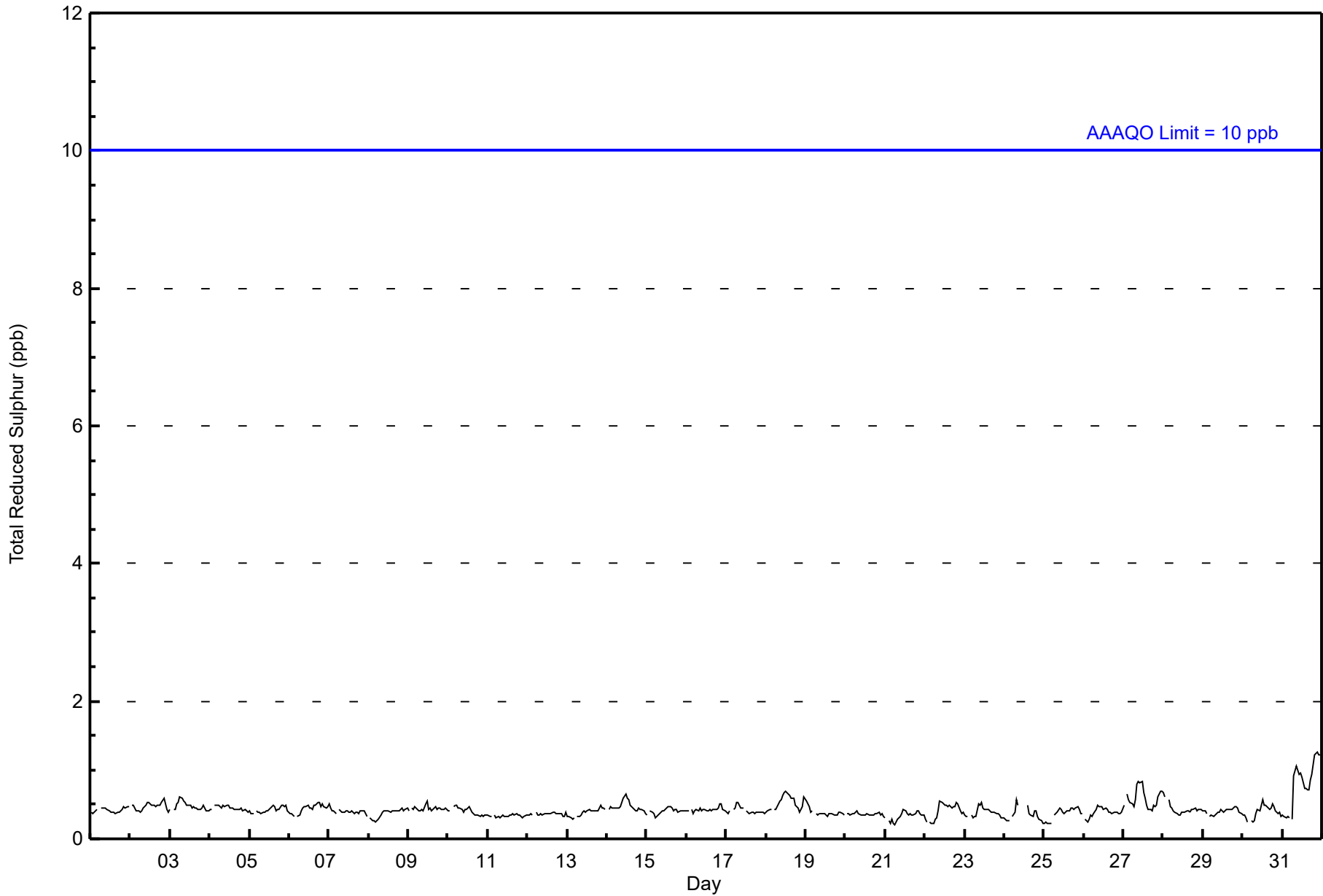


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744								
Maximum Value: 1.3 ppb on Aug 31 22:00				Maximum Daily Average: 0.8 ppb on Aug 31		Hours of Data: 707														707								
Minimum Value: 0.2 ppb on Aug 21 07:00				Minimum Daily Average: 0.3 ppb on Aug 21		Hours of Missing Data: 37														37								
Maximum Diurnal Average: 0.5 ppb at hour 12				Minimum Diurnal Average: 0.4 ppb at hour 3		Hours of Calibration: 36														36								
Monthly Average: 0.43 ppb				Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.4 Q ₃ = 0.5 P ₉₀ = 0.5 P ₉₉ = 0.9		Percent Operational Time: 99.9														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-Aug	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	0.5	0.4	0.5	0.5	0.4	0.5		
2-Aug	Z	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.6	
3-Aug	0.4	Z	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.6	
4-Aug	0.4	0.4	Z	0.5	0.5	0.5	0.5	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	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
5-Aug	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	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	
6-Aug	0.4	0.4	0.3	0.3	Z	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	
7-Aug	0.5	0.5	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	0.3	0.4	0.5	
8-Aug	Z	0.3	0.3	0.3	0.2	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	0.5
9-Aug	0.4	Z	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	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	0.5	
10-Aug	0.4	0.4	Z	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	
11-Aug	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	
12-Aug	0.4	0.4	0.4	0.4	Z	0.4	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	0.3	0.3	0.4	0.4	0.4	0.5	
13-Aug	0.3	0.3	0.3	0.3	0.3	Z	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	0.5	0.4	0.5	0.4	0.5	0.4	0.5	
14-Aug	Z	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
15-Aug	0.3	Z	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	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	0.5	
16-Aug	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	0.5	0.4	0.4	0.4	0.4	0.5	
17-Aug	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.5	0.5	0.4	0.4	M	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-Aug	0.4	0.4	0.4	0.4	Z	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7	
19-Aug	0.6	0.5	0.5	0.4	0.4	Z	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	
20-Aug	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	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
21-Aug	0.3	Z	0.3	0.2	0.3	0.2	0.2	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	0.3	0.4	0.4	
22-Aug	0.3	0.2	Z	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	
23-Aug	0.3	0.3	0.3	Z	0.3	0.3	0.3	0.3	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	0.3	0.3	0.3	0.3	0.4	0.5	
24-Aug	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.6	0.5	C	C	C	C	C	0.5	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.6	
25-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	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	0.5	0.4	0.4	0.4	0.4	0.4	0.5	
26-Aug	Z	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	
27-Aug	0.5	Z	0.6	0.6	0.5	0.5	0.5	0.6	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.8	
28-Aug	0.7	0.6	Z	0.6	0.5	0.4	0.4	0.4	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	0.4	0.4	0.7	
29-Aug	0.4	0.4	0.4	Z	0.3	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	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	
30-Aug	0.3	0.3	0.3	0.2	Z	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.6	
31-Aug	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.9	1.1	1.0	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.9	0.9	1.2	1.2	1.3	1.2	1.2	0.8	1.3	
																								Diurnal Average				
																								Diurnal Maximum				
																								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 0.5 0.4 0.4 0.4				
																								0.7 0.6 0.6 0.6 0.5 0.5 0.6 0.9 1.1 1.0 0.9 0.9 0.9 0.9 0.7 0.7 0.7 0.7 0.9 0.9 1.2 1.2 1.3 1.2 1.2				
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

Total Reduced Sulphur (TRS) - ppb
Conklin - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Conklin - August 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**

**Total Reduced Sulphur (TRS) - ppb
Conklin - August 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	42	13	5	13	10	39	62	56	61	49	66	48	32	74	81	52	703
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	42	13	5	13	10	39	62	56	61	49	66	48	32	74	81	52	703

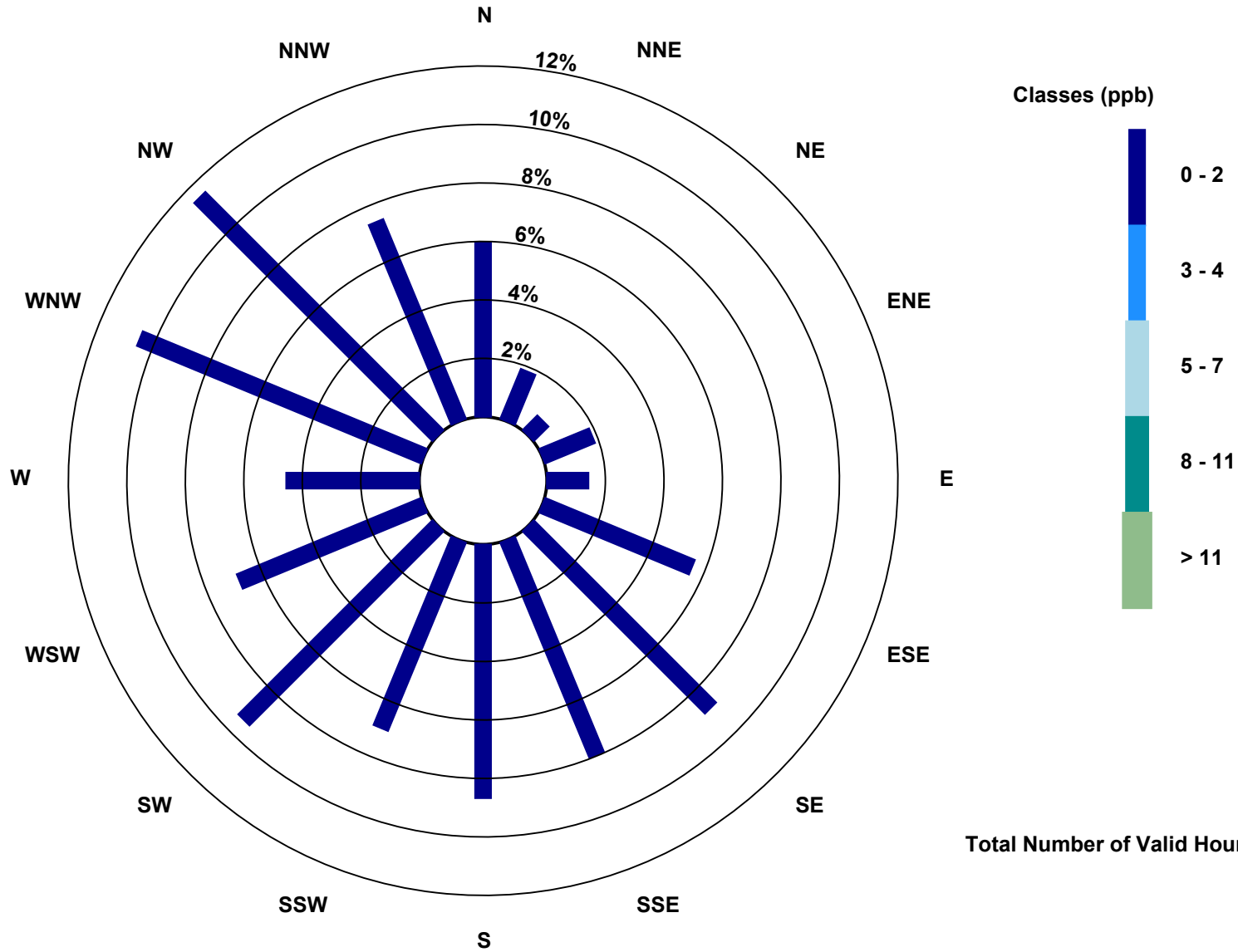
Total Number of Valid Hours: 703

Total Number of Hours: 744

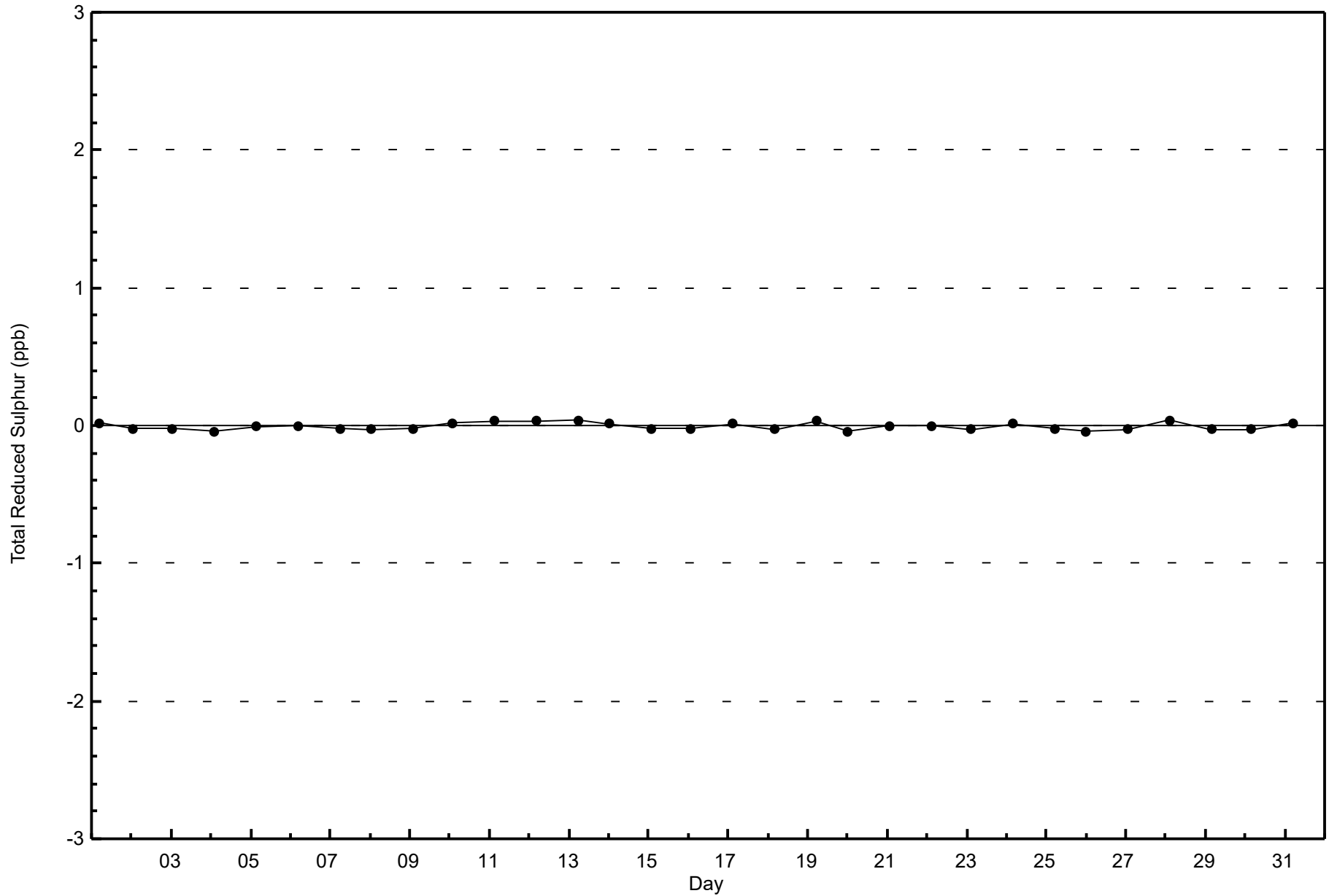


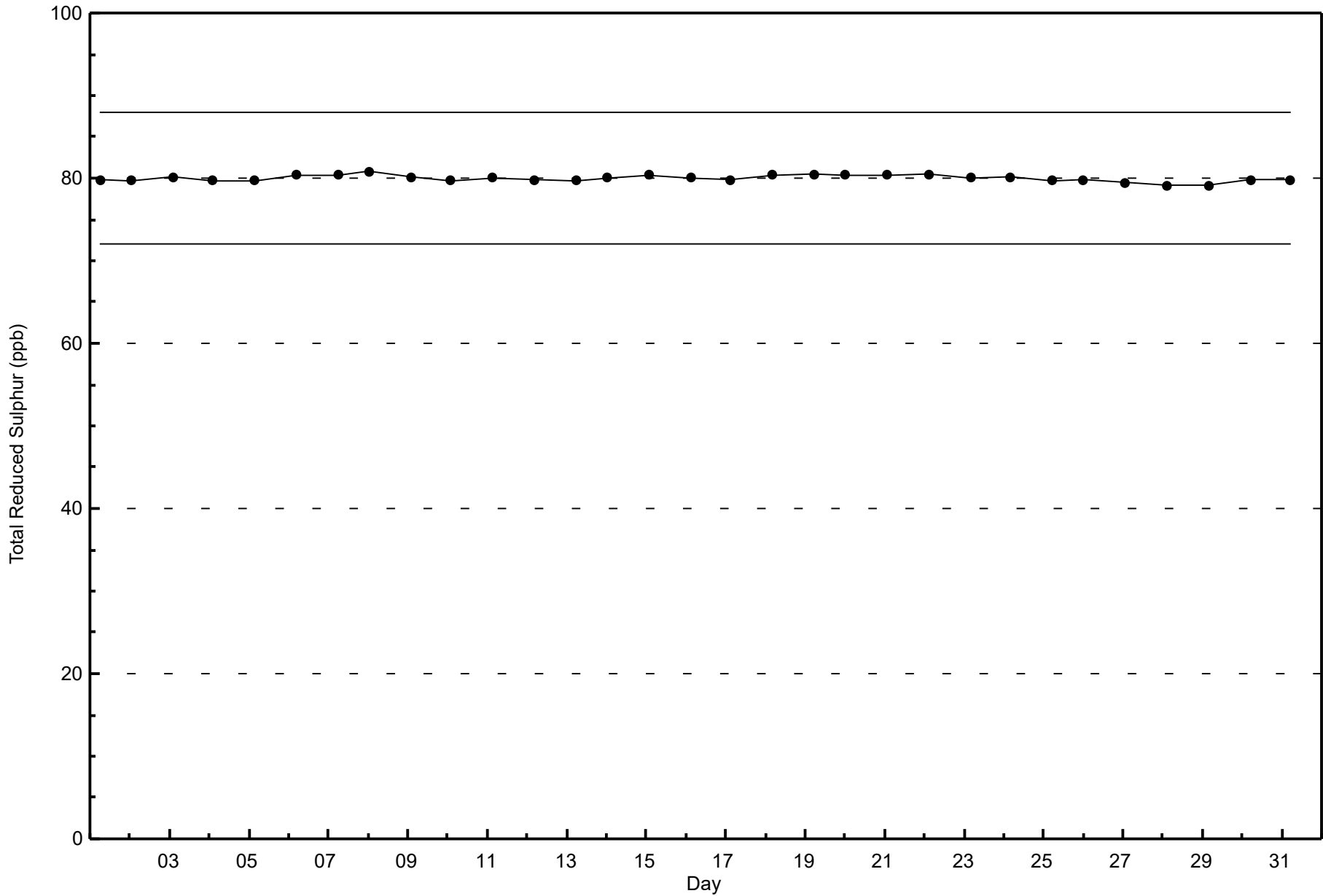
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Conklin



Total Number of Valid Hours: 703







Wood Buffalo Environmental Association
Summary of Hour Averages

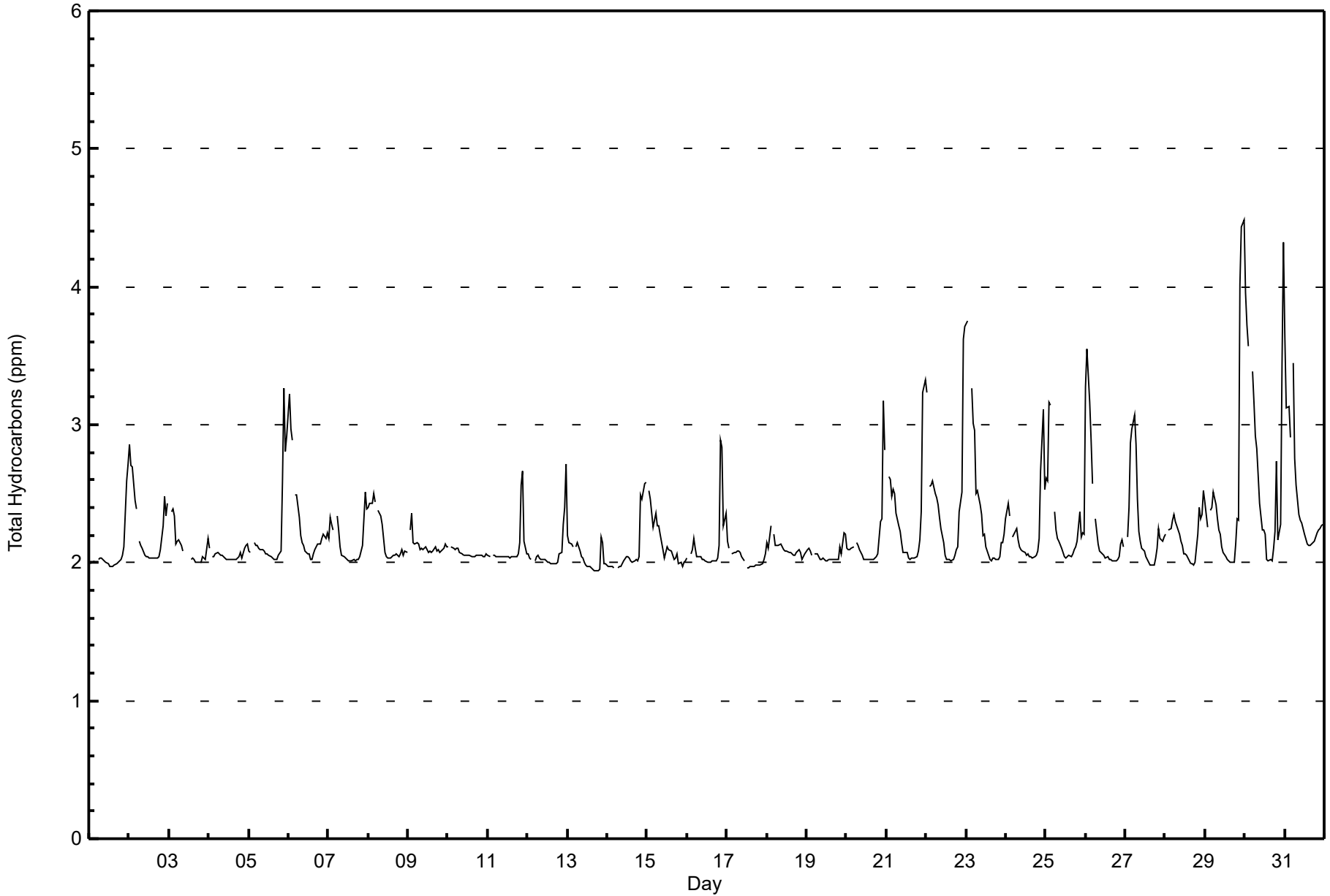
Total Hydrocarbons (THC) - ppm
Conklin - August 2023

Maximum Value: 4.5 ppm on Aug 30 00:00		Maximum Daily Average: 2.7 ppm on Aug 30		Hours in Service: 744																																													
Minimum Value: 1.9 ppm on Aug 13 18:00		Minimum Daily Average: 2.0 ppm on Aug 17		Hours of Data: 708																																													
Maximum Diurnal Average: 2.5 ppm at hour 24		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Missing Data: 36																																													
Monthly Average: 2.21 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.6 P ₉₉ = 3.7		Hours of Calibration: 35																																													
				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-Aug	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	2.6	2.7	2.1	2.7																							
2-Aug	2.9	2.7	2.7	2.5	2.4	Z	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	2.1	2.3	2.5	2.3	2.4	2.2	2.9																							
3-Aug	Z	2.4	2.4	2.3	2.1	2.2	2.2	2.1	2.1	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.4																							
4-Aug	2.1	Z	2.0	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	2.1	2.0	2.1	2.1	2.1	2.1	2.1																							
5-Aug	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.6	3.3	2.8	2.9	2.2	3.3																							
6-Aug	3.2	3.0	2.9	Z	2.5	2.5	2.3	2.2	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	2.3	3.2																							
7-Aug	2.2	2.3	2.3	2.2	Z	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.4	2.1	2.5																							
8-Aug	2.4	2.4	2.4	2.5	2.4	Z	2.4	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.5																							
9-Aug	Z	2.2	2.4	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	2.1	2.1	2.1	2.4																							
10-Aug	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1																							
11-Aug	2.1	2.0	Z	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	2.6	2.7	2.2	2.1	2.1	2.7																							
12-Aug	2.1	2.0	2.0	Z	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	2.0	2.0	2.1	2.1	2.3	2.4	2.7	2.1	2.7																							
13-Aug	2.2	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	1.9	1.9	1.9	2.0	2.2	2.1	2.0	2.0	2.0	2.0	2.2																							
14-Aug	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	2.5	2.5	2.6	2.6	2.1	2.6																							
15-Aug	Z	2.5	2.5	2.3	2.3	2.4	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.5																							
16-Aug	2.0	Z	2.1	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	2.1	2.9	2.8	2.3	2.4	2.1	2.9																							
17-Aug	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	M	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	2.2																							
18-Aug	2.1	2.1	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	2.0	2.0	2.1	2.1	2.3																							
19-Aug	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.2	2.2	2.2	2.1	2.2																							
20-Aug	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	2.1	2.3	2.3	3.2	2.8	2.2	3.2																							
21-Aug	Z	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	3.2	3.3	2.3	3.3																							
22-Aug	3.2	Z	2.5	2.6	2.6	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4	2.5	3.6	3.7	2.4	3.7																							
23-Aug	3.7	3.7	Z	3.3	3.0	3.0	2.5	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	3.7																							
24-Aug	2.3	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.7	3.1	2.5	2.2	3.1																							
25-Aug	2.6	2.6	3.2	3.1	Z	2.4	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.4	2.2	2.2	2.2	2.3	3.2																							
26-Aug	3.3	3.6	3.2	2.9	2.6	Z	2.3	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	2.1	2.2	2.1	2.1	2.3	3.6																							
27-Aug	Z	2.2	2.4	2.9	3.0	3.1	2.9	2.5	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.2	2.3	3.1																							
28-Aug	2.2	Z	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.3	2.4	2.5	2.2	2.5																							
29-Aug	2.4	2.3	Z	2.4	2.4	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	4.0	4.4	4.5	2.5	4.5																							
30-Aug	4.0	3.7	3.6	Z	3.4	3.2	2.9	2.8	2.6	2.4	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.2	2.7	2.2	2.3	3.4	4.3	2.7	4.3																							
31-Aug	3.6	3.1	3.1	2.9	Z	3.4	2.8	2.6	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.5	3.6																							
																								2.5	2.5	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.5	2.5	Diurnal Average		
																								4.0	3.7	3.6	3.3	3.4	3.4	2.9	2.8	2.6	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.7	2.9	4.0	4.4	4.5	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Conklin - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Conklin - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	258	36.44	36.44
2.1 - 3.0	418	59.04	95.48
3.1 - 10.0	32	4.52	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
Conklin - August 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	13	8	3	5	2	12	5	1	1	8	36	37	26	54	36	10	257
2.1 - 3.0	31	8	2	8	7	26	49	37	51	43	29	11	5	19	43	46	415
3.1 - 10.0	0	0	0	0	0	0	5	18	8	0	0	1	0	0	0	0	32
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	16	5	13	9	38	59	56	60	51	65	49	31	73	79	56	704

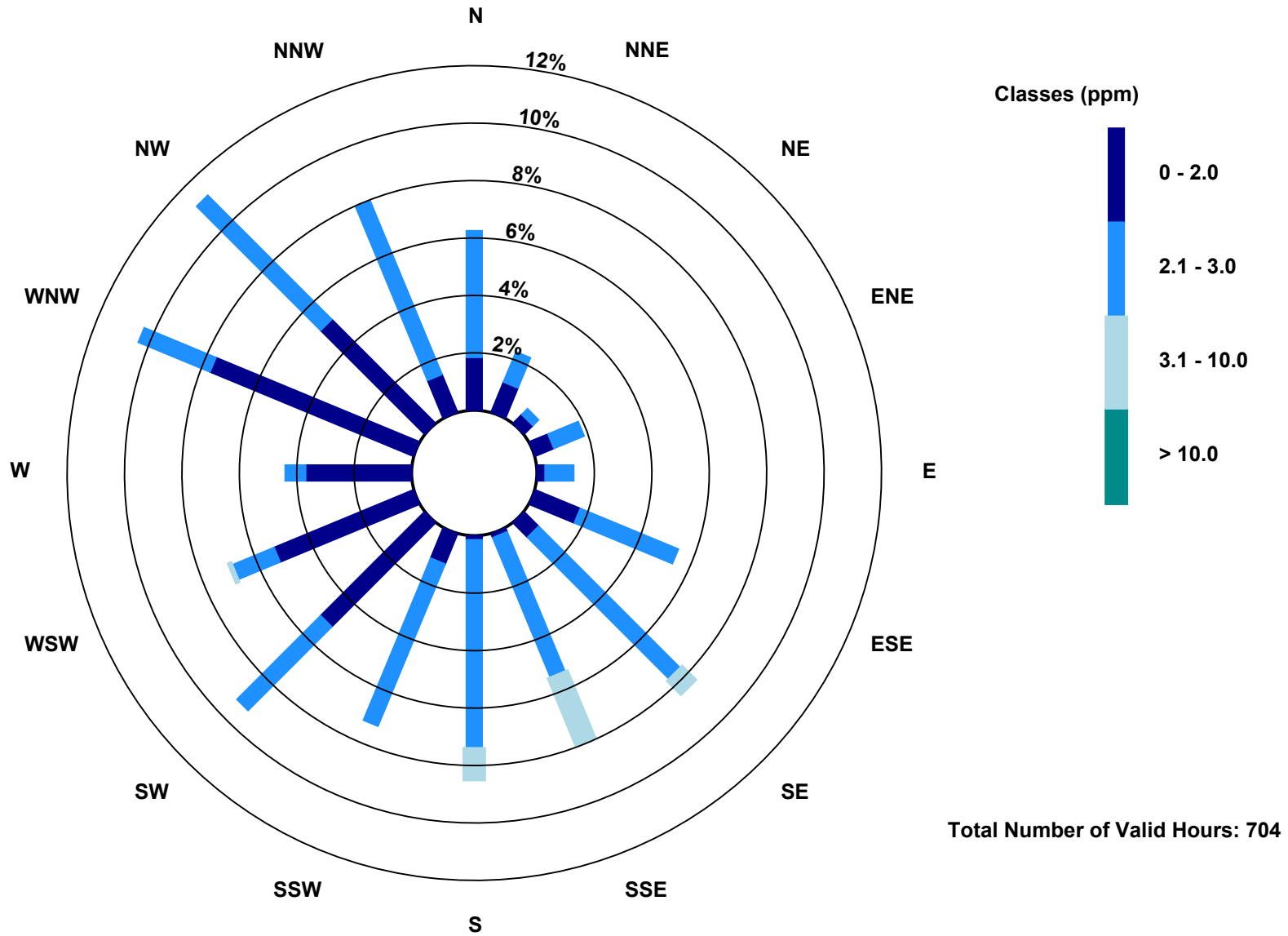
Total Number of Valid Hours: 704

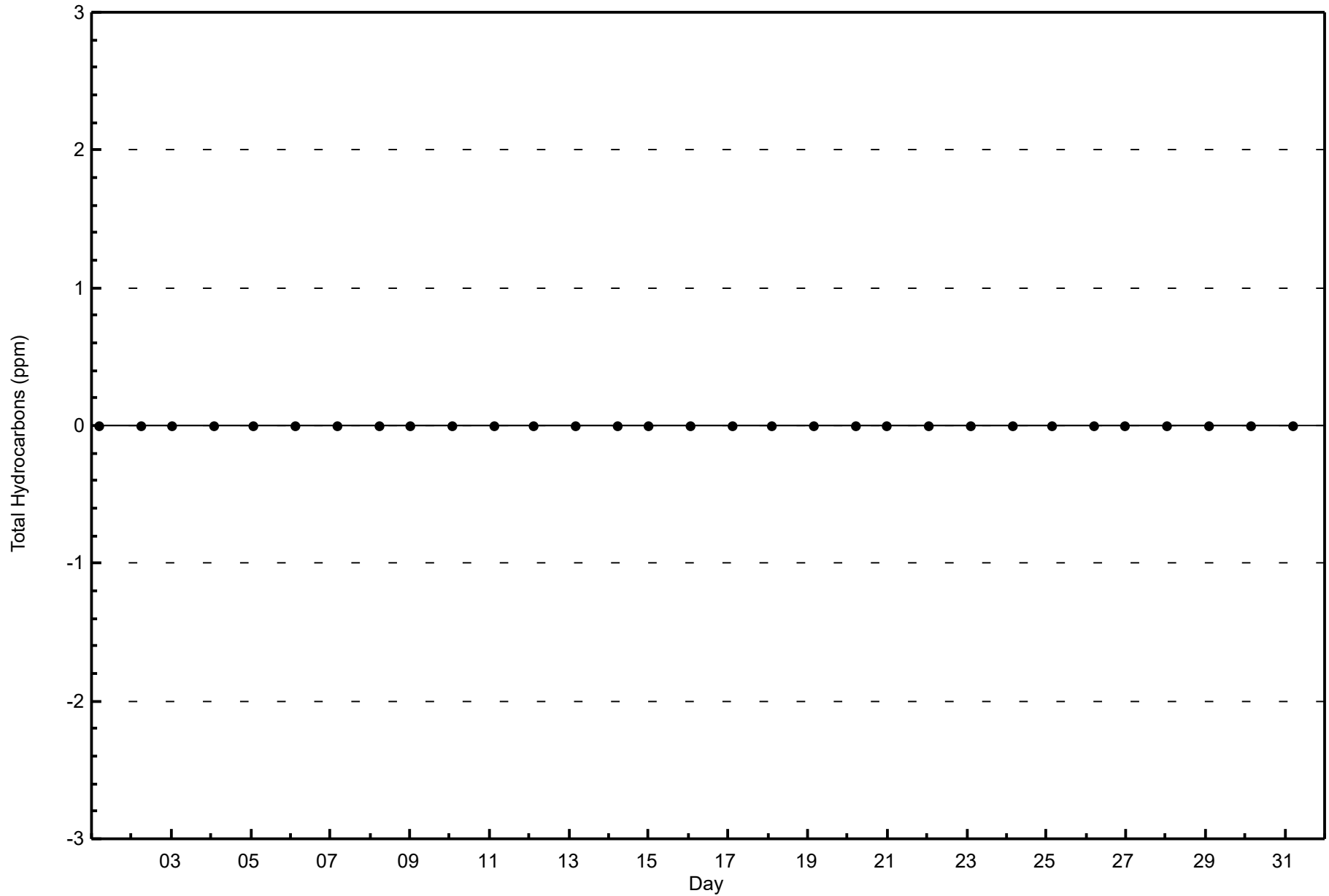
Total Number of Hours: 744

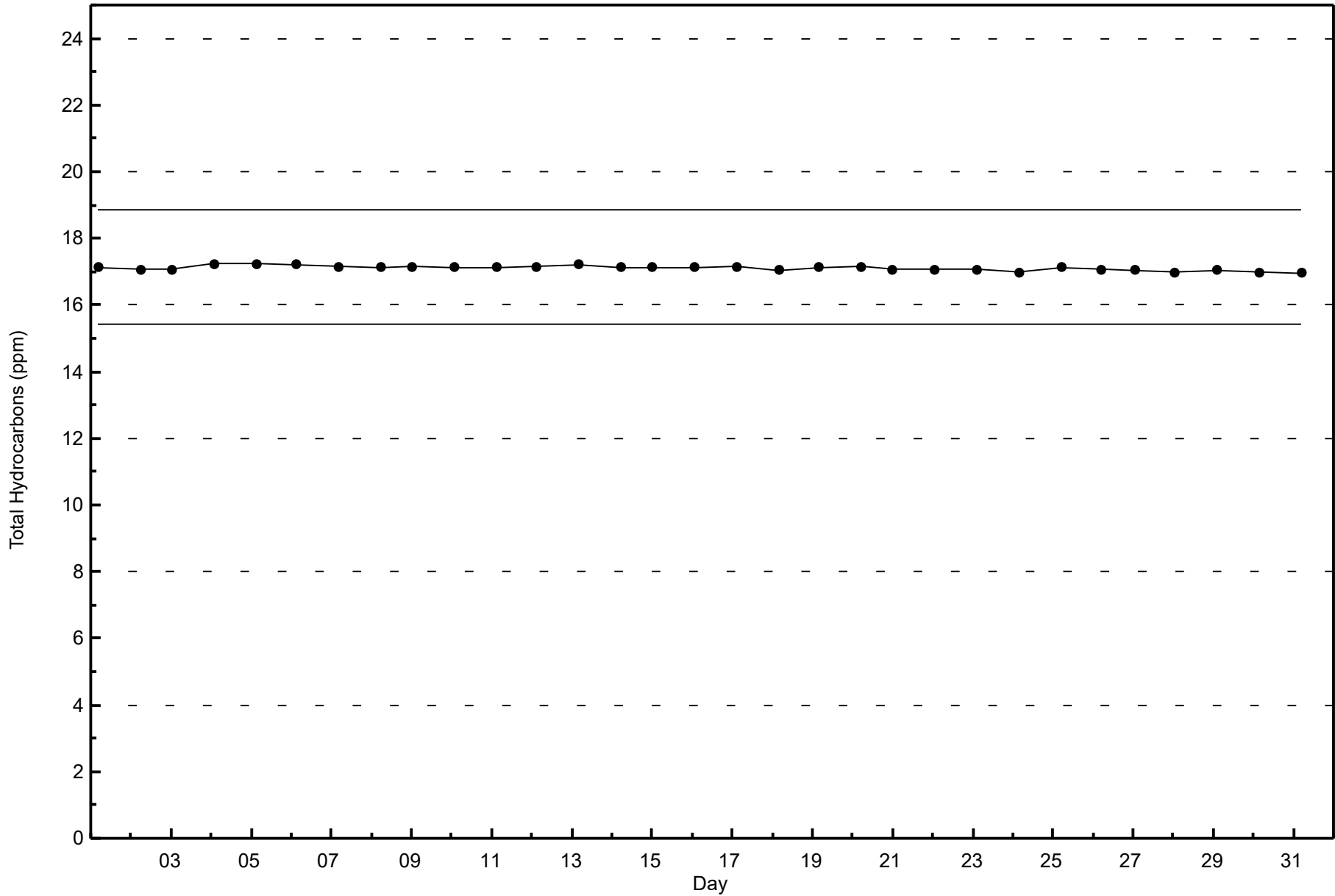


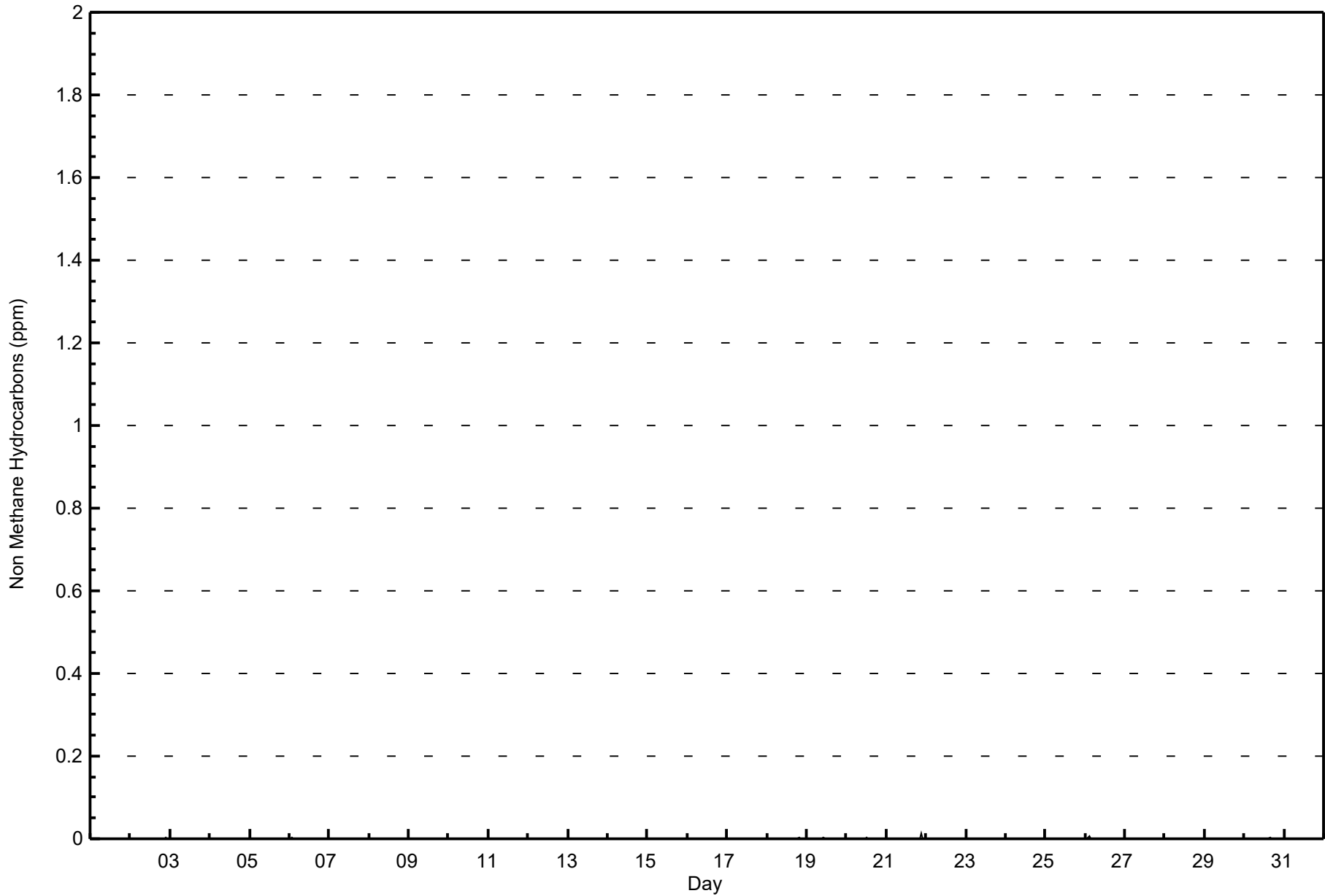
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Conklin











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Conklin - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	706	99.72	99.72
0.006 - 0.05	2	0.28	100.00
0.06 - 0.1	0	0.00	100.00
> 0.1	0	0.00	100.00

Total Number of Valid Hours: 708

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Conklin - August 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	43	16	5	13	9	38	59	56	59	51	65	49	31	73	79	56	702
0.006 - 0.05	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
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	16	5	13	9	38	59	56	60	51	65	49	31	73	79	56	704

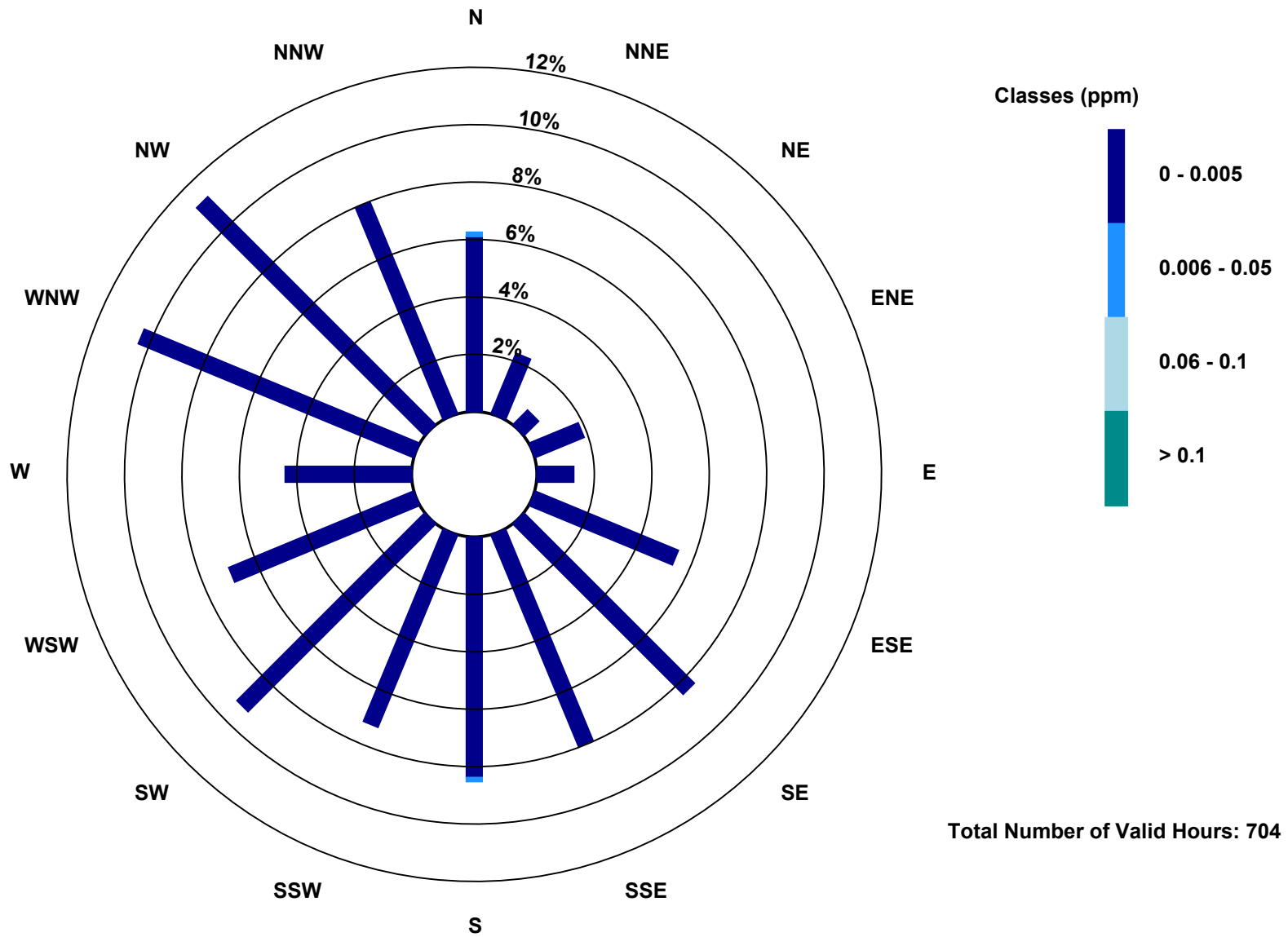
Total Number of Valid Hours: 704

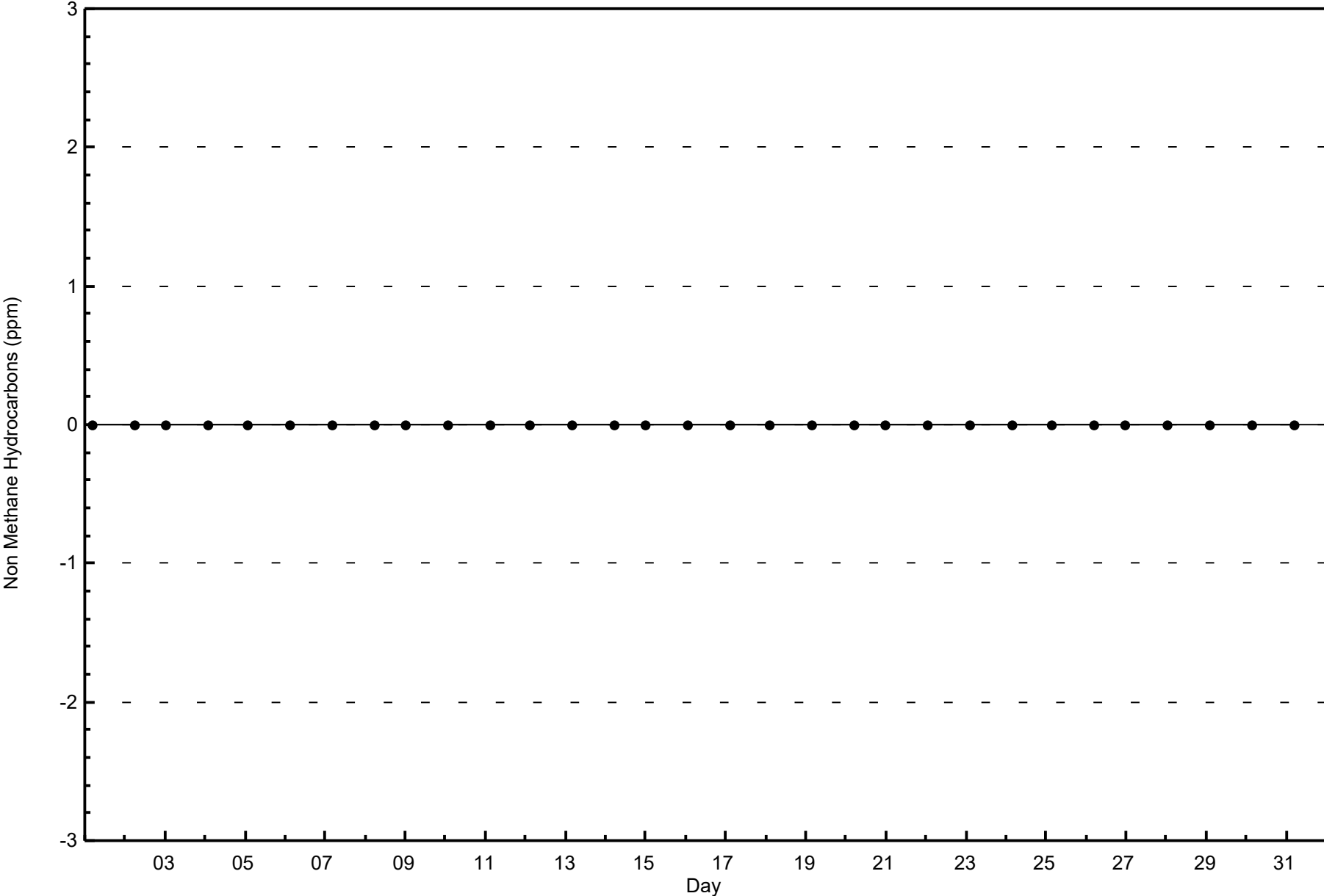
Total Number of Hours: 744

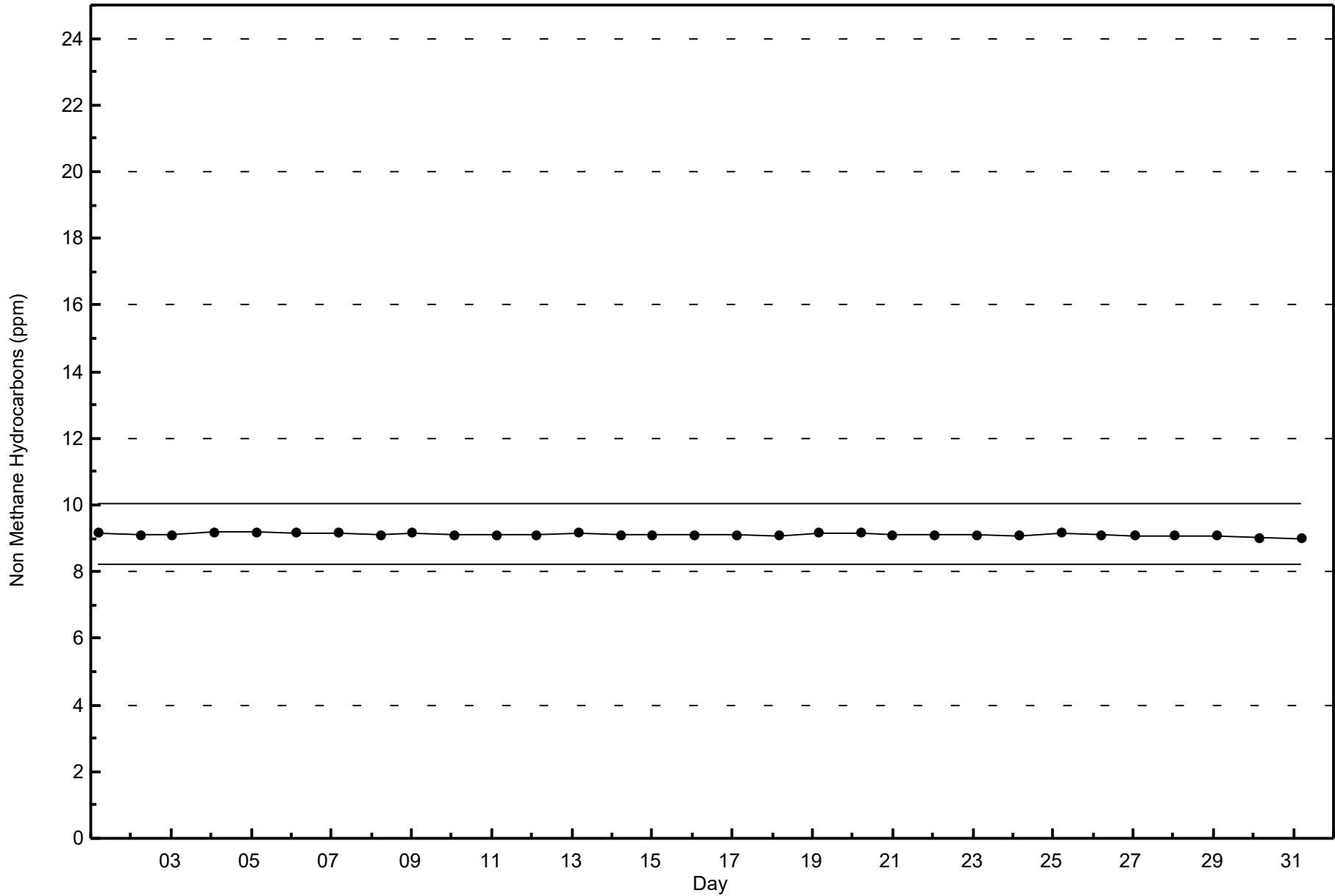


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Conklin





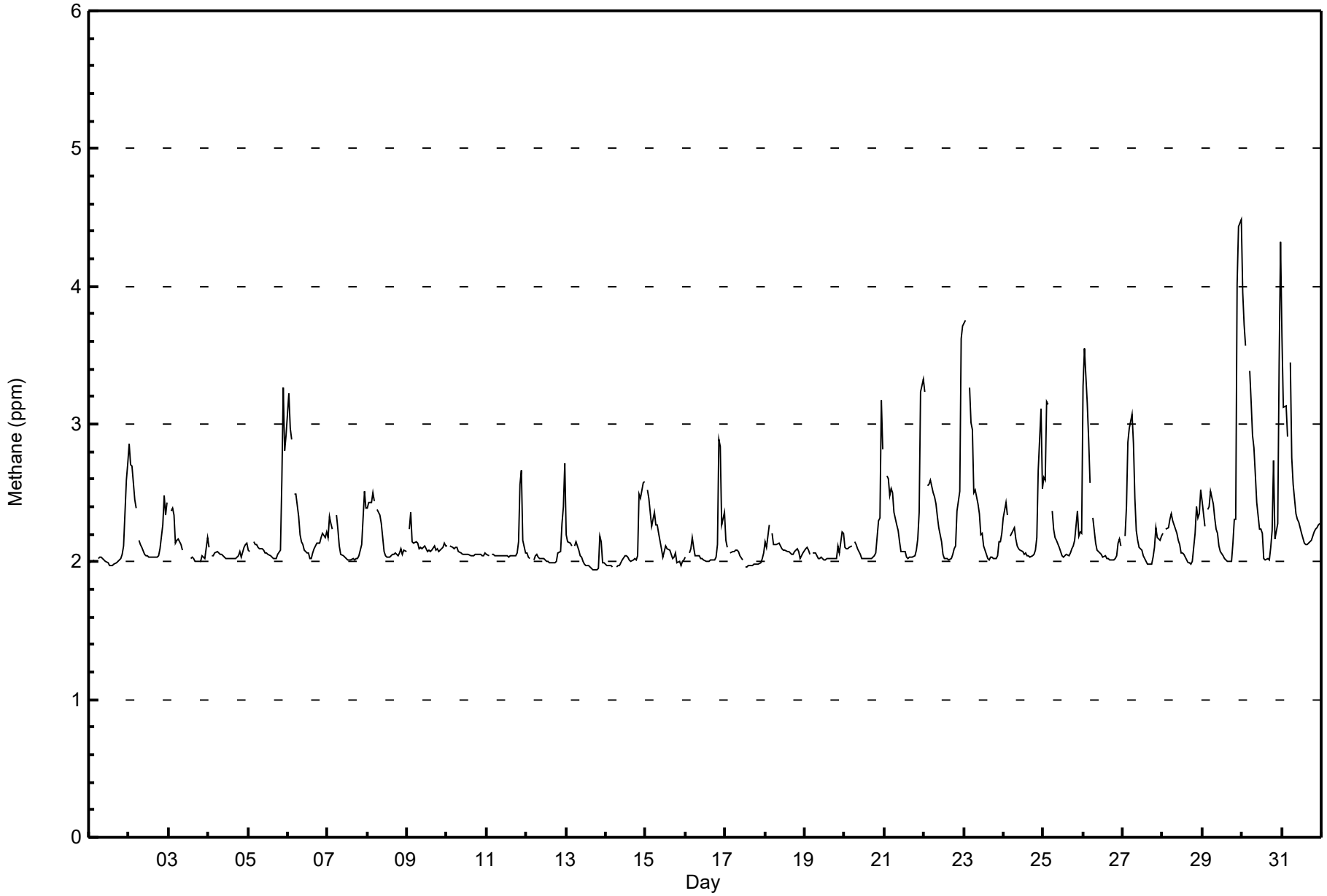




Wood Buffalo Environmental Association
Summary of Hour Averages

Methane (CH₄) - ppm
Conklin - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum																											
Maximum Value: 4.5 ppm on Aug 30 00:00		Maximum Daily Average: 2.7 ppm on Aug 30		Hours of Data: 708														Hours of Missing Data: 36		Hours of Calibration: 35		Percent Operational Time: 99.9																											
Minimum Value: 1.9 ppm on Aug 13 18:00		Minimum Daily Average: 2.0 ppm on Aug 17		Hours of Missing Data: 36														Hours of Calibration: 35		Percent Operational Time: 99.9																													
Maximum Diurnal Average: 2.5 ppm at hour 24		Minimum Diurnal Average: 2.0 ppm at hour 16		Hours of Calibration: 35														Hours of Calibration: 35		Percent Operational Time: 99.9																													
Monthly Average: 2.21 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.1 Q ₃ = 2.2 P ₉₀ = 2.6 P ₉₉ = 3.7		Hours of Calibration: 35														Hours of Calibration: 35		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-Aug	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	2.6	2.7	2.1	2.7																							
2-Aug	2.9	2.7	2.7	2.5	2.4	Z	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	2.1	2.3	2.5	2.3	2.4	2.2	2.9																							
3-Aug	Z	2.4	2.4	2.3	2.1	2.2	2.2	2.1	2.1	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.1	2.4																								
4-Aug	2.1	Z	2.0	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	2.1	2.0	2.1	2.1	2.1	2.1	2.1																							
5-Aug	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	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.6	3.3	2.8	2.9	2.2	3.3																							
6-Aug	3.2	3.0	2.9	Z	2.5	2.5	2.3	2.2	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	2.3	3.2																							
7-Aug	2.2	2.3	2.3	2.2	Z	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.5	2.4	2.1	2.5																							
8-Aug	2.4	2.4	2.4	2.5	2.4	Z	2.4	2.3	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.5																							
9-Aug	Z	2.2	2.4	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	2.1	2.1	2.1	2.4																							
10-Aug	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	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0	2.0	2.1	2.1	2.1																							
11-Aug	2.1	2.0	Z	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	2.6	2.7	2.2	2.1	2.1	2.7																							
12-Aug	2.1	2.0	2.0	Z	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	2.0	2.0	2.1	2.1	2.3	2.4	2.7	2.1	2.7																							
13-Aug	2.2	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	1.9	1.9	1.9	2.0	2.2	2.1	2.0	2.0	2.0	2.2	2.2																							
14-Aug	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	2.5	2.5	2.6	2.6	2.1	2.6																							
15-Aug	Z	2.5	2.5	2.3	2.3	2.4	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.5																							
16-Aug	2.0	Z	2.1	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	2.1	2.9	2.8	2.3	2.4	2.1	2.9																							
17-Aug	2.2	2.1	Z	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	M	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	2.2																							
18-Aug	2.1	2.1	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	2.0	2.0	2.1	2.1	2.3																							
19-Aug	2.1	2.1	2.1	2.1	Z	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	2.1	2.1	2.2	2.2	2.1	2.1	2.2																							
20-Aug	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	2.1	2.3	2.3	3.2	2.8	2.2	3.2																							
21-Aug	Z	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.4	3.2	3.3	2.3	3.3																							
22-Aug	3.2	Z	2.5	2.6	2.6	2.5	2.5	2.4	2.3	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.4	2.5	3.6	3.7	2.4	3.7																							
23-Aug	3.7	3.7	Z	3.3	3.0	3.0	2.5	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.4	3.7																							
24-Aug	2.3	2.4	2.3	Z	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.7	3.1	2.5	2.2	3.1																							
25-Aug	2.6	2.6	3.2	3.1	Z	2.4	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.4	2.2	2.2	2.2	2.3	3.2																							
26-Aug	3.3	3.6	3.2	2.9	2.6	Z	2.3	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	2.1	2.2	2.1	2.1	2.3	3.6																							
27-Aug	Z	2.2	2.4	2.9	3.0	3.1	2.9	2.5	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.2	2.2	2.2	2.3	3.1																							
28-Aug	2.2	Z	2.2	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	2.3	2.4	2.5	2.2	2.5																							
29-Aug	2.4	2.3	Z	2.4	2.4	2.5	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.3	2.3	4.0	4.4	4.5	2.5	4.5																							
30-Aug	4.0	3.7	3.6	Z	3.4	3.2	2.9	2.8	2.6	2.4	2.2	2.2	2.2	2.0	2.0	2.0	2.0	2.1	2.2	2.7	2.2	2.3	3.4	4.3	2.7	4.3																							
31-Aug	3.6	3.1	3.1	2.9	Z	3.4	2.8	2.6	2.4	2.3	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.5	3.6																							
																								2.5	2.5	2.4	2.4	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.3	2.5	2.5	Diurnal Average		
																								4.0	3.7	3.6	3.3	3.4	3.4	2.9	2.8	2.6	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.7	2.9	4.0	4.4	4.5	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance																					





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Methane (CH₄) - ppm
Conklin - August 2023**

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	258	36.44	36.44
2.1 - 3.0	418	59.04	95.48
3.1 - 10.0	32	4.52	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
Conklin - August 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	13	8	3	5	2	12	5	1	1	8	36	37	26	54	36	10	257
2.1 - 3.0	31	8	2	8	7	26	49	37	51	43	29	11	5	19	43	46	415
3.1 - 10.0	0	0	0	0	0	0	5	18	8	0	0	1	0	0	0	0	32
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	44	16	5	13	9	38	59	56	60	51	65	49	31	73	79	56	704

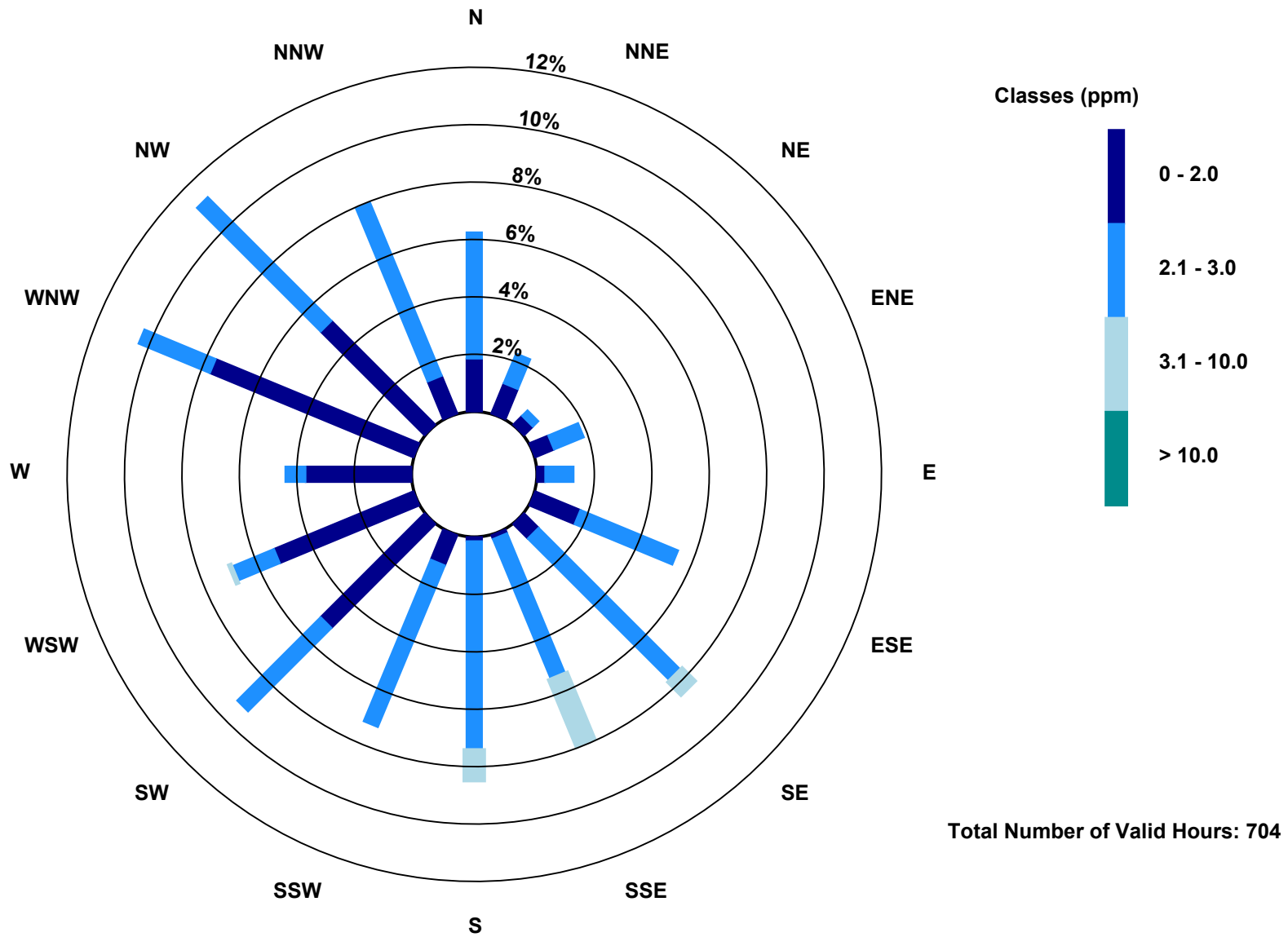
Total Number of Valid Hours: 704

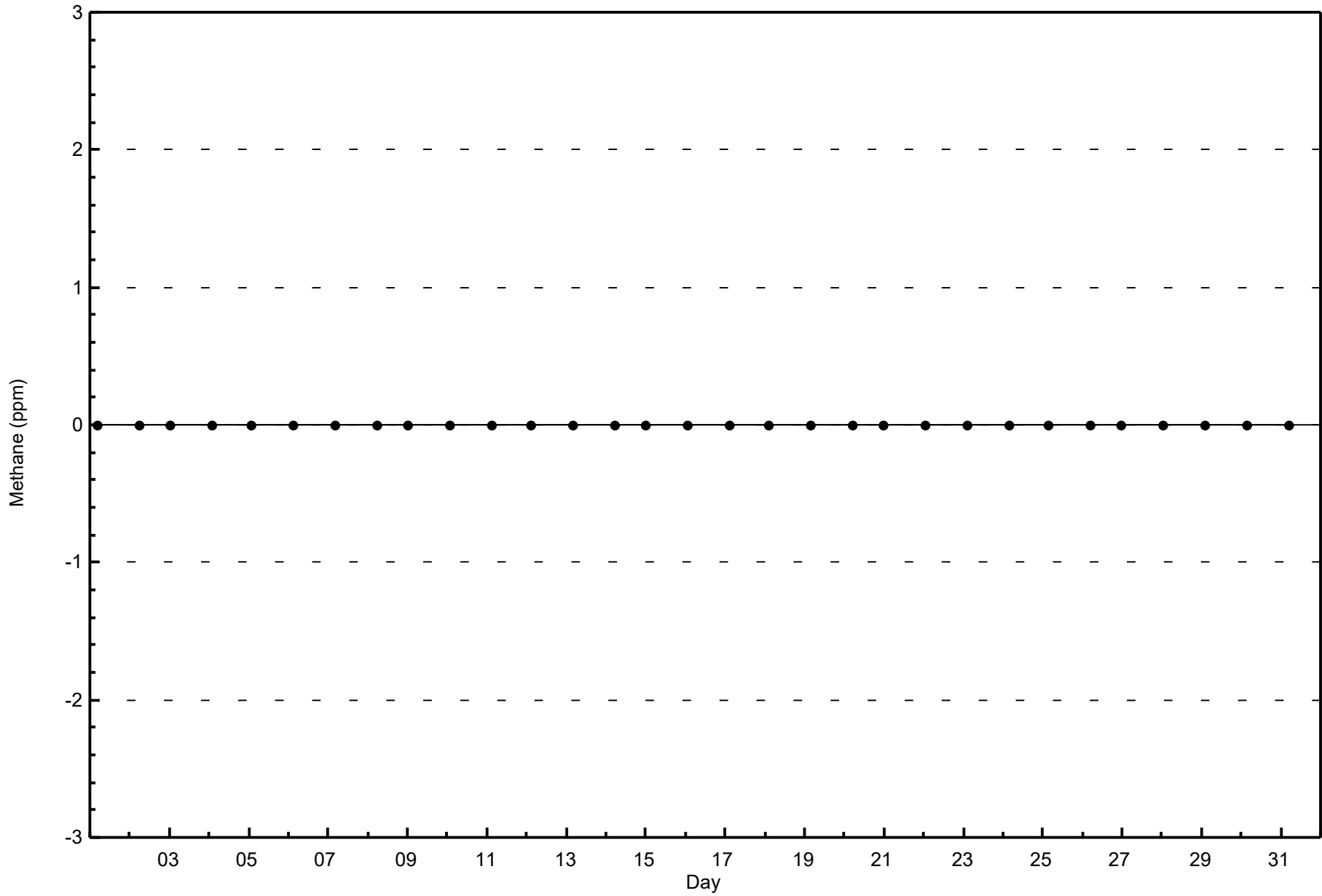
Total Number of Hours: 744

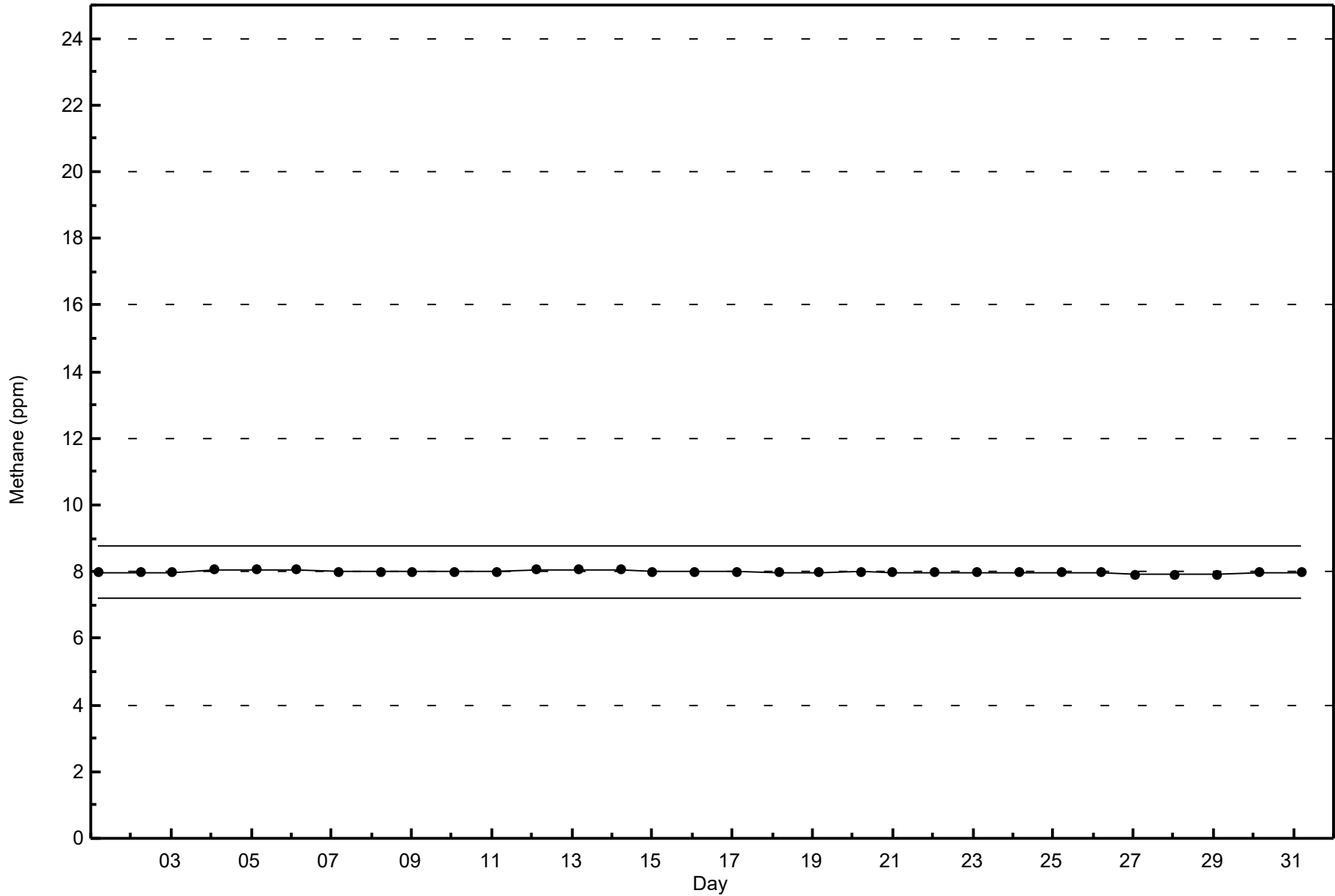


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Conklin









Wood Buffalo Environmental Association
Summary of Hour Averages

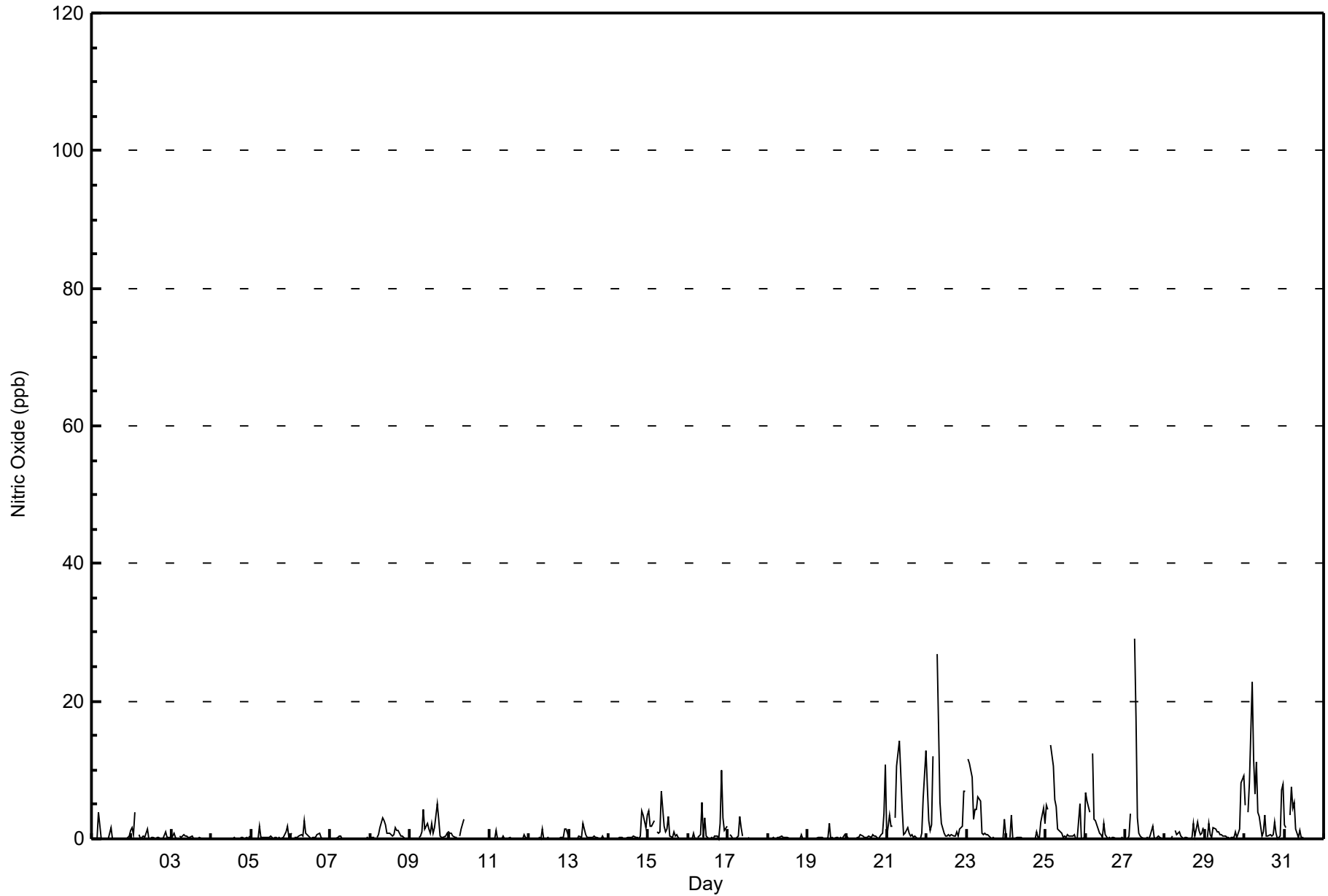
Nitric Oxide (NO) - ppb
Conklin - August 2023

Maximum Value: 29.0 ppb on Aug 27 06:00																					Maximum Daily Average: 4.5 ppb on Aug 30					Hours in Service: 744																							
Minimum Value: 0.0 ppb on Aug 1 01:00											Minimum Daily Average: 0.1 ppb on Aug 7					Hours of Data: 707																																	
Maximum Diurnal Average: 2.9 ppb at hour 5											Minimum Diurnal Average: 0.2 ppb at hour 15					Hours of Missing Data: 37																																	
Monthly Average: 1.14 ppb											Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.2 Q ₃ = 0.8 P ₉₀ = 3.1 P ₉₉ = 12.9					Hours of Calibration: 35																																	
																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-Aug	0.0	0.0	Z	0.0	3.9	0.0	0.0	0.1	0.1	0.0	0.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	0.3	3.9																								
2-Aug	1.6	0.6	3.8	Z	0.5	0.1	0.1	0.3	0.2	1.4	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.0	0.0	0.0	1.0	0.3	0.1	0.2	0.5	3.8																							
3-Aug	0.1	0.7	0.1	0.1	Z	0.4	0.3	0.5	0.3	0.4	0.3	0.3	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.7																							
4-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.2	0.0	0.4	0.1	0.4																							
5-Aug	Z	0.0	0.0	0.1	0.0	1.9	0.2	0.2	0.2	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	1.0	1.9	0.3	0.3	1.9																							
6-Aug	0.9	Z	0.2	0.2	0.2	0.4	0.6	0.4	2.7	0.9	0.7	0.1	0.1	0.1	0.2	0.1	0.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.7																							
7-Aug	0.0	0.0	Z	0.0	0.1	0.4	0.3	0.0	0.1	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	0.1	0.1	0.1	0.4																							
8-Aug	0.2	0.2	0.2	Z	0.2	0.6	1.7	3.2	2.7	2.0	0.7	0.7	0.8	0.5	0.6	1.5	1.1	1.2	0.4	0.4	0.3	0.1	0.0	0.0	0.8	3.2																							
9-Aug	0.0	0.1	0.0	0.0	Z	0.2	0.3	1.1	4.2	1.4	2.2	1.4	0.7	2.2	0.8	1.6	5.0	2.8	0.4	0.1	0.2	0.4	0.9	0.9	1.2	5.0																							
10-Aug	0.9	0.8	0.4	0.3	0.3	Z	0.4	1.4	2.9	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.9																							
11-Aug	Z	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.6	0.2	0.0	0.1	1.3																							
12-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.1	1.4	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.2	1.4	1.4	0.8	0.3	1.4																							
13-Aug	0.1	0.2	Z	0.0	0.0	0.0	0.3	0.2	2.2	1.4	0.6	0.2	0.1	0.3	0.2	0.3	0.3	0.1	0.1	0.1	0.4	0.0	0.0	0.0	0.3	2.2																							
14-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.1	0.1	0.1	0.4	4.0	3.5	1.5	3.5	0.6	4.0																							
15-Aug	4.0	1.9	1.8	2.7	Z	1.0	0.8	0.9	7.0	1.9	1.1	1.4	3.3	0.4	0.2	1.0	0.3	0.5	0.2	0.0	0.1	0.0	0.0	0.0	1.3	7.0																							
16-Aug	0.0	0.0	0.0	0.9	0.0	Z	0.1	0.7	5.2	0.1	3.0	0.5	0.1	0.1	0.1	0.1	0.3	0.3	0.1	2.2	9.9	3.1	1.1	1.8	1.3	9.9																							
17-Aug	Z	0.6	0.4	0.0	0.0	0.1	0.4	3.2	1.7	0.5	M	M	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.4	3.2																							
18-Aug	0.0	Z	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.0	0.1	0.6																							
19-Aug	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	2.3	0.1	0.1	0.1	0.1	0.1	0.0	0.3	0.1	0.6	0.6	0.2	2.3																							
20-Aug	0.1	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.5	0.5	0.3	0.2	0.2	0.3	0.2	0.6	0.4	0.3	0.1	0.1	0.6	0.8	3.6	10.9	0.9	10.9																							
21-Aug	0.3	3.5	1.8	1.8	Z	3.1	10.7	14.2	9.6	4.5	0.6	0.8	1.6	0.9	0.5	0.6	0.3	0.4	0.0	0.0	0.0	0.8	5.9	12.9	3.3	14.2																							
22-Aug	7.6	2.7	1.2	2.0	11.9	Z	26.9	16.2	5.2	2.2	0.9	0.5	0.5	0.6	0.5	0.5	0.5	0.5	1.1	0.5	1.4	1.8	6.9	6.8	4.3	26.9																							
23-Aug	Z	11.6	11.0	8.9	2.8	4.2	4.2	6.1	5.6	0.9	0.7	0.7	0.5	0.6	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.7	11.6																							
24-Aug	0.5	Z	0.1	3.5	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.3	0.2	2.5	4.5	2.1	0.7	4.5																							
25-Aug	4.8	4.2	Z	13.6	10.7	5.7	4.6	1.5	1.3	0.9	0.2	0.5	0.2	0.6	0.5	0.3	0.4	0.6	0.1	0.1	5.1	0.0	0.1	0.2	2.4	13.6																							
26-Aug	6.8	5.5	3.9	Z	12.4	2.9	2.7	1.5	0.8	0.7	0.3	2.3	0.7	0.1	0.2	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.2	0.0	1.8	12.4																							
27-Aug	0.0	0.0	0.5	3.6	Z	29.0	17.6	3.1	0.8	0.3	0.1	0.0	0.0	0.2	0.1	0.3	1.8	0.2	0.1	0.1	0.4	0.1	0.0	0.0	2.5	29.0																							
28-Aug	0.0	0.0	0.0	0.0	0.4	Z	1.1	0.6	1.0	0.5	0.2	0.1	0.2	0.1	0.0	0.0	0.3	2.3	0.3	2.5	1.2	0.5	0.7	1.6	0.6	2.5																							
29-Aug	Z	0.2	2.2	0.7	0.3	1.6	1.4	1.0	1.1	0.6	0.5	0.4	0.3	0.2	0.3	0.0	0.1	0.3	1.1	0.3	0.9	1.5	8.1	9.2	1.4	9.2																							
30-Aug	4.9	Z	3.8	8.1	22.7	11.7	6.5	11.2	3.9	3.4	0.5	1.0	3.5	0.4	0.5	0.5	0.5	0.7	2.5	0.9	0.0	0.3	7.1	8.0	4.5	22.7																							
31-Aug	2.1	1.7	Z	3.4	7.4	4.4	5.4	1.4	0.1	1.3	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	1.2	7.4																							
																								1.3	1.3	1.3	1.9	2.9	2.6	2.8	2.3	2.0	0.9	0.5	0.5	0.5	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.9	0.6	1.5	2.1	Diurnal Average	
																								7.6	11.6	11.0	13.6	22.7	29.0	26.9	16.2	9.6	4.5	3.0	2.3	3.5	2.3	0.8	1.6	5.0	2.8	2.5	2.5	9.9	3.5	8.1	12.9	Diurnal Maximum	
Z - zerospan			C - Calibration			M - Maintenance																																											



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Conklin - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Conklin - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	704	99.58	99.58
21 - 40	3	0.42	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
Conklin - August 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	16	5	11	8	39	61	54	59	52	66	44	32	74	80	56	700
21 - 40	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
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	43	16	5	11	8	39	61	54	62	52	66	44	32	74	80	56	703

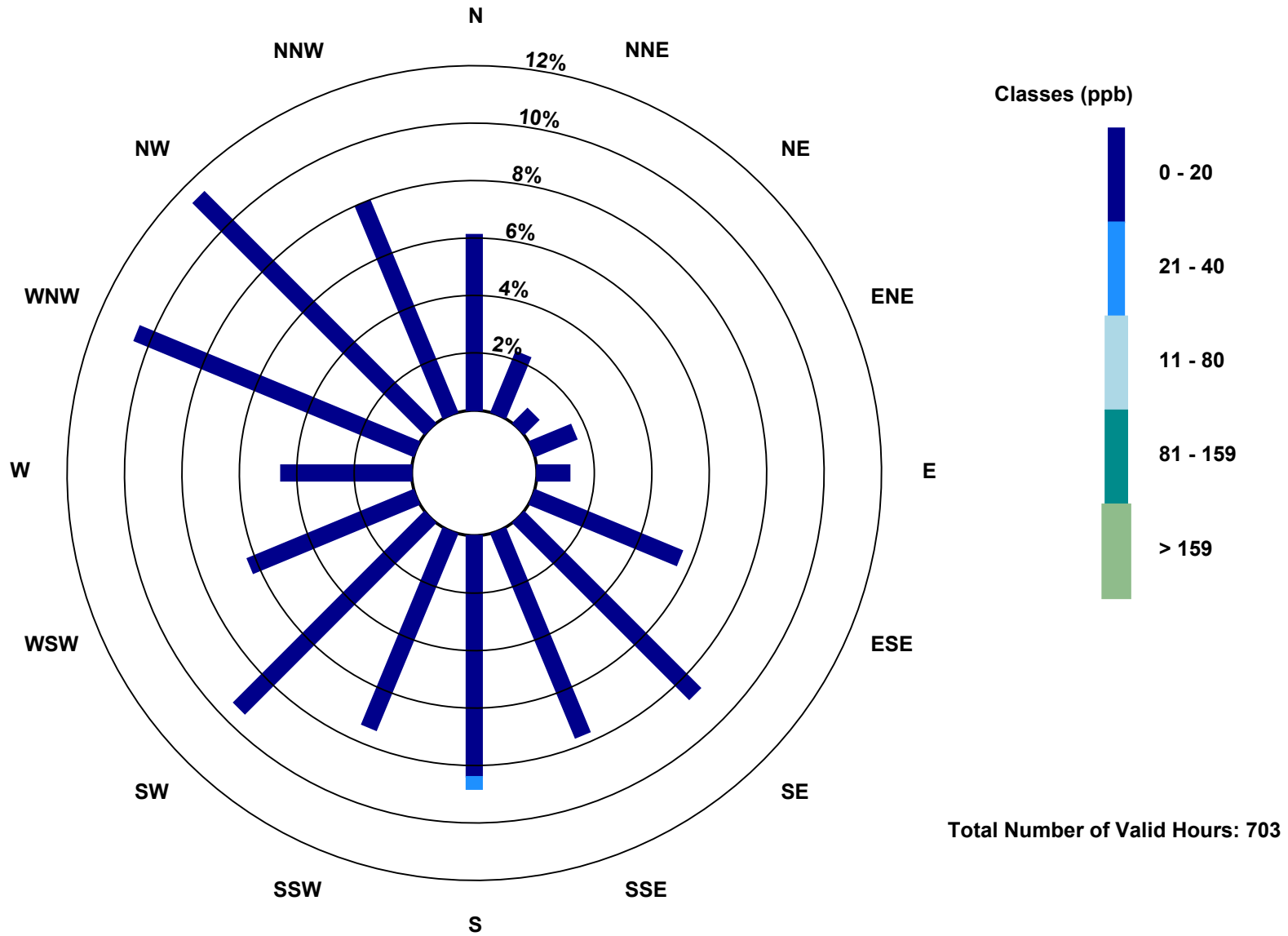
Total Number of Valid Hours: 703

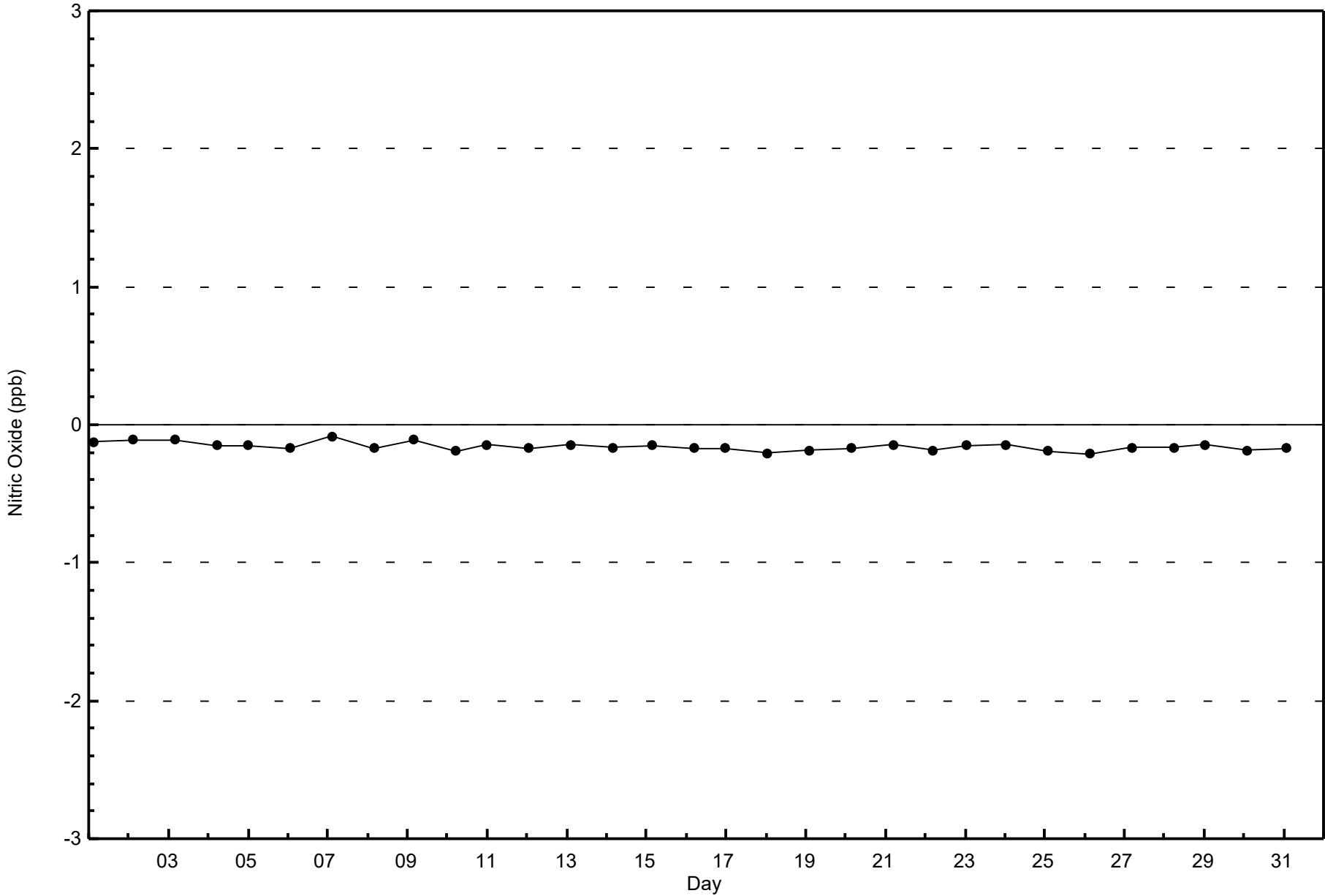
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Conklin

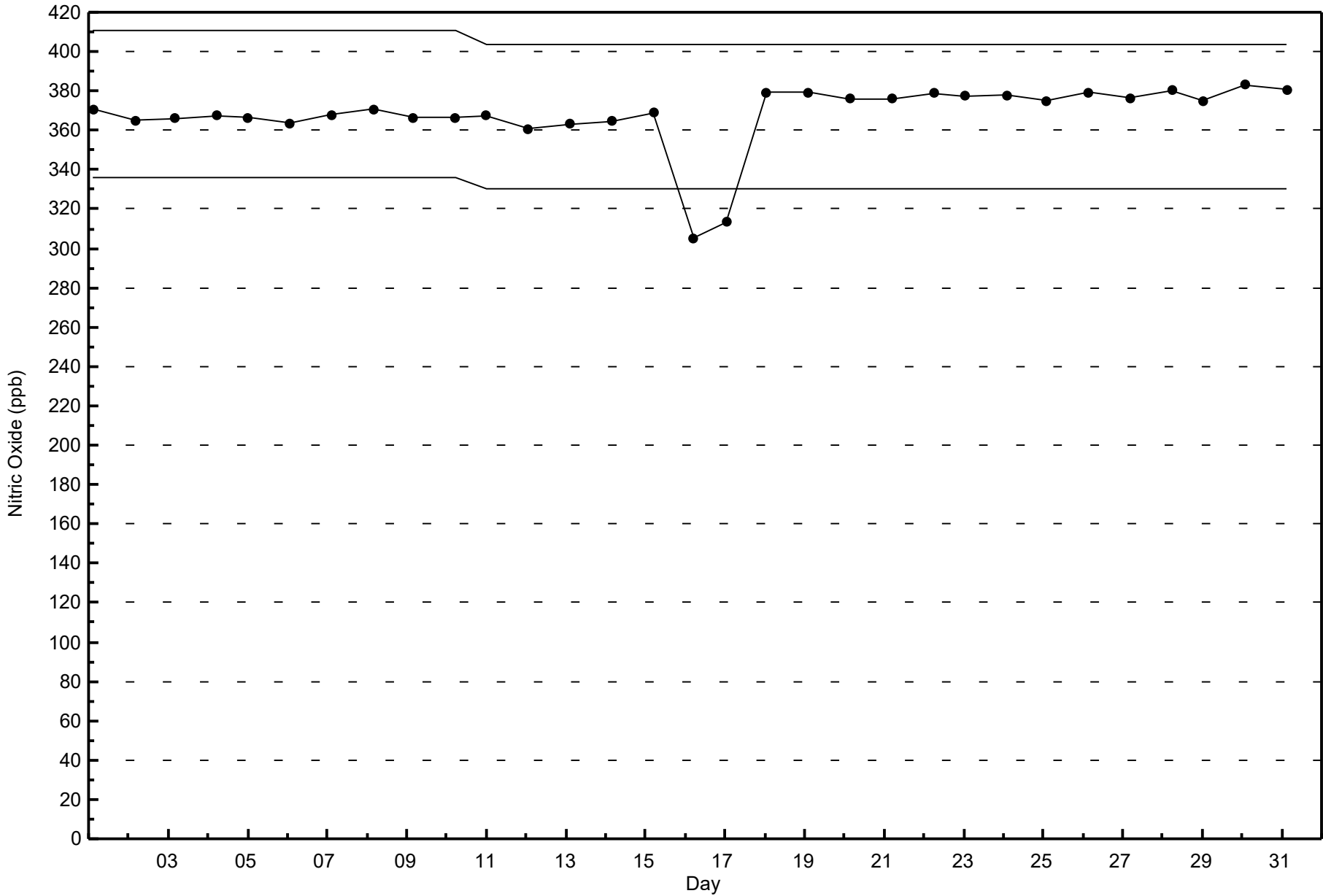






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Conklin - August 2023



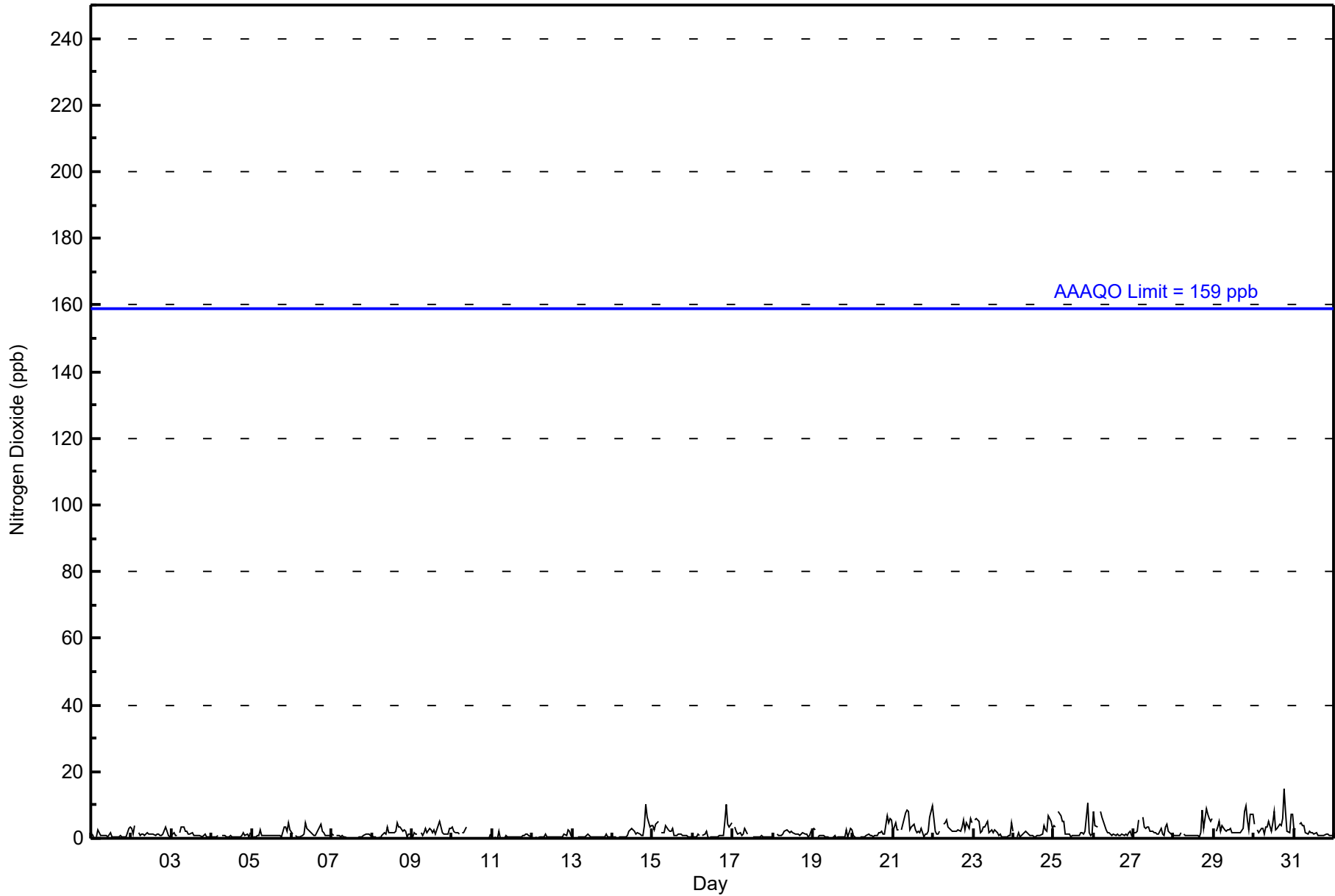


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744																											
Maximum Value: 15.0 ppb on Aug 30 19:00		Maximum Daily Average: 4.5 ppb on Aug 30																	Hours of Data:	707																													
Minimum Value: 0.0 ppb on Aug 10 16:00		Minimum Daily Average: 0.5 ppb on Aug 13																	Hours of Missing Data:	37																													
Maximum Diurnal Average: 2.9 ppb at hour 21		Minimum Diurnal Average: 1.0 ppb at hour 15																	Hours of Calibration:	35																													
Monthly Average: 1.84 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.6 Median = 1.2 Q ₃ = 2.4 P ₉₀ = 4.2 P ₉₉ = 8.6																	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-Aug	1.1	0.6	Z	0.6	2.4	1.0	0.8	0.8	0.8	0.8	0.6	1.7	0.5	0.5	0.4	0.5	0.6	0.7	0.5	0.6	0.6	0.6	2.9	3.5	1.0	3.5																							
2-Aug	3.1	1.1	3.9	Z	1.6	0.7	1.1	1.3	0.9	1.6	1.1	1.2	1.4	1.3	1.0	1.3	1.2	0.8	0.8	1.3	3.6	2.0	0.8	0.6	1.5	3.9																							
3-Aug	0.7	1.6	1.0	1.0	Z	1.9	3.6	3.4	2.1	2.0	1.2	1.2	1.9	0.7	0.7	0.7	0.7	0.6	0.9	1.4	0.6	0.5	0.5	1.3	3.6																								
4-Aug	0.5	0.4	0.5	0.6	0.8	Z	0.8	0.8	0.8	0.8	0.5	0.6	0.7	0.6	0.5	0.6	0.3	0.5	0.5	0.8	1.9	0.7	1.3	0.5	1.8	0.7	1.9																						
5-Aug	Z	0.6	0.6	1.0	0.8	2.5	1.0	0.8	0.8	0.8	0.7	0.8	1.0	0.7	0.9	1.0	0.8	0.8	0.6	3.3	3.2	2.3	4.5	2.5	1.4	4.5																							
6-Aug	1.3	Z	0.7	0.5	0.6	0.6	1.0	1.2	4.5	2.9	2.4	1.6	1.1	0.8	0.7	1.5	2.6	4.3	2.2	1.6	1.0	1.0	0.8	0.9	1.6	4.5																							
7-Aug	1.1	0.7	Z	0.8	0.7	0.4	0.8	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.5	0.9	1.3	1.3	1.1	0.9	0.6	1.3																							
8-Aug	0.7	0.5	0.4	Z	0.3	0.2	0.8	1.9	1.4	3.6	1.9	1.9	1.9	1.5	2.0	4.6	3.6	3.4	2.0	2.4	2.1	0.5	1.3	1.3	1.7	4.6																							
9-Aug	0.6	1.8	1.1	1.1	Z	1.6	0.9	1.6	3.1	1.5	2.8	2.5	1.5	2.6	1.1	2.6	5.1	3.2	1.9	1.4	1.4	1.2	2.9	2.8	2.0	5.1																							
10-Aug	3.3	2.3	1.6	1.7	1.3	Z	1.5	1.8	3.3	C	C	C	C	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	1.4	1.0	3.3																							
11-Aug	Z	0.6	0.2	0.2	2.0	0.2	0.1	0.2	0.7	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.6	0.7	1.0	1.1	1.4	0.8	0.3	0.6	2.0																							
12-Aug	0.2	Z	0.3	0.2	0.3	0.4	0.5	0.4	1.2	0.5	0.5	0.5	0.3	0.4	0.3	0.3	0.3	0.4	0.6	1.3	1.0	2.7	2.0	0.9	0.7	2.7																							
13-Aug	0.5	0.5	Z	0.4	0.3	0.4	0.6	0.5	0.8	1.3	0.8	0.5	0.3	0.4	0.5	0.5	0.5	0.3	0.6	1.4	0.4	0.3	0.3	0.5	1.4	0.5	1.4																						
14-Aug	0.3	0.3	0.4	Z	0.5	0.6	0.5	0.5	0.4	1.0	2.0	3.1	2.5	2.2	1.5	1.1	1.0	1.0	3.9	10.0	6.5	3.3	3.8	2.1	10.0	2.1	10.0																						
15-Aug	3.7	2.6	4.2	5.1	Z	1.6	1.5	1.6	3.9	2.5	2.1	2.1	3.1	0.8	0.7	1.4	1.1	1.4	1.0	0.9	0.9	0.5	0.5	0.4	1.9	5.1																							
16-Aug	0.4	0.5	0.5	1.3	0.7	Z	0.8	1.1	2.2	0.5	0.0	0.5	0.3	0.3	0.4	0.4	0.8	0.8	0.7	5.1	10.0	4.1	3.6	4.7	1.7	10.0																							
17-Aug	Z	3.5	2.2	1.2	1.6	0.9	1.2	3.1	2.3	1.2	M	M	0.6	0.5	0.5	0.5	0.4	0.8	0.6	0.6	0.5	0.6	0.4	0.3	1.1	3.5																							
18-Aug	0.4	Z	1.3	1.0	0.7	0.7	1.4	2.2	2.5	2.0	1.8	2.2	1.8	1.2	1.4	1.1	0.9	1.2	1.6	1.4	1.1	0.4	1.0	2.1	1.4	2.5																							
19-Aug	3.0	2.4	Z	0.5	0.7	0.7	0.8	0.5	0.3	0.3	0.2	0.2	0.3	0.9	0.2	0.3	0.4	0.5	0.4	0.3	2.4	0.6	3.0	2.5	0.9	3.0																							
20-Aug	0.8	0.5	0.2	Z	0.4	0.5	0.5	0.6	1.0	1.1	0.8	0.7	0.6	1.0	0.8	1.8	1.6	2.0	1.1	1.2	6.9	4.8	5.8	5.6	1.8	6.9																							
21-Aug	2.0	4.8	2.6	2.5	Z	2.5	4.1	7.6	8.5	8.0	2.5	3.5	4.4	2.7	1.9	2.0	1.9	3.1	0.6	1.2	1.3	2.1	6.5	9.8	3.7	9.8																							
22-Aug	6.1	2.2	1.2	1.1	2.3	Z	4.3	4.8	5.4	3.5	2.5	2.1	2.0	2.2	2.3	2.4	2.3	3.2	5.5	2.6	4.6	2.8	5.8	4.6	3.3	6.1																							
23-Aug	Z	5.3	5.8	5.0	1.9	2.3	3.4	3.2	4.9	1.6	2.1	2.4	1.9	2.7	1.5	0.8	1.4	0.6	0.3	0.3	0.3	0.9	0.7	4.5	2.3	5.8																							
24-Aug	2.2	Z	0.4	1.7	0.6	0.8	1.8	2.0	1.6	1.1	0.9	0.7	0.4	0.5	0.7	0.9	0.9	1.1	3.9	2.7	2.1	6.8	5.0	2.9	1.8	6.8																							
25-Aug	3.9	3.2	Z	7.9	6.8	4.9	5.1	1.4	1.2	1.1	0.5	0.8	0.8	0.9	0.9	0.9	1.6	1.9	1.3	2.3	10.4	1.8	0.8	1.1	2.7	10.4																							
26-Aug	8.0	3.9	3.2	Z	8.0	6.5	5.1	2.6	1.7	1.5	1.3	0.8	1.3	0.8	1.1	0.7	0.8	1.3	1.0	1.2	0.9	1.9	2.1	0.9	2.5	8.0																							
27-Aug	1.5	1.9	2.3	5.6	Z	6.3	3.4	2.8	3.6	3.4	2.3	2.2	1.8	1.8	1.3	1.2	2.9	1.1	1.0	3.3	4.4	2.3	1.1	1.2	2.6	6.3																							
28-Aug	1.0	0.9	1.0	0.9	1.7	Z	1.2	0.8	0.7	0.7	0.8	0.9	1.0	0.9	0.7	0.5	1.7	8.6	3.0	9.0	7.3	6.1	5.0	5.8	2.6	9.0																							
29-Aug	Z	2.2	3.2	4.9	2.1	3.7	2.5	2.3	2.6	2.4	3.0	1.7	1.6	1.7	1.9	1.5	1.6	3.0	8.0	9.9	5.3	2.7	7.0	7.1	3.6	9.9																							
30-Aug	4.2	Z	2.6	1.7	2.9	3.0	1.4	3.4	3.4	5.1	2.0	4.7	8.1	2.6	3.0	4.4	3.8	5.9	15.0	8.0	2.3	1.9	7.3	7.1	4.5	15.0																							
31-Aug	2.4	2.9	Z	4.1	4.6	3.8	3.7	1.8	1.4	2.3	1.5	1.5	1.4	1.5	1.0	0.8	0.9	1.0	1.0	1.2	1.1	1.0	0.9	0.9	1.9	4.6																							
																								2.0	1.8	1.7	2.0	1.8	1.9	1.8	1.9	2.2	1.8	1.4	1.5	1.5	1.1	1.0	1.2	1.4	1.8	1.9	2.3	2.9	2.0	2.5	2.7	Diurnal Average	
																								8.0	5.3	5.8	7.9	8.0	6.5	5.1	7.6	8.5	8.0	3.0	4.7	8.1	2.7	3.0	4.6	5.1	8.6	15.0	9.9	10.4	6.8	7.3	9.8	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
Conklin - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Conklin - August 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	16	5	11	8	39	61	54	62	52	66	44	32	74	80	56	703
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	43	16	5	11	8	39	61	54	62	52	66	44	32	74	80	56	703

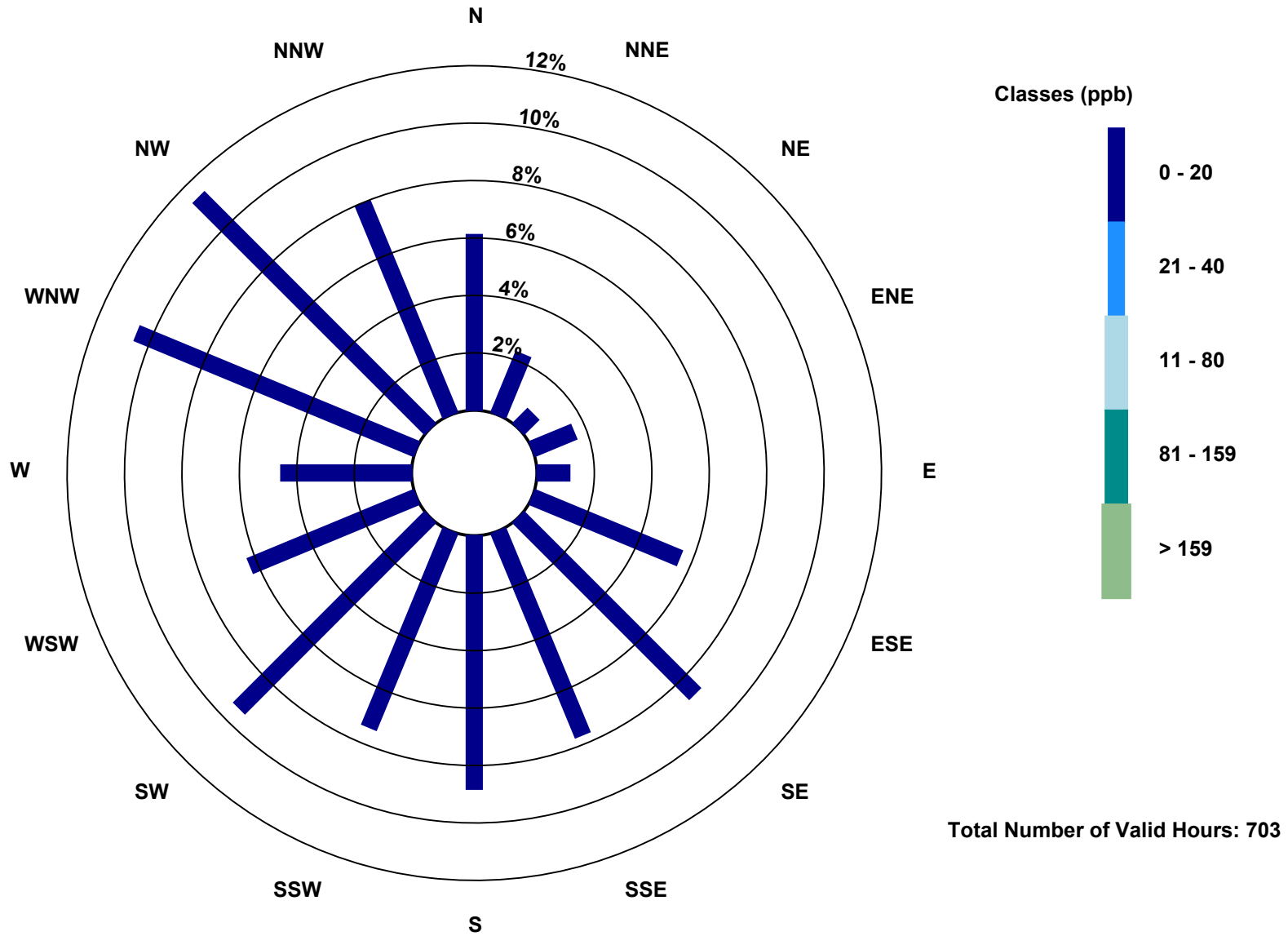
Total Number of Valid Hours: 703

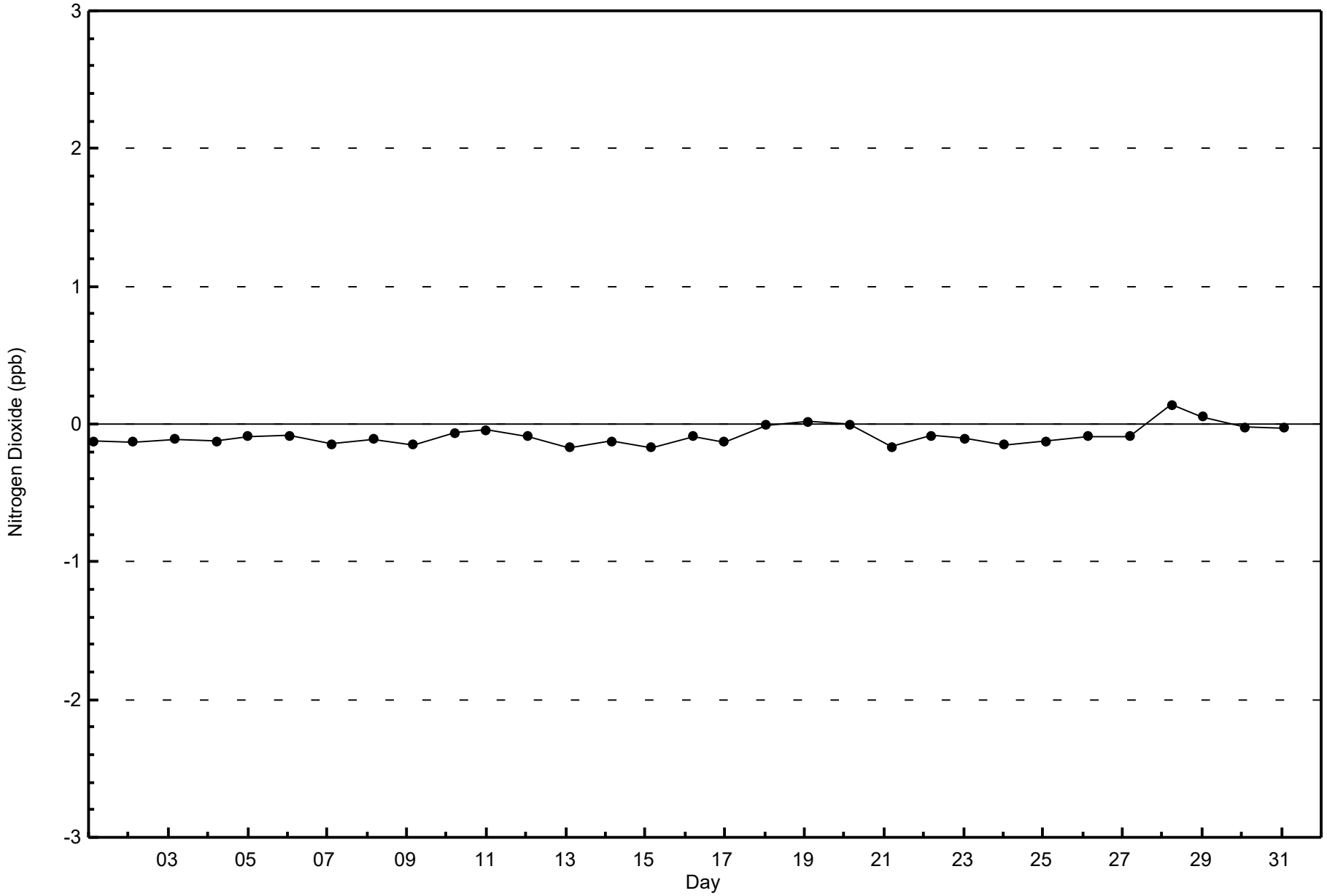
Total Number of Hours: 744

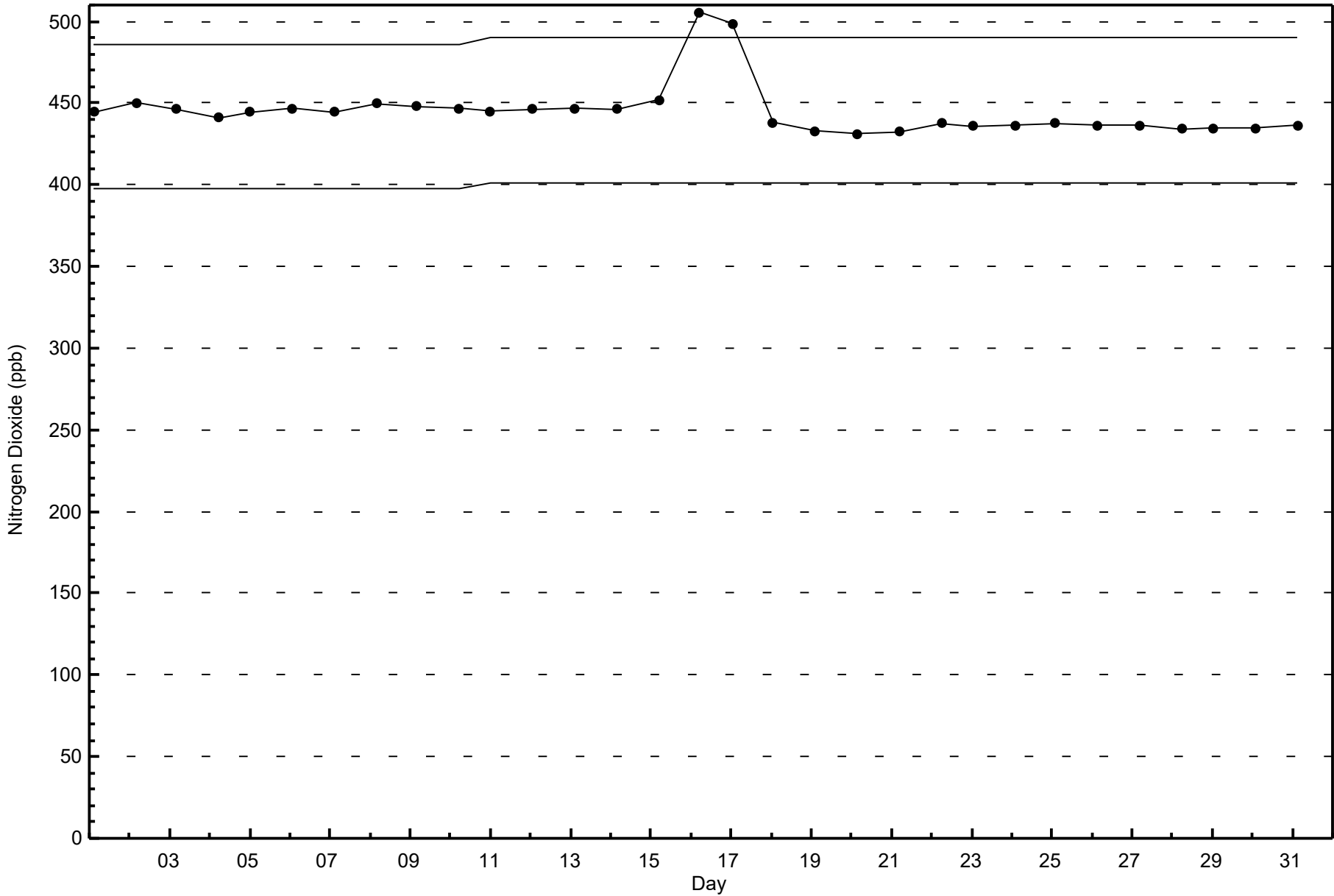


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Conklin





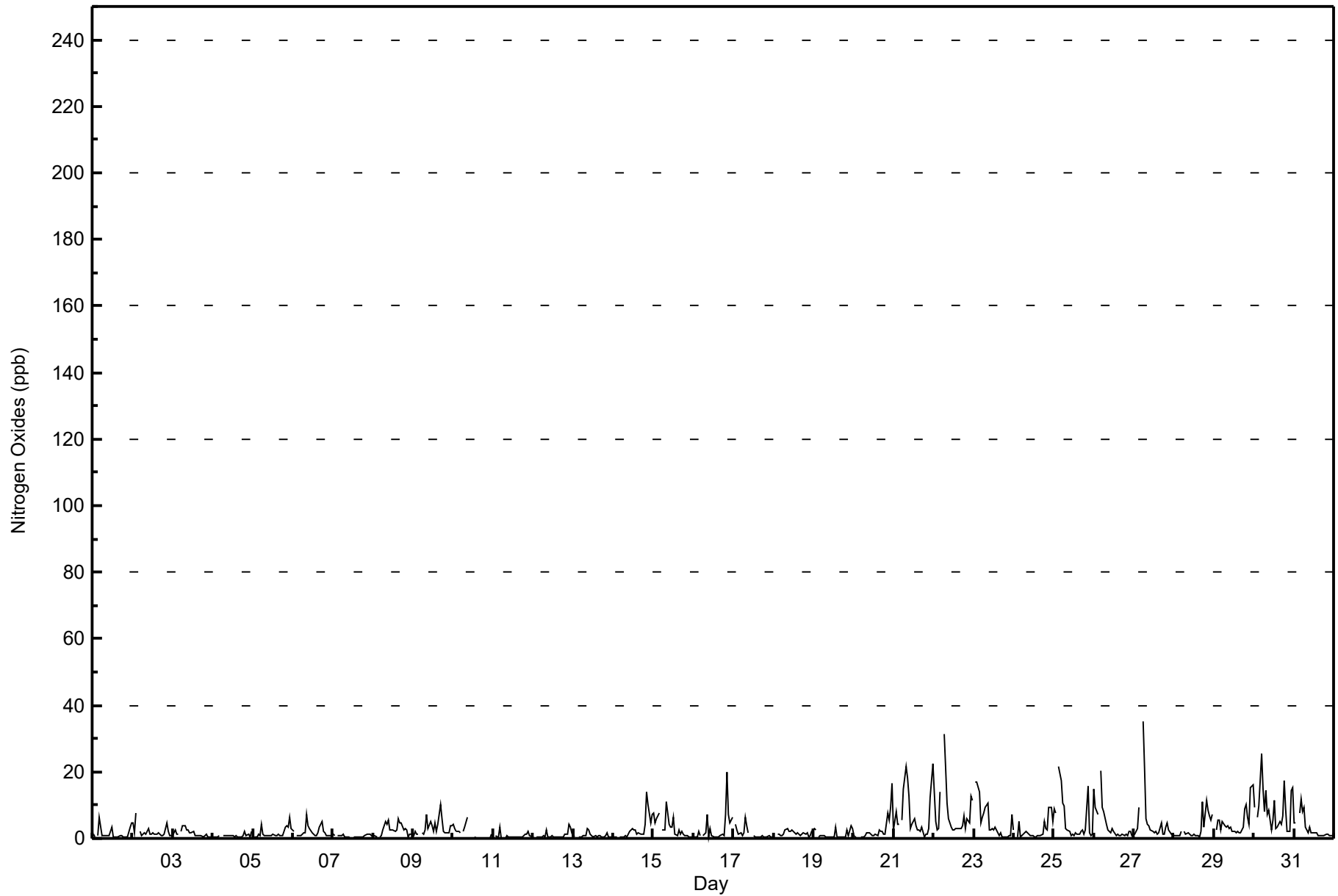




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Conklin - August 2023

Maximum Value: 35.3 ppb on Aug 27 06:00		Maximum Daily Average: 9.0 ppb on Aug 30		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Aug 10 22:00		Minimum Daily Average: 0.6 ppb on Aug 7		Hours of Data: 707																																													
Maximum Diurnal Average: 4.7 ppb at hour 24		Minimum Diurnal Average: 1.2 ppb at hour 15		Hours of Missing Data: 37																																													
Monthly Average: 2.98 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.4 Q ₁ = 0.7 Median = 1.4 Q ₃ = 3.3 P ₉₀ = 7.4 P ₉₉ = 20.9		Hours of Calibration: 35																																													
				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-Aug	1.1	0.6	Z	0.6	6.3	1.0	0.8	0.9	0.9	0.8	0.7	3.4	0.5	0.5	0.4	0.5	0.6	0.7	0.5	0.6	0.6	0.6	3.2	4.7	1.3	6.3																							
2-Aug	4.7	1.7	7.7	Z	2.1	0.8	1.2	1.6	1.1	3.0	1.2	1.3	1.5	1.4	1.1	1.6	1.4	0.8	0.8	1.3	4.6	2.3	0.9	0.8	2.0	7.7																							
3-Aug	0.8	2.3	1.1	1.1	Z	2.3	3.9	3.9	2.4	2.4	1.5	1.5	2.3	0.7	0.7	0.7	0.8	0.8	0.6	1.0	1.4	0.6	0.5	0.5	1.5	3.9																							
4-Aug	0.5	0.4	0.5	0.6	0.8	Z	0.8	0.8	0.9	0.6	0.7	0.8	0.7	0.6	0.7	0.4	0.6	0.6	1.0	2.1	0.7	1.5	0.5	2.2	0.8	2.2																							
5-Aug	Z	0.6	0.6	1.1	0.8	4.4	1.2	1.0	1.0	0.9	0.8	0.9	1.4	0.8	1.0	1.1	0.9	0.9	0.7	3.5	3.8	3.3	6.4	2.8	1.7	6.4																							
6-Aug	2.2	Z	0.9	0.7	0.8	1.0	1.6	1.6	7.2	3.8	3.1	1.7	1.2	0.9	0.9	1.6	3.3	5.0	2.3	1.6	1.0	1.0	0.8	0.9	2.0	7.2																							
7-Aug	1.1	0.7	Z	0.8	0.8	0.8	1.1	0.4	0.4	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.5	0.9	1.3	1.3	1.2	1.0	0.6	1.3																							
8-Aug	0.9	0.7	0.6	Z	0.5	0.8	2.5	5.1	4.1	5.6	2.6	2.6	2.7	2.0	2.6	6.1	4.7	4.6	2.4	2.8	2.4	0.6	1.3	1.3	2.6	6.1																							
9-Aug	0.6	1.9	1.1	1.1	Z	1.8	1.2	2.7	7.3	2.9	5.0	3.9	2.2	4.8	1.9	4.2	10.1	6.0	2.3	1.5	1.6	1.6	3.8	3.7	3.2	10.1																							
10-Aug	4.2	3.1	2.0	2.0	1.6	Z	1.9	3.2	6.2	C	C	C	C	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	1.4	1.4	1.4	6.2																							
11-Aug	Z	0.6	0.2	0.2	3.3	0.2	0.1	0.2	1.0	0.3	0.4	0.4	0.6	0.5	0.5	0.4	0.4	0.6	0.7	1.1	1.2	2.0	1.0	0.3	0.7	3.3																							
12-Aug	0.2	Z	0.3	0.2	0.3	0.4	0.7	0.5	2.6	0.6	0.6	0.7	0.4	0.5	0.3	0.3	0.4	0.5	0.6	1.4	1.2	4.1	3.4	1.7	1.0	4.1																							
13-Aug	0.6	0.7	Z	0.4	0.3	0.4	0.9	0.7	3.0	2.7	1.4	0.7	0.4	0.7	0.6	0.8	0.8	0.6	0.4	0.7	1.8	0.4	0.3	0.3	0.9	3.0																							
14-Aug	0.3	0.3	0.4	Z	0.5	0.6	0.6	0.7	0.5	1.1	2.1	3.2	2.6	2.4	1.3	1.9	1.2	1.1	1.1	4.3	14.0	10.0	4.8	7.3	2.7	14.0																							
15-Aug	7.7	4.5	6.0	7.8	Z	2.6	2.3	2.5	10.9	4.4	3.2	3.5	6.4	1.2	0.9	2.4	1.4	1.9	1.2	0.9	1.0	0.5	0.5	0.4	3.2	10.9																							
16-Aug	0.4	0.5	0.5	2.2	0.7	Z	0.9	1.8	7.4	0.6	3.0	1.0	0.4	0.4	0.5	0.5	1.1	1.1	0.8	7.3	19.9	7.2	4.7	6.5	3.0	19.9																							
17-Aug	Z	4.1	2.6	1.2	1.6	1.0	1.6	6.3	4.0	1.7	M	M	0.8	0.6	0.6	0.6	0.5	0.9	0.6	0.6	0.5	0.7	0.4	0.3	1.5	6.3																							
18-Aug	0.4	Z	1.4	1.1	0.7	0.7	1.5	2.4	2.9	2.3	2.0	2.5	2.0	1.3	1.5	1.1	0.9	1.2	1.7	1.4	1.7	0.4	1.0	2.1	1.5	2.9																							
19-Aug	3.1	2.4	Z	0.5	0.7	0.7	0.9	0.6	0.4	0.4	0.3	0.3	0.5	3.2	0.3	0.4	0.5	0.6	0.5	0.3	2.7	0.7	3.6	3.1	1.2	3.6																							
20-Aug	0.9	0.6	0.2	Z	0.5	0.6	0.6	0.7	1.5	1.6	1.1	0.9	0.8	1.3	1.0	2.4	2.0	2.3	1.2	1.3	7.5	5.6	9.4	16.5	2.6	16.5																							
21-Aug	2.3	8.3	4.4	4.3	Z	5.6	14.8	21.8	18.1	12.5	3.1	4.3	6.0	3.6	2.4	2.6	2.2	3.5	0.6	1.2	1.3	2.9	12.4	22.7	7.0	22.7																							
22-Aug	13.7	4.9	2.4	3.1	14.2	Z	31.2	21.0	10.6	5.7	3.4	2.6	2.5	2.8	2.8	2.9	2.8	3.7	6.6	3.1	6.0	4.6	12.7	11.4	7.6	31.2																							
23-Aug	Z	16.9	16.8	13.9	4.7	6.5	7.6	9.3	10.5	2.5	2.8	3.1	2.4	3.3	1.7	0.9	1.6	0.6	0.3	0.3	0.3	0.9	0.7	7.4	5.0	16.9																							
24-Aug	2.7	Z	0.5	5.2	0.6	0.8	1.9	2.2	1.7	1.3	1.0	0.8	0.4	0.5	0.7	0.9	0.9	1.2	4.9	3.0	2.3	9.3	9.5	5.0	2.5	9.5																							
25-Aug	8.7	7.4	Z	21.5	17.5	10.6	9.7	2.9	2.5	2.0	0.7	1.3	1.0	1.5	1.4	1.2	2.0	2.5	1.4	2.4	15.5	1.8	0.9	1.3	5.1	21.5																							
26-Aug	14.8	9.4	7.1	Z	20.4	9.4	7.8	4.1	2.5	2.2	1.6	3.1	2.0	0.9	1.3	0.7	0.9	1.5	1.0	1.2	0.9	2.0	2.3	0.9	4.3	20.4																							
27-Aug	1.5	1.9	2.8	9.2	Z	35.3	21.0	5.9	4.4	3.7	2.4	2.2	1.8	2.0	1.4	1.5	4.7	1.3	1.1	3.4	4.8	2.4	1.1	1.2	5.1	35.3																							
28-Aug	1.0	0.9	1.0	0.9	2.1	Z	2.3	1.4	1.7	1.2	1.0	1.0	1.2	1.0	0.7	0.5	2.0	10.9	3.3	11.5	8.5	6.6	5.7	7.4	3.2	11.5																							
29-Aug	Z	2.4	5.4	5.6	2.4	5.3	3.9	3.3	3.7	3.0	3.5	2.1	1.9	1.9	2.2	1.5	1.7	3.3	9.1	10.2	6.2	4.2	15.1	16.3	5.0	16.3																							
30-Aug	9.1	Z	6.4	9.8	25.6	14.7	7.9	14.6	7.3	8.5	2.5	5.7	11.6	3.0	3.5	4.9	4.3	6.6	17.5	8.9	2.3	2.2	14.4	15.1	9.0	25.6																							
31-Aug	4.5	4.6	Z	7.5	12.0	8.2	9.1	3.2	1.5	3.6	1.8	1.6	1.5	1.5	1.0	0.8	0.9	1.0	1.0	1.2	1.1	1.0	0.9	0.9	3.1	12.0																							
																								3.4	3.2	2.9	4.0	4.7	4.5	4.6	4.1	4.2	2.7	1.9	2.0	2.0	1.5	1.2	1.5	1.8	2.1	2.2	2.6	3.8	2.7	4.0	4.7	Diurnal Average	
																								14.8	16.9	16.8	21.5	25.6	35.3	31.2	21.8	18.1	12.5	5.0	5.7	11.6	4.8	3.5	6.1	10.1	10.9	17.5	11.5	19.9	10.0	15.1	22.7	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Conklin - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	699	98.87	98.87
21 - 40	8	1.13	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 Oxides (NO_x) - ppb
Conklin - August 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	16	5	10	8	39	61	52	57	52	66	44	32	74	80	56	695
21 - 40	0	0	0	1	0	0	0	2	5	0	0	0	0	0	0	0	8
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	43	16	5	11	8	39	61	54	62	52	66	44	32	74	80	56	703

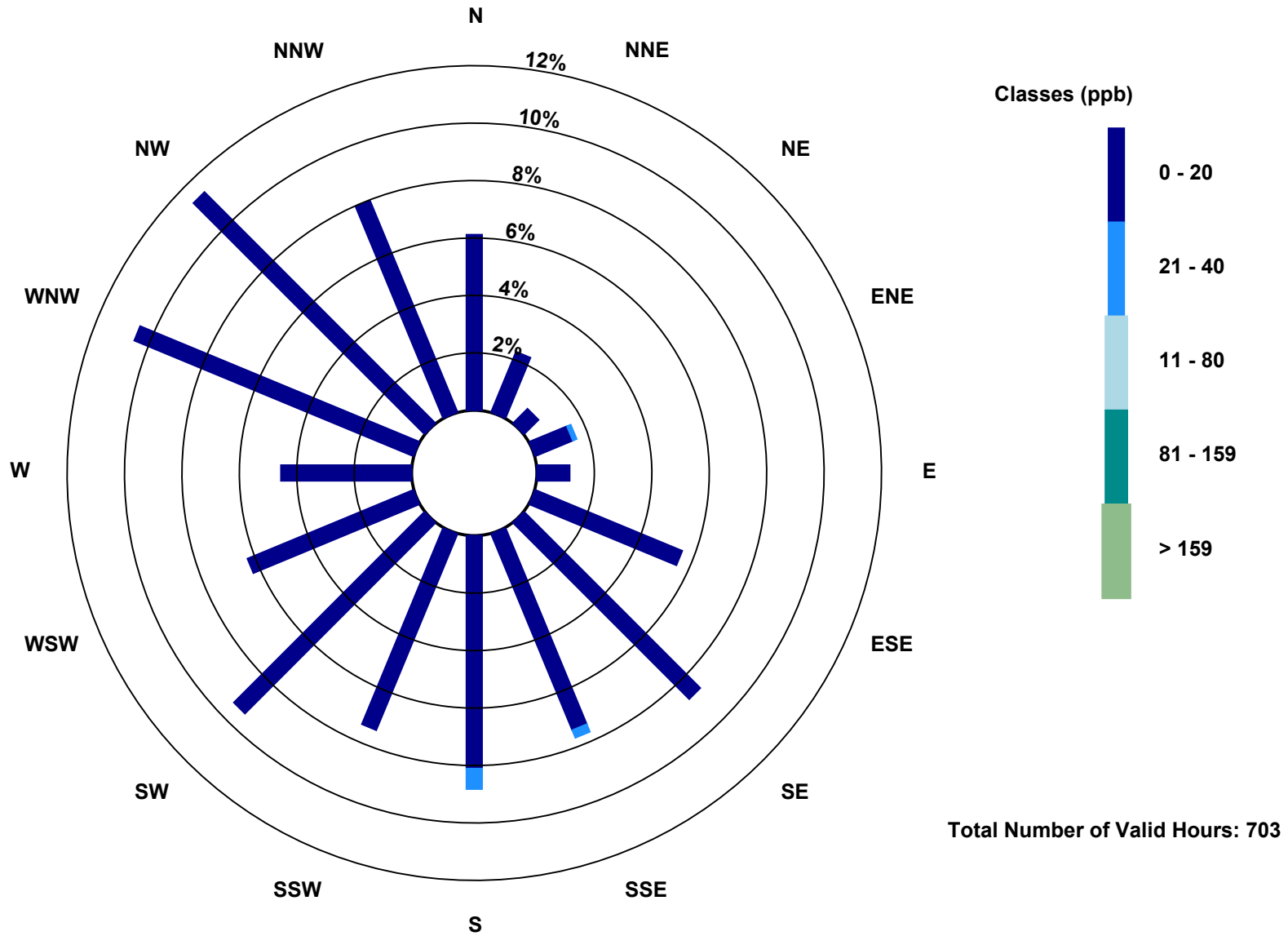
Total Number of Valid Hours: 703

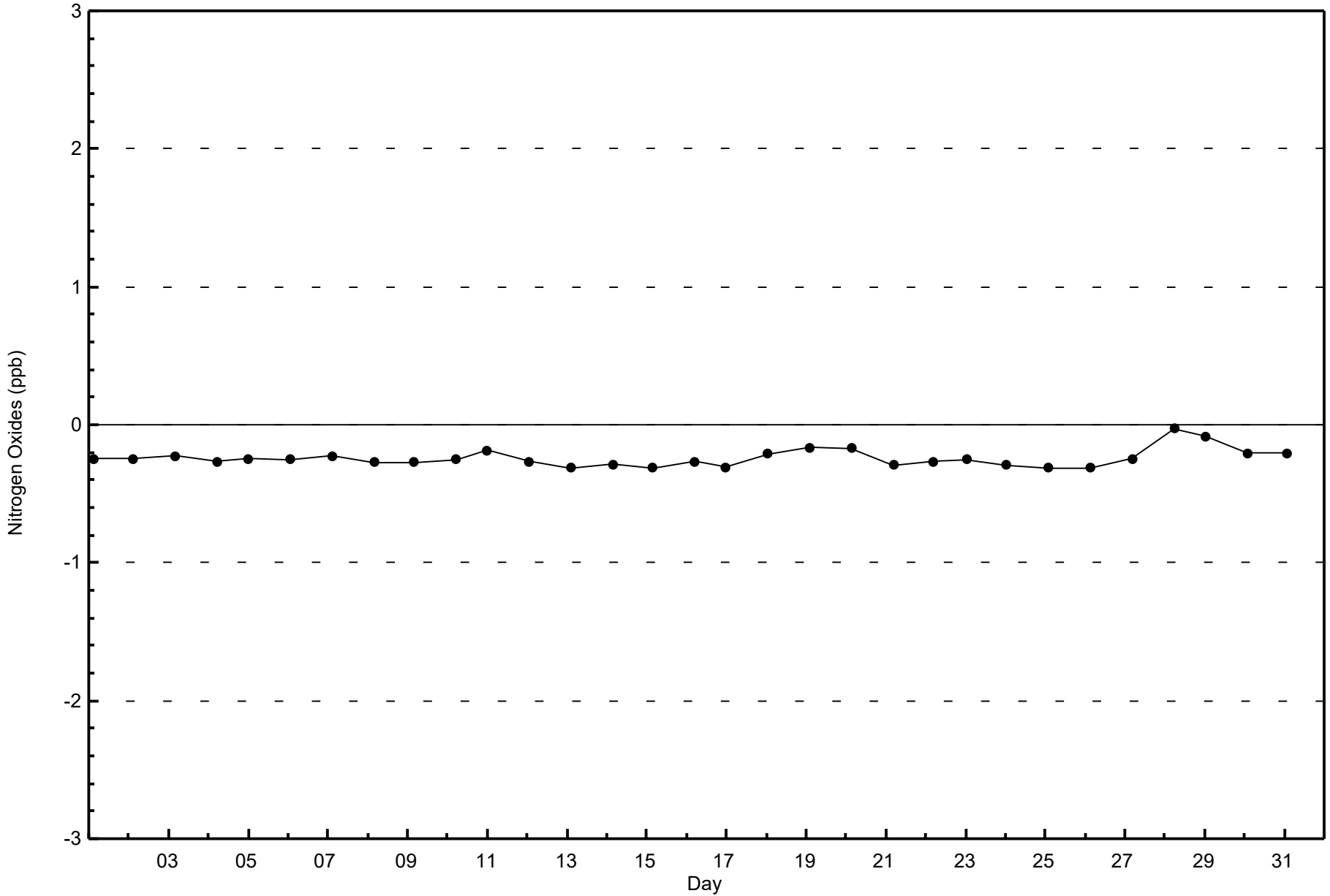
Total Number of Hours: 744

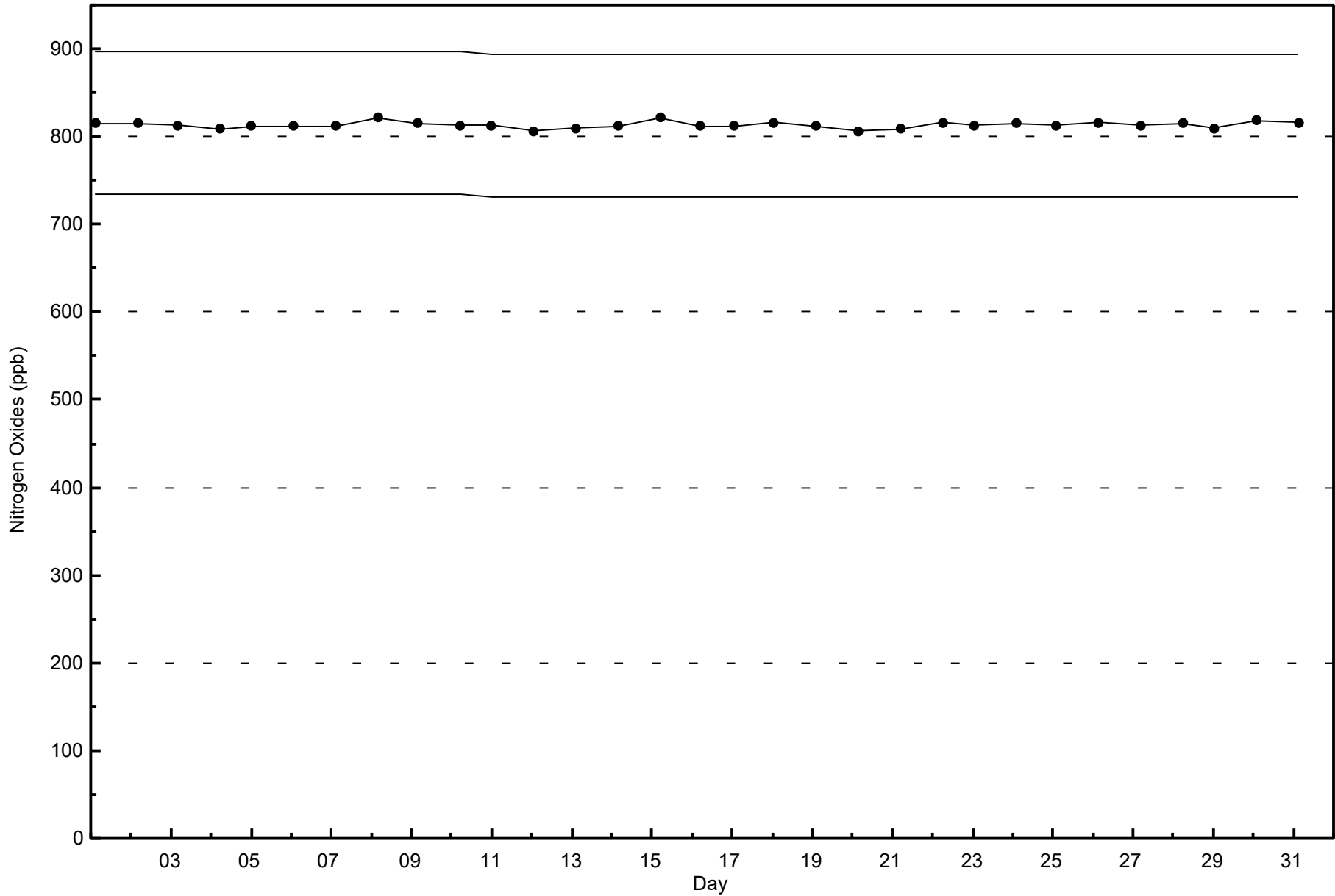


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Conklin









Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

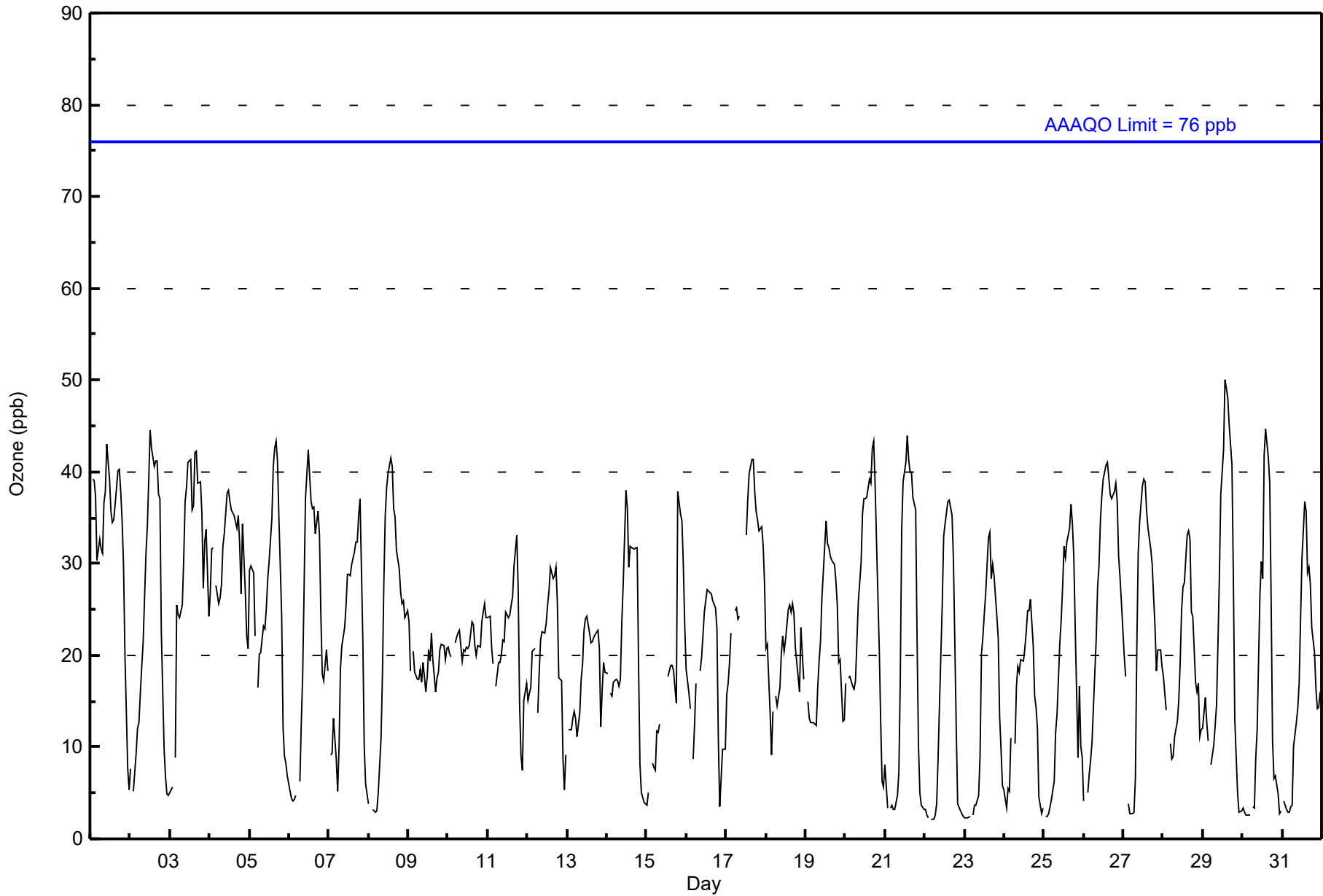
Conklin - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																									
Maximum Value: 50.1 ppb on Aug 29 14:00		Maximum Daily Average: 32.8 ppb on Aug 1				Hours of Data:		705																																									
Minimum Value: 2.2 ppb on Aug 22 05:00		Minimum Daily Average: 14.2 ppb on Aug 24				Hours of Missing Data:		39																																									
Maximum Diurnal Average: 33.5 ppb at hour 15		Minimum Diurnal Average: 11.4 ppb at hour 4				Hours of Calibration:		35																																									
Monthly Average: 21.63 ppb		Percentiles: P ₁ = 2.4 P ₁₀ = 4.8 Q ₁ = 12.6 Median = 21.2 Q ₃ = 30.9 P ₉₀ = 37.5 P ₉₉ = 43.4				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-Aug	Z	39.2	39.1	37.4	30.3	32.7	31.6	31.1	36.6	37.8	43.0	39.1	35.6	34.5	34.8	36.5	40.1	40.3	37.9	34.6	29.7	20.2	7.7	5.3	32.8	43.0																							
2-Aug	7.6	Z	5.2	9.4	12.0	12.7	15.9	18.8	21.3	31.0	34.1	39.0	44.5	42.6	40.6	41.1	41.3	37.5	37.1	22.6	9.8	6.8	4.9	4.7	23.5	44.5																							
3-Aug	5.1	5.7	Z	8.9	25.5	24.4	24.1	25.5	30.5	36.8	38.3	41.0	41.3	35.9	36.3	42.1	42.3	38.8	38.9	35.4	27.4	32.4	33.8	24.3	30.2	42.3																							
4-Aug	26.9	31.5	31.8	Z	27.7	25.7	26.2	27.8	31.9	33.2	37.7	37.9	36.7	35.9	35.5	35.2	33.8	35.2	32.0	26.7	34.4	27.0	22.1	20.8	31.0	37.9																							
5-Aug	29.4	29.8	29.0	22.2	Z	16.5	20.1	20.3	23.2	22.8	25.1	28.3	30.2	35.0	40.5	42.6	43.4	41.1	32.0	24.3	12.0	9.0	8.3	6.9	25.9	43.4																							
6-Aug	5.1	4.5	4.2	4.3	4.7	Z	6.3	12.6	17.8	27.2	37.1	42.4	39.5	36.8	36.0	36.1	33.2	35.7	33.1	24.4	18.0	17.2	20.6	18.3	22.4	42.4																							
7-Aug	Z	9.1	9.4	13.0	8.6	5.1	10.1	18.6	21.0	23.1	25.5	28.8	28.8	28.7	29.9	31.2	32.3	32.3	35.2	37.1	21.5	10.0	5.9	5.0	20.4	37.1																							
8-Aug	3.9	Z	3.2	3.0	3.0	3.0	5.0	11.0	17.8	27.9	35.2	38.3	39.8	41.5	40.6	36.0	35.1	31.5	29.5	26.8	25.6	25.9	24.1	24.8	23.1	41.5																							
9-Aug	23.6	18.3	Z	20.4	18.2	17.4	17.4	18.4	17.0	19.2	15.9	17.6	20.6	19.4	22.5	19.5	16.1	17.5	18.2	20.7	21.2	21.0	19.5	20.8	19.2	23.6																							
10-Aug	20.9	20.1	19.8	Z	21.3	22.0	22.4	22.7	19.4	20.6	20.4	20.9	20.7	21.0	23.7	23.4	21.0	20.0	21.1	20.9	23.7	24.7	25.6	24.0	21.8	25.6																							
11-Aug	24.1	24.3	20.8	19.1	Z	16.6	19.2	19.2	20.1	21.7	21.5	24.7	24.1	24.3	25.5	26.4	29.8	33.2	27.0	14.6	8.9	7.5	15.1	16.9	21.1	33.2																							
12-Aug	15.1	15.9	16.5	20.4	20.8	Z	13.7	18.2	21.6	22.6	22.5	23.5	25.5	27.0	29.5	28.3	28.7	29.6	25.6	17.5	17.3	8.8	5.3	9.1	20.1	29.6																							
13-Aug	Z	12.0	11.9	13.2	13.9	13.1	11.1	13.7	17.4	19.1	22.7	24.0	24.2	22.4	21.4	21.5	21.9	22.2	22.8	20.7	12.2	16.1	19.2	18.1	18.0	24.2																							
14-Aug	18.0	Z	15.9	15.5	17.1	17.5	17.3	16.7	17.4	23.4	27.7	38.0	36.0	29.5	31.9	31.7	31.6	31.7	31.8	18.9	8.2	5.1	3.9	3.9	21.2	38.0																							
15-Aug	3.7	5.0	Z	8.3	7.8	7.4	11.8	11.5	12.4	C	C	C	C	17.7	19.0	18.9	18.3	16.5	14.8	37.9	35.4	34.7	29.8	23.1	17.6	37.9																							
16-Aug	18.4	15.9	14.2	Z	8.7	12.3	17.0	M	18.3	19.6	22.2	24.7	27.2	27.0	26.9	26.8	26.0	25.1	22.9	10.9	3.5	6.6	9.8	9.7	17.9	27.2																							
17-Aug	15.7	16.9	19.3	22.3	Z	24.8	25.1	24.0	24.3	M	M	M	33.2	36.9	39.8	41.4	41.3	37.9	35.7	34.8	33.5	34.0	32.1	27.9	30.0	41.4																							
18-Aug	20.8	21.2	13.7	9.1	13.8	Z	15.5	14.5	16.5	20.2	22.1	20.4	21.6	25.0	25.6	24.7	25.6	24.6	20.9	17.7	16.1	23.0	20.2	17.4	19.6	25.6																							
19-Aug	Z	14.9	13.1	12.6	12.7	12.7	12.4	16.5	19.4	21.5	26.2	31.9	34.6	32.2	31.7	30.8	30.4	29.9	28.0	25.4	19.3	19.5	12.8	13.0	21.8	34.6																							
20-Aug	17.0	Z	17.6	17.7	16.6	16.3	17.3	21.4	25.7	30.1	35.4	37.0	37.0	37.3	39.2	38.8	42.6	43.3	38.7	32.6	20.5	12.7	6.3	5.7	26.4	43.3																							
21-Aug	8.1	3.3	Z	3.4	3.7	3.1	3.3	4.7	7.3	17.4	33.6	38.9	41.0	43.9	41.3	40.0	40.0	37.2	35.9	21.6	10.3	5.0	3.7	3.2	19.6	43.9																							
22-Aug	3.2	2.6	2.2	Z	2.2	2.2	2.6	3.8	8.7	14.5	25.6	32.9	34.3	35.5	36.7	36.9	35.2	30.2	21.3	11.9	3.8	3.1	2.7	2.5	15.4	36.9																							
23-Aug	2.3	2.3	2.2	2.4	Z	2.6	3.6	3.6	4.8	9.0	20.2	22.0	24.4	26.7	32.8	33.3	28.4	29.9	28.7	24.3	21.8	13.3	9.8	5.7	15.4	33.3																							
24-Aug	5.3	3.3	5.5	5.1	11.0	Z	10.4	16.7	18.8	18.2	19.5	19.4	20.7	22.5	24.9	24.9	26.1	21.1	15.5	14.4	12.0	4.6	2.7	3.3	14.2	26.1																							
25-Aug	Z	2.4	2.5	2.7	4.3	5.3	6.3	11.6	13.6	21.3	24.0	27.5	32.0	30.7	32.4	33.9	36.4	34.3	30.6	23.0	8.9	16.7	10.0	8.8	18.2	36.4																							
26-Aug	4.1	Z	5.1	7.0	8.5	10.6	14.4	21.8	27.4	29.7	34.6	37.4	39.2	40.7	41.1	39.4	37.5	37.1	37.8	38.8	36.7	30.9	28.5	25.7	27.6	41.1																							
27-Aug	19.9	17.7	Z	3.8	2.8	2.7	2.9	6.6	20.6	31.1	34.4	38.4	39.2	38.9	35.8	33.8	31.5	29.9	26.4	23.2	18.2	20.6	20.5	18.8	22.5	39.2																							
28-Aug	17.7	15.9	14.0	Z	10.3	8.8	9.0	11.1	12.7	15.0	19.2	24.8	27.4	27.8	33.2	33.6	32.6	24.7	24.2	17.1	16.0	17.0	11.1	11.9	18.9	33.6																							
29-Aug	12.0	15.5	12.6	10.6	Z	8.1	10.3	12.4	14.7	21.4	28.5	37.5	42.4	50.1	49.2	48.0	45.2	40.8	28.4	13.2	8.9	5.0	2.9	3.1	22.6	50.1																							
30-Aug	3.4	2.8	2.7	2.5	2.6	Z	3.5	3.3	8.8	12.0	26.7	30.2	28.3	41.8	44.7	41.4	38.7	25.7	10.7	6.6	6.9	4.9	2.8	3.0	15.4	44.7																							
31-Aug	Z	4.1	3.2	2.8	2.9	3.5	3.7	10.0	12.6	14.2	17.0	23.7	30.6	36.8	35.6	29.0	29.5	27.7	23.0	20.3	16.3	14.1	14.3	16.0	17.0	36.8																							
																								13.2	13.6	12.9	11.4	12.0	12.6	13.2	15.6	18.7	22.8	27.4	30.7	32.0	32.5	33.5	33.1	32.8	31.1	28.0	23.2	18.0	16.0	14.1	13.0	Diurnal Average	
																								29.4	39.2	39.1	37.4	30.3	32.7	31.6	31.1	36.6	37.8	43.0	42.4	44.5	50.1	49.2	48.0	45.2	43.3	38.9	38.8	36.7	34.7	33.8	27.9	Diurnal Maximum	
Z - zerospan C - Calibration M - Maintenance																																																	
Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 76 ppb																																																	



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Conklin - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Conklin - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	326	46.24	46.24
21 - 50	379	53.76	100.00
51 - 82	0	0.00	100.00
> 83	0	0.00	100.00

Total Number of Valid Hours: 705

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Ozone (O₃) - ppb
Conklin - August 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	19	6	2	2	4	7	39	48	59	23	22	11	3	13	34	32	324
21 - 50	24	10	3	10	6	30	23	8	4	22	43	34	30	58	45	27	377
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	43	16	5	12	10	37	62	56	63	45	65	45	33	71	79	59	701

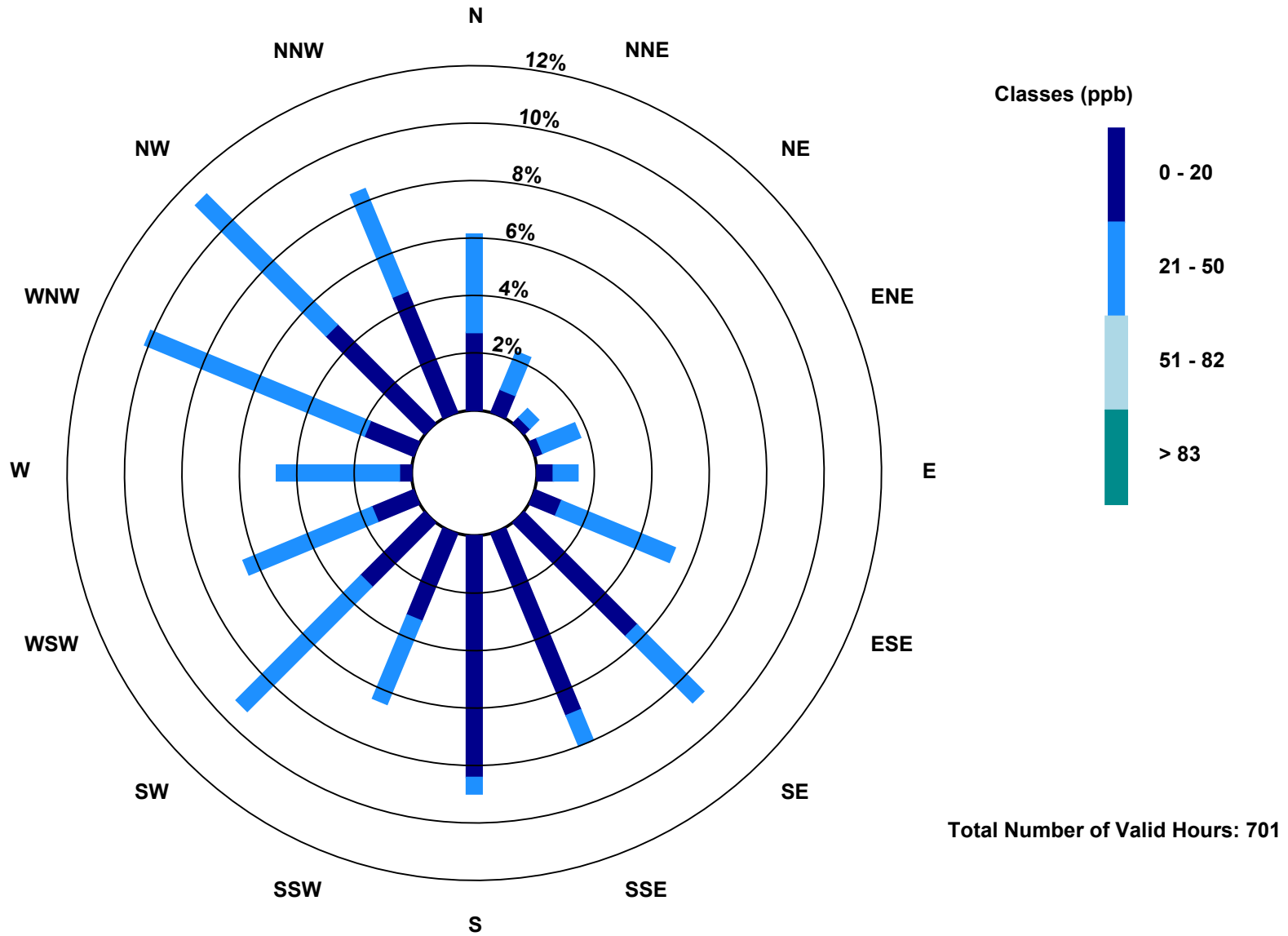
Total Number of Valid Hours: 701

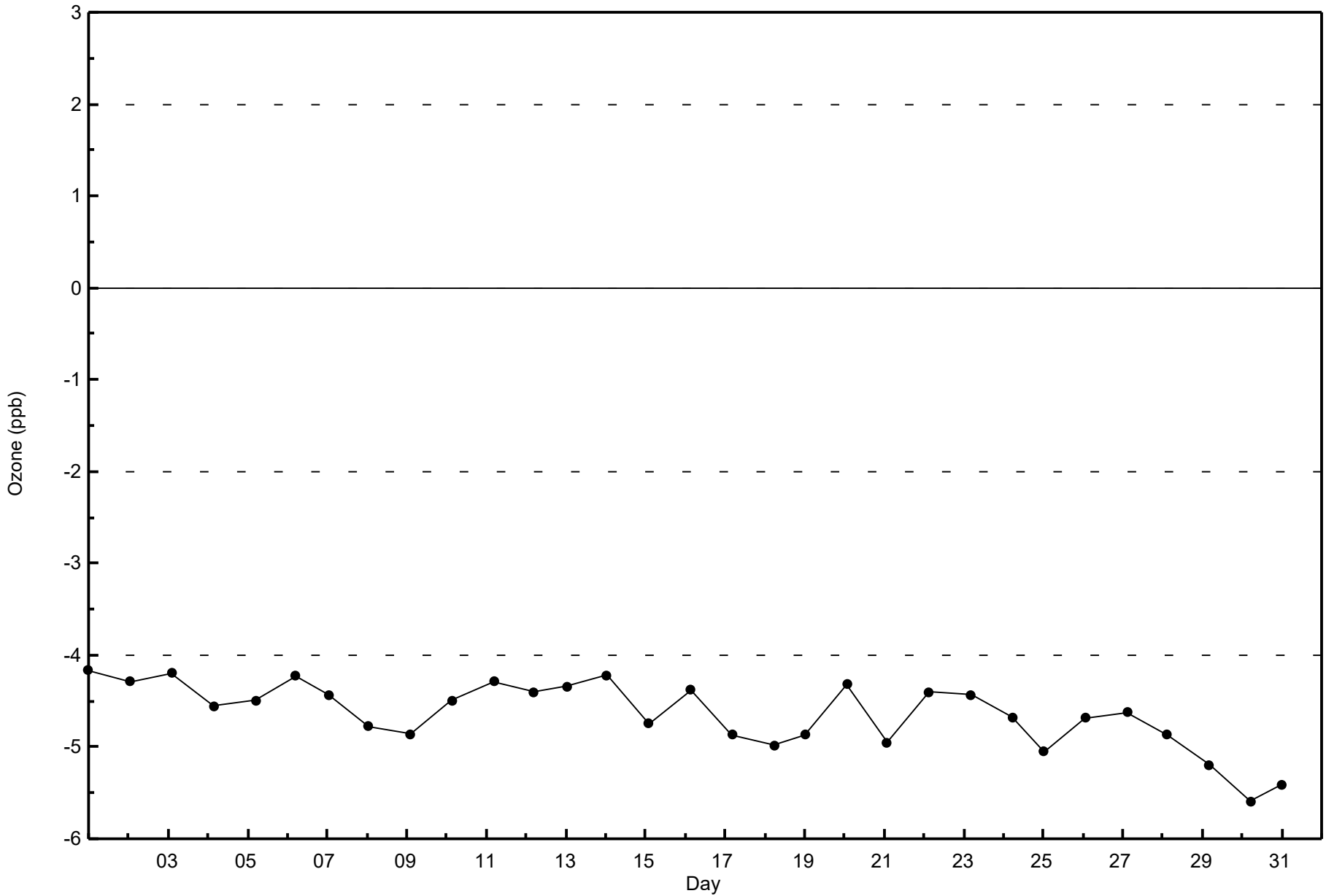
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Conklin

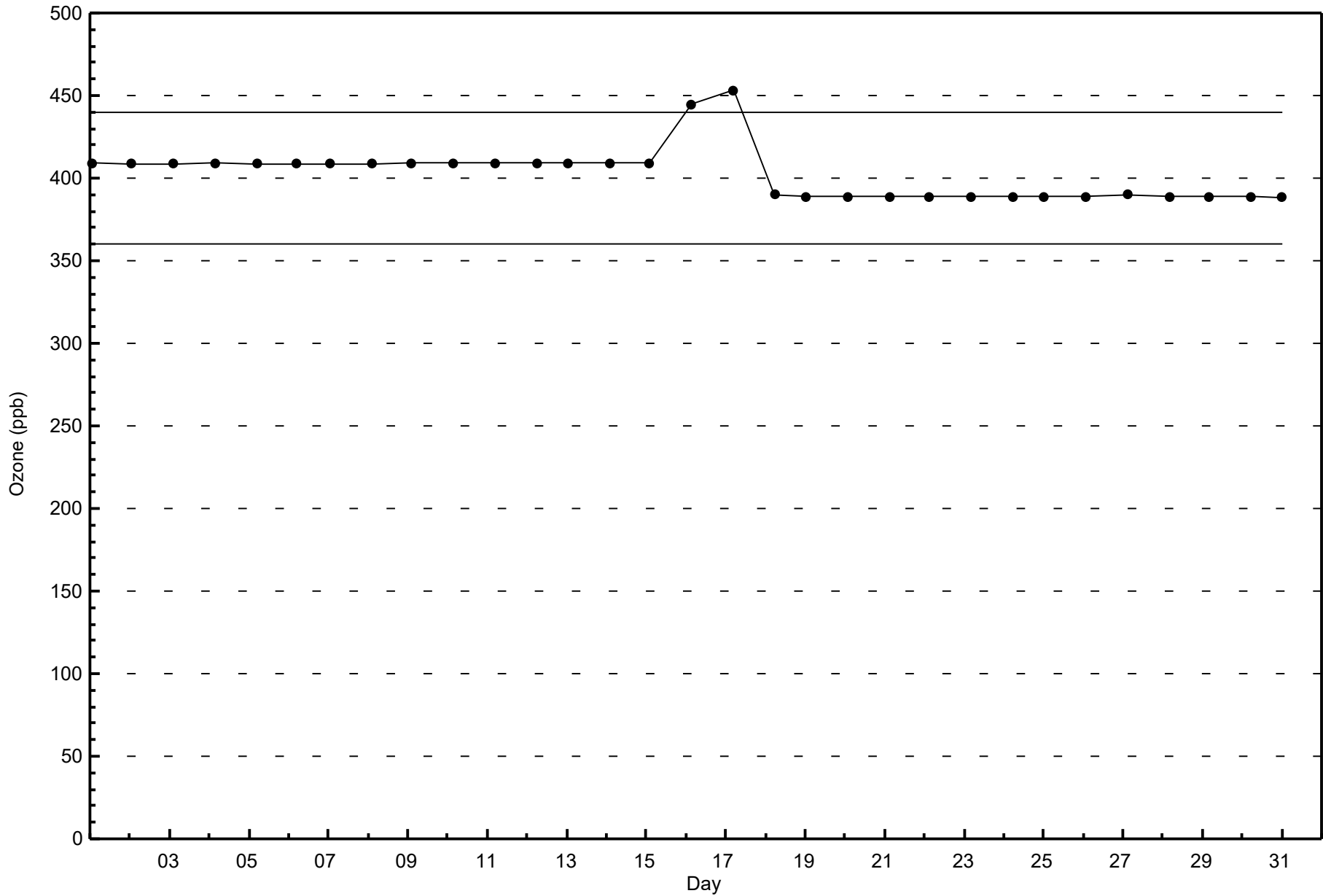






Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Conklin - August 2023



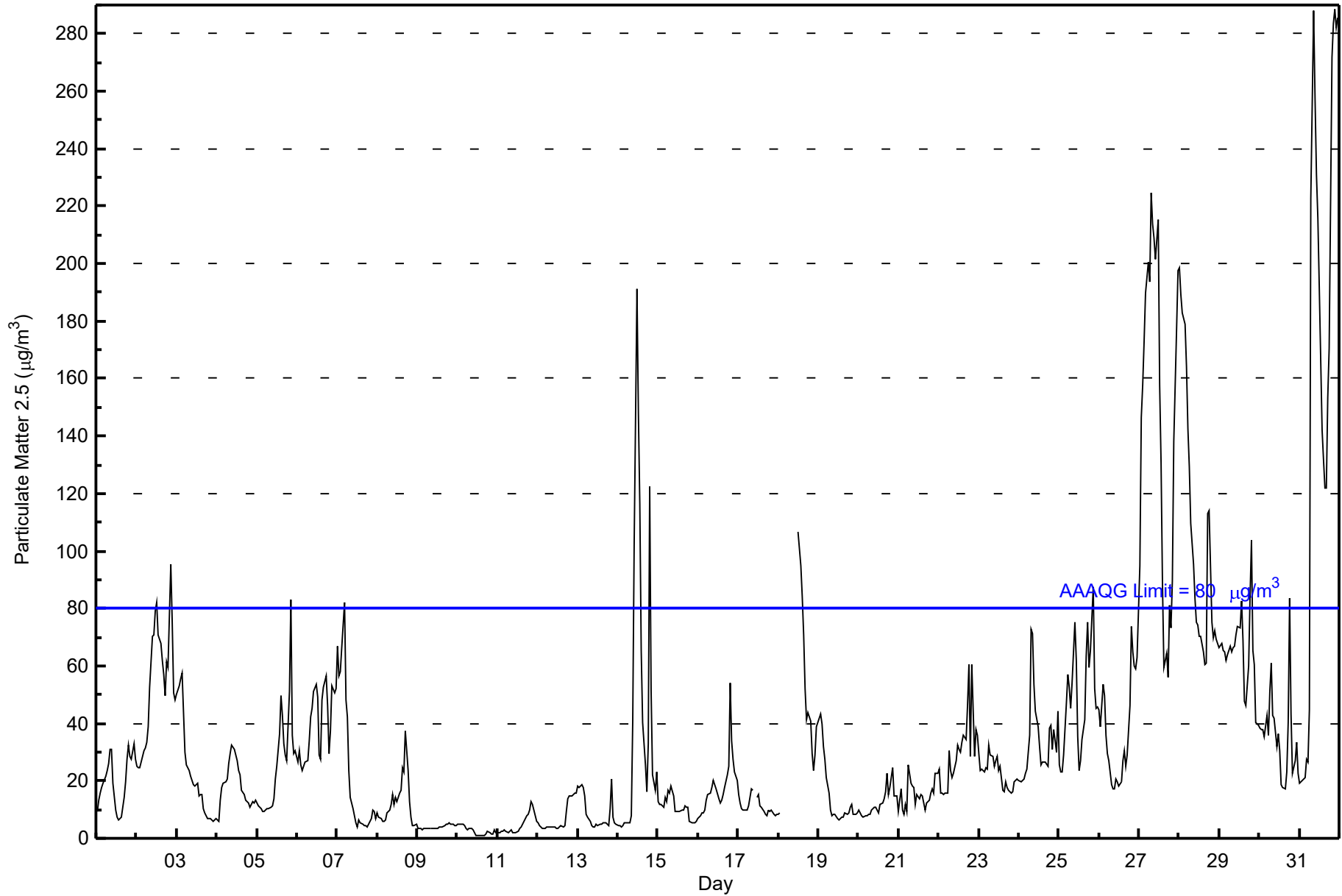


Number of Exceedences (AAAQO):	1-hr: 66	24-hr: 12	Hours in Service:	744
Maximum Value: 288.7 µg/m ³ on Aug 31 22:00	Maximum Daily Average: 160.0 µg/m ³ on Aug 31		Hours of Data:	733
Minimum Value: 1.0 µg/m ³ on Aug 10 13:00	Minimum Daily Average: 2.6 µg/m ³ on Aug 10		Hours of Missing Data:	11
Maximum Diurnal Average: 42.7 µg/m ³ at hour 12	Minimum Diurnal Average: 28.0 µg/m ³ at hour 17		Hours of Calibration:	1
Monthly Average: 35.47 µg/m ³	Percentiles: P ₁ = 1.6 P ₁₀ = 4.4 Q ₁ = 9.0 Median = 19.8 Q ₃ = 42.4 P ₉₀ = 73.9 P ₉₉ = 229.1		Percent Operational Time:	98.7

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-Aug	9.3	13.4	15.7	17.7	19.3	21.7	23.5	26.0	31.0	31.0	19.1	10.0	7.2	6.3	6.8	7.3	14.1	19.5	27.5	32.6	28.5	27.6	32.8	27.4	19.8	32.8
2-Aug	25.1	24.8	24.8	28.7	30.3	31.4	33.6	38.9	52.7	70.1	70.8	79.0	81.9	70.8	67.6	62.0	56.8	49.8	61.3	59.2	95.5	75.3	50.7	48.4	53.7	95.5
3-Aug	49.9	53.0	55.7	57.7	43.9	29.8	25.4	23.5	21.5	19.9	18.7	18.1	19.3	14.9	15.2	15.0	10.2	8.6	7.0	6.7	7.0	6.6	6.1	6.9	22.5	57.7
4-Aug	6.6	6.0	13.4	17.7	19.4	19.6	20.8	25.8	29.3	32.6	30.9	29.0	27.2	23.6	21.9	16.5	15.4	13.1	12.7	12.2	10.8	12.6	12.4	13.4	18.5	32.6
5-Aug	12.2	11.5	10.3	9.6	9.6	10.1	10.2	10.9	11.4	13.8	20.7	24.9	36.2	49.5	42.9	32.9	29.1	26.8	51.2	83.0	36.0	29.4	30.7	25.5	83.0	83.0
6-Aug	26.6	30.4	25.6	23.5	25.3	26.3	26.8	34.0	42.3	45.1	51.3	53.4	49.2	29.0	27.3	48.0	52.5	56.3	46.1	29.5	37.6	52.8	50.8	52.2	39.3	56.3
7-Aug	67.0	56.3	57.8	66.4	82.2	48.1	42.4	23.6	14.3	10.1	7.7	5.4	4.1	6.4	5.6	4.9	4.6	3.9	4.7	6.8	9.8	9.4	6.9	23.0	82.2	82.2
8-Aug	8.8	7.4	6.8	6.1	6.1	6.2	9.1	9.6	11.9	15.4	12.0	14.1	12.7	15.6	16.6	24.7	22.9	37.2	23.6	12.5	7.3	4.6	4.4	5.0	12.5	37.2
9-Aug	3.5	3.3	3.5	3.0	3.4	3.4	3.4	3.6	3.6	3.5	3.5	3.6	3.4	3.7	3.9	4.0	4.5	4.8	5.0	5.2	5.0	4.8	4.6	4.7	3.9	5.2
10-Aug	4.8	5.1	5.0	4.8	4.3	3.6	2.8	3.5	3.5	3.1	2.0	1.2	1.0	1.0	1.1	1.2	1.1	1.6	2.4	1.9	1.4	1.7	2.9	2.2	2.6	5.1
11-Aug	1.9	1.9	2.4	2.6	2.9	2.4	2.0	2.3	2.7	1.9	1.8	1.8	2.5	3.3	4.1	4.9	6.0	7.6	8.1	9.8	12.6	11.7	9.9	5.8	4.7	12.6
12-Aug	5.5	4.7	4.0	3.5	3.4	4.0	4.2	4.0	4.0	4.0	3.9	3.6	3.5	3.8	4.2	4.0	4.5	9.4	13.6	14.8	14.7	15.2	15.8	15.9	7.0	15.9
13-Aug	18.1	17.9	18.4	17.8	14.6	8.5	7.2	5.7	4.4	4.2	4.2	5.0	4.4	4.8	4.9	5.6	5.5	5.3	4.2	10.4	20.4	7.5	5.6	5.1	8.7	20.4
14-Aug	4.6	4.5	4.2	4.5	5.5	5.6	5.4	5.5	7.7	41.0	101.6	191.2	148.1	116.6	65.6	40.5	25.8	16.3	32.9	22.4	51.7	22.0	16.9	23.1	44.3	191.2
15-Aug	13.0	11.8	11.8	10.8	14.1	12.9	16.8	15.8	18.2	14.6	9.3	9.3	9.2	9.5	9.7	10.1	11.4	11.0	10.8	5.7	5.5	5.5	5.4	6.1	10.8	18.2
16-Aug	6.9	7.9	8.7	9.1	9.9	13.3	15.3	15.6	17.9	20.2	18.8	17.2	13.8	12.2	13.2	15.1	17.8	22.3	25.1	54.2	34.2	27.7	22.9	20.3	18.3	54.2
17-Aug	15.1	12.3	10.5	9.6	9.9	9.8	11.3	14.2	17.4	16.7	C	14.0	15.1	11.5	10.8	9.3	8.3	8.0	9.9	9.5	9.9	8.2	8.1	8.1	11.2	17.4
18-Aug	8.2	8.9	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	106.8	94.8	83.8	70.7	52.0	41.3	43.7	40.8	29.5	23.5	29.1	38.8	--	106.8
19-Aug	41.9	43.3	39.7	32.1	27.6	21.3	15.7	9.7	7.7	8.5	8.1	7.1	6.6	6.7	7.3	7.6	8.7	8.3	8.6	10.9	11.8	8.5	8.1	9.0	15.2	43.3
20-Aug	10.0	8.9	7.8	7.6	7.8	8.0	8.5	8.3	9.7	10.7	10.8	10.1	8.9	12.0	12.2	13.8	16.3	22.4	15.1	17.5	24.8	14.8	14.8	14.8	12.3	24.8
21-Aug	9.2	17.0	10.0	8.4	11.6	9.3	25.4	18.9	18.4	17.6	11.6	15.2	13.6	15.0	15.0	12.2	9.8	12.1	13.2	15.6	17.2	15.7	22.7	22.6	14.9	25.4
22-Aug	24.1	16.0	15.5	15.1	15.6	15.8	30.5	23.8	21.0	22.4	27.3	32.2	30.8	29.9	33.6	35.7	34.4	46.4	60.3	28.5	60.3	28.7	37.7	35.9	30.1	60.3
23-Aug	29.7	23.8	24.0	23.1	24.6	24.3	32.6	29.2	28.6	25.2	27.0	28.8	23.5	24.8	16.5	16.3	19.8	17.9	16.5	15.8	16.3	19.8	20.0	20.6	22.9	32.6
24-Aug	20.0	19.5	20.4	20.8	22.5	24.2	35.8	72.7	71.0	53.8	44.1	39.1	31.9	25.7	26.7	26.5	26.4	25.1	38.2	39.1	31.1	37.8	29.8	44.3	34.4	72.7
25-Aug	25.6	23.2	23.2	29.0	47.2	56.8	52.5	45.3	54.1	75.2	61.9	35.3	23.4	26.9	34.5	41.5	63.4	75.2	59.4	65.2	87.3	52.0	45.4	45.5	47.9	87.3
26-Aug	44.8	38.8	53.8	49.6	35.9	29.4	27.3	18.9	17.2	17.2	20.8	19.8	18.2	19.8	26.8	30.4	24.9	28.8	46.3	73.9	64.8	59.8	59.1	62.9	37.1	73.9
27-Aug	95.0	146.2	158.0	173.2	190.0	200.4	193.7	224.7	213.7	209.0	201.3	215.5	157.8	130.7	88.6	59.3	64.6	56.0	81.2	73.1	89.4	138.4	177.6	197.6	147.3	224.7
28-Aug	198.4	189.1	182.9	178.9	164.2	142.3	129.1	109.8	95.4	83.7	75.0	74.0	70.4	70.3	64.8	60.3	60.9	113.1	114.0	75.1	69.6	72.5	69.5	68.0	105.5	198.4
29-Aug	66.5	67.7	65.6	64.9	62.0	63.9	67.0	64.8	66.6	66.6	70.9	73.7	73.3	82.5	68.9	47.6	46.0	60.0	84.2	103.8	65.6	60.5	40.5	39.4	65.5	103.8
30-Aug	38.2	38.1	37.9	35.4	42.5	35.9	51.0	61.0	42.8	42.0	31.9	36.6	30.6	18.8	17.6	17.4	23.3	40.2	83.8	43.3	22.4	27.0	33.6	22.6	36.4	83.8
31-Aug	19.4	19.6	20.6	21.3	27.4	26.5	44.6	22.7	288.0	257.3	231.2	215.6	191.5	142.2	131.6	121.9	121.9	153.6	170.3	272.1	283.5	288.7	282.4	285.6	160.0	288.7

29.4	30.1	31.3	31.7	32.8	30.5	32.5	39.1	40.9	41.1	41.1	42.7	39.2	34.5	30.8	28.3	28.0	32.4	37.3	42.5	42.1	38.0	37.4	38.4	Diurnal Average
198.4	189.1	182.9	178.9	190.0	200.4	193.7	224.7	288.0	257.3	231.2	215.6	191.5	142.2	131.6	121.9	121.9	153.6	170.3	272.1	283.5	288.7	282.4	285.6	Diurnal Maximum

C - Calibration M - Maintenance AF - Analyzer 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}) - $\mu\text{g}/\text{m}^3$
Conklin - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	109	14.87	14.87
6 - 15	195	26.60	41.47
16 - 25	131	17.87	59.35
26 - 80	232	31.65	91.00
> 81.0	66	9.00	100.00

Total Number of Valid Hours: 733

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Conklin - August 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	9	4	2	3	2	5	29	2	0	2	15	6	3	7	11	9	109
6 - 15	8	1	0	2	4	10	5	11	14	22	24	14	18	31	21	10	195
16 - 25	8	1	2	8	0	9	15	16	14	5	7	10	3	9	17	7	131
26 - 80	13	8	0	0	3	15	15	27	28	14	15	16	9	16	26	23	228
> 81.0	4	1	1	0	1	0	0	4	11	10	7	2	1	11	8	5	66
Totals	42	15	5	13	10	39	64	60	67	53	68	48	34	74	83	54	729

Total Number of Valid Hours: 729

Total Number of Hours: 744

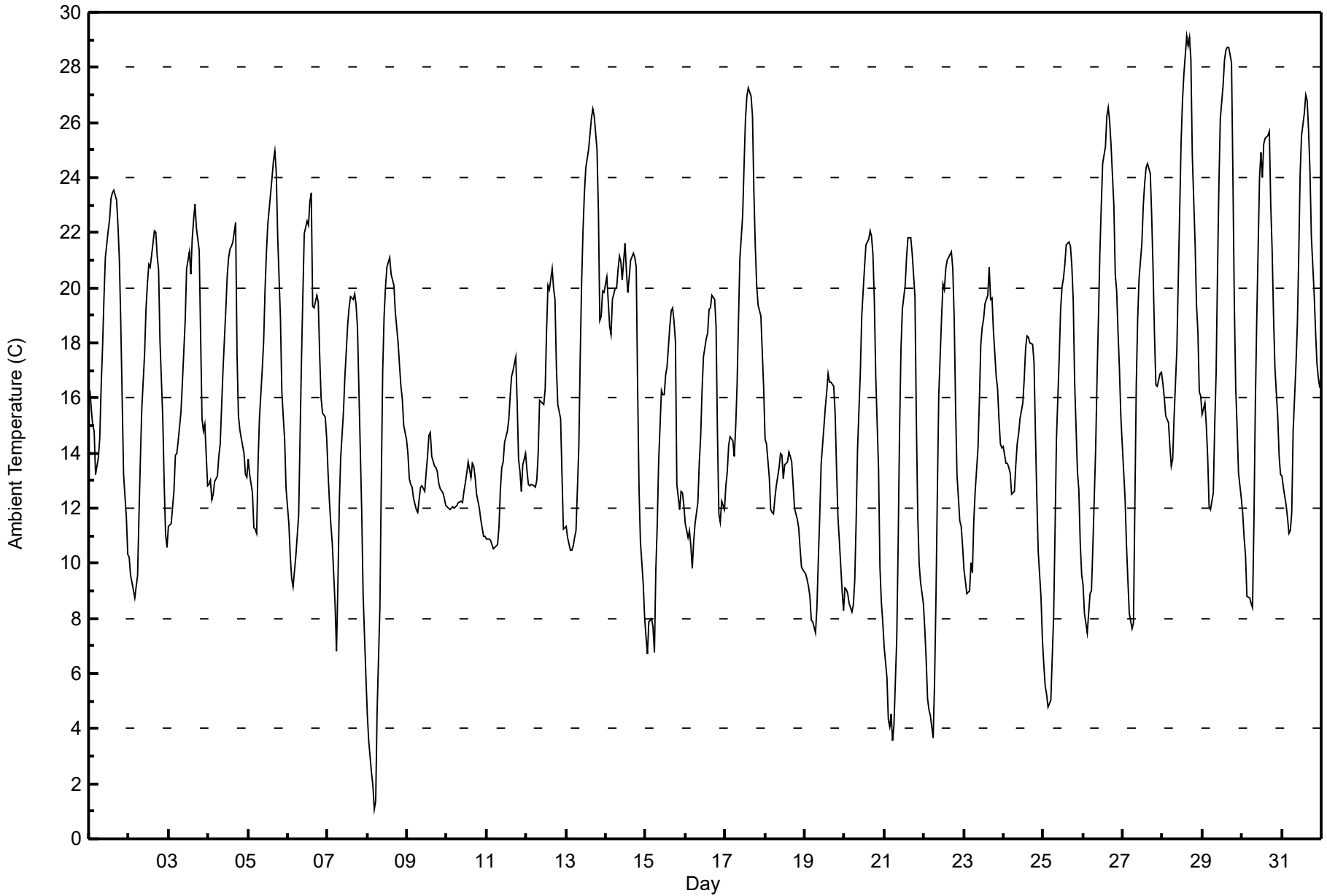


Maximum Value: 29.1 C on Aug 28 15:00		Maximum Daily Average: 20.5 C on Aug 28		Hours in Service: 744																							
Minimum Value: 1.1 C on Aug 8 05:00		Minimum Daily Average: 11.9 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 21.5 C at hour 16		Minimum Diurnal Average: 10.2 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 15.65 C		Percentiles: P ₁ = 4.1 P ₁₀ = 9.1 Q ₁ = 12.0 Median = 15.0 Q ₃ = 19.7 P ₉₀ = 22.6 P ₉₉ = 28.2		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-Aug	16.3	15.5	15.0	14.8	13.2	13.8	14.6	16.4	17.9	19.6	21.1	22.1	22.5	23.3	23.5	23.5	23.2	22.3	21.0	18.7	15.9	13.2	11.7	10.3	17.9	23.5	
2-Aug	10.2	9.6	9.3	8.8	9.2	9.6	11.7	13.8	15.6	17.6	19.2	20.1	20.8	20.8	21.6	22.1	22.0	21.2	20.7	18.1	15.2	12.9	11.0	10.6	15.5	22.1	
3-Aug	11.3	11.4	12.1	12.6	13.9	14.0	14.4	15.5	16.6	17.7	18.8	20.7	21.3	20.5	21.7	22.5	23.0	22.2	21.3	18.3	15.3	14.8	15.0	12.8	17.0	23.0	
4-Aug	12.9	13.0	12.3	12.5	13.0	13.2	13.9	14.3	15.7	17.0	19.2	20.5	21.1	21.4	21.5	21.6	22.4	17.6	15.3	14.9	14.6	14.0	13.2	13.1	16.2	22.4	
5-Aug	13.8	13.2	12.6	11.3	11.2	11.1	13.6	15.3	17.0	18.1	20.0	21.3	22.3	23.4	24.0	24.6	24.9	24.2	21.9	18.9	16.2	15.3	14.5	12.7	17.6	24.9	
6-Aug	11.4	10.3	9.5	9.2	9.7	10.3	11.8	14.6	17.4	19.7	22.0	22.4	22.3	23.1	23.4	19.3	19.3	19.7	19.5	17.6	16.0	15.5	15.3	14.5	16.4	23.4	
7-Aug	13.3	12.2	11.4	10.7	8.5	6.8	9.2	12.1	13.8	15.5	16.8	17.7	18.6	19.3	19.7	19.6	19.8	19.4	18.5	16.3	11.9	8.9	7.4	5.9	13.9	19.8	
8-Aug	4.5	3.6	2.4	1.9	1.1	1.4	4.6	8.4	13.0	17.0	19.0	20.0	20.8	21.1	20.5	20.3	20.1	19.1	18.0	17.2	16.4	15.9	15.0	14.5	13.2	21.1	
9-Aug	14.0	13.1	12.9	12.7	12.4	12.0	11.8	12.3	12.8	12.8	12.6	13.2	13.9	14.6	14.8	13.9	13.5	13.5	13.3	12.9	12.7	12.5	12.3	12.1	13.0	14.8	
10-Aug	12.0	12.0	12.0	12.1	12.0	12.0	12.1	12.2	12.2	12.2	12.6	12.9	13.3	13.7	13.1	13.6	13.5	13.1	12.5	12.0	11.6	11.3	11.0	11.0	12.3	13.7	
11-Aug	10.9	10.9	10.8	10.7	10.5	10.6	10.7	11.3	12.7	13.5	13.7	14.4	14.8	15.2	16.1	16.8	17.0	17.5	15.8	13.8	13.3	12.6	13.6	14.0	13.4	17.5	
12-Aug	13.4	12.9	12.8	12.9	12.8	12.7	13.0	14.0	15.9	15.8	15.8	16.3	18.5	20.1	19.9	20.7	20.0	19.6	17.1	15.8	15.3	13.2	11.2	11.3	15.5	20.7	
13-Aug	11.3	10.9	10.5	10.5	10.6	10.9	11.2	14.2	17.5	20.2	22.1	23.4	24.4	25.0	25.6	26.1	26.5	26.2	25.0	22.8	18.8	19.0	19.9	19.8	18.9	26.5	
14-Aug	20.4	19.6	18.6	18.3	19.6	20.0	20.0	20.6	21.2	21.0	20.3	21.6	20.6	19.8	20.4	21.0	21.3	21.1	20.7	16.4	12.7	10.8	9.2	8.0	18.5	21.6	
15-Aug	7.3	6.7	7.9	8.0	7.7	6.7	9.7	11.4	13.7	16.3	16.1	16.1	16.8	17.1	18.6	19.2	19.3	18.8	18.1	12.9	11.9	12.6	12.6	12.1	13.2	19.3	
16-Aug	11.4	11.0	11.2	10.6	9.8	10.8	11.4	12.2	13.6	14.6	16.3	17.5	18.1	18.3	19.2	19.3	19.7	19.6	18.6	14.7	11.8	11.5	12.2	11.9	14.4	19.7	
17-Aug	12.8	13.3	14.3	14.6	14.4	13.9	14.9	16.5	18.8	21.0	22.6	24.4	26.1	27.0	27.3	27.0	26.2	23.5	21.5	20.1	19.3	19.0	17.6	16.3	19.7	27.3	
18-Aug	14.5	14.4	13.1	12.0	11.8	11.8	12.4	12.8	13.5	14.0	13.9	13.1	13.6	13.7	14.1	13.9	13.7	12.8	12.0	11.6	11.3	10.5	9.9	9.8	12.7	14.5	
19-Aug	9.6	9.4	9.1	8.8	7.9	7.9	7.5	8.4	10.1	11.7	13.6	14.9	15.7	16.2	16.9	16.6	16.6	16.4	15.4	13.5	11.7	10.8	9.0	8.3	11.9	16.9	
20-Aug	9.1	9.1	8.9	8.6	8.2	8.5	9.4	11.5	14.1	17.0	18.9	19.9	20.7	21.5	21.8	22.1	21.8	21.2	19.5	16.8	13.4	9.8	8.6	7.9	14.5	22.1	
21-Aug	7.0	5.8	4.3	4.1	4.5	3.5	4.1	7.2	10.7	14.8	17.8	19.2	20.1	21.1	21.8	21.8	21.8	21.3	19.7	15.2	11.7	9.9	9.3	8.5	12.7	21.8	
22-Aug	7.6	6.5	5.1	4.7	4.5	3.7	5.7	8.8	12.6	16.1	18.9	20.1	19.9	20.7	21.0	21.1	21.3	20.7	18.9	15.7	13.2	11.5	11.3	10.6	13.3	21.3	
23-Aug	9.8	9.3	8.9	9.0	10.0	9.7	11.5	12.6	14.2	15.9	17.9	18.6	18.9	19.4	19.7	20.7	19.6	19.6	18.5	16.8	16.3	15.2	14.3	14.2	15.0	20.7	
24-Aug	14.2	13.6	13.6	13.5	13.3	12.5	12.6	13.6	14.3	14.7	15.3	15.8	16.7	17.8	18.3	18.2	18.0	17.9	17.3	14.8	12.4	10.4	8.8	7.2	14.4	18.3	
25-Aug	6.3	5.5	5.2	4.8	5.0	6.6	8.1	11.1	14.5	17.5	19.2	20.0	20.4	20.8	21.6	21.6	21.5	20.8	19.5	16.6	13.3	12.7	10.7	9.6	13.9	21.6	
26-Aug	9.2	8.2	7.5	8.2	8.9	9.0	10.6	14.1	16.7	18.9	21.2	22.9	24.5	25.1	26.2	26.6	26.0	25.2	23.0	20.5	19.9	18.4	17.0	15.3	17.6	26.6	
27-Aug	13.3	12.4	10.7	9.4	8.2	7.6	7.8	12.1	16.5	18.9	20.3	21.6	23.0	23.8	24.4	24.5	24.1	22.6	20.6	18.3	16.5	16.4	16.9	16.9	17.0	24.5	
28-Aug	16.5	16.0	15.4	15.1	14.3	13.5	13.8	15.3	17.8	20.3	22.8	25.3	26.8	27.8	29.1	28.8	29.1	28.3	24.8	21.6	19.4	18.4	16.2	16.1	20.5	29.1	
29-Aug	15.4	15.8	15.0	13.8	12.0	12.0	12.6	15.0	16.9	20.5	23.7	26.1	27.4	28.2	28.6	28.7	28.7	28.2	24.0	19.4	16.4	14.9	13.2	12.4	19.5	28.7	
30-Aug	11.8	10.9	10.3	8.8	8.8	8.5	8.4	11.5	15.7	18.8	24.0	24.9	24.0	25.2	25.4	25.5	25.7	23.0	21.3	19.0	17.1	15.3	13.9	13.2	17.1	25.7	
31-Aug	13.2	12.8	12.1	11.6	11.1	11.2	11.9	14.8	17.2	18.7	21.2	24.2	25.5	26.3	27.0	26.8	25.7	24.3	21.8	19.8	18.4	17.2	16.8	16.4	18.6	27.0	
		11.8	11.3	10.8	10.5	10.3	10.2	11.1	13.0	15.2	17.0	18.6	19.7	20.4	21.0	21.5	21.5	21.5	20.7	19.2	16.8	14.8	13.7	12.9	12.2	Diurnal Average	
		20.4	19.6	18.6	18.3	19.6	20.0	20.0	20.6	21.2	21.0	24.0	26.1	27.4	28.2	29.1	28.8	29.1	28.3	25.0	22.8	19.9	19.0	19.9	19.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Conklin - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Conklin - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	102	13.71	13.71
10 - 20	472	63.44	77.15
> 20	170	22.85	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

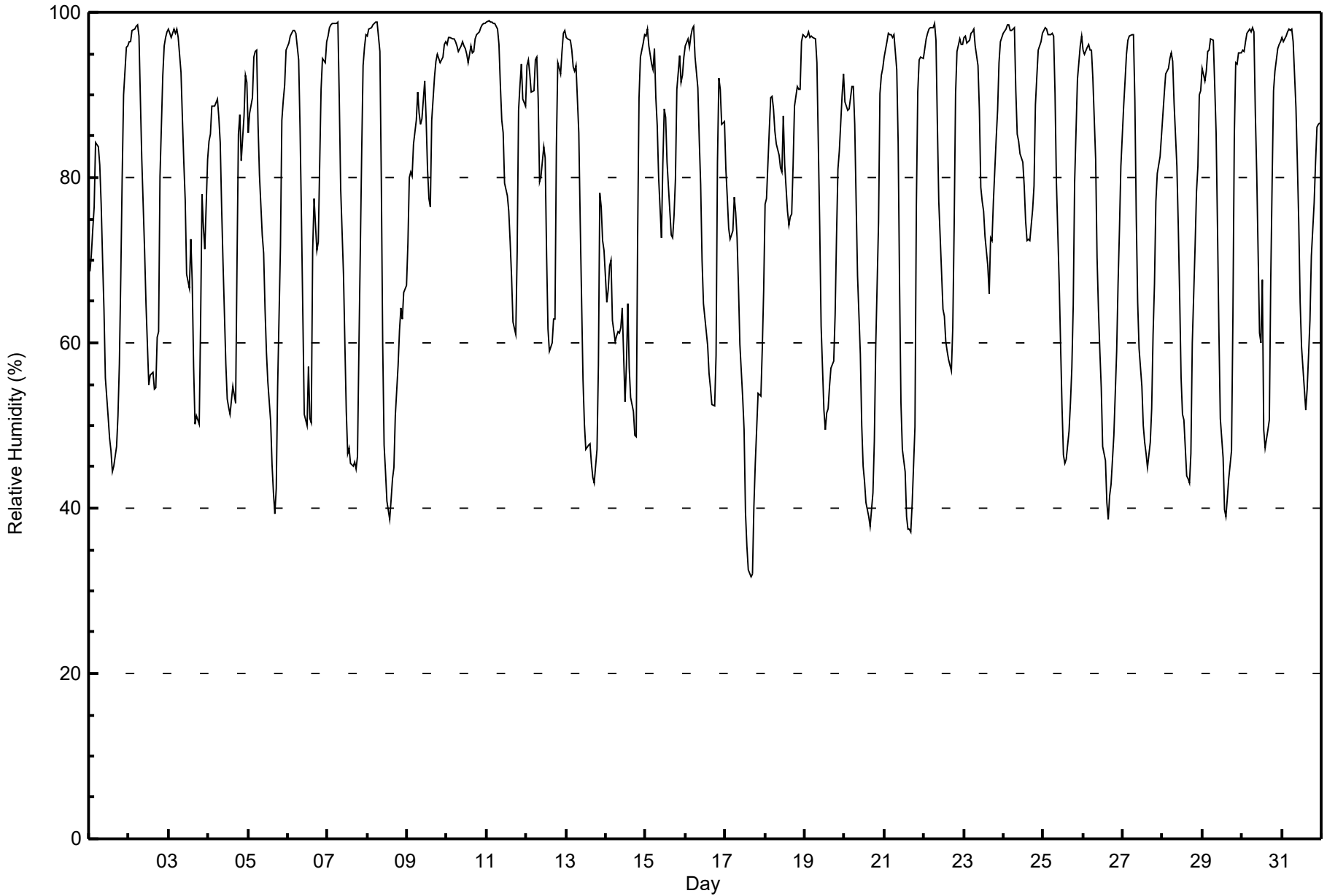
Conklin - August 2023

Maximum Value: 98.9 % on Aug 11 02:00 Maximum Daily Average: 96.5 % on Aug 10																						Hours in Service: 744 Hours of Data: 744																										
Minimum Value: 31.7 % on Aug 17 16:00 Minimum Daily Average: 57.2 % on Aug 17 Maximum Diurnal Average: 93.7 % at hour 6 Minimum Diurnal Average: 54.7 % at hour 15 Monthly Average: 77.32 % Percentiles: P ₁ = 38.1 P ₁₀ = 48.3 Q ₁ = 61.1 Median = 81.9 Q ₃ = 95.0 P ₉₀ = 97.3 P ₉₉ = 98.7																						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-Aug	68.7	70.7	73.7	76.5	84.2	83.7	81.6	76.8	70.2	64.0	55.7	51.0	48.4	46.9	44.3	45.0	47.4	51.1	57.5	67.9	80.0	90.1	95.8	95.9	67.8	95.9																						
2-Aug	96.5	96.5	97.7	98.0	98.2	98.6	97.1	89.5	82.2	71.2	64.7	59.8	55.0	56.1	56.4	54.5	54.5	60.6	61.4	80.2	92.3	96.0	97.0	97.6	79.6	98.6																						
3-Aug	98.1	96.9	97.4	98.0	97.5	98.0	97.0	92.6	87.1	81.8	77.3	68.3	66.7	72.6	67.5	57.0	50.1	51.3	50.1	62.6	77.9	73.9	71.4	82.2	78.1	98.1																						
4-Aug	84.4	85.3	88.6	88.6	88.7	89.4	87.3	84.3	76.5	69.7	57.4	53.2	52.2	51.4	53.0	54.8	52.7	69.9	85.3	87.7	82.0	87.4	92.3	91.5	75.6	92.3																						
5-Aug	85.4	87.8	89.7	94.5	95.2	95.5	86.5	80.3	73.1	70.8	64.1	58.8	55.3	50.4	45.2	41.8	39.4	42.3	54.7	71.7	86.9	89.3	91.1	95.4	72.7	95.5																						
6-Aug	96.3	97.1	97.5	97.8	97.8	97.5	94.2	86.0	75.0	63.2	51.4	50.0	57.2	50.9	50.3	71.1	77.5	71.1	72.2	81.5	90.8	94.4	93.9	96.5	79.6	97.8																						
7-Aug	97.1	98.2	98.5	98.7	98.6	98.7	98.9	89.5	78.6	68.2	59.8	51.7	46.7	47.3	45.5	45.0	45.7	44.8	46.3	59.2	83.1	93.6	95.8	97.3	74.4	98.9																						
8-Aug	97.2	97.9	98.2	98.5	98.6	98.7	98.8	95.2	79.9	59.8	47.7	44.4	40.8	38.6	41.0	43.6	44.9	51.2	57.3	61.5	64.3	62.8	66.2	66.9	68.9	98.8																						
9-Aug	72.0	80.0	80.6	80.2	84.1	87.0	90.3	87.8	86.4	87.1	91.7	87.1	81.0	77.5	76.5	86.9	92.2	94.2	94.9	94.3	94.0	94.6	96.1	96.5	87.2	96.5																						
10-Aug	96.2	97.0	96.9	96.7	96.8	96.5	95.9	95.2	95.9	96.4	95.9	95.5	94.9	94.0	95.9	95.0	95.3	96.8	97.2	97.6	98.1	98.5	98.6	98.7	96.5	98.7																						
11-Aug	98.8	98.9	98.9	98.8	98.7	98.7	97.9	96.0	91.1	86.9	85.4	79.3	77.8	75.9	72.1	68.0	62.5	61.1	71.0	88.1	91.3	93.8	89.4	88.6	86.2	98.9																						
12-Aug	93.6	94.3	92.5	90.4	90.5	94.3	94.7	89.5	79.5	80.2	83.8	82.4	70.6	61.6	59.0	60.0	62.8	62.9	83.8	93.9	92.5	95.3	97.5	97.8	83.5	97.8																						
13-Aug	97.0	96.8	96.7	95.4	93.5	92.9	93.6	85.5	74.7	65.1	55.6	50.2	47.1	47.6	47.8	45.4	43.7	43.1	47.1	57.2	78.2	76.4	72.3	71.2	69.7	97.0																						
14-Aug	64.9	66.5	69.3	70.1	62.8	60.2	60.8	61.4	61.2	61.9	64.3	52.9	57.3	64.7	56.9	53.5	51.7	48.9	48.7	72.7	89.7	94.6	96.3	97.2	66.2	97.2																						
15-Aug	97.1	98.0	95.9	93.7	93.1	95.6	89.7	86.3	80.0	72.7	81.7	88.4	87.4	81.9	76.0	73.0	72.7	75.4	79.9	90.8	94.8	91.5	92.3	94.6	86.8	98.0																						
16-Aug	95.9	96.8	95.8	97.1	98.0	98.3	94.6	90.8	84.6	79.2	70.0	64.7	61.4	59.6	56.2	54.7	52.5	52.4	58.5	81.8	92.0	90.7	86.5	86.7	79.1	98.3																						
17-Aug	81.0	77.7	73.9	72.5	73.5	77.7	75.8	72.7	66.7	59.9	53.4	49.6	39.5	35.4	32.6	31.7	32.0	40.2	45.4	49.6	53.8	53.5	59.4	66.5	57.2	81.0																						
18-Aug	76.7	77.5	85.7	89.7	89.8	88.3	85.5	84.1	82.7	81.1	80.8	87.4	81.5	76.0	74.2	75.3	75.6	81.6	88.7	91.0	90.6	90.7	96.5	97.3	84.5	97.3																						
19-Aug	96.9	97.2	97.6	96.9	97.1	96.9	96.8	93.8	84.1	74.1	62.1	51.9	49.4	51.6	52.0	54.7	56.9	57.8	63.4	72.9	80.9	83.2	90.0	92.5	77.1	97.6																						
20-Aug	89.2	88.6	88.1	88.4	91.0	91.0	86.4	77.2	68.1	58.7	50.0	45.0	43.2	40.6	39.0	37.7	39.9	41.8	48.2	59.6	74.6	90.2	92.3	93.2	67.6	93.2																						
21-Aug	94.6	96.5	97.4	97.3	97.3	97.0	97.3	93.1	84.2	67.2	52.7	47.1	44.4	39.0	37.4	37.5	37.2	40.4	49.8	76.7	90.4	94.2	94.6	94.4	73.2	97.4																						
22-Aug	95.6	96.8	97.5	98.0	98.1	98.1	98.7	96.7	86.4	77.1	68.5	64.1	63.2	60.1	59.0	58.0	56.6	61.8	74.5	90.2	95.2	96.8	96.1	96.1	82.6	98.7																						
23-Aug	97.0	97.1	96.2	96.7	97.4	97.6	97.9	95.9	93.6	88.2	78.9	77.1	75.9	72.9	69.3	65.9	72.8	72.4	77.1	84.7	88.2	93.9	96.4	97.0	86.7	97.9																						
24-Aug	97.5	98.0	98.5	98.4	97.9	97.8	98.1	90.4	85.2	84.4	82.8	81.8	78.9	74.8	72.4	72.5	72.3	76.1	79.1	88.9	92.3	95.4	96.5	97.4	87.8	98.5																						
25-Aug	97.8	98.1	98.0	97.3	97.3	97.5	97.1	90.2	79.4	67.1	59.5	52.1	46.5	45.4	46.0	49.3	52.7	56.9	64.5	79.4	91.9	94.0	95.9	97.1	77.1	98.1																						
26-Aug	95.4	95.0	95.7	96.1	95.4	95.5	92.1	82.2	70.3	64.0	58.9	54.5	47.5	45.7	40.8	38.6	41.5	42.9	48.7	53.8	58.9	67.1	73.7	81.4	68.1	96.1																						
27-Aug	88.6	91.7	95.0	96.6	97.1	97.3	97.2	89.4	75.2	64.9	59.4	54.7	50.0	48.0	46.6	44.9	48.0	52.0	61.0	67.1	77.2	80.5	82.5	85.0	72.9	97.3																						
28-Aug	87.7	90.2	92.6	93.3	94.4	95.1	94.1	88.9	81.3	74.1	65.4	55.8	51.4	50.7	44.0	43.6	43.1	46.7	60.0	71.7	78.2	81.4	89.9	90.6	73.5	95.1																						
29-Aug	93.2	91.6	92.9	95.2	95.4	96.7	96.7	91.3	85.4	73.8	61.3	50.9	46.0	39.8	39.0	41.2	43.5	47.0	63.3	85.0	93.9	93.7	95.0	95.1	75.3	96.7																						
30-Aug	95.5	95.3	96.5	97.4	97.9	97.6	98.1	97.6	87.7	80.5	61.1	60.1	67.6	49.5	47.3	49.4	50.8	67.5	79.5	90.5	92.8	95.5	96.2	96.5	81.2	98.1																						
31-Aug	97.0	96.4	97.1	97.6	97.9	97.8	98.0	96.5	88.4	81.9	74.6	64.8	59.5	54.5	51.9	54.4	58.4	62.7	70.4	76.9	81.9	86.1	86.5	86.6	79.9	98.0																						
																								91.1	91.8	92.6	93.0	93.3	93.7	92.5	87.9	80.5	73.4	67.0	62.4	59.5	56.8	54.7	55.0	55.7	58.9	65.8	77.0	84.8	87.7	89.5	91.0	Diurnal Average
																								98.8	98.9	98.9	98.8	98.7	98.7	98.9	97.6	95.9	96.4	95.9	95.5	94.9	94.0	95.9	95.0	95.3	96.8	97.2	97.6	98.1	98.5	98.6	98.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Conklin - August 2023





Maximum Speed: 17 km/h on Aug 13 13:00	Maximum Daily Speed Average: 8.8 km/h on Aug 13	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 3 01:00	Minimum Daily Speed Average: 0.3 km/h on Aug 6	Hours of Data: 740
Maximum Diurnal Speed Average: 2.6 km/h at hour 15	Minimum Diurnal Speed Average: 0.9 km/h at hour 21	Hours of Missing Data: 4
Monthly Average Velocity: 1.7 km/h 242.3 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 3 Median = 5 Q ₃ = 7 P ₉₀ = 10 P ₉₉ = 13	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-Aug	WSW11	WSW10	WSW11	WSW10	SW8	WSW9	W9	WNW8	WNW9	WNW9	NW10	WNW9	WNW10	WNW9	W10	WNW10	NW9	WNW7	NW6	NW4	NW3	NW1	SE1	ESE1	W6.7	WSW11
2-Aug	SSE3	ESE2	SE2	N1	N3	N2	NNW4	NW3	NNW4	NNW4	WNW3	W4	WSW4	WSW5	SW3	SW3	W3	NNW3	UO	NNW1	E0	NNW0	NW2	NNW2	WNW1.3	WSW5
3-Aug	E0	NNW2	WSW1	W1	SW6	ESE8	SSE2	NW1	SE3	SE6	SE7	SE7	SE5	NW5	NW5	W7	W8	W7	WNW5	NW5	NW2	WNW4	WSW4	SSW5	WSW1.3	W8
4-Aug	W4	W6	W6	WNW4	WNW4	NW3	NW5	NW6	NW6	NW7	NW8	NW7	WNW7	WNW6	WSW5	N4	NNW3	WNW3	SW4	WSW1	NW4	SW2	SSW3	NNW3	WNW4.0	NW8
5-Aug	W2	WNW2	NNW3	NNW1	N2	NNW2	NW3	NW4	NW5	NW5	NW5	NW5	WNW6	WNW6	W7	WNW6	WNW6	W5	WNW2	SSE0	S2	SE3	SE2	SSE1	WNW2.8	W7
6-Aug	SSE0	WSW0	S1	S1	S1	SSW1	S3	S2	SSE1	SW1	ESE1	SSW2	NW5	W1	SW2	N4	ESE3	ESE6	SSE4	NNW1	NNW3	N3	NNE1	NNE2	SSE0.3	ESE6
7-Aug	NW2	N1	NNW4	NNW3	NNW3	NNW4	NNW4	N4	N5	N8	N9	N9	NNE6	NNE7	N6	NE6	N7	N7	NNE6	N5	NW2	N1	WNW1	S1	N4.4	N9
8-Aug	NNW1	S0	N0	SSE1	S1	SE1	ENE1	SE3	SE5	ESE6	ESE7	ESE7	ESE8	ESE7	SE7	ESE5	ESE7	ESE7	ESE9	ESE8	SE10	SE11	SE9	SE10	SE5.2	SE11
9-Aug	SSE7	SE3	SSE4	SE6	SE8	SE6	SE7	SE9	SE8	SE9	SE7	SE9	SE12	SE12	SE12	SE9	SE8	SE10	SE10	SE11	SE11	SE9	SE6	ESE7	SE8.4	SE12
10-Aug	ESE10	ESE8	SE10	SE9	SE9	SE11	ESE11	SE10	ESE7	E7	E7	ENE7	ENE6	ENE4	NNE7	NNE6	NE5	N6	N8	NNW7	N6	N8	N8	NNW8	ENE4.5	ESE11
11-Aug	NNW9	NNW8	NW7	NNW6	NW5	NW5	NW6	NW6	NNW7	NW7	NNW6	NNW7	NNW6	NW5	NW6	NW5	WNW4	NW5	N2	SSE0	S1	S2	WSW6	SW6	NW4.4	NNW9
12-Aug	SW4	WSW6	SW6	SW5	SW5	SW4	SSW4	WSW4	WNW5	WNW6	WNW6	W5	WNW6	WNW6	NW9	WNW6	WNW5	W6	W3	WSW1	WSW2	SSE1	SE2	S4	W3.6	NW9
13-Aug	S3	SSE3	SSE4	S5	S7	SSW7	SSE5	SSW10	SSW12	SW12	SW14	SW15	SW17	WSW15	SW14	WSW13	WSW13	WSW11	WSW10	SW6	SSW5	SSW7	SW12	SW12	SW8.8	SW17
14-Aug	SW11	SW11	SW11	SW13	WSW12	W11	W10	WNW8	NW10	NW8	NW6	WNW6	WNW5	WNW3	WNW5	WSW7	WNW3	NNW4	N2	S2	SSE2	WNW0	ESE1	SSE2	W4.9	SW13
15-Aug	SSE2	S3	SSE3	SSE4	SSE4	S6	SSE6	S6	SSW8	SSW8	SSW4	SSW5	SW7	SW9	WSW8	WSW7	SW5	WS5	WNW6	SW7	W6	NW5	NW6	SSW4.2	SW9	
16-Aug	NW5	NW4	NW4	NW3	NNW3	NW3	WNW5	WNW5	NW7	NW8	NW8	NW8	NW6	WNW6	WNW7	W7	W6	W6	WSW2	S2	SSE3	S5	S6	S6	WNW3.6	NW8
17-Aug	S7	S6	SSW8	SSW10	SSW11	SSW12	SW13	SW13	SW11	WSW9	WSW9	W7	WSW12	WNW10	WNW10	WNW9	WNW9	NNW6	W4	W4	W5	WNW5	NW4	NNW3	WSW6.2	SW13
18-Aug	NNW3	NNW4	NNE1	NNW2	NNW4	NNW4	NNW4	NNW3	NNW6	N10	N12	N10	N8	N9	NNW8	NNW8	NNW8	NW5	NW3	WNW2	NW4	NW6	NW5	NW3	NNW5.3	N12
19-Aug	WNW3	NW4	NW3	NW4	NW4	NW4	NW5	WNW6	WNW6	WNW7	WNW7	WNW9	WNW8	WNW7	WNW7	W8	W7	W6	WSW6	SW6	SW5	SW6	S5	S5	W4.6	WNW9
20-Aug	SSW8	SSW9	SW10	SSW10	SSW9	SSW10	SW9	SW10	SW10	SW9	SW11	SW10	WSW10	SSW7	SSW6	SW5	SW6	SW6	SSW7	SSW6	SSE4	E1	S3	SSW6	SW7.3	SW11
21-Aug	S2	SSE2	S1	SSE2	SE4	SSE2	S2	S1	NE1	SE2	E4	ESE7	ESE7	E7	ESE7	ESE7	ESE6	E4	ENE3	N1	NNW1	N0	SSE2	SSE3	ESE2.6	ESE7
22-Aug	SSE2	S1	NNW0	SW0	SE1	NNW1	S1	ENE1	SE1	ESE2	SE5	ESE7	SE8	ESE8	ESE6	SE5	ESE6	ESE4	ESE1	NNW1	UO	SE1	SSE2	SE2	ESE2.5	ESE8
23-Aug	SSE1	SSE2	SSE3	SSE3	ENE1	S2	SE1	SE1	NNW1	N3	ESE3	E4	ENE4	ENE3	ENE4	ENE5	ENE6	ENE6	NE3	N3	N5	WNW1	NW2	WNW1	ENE1.5	ENE6
24-Aug	NW1	N2	NNW3	NW3	NNW3	NW3	NW2	N6	N7	NNE8	NNE9	NNE8	N9	N9	NNE8	NNE9	N7	NW3	SW2	WNW2	NNW1	SSE2	S2	SSE2	N3.7	N9
25-Aug	ESE1	SE2	SSE2	SSE3	S5	S4	SSE5	SSW7	SSW7	SW10	WSW10	SW11	SW10	SW10	SSW11	SW10	SSW11	SW9	SSW5	S2	SSE2	SSW3	N1	E2	SSW5.2	SSW11
26-Aug	SSE4	S4	S4	S6	S5	S7	S8	SSW10	SSW13	SSW11	SW9	SW10	WSW11	WSW12	WSW10	W8	WSW10	WSW8	WSW6	WSW6	W5	W3	NW4	NNW4	SW6.1	SSW13
27-Aug	NNW4	N2	N1	NE0	S0	S1	S0	SSE2	NNW2	S3	SSE5	SW3	NNE3	SSE1	WSW5	SW6	WSW8	WSW9	SSW6	SSW5	S5	SSW6	SW9	SW11	SW2.8	SW11
28-Aug	SW10	SW6	SSW5	SSW6	SSW5	S5	SSW6	SSW7	SSW6	SSW5	SSW5	SW5	WSW5	WSW4	WNW3	NNW4	WNW2	SW3	SW4	S4	S5	S5	SE3	S5	SSW4.1	SW10
29-Aug	S6	SSW7	S5	S3	SSE3	SSE4	SSE5	S5	S4	S4	SSW5	SSW8	SW9	SSW9	SSW8	WSW6	WSW5	SW4	S1	S1	UO	SE3	SSE3	SSE3	SSW4.3	SSW9
30-Aug	SE3	SSE3	SSE1	NW2	S1	SSE1	NNW1	SE1	SE2	N1	C	E4	SSE5	SE7	SE6	ESE3	ESE3	NNE0	S0	WSW0	NNW2	SSE0	SSE2	SSE3	SE1.6	SE7
31-Aug	SE4	S2	WSW1	NNE2	SSE2	S3	SSE1	NNW4	NW4	WNW4	WNW4	WNW5	WNW4	WNW5	W5	WNW6	NW8	WNW6	WNW5	NW5	NW5	NW4	NW5	NW5	WNW3.2	NW8

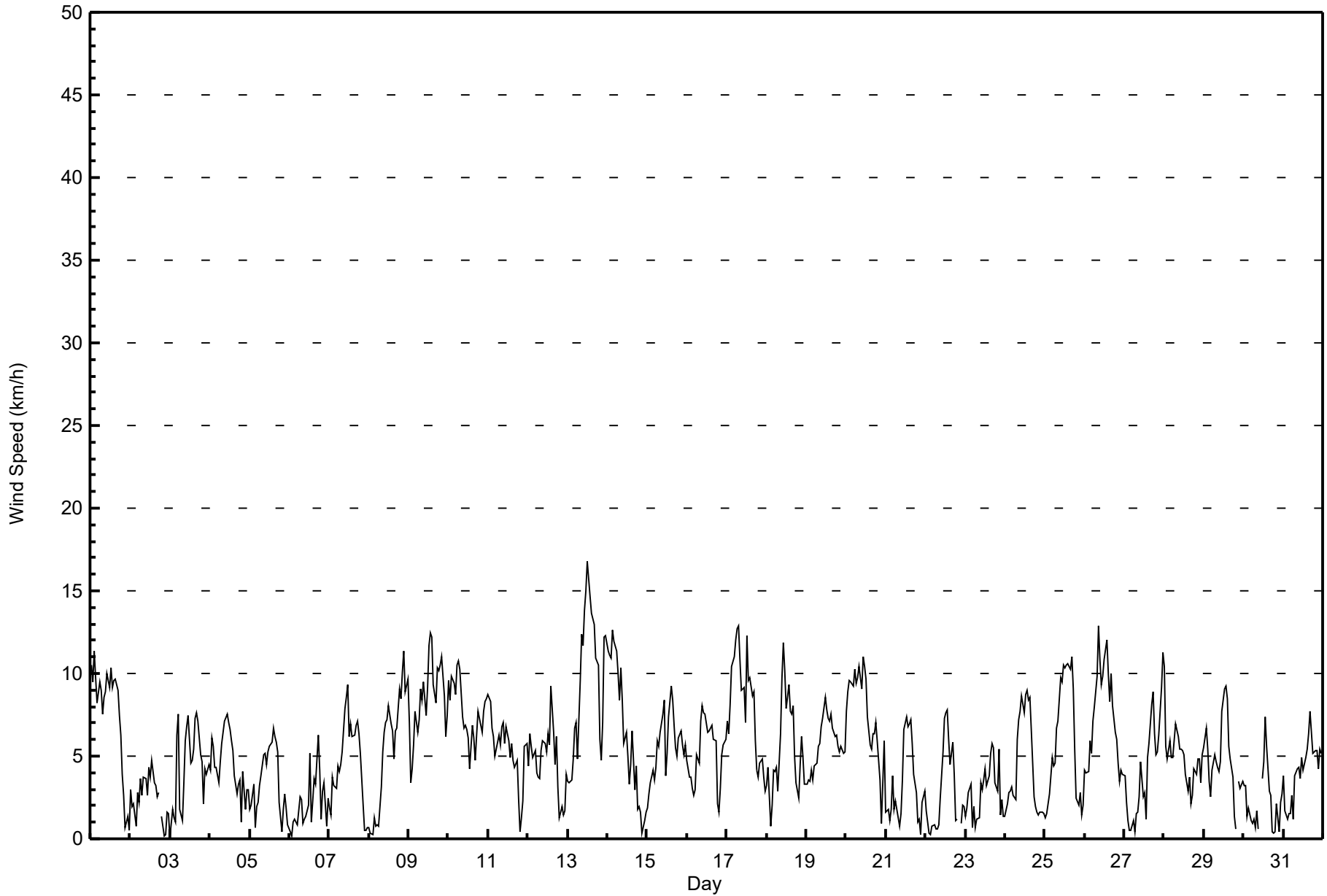
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SW11	SW11	WSW11	SW13	WSW12	SSW12	SW13	SW13	SSW13	SW12	SW14	SW15	SW17	WSW15	SW14	WSW13	WSW13	WSW11	WSW10	SE11	SE11	SE11	SW12	SW12	Diurnal Maximum	

C - Calibration 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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	414	55.95	55.95
6 - 11	303	40.95	96.89
12 - 19	23	3.11	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: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Conklin - August 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	24	6	4	9	7	14	28	58	56	16	21	17	15	35	57	47	414
6 - 11	20	10	1	4	3	25	33	2	11	34	37	26	19	39	26	13	303
12 - 19	1	0	0	0	0	0	3	0	0	3	10	6	0	0	0	0	23
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	45	16	5	13	10	39	64	60	67	53	68	49	34	74	83	60	740

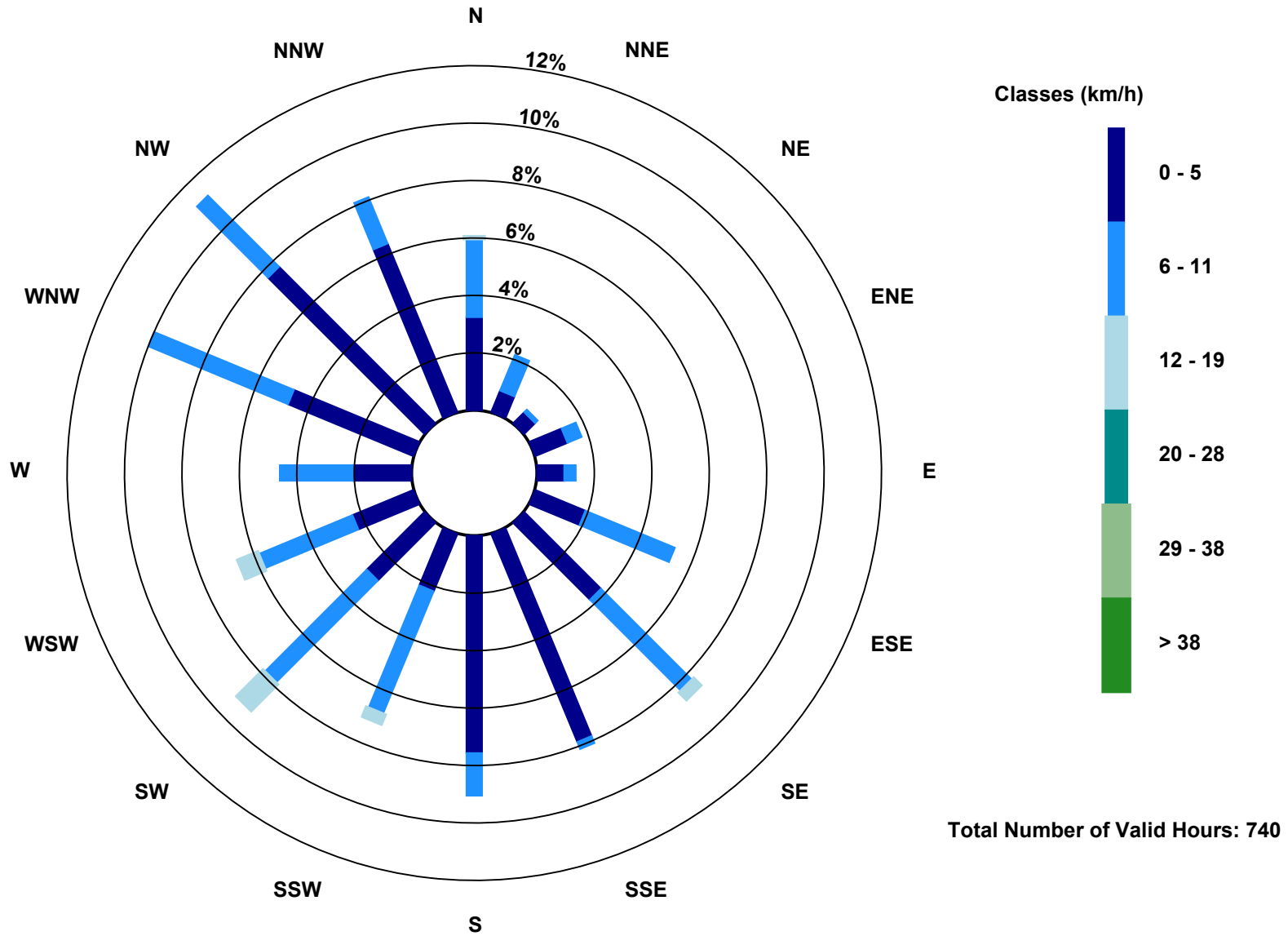
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Conklin





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Conklin - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Aug 15 20:00 Minimum Value: 0 km/h on Aug 30 02:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 1 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-Aug	4	3	4	3	2	3	4	4	4	4	4	4	4	4	5	5	5	3	3	2	2	1	1	1	5
2-Aug	1	1	1	1	1	2	1	1	2	2	2	2	2	2	3	2	2	1	UO	1	1	1	1	1	3
3-Aug	1	1	1	1	3	3	3	1	3	2	2	2	2	2	2	3	3	3	3	2	1	2	2	1	3
4-Aug	2	3	2	2	2	1	2	3	3	3	3	3	2	3	2	3	2	3	3	1	2	1	2	1	3
5-Aug	1	1	1	1	1	1	2	2	2	2	2	2	2	3	4	3	2	2	2	1	1	1	1	1	4
6-Aug	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	2	1	1	1	2	2	2	3
7-Aug	1	1	1	1	1	0	1	1	2	3	3	4	3	4	3	3	3	3	2	2	1	1	2	1	4
8-Aug	1	1	1	1	1	1	1	1	2	2	3	3	4	3	2	1	2	2	3	2	3	3	2	3	4
9-Aug	2	1	1	1	2	2	2	2	2	3	2	3	3	3	3	3	2	3	3	3	3	3	2	3	3
10-Aug	3	3	3	3	3	4	4	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4
11-Aug	3	3	2	2	2	2	2	2	2	3	2	3	3	2	2	2	2	3	1	1	1	1	3	2	3
12-Aug	2	2	2	2	2	2	1	1	3	3	3	3	3	3	5	3	3	2	3	1	2	1	1	1	5
13-Aug	1	1	1	1	2	2	2	2	3	3	5	5	5	5	5	5	5	4	4	3	1	2	3	3	5
14-Aug	3	3	3	3	5	4	4	4	5	4	2	3	2	2	2	2	2	2	1	1	1	1	1	1	5
15-Aug	1	1	1	1	1	1	1	1	1	3	4	1	2	3	3	3	2	2	2	6	3	3	2	3	6
16-Aug	2	2	1	1	1	1	2	2	3	4	3	3	2	3	3	3	3	3	2	2	1	1	1	1	4
17-Aug	2	1	2	3	3	3	3	3	3	3	4	3	6	4	4	4	4	3	2	2	2	2	2	1	6
18-Aug	2	3	1	1	1	1	1	1	3	3	4	3	3	3	2	3	3	2	1	1	2	2	2	1	4
19-Aug	1	2	2	2	2	2	2	3	2	3	3	4	4	3	3	4	3	3	2	1	2	1	1	1	4
20-Aug	2	2	3	2	2	3	3	3	3	3	4	3	3	4	3	2	2	2	2	2	1	1	1	1	4
21-Aug	1	2	2	1	1	1	1	1	1	1	1	2	2	3	3	3	2	2	1	1	1	1	1	1	3
22-Aug	1	1	1	1	1	1	1	1	1	2	2	3	2	2	2	2	2	2	1	1	UO	1	1	1	3
23-Aug	1	0	1	1	2	1	1	1	1	1	2	1	2	2	1	3	3	2	1	1	1	1	1	1	3
24-Aug	1	1	1	1	1	1	1	2	3	3	3	2	3	3	3	3	2	1	1	1	1	1	1	1	3
25-Aug	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	4	3	2	1	1	1	1	4
26-Aug	0	0	1	1	1	1	2	3	4	3	3	3	4	4	5	4	4	3	2	2	2	2	2	1	5
27-Aug	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	2	1	1	2	3	4	4
28-Aug	3	2	2	2	1	1	2	2	1	1	1	2	2	2	2	2	1	1	2	1	1	1	1	1	3
29-Aug	1	1	2	1	1	1	1	1	1	1	1	2	3	3	3	2	1	1	1	1	UO	1	1	0	3
30-Aug	1	0	1	1	1	2	1	2	1	1	C	2	2	3	3	2	1	1	1	1	2	1	1	1	3
31-Aug	2	2	1	1	1	2	1	2	2	2	2	2	2	2	3	3	4	3	2	2	2	2	2	2	4
																	Diurnal Maximum								
C - Calibration																	UO - Unstable Operation								



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Conklin - August 2023

Direction of Maximum Speed: 232 deg on Aug 13 13:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 223.1 deg on Aug 13	Hours of Data: 740
Direction of Minimum Speed: 87 deg on Aug 3 01:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 0.3 deg on Aug 6	Percent Operational Time: 99.6
Monthly Average Direction: 242.3 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-Aug	253	254	249	249	227	254	272	294	288	299	306	297	290	291	278	300	309	299	320	317	320	323	144	117	280.6
2-Aug	151	120	130	1	354	357	329	314	338	337	287	268	251	245	231	220	267	332	UO	330	80	342	322	334	293.0
3-Aug	87	328	251	263	218	116	160	311	127	124	126	138	124	324	305	274	267	274	292	309	304	286	253	209	239.8
4-Aug	277	274	274	290	296	313	318	312	306	323	313	312	299	290	256	352	341	285	220	239	316	218	200	327	296.9
5-Aug	266	297	329	344	6	327	310	315	307	310	312	305	282	291	271	292	300	277	283	153	178	143	132	161	295.7
6-Aug	165	244	182	173	182	194	190	173	166	218	107	205	316	274	216	6	111	123	165	336	345	351	30	18	154.5
7-Aug	316	350	342	331	338	339	344	357	356	10	359	3	15	14	7	45	5	5	21	10	326	4	294	170	2.4
8-Aug	327	188	358	165	175	140	66	144	144	120	107	102	110	121	127	119	116	118	112	117	126	135	141	144	124.0
9-Aug	149	139	148	145	130	142	139	142	142	143	131	134	136	136	141	136	131	130	135	136	135	133	125	116	136.2
10-Aug	114	122	129	125	126	126	122	126	106	81	84	77	76	58	24	28	38	6	0	347	358	351	352	344	74.6
11-Aug	338	339	326	327	326	326	326	321	327	321	333	337	329	317	320	312	297	324	6	153	190	173	240	232	319.8
12-Aug	231	242	221	227	215	220	211	244	289	294	295	277	292	296	308	289	302	263	277	242	256	157	144	174	262.5
13-Aug	172	168	162	179	186	193	161	206	207	214	228	221	232	243	233	244	250	254	248	229	195	207	233	231	223.1
14-Aug	236	232	232	232	252	268	280	297	318	325	319	303	294	299	290	247	300	342	349	171	150	291	122	158	270.5
15-Aug	155	172	158	167	160	158	183	164	182	197	212	193	194	220	216	237	244	225	216	295	225	265	308	312	213.5
16-Aug	313	304	319	326	331	318	290	299	312	318	305	310	309	289	287	281	273	266	251	174	152	173	187	183	288.1
17-Aug	188	181	192	201	197	206	217	220	231	242	248	259	251	294	290	296	295	305	273	266	270	296	323	341	243.6
18-Aug	345	330	26	347	335	334	334	343	348	2	7	6	9	355	335	329	329	320	310	302	318	317	318	310	341.6
19-Aug	303	318	320	313	317	318	322	297	294	294	292	293	283	293	299	265	277	265	254	228	222	215	188	185	278.6
20-Aug	204	208	216	212	210	211	215	230	228	221	235	222	241	198	209	217	226	219	210	204	165	101	179	202	215.3
21-Aug	174	149	189	158	135	159	169	178	36	146	98	114	117	95	104	106	107	83	64	5	331	357	161	157	116.1
22-Aug	166	171	328	221	134	330	172	71	127	114	128	110	124	113	114	141	122	119	112	340	UO	140	168	138	123.5
23-Aug	153	161	163	155	76	184	128	140	335	351	120	84	58	71	62	61	73	60	37	355	354	297	319	300	61.4
24-Aug	321	350	330	322	336	320	304	354	6	13	20	14	4	9	22	18	360	310	232	286	343	163	178	159	0.6
25-Aug	116	130	152	152	177	184	167	205	205	215	239	219	235	226	208	226	204	215	198	183	155	206	11	101	207.7
26-Aug	152	184	186	178	191	185	181	197	209	208	222	222	237	240	255	272	246	240	252	253	271	260	318	335	225.8
27-Aug	340	355	10	42	170	178	181	147	348	174	158	223	22	150	251	223	237	239	209	192	186	202	227	233	220.9
28-Aug	231	218	198	208	195	191	199	201	208	213	200	234	257	241	294	337	301	228	216	187	188	184	142	176	211.7
29-Aug	177	192	189	176	149	165	166	170	176	184	210	203	218	207	211	240	242	226	180	176	UO	146	148	150	193.5
30-Aug	139	148	159	322	176	147	331	133	143	10	C	98	147	141	129	109	117	15	170	256	338	166	160	155	135.0
31-Aug	134	176	243	14	162	183	148	331	316	295	286	295	297	289	274	293	313	302	295	305	309	313	319	319	298.9

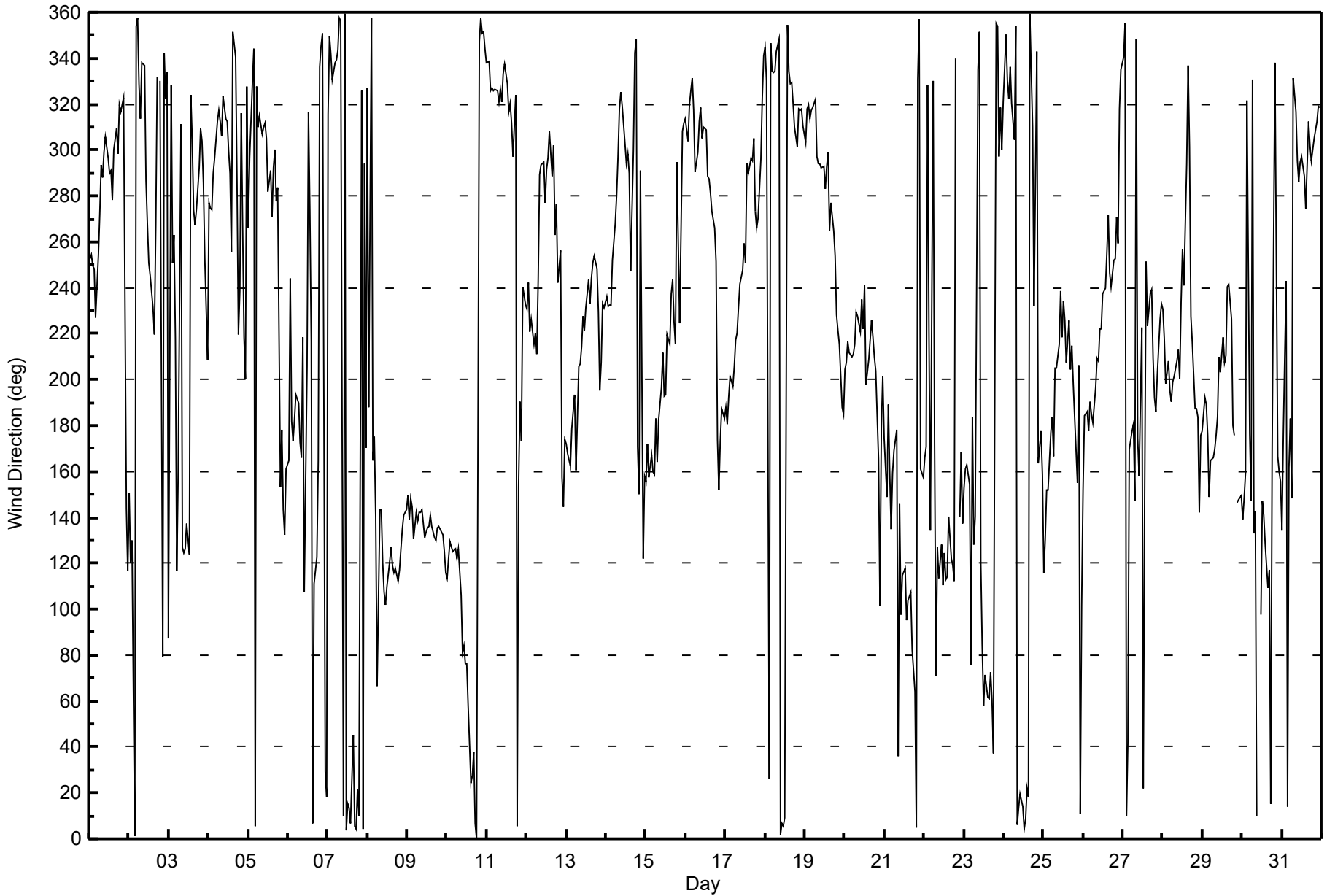
212.9 221.8 217.4 214.5 207.5 209.8 223.2 232.6 255.7 267.9 265.9 257.5 259.5 261.7 261.5 276.1 274.1 267.3 245.3 249.1 230.4 209.5 219.8 209.0
 Diurnal Average

C - Calibration 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
Conklin - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Conklin - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 100 deg on Aug 30 18:00 Minimum Value: 7 deg on Aug 26 03:00 Percentiles: P ₁ = 11 P ₁₀ = 19 Q ₁ = 23 Median = 37 Q ₃ = 54 P ₉₀ = 74 P ₉₉ = 94		Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 1 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-Aug	33	32	26	29	20	30	48	56	55	49	47	52	48	48	52	48	48	50	37	34	28	81	35	65	81
2-Aug	35	44	18	89	58	46	37	60	51	57	88	59	72	47	74	77	62	33	UO	61	61	84	66	77	89
3-Aug	76	60	76	71	39	29	77	86	58	31	34	34	62	35	42	49	48	47	52	39	46	55	48	18	86
4-Aug	64	49	45	61	53	55	53	38	47	40	48	50	53	50	55	81	77	71	53	79	50	76	40	51	81
5-Aug	87	87	58	94	89	52	57	54	44	48	55	49	51	56	55	55	49	48	74	95	23	20	58	52	95
6-Aug	62	90	76	26	66	83	55	31	94	89	75	77	44	96	85	77	77	25	22	77	44	56	88	65	96
7-Aug	56	68	20	24	22	8	17	30	39	36	35	35	54	51	68	58	54	49	25	20	66	69	75	74	75
8-Aug	93	91	96	52	77	72	56	41	29	32	43	44	47	53	39	33	30	29	21	22	20	17	17	17	96
9-Aug	15	18	19	17	17	17	16	17	17	16	19	20	20	19	18	17	19	19	18	20	18	20	21	20	21
10-Aug	20	21	20	20	21	20	21	24	29	36	37	33	39	51	29	32	37	23	22	20	21	21	20	20	51
11-Aug	21	23	24	23	24	29	26	35	28	31	31	28	40	46	49	54	58	50	30	88	50	31	42	31	88
12-Aug	40	27	24	31	22	35	25	45	57	56	56	55	51	61	50	52	80	37	56	75	73	42	39	27	80
13-Aug	26	28	26	16	20	23	37	17	17	23	27	25	25	28	30	29	33	32	27	22	13	20	19	20	37
14-Aug	22	19	20	20	36	39	43	54	42	32	42	49	57	57	53	33	50	21	82	28	58	91	48	52	91
15-Aug	24	23	21	20	24	25	17	19	15	21	22	31	28	26	23	22	24	24	22	68	44	49	53	48	68
16-Aug	47	53	49	31	37	47	61	60	49	40	48	48	48	52	53	50	48	47	74	41	23	14	15	13	74
17-Aug	18	17	18	18	17	19	21	21	24	32	34	49	44	47	49	51	45	46	39	49	44	50	44	45	51
18-Aug	32	31	81	52	18	25	21	25	28	25	24	23	28	23	26	25	23	30	44	55	42	35	43	54	81
19-Aug	62	47	47	33	44	34	30	50	55	51	50	47	52	51	53	46	48	41	31	17	24	20	16	23	62
20-Aug	20	21	20	20	20	20	22	27	26	25	26	30	35	50	52	53	44	23	21	18	23	56	22	8	56
21-Aug	71	60	78	73	13	63	22	74	90	73	50	38	36	50	40	38	31	38	29	44	59	80	33	13	90
22-Aug	19	56	91	86	72	86	84	85	89	59	35	34	23	25	27	33	28	25	75	68	UO	70	29	39	91
23-Aug	15	19	20	16	85	57	82	80	67	30	64	52	53	69	38	61	38	39	39	23	21	57	22	30	85
24-Aug	68	43	31	25	27	22	33	24	30	33	28	28	28	30	31	27	27	47	36	54	73	36	27	40	73
25-Aug	52	34	30	15	14	18	24	22	23	23	27	27	28	29	25	33	23	24	24	35	52	20	77	70	77
26-Aug	15	9	7	10	13	10	13	20	21	22	33	31	35	27	38	48	32	23	26	24	56	68	47	34	68
27-Aug	25	27	68	73	88	71	89	37	85	61	41	79	71	98	56	37	28	19	20	20	18	27	24	22	98
28-Aug	20	34	25	25	23	15	16	18	14	16	23	33	52	66	72	44	58	22	23	16	15	14	35	14	72
29-Aug	23	15	29	21	40	17	16	18	22	29	30	25	24	26	30	31	23	21	65	45	UO	19	10	13	65
30-Aug	12	11	50	56	80	75	79	98	68	91	C	53	26	22	37	43	53	100	97	74	50	84	28	25	100
31-Aug	18	57	68	73	82	53	73	54	52	55	73	48	58	48	51	49	42	47	54	56	50	51	44	41	82
Diurnal Maximum																									
C - Calibration UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS22
JANVIER
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
AUGUST 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	0.9	0	0.3	0
TRS(ppb) Average	687	37	57	97.31	0.6	0	0.3	0
THC(ppm) Average	709	35	35	100	2.5	-	2.2	-
NMHC(ppm) Average	709	35	35	100	0.238	-	0.058	-
CH4(ppm) Average	709	35	35	100	2.5	-	2.2	-
O3 (ppb) Average	708	35	36	99.87	39.8	0	30.4	-
NO2 (ppb) Average	707	36	37	99.87	8.7	0	3	-
NO (ppb) Average	707	36	37	99.87	11.3	-	2.5	-
NOX (ppb) Average	707	36	37	99.87	15.5	-	5.5	-
PM2.5 (ug/m3) Average	726	1	18	97.72	314.6	51	164.8	10
Temperature 2 m (C) Average	744	0	0	100	28.4	-	20.2	-
Relative Humidity (%) Average	744	0	0	100	100	-	97.7	-
Wind Speed 20 m (km/h) Average	740	2	4	99.73	17	-	12	-
Wind Direction 20 m (deg) Average	740	2	4	99.73	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
AUGUST 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	0.11	0.1	-	0	0	0	0.1	0.2	0.3	0.9
TRS (ppb) Average	687	0.11	0.1	-	0	0	0.1	0.1	0.1	0.2	0.6
THC (ppm) Average	709	2.04	0.1	-	1.9	1.9	2	2	2.1	2.2	2.5
NMHC(ppm) Average	709	0.005	0.026	-	0	0	0	0	0	0	0.238
CH4(ppm) Average	709	2.04	0.1	-	1.9	1.9	2	2	2.1	2.2	2.5
O3 (ppb) Average	708	19.78	8.2	-	2.8	9.7	13.1	19.2	25.3	32.2	39.8
NO2 (ppb) Average	707	1.01	0.9	-	0	0.3	0.5	0.7	1.2	1.8	8.7
NO (ppb) Average	707	0.36	0.8	-	0	0	0.1	0.2	0.4	0.7	11.3
NOX (ppb) Average	707	1.37	1.6	-	0	0.5	0.7	1	1.5	2.4	15.5
PM2.5 (ug/m3) Average	726	31.73	43.9	-	1.1	4.5	7.6	17.8	37.7	62.3	314.6
Temperature 2 m (C) Average	744	16.27	4.7	-	5.5	11	12.6	15.4	19.7	22.9	28.4
Relative Humidity (%) Average	744	80.7	17.8	-	36.2	52	68.1	84.8	97.2	99	100
Wind Speed 20 m (km/h) Average	740	6.7	3	-	0	2	4	7	9	11	17
Wind Direction 20 m (deg) Average	740	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JANVIER (AMS22)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
TRS	04 Aug 2023 14:00	04 Aug 2023 15:00	2	Maintenance - reinitiated daily QA check
TRS	06 Aug 2023 10:00	06 Aug 2023 11:00	2	Maintenance - reinitiated daily QA check
TRS	24 Aug 2023 12:00	24 Aug 2023 12:00	1	Maintenance - reinitiated daily QA check
TRS	29 Aug 2023 11:00	29 Aug 2023 15:00	5	Maintenance - SO2 scrubber beads replaced
TRS	31 Aug 2023 08:00	31 Aug 2023 09:00	2	Maintenance - reinitiated daily QA check
TRS	31 Aug 2023 12:00	31 Aug 2023 18:00	7	Maintenance - zero air generator testing
NO2, O3, TRS	23 Aug 2023 14:00	23 Aug 2023 14:00	1	Maintenance - sample manifold cleaned
PM2.5	10 Aug 2023 18:00	11 Aug 2023 09:00	16	Unstable Operation - flatline in analyzer output signal
PM2.5	11 Aug 2023 10:00	11 Aug 2023 10:00	1	Maintenance - analyzer rebooted
Wind Speed, Wind Direction	22 Aug 2023 04:00	22 Aug 2023 04:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Aug 2023 02:00	30 Aug 2023 02:00	1	Flat line in sensor output signal

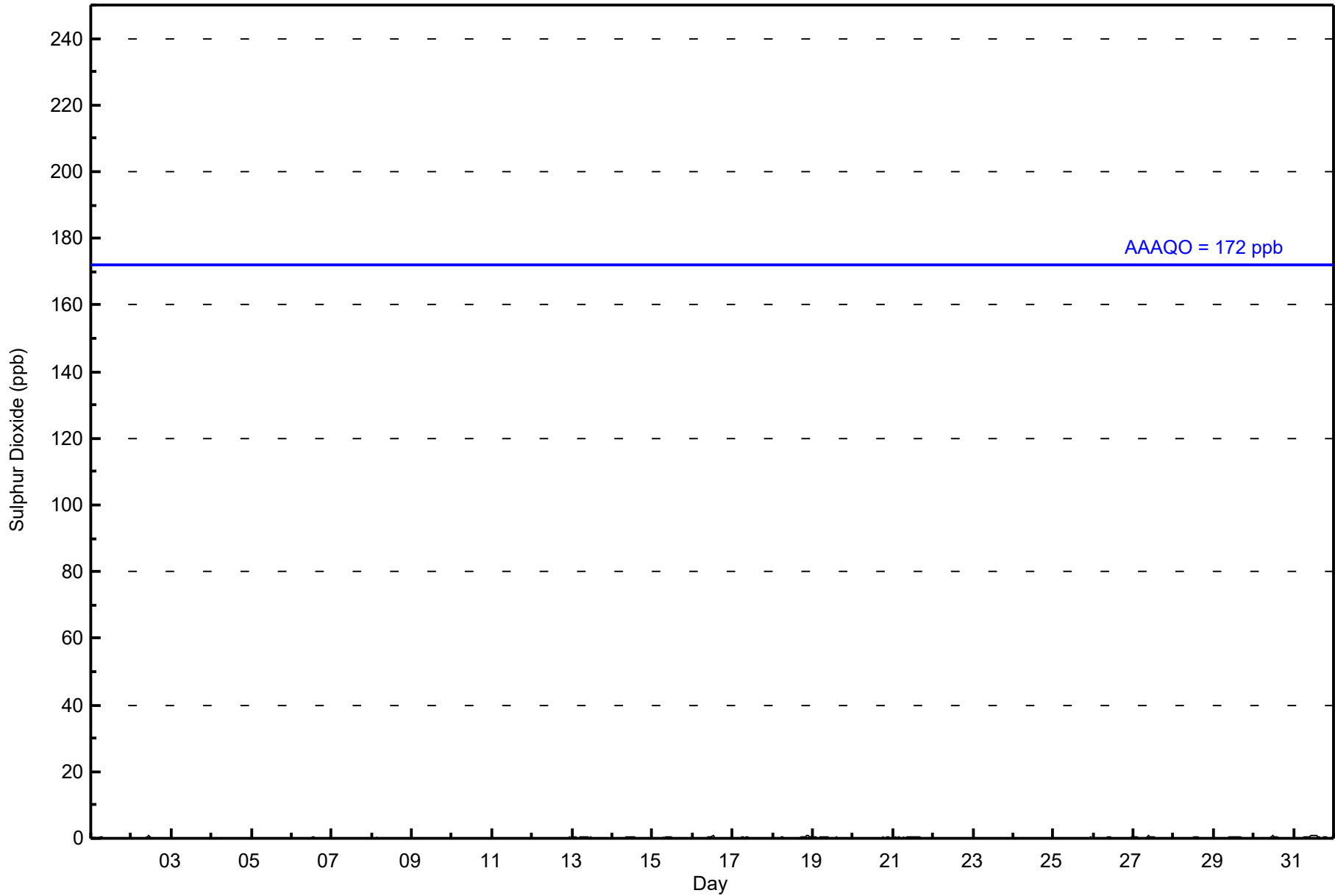


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744					
Maximum Value: 0.9 ppb on Aug 16 13:00		Maximum Daily Average: 0.3 ppb on Aug 31																	Hours of Data: 709							
Minimum Value: 0.0 ppb on Aug 2 04:00		Minimum Daily Average: 0.0 ppb on Aug 5																	Hours of Missing Data: 35							
Maximum Diurnal Average: 0.2 ppb at hour 11		Minimum Diurnal Average: 0.1 ppb at hour 4																	Hours of Calibration: 35							
Monthly Average: 0.11 ppb		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 = 0.7																	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-Aug	0.3	0.2	0.2	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	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.3
2-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.6	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	0.6
3-Aug	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
4-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
5-Aug	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
6-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4
7-Aug	0.0	0.0	0.0	Z	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2
8-Aug	0.1	0.2	0.2	0.2	Z	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2
9-Aug	0.0	0.0	0.0	0.0	0.0	Z	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	0.1	0.1	0.1	0.1	0.1	0.0	0.1
10-Aug	Z	0.2	0.1	0.1	0.1	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	0.2
11-Aug	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
12-Aug	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	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.2
13-Aug	0.2	0.3	0.2	Z	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.4
14-Aug	0.0	0.1	0.0	0.0	Z	0.1	0.1	0.1	0.5	0.2	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.5
15-Aug	0.2	0.1	0.2	0.2	Z	0.3	0.2	0.3	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4
16-Aug	Z	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.5	0.4	0.4	0.9	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.9
17-Aug	0.3	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	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	0.3
18-Aug	0.1	0.3	Z	0.1	0.2	0.6	0.4	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.5	0.4	0.6	0.9	0.7	0.6	0.5	0.3	0.9
19-Aug	0.4	0.3	0.3	Z	0.4	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.2	0.4
20-Aug	0.0	0.1	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.3
21-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.5	0.6	0.4	0.4	0.6	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.3	0.6
22-Aug	Z	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
23-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
24-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
25-Aug	0.0	0.0	0.0	Z	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	0.2	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.3
26-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.2	0.3	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.1	0.4
27-Aug	0.4	0.3	0.2	0.1	0.1	Z	0.2	0.1	0.2	0.7	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
28-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.3
29-Aug	0.1	Z	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.2	0.4
30-Aug	0.1	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.8	0.6	0.3	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.8
31-Aug	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.9	0.8	0.8	0.6	0.4	0.2	0.2	0.4	0.2	0.1	0.1	0.2	0.2	0.3	0.9
																								Diurnal Average		
																								Diurnal Maximum		
																								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 0.1 0.1 0.1 0.1 0.1 0.1		
																								0.4 0.3 0.3 0.2 0.4 0.6 0.4 0.4 0.5 0.7 0.8 0.9 0.9 0.8 0.6 0.5 0.3 0.5 0.4 0.6 0.9 0.7 0.6 0.5		
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
Janvier - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Janvier - August 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
Janvier - August 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	38	62	17	30	9	33	32	19	31	126	129	53	29	44	22	31	705
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	38	62	17	30	9	33	32	19	31	126	129	53	29	44	22	31	705

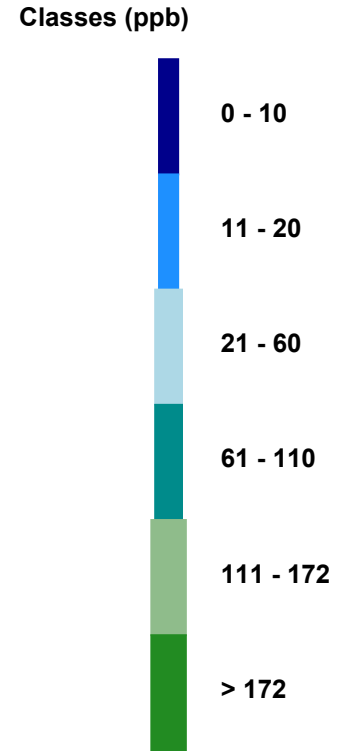
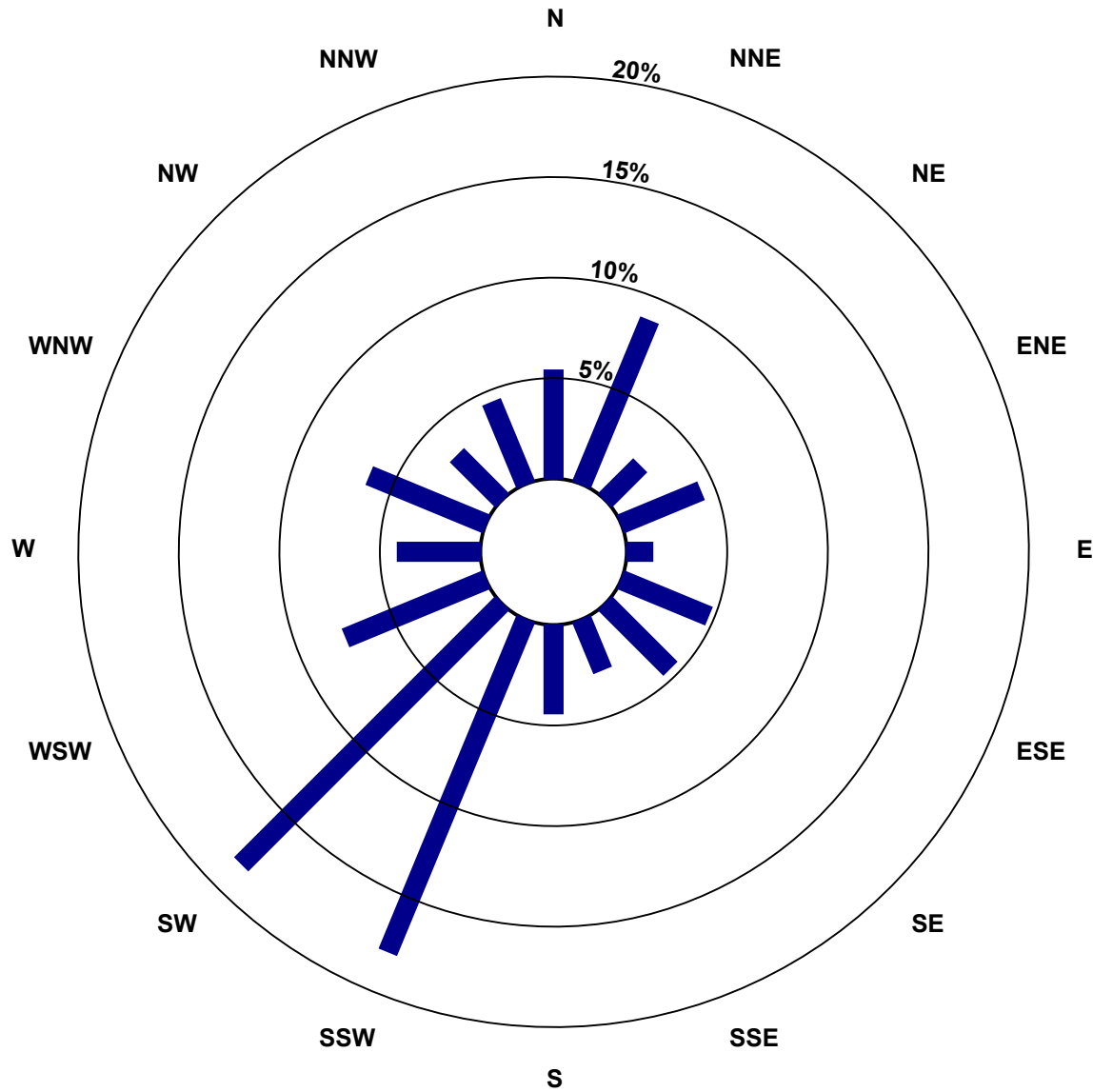
Total Number of Valid Hours: 705

Total Number of Hours: 744

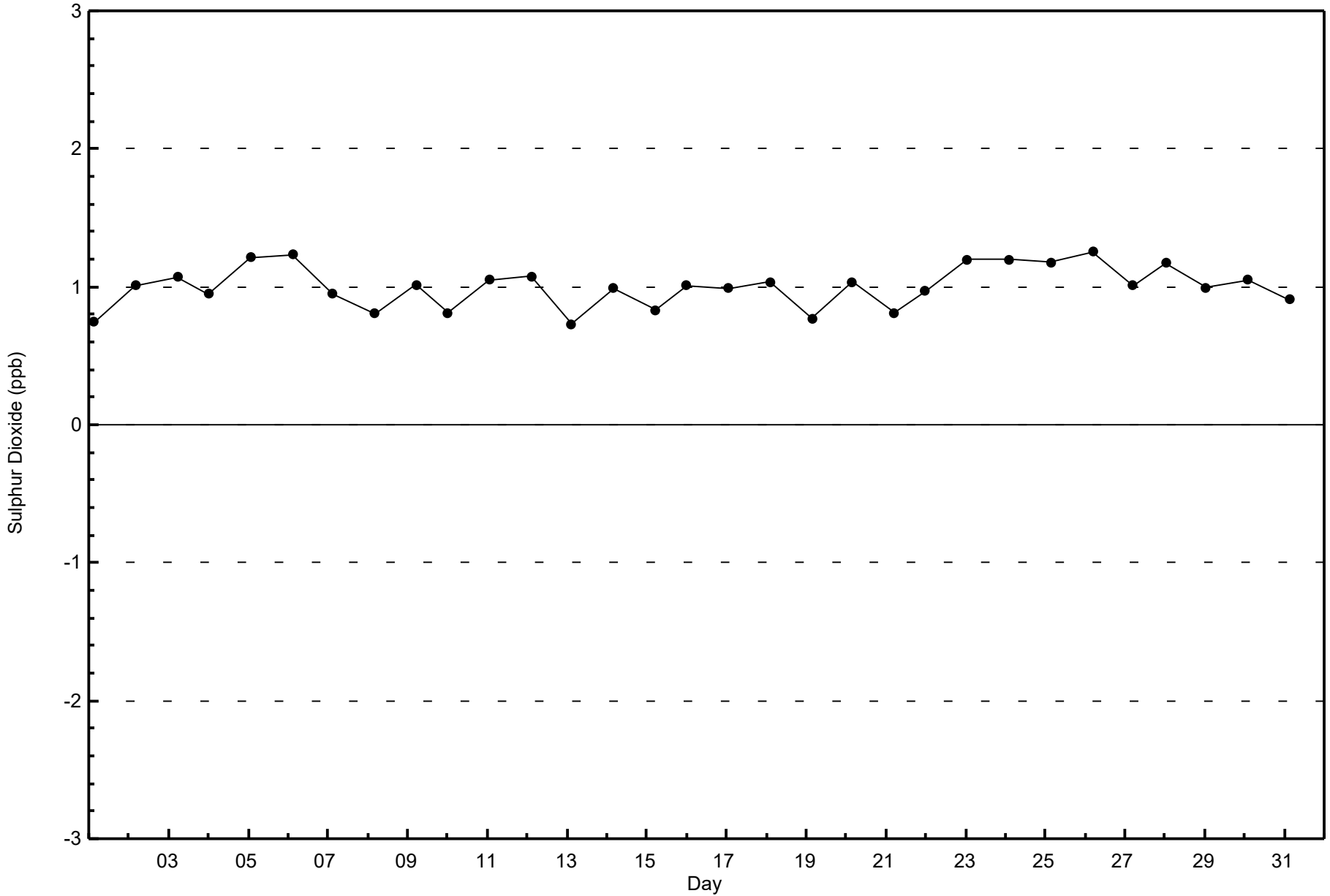


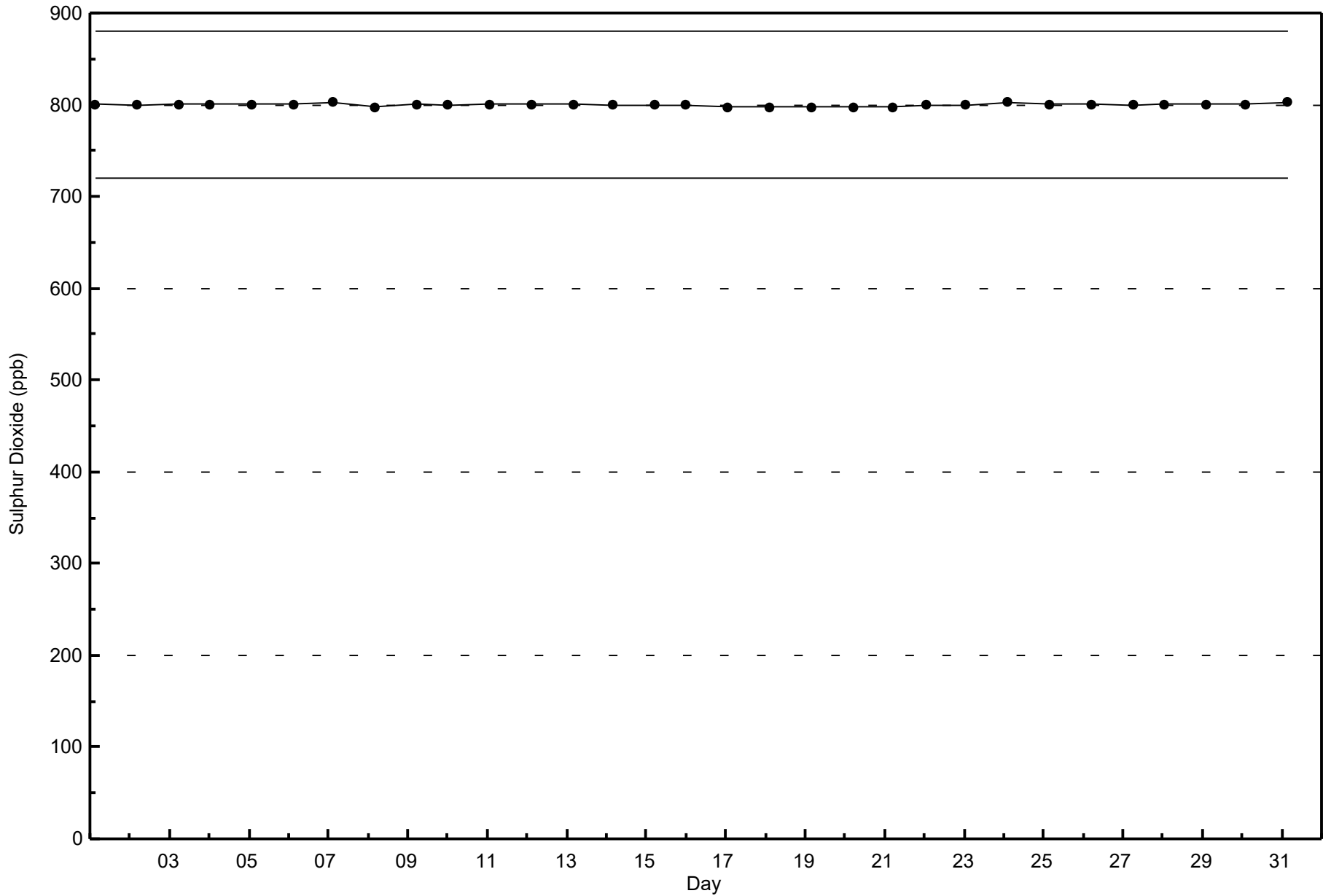
Wood Buffalo Environmental Association
Wind Rose Aug 2023

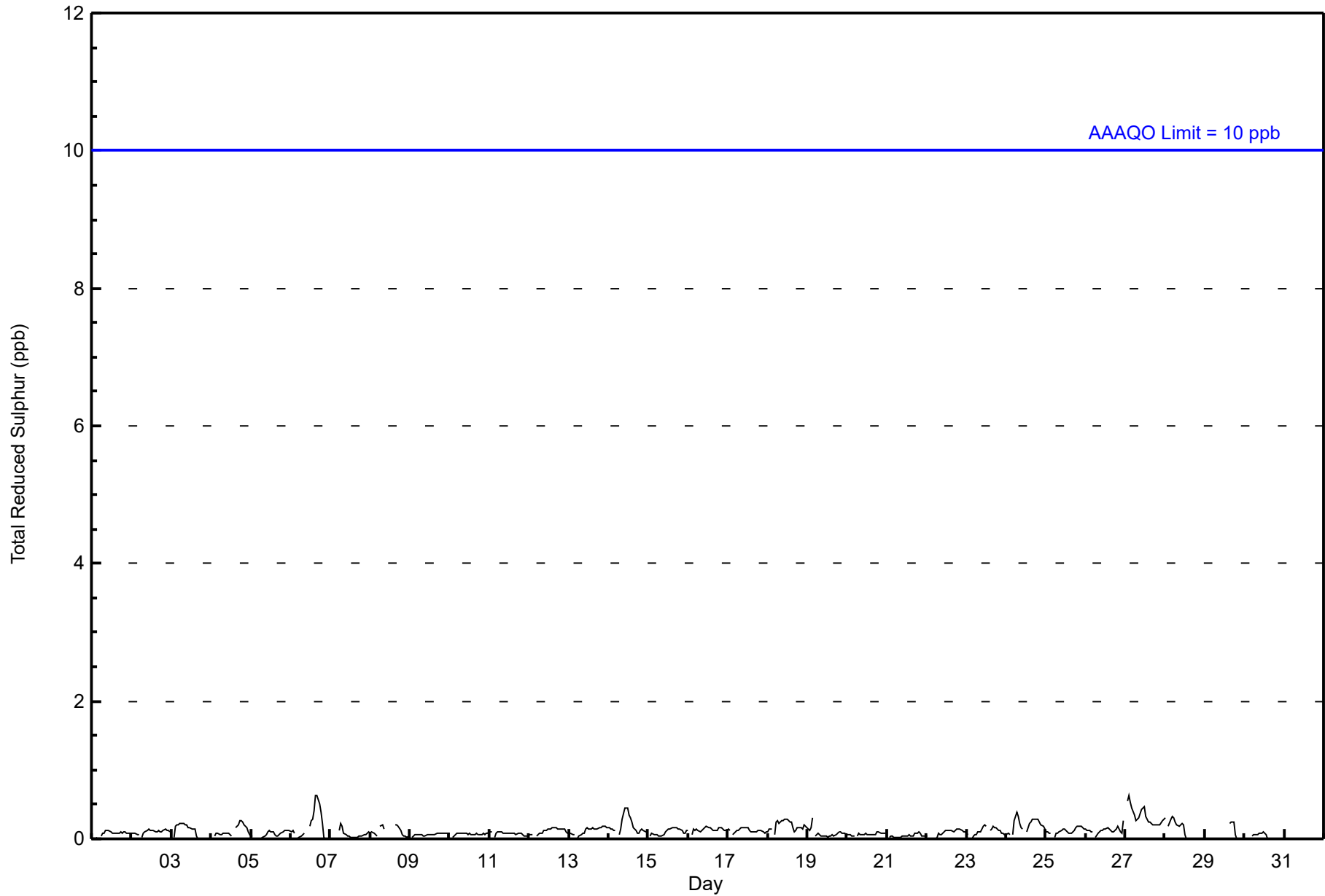
Sulphur Dioxide (SO₂) - ppb
Janvier



Total Number of Valid Hours: 705









**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Janvier - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	687	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: 687

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Janvier - August 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	36	62	16	25	10	32	30	17	30	128	125	50	27	41	23	32	684
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	36	62	16	25	10	32	30	17	30	128	125	50	27	41	23	32	684

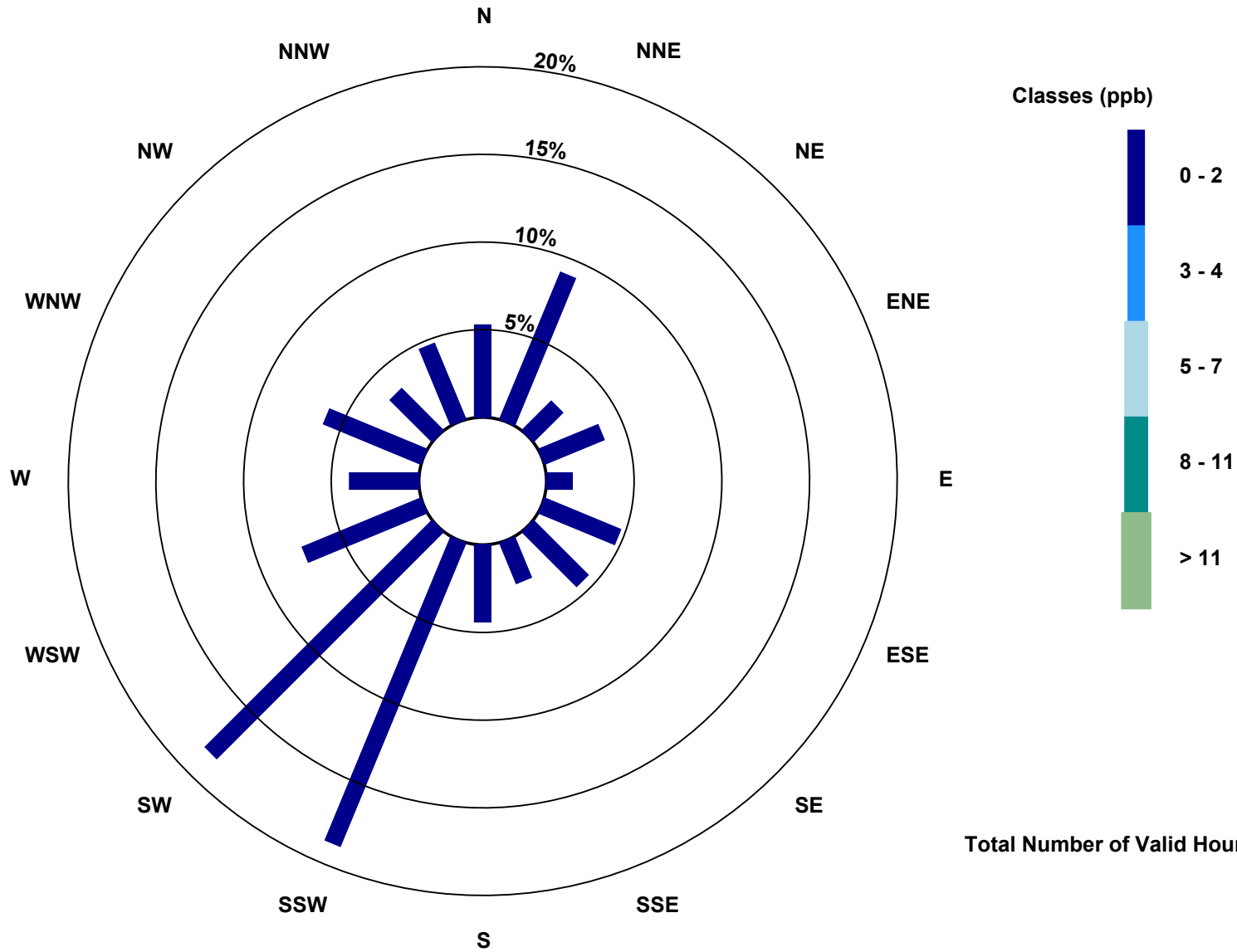
Total Number of Valid Hours: 684

Total Number of Hours: 744

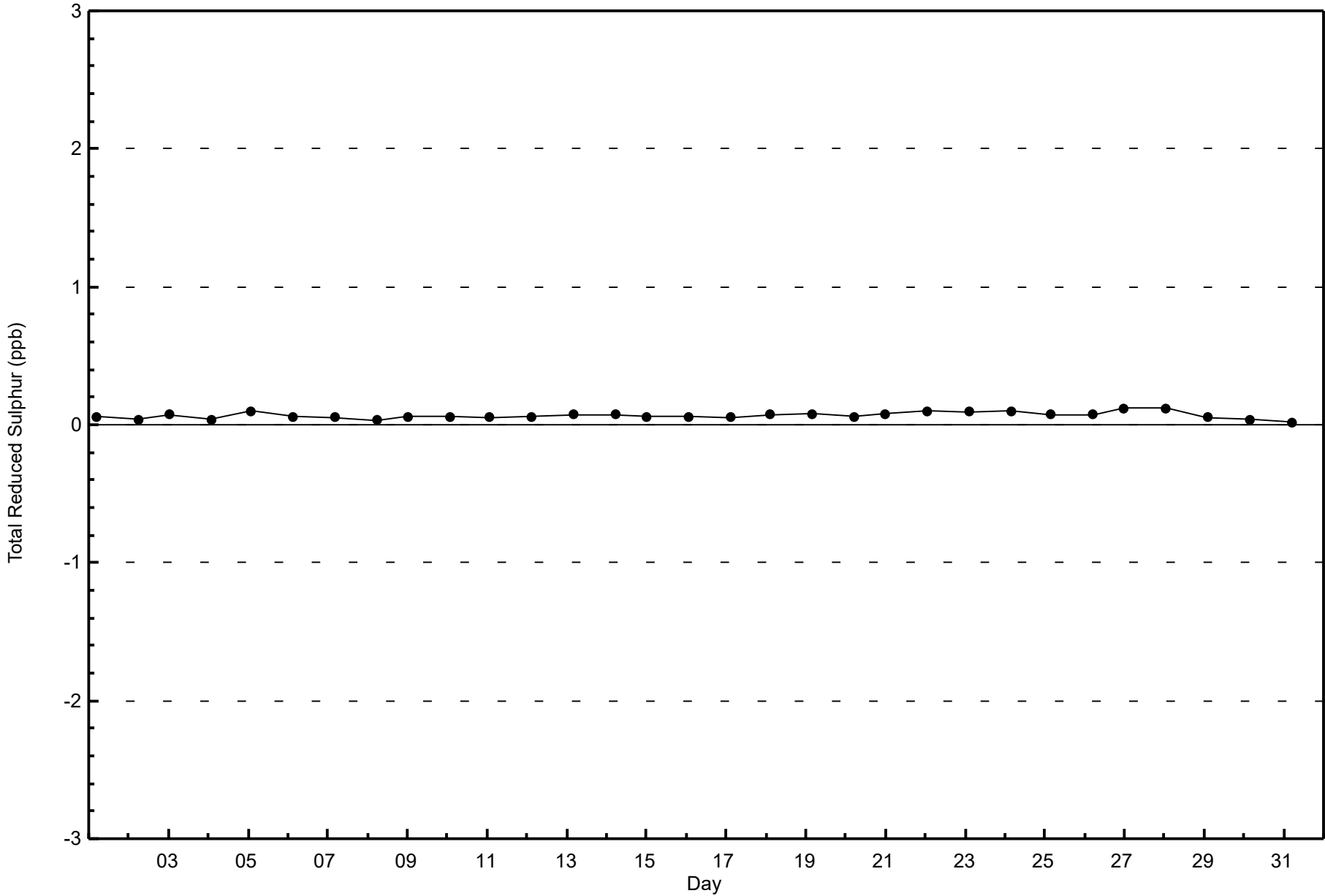


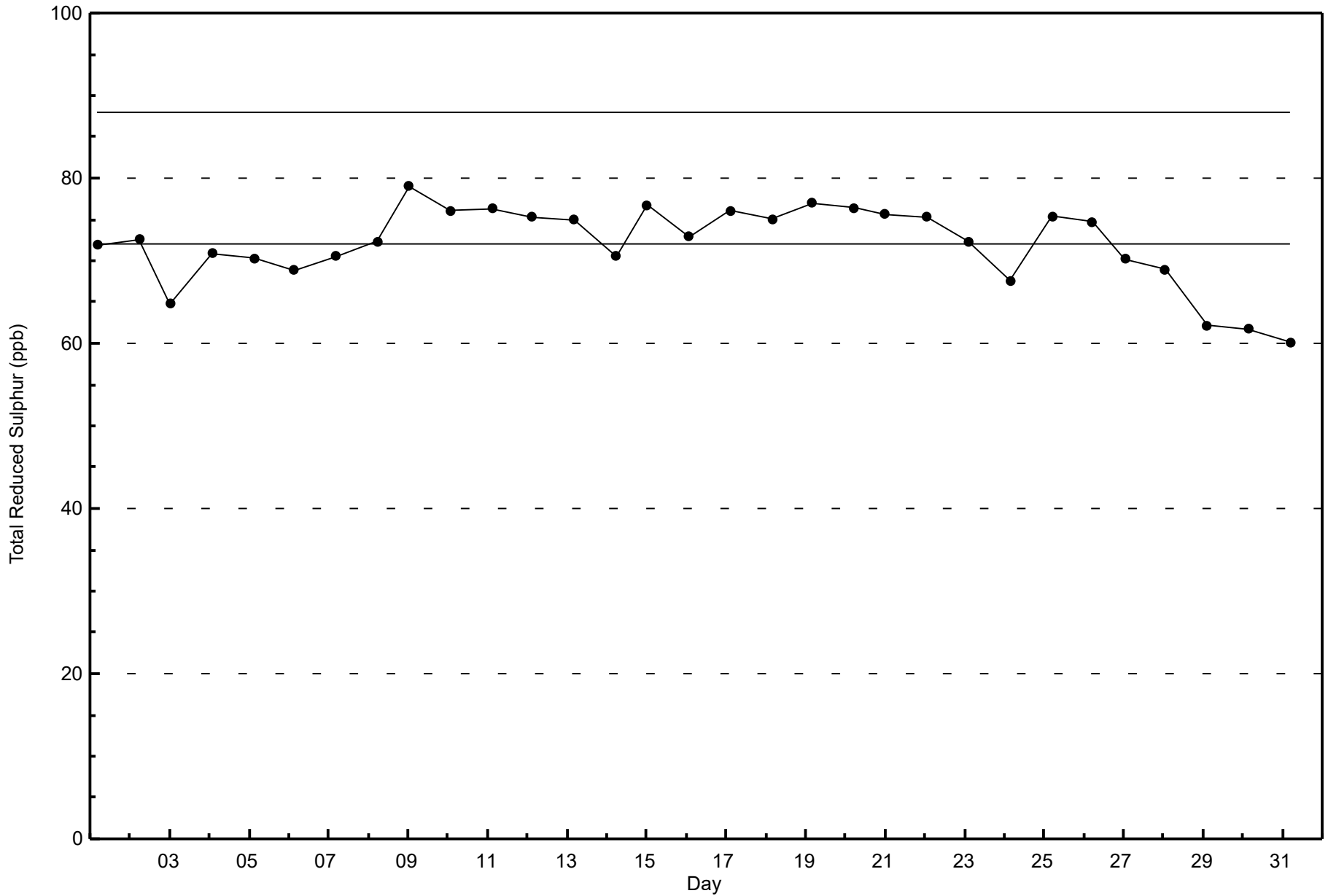
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Janvier



Total Number of Valid Hours: 684

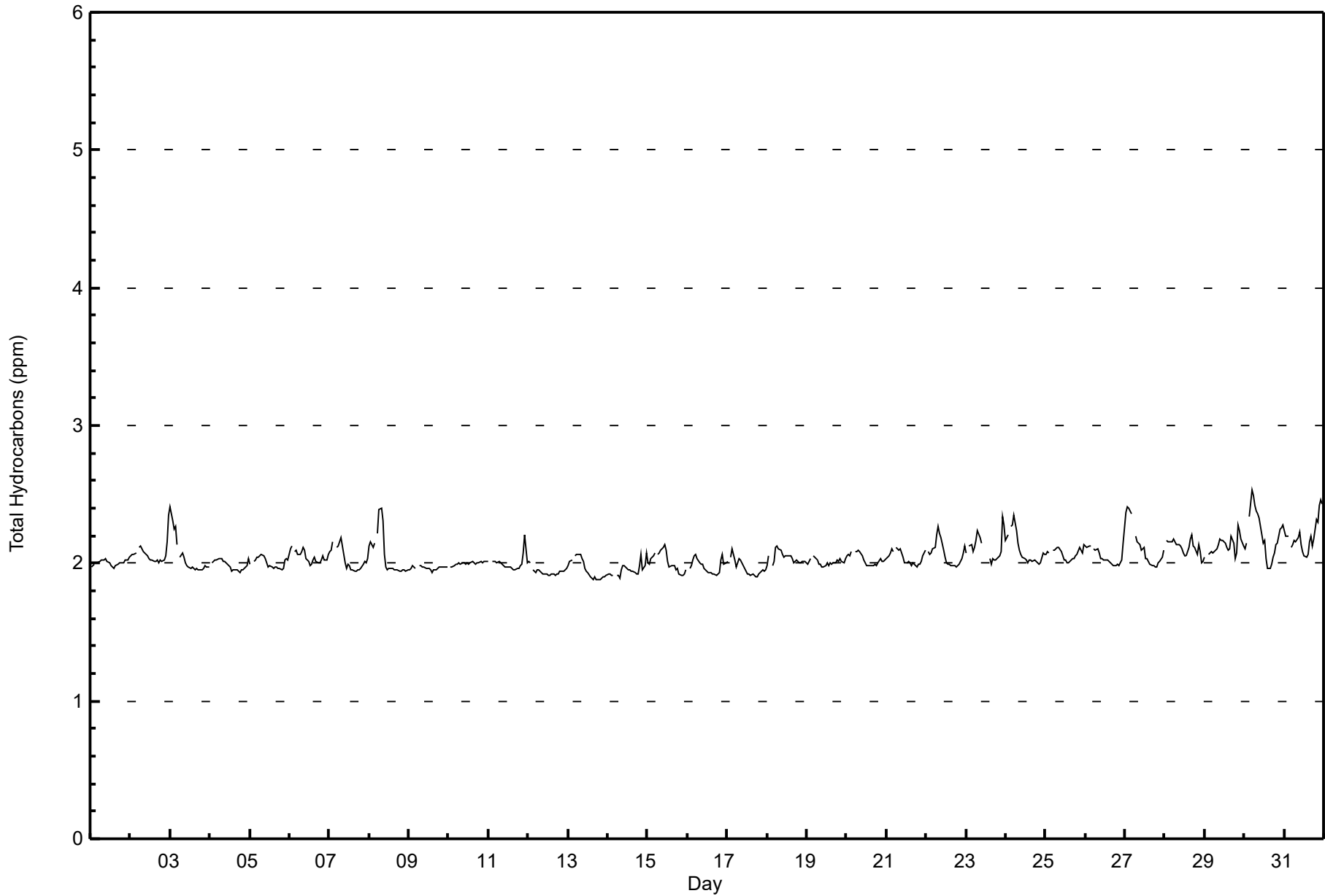






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Janvier - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Janvier - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	455	64.17	64.17
2.1 - 3.0	254	35.83	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

Total Hydrocarbons (THC) - ppm
Janvier - August 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	17	29	14	24	8	30	21	9	11	48	88	45	24	39	19	27	453
2.1 - 3.0	21	33	3	6	1	3	11	10	20	78	41	8	5	5	3	4	252
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	38	62	17	30	9	33	32	19	31	126	129	53	29	44	22	31	705

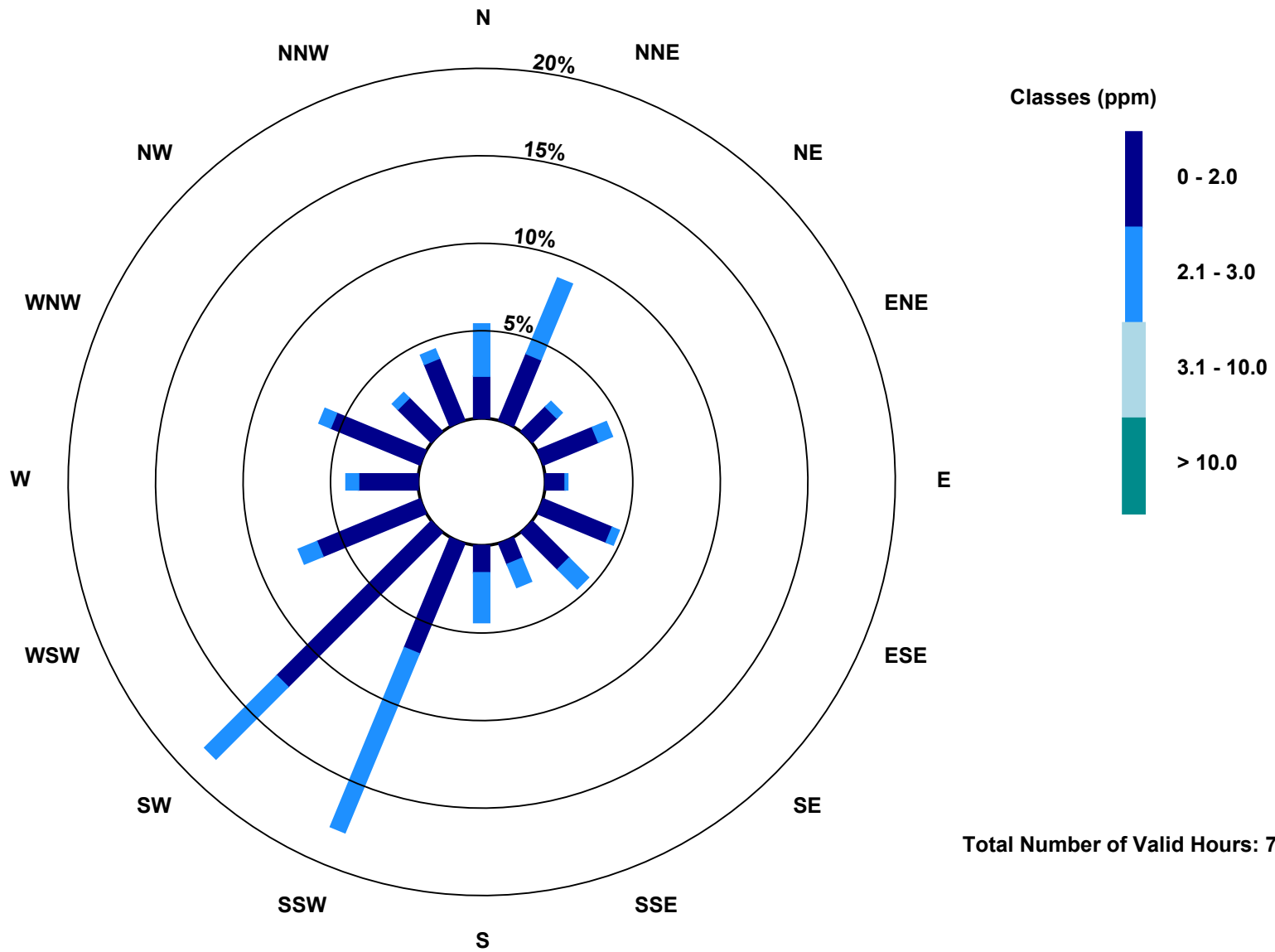
Total Number of Valid Hours: 705

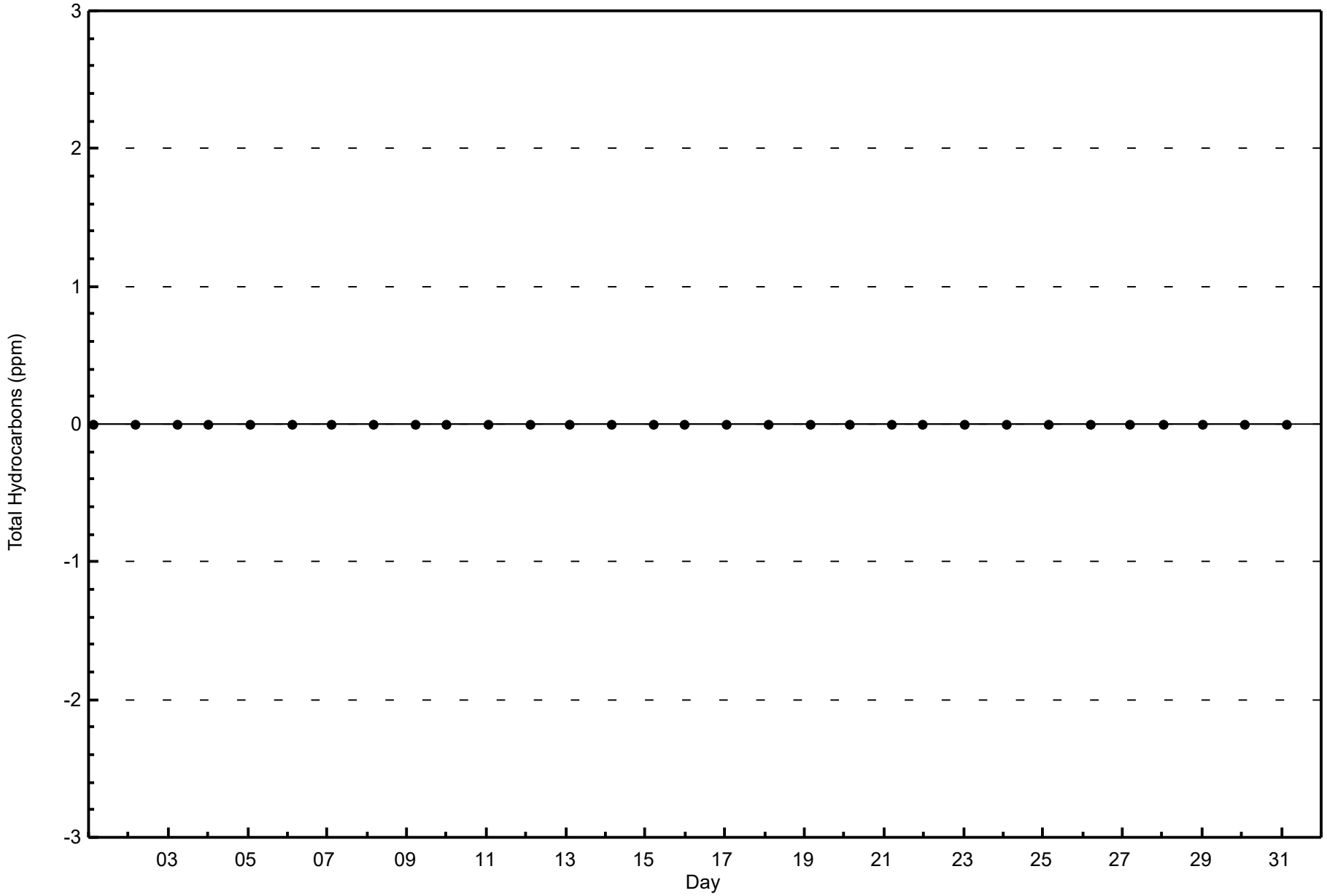
Total Number of Hours: 744

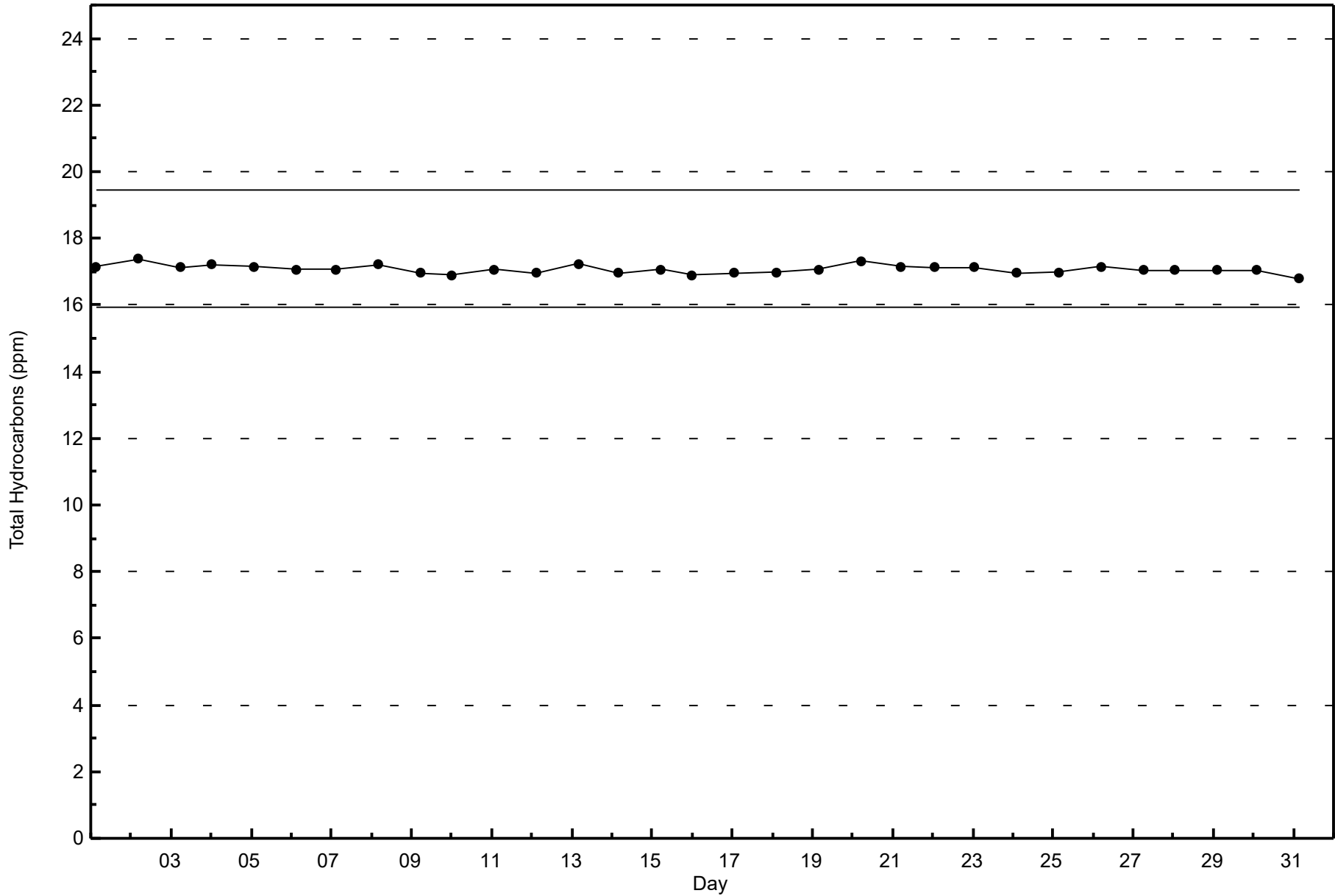


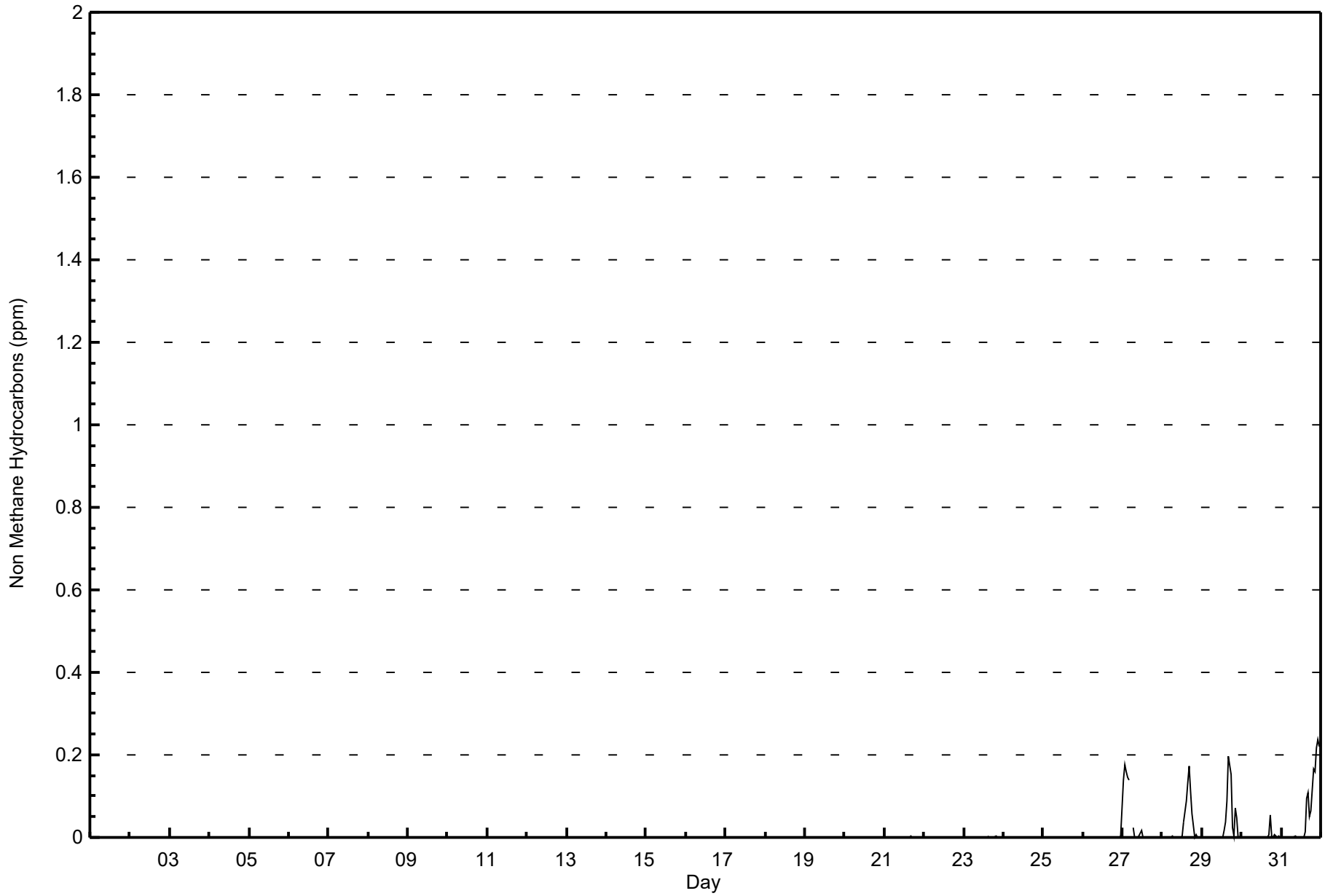
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Janvier











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	674	95.06	95.06
0.006 - 0.05	13	1.83	96.90
0.06 - 0.1	12	1.69	98.59
> 0.1	10	1.41	100.00

Total Number of Valid Hours: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Janvier - August 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	36	59	17	29	9	30	30	15	29	118	129	51	25	41	21	31	670
0.006 - 0.05	0	2	0	0	0	1	1	2	1	3	0	0	2	1	0	0	13
0.06 - 0.1	1	0	0	1	0	1	1	2	0	4	0	1	0	0	1	0	12
> 0.1	1	1	0	0	0	1	0	0	1	1	0	1	2	2	0	0	10
Totals	38	62	17	30	9	33	32	19	31	126	129	53	29	44	22	31	705

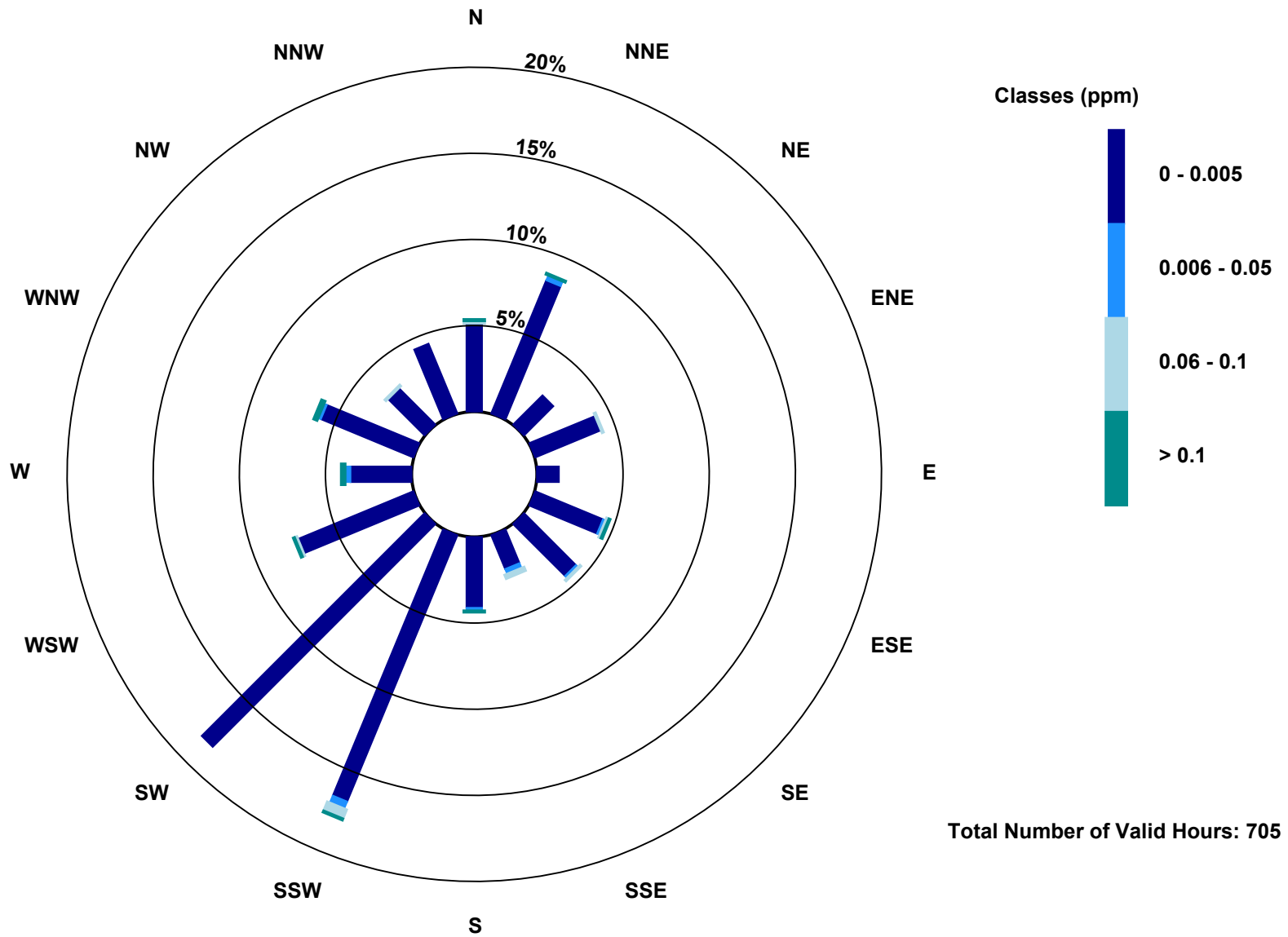
Total Number of Valid Hours: 705

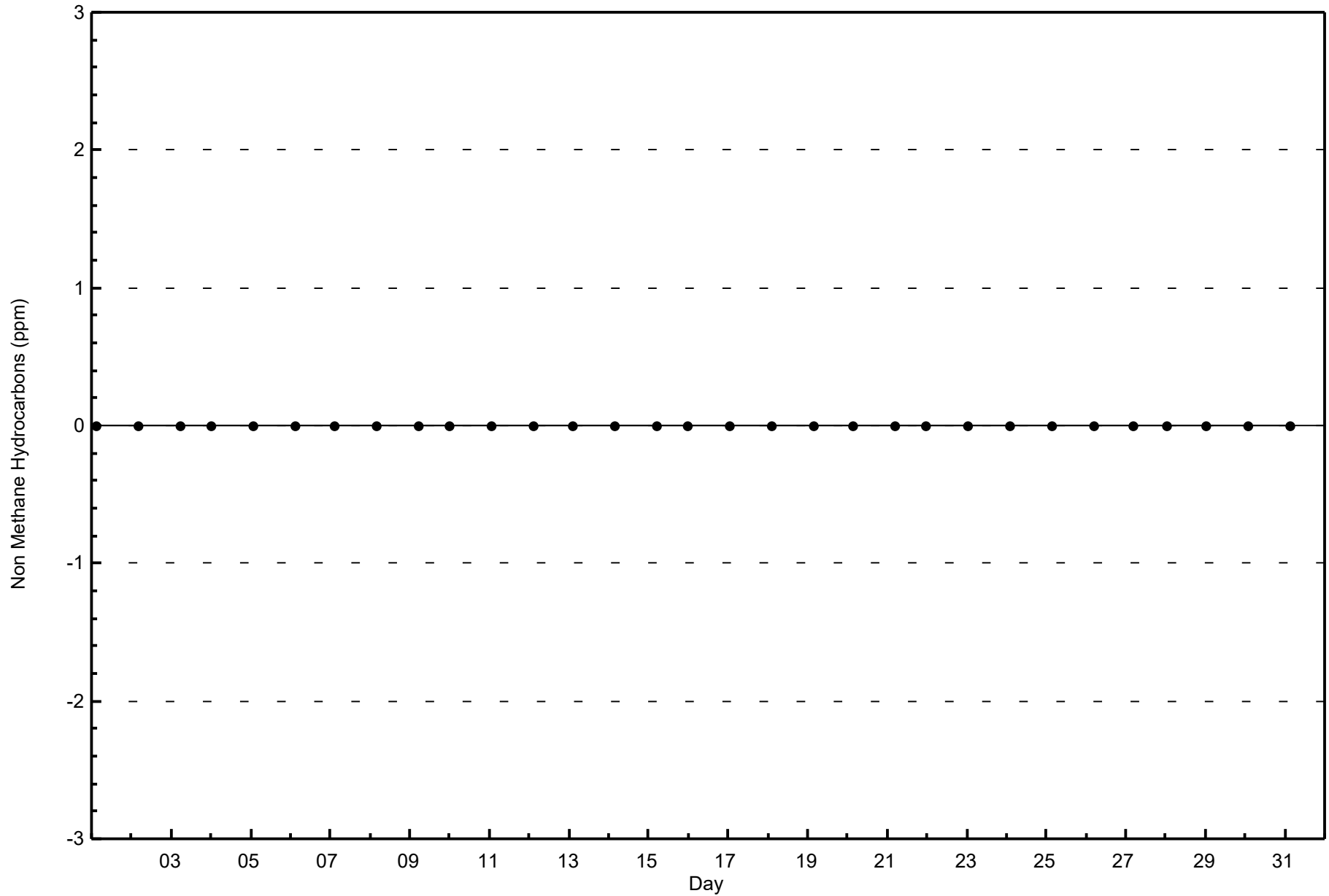
Total Number of Hours: 744

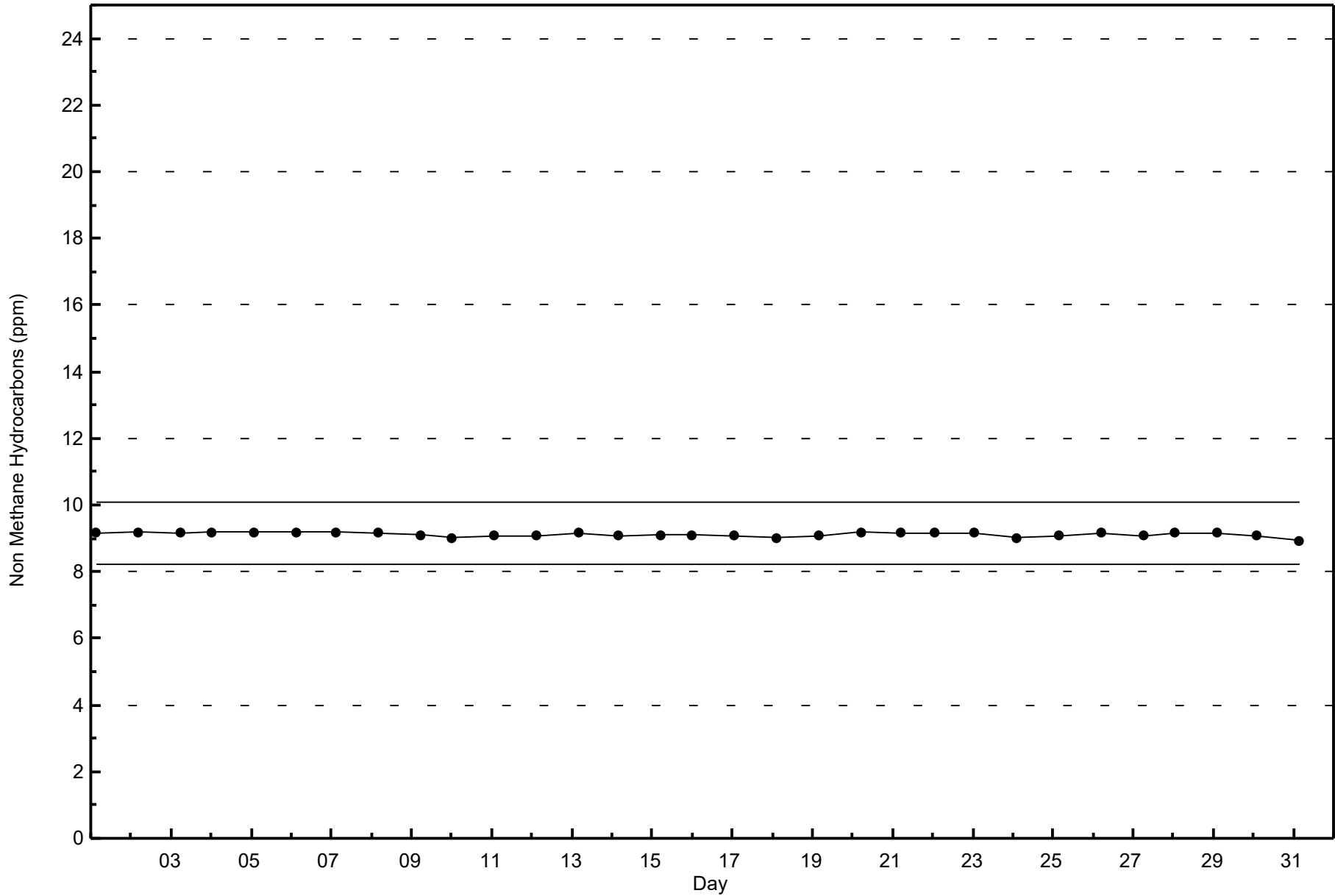


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Janvier



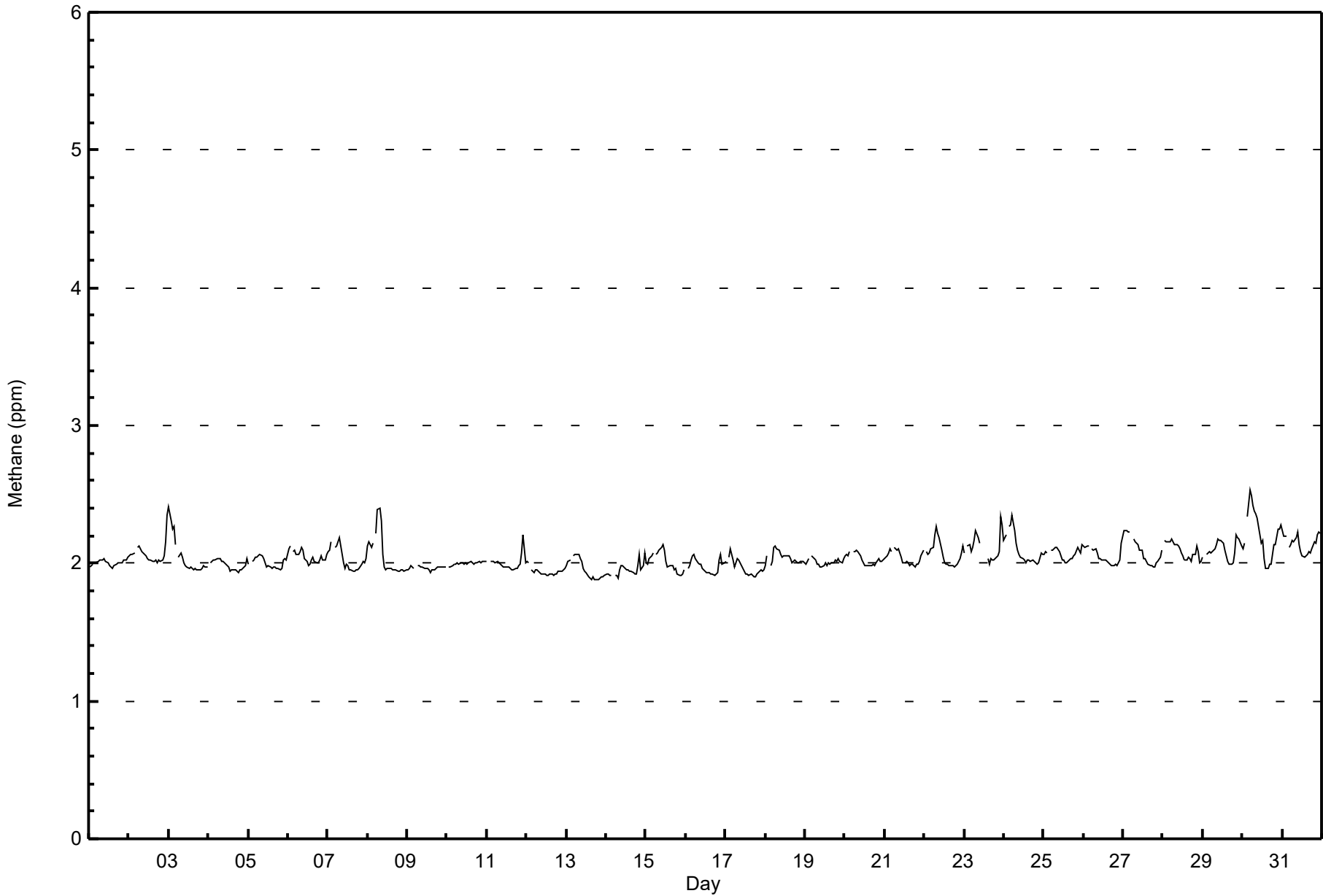






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Janvier - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Janvier - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	464	65.44	65.44
2.1 - 3.0	245	34.56	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
Janvier - August 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	17	29	14	24	8	32	21	11	12	51	88	46	24	39	19	27	462
2.1 - 3.0	21	33	3	6	1	1	11	8	19	75	41	7	5	5	3	4	243
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	38	62	17	30	9	33	32	19	31	126	129	53	29	44	22	31	705

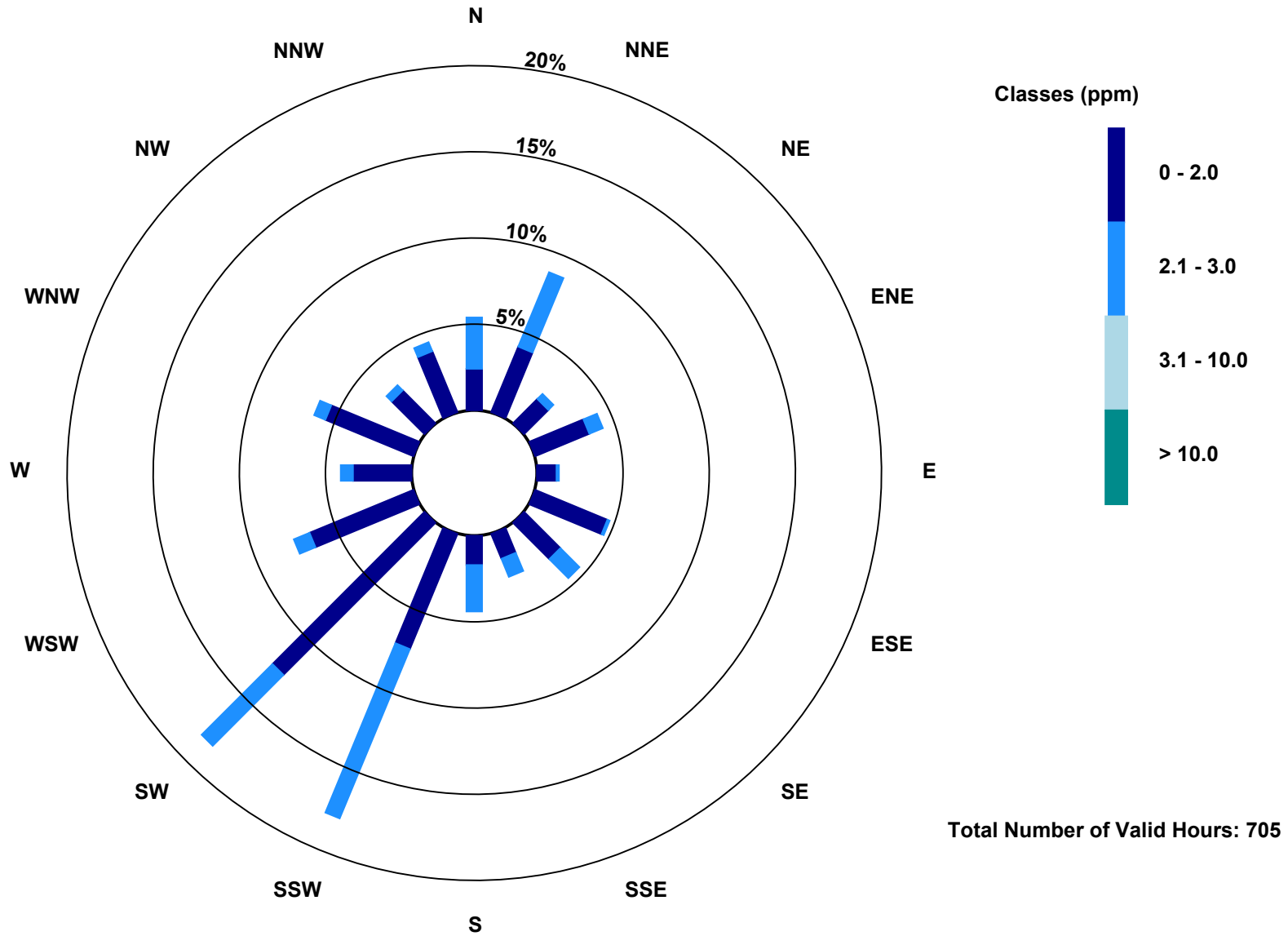
Total Number of Valid Hours: 705

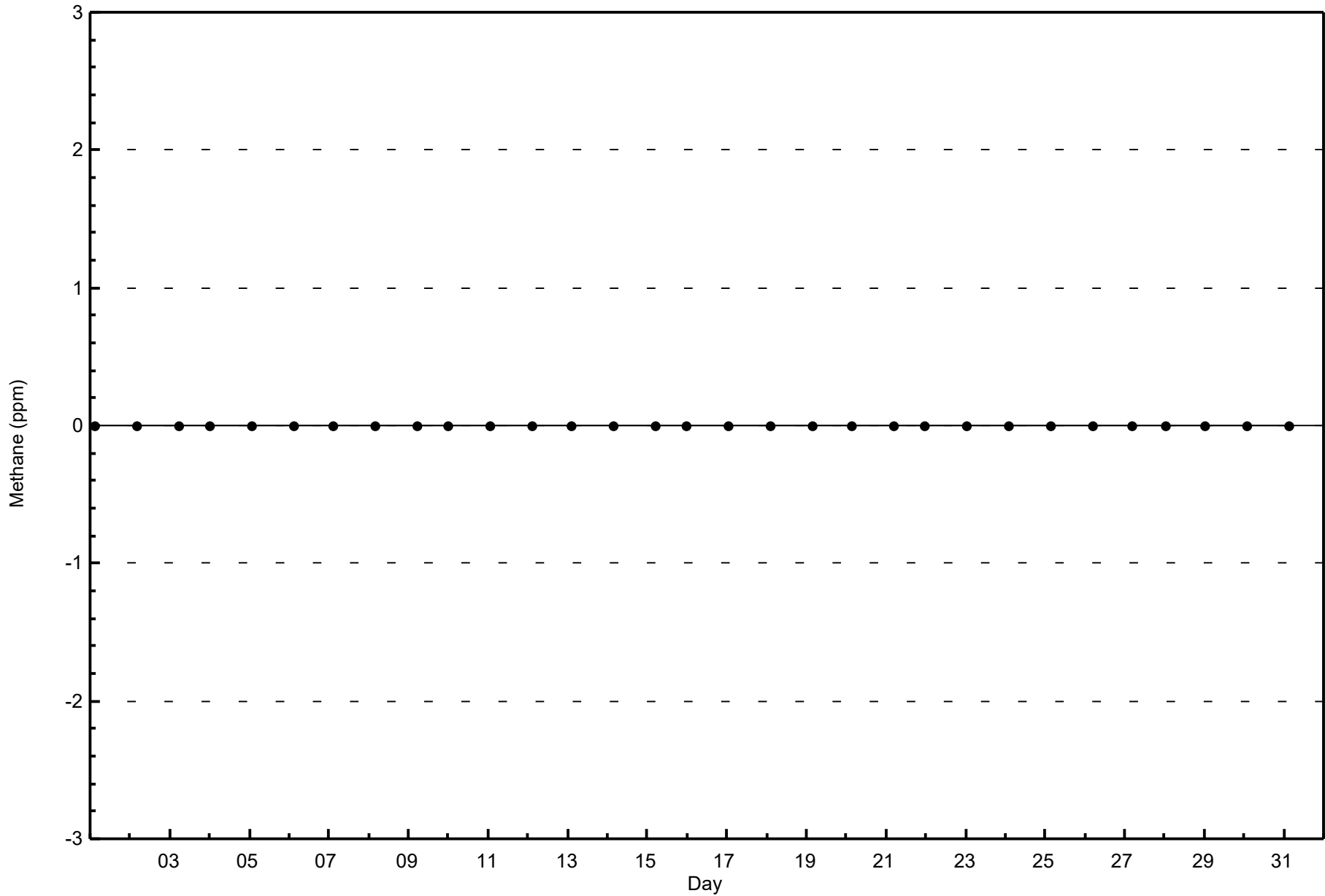
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Janvier

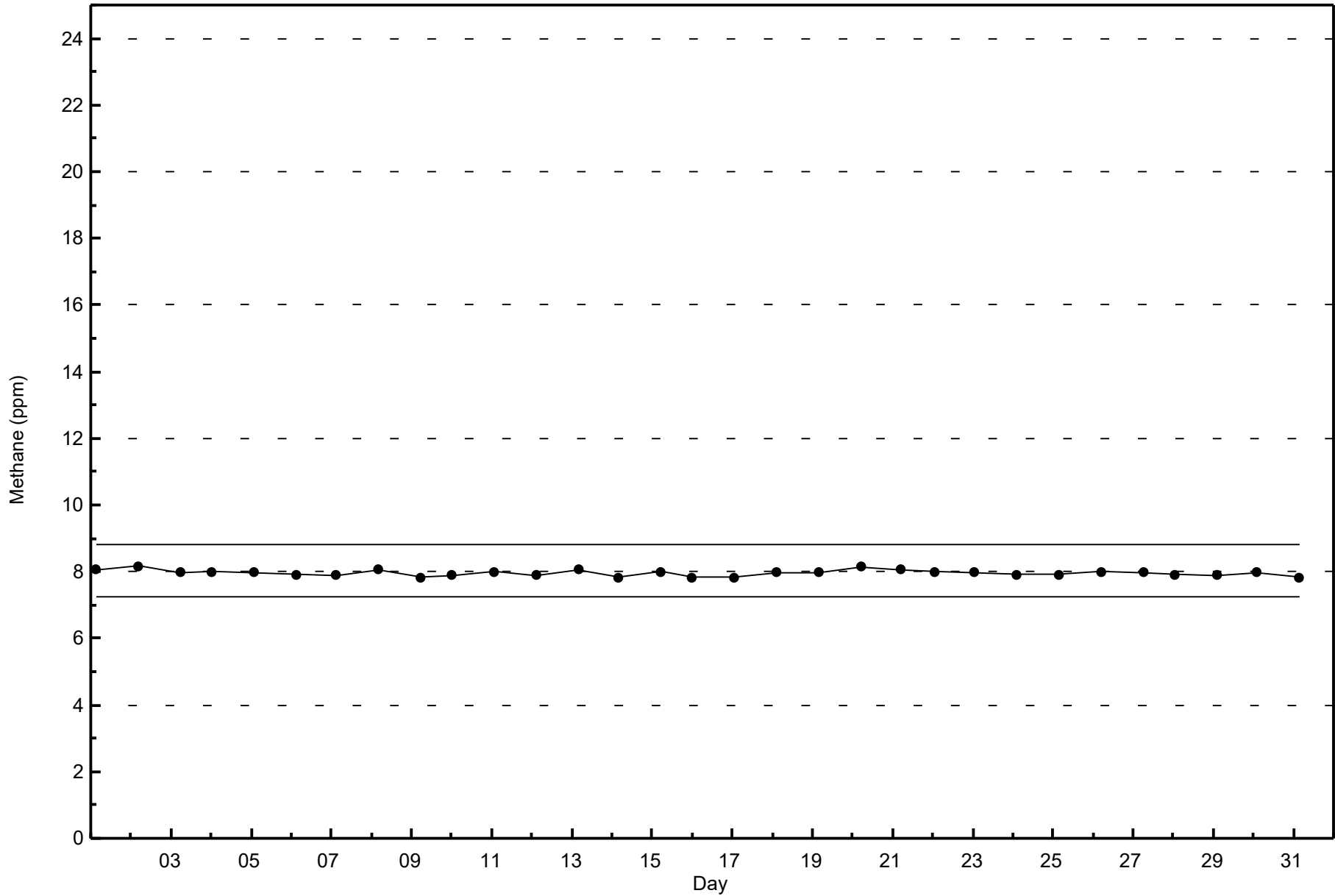






Wood Buffalo Environmental Association
Span Responses

Methane (CH₄) - ppm
Janvier - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

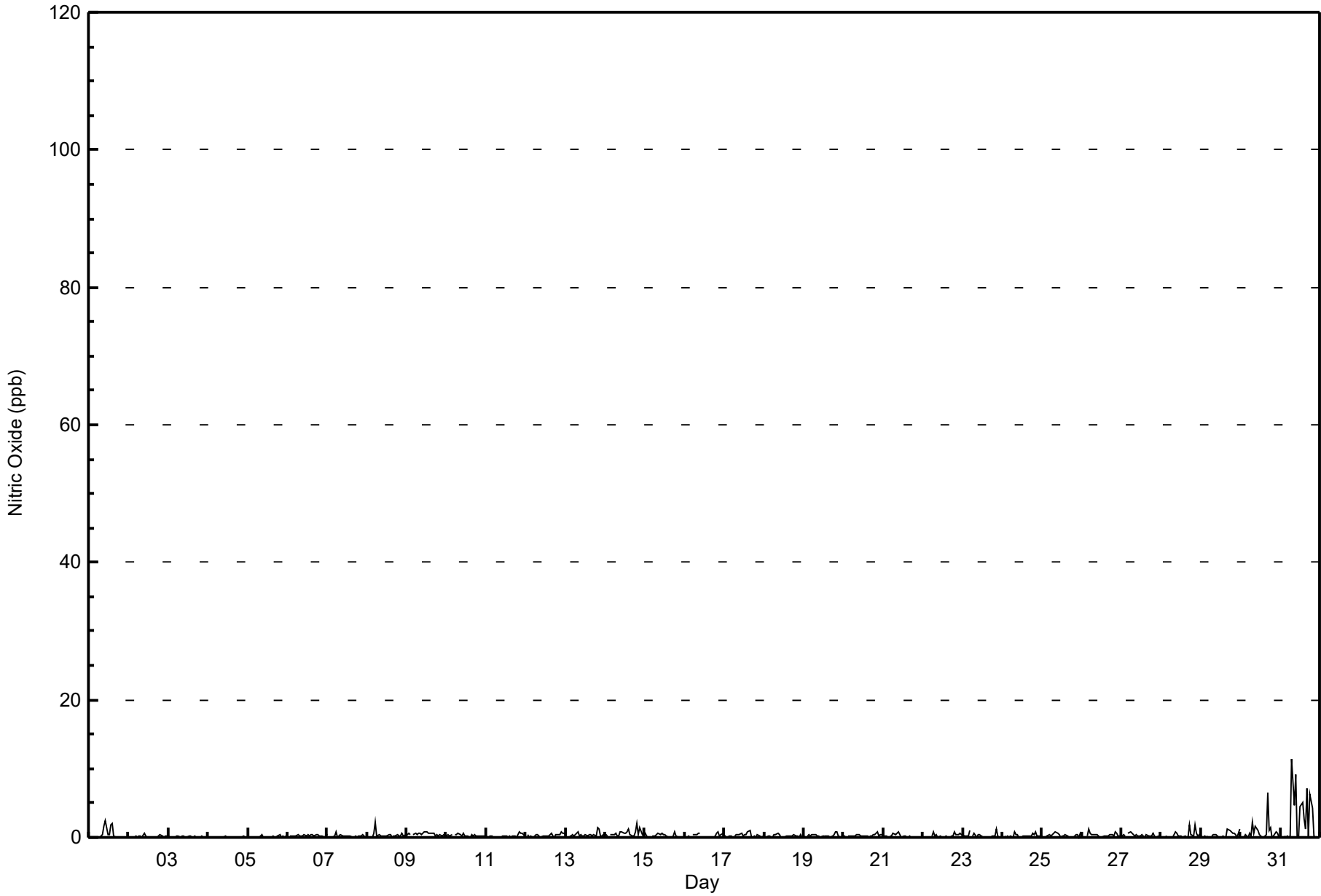
Nitric Oxide (NO) - ppb
Janvier - August 2023

Maximum Value: 11.3 ppb on Aug 31 08:00		Maximum Daily Average: 2.5 ppb on Aug 31		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Aug 1 01:00		Minimum Daily Average: 0.0 ppb on Aug 4		Hours of Data: 707																						
Maximum Diurnal Average: 0.8 ppb at hour 8		Minimum Diurnal Average: 0.1 ppb at hour 3		Hours of Missing Data: 37																						
Monthly Average: 0.36 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 = 4.4		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-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	0.3	1.5	2.4	0.4	0.5	1.9	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.4
2-Aug	0.0	0.0	Z	0.0	0.2	0.0	0.2	0.2	0.1	0.5	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.3	0.4	0.2	0.0	0.1	0.2	0.1	0.5
3-Aug	0.1	0.0	0.0	Z	0.1	0.2	0.1	0.0	0.2	0.2	0.1	0.0	0.2	0.2	0.1	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3
4-Aug	0.0	0.0	0.0	0.0	Z	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	0.2	0.0	0.1	0.0	0.2
5-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.3	0.0	0.2	0.0	0.1	0.1	0.3
6-Aug	Z	0.2	0.3	0.1	0.2	0.2	0.4	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.1	0.3	0.4	0.2	0.2	0.1	0.0	0.4	0.2	0.4
7-Aug	0.5	Z	0.0	0.0	0.3	0.9	0.0	0.1	0.4	0.2	0.1	0.2	0.2	0.2	0.3	0.1	0.0	0.1	0.1	0.3	0.3	0.5	0.2	0.1	0.2	0.9
8-Aug	0.0	0.0	Z	0.0	0.6	2.3	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.3	0.4	0.0	0.2	0.2	0.4	0.2	0.2	0.5	0.2	0.4	0.3	2.3
9-Aug	0.4	0.6	0.3	Z	0.4	0.5	0.5	0.6	0.6	0.3	0.7	0.8	0.9	0.6	0.5	0.6	0.6	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.5	0.9
10-Aug	0.3	0.4	0.2	0.5	Z	0.4	0.4	0.5	0.4	0.2	0.6	0.3	0.1	0.2	0.0	0.4	0.2	0.4	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.6
11-Aug	0.1	0.0	0.1	0.2	0.3	Z	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.2	0.0	0.2	0.2	0.1	0.3	0.7	0.5	0.6	0.3	0.2	0.7
12-Aug	Z	0.3	0.0	0.2	0.1	0.2	0.3	0.4	0.2	0.0	0.1	0.1	0.2	0.3	0.1	0.5	0.3	0.1	0.5	0.4	0.4	0.8	0.6	0.6	0.3	0.8
13-Aug	0.3	Z	0.2	0.2	0.3	0.1	0.4	0.9	0.3	0.5	0.1	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.2	1.4	1.2	0.3	0.3	0.3	0.4	1.4
14-Aug	0.3	0.2	Z	0.3	0.3	0.4	0.6	0.3	0.3	0.7	0.8	0.7	0.7	0.9	1.3	0.3	0.2	0.2	0.9	2.0	0.5	1.4	0.4	0.2	0.6	2.0
15-Aug	0.6	0.3	0.1	Z	0.2	0.2	0.2	0.3	0.5	0.4	0.6	0.4	0.5	0.2	0.1	0.1	0.0	0.2	0.7	0.1	0.0	0.0	0.0	0.0	0.2	0.7
16-Aug	0.0	0.0	0.1	0.0	Z	0.3	0.5	0.5	0.5	0.6	C	C	C	C	C	0.0	0.0	0.0	0.2	0.7	0.8	0.2	0.3	0.6	0.3	0.8
17-Aug	0.2	0.0	0.1	0.1	0.2	Z	0.3	0.4	0.5	0.4	0.6	0.1	0.4	0.4	0.9	1.0	0.1	0.1	0.3	0.0	0.3	0.2	0.1	0.1	0.3	1.0
18-Aug	Z	0.0	0.1	0.1	0.1	0.0	0.4	0.5	0.5	0.4	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.1	0.1	0.1	0.3	0.0	0.2	0.5
19-Aug	0.2	Z	0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.2	0.0	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.3	0.8	0.9	0.1	0.0	0.2	0.3	0.9
20-Aug	0.2	0.1	Z	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.3	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.5	0.5	0.9	0.2	0.4	0.3	0.3	0.9
21-Aug	0.1	0.2	0.1	Z	0.2	0.1	0.6	0.3	0.6	0.8	0.5	0.1	0.2	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8
22-Aug	0.0	0.0	0.0	0.0	Z	0.1	0.7	0.1	0.3	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.2	0.8	0.4	0.3	0.6	0.3	0.2	0.8
23-Aug	0.3	0.2	0.3	0.2	1.1	Z	0.1	0.6	0.1	0.5	0.4	0.2	0.2	M	0.0	0.0	0.0	0.1	0.2	0.2	1.3	0.2	0.0	0.0	0.3	1.3
24-Aug	Z	0.2	0.0	0.1	0.0	0.1	0.1	0.9	0.3	0.4	0.1	0.0	0.2	0.1	0.2	0.3	0.3	0.2	0.6	0.3	0.9	0.2	0.2	0.3	0.3	0.9
25-Aug	0.3	Z	0.1	0.2	0.3	0.2	0.4	0.6	0.7	0.7	0.4	0.1	0.2	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.4	0.5	0.0	0.5	0.3	0.7
26-Aug	0.2	0.0	Z	0.3	1.2	0.5	0.5	0.4	0.4	0.3	0.3	0.0	0.1	0.1	0.2	0.1	0.2	0.3	0.4	0.2	0.7	0.5	0.3	0.3	0.3	1.2
27-Aug	0.3	0.3	0.1	Z	0.7	0.7	0.6	0.4	0.3	0.4	0.2	0.2	0.3	0.2	0.0	0.3	0.3	0.3	0.1	0.6	0.2	0.0	0.1	0.0	0.3	0.7
28-Aug	0.0	0.0	0.0	0.1	Z	0.1	0.0	0.1	0.8	0.6	0.2	0.1	0.1	0.1	0.2	0.1	0.0	1.7	0.3	0.1	1.8	0.5	0.1	0.3	0.3	1.8
29-Aug	0.2	0.1	0.1	0.0	0.2	Z	0.2	0.4	0.4	0.4	0.2	0.0	0.1	0.2	0.0	0.0	1.1	1.0	0.9	0.7	0.7	0.5	0.1	1.3	0.4	1.3
30-Aug	Z	0.1	0.0	0.3	0.0	0.7	0.1	2.2	0.5	1.7	1.0	0.3	0.3	0.1	0.1	0.4	6.5	1.0	1.4	0.0	0.2	0.8	0.7	0.1	0.8	6.5
31-Aug	0.1	Z	0.3	0.0	0.2	0.0	0.2	11.3	4.7	9.1	0.0	0.1	4.4	5.0	2.7	1.3	7.1	0.1	6.2	4.3	0.1	0.0	0.0	0.0	2.5	11.3
																								Diurnal Average		
																								Diurnal Maximum		
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Janvier - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Janvier - August 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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703
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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703

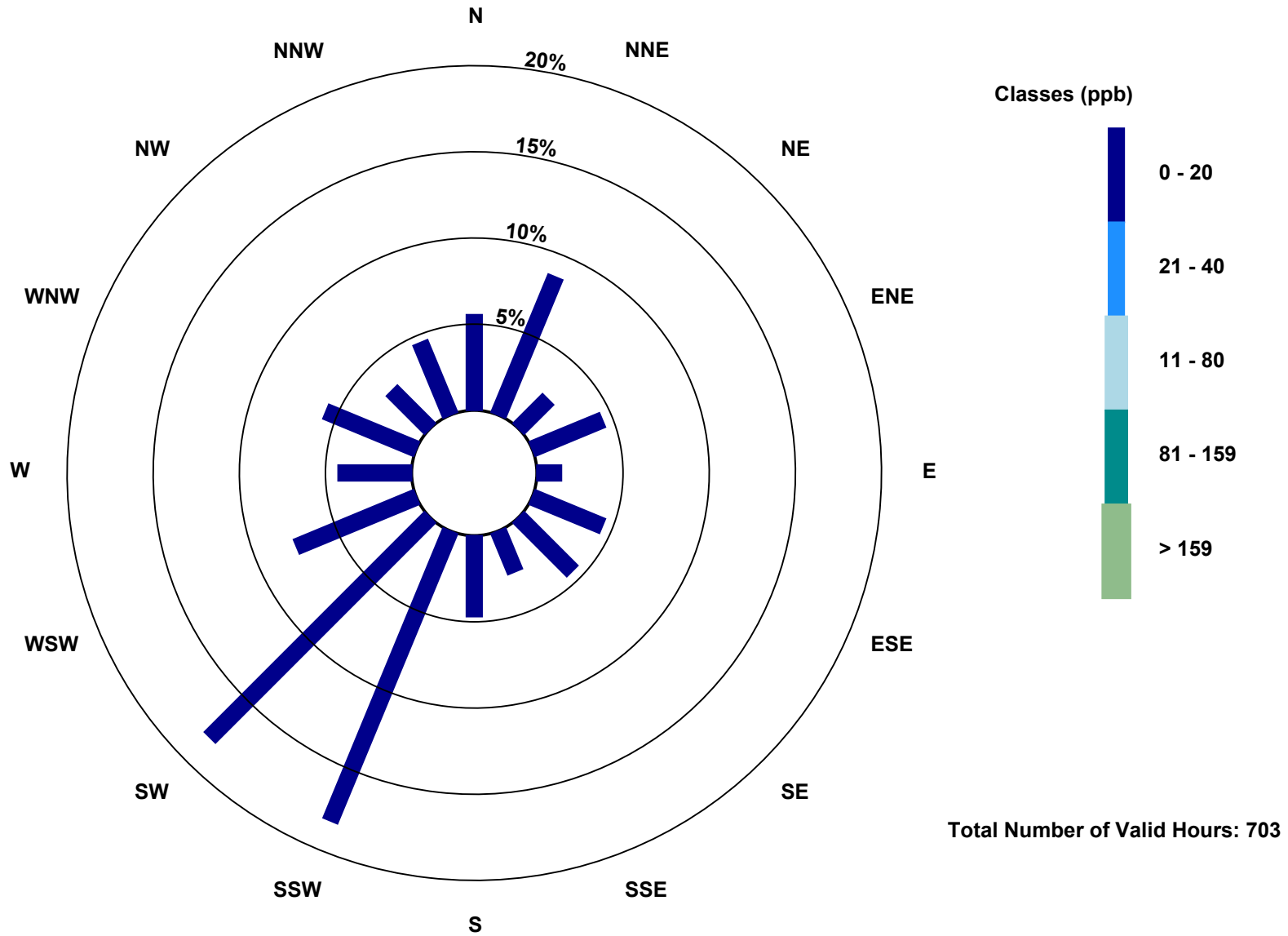
Total Number of Valid Hours: 703

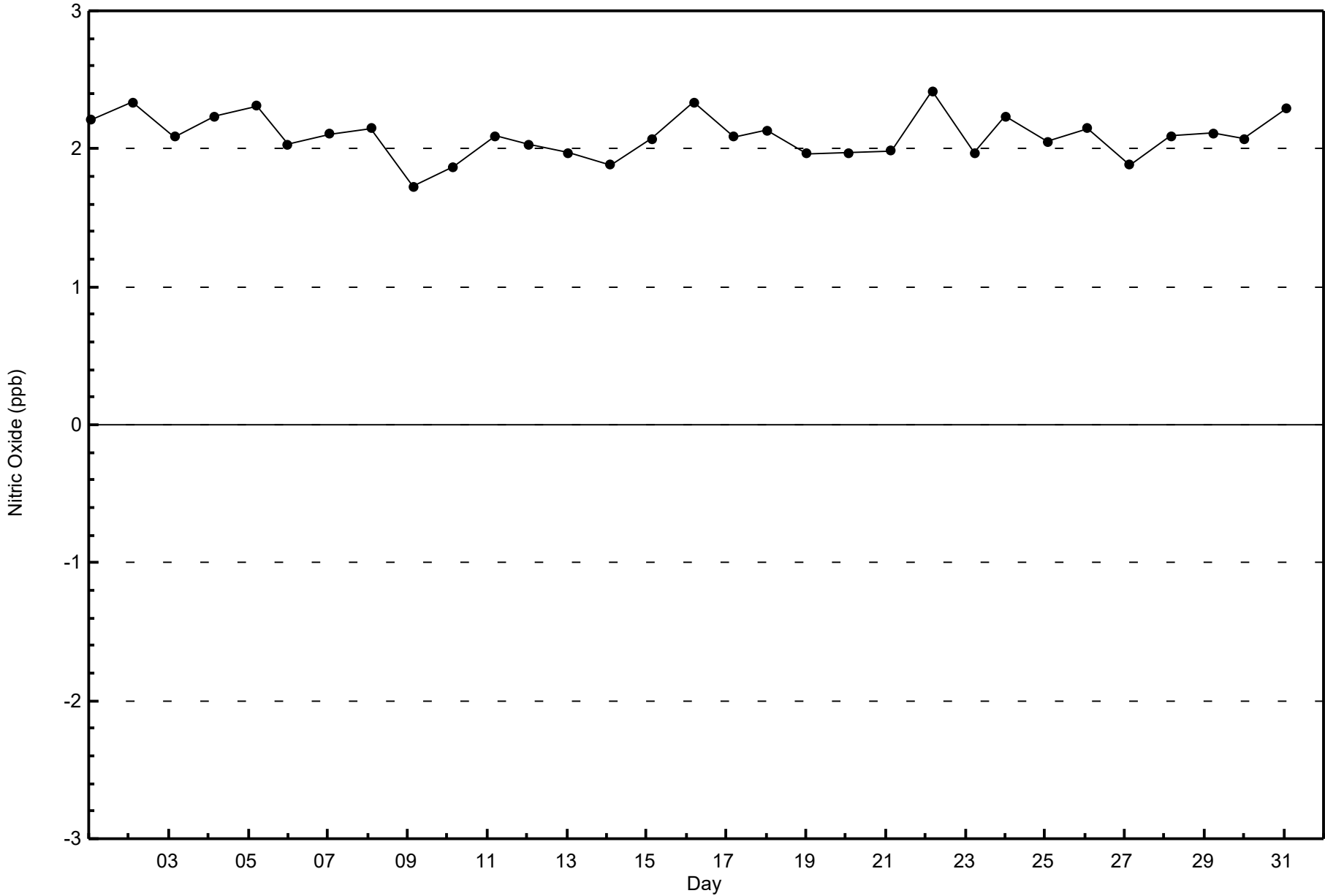
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Janvier

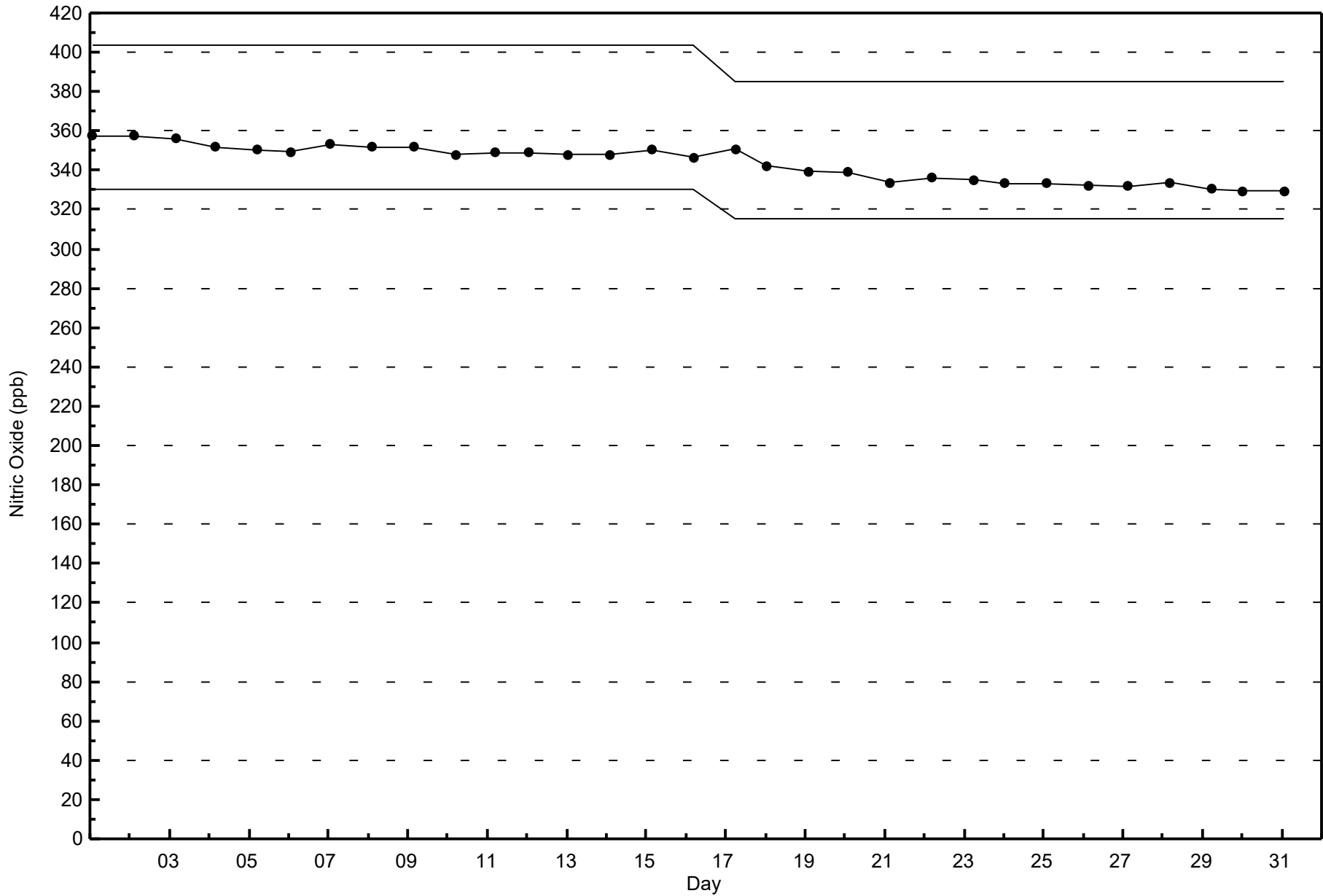






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Janvier - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

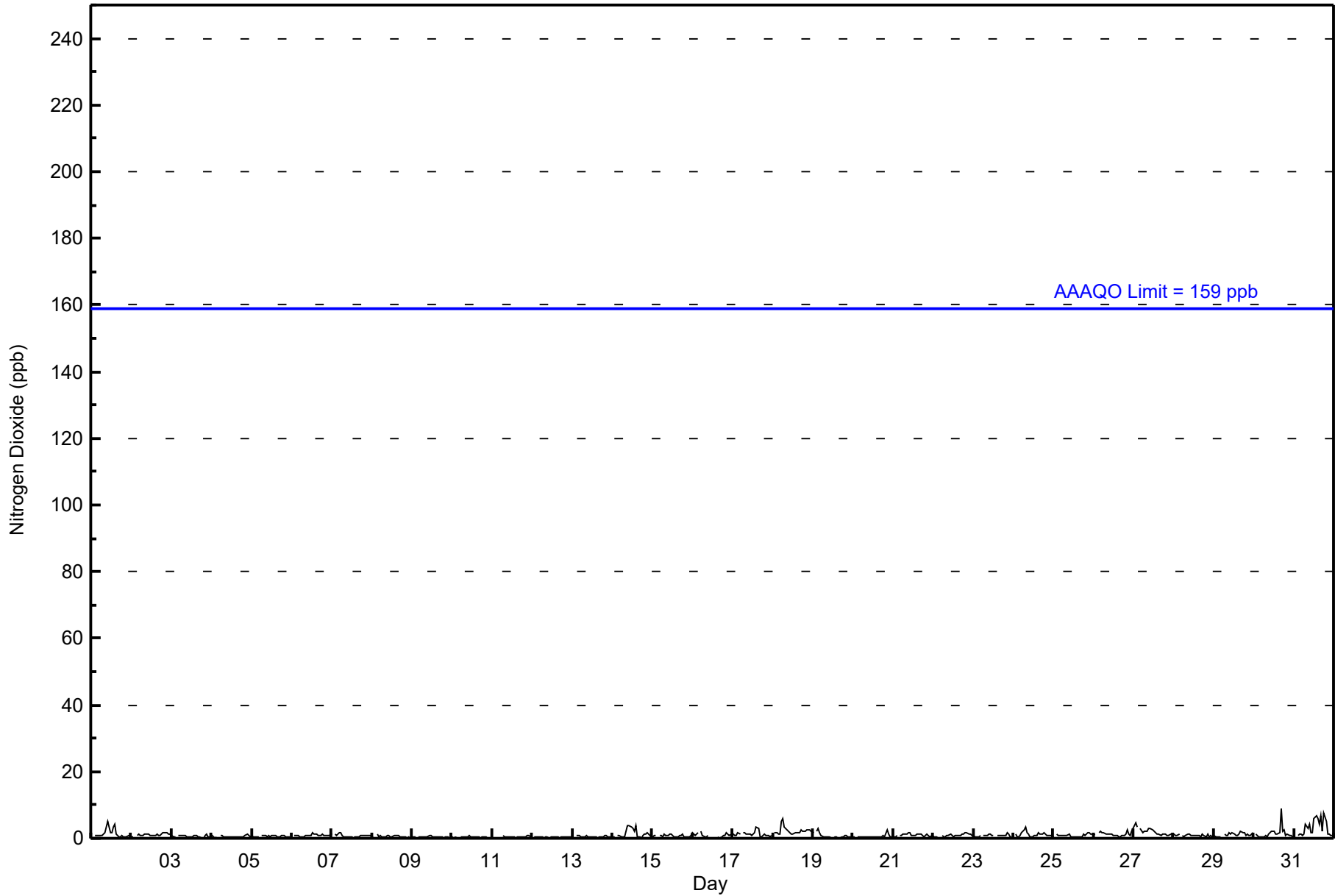
Janvier - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744																											
Maximum Value: 8.7 ppb on Aug 30 17:00		Maximum Daily Average: 3.0 ppb on Aug 31																	Hours of Data: 707																													
Minimum Value: 0.0 ppb on Aug 11 02:00		Minimum Daily Average: 0.3 ppb on Aug 10																	Hours of Missing Data: 37																													
Maximum Diurnal Average: 1.3 ppb at hour 10		Minimum Diurnal Average: 0.8 ppb at hour 23																	Hours of Calibration: 36																													
Monthly Average: 1.01 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.5 Median = 0.7 Q ₃ = 1.2 P ₉₀ = 1.8 P ₉₉ = 5.2																	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-Aug	0.8	Z	0.9	0.8	0.9	0.7	0.7	1.1	1.6	3.6	4.9	1.9	1.6	3.4	4.1	1.2	0.4	0.4	0.7	0.6	0.6	0.6	0.8	0.9	1.4	4.9																						
2-Aug	0.6	0.5	Z	1.0	1.1	0.8	0.7	1.0	1.1	1.3	1.2	1.0	0.9	0.9	0.8	1.4	0.9	0.9	1.4	1.7	1.8	1.9	1.3	1.2	1.1	1.9																						
3-Aug	0.9	0.6	0.6	Z	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.5	0.3	0.2	0.2	0.7	1.1	0.4	0.4	0.6	1.1																						
4-Aug	0.7	0.4	0.2	0.4	Z	0.7	0.7	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.6	0.7	1.3	0.7	0.5	0.6	1.3																						
5-Aug	0.8	0.6	0.6	0.5	0.5	Z	0.7	0.7	0.9	0.6	0.7	0.5	0.9	1.0	0.8	0.5	0.5	0.5	0.7	0.9	0.5	0.6	0.6	0.5	0.7	1.0																						
6-Aug	Z	0.8	0.8	0.7	0.8	0.6	0.5	0.6	0.8	0.7	1.0	1.0	1.9	1.4	1.4	1.2	1.0	1.0	1.4	1.0	0.7	0.9	0.8	1.3	1.0	1.9																						
7-Aug	1.1	Z	1.1	1.0	1.5	1.6	0.9	0.6	0.5	0.4	0.4	0.4	0.4	0.2	0.3	0.3	0.5	0.8	0.7	0.7	0.8	0.8	0.8	0.7	1.6																							
8-Aug	0.6	0.6	Z	1.1	0.5	0.8	0.4	0.5	0.6	0.8	0.7	0.6	0.6	0.7	0.8	0.7	0.8	0.6	0.5	0.4	0.4	0.2	0.3	0.2	0.6	1.1																						
9-Aug	0.3	0.4	0.3	Z	0.4	0.4	0.4	0.4	0.4	0.5	0.8	0.8	0.6	0.5	0.4	0.5	0.4	0.5	0.3	0.2	0.3	0.3	0.2	0.3	0.4	0.8																						
10-Aug	0.4	0.1	0.3	0.1	Z	0.4	0.5	0.6	0.4	0.5	0.9	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.1	0.2	0.3	0.9																						
11-Aug	0.2	0.0	0.2	0.2	0.1	Z	0.7	0.4	0.5	0.4	0.3	0.6	0.5	0.5	0.2	0.4	0.4	0.5	0.4	0.4	0.5	0.7	0.8	0.4	0.4	0.8																						
12-Aug	Z	0.6	0.4	0.4	0.4	0.4	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.5	0.2	0.3	0.5	0.5	0.6	0.5	0.6	0.4	0.4	0.6	0.6																						
13-Aug	0.6	Z	1.0	0.8	0.7	0.6	0.4	0.6	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.9	0.8	0.5	0.4	0.6	0.5	1.0																						
14-Aug	0.4	0.5	Z	0.7	0.7	0.6	0.6	0.4	2.3	4.0	3.8	3.4	2.9	2.3	3.9	0.6	0.5	0.2	1.0	1.4	1.4	1.8	0.8	0.3	1.5	4.0																						
15-Aug	0.4	0.7	0.7	Z	0.9	0.7	0.6	1.2	0.8	1.0	1.4	1.2	0.8	0.6	0.6	0.5	0.7	1.0	1.3	0.5	0.3	0.4	0.3	0.9	0.8	1.4																						
16-Aug	1.5	1.0	1.4	1.8	Z	2.0	0.9	0.6	0.5	0.7	C	C	C	C	C	0.5	0.2	0.6	0.7	0.9	1.5	1.1	0.7	1.3	1.0	2.0																						
17-Aug	1.2	0.8	1.0	1.5	1.2	Z	1.6	1.5	1.3	1.3	1.3	0.9	1.1	1.7	3.4	2.9	0.6	0.5	0.9	1.3	0.9	0.7	0.6	0.8	1.3	3.4																						
18-Aug	Z	1.5	1.7	1.4	1.4	5.1	5.8	3.5	2.6	2.2	1.8	1.2	1.2	1.6	1.8	1.5	1.5	2.4	2.2	2.0	2.4	2.6	2.6	2.1	2.3	5.8																						
19-Aug	1.6	Z	2.3	3.1	1.5	0.8	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.9	1.0	0.3	0.4	0.3	0.7	3.1																						
20-Aug	0.5	0.3	Z	0.6	0.4	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.3	0.4	0.4	0.4	0.4	0.5	1.0	0.6	2.5	1.4	0.6	0.6	0.6	2.5																						
21-Aug	0.4	0.4	0.7	Z	0.7	0.7	1.3	1.2	1.2	1.9	1.6	0.7	0.8	0.9	1.2	1.1	1.1	1.4	0.6	0.8	1.3	0.9	0.5	0.7	1.0	1.9																						
22-Aug	0.6	0.5	0.5	0.2	Z	0.9	0.6	0.5	0.8	0.9	1.2	0.9	0.6	0.8	0.9	0.7	0.7	1.1	1.3	1.8	1.5	1.1	1.1	0.9	0.9	1.8																						
23-Aug	0.7	0.5	0.5	0.5	0.7	Z	0.8	0.9	1.0	1.2	1.2	0.9	0.8	M	0.8	0.9	0.8	0.7	0.8	0.8	1.8	1.4	0.5	0.4	0.8	1.8																						
24-Aug	Z	1.2	0.6	0.6	0.9	1.9	2.6	3.3	1.8	1.1	0.4	0.5	0.7	0.9	1.0	1.5	1.4	1.3	1.8	1.2	1.0	0.7	1.0	0.5	1.2	3.3																						
25-Aug	0.6	Z	1.1	1.0	1.0	0.7	0.7	1.0	0.8	1.1	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.6	1.3	0.7	1.8	1.6	1.2	1.3	0.9	1.8																						
26-Aug	0.9	1.1	Z	1.8	2.3	1.5	1.6	1.2	1.1	1.1	1.1	1.1	0.9	0.7	0.7	0.6	0.5	0.7	1.0	1.3	2.6	1.4	1.0	2.2	1.2	2.6																						
27-Aug	4.0	4.7	3.5	Z	2.8	1.7	2.0	2.0	2.0	3.1	3.1	2.6	2.0	1.5	1.3	1.2	0.9	1.2	1.1	1.3	0.9	0.8	1.1	1.2	2.0	4.7																						
28-Aug	1.1	0.9	1.0	1.1	Z	1.0	0.5	0.8	1.3	1.1	0.8	0.9	1.0	0.8	0.9	0.7	0.6	1.4	0.8	0.5	1.2	0.5	0.7	0.5	0.9	1.4																						
29-Aug	0.7	0.5	0.5	0.5	0.6	Z	1.4	0.7	1.0	1.5	1.1	1.5	1.2	1.0	0.9	1.1	2.3	1.5	1.5	0.9	1.1	0.8	0.8	1.9	1.1	2.3																						
30-Aug	Z	1.3	1.0	0.6	0.5	0.5	0.5	0.9	0.6	1.4	2.2	2.2	2.0	1.2	1.1	1.6	8.7	2.2	2.5	0.7	1.1	0.7	0.7	0.6	1.5	8.7																						
31-Aug	0.4	Z	0.9	1.1	1.2	1.0	1.1	4.2	2.8	4.4	1.6	1.5	6.0	6.8	5.8	4.2	6.8	2.1	7.5	5.2	1.3	1.1	0.9	1.0	3.0	7.5																						
0.8																								0.8	0.9	0.9	1.0	1.1	1.0	1.1	1.0	1.3	1.2	1.0	1.1	1.1	1.2	0.9	1.1	0.9	1.2	1.0	1.1	0.9	0.8	0.8	Diurnal Average	
4.0																								4.7	3.5	3.1	2.8	5.1	5.8	4.2	2.8	4.4	4.9	3.4	6.0	6.8	5.8	4.2	8.7	2.4	7.5	5.2	2.6	2.6	2.6	2.2	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
Janvier - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Janvier - August 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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703
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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703

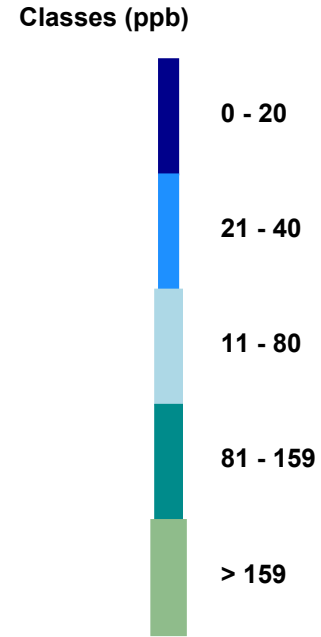
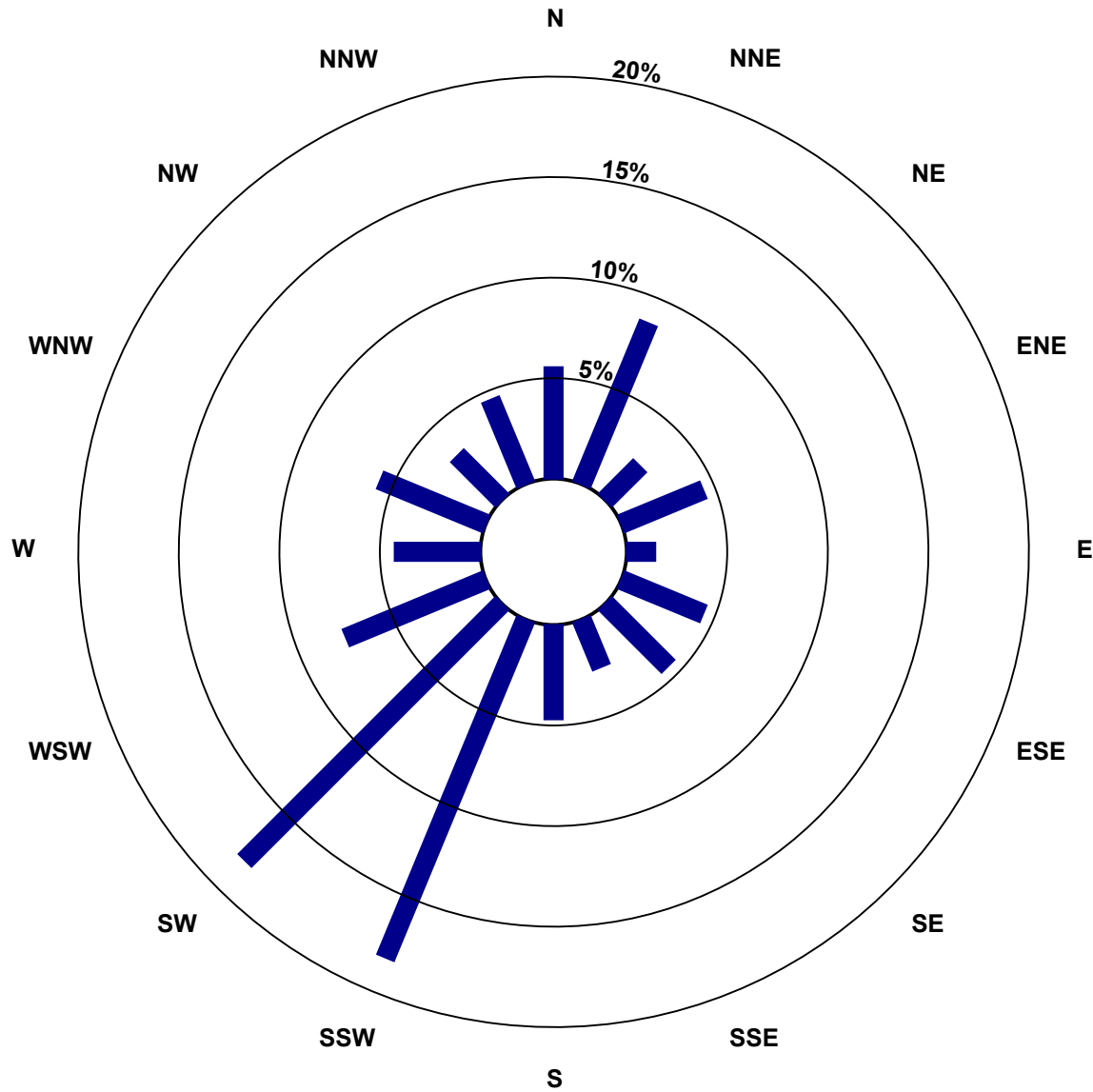
Total Number of Valid Hours: 703

Total Number of Hours: 744

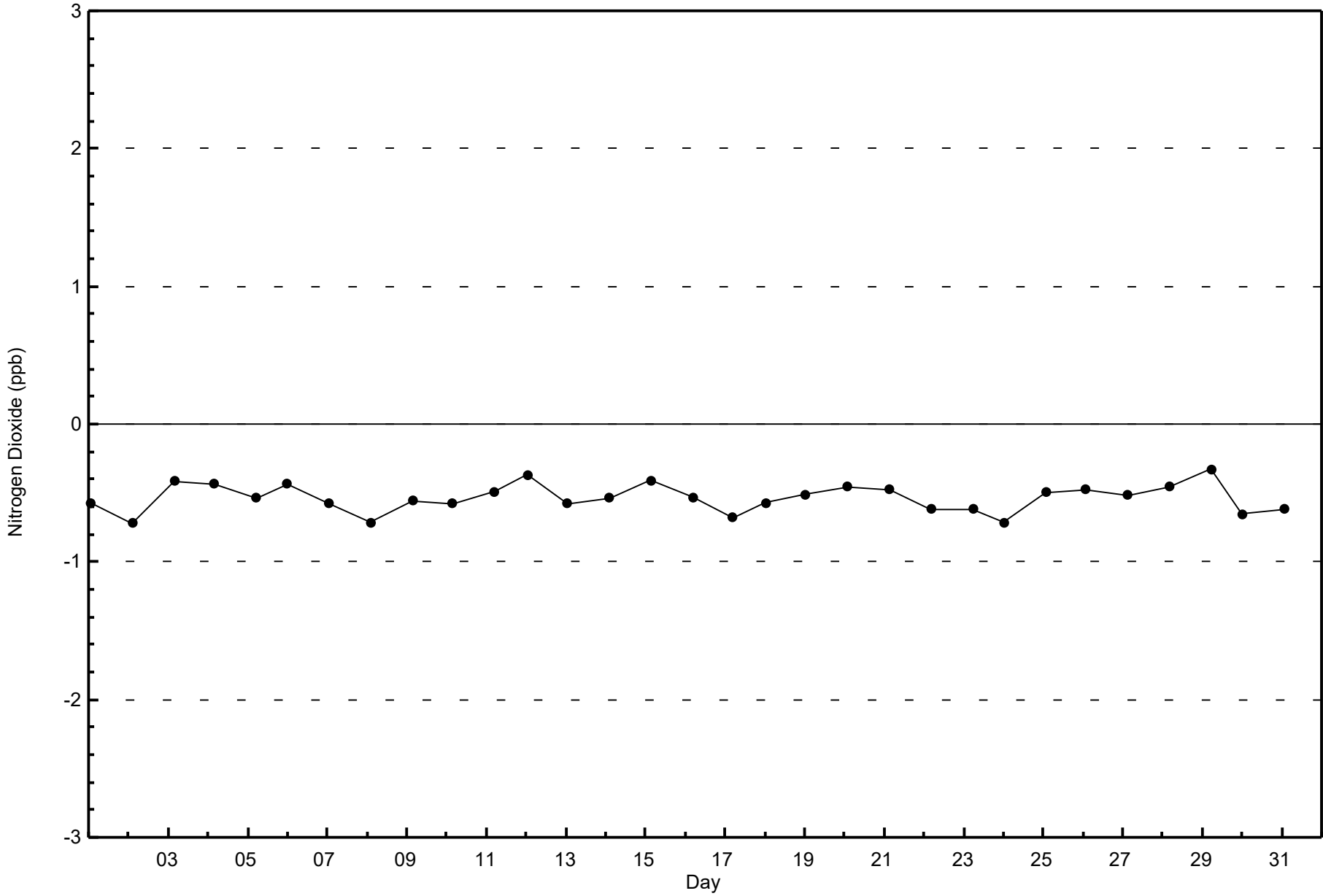


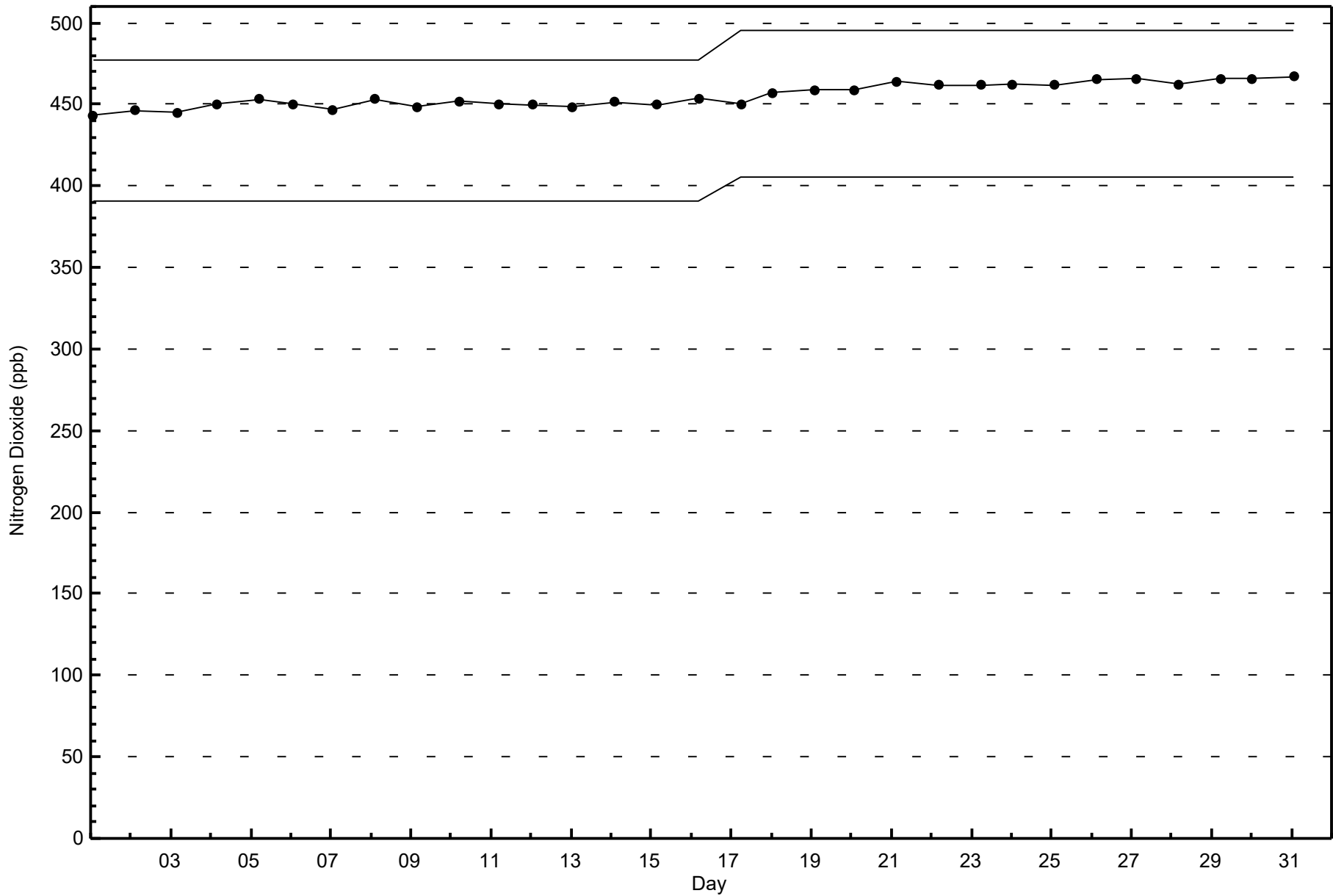
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Janvier



Total Number of Valid Hours: 703







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

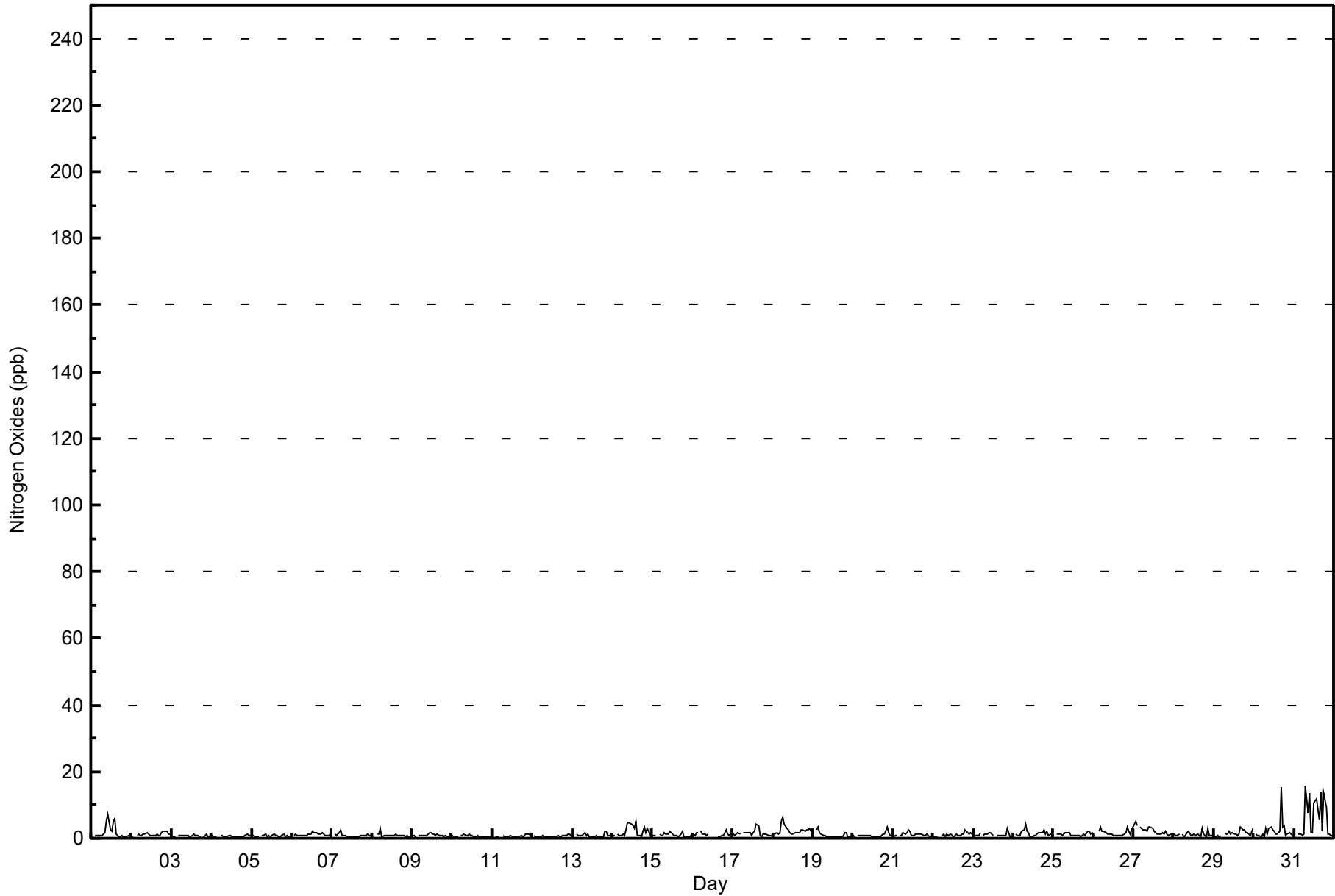
Janvier - August 2023

Maximum Value: 15.5 ppb on Aug 31 08:00		Maximum Daily Average: 5.5 ppb on Aug 31		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Aug 11 02:00		Minimum Daily Average: 0.6 ppb on Aug 4		Hours of Data: 707																																													
Maximum Diurnal Average: 2.0 ppb at hour 10		Minimum Diurnal Average: 0.9 ppb at hour 2		Hours of Missing Data: 37																																													
Monthly Average: 1.37 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.5 Q ₁ = 0.7 Median = 1.0 Q ₃ = 1.5 P ₉₀ = 2.4 P ₉₉ = 9.4		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-Aug	0.8	Z	0.9	0.8	0.9	0.7	0.8	1.4	1.9	5.1	7.3	2.3	2.1	5.3	6.1	1.4	0.4	0.4	0.7	0.6	0.6	0.6	0.8	0.9	1.9	7.3																							
2-Aug	0.6	0.5	Z	1.0	1.3	0.8	0.9	1.2	1.2	1.8	1.3	1.0	1.0	0.9	0.9	1.4	1.0	0.9	1.7	2.1	2.0	1.9	1.4	1.4	1.2	2.1																							
3-Aug	1.0	0.6	0.6	Z	1.1	1.1	0.9	0.7	0.9	0.8	0.7	0.6	0.8	1.1	1.0	0.7	0.8	0.3	0.2	0.2	0.8	1.1	0.4	0.4	0.7	1.1																							
4-Aug	0.7	0.4	0.2	0.4	Z	0.7	0.7	0.5	0.6	0.6	0.8	0.7	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.6	0.7	1.5	0.7	0.6	0.6	1.5																							
5-Aug	0.8	0.6	0.6	0.5	0.5	Z	0.7	0.7	1.2	0.6	0.7	0.5	0.9	1.1	0.9	0.7	0.5	0.5	0.8	1.2	0.5	0.8	0.6	0.6	0.7	1.2																							
6-Aug	Z	1.0	1.1	0.8	1.0	0.8	0.9	0.8	1.0	0.9	1.3	1.2	2.2	1.6	1.7	1.5	1.1	1.3	1.8	1.2	0.9	1.0	0.8	1.7	1.2	2.2																							
7-Aug	1.6	Z	1.1	1.0	1.8	2.5	0.9	0.7	0.9	0.6	0.5	0.6	0.6	0.4	0.6	0.4	0.5	0.9	0.8	1.0	1.0	1.3	1.0	0.9	0.9	2.5																							
8-Aug	0.6	0.6	Z	1.1	1.1	3.1	0.6	0.8	0.8	0.9	0.9	0.7	0.8	1.0	1.2	0.7	1.0	0.8	0.9	0.6	0.6	0.7	0.5	0.6	0.9	3.1																							
9-Aug	0.7	1.0	0.6	Z	0.8	0.9	0.9	1.0	1.0	0.8	1.5	1.6	1.5	1.1	0.9	1.1	1.0	0.8	0.7	0.5	0.6	0.6	0.6	0.6	0.9	1.6																							
10-Aug	0.7	0.5	0.5	0.6	Z	0.8	0.9	1.1	0.8	0.7	1.5	0.7	0.6	0.6	0.4	0.7	0.5	0.6	0.5	0.5	0.6	0.3	0.2	0.4	0.6	1.5																							
11-Aug	0.3	0.0	0.3	0.4	0.4	Z	0.7	0.4	0.6	0.4	0.5	0.7	0.6	0.5	0.4	0.4	0.6	0.7	0.5	0.7	1.2	1.2	1.4	0.7	0.6	1.4																							
12-Aug	Z	0.9	0.4	0.6	0.5	0.6	0.7	0.6	0.5	0.3	0.3	0.4	0.5	0.6	0.4	1.0	0.5	0.4	1.0	0.9	1.0	1.3	1.2	1.0	0.7	1.3																							
13-Aug	0.9	Z	1.2	1.0	1.0	0.7	0.8	1.5	1.0	1.1	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	2.3	2.0	0.8	0.7	0.9	0.9	2.3																							
14-Aug	0.7	0.7	Z	1.1	1.0	1.0	1.2	0.7	2.6	4.7	4.6	4.1	3.6	3.2	5.2	0.9	0.7	0.4	1.9	3.4	1.9	3.2	1.2	0.5	2.1	5.2																							
15-Aug	1.0	1.0	0.8	Z	1.1	0.9	0.8	1.5	1.3	1.4	2.0	1.6	1.3	0.8	0.7	0.6	0.7	1.2	2.0	0.6	0.3	0.4	0.3	0.9	1.0	2.0																							
16-Aug	1.5	1.0	1.5	1.8	Z	2.3	1.4	1.1	1.0	1.3	C	C	C	C	C	0.5	0.2	0.6	0.9	1.6	2.3	1.3	1.0	1.9	1.3	2.3																							
17-Aug	1.4	0.8	1.1	1.6	1.4	Z	1.9	1.9	1.8	1.7	1.9	1.0	1.5	2.1	4.3	3.9	0.7	0.6	1.2	1.3	1.2	0.9	0.7	0.9	1.5	4.3																							
18-Aug	Z	1.5	1.8	1.5	1.5	5.1	6.2	4.0	3.1	2.6	1.9	1.2	1.3	1.7	1.9	1.7	1.8	2.6	2.5	2.1	2.5	2.7	2.9	2.1	2.4	6.2																							
19-Aug	1.8	Z	2.5	3.4	1.8	1.1	0.8	0.7	0.6	0.5	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.6	0.7	1.7	1.9	0.4	0.4	0.5	1.0	3.4																							
20-Aug	0.7	0.4	Z	0.8	0.7	0.8	0.8	0.9	1.0	1.0	0.9	0.6	0.6	0.6	0.6	0.5	0.6	0.7	1.5	1.1	3.4	1.6	1.0	0.9	0.9	3.4																							
21-Aug	0.5	0.6	0.8	Z	0.9	0.8	1.9	1.5	1.8	2.7	2.1	0.8	1.0	1.2	1.3	1.1	1.3	1.4	0.6	0.8	1.3	0.9	0.5	0.7	1.1	2.7																							
22-Aug	0.6	0.5	0.5	0.2	Z	1.0	1.3	0.6	1.1	1.0	1.3	0.9	0.6	0.9	1.1	0.7	0.7	1.2	1.5	2.6	1.9	1.4	1.7	1.2	1.1	2.6																							
23-Aug	1.0	0.7	0.8	0.7	1.8	Z	0.9	1.5	1.1	1.7	1.6	1.1	1.0	M	0.8	0.9	0.8	0.8	1.0	1.0	3.1	1.6	0.5	0.4	1.1	3.1																							
24-Aug	Z	1.4	0.6	0.7	0.9	2.0	2.7	4.2	2.1	1.5	0.5	0.9	1.0	1.2	1.8	1.7	1.5	2.4	1.5	1.9	0.9	1.2	0.8	1.5	4.2																								
25-Aug	0.9	Z	1.2	1.2	1.3	0.9	1.1	1.6	1.5	1.8	1.0	0.7	0.8	0.7	0.9	0.6	0.6	0.7	1.3	0.8	2.2	2.1	1.2	1.8	1.2	2.2																							
26-Aug	1.1	1.1	Z	2.1	3.5	2.0	2.1	1.6	1.5	1.4	1.4	1.1	1.0	0.8	0.9	0.7	0.7	1.0	1.4	1.5	3.3	1.9	1.3	2.5	1.6	3.5																							
27-Aug	4.3	5.0	3.6	Z	3.5	2.4	2.6	2.4	2.3	3.5	3.3	2.8	2.3	1.7	1.3	1.5	1.2	1.5	1.2	1.9	1.1	0.8	1.2	1.2	2.3	5.0																							
28-Aug	1.1	0.9	1.0	1.2	Z	1.1	0.5	0.9	2.1	1.7	1.0	1.0	1.1	0.9	1.1	0.8	0.6	3.1	1.1	0.6	3.0	1.0	0.8	0.8	1.2	3.1																							
29-Aug	0.9	0.6	0.6	0.5	0.8	Z	1.6	1.1	1.4	1.9	1.3	1.5	1.3	1.2	0.9	1.1	3.4	2.5	2.4	1.6	1.8	1.3	0.9	3.2	1.5	3.4																							
30-Aug	Z	1.4	1.0	0.9	0.5	1.2	0.6	3.1	1.1	3.1	3.2	2.5	2.3	1.3	1.2	2.0	15.2	3.2	3.9	0.7	1.3	1.5	1.4	0.7	2.3	15.2																							
31-Aug	0.5	Z	1.2	1.1	1.4	1.0	1.3	15.5	7.5	13.5	1.6	1.6	10.4	11.8	8.5	5.5	13.9	2.2	13.7	9.5	1.4	1.1	0.9	1.0	5.5	15.5																							
																								1.0	0.9	1.0	1.0	1.3	1.4	1.3	1.8	1.5	2.0	1.6	1.2	1.5	1.6	1.6	1.2	1.7	1.1	1.7	1.5	1.6	1.2	1.0	1.1	Diurnal Average	
																								4.3	5.0	3.6	3.4	3.5	5.1	6.2	15.5	7.5	13.5	7.3	4.1	10.4	11.8	8.5	5.5	15.2	3.2	13.7	9.5	3.4	3.2	2.9	3.2	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Janvier - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Janvier - August 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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703
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	39	61	17	31	10	31	31	18	33	128	127	53	30	40	22	32	703

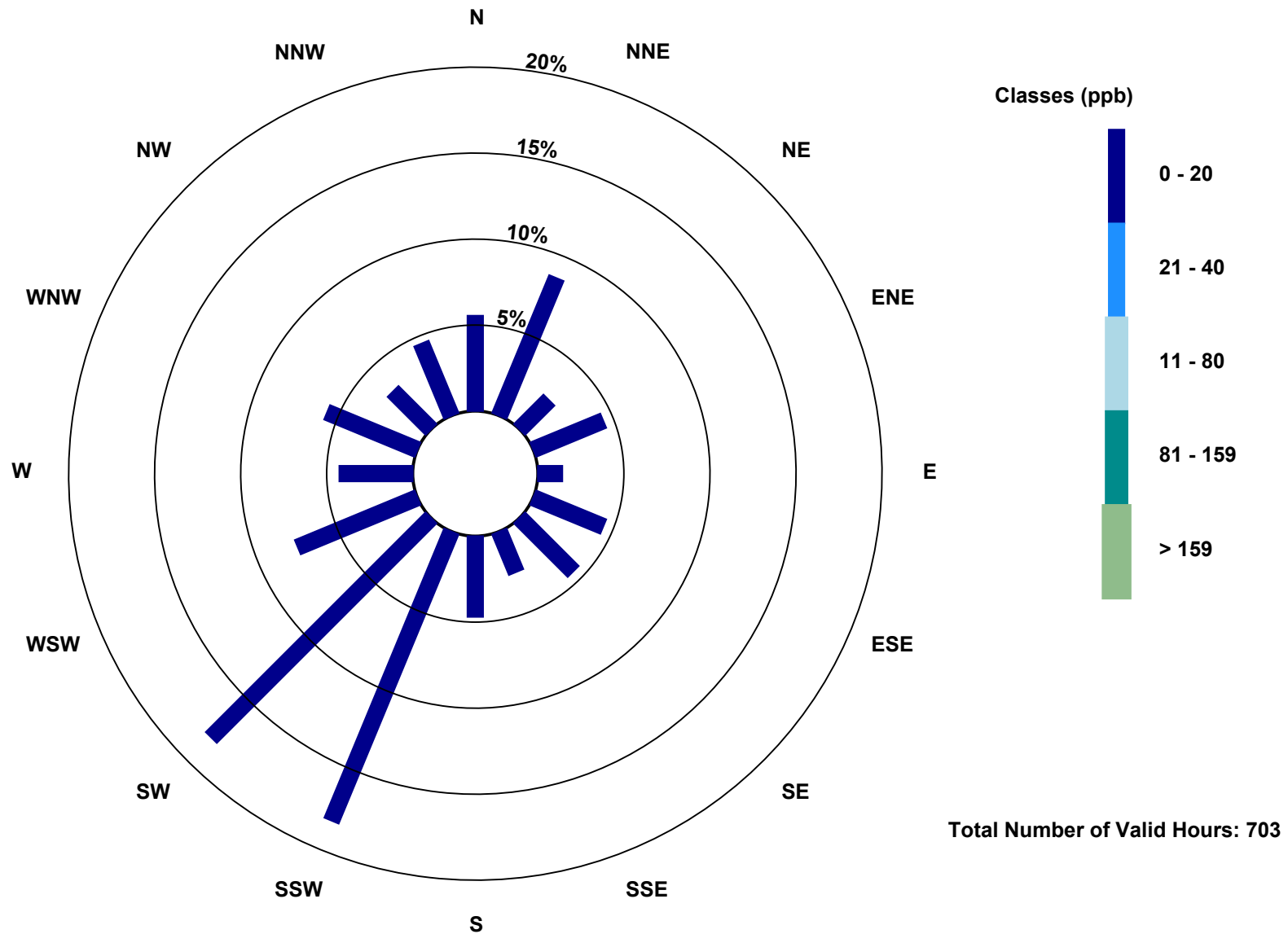
Total Number of Valid Hours: 703

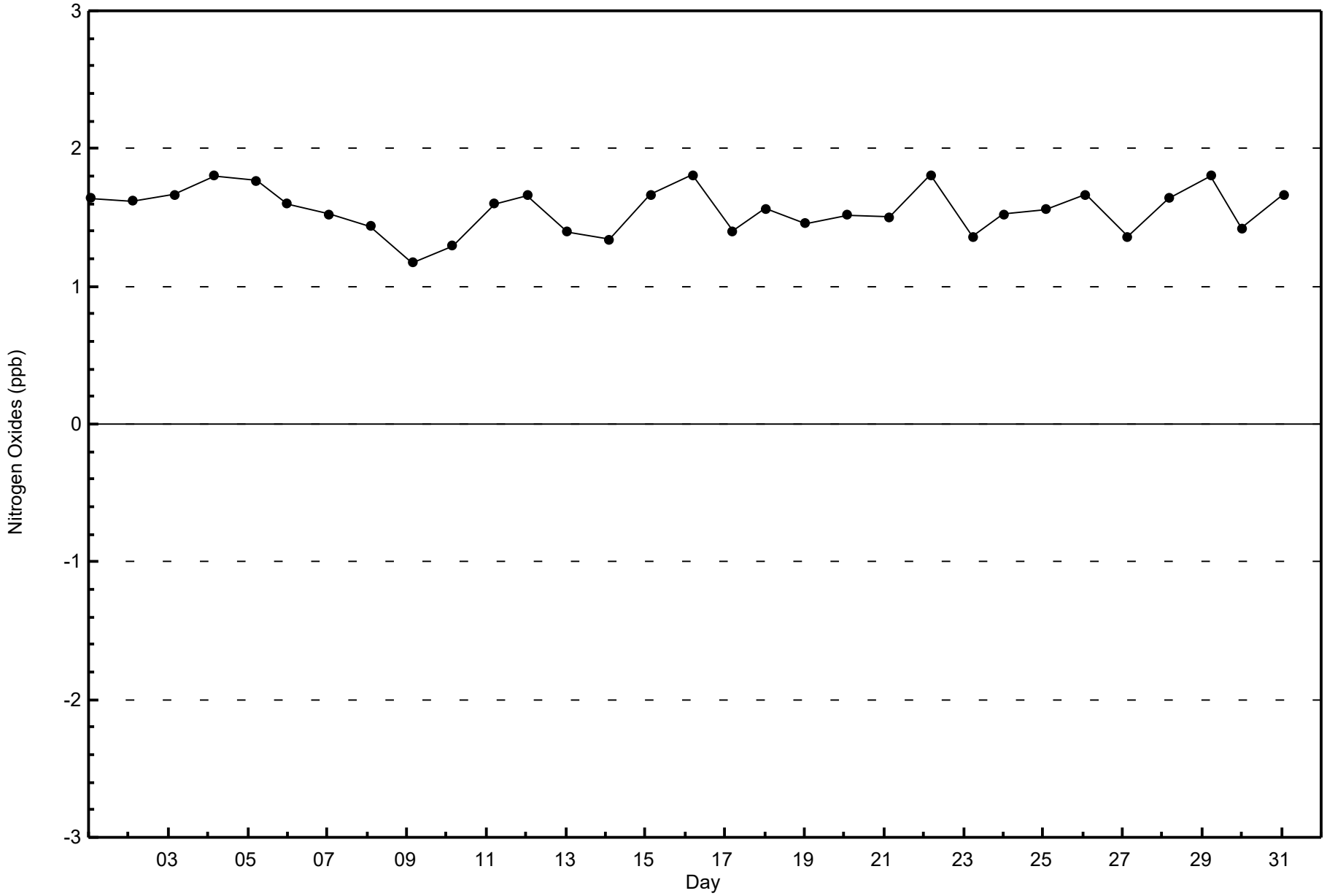
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Janvier

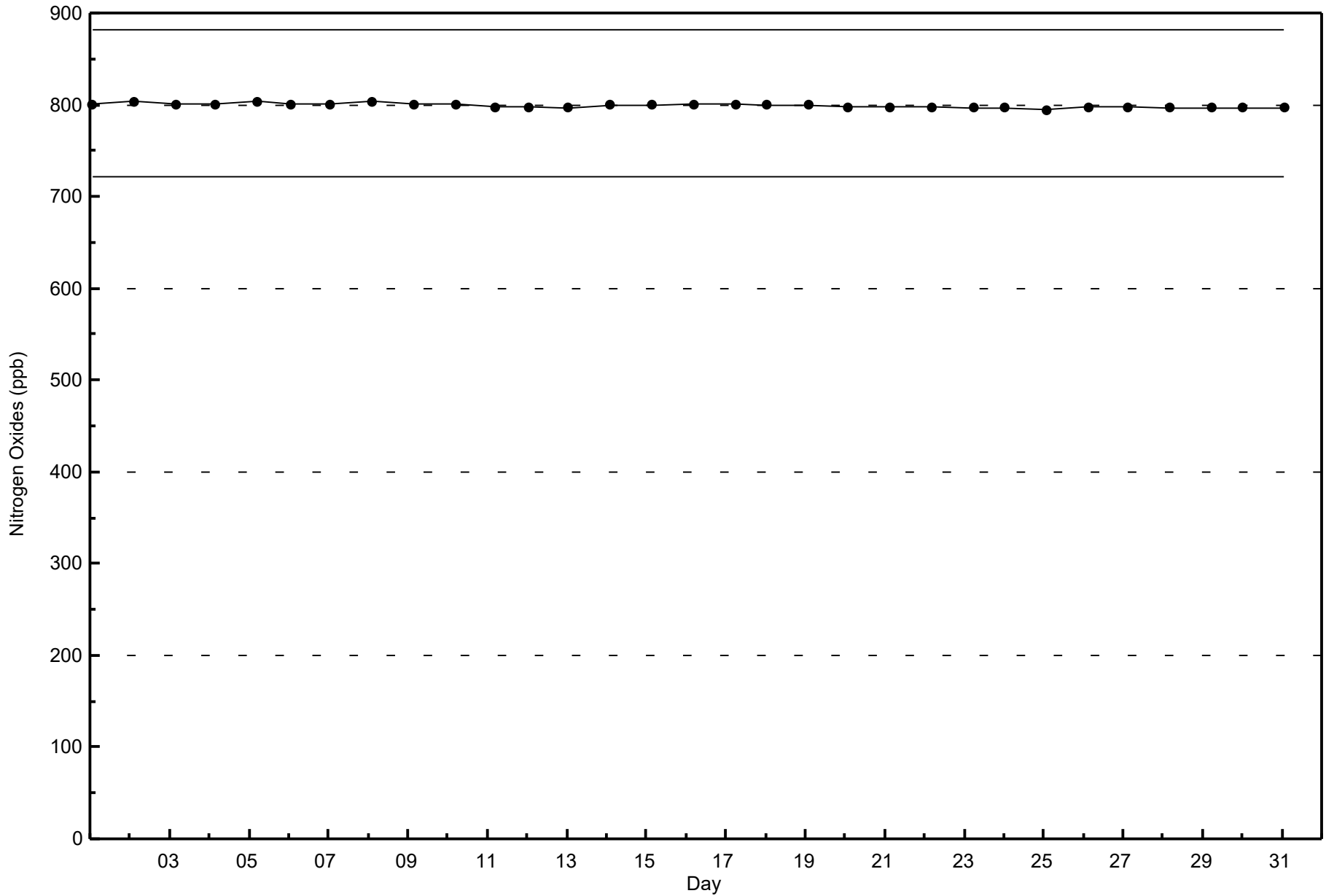






Wood Buffalo Environmental Association
Span Responses

Nitrogen Oxides (NO_x) - ppb
Janvier - August 2023





Wood Buffalo Environmental Association

Summary of Hour Averages

Ozone (O₃) - ppb

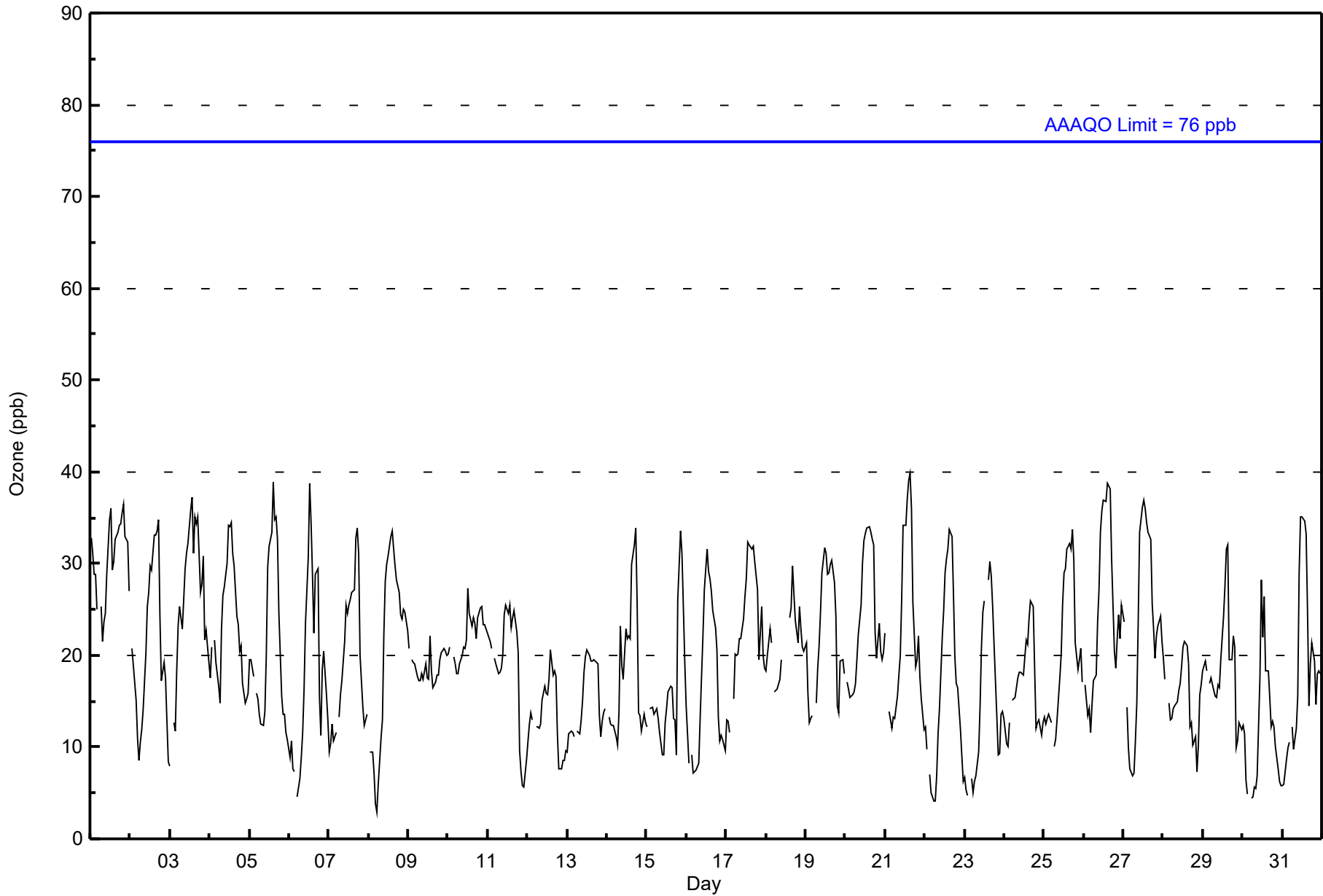
Janvier - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service:																	744												
Maximum Value: 39.8 ppb on Aug 21 16:00		Maximum Daily Average: 30.4 ppb on Aug 1																	Hours of Data:		708												
Minimum Value: 2.8 ppb on Aug 8 06:00		Minimum Daily Average: 12.0 ppb on Aug 30																	Hours of Missing Data:		36												
Maximum Diurnal Average: 28.6 ppb at hour 14		Minimum Diurnal Average: 12.7 ppb at hour 6																	Hours of Calibration:		35												
Monthly Average: 19.78 ppb		Percentiles: P ₁ = 4.8 P ₁₀ = 9.7 Q ₁ = 13.1 Median = 19.2 Q ₃ = 25.3 P ₉₀ = 32.2 P ₉₉ = 37.1																	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-Aug	32.8	31.1	28.8	28.9	25.1	Z	25.3	21.6	23.7	24.6	28.9	34.7	36.0	29.3	30.2	32.6	33.4	34.2	34.3	35.5	36.4	32.9	32.4	27.1	30.4	36.4							
2-Aug	Z	20.7	18.9	15.1	11.0	8.6	10.5	11.9	14.1	20.3	25.4	26.9	29.8	29.3	33.1	33.1	33.6	34.8	24.2	17.2	19.3	17.5	12.8	8.3	20.7	34.8							
3-Aug	8.0	Z	12.7	11.7	18.3	23.2	25.3	22.9	26.1	29.5	31.2	32.2	35.8	37.1	31.1	35.1	34.3	35.0	26.9	27.8	30.8	21.7	22.7	19.2	26.0	37.1							
4-Aug	17.6	20.9	Z	21.6	19.2	16.6	14.9	22.8	26.6	27.5	30.0	34.2	34.0	34.4	31.2	29.7	24.2	23.4	20.5	21.1	16.9	14.8	15.2	15.8	23.2	34.4							
5-Aug	19.5	19.5	17.7	Z	15.9	15.3	13.6	12.6	12.3	13.8	19.9	29.6	31.8	33.5	38.9	34.9	35.2	32.7	24.5	15.6	13.5	13.5	11.5	10.9	21.1	38.9							
6-Aug	8.9	10.7	7.7	7.4	Z	4.6	6.6	8.9	11.6	16.3	23.5	30.6	38.8	34.4	28.8	22.4	28.8	29.4	15.5	11.3	18.4	20.5	15.7	13.0	18.0	38.8							
7-Aug	9.5	10.4	12.5	10.7	11.6	Z	13.3	15.7	17.2	21.5	25.5	24.5	25.5	26.1	26.8	27.1	32.8	33.9	31.1	20.0	14.4	12.3	12.9	13.5	19.5	33.9							
8-Aug	Z	9.4	9.4	7.2	3.9	2.8	6.0	10.9	13.0	22.2	28.0	29.9	30.8	32.9	33.6	31.6	29.7	28.2	26.9	24.5	24.0	25.0	24.7	22.7	20.8	33.6							
9-Aug	20.8	Z	19.6	19.3	19.1	17.7	17.2	17.2	18.0	17.3	19.1	17.6	17.3	22.1	18.2	16.4	17.1	17.9	17.9	19.5	20.3	20.7	20.4	20.0	18.7	22.1							
10-Aug	20.2	20.9	Z	19.8	19.1	18.0	18.0	19.1	20.0	20.9	20.8	21.6	27.3	24.6	23.1	24.0	23.5	21.9	24.2	25.2	25.3	23.4	23.3	22.8	22.0	27.3							
11-Aug	22.4	21.5	20.8	Z	19.6	19.0	17.9	18.2	18.6	20.2	24.3	25.4	24.6	25.5	23.0	24.1	24.8	22.6	20.3	9.6	7.3	5.7	5.6	8.7	18.7	25.5							
12-Aug	10.7	12.4	13.7	13.0	Z	12.1	12.1	12.0	12.4	15.0	16.6	15.8	15.7	17.4	20.6	17.8	18.3	17.7	11.5	7.6	7.6	8.6	8.6	9.7	13.4	20.6							
13-Aug	9.5	11.4	11.7	11.6	11.1	Z	11.8	11.5	13.0	15.1	18.1	19.8	20.6	20.0	19.3	19.4	19.6	19.4	19.1	13.5	11.1	12.9	13.8	14.1	15.1	20.6							
14-Aug	Z	13.3	12.6	12.3	12.3	11.2	10.2	13.8	23.2	18.8	17.4	22.9	21.8	22.1	21.9	29.8	32.1	33.9	25.5	13.8	13.5	11.7	13.5	12.6	18.3	33.9							
15-Aug	12.3	Z	14.2	14.3	13.5	13.8	14.1	13.0	11.6	9.1	9.1	12.7	14.2	16.0	16.7	16.5	13.2	13.0	9.1	26.2	33.6	31.1	25.3	19.4	16.2	33.6							
16-Aug	14.5	8.3	Z	9.2	7.1	7.3	7.5	8.2	13.1	17.7	22.1	27.2	31.5	29.1	28.3	27.0	24.9	23.1	20.6	13.3	10.6	11.3	10.8	9.6	16.6	31.5							
17-Aug	13.0	12.8	11.6	Z	15.3	20.2	20.0	20.1	21.8	21.8	23.9	26.4	28.4	32.4	32.0	31.6	31.8	30.1	28.7	27.2	19.6	25.3	20.0	18.6	23.2	32.4							
18-Aug	18.3	20.0	22.9	21.4	Z	16.0	16.2	16.3	17.3	19.6	C	C	C	C	24.1	25.2	29.7	26.7	23.8	21.4	25.3	22.9	20.9	20.5	21.5	29.7							
19-Aug	21.3	15.9	12.7	13.1	13.5	Z	14.8	18.6	21.1	24.7	28.9	31.7	31.1	28.8	29.1	29.9	30.4	27.9	24.2	14.4	13.7	19.4	19.6	17.9	21.9	31.7							
20-Aug	Z	17.1	16.3	15.3	15.6	16.0	17.0	19.5	22.3	25.4	30.1	32.5	33.3	33.9	34.0	33.4	32.7	32.1	22.6	19.7	23.4	20.4	19.6	20.3	24.0	34.0							
21-Aug	22.4	Z	13.9	12.9	12.1	13.2	13.1	15.6	17.8	20.0	26.2	34.2	34.2	37.1	39.1	39.8	36.1	25.8	18.7	19.5	22.0	17.7	15.2	11.9	22.5	39.8							
22-Aug	12.2	9.7	Z	7.0	5.0	4.2	4.1	6.9	11.5	14.1	21.9	24.9	28.9	30.5	31.6	33.7	33.0	26.7	19.8	16.9	16.5	11.9	9.0	6.2	16.8	33.7							
23-Aug	6.7	5.3	4.8	Z	6.5	5.1	6.2	6.8	9.4	14.3	20.9	24.6	25.9	M	28.2	30.2	28.7	25.3	21.2	13.2	9.1	9.3	13.6	13.9	15.0	30.2							
24-Aug	13.1	10.3	10.1	12.7	Z	15.2	15.4	16.5	17.5	18.1	18.2	17.8	19.8	21.6	21.2	24.0	26.0	25.4	18.6	12.0	12.6	13.0	11.2	12.7	16.6	26.0							
25-Aug	13.3	12.5	13.1	13.6	12.6	Z	10.1	10.9	13.0	17.6	20.1	25.6	29.0	29.4	31.6	32.2	31.6	33.7	30.3	21.3	18.5	19.5	20.8	17.0	20.8	33.7							
26-Aug	Z	16.7	13.4	14.2	11.6	14.7	17.2	17.9	23.7	27.1	33.4	35.6	36.9	36.8	38.8	38.5	38.2	30.4	20.5	18.5	21.9	24.4	21.9	25.5	25.1	38.8							
27-Aug	23.6	Z	14.4	9.8	7.7	6.8	7.1	10.7	14.8	23.7	33.4	36.2	36.9	36.1	34.5	33.3	32.6	25.6	22.9	19.6	22.1	23.2	24.3	21.5	22.7	36.9							
28-Aug	19.7	17.3	Z	14.8	12.9	13.2	14.1	14.5	15.0	16.2	16.9	18.8	20.8	21.4	21.1	19.1	12.1	12.7	10.2	11.1	7.2	10.2	15.6	16.8	15.3	21.4							
29-Aug	18.3	19.4	18.3	Z	16.9	17.6	16.2	15.6	15.4	16.8	16.5	19.5	24.3	27.6	31.5	32.0	19.5	19.6	22.2	20.9	9.9	10.7	12.7	11.9	18.8	32.0							
30-Aug	12.3	11.4	6.5	4.8	Z	4.4	4.5	5.7	5.5	6.9	17.7	28.1	22.0	26.3	18.3	18.3	15.5	12.2	12.7	12.2	10.1	7.7	6.2	5.8	12.0	28.1							
31-Aug	5.8	6.0	8.6	9.9	10.6	Z	12.3	9.8	12.1	15.5	28.9	35.1	35.0	34.6	33.3	24.7	14.4	19.1	21.4	19.3	14.6	18.0	18.4	17.9	18.5	35.1							
		15.6	14.8	14.1	13.5	13.4	12.7	13.3	14.4	16.5	19.1	23.2	26.6	28.1	28.6	28.2	28.0	27.0	25.6	21.6	18.4	17.7	17.3	16.7	15.7	Diurnal Average							
		32.8	31.1	28.8	28.9	25.1	23.2	25.3	22.9	26.6	29.5	33.4	36.2	38.8	37.1	39.1	39.8	38.2	35.0	34.3	35.5	36.4	32.9	32.4	27.1	Diurnal Maximum							
Z - zerospan		C - Calibration		M - Maintenance																													
Alberta Ambient Air Quality Objectives (AAAQO):		1-hr		76 ppb																													



Wood Buffalo Environmental Association
Hourly Averages

Ozone (O₃) - ppb
Janvier - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ozone (O₃) - ppb
Janvier - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	409	57.77	57.77
21 - 50	299	42.23	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
Janvier - August 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	18	36	5	11	5	20	17	10	24	116	86	18	10	12	7	10	405
21 - 50	18	24	12	20	5	13	13	9	8	13	42	33	19	33	16	21	299
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	36	60	17	31	10	33	30	19	32	129	128	51	29	45	23	31	704

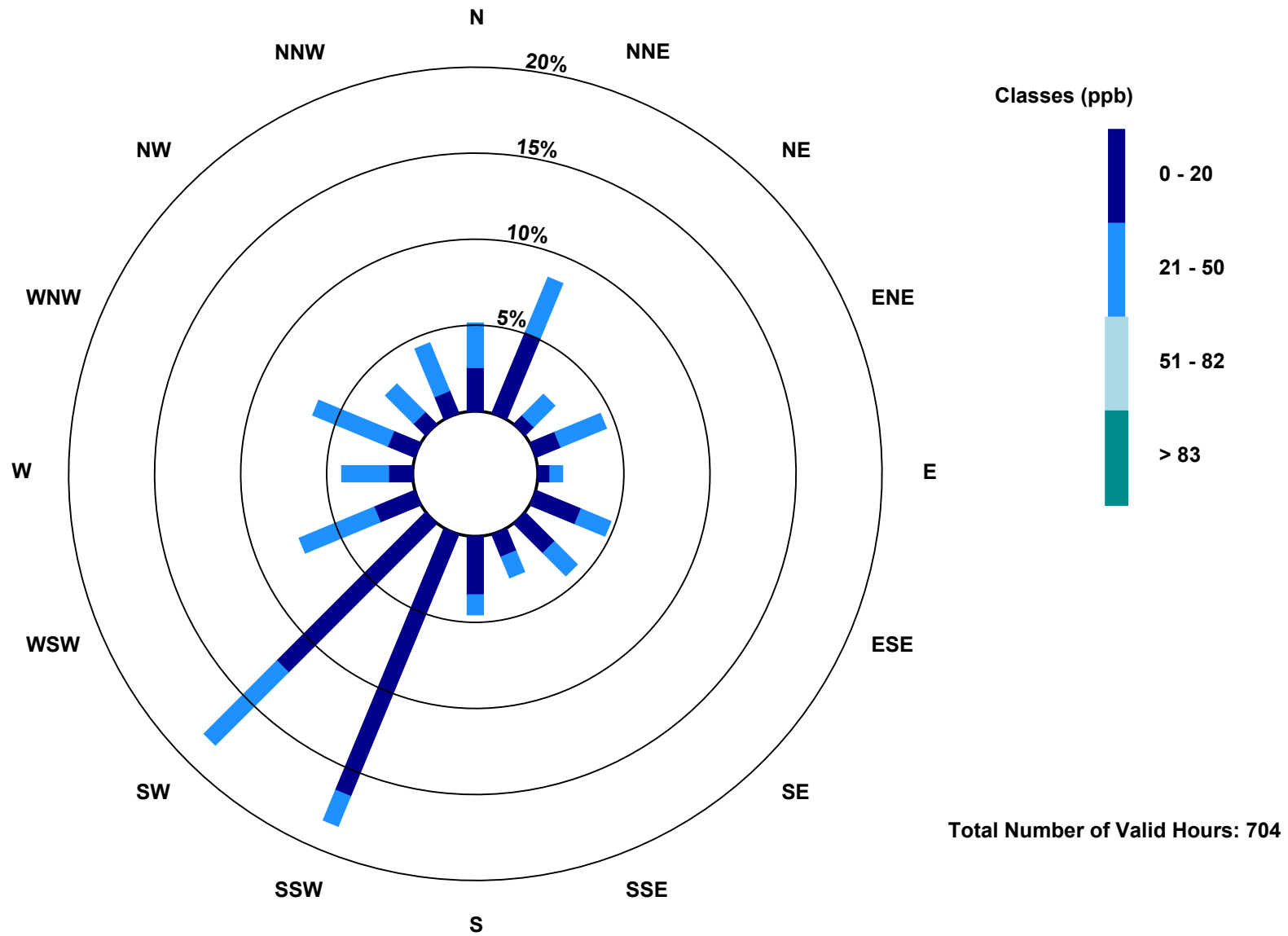
Total Number of Valid Hours: 704

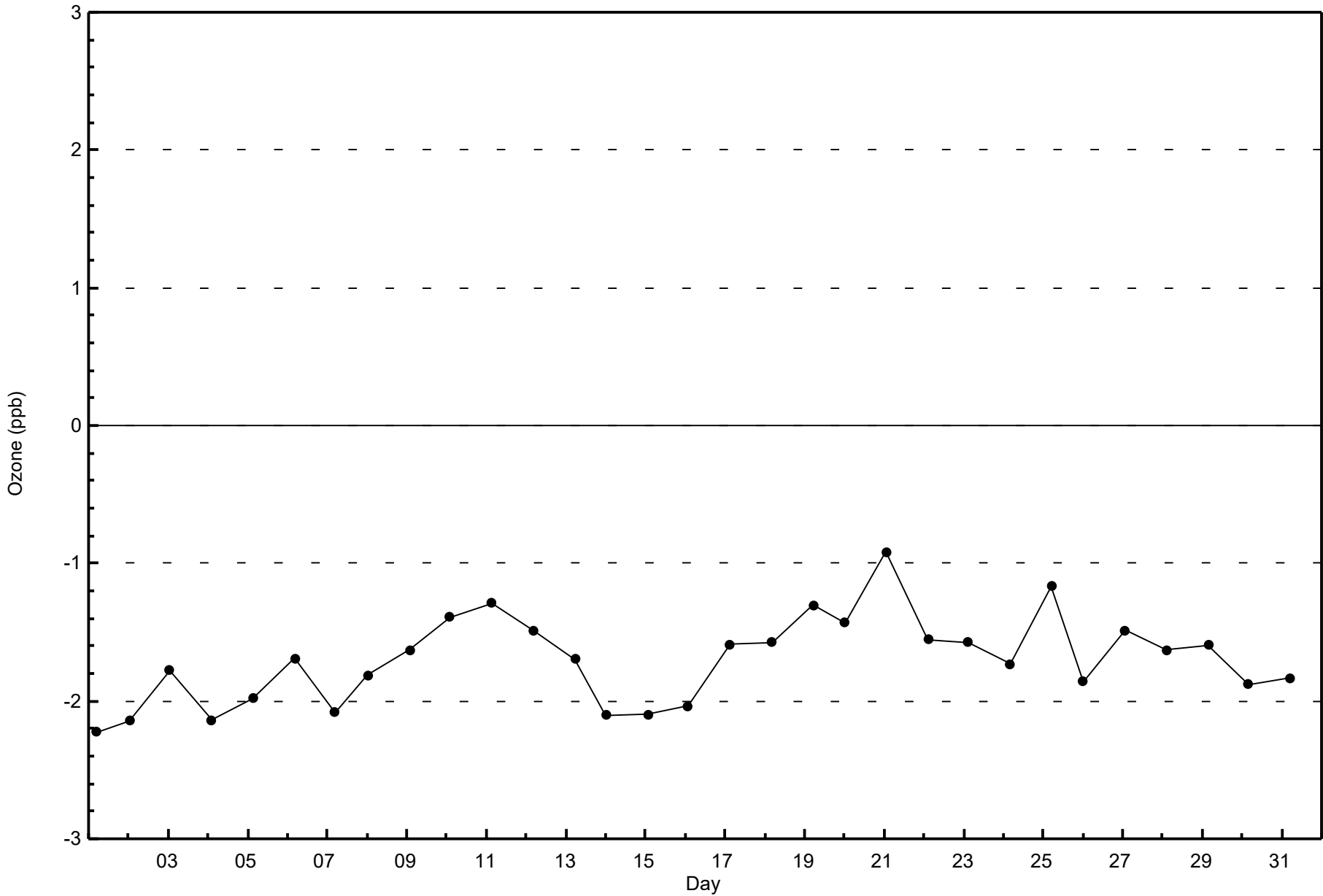
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Ozone (O₃) - ppb
Janvier

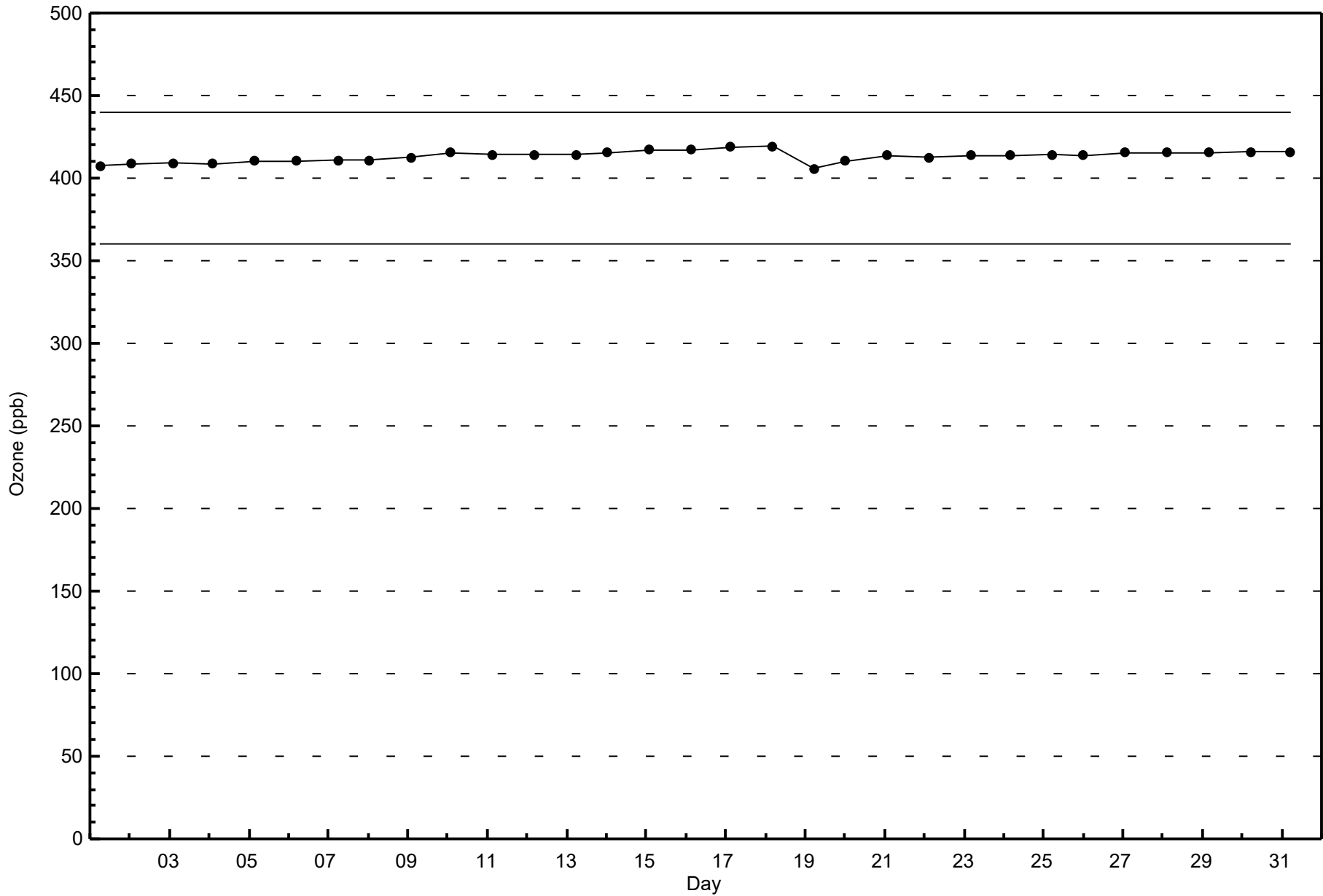






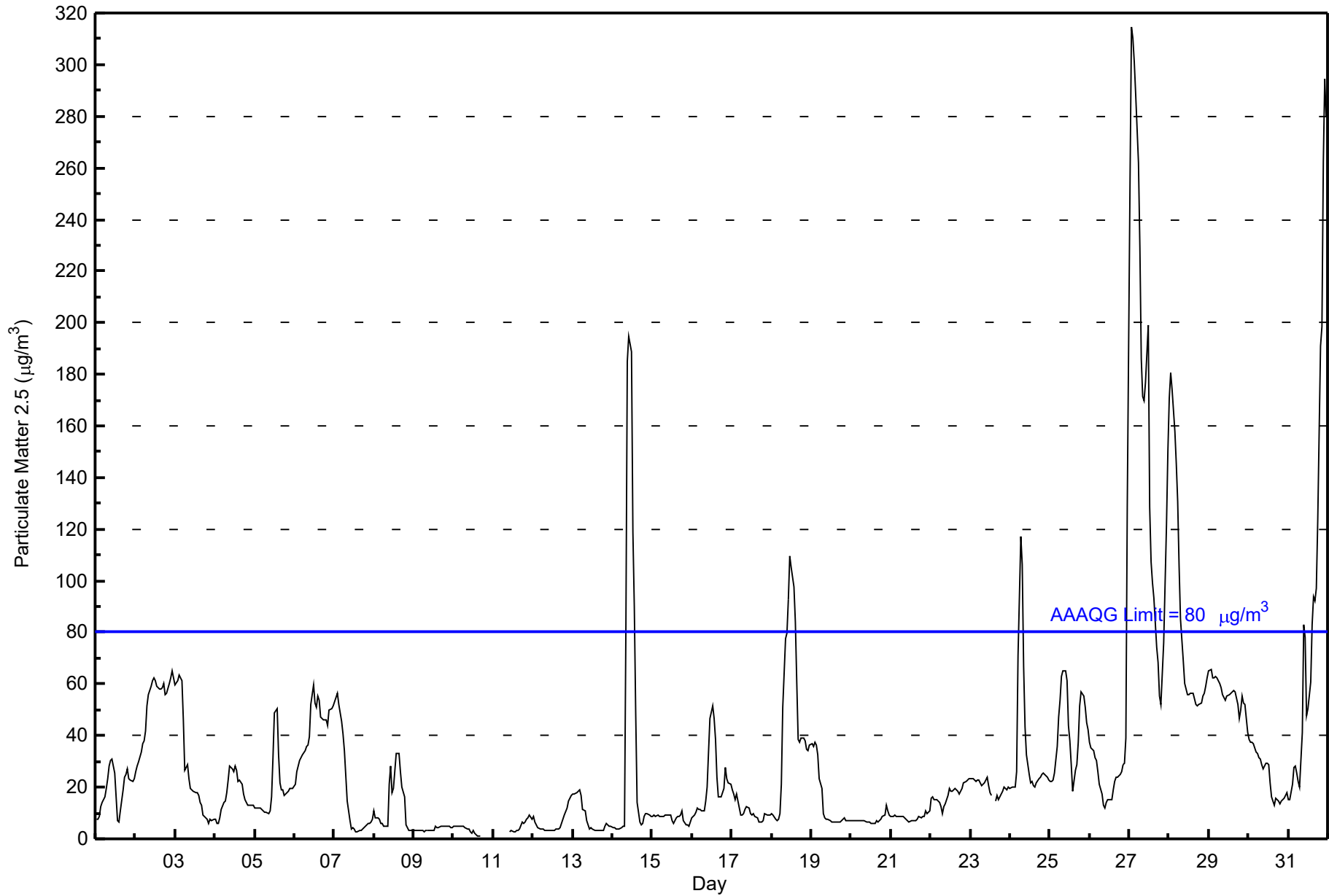
Wood Buffalo Environmental Association
Span Responses

Ozone (O₃) - ppb
Janvier - August 2023





Number of Exceedences (AAAQO): 1-hr: 51 24-hr: 10 Maximum Value: 314.6 µg/m ³ on Aug 27 02:00 Minimum Value: 1.1 µg/m ³ on Aug 10 16:00 Maximum Diurnal Average: 37.5 µg/m ³ at hour 11 Monthly Average: 31.73 µg/m ³		Maximum Daily Average: 164.8 µg/m ³ on Aug 27 Minimum Daily Average: 3.9 µg/m ³ on Aug 9 Minimum Diurnal Average: 23.3 µg/m ³ at hour 17 Percentiles: P ₁ = 2.9 P ₁₀ = 4.5 Q ₁ = 7.6 Median = 17.8 Q ₃ = 37.7 P ₉₀ = 62.3 P ₉₉ = 260.6		Hours in Service: 744 Hours of Data: 726 Hours of Missing Data: 18 Hours of Calibration: 1 Percent Operational Time: 97.7																							
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-Aug	7.3	7.6	8.8	12.3	14.3	16.3	19.6	23.3	28.0	30.3	30.9	25.6	16.5	6.9	6.6	10.7	19.2	23.6	25.1	27.0	23.1	22.7	22.1	23.4	18.8	30.9	
2-Aug	26.3	28.1	29.8	33.8	37.1	38.0	41.8	51.8	55.9	59.3	61.5	62.1	61.3	59.0	57.9	58.0	58.4	60.4	55.9	56.4	60.0	62.3	65.2	62.2	51.8	65.2	
3-Aug	59.8	61.5	63.3	62.1	61.5	46.2	26.8	28.9	23.6	19.8	19.0	18.2	17.7	18.0	16.9	14.1	13.0	9.4	8.2	7.7	6.0	7.5	6.9	7.4	26.0	63.3	
4-Aug	7.7	6.0	6.0	8.2	11.2	14.3	14.5	17.8	22.9	28.1	27.3	26.0	28.0	26.4	22.2	22.7	21.2	17.6	15.1	14.0	13.3	13.2	13.2	12.9	17.1	28.1	
5-Aug	11.8	11.9	11.8	11.9	11.5	10.6	10.3	10.2	10.0	10.7	16.4	31.6	48.9	50.5	32.7	21.9	19.1	19.0	16.6	17.8	18.6	19.5	19.7	19.5	19.3	50.5	
6-Aug	21.1	25.9	28.1	30.4	31.3	32.8	34.4	35.6	36.5	39.7	52.0	59.6	52.8	51.2	55.5	53.9	47.2	45.9	45.8	45.9	44.1	50.0	50.4	51.6	42.6	59.6	
7-Aug	52.9	54.9	56.5	51.9	45.6	40.8	33.9	24.5	14.6	7.1	4.0	4.3	3.6	3.0	2.9	3.1	3.3	3.7	4.1	4.7	5.9	5.8	6.7	7.8	18.6	56.5	
8-Aug	10.6	8.0	8.4	7.5	6.1	6.0	4.9	4.6	5.1	21.0	27.9	18.0	19.5	33.0	33.3	33.1	26.1	20.0	16.5	5.5	4.2	3.3	3.0	3.1	13.7	33.3	
9-Aug	3.1	3.3	3.2	3.1	3.1	3.1	3.0	3.0	3.0	3.2	3.3	3.5	3.4	4.7	4.1	4.4	4.7	4.8	5.0	5.1	4.9	4.6	4.5	4.5	3.9	5.1	
10-Aug	4.9	5.0	4.9	4.9	4.9	4.9	4.7	4.4	4.0	3.8	2.9	2.2	3.1	2.4	1.2	1.1	1.3	UO	UO	UO	UO	UO	UO	UO	UO	--	5.0
11-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	2.5	3.0	2.9	2.9	3.1	3.4	4.0	6.3	6.2	6.8	7.5	8.0	9.0	7.8	--	9.0	
12-Aug	8.6	6.8	5.2	4.3	3.9	3.8	3.7	3.5	3.4	3.1	3.2	3.2	3.1	3.2	3.6	3.7	4.5	5.9	7.4	9.1	11.9	14.8	15.6	16.6	6.3	16.6	
13-Aug	17.1	17.6	17.8	18.5	18.7	17.0	11.6	11.1	7.1	5.4	4.0	4.1	3.8	3.4	3.3	3.1	3.5	3.5	3.4	5.0	5.7	5.6	4.7	4.9	8.3	18.7	
14-Aug	4.5	4.2	4.0	4.0	3.9	4.4	5.1	4.9	82.0	185.2	194.5	189.0	118.7	90.0	48.8	13.9	6.6	5.5	6.1	8.4	9.8	9.5	9.4	8.7	42.6	194.5	
15-Aug	8.7	9.0	8.8	9.0	8.9	8.8	8.9	8.7	9.1	9.2	9.2	9.0	7.0	6.2	7.9	8.4	8.7	9.0	10.9	7.1	5.6	5.3	5.0	6.4	8.1	10.9	
16-Aug	8.2	9.3	10.6	12.1	11.5	11.2	10.6	10.7	14.6	20.1	33.5	46.9	51.7	46.9	38.3	23.7	16.5	16.2	17.6	19.7	27.6	23.2	21.9	21.1	21.8	51.7	
17-Aug	19.2	17.2	15.4	17.2	11.7	9.4	9.2	9.8	11.3	12.3	11.9	9.6	9.5	9.8	8.8	8.1	6.4	6.4	6.6	7.1	9.8	9.0	9.1	9.4	10.6	19.2	
18-Aug	9.7	9.0	7.8	7.3	7.7	9.6	20.9	51.2	77.3	79.8	92.5	109.8	105.1	97.9	83.9	60.9	38.6	37.4	39.2	39.3	37.7	34.5	34.2	36.4	47.0	109.8	
19-Aug	36.8	35.8	37.2	36.2	32.7	23.5	19.6	9.6	8.2	7.5	7.5	6.9	6.4	6.6	6.5	6.3	6.6	6.8	7.1	7.7	7.9	7.2	6.9	6.9	14.3	37.2	
20-Aug	6.9	6.9	6.9	6.9	6.9	7.2	6.9	7.0	6.8	6.7	6.2	6.3	6.0	5.9	6.0	7.2	6.7	7.0	7.6	8.9	9.4	13.0	10.8	9.3	7.5	13.0	
21-Aug	8.8	8.8	9.2	8.5	8.8	8.6	8.5	8.6	7.9	7.6	7.1	6.6	6.9	7.1	7.3	7.1	7.3	8.8	8.4	8.5	8.5	10.9	9.8	10.7	8.4	10.9	
22-Aug	16.0	16.1	15.2	15.0	15.1	14.2	12.6	9.9	12.3	13.5	16.8	19.4	18.6	18.5	18.8	19.6	18.3	17.2	18.2	19.8	21.9	22.5	22.7	23.6	17.3	23.6	
23-Aug	23.5	23.3	23.2	22.1	22.7	22.8	21.9	20.6	21.7	22.7	23.8	20.3	17.8	16.7	C	14.8	16.8	15.4	16.5	18.3	19.8	19.4	19.1	19.9	20.1	23.8	
24-Aug	19.8	19.9	19.9	19.9	26.0	71.1	117.3	106.2	66.5	43.2	32.4	24.8	21.9	22.0	20.9	20.2	21.8	23.5	23.8	24.9	25.6	25.1	23.9	23.0	35.1	117.3	
25-Aug	22.4	22.3	22.7	25.4	36.0	47.4	53.6	62.8	65.1	64.8	61.5	44.1	38.2	28.5	18.5	26.5	28.6	37.5	51.5	56.7	55.4	50.8	45.3	42.3	42.0	65.1	
26-Aug	37.2	35.3	34.3	31.5	30.2	25.8	21.4	17.2	13.1	11.9	14.0	15.1	15.4	15.3	18.9	22.0	23.7	23.6	24.7	26.1	28.7	29.4	39.1	129.0	28.5		
27-Aug	256.8	314.6	310.5	300.8	288.3	261.9	229.5	186.1	171.6	169.6	177.0	199.1	128.4	107.6	99.0	93.1	74.6	68.3	55.3	51.8	64.3	75.8	121.4	150.4	164.8	314.6	
28-Aug	171.0	180.5	174.0	157.8	145.3	130.5	105.8	85.2	68.9	60.0	58.0	55.6	55.7	56.4	56.2	54.2	51.8	51.5	52.0	52.4	55.5	56.5	59.3	62.1	85.7	180.5	
29-Aug	65.1	65.8	62.5	62.4	63.2	62.6	60.2	58.5	55.9	54.9	53.6	55.1	55.8	56.6	56.9	57.7	56.8	52.1	46.5	49.9	55.5	52.5	52.1	41.0	56.4	65.8	
30-Aug	38.4	37.4	37.6	36.7	33.9	33.1	31.7	30.8	28.9	27.3	29.2	29.5	28.6	21.6	16.1	12.8	15.5	15.4	14.7	13.8	14.9	15.5	16.6	17.8	24.9	38.4	
31-Aug	15.0	15.4	21.1	27.5	28.0	25.7	22.1	19.9	41.3	83.0	78.0	47.5	50.3	60.5	83.2	94.1	92.1	97.2	123.3	190.7	198.5	262.3	294.4	280.0	93.8	294.4	
33.3 35.6 35.5 35.0 34.3 33.7 32.5 30.9 32.6 37.0 37.5 37.3 32.5 30.3 28.0 25.3 23.3 24.0 24.6 27.2 28.7 31.3 34.1 37.3																								Diurnal Average			
256.8 314.6 310.5 300.8 288.3 261.9 229.5 186.1 171.6 169.6 177.0 199.1 128.4 107.6 99.0 94.1 92.1 97.2 123.3 190.7 198.5 262.3 294.4 280.0																								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 - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	104	14.33	14.33
6 - 15	228	31.40	45.73
16 - 25	136	18.73	64.46
26 - 80	207	28.51	92.98
> 81.0	51	7.02	100.00

Total Number of Valid Hours: 726

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - µg/m³
Janvier - August 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	5	10	2	9	4	22	10	0	0	1	23	8	3	3	2	2	104
6 - 15	7	14	6	6	2	3	5	3	8	54	62	18	11	19	4	5	227
16 - 25	6	11	4	6	2	7	7	5	14	26	13	10	6	9	3	6	135
26 - 80	11	22	2	10	2	2	9	8	11	48	26	12	6	11	13	12	205
> 81.0	7	5	0	0	0	0	1	3	1	10	10	5	4	3	1	1	51
Totals	36	62	14	31	10	34	32	19	34	139	134	53	30	45	23	26	722

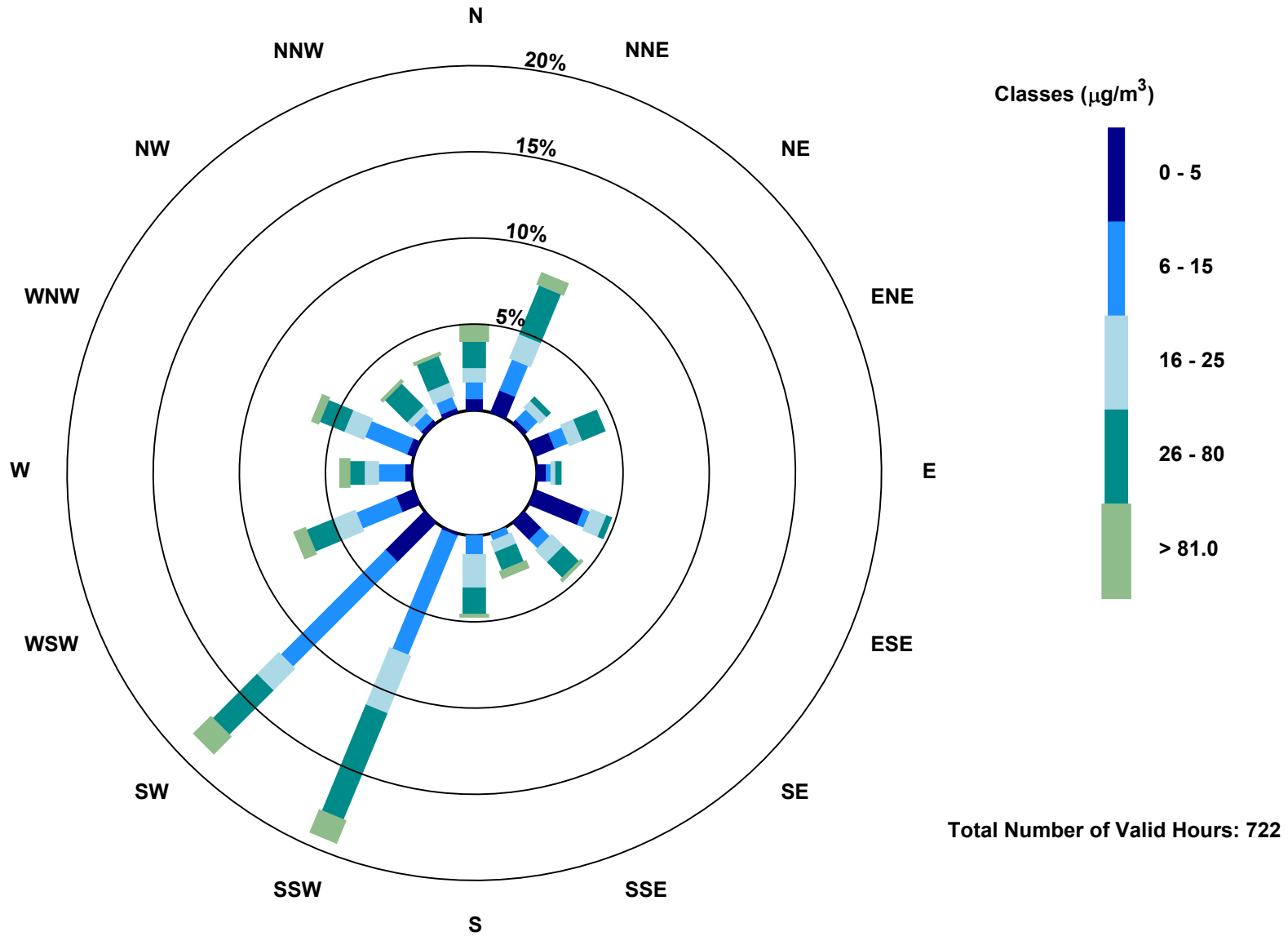
Total Number of Valid Hours: 722

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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



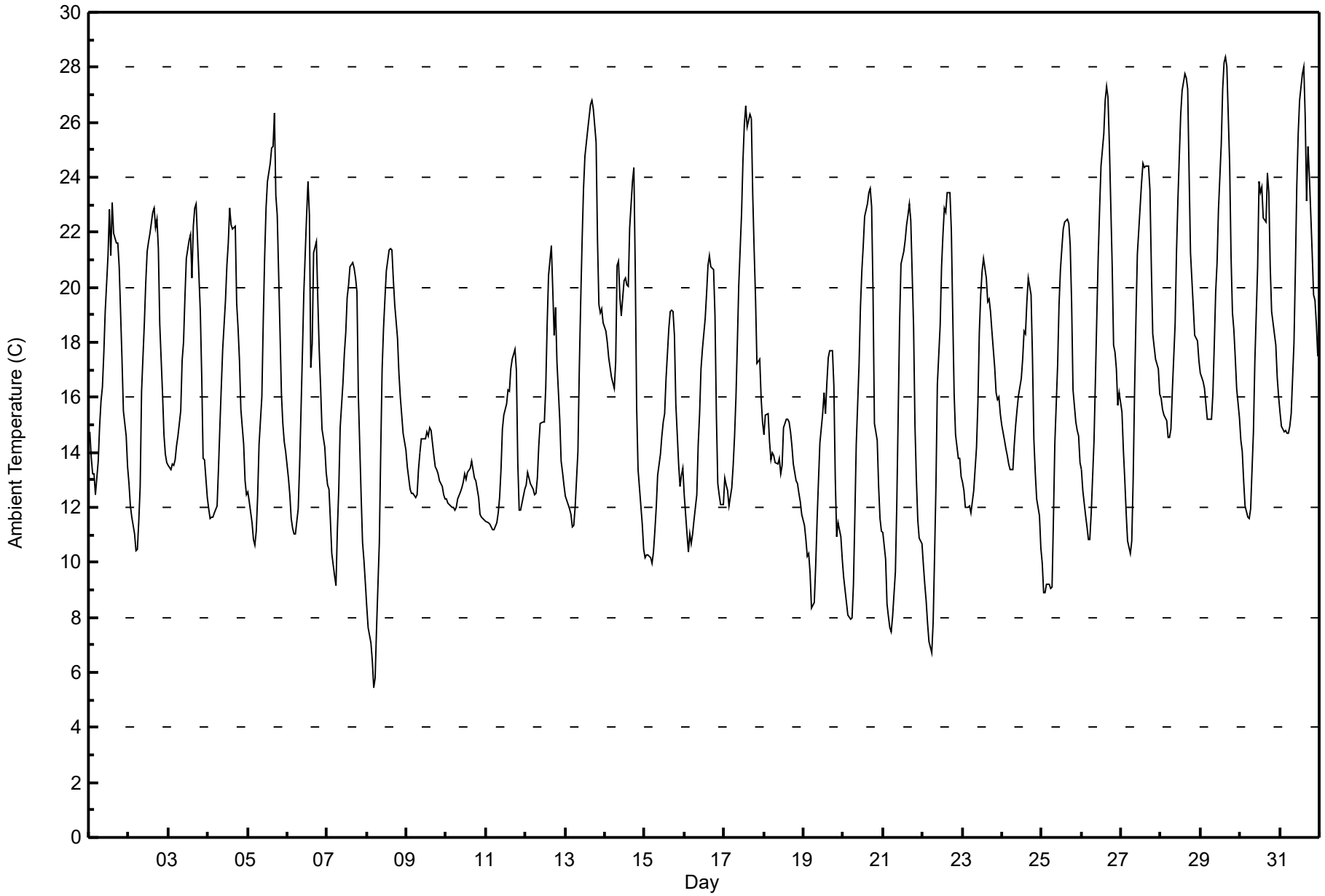


Maximum Value: 28.4 C on Aug 29 16:00		Maximum Daily Average: 20.2 C on Aug 31		Hours in Service: 744																																												
Minimum Value: 5.5 C on Aug 8 05:00		Minimum Daily Average: 12.5 C on Aug 10		Hours of Data: 744																																												
Maximum Diurnal Average: 21.8 C at hour 17		Minimum Diurnal Average: 11.4 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 16.27 C		Percentiles: P ₁ = 7.6 P ₁₀ = 11.0 Q ₁ = 12.6 Median = 15.4 Q ₃ = 19.7 P ₉₀ = 22.9 P ₉₉ = 27.3		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-Aug	14.7	13.8	13.2	13.2	12.4	13.7	15.0	15.9	16.4	17.6	19.1	21.1	22.8	21.2	23.1	21.9	21.6	21.6	20.7	19.0	17.4	15.5	14.6	13.5	17.5	23.1																						
2-Aug	12.9	12.1	11.6	11.0	10.4	10.5	11.5	12.7	16.2	18.7	20.2	21.3	21.7	22.0	22.7	22.9	22.2	22.5	21.4	18.7	16.1	14.6	13.9	13.6	16.7	22.9																						
3-Aug	13.5	13.4	13.6	13.5	13.7	14.3	14.6	15.5	17.3	18.0	19.6	21.0	21.7	21.9	20.4	22.2	22.9	23.1	20.4	19.1	16.8	13.8	13.7	12.4	17.3	23.1																						
4-Aug	11.9	11.6	11.7	11.6	11.8	12.0	13.4	14.9	16.4	17.7	19.5	20.8	21.6	22.9	22.3	22.1	22.2	19.4	18.5	17.3	15.6	14.3	13.0	12.4	16.5	22.9																						
5-Aug	12.6	12.2	11.4	10.9	10.6	11.1	12.4	14.3	16.0	18.8	21.1	22.9	23.9	24.5	25.1	25.1	26.3	23.4	22.6	18.4	16.1	15.1	14.4	14.1	17.6	26.3																						
6-Aug	13.1	12.5	11.6	11.2	11.0	11.0	11.9	13.5	15.5	17.6	19.8	22.6	23.8	22.6	17.1	18.0	21.3	21.6	19.6	17.8	16.4	14.9	14.2	13.3	16.3	23.8																						
7-Aug	12.8	12.6	11.5	10.3	9.5	9.2	11.2	12.7	14.9	16.5	17.6	18.3	19.6	20.1	20.8	20.9	20.7	20.3	19.8	16.1	12.4	10.7	10.1	9.2	14.9	20.9																						
8-Aug	8.4	7.6	7.1	6.4	5.5	5.8	7.6	10.7	14.0	17.0	18.5	19.6	20.6	21.3	21.4	21.4	20.3	19.4	18.1	16.9	16.0	15.4	14.7	14.1	14.5	21.4																						
9-Aug	13.5	13.1	12.7	12.5	12.5	12.4	12.5	13.4	14.0	14.5	14.5	14.5	14.7	14.6	14.9	14.8	13.9	13.5	13.4	13.2	13.0	12.8	12.5	12.3	13.5	14.9																						
10-Aug	12.3	12.1	12.1	12.0	12.0	11.9	12.0	12.3	12.6	12.7	12.9	13.2	13.0	13.3	13.4	13.7	13.4	13.1	12.9	12.3	11.8	11.7	11.6	11.6	12.5	13.7																						
11-Aug	11.5	11.4	11.4	11.3	11.2	11.2	11.4	11.8	12.3	13.4	14.8	15.4	15.8	16.2	16.2	17.0	17.4	17.8	17.0	13.6	11.9	11.9	12.2	12.7	13.6	17.8																						
12-Aug	12.8	13.2	13.1	12.9	12.7	12.5	12.5	13.1	14.3	15.0	15.1	15.1	16.4	18.7	20.4	21.5	19.9	18.3	19.3	17.3	15.2	13.7	13.3	12.8	15.4	21.5																						
13-Aug	12.4	12.2	11.9	11.8	11.3	11.3	12.0	14.0	17.1	19.5	21.7	23.6	24.8	25.7	26.2	26.6	26.8	26.5	25.3	21.7	19.4	19.1	19.2	18.7	19.1	26.8																						
14-Aug	18.4	18.0	17.4	17.1	16.7	16.3	17.3	20.8	20.9	19.6	19.0	20.2	20.4	20.1	20.0	22.2	23.8	24.4	20.6	15.6	13.4	12.7	11.4	10.5	18.2	24.4																						
15-Aug	10.2	10.3	10.3	10.2	10.0	10.4	11.1	12.0	13.1	13.9	14.6	15.1	15.4	16.7	18.5	19.1	19.2	19.1	18.3	15.7	13.6	12.7	13.2	13.4	14.0	19.2																						
16-Aug	12.4	11.1	10.4	11.0	10.7	11.0	11.5	12.5	14.3	15.4	17.1	17.8	18.9	19.8	20.8	21.1	20.8	20.6	19.0	15.4	12.9	12.5	12.1	12.1	15.0	21.1																						
17-Aug	13.1	12.8	12.6	12.0	12.7	13.5	14.6	16.0	18.0	20.1	22.7	24.6	25.9	26.6	25.8	26.3	26.1	23.3	21.4	19.6	17.3	17.4	16.0	15.1	18.9	26.6																						
18-Aug	14.6	15.4	15.4	14.4	13.7	14.0	13.9	13.6	13.6	13.8	13.2	13.5	14.9	15.2	15.2	15.1	14.7	14.2	13.6	13.0	12.9	12.5	12.2	11.7	13.9	15.4																						
19-Aug	11.4	10.8	10.2	10.3	9.6	8.3	8.5	9.8	11.5	13.0	14.3	15.4	16.2	15.4	16.5	17.4	17.7	17.7	16.4	13.1	10.9	11.4	11.0	10.1	12.8	17.7																						
20-Aug	9.5	9.0	8.5	8.1	7.9	8.0	9.2	11.6	14.3	17.2	19.3	20.6	21.5	22.6	23.0	23.5	23.6	22.9	19.9	15.1	14.4	12.8	11.6	11.1	15.2	23.6																						
21-Aug	11.1	10.1	8.5	8.0	7.6	7.5	8.0	9.6	12.2	15.4	18.7	20.8	21.3	21.7	22.3	22.6	23.0	22.4	18.6	14.9	13.0	11.5	10.9	10.7	14.6	23.0																						
22-Aug	9.9	9.2	8.6	7.8	7.1	6.7	7.8	10.2	12.8	16.5	18.6	20.8	21.9	22.9	22.7	23.5	23.4	22.1	19.0	16.1	14.6	13.8	13.8	13.1	15.1	23.5																						
23-Aug	12.9	12.6	12.0	12.0	12.0	11.8	12.2	12.6	14.2	15.8	18.4	19.7	20.6	21.1	20.4	19.5	19.6	19.1	18.4	17.1	16.2	15.9	16.0	15.4	16.1	21.1																						
24-Aug	15.0	14.4	14.2	13.9	13.6	13.4	13.4	14.3	15.0	15.6	16.1	16.7	17.4	18.4	18.3	19.5	20.3	19.7	17.5	14.5	13.3	12.3	11.7	10.5	15.4	20.3																						
25-Aug	9.9	8.9	8.9	9.2	9.2	9.0	9.1	11.6	14.3	17.2	19.4	20.7	21.4	22.1	22.4	22.5	22.3	21.5	19.4	16.3	15.1	14.8	14.6	13.6	15.6	22.5																						
26-Aug	13.4	12.6	11.7	11.3	10.8	10.8	11.8	14.4	16.6	18.9	21.1	22.8	24.4	25.6	26.8	27.3	26.9	25.2	20.8	17.9	17.7	17.0	15.7	16.2	18.2	27.3																						
27-Aug	15.5	14.1	13.0	11.8	10.8	10.3	10.8	13.0	16.2	18.9	21.2	22.9	23.8	24.5	24.4	24.4	24.4	23.6	20.8	18.3	17.8	17.4	17.0	16.1	18.0	24.5																						
28-Aug	16.0	15.6	15.3	15.2	14.6	14.5	14.8	16.2	18.7	21.3	23.2	24.8	26.3	27.2	27.8	27.6	27.2	24.2	21.2	19.2	18.2	18.1	18.1	17.3	20.1	27.8																						
29-Aug	16.9	16.6	16.3	15.8	15.2	15.2	15.2	16.1	17.9	19.8	20.9	22.9	25.2	27.2	28.2	28.4	28.0	24.4	21.1	19.1	18.5	17.5	16.3	15.2	19.9	28.4																						
30-Aug	14.5	14.0	12.9	12.1	11.7	11.6	12.0	13.4	14.7	17.3	20.7	23.9	23.4	23.7	22.5	22.4	24.2	23.4	20.7	19.1	18.7	17.9	16.7	16.0	17.8	24.2																						
31-Aug	15.4	14.9	14.8	14.8	14.7	14.7	14.9	15.4	18.0	20.7	23.7	25.6	26.8	27.8	28.0	26.2	23.1	25.1	24.1	21.2	19.7	19.5	18.7	17.5	20.2	28.0																						
																								13.0	12.5	12.1	11.7	11.4	11.4	12.1	13.5	15.3	17.0	18.6	19.9	20.8	21.4	21.5	21.8	21.8	21.1	19.3	16.9	15.4	14.6	14.0	13.4	Diurnal Average
																								18.4	18.0	17.4	17.1	16.7	16.3	17.3	20.8	20.9	21.3	23.7	25.6	26.8	27.8	28.2	28.4	28.0	26.5	25.3	21.7	19.7	19.5	19.2	18.7	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Janvier - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Janvier - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	42	5.65	5.65
10 - 20	522	70.16	75.81
> 20	180	24.19	100.00

Total Number of Valid Hours: 744

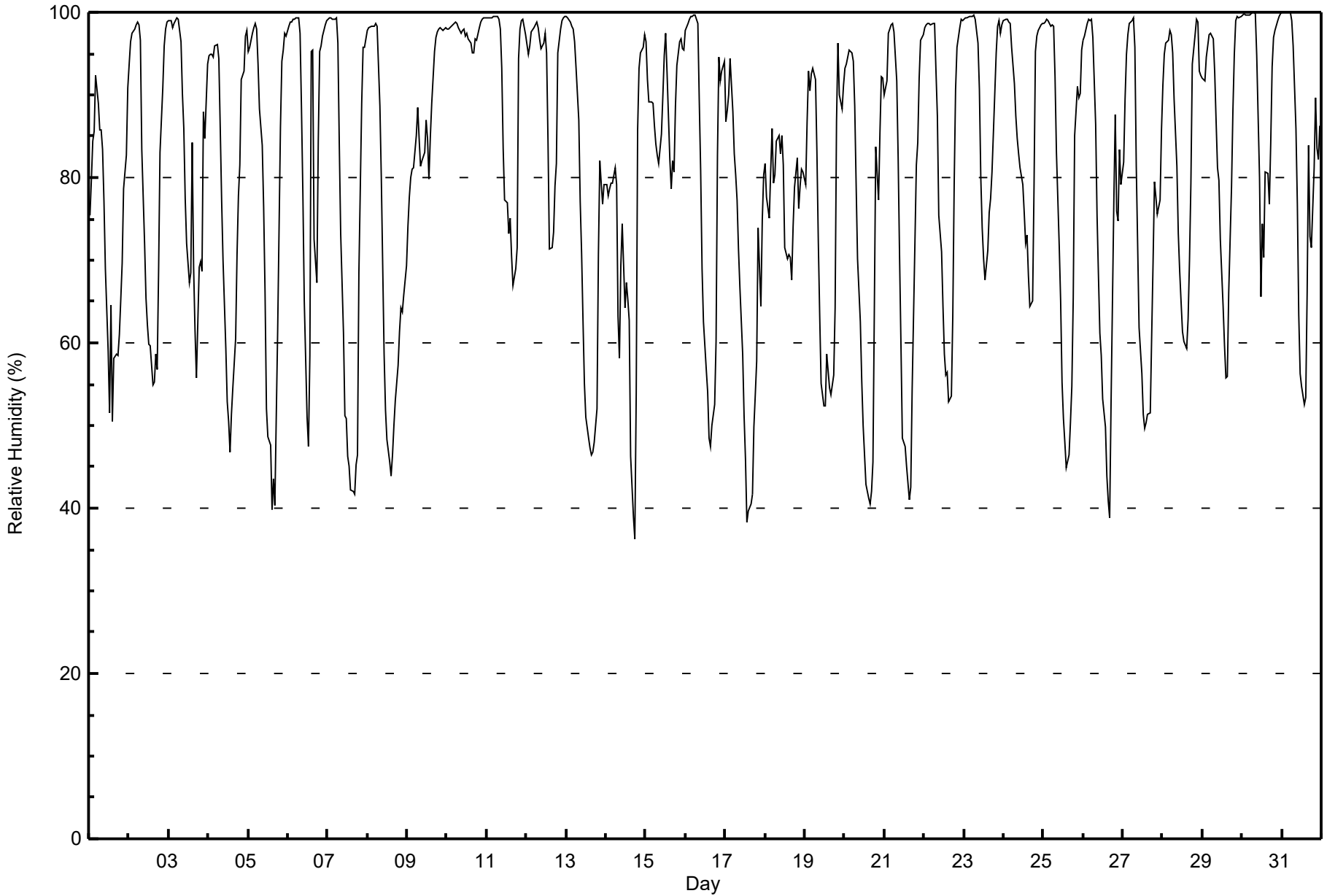
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Janvier - August 2023

Maximum Value: 100.0 % on Aug 30 08:00 Maximum Daily Average: 97.7 % on Aug 10																						Hours in Service: 744 Hours of Data: 744																										
Minimum Value: 36.2 % on Aug 14 18:00 Minimum Daily Average: 66.5 % on Aug 17 Maximum Diurnal Average: 95.9 % at hour 5 Minimum Diurnal Average: 59.9 % at hour 16 Monthly Average: 80.70 % Percentiles: P ₁ = 40.6 P ₁₀ = 52.0 Q ₁ = 68.1 Median = 84.8 Q ₃ = 97.2 P ₉₀ = 99.0 P ₉₉ = 99.9																						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-Aug	75.4	79.6	84.4	85.5	92.4	88.9	85.7	85.8	83.5	77.1	68.9	58.9	51.5	64.5	50.5	58.1	58.6	58.5	61.0	65.2	69.7	78.7	82.6	90.8	73.2	92.4																						
2-Aug	93.7	96.4	97.5	98.0	98.5	98.8	98.5	96.6	83.4	72.1	65.5	62.3	59.9	59.7	54.8	55.2	58.6	56.7	68.6	83.0	90.8	96.0	98.0	98.7	80.9	98.8																						
3-Aug	99.0	99.0	98.1	98.6	99.1	99.4	99.2	96.5	90.1	86.0	77.5	72.0	67.2	68.6	84.2	69.1	61.6	55.8	69.1	69.8	68.6	87.9	84.8	93.8	83.1	99.4																						
4-Aug	94.7	94.9	94.9	94.5	95.9	96.1	94.4	86.0	77.3	70.1	59.4	53.0	50.6	46.7	51.3	54.6	60.5	70.6	77.9	81.5	91.8	92.9	97.2	97.8	78.5	97.8																						
5-Aug	95.3	95.8	97.4	98.2	98.6	98.0	93.7	88.4	83.8	76.5	66.2	52.0	48.6	47.6	39.8	43.6	40.3	50.9	61.4	86.1	94.1	95.5	97.5	97.2	76.9	98.6																						
6-Aug	98.3	98.7	98.9	99.1	99.2	99.3	99.3	97.4	88.4	78.1	65.1	51.1	47.5	58.5	95.2	95.4	72.5	67.3	84.4	95.2	95.9	97.1	98.5	98.9	86.6	99.3																						
7-Aug	99.2	99.4	99.3	99.2	99.2	99.3	96.2	84.0	73.3	61.2	51.2	50.8	46.3	45.0	42.3	42.0	41.6	45.3	46.5	68.4	89.0	95.7	95.7	96.8	73.6	99.4																						
8-Aug	97.8	98.2	98.3	98.3	98.3	98.6	98.4	88.6	79.9	69.3	58.7	51.9	48.3	45.6	43.9	46.5	49.9	53.0	57.4	61.4	64.2	63.7	65.8	69.4	71.1	98.6																						
9-Aug	74.1	77.7	80.1	81.0	81.1	85.1	88.5	84.8	81.4	82.0	83.0	86.9	84.7	79.9	84.9	89.0	95.2	97.0	97.6	97.9	98.2	97.8	98.0	98.2	87.7	98.2																						
10-Aug	98.0	98.0	98.1	98.5	98.6	98.8	98.6	98.1	97.4	97.8	97.9	97.1	97.4	96.8	96.3	95.1	95.2	96.7	96.6	98.1	98.9	99.2	99.3	99.4	97.7	99.4																						
11-Aug	99.4	99.4	99.4	99.4	99.4	99.5	99.5	99.1	98.0	93.2	83.6	77.3	76.9	73.3	75.0	70.4	67.0	69.0	71.5	94.4	98.0	99.0	99.2	97.3	89.1	99.5																						
12-Aug	96.2	95.0	95.9	97.6	98.2	98.5	98.8	98.2	96.8	95.7	96.3	97.5	95.0	84.6	71.3	71.5	73.4	79.0	81.7	95.1	98.0	99.0	99.4	99.4	92.2	99.4																						
13-Aug	99.5	99.3	98.7	98.3	97.9	96.5	93.4	86.9	77.1	70.8	62.7	55.1	51.0	48.5	47.3	46.4	46.8	48.0	52.0	70.7	82.0	79.4	76.8	79.1	73.5	99.5																						
14-Aug	79.1	77.7	78.7	79.3	79.3	81.2	79.2	63.3	58.1	69.4	74.4	64.3	65.2	62.7	46.3	38.9	36.2	53.9	85.8	93.3	95.1	95.8	97.2	71.7	97.2																							
15-Aug	96.5	91.9	89.1	89.2	88.9	86.3	84.2	82.8	81.7	85.3	89.9	94.7	97.4	92.8	82.2	78.6	82.1	80.7	88.7	93.6	96.4	96.8	95.6	95.5	89.2	97.4																						
16-Aug	97.9	98.6	99.2	99.6	99.6	99.7	99.7	98.6	89.3	80.8	69.0	62.6	56.8	54.0	48.6	47.5	49.9	52.6	60.3	82.7	94.5	91.7	92.9	94.1	80.0	99.7																						
17-Aug	86.8	88.2	90.0	94.4	88.0	82.9	80.4	77.2	71.4	66.8	58.6	51.2	45.9	38.3	39.6	40.6	41.7	49.9	53.7	57.8	73.9	64.3	75.0	80.3	66.5	94.4																						
18-Aug	81.7	77.7	75.2	80.9	86.0	79.4	80.4	84.4	85.1	82.9	85.1	81.5	71.5	70.2	70.6	70.4	67.7	74.1	78.9	82.4	76.3	79.0	81.0	80.6	78.4	86.0																						
19-Aug	79.1	86.8	92.9	90.4	92.5	93.3	91.9	83.0	72.3	63.2	55.1	52.4	52.4	58.7	56.6	54.6	53.7	56.1	64.2	86.8	96.2	90.0	88.4	91.1	75.1	96.2																						
20-Aug	93.1	93.8	94.6	95.4	95.1	94.0	88.7	79.2	70.2	62.5	55.4	50.1	46.4	42.9	41.3	40.6	42.0	45.5	64.1	83.8	77.3	85.4	92.2	92.1	71.9	95.4																						
21-Aug	90.0	91.8	97.4	98.1	98.5	98.7	97.6	91.6	82.3	70.5	59.8	48.4	47.5	45.2	43.0	41.1	42.5	54.3	72.3	81.6	84.2	92.1	96.6	97.3	75.9	98.7																						
22-Aug	98.1	98.4	98.6	98.6	98.5	98.6	98.7	92.9	87.5	75.5	71.1	64.3	58.6	56.2	56.4	52.9	53.5	63.2	79.2	90.7	95.8	98.1	99.1	99.0	82.6	99.1																						
23-Aug	99.2	99.3	99.3	99.5	99.6	99.6	99.6	99.1	96.2	90.6	79.9	73.9	70.2	67.7	71.2	75.7	77.4	80.7	85.5	95.0	98.3	99.1	97.4	98.4	89.7	99.6																						
24-Aug	99.0	99.1	99.2	98.8	98.7	95.7	91.4	87.4	84.7	82.9	81.2	79.1	75.8	72.0	73.0	68.1	64.4	65.1	78.8	95.3	97.1	97.8	98.5	98.7	86.7	99.2																						
25-Aug	98.7	98.8	99.2	99.0	98.3	98.4	98.3	92.3	83.0	71.8	65.1	55.2	50.8	47.9	45.0	46.4	50.3	54.8	65.4	85.0	91.0	89.6	90.2	95.4	77.9	99.2																						
26-Aug	96.7	97.1	98.6	99.1	99.1	99.2	96.9	86.5	75.4	68.2	61.1	58.4	53.1	49.8	43.9	40.9	38.7	52.7	77.3	87.6	75.8	74.8	83.3	79.2	74.7	99.2																						
27-Aug	81.9	89.5	94.9	97.3	98.7	99.0	99.3	95.7	81.3	71.6	61.9	56.3	51.4	49.6	50.4	51.3	51.6	60.9	69.8	79.5	77.6	75.6	77.3	85.7	75.3	99.3																						
28-Aug	91.1	94.9	96.3	96.6	97.8	97.2	95.1	89.5	81.3	73.2	68.7	64.9	61.4	60.2	59.3	62.8	70.0	79.3	93.7	97.3	99.1	98.8	92.8	92.4	83.9	99.1																						
29-Aug	92.0	91.7	94.6	96.0	97.3	97.4	96.8	92.7	86.7	81.2	79.6	72.6	64.5	59.7	55.8	55.9	66.1	78.8	88.2	94.9	99.0	99.4	99.4	99.5	85.0	99.5																						
30-Aug	99.7	99.8	99.7	99.6	99.7	99.9	100.0	100.0	99.8	94.7	80.0	65.6	74.5	70.4	80.7	80.6	76.8	84.3	93.4	97.0	97.8	98.9	99.5	99.9	91.3	100.0																						
31-Aug	100.0	100.0	100.0	100.0	100.0	100.0	99.0	95.9	85.9	76.8	63.4	56.3	54.8	52.5	53.4	66.0	83.8	72.8	71.6	81.1	89.7	83.6	82.2	86.3	81.5	100.0																						
																								92.9	93.8	94.8	95.4	95.9	95.4	94.2	89.8	83.3	77.3	70.8	65.1	62.1	60.4	60.3	59.9	60.4	64.2	73.0	84.7	88.8	90.1	91.3	92.9	Diurnal Average
																								100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	97.8	97.9	97.5	97.4	96.8	96.3	95.4	95.2	97.0	97.6	98.1	99.1	99.4	99.5	99.9	Diurnal Maximum





Maximum Speed: 17 km/h on Aug 13 15:00	Maximum Daily Speed Average: 11.5 km/h on Aug 13	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 22 05:00	Minimum Daily Speed Average: 0.5 km/h on Aug 6	Hours of Data: 740
Maximum Diurnal Speed Average: 4.7 km/h at hour 5	Minimum Diurnal Speed Average: 1.3 km/h at hour 19	Hours of Missing Data: 4
Monthly Average Velocity: 2.5 km/h 232.6 deg	Percentiles: P ₁ = 1 P ₁₀ = 2 Q ₁ = 4 Median = 7 Q ₃ = 9 P ₉₀ = 11 P ₉₉ = 14	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-Aug	SW10	SW12	SW11	SSW7	SSW7	SW9	SW9	SW8	WSW10	W11	WNW11	NW11	W13	WNW14	WNW17	NNW10	NW11	WNW11	WNW11	WNW10	WNW6	WSW7	WSW8	SW7	W7.8	WNW17	
2-Aug	SW7	SW7	SW7	SSW5	S5	SW3	SSW7	SW6	S4	SSW3	NNE1	S3	WSW5	SW5	N2	NNE3	NNE8	NNE7	ENE4	ENE4	ENE5	NE4	NNE5	NNE3	SSW0.9	NNE8	
3-Aug	NNE2	NNE3	N3	SW5	SSW12	S12	ENE3	NNE3	ESE5	SE5	ESE4	S4	ESE2	SSE1	SW3	SW7	WSW8	W6	WNW5	WNW8	W7	WSW6	SW7	SSW6	SSW2.5	SSW12	
4-Aug	SW6	SW8	SW9	WSW8	SW8	SSW6	WSW4	WNW8	WNW8	WNW9	NW7	NW8	NW11	WNW10	WNW6	WSW5	SW4	WSW6	SSW5	SW6	WSW5	S5	SSW7	WSW5.2	NW11		
5-Aug	SSW8	SSW8	SSW8	SSW7	SSW8	SSW8	SSW6	SSW6	SSW6	SW6	SW5	SW7	W8	NW3	NW3	NNW7	N5	NNW3	NW6	SSW0	SSE4	SSE4	SSW3	NNE3	NE4	SSW3.0	SSW8
6-Aug	NNE4	WSW1	SSW4	S3	SSW3	S3	SSW4	SSW3	SW4	SW3	S4	SE1	SE3	E6	NNW2	NW3	ENE3	SSE3	W2	NNE1	NNE5	NNE5	N2	N3	SSE0.5	E6	
7-Aug	N2	NNE3	NNE4	NNE4	NNE5	NNE4	NNE4	NNE7	NNE5	N6	NNE10	NNE7	NNE9	NNE11	NNE9	NNE10	NNE10	NNE9	NNE10	NNE4	N2	NW1	NE4	NNE5	NNE5.9	NNE11	
8-Aug	NNW2	NNE4	NNE2	NNW1	W1	NNE2	N4	N4	N4	ENE6	NE10	ENE10	ENE9	E8	ENE9	ENE10	E11	E9	ESE9	ESE10	ESE10	ESE11	SE9	SE5	E5.1	ESE11	
9-Aug	ESE4	SE5	ESE7	ESE8	SE8	ESE7	ESE7	SE7	SE7	ESE8	SE10	SE8	ESE8	ESE10	ESE7	ESE6	SE7	ESE7	ESE7	ESE9	ESE8	ESE7	ESE5	E5	ESE7.0	ESE10	
10-Aug	E5	ESE9	ESE10	ESE10	ESE10	E8	E7	ENE7	ENE7	ENE8	ENE9	ENE10	ENE11	ENE9	ENE11	ENE10	NE10	NE9	NE9	NNE10	NNE10	NNE8	NNE8	N8	ENE7.7	ENE11	
11-Aug	N8	N7	N7	NNW7	NNW7	NNW7	NNW7	NNW6	NNW7	NNW7	N7	N6	NNW5	NW5	WNW8	WNW7	W6	WNW3	WSW2	SE3	SSE4	SSE3	SSW4	SSW5	NNW3.6	WNW8	
12-Aug	SSW8	SW7	SW7	SW9	SW10	SW8	SW9	SW9	WSW6	W6	W7	WSW6	SW6	SSW3	NE3	SE3	SW7	SW5	SSW3	SSW5	SW6	SW6	SSW7	SSW8	SSW5.7	SW10	
13-Aug	SSW9	SSW9	SSW9	SSW11	SSW11	SSW12	SSW13	SW10	SW9	SW10	SW14	SW16	SW17	WSW16	WSW17	SW16	WSW15	WSW12	SW10	SW8	SSW8	SSW10	SW10	SW11	SW11.5	WSW17	
14-Aug	SW11	SW11	SW12	SW13	SW13	SW10	SW8	WNW13	NNW9	WSW0	SW6	WSW8	W3	W6	NNW7	N5	NW5	NNW5	W3	S5	SW5	SW3	S6	SSW6	WSW5.1	WNW13	
15-Aug	SSW8	SSW9	SSW11	SSW12	SSW11	SSW11	SSW10	SSW8	SW5	SW4	SW5	SW8	SSW8	S9	SW12	SW10	SW7	SW6	SW5	WSW11	SW11	WSW9	NW9	NW10	SSW7.6	SSW12	
16-Aug	WNW8	W5	WSW5	SW5	SW5	SW5	SW5	SW6	WNW7	WNW9	WNW8	WNW11	NW9	WNW9	WNW11	WNW10	W9	WSW9	WSW7	SSW6	SSE6	S7	SSW6	SSW8	W5.8	WNW11	
17-Aug	SSW8	SSW8	S5	S8	SSW11	SSW12	SW10	SW11	SW13	SW13	SW12	SW13	WSW12	W15	WNW11	WNW10	NW9	WNW9	W7	W7	SW6	SW7	WSW3	NNW2	WSW7.8	W15	
18-Aug	NNE5	N7	NNE7	N4	NNE6	N7	N9	N8	N8	N13	N12	NNE11	NNE11	N9	N10	N11	N9	NNW5	NNW4	NW5	NNW7	NNW7	NNW7	NNW8	N7.7	N13	
19-Aug	NNW7	WNW1	NW3	NW3	WNW6	W6	W7	WNW11	WNW14	WNW12	WNW13	WNW11	WNW11	WNW8	W9	W10	WNW9	W8	WSW6	SSW5	SSW8	SW11	SW12	SW11	W6.9	WNW14	
20-Aug	SSW12	SSW12	SSW12	SW11	SW11	SW12	SW11	SW11	SW11	SW10	SW12	WSW11	WSW10	WSW9	WSW8	WSW7	WSW6	WSW5	SSW4	SSW6	SSW9	SW7	SSW8	SSW9	SSW9.0	SW12	
21-Aug	SSW10	SSW5	S6	SSW5	SSW8	SSW8	SSW8	SSW8	SSW7	SSW4	S5	SE4	E6	E6	ENE6	NE6	NE5	NE3	ENE4	ENE6	NE4	ESE1	S4	SE2	SSE2.5	SSW10	
22-Aug	SSW2	S1	SE1	UO	SSE0	ENE0	WNW1	NNW2	N2	NNE1	NE5	NE5	ENE4	SE4	SE5	SSE3	ESE5	ESE4	SE5	SE4	SE2	S2	SSE1	SSW1	ESE1.5	NE5	
23-Aug	SE1	S2	SSW2	S3	S2	ESE3	S3	W2	SSW1	SSW1	NNW2	ENE4	NNW2	N4	NE8	NNE5	NNE7	NNE4	NNE4	ENE1	E3	NNE4	NNE4	NNE3	NE1.5	NE8	
24-Aug	NNE5	NE3	NNE4	NNE5	N6	NNE7	N7	NNE9	NNE10	NNE11	C	C	N9	N8	NNW7	N7	NNW7	NNW6	WNW3	WSW3	W3	SSW4	S5	SSW8	N4.0	NNE11	
25-Aug	SSW7	S7	SSW8	SSW9	SSW10	SSW9	SSW9	SSW8	SSW9	SW8	SSW10	SW11	SW12	WSW10	WSW10	SW11	SW10	SW9	SSW9	SSW7	SSW9	SSW9	S9	S8	SSW8.7	SW12	
26-Aug	SSW9	SSW8	SSW8	SSW8	SSW7	SSW8	SSW8	SW6	SW11	SW10	WSW10	SW10	SW12	SW13	SW11	WSW9	W10	WSW6	SW5	WSW7	WSW8	WSW7	NNW5	NNE7	SSW7.3	SW13	
27-Aug	N6	NNE5	N5	SSW2	SSW3	SSW4	SSW5	SSW3	SW1	N2	S3	SSE4	SSE4	SW3	SW5	WSW7	SW8	SSW5	SW8	SW9	SW10	SSW10	SW11	SW11	SSW3.9	SW11	
28-Aug	SW11	SW11	SW11	SW10	SSW10	SSW11	SSW11	SSW9	SSW6	SSW6	SSW7	SSW7	SSW6	SSW4	SSE4	SSE5	ESE3	ESE2	ENE0	SE3	SSW4	SSW9	SW8	SW8	SSW6.5	SW11	
29-Aug	SSW9	SSW9	SSW11	SSW10	SSW11	SSW10	SSW8	SSW6	SSW7	SSW7	WSW5	WSW5	WSW5	W4	W5	WSW5	SSW2	S3	SE5	SE6	SSW2	S3	SSE1	SE3	SSW5.1	SSW11	
30-Aug	SE1	UO	NNE2	NNW0	WSW1	SW1	SW1	SW2	NW1	NW2	SSE2	SE4	SSE4	S7	NW1	NE1	ESE1	NNE3	ENE2	ENE3	NNE3	NE2	S1	S1	SE0.6	S7	
31-Aug	SE3	SW5	SW4	SSW3	SSW6	SSW5	SW9	SW6	SW3	WSW3	N4	ENE4	SE4	SSE3	SSE4	SE3	SSW3	WNW2	NW6	W8	WSW2	WNW8	W8	WNW6	SSW2.5	SW9	

SW3.2SSW3.7SSW3.6SSW4.3SSW4.7SSW4.7SW4.1WSW3.5WSW3.0W2.5WSW2.4WSW2.5WSW2.0W2.1NNW2.8NNW2.3NNW2.1NNW1.8WSW1.3SSW1.8SSW2.3SW3.0SW2.8SW2.3SSW12SSW12SW12SW13SSW12SSW13WNW13WNW14SW13WSW14SW16SW17WSW16WSW17SW16WSW15WSW12WNW11WSW11SW11ESE11SW12SW11	Diurnal Average
	Diurnal Maximum

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



Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

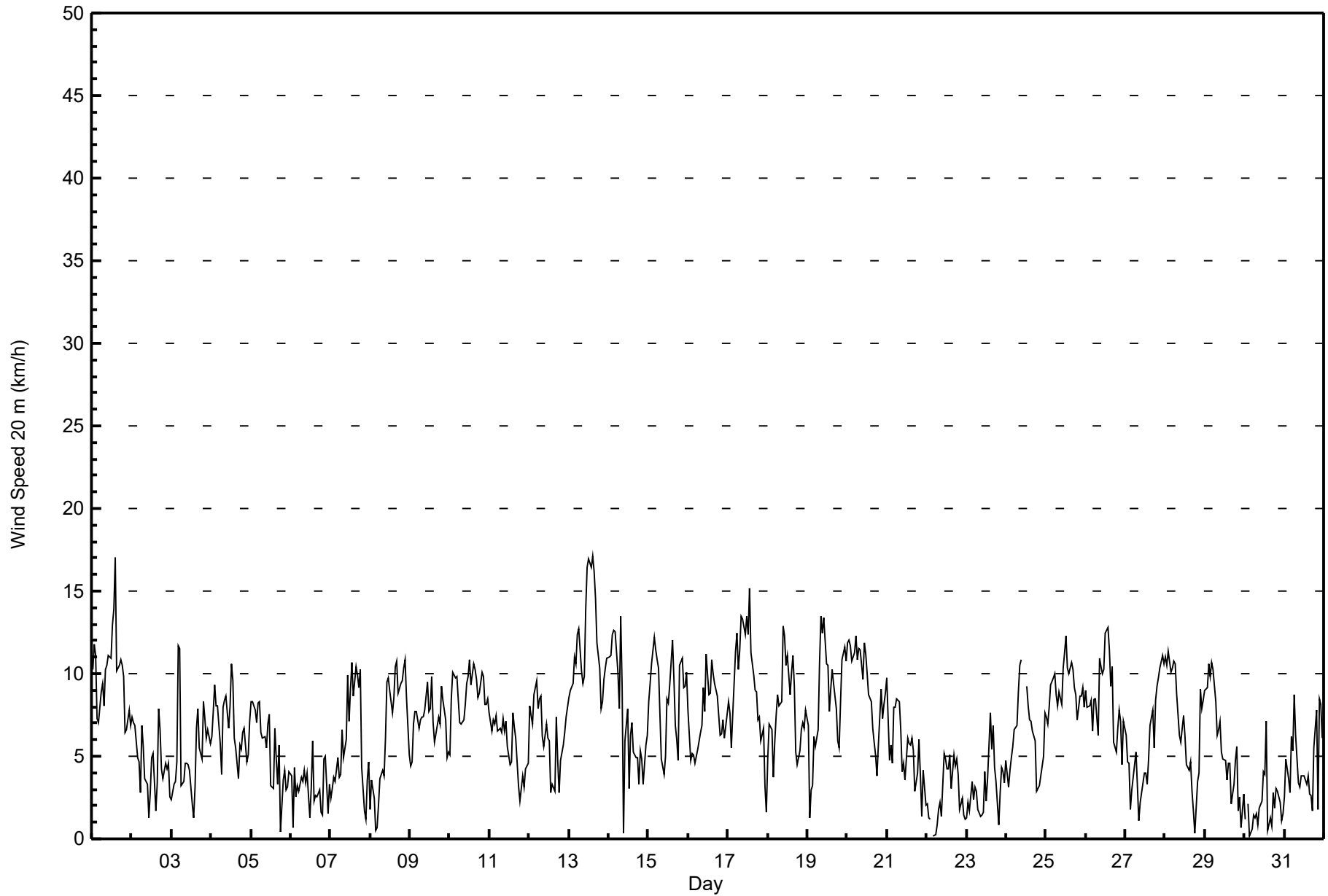
Wind Speed 20 m (WS20m) - km/h
Janvier - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Aug 1 14:00 Minimum Value: 0 km/h on Aug 29 18:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 3 P ₉₉ = 5																	Hours in Service: 744 Hours of Data: 740 Hours of Missing Data: 4 Hours of Calibration: 2 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-Aug	2	3	3	3	1	2	2	2	4	4	4	4	6	6	6	5	4	4	3	4	2	1	2	1	6
2-Aug	1	1	1	1	1	1	3	2	1	2	2	2	2	2	2	1	3	2	1	1	1	1	1	2	3
3-Aug	1	2	1	2	4	3	4	1	2	1	2	2	3	2	2	3	3	3	4	2	2	1	2	4	
4-Aug	1	2	2	2	2	2	1	3	3	3	3	4	4	3	2	1	2	2	2	2	1	1	2	4	
5-Aug	2	2	1	1	1	1	1	1	2	2	2	3	2	3	3	3	2	4	1	1	1	1	2	4	
6-Aug	1	1	1	2	1	1	1	1	1	1	1	2	2	4	1	1	1	1	3	2	1	1	1	4	
7-Aug	1	1	1	1	1	1	1	2	2	3	3	3	4	3	4	4	3	4	4	2	1	1	1	4	
8-Aug	1	1	2	2	1	2	1	1	1	3	2	3	3	2	3	3	4	3	3	3	3	3	2	4	
9-Aug	1	1	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	3	2	3	2	3	
10-Aug	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	2	3	3	3	2	2	3	
11-Aug	2	2	3	3	3	3	2	2	3	3	3	2	2	2	2	2	2	1	2	1	1	1	2	3	
12-Aug	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2	1	3	2	1	2	1	1	1	3	
13-Aug	1	2	2	2	2	2	3	3	3	3	4	6	6	5	6	5	5	4	3	2	1	2	3	6	
14-Aug	3	2	3	3	3	3	2	5	5	1	2	3	2	2	2	2	2	2	2	1	1	2	1	5	
15-Aug	2	2	1	2	2	2	2	2	2	1	2	2	2	3	4	3	2	2	1	4	4	3	4	4	
16-Aug	2	2	2	1	2	1	1	2	3	3	3	4	4	3	3	3	3	3	2	1	2	1	1	4	
17-Aug	1	2	2	2	2	3	3	4	4	4	4	4	4	5	4	4	4	3	3	2	1	2	2	5	
18-Aug	3	2	2	2	2	2	3	3	3	4	5	4	3	3	4	4	4	2	1	2	3	3	3	5	
19-Aug	3	1	1	1	2	1	3	4	4	5	5	4	4	2	3	4	3	2	2	1	1	2	3	5	
20-Aug	3	2	2	2	2	3	3	3	3	3	4	4	3	3	3	2	2	2	1	3	2	1	2	4	
21-Aug	1	3	3	1	1	1	1	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	3	
22-Aug	1	1	1	UO	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1	1	2	1	1	2	
23-Aug	1	2	1	1	2	2	2	1	1	1	1	2	1	1	2	2	2	2	2	1	1	1	1	2	
24-Aug	1	1	1	1	1	2	2	3	3	3	C	C	3	3	3	3	3	3	1	1	1	1	1	3	
25-Aug	2	1	2	2	2	2	2	2	3	2	4	3	4	4	3	4	3	3	3	1	1	2	2	4	
26-Aug	2	1	1	1	2	2	2	2	4	4	3	4	4	4	3	3	3	2	1	1	1	2	1	4	
27-Aug	1	1	1	2	2	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	3	3	
28-Aug	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1	2	2	1	3	2	2	2	3	
29-Aug	2	2	2	2	2	2	2	2	1	2	1	2	2	1	1	1	1	0	1	2	2	2	1	2	
30-Aug	1	UO	1	1	1	1	1	2	1	1	1	3	3	2	2	2	1	2	1	2	1	1	1	3	
31-Aug	2	1	1	1	2	1	2	2	1	1	2	2	2	1	1	2	2	2	2	2	3	3	2	3	
																	Diurnal Maximum								
C - Calibration																	UO - Unstable Operation								



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed 20 m (WS20m) - km/h
Janvier - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed 20 m (WS20m) - km/h
Janvier - August 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	289	39.05	39.05
6 - 11	408	55.14	94.19
12 - 19	43	5.81	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: 740

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed 20 m (WS20m) - km/h
Janvier - August 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	40	11	14	3	12	24	18	24	38	30	17	9	6	12	14	289
6 - 11	21	26	6	17	7	22	8	1	9	93	86	30	19	33	11	19	408
12 - 19	2	0	0	0	0	0	0	0	1	8	18	6	2	6	0	0	43
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	66	17	31	10	34	32	19	34	139	134	53	30	45	23	33	740

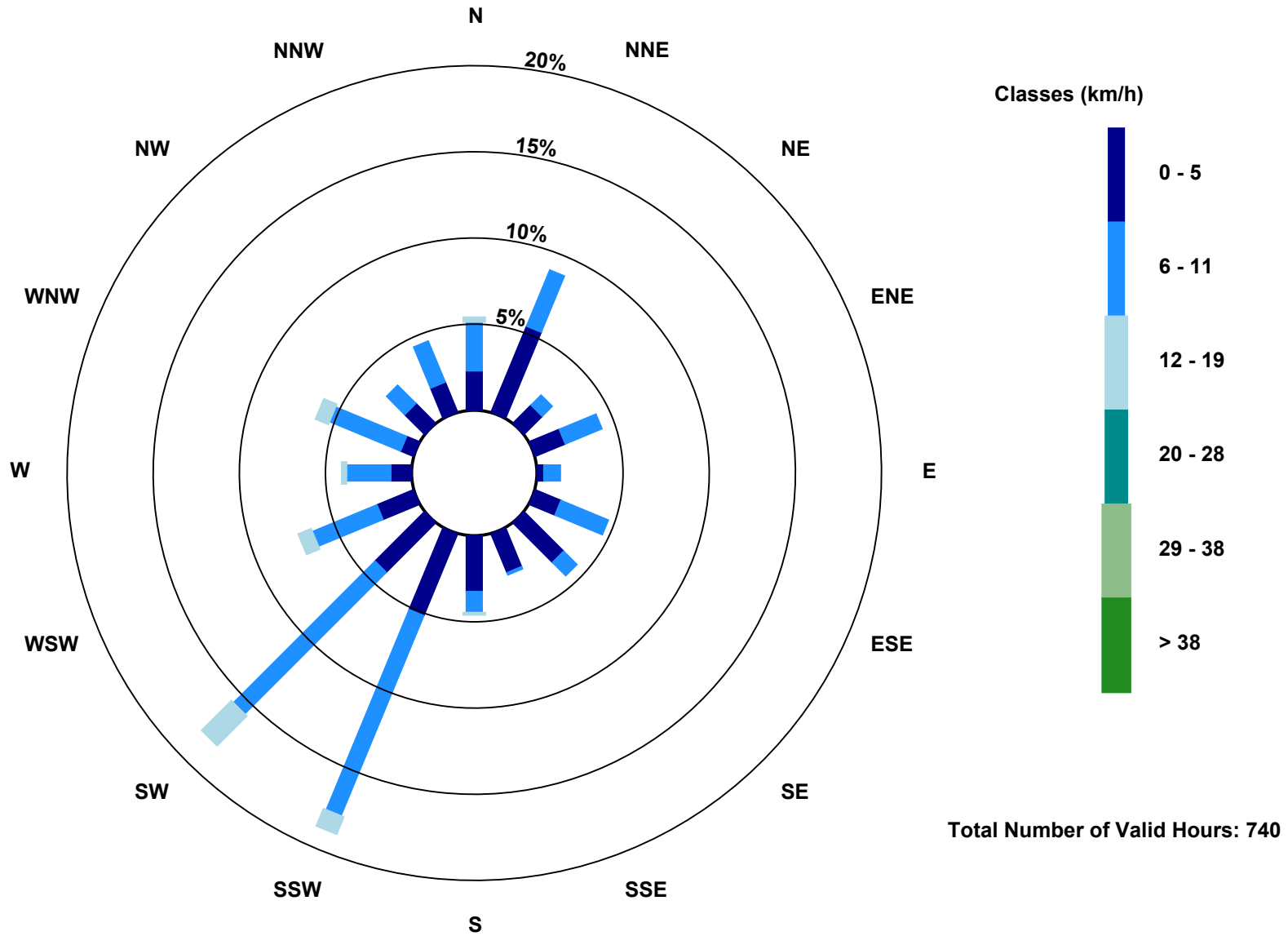
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction 20 m (WD20m) - deg
Janvier - August 2023

Direction of Maximum Speed: 240 deg on Aug 13 15:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 223.3 deg on Aug 13	Hours of Data: 740
Direction of Minimum Speed: 164 deg on Aug 22 05:00	Hours of Missing Data: 4
Direction of Minimum Daily Speed Average: 0.5 deg on Aug 6	Percent Operational Time: 99.7
Monthly Average Direction: 232.6 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-Aug	218	217	217	202	204	220	226	224	252	271	290	307	279	293	293	333	320	301	303	303	282	242	238	235	266.0
2-Aug	227	225	224	207	187	227	207	233	187	203	22	182	241	230	9	32	20	29	68	77	71	47	20	18	212.7
3-Aug	15	28	7	220	205	190	71	22	121	129	122	174	123	162	233	234	249	273	290	293	277	253	235	206	226.9
4-Aug	232	220	224	245	236	212	244	295	295	303	306	312	304	302	295	258	217	241	207	216	215	220	188	195	254.1
5-Aug	209	205	202	201	204	207	206	209	221	222	231	267	314	311	343	350	335	324	202	151	156	211	22	35	227.7
6-Aug	26	244	197	182	200	185	210	213	218	223	176	133	125	99	346	321	75	154	278	22	29	25	7	6	157.1
7-Aug	6	14	14	16	19	26	17	22	14	358	31	20	33	33	27	26	27	31	33	25	4	307	34	26	23.9
8-Aug	341	12	30	335	266	14	357	356	349	66	49	58	76	79	72	77	90	100	105	106	110	121	132	138	81.4
9-Aug	103	136	121	120	127	123	117	142	141	122	129	134	120	115	110	116	126	114	118	121	115	119	108	84	120.9
10-Aug	91	103	109	109	107	99	91	76	77	69	75	72	64	63	62	66	55	37	40	29	27	17	12	11	65.0
11-Aug	5	1	351	344	346	335	344	344	337	344	354	5	338	307	290	296	279	292	247	145	163	149	204	193	330.4
12-Aug	206	214	220	222	223	219	227	229	245	274	263	252	236	192	48	128	230	234	198	212	233	232	208	205	225.2
13-Aug	206	211	207	209	202	204	207	221	227	234	236	229	227	237	240	236	239	238	235	217	197	210	219	222	223.3
14-Aug	222	217	215	219	222	216	227	299	345	240	220	252	267	275	303	356	314	328	267	186	217	219	190	195	241.7
15-Aug	202	203	203	207	207	205	206	206	217	224	231	217	192	179	221	231	220	219	218	257	230	240	304	314	220.7
16-Aug	290	270	250	228	236	234	226	233	282	297	297	292	306	289	290	290	270	258	237	211	168	188	210	206	260.1
17-Aug	205	207	185	186	209	210	219	224	229	232	234	230	248	274	283	284	322	300	270	275	218	234	238	334	240.4
18-Aug	18	9	15	5	14	7	7	5	7	10	9	13	12	5	354	350	349	341	335	320	344	344	344	347	0.1
19-Aug	346	296	307	306	299	260	265	283	285	296	283	290	286	301	277	275	288	277	252	208	204	214	217	217	270.7
20-Aug	210	208	212	214	214	216	222	230	230	233	230	250	238	241	242	249	238	245	192	193	210	216	205	203	222.7
21-Aug	205	209	184	192	195	209	206	209	209	211	179	131	86	84	65	54	50	38	61	78	51	121	190	143	162.7
22-Aug	198	191	142	UO	164	75	303	340	350	18	38	38	59	129	136	162	118	114	138	133	142	173	167	203	114.5
23-Aug	133	172	193	189	178	110	171	263	210	213	341	78	340	7	38	24	23	22	22	69	89	21	13	28	41.4
24-Aug	22	45	13	17	9	14	9	12	14	18	C	C	11	8	336	351	329	330	294	245	270	204	177	203	358.0
25-Aug	198	190	204	212	209	210	213	215	206	227	230	231	234	255	239	230	233	222	210	192	195	194	187	191	215.4
26-Aug	200	204	198	204	199	207	212	222	228	231	241	235	230	227	234	251	275	254	233	240	241	245	331	12	231.1
27-Aug	9	13	8	209	196	199	200	208	236	352	172	151	147	217	223	243	228	201	218	214	220	213	217	214	215.4
28-Aug	216	215	214	216	207	205	203	202	193	198	206	199	200	204	160	161	121	107	71	133	202	208	218	214	202.3
29-Aug	212	212	211	212	205	208	211	208	207	204	238	251	244	262	263	249	204	177	145	131	209	170	153	142	209.9
30-Aug	142	UO	32	336	249	219	219	225	323	323	157	135	157	171	320	34	122	27	74	59	14	44	180	181	124.9
31-Aug	135	232	230	199	192	204	220	222	218	251	4	58	125	161	157	129	204	292	313	280	241	291	262	288	235.9

216.6 211.8 209.2 208.5 208.0 207.8 216.7 241.5 249.2 263.5 256.9 253.4 258.0 264.0 285.9 292.0 290.2 284.6 240.4 210.9 205.2 216.0 220.1 219.0
 Diurnal Average

C - Calibration 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 - August 2023

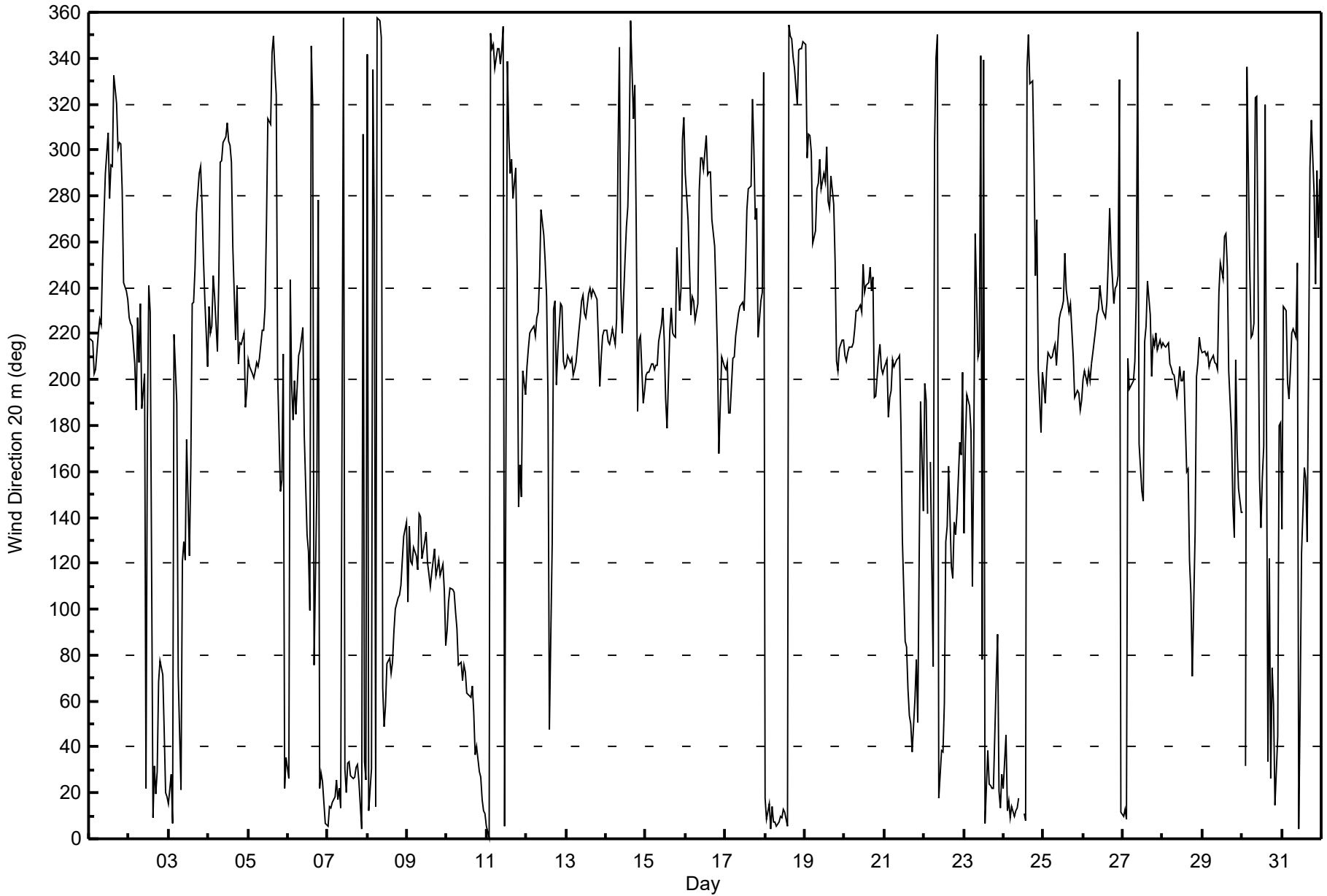
Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 99 deg on Aug 30 15:00	Hours of Data: 740
Minimum Value: 9 deg on Aug 26 04:00	Hours of Missing Data: 4
Percentiles: P ₁ = 10 P ₁₀ = 13 Q ₁ = 18 Median = 25 Q ₃ = 36 P ₉₀ = 60 P ₉₉ = 92	Hours of Calibration: 2
	Percent 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-Aug	19	19	22	31	20	21	22	24	28	27	24	32	27	24	21	39	33	29	23	22	27	17	17	14	39
2-Aug	18	13	15	26	24	41	28	32	48	64	97	73	49	31	87	57	23	24	18	14	21	28	15	34	97
3-Aug	29	34	47	32	18	23	75	45	41	36	50	62	91	88	46	33	34	57	54	25	19	17	19	22	91
4-Aug	18	15	17	23	21	21	25	24	26	26	47	39	27	33	38	41	47	36	17	20	27	31	17	14	47
5-Aug	14	11	11	14	9	12	17	20	24	31	25	31	70	96	43	56	61	38	97	18	31	58	41	27	97
6-Aug	18	72	12	17	23	13	19	24	26	35	23	94	66	42	92	46	69	28	59	77	51	15	73	37	94
7-Aug	30	21	17	17	11	15	20	17	46	43	23	35	32	27	41	22	20	23	16	16	60	53	12	14	60
8-Aug	65	34	56	79	76	44	30	39	45	47	24	29	36	36	31	31	23	22	22	18	21	19	25	28	79
9-Aug	20	29	17	19	21	21	23	28	25	24	25	24	23	21	22	22	22	22	21	21	23	28	27	28	29
10-Aug	24	23	21	22	21	22	27	27	29	25	26	26	22	28	22	23	20	16	18	17	18	19	19	22	29
11-Aug	26	29	34	35	33	36	33	33	32	39	42	35	39	47	25	31	42	55	74	23	13	20	15	36	74
12-Aug	14	17	19	19	19	19	22	21	28	28	24	25	24	61	55	63	29	38	40	31	18	19	14	10	63
13-Aug	10	14	13	16	15	15	16	22	29	29	26	30	29	28	27	27	26	28	24	19	12	12	16	18	30
14-Aug	19	18	19	19	20	18	30	26	36	92	22	30	74	24	22	43	51	47	46	14	16	67	9	12	92
15-Aug	13	11	10	14	14	15	14	16	25	23	41	20	22	21	27	23	23	21	33	41	34	32	32	26	41
16-Aug	17	28	32	22	22	17	17	23	30	24	44	23	35	33	25	28	25	24	21	22	18	19	18	12	44
17-Aug	13	13	21	14	15	17	22	25	25	26	27	27	30	25	24	29	32	24	32	23	21	37	56	69	69
18-Aug	32	22	17	37	21	20	22	24	26	25	26	25	25	28	33	34	34	36	29	28	35	36	36	34	37
19-Aug	35	67	43	33	20	28	23	22	22	27	29	26	28	26	27	31	23	24	25	13	11	14	19	18	67
20-Aug	16	16	16	17	17	18	19	24	24	30	29	29	32	34	41	38	34	31	17	23	12	12	11	11	41
21-Aug	10	18	20	23	10	15	13	19	23	38	29	65	34	34	31	29	22	27	24	10	30	65	21	55	65
22-Aug	71	87	46	UO	92	93	62	40	66	95	34	55	56	46	35	82	40	19	10	12	64	37	71	75	95
23-Aug	73	66	73	42	65	54	51	63	62	66	77	38	66	45	17	22	17	17	16	52	37	23	18	25	77
24-Aug	11	28	18	13	15	19	19	21	22	24	C	C	27	33	37	37	42	41	43	27	22	35	13	11	43
25-Aug	13	14	10	13	14	13	14	21	22	30	25	27	25	29	27	26	22	20	16	11	11	12	13	12	30
26-Aug	13	9	9	9	12	12	14	22	22	25	27	28	25	23	26	29	22	23	28	12	14	16	42	15	42
27-Aug	17	14	22	65	46	12	12	19	80	65	57	40	39	62	42	23	22	18	15	11	14	12	15	15	80
28-Aug	15	13	13	13	11	11	11	12	13	21	21	18	20	30	27	18	19	74	43	56	26	11	12	12	74
29-Aug	10	11	11	12	10	11	13	16	18	18	25	30	29	26	21	21	27	21	16	37	56	21	76	11	76
30-Aug	30	UO	15	74	76	63	73	80	69	66	40	57	31	28	99	78	73	16	72	52	27	17	77	74	99
31-Aug	59	25	21	55	23	22	20	20	40	56	63	39	49	49	31	47	55	76	33	21	74	21	20	23	76
	73	87	73	79	92	93	75	80	80	95	97	94	91	96	99	82	73	76	97	77	74	67	77	75	

Diurnal Maximum

C - Calibration

UO - Unstable Operation





WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS23
FORT HILLS
AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
AUGUST 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	682	34	62	96.24	20.3	0	3.3	0
TRS(ppb) Average	683	34	61	96.37	1.9	0	0.7	0
THC(ppm) Average	682	34	62	96.24	8.8	-	3.8	-
NMHC(ppm) Average	682	34	62	96.24	1.451	-	0.804	-
CH4(ppm) Average	682	34	62	96.24	7.4	-	3	-
NO2 (ppb) Average	681	35	63	96.24	44.7	0	19.1	-
NO (ppb) Average	681	35	63	96.24	254.1	-	44.1	-
NOX (ppb) Average	681	35	63	96.24	282.3	-	59.2	-
PM2.5 (ug/m3) Average	714	3	30	96.37	932.3	164	230.9	18
Temperature 2 m (C) Average	743	0	1	99.87	30.1	-	22.5	-
Relative Humidity (%) Average	743	0	1	99.87	97.5	-	88.6	-
Wind Speed 10 m (km/h) Average	742	0	2	99.73	28	-	18	-
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 - FORT HILLS (AMS23)
AUGUST 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	682	0.53	1.6	-	0	0	0	0.1	0.3	1	20.3
TRS (ppb) Average	683	0.22	0.2	-	0	0.1	0.1	0.2	0.2	0.4	1.9
THC (ppm) Average	682	2.51	0.7	-	1.9	2	2.1	2.3	2.6	3.3	8.8
NMHC(ppm) Average	682	0.209	0.232	-	0	0	0.1	0.1	0.3	0.5	1.451
CH4(ppm) Average	682	2.3	0.5	-	1.9	2	2	2.2	2.4	2.7	7.4
NO2 (ppb) Average	681	8.07	7.6	-	0	1	2.2	5.6	11.7	18.9	44.7
NO (ppb) Average	681	6.72	18.2	-	0	0	0.1	0.8	4.5	16.6	254.1
NOX (ppb) Average	681	14.79	23.5	-	0	1	2.4	7	17.1	35.1	282.3
PM2.5 (ug/m3) Average	714	57.66	89.3	-	2.8	6.1	11.2	28.4	76.3	124.2	932.3
Temperature 2 m (C) Average	743	17.52	4.2	-	8.3	12.8	14.4	16.8	20.5	23.2	30.1
Relative Humidity (%) Average	743	71.49	16.3	-	33	48	59.7	73	85.3	91.4	97.5
Wind Speed 10 m (km/h) Average	742	9.5	5	-	0	3	6	9	12	17	28
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - FORT HILLS (AMS23)
AUGUST 2023

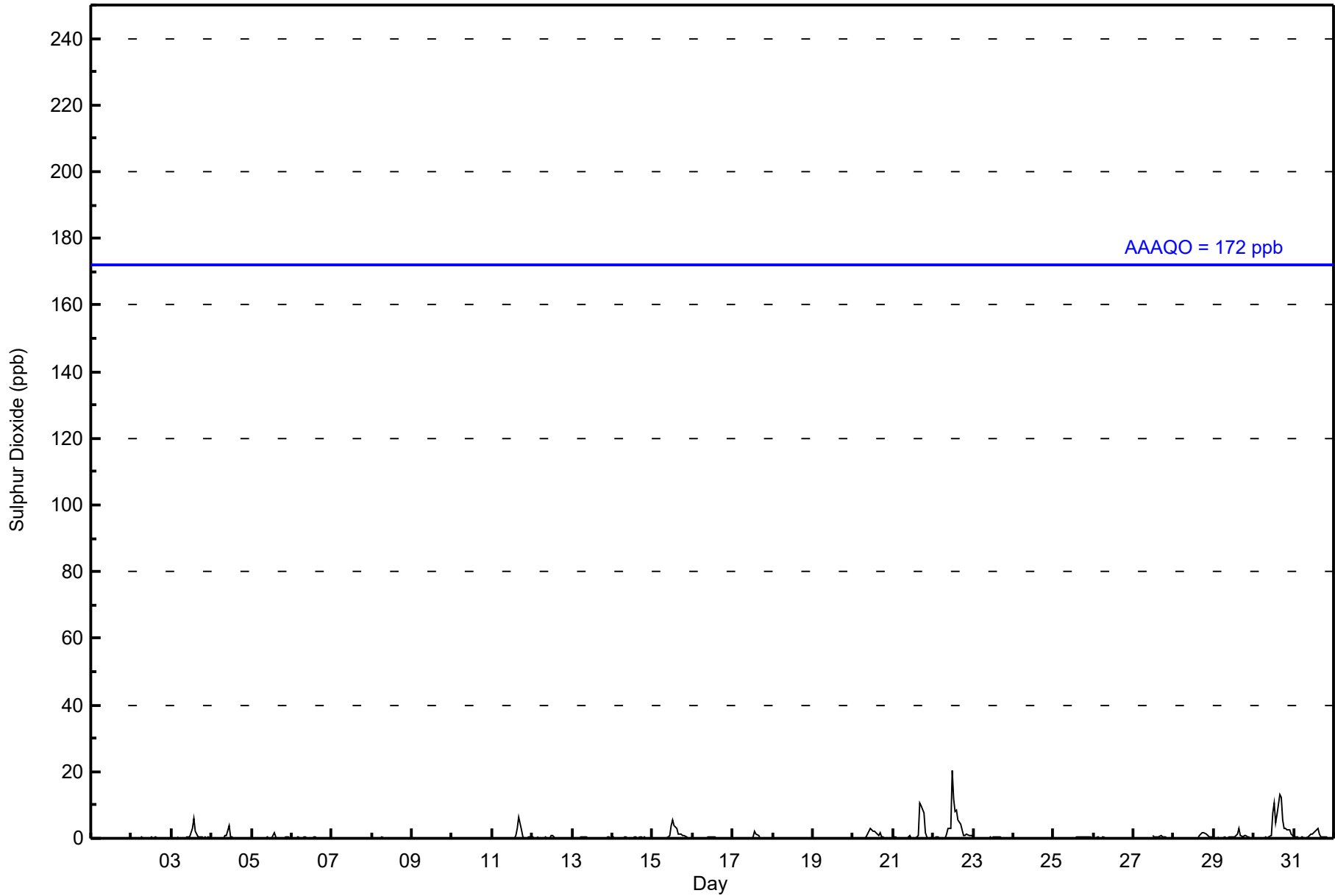
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	26 Aug 2023 09:00	26 Aug 2023 09:00	1	DAS Failure - data not recorded
AIR QUALITY ANALYZERS	26 Aug 2023 10:00	27 Aug 2023 10:00	25	Station power failure
AIR QUALITY ANALYZERS	27 Aug 2023 11:00	27 Aug 2023 11:00	1	Maintenance - station logger/modem reset
NO2, SO2 ,THC/NMHC/CH4	17 Aug 2023 09:00	17 Aug 2023 09:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	12 Aug 2023 23:00	12 Aug 2023 23:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	676	99.12	99.12
11 - 20	6	0.88	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: 682

Total Number of Hours: 744



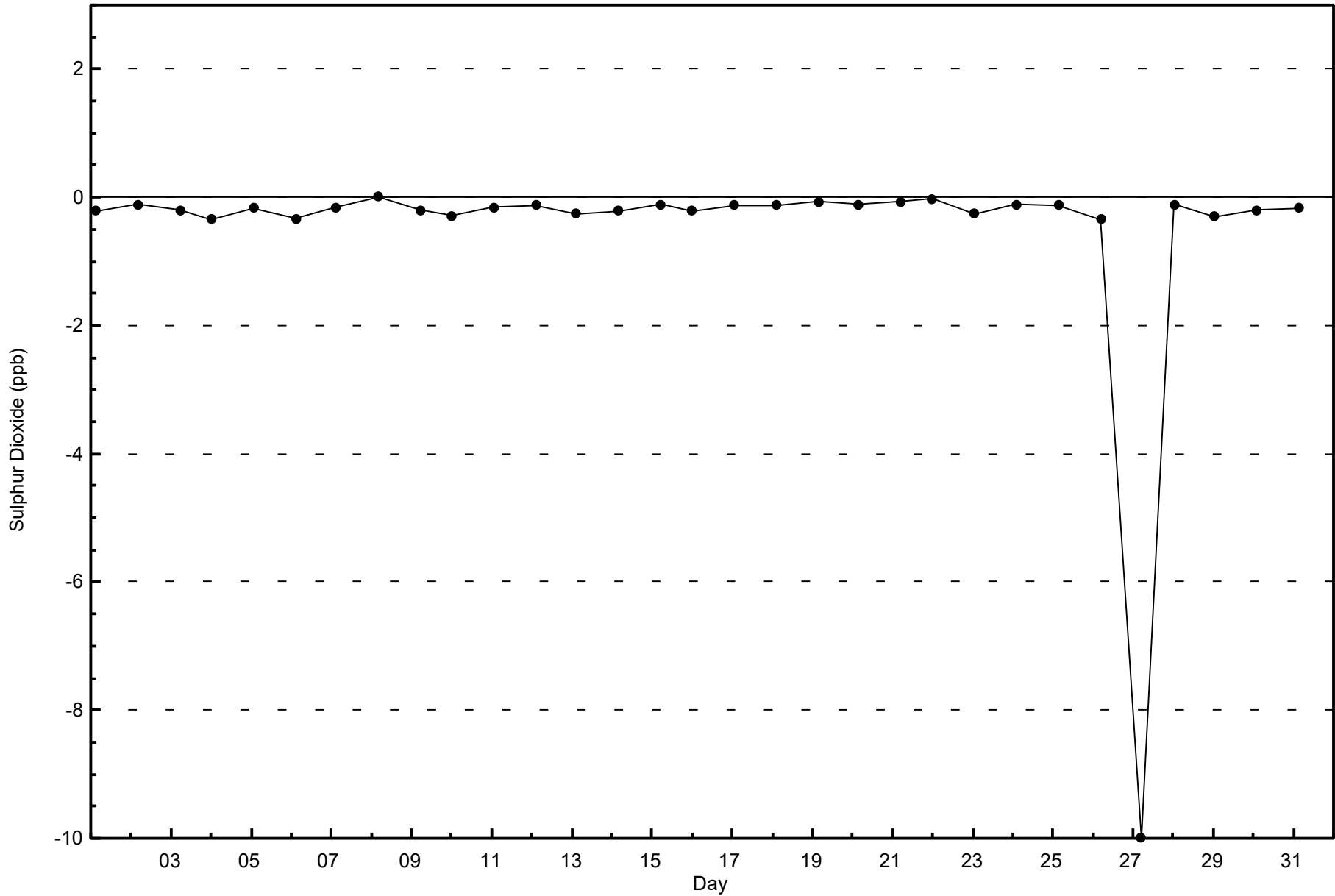
Wood Buffalo Environmental Association
Frequency Distribution

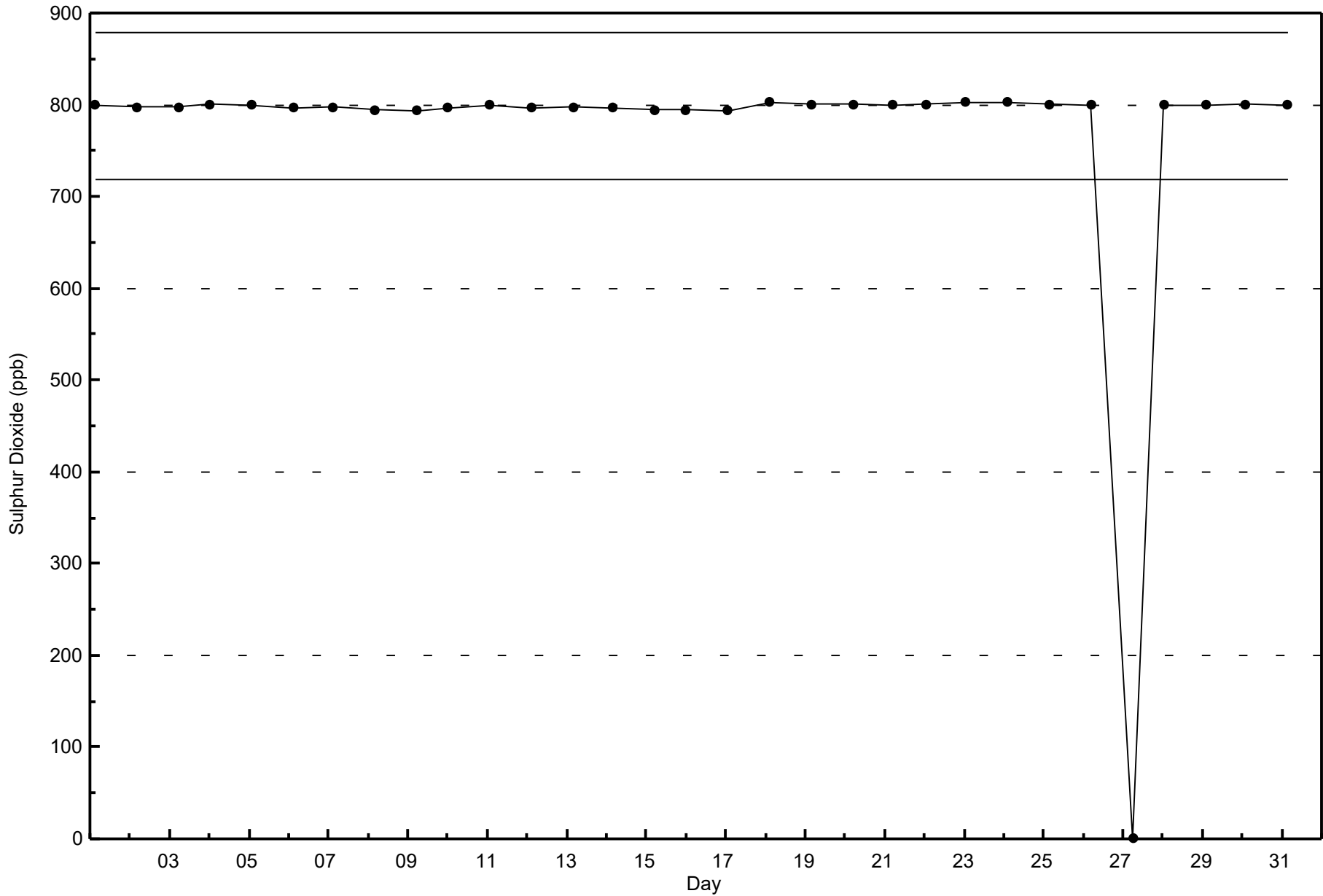
Sulphur Dioxide (SO₂) - ppb
Fort Hills - August 2023

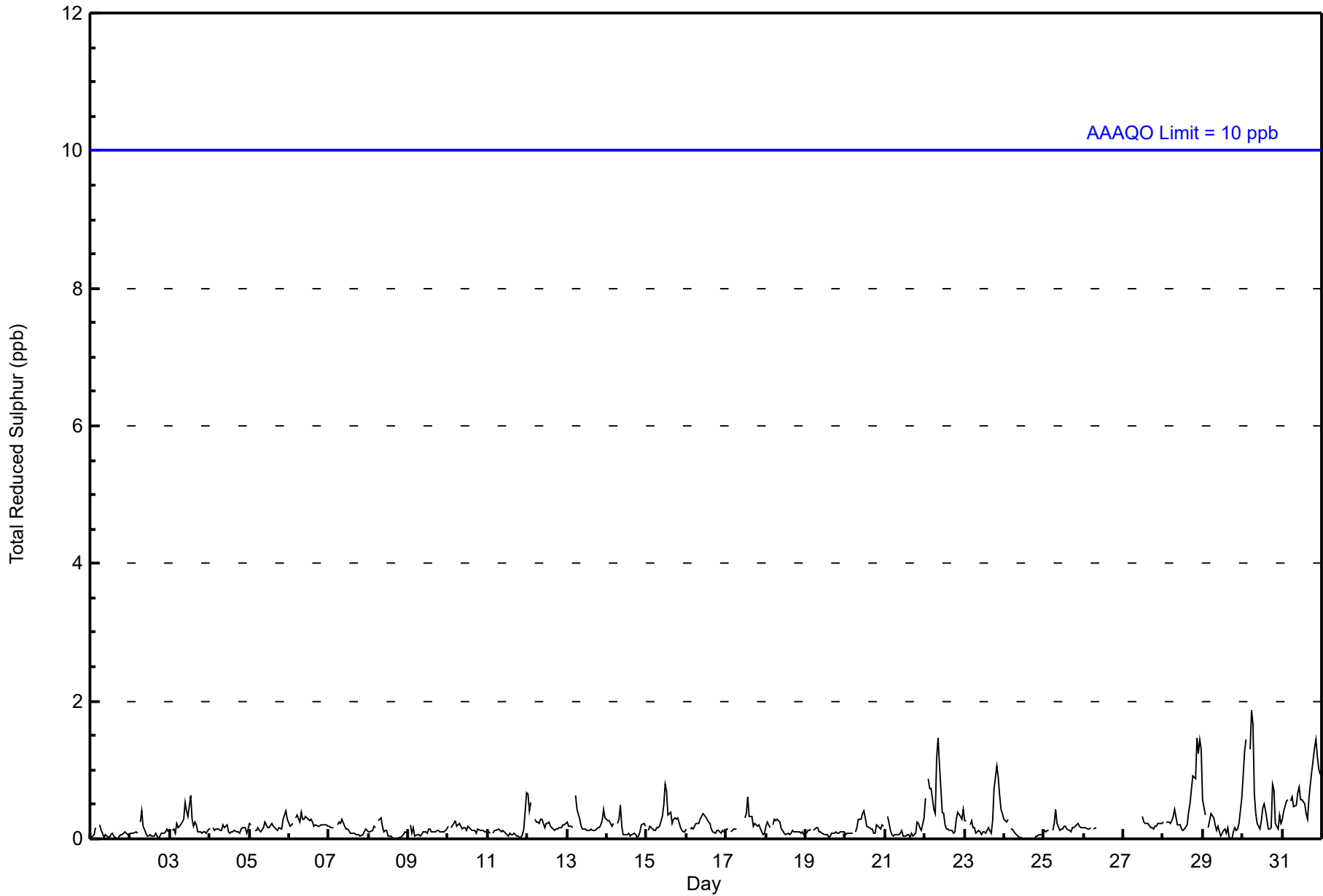
Concentration Ranges (ppb)	Wind Direction																Totals
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
0 - 10	76	46	6	7	8	13	53	84	97	83	50	25	31	26	18	52	675
11 - 20	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	6
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61 - 110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	76	46	6	7	8	13	53	84	100	86	50	25	31	26	18	52	681

Total Number of Valid Hours: 681

Total Number of Hours: 744









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	683	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: 683

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Fort Hills - August 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	76	45	8	7	9	14	51	87	97	86	50	24	32	25	19	52	682
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	76	45	8	7	9	14	51	87	97	86	50	24	32	25	19	52	682

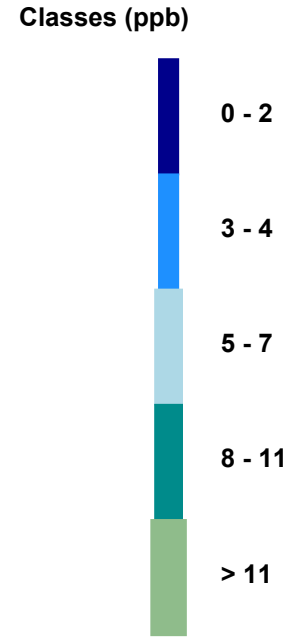
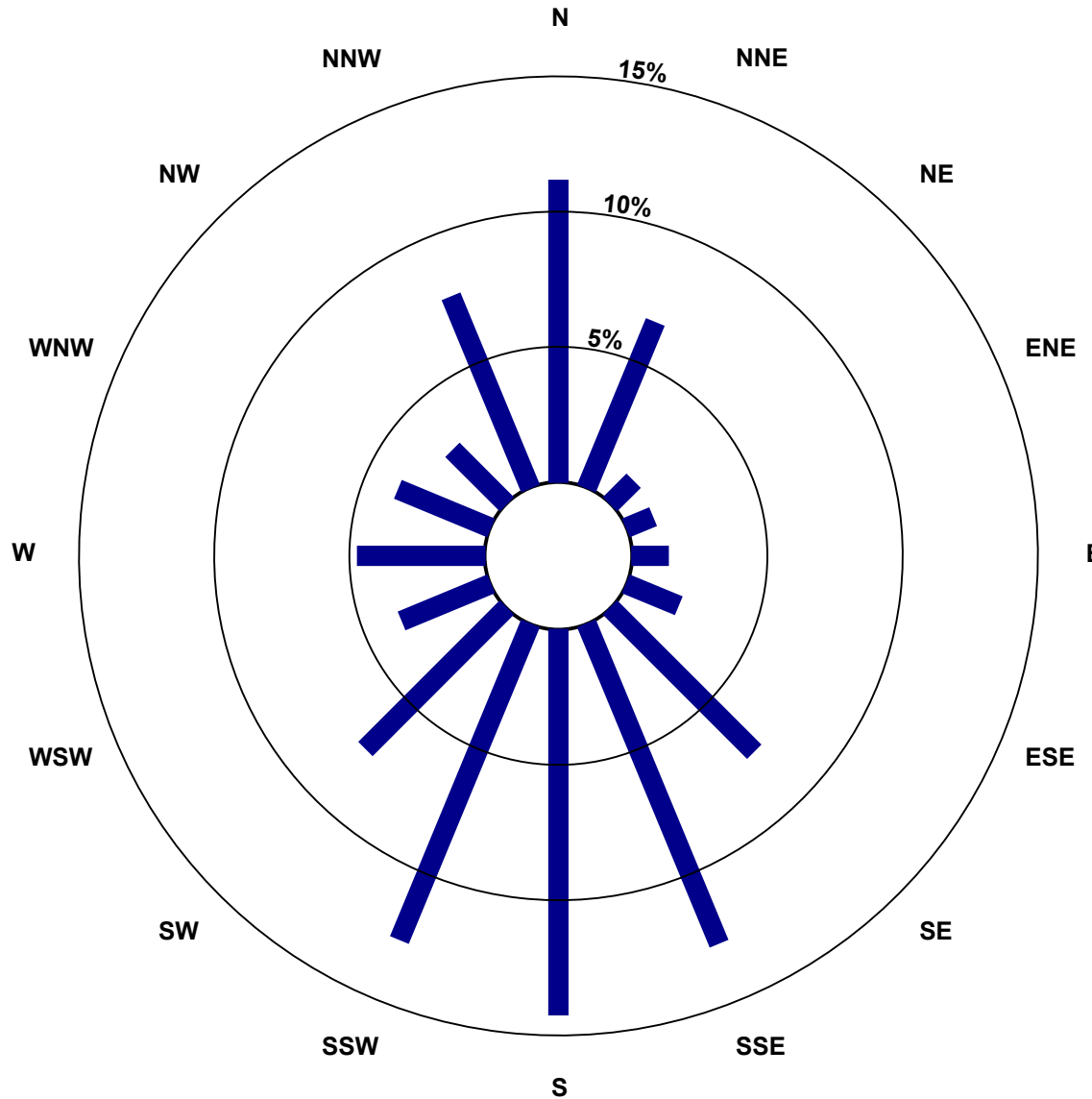
Total Number of Valid Hours: 682

Total Number of Hours: 744

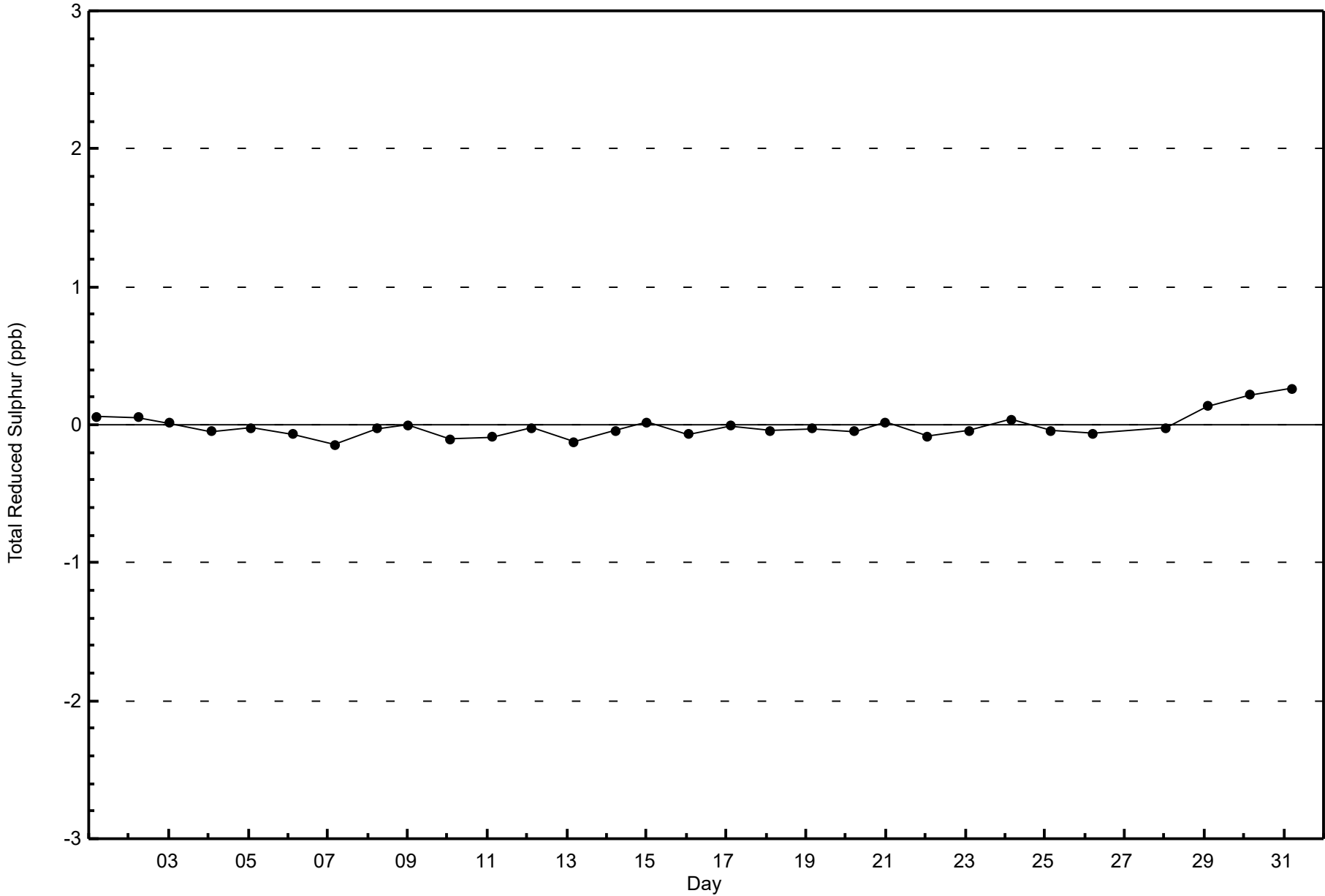


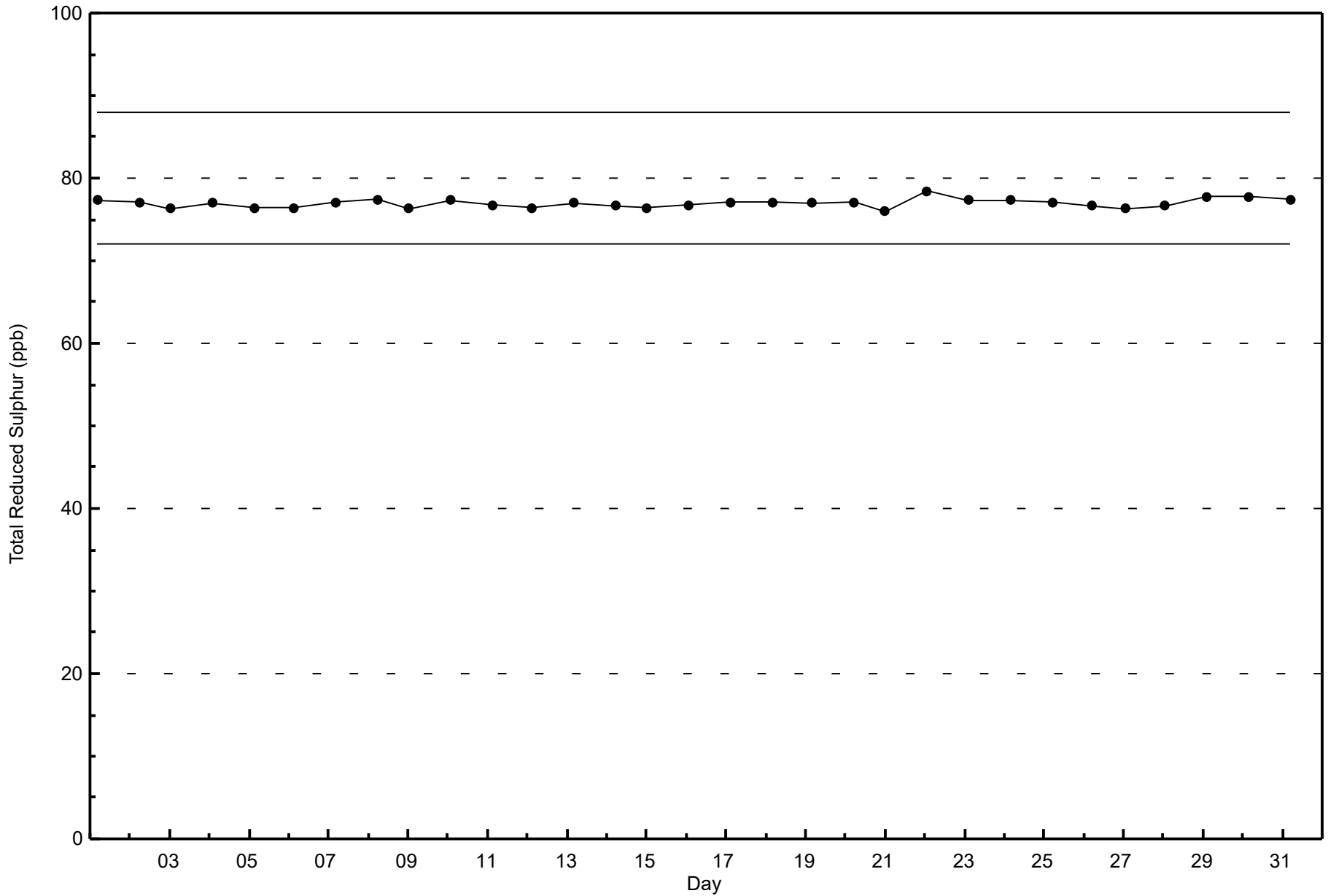
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Fort Hills



Total Number of Valid Hours: 682







Wood Buffalo Environmental Association

Summary of Hour Averages

Total Hydrocarbons (THC) - ppm

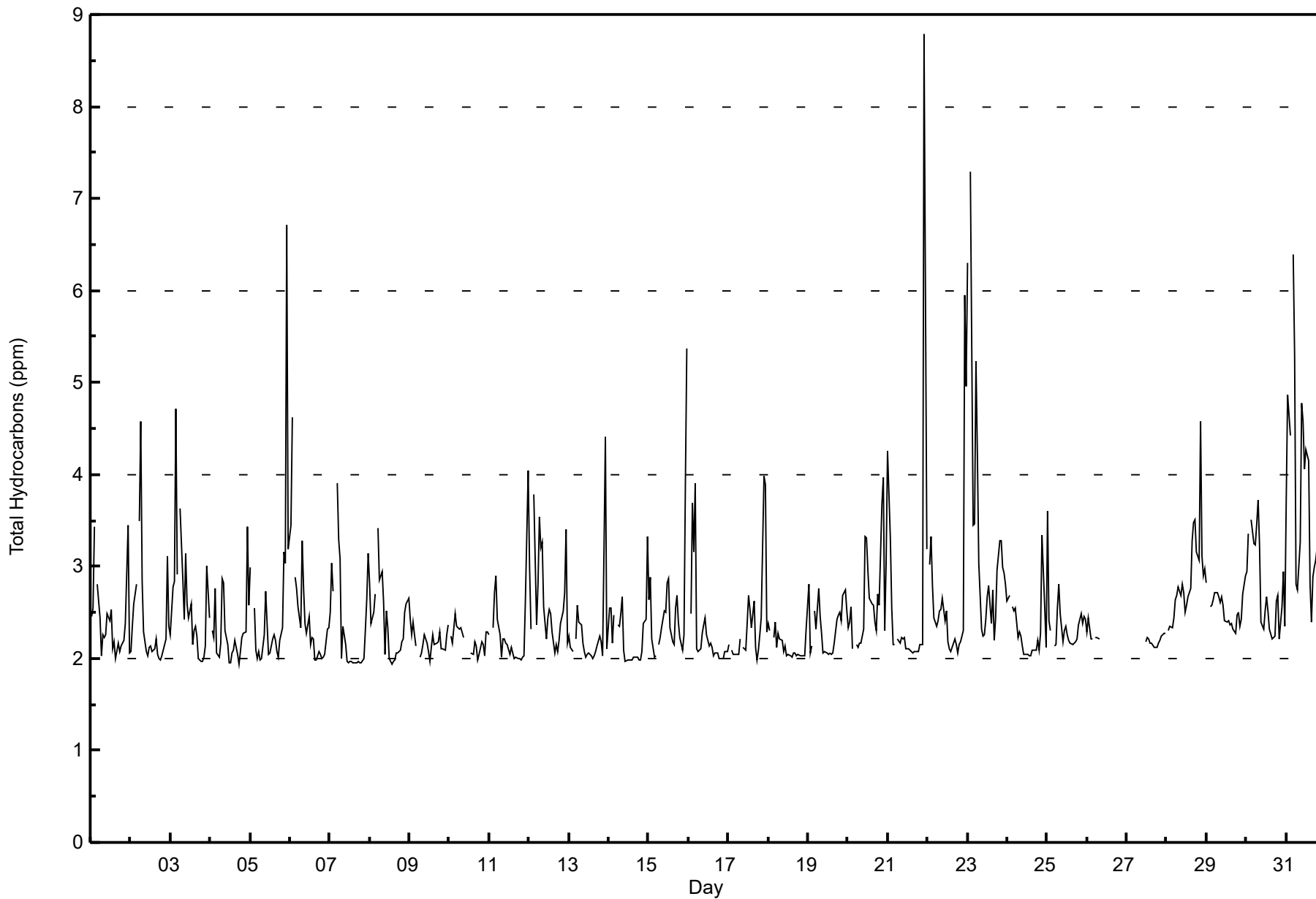
Fort Hills - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:														744																													
Maximum Value: 8.8 ppm on Aug 21 23:00		Maximum Daily Average: 3.8 ppm on Aug 31		Hours of Data:														682																															
Minimum Value: 1.9 ppm on Aug 8 14:00		Minimum Daily Average: 2.1 ppm on Aug 18		Hours of Missing Data:														62																															
Maximum Diurnal Average: 3.3 ppm at hour 23		Minimum Diurnal Average: 2.2 ppm at hour 18		Hours of Calibration:														34																															
Monthly Average: 2.51 ppm		Percentiles: P ₁ = 2.0 P ₁₀ = 2.0 Q ₁ = 2.1 Median = 2.3 Q ₃ = 2.6 P ₉₀ = 3.3 P ₉₉ = 5.3		Percent Operational Time:														96.2																															
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-Aug	2.5	2.6	3.4	Z	2.8	2.4	2.0	2.3	2.2	2.3	2.5	2.4	2.5	2.1	2.2	2.0	2.2	2.1	2.1	2.2	2.2	2.4	3.4	2.1	2.4	3.4																							
2-Aug	2.1	2.3	2.6	2.8	Z	3.5	4.6	2.8	2.3	2.1	2.0	2.1	2.1	2.1	2.2	2.0	2.0	2.0	2.0	2.1	2.2	3.1	2.3	2.4	4.6																								
3-Aug	2.3	2.8	2.8	4.7	2.9	Z	3.6	2.9	2.4	3.1	2.6	2.4	2.6	2.1	2.3	2.4	2.2	2.0	2.0	2.0	2.1	3.0	2.4	2.6	4.7																								
4-Aug	Z	2.3	2.2	2.8	2.1	2.0	2.2	2.9	2.8	2.3	2.2	2.0	2.0	2.1	2.1	2.2	2.0	1.9	2.1	2.2	2.3	3.4	2.6	2.3	3.4																								
5-Aug	3.0	Z	2.5	2.1	2.0	2.1	2.0	2.0	2.3	2.7	2.4	2.0	2.1	2.2	2.3	2.2	2.1	2.0	2.2	2.3	3.2	3.0	6.7	3.2	2.5	6.7																							
6-Aug	3.4	4.6	Z	2.9	2.8	2.6	2.3	3.3	2.8	2.4	2.3	2.5	2.1	2.2	2.2	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.3	2.3	2.5	4.6																							
7-Aug	2.5	3.0	2.7	Z	3.9	3.3	3.1	2.0	2.3	2.2	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.3	2.6	3.1	2.4	3.9																							
8-Aug	2.8	2.4	2.5	2.7	Z	3.4	2.9	2.9	2.6	2.0	2.5	2.3	2.0	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.5	2.6	2.7	2.4	3.4																							
9-Aug	2.4	2.3	2.4	2.3	2.1	Z	2.0	2.1	2.2	2.3	2.2	2.1	2.0	2.1	2.3	2.2	2.2	2.2	2.3	2.1	2.1	2.1	2.3	2.4	2.2	2.4																							
10-Aug	Z	2.2	2.2	2.5	2.4	2.3	2.3	2.3	2.2	C	C	C	C	2.1	2.0	2.2	2.1	2.0	2.0	2.2	2.1	2.0	2.3	2.3	2.2	2.5																							
11-Aug	2.3	Z	2.3	2.7	2.9	2.4	2.3	2.0	2.2	2.2	2.2	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.6	4.0	2.3	4.0																								
12-Aug	3.0	2.3	Z	3.8	2.4	2.8	3.5	3.2	3.3	2.6	2.2	2.4	2.5	2.5	2.3	2.1	2.1	2.1	2.2	2.4	2.5	2.7	3.4	2.2	2.6	3.8																							
13-Aug	2.2	2.1	2.1	Z	2.2	2.6	2.4	2.4	2.2	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.0	3.2	4.4	2.1	2.3	4.4																							
14-Aug	2.5	2.5	2.2	2.5	Z	2.4	2.4	2.5	2.7	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.4	2.4	3.3	2.3	2.3	3.3																							
15-Aug	2.6	2.9	2.2	2.0	2.0	Z	2.1	2.2	2.3	2.5	2.5	2.8	2.9	2.3	2.2	2.1	2.6	2.7	2.4	2.2	2.1	2.3	3.9	5.4	2.6	5.4																							
16-Aug	Z	2.5	3.7	3.2	3.9	2.1	2.1	2.3	2.4	2.4	2.3	2.1	2.2	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.3	3.9	2.3	3.9																						
17-Aug	2.2	Z	2.1	2.0	2.0	2.0	2.2	M	2.1	2.1	2.4	2.7	2.5	2.3	2.6	2.1	2.0	2.1	2.3	2.4	4.0	3.9	2.3	2.4	4.0	2.4	4.0																						
18-Aug	2.4	2.3	Z	2.2	2.4	2.1	2.3	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.4	2.1	2.4																						
19-Aug	2.8	2.1	2.1	Z	2.5	2.3	2.8	2.5	2.3	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.2	2.4	2.5	2.5	2.4	2.7	2.7	2.5	2.3	2.8																							
20-Aug	2.3	2.4	2.6	2.1	Z	2.2	2.1	2.2	2.2	2.3	3.3	3.3	3.0	2.6	2.6	2.6	2.4	2.3	2.7	2.6	3.7	4.0	2.3	3.1	2.6	4.0																							
21-Aug	4.3	3.3	2.5	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	2.2	2.1	8.8	3.2	2.6	8.8																							
22-Aug	Z	3.0	3.3	2.8	2.4	2.4	2.4	2.5	2.5	2.7	2.4	2.5	2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.3	5.9	5.0	2.7	5.9																							
23-Aug	6.3	Z	7.3	3.4	3.5	5.2	4.2	3.0	2.3	2.2	2.3	2.4	2.7	2.8	2.4	2.7	2.2	2.4	3.0	3.3	3.0	2.9	2.8	3.3	7.3	3.3	7.3																						
24-Aug	2.6	2.7	Z	2.6	2.5	2.6	2.2	2.3	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.3	3.3	2.6	2.1	2.3	3.3																						
25-Aug	3.6	2.4	2.3	Z	2.1	2.1	2.6	2.8	2.5	2.2	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.5	2.4	2.5	2.4	2.4	2.4	3.6																						
26-Aug	2.3	2.4	2.2	2.2	Z	2.2	2.2	2.2	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	2.4																						
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	--	2.3																						
28-Aug	Z	2.3	2.3	2.3	2.4	2.6	2.7	2.8	2.7	2.8	2.7	2.5	2.6	2.7	2.8	3.3	3.5	3.5	3.2	3.1	4.6	3.1	2.9	3.0	2.9	4.6	2.9	4.6																					
29-Aug	2.8	Z	2.6	2.6	2.6	2.7	2.7	2.7	2.6	2.7	2.6	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.5	2.5	2.4	2.4	2.7	2.9	2.5	2.9	2.5	2.9																					
30-Aug	2.9	3.4	Z	3.5	3.2	3.2	3.5	3.7	3.2	2.4	2.3	2.5	2.7	2.5	2.3	2.2	2.2	2.2	2.6	2.7	2.2	2.6	2.9	2.4	2.8	2.8	3.7																						
31-Aug	3.7	4.9	4.4	Z	6.4	5.3	2.8	2.7	3.3	4.8	4.6	4.1	4.3	4.1	2.8	2.4	2.9	3.0	3.1	3.3	3.3	3.8	5.1	2.9	3.8	6.4	3.8	6.4																					
																								2.9	2.7	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.6	3.3	2.8	Diurnal Average	
																								6.3	4.9	7.3	4.7	6.4	5.3	4.6	3.7	3.3	4.8	4.6	4.1	4.3	4.1	2.8	3.3	3.5	3.5	3.2	3.3	4.6	4.0	8.8	5.4	Diurnal Maximum	
Z - zerospan			C - Calibration			M - Maintenance			DF - DAS Failure			PF - Power Failure																																					



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	104	15.25	15.25
2.1 - 3.0	490	71.85	87.10
3.1 - 10.0	88	12.90	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 744



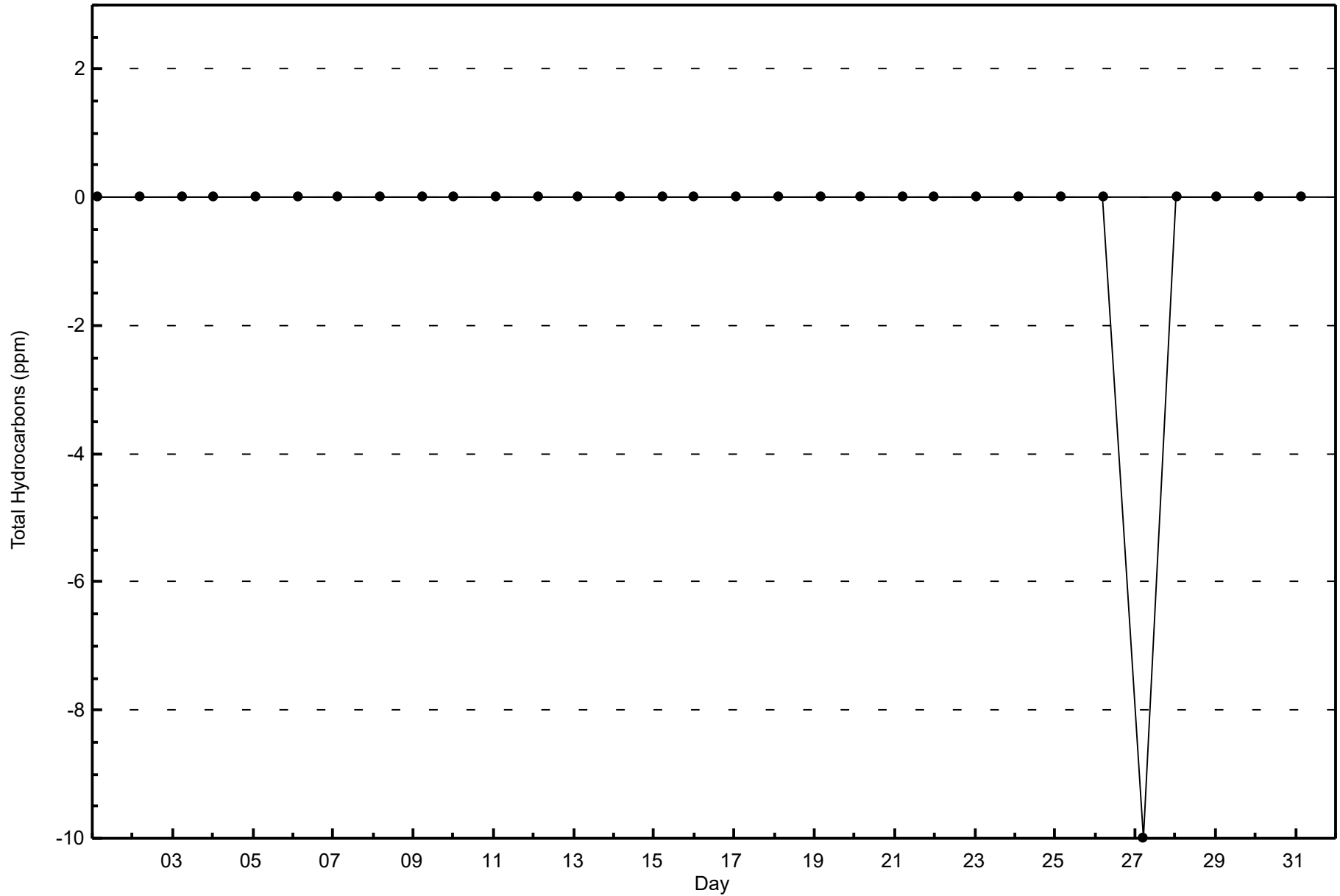
**Wood Buffalo Environmental Association
Frequency Distribution**

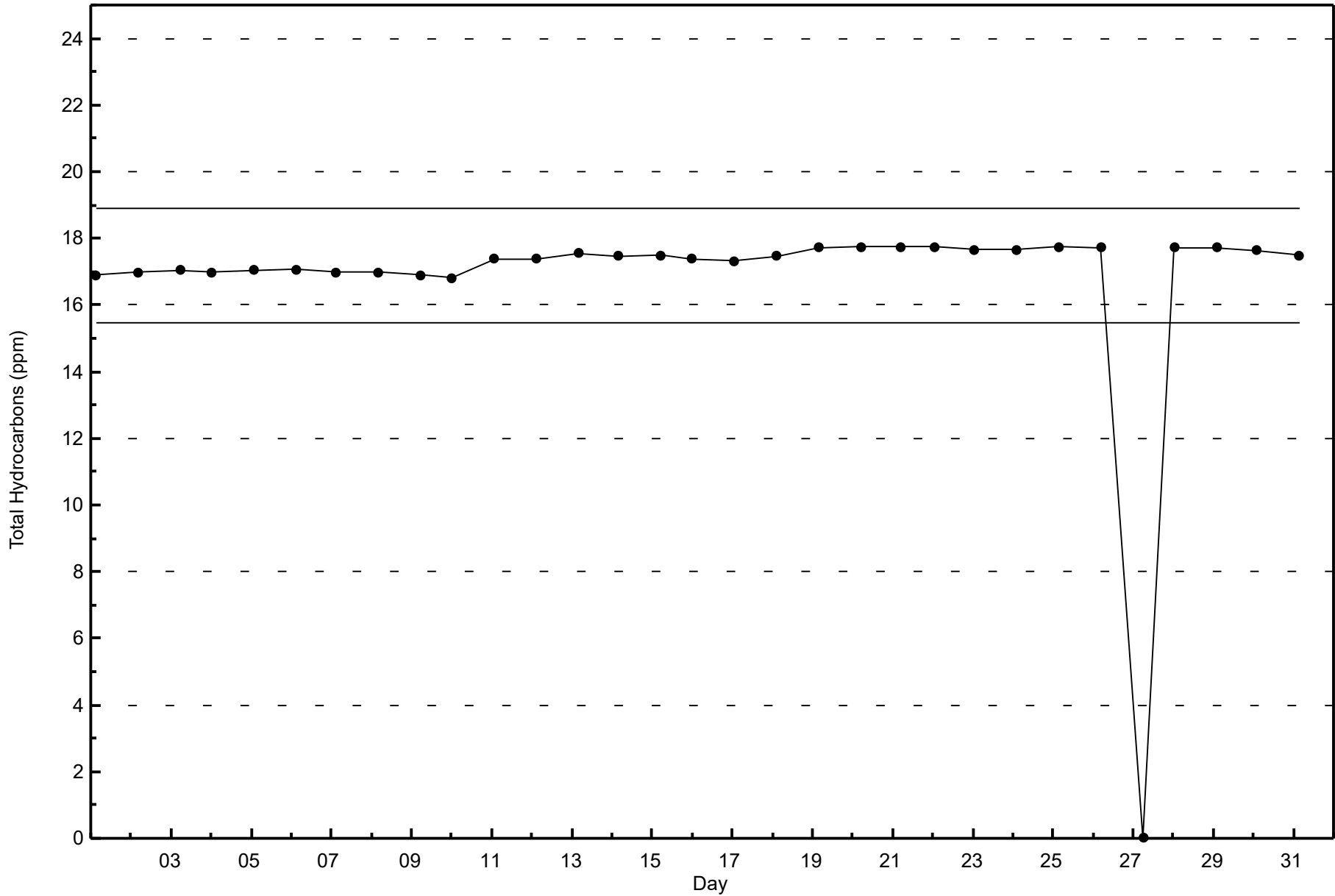
**Total Hydrocarbons (THC) - ppm
Fort Hills - August 2023**

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	12	16	1	2	3	2	5	10	8	13	8	2	10	3	1	8	104
2.1 - 3.0	54	26	3	4	4	11	40	60	91	70	34	17	17	17	11	31	490
3.1 - 10.0	10	4	2	1	1	0	8	14	1	3	8	6	4	6	6	13	87
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	76	46	6	7	8	13	53	84	100	86	50	25	31	26	18	52	681

Total Number of Valid Hours: 681

Total Number of Hours: 744



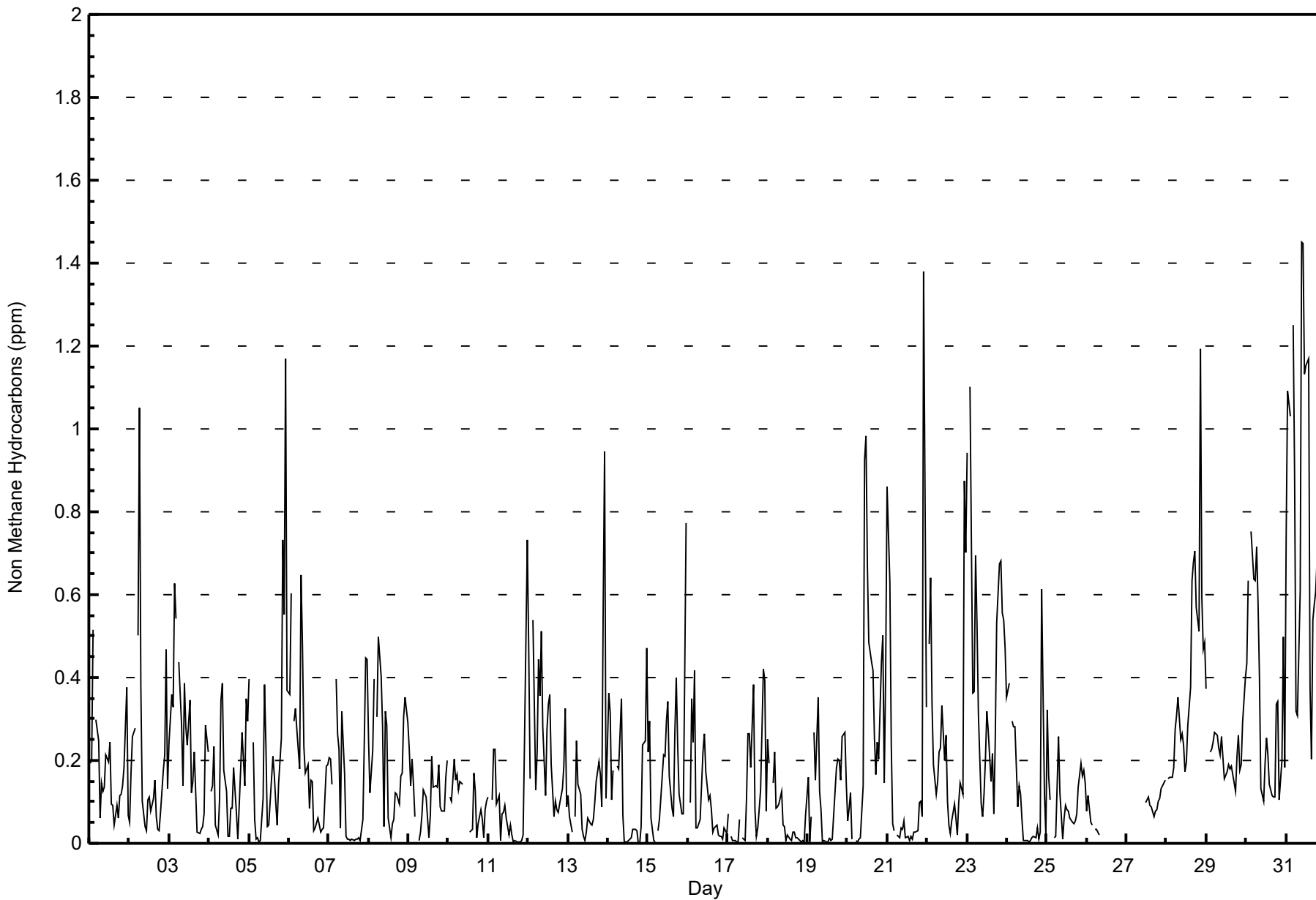




Summary of Hour Averages

Fort Hills - August 2023

Maximum Value: 1.451 ppm on Aug 31 10:00		Maximum Daily Average: 0.804 ppm on Aug 31		Hours in Service:	744																						
Minimum Value: 0.000 ppm on Aug 14 20:00		Minimum Daily Average: 0.065 ppm on Aug 18		Hours of Data:	682																						
Maximum Diurnal Average: 0.410 ppm at hour 23		Minimum Diurnal Average: 0.119 ppm at hour 15		Hours of Missing Data:	62																						
Monthly Average: 0.209 ppm		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.2		Hours of Calibration:	34																						
				Percent Operational Time:	96.2																						
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-Aug	0.195	0.199	0.516	Z	0.300	0.249	0.061	0.146	0.125	0.134	0.214	0.197	0.245	0.094	0.091	0.043	0.092	0.062	0.116	0.119	0.138	0.182	0.376	0.068	0.172	0.516	
2-Aug	0.051	0.170	0.257	0.278	Z	0.502	1.052	0.378	0.102	0.041	0.029	0.105	0.113	0.077	0.108	0.154	0.064	0.034	0.031	0.074	0.178	0.215	0.469	0.133	0.201	1.052	
3-Aug	0.240	0.358	0.327	0.628	0.543	Z	0.438	0.284	0.139	0.387	0.282	0.237	0.346	0.122	0.151	0.219	0.125	0.026	0.022	0.033	0.042	0.073	0.286	0.219	0.240	0.628	
4-Aug	Z	0.125	0.139	0.233	0.045	0.020	0.106	0.346	0.388	0.177	0.127	0.017	0.016	0.084	0.083	0.184	0.074	0.012	0.091	0.177	0.267	0.140	0.351	0.295	0.152	0.388	
5-Aug	0.396	Z	0.246	0.056	0.010	0.012	0.004	0.007	0.108	0.382	0.238	0.041	0.046	0.155	0.210	0.163	0.099	0.045	0.142	0.255	0.733	0.551	1.168	0.368	0.236	1.168	
6-Aug	0.360	0.604	Z	0.295	0.325	0.276	0.180	0.647	0.479	0.235	0.170	0.189	0.086	0.152	0.149	0.031	0.037	0.059	0.045	0.026	0.033	0.038	0.186	0.189	0.208	0.647	
7-Aug	0.207	0.204	0.141	Z	0.397	0.266	0.228	0.036	0.318	0.164	0.017	0.011	0.010	0.008	0.011	0.006	0.009	0.009	0.012	0.008	0.056	0.243	0.448	0.444	0.141	0.448	
8-Aug	0.254	0.121	0.224	0.397	Z	0.305	0.498	0.404	0.284	0.041	0.319	0.285	0.061	0.013	0.047	0.059	0.121	0.119	0.095	0.161	0.171	0.306	0.354	0.293	0.214	0.498	
9-Aug	0.226	0.139	0.203	0.143	0.064	Z	0.007	0.026	0.066	0.129	0.112	0.063	0.013	0.069	0.212	0.137	0.138	0.136	0.190	0.088	0.077	0.077	0.158	0.199	0.116	0.226	
10-Aug	Z	0.110	0.102	0.204	0.151	0.166	0.128	0.150	0.141	C	C	C	C	0.027	0.033	0.169	0.124	0.013	0.047	0.080	0.058	0.013	0.080	0.102	0.100	0.204	
11-Aug	0.112	Z	0.105	0.229	0.229	0.093	0.117	0.005	0.070	0.073	0.092	0.060	0.021	0.043	0.022	0.003	0.005	0.002	0.002	0.004	0.006	0.019	0.243	0.733	0.100	0.733	
12-Aug	0.470	0.156	Z	0.538	0.130	0.219	0.442	0.356	0.513	0.282	0.116	0.273	0.335	0.360	0.189	0.063	0.102	0.081	0.073	0.094	0.133	0.188	0.324	0.087	0.240	0.538	
13-Aug	0.117	0.065	0.028	Z	0.063	0.246	0.142	0.120	0.035	0.015	0.008	0.027	0.060	0.047	0.044	0.058	0.097	0.148	0.197	0.165	0.087	0.570	0.946	0.109	0.148	0.946	
14-Aug	0.364	0.315	0.106	0.178	Z	0.186	0.180	0.263	0.350	0.069	0.002	0.004	0.008	0.011	0.012	0.033	0.033	0.031	0.002	0.000	0.040	0.237	0.248	0.470	0.137	0.470	
15-Aug	0.220	0.295	0.063	0.005	0.004	Z	0.029	0.056	0.107	0.214	0.209	0.295	0.344	0.162	0.085	0.064	0.267	0.401	0.236	0.117	0.070	0.070	0.403	0.773	0.195	0.773	
16-Aug	Z	0.100	0.351	0.243	0.416	0.038	0.036	0.057	0.139	0.219	0.263	0.174	0.105	0.116	0.082	0.028	0.037	0.044	0.019	0.017	0.016	0.009	0.036	0.023	0.112	0.416	
17-Aug	0.072	Z	0.016	0.006	0.006	0.004	0.003	0.059	M	0.013	0.008	0.110	0.265	0.266	0.182	0.383	0.081	0.016	0.038	0.083	0.129	0.419	0.393	0.077	0.119	0.419	
18-Aug	0.252	0.192	Z	0.147	0.222	0.083	0.089	0.095	0.127	0.043	0.041	0.006	0.019	0.010	0.007	0.029	0.026	0.014	0.013	0.006	0.005	0.007	0.004	0.069	0.065	0.252	
19-Aug	0.161	0.003	0.063	Z	0.266	0.152	0.354	0.127	0.080	0.003	0.006	0.004	0.003	0.014	0.006	0.011	0.068	0.184	0.203	0.201	0.153	0.259	0.267	0.144	0.119	0.354	
20-Aug	0.055	0.086	0.124	0.010	Z	0.005	0.005	0.009	0.015	0.138	0.927	0.982	0.671	0.485	0.438	0.417	0.258	0.167	0.244	0.204	0.438	0.502	0.145	0.410	0.293	0.982	
21-Aug	0.861	0.632	0.236	0.047	0.029	Z	0.020	0.014	0.039	0.032	0.053	0.014	0.017	0.007	0.016	0.011	0.027	0.027	0.030	0.097	0.102	0.064	1.380	0.330	0.178	1.380	
22-Aug	Z	0.482	0.641	0.337	0.190	0.119	0.149	0.220	0.229	0.332	0.201	0.262	0.100	0.046	0.023	0.056	0.095	0.062	0.021	0.100	0.147	0.119	0.875	0.701	0.239	0.875	
23-Aug	0.941	Z	1.102	0.364	0.366	0.695	0.530	0.311	0.096	0.066	0.120	0.202	0.317	0.270	0.149	0.218	0.072	0.252	0.533	0.675	0.681	0.555	0.540	0.472	0.414	1.102	
24-Aug	0.353	0.386	Z	0.296	0.282	0.281	0.087	0.141	0.120	0.056	0.007	0.007	0.006	0.002	0.007	0.013	0.016	0.013	0.038	0.010	0.028	0.612	0.118	0.021	0.126	0.612	
25-Aug	0.323	0.163	0.106	Z	0.012	0.016	0.137	0.257	0.121	0.009	0.063	0.090	0.082	0.079	0.060	0.050	0.048	0.055	0.070	0.137	0.194	0.164	0.176	0.145	0.111	0.323	
26-Aug	0.076	0.114	0.051	0.043	Z	0.033	0.034	0.021	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.114
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	0.099	0.105	0.110	0.092	0.089	0.065	0.077	0.083	0.100	0.109	0.133	0.146	0.153	--	0.153	
28-Aug	Z	0.155	0.161	0.159	0.182	0.274	0.308	0.352	0.251	0.265	0.239	0.171	0.196	0.285	0.375	0.633	0.677	0.706	0.571	0.511	1.194	0.593	0.467	0.483	0.400	1.194	
29-Aug	0.374	Z	0.219	0.226	0.244	0.267	0.262	0.230	0.213	0.259	0.205	0.154	0.172	0.189	0.181	0.186	0.166	0.126	0.209	0.261	0.177	0.188	0.292	0.400	0.226	0.400	
30-Aug	0.434	0.634	Z	0.753	0.639	0.635	0.716	0.581	0.398	0.131	0.102	0.194	0.253	0.215	0.143	0.117	0.112	0.113	0.334	0.343	0.104	0.201	0.497	0.185	0.341	0.753	
31-Aug	0.738	1.091	1.031	Z	1.252	0.891	0.319	0.310	0.610	1.451	1.447	1.131	1.151	1.169	0.375	0.204	0.539	0.575	0.606	0.768	0.685	0.752	0.937	0.454	0.804	1.451	
		0.314	0.276	0.262	0.242	0.255	0.232	0.222	0.200	0.202	0.191	0.201	0.186	0.178	0.156	0.119	0.128	0.122	0.120	0.144	0.164	0.208	0.250	0.410	0.285	Diurnal Average	
		0.941	1.091	1.102	0.753	1.252	0.891	1.052	0.647	0.610	1.451	1.447	1.131	1.151	1.169	0.438	0.633	0.677	0.706	0.606	0.768	1.194	0.752	1.380	0.773	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance				DF - DAS Failure				PF - Power Failure													





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	26	3.81	3.81
0.006 - 0.05	143	20.97	24.78
0.06 - 0.1	195	28.59	53.37
> 0.1	318	46.63	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills - August 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	1	0	0	0	0	0	5	4	5	2	0	2	3	0	2	26
0.006 - 0.05	13	15	1	3	3	1	4	15	18	30	9	2	11	3	2	13	143
0.06 - 0.1	17	14	2	0	3	7	14	19	35	30	13	4	7	11	3	16	195
> 0.1	44	16	3	4	2	5	35	45	43	21	26	19	11	9	13	21	317
Totals	76	46	6	7	8	13	53	84	100	86	50	25	31	26	18	52	681

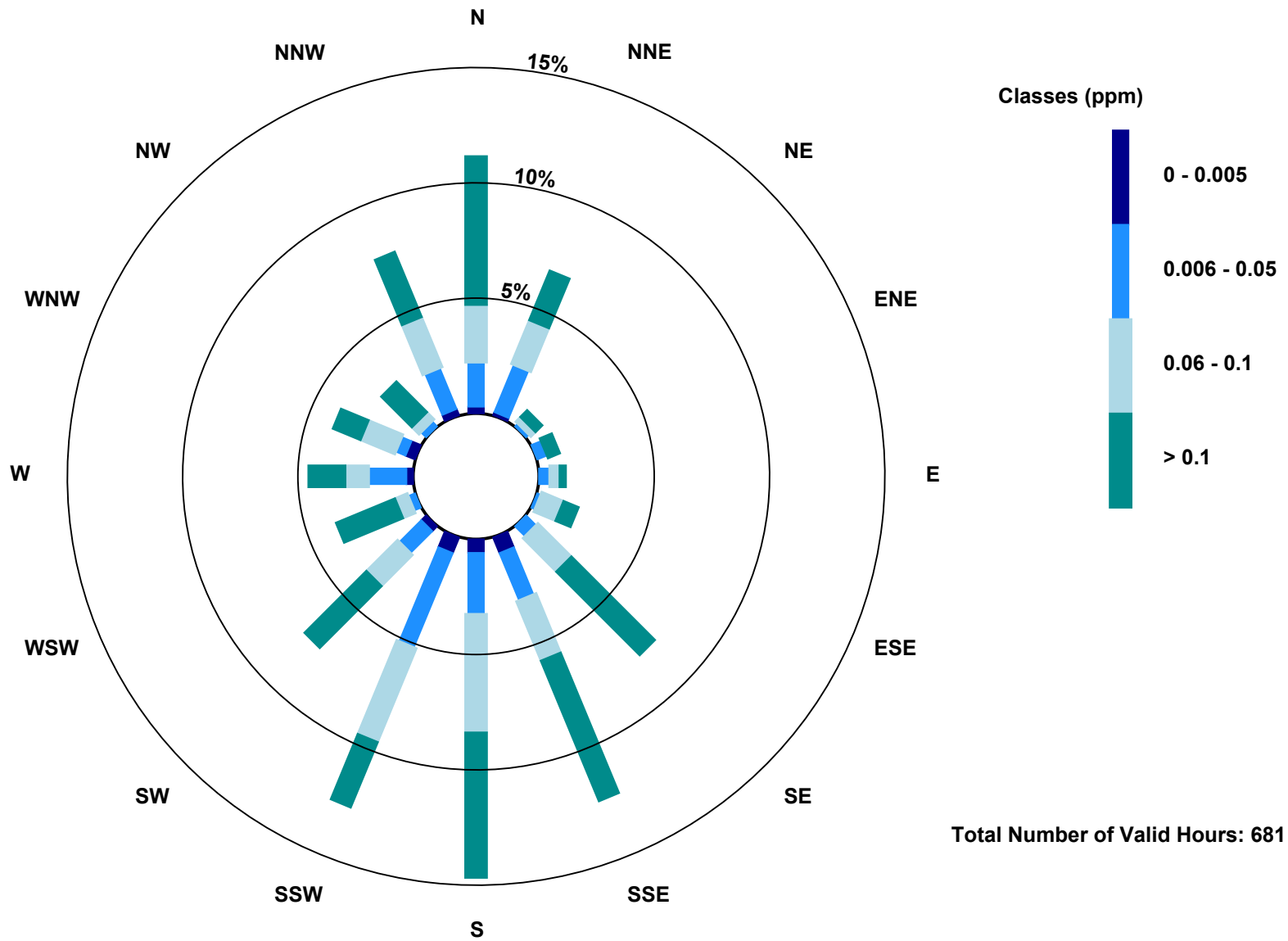
Total Number of Valid Hours: 681

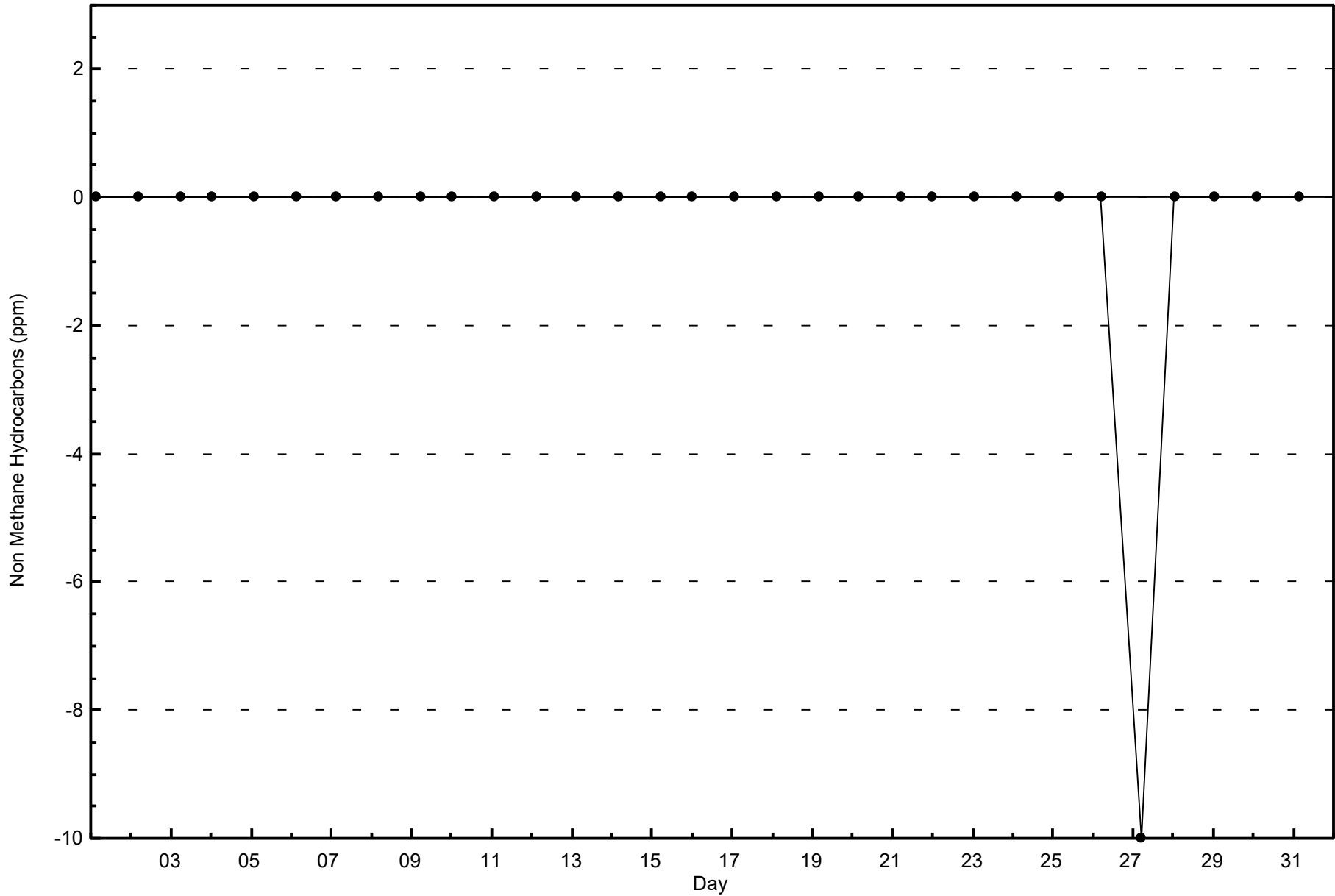
Total Number of Hours: 744

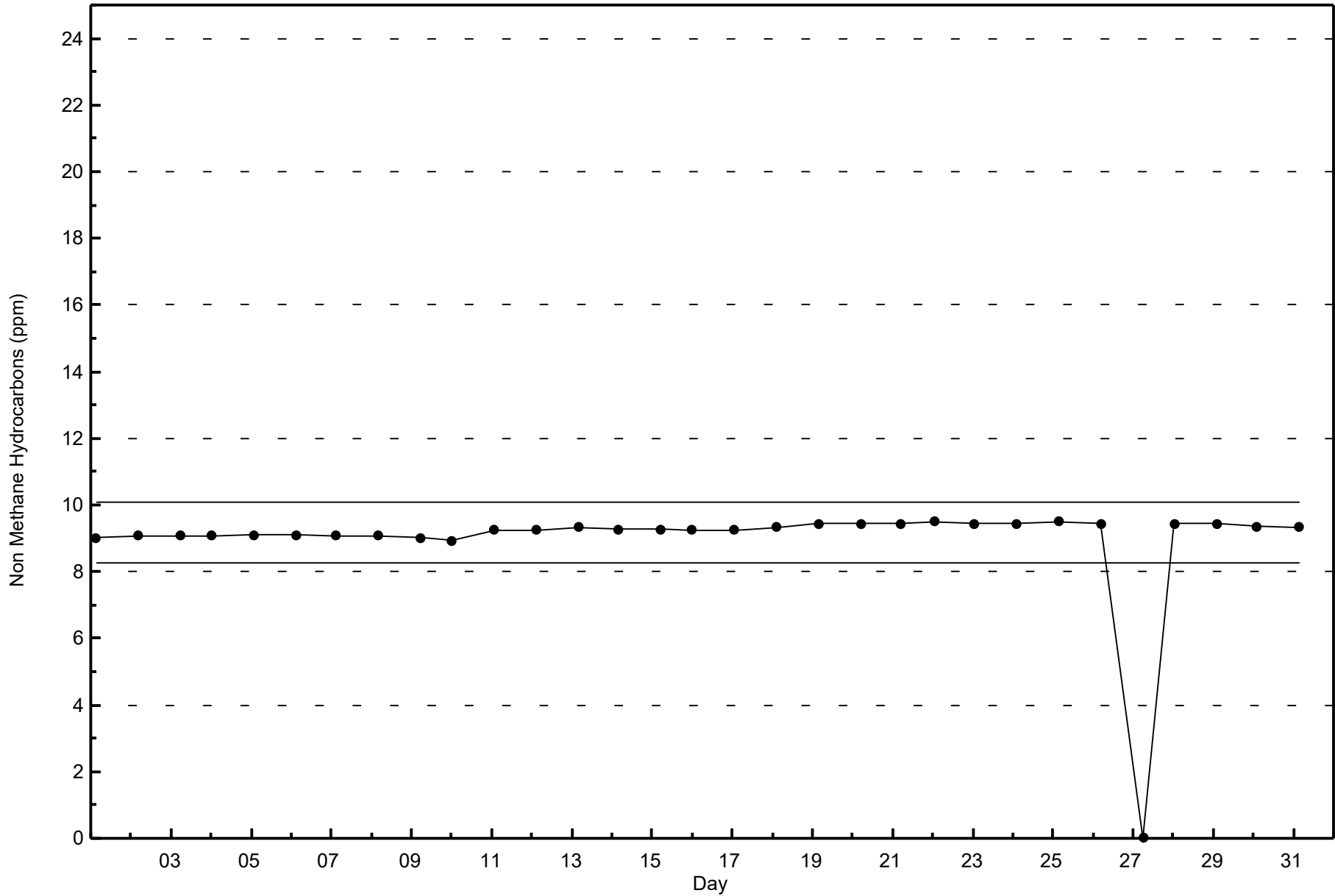


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

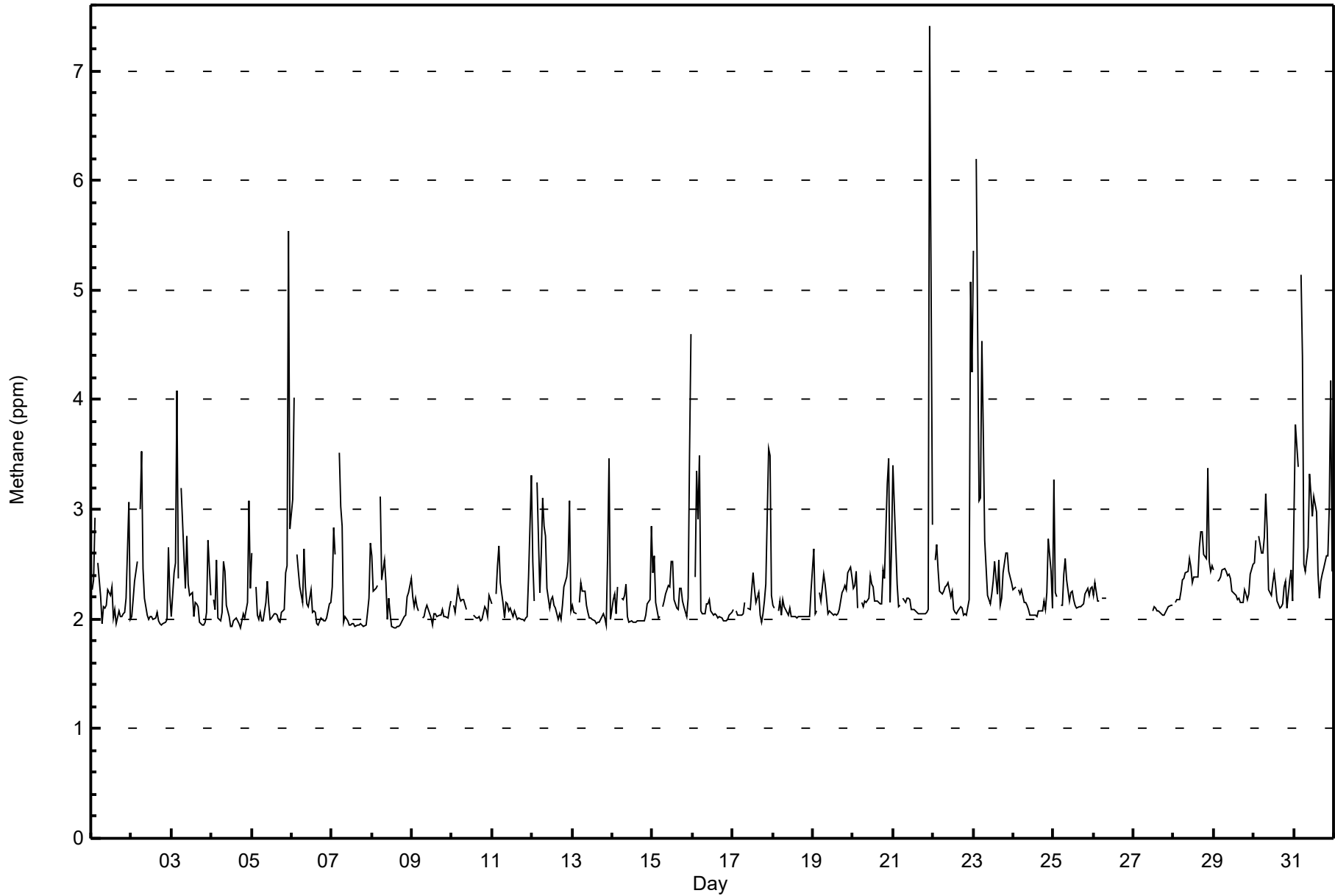
Methane (CH₄) - ppm
Fort Hills - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum																											
Maximum Value: 7.4 ppm on Aug 21 23:00		Maximum Daily Average: 3.0 ppm on Aug 31		Hours of Data: 682														Hours of Missing Data: 62		Hours of Calibration: 34		Percent Operational Time: 96.2																											
Minimum Value: 1.9 ppm on Aug 8 15:00		Minimum Daily Average: 2.1 ppm on Aug 18		Hours of Missing Data: 62														Hours of Calibration: 34		Percent Operational Time: 96.2																													
Maximum Diurnal Average: 2.9 ppm at hour 23		Minimum Diurnal Average: 2.1 ppm at hour 18		Hours of Calibration: 34														Hours of Calibration: 34		Percent Operational Time: 96.2																													
Monthly Average: 2.30 ppm		Percentiles: P ₁ = 1.9 P ₁₀ = 2.0 Q ₁ = 2.0 Median = 2.2 Q ₃ = 2.4 P ₉₀ = 2.7 P ₉₉ = 4.5		Hours of Calibration: 34														Hours of Calibration: 34		Percent Operational Time: 96.2																													
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-Aug	2.3	2.4	2.9	Z	2.5	2.2	2.0	2.1	2.1	2.1	2.3	2.2	2.3	2.0	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.2	3.1	2.0	2.2	3.1																							
2-Aug	2.0	2.2	2.3	2.5	Z	3.0	3.5	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.6	2.2	2.2	3.5																							
3-Aug	2.0	2.4	2.5	4.1	2.4	Z	3.2	2.6	2.3	2.8	2.3	2.2	2.2	2.0	2.2	2.1	2.1	2.0	1.9	1.9	2.0	2.1	2.7	2.2	2.4	4.1																							
4-Aug	Z	2.2	2.1	2.5	2.0	2.0	2.1	2.5	2.4	2.1	2.0	1.9	1.9	2.0	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.2	3.1	2.3	2.1	3.1																							
5-Aug	2.6	Z	2.3	2.0	2.0	2.1	2.0	2.0	2.1	2.3	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.4	2.5	5.5	2.8	2.3	5.5																							
6-Aug	3.1	4.0	Z	2.6	2.4	2.3	2.2	2.6	2.3	2.1	2.1	2.3	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.3	4.0	2.3	4.0																						
7-Aug	2.3	2.8	2.6	Z	3.5	3.0	2.8	2.0	2.0	2.0	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.9	2.1	2.2	2.7	2.2	3.5	2.2	3.5																					
8-Aug	2.6	2.3	2.3	2.3	Z	3.1	2.4	2.5	2.3	2.0	2.2	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.2	2.4	2.2	3.1	2.2	3.1																					
9-Aug	2.2	2.1	2.2	2.1	2.1	Z	2.0	2.0	2.1	2.1	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	2.1	2.2	2.1	2.2	2.1	2.2																					
10-Aug	Z	2.1	2.1	2.3	2.2	2.2	2.2	2.2	2.1	C	C	C	C	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	2.2	2.1	2.3	2.1	2.3																					
11-Aug	2.1	Z	2.2	2.5	2.7	2.3	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.4	3.3	2.2	3.3	2.2	3.3																						
12-Aug	2.5	2.2	Z	3.2	2.2	2.6	3.1	2.8	2.8	2.3	2.1	2.2	2.2	2.1	2.1	2.0	2.0	2.0	2.1	2.3	2.4	2.5	3.1	2.1	2.4	3.2	2.4	3.2																					
13-Aug	2.1	2.1	2.0	Z	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	2.0	2.1	2.0	1.9	2.6	3.5	2.0	2.1	3.5	2.1	3.5																					
14-Aug	2.2	2.2	2.1	Z	2.2	2.2	2.2	2.2	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.8	2.1	2.8	2.1	2.8																					
15-Aug	2.4	2.6	2.1	2.0	2.0	Z	2.1	2.2	2.2	2.3	2.3	2.5	2.5	2.2	2.1	2.1	2.3	2.3	2.2	2.1	2.0	2.2	3.5	4.6	2.4	4.6	2.4	4.6																					
16-Aug	Z	2.4	3.3	2.9	3.5	2.1	2.0	2.1	2.1	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	2.1	2.2	3.5	2.2	3.5	2.2	3.5																				
17-Aug	2.1	Z	2.1	2.0	2.0	2.0	2.0	2.2	M	2.1	2.1	2.3	2.4	2.3	2.2	2.2	2.0	2.0	2.0	2.2	2.3	3.6	3.5	2.2	2.3	3.6	2.3	3.6																					
18-Aug	2.1	2.1	Z	2.1	2.2	2.0	2.2	2.1	2.1	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.1	2.3	2.1	2.3	2.1	2.3																				
19-Aug	2.6	2.0	2.1	Z	2.2	2.2	2.4	2.3	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.3	2.3	2.4	2.5	2.4	2.2	2.6	2.2	2.6																					
20-Aug	2.3	2.3	2.4	2.1	Z	2.2	2.1	2.2	2.2	2.2	2.4	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.5	2.4	3.2	3.5	2.2	2.6	2.3	3.5	2.3	3.5																					
21-Aug	3.4	2.7	2.3	2.1	2.1	Z	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.1	7.4	2.9	2.5	7.4	2.5	7.4																					
22-Aug	Z	2.5	2.7	2.5	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.2	5.1	4.3	2.4	5.1	2.4	5.1																					
23-Aug	5.4	Z	6.2	3.1	3.1	4.5	3.7	2.7	2.2	2.2	2.1	2.2	2.3	2.5	2.2	2.5	2.1	2.2	2.4	2.6	2.6	2.4	2.4	2.3	2.9	6.2	2.9	6.2																					
24-Aug	2.3	2.3	Z	2.3	2.2	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.7	2.4	2.1	2.2	2.7	2.2	2.7																					
25-Aug	3.3	2.2	2.2	Z	2.1	2.1	2.4	2.5	2.4	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	2.3	2.3	2.3	2.3	3.3	3.3																				
26-Aug	2.2	2.3	2.2	2.2	Z	2.2	2.2	2.2	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	2.3	--	2.3																				
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	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																				
28-Aug	Z	2.1	2.2	2.2	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.3	2.4	2.4	2.4	2.6	2.8	2.8	2.6	2.6	3.4	2.5	2.4	2.5	2.5	2.5	2.5	3.4	2.5	3.4																			
29-Aug	2.5	Z	2.3	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.3	2.2	2.2	2.2	2.4	2.5	2.3	2.5	2.3	2.5																				
30-Aug	2.5	2.7	Z	2.8	2.6	2.6	2.7	3.1	2.8	2.3	2.2	2.3	2.4	2.3	2.2	2.1	2.1	2.1	2.3	2.3	2.1	2.4	2.4	2.2	2.4	2.4	2.4	3.1	2.4	3.1																			
31-Aug	3.0	3.8	3.4	Z	5.1	4.4	2.5	2.4	2.7	3.3	3.1	2.9	3.1	3.0	2.4	2.2	2.3	2.4	2.5	2.6	2.6	3.0	4.2	2.4	3.0	5.1	3.0	5.1	3.0	5.1																			
																								2.6	2.4	2.5	2.5	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.9	2.5	Diurnal Average	
																								5.4	4.0	6.2	4.1	5.1	4.5	3.7	3.1	2.8	3.3	3.1	2.9	3.1	3.0	2.4	2.6	2.8	2.8	2.6	2.6	3.4	3.6	7.4	4.6	Diurnal Maximum	
Z - zerospan			C - Calibration			M - Maintenance			DF - DAS Failure			PF - Power Failure																																					



Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Fort Hills - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Fort Hills - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	197	28.89	28.89
2.1 - 3.0	441	64.66	93.55
3.1 - 10.0	44	6.45	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 682

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Fort Hills - August 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	21	22	3	6	6	6	16	14	18	28	15	6	15	8	3	10	197
2.1 - 3.0	50	24	3	1	2	7	36	64	82	57	31	16	14	12	11	31	441
3.1 - 10.0	5	0	0	0	0	0	1	6	0	1	4	3	2	6	4	11	43
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	76	46	6	7	8	13	53	84	100	86	50	25	31	26	18	52	681

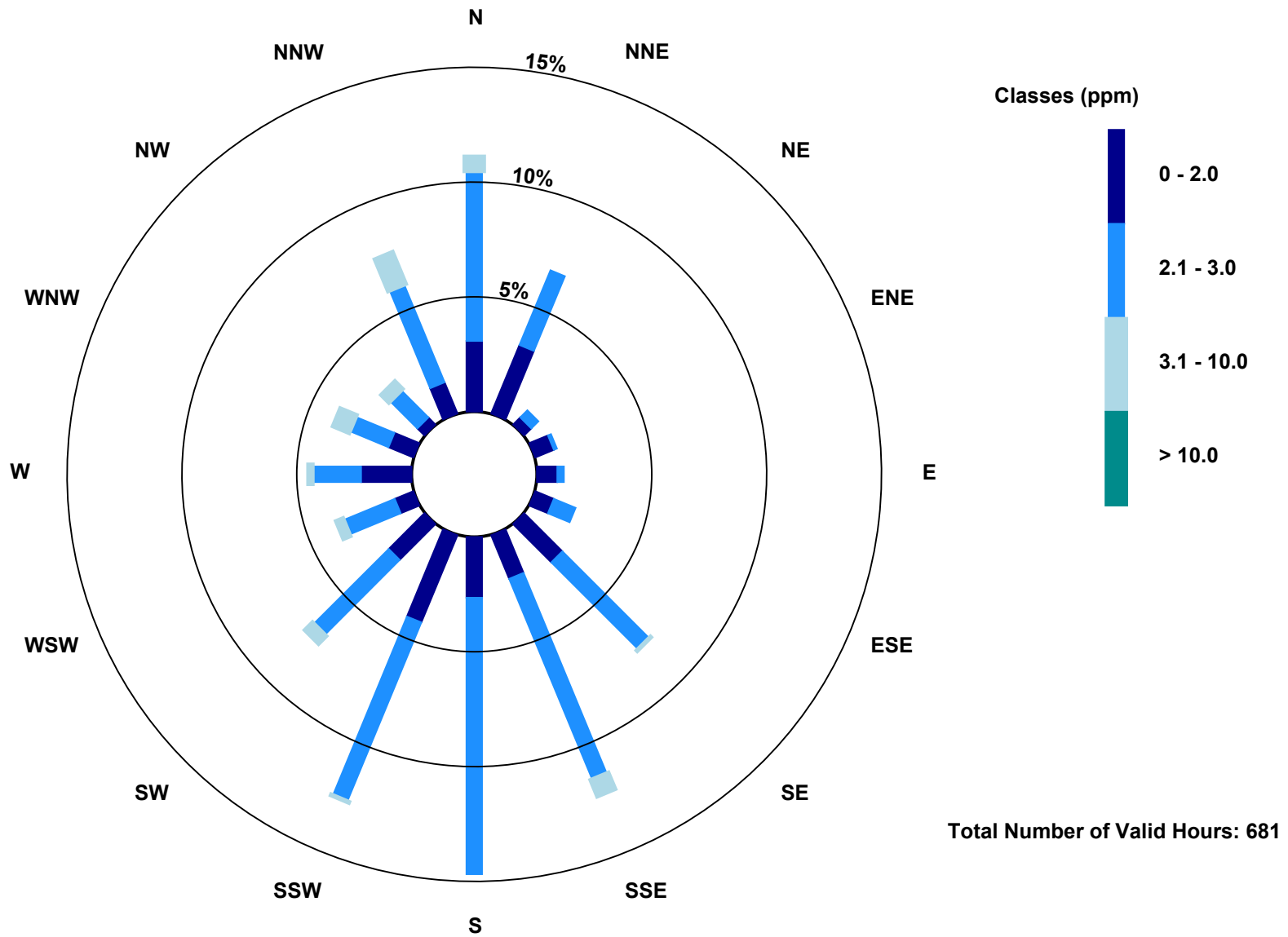
Total Number of Valid Hours: 681

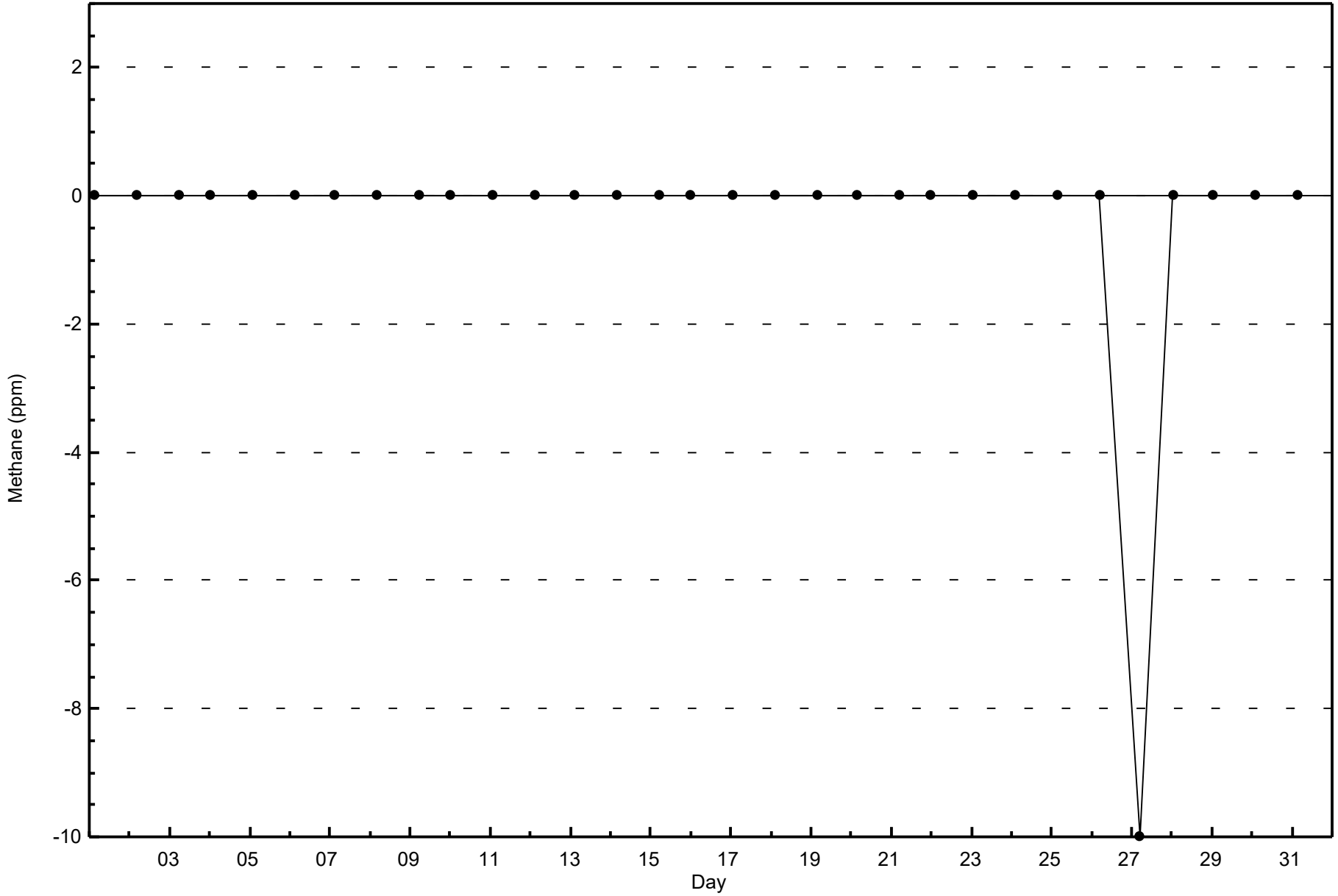
Total Number of Hours: 744

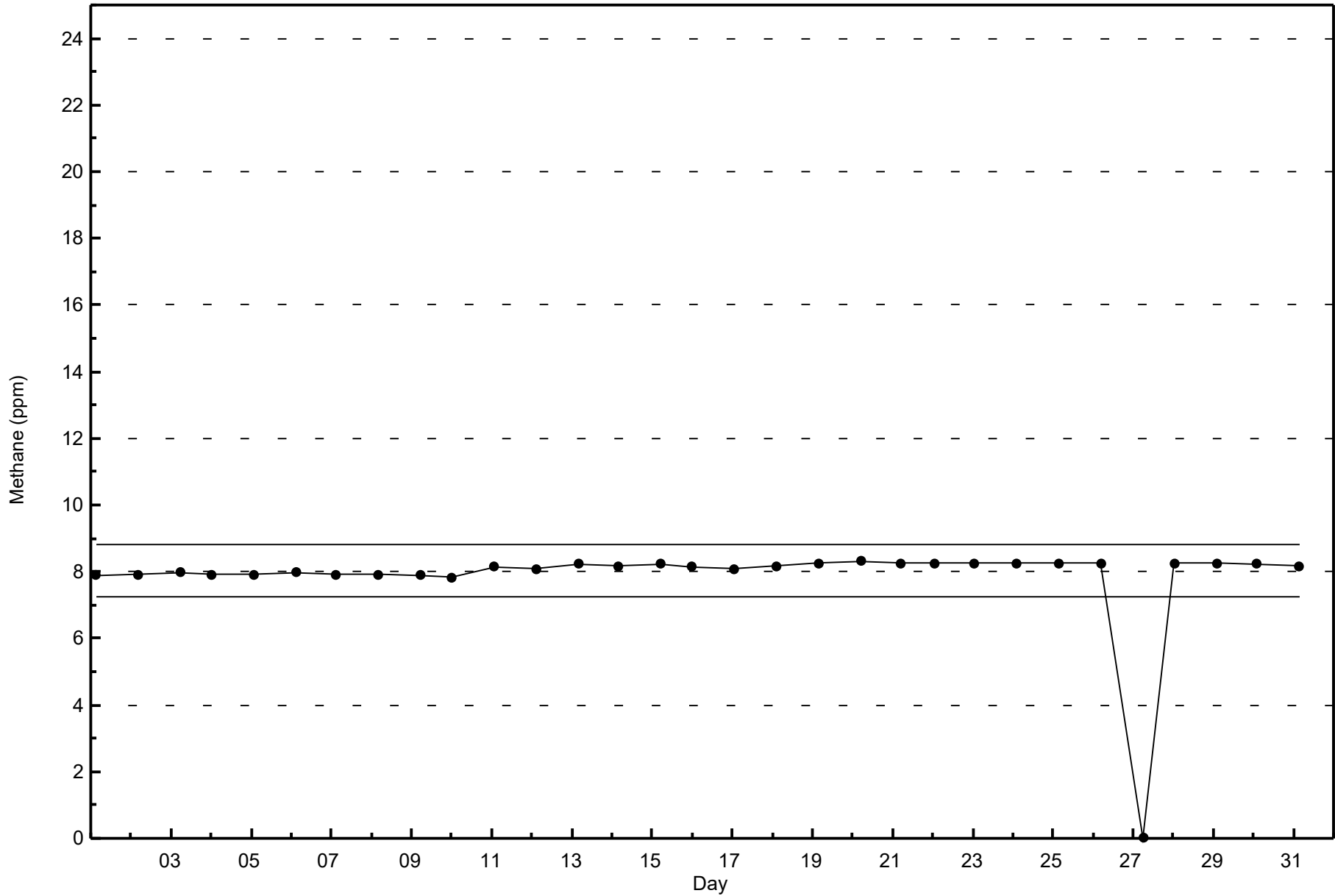


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

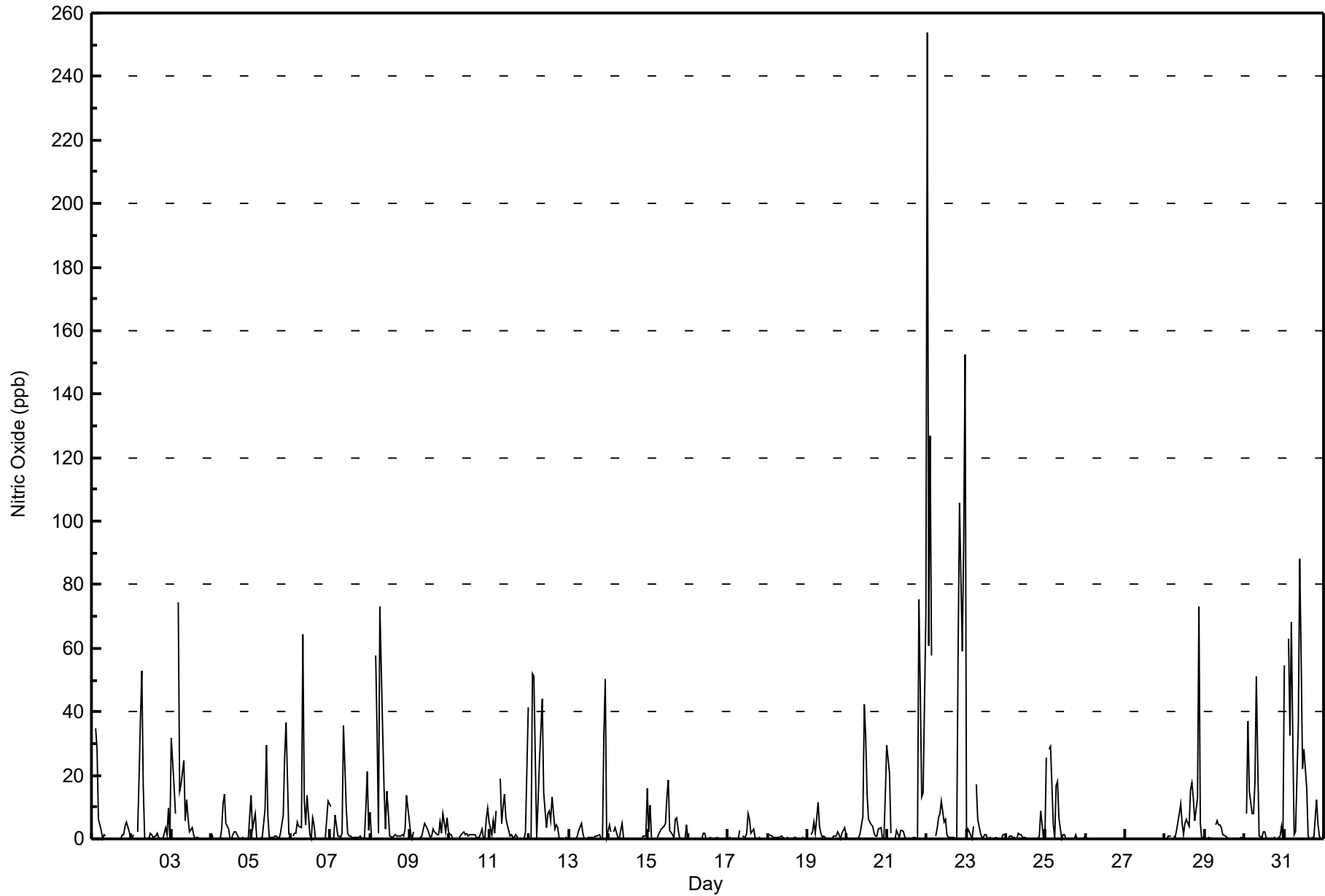
Fort Hills - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																744				
Maximum Value: 254.1 ppb on Aug 22 01:00				Maximum Daily Average: 44.1 ppb on Aug 22		Hours of Data:																681				
Minimum Value: 0.0 ppb on Aug 1 01:00				Minimum Daily Average: 0.2 ppb on Aug 16		Hours of Missing Data:																63				
Maximum Diurnal Average: 17.9 ppb at hour 1				Minimum Diurnal Average: 0.9 ppb at hour 19		Hours of Calibration:																35				
Monthly Average: 6.72 ppb				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.8 Q ₃ = 4.5 P ₉₀ = 16.6 P ₉₉ = 74.5		Percent Operational Time:																96.2				
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-Aug	0.0	Z	34.9	28.1	6.1	2.6	0.0	1.5	0.9	C	C	C	C	C	0.0	0.0	0.0	0.0	1.1	1.2	3.9	5.4	2.3	0.0	4.9	34.9
2-Aug	0.0	1.3	Z	2.3	19.0	38.1	52.9	16.6	0.2	0.0	0.0	1.6	1.2	0.6	0.7	1.6	0.4	0.0	0.0	0.2	3.5	1.4	9.5	0.0	6.6	52.9
3-Aug	31.7	16.7	8.1	Z	74.3	15.0	17.1	24.5	5.8	12.4	6.7	2.4	3.6	1.2	0.0	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	9.6	74.3
4-Aug	1.3	0.0	0.0	0.0	Z	0.2	3.2	11.2	14.1	4.7	3.1	0.0	0.0	1.1	2.3	2.1	0.6	0.0	0.2	0.4	0.2	0.0	0.0	7.2	2.3	14.1
5-Aug	13.6	2.9	7.7	0.3	0.0	Z	0.3	0.5	9.3	29.5	7.6	0.4	0.3	0.3	0.8	1.0	0.5	0.2	1.9	7.6	26.2	36.5	19.2	1.2	7.3	36.5
6-Aug	Z	0.7	1.7	1.9	5.4	4.1	3.7	64.4	12.5	4.6	13.5	1.3	0.1	6.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	11.0	6.4	64.4
7-Aug	10.3	Z	0.1	7.4	1.0	0.7	0.6	1.8	35.5	9.9	1.6	0.7	0.8	0.5	0.5	0.6	0.4	0.4	0.8	0.2	0.6	9.7	21.0	2.7	4.7	35.5
8-Aug	8.2	0.6	Z	57.6	34.3	2.0	73.0	33.7	16.0	3.0	14.8	8.4	0.9	0.3	1.1	1.2	0.8	0.8	1.0	1.2	1.0	2.9	13.7	5.5	12.3	73.0
9-Aug	1.9	0.2	2.2	Z	0.0	0.0	0.4	1.0	3.0	4.7	3.2	2.0	0.3	0.8	3.2	2.3	1.3	1.2	5.5	1.8	7.8	2.2	6.4	2.4	2.3	7.8
10-Aug	1.4	1.1	0.1	0.0	Z	0.1	0.3	1.2	2.4	1.4	2.0	0.8	1.2	1.3	1.2	1.2	0.5	0.6	0.2	3.2	0.2	0.2	6.2	9.8	1.6	9.8
11-Aug	5.3	1.5	5.8	1.9	8.6	Z	19.1	5.0	10.3	14.1	6.6	4.4	1.1	1.2	0.6	0.5	1.1	0.1	0.0	0.0	0.0	0.0	2.0	41.4	5.7	41.4
12-Aug	Z	0.0	52.0	51.3	0.5	12.0	24.6	34.4	43.9	14.5	3.5	7.9	9.0	5.9	13.1	3.3	4.3	3.7	0.5	0.0	0.1	0.0	0.5	0.0	12.4	52.0
13-Aug	0.6	Z	0.0	0.0	0.0	1.1	2.6	4.8	1.7	0.2	0.0	0.2	0.3	0.3	0.3	0.6	1.0	0.9	1.4	0.2	0.0	32.8	50.3	0.6	4.3	50.3
14-Aug	4.5	2.1	Z	2.1	3.4	0.6	0.1	2.7	5.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.1	0.8	16.0	1.7	16.0
15-Aug	2.0	10.8	0.6	Z	0.0	0.0	1.3	2.0	3.0	4.2	4.7	13.2	18.5	2.5	1.3	0.5	6.2	6.5	3.0	0.4	0.2	0.0	0.0	4.4	3.7	18.5
16-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	1.7	1.9	0.1	0.1	0.4	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9
17-Aug	0.0	0.5	0.0	0.0	0.0	Z	0.1	2.8	M	1.0	0.4	1.6	8.0	6.1	1.9	3.1	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	1.2	8.0
18-Aug	Z	1.5	1.0	0.3	0.5	0.4	0.3	0.6	0.8	0.4	0.0	0.0	0.4	0.2	0.0	0.0	0.3	0.3	0.0	0.0	0.1	0.3	0.0	0.0	0.3	1.5
19-Aug	0.0	Z	1.2	2.4	5.3	1.9	11.5	3.9	1.9	0.3	0.8	0.0	0.0	0.1	0.0	0.0	0.8	0.8	2.1	1.5	0.0	1.7	3.5	1.3	1.8	11.5
20-Aug	0.1	0.1	Z	0.0	0.0	0.0	0.1	0.3	1.7	6.9	42.2	32.1	13.9	6.0	4.5	3.8	1.9	1.1	1.0	3.3	3.5	0.0	0.0	13.7	5.9	42.2
21-Aug	29.5	20.7	1.7	Z	0.0	0.1	2.8	0.6	2.5	2.6	2.2	0.3	0.1	0.0	0.0	0.0	0.6	0.3	0.1	75.3	46.4	13.3	14.4	71.5	12.4	75.3
22-Aug	254.1	60.9	127.0	57.7	Z	0.8	2.9	6.6	8.1	12.0	5.1	6.4	1.5	0.4	0.3	0.3	0.4	0.1	0.0	58.4	105.8	58.8	94.0	152.5	44.1	254.1
23-Aug	0.9	3.1	2.4	0.2	3.9	Z	17.0	6.0	1.6	0.6	0.5	1.5	1.3	0.2	0.6	0.0	0.0	0.2	0.3	0.0	0.1	0.0	1.4	1.2	1.9	17.0
24-Aug	Z	0.6	0.7	1.1	0.6	0.2	0.1	1.7	1.5	1.4	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	8.7	0.0	0.0	0.8	8.7
25-Aug	25.8	Z	28.3	28.9	4.6	0.0	16.6	18.1	6.4	0.2	1.5	1.1	0.1	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.0	0.4	5.8	28.9
26-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	0.0
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	--	0.7
28-Aug	0.1	0.0	0.8	0.8	Z	1.1	0.5	2.4	7.9	10.9	4.8	1.4	4.9	6.3	3.9	15.2	17.8	12.8	5.7	12.9	73.4	4.8	0.1	0.4	8.2	73.4
29-Aug	0.6	0.2	0.3	0.2	0.3	Z	4.4	5.7	4.6	4.4	3.7	1.3	0.8	0.3	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.4	0.2	1.2	5.7
30-Aug	Z	7.9	36.9	14.9	7.8	7.8	17.8	51.1	23.6	1.0	0.3	2.0	2.1	0.3	0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.8	3.8	0.1	7.8	51.1
31-Aug	54.7	Z	62.9	32.7	68.3	33.0	1.3	2.4	36.1	88.1	57.1	22.0	28.0	16.0	0.8	0.2	0.1	0.3	0.2	12.3	4.7	1.0	0.0	0.0	22.7	88.1
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure PF - Power Failure																										



Wood Buffalo Environmental Association
Hourly Averages

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





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	623	91.48	91.48
21 - 40	28	4.11	95.59
41 - 80	24	3.52	99.12
81 - 159	5	0.73	99.85
> 159	1	0.15	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Fort Hills - August 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	68	43	6	6	8	14	49	73	91	84	43	17	30	21	16	53	622
21 - 40	4	2	1	0	0	0	2	5	1	0	3	6	2	1	1	0	28
11 - 80	5	0	1	1	1	0	1	5	4	2	2	1	0	0	1	0	24
81 - 159	0	0	0	0	0	0	1	1	1	0	0	0	0	2	0	0	5
> 159	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Totals	77	45	8	7	9	14	53	85	97	86	48	24	32	24	18	53	680

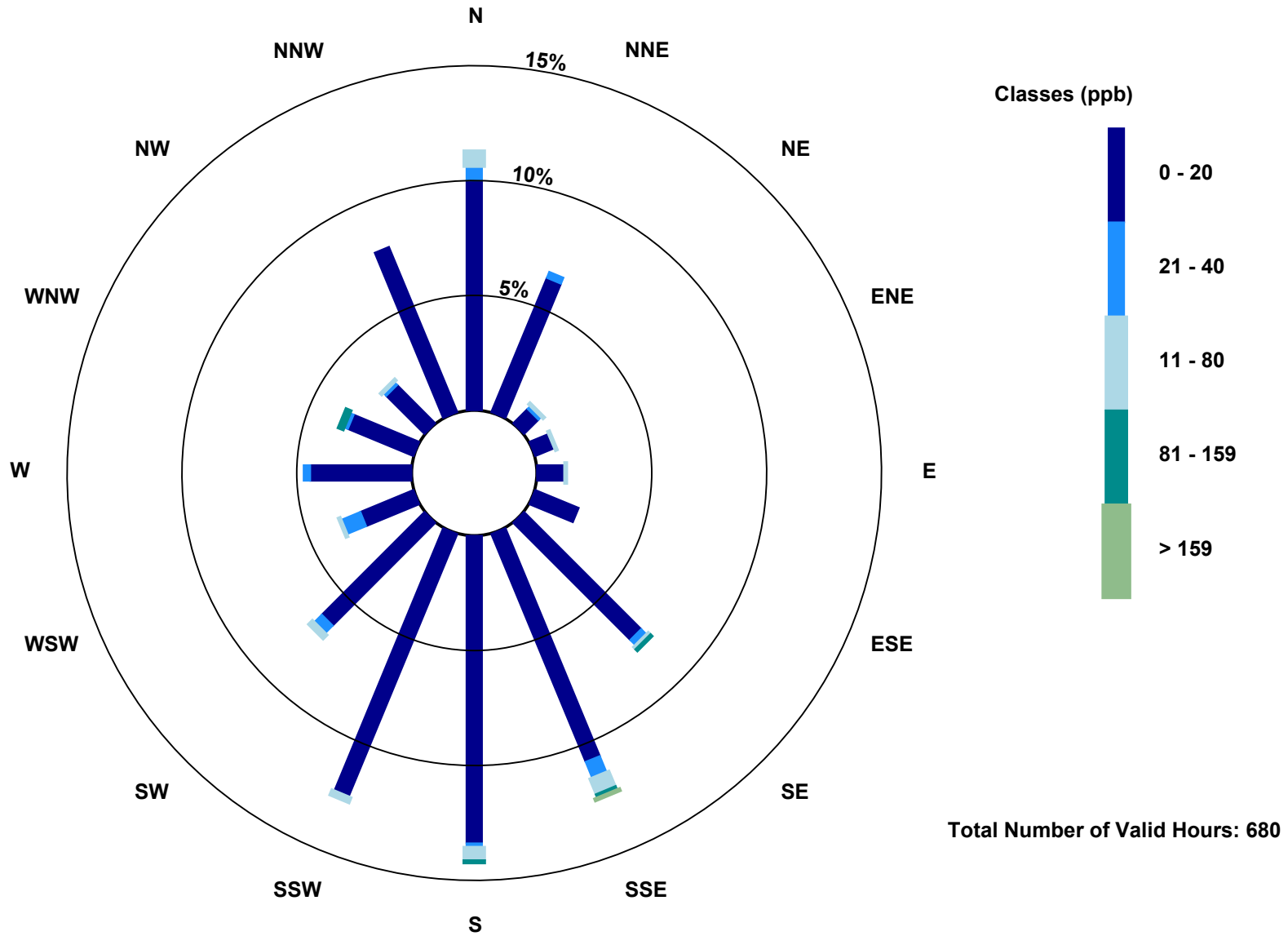
Total Number of Valid Hours: 680

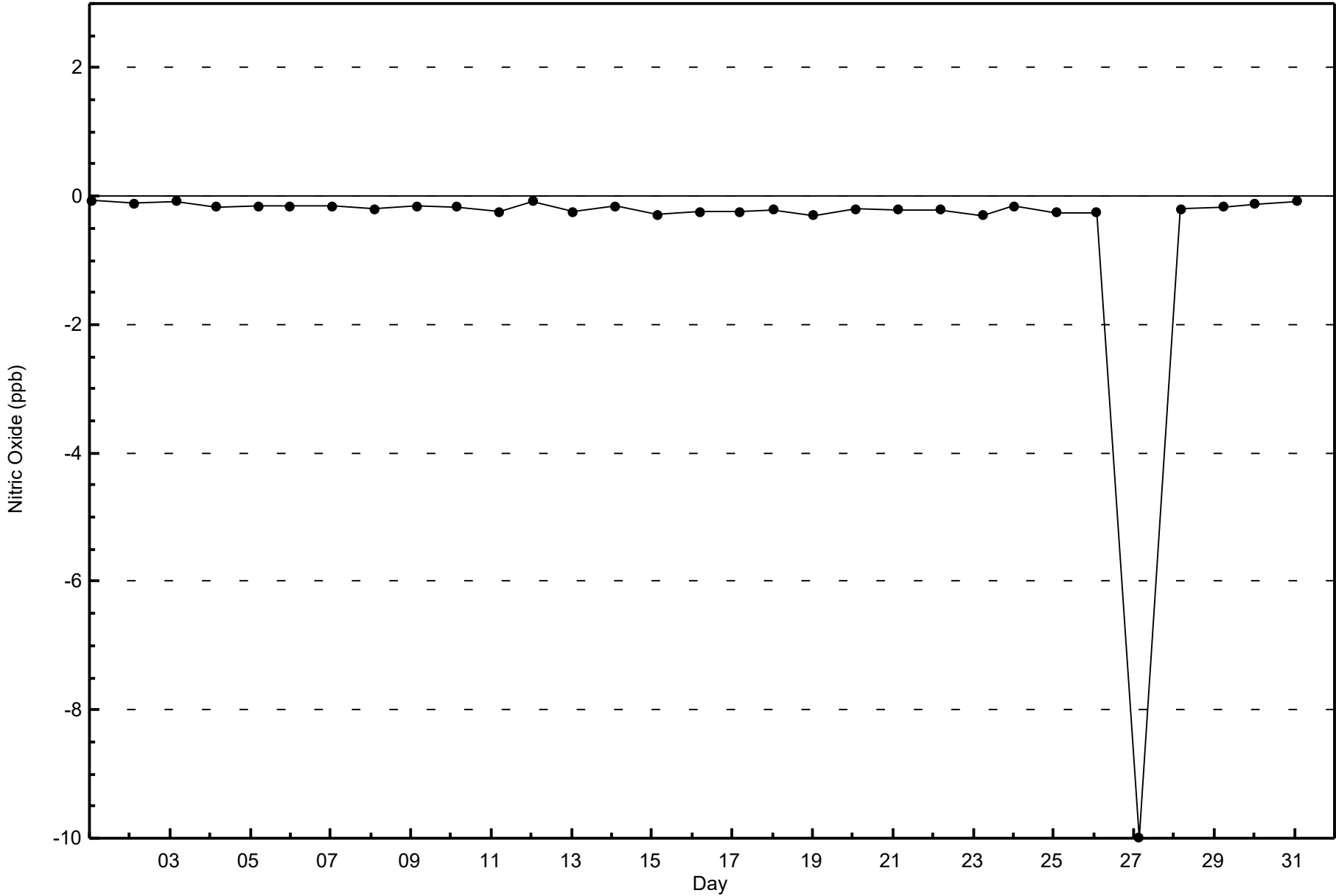
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Fort Hills

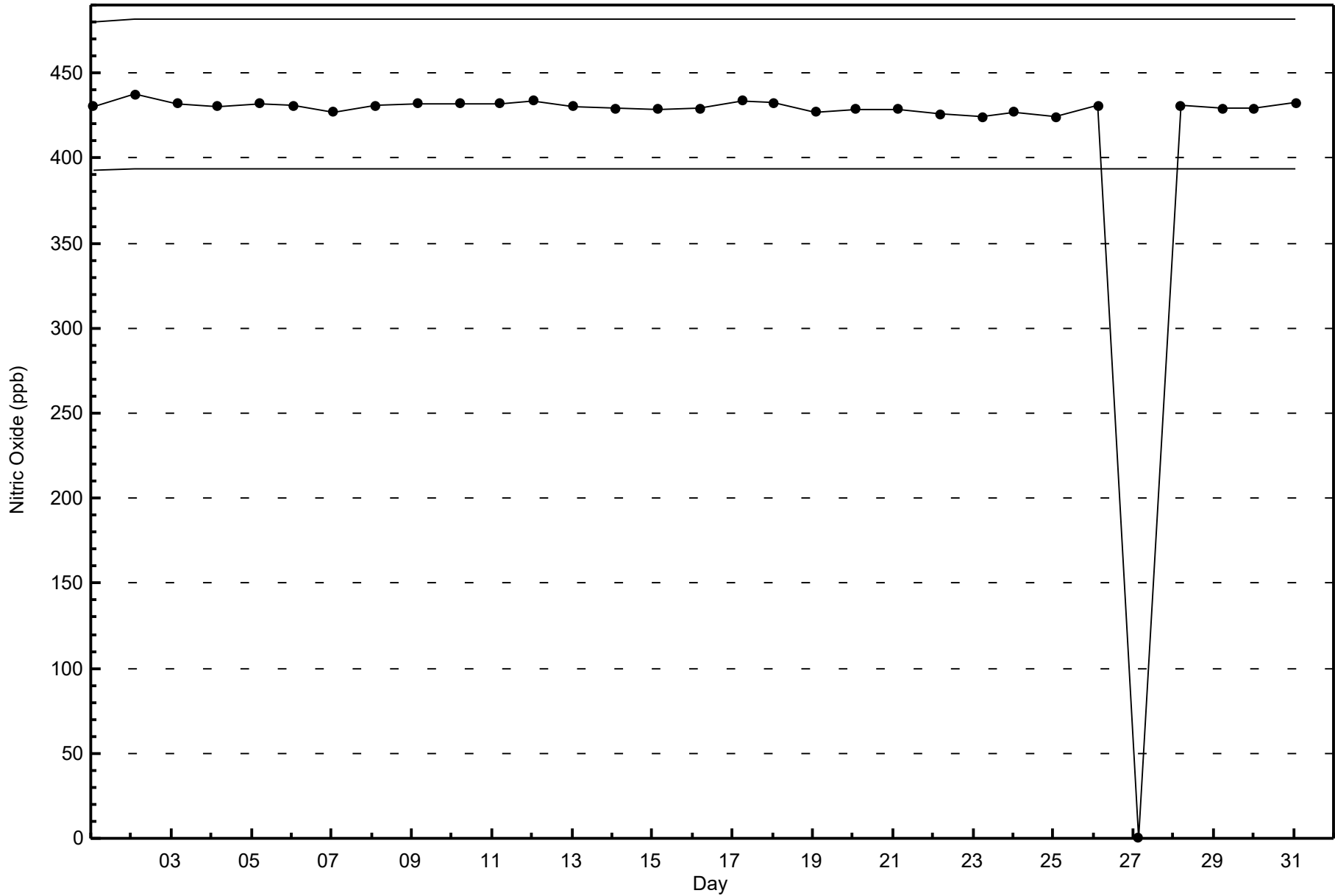






Wood Buffalo Environmental Association
Span Responses

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





Wood Buffalo Environmental Association
Summary of Hour Averages

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

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 44.7 ppb on Aug 31 14:00	Maximum Daily Average: 19.1 ppb on Aug 31		Hours of Data:	681
Minimum Value: 0.0 ppb on Aug 24 16:00	Minimum Daily Average: 1.9 ppb on Aug 16		Hours of Missing Data:	63
Maximum Diurnal Average: 13.0 ppb at hour 23	Minimum Diurnal Average: 4.3 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 8.07 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 1.0 Q ₁ = 2.2 Median = 5.6 Q ₃ = 11.7 P ₉₀ = 18.9 P ₉₉ = 32.9		Percent Operational Time:	96.2

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-Aug	7.5	Z	16.5	18.0	19.0	12.3	1.6	8.1	7.8	C	C	C	C	C	1.1	0.9	0.8	0.8	8.8	13.9	17.4	14.5	11.4	2.5	9.1	19.0	
2-Aug	2.4	8.5	Z	9.1	10.1	11.3	14.3	9.3	1.5	0.3	0.3	4.0	4.1	3.3	4.1	8.7	3.8	2.2	1.4	5.1	21.9	16.4	27.0	5.9	7.6	27.0	
3-Aug	18.2	18.9	15.0	Z	20.0	15.7	11.4	10.7	7.5	11.8	10.8	5.9	9.5	6.9	4.7	10.7	7.6	2.0	2.0	2.3	3.3	4.0	4.8	9.9	9.3	20.0	
4-Aug	9.9	2.6	2.0	2.1	Z	4.4	5.6	11.4	13.1	6.4	5.8	0.9	0.8	4.3	7.7	10.1	3.3	1.0	2.6	7.0	9.1	3.3	2.5	13.0	5.6	13.1	
5-Aug	16.1	12.5	13.7	3.1	1.8	Z	1.5	1.5	9.2	24.4	14.8	2.8	3.3	5.5	7.2	6.0	3.2	2.6	12.5	24.8	32.9	33.0	26.4	9.7	11.7	33.0	
6-Aug	Z	4.4	7.8	7.4	10.5	5.6	3.6	20.2	23.3	12.5	14.1	6.8	1.8	16.8	14.4	1.9	1.2	1.4	1.4	1.9	2.7	4.5	16.3	20.6	8.7	23.3	
7-Aug	14.7	Z	3.0	8.4	5.5	2.8	1.7	3.1	17.2	7.1	2.5	1.5	1.7	1.4	1.3	1.7	1.1	1.7	4.2	3.6	10.9	19.6	25.8	19.6	7.0	25.8	
8-Aug	11.1	5.1	Z	19.7	15.6	5.0	18.9	16.1	12.8	4.0	14.6	11.5	3.3	2.1	3.1	3.4	3.1	3.4	4.4	9.6	12.8	21.2	24.9	26.3	11.0	26.3	
9-Aug	21.7	12.6	20.1	Z	7.4	2.5	3.6	4.6	6.4	8.3	6.9	4.9	2.1	4.6	11.6	10.2	7.7	11.4	15.8	14.5	19.7	15.1	19.8	18.5	10.9	21.7	
10-Aug	17.5	16.9	15.2	13.0	Z	10.1	7.7	9.0	8.6	6.1	6.5	3.5	5.4	6.3	6.2	7.0	5.3	8.2	7.6	17.7	11.8	9.2	24.6	25.4	10.8	25.4	
11-Aug	25.2	22.1	19.8	22.3	21.3	Z	21.1	15.1	16.9	16.1	10.7	7.3	2.8	3.6	2.7	2.5	4.4	2.5	0.8	0.6	2.6	2.3	15.0	25.1	11.4	25.2	
12-Aug	Z	10.0	20.6	18.7	9.8	8.5	9.2	8.6	10.5	7.5	4.3	9.1	11.7	10.9	17.9	6.4	8.0	9.1	3.7	3.5	4.1	2.0	4.7	2.9	8.8	20.6	
13-Aug	3.2	Z	0.5	0.8	4.6	6.4	4.9	4.4	2.0	0.9	0.3	0.8	1.0	1.1	1.1	1.5	2.3	2.4	4.7	2.7	1.7	11.4	14.2	1.8	3.2	14.2	
14-Aug	9.5	10.7	Z	7.6	8.8	7.0	5.5	9.2	11.4	2.2	0.9	0.7	0.6	1.0	0.8	1.1	1.2	0.7	0.2	1.3	3.5	20.8	16.6	17.3	6.0	20.8	
15-Aug	13.3	16.6	4.5	Z	0.6	1.0	3.7	5.2	8.4	10.2	9.6	14.8	17.9	5.5	3.2	2.8	14.3	17.6	11.8	6.4	5.7	1.1	2.6	15.5	8.4	17.9	
16-Aug	5.0	1.2	1.0	1.0	Z	1.7	1.1	1.6	1.7	5.0	5.9	2.8	1.6	2.4	1.2	0.6	1.4	1.3	0.3	0.3	0.3	0.3	4.0	2.5	1.9	5.9	
17-Aug	5.7	9.1	1.5	0.2	0.2	Z	1.1	7.0	M	2.4	1.5	2.5	9.3	10.0	7.0	14.5	2.8	0.7	1.3	2.9	1.8	1.4	0.6	1.5	3.9	14.5	
18-Aug	Z	18.0	18.2	14.9	12.5	4.3	2.2	3.0	3.8	1.9	0.7	1.0	1.8	1.3	0.7	1.5	2.0	1.2	0.7	0.5	0.9	1.2	0.3	0.1	4.0	18.2	
19-Aug	0.2	Z	3.8	7.8	8.2	6.5	13.4	9.7	5.4	1.0	1.2	0.3	0.4	0.7	0.5	0.5	4.3	5.1	10.7	12.8	5.0	14.8	19.0	9.9	6.1	19.0	
20-Aug	4.8	7.0	Z	0.4	0.5	1.4	1.3	1.5	2.7	6.7	22.8	23.4	18.2	13.1	12.6	14.6	10.3	8.5	9.5	15.3	19.3	8.9	3.3	16.4	9.7	23.4	
21-Aug	21.0	21.1	13.2	Z	2.3	3.2	4.0	1.6	3.7	3.9	4.5	1.9	2.1	1.7	1.6	1.7	4.5	4.2	4.0	31.1	27.4	14.4	23.7	25.9	9.7	31.1	
22-Aug	28.2	22.4	23.3	21.4	Z	8.7	8.3	8.6	10.0	14.1	10.2	13.0	5.6	4.0	3.9	4.2	6.2	5.1	1.6	24.5	39.8	28.2	28.8	28.0	15.1	39.8	
23-Aug	5.8	5.0	6.5	3.0	4.8	Z	9.6	8.0	5.0	3.0	3.3	5.2	8.4	5.1	4.5	2.5	2.0	4.7	6.9	4.9	7.6	5.8	11.8	12.0	5.9	12.0	
24-Aug	Z	10.3	8.7	8.4	6.3	4.6	2.0	6.3	3.8	3.0	0.7	0.6	0.4	0.2	0.3	0.0	0.1	0.0	0.5	0.1	6.4	19.3	1.4	0.2	3.6	19.3	
25-Aug	9.3	Z	7.4	8.4	2.9	0.7	8.3	10.5	6.5	0.9	2.8	3.0	1.4	1.3	1.2	0.9	0.8	1.2	4.4	4.4	2.9	4.4	9.3	9.2	4.4	10.5	
26-Aug	3.2	5.4	Z	1.3	2.1	1.0	0.7	0.6	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	5.4
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	2.3	3.5	1.9	1.1	1.1	1.0	0.9	0.8	1.4	1.5	1.1	1.2	2.1	--	3.5
28-Aug	1.0	1.0	2.0	2.0	Z	4.6	4.5	6.2	6.0	6.8	5.6	3.6	7.8	10.6	12.6	20.0	21.1	18.7	14.9	12.0	20.7	12.5	10.5	11.8	9.4	21.1	
29-Aug	11.2	10.3	9.3	8.5	8.6	Z	9.4	7.9	6.6	7.5	7.8	5.4	5.5	4.3	3.7	3.8	4.5	3.0	2.4	3.1	2.4	3.6	10.0	9.9	6.5	11.2	
30-Aug	Z	14.2	16.5	14.9	13.0	12.0	11.3	16.4	15.8	4.9	3.2	9.4	13.3	7.2	6.0	6.2	6.0	3.6	11.7	13.1	3.9	8.5	27.8	11.8	10.9	27.8	
31-Aug	32.9	Z	29.0	27.0	23.7	19.6	8.7	7.6	18.7	34.2	41.1	35.4	43.1	44.7	12.8	4.4	3.5	4.7	6.6	18.8	13.5	7.9	1.8	0.7	19.1	44.7	

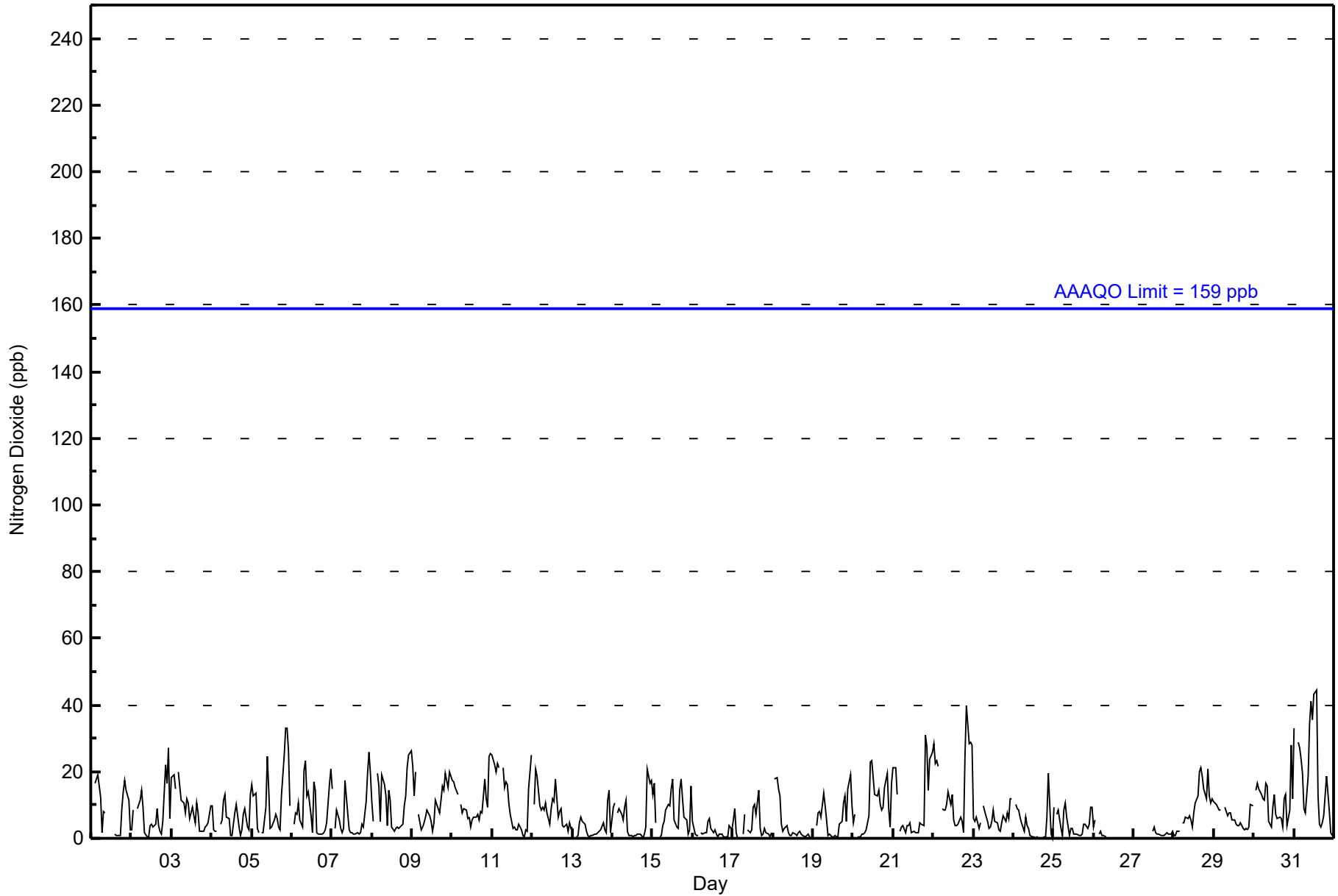
11.9	11.1	11.2	9.6	8.8	6.4	6.7	7.8	8.8	7.6	7.6	6.4	6.5	6.3	5.2	5.0	4.6	4.3	5.3	8.7	10.5	10.4	13.0	11.9	Diurnal Average	
32.9	22.4	29.0	27.0	23.7	19.6	21.1	20.2	23.3	34.2	41.1	35.4	43.1	44.7	17.9	20.0	21.1	18.7	15.8	31.1	39.8	33.0	28.8	28.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure PF - Power Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	628	92.22	92.22
21 - 40	50	7.34	99.56
41 - 80	3	0.44	100.00
81 - 159	0	0.00	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Fort Hills - August 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	36	7	5	8	13	46	77	92	84	46	21	31	22	17	52	627
21 - 40	6	9	1	2	1	1	7	8	5	2	1	2	1	2	1	1	50
11 - 80	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	3
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	77	45	8	7	9	14	53	85	97	86	48	24	32	24	18	53	680

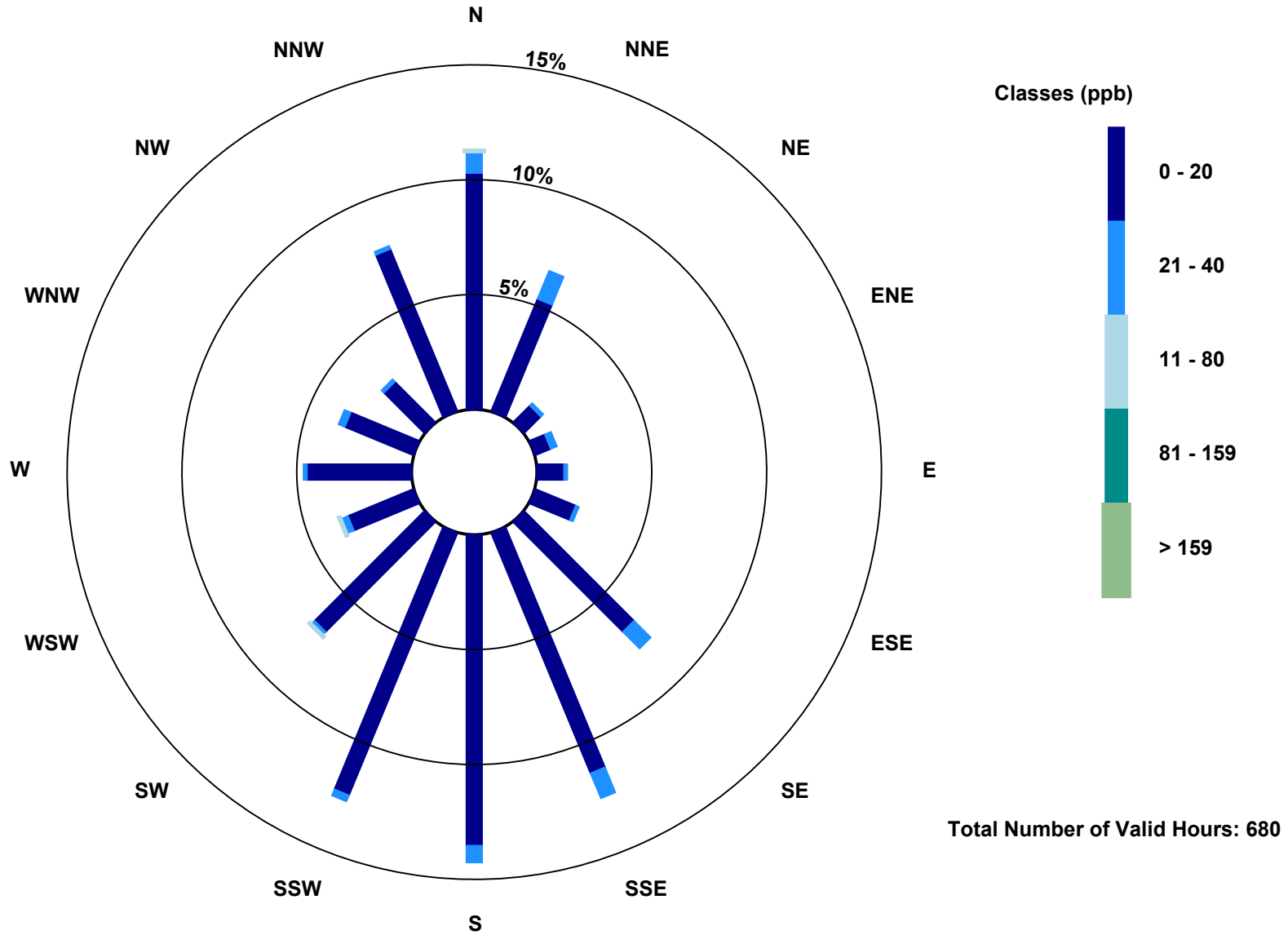
Total Number of Valid Hours: 680

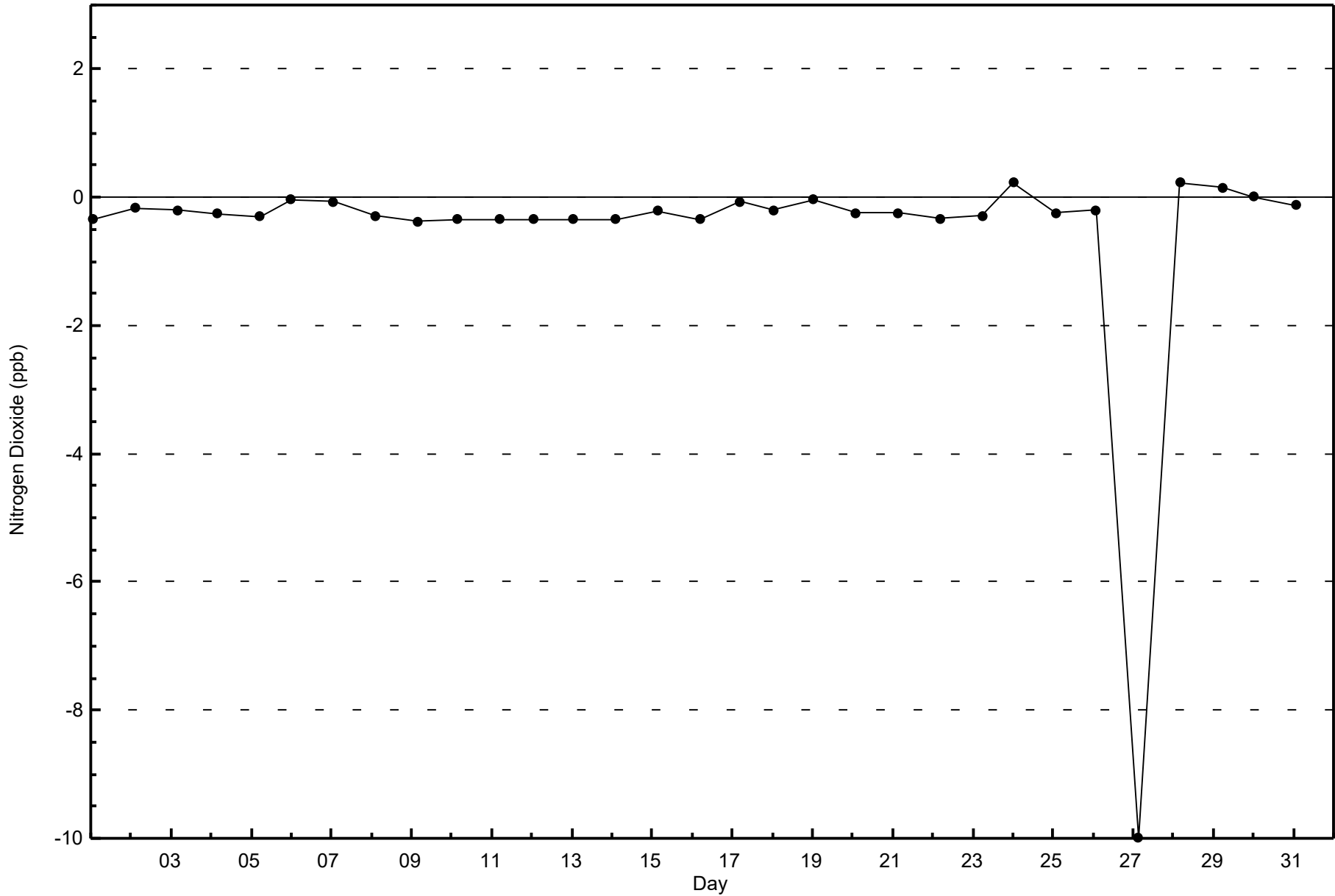
Total Number of Hours: 744

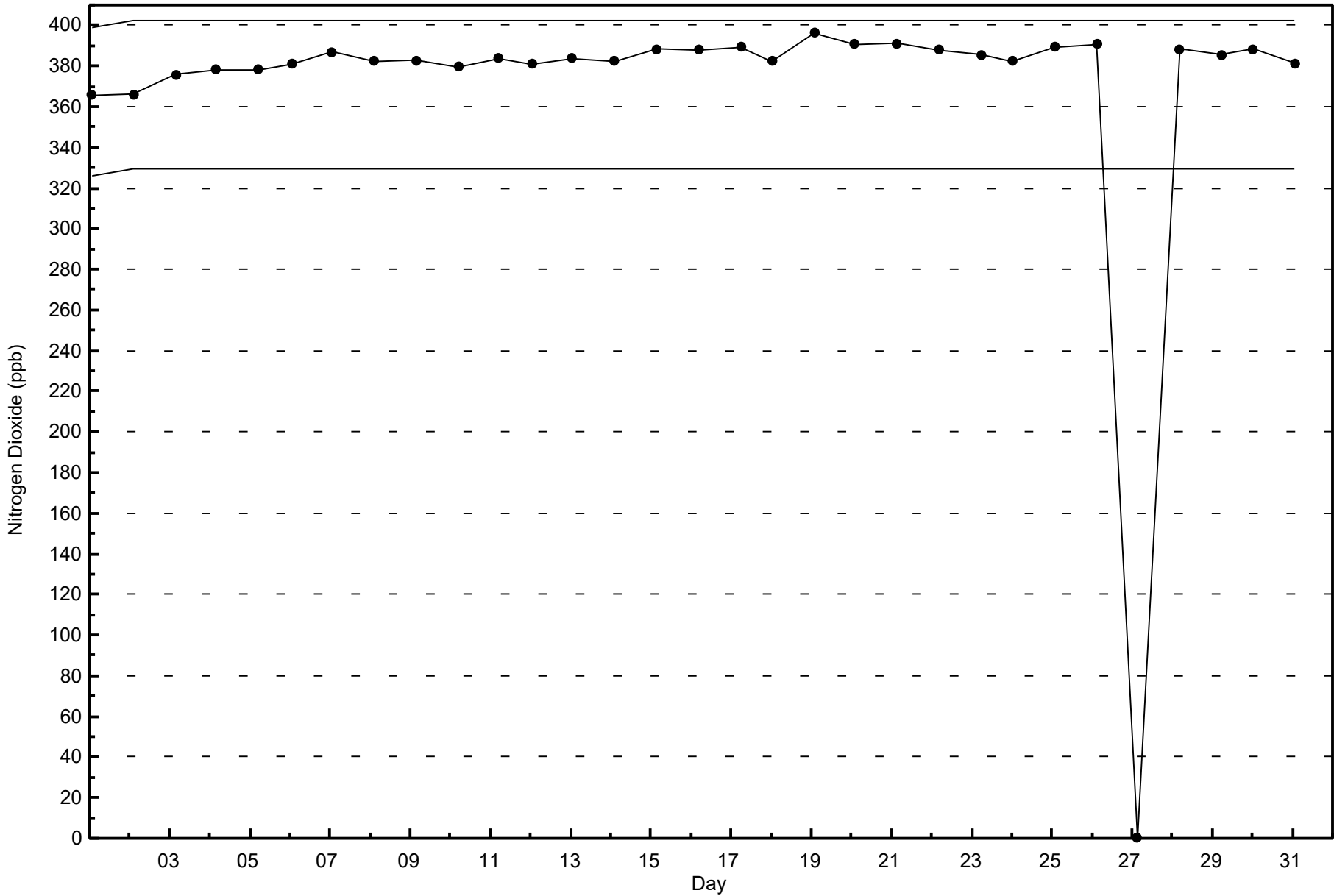


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Fort Hills









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

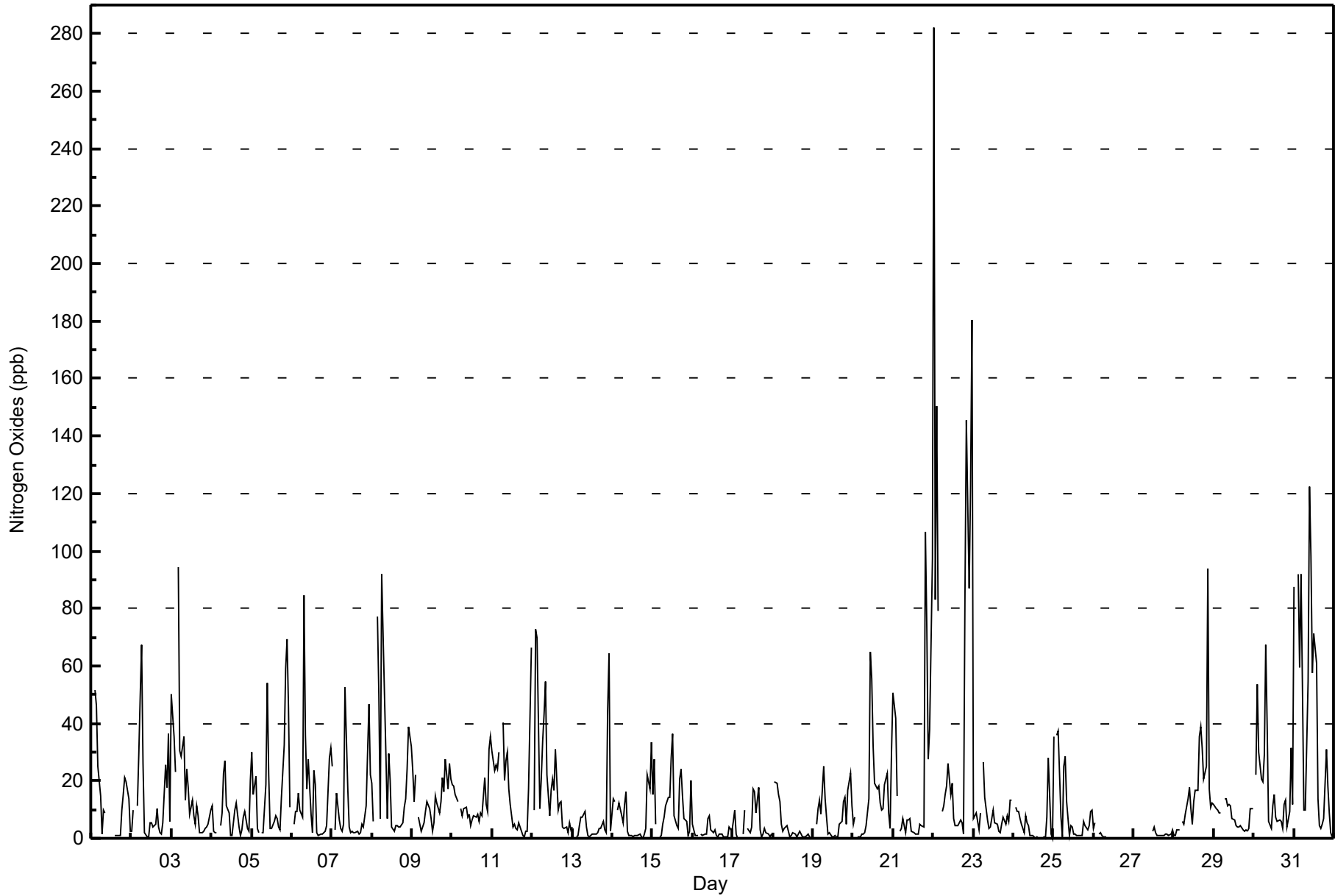
Fort Hills - August 2023

Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 282.3 ppb on Aug 22 01:00	Maximum Daily Average: 59.2 ppb on Aug 22		Hours of Data:	681
Minimum Value: 0.0 ppb on Aug 24 16:00	Minimum Daily Average: 2.1 ppb on Aug 16		Hours of Missing Data:	63
Maximum Diurnal Average: 29.8 ppb at hour 1	Minimum Diurnal Average: 5.3 ppb at hour 18		Hours of Calibration:	35
Monthly Average: 14.79 ppb	Percentiles: P ₁ = 0.2 P ₁₀ = 1.0 Q ₁ = 2.4 Median = 7.0 Q ₃ = 17.1 P ₉₀ = 35.1 P ₉₉ = 99.9		Percent Operational Time:	96.2

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-Aug	7.5	Z	51.4	46.1	25.1	14.9	1.6	9.6	8.7	C	C	C	C	C	1.1	0.9	0.8	0.8	9.9	15.1	21.3	19.9	13.7	2.5	13.9	51.4	
2-Aug	2.4	9.8	Z	11.4	29.1	49.4	67.2	25.9	1.7	0.3	0.3	5.6	5.3	3.9	4.8	10.3	4.2	2.2	1.4	5.3	25.4	17.8	36.5	5.9	14.2	67.2	
3-Aug	49.9	35.6	23.1	Z	94.3	30.7	28.5	35.2	13.3	24.2	17.5	8.3	13.1	8.1	4.7	11.1	8.0	2.1	2.0	2.3	3.3	4.0	4.8	9.9	18.9	94.3	
4-Aug	11.2	2.6	2.0	2.1	Z	4.6	8.8	22.6	27.2	11.1	8.9	0.9	0.8	5.4	10.0	12.2	3.9	1.0	2.8	7.4	9.3	3.3	2.5	20.2	7.9	27.2	
5-Aug	29.7	15.4	21.4	3.4	1.8	Z	1.8	2.0	18.5	53.9	22.4	3.2	3.6	5.8	8.0	7.0	3.7	2.8	14.4	32.4	59.1	69.5	45.6	10.9	19.0	69.5	
6-Aug	Z	5.1	9.5	9.3	15.9	9.7	7.3	84.6	35.8	17.1	27.6	8.1	1.9	23.6	18.9	1.9	1.2	1.4	1.4	1.9	2.7	4.5	28.2	31.6	15.2	84.6	
7-Aug	25.0	Z	3.1	15.8	6.5	3.5	2.3	4.9	52.7	17.0	4.1	2.2	2.5	1.9	1.8	2.3	1.5	2.1	5.0	3.8	11.5	29.3	46.8	22.3	11.7	52.7	
8-Aug	19.3	5.7	Z	77.3	49.9	7.0	91.9	49.8	28.8	7.0	29.4	19.9	4.2	2.4	4.2	4.6	3.9	4.2	5.4	10.8	13.8	24.1	38.6	31.8	23.2	91.9	
9-Aug	23.6	12.8	22.3	Z	7.4	2.5	4.0	5.6	9.4	13.0	10.1	6.9	2.4	5.4	14.8	12.5	9.0	12.6	21.3	16.3	27.5	17.3	26.2	20.9	13.2	27.5	
10-Aug	18.9	18.0	15.3	13.0	Z	10.2	8.0	10.2	11.0	7.5	8.5	4.3	6.6	7.6	7.4	8.2	5.8	8.8	7.8	20.9	12.0	9.4	30.8	35.2	12.4	35.2	
11-Aug	30.5	23.6	25.6	24.2	29.9	Z	40.2	20.1	27.2	30.2	17.3	11.7	3.9	4.8	3.3	3.0	5.5	2.6	0.8	0.6	2.6	2.3	17.0	66.5	17.1	66.5	
12-Aug	Z	10.0	72.6	70.0	10.3	20.5	33.8	43.0	54.4	22.0	7.8	17.0	20.7	16.8	31.0	9.7	12.3	12.8	4.2	3.5	4.2	2.0	5.2	2.9	21.2	72.6	
13-Aug	3.8	Z	0.5	0.8	4.6	7.5	7.5	9.2	3.7	1.1	0.3	1.0	1.3	1.4	1.4	2.1	3.3	3.3	6.1	2.9	1.7	44.2	64.5	2.4	7.6	64.5	
14-Aug	14.0	12.8	Z	9.7	12.2	7.6	5.6	11.9	16.4	2.5	0.9	0.8	0.6	1.0	0.8	1.1	1.3	0.7	0.2	1.3	3.5	21.9	17.4	33.3	7.7	33.3	
15-Aug	15.3	27.4	5.1	Z	0.6	1.0	5.0	7.2	11.4	14.4	14.3	28.0	36.4	8.0	4.5	3.3	20.5	24.1	14.8	6.8	5.9	1.1	2.6	19.9	12.1	36.4	
16-Aug	5.0	1.2	1.0	1.0	Z	1.7	1.1	1.6	1.7	6.7	7.8	2.9	1.7	2.8	1.2	0.6	1.6	1.6	0.3	0.3	0.3	0.3	4.0	2.5	2.1	7.8	
17-Aug	5.7	9.6	1.5	0.2	0.2	Z	1.2	9.8	M	3.4	1.9	4.1	17.3	16.1	8.9	17.6	3.1	0.7	1.3	3.3	1.8	1.4	0.6	1.5	5.1	17.6	
18-Aug	Z	19.5	19.2	15.2	13.0	4.7	2.5	3.6	4.6	2.3	0.7	1.0	2.2	1.5	0.7	1.5	2.3	1.5	0.7	0.5	1.0	1.5	0.3	0.1	4.4	19.5	
19-Aug	0.2	Z	5.0	10.2	13.5	8.4	24.9	13.6	7.3	1.3	2.0	0.3	0.4	0.8	0.5	0.5	5.1	5.9	12.8	14.3	5.0	16.5	22.5	11.2	7.9	24.9	
20-Aug	4.9	7.1	Z	0.4	0.5	1.4	1.4	1.8	4.4	13.6	65.0	55.5	32.1	19.1	17.1	18.4	12.2	9.6	10.5	18.6	22.8	8.9	3.3	30.1	15.6	65.0	
21-Aug	50.5	41.8	14.9	Z	2.3	3.3	6.8	2.2	6.2	6.5	6.7	2.2	2.2	1.7	1.6	1.7	5.1	4.5	4.1	106.5	73.8	27.7	38.1	97.4	22.1	106.5	
22-Aug	282.3	83.3	150.3	79.1	Z	9.5	11.2	15.2	18.1	26.1	15.3	19.4	7.1	4.4	4.2	4.5	6.6	5.2	1.6	82.9	145.6	87.0	122.8	180.5	59.2	282.3	
23-Aug	6.7	8.1	8.9	3.2	8.7	Z	26.6	14.0	6.6	3.6	3.8	6.7	9.7	5.3	5.1	2.5	2.0	4.9	7.2	4.9	7.7	5.8	13.2	13.2	7.8	26.6	
24-Aug	Z	10.9	9.4	9.5	6.9	4.8	2.1	8.0	5.3	4.4	1.1	1.0	0.6	0.2	0.3	0.0	0.1	0.0	0.5	0.1	7.5	28.0	1.4	0.2	4.5	28.0	
25-Aug	35.1	Z	35.7	37.3	7.5	0.7	24.9	28.6	12.9	1.1	4.3	4.1	1.5	1.3	1.2	0.9	0.8	1.2	5.7	4.5	2.9	4.4	9.3	9.6	10.2	37.3	
26-Aug	3.2	5.4	Z	1.3	2.1	1.0	0.7	0.6	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	5.4
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	2.3	3.7	1.9	1.1	1.1	1.0	0.9	0.8	1.4	1.5	1.1	1.2	2.8	--	3.7	
28-Aug	1.1	1.0	2.8	2.8	Z	5.7	5.0	8.6	13.9	17.7	10.4	5.0	12.7	16.9	16.5	35.2	38.9	31.5	20.6	24.9	94.1	17.3	10.6	12.2	17.6	94.1	
29-Aug	11.8	10.5	9.6	8.7	8.9	Z	13.8	13.6	11.2	11.9	11.5	6.7	6.3	4.6	3.8	3.9	4.7	3.0	2.4	3.1	2.4	3.6	10.4	10.1	7.7	13.8	
30-Aug	Z	22.1	53.4	29.8	20.8	19.8	29.1	67.5	39.4	5.9	3.5	11.4	15.4	7.5	6.1	6.3	6.1	3.6	12.0	13.1	3.9	9.3	31.6	11.9	18.7	67.5	
31-Aug	87.6	Z	91.9	59.7	92.0	52.6	10.0	10.0	54.8	122.3	98.2	57.4	71.1	60.7	13.6	4.6	3.6	5.0	6.8	31.1	18.2	8.9	1.8	0.7	41.9	122.3	

29.8	16.7	26.2	20.8	18.6	11.3	15.8	18.0	18.1	16.0	14.4	10.3	9.9	8.3	6.6	6.3	5.9	5.3	6.2	14.7	19.7	16.4	21.7	23.4	Diurnal Average	
282.3	83.3	150.3	79.1	94.3	52.6	91.9	84.6	54.8	122.3	98.2	57.4	71.1	60.7	31.0	35.2	38.9	31.5	21.3	106.5	145.6	87.0	122.8	180.5	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance DF - DAS Failure PF - Power Failure





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	542	79.59	79.59
21 - 40	85	12.48	92.07
41 - 80	35	5.14	97.21
81 - 159	17	2.50	99.71
> 159	2	0.29	100.00

Total Number of Valid Hours: 681

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Fort Hills - August 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	53	30	5	5	8	12	33	63	87	81	35	16	27	21	15	50	541
21 - 40	14	13	1	1	0	2	16	12	5	3	8	1	4	1	1	3	85
11 - 80	6	2	1	1	0	0	3	6	2	0	5	7	1	0	1	0	35
81 - 159	4	0	1	0	1	0	1	3	3	2	0	0	0	1	1	0	17
> 159	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2
Totals	77	45	8	7	9	14	53	85	97	86	48	24	32	24	18	53	680

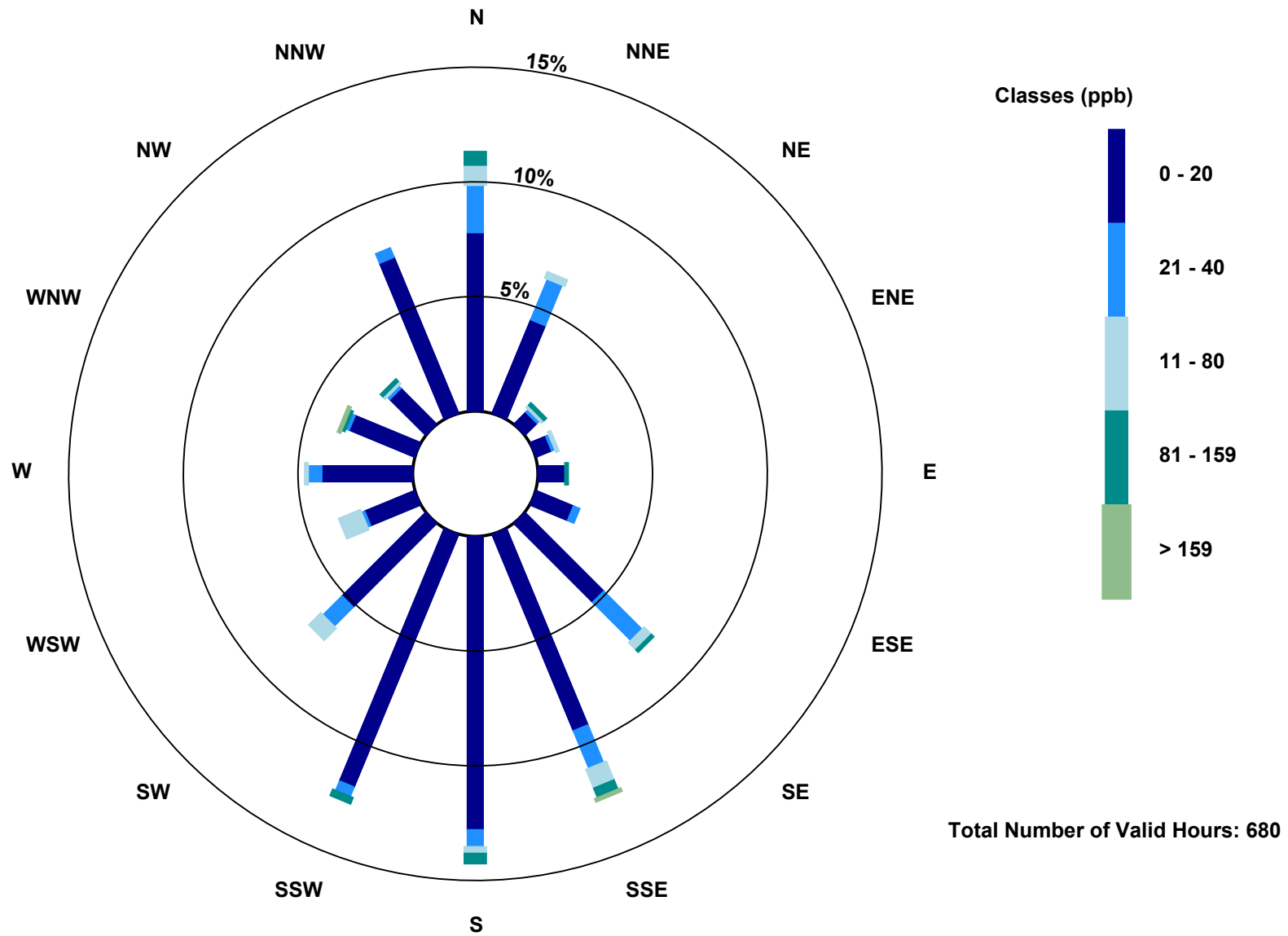
Total Number of Valid Hours: 680

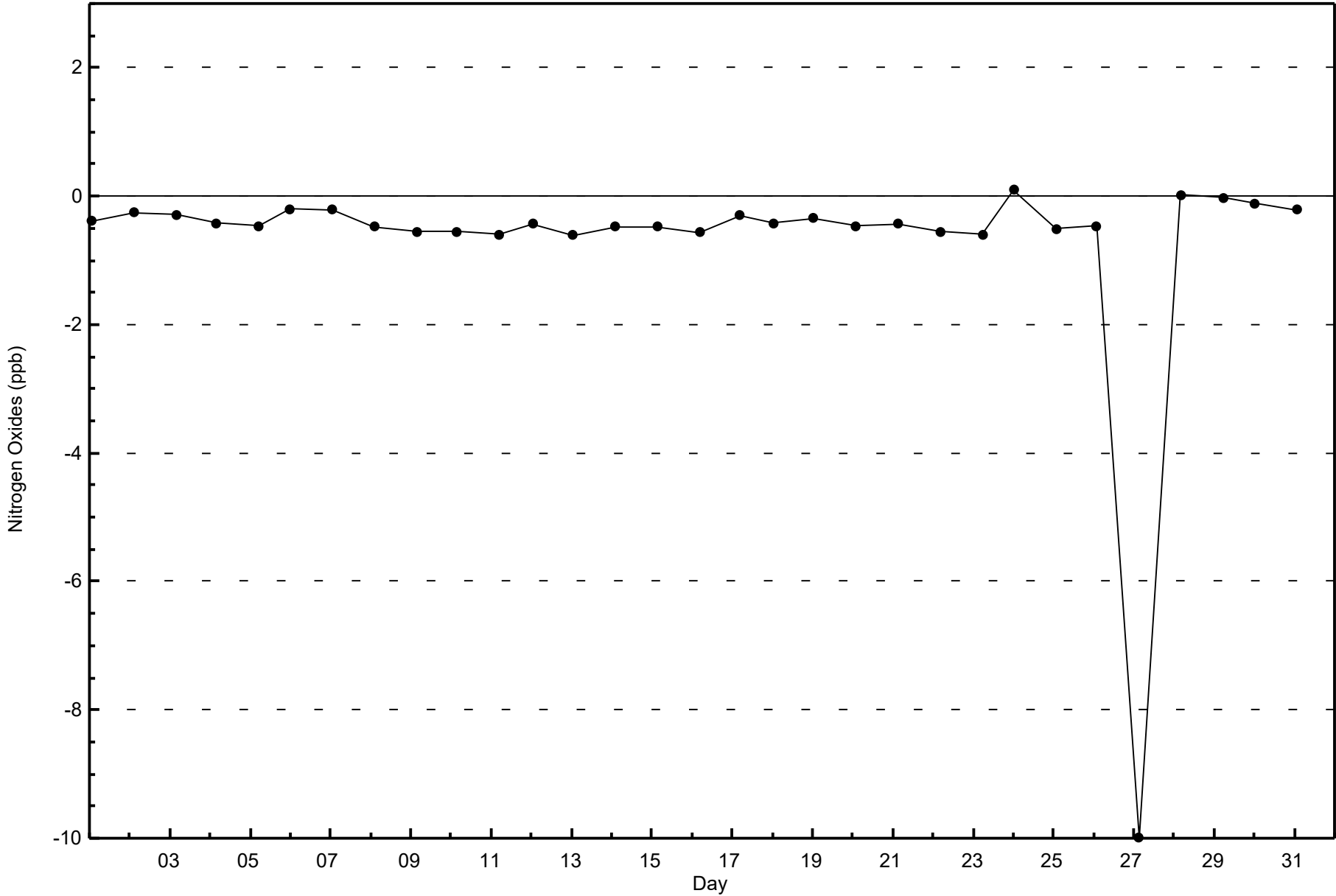
Total Number of Hours: 744

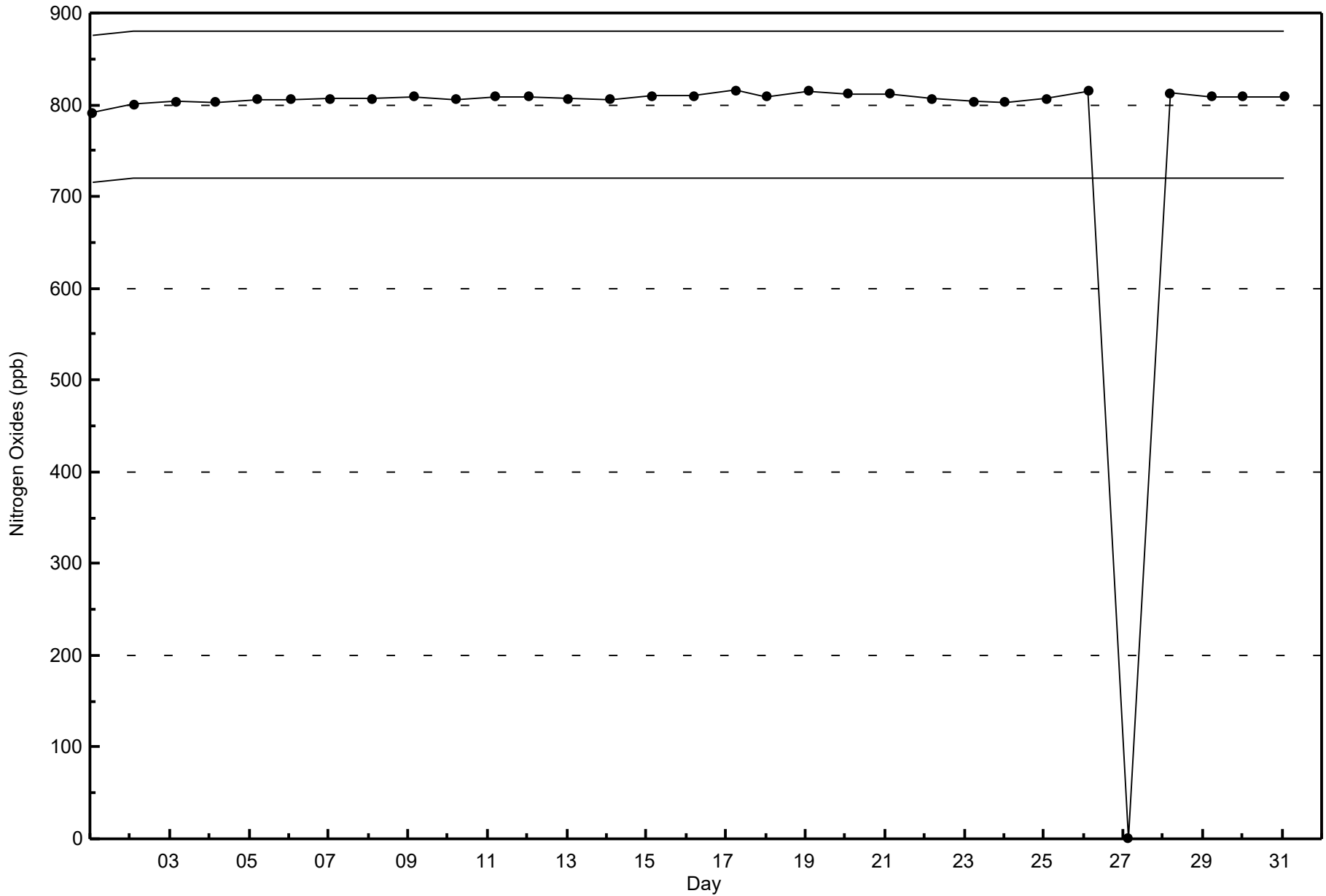


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Fort Hills









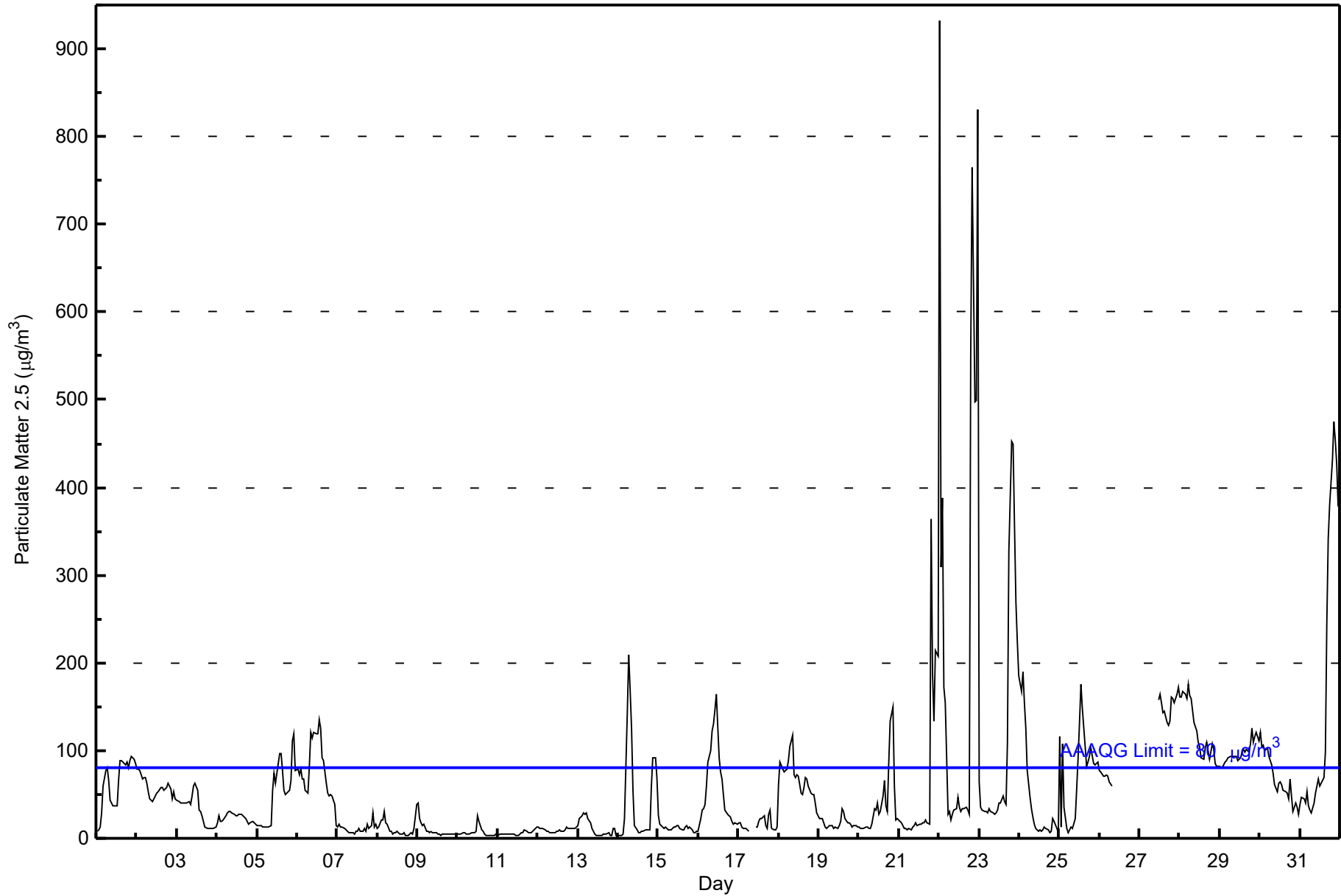
Wood Buffalo Environmental Association

Summary of Hour Averages

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

Fort Hills - August 2023

Number of Exceedences (AAAQO):		1-hr: 164	24-hr: 18	Hours in Service:		744																					
Maximum Value: 932.3 µg/m ³ on Aug 22 01:00		Maximum Daily Average: 230.9 µg/m ³ on Aug 22		Hours of Data:		714																					
Minimum Value: 2.8 µg/m ³ on Aug 14 01:00		Minimum Daily Average: 5.9 µg/m ³ on Aug 11		Hours of Missing Data:		30																					
Maximum Diurnal Average: 101.0 µg/m ³ at hour 21		Minimum Diurnal Average: 40.5 µg/m ³ at hour 10		Hours of Calibration:		3																					
Monthly Average: 57.66 µg/m ³		Percentiles: P ₁ = 3.4 P ₁₀ = 6.1 Q ₁ = 11.2 Median = 28.4 Q ₃ = 76.3 P ₉₀ = 124.2 P ₉₉ = 454.2		Percent Operational Time:		96.4																					
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-Aug	8.4	9.2	13.4	28.7	59.1	77.4	79.7	66.5	43.9	41.0	36.5	37.1	37.8	66.2	89.4	89.2	85.1	83.2	86.9	80.5	87.8	93.5	89.8	84.8	61.5	93.5	
2-Aug	79.0	78.8	76.7	67.8	69.8	68.8	62.4	53.8	44.8	42.5	44.6	48.0	51.2	53.8	58.6	58.4	55.1	56.9	58.5	63.2	55.9	45.7	53.1	45.7	58.0	79.0	
3-Aug	43.0	41.2	40.1	40.4	40.7	39.8	40.4	41.8	38.9	48.0	59.8	62.3	54.6	33.0	31.2	26.2	18.9	12.3	11.2	10.5	11.3	11.4	11.7	13.6	32.6	62.3	
4-Aug	18.4	25.8	18.9	18.8	21.2	25.0	29.1	30.7	31.3	29.4	27.9	25.4	25.5	27.8	27.2	27.5	23.9	22.8	19.0	16.5	17.1	18.8	16.9	15.5	23.3	31.3	
5-Aug	14.5	14.0	13.9	13.3	12.6	12.3	12.3	12.4	13.9	54.1	73.9	62.8	73.4	96.7	96.6	77.1	55.4	49.3	51.4	55.5	65.6	110.5	118.7	76.6	51.5	118.7	
6-Aug	79.5	72.1	79.6	68.4	68.2	55.5	51.7	82.3	120.0	115.1	121.4	118.7	119.8	135.3	125.8	91.5	88.5	62.8	52.1	48.9	50.1	48.0	39.0	14.0	79.5	135.3	
7-Aug	12.1	16.5	13.3	12.2	11.6	9.2	7.6	6.4	6.4	6.0	5.6	7.4	8.4	11.9	8.4	7.5	11.8	8.5	15.4	11.4	14.8	29.3	13.6	16.2	11.3	29.3	
8-Aug	12.0	13.6	20.1	20.3	30.1	18.0	16.1	8.2	7.3	4.5	6.4	6.8	8.7	5.4	4.5	4.5	6.7	3.4	3.4	4.4	6.1	5.0	11.6	38.7	11.1	38.7	
9-Aug	39.9	23.0	17.7	14.2	15.9	8.2	7.4	6.7	7.3	7.0	7.0	6.1	5.0	4.2	3.6	4.5	5.3	5.2	5.0	4.9	5.0	5.0	5.0	5.1	9.1	39.9	
10-Aug	4.9	5.0	5.5	6.0	5.9	5.0	4.9	5.1	5.9	6.3	6.3	7.8	25.3	19.4	10.1	7.4	5.5	3.7	3.7	4.0	4.0	3.8	4.0	4.3	6.8	25.3	
11-Aug	3.9	4.2	4.2	4.2	4.4	4.1	4.8	4.2	4.3	5.0	4.5	3.6	3.4	4.9	6.2	6.5	9.3	8.7	7.0	5.8	6.2	8.0	10.1	13.3	5.9	13.3	
12-Aug	13.4	11.3	11.2	10.7	9.3	8.6	7.6	6.9	6.3	6.4	6.7	7.9	8.2	9.2	8.7	8.4	9.7	12.2	11.2	11.3	10.5	10.6	10.5	12.4	9.6	13.4	
13-Aug	15.1	22.1	26.3	28.4	27.9	28.3	21.9	18.2	11.6	7.3	4.2	3.6	3.4	3.5	3.6	4.3	4.4	4.3	5.8	3.2	2.8	11.0	10.6	3.8	11.5	28.4	
14-Aug	2.8	3.3	3.3	5.4	23.3	144.1	209.4	169.8	126.1	54.5	14.9	10.2	6.7	6.5	7.9	8.6	10.1	10.1	10.0	9.5	57.7	92.0	91.5	67.5	47.7	209.4	
15-Aug	25.5	15.5	14.9	11.4	12.7	10.8	10.3	9.8	10.4	13.4	13.2	15.1	14.0	11.5	10.4	10.3	12.5	14.8	12.0	13.3	8.9	7.1	7.2	7.4	12.2	25.5	
16-Aug	8.5	22.1	31.6	34.2	38.2	58.9	87.1	99.2	122.6	131.1	146.4	164.8	91.7	76.3	67.9	50.0	32.4	27.0	25.7	23.6	19.8	16.9	17.4	15.7	58.7	164.8	
17-Aug	17.1	18.0	13.7	12.0	10.5	8.9	8.6	C	C	C	13.3	13.2	20.1	22.3	21.9	25.4	14.1	10.8	27.6	32.3	11.3	9.1	10.2	12.8	15.9	32.3	
18-Aug	61.4	86.7	79.3	76.1	77.3	78.7	88.7	104.8	118.2	72.6	68.9	73.0	70.7	52.0	50.3	58.6	69.8	67.9	60.3	51.5	50.1	49.9	39.8	28.5	68.1	118.2	
19-Aug	22.5	23.0	23.2	17.6	13.3	11.7	15.0	14.5	13.9	11.5	12.5	11.9	14.2	19.6	34.6	30.7	23.0	18.3	17.2	16.8	12.8	13.9	14.2	13.3	17.5	34.6	
20-Aug	12.3	11.8	11.6	11.1	13.0	13.3	11.0	10.7	16.6	33.9	31.5	39.5	27.2	30.0	48.7	65.3	37.0	30.8	84.9	133.6	149.8	59.3	20.3	22.1	38.6	149.8	
21-Aug	21.6	17.7	14.1	11.3	10.7	10.4	11.4	10.4	12.2	14.3	16.9	14.7	16.8	16.8	18.3	17.2	20.8	17.0	16.8	363.7	187.2	134.2	214.4	207.8	58.2	363.7	
22-Aug	932.3	308.4	388.4	172.0	155.2	26.9	30.9	20.9	27.4	32.1	34.6	46.2	35.4	31.0	33.5	34.6	35.0	32.5	27.1	545.1	765.0	497.5	499.2	831.1	230.9	932.3	
23-Aug	64.2	35.5	32.8	30.2	30.0	28.6	33.9	29.9	28.6	28.0	28.3	31.9	40.2	39.5	47.6	41.2	39.1	109.6	326.3	452.6	449.1	356.1	269.1	224.2	116.5	452.6	
24-Aug	184.8	168.2	189.3	155.1	124.9	77.9	46.3	34.5	24.4	16.2	10.7	7.4	9.4	8.7	9.6	12.4	10.7	10.2	5.8	7.7	21.9	19.9	11.0	6.8	48.9	189.3	
25-Aug	116.3	12.4	108.7	34.9	10.7	6.3	9.0	13.1	10.7	22.1	56.4	92.1	131.9	174.9	148.9	105.2	82.8	86.2	93.2	103.6	84.9	84.4	85.3	86.3	73.3	174.9	
26-Aug	78.1	75.5	71.0	71.3	72.0	70.5	64.0	59.4	DF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	--	78.1
27-Aug	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	PF	M	158.5	163.9	154.9	143.4	145.3	131.6	128.6	133.3	160.8	158.8	154.6	163.8	171.9	--	171.9
28-Aug	160.7	161.2	166.7	163.9	159.3	175.8	163.2	159.5	132.5	126.8	122.7	108.9	104.0	92.6	90.1	103.1	109.0	99.2	90.6	108.5	101.6	85.5	81.8	81.4	122.9	175.8	
29-Aug	82.2	80.6	83.1	86.3	88.3	91.1	93.0	92.7	93.3	93.5	92.9	88.8	91.5	97.7	101.2	98.8	101.3	97.9	108.0	126.0	110.0	115.7	121.0	111.3	97.8	126.0	
30-Aug	121.5	104.1	105.8	99.8	102.6	94.0	87.8	83.0	74.1	60.9	53.9	62.2	63.7	60.7	55.4	53.5	52.1	44.9	67.8	48.6	30.2	40.4	34.6	26.9	67.9	121.5	
31-Aug	38.9	47.2	44.9	40.3	52.8	37.6	31.4	29.2	39.5	51.4	59.5	67.0	58.9	66.4	69.2	97.4	245.2	341.0	380.6	431.3	475.4	454.5	426.4	377.9	165.2	475.4	
76.5 50.9 57.4 45.6 45.7 43.5 44.9 44.3 42.6 40.5 40.7 46.8 46.2 47.8 47.8 45.7 46.9 49.3 60.6 98.3 101.0 86.4 83.4 87.9																								Diurnal Average			
932.3 308.4 388.4 172.0 159.3 175.8 209.4 169.8 132.5 131.1 146.4 164.8 163.9 174.9 148.9 145.3 245.2 341.0 380.6 545.1 765.0 497.5 499.2 831.1																								Diurnal Maximum			
C - Calibration		M - Maintenance		DF - DAS Failure		PF - Power Failure																					
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 Hills - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	63	8.82	8.82
6 - 15	203	28.43	37.25
16 - 25	71	9.94	47.20
26 - 80	213	29.83	77.03
> 81.0	164	22.97	100.00

Total Number of Valid Hours: 714

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Particulate Matter 2.5 (PM_{2.5}) - μg/m³
Fort Hills - August 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	6	5	2	2	2	8	15	3	2	5	7	3	1	0	0	2	63
6 - 15	14	19	1	1	5	5	15	33	27	25	17	4	11	3	3	19	202
16 - 25	6	3	1	1	0	0	2	8	13	13	6	3	7	4	1	3	71
26 - 80	30	10	2	3	2	1	13	15	22	26	19	13	10	11	13	23	213
> 81.0	25	9	2	0	0	0	10	33	37	19	2	4	4	8	3	8	164
Totals	81	46	8	7	9	14	55	92	101	88	51	27	33	26	20	55	713

Total Number of Valid Hours: 713

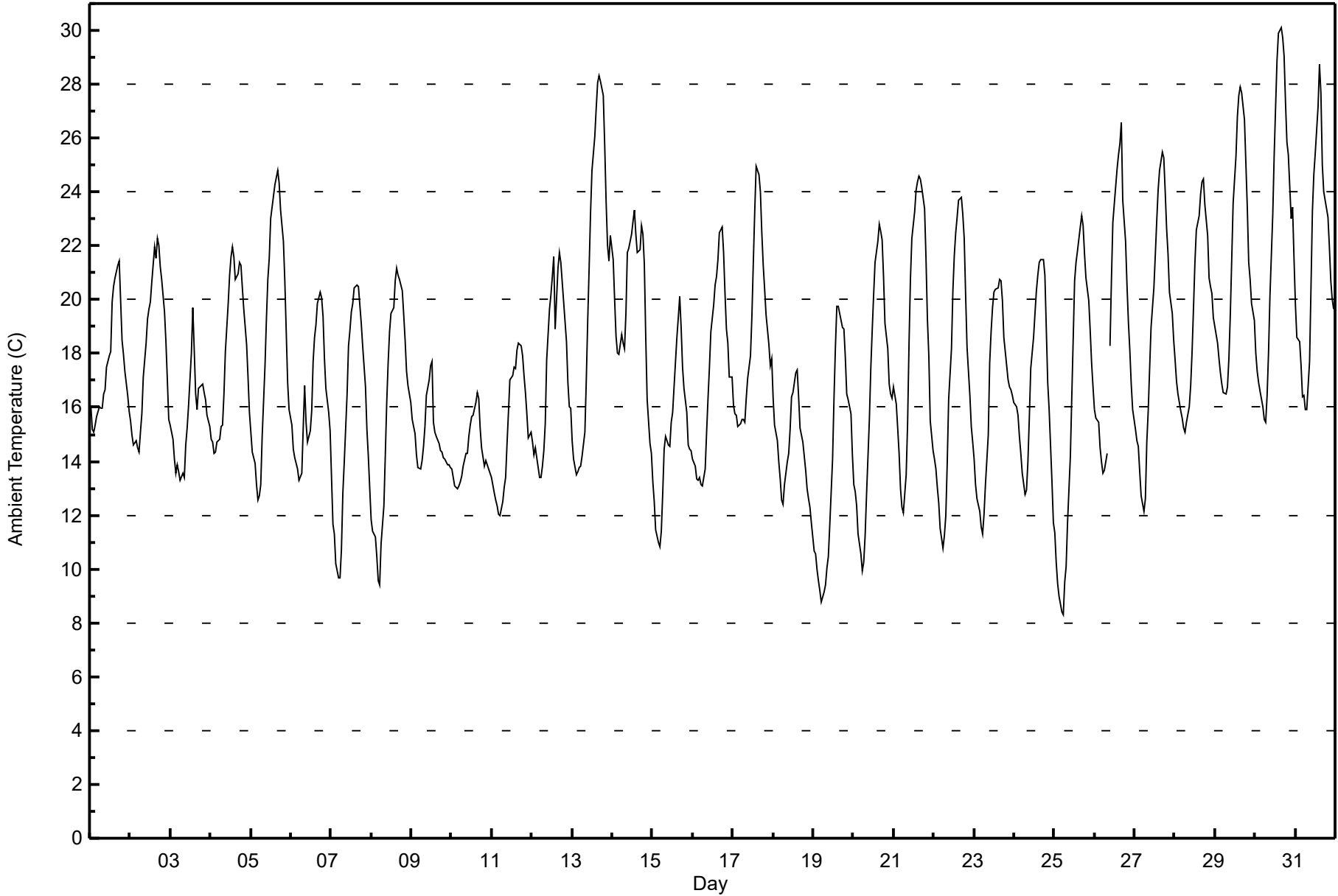
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Maximum Value: 30.1 C on Aug 30 16:00 Minimum Value: 8.3 C on Aug 25 06:00 Maximum Diurnal Average: 22.1 C at hour 17 Monthly Average: 17.52 C		Maximum Daily Average: 22.5 C on Aug 30 Minimum Daily Average: 14.0 C on Aug 19 Minimum Diurnal Average: 13.1 C at hour 6 Percentiles: P ₁ = 9.4 P ₁₀ = 12.8 Q ₁ = 14.4 Median = 16.8 Q ₃ = 20.5 P ₉₀ = 23.2 P ₉₉ = 28.1		Hours in Service: 744 Hours of Data: 743 Hours of Missing Data: 1 Hours of Calibration: 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-Aug	16.0	15.2	15.1	15.3	15.7	16.0	16.0	16.0	16.5	16.6	17.5	17.9	18.1	19.9	20.5	20.8	21.3	21.5	19.9	18.5	18.0	17.3	16.4	15.9	17.6	21.5																						
2-Aug	15.5	15.0	14.6	14.7	14.5	14.3	15.1	15.8	17.1	18.4	19.3	19.7	19.9	20.6	21.9	21.5	22.3	22.0	21.2	20.7	19.5	18.4	17.0	15.5	18.1	22.3																						
3-Aug	15.4	14.8	14.1	13.6	13.9	13.6	13.3	13.5	13.4	14.6	15.2	16.1	18.0	19.7	18.1	16.5	15.9	16.7	16.8	16.8	16.5	16.3	15.7	15.3	15.6	19.7																						
4-Aug	14.8	14.7	14.3	14.3	14.7	14.8	15.3	15.4	16.5	18.1	19.9	20.9	21.6	22.0	21.6	20.8	21.0	21.4	21.3	20.5	19.7	18.3	17.1	15.8	18.1	22.0																						
5-Aug	15.1	14.3	13.9	13.1	12.6	12.7	13.1	14.9	17.5	19.3	20.7	21.6	23.0	23.8	24.3	24.5	24.8	24.3	23.3	22.2	20.7	18.8	16.9	15.9	18.8	24.8																						
6-Aug	15.4	14.4	14.1	13.9	13.7	13.3	13.5	15.2	16.8	15.4	14.7	15.1	15.9	17.7	18.6	19.1	19.9	20.3	20.1	19.4	17.8	16.7	15.8	15.1	16.3	20.3																						
7-Aug	13.4	11.7	11.3	10.2	9.7	9.7	10.7	12.8	14.0	16.5	18.3	18.9	19.5	19.9	20.4	20.6	20.5	19.8	19.1	18.3	16.7	15.2	14.2	13.0	15.6	20.6																						
8-Aug	11.8	11.4	11.2	10.5	9.6	9.4	10.9	12.4	14.3	16.2	17.7	18.8	19.5	19.7	20.7	21.2	20.9	20.7	20.3	19.4	18.5	17.3	16.8	16.2	16.1	21.2																						
9-Aug	15.5	15.3	15.0	14.2	13.8	13.7	14.1	14.5	15.3	16.5	17.0	17.6	17.7	15.4	15.1	14.9	14.7	14.4	14.3	14.1	14.1	13.9	13.8	13.8	14.9	17.7																						
10-Aug	13.7	13.4	13.1	13.0	13.1	13.3	13.5	13.8	14.3	14.3	14.9	15.4	15.6	15.7	16.2	16.5	16.4	15.2	14.5	13.8	14.0	13.9	13.7	13.6	14.4	16.5																						
11-Aug	13.4	12.8	12.6	12.4	12.1	12.0	12.5	13.0	13.4	14.7	15.8	17.0	17.2	17.5	17.5	18.1	18.4	18.3	17.9	17.2	16.5	15.8	14.9	15.1	15.2	18.4																						
12-Aug	14.7	14.2	14.5	14.1	13.4	13.4	13.8	14.4	15.4	17.8	19.6	20.2	20.8	21.6	18.9	21.2	21.8	21.4	20.7	19.9	18.4	16.9	16.0	16.0	17.5	21.8																						
13-Aug	14.8	14.1	13.5	13.6	13.8	13.8	14.2	15.1	17.0	19.3	21.2	23.2	24.8	26.1	27.1	28.0	28.3	28.1	27.6	25.7	23.6	22.0	21.4	22.4	20.8	28.3																						
14-Aug	21.5	20.0	18.7	18.0	18.0	18.7	18.4	18.2	19.5	21.8	21.9	22.4	22.9	23.3	22.4	21.7	21.9	22.8	22.4	21.3	18.6	16.3	14.7	14.3	20.0	23.3																						
15-Aug	13.2	12.5	11.5	11.0	10.8	11.4	12.8	14.5	14.9	14.6	14.5	15.5	15.8	16.8	18.6	19.3	20.1	19.0	17.5	16.7	15.8	14.6	14.4	14.4	15.0	20.1																						
16-Aug	14.1	13.8	13.3	13.3	13.4	13.1	13.1	13.7	15.1	16.4	17.5	18.8	19.8	20.5	20.9	21.5	22.5	22.7	21.8	20.2	18.9	18.4	17.1	17.1	17.4	22.7																						
17-Aug	16.1	15.8	15.7	15.3	15.4	15.5	15.5	15.4	16.3	17.1	17.9	19.4	21.4	23.3	25.0	24.7	24.0	22.5	21.3	20.4	19.4	18.3	17.5	17.8	18.8	25.0																						
18-Aug	16.3	15.3	14.8	14.0	13.3	12.5	12.4	13.1	14.0	14.3	15.2	16.4	16.5	17.3	17.4	16.4	15.2	15.0	14.7	13.6	13.0	12.6	12.3	11.7	14.5	17.4																						
19-Aug	10.7	10.5	10.0	9.6	9.2	8.8	9.2	9.4	10.1	10.4	11.6	14.1	16.4	18.2	19.8	19.7	19.5	19.0	18.9	17.9	16.5	16.3	15.8	14.2	14.0	19.8																						
20-Aug	13.1	12.9	12.3	11.3	10.6	9.9	10.3	11.3	12.8	15.5	17.4	18.8	20.2	21.4	22.2	22.8	22.6	22.2	20.8	19.1	18.2	16.8	16.5	16.3	16.5	22.8																						
21-Aug	16.7	16.1	15.2	14.3	13.0	12.3	12.1	13.5	15.4	18.3	20.8	22.3	23.3	24.1	24.4	24.6	24.5	24.2	23.4	21.5	19.3	17.9	15.5	14.4	18.6	24.6																						
22-Aug	14.1	13.7	13.0	12.5	11.5	10.8	11.2	12.0	13.9	16.3	18.2	20.3	21.7	22.5	23.1	23.7	23.8	23.2	22.3	20.2	18.3	16.4	15.3	14.7	17.2	23.8																						
23-Aug	14.1	13.1	12.6	12.2	11.5	11.3	12.0	13.1	15.0	17.7	18.8	19.7	20.3	20.4	20.4	20.8	20.7	20.0	18.6	17.5	17.0	16.8	16.7	16.4	16.5	20.8																						
24-Aug	16.2	16.0	15.7	14.9	14.3	13.6	12.8	12.9	14.0	15.6	17.4	18.6	19.5	20.3	20.9	21.4	21.5	21.5	20.9	18.9	16.9	15.9	13.2	11.7	16.9	21.5																						
25-Aug	11.3	10.3	9.5	9.0	8.4	8.3	9.5	10.1	11.7	14.2	16.4	18.5	20.7	21.4	21.8	22.7	23.1	22.7	21.7	20.8	20.0	18.9	17.6	16.8	16.1	23.1																						
26-Aug	15.9	15.6	15.5	14.5	14.0	13.6	13.6	14.3	DF	18.3	20.7	22.9	23.6	24.8	25.4	25.8	26.6	23.7	22.2	20.5	19.2	18.1	16.9	15.9	19.2	26.6																						
27-Aug	15.2	14.8	14.6	13.6	12.7	12.1	12.6	14.7	15.9	17.5	19.0	20.4	21.7	22.9	24.1	24.8	25.5	25.3	24.0	22.6	21.7	20.3	19.5	18.5	18.9	25.5																						
28-Aug	17.8	17.0	16.5	15.9	15.6	15.2	15.1	15.5	16.0	16.8	18.1	19.7	21.4	22.6	23.1	23.9	24.4	24.5	23.5	22.4	20.8	20.5	20.2	19.4	19.4	24.5																						
29-Aug	19.0	18.4	17.8	17.3	16.9	16.6	16.5	16.8	17.8	19.4	21.5	23.6	25.3	26.8	27.6	27.9	27.7	26.7	25.0	23.4	21.4	20.7	19.9	19.2	21.4	27.9																						
30-Aug	18.0	17.4	16.9	16.6	16.0	15.5	15.5	16.5	18.0	20.1	23.2	25.4	27.2	28.9	29.9	30.1	29.7	29.0	27.3	25.8	25.4	23.0	23.4	21.6	22.5	30.1																						
31-Aug	19.8	18.6	18.4	17.5	16.4	16.5	15.9	15.9	17.7	20.5	23.3	24.7	25.4	27.2	28.8	27.7	25.0	24.0	23.7	23.1	22.0	20.7	20.0	19.6	21.3	28.8																						
																								15.2	14.6	14.2	13.7	13.3	13.1	13.4	14.1	15.3	16.8	18.2	19.5	20.5	21.4	21.8	22.0	22.1	21.7	20.9	19.8	18.6	17.5	16.7	16.1	Diurnal Average
																								21.5	20.0	18.7	18.0	18.0	18.7	18.4	18.2	19.5	21.8	23.3	25.4	27.2	28.9	29.9	30.1	29.7	29.0	27.6	25.8	25.4	23.0	23.4	22.4	Diurnal Maximum
DF - DAS Failure																																																





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	16	2.15	2.15
10 - 20	520	69.99	72.14
> 20	207	27.86	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

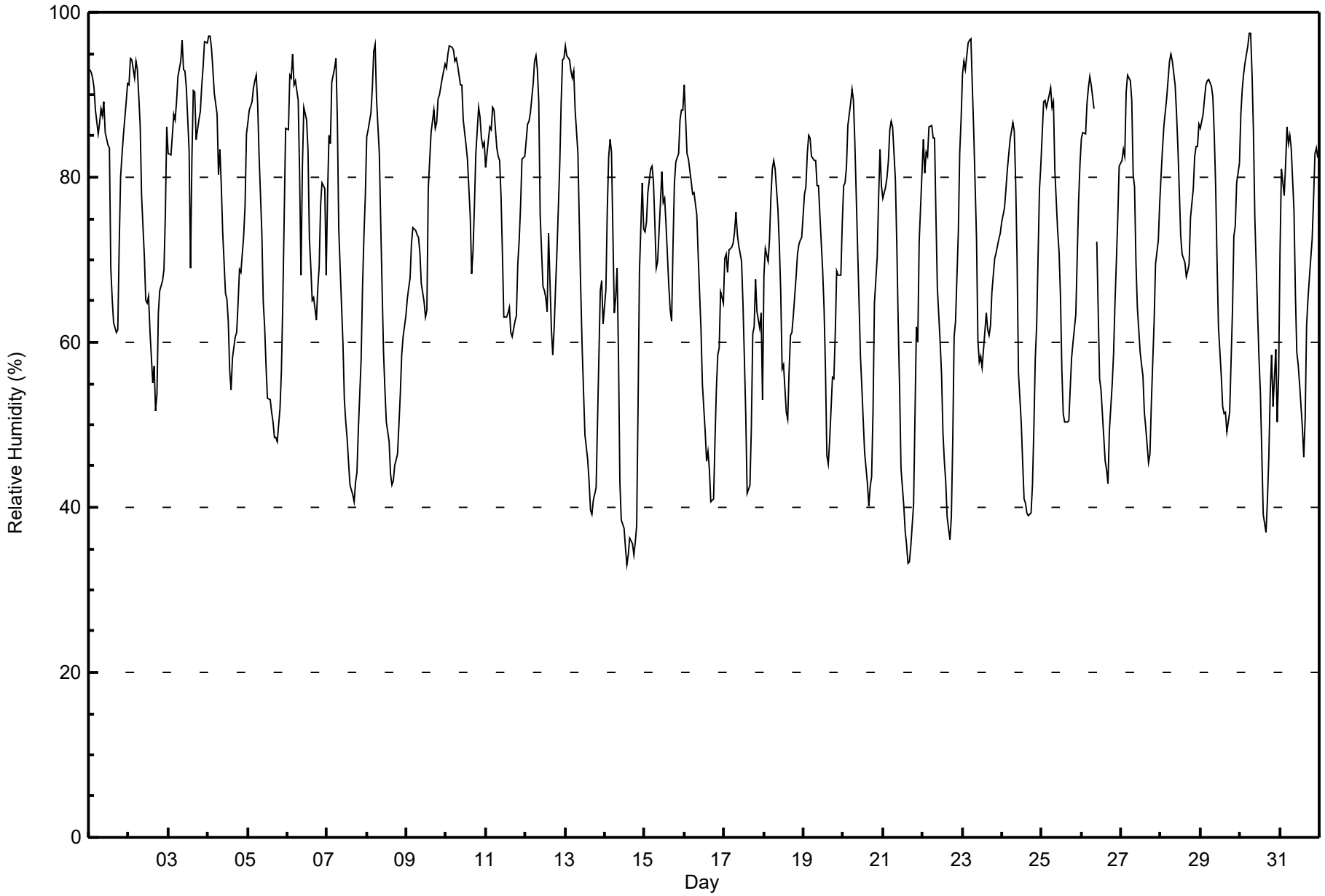
Relative Humidity (RH) - %
Fort Hills - August 2023

Maximum Value: 97.5 % on Aug 30 07:00		Maximum Daily Average: 88.6 % on Aug 3																				Hours in Service: 744																										
Minimum Value: 33.0 % on Aug 14 14:00		Minimum Daily Average: 55.2 % on Aug 14																				Hours of Data: 743																										
Maximum Diurnal Average: 88.0 % at hour 5		Minimum Diurnal Average: 52.8 % at hour 16																				Hours of Missing Data: 1																										
Monthly Average: 71.49 %		Percentiles: P ₁ = 35.4 P ₁₀ = 48.0 Q ₁ = 59.7 Median = 73.0 Q ₃ = 85.3 P ₉₀ = 91.4 P ₉₉ = 96.3																				Hours of Calibration: 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-Aug	93.0	92.7	92.0	90.9	88.2	85.2	86.7	88.2	87.5	89.2	85.5	83.9	83.5	69.0	65.2	62.4	61.1	61.5	71.7	80.0	82.8	85.0	89.1	91.4	81.9	93.0																						
2-Aug	91.2	94.4	94.2	92.1	94.0	93.0	89.8	86.2	77.8	70.3	65.0	64.8	65.5	61.4	55.1	57.2	51.6	53.8	63.6	66.3	67.5	68.8	75.3	86.1	74.4	94.4																						
3-Aug	82.9	82.7	85.1	87.6	86.9	89.2	92.2	94.0	96.7	93.0	92.9	90.8	83.3	69.0	82.3	90.5	90.4	84.7	86.9	87.9	91.0	93.4	96.4	96.2	88.6	96.7																						
4-Aug	97.2	97.1	95.6	93.0	90.2	87.7	80.3	83.5	79.1	73.3	66.0	65.2	62.5	56.6	54.3	58.2	60.7	61.3	64.8	68.8	68.4	72.9	76.5	85.2	74.9	97.2																						
5-Aug	86.5	88.2	89.2	90.9	91.6	92.4	89.0	82.8	73.2	65.0	61.9	57.2	53.2	53.1	51.5	50.3	48.5	48.5	48.0	52.0	56.6	65.0	75.4	86.0	69.0	92.4																						
6-Aug	85.8	92.3	92.1	94.9	91.1	91.6	89.4	80.3	68.2	81.4	88.5	87.0	83.2	72.6	69.2	65.0	65.4	62.7	66.6	69.2	76.5	79.4	78.6	68.2	79.1	94.9																						
7-Aug	77.9	85.1	84.1	91.6	93.2	94.3	86.8	73.8	69.0	59.8	53.1	50.3	48.4	45.5	42.8	41.5	40.8	43.1	44.3	49.4	57.9	66.8	72.9	77.9	64.6	94.3																						
8-Aug	85.0	85.7	87.9	90.9	95.2	96.2	89.4	82.9	74.5	66.4	58.7	54.2	50.4	48.0	44.1	42.7	43.2	45.1	46.4	50.0	53.8	58.4	60.7	63.2	65.5	96.2																						
9-Aug	65.2	66.6	67.8	72.0	73.8	73.6	73.0	72.8	70.8	67.1	65.0	63.1	63.9	78.6	82.0	85.4	88.1	86.0	86.6	89.6	90.0	92.1	92.9	93.7	77.5	93.7																						
10-Aug	93.2	95.0	96.0	95.7	95.5	94.0	94.5	93.5	91.2	91.2	86.9	85.4	83.9	82.2	75.2	68.3	71.0	76.7	82.9	88.5	87.3	84.8	83.8	84.3	86.7	96.0																						
11-Aug	81.1	84.6	86.2	85.8	88.4	88.1	83.6	82.6	82.0	77.8	70.9	63.1	63.0	63.5	64.2	61.1	60.7	62.6	63.3	69.5	72.4	76.7	82.3	82.6	74.8	88.4																						
12-Aug	84.5	86.5	86.7	87.7	91.3	94.0	94.8	93.1	89.2	75.4	66.8	66.3	65.4	63.8	73.3	61.7	58.5	61.7	66.7	71.0	81.5	89.0	94.2	94.4	79.1	94.8																						
13-Aug	96.0	94.8	94.2	92.8	92.0	92.8	88.2	83.0	74.4	66.4	59.6	54.0	48.9	45.7	43.1	39.6	39.2	40.8	42.3	50.3	58.3	66.2	67.5	62.2	66.3	96.0																						
14-Aug	66.4	76.2	82.5	84.6	83.1	63.6	65.5	69.0	58.5	43.0	38.5	37.5	35.1	33.0	34.2	36.2	35.6	34.2	35.7	37.8	52.4	68.6	79.3	73.7	55.2	84.6																						
15-Aug	73.5	74.5	78.2	81.1	81.3	79.4	74.5	69.1	69.8	77.0	80.6	77.0	77.4	74.2	66.7	63.9	62.6	71.8	79.3	81.9	82.9	87.0	88.2	88.2	76.7	88.2																						
16-Aug	91.2	82.9	82.2	80.8	79.5	78.0	78.1	75.4	70.5	65.9	61.5	55.0	49.1	45.6	46.8	44.6	40.6	41.1	48.1	54.4	58.4	59.3	66.2	64.8	63.3	91.2																						
17-Aug	70.2	70.6	68.5	71.2	71.6	72.1	73.3	75.8	73.1	71.7	69.8	64.7	58.2	51.3	41.6	42.6	49.6	61.1	61.8	67.5	63.8	61.7	63.6	53.1	63.7	75.8																						
18-Aug	68.2	71.4	69.8	72.6	77.6	81.1	82.1	81.0	76.2	71.9	66.0	56.9	57.3	51.6	50.6	56.6	60.9	61.3	63.2	67.9	70.6	71.9	72.4	72.7	68.0	82.1																						
19-Aug	78.0	78.8	82.9	85.1	84.8	82.5	82.1	82.0	79.0	79.0	75.4	68.7	64.0	56.5	46.2	45.2	48.2	55.8	55.7	61.0	68.6	68.1	68.1	74.4	69.6	85.1																						
20-Aug	79.0	79.4	81.2	86.3	89.0	90.8	89.3	84.3	77.8	65.0	58.4	54.6	50.5	46.6	42.8	40.1	42.6	43.8	51.7	64.8	70.4	77.6	83.5	78.9	67.8	90.8																						
21-Aug	77.4	78.8	79.9	82.0	85.7	86.8	86.1	79.6	71.9	62.3	54.3	44.8	40.1	37.1	35.3	33.2	33.4	35.3	40.3	51.1	61.8	59.9	72.1	80.6	61.3	86.8																						
22-Aug	84.7	80.5	83.1	82.5	86.0	86.3	84.8	84.7	75.3	66.6	59.9	56.1	49.0	45.7	43.1	38.8	36.1	38.8	48.2	60.8	62.6	73.4	83.1	87.2	66.5	87.2																						
23-Aug	92.5	94.1	93.1	96.2	96.7	96.9	91.0	85.6	72.6	60.1	57.7	58.3	56.9	59.2	63.5	61.6	60.8	62.1	66.1	70.2	70.8	71.7	72.5	73.2	74.3	96.9																						
24-Aug	74.6	76.2	78.4	80.8	82.8	84.7	86.7	85.6	79.4	70.0	56.2	50.1	45.4	41.0	40.6	39.3	39.0	39.4	42.6	49.6	58.0	62.0	78.5	81.6	63.4	86.7																						
25-Aug	85.5	89.2	89.4	88.5	90.1	90.8	88.5	89.2	80.9	73.5	71.0	65.7	56.7	51.3	50.3	50.3	50.6	54.4	58.2	60.0	63.3	70.4	77.1	81.6	71.9	90.8																						
26-Aug	84.7	85.5	85.3	89.0	90.8	92.2	91.2	88.3	DF	72.3	63.9	55.6	54.2	48.5	45.5	44.6	43.0	49.2	54.9	58.6	64.8	69.9	75.0	81.4	69.1	92.2																						
27-Aug	82.0	83.4	82.6	90.4	92.3	91.8	89.3	80.4	78.8	69.7	64.2	58.8	57.3	55.9	51.5	49.6	45.3	46.5	52.5	57.7	62.6	69.4	72.3	76.9	69.2	92.3																						
28-Aug	80.4	83.5	86.2	89.7	91.9	94.0	94.9	94.0	91.2	87.8	83.6	78.3	73.0	70.6	69.6	67.9	68.7	69.6	75.1	78.6	82.5	83.7	83.7	86.5	81.9	94.9																						
29-Aug	85.9	87.6	89.4	91.2	91.8	91.9	91.0	89.7	85.1	78.8	69.6	61.8	55.9	52.2	51.3	51.6	49.2	51.6	57.6	63.7	72.8	74.0	79.3	81.7	73.1	91.9																						
30-Aug	87.6	90.7	92.5	93.9	95.9	97.4	97.5	92.6	85.6	75.0	63.4	57.9	53.8	46.5	39.2	37.0	40.9	46.0	53.9	58.4	52.2	59.2	50.4	56.1	67.7	97.5																						
31-Aug	70.9	81.1	77.8	81.4	86.1	84.1	85.0	83.6	76.0	65.9	58.8	57.3	54.8	49.6	46.1	50.9	62.0	65.2	67.8	72.5	77.5	82.9	83.6	82.4	71.0	86.1																						
																								82.3	84.2	85.0	86.9	88.0	87.6	86.1	83.4	77.8	72.0	66.9	62.7	59.5	55.7	53.8	52.8	53.2	55.3	59.6	64.8	69.0	73.2	77.2	78.9	Diurnal Average
																								97.2	97.1	96.0	96.2	96.7	97.4	97.5	94.0	96.7	93.0	92.9	90.8	83.9	82.2	82.3	90.5	90.4	86.0	86.9	89.6	91.0	93.4	96.4	96.2	Diurnal Maximum
DF - DAS Failure																																																



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

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

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	25	3.36	3.36
40 - 60	164	22.07	25.44
60 - 80	269	36.20	61.64
80 - 100	285	38.36	100.00

Total Number of Valid Hours: 743

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Fort Hills - August 2023

Maximum Speed: 28 km/h on Aug 24 04:00	Maximum Daily Speed Average: 16.9 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 21 23:00	Minimum Daily Speed Average: 0.3 km/h on Aug 3	Hours of Data: 742
Maximum Diurnal Speed Average: 5.2 km/h at hour 13	Minimum Diurnal Speed Average: 0.3 km/h at hour 22	Hours of Missing Data: 2
Monthly Average Velocity: 1.9 km/h 199.5 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 17 P ₉₉ = 25	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-Aug	SW3	SSW7	WSW9	WSW12	SW13	W10	W6	SSW8	SW13	SW14	SW13	WSW13	WSW12	WNW13	NW14	WNW14	NW15	NW11	N9	NNE8	N6	NNE5	NNW4	WNW6	W6.8	NW15
2-Aug	W5	SW3	WSW3	NW2	SW5	WSW5	WSW6	W6	NW7	NW6	NW6	SW6	SSW9	SSW4	SSW3	SSW4	SW2	SW6	SW6	SE3	ENE6	ENE5	NNE4	NNW7	WSW2.4	SSW9
3-Aug	N8	N10	N7	N4	N7	N6	NNW3	WNW3	NNW4	SSW2	S9	SSW8	SSE11	S6	WNW3	SE5	S6	S8	SSW7	SSE4	SE2	S3	NNW4	NNW6	SW0.3	SSE11
4-Aug	NNW7	NNW5	WNW5	WNW4	W7	W6	WSW7	SW13	SW10	SSW10	S9	SSE11	SSE12	ESE9	NE11	SSE9	SSW12	SSW9	SW6	SW6	WSW6	W5	W5	SSW4	SW4.0	SW13
5-Aug	S4	SSW4	SSW4	S6	SE6	SSE9	SSE6	SE5	SSE2	NNE6	N8	N5	E2	SSE3	NE2	NNE8	NNE9	NNE12	NNE13	NNE12	NE9	NNE5	N3	W4	NE2.5	NNE13
6-Aug	NW4	NW3	NW3	W3	S2	S7	SE3	NE8	SE5	N13	NNE8	N6	NNW5	N4	WNW3	NNW6	NNW5	NNW8	NNW8	N9	N10	N9	N10	NNE10	N4.5	N13
7-Aug	NW5	NNW5	NNW3	NNW4	NNW6	NW4	NNW4	N9	N7	N8	NNE11	NNE15	NNE15	NNE14	NNE15	NNE17	NNE17	NNE18	NNE19	NNE15	N10	N9	N10	NNE5	NNE9.8	NNE19
8-Aug	N7	N8	N9	N8	N7	N8	N7	NW4	WSW1	SE4	ESE3	ENE5	E9	E10	ESE11	ESE11	E12	ESE13	ESE15	SE15	SE18	ESE12	SE11	SE9	E5.4	SE18
9-Aug	SE7	SE13	SE15	SSE11	SSE9	SSE7	SSE8	SSE11	SSE15	SE21	SE20	SE20	S22	SSE21	SE20	SE18	SE16	SE19	SE17	SE18	SE15	SE17	SE16	SE13	SE15.0	S22
10-Aug	SE15	SE16	SE12	ESE7	SE6	ESE10	ESE8	ESE8	ESE12	ESE12	E7	NE10	NE11	ENE11	E10	ESE13	E9	ENE12	ENE14	NE9	N7	NE6	NNE8	NNE9	E8.0	SE16
11-Aug	NNE8	N8	NNE8	N5	NNW5	N9	N12	NNE15	N9	NNW5	SSE3	SSE7	SSW11	SW14	SW12	SW12	SW10	SSW11	SSW9	SSE9	S9	SSE8	SE8	SSE5	SSW1.3	NNE15
12-Aug	SSW5	SE7	SE9	SSE7	SSE5	S4	SW5	SW5	SW4	W1	S3	SSE6	SE7	E7	NNE11	NNE8	NNE8	NNE7	N6	NNW5	NNW2	SW2	UO	SSE5	ESE1.6	NNE11
13-Aug	S5	SSE8	SSE8	SSE11	SSE12	SSE12	S14	S16	SSW16	SSW17	SSW21	SW20	SW22	SW20	SW19	WSW21	WSW18	SW17	SW16	SSW11	SSW8	SW7	SW8	W12	SSW12.2	SW22
14-Aug	SSW4	SW7	S10	WSW2	NNW4	N10	W3	SW9	WSW9	NNW13	W16	W23	W20	W23	W25	W19	W20	W22	W16	NNW10	NNW10	NNE1	S4	SSW5	W9.9	W25
15-Aug	S5	S4	SSE8	SSE8	SSE9	SSE11	SSE11	S12	S12	SSW5	S3	SE9	SSE12	S10	SE7	SW4	SE6	NNE14	N20	N18	N16	NNW6	NNW6	NNW2	SE2.4	N20
16-Aug	W6	NNW10	NNW6	NW4	NW4	WNW8	WNW8	WNW9	WNW6	WSW7	WSW8	W11	W13	WSW12	SSW16	SSW17	SW15	SW16	SSW12	SSW10	S10	S12	S8	SSW9	WSW7.3	SSW17
17-Aug	S8	SSW6	S10	S11	SSE11	S12	S12	S11	S11	SSW10	SSW9	SW7	SW5	SSE4	SSE4	SSE4	S8	SSW12	WSW2	W4	NNW5	NNW7	NNW10	N13	SSW4.9	N13
18-Aug	NNE16	NNE15	N14	N13	N11	N11	NNW10	N10	NNE16	N13	NNW9	N14	N15	NNE15	N16	N20	N16	N17	NNW15	NNW12	NNW9	NNW10	NNW10	NNW11	N12.9	N20
19-Aug	NW6	WNW8	W8	WSW9	WSW9	WSW8	SW10	SW13	SW13	SSW14	SSW14	SSW13	SSW14	SSW12	WSW11	W13	W12	SW14	SW14	SW9	SSW11	SW10	SW12	SSW10	SW9.8	SSW14
20-Aug	SSW10	SSW10	SSE6	SSE9	SSW8	S8	S9	SSW8	S5	SE3	ENE4	SE4	SE2	SE4	SE5	S5	W9	WSW1	NNW1	SSE1	SSE0	WNW2	SSW4	W1	S3.7	SSW10
21-Aug	WSW6	SSE6	S8	S9	S9	SSE8	SSE8	SSE9	S9	SSE8	S8	SSW13	SSW11	SSW11	SSW12	S14	S15	SSW14	SSW9	S6	S7	SSE5	SW0	N1	S8.1	S15
22-Aug	SSE2	SSE4	SSE3	S5	SSE6	S6	SSE9	SSW7	S5	SSE8	S11	SSW9	S15	SSW8	SW9	SW7	SW6	SSW5	SSW5	SSW3	S4	S1	WNW0	WNW1	S5.2	S15
23-Aug	WNW3	NW2	NNW3	WNW2	WNW2	NNW3	N4	NW4	NNW6	NNW6	NNW9	NNW7	NW6	NW5	WNW4	NNW6	N11	N20	N22	N21	N17	N16	N22	N23	N8.6	N23
24-Aug	N23	N22	N26	N28	N28	N26	N19	NNE20	NNE24	NNE24	NNE27	NNE20	N17	N14	NNW14	NNW13	NNW12	NNW10	NNW8	N7	N8	WNW5	W5	N16.9	N28	
25-Aug	W2	S5	SSE6	SSE6	SSE8	SSE9	S11	S12	S13	S14	S17	SSW16	SSW18	SSW22	SSW23	SSW16	SSW17	S15	S12	S15	S17	S14	SSW11	S11	S12.4	SSW23
26-Aug	SSW7	SSW8	SSW10	S9	S9	S12	SSW13	SSW16	DF	SSW19	SSW19	SW19	SW17	SW17	WSW15	WSW12	NNW10	N27	NNE22	N19	NNE12	N9	NNW7	NW4	WSW4.8	N27
27-Aug	NW6	N7	NNW7	W3	SSW5	SSW4	S4	SSE1	SSW4	S9	SSW9	SSW11	S13	SSW14	SSW14	S15	SSW15	SSW14	S12	SSW12	SSW13	SSW11	SSW8	S8	SSW7.4	S15
28-Aug	S7	SE7	SE7	SE8	SE7	SSE7	SSE9	SSE8	S8	S8	S8	S8	S8	SSE10	SSE11	SSE11	SSE10	SSE9	SSE9	SE9	SSE10	SSE10	S11	SSE10	SSE8.7	S11
29-Aug	S12	S12	SSE11	S11	S12	S15	S17	S12	S15	S15	SSW15	S14	S14	SSW13	S14	S16	S17	S13	SSE10	SSE10	S6	SSE6	SSE8	SSE8	S12.1	S17
30-Aug	SSE7	SSE7	SSE9	SE9	SE8	SE6	SE8	SSE8	S7	S7	SSE5	S6	SSW7	SSW9	SSW15	SSW10	S13	S11	SSE11	SSE11	S12	S4	S6	SE3	S7.7	SSW15
31-Aug	E2	SW3	SSW1	W3	NW1	SSE4	S8	SSE4	SE2	SE3	N3	WSW3	WSW6	SW3	NNW3	N12	N26	N25	NNE19	NNE11	N9	NNW7	NNW7	WSW4	N3.9	N26

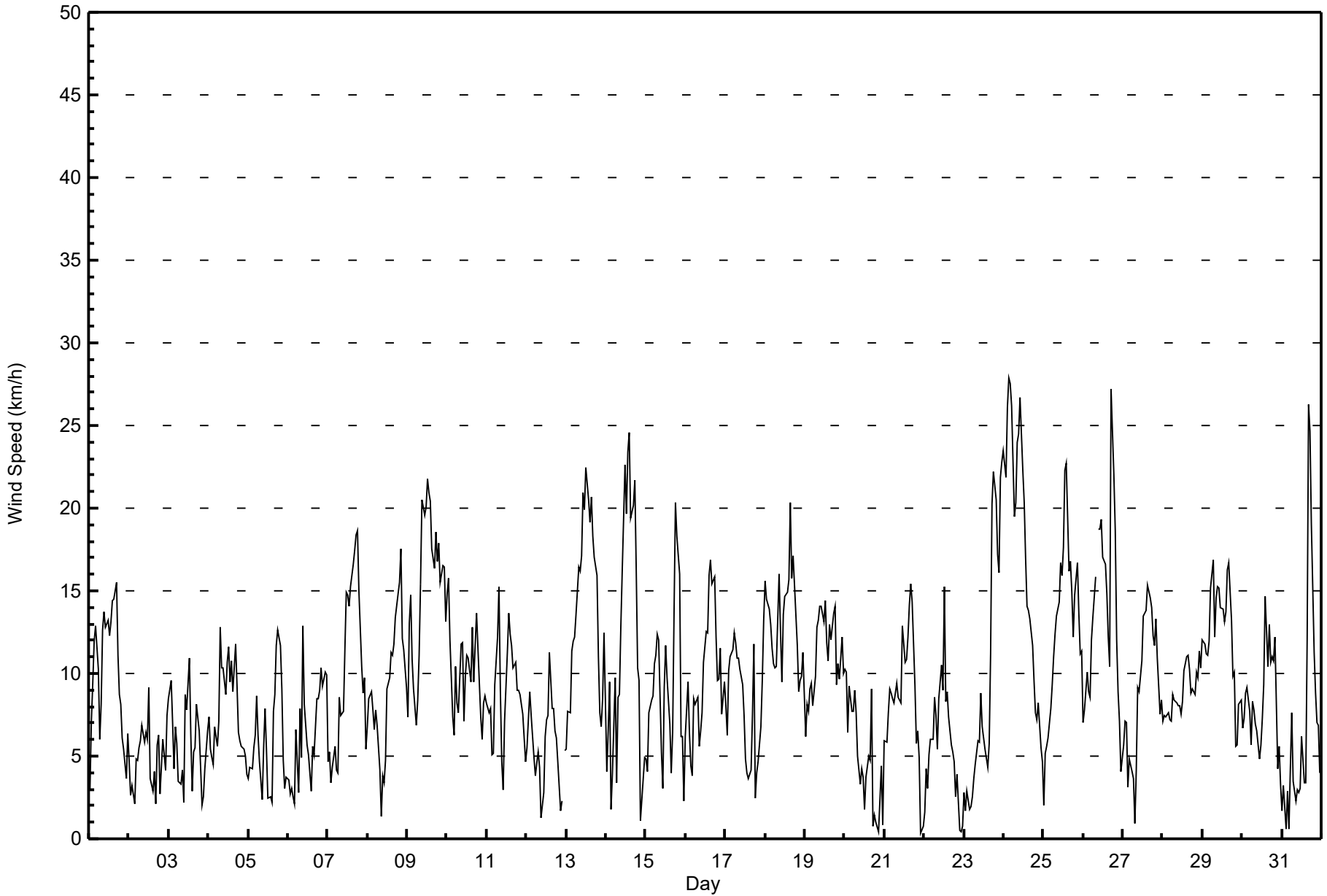
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N23	N22	N26	N28	N28	N26	N19	NNE20	NNE24	NNE24	NNE27	W23	SW22	W23	W25	WSW21	N26	N27	N22	N21	SE18	SE17	N22	N23	Diurnal Maximum	

DF - DAS Failure 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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

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

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	176	23.72	23.72
6 - 11	338	45.55	69.27
12 - 19	186	25.07	94.34
20 - 28	42	5.66	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
Fort Hills - August 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	5	1	3	2	1	15	21	18	19	13	8	13	13	14	22	176
6 - 11	41	16	7	2	6	7	20	66	47	40	18	13	9	9	6	31	338
12 - 19	20	20	0	2	1	6	16	5	39	33	20	7	6	4	2	5	186
20 - 28	16	7	0	0	0	0	4	1	1	3	3	1	6	0	0	0	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	85	48	8	7	9	14	55	93	105	95	54	29	34	26	22	58	742

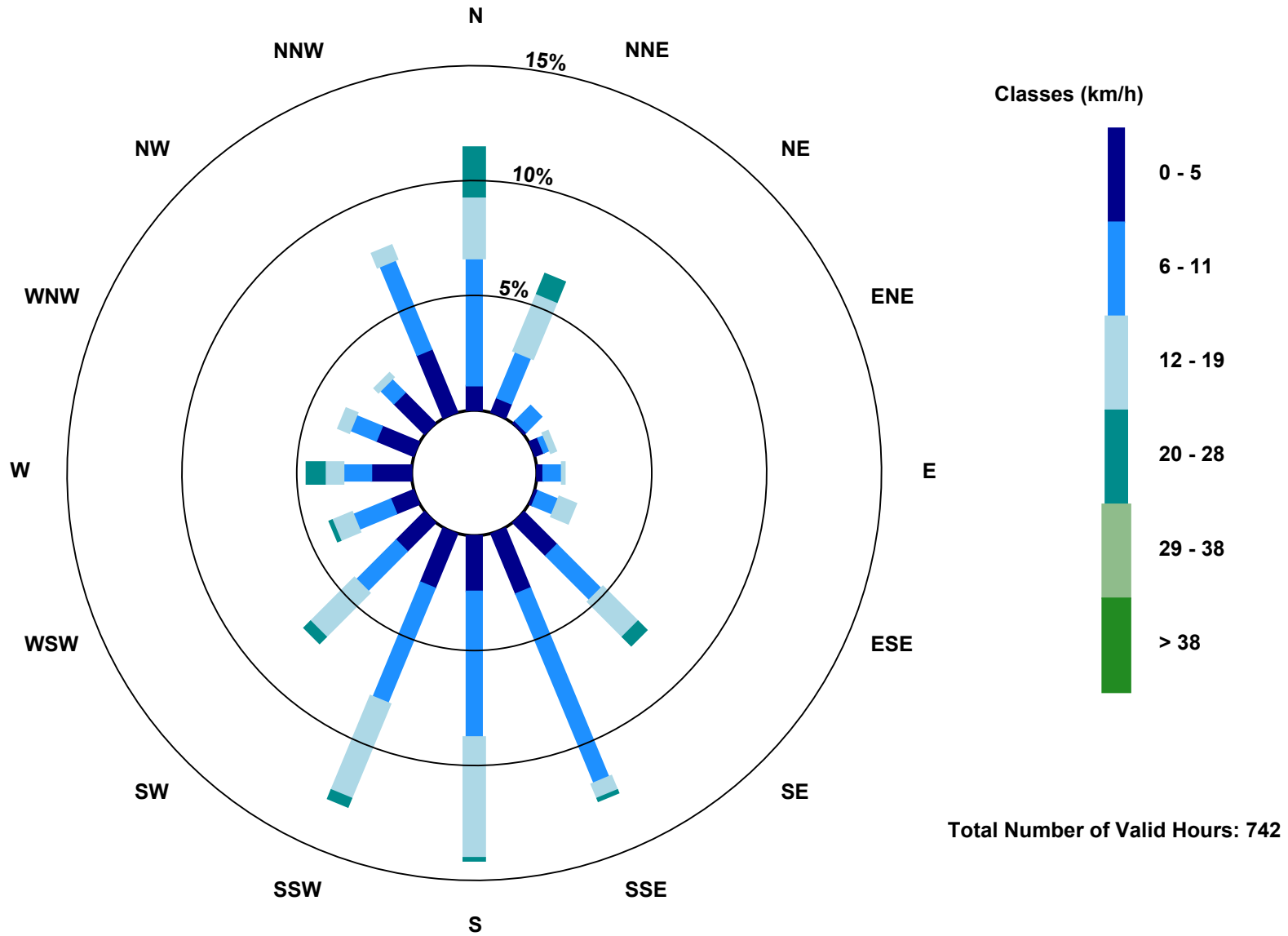
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Fort Hills





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Aug 26 17:00	Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 0 Percent Operational Time: 99.7
Minimum Value: 0 km/h on Aug 21 20:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 P ₉₀ = 4 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-Aug	2	2	2	2	3	2	1	2	2	2	2	2	3	3	3	3	2	3	2	2	2	1	1	3	
2-Aug	2	2	1	2	1	1	1	1	2	2	3	3	3	2	2	1	1	2	2	1	1	2	1	1	3
3-Aug	1	2	1	2	1	2	1	1	2	2	1	1	2	4	4	2	3	2	2	1	1	2	1	1	4
4-Aug	1	1	1	2	1	2	1	2	2	2	2	2	3	5	5	4	2	3	1	2	1	1	2	1	5
5-Aug	1	1	1	1	2	1	1	1	1	3	3	2	2	1	2	3	3	3	2	2	2	1	1	1	3
6-Aug	1	1	1	1	1	1	2	3	2	5	4	2	1	2	2	2	2	2	1	2	1	1	1	2	5
7-Aug	2	2	1	1	1	2	1	3	2	2	3	3	3	4	5	5	4	4	4	4	2	2	2	2	5
8-Aug	2	2	2	2	1	1	1	1	1	2	2	3	3	4	4	4	4	4	4	3	4	2	2	3	4
9-Aug	3	2	3	2	1	1	2	2	3	3	3	3	4	3	3	3	4	3	3	3	3	2	3	2	4
10-Aug	3	3	3	2	2	2	2	2	3	3	2	2	2	2	3	3	3	3	3	2	1	2	1	1	3
11-Aug	1	1	2	1	1	2	2	2	4	1	2	4	4	4	3	3	3	2	1	1	1	1	1	2	4
12-Aug	1	2	1	1	1	1	1	1	1	1	2	2	3	5	5	2	2	1	3	1	2	2	2	2	5
13-Aug	1	1	1	1	2	1	2	3	2	3	3	4	4	4	4	4	4	3	3	1	2	1	3	4	4
14-Aug	3	4	2	2	3	2	2	3	2	4	4	5	4	6	6	4	5	4	4	2	4	2	1	2	6
15-Aug	1	1	1	1	1	1	2	2	3	2	2	3	2	2	3	2	2	4	5	4	5	1	1	2	5
16-Aug	1	2	1	1	3	1	2	1	2	3	3	3	3	3	4	4	3	3	2	2	1	1	2	2	4
17-Aug	4	3	3	1	2	3	1	2	3	2	2	2	2	2	2	2	2	4	4	4	3	1	2	3	4
18-Aug	3	3	3	3	3	2	3	4	3	3	4	3	3	4	3	5	4	4	3	2	3	2	2	3	5
19-Aug	1	1	2	1	2	2	2	1	2	2	2	2	2	4	3	3	3	2	2	3	2	2	3	2	4
20-Aug	2	3	1	2	1	1	1	2	1	1	2	2	2	2	2	2	3	2	1	2	1	1	2	2	3
21-Aug	3	2	1	2	2	1	1	1	1	2	2	3	4	4	4	3	3	2	2	0	1	2	1	1	4
22-Aug	2	1	2	1	1	1	1	1	2	2	2	4	4	3	2	3	2	1	1	2	1	1	2	1	4
23-Aug	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	4	5	4	4	4	3	4	4	5	5
24-Aug	4	4	5	4	4	5	4	4	4	5	5	4	4	4	4	3	3	2	2	1	1	1	2	2	5
25-Aug	1	1	1	1	1	3	2	2	2	3	2	3	4	3	3	3	3	3	1	2	2	4	2	2	4
26-Aug	2	2	2	2	2	2	2	2	DF	2	3	3	3	3	3	2	10	5	4	3	4	2	1	1	10
27-Aug	1	1	2	1	1	1	1	1	2	2	2	3	3	3	3	3	3	2	1	1	1	1	1	1	3
28-Aug	1	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
29-Aug	2	2	1	2	2	2	3	2	2	2	2	2	2	3	3	2	2	3	1	1	2	1	1	1	3
30-Aug	1	2	1	2	1	1	2	1	2	1	2	3	2	3	3	2	2	2	1	2	2	2	2	2	3
31-Aug	2	2	2	2	1	2	3	3	2	2	1	2	2	2	2	6	5	4	4	3	2	2	1	2	6
Diurnal Maximum																									
4 4 5 4 4 5 4 4 4 4 5 5 5 4 6 6 6 10 5 5 4 5 4 4 4 4																									

DF - DAS Failure UO - Unstable Operation



Wood Buffalo Environmental Association
Summary of Hour Averages

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

Direction of Maximum Speed: 11 deg on Aug 24 04:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 4.8 deg on Aug 24	Hours of Data: 742
Direction of Minimum Speed: 236 deg on Aug 21 23:00	Direction of Minimum Daily Speed Average: 0.3 deg on Aug 3
Direction of Minimum Speed: 236 deg on Aug 21 23:00	Hours of Missing Data: 2
Monthly Average Direction: 199.5 deg	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-Aug	225	213	244	238	224	271	270	208	221	218	234	239	239	286	307	302	313	305	357	23	5	15	330	285	267.5
2-Aug	275	236	248	311	236	246	255	263	304	308	312	226	202	195	210	198	216	227	223	141	67	58	23	345	255.3
3-Aug	0	1	357	5	3	356	345	290	347	202	189	195	153	181	282	137	179	171	213	156	140	169	342	344	232.6
4-Aug	345	331	290	302	276	266	256	221	221	201	186	154	156	119	51	150	199	202	217	236	251	281	270	205	214.5
5-Aug	178	211	206	178	143	147	149	143	151	12	10	353	98	154	46	18	26	29	30	32	41	20	349	279	50.4
6-Aug	316	312	318	261	187	181	132	43	130	2	28	352	345	1	297	336	343	342	344	354	8	3	4	23	359.1
7-Aug	313	347	345	331	330	315	338	8	3	356	15	21	28	13	26	29	21	26	23	12	9	9	11	15	12.4
8-Aug	351	355	6	358	359	350	356	310	246	138	115	71	81	94	102	105	97	118	122	129	125	123	132	146	94.2
9-Aug	143	146	146	156	152	158	147	158	147	145	139	144	171	158	134	133	128	129	130	134	134	132	130	129	141.8
10-Aug	133	134	126	118	125	120	114	114	123	123	90	55	53	64	84	106	94	78	57	35	6	43	29	26	90.3
11-Aug	24	354	18	3	343	351	4	14	11	337	155	155	210	227	214	217	214	199	192	160	171	162	142	150	209.4
12-Aug	198	130	132	158	152	183	215	225	220	277	173	156	142	83	31	16	19	16	359	348	335	216	UO	160	120.8
13-Aug	169	150	158	163	153	165	175	188	197	196	211	231	225	233	232	242	241	234	231	213	206	218	224	280	212.2
14-Aug	195	234	191	243	342	359	265	219	247	286	281	267	268	263	266	267	268	269	278	291	343	19	190	201	268.0
15-Aug	177	171	150	165	156	163	156	171	174	200	186	144	154	172	166	216	133	15	8	358	359	340	346	347	140.9
16-Aug	271	301	340	305	307	297	288	293	299	238	253	261	266	255	209	197	225	222	209	197	191	190	183	199	238.0
17-Aug	183	209	190	187	164	174	172	179	189	205	211	231	223	164	162	147	179	212	256	266	345	343	340	351	198.1
18-Aug	12	15	11	11	10	0	348	354	12	356	337	355	11	14	353	5	351	0	347	341	339	341	343	338	358.5
19-Aug	317	285	262	250	247	251	217	223	219	204	205	196	192	213	258	281	263	223	232	225	212	220	227	201	229.3
20-Aug	196	202	164	148	195	172	181	200	182	131	69	124	127	136	134	177	264	255	337	165	163	295	208	268	180.8
21-Aug	245	156	174	169	172	157	161	168	179	158	181	195	202	200	196	189	184	194	197	181	182	165	236	353	183.3
22-Aug	160	150	148	172	168	172	165	206	184	156	176	212	191	200	232	229	220	206	207	193	171	185	288	287	190.4
23-Aug	290	320	331	291	299	331	352	305	345	342	348	327	318	307	295	333	358	10	9	6	4	2	8	9	354.3
24-Aug	9	8	8	11	10	9	5	13	15	17	15	16	6	358	337	339	338	334	341	3	6	299	279	4.8	
25-Aug	260	184	162	157	166	161	170	178	185	186	188	203	208	209	213	203	194	188	180	170	177	189	197	191	189.7
26-Aug	197	202	195	190	185	186	196	207	DF	207	206	223	223	233	242	248	331	10	12	9	12	0	347	309	239.7
27-Aug	315	351	342	278	200	194	171	159	194	190	196	196	188	193	196	188	206	202	184	198	213	208	196	171	199.9
28-Aug	169	143	141	143	144	153	154	155	169	169	170	182	174	156	152	153	152	152	162	144	150	167	178	164	158.2
29-Aug	169	172	167	172	171	179	184	181	178	180	197	188	189	194	189	171	182	170	166	156	188	147	165	156	177.3
30-Aug	156	147	153	142	145	142	141	164	190	189	168	182	211	196	195	201	190	177	154	154	169	190	169	132	170.8
31-Aug	79	226	204	266	305	158	169	158	139	133	4	255	251	226	348	6	10	10	12	13	1	347	342	258	0.7

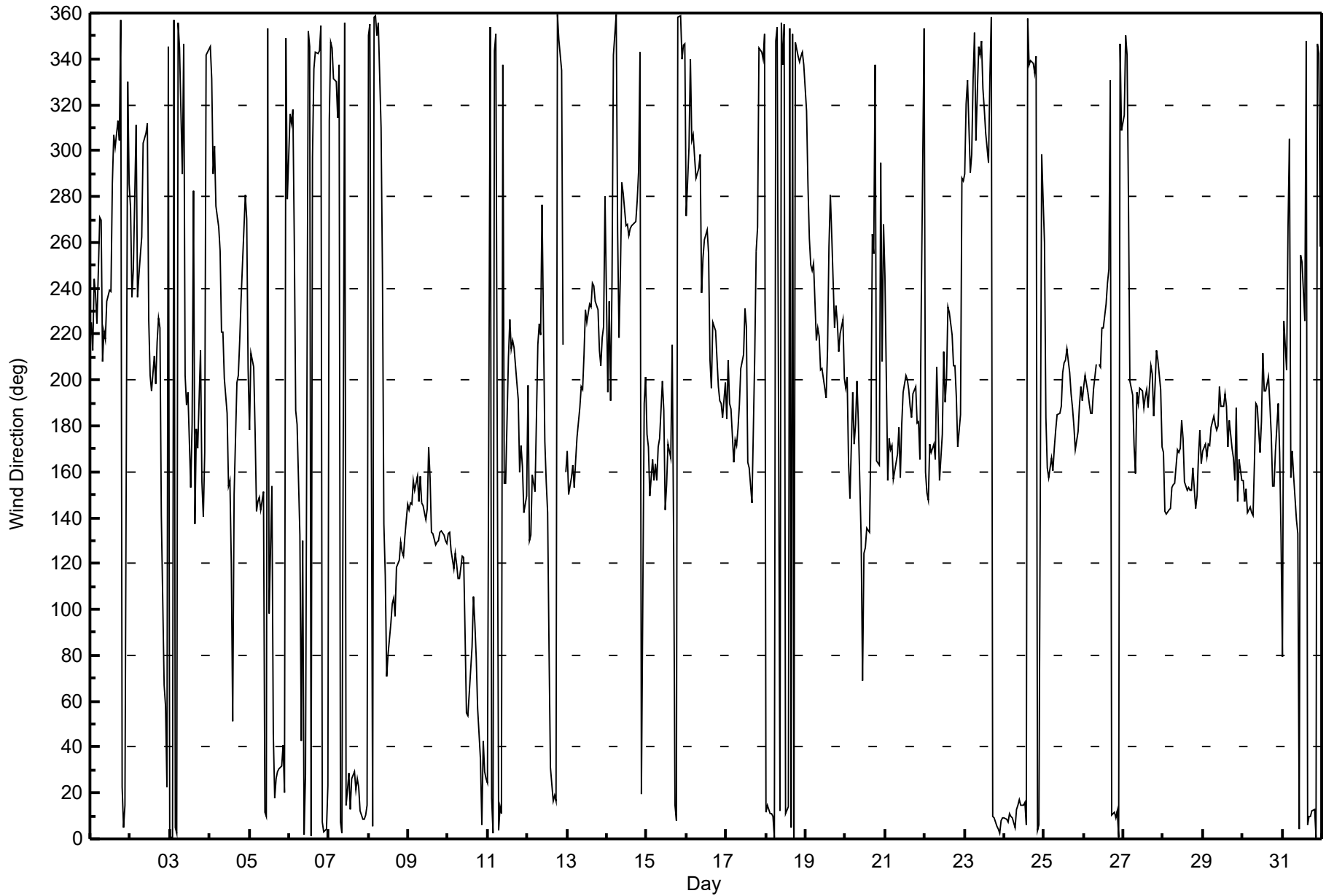
229.4 182.6 157.0 176.0 175.1 180.4 182.1 195.6 191.7 193.3 201.9 209.4 201.3 208.1 216.7 213.7 236.6 254.5 354.6 56.7 79.0 100.1 308.5 273.9
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

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





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

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

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 100 deg on Aug 31 03:00	Hours of Data: 742
Minimum Value: 5 deg on Aug 26 00:00	Hours of Missing Data: 2
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 12 Median = 16 Q ₃ = 26 P ₉₀ = 52 P ₉₉ = 92	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-Aug	68	24	10	10	17	18	23	23	11	8	11	9	9	22	15	13	16	14	38	11	16	20	37	18	68
2-Aug	39	64	56	60	23	18	14	14	26	39	35	63	14	39	67	40	56	22	28	50	11	14	47	10	67
3-Aug	11	13	11	15	9	22	32	16	23	65	11	14	17	51	70	47	55	17	19	21	57	71	27	10	71
4-Aug	14	31	12	23	16	12	22	9	13	16	23	24	17	52	24	28	13	12	17	18	17	20	31	24	52
5-Aug	36	20	17	15	21	10	22	20	48	69	26	35	76	79	89	47	21	14	10	13	15	9	14	29	89
6-Aug	39	35	32	42	44	12	58	39	40	24	42	33	28	42	70	41	53	19	15	12	8	12	13	18	70
7-Aug	47	33	44	30	12	28	18	14	17	23	24	22	22	18	21	18	16	17	15	12	9	9	8	38	47
8-Aug	12	14	11	12	13	17	19	37	94	72	78	62	40	40	24	27	25	22	16	10	11	13	11	16	94
9-Aug	16	8	8	9	9	16	13	11	10	11	12	14	15	17	10	10	14	13	10	9	9	9	10	11	17
10-Aug	12	10	13	19	19	19	22	20	15	15	25	15	12	13	23	24	26	17	14	12	15	36	9	13	36
11-Aug	18	13	14	28	31	19	15	9	22	36	62	41	38	17	18	21	23	20	15	7	8	9	12	14	62
12-Aug	27	16	8	15	20	35	17	20	16	90	83	50	46	50	14	18	23	17	26	26	57	68	UO	22	90
13-Aug	23	12	20	11	12	9	12	14	13	13	12	14	15	16	12	15	11	12	6	14	12	23	19	23	23
14-Aug	63	31	23	85	73	18	62	11	15	24	16	12	13	12	11	12	12	13	9	34	84	18	40	85	85
15-Aug	24	40	12	16	12	12	14	12	33	58	60	14	14	19	39	59	47	16	13	16	15	24	20	59	60
16-Aug	14	17	21	36	37	14	10	10	26	42	42	23	19	26	23	19	16	12	9	8	8	7	12	11	42
17-Aug	43	67	15	9	11	8	9	12	16	14	15	25	52	48	52	30	15	12	92	59	46	17	13	17	92
18-Aug	12	10	11	13	13	14	19	19	14	19	23	17	19	18	19	15	16	16	19	10	10	10	11	12	23
19-Aug	17	9	18	14	18	24	10	9	11	8	11	12	16	26	17	19	15	9	9	13	8	12	10	10	26
20-Aug	9	13	27	14	23	16	12	15	30	53	56	67	93	65	50	48	18	95	77	99	94	40	42	68	99
21-Aug	68	25	12	13	13	11	16	11	17	22	28	18	31	28	23	16	16	10	7	10	7	34	74	93	93
22-Aug	69	25	53	23	20	16	12	16	31	17	22	33	19	37	18	37	29	18	13	51	20	92	79	64	92
23-Aug	37	55	23	57	15	35	67	40	32	31	21	21	23	18	18	14	16	12	13	14	15	15	13	12	67
24-Aug	11	12	12	11	11	12	15	12	11	12	12	14	14	19	22	20	17	16	12	6	9	12	14	24	24
25-Aug	51	14	17	17	13	21	14	14	11	11	15	15	18	11	10	16	10	8	7	6	7	12	10	5	51
26-Aug	6	11	11	10	12	8	8	10	DF	10	11	10	9	12	14	12	45	12	13	11	12	13	9	21	45
27-Aug	11	13	23	35	16	16	30	84	15	12	19	20	20	18	20	13	10	10	9	7	8	7	14	8	84
28-Aug	16	13	16	13	11	13	11	12	13	15	20	16	18	11	9	6	7	8	6	7	6	9	10	10	20
29-Aug	11	9	9	10	9	8	8	10	9	8	10	12	15	19	17	14	9	9	8	7	23	11	7	7	23
30-Aug	10	7	7	6	10	9	10	13	14	17	24	29	24	23	14	15	8	8	10	7	12	50	46	51	51
31-Aug	67	57	100	56	100	26	20	73	68	49	76	58	30	56	83	18	13	14	10	12	14	29	20	39	100
	69	67	100	85	100	35	67	84	94	90	83	67	93	79	89	59	56	95	92	99	94	92	79	93	

Diurnal Maximum

DF - DAS Failure

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS25 WASKŌW OHCI PIMÂTISIWIN AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
AUGUST 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	16.3	0	3.6	0
H2S(ppb) Average	708	36	36	100	2.3	0	0.9	0
Temperature 2 m (C) Average	744	0	0	100	30.8	0	21.1	0
Relative Humidity (%) Average	744	0	0	100	100	-	95.6	-
Wind Speed 10 m (km/h) Average	732	1	12	98.52	13	0	9	0
Wind Direction 10 m (deg) Average	732	1	12	98.52	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)
 AUGUST 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	0.65	2	-	0	0	0	0.1	0.3	1.2	16.3
H2S (ppb) Average	708	0.31	0.3	-	0	0.1	0.1	0.2	0.4	0.8	2.3
Temperature 2 m (C) Average	744	16.73	4.8	-	5.8	11.3	13.2	15.9	20.2	23.3	30.8
Relative Humidity (%) Average	744	77.79	17.8	-	35.9	51.3	63.3	79.9	94.8	99.4	100
Wind Speed 10 m (km/h) Average	732	4.1	2	-	0	1	2	4	5	7	13
Wind Direction 10 m (deg) Average	732	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - WASKŌW OHCI PIMĀTISIWIN (AMS25)

AUGUST 2023

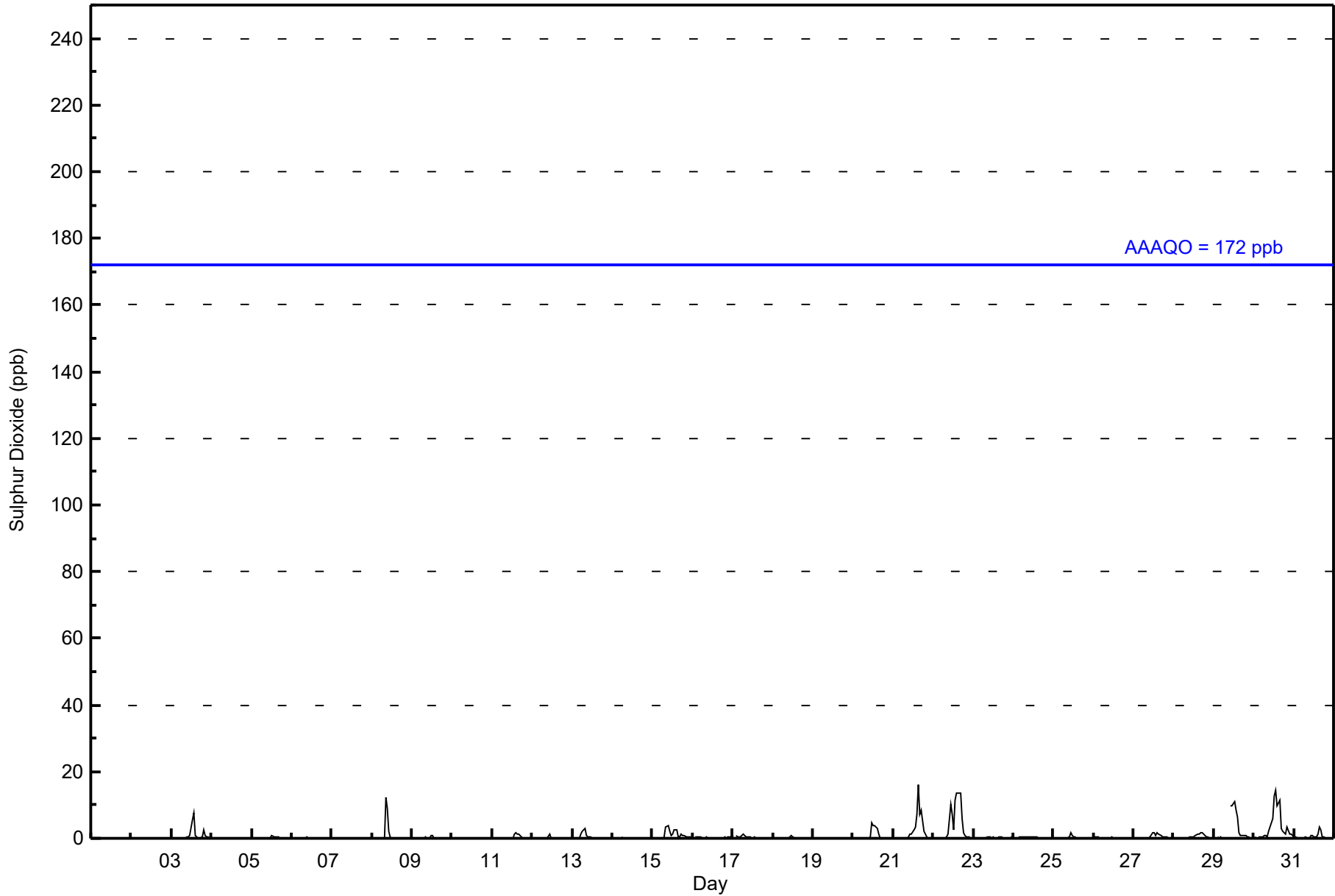
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
Wind Speed, Wind Direction	12 Aug 2023 02:00	12 Aug 2023 02:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	21 Aug 2023 23:00	21 Aug 2023 23:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	22 Aug 2023 05:00	22 Aug 2023 05:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	28 Aug 2023 20:00	28 Aug 2023 20:00	1	Flat line in sensor output signal
Wind Speed, Wind Direction	30 Aug 2023 01:00	30 Aug 2023 07:00	7	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	699	98.59	98.59
11 - 20	10	1.41	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
Waskow ohci Pimatisiwin - August 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	14	11	12	20	32	60	114	54	35	36	45	66	51	40	59	688
11 - 20	0	0	0	0	1	1	5	3	0	0	0	0	0	0	0	0	10
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	14	11	12	21	33	65	117	54	35	36	45	66	51	40	59	698

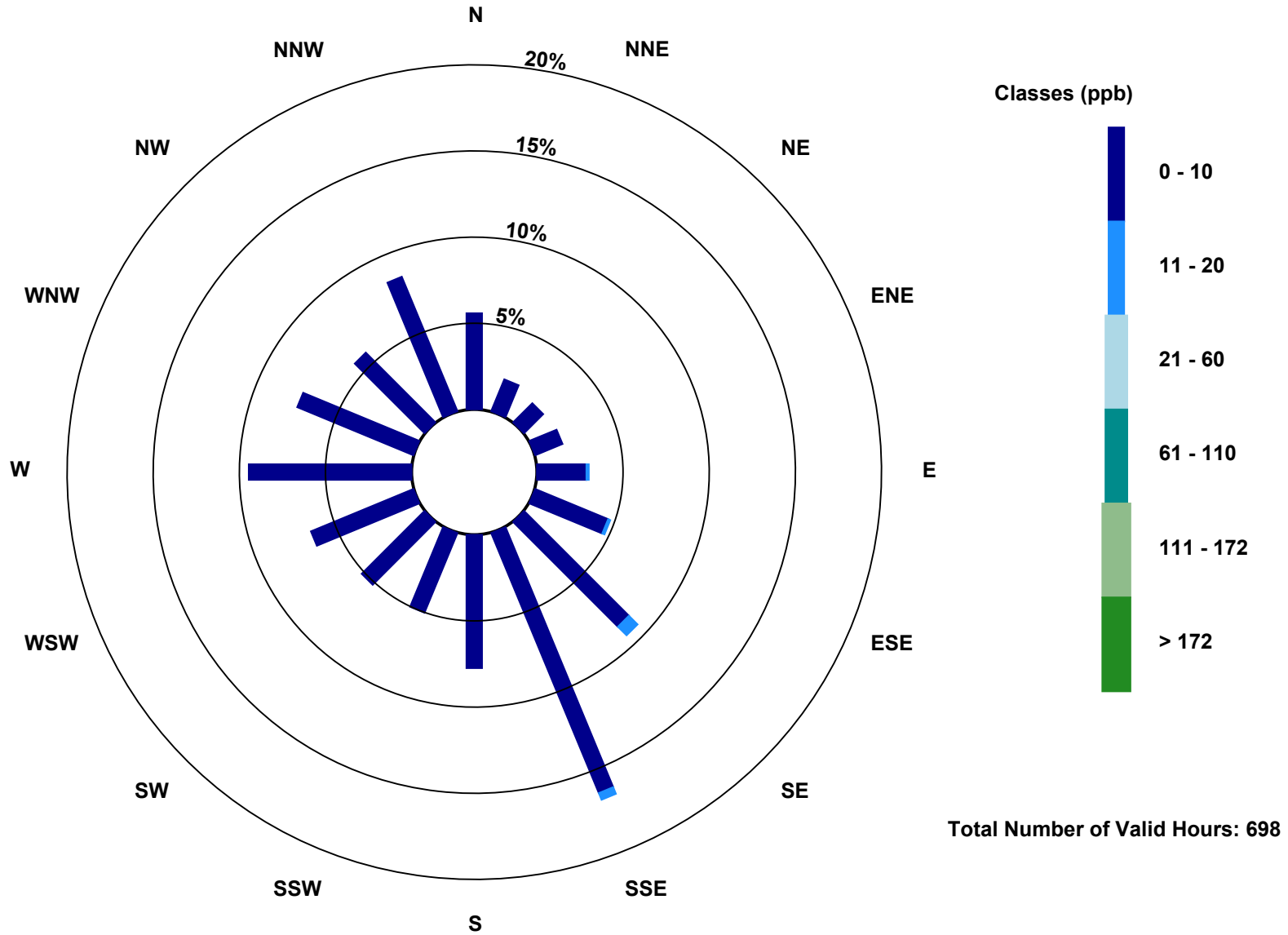
Total Number of Valid Hours: 698

Total Number of Hours: 744

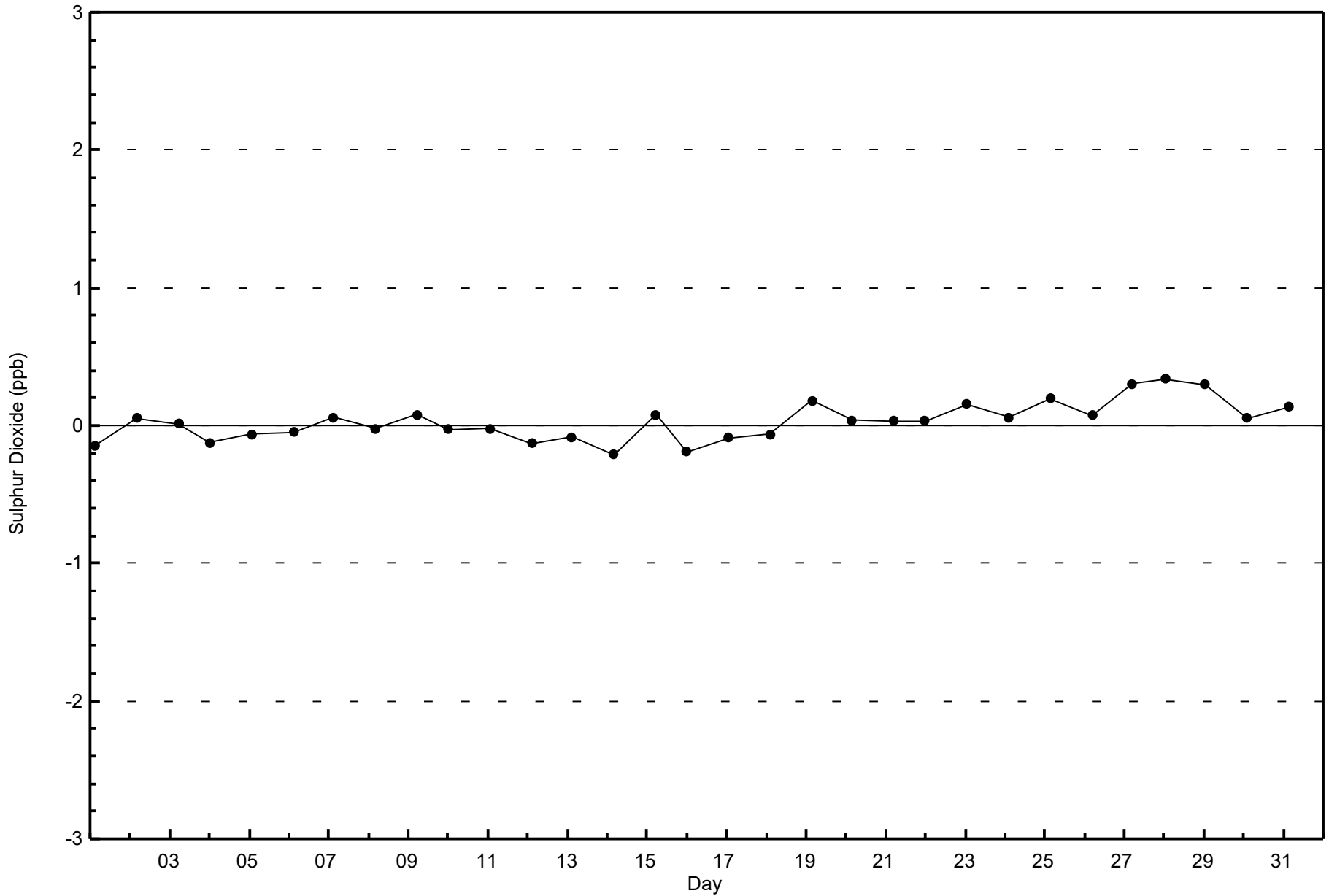


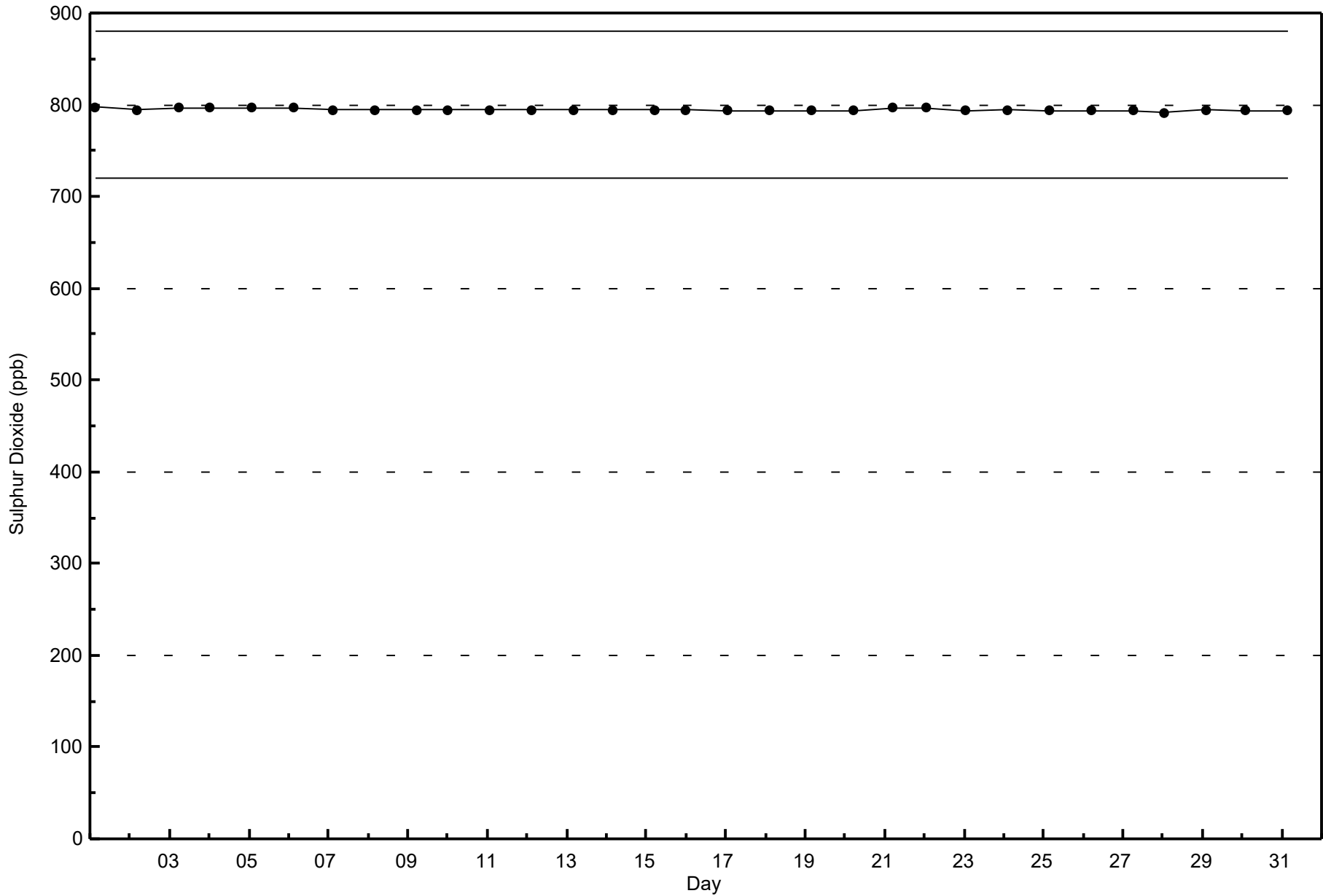
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Waskow ohci Pimatisiwin



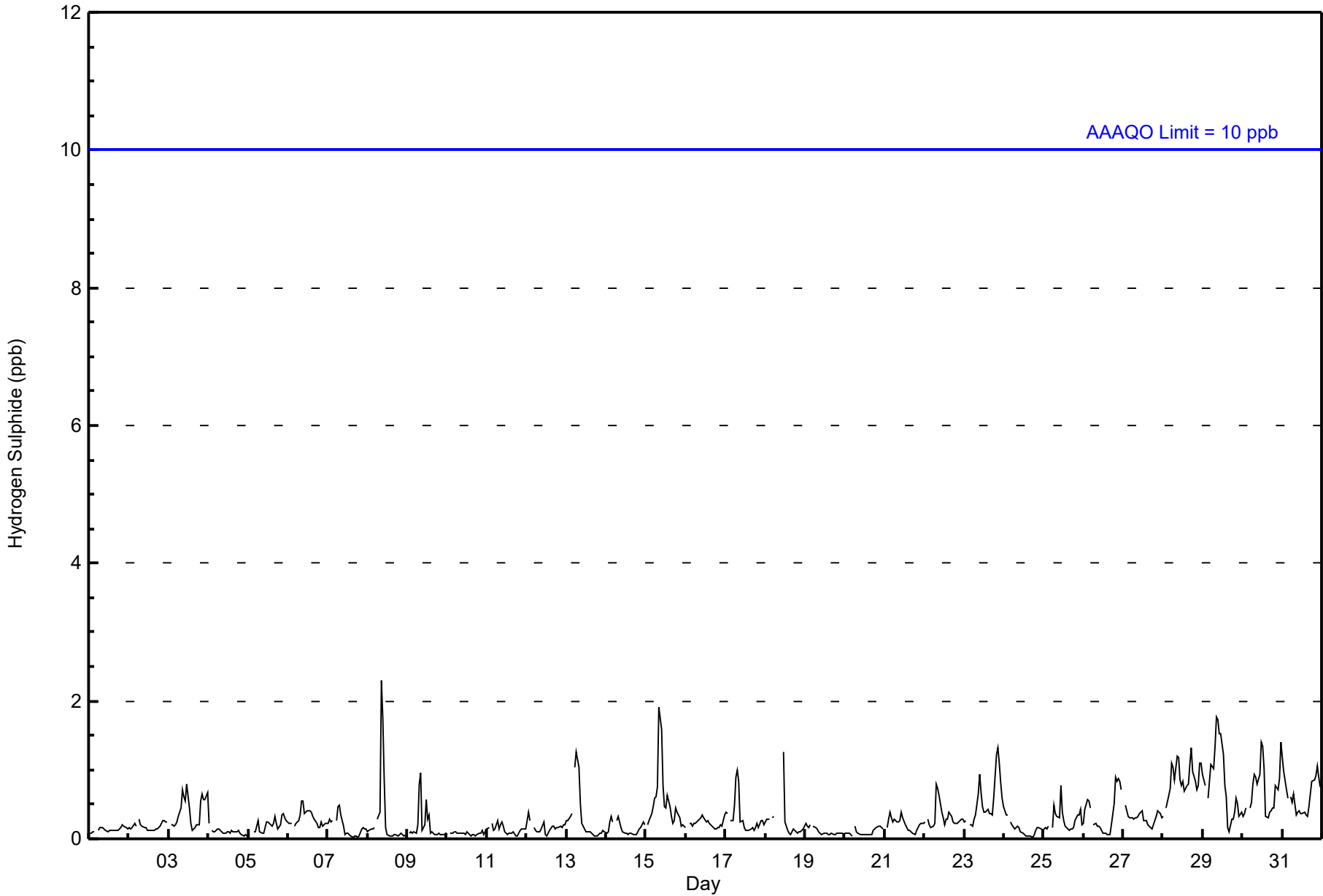
Total Number of Valid Hours: 698







Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744							
Maximum Value: 2.3 ppb on Aug 8 09:00		Maximum Daily Average: 0.9 ppb on Aug 28		Hours of Data: 708														708									
Minimum Value: 0.0 ppb on Aug 7 19:00		Minimum Daily Average: 0.1 ppb on Aug 10		Hours of Missing Data: 36														36									
Maximum Diurnal Average: 0.6 ppb at hour 9		Minimum Diurnal Average: 0.2 ppb at hour 9		Hours of Calibration: 36														36									
Monthly Average: 0.31 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.4 P ₉₀ = 0.8 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-Aug	0.1	0.1	0.1	0.1	Z	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	0.2	0.2	0.2	0.1	0.1	0.2	
2-Aug	0.2	0.2	0.2	0.2	0.2	Z	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	0.2	0.3	0.3	0.3	0.2	0.2	0.3
3-Aug	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.7	0.6	0.5	0.8	0.5	0.2	0.1	0.1	0.2	0.2	0.2	0.5	0.6	0.6	0.6	0.7	0.4	0.8	
4-Aug	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	0.0	0.1	0.0	0.1	0.2	
5-Aug	0.1	0.1	Z	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.4	
6-Aug	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.6	0.6	
7-Aug	0.2	0.3	0.2	0.3	Z	0.3	0.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.5	
8-Aug	0.1	0.1	0.1	0.1	0.2	Z	0.3	0.4	2.3	1.7	0.9	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.3	2.3	
9-Aug	Z	0.1	0.1	0.1	0.1	0.1	0.2	0.8	1.0	0.1	0.2	0.6	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0	
10-Aug	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	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
11-Aug	0.1	0.2	Z	0.2	0.1	0.1	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.3	
12-Aug	0.3	0.4	0.3	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	
13-Aug	0.3	0.3	0.3	0.4	Z	1.0	1.3	1.0	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	1.3	
14-Aug	0.1	0.1	0.2	0.3	0.2	Z	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	0.1	0.2	0.2	0.2	0.2	0.3	
15-Aug	Z	0.2	0.3	0.4	0.5	0.6	0.6	0.8	1.9	1.6	0.8	0.5	0.4	0.6	0.5	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.5	1.9	
16-Aug	0.2	Z	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	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.3	
17-Aug	0.4	0.4	Z	0.3	0.3	0.5	0.9	1.0	0.8	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	1.0	
18-Aug	0.2	0.3	0.3	Z	0.3	0.3	C	C	C	C	C	1.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.3	
19-Aug	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
20-Aug	0.1	0.1	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	0.2	0.2	0.2	0.2	0.1	0.1	0.2	
21-Aug	Z	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4	
22-Aug	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.8	0.7	0.6	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.8	
23-Aug	0.2	0.3	Z	0.2	0.2	0.2	0.3	0.4	0.7	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.6	1.2	1.3	1.1	0.8	0.6	0.5	1.3		
24-Aug	0.5	0.3	0.3	Z	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.5		
25-Aug	0.1	0.2	0.1	0.2	Z	0.2	0.5	0.4	0.3	0.3	0.8	0.4	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.2	0.8		
26-Aug	0.2	0.4	0.6	0.6	0.4	Z	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.9	0.8	0.9	0.8	0.7	0.9	0.9	
27-Aug	Z	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.5	
28-Aug	0.3	Z	0.4	0.6	0.7	1.1	1.0	0.9	1.2	1.2	0.9	0.8	0.8	0.7	0.8	0.8	1.1	1.3	1.0	0.8	0.7	0.8	1.1	1.1	0.9	1.3	
29-Aug	0.9	0.8	Z	0.6	0.8	1.1	1.0	1.3	1.8	1.7	1.5	1.5	1.2	0.8	0.6	0.2	0.1	0.3	0.3	0.4	0.6	0.5	0.3	0.4	0.8	1.8	
30-Aug	0.3	0.4	0.5	Z	0.5	0.5	0.8	0.9	0.9	0.8	0.9	1.4	1.4	1.0	0.3	0.3	0.4	0.4	0.4	0.4	0.8	0.7	0.9	1.4	0.7	1.4	
31-Aug	1.2	1.0	0.7	0.6	Z	0.6	0.5	0.6	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.6	0.8	0.9	0.9	1.1	0.9	0.8	0.6	1.2	
																								Diurnal Average			
																								Diurnal Maximum			
																								0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.6 0.5 0.4 0.4 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3			
																								1.2 1.0 0.7 0.6 0.8 1.1 1.3 1.3 2.3 1.7 1.5 1.5 1.4 1.0 0.8 0.8 1.1 1.3 1.0 1.2 1.3 1.1 1.1 1.4			
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
Waskow ohci Pimatisiwin - August 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
Waskow ohci Pimatisiwin - August 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	40	13	11	12	21	33	66	120	54	36	36	42	70	49	39	55	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	40	13	11	12	21	33	66	120	54	36	36	42	70	49	39	55	697

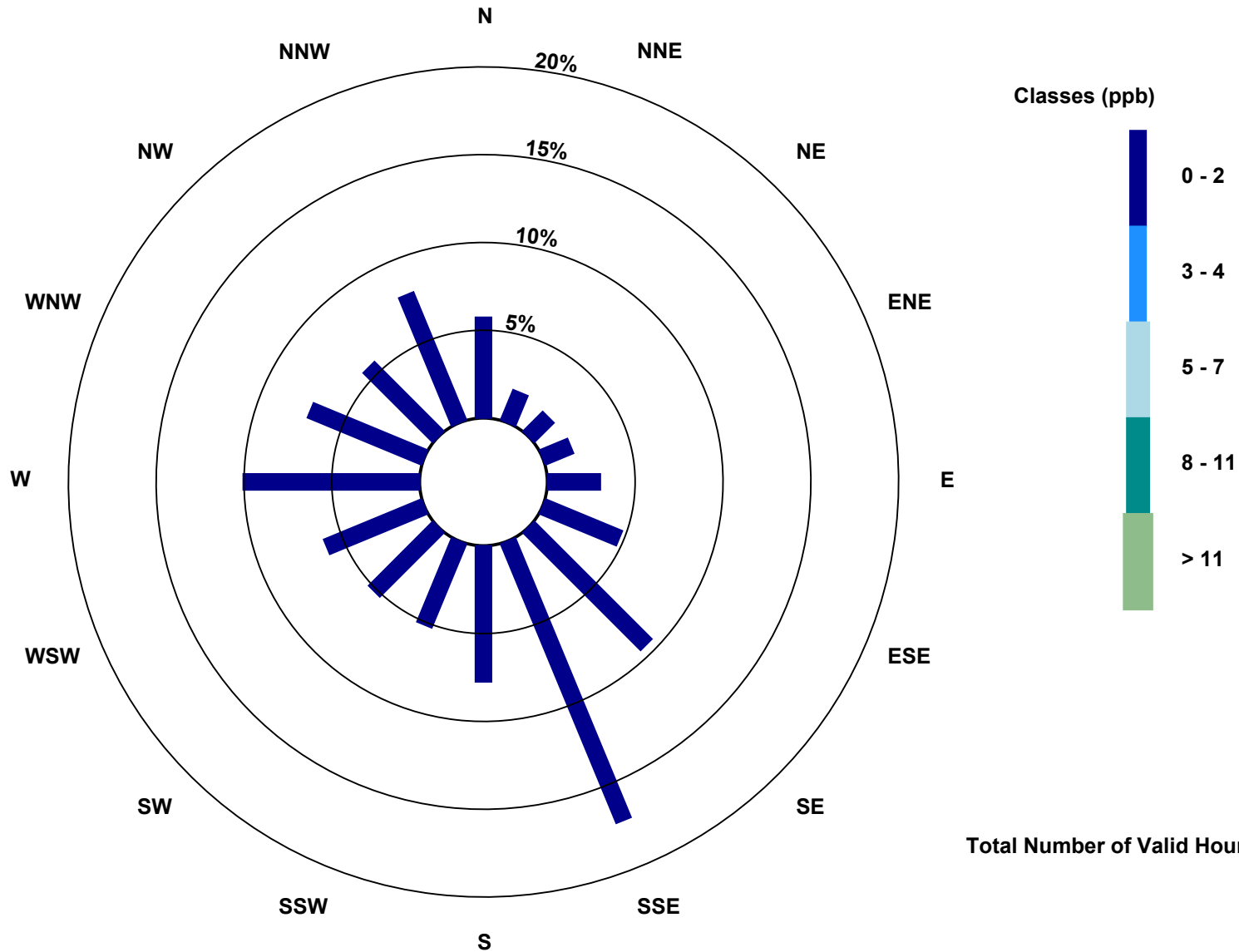
Total Number of Valid Hours: 697

Total Number of Hours: 744

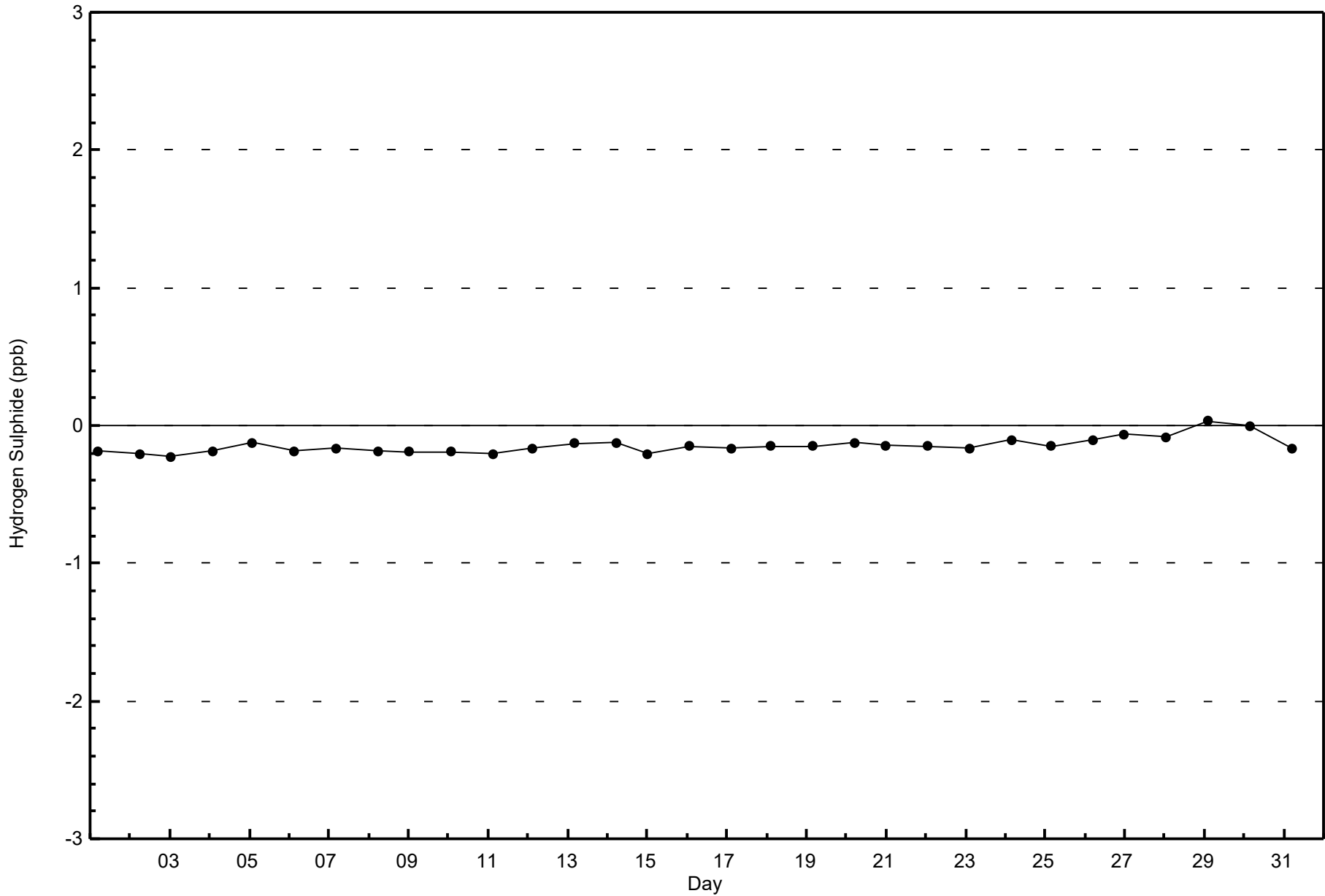


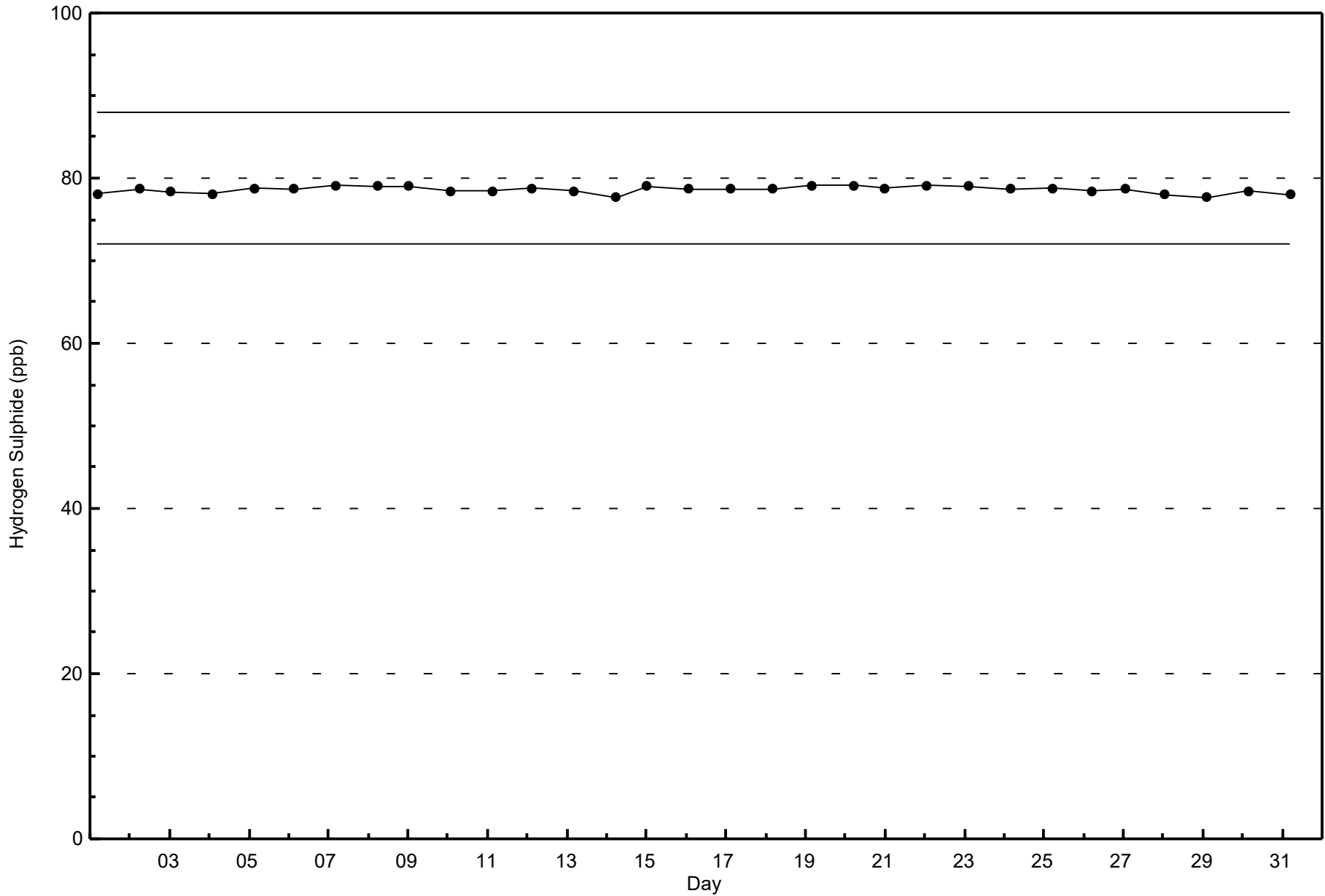
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Waskow ohci Pimatisiwin



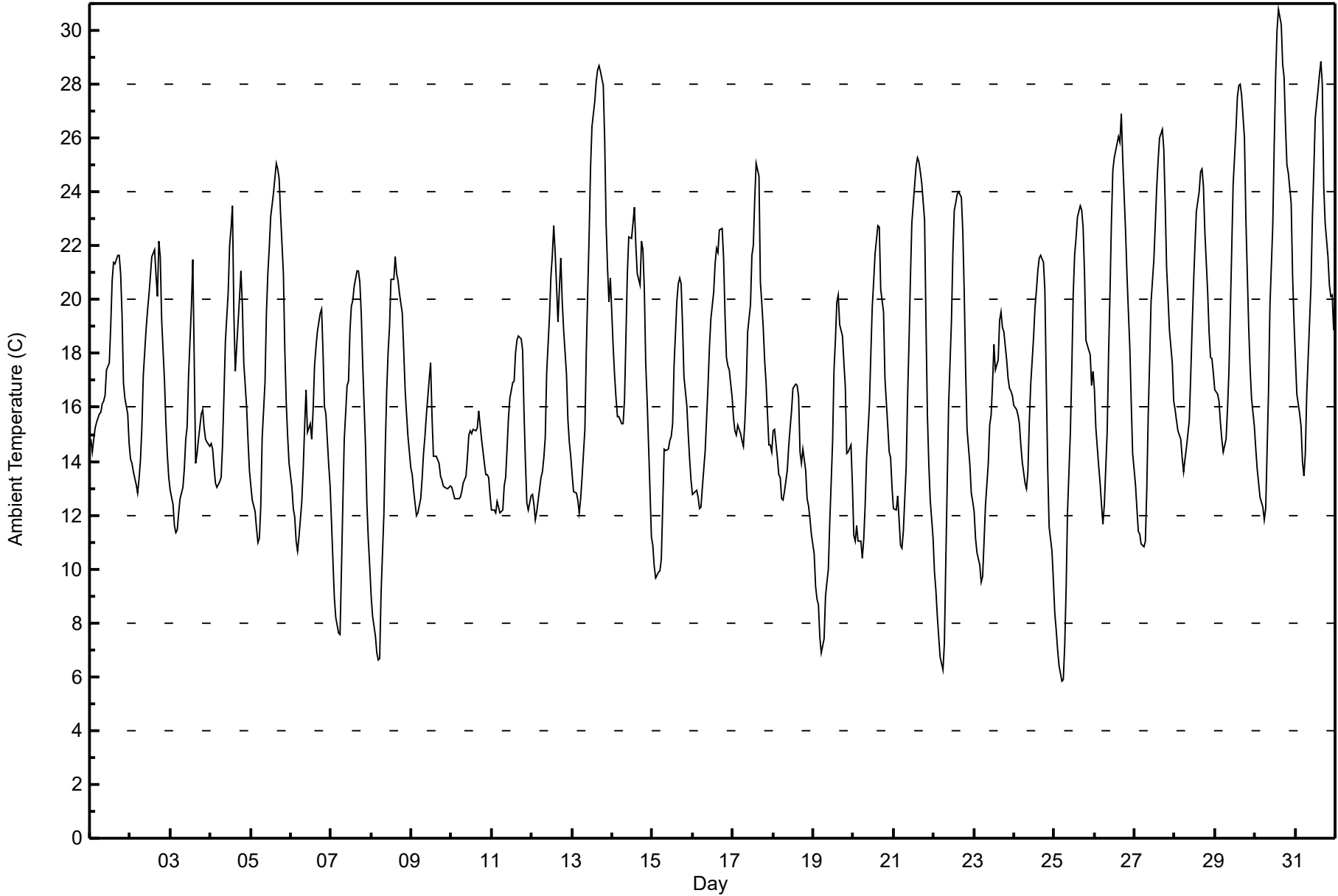
Total Number of Valid Hours: 697







Maximum Value: 30.8 C on Aug 30 15:00		Maximum Daily Average: 21.1 C on Aug 30		Hours in Service: 744																							
Minimum Value: 5.8 C on Aug 25 05:00		Minimum Daily Average: 13.3 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 22.1 C at hour 15		Minimum Diurnal Average: 11.6 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 16.73 C		Percentiles: P ₁ = 6.9 P ₁₀ = 11.3 Q ₁ = 13.2 Median = 15.9 Q ₃ = 20.2 P ₉₀ = 23.3 P ₉₉ = 28.4		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-Aug	14.8	14.4	14.8	15.2	15.5	15.8	15.8	16.1	16.2	16.5	17.4	17.6	19.0	20.7	21.4	21.3	21.7	21.6	21.0	19.5	16.9	16.4	15.7	14.6	17.5	21.7	
2-Aug	14.1	13.9	13.6	13.1	12.8	13.3	14.0	15.2	17.2	18.9	19.6	20.2	20.8	21.6	21.8	20.9	20.1	22.2	21.6	19.2	17.0	15.4	14.2	13.4	17.3	22.2	
3-Aug	12.9	12.4	11.6	11.3	11.5	12.1	12.6	13.1	13.7	14.8	15.3	17.2	19.7	21.5	17.8	13.9	14.3	14.8	15.8	15.9	15.2	14.8	14.7	14.5	14.6	21.5	
4-Aug	14.7	14.5	13.8	13.2	13.0	13.3	13.4	14.6	16.4	18.5	20.3	22.0	22.6	23.5	19.5	17.4	19.2	20.1	21.1	19.8	17.6	16.0	14.8	13.7	17.2	23.5	
5-Aug	13.1	12.6	12.2	11.5	11.0	11.1	12.3	14.9	16.9	19.5	21.0	21.9	23.1	24.0	24.5	25.1	24.9	24.5	23.2	21.0	18.1	16.2	14.9	13.9	18.0	25.1	
6-Aug	13.0	12.2	11.9	11.0	10.7	11.2	12.5	13.7	15.3	16.6	15.1	15.4	14.8	15.9	17.5	18.2	18.8	19.5	19.7	18.0	16.0	15.8	13.9	13.1	15.0	19.7	
7-Aug	11.7	10.3	8.9	8.2	7.6	7.6	9.9	12.5	14.8	16.8	17.0	18.8	19.8	20.0	20.5	21.1	21.1	20.6	19.5	17.6	14.6	12.4	11.1	10.1	14.7	21.1	
8-Aug	9.0	8.2	7.5	6.9	6.6	6.7	9.1	12.0	14.6	16.6	18.1	19.0	20.8	20.7	21.6	21.0	20.7	20.3	19.5	18.1	16.6	15.7	14.9	13.8	14.9	21.6	
9-Aug	13.5	12.9	12.4	12.0	12.1	12.6	13.3	14.3	14.9	15.7	17.0	17.6	15.7	14.2	14.2	14.2	13.9	13.5	13.3	13.1	13.0	13.0	13.0	13.1	13.9	17.6	
10-Aug	13.1	12.8	12.6	12.6	12.6	12.6	12.9	13.2	13.5	14.1	15.0	15.1	15.0	15.2	15.1	15.2	15.9	15.4	14.8	13.9	13.5	13.5	13.4	12.7	13.9	15.9	
11-Aug	12.2	12.2	12.1	12.5	12.3	12.1	12.2	13.1	13.4	14.4	15.6	16.3	16.9	17.0	18.0	18.5	18.6	18.6	18.1	15.8	14.0	12.5	12.2	12.7	14.6	18.6	
12-Aug	12.8	12.4	11.8	12.2	13.0	13.4	13.6	14.2	14.9	17.3	19.4	20.8	21.6	22.7	21.8	19.2	20.5	21.6	19.9	18.8	17.3	15.6	14.7	14.2	16.8	22.7	
13-Aug	13.5	12.9	12.8	12.6	12.1	12.6	13.4	15.2	18.1	20.3	22.4	24.9	26.4	27.4	28.1	28.5	28.7	28.5	27.9	25.9	22.8	21.2	19.9	20.8	20.7	28.7	
14-Aug	18.2	17.2	16.4	15.7	15.7	15.4	15.4	16.3	18.6	20.9	22.3	22.9	23.4	22.0	21.0	20.5	20.5	22.2	21.8	20.4	17.6	16.3	12.9	11.2	18.6	23.4	
15-Aug	10.9	10.1	9.7	9.9	9.9	10.4	12.3	14.5	14.4	14.5	14.8	14.9	15.4	17.6	20.0	20.6	20.8	20.6	19.1	17.1	16.1	15.0	14.1	13.3	14.8	20.8	
16-Aug	12.8	12.9	12.9	12.7	12.2	12.3	13.0	14.4	15.6	16.8	18.2	19.3	20.3	21.3	21.9	21.7	22.6	22.7	21.5	19.4	17.9	17.5	17.4	16.4	17.2	22.7	
17-Aug	15.6	15.1	15.0	15.3	15.1	14.7	14.5	15.4	16.8	18.8	19.8	21.6	22.0	23.7	25.1	24.6	20.7	19.9	18.9	17.8	16.9	14.6	14.6	14.4	18.0	25.1	
18-Aug	15.1	15.2	14.1	13.5	13.4	12.6	12.5	12.9	13.7	14.6	15.2	15.9	16.7	16.9	16.8	16.4	14.3	13.9	14.5	13.7	12.6	12.4	11.9	11.3	14.2	16.9	
19-Aug	10.6	9.3	8.9	8.6	7.5	6.9	7.4	9.0	9.5	10.0	11.7	14.7	17.4	18.5	19.9	20.2	19.1	18.6	17.7	16.8	14.3	14.3	14.6	13.1	13.3	20.2	
20-Aug	11.2	11.1	11.6	11.0	11.0	10.4	11.1	12.4	14.1	16.1	17.9	19.7	20.6	21.7	22.8	22.7	20.4	20.0	19.5	17.1	15.3	14.3	14.1	13.0	15.8	22.8	
21-Aug	12.3	12.2	12.7	11.8	10.9	10.8	11.4	13.8	16.4	18.5	20.8	22.9	24.3	25.0	25.3	25.1	24.7	24.3	23.0	19.1	15.7	13.9	12.5	11.1	17.4	25.3	
22-Aug	9.9	9.2	8.2	7.5	6.7	6.2	7.2	10.3	13.2	16.1	19.2	21.8	23.3	23.6	23.9	24.0	23.8	22.5	20.3	17.4	15.2	13.9	12.8	12.5	15.4	24.0	
23-Aug	12.1	11.2	10.6	10.1	9.5	9.7	11.0	12.4	13.9	15.3	15.7	16.9	18.3	17.4	17.7	19.2	19.5	19.0	18.8	17.8	17.1	16.7	16.6	16.4	15.1	19.5	
24-Aug	16.1	15.9	15.7	15.4	14.6	14.0	13.2	13.0	13.6	15.5	16.9	18.6	19.7	20.3	21.1	21.5	21.7	21.4	20.3	16.9	13.7	11.6	10.7	9.6	16.3	21.7	
25-Aug	8.4	7.7	7.0	6.4	5.8	5.9	7.2	9.2	12.1	15.1	17.4	20.2	21.7	22.3	23.1	23.5	23.3	22.7	20.9	18.5	18.1	18.0	16.8	17.3	15.4	23.5	
26-Aug	16.7	15.2	13.8	13.2	12.4	11.7	12.4	15.1	17.9	20.3	22.9	24.8	25.3	25.8	26.1	25.9	26.9	25.2	22.6	20.9	19.6	18.2	16.2	14.3	19.3	26.9	
27-Aug	13.1	12.2	11.4	11.3	11.0	10.8	11.0	13.0	15.7	17.7	19.9	21.5	22.8	24.2	25.2	26.0	26.3	25.6	23.6	21.2	20.1	18.9	17.7	16.2	18.2	26.3	
28-Aug	15.9	15.5	15.1	14.8	14.1	13.6	14.1	14.5	15.5	17.1	18.9	20.5	22.0	23.3	24.0	24.8	24.9	24.2	22.5	20.3	18.8	17.9	17.8	17.3	18.6	24.9	
29-Aug	16.7	16.5	16.2	15.5	14.8	14.4	14.8	15.9	17.3	19.5	21.8	24.3	26.3	27.6	28.0	28.0	27.6	26.0	23.0	20.9	19.0	17.4	16.4	15.3	20.1	28.0	
30-Aug	14.5	13.7	13.2	12.7	12.3	11.8	12.3	14.4	16.6	19.7	22.7	25.7	28.3	30.0	30.8	30.2	28.7	28.2	26.4	25.0	24.7	23.6	20.9	19.2	21.1	30.8	
31-Aug	17.8	16.5	15.7	15.3	14.0	13.4	14.3	16.5	19.2	20.5	23.1	24.8	26.8	27.8	28.4	28.9	28.0	24.2	22.9	21.6	20.6	20.1	20.2	18.9	20.8	28.9	
		13.4	12.9	12.4	12.0	11.7	11.6	12.3	13.7	15.3	17.0	18.5	19.9	21.0	21.8	22.1	21.9	21.7	21.4	20.4	18.7	17.0	15.9	15.0	14.2	Diurnal Average	
		18.2	17.2	16.4	15.7	15.7	15.8	15.8	16.5	19.2	20.9	23.1	25.7	28.3	30.0	30.8	30.2	28.7	28.5	27.9	25.9	24.7	23.6	20.9	20.8	Diurnal Maximum	





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Waskow ohci Pimatisiwin - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	42	5.65	5.65
10 - 20	510	68.55	74.19
> 20	192	25.81	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Relative Humidity (RH) - %

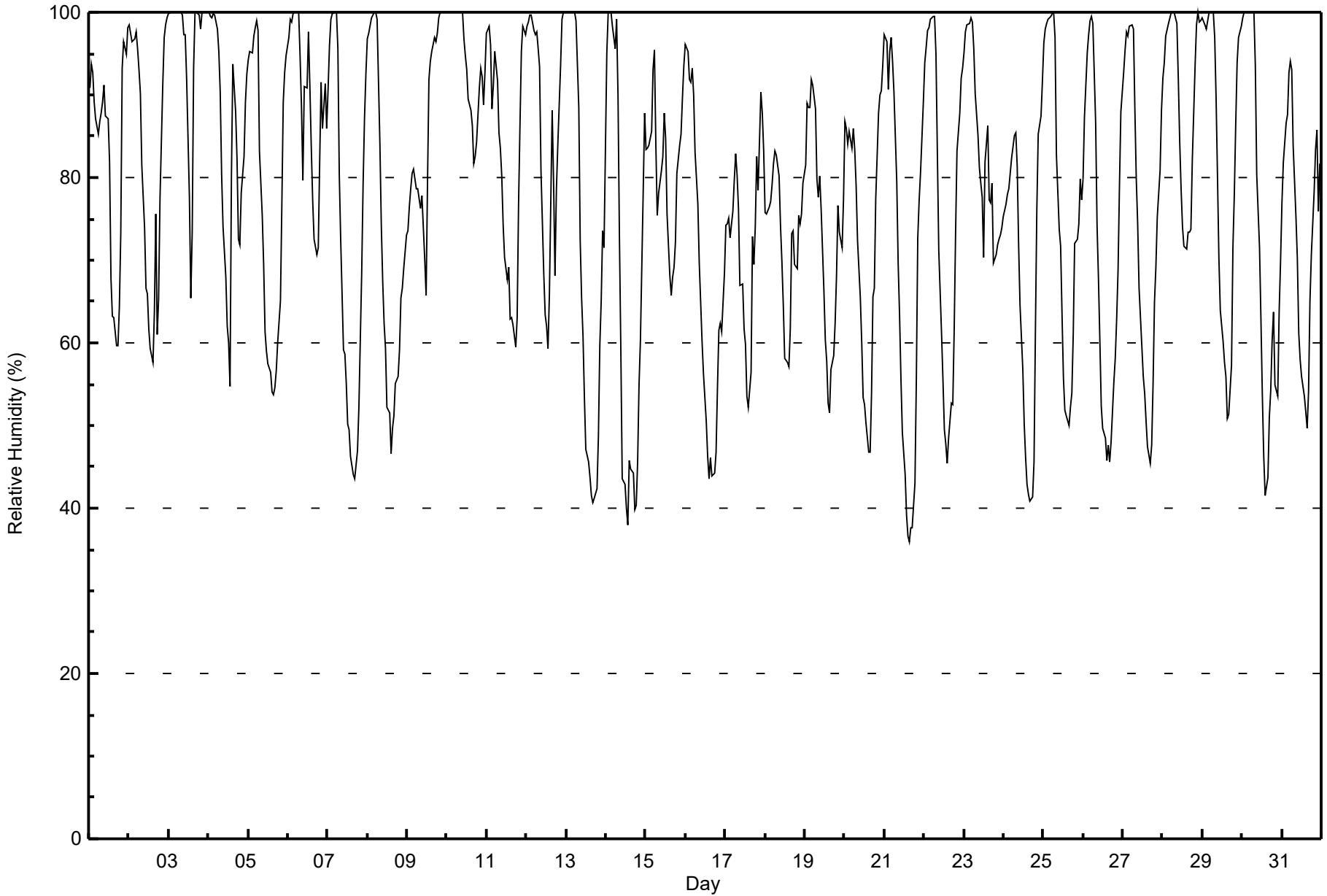
Waskow ohci Pimatisiwin - August 2023

Maximum Value: 100.0 % on Aug 3 03:00 Maximum Daily Average: 95.6 % on Aug 3																						Hours in Service:	744			
Minimum Value: 35.9 % on Aug 21 16:00 Minimum Daily Average: 66.6 % on Aug 16																						Hours of Data:	744			
Maximum Diurnal Average: 94.7 % at hour 6 Minimum Diurnal Average: 58.2 % at hour 15																						Hours of Missing Data:	0			
Monthly Average: 77.79 % Percentiles: P ₁ = 40.1 P ₁₀ = 51.3 Q ₁ = 63.3 Median = 79.9 Q ₃ = 94.8 P ₉₀ = 99.4 P ₉₉ = 100.0																						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-Aug	90.9	93.8	92.7	89.1	87.1	85.3	86.7	87.9	89.1	91.2	87.5	87.1	81.8	67.8	63.2	63.0	59.7	59.7	64.4	73.2	93.3	96.4	94.9	98.1	82.7	98.1
2-Aug	98.5	97.5	96.5	96.9	97.6	95.6	93.1	90.1	81.5	73.9	66.6	65.9	61.6	59.4	57.7	63.8	75.7	61.0	65.2	77.4	91.4	96.9	98.5	99.3	81.7	99.3
3-Aug	99.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	97.3	97.3	92.0	77.5	65.4	73.4	93.2	100.0	100.0	99.7	98.0	100.0	100.0	100.0	100.0	95.6	100.0
4-Aug	100.0	99.4	99.3	99.8	99.7	97.9	95.3	90.4	80.3	74.0	68.0	62.1	60.0	54.8	80.1	93.8	87.9	82.2	72.5	71.8	78.1	82.5	89.1	92.6	83.8	100.0
5-Aug	94.3	95.2	95.0	97.2	98.1	99.0	97.8	83.2	75.4	69.4	61.4	59.0	57.4	56.4	54.1	53.7	54.6	56.6	60.0	65.0	76.9	89.2	92.7	94.7	76.5	99.0
6-Aug	96.9	99.1	98.8	99.9	100.0	100.0	99.9	94.7	88.6	79.7	91.0	90.9	97.7	91.0	83.7	77.3	72.6	70.7	71.6	81.8	91.5	86.0	91.4	85.9	89.2	100.0
7-Aug	90.6	95.9	99.1	99.9	100.0	100.0	95.6	80.4	72.5	59.1	58.6	55.0	50.1	49.5	46.2	44.1	43.6	45.3	47.0	52.2	68.5	79.1	87.1	92.6	71.3	100.0
8-Aug	96.7	97.5	99.3	99.7	100.0	100.0	99.2	84.1	74.2	67.4	62.3	59.3	52.3	51.5	46.5	49.7	51.3	55.1	56.0	59.2	65.4	66.6	69.0	73.0	72.3	100.0
9-Aug	73.5	76.4	78.7	80.5	81.1	78.7	78.6	77.4	76.3	77.9	70.1	65.8	79.6	91.9	94.1	95.3	97.0	96.4	97.5	99.3	100.0	100.0	100.0	100.0	86.1	100.0
10-Aug	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.8	94.7	93.0	89.4	88.1	86.3	81.7	82.5	84.2	90.9	93.3	92.2	88.8	92.7	93.9	100.0
11-Aug	97.5	98.4	96.2	88.4	91.2	95.3	91.8	85.4	83.5	80.2	74.2	70.4	67.6	69.2	62.9	63.0	62.2	59.5	63.1	76.8	86.3	95.3	98.3	97.3	81.4	98.4
12-Aug	98.4	98.8	99.7	99.7	97.8	97.3	97.6	95.7	93.4	80.8	68.3	63.3	62.0	59.3	65.7	88.1	79.5	68.1	78.5	83.9	93.5	99.1	100.0	100.0	86.2	100.0
13-Aug	100.0	100.0	100.0	100.0	100.0	100.0	99.0	88.5	72.4	65.5	60.8	53.4	47.1	45.6	43.8	41.6	40.6	41.2	42.4	48.6	59.6	65.1	73.5	71.4	69.2	100.0
14-Aug	95.1	100.0	100.0	100.0	98.3	95.6	99.1	89.9	72.9	59.2	43.6	42.9	40.0	38.0	45.7	44.8	44.3	39.8	40.3	45.5	54.9	60.3	78.5	87.8	67.3	100.0
15-Aug	83.4	83.6	84.0	85.6	93.1	95.4	84.0	75.4	78.1	80.9	82.5	87.8	84.8	75.6	68.1	65.7	68.0	69.2	72.2	80.5	83.9	85.3	89.6	93.6	81.3	95.4
16-Aug	96.1	95.3	91.9	91.4	93.2	90.0	83.0	76.7	69.6	64.9	60.2	56.3	50.5	46.2	43.5	46.1	43.8	44.3	46.8	54.6	61.6	62.4	61.4	68.4	66.6	96.1
17-Aug	74.2	74.4	75.2	72.8	76.0	79.6	82.9	80.3	76.2	67.0	67.0	61.6	59.9	53.6	52.2	56.5	72.9	69.5	74.1	82.5	78.5	90.4	87.8	83.3	72.8	90.4
18-Aug	75.7	75.7	76.5	77.2	79.2	81.8	83.2	82.7	80.1	74.2	69.9	64.5	58.1	57.6	57.2	61.6	73.2	73.5	69.5	69.1	75.3	74.4	75.7	79.3	72.7	83.2
19-Aug	81.6	89.0	88.6	88.5	91.8	91.3	88.4	79.9	77.6	80.2	76.2	66.2	60.3	57.8	52.7	51.5	56.8	58.4	62.4	68.1	76.7	73.4	71.5	77.4	73.6	91.8
20-Aug	86.8	86.0	84.1	85.6	83.5	85.9	83.4	79.1	72.3	65.4	60.0	53.5	52.6	50.4	46.8	46.7	53.8	65.6	66.6	77.5	87.8	90.0	90.6	93.5	72.8	93.5
21-Aug	97.2	96.4	90.7	95.3	96.9	94.0	90.4	79.6	69.7	63.5	55.5	49.1	44.1	39.2	36.6	35.9	37.6	37.7	43.0	55.8	72.7	77.3	80.7	89.2	67.8	97.2
22-Aug	93.8	95.7	97.8	98.2	99.1	99.4	99.5	94.9	82.8	71.1	61.0	55.4	49.5	47.9	45.5	48.4	52.7	52.6	61.5	73.2	83.3	87.7	92.1	93.3	76.5	99.5
23-Aug	95.0	97.6	98.5	98.6	99.3	98.9	95.6	90.2	85.1	81.2	79.3	77.6	70.3	81.9	86.4	77.3	77.0	79.3	69.7	70.7	71.9	72.5	73.1	73.9	83.4	99.3
24-Aug	75.3	76.8	78.0	78.7	80.5	82.3	85.1	85.4	81.4	71.8	64.5	56.9	50.2	46.1	42.9	41.7	40.9	41.3	45.7	61.6	76.0	85.3	87.5	91.7	67.8	91.7
25-Aug	96.2	97.9	98.6	99.2	99.4	99.9	100.0	97.0	82.8	73.7	71.6	63.3	55.8	51.9	51.1	50.0	52.1	54.0	61.0	72.1	72.5	74.4	79.9	77.2	76.3	100.0
26-Aug	79.8	87.3	95.1	97.4	99.1	99.5	98.7	86.6	74.2	67.8	60.4	52.4	49.7	48.5	45.7	47.7	45.6	48.0	55.2	58.2	62.9	68.8	78.9	87.9	70.6	99.5
27-Aug	92.8	95.4	97.6	97.1	98.3	98.4	98.0	88.2	79.8	74.4	66.6	59.5	55.9	53.9	50.4	47.5	45.4	47.7	55.0	64.9	69.1	75.2	80.8	88.2	74.2	98.4
28-Aug	92.1	93.9	97.2	98.6	99.4	100.0	100.0	100.0	98.6	92.0	84.3	78.6	74.1	71.8	71.3	73.4	73.4	73.8	82.0	93.5	98.5	99.9	98.9	98.9	89.3	100.0
29-Aug	99.3	98.4	98.0	99.1	99.9	100.0	100.0	96.9	89.4	80.1	70.1	63.9	60.1	57.7	56.0	50.9	51.3	57.3	71.5	78.0	86.4	94.0	96.9	98.3	81.4	100.0
30-Aug	99.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	93.5	80.3	71.6	62.9	53.7	46.3	41.5	43.8	51.1	54.3	60.4	63.6	55.0	53.6	63.7	69.9	73.5	100.0
31-Aug	76.9	81.8	86.6	87.7	92.6	94.1	93.1	84.0	75.2	70.1	61.2	57.9	55.9	53.5	51.7	49.7	54.0	65.0	70.7	78.4	83.3	85.8	76.0	81.6	73.6	94.1
																								Diurnal Average		
																								Diurnal Maximum		



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Waskow ohci Pimatisiwin - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	7	0.94	0.94
40 - 60	145	19.49	20.43
60 - 80	221	29.70	50.13
80 - 100	316	42.47	92.61

Total Number of Valid Hours: 744

Total Number of Hours: 744

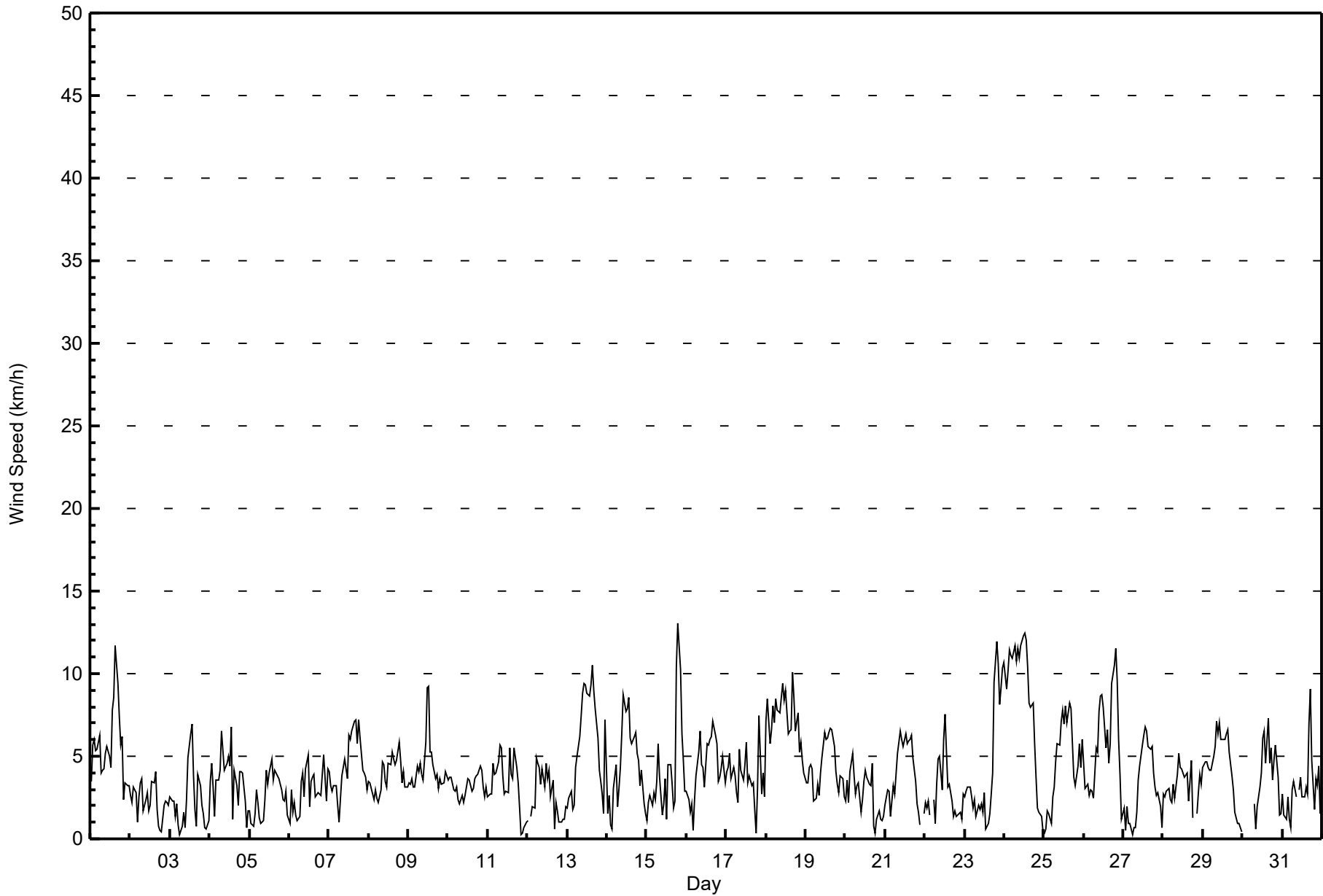


Maximum Speed: 13 km/h on Aug 15 20:00	Maximum Daily Speed Average: 8.2 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 3 07:00	Minimum Daily Speed Average: 0.4 km/h on Aug 20	Hours of Data: 732
Maximum Diurnal Speed Average: 1.9 km/h at hour 14	Minimum Diurnal Speed Average: 0.4 km/h at hour 18	Hours of Missing Data: 12
Monthly Average Velocity: 0.6 km/h 225.6 deg	Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 2 Median = 4 Q ₃ = 5 P ₉₀ = 7 P ₉₉ = 12	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-Aug	WSW3	W6	W6	W5	WSW5	WNW6	WSW4	WSW4	SW4	SW5	SW6	WSW5	WSW4	WNW8	NW9	NNW12	NW9	NW7	WNW6	NW6	W2	W3	WNW3	WNW3	W4.7	NNW12	
2-Aug	WNW3	W2	WNW3	NW3	WNW1	WNW3	NW3	WNW4	NNW2	ESE2	WNW3	SW2	W2	SSW3	SW3	S4	SSE2	ESE1	ENE0	ESE0	WNW2	W2	W2	W2	W1.4	S4	
3-Aug	WNW3	W2	W2	WNW1	NW2	W1	NW0	W1	NW2	WSW1	SSE2	SE5	SE6	SE7	WNW4	SSW2	WNW1	SSE4	SSE3	SSE2	SSE1	E1	SSE1	SSW1	S1.0	SE7	
4-Aug	WNW4	WNW5	WNW3	NW1	W4	W4	WSW4	WSW7	WSW5	SSW4	SSW5	S5	SSW4	S7	E1	SSE4	SSE3	S2	SW4	WNW4	W2	SSE1	WNW2	SW2.5	S7		
5-Aug	NNW2	W1	SW1	S2	SSE3	SE2	SSE1	SSE1	WSW1	E2	N4	N3	E4	SE5	ENE4	NE4	NE4	NNE4	NNE4	N3	NW2	WSW2	W3	W1	NE0.8	SE5	
6-Aug	W1	W3	W2	WSW2	SSW1	SSW1	SE1	N4	SSE4	NNE3	N4	N5	WNW2	N4	NNW4	NNW4	NNW3	NNW3	NNW3	NW3	NNW4	NW5	NNW2	NNW4	NNW1.9	N5	
7-Aug	WNW4	NW3	WSW3	W3	W3	W2	WNW1	N2	N4	N5	NNW4	N4	NNE6	NNE6	N7	NNE7	NE6	NNE7	N6	NNW4	NW4	NW4	NW3	NNW3.4	NNE7		
8-Aug	W4	WNW3	W3	W2	W3	W2	NW2	SE3	SE5	SE4	NNE3	NE3	ESE5	ESE5	ENE5	E5	E4	E5	E6	E5	E3	ESE4	ESE3	ESE3	E1.9	E6	
9-Aug	SE3	SE3	SE4	SE3	ESE3	SE4	ESE4	SE5	ESE4	ESE4	SE6	SE9	SSE9	ESE5	ESE5	ESE4	E4	E4	ESE3	ESE4	E3	ESE3	ESE4	ESE4	ESE4.2	SSE9	
10-Aug	ESE4	ESE4	ESE4	E3	ESE3	ESE3	ENE2	E2	E3	E2	ENE3	ENE3	ENE4	ENE4	ESE3	E3	ENE4	ENE4	NE4	NNE4	NNW4	N3	N3	N3	ENE2.5	NNE4	
11-Aug	WNW3	WNW3	NNW3	N5	N4	NW4	NW5	NNW6	NNW5	NNW4	N3	N3	SSW3	SW6	SSW4	S4	SSE6	S4	S3	SSE2	SSE0	SW0	SE1	ESE1	WNW0.9	NNW6	
12-Aug	S1	UO	SW1	SSE2	WSW2	W5	W5	W4	W3	WSW4	W3	S5	SSE4	S4	SSE3	NNE4	SE1	SSW2	S2	W1	WSW1	SSW1	SE1	SSE2	SW1.5	W5	
13-Aug	SSE2	SSE2	SSE3	S2	SSE2	SSE4	SSE5	SSE6	SSE7	S9	S9	S9	SW9	SSW9	SSW9	SW11	SW9	SW8	SW6	SSW4	S3	SW3	SW2	WNW7	SSW4.9	SW11	
14-Aug	SW2	S3	SW1	WNW1	NNW3	NW4	S2	SSW3	WSW4	W6	WNW9	W8	W8	WSW9	WSW6	W6	WSW6	W6	W5	WNW5	W3	NW4	SW2	SW2	W3.9	WNW9	
15-Aug	S1	SSE2	SSE3	SE2	S3	SSE2	SSE4	SSE6	SW4	ESE1	SSE2	ESE4	SE1	SE5	ESE4	ESE3	E2	NNW2	N10	NNW13	NNW10	NW6	NW5	WNW3	NE0.5	NNW13	
16-Aug	WSW3	WNW2	NW2	NNW2	WSW1	WNW2	WNW4	WNW5	NW7	WNW5	WNW4	W3	W6	SW6	WSW6	S6	S7	SSW6	S6	S3	S4	SSE4	S5	SE3	SW2.5	S7	
17-Aug	SSE4	SSE4	SSE5	SSE4	SSE4	SSE4	SSE3	SSE2	SSE5	S4	SSE4	WSW4	W6	W3	SE4	NE3	SSW3	SE2	NNE0	WNW3	NW7	W3	NW4	NW3	SSW1.6	NW7	
18-Aug	NNW7	NNW8	NNW6	NNW7	N8	NNW7	NNW8	NNW8	NNW8	NNW9	N9	NNW8	NNW9	NNW6	NNW7	NW7	NNW10	NW9	NNW7	NNW8	NW5	NNW6	NW5	WNW4	NNW7.1	NNW10	
19-Aug	WNW3	W3	W4	W4	W4	WSW2	SSW2	SSW3	SSW3	S4	SSW5	SW6	SW6	SSW6	SW6	WSW7	SW7	SW6	SSW4	S3	S3	SSW4	SSW4	SSE3	SW3.7	WSW7	
20-Aug	SE2	SSE4	NNW2	S4	S5	S4	SSE3	S3	SW3	W2	NE2	NE3	NE4	NE4	N3	WNW3	NW5	SSE1	ESE0	SW1	W2	SW1	W1	SSE1	S0.4	S5	
21-Aug	W2	SSE3	SSE3	W1	S2	SSE3	SSE3	SSE5	SSE6	SE7	SE6	SE6	SSE6	SSE6	SE6	SSE6	SSE6	SSE5	S3	SSE2	SW2	WSW1	UO	W2	SSE3.5	SE7	
22-Aug	W2	WSW2	WSW2	W1	UO	W2	SSW1	SSE3	SE5	SE5	SE3	SE6	SE8	SE5	SE3	E3	ESE2	SSW1	W2	SW1	WSW1	W2	WNW1	WNW3	SSE1.5	SE8	
23-Aug	W3	W3	W3	W3	W3	WNW2	W2	WSW1	W2	WSW2	WSW2	SSW2	NW3	WSW1	SSW1	NNW1	NW3	NNW4	NNW10	NNW12	NNW11	NNW8	NNW9	N10	NW3.3	NNW12	
24-Aug	N11	N9	N10	NNE11	N11	N11	N12	N11	N12	N11	N12	N12	N12	N12	NNW12	NNW10	NNW8	NNW8	NNW8	NW6	NW4	W2	WSW2	W1	WNW0	N8.2	N12
25-Aug	SW0	SSE1	S2	SSW2	WSW1	S3	S3	S5	SSE6	SSE6	SE7	S8	S7	S8	S7	S8	S8	S6	SSE4	SE3	SE4	SSE6	SSE4	S6	SSE4.5	S8	
26-Aug	SSE5	SE3	SSE3	S3	S3	S3	S2	SSE5	SSE5	SSE8	S9	S9	SSW8	SW6	WSW7	WSW5	W6	N9	N10	NNW11	NNW10	NNW6	WNW4	WSW1	SW1.4	NNW11	
27-Aug	WSW2	SSE1	WSW2	WSW1	NW1	N0	SW1	NW1	SE2	SE4	SE4	SE6	S6	S7	SSE7	S6	SSW5	S6	SSE4	SSE3	SSE3	SSE3	SSE2	SW1	S2.6	SSE7	
28-Aug	SE3	SE3	SSE3	SE3	SE2	SSE2	SSE3	SE2	SSE4	SSE5	SE4	SE4	SE4	SE4	SSE4	SE2	SSE3	SSE5	SE1	UO	SE1	SE3	SSE4	SSE3	SSE3.2	SSE5	
29-Aug	SSE4	SSE5	SSE5	SSE4	SSE4	SSE4	SSE5	SE6	SSE7	SSE6	SSE7	SE6	SE6	SE6	SE6	SSE7	SSE5	SE4	SSE3	SSE2	SSE1	N1	W1	WNW0	SSE4.2	SSE7	
30-Aug	UO	UO	UO	UO	UO	UO	UO	W2	N1	NNE2	SE3	SE4	SE6	SE7	SE5	SSE7	SSE5	SSE6	SSE4	SSE5	SSE6	SSE4	SSE1	S2	---	SSE7	
31-Aug	NNW3	SW1	SSW1	WSW3	WNW1	SW1	SSE3	SSE3	NNW3	C	SE3	SSE4	E3	NE3	ENE3	ENE3	N7	NNW9	NNW5	W2	WNW4	WNW3	NW4	SW2	NNW0.9	NNW9	

W0.9WSW0.9WSW0.8	W0.7WSW0.7WSW0.9	SW0.6SSW0.9	S1.0	SSE1.0	SSE0.8	SSE1.5	S1.6	S1.9	S1.0	S0.8	SW0.8WSW0.4	NW0.8NNW1.4	NW1.3NNW1.0	W0.8	W0.8	Diurnal Average							
N11	N9	N10	NNE11	N11	N11	N12	N11	N12	N11	N12	N12	NNW12	NNW10	NNW12	NNW10	NNW9	N10	NNW13	NNW11	NNW8	NNW9	N10	Diurnal Maximum

C - Calibration 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
Waskow ohci Pimatisiwin - August 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	555	75.82	75.82
6 - 11	168	22.95	98.77
12 - 19	9	1.23	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: 732

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Wind Speed (WS) - km/h
Waskow ohci Pimatisiwin - August 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	22	8	10	12	20	34	50	100	37	30	25	39	65	49	30	24	555
6 - 11	14	6	1	0	1	0	18	24	20	6	12	8	10	5	10	33	168
12 - 19	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	9
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	41	14	11	12	21	34	68	124	57	36	37	47	75	54	40	61	732

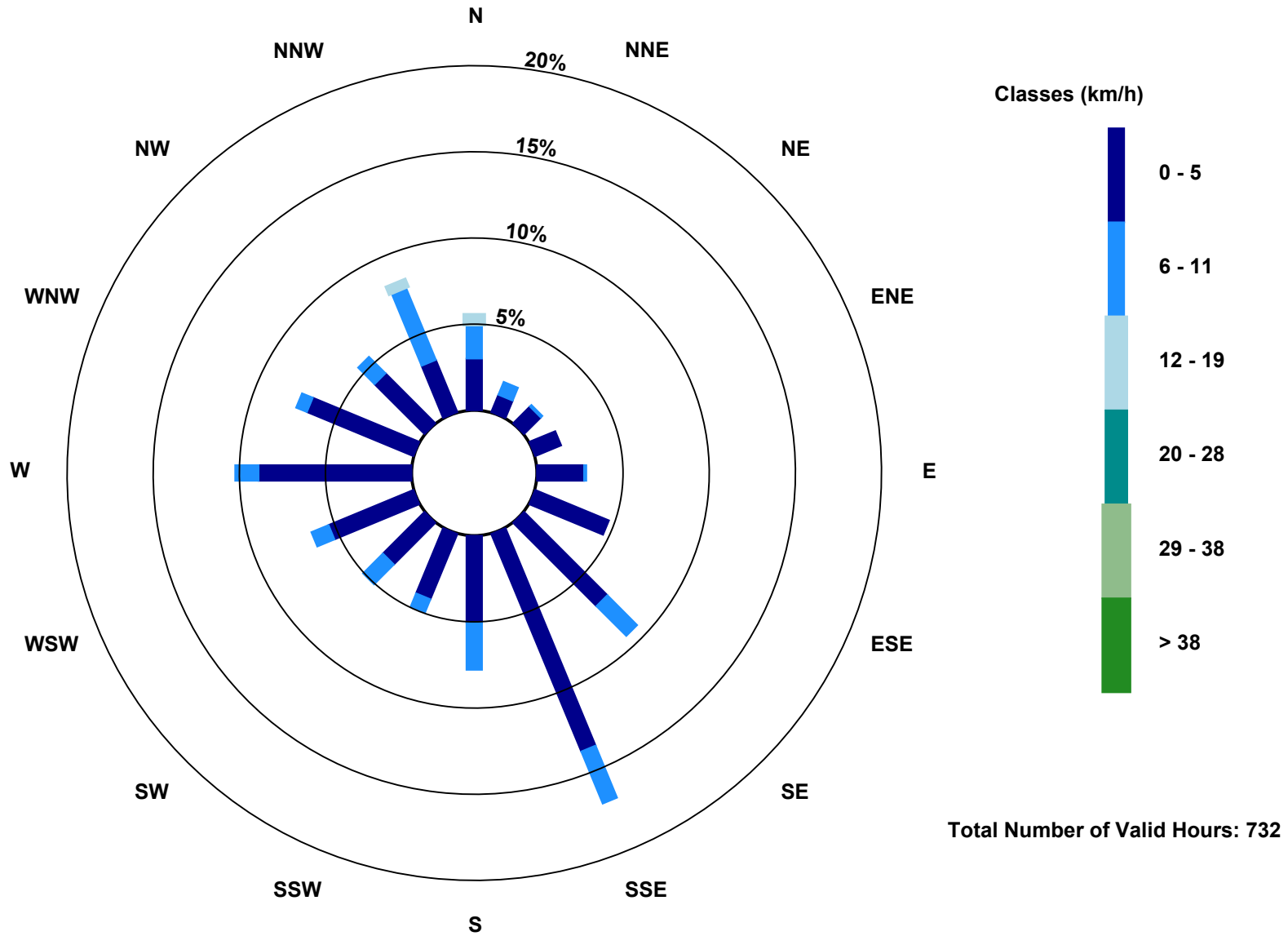
Total Number of Valid Hours: 732

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 6 km/h on Aug 31 17:00														Hours in Service: 744 Hours of Data: 732 Hours of Missing Data: 12 Hours of Calibration: 1 Percent Operational Time: 98.5											
Minimum Value: 0 km/h on Aug 2 21:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 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-Aug	1	2	2	2	3	3	2	2	2	2	2	2	3	3	4	4	3	2	3	2	1	1	1	4	
2-Aug	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	1	2	1	1	1	0	1	0	1	2
3-Aug	1	1	1	1	1	1	1	1	1	1	1	2	2	3	4	5	2	1	1	2	1	1	1	1	5
4-Aug	1	2	1	1	1	2	2	3	2	2	2	2	3	3	2	2	2	1	2	2	2	1	1	1	3
5-Aug	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1	2	2	1	2	1	1	1	2	1	2
6-Aug	2	1	1	1	1	1	1	2	1	3	5	2	1	1	1	1	1	1	1	1	2	1	1	2	5
7-Aug	1	1	1	1	1	1	1	1	2	2	1	2	3	2	3	3	2	3	2	1	0	1	1	1	3
8-Aug	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2
9-Aug	2	1	1	1	1	2	2	2	1	2	3	3	4	2	2	2	2	2	2	1	1	1	2	2	4
10-Aug	1	2	1	1	1	1	1	1	1	1	1	1	2	1	2	1	2	1	2	2	1	1	1	2	2
11-Aug	1	1	1	2	2	1	1	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	2
12-Aug	1	UO	1	1	1	2	2	1	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	3
13-Aug	1	1	1	1	1	1	2	2	3	3	3	4	4	4	4	4	4	3	3	2	1	1	1	4	4
14-Aug	2	2	1	2	2	2	1	2	2	3	3	3	4	4	3	3	3	3	3	2	1	2	2	1	4
15-Aug	1	1	1	1	1	1	1	2	2	1	1	2	1	2	2	1	1	4	3	4	3	2	1	1	4
16-Aug	1	1	1	1	1	1	1	2	2	2	2	3	3	3	3	2	3	2	2	1	2	1	2	1	3
17-Aug	1	2	1	1	1	1	1	1	2	2	2	2	3	2	2	3	3	1	1	1	6	2	1	2	6
18-Aug	3	3	2	3	3	2	3	2	2	3	3	3	3	3	2	2	4	2	2	2	1	1	1	2	4
19-Aug	1	1	1	2	2	2	2	2	1	2	2	3	3	2	3	3	3	2	2	1	1	1	1	1	3
20-Aug	1	1	2	2	2	1	1	2	2	1	1	1	2	2	2	3	2	1	1	1	2	1	1	2	3
21-Aug	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	UO	1	2
22-Aug	1	1	1	1	UO	1	1	2	1	2	1	2	3	2	2	1	1	1	1	1	1	1	1	1	3
23-Aug	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2	3	3	3	3	3	3	3
24-Aug	3	3	4	4	4	3	4	4	4	4	4	5	4	4	4	3	3	2	2	1	1	1	2	1	5
25-Aug	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	2	1	1	2	2	2	2	3
26-Aug	2	1	1	1	1	1	1	2	2	3	4	4	3	3	3	3	3	5	3	5	3	2	1	1	5
27-Aug	2	1	1	1	1	1	1	2	1	1	2	2	3	3	3	2	2	2	1	1	1	1	1	1	3
28-Aug	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	1	2	UO	2	1	1	1	2
29-Aug	1	1	1	1	1	1	1	2	2	3	3	2	2	2	2	2	2	2	1	1	1	1	1	2	3
30-Aug	UO	UO	UO	UO	UO	UO	UO	1	1	1	1	1	3	3	2	2	2	2	1	2	2	2	1	1	3
31-Aug	1	1	2	1	1	1	2	1	2	C	1	2	1	1	1	2	6	3	2	1	1	2	2	1	6
														Diurnal Maximum											
														3 3 4 4 4 3 4 4 4 4 5 5 4 4 4 5 6 5 3 5 6 3 3 4											
C - Calibration UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - August 2023

Direction of Maximum Speed: 343 deg on Aug 15 20:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 352.3 deg on Aug 24	Hours of Data: 732
Direction of Minimum Speed: 308 deg on Aug 3 07:00	Hours of Missing Data: 12
Direction of Minimum Daily Speed Average: 0.4 deg on Aug 20	Percent Operational Time: 98.5
Monthly Average Direction: 225.6 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-Aug	258	267	265	276	253	290	251	247	219	221	226	238	252	293	308	327	307	308	297	321	272	278	292	284	280.1	
2-Aug	287	269	292	318	291	284	316	289	333	121	289	215	276	193	227	188	147	118	65	120	300	268	259	270	265.7	
3-Aug	283	265	269	286	313	262	308	262	325	253	147	134	134	143	286	194	290	165	152	147	155	85	149	204	179.2	
4-Aug	302	292	288	309	280	272	242	252	247	208	210	170	210	186	84	158	160	171	216	284	286	268	157	296	235.9	
5-Aug	332	269	222	172	168	144	147	157	256	91	7	4	96	128	73	42	38	20	28	354	319	256	259	265	45.4	
6-Aug	263	273	273	239	193	213	133	355	160	12	2	3	295	4	346	332	338	332	327	322	336	324	341	346	332.9	
7-Aug	303	304	256	275	262	259	285	6	9	5	338	350	19	12	4	22	17	35	19	350	320	308	305	272	347.2	
8-Aug	260	297	266	266	261	263	317	136	136	140	31	54	102	103	74	84	89	89	94	98	93	115	109	119	100.1	
9-Aug	138	125	129	128	116	135	112	126	106	107	126	145	148	120	110	104	95	99	105	104	99	105	107	111	119.8	
10-Aug	111	109	115	94	102	104	78	89	99	81	73	59	75	75	106	79	65	65	42	27	342	4	10	352	69.3	
11-Aug	287	286	348	357	1	322	322	343	336	342	358	2	199	236	195	190	159	189	182	158	152	234	134	109	297.5	
12-Aug	178	UO	224	160	253	263	267	268	262	257	278	173	164	177	149	24	141	207	171	270	249	210	141	163	222.3	
13-Aug	155	157	157	169	150	165	154	150	168	170	170	185	225	200	208	218	235	220	234	197	188	235	217	295	197.1	
14-Aug	219	190	220	287	336	313	190	208	237	281	283	280	260	254	238	264	250	259	267	291	280	315	233	228	264.5	
15-Aug	181	153	162	127	169	155	157	155	157	106	152	122	135	131	123	107	90	339	349	343	337	320	305	292	42.6	
16-Aug	254	282	317	331	243	285	285	290	312	296	297	261	270	231	240	177	191	194	186	179	172	166	169	132	233.0	
17-Aug	150	163	149	162	159	158	152	160	160	180	156	253	268	267	129	52	205	132	13	286	318	260	308	304	193.1	
18-Aug	337	345	346	340	350	338	341	336	340	345	351	332	340	343	327	313	330	322	338	333	323	330	314	295	335.3	
19-Aug	289	270	279	276	261	241	201	208	202	189	201	214	214	205	223	239	224	223	204	174	183	197	193	149	220.2	
20-Aug	143	162	341	191	185	174	160	189	216	279	37	49	38	49	11	297	313	153	114	221	260	225	273	163	189.0	
21-Aug	268	168	154	275	173	162	159	167	155	134	133	137	154	160	142	149	149	163	173	168	224	251	UO	271	157.4	
22-Aug	264	240	244	261	UO	264	200	154	136	135	125	137	133	142	125	85	103	192	281	220	243	266	294	282	159.2	
23-Aug	272	265	266	276	259	291	280	257	277	248	250	199	318	251	200	341	314	334	342	343	340	338	345	354	321.9	
24-Aug	359	2	1	12	10	358	355	4	1	359	2	353	350	347	338	341	338	334	323	315	279	250	268	303	352.3	
25-Aug	235	162	172	194	238	176	180	170	161	150	141	170	188	175	189	179	177	169	153	141	144	153	153	174	168.2	
26-Aug	153	136	165	176	177	177	178	163	159	156	172	186	202	214	248	237	281	349	355	348	347	333	297	237	224.7	
27-Aug	248	155	247	241	306	4	214	315	130	124	130	139	169	169	164	184	200	187	168	156	163	160	156	224	169.8	
28-Aug	143	139	164	146	146	166	152	143	154	156	134	144	134	137	153	146	154	153	146	UO	142	140	150	155	147.9	
29-Aug	163	164	160	161	158	162	153	143	148	148	148	148	136	135	135	140	166	160	144	165	147	155	354	265	302	151.3
30-Aug	UO	UO	UO	UO	UO	UO	UO	271	356	19	130	129	146	145	129	153	163	150	154	155	155	166	155	178	--	
31-Aug	327	218	198	255	285	220	167	153	345	C	127	150	101	50	69	67	357	347	329	268	297	298	310	230	335.9	

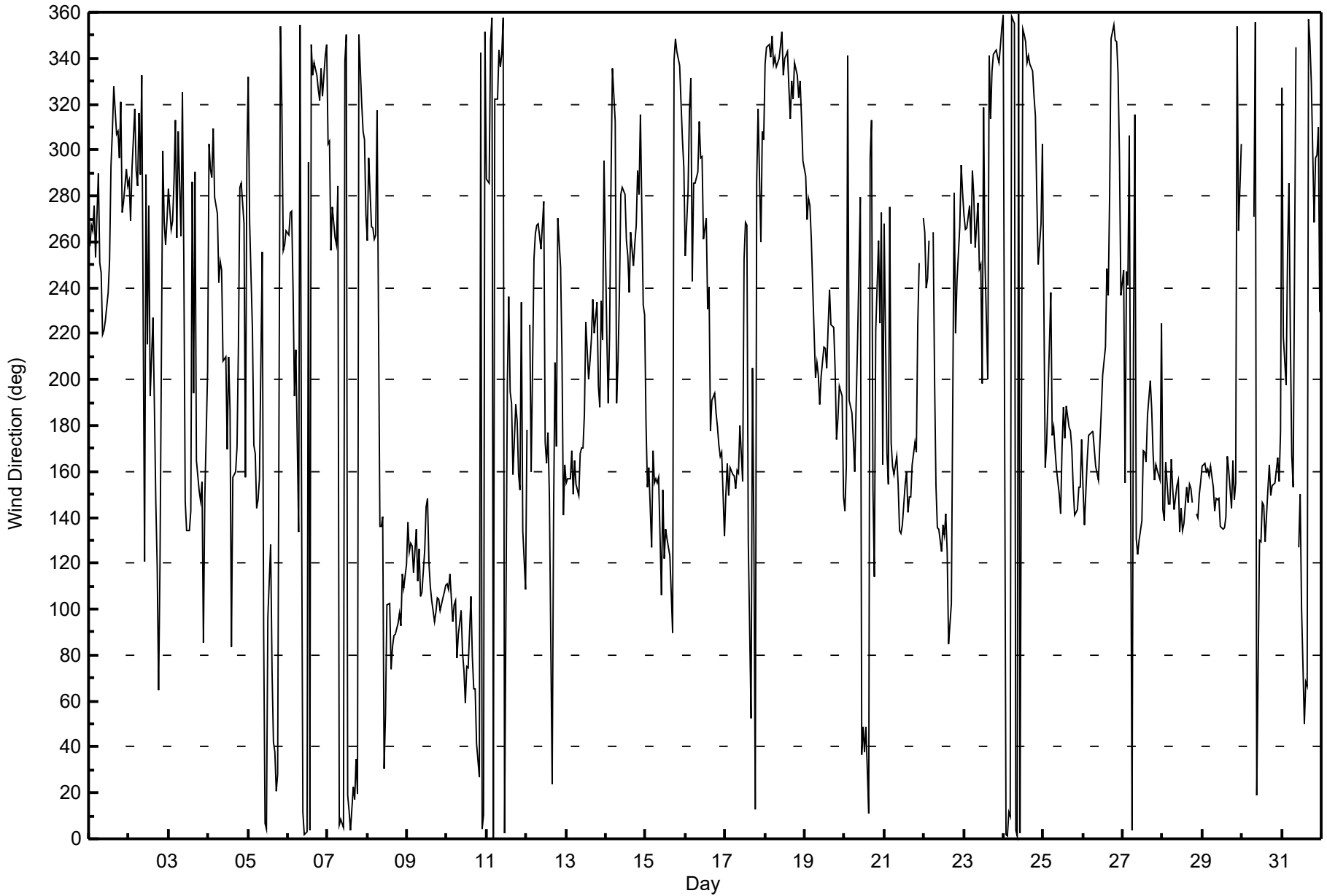
270.6 248.3 245.5 269.1 248.5 249.0 221.9 198.9 179.3 156.9 148.5 162.4 180.8 175.1 183.9 182.2 230.8 241.7 325.7 331.1 310.8 285.3 278.0 274.4
 Diurnal Average

C - Calibration 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
Waskow ohci Pimatisiwin - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Waskow ohci Pimatisiwin - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 110 deg on Aug 3 17:00	Hours of Data: 732
Minimum Value: 11 deg on Aug 6 22:00	Hours of Missing Data: 12
Percentiles: P ₁ = 15 P ₁₀ = 23 Q ₁ = 29 Median = 39 Q ₃ = 57 P ₉₀ = 76 P ₉₉ = 97	Hours of Calibration: 1
	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-Aug	51	45	47	56	62	47	73	56	52	51	55	54	66	43	34	23	33	27	33	31	54	23	36	32	73
2-Aug	49	80	52	46	97	72	40	58	89	75	85	104	88	71	63	34	59	55	51	73	35	28	32	34	104
3-Aug	41	34	34	46	25	76	78	80	60	93	42	31	37	36	91	99	110	38	45	58	57	81	72	69	110
4-Aug	30	32	40	48	44	59	65	44	49	65	59	56	77	47	83	43	60	67	45	47	39	79	96	70	96
5-Aug	73	101	102	71	16	23	78	93	90	70	53	67	43	36	41	39	40	34	30	30	21	28	21	42	102
6-Aug	57	27	55	48	59	60	55	46	31	83	66	29	78	47	48	25	52	39	39	27	17	11	64	26	83
7-Aug	19	24	25	19	15	32	58	36	44	39	39	83	46	41	43	40	37	39	35	21	13	14	25	15	83
8-Aug	22	19	27	43	16	33	39	59	37	53	61	69	51	48	42	38	35	31	27	30	30	36	39	35	69
9-Aug	34	39	35	35	38	39	40	43	34	45	38	30	31	38	33	39	31	30	44	30	28	32	34	36	45
10-Aug	38	37	37	38	41	45	36	44	34	36	38	31	33	30	48	36	34	31	35	29	17	31	37	32	48
11-Aug	35	20	25	23	35	22	24	22	20	52	70	65	71	52	70	78	43	51	34	29	79	92	42	36	92
12-Aug	68	UO	63	48	98	49	43	40	70	67	84	64	78	64	92	50	85	58	43	66	86	76	59	26	98
13-Aug	23	17	20	25	25	28	23	32	34	34	37	44	52	49	51	49	53	47	47	30	23	47	84	38	84
14-Aug	81	69	95	101	65	29	63	63	43	50	40	41	54	53	60	57	54	57	57	31	28	38	63	87	101
15-Aug	80	39	29	40	20	26	25	27	63	91	67	35	87	36	42	43	58	90	20	19	21	23	21	38	91
16-Aug	36	48	76	59	87	61	45	39	27	67	66	81	64	67	59	44	40	43	32	35	34	37	37	36	87
17-Aug	32	31	24	25	26	31	31	39	31	60	45	68	54	72	55	52	79	76	91	50	56	53	26	50	91
18-Aug	28	19	22	23	21	22	21	20	23	23	27	29	27	41	26	23	21	19	21	20	17	18	23	24	41
19-Aug	32	40	38	35	50	75	80	74	78	51	48	51	55	49	54	56	47	45	38	28	23	38	45	38	80
20-Aug	22	23	88	65	47	43	50	56	68	94	68	51	50	49	61	88	27	95	77	69	81	51	85	62	95
21-Aug	54	31	57	82	32	26	44	35	28	32	35	37	41	49	43	39	32	33	24	27	34	71	UO	42	82
22-Aug	54	41	41	51	UO	12	65	38	31	38	62	39	32	48	71	36	47	71	21	63	52	68	72	49	72
23-Aug	37	35	31	20	45	54	42	67	67	78	54	75	26	77	83	59	32	15	18	18	20	22	21	21	83
24-Aug	24	25	26	26	24	24	24	26	27	28	30	29	25	27	31	36	27	24	17	13	33	60	48	47	60
25-Aug	74	64	61	55	82	25	21	26	27	38	30	42	47	34	42	39	35	28	24	23	32	25	36	34	82
26-Aug	37	30	22	17	23	23	29	24	33	34	40	48	36	60	54	57	49	37	25	21	19	22	16	68	68
27-Aug	58	80	55	85	73	86	63	81	63	29	36	32	46	45	43	42	42	31	29	26	35	17	42	60	86
28-Aug	27	26	23	31	36	24	19	31	24	25	30	30	35	29	27	25	19	24	64	UO	64	23	25	25	64
29-Aug	22	22	24	25	21	20	21	28	27	28	34	33	31	31	30	31	33	28	22	34	64	15	43	65	65
30-Aug	UO	UO	UO	UO	UO	UO	UO	38	95	64	47	43	35	33	41	24	26	23	22	26	33	49	74	55	95
31-Aug	50	61	80	57	71	91	44	32	71	C	61	51	77	69	43	48	43	23	34	64	20	56	43	80	91
Diurnal Maximum																									
81 101 102 101 98 91 80 93 95 94 85 104 88 77 92 99 110 95 91 73 86 92 96 87																									

C - Calibration UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS26 CHRISTINA LAKE AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
AUGUST 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	35	39	99.46	30.7	0	4.9	0
H2S (ppb) Average	704	36	40	99.46	2.7	0	0.8	0
NO2 (ppb) Average	704	37	40	99.6	30.1	0	9.1	-
NO (ppb) Average	704	37	40	99.6	64.8	-	15.8	-
NOX (ppb) Average	704	37	40	99.6	89.3	-	24.2	-
Temperature 2 m (C) Average	741	0	3	99.6	29.2	-	21.3	-
Relative Humidity (%) Average	741	0	3	99.6	98.2	-	95.4	-
Wind Speed 10 m (km/h) Average	741	0	3	99.6	22	-	15	-
Wind Direction 10 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)
AUGUST 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	1.37	3.1	-	0	0	0.1	0.3	1.2	3.5	30.7
H2S (ppb) Average	704	0.28	0.3	-	0	0	0.1	0.2	0.4	0.7	2.7
NO2 (ppb) Average	704	3.96	4.2	-	0.1	0.7	1.2	2.3	5.2	9.8	30.1
NO (ppb) Average	704	4.41	8.1	-	0	0	0.1	0.7	4.7	13.8	64.8
NOX (ppb) Average	704	8.36	11.9	-	0.2	0.8	1.4	3.1	10.3	24.2	89.3
Temperature 2 m (C) Average	741	16.53	4.7	-	4.8	11.3	13.2	15.8	19.8	22.8	29.2
Relative Humidity (%) Average	741	72.98	17.6	-	28.1	47.1	58.7	76.4	88.7	94.2	98.2
Wind Speed 10 m (km/h) Average	741	9.6	5	-	0	4	6	10	13	16	22
Wind Direction 10 m (deg) Average	741	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - CHRISTINA LAKE (AMS26)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	08 Aug 2023 19:00	08 Aug 2023 20:00	2	DAS Failure - data not recorded
ALL PARAMETERS	09 Aug 2023 08:00	09 Aug 2023 08:00	1	Maintenance - station logger/modem reset
H2S, SO2	17 Aug 2023 15:00	17 Aug 2023 15:00	1	Maintenance - sample manifold cleaned



Wood Buffalo Environmental Association
Summary of Hour Averages

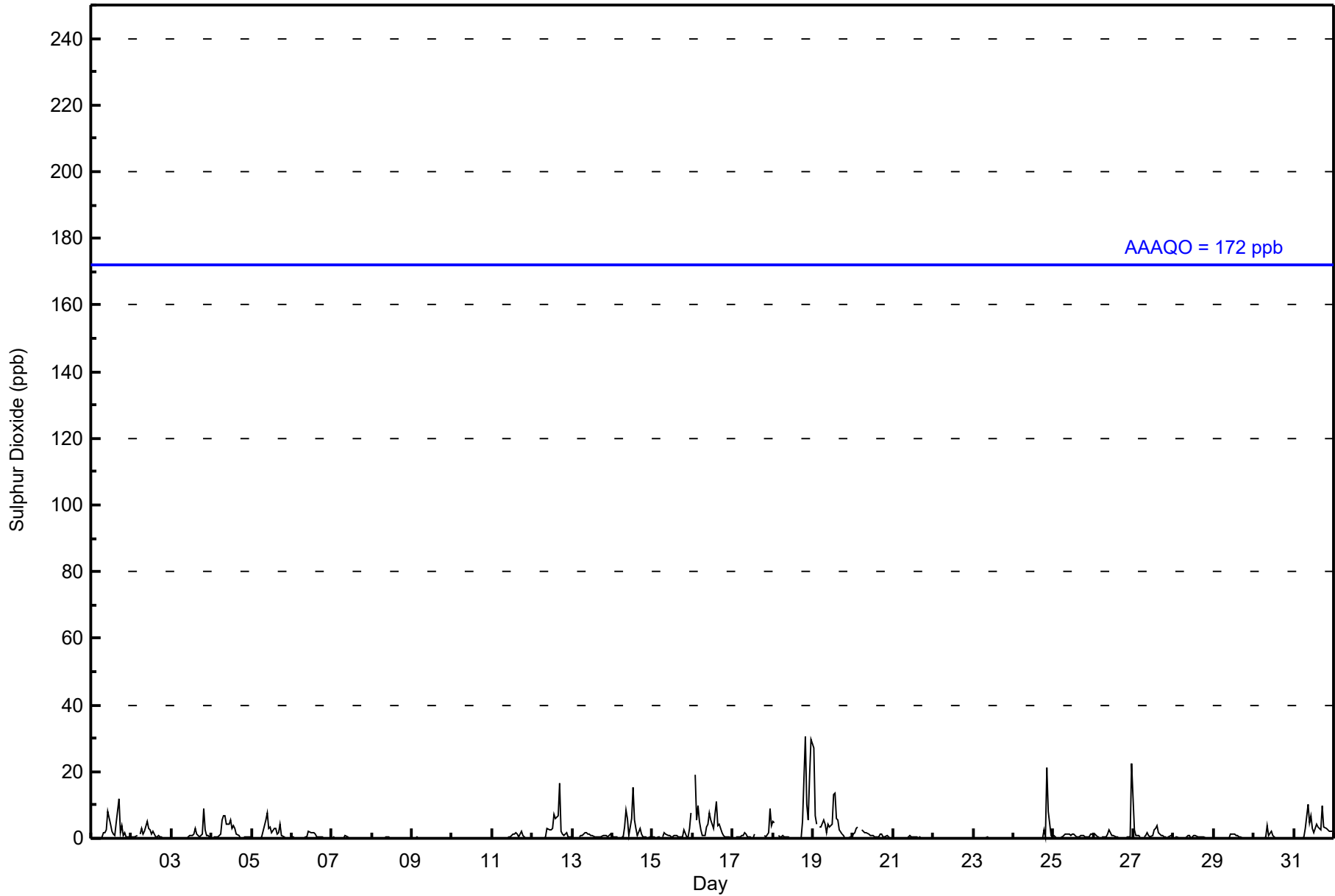
Sulphur Dioxide (SO₂) - ppb
Christina Lake - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														Daily Average		Daily Maximum																											
Maximum Value: 30.7 ppb on Aug 18 20:00		Maximum Daily Average: 4.9 ppb on Aug 18		Hours of Data: 705														Hours of Missing Data: 39		Hours of Calibration: 35																													
Minimum Value: 0.0 ppb on Aug 1 01:00		Minimum Daily Average: 0.0 ppb on Aug 10		Hours of Calibration: 35														Percent Operational Time: 99.5																															
Maximum Diurnal Average: 2.4 ppb at hour 24		Minimum Diurnal Average: 0.5 ppb at hour 5		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.3 Q ₃ = 1.2 P ₉₀ = 3.5 P ₉₉ = 16.6																																													
Monthly Average: 1.37 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-Aug	0.0	0.1	0.0	Z	0.0	0.0	0.5	1.5	1.5	2.5	8.0	4.1	2.1	1.3	0.8	4.7	11.8	1.6	3.6	0.9	1.8	0.5	0.3	0.2	2.1	11.8																							
2-Aug	0.2	0.3	0.4	1.0	Z	1.4	2.8	1.3	2.2	4.9	3.1	2.5	1.3	2.1	0.6	0.6	0.8	0.6	0.2	0.2	0.2	0.2	0.2	0.1	1.2	4.9																							
3-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.2	0.0	0.1	0.1	0.4	1.0	0.9	1.1	3.0	1.4	0.9	0.3	1.4	9.0	2.4	0.9	0.7	0.2	1.1	9.0																							
4-Aug	Z	0.4	0.4	0.3	0.5	1.2	5.5	6.6	6.8	4.2	4.4	5.5	3.2	3.8	2.9	1.4	0.8	0.2	0.2	0.1	0.5	0.3	0.3	0.2	2.2	6.8																							
5-Aug	0.4	Z	0.2	0.2	0.1	0.1	0.3	1.9	5.6	7.8	2.9	3.5	1.9	3.1	3.0	1.4	1.8	4.2	1.0	0.2	0.1	0.1	0.2	0.2	1.7	7.8																							
6-Aug	0.4	0.3	Z	0.1	0.1	0.0	0.1	0.1	0.5	0.6	2.2	1.7	1.7	1.5	1.5	0.2	0.3	0.3	0.5	0.2	0.1	0.1	0.1	0.0	0.6	2.2																							
7-Aug	0.2	0.2	0.2	Z	0.1	0.1	0.1	0.2	0.8	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.8																						
8-Aug	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.2	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	DF	DF	0.2	0.1	0.0	0.1	0.1	0.6																							
9-Aug	0.1	0.1	0.2	0.3	0.1	Z	0.1	M	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	0.3																							
10-Aug	Z	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																							
11-Aug	0.0	Z	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.4	0.5	1.4	1.2	1.8	1.4	0.5	2.0	0.8	0.4	0.0	0.0	0.0	0.0	0.5	2.0																							
12-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.6	2.9	2.6	2.7	3.0	7.3	6.1	6.7	16.6	2.1	1.4	0.8	1.7	0.5	0.5	0.5	2.4	16.6																							
13-Aug	0.2	0.1	0.2	Z	0.3	0.8	0.9	1.9	1.7	1.3	1.1	0.6	0.7	0.6	0.4	0.5	0.5	0.6	1.0	1.0	0.8	0.4	0.8	1.3	0.8	1.9																							
14-Aug	0.5	0.3	0.2	0.3	Z	0.4	0.4	3.4	8.5	5.7	0.9	6.1	15.3	5.3	3.0	0.9	3.1	1.5	0.6	0.3	0.3	0.2	0.3	0.2	2.5	15.3																							
15-Aug	0.2	0.3	0.2	0.2	0.2	Z	0.4	1.5	1.1	0.9	0.9	0.6	0.4	0.7	0.7	0.6	0.5	0.3	0.3	2.7	0.4	0.6	3.1	7.8	1.1	7.8																							
16-Aug	Z	19.2	5.3	9.8	5.2	2.5	1.1	1.0	3.5	4.2	7.5	5.7	2.8	7.0	10.8	4.0	4.2	1.9	0.7	0.5	0.4	0.3	0.4	0.2	4.3	19.2																							
17-Aug	0.4	Z	0.3	0.5	0.4	0.9	0.8	1.5	1.2	0.5	0.3	0.1	0.0	1.4	M	C	C	C	C	0.9	0.5	1.7	9.0	3.7	1.3	9.0																							
18-Aug	5.0	4.6	Z	0.7	0.6	0.5	0.7	0.6	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	5.2	30.7	10.3	5.7	18.6	29.6	4.9	30.7																							
19-Aug	27.2	6.7	4.4	Z	3.3	3.5	5.5	4.4	1.6	4.3	3.3	4.2	13.3	13.6	6.1	5.4	2.5	1.4	0.7	0.1	0.1	0.2	0.4	0.6	4.9	27.2																							
20-Aug	1.4	1.7	2.8	3.2	Z	2.7	2.0	1.6	1.6	1.1	1.0	0.7	0.7	0.5	0.6	0.5	1.1	1.1	0.5	0.4	1.0	0.4	0.2	0.2	1.2	3.2																							
21-Aug	0.2	0.1	0.0	0.0	0.0	Z	0.0	0.1	0.1	0.3	0.8	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.8																							
22-Aug	Z	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.2																						
23-Aug	0.2	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	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	0.1	0.2																							
24-Aug	0.0	0.0	Z	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	0.1	2.6	0.4	21.3	8.1	1.0	0.6	1.5	21.3																							
25-Aug	0.7	0.3	0.2	Z	0.6	0.4	0.7	1.1	1.3	1.1	0.8	1.1	1.2	0.7	0.5	0.4	0.7	0.8	1.0	0.4	0.4	0.4	1.4	1.2	0.8	1.4																							
26-Aug	1.2	1.4	0.4	0.4	Z	0.2	0.3	0.4	1.4	2.6	1.8	0.9	0.8	0.4	0.3	0.1	0.2	0.1	0.1	0.2	0.4	0.4	0.6	22.2	1.6	22.2																							
27-Aug	2.4	0.9	0.7	0.8	0.6	Z	0.3	0.7	1.5	0.7	0.6	0.7	2.5	2.8	3.6	1.8	0.7	0.8	0.2	0.2	0.1	0.2	1.0	1.2	1.1	3.6																							
28-Aug	Z	0.6	0.3	0.1	0.1	0.2	0.2	0.2	0.7	0.8	0.2	0.3	0.7	1.0	0.6	0.3	0.5	0.6	0.4	0.2	0.0	0.2	0.2	0.0	0.4	1.0																							
29-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.3	1.4	1.2	0.9	0.9	0.5	0.6	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	1.4																							
30-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	3.9	1.1	2.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	3.9																							
31-Aug	0.0	0.1	0.2	Z	0.2	0.2	0.5	2.8	10.2	4.6	6.7	2.9	1.6	4.2	3.2	3.2	2.4	9.8	3.5	2.9	2.5	2.3	2.0	2.2	3.0	10.2																							
																								1.6	1.5	0.7	0.7	0.5	0.6	0.8	1.1	1.9	1.7	1.7	1.6	1.9	2.0	1.7	1.2	1.7	1.0	0.9	1.8	1.5	0.8	1.3	2.4	Diurnal Average	
																								27.2	19.2	5.3	9.8	5.2	3.5	5.5	6.6	10.2	7.8	8.0	6.1	15.3	13.6	10.8	6.7	16.6	9.8	5.2	30.7	21.3	8.1	18.6	29.6	Diurnal Maximum	
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
Christina Lake - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Christina Lake - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	692	98.16	98.16
11 - 20	8	1.13	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: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Sulphur Dioxide (SO₂) - ppb
Christina Lake - August 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	27	40	21	18	32	47	17	46	79	80	104	72	43	37	18	692
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	1	4	3	0	8
21 - 60	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	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	11	27	40	21	18	32	47	17	46	79	80	104	73	48	44	18	705

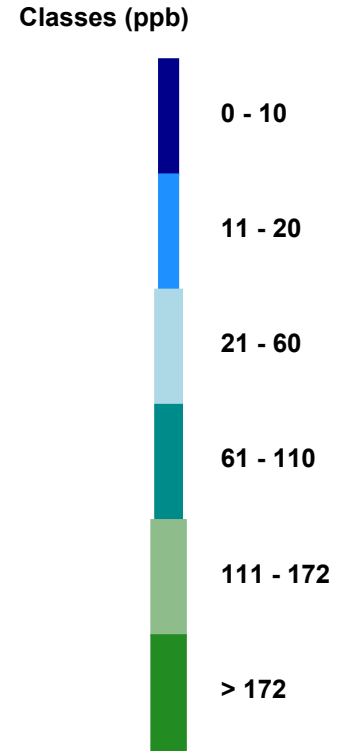
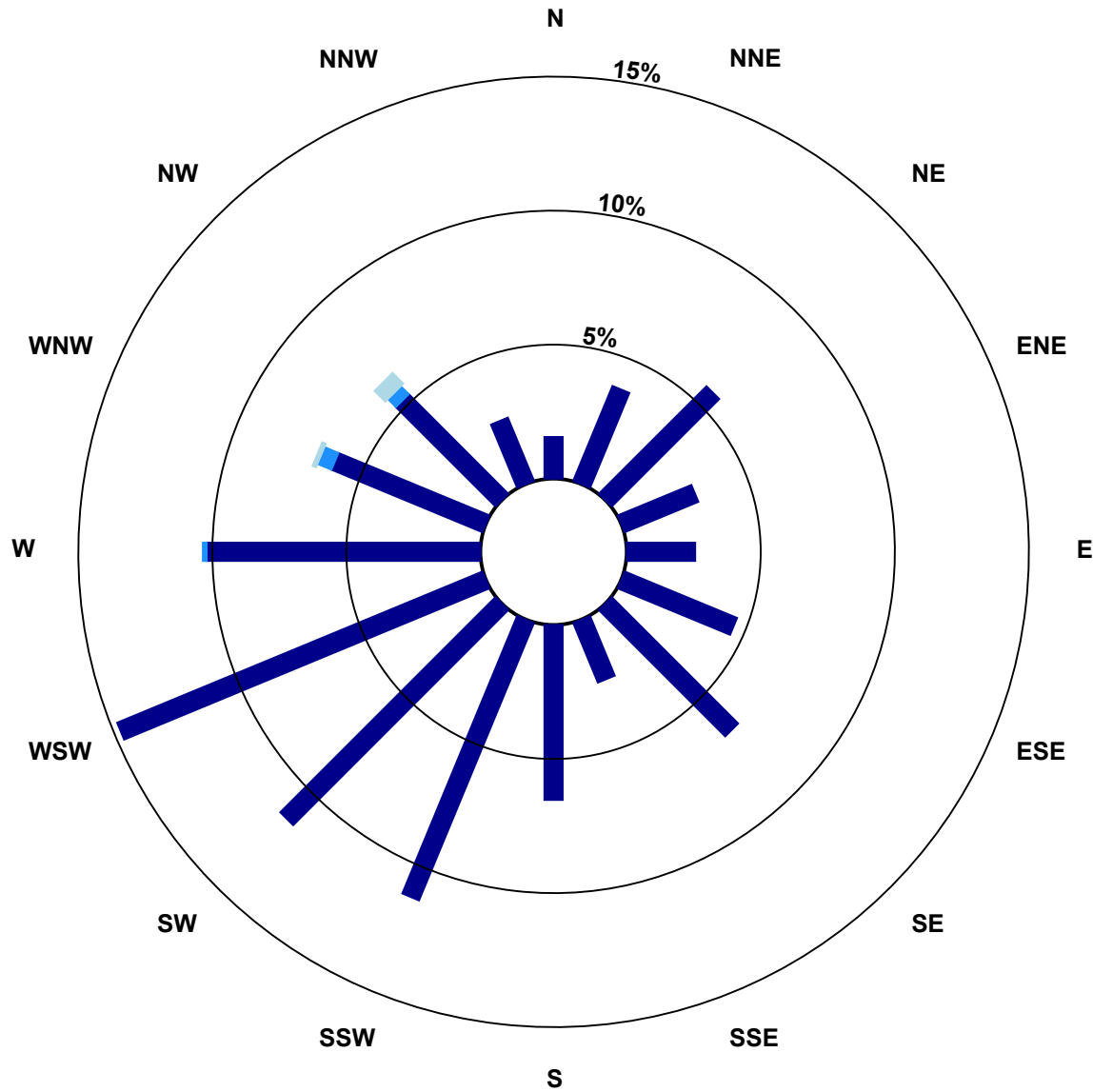
Total Number of Valid Hours: 705

Total Number of Hours: 744

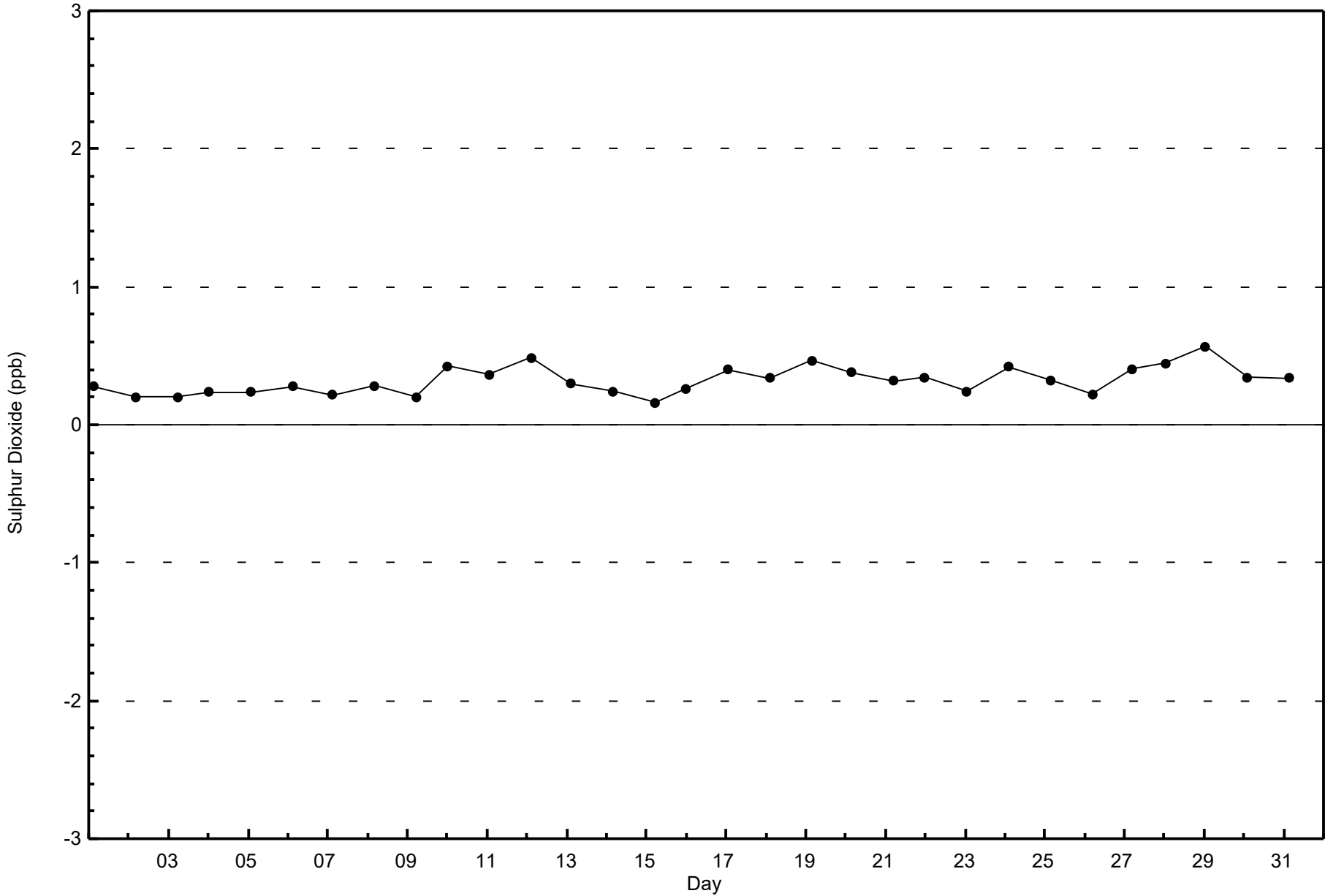


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Christina Lake



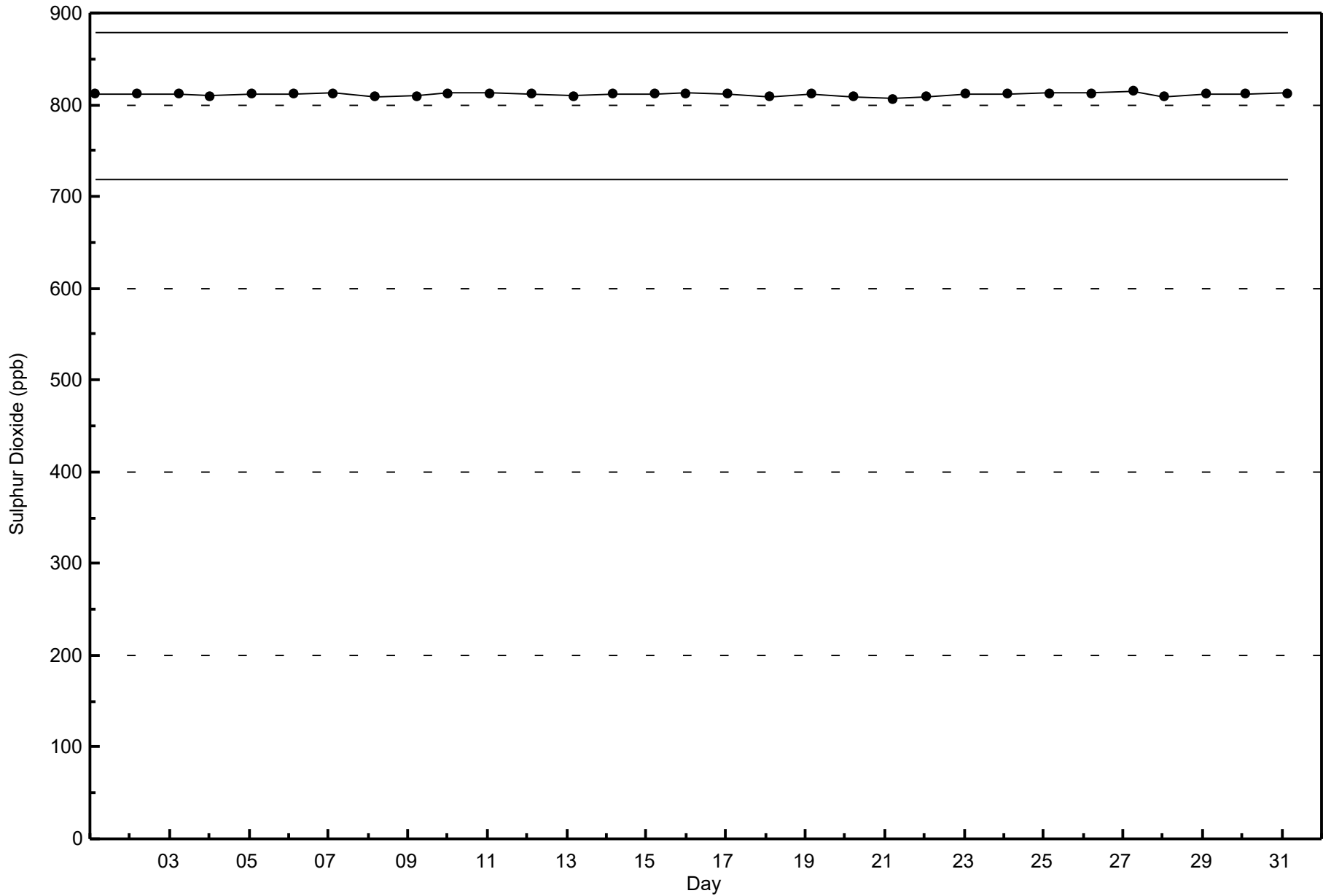
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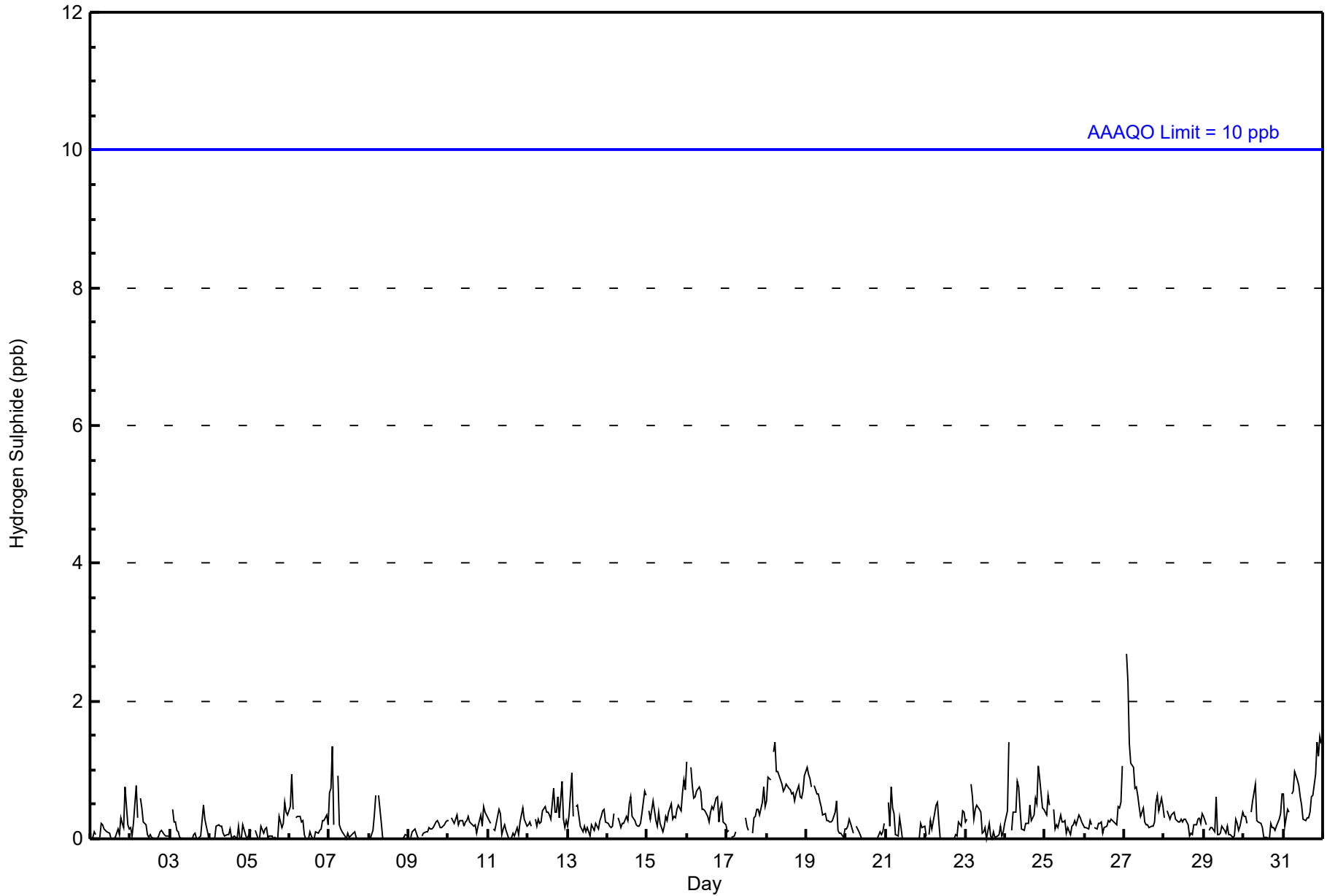




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Christina Lake - August 2023







**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	703	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Christina Lake - August 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	29	37	21	18	34	48	17	45	80	77	103	72	50	44	17	703
3 - 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	11	29	37	21	18	34	48	17	45	80	77	103	72	50	44	18	704

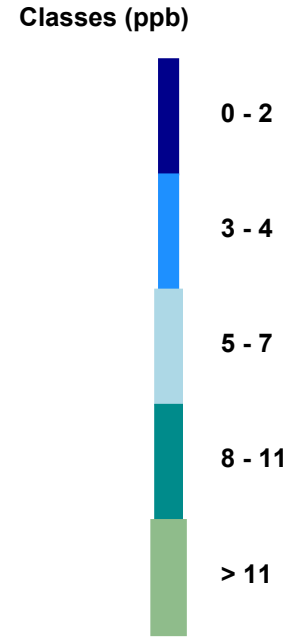
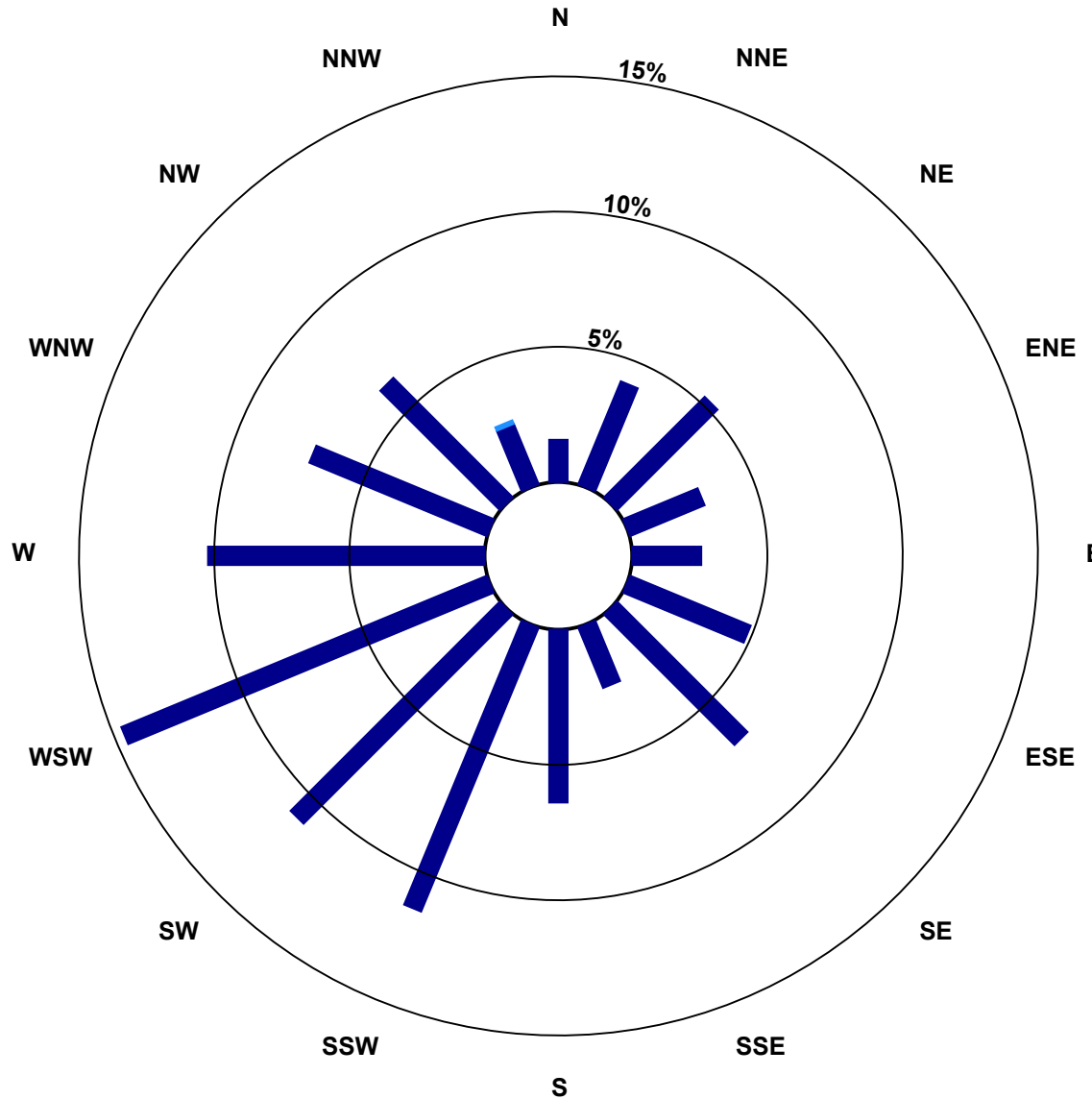
Total Number of Valid Hours: 704

Total Number of Hours: 744

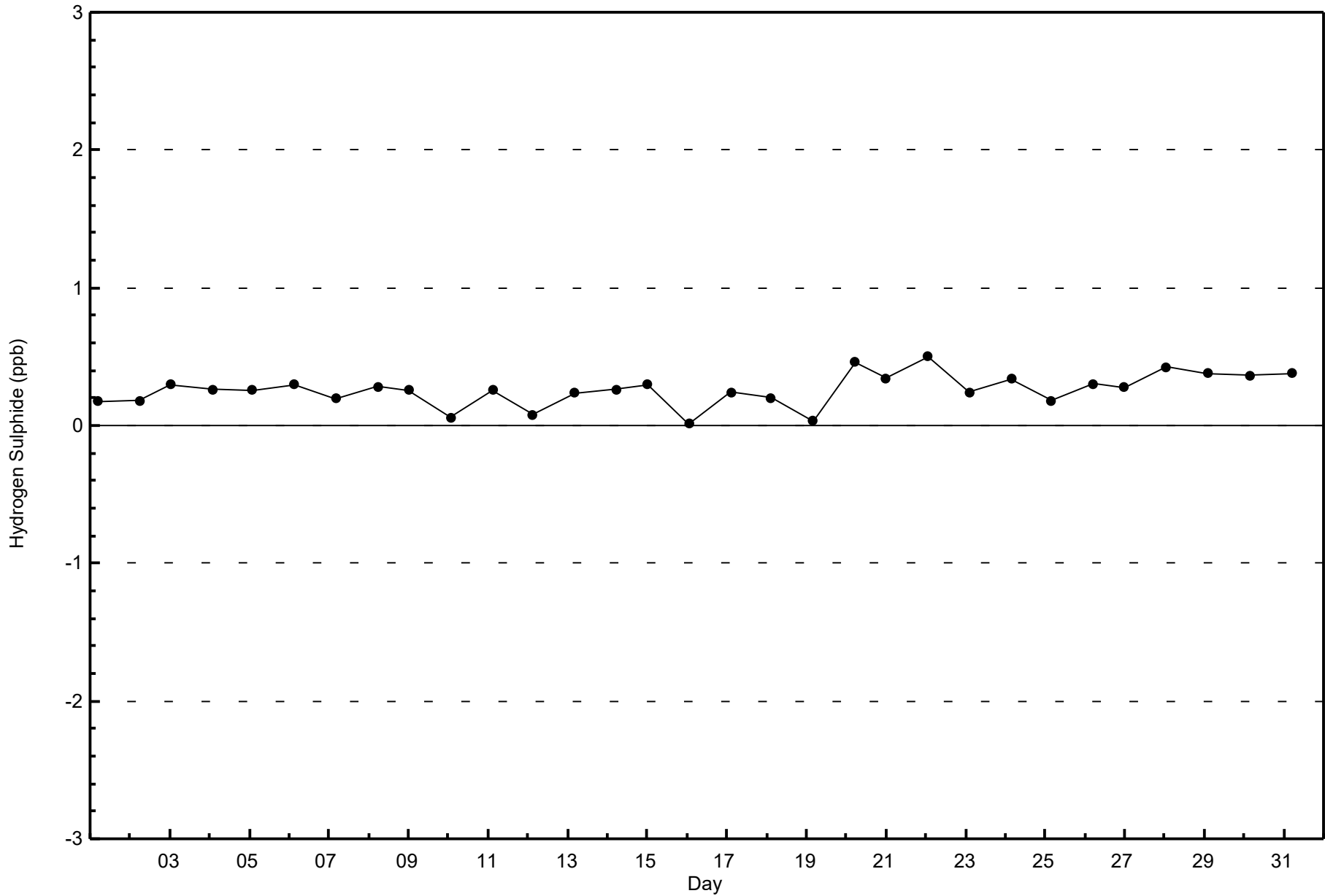


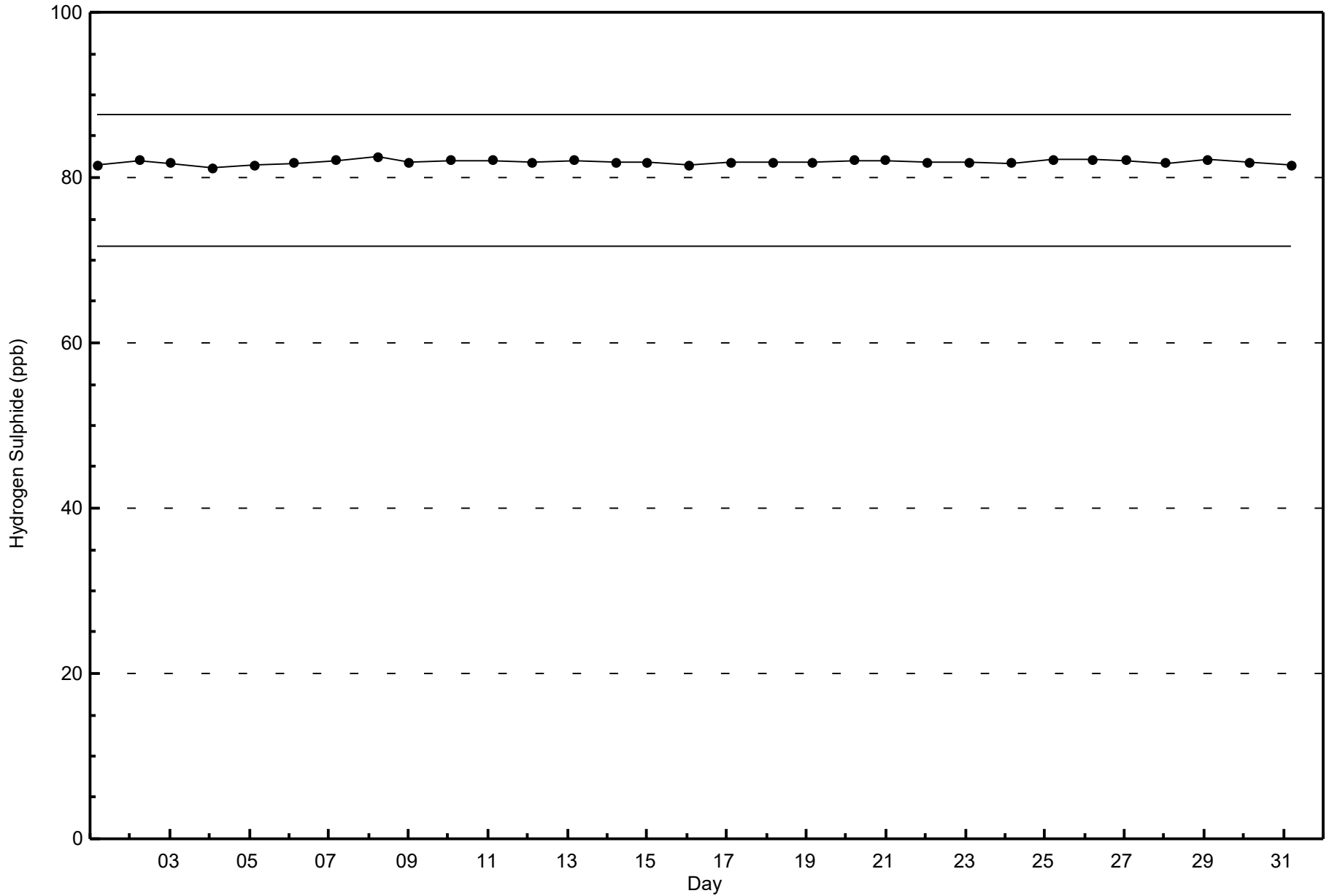
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Christina Lake



Total Number of Valid Hours: 704





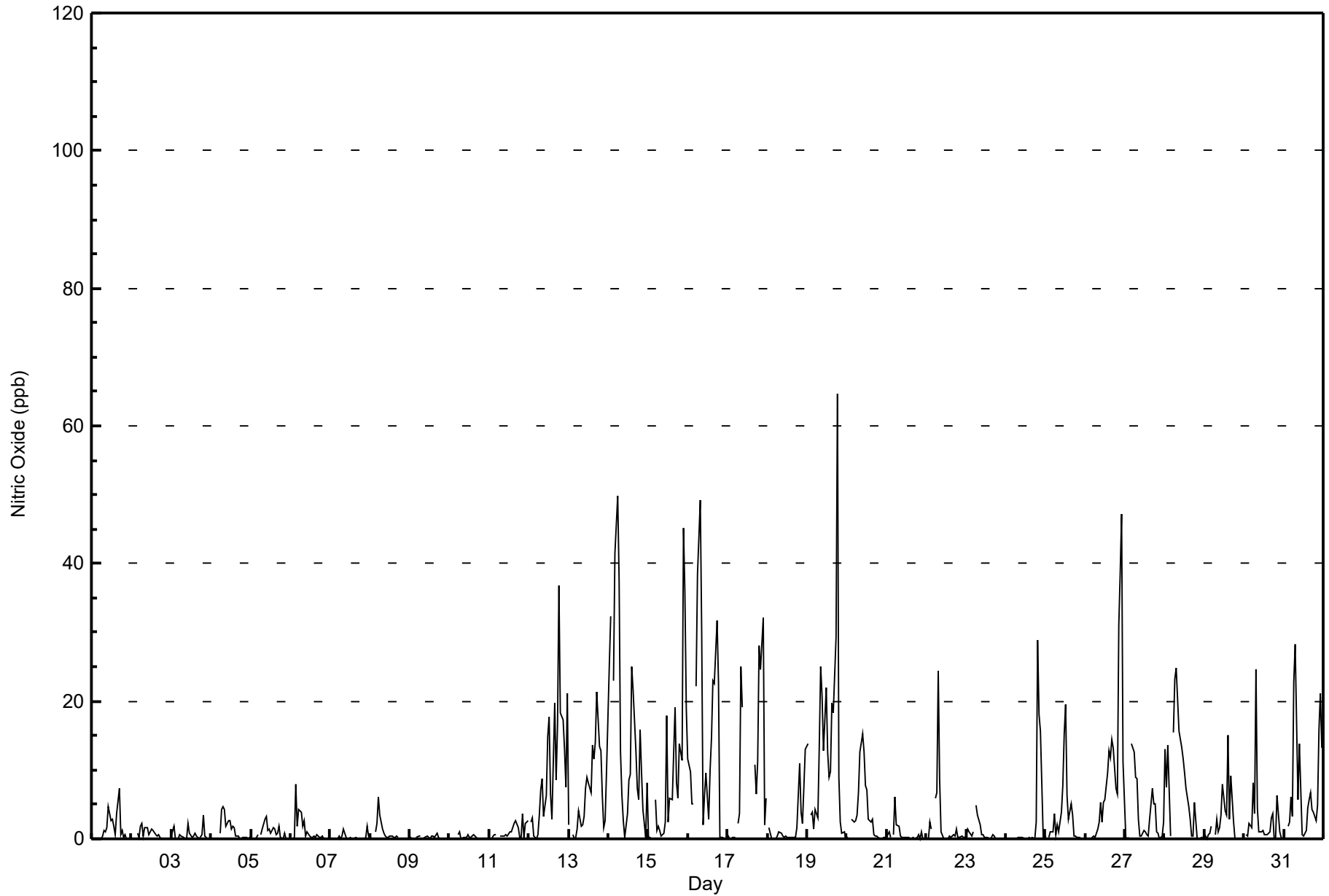


Maximum Value: 64.8 ppb on Aug 19 19:00																				Maximum Daily Average: 15.8 ppb on Aug 14					Hours in Service:	744
Minimum Value: 0.0 ppb on Aug 1 01:00																				Minimum Daily Average: 0.2 ppb on Aug 9					Hours of Data:	704
Maximum Diurnal Average: 7.7 ppb at hour 8																				Minimum Diurnal Average: 1.3 ppb at hour 3					Hours of Missing Data:	40
Monthly Average: 4.41 ppb																				Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.7 Q ₃ = 4.7 P ₉₀ = 13.8 P ₉₉ = 38.4					Hours of Calibration:	37
																									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-Aug	0.0	Z	0.0	0.0	0.0	0.1	0.4	1.1	1.0	1.7	4.8	2.6	2.9	1.8	0.7	3.6	7.3	0.6	1.3	0.2	0.6	0.1	0.1	0.0	1.3	7.3
2-Aug	0.0	0.0	Z	0.9	0.3	1.9	2.3	0.5	1.6	1.6	0.7	1.1	1.4	1.3	0.6	0.3	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.7	2.3
3-Aug	0.5	1.8	0.0	Z	0.0	0.7	0.3	0.2	0.1	0.1	2.1	0.9	0.2	0.4	0.8	0.4	0.3	0.1	0.5	3.4	0.4	0.2	0.1	0.0	0.6	3.4
4-Aug	0.0	0.1	0.0	0.0	Z	0.8	4.2	4.6	4.3	1.8	2.7	2.7	1.4	1.9	1.6	0.5	0.3	0.1	0.1	0.1	0.2	0.2	0.0	0.1	1.2	4.6
5-Aug	0.1	0.1	0.1	0.2	0.5	Z	0.5	1.4	2.9	3.3	1.3	1.4	0.8	1.7	1.5	0.7	0.7	1.9	0.2	0.1	0.8	0.0	0.1	0.0	0.9	3.3
6-Aug	Z	0.1	0.1	8.0	1.8	4.3	3.8	1.9	2.6	0.5	1.0	0.4	0.2	0.3	0.4	0.2	0.6	0.1	0.1	0.4	0.1	0.1	0.0	0.0	1.2	8.0
7-Aug	0.0	Z	0.0	0.0	0.0	0.4	0.1	0.5	1.4	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2	1.8	0.3	0.2	1.8
8-Aug	0.1	0.1	Z	1.1	2.2	6.0	3.5	1.4	0.8	0.4	0.2	0.3	0.4	0.4	0.2	0.1	0.3	0.2	DF	DF	0.0	0.1	0.1	0.0	0.9	6.0
9-Aug	0.2	0.0	0.0	Z	0.1	0.3	0.4	M	0.1	0.3	0.5	0.1	0.1	0.3	0.3	0.2	0.8	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.8
10-Aug	0.0	0.0	0.0	0.0	Z	0.7	1.0	0.1	0.2	0.3	0.1	0.6	0.3	0.3	0.6	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.0
11-Aug	0.1	0.1	0.4	0.6	0.6	Z	0.4	0.4	0.4	0.3	0.5	0.4	1.0	0.9	1.7	2.1	2.7	1.6	0.3	0.1	3.7	0.2	2.3	2.6	1.0	3.7
12-Aug	Z	2.3	3.1	0.3	0.1	0.5	3.5	7.2	8.7	3.3	6.2	14.9	17.7	6.5	2.8	19.8	8.6	16.5	36.8	18.3	17.4	13.0	7.6	21.2	10.3	36.8
13-Aug	2.1	Z	0.6	0.0	0.1	1.5	4.2	1.9	2.0	3.4	7.4	9.0	8.1	6.6	13.7	11.7	14.0	21.4	13.4	12.8	6.3	1.6	2.7	9.7	6.7	21.4
14-Aug	25.2	32.3	Z	22.9	41.5	49.9	37.7	12.6	6.2	2.7	0.1	3.7	8.6	9.3	25.0	21.5	12.7	7.3	5.7	15.8	9.9	4.3	0.2	8.2	15.8	49.9
15-Aug	0.2	0.1	0.1	Z	5.7	1.2	1.9	1.3	0.4	0.8	2.4	18.0	2.5	5.8	5.7	12.5	19.1	8.1	5.9	13.9	11.5	45.2	35.8	18.9	9.4	45.2
16-Aug	11.6	9.8	5.1	5.1	Z	22.2	38.4	49.2	30.0	2.0	6.3	9.5	2.7	9.9	14.7	23.1	22.5	31.7	22.9	0.1	0.2	0.2	0.0	0.1	13.8	49.2
17-Aug	0.5	0.0	0.0	0.2	0.1	Z	2.2	3.7	25.1	19.0	C	C	C	C	C	C	10.8	6.4	11.2	28.1	24.6	32.1	2.0	5.9	--	32.1
18-Aug	Z	1.6	0.0	0.0	0.0	0.1	0.4	1.0	0.9	0.3	0.2	0.4	0.2	0.1	0.3	0.2	0.2	0.2	1.7	10.9	3.9	2.1	7.6	13.1	2.0	13.1
19-Aug	13.9	Z	3.4	3.9	1.4	4.4	3.1	13.3	25.0	20.7	12.7	22.0	12.6	8.9	9.9	19.8	18.3	29.3	64.8	9.0	2.5	0.7	1.1	0.1	13.1	64.8
20-Aug	0.2	0.0	Z	2.8	2.5	2.6	3.5	6.7	12.6	15.2	12.6	7.8	7.1	2.8	2.5	2.9	0.5	0.4	0.5	0.1	0.0	0.0	0.2	0.2	3.6	15.2
21-Aug	0.3	1.1	0.2	Z	0.7	6.0	2.1	1.7	0.4	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.5	0.0	1.0	0.1	0.0	0.7	6.0
22-Aug	0.1	0.1	2.4	1.4	Z	5.9	6.8	24.3	8.5	1.0	0.1	0.1	0.1	0.1	0.3	0.2	0.5	0.3	1.5	0.2	0.1	0.3	0.2	0.2	2.4	24.3
23-Aug	0.3	1.3	1.0	0.4	1.0	Z	5.0	3.4	2.0	0.7	0.6	0.2	0.2	0.2	0.1	0.2	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.0
24-Aug	Z	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1	2.4	28.8	18.1	15.7	0.2	0.2	2.9	28.8
25-Aug	0.4	Z	0.1	1.1	1.0	3.7	0.6	2.1	1.1	3.9	7.8	15.3	19.6	6.2	2.9	5.0	3.5	0.5	0.4	0.1	0.2	0.1	0.1	0.0	3.3	19.6
26-Aug	0.1	0.1	Z	0.0	0.1	0.5	0.3	1.4	2.5	5.4	2.4	5.3	5.6	9.6	12.8	11.9	14.4	13.2	7.3	6.4	31.2	38.6	47.1	11.2	9.9	47.1
27-Aug	0.3	0.1	0.2	Z	13.8	12.6	9.0	8.8	2.9	0.5	0.4	1.1	1.0	0.7	0.4	2.9	7.4	5.2	5.1	1.0	0.9	0.0	0.5	2.4	3.3	13.8
28-Aug	13.0	7.4	13.7	0.4	Z	15.5	23.1	24.7	15.6	14.5	13.3	11.7	9.6	7.3	4.7	2.9	0.5	0.4	5.2	0.1	0.0	0.1	0.2	0.1	8.0	24.7
29-Aug	0.8	0.0	0.6	0.9	1.9	Z	0.6	2.8	1.1	1.7	3.4	7.8	4.0	3.4	15.0	2.8	9.1	2.5	0.1	0.1	0.0	0.1	0.1	0.1	2.6	15.0
30-Aug	Z	0.6	0.4	2.3	1.7	8.1	3.6	24.6	4.5	1.0	0.9	1.2	0.6	0.7	0.6	1.1	3.0	3.8	0.1	0.1	6.3	0.9	0.1	0.1	2.9	24.6
31-Aug	0.1	Z	1.9	2.5	6.0	3.3	22.8	28.2	5.7	13.9	7.0	0.7	0.3	1.2	4.5	5.7	6.7	4.3	3.9	2.7	4.9	15.8	21.2	13.2	7.7	28.2
																								Diurnal Average		
																								Diurnal Maximum		
2.7 2.4 1.3 2.1 3.2 5.9 6.0 7.7 5.5 3.9 3.3 4.7 3.7 3.0 4.1 5.1 5.4 5.1 6.4 5.1 4.6 5.6 4.2 3.5																										
25.2 32.3 13.7 22.9 41.5 49.9 38.4 49.2 30.0 20.7 13.3 22.0 19.6 9.9 25.0 23.1 22.5 31.7 64.8 28.8 31.2 45.2 47.1 21.2																										
Z - zerospan C - Calibration M - Maintenance DF - DAS Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Christina Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Christina Lake - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	94.18	94.18
21 - 40	35	4.97	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Christina Lake - August 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	10	29	41	20	18	34	46	16	48	76	78	84	52	48	46	17	663
21 - 40	0	0	0	0	0	0	0	0	1	1	0	17	15	1	0	0	35
11 - 80	0	0	0	0	0	0	0	0	0	0	0	3	3	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	10	29	41	20	18	34	46	16	49	77	78	104	70	49	46	17	704

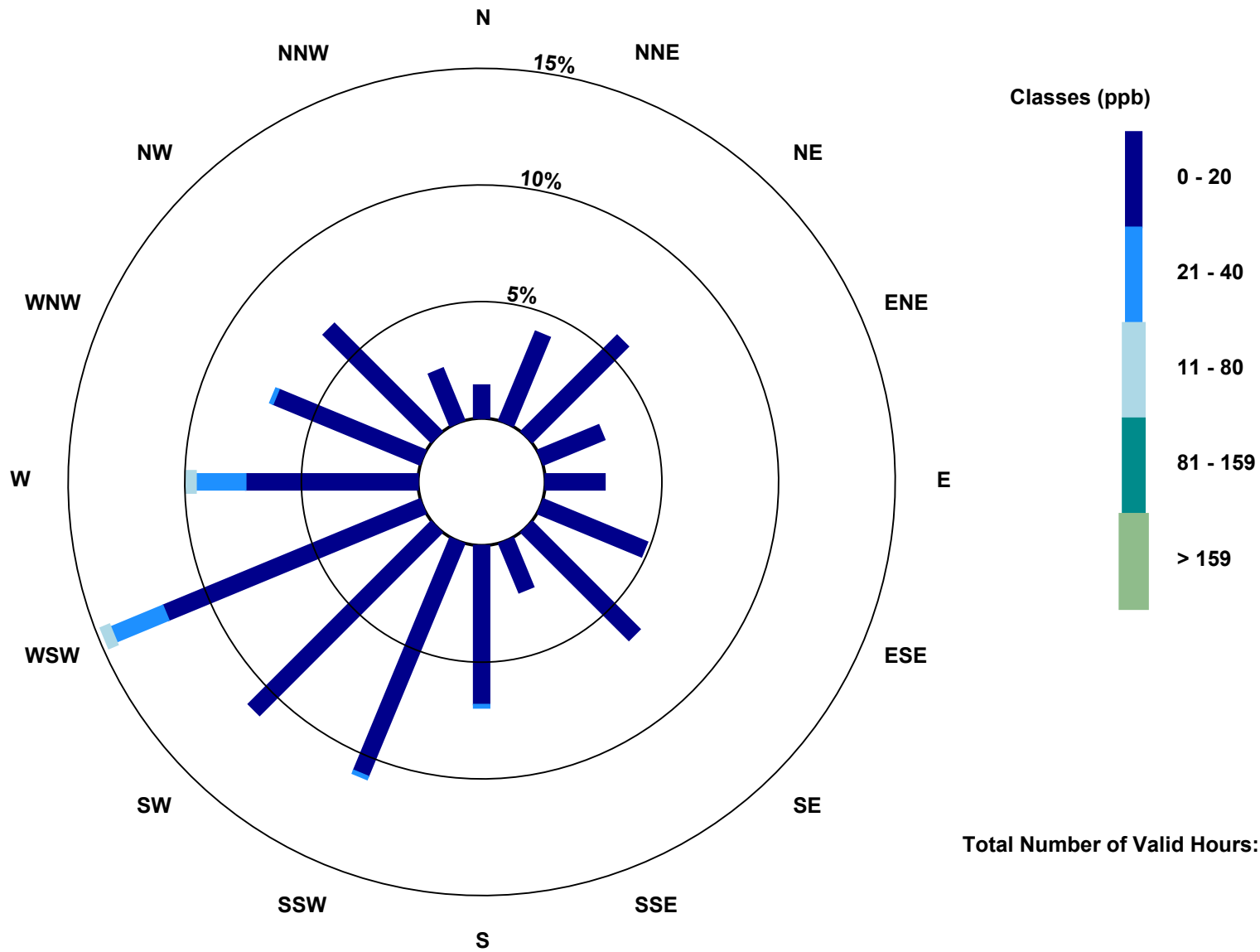
Total Number of Valid Hours: 704

Total Number of Hours: 744

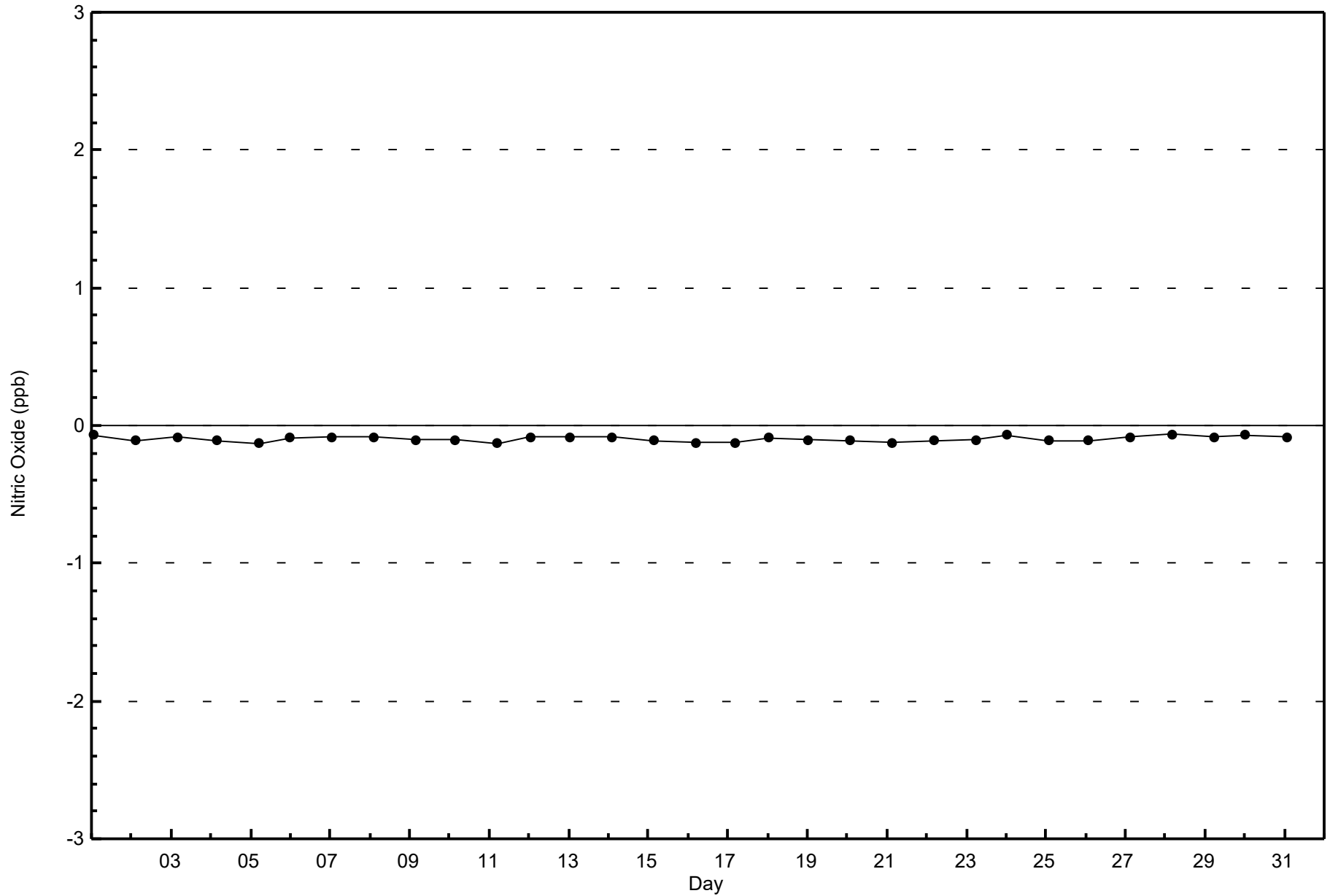


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Christina Lake



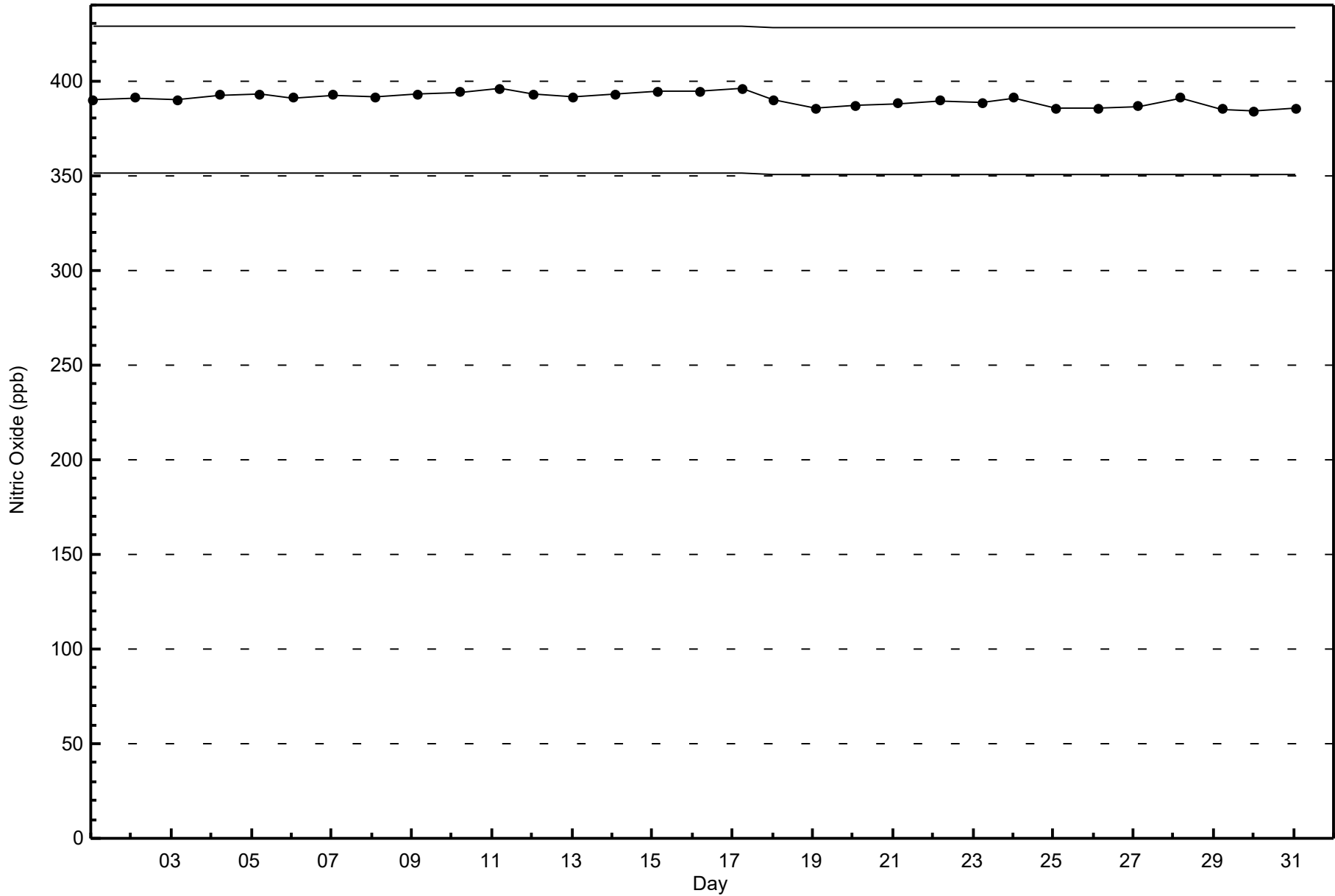
Total Number of Valid Hours: 704





Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Christina Lake - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Christina Lake - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 30.1 ppb on Aug 15 22:00	Maximum Daily Average: 9.1 ppb on Aug 26
Minimum Value: 0.1 ppb on Aug 8 22:00	Hours of Data: 704
Maximum Diurnal Average: 5.3 ppb at hour 17	Hours of Missing Data: 40
Monthly Average: 3.96 ppb	Hours of Calibration: 37
Minimum Daily Average: 0.4 ppb on Aug 9	Percent Operational Time: 99.6
Minimum Diurnal Average: 2.1 ppb at hour 3	
Percentiles: P ₁ = 0.2 P ₁₀ = 0.7 Q ₁ = 1.2 Median = 2.3 Q ₃ = 5.2 P ₉₀ = 9.8 P ₉₉ = 19.2	

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-Aug	0.7	Z	1.0	0.7	0.9	1.2	2.3	3.0	2.5	3.6	6.9	4.3	3.6	2.5	1.8	4.2	9.6	2.3	4.5	1.3	2.3	2.1	1.1	1.2	2.8	9.6
2-Aug	1.6	2.7	Z	3.0	2.6	5.3	4.8	1.8	3.4	4.1	2.9	2.9	2.6	3.9	2.2	1.9	2.0	1.6	0.8	0.9	0.9	1.6	2.0	1.7	2.5	5.3
3-Aug	2.9	4.4	2.1	Z	2.0	2.4	1.6	1.1	0.7	0.6	3.0	2.5	1.0	1.9	3.3	2.0	1.6	0.7	2.3	9.7	3.4	2.3	1.6	1.0	2.4	9.7
4-Aug	0.9	3.0	1.9	1.6	Z	2.8	6.4	6.4	5.2	3.5	4.2	4.3	2.9	3.7	2.6	1.5	1.4	0.9	0.8	2.0	2.0	2.1	0.9	1.3	2.7	6.4
5-Aug	1.6	1.8	1.5	1.5	2.3	Z	2.0	2.9	5.3	5.5	2.3	3.3	2.4	3.7	3.7	2.1	2.7	3.9	1.7	1.3	1.2	1.2	1.7	1.4	2.5	5.5
6-Aug	Z	1.7	1.5	2.3	2.4	4.3	4.1	3.8	5.0	2.3	4.3	2.8	2.1	1.9	2.2	2.5	2.4	1.2	1.5	2.5	1.2	1.4	1.3	1.6	2.4	5.0
7-Aug	2.4	Z	1.3	1.3	1.0	1.8	0.4	0.9	2.1	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.8	1.3	1.8	1.4	1.4	0.9	2.4
8-Aug	1.1	1.3	Z	1.3	1.5	2.1	2.3	1.5	1.5	1.3	0.6	0.5	0.7	0.9	0.6	0.7	0.8	0.5	DF	DF	0.3	0.1	0.2	0.2	1.0	2.3
9-Aug	0.4	0.3	0.3	Z	0.4	0.6	0.7	M	0.3	0.4	0.5	0.3	0.2	0.4	0.5	0.5	0.6	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.7
10-Aug	0.4	0.3	0.4	0.4	Z	0.7	0.9	0.9	0.6	0.6	0.5	0.6	0.5	0.8	0.8	1.1	0.7	0.5	0.3	0.3	0.3	0.3	0.4	0.2	0.5	1.1
11-Aug	0.3	0.4	1.1	1.6	1.8	Z	1.2	1.0	0.8	0.8	1.0	0.9	1.7	1.7	2.2	2.8	3.4	2.5	1.3	1.4	3.3	1.1	2.9	2.5	1.6	3.4
12-Aug	Z	3.0	2.7	0.8	1.5	2.7	3.6	4.3	5.8	4.2	5.4	9.1	9.5	5.5	3.8	8.2	9.3	11.3	18.9	11.4	10.4	8.8	6.9	11.9	6.9	18.9
13-Aug	3.2	Z	1.2	1.5	1.2	3.2	2.9	2.3	2.4	2.7	4.4	4.4	4.1	3.7	5.8	5.7	5.9	7.8	5.6	7.3	5.1	2.2	2.8	6.5	4.0	7.8
14-Aug	10.1	14.0	Z	6.3	13.8	13.6	9.8	4.9	3.3	2.1	2.8	8.2	12.5	11.7	17.5	15.7	10.7	7.0	8.5	5.9	5.5	4.3	1.9	4.1	8.4	17.5
15-Aug	1.1	1.5	1.4	Z	2.7	1.8	2.9	3.3	1.1	1.7	3.5	5.1	2.2	4.8	4.9	6.9	9.4	5.2	4.9	10.7	8.9	30.1	23.5	13.1	6.6	30.1
16-Aug	12.7	10.0	5.9	5.0	Z	8.7	13.3	17.6	7.1	2.3	3.8	5.1	2.9	6.8	10.6	8.7	11.2	13.3	11.3	0.9	0.7	1.0	0.5	0.5	7.0	17.6
17-Aug	2.0	2.2	0.7	1.4	1.4	Z	3.2	5.2	12.1	11.0	C	C	C	C	C	C	13.8	12.4	14.3	19.2	18.4	21.9	7.5	11.8	--	21.9
18-Aug	Z	3.0	1.2	1.6	1.9	1.5	3.5	5.6	4.0	2.1	1.5	1.8	1.9	1.6	2.0	2.0	1.7	1.5	4.0	13.1	5.2	3.0	8.6	12.4	3.7	13.1
19-Aug	13.0	Z	4.1	4.0	1.4	3.6	2.9	6.4	10.1	7.8	6.7	8.9	8.5	6.9	7.1	9.4	8.5	11.1	24.5	5.4	2.5	1.5	2.6	1.3	6.9	24.5
20-Aug	1.9	1.9	Z	4.8	4.6	5.3	4.4	5.7	8.7	10.2	9.8	7.0	8.0	3.2	3.7	6.3	2.3	1.8	1.4	1.0	1.5	0.9	1.0	0.9	4.2	10.2
21-Aug	1.4	4.0	1.1	Z	1.3	3.3	2.4	2.6	1.3	1.4	1.5	1.2	1.0	0.7	0.5	0.5	1.0	0.8	1.2	1.5	1.0	1.9	0.8	0.7	1.4	4.0
22-Aug	0.8	0.7	1.2	1.5	Z	2.1	2.0	10.3	6.4	2.1	0.7	0.7	0.7	0.7	1.1	1.1	1.9	1.5	3.3	1.4	1.3	1.1	0.7	0.6	1.9	10.3
23-Aug	0.8	2.0	0.7	0.8	1.2	Z	2.2	3.7	3.4	2.2	1.6	1.2	1.1	0.9	0.8	0.9	1.7	1.2	0.7	1.2	0.6	1.2	1.1	1.1	1.4	3.7
24-Aug	Z	1.2	1.0	0.7	0.6	0.8	1.6	2.0	1.8	1.4	0.9	0.5	0.3	0.4	0.8	0.7	0.9	0.9	4.7	12.9	15.8	12.9	1.5	1.4	2.9	15.8
25-Aug	2.0	Z	1.3	1.9	2.2	2.9	1.3	2.2	1.4	3.1	5.2	7.2	11.1	5.3	2.9	5.0	4.0	1.7	2.1	1.2	1.4	0.8	2.6	2.6	3.1	11.1
26-Aug	2.8	2.6	Z	1.7	1.7	2.3	1.5	2.7	3.8	6.4	4.7	6.9	5.7	9.6	12.0	12.7	12.2	13.6	8.8	9.2	22.8	24.7	27.7	14.0	9.1	27.7
27-Aug	2.9	2.8	3.7	Z	10.0	8.2	6.5	7.5	6.9	4.1	4.3	5.0	5.4	5.6	4.4	6.6	9.1	5.9	6.1	2.5	1.6	1.5	2.8	4.5	5.1	10.0
28-Aug	10.6	9.4	11.2	1.1	Z	11.3	13.9	14.0	10.8	9.5	8.7	9.3	8.7	8.6	5.1	3.6	2.6	2.3	6.2	1.2	1.1	1.3	2.0	1.3	6.7	14.0
29-Aug	1.8	1.1	1.0	2.1	2.3	Z	2.1	5.5	3.6	4.4	6.4	9.9	6.9	6.9	17.1	8.1	15.1	6.9	1.6	1.7	1.4	1.6	1.0	1.1	4.8	17.1
30-Aug	Z	1.7	1.8	2.3	3.8	5.3	3.8	13.9	9.5	3.6	4.5	4.7	1.9	2.4	2.7	5.5	8.5	10.0	1.9	2.9	5.3	2.7	1.1	0.7	4.4	13.9
31-Aug	0.6	Z	3.6	5.2	7.5	4.8	13.4	12.8	5.8	8.2	5.8	2.5	1.7	3.6	6.5	7.9	7.6	8.4	5.1	5.1	5.2	6.7	9.4	6.9	6.3	13.4

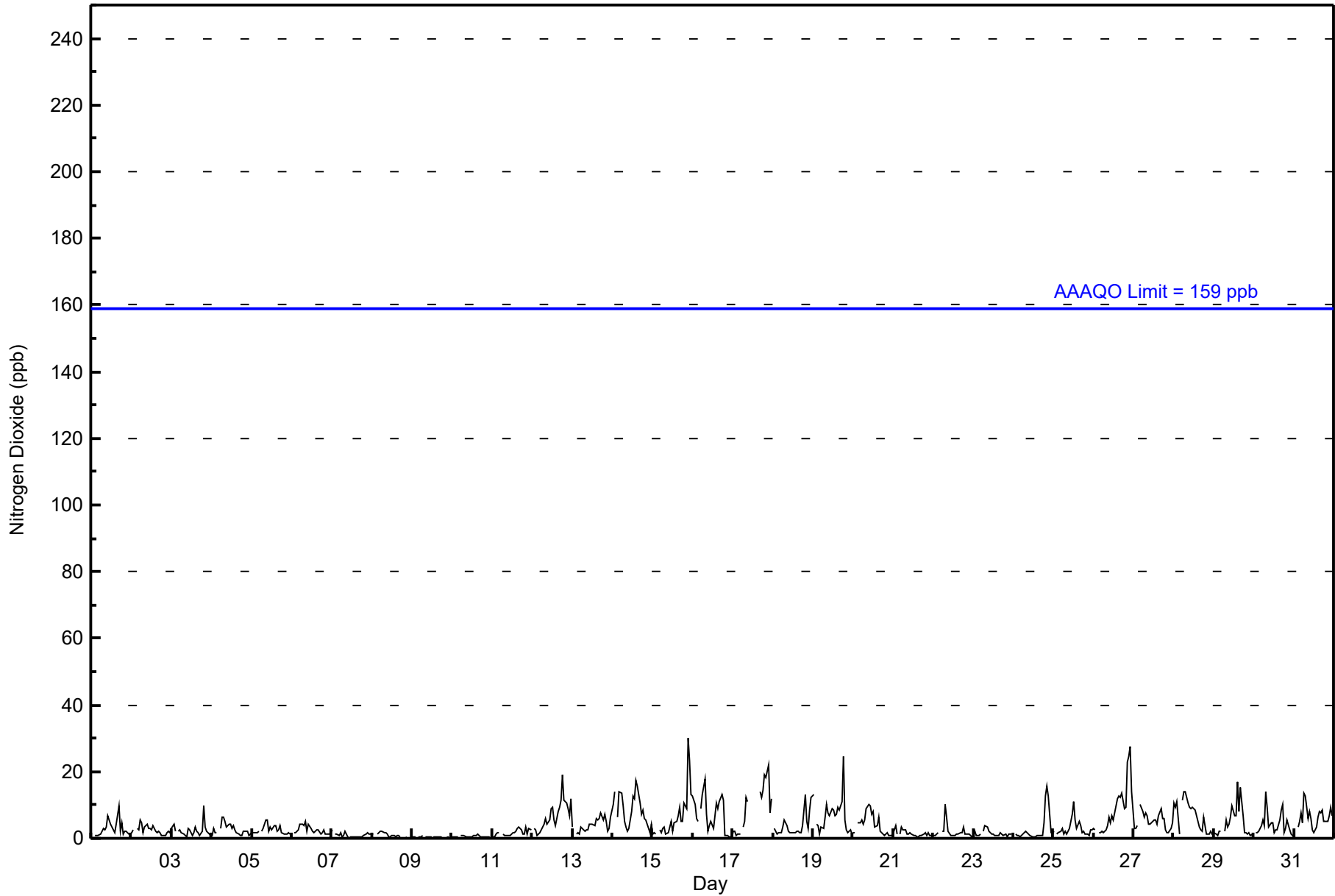
3.1	3.1	2.1	2.2	2.8	3.9	4.0	5.2	4.4	3.7	3.6	4.0	3.7	3.7	4.3	4.5	5.3	4.5	5.0	4.5	4.3	4.7	3.9	3.6	Diurnal Average	
13.0	14.0	11.2	6.3	13.8	13.6	13.9	17.6	12.1	11.0	9.8	9.9	12.5	11.7	17.5	15.7	15.1	13.6	24.5	19.2	22.8	30.1	27.7	14.0	Diurnal Maximum	

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
Christina Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	697	99.01	99.01
21 - 40	7	0.99	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: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Christina Lake - August 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	10	29	41	20	18	34	46	16	49	77	78	99	69	48	46	17	697
21 - 40	0	0	0	0	0	0	0	0	0	0	0	5	1	1	0	0	7
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	10	29	41	20	18	34	46	16	49	77	78	104	70	49	46	17	704

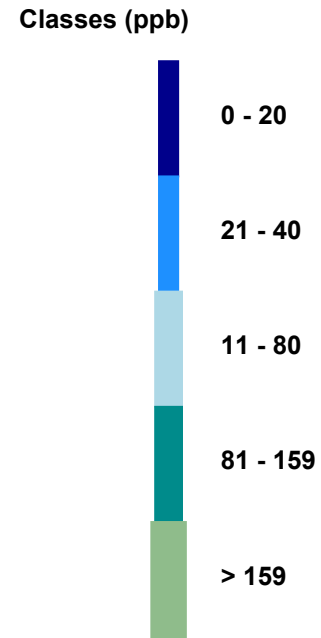
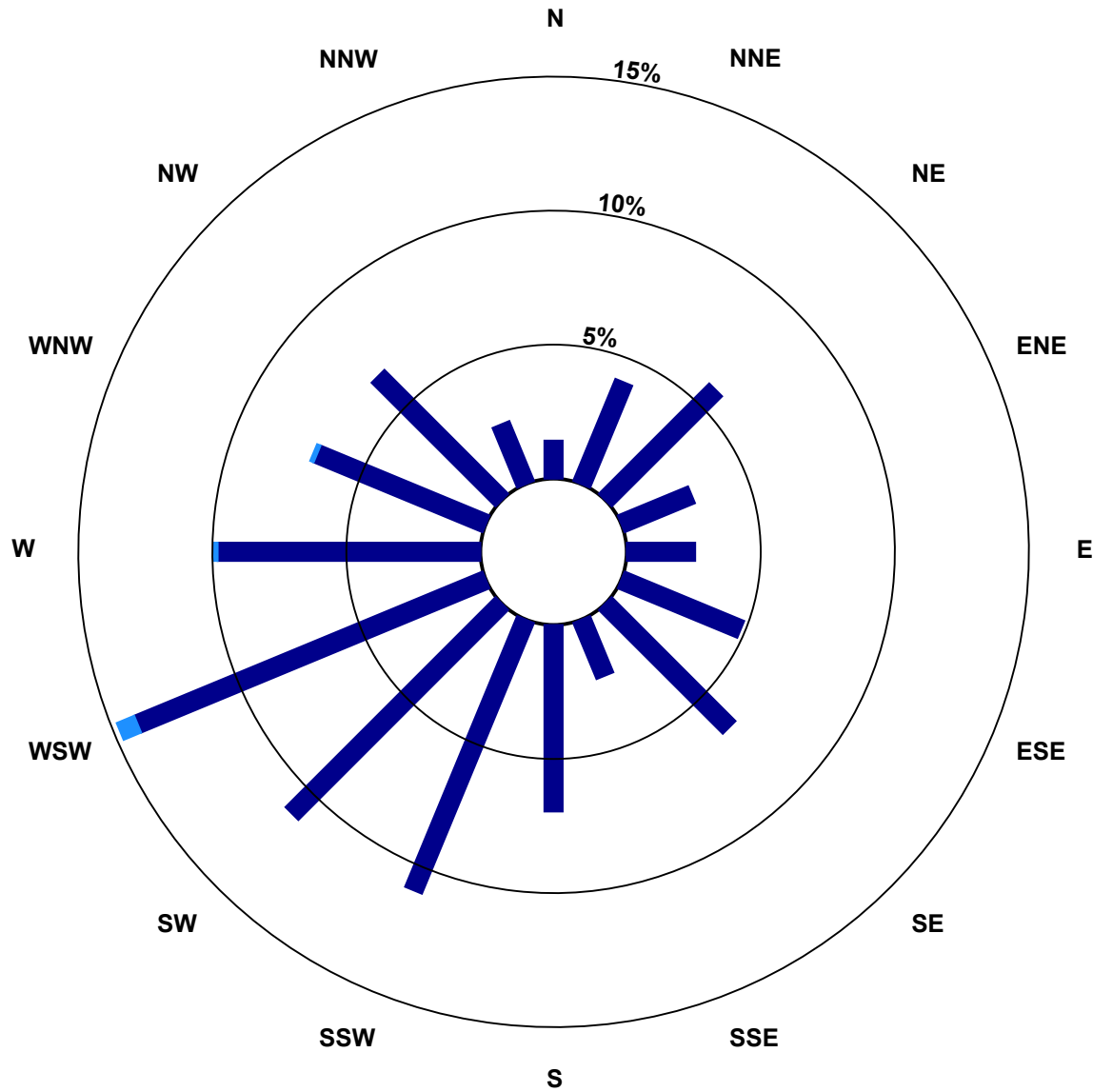
Total Number of Valid Hours: 704

Total Number of Hours: 744

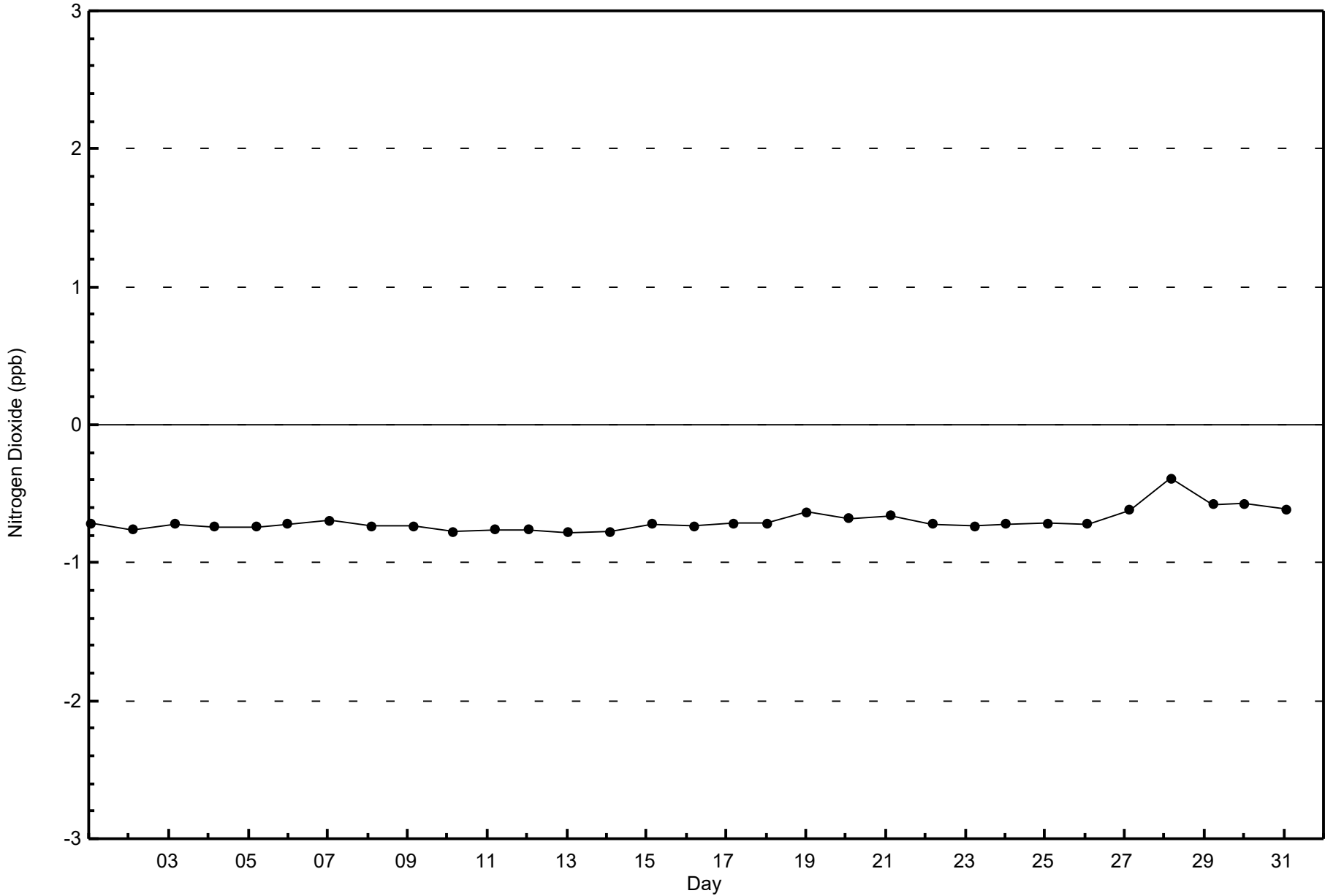


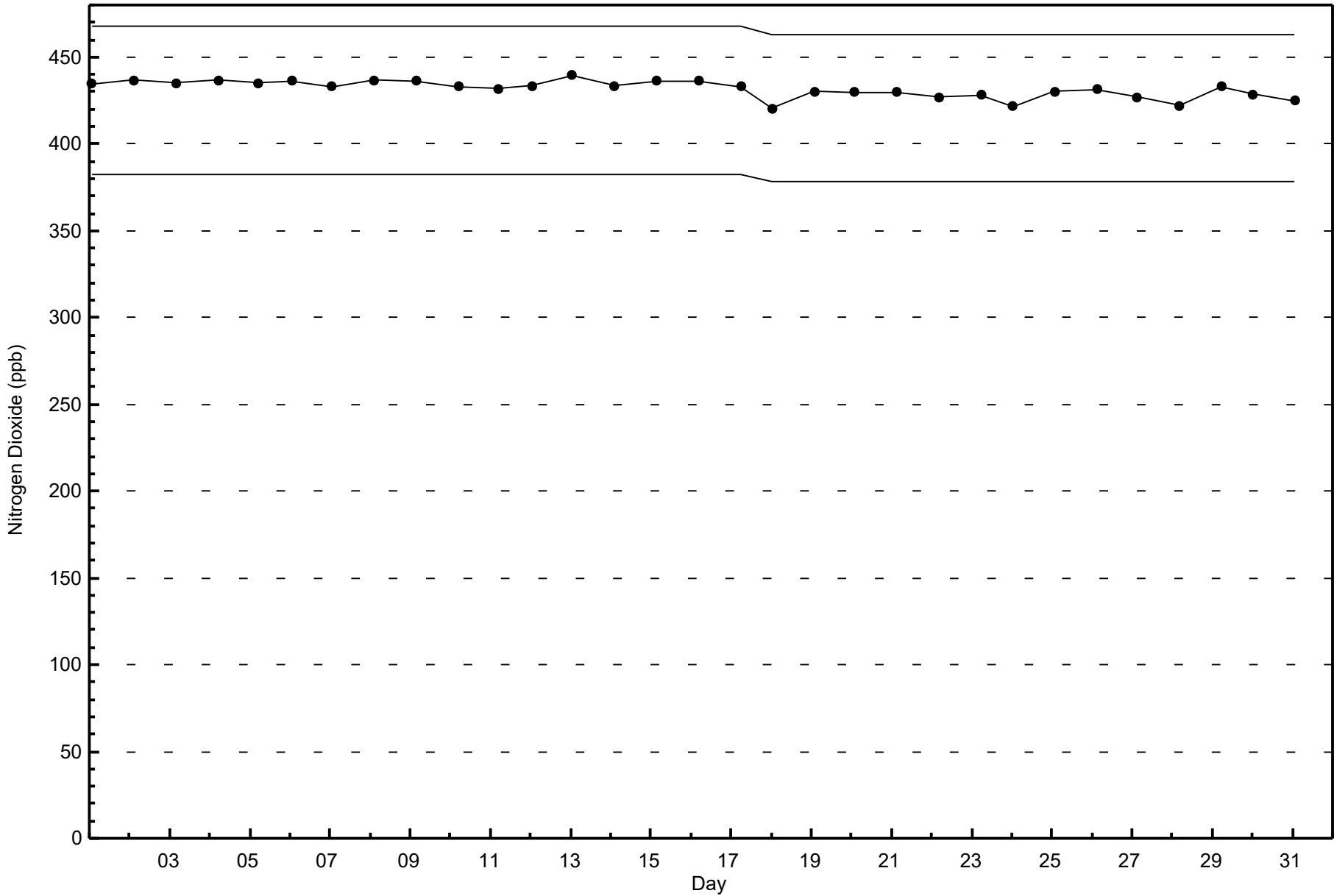
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Christina Lake



Total Number of Valid Hours: 704







Wood Buffalo Environmental Association
Summary of Hour Averages

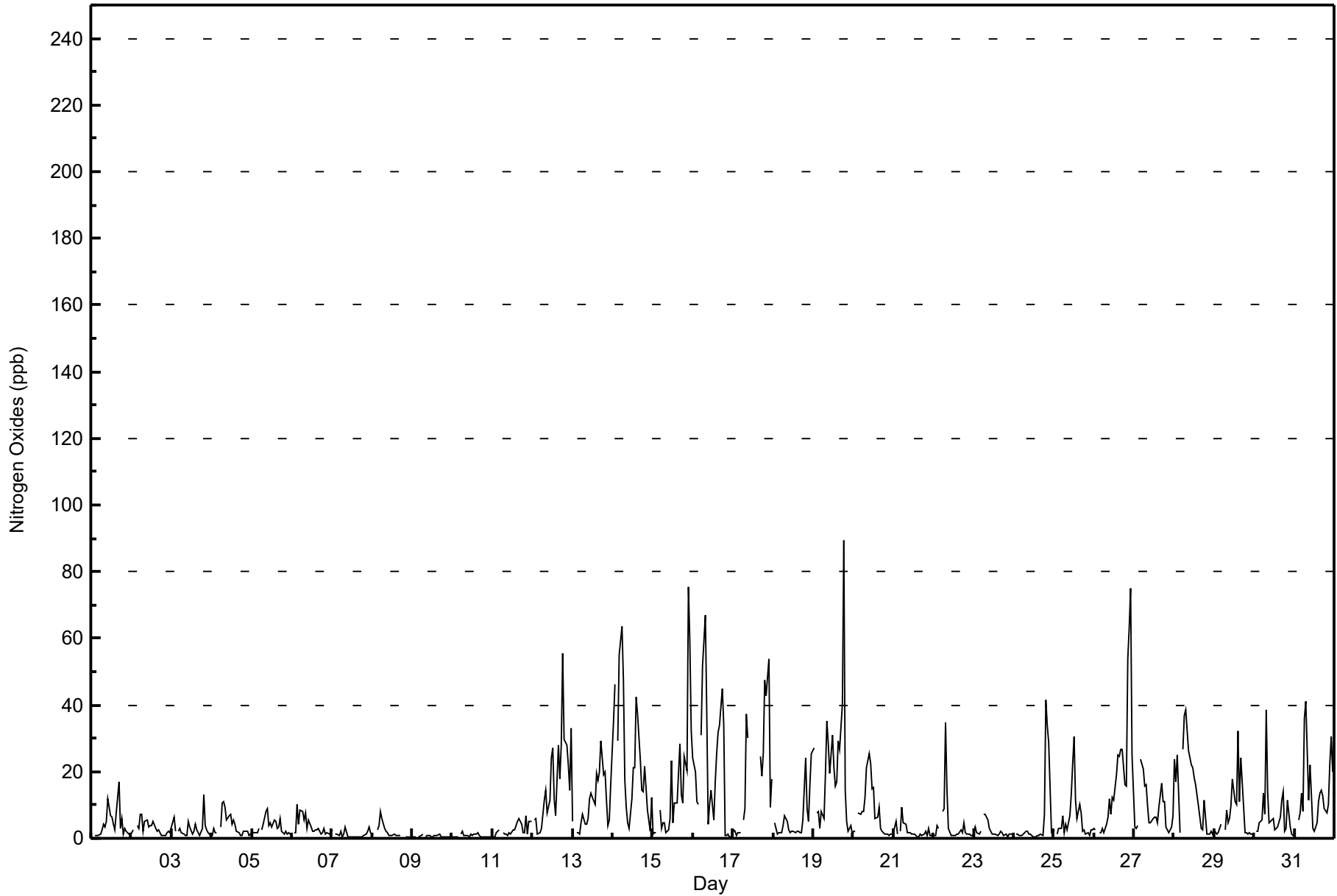
Nitrogen Oxides (NO_x) - ppb
Christina Lake - August 2023

Maximum Value: 89.3 ppb on Aug 19 19:00		Maximum Daily Average: 24.2 ppb on Aug 14		Hours in Service: 744																							
Minimum Value: 0.2 ppb on Aug 9 00:00		Minimum Daily Average: 0.6 ppb on Aug 9		Hours of Data: 704																							
Maximum Diurnal Average: 12.9 ppb at hour 8		Minimum Diurnal Average: 3.4 ppb at hour 3		Hours of Missing Data: 40																							
Monthly Average: 8.36 ppb		Percentiles: P ₁ = 0.3 P ₁₀ = 0.8 Q ₁ = 1.4 Median = 3.1 Q ₃ = 10.3 P ₉₀ = 24.2 P ₉₉ = 55.7		Hours of Calibration: 37																							
				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-Aug	0.7	Z	1.0	0.7	0.9	1.3	2.7	4.1	3.5	5.3	11.7	6.9	6.5	4.3	2.5	7.8	16.9	2.9	5.8	1.5	2.9	2.2	1.2	1.2	4.1	16.9	
2-Aug	1.6	2.7	Z	3.9	2.9	7.2	7.1	2.3	5.0	5.7	3.6	4.0	4.0	5.2	2.8	2.2	2.6	1.7	0.9	0.9	0.9	1.6	2.0	1.7	3.1	7.2	
3-Aug	3.4	6.2	2.1	Z	2.0	3.1	1.9	1.3	0.8	0.7	5.1	3.4	1.2	2.3	4.1	2.4	1.9	0.8	2.8	13.1	3.8	2.5	1.7	1.0	2.9	13.1	
4-Aug	0.9	3.1	1.9	1.6	Z	3.6	10.6	11.0	9.5	5.3	6.9	7.0	4.3	5.6	4.2	2.0	1.7	1.0	0.9	2.1	2.2	2.3	0.9	1.4	3.9	11.0	
5-Aug	1.7	1.9	1.6	1.7	2.8	Z	2.5	4.3	8.2	8.8	3.6	4.7	3.2	5.4	5.2	2.8	3.4	5.8	1.9	1.4	2.0	1.2	1.8	1.4	3.4	8.8	
6-Aug	Z	1.8	1.6	10.3	4.2	8.6	7.9	5.7	7.6	2.8	5.3	3.2	2.3	2.2	2.6	2.7	3.0	1.3	1.6	2.9	1.3	1.5	1.3	1.6	3.6	10.3	
7-Aug	2.4	Z	1.3	1.3	1.0	2.2	0.5	1.4	3.5	0.6	0.3	0.4	0.5	0.3	0.3	0.5	0.4	0.5	0.4	0.8	1.3	2.0	3.2	1.7	1.2	3.5	
8-Aug	1.2	1.4	Z	2.4	3.7	8.1	5.8	2.9	2.3	1.7	0.8	0.8	1.1	1.3	0.8	0.8	1.1	0.7	DF	DF	0.3	0.2	0.3	0.2	1.8	8.1	
9-Aug	0.6	0.3	0.3	Z	0.5	0.9	1.1	M	0.4	0.7	1.0	0.4	0.3	0.7	0.8	0.7	1.4	0.5	0.3	0.3	0.2	0.3	0.2	0.2	0.6	1.4	
10-Aug	0.4	0.3	0.4	0.4	Z	1.4	1.9	1.0	0.8	0.9	0.6	1.2	0.8	1.1	1.4	1.5	1.0	0.6	0.3	0.3	0.3	0.3	0.4	0.3	0.8	1.9	
11-Aug	0.4	0.5	1.5	2.2	2.4	Z	1.6	1.4	1.2	1.1	1.5	1.3	2.7	2.6	3.9	4.9	6.1	4.1	1.6	1.5	7.0	1.3	5.2	5.1	2.7	7.0	
12-Aug	Z	5.3	5.8	1.1	1.6	3.2	7.1	11.5	14.5	7.5	11.6	24.0	27.2	12.0	6.6	28.0	17.9	27.8	55.7	29.7	27.8	21.8	14.5	33.1	17.2	55.7	
13-Aug	5.3	Z	1.8	1.5	1.3	4.7	7.1	4.2	4.4	6.1	11.8	13.4	12.2	10.3	19.5	17.4	19.9	29.2	19.0	20.1	11.4	3.8	5.5	16.2	10.7	29.2	
14-Aug	35.3	46.3	Z	29.2	55.3	63.5	47.5	17.5	9.5	4.8	2.9	11.9	21.1	21.0	42.5	37.2	23.4	14.3	14.2	21.7	15.4	8.6	2.1	12.3	24.2	63.5	
15-Aug	1.3	1.6	1.5	Z	8.4	3.0	4.8	4.6	1.5	2.5	5.9	23.1	4.7	10.6	10.6	19.4	28.5	13.3	10.8	24.6	20.4	75.3	59.3	32.0	16.0	75.3	
16-Aug	24.3	19.8	11.0	10.1	Z	30.9	51.7	66.8	37.1	4.3	10.1	14.6	5.6	16.7	25.3	31.8	33.7	45.0	34.2	1.0	0.9	1.2	0.5	0.6	20.7	66.8	
17-Aug	2.5	2.2	0.7	1.6	1.5	Z	5.4	8.9	37.2	30.0	C	C	C	C	C	C	24.6	18.8	25.5	47.3	43.0	54.0	9.5	17.7	--	54.0	
18-Aug	Z	4.6	1.2	1.6	1.9	1.6	3.9	6.6	4.9	2.4	1.7	2.2	2.1	1.7	2.3	2.2	1.9	1.7	5.7	24.0	9.1	5.1	16.2	25.5	5.7	25.5	
19-Aug	26.9	Z	7.5	7.9	2.8	8.0	6.0	19.7	35.1	28.5	19.4	30.9	21.1	15.8	17.0	29.2	26.8	40.4	89.3	14.4	5.0	2.2	3.7	1.4	20.0	89.3	
20-Aug	2.1	1.9	Z	7.6	7.1	7.9	7.9	12.4	21.3	25.4	22.4	14.8	15.1	6.0	6.2	9.2	2.8	2.2	1.9	1.1	1.5	0.9	1.2	1.1	7.8	25.4	
21-Aug	1.7	5.1	1.3	Z	2.0	9.3	4.5	4.3	1.7	1.7	1.8	1.3	1.2	0.9	0.6	0.6	1.1	0.9	1.4	2.0	1.0	2.9	0.9	0.7	2.1	9.3	
22-Aug	0.9	0.8	3.6	2.9	Z	8.0	8.8	34.6	14.9	3.1	0.8	0.8	0.8	0.8	1.4	1.3	2.4	1.8	4.8	1.6	1.4	1.4	0.9	0.8	4.3	34.6	
23-Aug	1.1	3.3	1.7	1.2	2.2	Z	7.2	7.1	5.4	2.9	2.2	1.4	1.3	1.1	0.9	1.1	2.2	1.7	0.7	1.2	0.6	1.2	1.1	1.1	2.2	7.2	
24-Aug	Z	1.2	1.1	0.7	0.6	0.8	1.7	2.2	2.0	1.5	1.1	0.6	0.4	0.9	0.8	1.1	1.0	7.1	41.7	33.9	28.6	1.7	1.6	5.8	41.7		
25-Aug	2.4	Z	1.4	3.0	3.2	6.6	1.9	4.3	2.5	7.0	13.0	22.5	30.7	11.5	5.8	10.0	7.5	2.2	2.5	1.3	1.6	0.9	2.7	2.6	6.4	30.7	
26-Aug	2.9	2.7	Z	1.7	1.8	2.8	1.8	4.1	6.3	11.8	7.1	12.2	11.3	19.2	24.8	24.6	26.6	26.8	16.1	15.6	54.0	63.3	74.8	25.2	19.0	74.8	
27-Aug	3.2	2.9	3.9	Z	23.8	20.8	15.5	16.3	9.8	4.6	4.7	6.1	6.4	6.3	4.8	9.5	16.5	11.1	11.2	3.5	2.5	1.5	3.3	6.9	8.5	23.8	
28-Aug	23.6	16.8	24.9	1.5	Z	26.8	37.0	38.7	26.4	24.0	22.0	21.0	18.3	15.9	9.8	6.5	3.1	2.7	11.4	1.3	1.1	1.4	2.2	1.4	14.7	38.7	
29-Aug	2.6	1.1	1.6	3.0	4.2	Z	2.7	8.3	4.7	6.1	9.8	17.7	10.9	10.3	32.1	10.9	24.2	9.4	1.7	1.8	1.4	1.7	1.1	1.2	7.3	32.1	
30-Aug	Z	2.3	2.2	4.6	5.5	13.4	7.4	38.5	14.0	4.6	5.4	5.9	2.5	3.1	3.3	6.6	11.5	13.8	2.0	3.0	11.6	3.6	1.2	0.8	7.3	38.5	
31-Aug	0.7	Z	5.5	7.7	13.5	8.1	36.2	41.0	11.5	22.1	12.8	3.2	2.0	4.8	11.0	13.6	14.3	12.7	9.0	7.8	10.1	22.5	30.6	20.1	13.9	41.0	
		5.8	5.4	3.4	4.3	6.0	9.8	10.0	12.9	9.9	7.6	6.9	8.7	7.4	6.6	8.5	9.6	10.6	9.6	11.4	9.6	8.9	10.2	8.1	7.0	Diurnal Average	
		35.3	46.3	24.9	29.2	55.3	63.5	51.7	66.8	37.2	30.0	22.4	30.9	30.7	21.0	42.5	37.2	33.7	45.0	89.3	47.3	54.0	75.3	74.8	33.1	Diurnal Maximum	
Z - zerospan		C - Calibration			M - Maintenance			DF - DAS Failure																			



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Christina Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	612	86.93	86.93
21 - 40	72	10.23	97.16
41 - 80	19	2.70	99.86
81 - 159	1	0.14	100.00
> 159	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Christina Lake - August 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	10	29	41	20	18	34	46	16	47	75	76	62	42	38	41	17	612
21 - 40	0	0	0	0	0	0	0	0	2	2	2	32	19	10	5	0	72
11 - 80	0	0	0	0	0	0	0	0	0	0	0	9	9	1	0	0	19
81 - 159	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	10	29	41	20	18	34	46	16	49	77	78	104	70	49	46	17	704

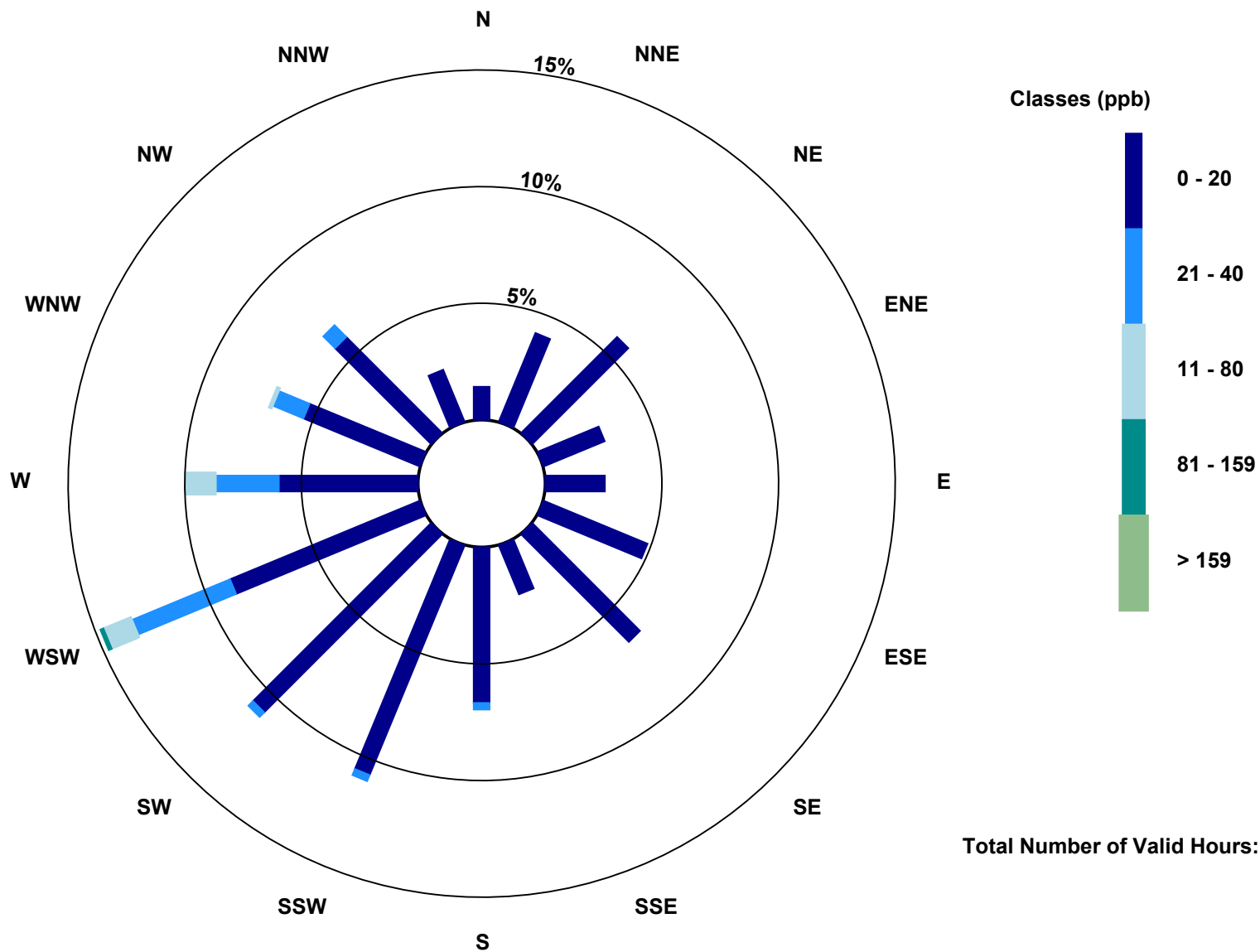
Total Number of Valid Hours: 704

Total Number of Hours: 744

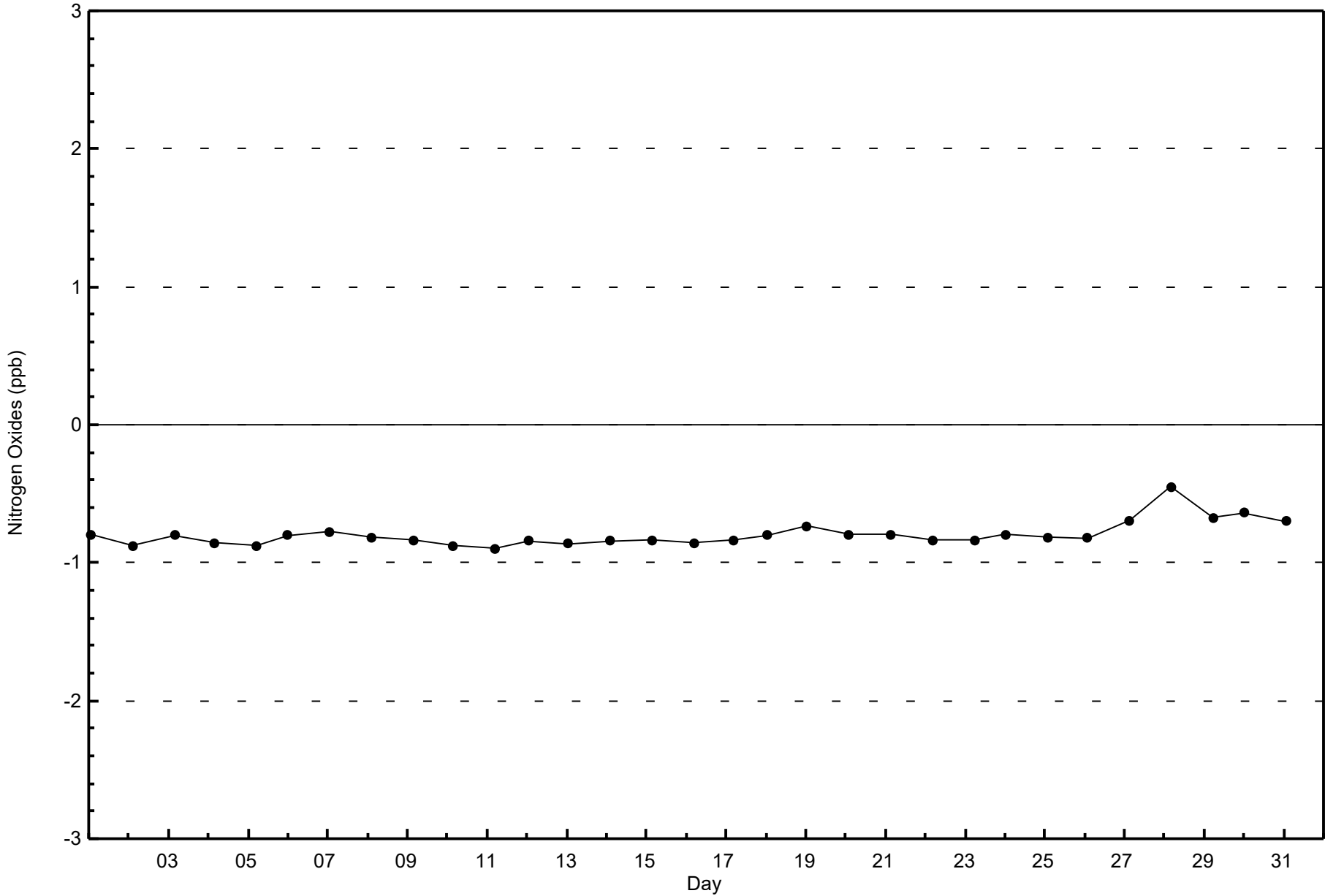


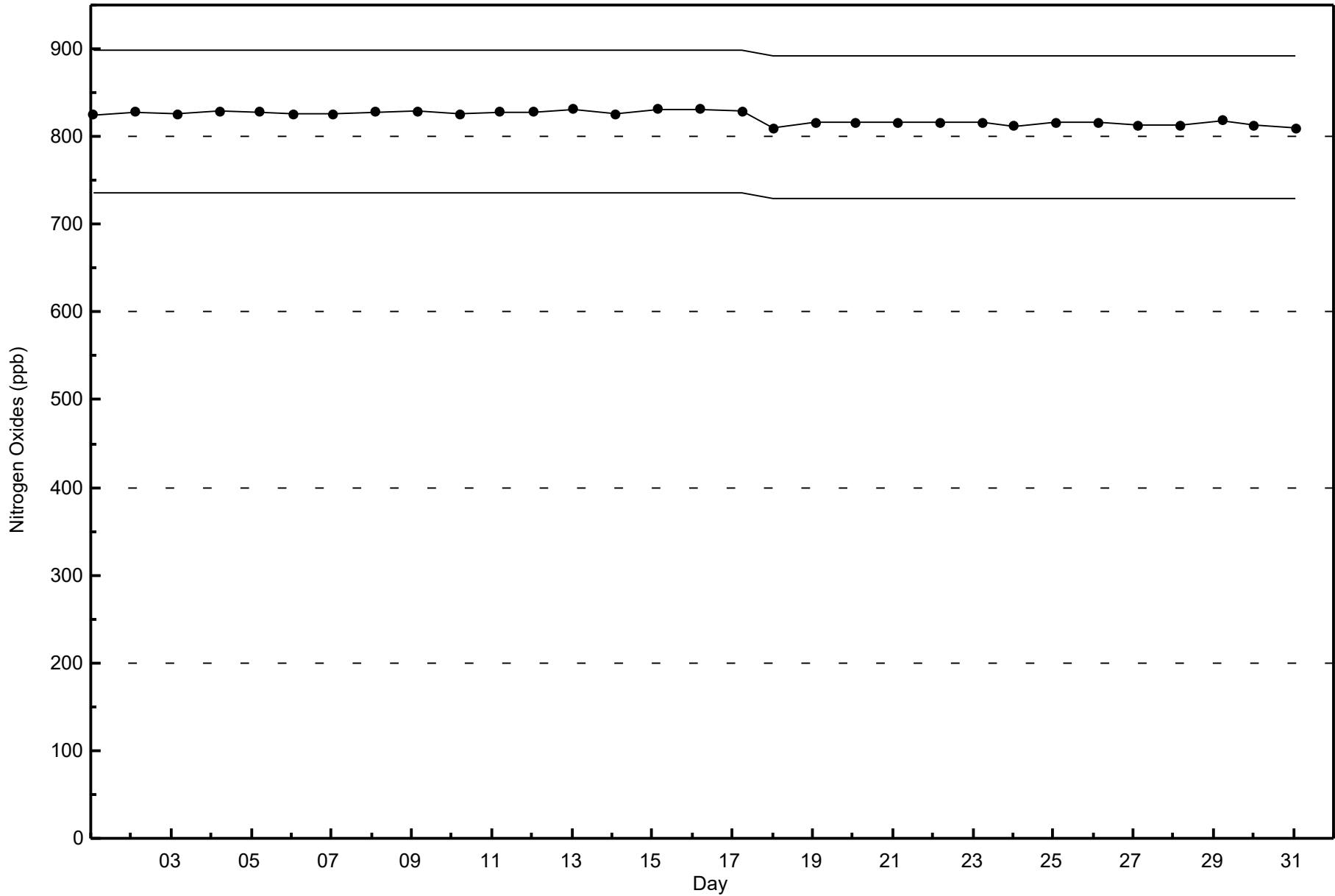
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Christina Lake



Total Number of Valid Hours: 704







Wood Buffalo Environmental Association
Summary of Hour Averages

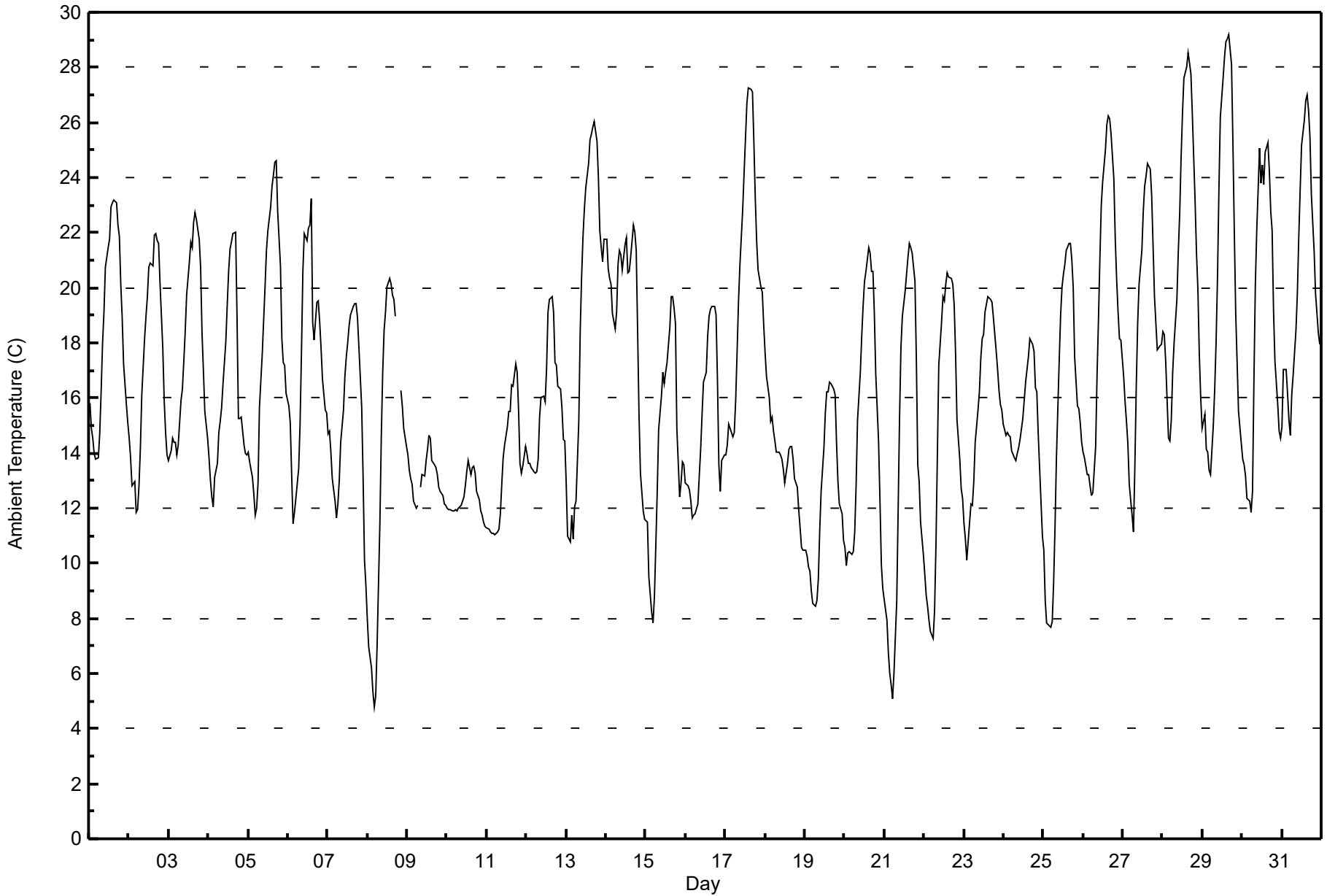
Ambient Temperature (AT) - C
Christina Lake - August 2023

Maximum Value: 29.2 C on Aug 29 17:00		Maximum Daily Average: 21.3 C on Aug 28		Hours in Service: 744																							
Minimum Value: 4.8 C on Aug 8 05:00		Minimum Daily Average: 12.4 C on Aug 10		Hours of Data: 741																							
Maximum Diurnal Average: 21.3 C at hour 16		Minimum Diurnal Average: 11.9 C at hour 6		Hours of Missing Data: 3																							
Monthly Average: 16.53 C		Percentiles: P ₁ = 6.4 P ₁₀ = 11.3 Q ₁ = 13.2 Median = 15.8 Q ₃ = 19.8 P ₉₀ = 22.8 P ₉₉ = 27.9		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-Aug	15.8	14.9	14.6	14.0	13.8	13.8	14.7	16.3	18.0	19.1	20.8	21.5	21.8	22.9	23.1	23.2	23.1	22.3	21.9	20.1	18.9	17.2	15.8	15.1	18.4	23.2	
2-Aug	14.6	13.8	12.8	13.0	11.8	12.0	12.8	14.2	16.1	18.2	19.0	19.7	20.8	20.9	20.8	21.9	22.0	21.7	21.6	20.2	17.8	15.9	14.7	14.0	17.1	22.0	
3-Aug	13.7	14.1	14.5	14.4	14.4	13.9	14.3	15.9	16.3	17.4	18.4	19.7	21.0	21.7	21.5	22.4	22.7	22.5	21.8	20.7	18.3	17.0	15.5	14.5	17.8	22.7	
4-Aug	13.8	13.0	12.4	12.1	13.1	13.6	14.7	15.2	15.7	16.5	18.0	19.4	20.6	21.4	21.6	22.0	22.0	18.9	15.3	15.3	14.3	14.0	13.9		16.3	22.0	
5-Aug	14.0	13.7	13.1	12.5	11.8	12.0	12.9	15.7	17.6	18.8	20.0	21.4	22.1	22.9	23.7	24.1	24.6	24.6	22.8	20.8	18.2	17.3	17.2	16.2	18.2	24.6	
6-Aug	15.7	15.1	13.2	11.4	11.8	12.3	13.4	15.1	17.6	20.6	22.0	21.7	22.2	22.3	23.2	18.8	18.1	19.5	19.5	18.7	17.8	16.7	15.6	15.4	17.4	23.2	
7-Aug	14.7	14.8	14.0	13.1	12.3	11.6	12.1	13.0	14.4	15.6	16.8	17.5	18.0	18.6	19.0	19.3	19.4	19.4	18.9	17.8	15.7	13.1	10.1	9.2	15.4	19.4	
8-Aug	8.0	7.0	6.2	5.4	4.8	5.2	7.0	11.5	14.6	16.9	18.4	19.1	20.1	20.3	20.1	19.7	19.6	19.0	DF	DF	16.3	15.7	14.9	14.3	13.8	20.3	
9-Aug	13.9	13.4	13.0	12.8	12.2	12.0	12.1	M	12.8	13.2	13.2	13.7	14.2	14.7	14.6	13.7	13.6	13.5	13.2	12.7	12.6	12.5	12.2	12.1	13.1	14.7	
10-Aug	12.0	11.9	11.9	11.9	11.9	12.0	11.9	12.0	12.1	12.3	12.4	12.8	13.3	13.7	13.2	13.5	13.5	13.2	12.6	12.3	11.9	11.7	11.5	11.4	12.4	13.7	
11-Aug	11.3	11.2	11.1	11.1	11.1	11.0	11.1	11.2	11.8	12.9	13.8	14.3	14.9	15.5	15.5	16.5	16.4	17.2	16.9	15.5	13.6	13.3	13.5	14.3	13.5	17.2	
12-Aug	14.0	13.6	13.6	13.5	13.3	13.3	13.3	13.8	15.3	16.0	16.1	15.8	17.1	19.1	19.6	19.7	19.1	17.3	17.2	16.4	16.3	15.6	14.5	14.4	15.7	19.7	
13-Aug	12.9	11.0	10.8	11.8	10.9	12.0	12.3	15.1	18.4	20.4	21.9	22.9	23.7	24.5	25.4	25.6	25.8	26.1	25.3	24.0	22.0	21.5	20.9	21.7	19.5	26.1	
14-Aug	21.7	20.7	20.3	20.1	19.1	18.5	19.1	20.9	21.4	21.2	20.7	21.6	21.8	20.6	20.6	21.1	22.3	22.0	21.3	18.4	15.3	13.3	11.9	11.6	19.4	22.3	
15-Aug	11.5	11.5	9.5	8.3	7.8	8.8	10.7	12.6	14.8	16.0	16.9	16.5	16.9	17.3	18.6	19.7	19.7	19.3	18.7	14.9	12.4	12.9	13.7	13.6	14.3	19.7	
16-Aug	12.9	12.8	12.7	12.2	11.6	11.8	11.8	12.2	13.2	14.1	15.4	16.6	17.0	18.3	19.0	19.2	19.3	19.3	19.0	16.6	13.6	12.6	13.7	14.0	15.0	19.3	
17-Aug	13.9	14.3	15.0	14.9	14.6	14.8	15.9	17.7	19.5	20.8	22.8	24.2	25.4	26.7	27.2	27.2	27.1	25.3	23.2	21.7	20.6	20.0	19.8	18.7	20.5	27.2	
18-Aug	17.7	16.8	16.0	15.2	15.3	14.8	14.4	14.0	14.0	13.9	13.8	13.4	12.9	13.7	14.1	14.2	14.2	13.8	13.0	12.8	12.0	11.3	10.6	10.5	13.9	17.7	
19-Aug	10.5	10.3	9.9	9.7	9.0	8.5	8.4	8.6	9.4	11.2	12.6	14.2	15.5	16.2	16.2	16.6	16.5	16.3	16.1	14.4	13.0	12.1	11.8	10.9	12.4	16.6	
20-Aug	10.6	9.9	10.4	10.4	10.3	10.4	11.1	12.9	15.2	16.9	18.3	19.3	20.3	20.6	21.4	21.2	20.6	20.6	19.0	16.9	14.4	12.3	9.9	9.1	15.1	21.4	
21-Aug	8.7	7.9	6.8	6.0	5.6	5.1	6.0	8.6	11.9	15.3	17.9	18.9	19.9	20.5	21.1	21.6	21.4	21.3	20.3	17.4	13.6	12.9	11.5	10.3	13.8	21.6	
22-Aug	9.6	8.9	8.5	7.9	7.5	7.3	8.3	10.7	13.9	17.2	18.8	19.7	19.5	20.2	20.5	20.4	20.3	20.1	19.4	17.6	15.2	13.8	12.7	12.4	14.6	20.5	
23-Aug	11.5	10.9	10.1	11.5	12.2	12.1	13.0	14.4	15.6	16.2	17.4	18.2	18.3	19.1	19.7	19.6	19.6	19.5	18.9	17.7	17.0	16.3	15.8	15.6	15.8	19.7	
24-Aug	15.1	14.7	14.8	14.6	14.6	14.1	13.8	13.7	14.0	14.2	14.5	15.2	15.9	16.6	17.0	17.5	18.2	18.0	17.7	16.4	16.2	14.7	12.2	11.0	15.2	18.2	
25-Aug	10.5	8.6	7.8	7.8	7.7	7.9	9.3	11.3	13.9	17.4	19.0	20.1	20.5	20.8	21.4	21.6	21.6	21.0	20.0	17.5	15.7	15.6	15.1	14.4	15.3	21.6	
26-Aug	14.1	13.8	13.2	13.2	12.8	12.4	12.6	14.2	16.8	18.8	21.0	23.0	23.8	25.0	25.9	26.3	26.1	25.6	23.9	21.7	20.3	19.1	18.2	18.1	19.2	26.3	
27-Aug	16.8	15.8	15.1	14.3	12.8	11.7	11.1	13.5	16.4	18.7	20.2	21.4	22.8	23.7	24.1	24.5	24.3	23.3	21.5	19.7	18.7	17.8	17.9	17.9	18.5	24.5	
28-Aug	18.4	18.3	17.3	14.6	14.4	15.2	16.9	18.0	19.6	21.3	22.7	24.7	26.4	27.6	28.0	28.5	28.2	27.8	26.3	23.1	21.3	19.9	17.6	16.0	21.3	28.5	
29-Aug	14.9	15.4	14.1	14.0	13.4	13.2	15.0	16.3	18.0	20.4	23.6	26.2	27.6	28.4	28.9	29.0	29.2	28.1	25.3	22.0	19.1	17.3	15.5	14.3	20.4	29.2	
30-Aug	13.8	13.6	13.1	12.4	12.3	11.9	12.6	16.6	20.1	22.1	25.1	23.8	24.4	23.8	24.9	25.3	24.3	22.8	22.1	19.2	17.3	15.8	14.8	14.5	18.6	25.3	
31-Aug	15.0	17.1	17.0	16.2	15.2	14.7	16.1	16.8	18.5	19.8	21.8	23.5	25.2	26.1	26.8	27.0	26.5	25.5	23.4	21.3	19.8	19.1	18.3	18.0	20.4	27.0	
		13.6	13.2	12.7	12.3	11.9	11.9	12.5	14.1	15.7	17.2	18.5	19.4	20.1	20.8	21.2	21.3	21.3	20.8	19.9	18.1	16.5	15.4	14.6	14.1	Diurnal Average	
		21.7	20.7	20.3	20.1	19.1	18.5	19.1	20.9	21.4	22.1	25.1	26.2	27.6	28.4	28.9	29.0	29.2	28.1	26.3	24.0	22.0	21.5	20.9	21.7	Diurnal Maximum	
M - Maintenance		DF - DAS Failure																									



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Christina Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Christina Lake - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	43	5.80	5.80
10 - 20	516	69.64	75.44
> 20	182	24.56	100.00

Total Number of Valid Hours: 741

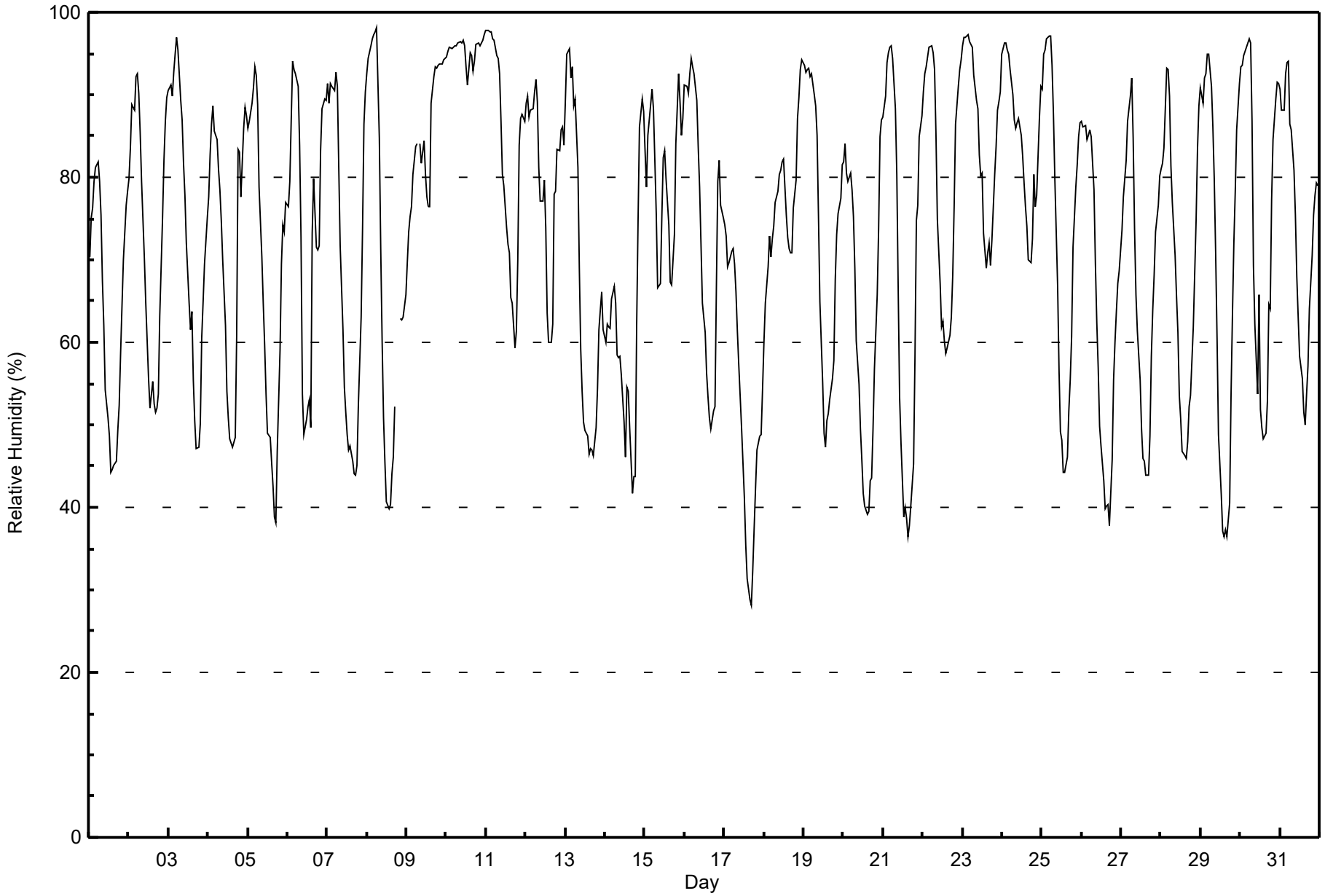
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Relative Humidity (RH) - %
Christina Lake - August 2023

Maximum Value: 98.2 % on Aug 8 07:00 Maximum Daily Average: 95.4 % on Aug 10																						Hours in Service:	744			
Minimum Value: 28.1 % on Aug 17 17:00 Minimum Daily Average: 52.2 % on Aug 17																						Hours of Data:	741			
Maximum Diurnal Average: 89.6 % at hour 6 Minimum Diurnal Average: 54.0 % at hour 15																						Hours of Missing Data:	3			
Monthly Average: 72.98 % Percentiles: P ₁ = 36.7 P ₁₀ = 47.1 Q ₁ = 58.7 Median = 76.4 Q ₃ = 88.7 P ₉₀ = 94.2 P ₉₉ = 97.3																						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-Aug	70.3	75.1	76.3	79.5	81.2	81.9	79.5	75.4	67.4	62.1	54.2	50.9	48.6	44.2	44.5	45.1	45.6	49.4	52.4	58.7	64.4	70.0	76.6	78.3	63.8	81.9
2-Aug	79.8	83.5	88.9	88.1	92.2	92.6	90.2	85.4	79.5	70.2	64.7	60.2	55.6	52.1	55.2	52.5	51.4	52.1	53.7	63.2	75.0	82.1	86.8	89.7	72.7	92.6
3-Aug	90.6	91.3	89.8	92.8	94.9	96.9	95.5	89.3	87.0	81.7	77.8	72.0	64.8	61.5	63.7	55.4	50.5	47.0	47.3	50.2	60.5	64.9	69.5	75.0	73.7	96.9
4-Aug	77.5	82.6	86.4	88.6	85.5	84.6	81.1	78.4	74.7	70.0	62.1	54.2	50.9	48.2	47.8	47.3	48.4	60.9	83.5	83.1	77.6	85.9	88.6	87.5	72.3	88.6
5-Aug	85.9	86.8	88.9	90.8	93.5	92.4	88.8	78.9	70.3	64.8	59.6	53.7	49.0	48.6	45.4	42.6	38.8	38.1	46.8	58.9	69.5	74.3	73.4	77.0	67.4	93.5
6-Aug	76.4	79.4	86.9	94.1	93.1	92.5	90.9	83.9	72.7	53.8	48.9	50.7	52.1	53.1	49.7	73.2	79.9	71.5	71.2	71.7	83.2	88.3	89.4	89.4	74.8	94.1
7-Aug	91.4	89.0	91.4	91.0	90.5	92.7	91.0	81.2	71.6	61.6	54.6	51.6	48.8	47.0	47.5	45.5	44.1	43.9	45.1	52.3	63.0	73.7	86.5	90.4	68.6	92.7
8-Aug	92.5	94.4	95.9	96.8	97.3	97.7	98.2	84.8	71.4	60.2	50.8	45.5	40.7	39.9	40.3	44.1	46.1	52.2	DF	DF	62.8	62.6	63.0	65.8	68.3	98.2
9-Aug	69.7	73.4	75.3	76.5	80.3	83.7	84.1	M	84.2	81.6	84.4	80.3	77.7	76.5	76.4	89.0	92.2	93.4	93.1	93.6	93.8	93.8	94.2	94.4	84.4	94.4
10-Aug	94.6	95.3	95.7	95.7	95.8	95.9	95.9	96.3	96.4	96.3	96.6	95.9	93.4	91.1	95.2	94.7	92.9	94.1	96.1	96.3	96.0	96.3	96.5	97.4	95.4	97.4
11-Aug	97.7	97.7	97.6	97.7	96.7	96.7	94.7	94.4	92.5	86.8	80.3	79.0	73.9	71.9	70.8	65.4	64.8	59.4	61.3	70.1	83.9	87.1	87.6	86.8	83.1	97.7
12-Aug	88.9	89.8	87.3	88.2	88.3	90.3	91.8	89.2	81.3	77.1	77.2	79.6	73.8	63.5	59.9	60.1	62.3	78.0	78.2	83.4	83.1	85.8	86.1	83.9	80.3	91.8
13-Aug	89.2	94.9	95.6	92.0	93.4	88.6	89.5	81.2	69.0	59.2	54.1	50.3	49.3	48.7	46.4	47.1	46.9	46.2	49.7	54.4	61.4	63.9	66.1	61.6	66.6	95.6
14-Aug	60.1	62.2	61.9	61.7	65.2	66.9	64.8	58.5	58.2	58.4	56.1	50.4	46.0	54.6	54.0	49.7	41.8	43.7	43.8	62.0	74.8	86.2	89.4	87.9	60.8	89.4
15-Aug	83.3	78.8	85.2	88.9	90.7	88.3	82.1	75.7	66.6	67.2	75.3	82.3	83.2	79.8	74.3	67.3	67.0	69.9	73.1	84.0	92.5	89.2	85.2	87.2	79.9	92.5
16-Aug	91.2	91.0	90.2	92.5	94.4	93.3	92.6	89.3	83.8	78.8	71.9	64.8	61.2	56.2	53.4	50.8	49.5	51.6	52.1	66.6	79.5	82.0	76.5	75.1	74.5	94.4
17-Aug	74.2	72.9	69.1	69.7	71.1	71.4	69.5	66.0	61.3	57.2	49.7	45.4	41.2	35.4	31.3	28.8	28.1	32.3	37.5	42.3	46.9	48.7	48.8	54.2	52.2	74.2
18-Aug	59.9	64.8	69.2	72.9	70.4	72.6	74.1	76.9	78.2	80.3	80.8	81.9	82.2	75.5	72.7	71.3	70.8	70.8	76.2	79.6	87.1	89.7	93.1	94.3	76.9	94.3
19-Aug	93.6	92.7	93.0	93.2	92.3	92.5	89.9	88.6	85.2	75.3	64.9	55.0	48.9	47.3	50.5	51.4	53.1	55.6	57.8	67.6	73.1	75.7	77.5	81.5	73.2	93.6
20-Aug	81.8	84.1	80.5	79.6	80.6	78.5	75.3	69.0	60.2	54.9	49.4	45.8	41.7	40.2	39.2	39.4	43.2	43.6	49.5	56.9	65.7	73.7	85.0	87.0	62.7	87.0
21-Aug	87.3	89.9	93.9	95.1	95.8	95.9	94.5	88.4	80.4	66.4	53.3	47.8	38.7	40.1	38.7	36.4	37.8	40.1	45.2	58.4	74.8	76.6	85.0	87.5	68.7	95.9
22-Aug	90.4	92.6	93.4	94.6	95.7	95.9	95.2	93.0	85.2	75.0	67.2	61.9	62.6	60.1	58.7	59.3	60.8	63.1	68.2	76.5	86.5	91.0	93.1	94.2	79.7	95.9
23-Aug	95.9	96.9	97.0	97.2	96.4	96.0	95.8	92.4	89.4	88.2	82.7	80.2	80.6	73.2	69.0	70.9	72.0	69.3	72.5	80.3	83.7	88.2	89.2	90.3	85.3	97.2
24-Aug	94.9	96.3	96.2	95.4	94.9	93.1	90.0	86.9	85.9	86.6	87.2	85.1	82.6	79.2	76.4	74.1	70.0	69.6	72.6	80.3	76.4	77.8	87.2	91.0	84.6	96.3
25-Aug	90.6	94.9	95.4	96.9	97.1	97.1	93.6	87.7	79.9	66.7	56.7	49.2	48.1	44.3	44.2	46.1	51.7	55.4	60.6	71.6	78.9	81.6	84.8	86.6	73.3	97.1
26-Aug	86.8	86.1	86.3	84.6	85.1	85.8	84.8	78.5	69.5	62.4	57.0	49.9	47.5	43.2	39.8	40.2	40.3	37.9	45.8	55.4	59.9	63.7	67.2	68.7	63.6	86.8
27-Aug	73.6	77.7	79.8	82.1	86.9	89.8	92.0	84.8	73.8	65.8	61.3	55.5	49.4	45.8	45.7	43.8	43.8	48.7	58.2	63.9	68.1	73.3	76.6	80.2	67.5	92.0
28-Aug	80.9	81.6	83.6	93.2	93.0	89.9	81.4	76.9	70.4	65.6	61.2	53.5	50.7	46.7	46.2	46.0	47.9	52.1	53.5	61.9	68.3	74.7	83.4	88.7	68.8	93.2
29-Aug	90.9	89.0	92.0	92.5	94.8	94.8	91.1	86.0	79.7	70.6	60.4	48.7	41.5	37.2	36.4	37.3	36.4	40.5	53.7	63.5	72.0	78.4	85.8	91.4	69.4	94.8
30-Aug	93.3	93.5	94.7	95.2	96.2	96.7	96.3	86.8	69.3	62.3	53.7	65.8	51.9	49.6	48.3	49.1	52.8	64.5	64.1	77.2	84.6	89.4	91.6	91.4	75.8	96.7
31-Aug	90.7	88.1	88.2	92.6	93.9	94.1	86.5	85.7	80.9	75.5	68.0	63.0	58.4	55.6	51.6	49.9	53.7	57.1	64.1	70.5	75.4	77.8	79.3	78.9	74.1	94.1
																						Diurnal Average				
																						Diurnal Maximum				
M - Maintenance DF - DAS Failure																										





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Christina Lake - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	21	2.83	2.83
40 - 60	174	23.48	26.32
60 - 80	229	30.90	57.22
80 - 100	317	42.78	100.00

Total Number of Valid Hours: 741

Total Number of Hours: 744



Maximum Speed: 22 km/h on Aug 13 13:00	Maximum Daily Speed Average: 14.3 km/h on Aug 1	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 22 10:00	Minimum Daily Speed Average: 1.2 km/h on Aug 6	Hours of Data: 741
Maximum Diurnal Speed Average: 4.9 km/h at hour 17	Minimum Diurnal Speed Average: 2.7 km/h at hour 21	Hours of Missing Data: 3
Monthly Average Velocity: 3.8 km/h 257.3 deg	Percentiles: P ₁ = 1 P ₁₀ = 4 Q ₁ = 6 Median = 10 Q ₃ = 13 P ₉₀ = 16 P ₉₉ = 20	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-Aug	WSW15	WSW13	WSW15	WSW15	WSW16	W13	W15	W15	W17	W19	WNW19	WNW19	W19	W19	W16	W15	WNW20	W15	NW16	NW17	NW16	WNW7	WSW6	WSW11	W14.3	WNW20	
2-Aug	WSW12	WSW11	WSW6	NW10	SW4	W5	W5	WNW3	NNW1	ESE1	N6	W6	WNW6	WSW7	SW8	S3	SSW2	W2	NE3	NE8	ENE7	ESE6	E5	ESE4	W2.1	WSW12	
3-Aug	S4	E4	WSW3	SW9	SW10	SE9	SE7	SSW3	SSE7	SSW2	S3	SSW4	SW4	SW2	NW7	W12	W15	W16	W13	WNW15	WNW10	W11	WSW10	WSW9	WSW5.3	W16	
4-Aug	WSW10	WSW11	WSW10	WSW10	SW10	W13	W14	WNW17	NW18	WNW16	NW14	WNW12	WNW13	WNW14	WNW13	W13	NW10	SW5	N5	WSW11	WSW11	W13	WSW10	WSW8	WSW6	W10.1	NW18
5-Aug	WSW11	WSW11	WSW10	SW10	SW10	WSW9	SW11	W6	WNW8	WNW8	NW11	WNW10	W10	W11	W12	WNW8	WNW8	WNW13	NW7	SSE3	SSE6	SW8	SW4	SSW4	W7.1	WNW13	
6-Aug	SW5	WNW5	W4	WSW4	SSW4	SW3	SSW4	SSW3	SSW2	ENE2	E2	NE7	NNE9	NNE4	NNE6	NE13	SE4	SSE6	SSW6	S2	NE10	NE9	SE5	SE2	ENE1.2	NE13	
7-Aug	NE3	N8	NNE8	NE8	NE8	NNE6	NE9	NE11	NE8	NE11	NE11	NNE12	NE10	NE11	NE10	NE12	NNE13	NE13	NE13	NE11	NE8	ENE4	S3	SW5	NE8.1	NE13	
8-Aug	SSW4	SSW4	SSW4	SSW4	S3	S3	S3	ENE3	ENE5	E5	E8	ESE7	ESE7	E6	ESE7	SE8	SE10	ESE11	DF	DF	SE13	SE15	SE12	SE11	SE5.7	SE15	
9-Aug	SSE11	SSE8	SE7	SE7	SE10	SE11	SE12	M	SE12	SE11	SE12	SE14	SE17	SE15	SE15	SE9	SE10	SE12	SE15	SE15	SE14	SE13	SE10	ESE9	SE11.6	SE17	
10-Aug	SE11	SE13	SE13	SE14	SE11	ESE12	ESE11	ESE10	ESE10	E11	E10	E12	E11	NE12	ENE14	NE12	ENE13	NE12	NNE13	NNE12	NNE13	NNE13	NNE13	N13	E8.9	ENE14	
11-Aug	N13	NNW16	NNW19	NNW19	NNW16	NNW14	NW16	NW17	NW16	NNW14	NNW15	N12	NW12	WNW12	WNW11	WNW10	W10	WNW9	NW8	W4	S6	S6	SW8	WSW10	NW9.8	NNW19	
12-Aug	WSW10	WSW9	WSW12	WSW10	W7	WSW9	WSW9	WSW11	W11	NW12	WNW15	W13	W10	WNW14	NW12	W14	WNW21	WSW8	W10	WSW10	W8	WSW8	WSW6	WSW12	W10.1	WNW21	
13-Aug	SW6	SSW6	SSW6	SSW7	S6	SW9	S5	SSW7	SW12	SW17	SW18	WSW21	WSW22	WSW21	WSW20	WSW20	WSW20	WSW17	WSW15	SW12	SW10	SW14	SW13	WSW16	SW13.0	WSW22	
14-Aug	WSW15	WSW12	WSW16	WSW19	WSW14	W12	W14	W18	WNW19	NNW18	NNW14	NW14	WNW17	WNW12	W11	WSW11	W11	W9	W6	S3	S6	SW5	SSW5	SW3	W10.1	WNW19	
15-Aug	SW7	SW6	SSW5	SSW5	SSW5	SSW5	SSW5	SSW5	SSW11	SSW14	SW12	SSW7	SSW6	SW10	SW12	WSW15	WSW13	WSW13	WSW9	WNW16	SW9	W12	WNW16	WNW17	WSW8.2	WNW17	
16-Aug	NW14	NW15	WNW14	NW16	NW15	W11	W12	W11	W14	NW16	NW15	NW14	NW14	WNW12	W12	W12	W13	W9	WSW8	S7	S7	S7	SSW9	SSW10	WNW9.2	NW16	
17-Aug	SSW12	SSW14	SSW16	SSW14	SSW12	SW10	SW13	SW13	WSW14	WSW15	W14	WSW17	WSW21	W19	W20	W20	WNW21	NW18	WNW12	WSW9	WSW9	W11	WNW11	W7	WSW11.8	WNW21	
18-Aug	NNW7	NNW12	NNE10	NE5	N5	N6	NNE11	NNE11	NNE11	NNE15	NNE20	NNE19	N16	NNE16	N14	NNW15	N16	NNW16	NW18	NW16	NW15	NW19	NW19	NW18	N12.3	NNE20	
19-Aug	NW14	WNW11	NW17	NW16	NW19	NW12	NW14	W13	W11	W12	W14	W15	WNW15	NW16	WNW14	WNW12	W14	W12	WSW11	SW9	SW10	SW11	SW11	SW9	WNW11.2	NW19	
20-Aug	SW10	SW10	SW11	SW11	SW11	SW11	SW12	SW11	WSW14	WSW15	WSW17	WSW12	WSW10	SW9	WSW6	WSW6	S6	S8	SSW12	SSW9	SSW7	SSW6	SSW6	SSW7	SW9.4	WSW17	
21-Aug	SSW6	SSW3	SSW2	SSE3	SSW3	S4	SSW4	S3	ESE2	ENE2	ENE4	ENE6	E9	ESE12	E7	E7	ESE7	SE8	SE7	SE7	SSE7	S7	SE4	ESE5	SE4.2	ESE12	
22-Aug	SE3	S3	S5	S2	SSW4	S3	S1	S1	ESE1	WNW0	SE10	SE12	SSE10	SE8	SE6	ESE6	E7	ESE6	E5	SE4	ESE4	SSE4	SSE5	SE2	SE4.2	SE12	
23-Aug	S3	S4	SE4	S3	ESE3	SE3	S5	SSW4	NE4	NE5	ENE5	NE6	NE8	NE7	NE9	NE12	ENE14	ENE13	ENE10	ENE8	NE9	ENE6	ENE6	E6	ENE5.1	ENE14	
24-Aug	ENE5	ESE5	NNE7	NE5	NE9	NE10	NE9	NNE10	NNE12	NNE14	NE15	NE14	NNE14	NNE13	NNE13	NNW14	NW14	NW9	WSW5	WNW11	SW4	S5	SW6	SW6	NNE6.8	NE15	
25-Aug	SW7	SSW7	SSW6	SSW8	SSW8	SSW8	SSW9	SSW9	SSW9	SSW9	SW12	SW13	WSW13	WSW13	SW13	SW14	SW14	SW13	SW13	SW10	SSW7	S6	SSW10	S10	S9	SW9.4	SW14
26-Aug	S9	SSW9	SSW9	SSW13	SSW11	SSW9	SSW11	SSW14	SW15	SW13	SW12	WSW14	WSW15	WSW16	W16	WSW15	WSW17	WSW16	WSW12	WSW11	WSW10	WSW10	WSW10	NW14	SW11.1	WSW17	
27-Aug	NW10	NNW5	NNW5	W3	W4	WSW3	SSW4	SW3	SE1	E3	ESE4	SSE4	WSW3	S1	S4	WSW6	WSW10	WSW12	WSW11	SW9	SW11	SW9	SW8	SW7	WSW4.3	WSW12	
28-Aug	WSW8	WSW7	WSW5	SSW4	SW4	WSW7	WSW9	WSW8	WSW10	WSW9	WSW9	W8	WSW7	SW7	SSW6	ENE5	ESE4	SW8	SW9	SW9	SSW8	S5	SSW5	SSW5	SW6.0	WSW10	
29-Aug	S5	SSW6	SSW5	SSW6	S3	SSW5	SSW6	SSW5	S5	SSW9	SSW9	SW10	SW12	SW13	WSW12	SW10	SW9	SW8	S7	S6	SSE6	SE4	ESE4	ESE2	SSW6.0	SW13	
30-Aug	SSE2	E4	ESE3	NE2	SW3	S3	SE2	SSW1	SSW6	S3	NE4	ESE6	SSE11	SSE9	ESE7	ESE5	ENE3	S4	ENE4	SSE3	SW2	SW3	SSW5	S5	SSE2.8	SSE11	
31-Aug	SE7	SE6	SSW6	SSE2	SW2	SSW5	WSW9	W8	NW10	WNW10	NW6	NNW7	NNW9	NW10	W10	W12	W15	WNW15	WNW17	WNW16	W14	W13	W11	W14	WNW7.6	WNW17	

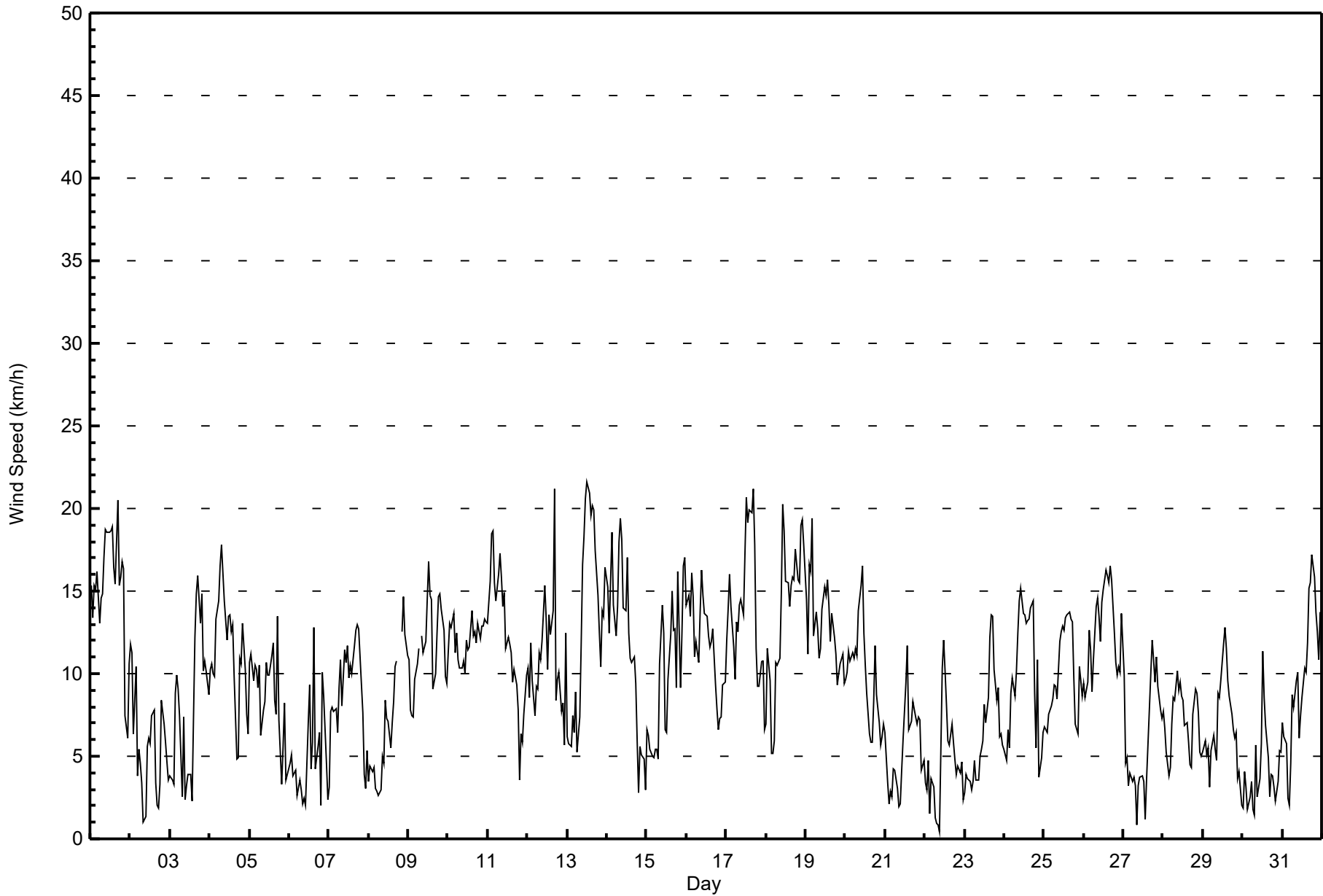
WSW4.3	WSW3.8	WSW3.9	WSW3.9	WSW3.8	SW3.8	WSW4.1	W4.3	W4.0	WNW3.9	WNW3.2	WNW3.6	W4.3	W4.6	W4.8	W4.7	W4.9	W4.3	W4.5	WSW3.5	SW2.7	SW3.8	SW3.8	WSW4.1	Diurnal Average
WSW15	NNW16	NNW19	NNW19	NW19	NNW14	WNW17	WNW18	WNW19	W19	NNE20	WSW21	WSW22	WSW21	W20	WSW20	WNW21	NW18	NW18	NW17	NW16	NW19	NW19	NW18	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Christina Lake - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Christina Lake - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	167	22.54	22.54
6 - 11	313	42.24	64.78
12 - 19	248	33.47	98.25
20 - 28	13	1.75	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
Christina Lake - August 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	1	8	11	7	16	10	8	34	34	17	6	7	3	0	3	167
6 - 11	3	11	23	6	10	15	22	10	15	42	43	60	24	15	11	3	313
12 - 19	6	16	10	4	1	3	18	0	0	9	22	38	43	29	36	13	248
20 - 28	0	1	0	0	0	0	0	0	0	0	0	7	2	3	0	0	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	11	29	41	21	18	34	50	18	49	85	82	111	76	50	47	19	741

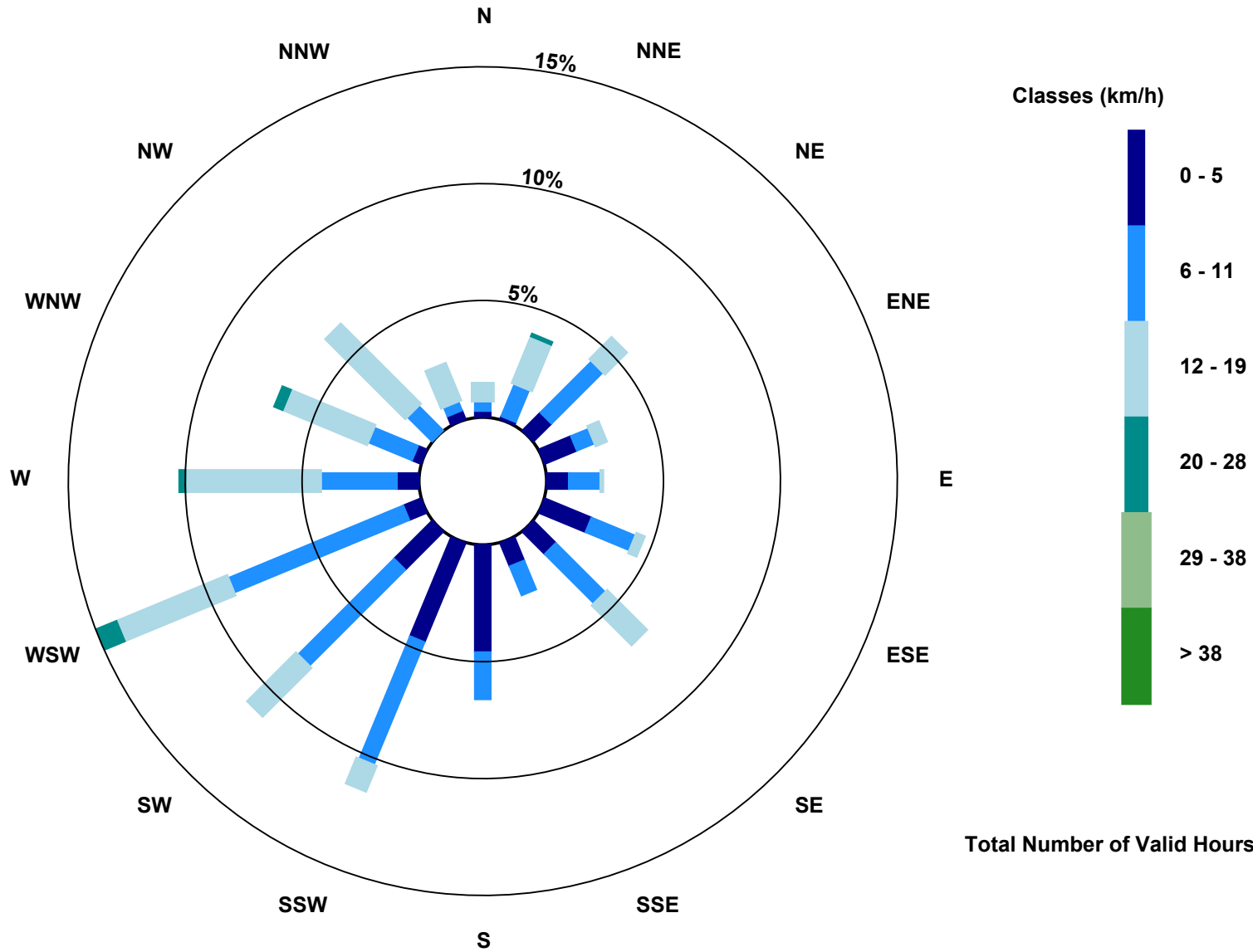
Total Number of Valid Hours: 741

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Christina Lake





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Christina Lake - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Aug 15 20:00																	Hours in Service: 744 Hours of Data: 741 Hours of Missing Data: 3 Hours of Calibration: 0 Percent Operational Time: 99.6								
Minimum Value: 0 km/h on Aug 29 03:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 3 Q ₃ = 3 P ₉₀ = 4 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-Aug	3	3	3	3	4	4	4	4	5	5	5	5	6	5	5	5	6	5	5	3	3	4	4	1	6
2-Aug	1	2	3	7	2	3	2	2	1	1	2	3	3	2	2	2	2	2	2	2	1	1	1	1	7
3-Aug	1	1	2	2	2	3	3	2	2	2	2	2	3	4	5	5	4	4	5	4	3	2	2	2	5
4-Aug	2	2	2	2	3	4	5	5	4	4	4	5	4	4	4	4	2	6	3	2	3	2	4	3	6
5-Aug	2	2	2	2	2	2	2	2	3	3	3	3	3	4	4	4	3	4	4	2	2	2	2	2	4
6-Aug	2	3	2	1	1	1	1	1	1	1	2	2	3	3	7	4	2	1	2	1	3	3	1	3	7
7-Aug	2	3	2	2	1	2	1	1	3	3	3	4	4	4	4	4	4	3	3	2	2	1	1	1	4
8-Aug	2	2	1	2	2	1	1	1	2	3	4	4	4	4	3	3	2	3	DF	DF	3	4	3	3	4
9-Aug	2	1	1	2	2	2	2	M	3	2	2	3	4	4	4	2	2	3	3	4	4	3	3	2	4
10-Aug	3	3	3	3	3	3	3	3	2	2	2	3	2	3	3	3	2	2	2	2	2	3	2	3	3
11-Aug	3	3	3	3	3	3	4	3	3	3	3	3	3	4	3	3	3	3	3	2	2	1	3	2	4
12-Aug	2	2	3	2	2	2	2	2	3	4	5	4	3	4	4	4	9	2	2	3	3	3	4	2	9
13-Aug	2	1	1	1	1	1	1	1	3	4	4	6	4	5	5	5	5	5	3	2	2	2	2	4	6
14-Aug	4	3	3	4	4	3	4	6	5	5	3	3	5	4	3	2	3	3	3	1	1	2	2	1	6
15-Aug	1	1	2	1	1	1	1	2	4	3	4	1	1	3	3	4	3	3	2	9	2	3	5	4	9
16-Aug	3	4	4	4	4	3	3	2	4	4	4	4	4	4	4	3	4	2	2	1	1	2	2	2	4
17-Aug	3	3	3	3	2	2	3	3	4	4	4	5	6	6	5	6	5	5	4	2	2	2	3	3	6
18-Aug	4	6	4	2	3	3	3	3	2	3	4	4	3	4	4	4	4	4	3	3	4	4	4	4	6
19-Aug	4	3	4	4	3	4	3	4	3	4	4	5	4	4	4	4	4	3	3	2	1	2	2	1	5
20-Aug	2	1	2	2	2	2	2	3	3	3	4	3	3	3	3	3	2	3	3	2	1	2	2	2	4
21-Aug	1	1	2	1	2	1	2	1	1	1	2	3	4	4	4	3	3	2	1	0	1	1	1	1	4
22-Aug	1	1	1	2	3	1	1	1	1	2	4	4	4	3	2	2	1	1	1	1	1	1	2	2	4
23-Aug	1	1	1	2	1	2	1	1	2	2	1	2	1	2	2	4	3	3	3	1	1	2	1	1	4
24-Aug	1	1	2	2	2	2	2	2	3	3	3	2	3	3	3	3	3	3	4	4	3	3	2	3	4
25-Aug	1	1	1	1	1	2	1	2	1	3	3	3	3	3	3	3	3	3	3	1	1	1	1	2	3
26-Aug	2	2	2	2	2	2	2	3	3	3	3	4	4	5	4	5	5	4	2	2	2	2	2	4	5
27-Aug	2	1	2	2	1	2	1	1	1	1	2	2	2	2	2	3	3	2	2	2	2	2	3	3	3
28-Aug	2	2	2	1	2	1	2	2	2	2	2	3	2	2	2	2	2	1	3	1	1	2	1	1	3
29-Aug	2	1	0	1	1	2	1	1	2	2	2	2	3	3	3	3	2	2	1	1	1	1	1	1	3
30-Aug	1	2	1	1	2	1	2	1	3	1	2	3	3	3	2	1	3	2	1	2	2	2	1	1	3
31-Aug	3	3	2	2	2	3	2	3	3	3	2	3	3	3	3	3	5	4	4	4	3	4	3	3	5
Diurnal Maximum																									
M - Maintenance DF - DAS Failure																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Christina Lake - August 2023

Direction of Maximum Speed: 240 deg on Aug 13 13:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 276.1 deg on Aug 1	Hours of Data: 741
Direction of Minimum Speed: 291 deg on Aug 22 10:00	Hours of Missing Data: 3
Direction of Minimum Daily Speed Average: 1.2 deg on Aug 6	Percent Operational Time: 99.6
Monthly Average Direction: 257.3 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-Aug	250	249	251	249	250	261	271	279	275	281	289	284	277	277	270	270	295	269	307	324	320	302	254	246	276.1
2-Aug	246	248	248	308	235	261	280	300	348	103	358	275	292	253	234	189	212	276	43	41	78	109	101	120	267.2
3-Aug	174	92	247	230	234	128	138	195	162	197	186	198	232	234	321	265	267	264	273	300	283	267	245	244	248.6
4-Aug	254	252	248	246	267	279	291	308	300	320	303	302	295	283	279	314	226	4	239	247	267	230	246	243	278.1
5-Aug	251	249	253	230	222	238	236	272	298	290	307	300	277	278	276	296	291	283	322	152	168	227	218	198	263.4
6-Aug	229	299	267	238	213	215	195	205	199	73	80	52	29	23	12	54	126	155	197	182	38	56	140	139	78.3
7-Aug	50	4	27	41	38	33	35	39	35	39	45	32	36	35	35	43	25	47	41	36	46	75	172	214	37.7
8-Aug	213	208	210	208	184	170	184	76	72	92	88	117	115	82	113	144	125	112	DF	DF	124	134	141	138	129.5
9-Aug	159	149	140	135	135	146	146	M	138	141	139	138	139	135	146	133	128	129	142	140	134	137	135	123	138.7
10-Aug	124	130	135	136	132	121	122	114	108	99	99	97	88	54	63	52	59	42	33	31	33	20	17	10	78.8
11-Aug	349	340	334	339	335	329	321	319	322	335	339	351	321	289	287	286	259	285	308	260	183	185	233	250	315.5
12-Aug	238	245	248	251	261	243	251	251	263	304	285	280	277	295	314	277	301	240	262	249	274	256	238	247	268.3
13-Aug	222	203	210	204	190	218	187	205	215	230	235	239	240	240	249	243	243	239	232	222	225	227	239	231.7	
14-Aug	251	256	246	247	257	260	261	281	289	330	335	306	295	282	267	257	275	281	274	187	183	223	206	225	272.1
15-Aug	223	220	202	204	204	205	197	180	196	201	216	205	197	227	230	248	253	243	238	286	217	267	282	301	236.4
16-Aug	313	307	295	322	320	272	264	259	277	313	311	308	319	297	281	274	273	263	248	187	177	183	198	199	283.7
17-Aug	203	198	195	202	200	214	225	228	249	253	260	255	248	270	279	269	301	306	290	248	248	259	301	272	251.7
18-Aug	344	336	19	48	359	359	12	18	20	18	26	24	4	14	6	344	359	334	324	322	322	323	324	323	352.7
19-Aug	318	297	318	322	323	311	311	281	266	279	281	280	299	306	292	284	274	260	255	236	233	230	229	220	285.1
20-Aug	218	214	225	230	228	230	232	236	239	241	243	245	252	217	242	245	178	187	205	211	207	199	192	199	225.1
21-Aug	204	196	200	163	197	188	203	176	121	67	58	76	100	117	92	97	106	126	135	141	168	170	141	114	133.4
22-Aug	141	174	182	176	202	182	185	181	111	291	137	134	147	126	138	115	100	102	94	124	112	160	152	140	136.9
23-Aug	174	171	141	170	116	127	177	206	46	35	74	55	41	50	34	49	69	75	77	70	51	69	78	81	72.4
24-Aug	59	106	30	45	40	34	36	26	25	32	47	37	30	30	22	18	338	326	306	242	298	232	189	216	17.5
25-Aug	226	209	197	207	206	204	204	206	202	232	230	246	245	236	233	232	222	217	218	193	180	192	183	180	216.1
26-Aug	182	197	198	197	200	208	199	206	217	218	222	253	247	255	262	255	255	248	244	242	250	249	255	308	234.6
27-Aug	312	334	329	276	265	243	213	218	135	86	123	167	237	191	176	243	244	240	239	229	224	214	226	227	236.9
28-Aug	242	244	250	204	216	244	253	255	251	258	244	256	260	255	225	209	67	111	227	218	214	208	186	204	234.2
29-Aug	187	201	192	208	190	194	197	195	185	204	206	219	232	234	241	226	234	223	191	177	151	139	103	121	206.3
30-Aug	168	86	103	53	218	186	124	192	192	175	50	122	159	160	103	116	64	182	63	159	219	217	206	187	150.4
31-Aug	133	126	205	154	225	201	254	274	320	285	318	336	335	318	279	277	279	301	282	282	278	276	273	275	282.2

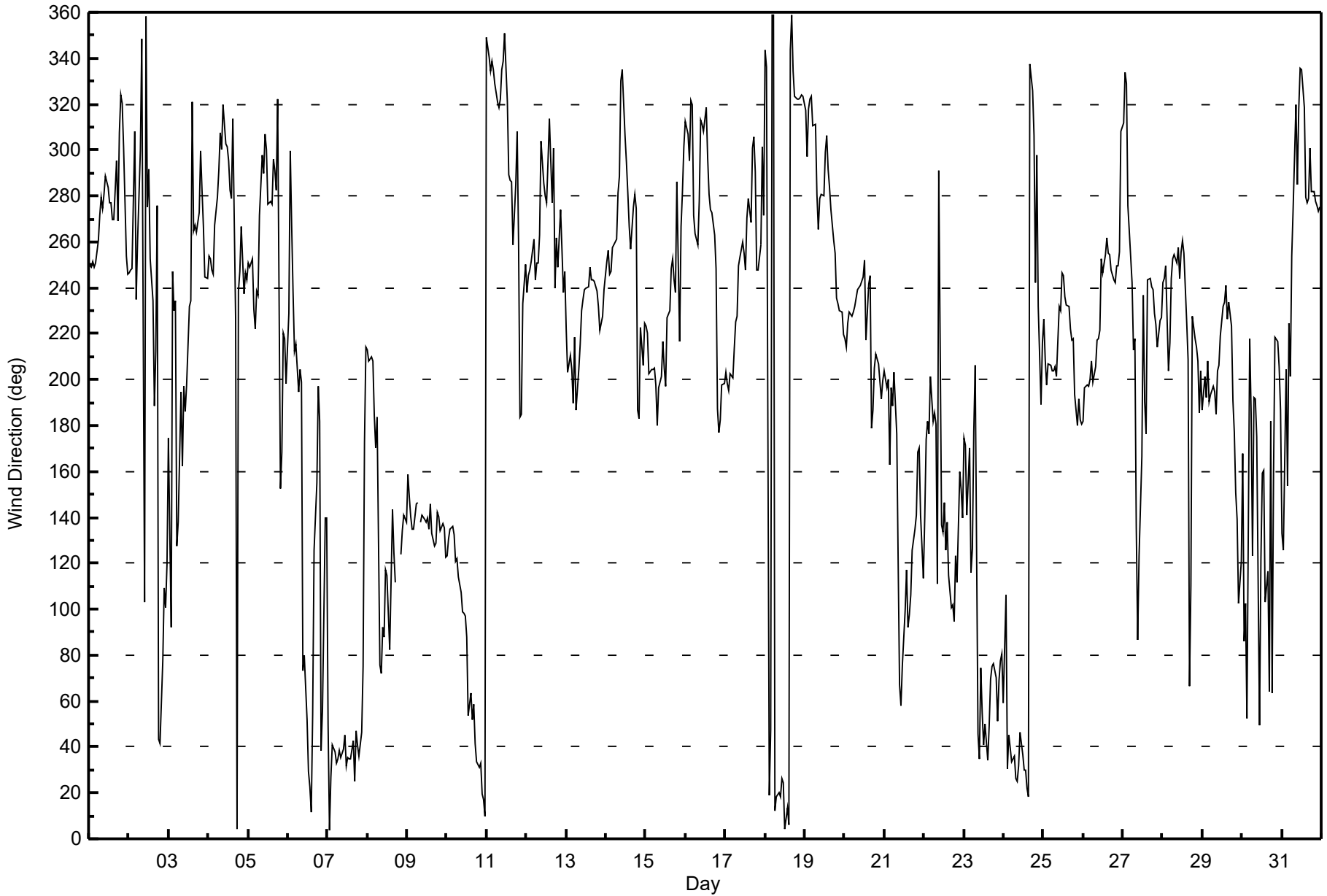
237.6 240.6 243.4 241.5 243.3 235.3 244.0 262.1 262.4 284.5 288.7 282.8 276.7 275.5 276.6 273.8 279.2 265.9 263.8 252.0 233.8 225.2 226.6 239.5
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Christina Lake - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Christina Lake - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 96 deg on Aug 27 14:00 Minimum Value: 5 deg on Aug 29 04:00 Percentiles: P ₁ = 7 P ₁₀ = 11 Q ₁ = 13 Median = 18 Q ₃ = 28 P ₉₀ = 50 P ₉₉ = 86																	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-Aug	14	14	15	13	14	18	17	18	20	17	21	20	18	20	18	28	19	22	23	9	9	37	73	10	73
2-Aug	8	9	43	45	64	41	54	67	81	86	57	61	60	37	22	67	87	89	57	10	12	12	18	30	89
3-Aug	33	44	71	10	21	33	28	59	22	86	64	65	66	78	67	31	21	18	18	18	27	19	14	14	86
4-Aug	14	13	13	16	16	16	18	20	22	25	33	31	30	25	23	40	59	74	18	16	17	17	50	45	74
5-Aug	19	12	16	13	14	18	13	34	30	30	21	33	31	28	29	56	61	25	50	56	28	7	66	45	66
6-Aug	42	49	24	25	14	31	17	39	49	67	80	23	36	89	87	23	50	34	19	65	18	16	27	57	89
7-Aug	66	35	14	10	9	16	12	10	22	22	29	28	44	31	46	27	28	18	13	9	23	16	33	12	66
8-Aug	37	52	27	34	31	36	33	40	30	58	39	65	76	76	51	20	15	14	DF	DF	15	14	14	19	76
9-Aug	12	12	12	23	15	11	12	M	13	13	13	13	14	15	13	13	13	13	13	14	13	14	15	12	23
10-Aug	14	13	13	13	14	13	12	12	12	12	12	15	15	17	11	14	14	11	11	10	11	14	13	18	18
11-Aug	20	17	10	12	15	18	15	10	13	17	15	28	18	25	29	37	19	34	33	47	9	13	23	14	47
12-Aug	14	13	14	18	18	16	14	11	20	24	17	19	27	27	28	22	19	19	22	24	28	34	65	11	65
13-Aug	32	16	10	7	10	10	14	16	14	13	16	17	15	18	18	17	17	17	12	12	12	10	10	13	32
14-Aug	15	17	12	13	18	18	17	20	19	20	17	24	18	19	20	17	27	37	34	46	14	29	32	51	51
15-Aug	11	15	13	8	13	10	11	20	13	11	17	21	19	14	15	16	16	12	12	37	35	18	17	22	37
16-Aug	16	19	22	13	16	21	16	17	20	20	24	28	27	30	31	26	25	27	20	12	7	10	11	13	31
17-Aug	12	11	10	12	13	15	13	15	17	17	20	18	20	21	19	21	19	19	33	15	14	18	20	54	54
18-Aug	60	33	20	26	41	31	17	14	15	13	13	14	21	14	21	20	23	14	10	13	13	10	11	11	60
19-Aug	15	19	12	13	9	23	20	20	19	26	22	22	24	26	25	23	20	19	17	11	9	9	10	11	26
20-Aug	11	9	10	11	11	13	13	16	13	15	17	21	23	40	51	32	25	17	12	10	7	11	23	16	51
21-Aug	11	57	54	35	47	17	23	22	53	46	54	46	27	41	55	40	38	15	12	6	12	9	18	11	57
22-Aug	32	26	16	58	72	30	43	64	75	93	27	23	20	31	29	24	11	11	19	26	32	21	17	27	93
23-Aug	49	11	23	38	40	27	16	21	48	15	23	22	16	19	20	19	18	12	13	12	8	17	11	14	49
24-Aug	20	16	22	18	9	10	14	15	14	13	12	11	14	14	18	17	18	16	28	81	26	58	25	33	81
25-Aug	11	11	7	7	7	9	8	10	12	17	17	23	22	17	15	17	20	15	13	8	10	8	8	9	23
26-Aug	9	14	12	11	13	15	13	12	15	17	20	21	24	21	19	20	19	14	11	9	13	13	15	18	24
27-Aug	12	31	31	51	31	39	16	30	78	49	57	51	53	96	57	54	19	13	12	10	9	10	16	17	96
28-Aug	19	21	21	20	29	13	14	18	13	18	13	24	24	32	31	36	47	25	33	7	5	12	10	16	47
29-Aug	13	10	8	5	10	10	8	11	20	12	16	21	15	14	17	18	17	19	9	6	10	25	11	16	25
30-Aug	19	12	19	72	45	13	78	53	22	68	38	49	17	24	25	28	89	63	41	29	78	27	18	24	89
31-Aug	35	46	38	82	83	42	20	32	23	27	41	30	33	23	26	22	17	19	15	14	15	19	21	17	83
66 57 71 82 83 42 78 67 81 93 80 65 76 96 87 67 89 89 57 81 78 58 73 57																								Diurnal Maximum	
M - Maintenance DF - DAS Failure																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS27
JACKFISH 2/3
AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
AUGUST 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	35	36	99.87	5.3	0	1.5	0
H2S (ppb) Average	709	35	35	100	0.8	0	0.5	0
NO2 (ppb) Average	707	36	37	99.87	5	0	1.8	-
NO (ppb) Average	707	36	37	99.87	4.7	-	0.5	-
NOX (ppb) Average	707	36	37	99.87	7.5	-	1.9	-
Temperature 2 m (C) Average	744	0	0	100	28.3	-	21	-
Relative Humidity (%) Average	744	0	0	100	100	-	98.8	-
Wind Speed 10 m (km/h) Average	742	1	2	99.87	16	-	10	-
Wind Direction 10 m (deg) Average	742	1	2	99.87	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
AUGUST 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	0.52	0.7	-	0	0	0.1	0.3	0.6	1.4	5.3
H2S (ppb) Average	709	0.24	0.1	-	0	0.1	0.1	0.2	0.3	0.4	0.8
NO2 (ppb) Average	707	0.55	0.8	-	0	0	0	0.2	0.7	1.6	5
NO (ppb) Average	707	0.2	0.4	-	0	0	0	0.1	0.3	0.5	4.7
NOX (ppb) Average	707	0.74	1	-	0	0	0.1	0.4	1	1.9	7.5
Temperature 2 m (C) Average	744	15.9	4.4	-	6.6	10.8	12.5	15.4	19	21.8	28.3
Relative Humidity (%) Average	744	76.28	17.3	-	31	50.1	62.6	80	91.3	97	100
Wind Speed 10 m (km/h) Average	742	5.9	3	-	0	3	4	6	8	9	16
Wind Direction 10 m (deg) Average	742	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - JACKFISH 2/3 (AMS27)
AUGUST 2023

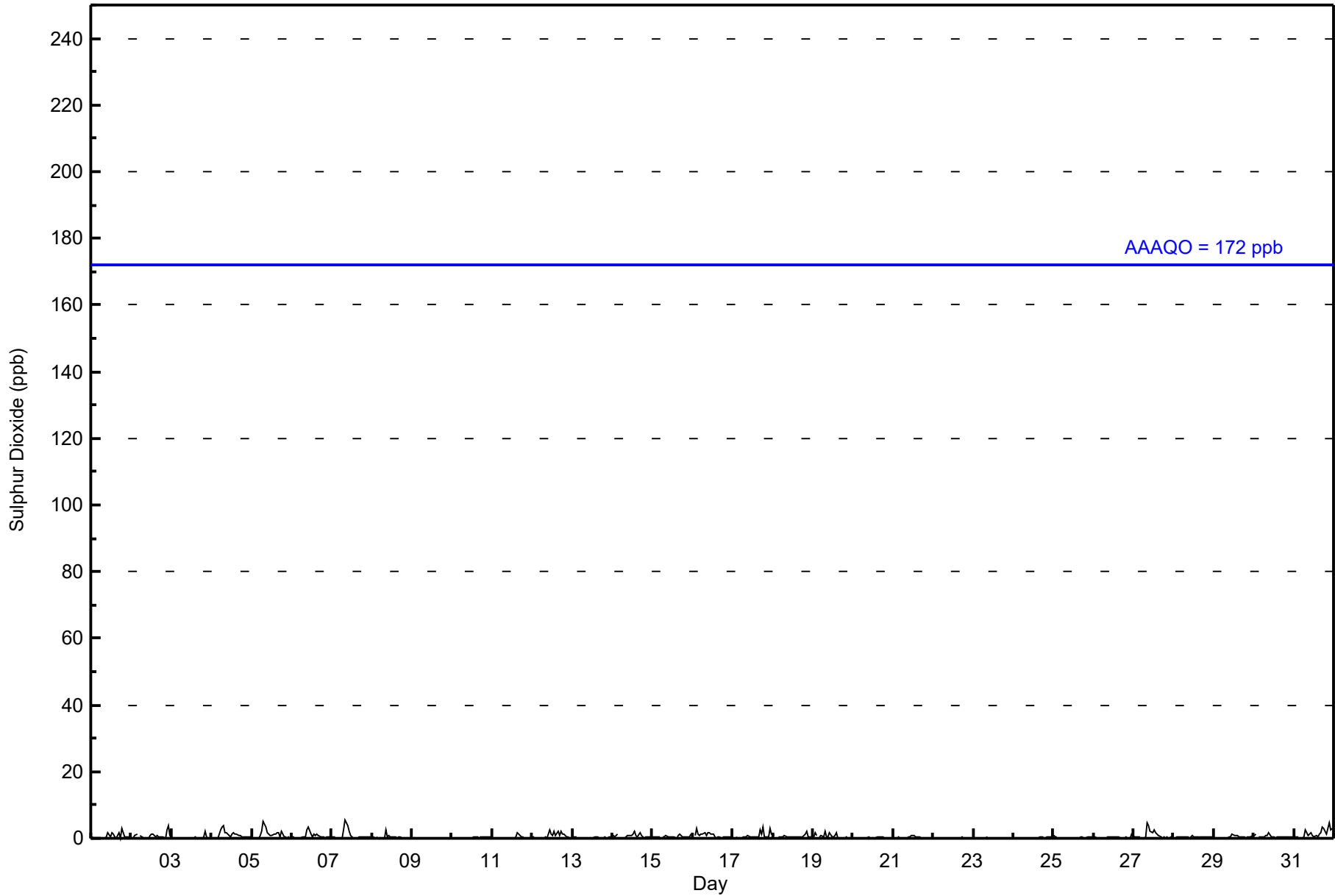
OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2, SO2	02 Aug 2023 09:00	02 Aug 2023 09:00	1	Maintenance - sample manifold cleaned
Wind Speed, Wind Direction	30 Aug 2023 23:00	30 Aug 2023 23:00	1	Flat line in sensor output signal



Wood Buffalo Environmental Association
Hourly Averages

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	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: 708

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3 - August 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	12	24	7	10	13	32	6	10	16	16	38	36	28	17	6	277
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	6	12	24	7	10	13	32	6	10	16	16	38	36	28	17	6	277

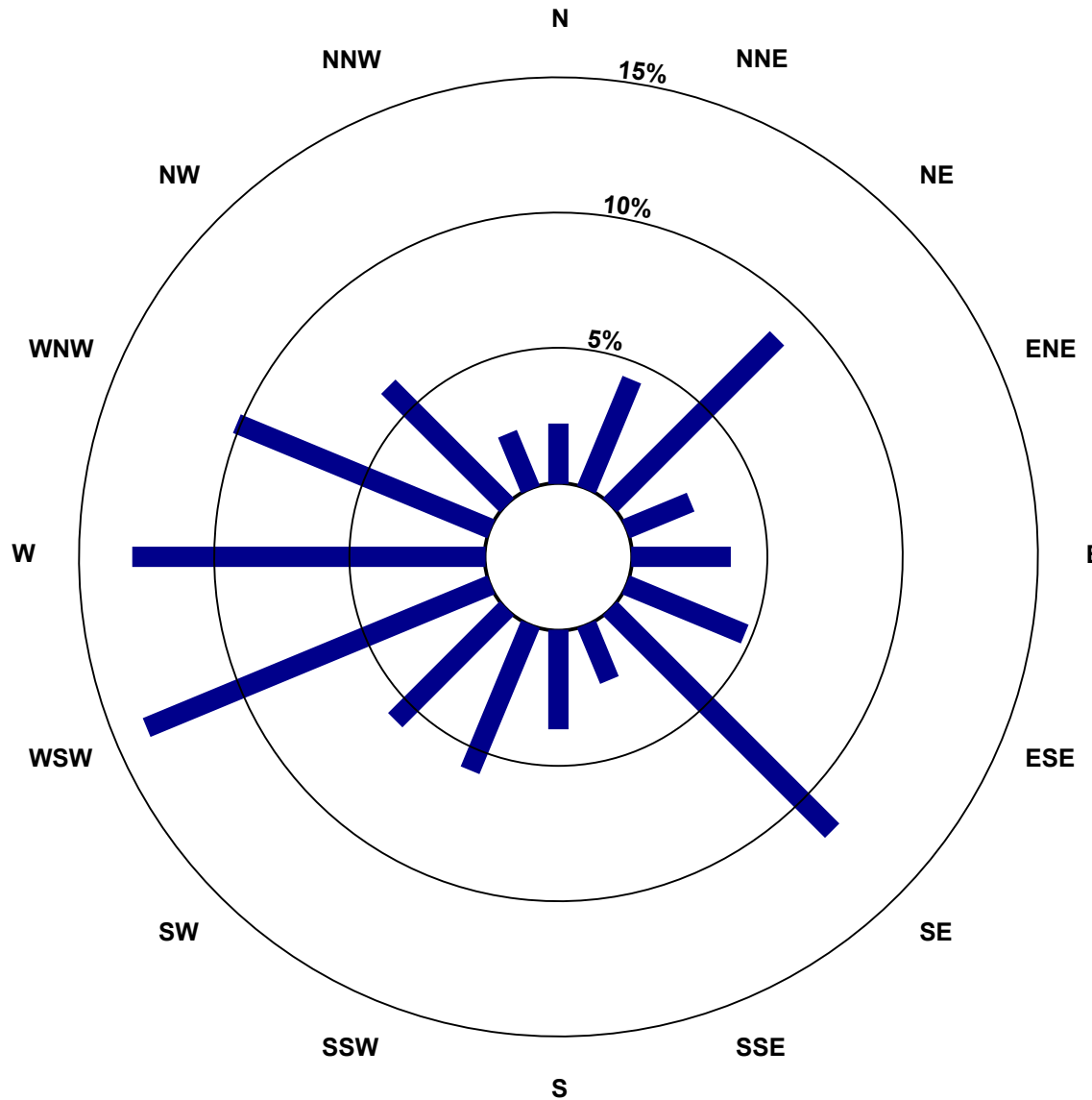
Total Number of Valid Hours: 277

Total Number of Hours: 744

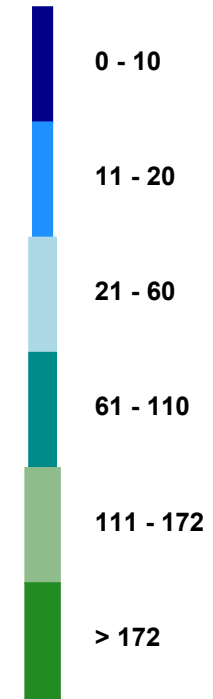


Wood Buffalo Environmental Association
Wind Rose Aug 2023

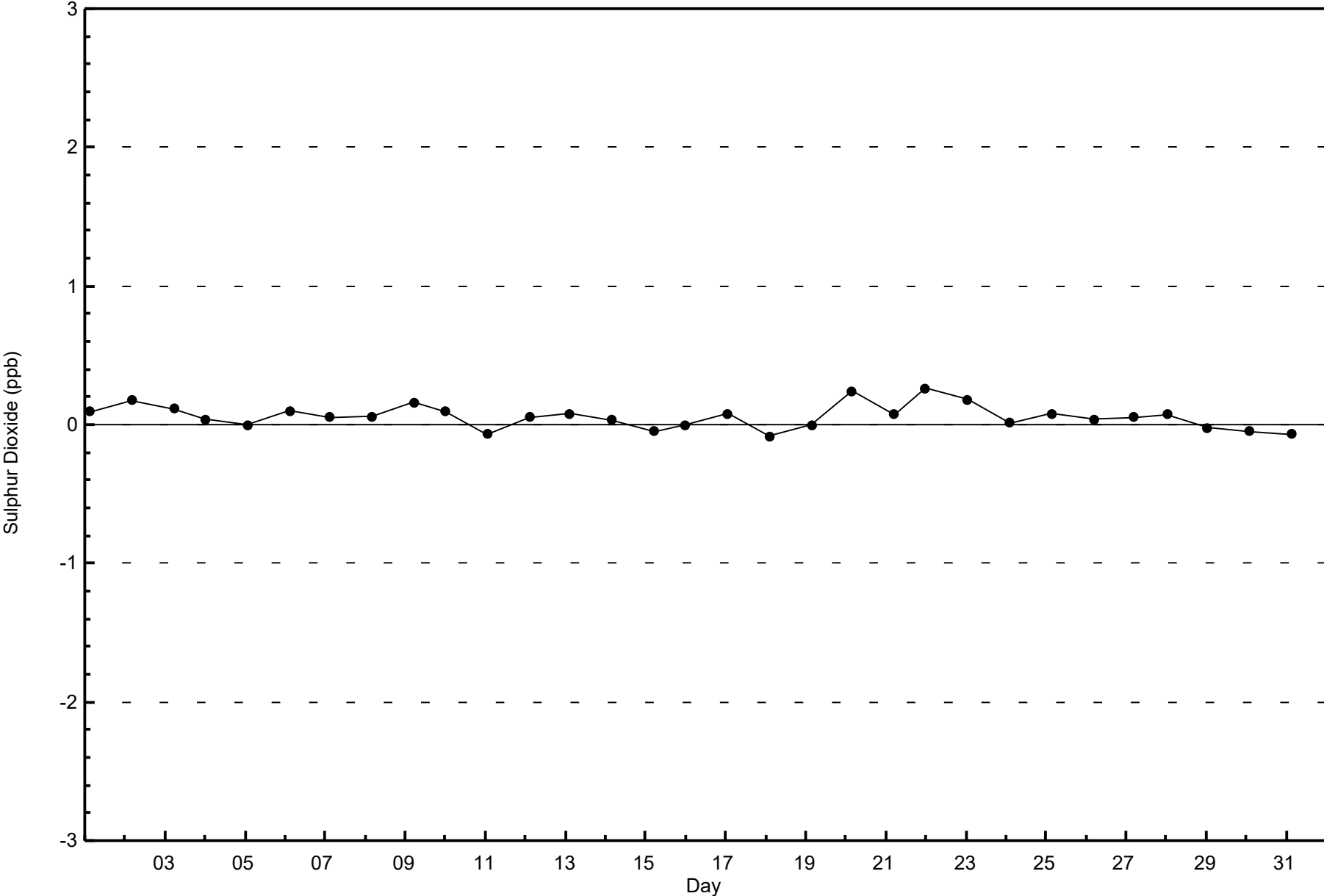
Sulphur Dioxide (SO₂) - ppb
Jackfish 2/3

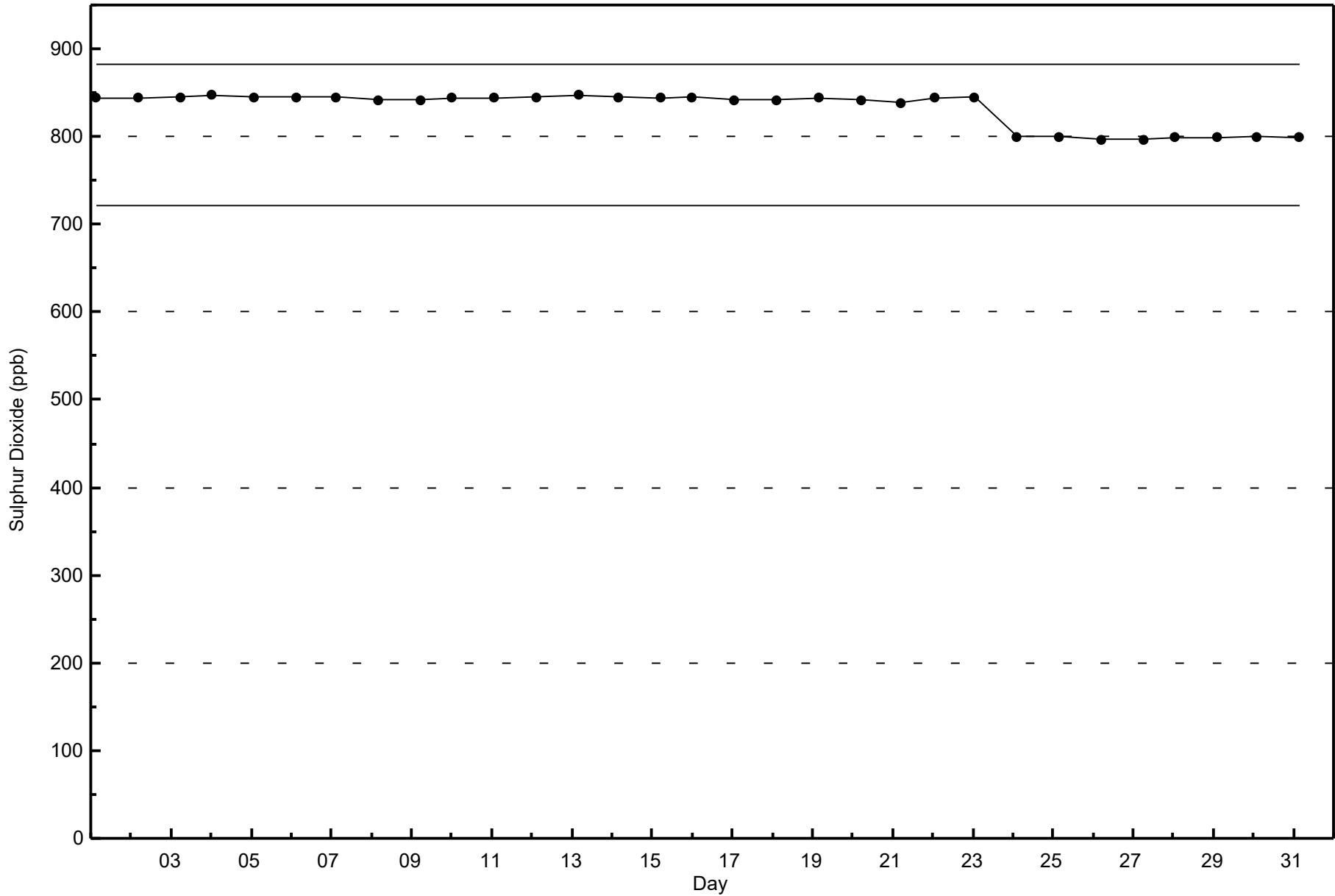


Classes (ppb)



Total Number of Valid Hours: 277







Wood Buffalo Environmental Association

Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb

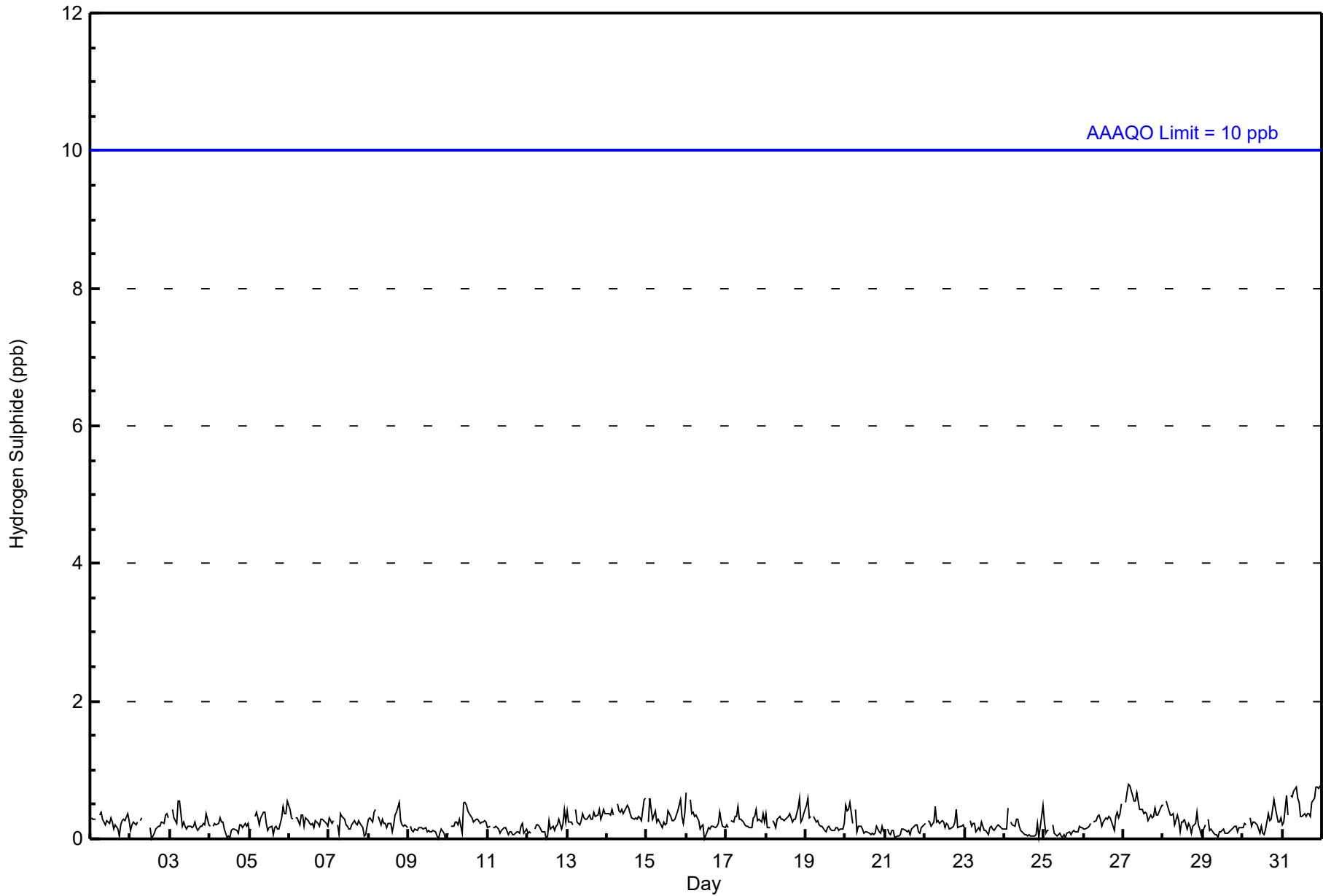
Jackfish 2/3 - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 0.8 ppb on Aug 27 04:00		Maximum Daily Average: 0.5 ppb on Aug 31		Hours of Data:		709		Hours of Missing Data:		35																
Minimum Value: 0.0 ppb on Aug 2 14:00		Minimum Daily Average: 0.1 ppb on Aug 25		Hours of Calibration:		35		Percent Operational Time:		100.0																
Maximum Diurnal Average: 0.3 ppb at hour 3		Minimum Diurnal Average: 0.2 ppb at hour 15		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.4 P ₉₉ = 0.7																						
Monthly Average: 0.24 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-Aug	0.3	0.3	0.3	0.3	Z	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.0	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.4
2-Aug	0.1	0.2	0.3	0.2	0.2	Z	0.3	0.3	C	C	C	C	0.2	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.2	0.4
3-Aug	Z	0.4	0.3	0.3	0.2	0.5	0.5	0.2	0.2	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	0.4	0.2	0.2	0.5
4-Aug	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.1	0.0	0.0	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	0.3
5-Aug	0.1	0.2	Z	0.3	0.4	0.3	0.2	0.3	0.4	0.4	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.3	0.5	0.4	0.4	0.5	0.3	0.5
6-Aug	0.4	0.3	0.3	Z	0.3	0.3	0.2	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.4
7-Aug	0.3	0.3	0.2	0.3	Z	0.2	0.1	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.0	0.1	0.2	0.2	0.4
8-Aug	0.3	0.3	0.3	0.4	0.4	Z	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.3	0.5
9-Aug	Z	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.2
10-Aug	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.5
11-Aug	0.2	0.2	Z	0.2	0.2	0.2	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	0.2	0.2	0.1	0.1	0.1	0.2
12-Aug	0.1	0.1	0.1	Z	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.3	0.1	0.2	0.1	0.2	0.2	0.3	0.1	0.2	0.4	0.2	0.2	0.4
13-Aug	0.4	0.2	0.2	0.2	Z	0.4	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.4
14-Aug	0.4	0.4	0.3	0.4	0.3	Z	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.4	0.6
15-Aug	Z	0.2	0.6	0.3	0.4	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.3	0.2	0.4	0.3	0.6
16-Aug	0.7	Z	0.6	0.4	0.4	0.3	0.4	0.3	0.1	0.2	0.2	0.0	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.7
17-Aug	0.2	0.2	Z	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.4	0.2	0.3	0.5
18-Aug	0.4	0.2	0.2	Z	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.4	0.6	0.3	0.3	0.4	0.3	0.6
19-Aug	0.5	0.6	0.3	0.3	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.6
20-Aug	0.5	0.4	0.4	0.5	0.2	Z	0.4	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.5
21-Aug	Z	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	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2
22-Aug	0.2	Z	0.3	0.3	0.2	0.2	0.5	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5
23-Aug	0.1	0.2	Z	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
24-Aug	0.1	0.1	0.5	Z	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.3	0.5	0.2	0.5
25-Aug	0.2	0.1	0.1	0.1	Z	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2
26-Aug	0.1	0.1	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.4	0.3	0.4	0.5	0.3	0.5
27-Aug	Z	0.5	0.7	0.8	0.8	0.6	0.5	0.6	0.7	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.4	0.3	0.4	0.5	0.5	0.8
28-Aug	0.5	Z	0.5	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.2	0.1	0.1	0.3	0.5
29-Aug	0.1	0.2	Z	0.3	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	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.3
30-Aug	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.4	0.3	0.3	0.4	0.6	0.5	0.2	0.2	0.3	0.2	0.6
31-Aug	0.2	0.2	0.6	0.3	Z	0.6	0.6	0.7	0.7	0.6	0.5	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.5	0.6	0.8	0.7	0.7	0.8	0.5	0.8
																								Diurnal Average		
																								Diurnal Maximum		
																								0.3 0.2 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 0.2 0.3 0.3 0.2 0.3 0.3		
																								0.7 0.6 0.7 0.8 0.8 0.6 0.6 0.7 0.7 0.6 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.6 0.8 0.7 0.7 0.8		
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
Jackfish 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	709	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: 709

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3 - August 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	16	34	31	24	30	39	24	16	65	59	106	106	65	53	26	13	707
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	16	34	31	24	30	39	24	16	65	59	106	106	65	53	26	13	707

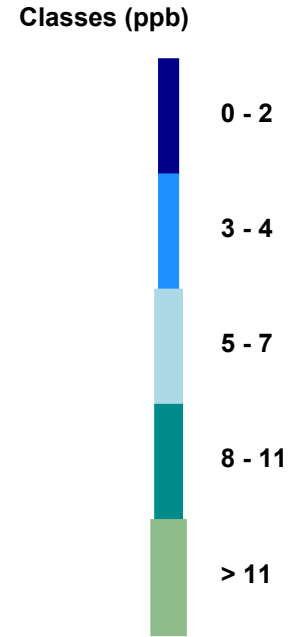
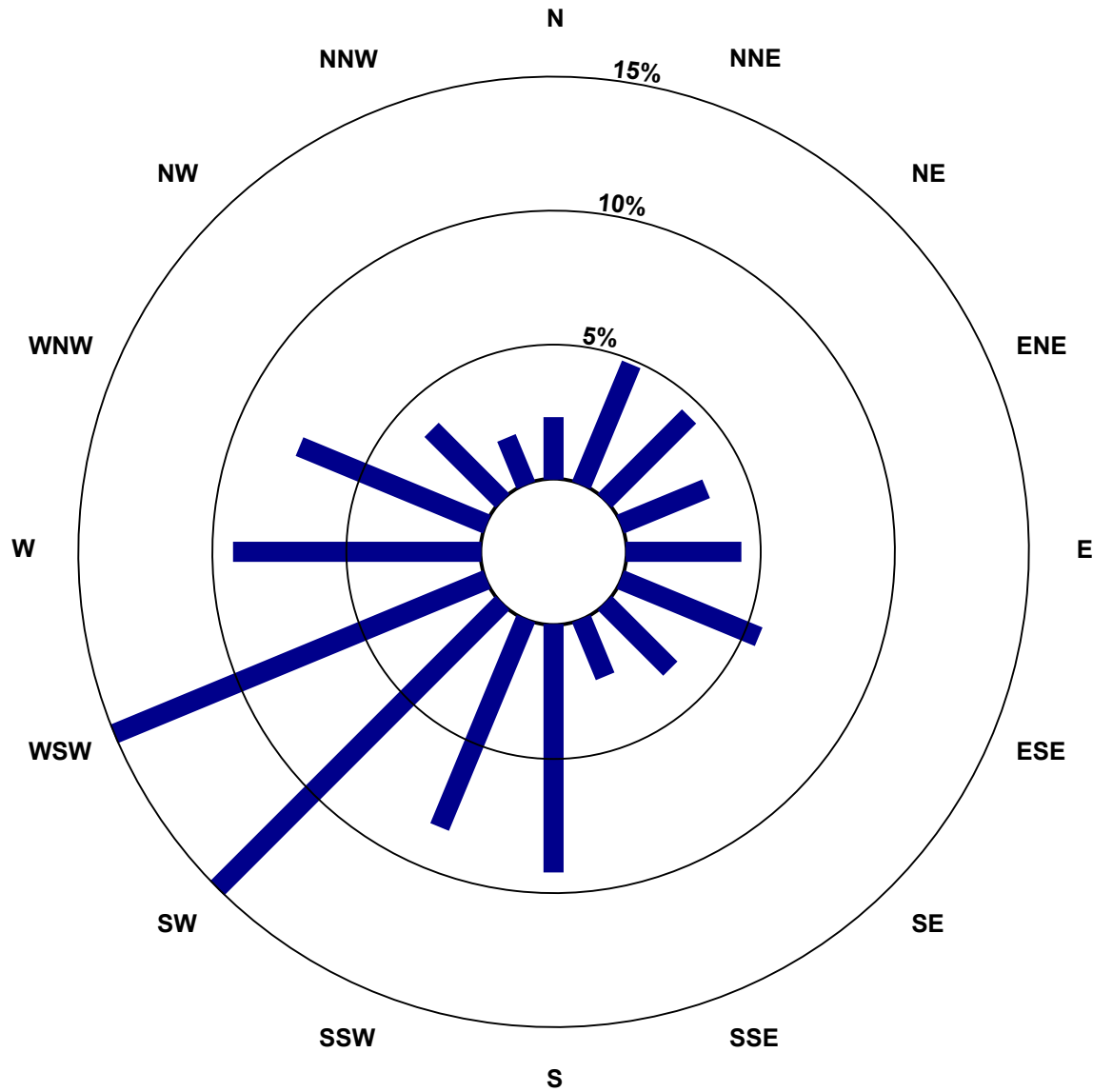
Total Number of Valid Hours: 707

Total Number of Hours: 744

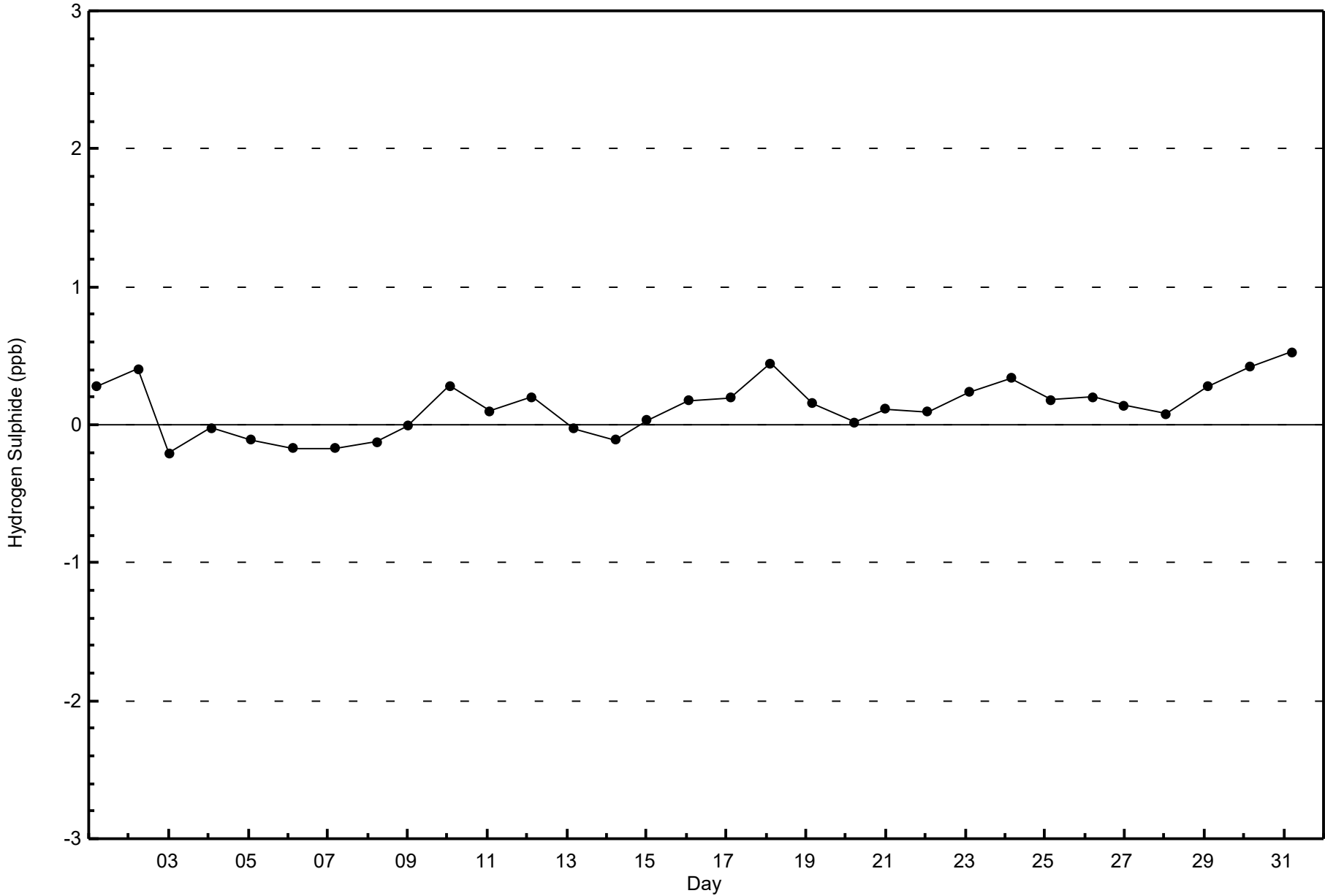


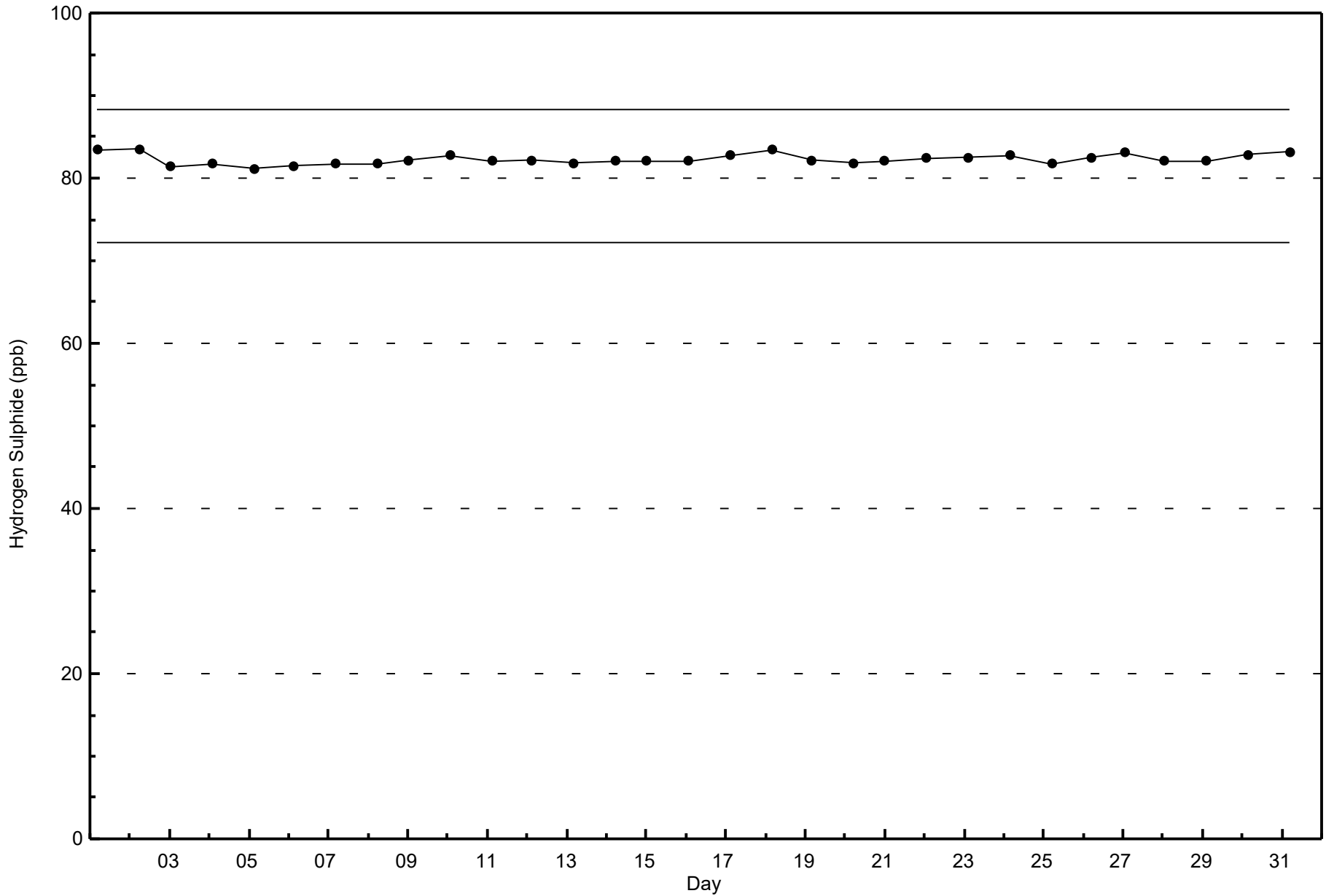
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Jackfish 2/3



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

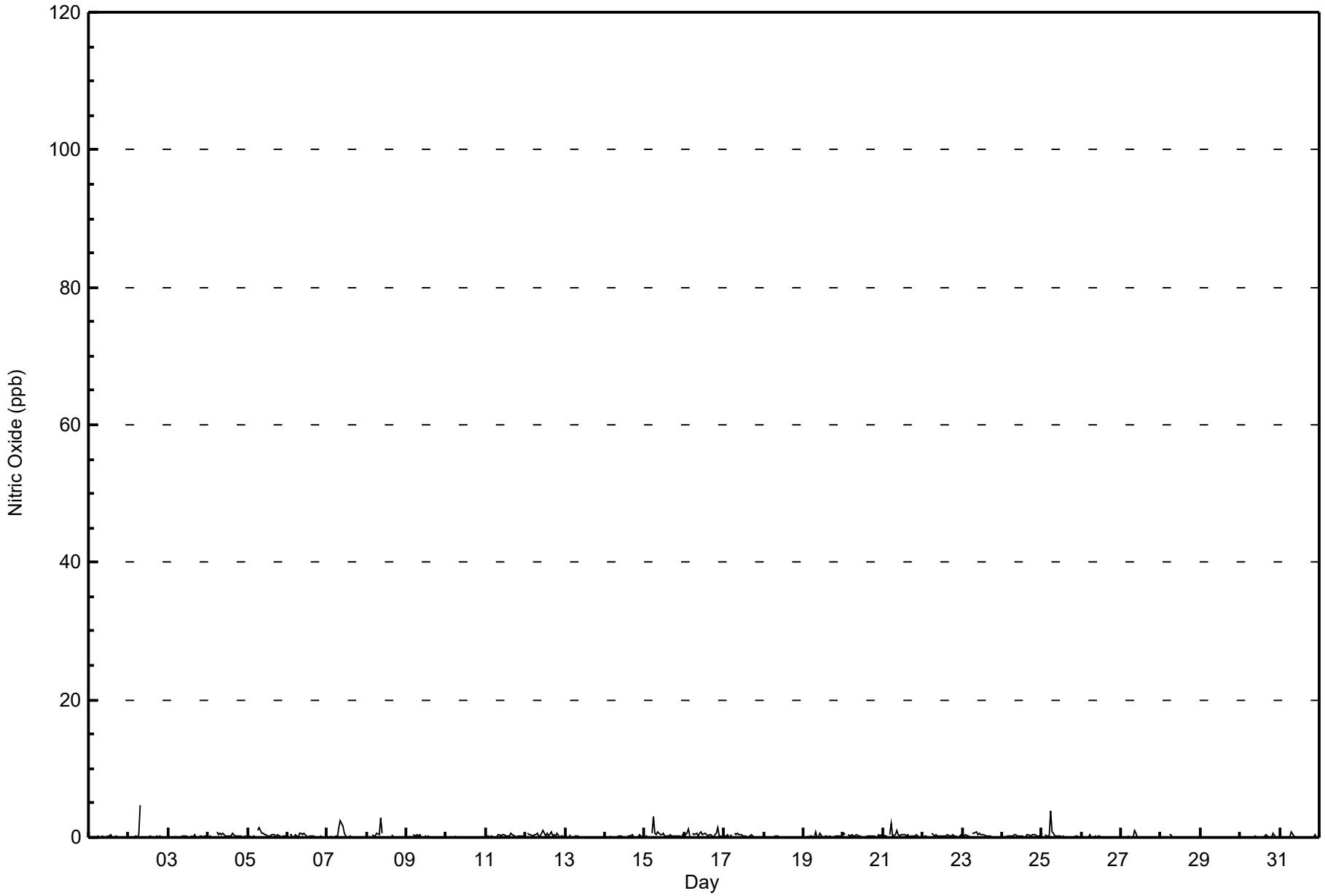
Nitric Oxide (NO) - ppb
Jackfish 2/3 - August 2023

Maximum Value: 4.7 ppb on Aug 2 08:00		Maximum Daily Average: 0.5 ppb on Aug 16		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Aug 1 05:00		Minimum Daily Average: 0.0 ppb on Aug 29		Hours of Data: 707																						
Maximum Diurnal Average: 0.6 ppb at hour 6		Minimum Diurnal Average: 0.1 ppb at hour 23		Hours of Missing Data: 37																						
Monthly Average: 0.20 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.4		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-Aug	0.0	Z	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.0	0.0	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.3
2-Aug	0.0	0.0	Z	0.2	0.1	0.0	0.3	4.7	M	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.3	4.7
3-Aug	0.1	0.1	0.1	Z	0.2	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.2	0.0	0.3	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1	0.3
4-Aug	0.1	0.2	0.1	0.1	Z	0.8	0.4	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.5	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.8
5-Aug	0.2	0.2	0.0	0.2	0.1	Z	1.1	1.4	0.6	0.6	0.4	0.4	0.3	0.3	0.5	0.4	0.3	0.0	0.3	0.2	0.1	0.2	0.2	0.2	0.4	1.4
6-Aug	Z	0.3	0.3	0.1	0.0	0.3	0.0	0.6	0.6	0.5	0.6	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.6
7-Aug	0.1	Z	0.3	0.0	0.0	0.2	0.0	1.4	2.5	1.6	0.7	0.3	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	2.5
8-Aug	0.0	0.0	Z	0.4	0.2	0.3	0.5	0.4	2.9	0.6	C	C	C	C	C	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.9
9-Aug	0.0	0.0	0.1	Z	0.4	0.2	0.3	0.3	0.3	0.0	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	0.1	0.4
10-Aug	0.0	0.0	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	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1
11-Aug	0.1	0.2	0.1	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.6	0.5	0.2	0.1	0.2	0.2	0.3	0.2	0.1	0.3	0.6
12-Aug	Z	0.6	0.3	0.3	0.1	0.4	0.4	0.6	0.2	0.2	0.9	0.6	0.2	0.5	0.2	0.8	0.1	0.5	0.2	0.6	0.1	0.2	0.1	0.1	0.4	0.9
13-Aug	0.4	Z	0.4	0.0	0.0	0.0	0.1	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	0.4
14-Aug	0.0	0.0	Z	0.1	0.0	0.0	0.1	0.0	0.3	0.3	0.2	0.1	0.0	0.1	0.2	0.2	0.3	0.0	0.0	0.1	0.4	0.1	0.4	0.1	0.4	0.4
15-Aug	0.0	0.3	0.1	Z	0.6	3.0	0.6	0.4	0.8	0.3	0.4	0.7	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.0	0.3	0.4	3.0
16-Aug	0.2	0.6	1.2	0.2	Z	0.7	0.4	0.6	0.2	0.6	0.7	0.4	0.6	0.4	0.2	0.3	0.4	0.1	0.4	0.6	1.4	0.2	0.2	0.0	0.5	1.4
17-Aug	0.2	0.2	0.3	0.1	0.3	Z	0.6	0.5	0.6	0.4	0.4	0.2	0.2	0.1	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6
18-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.0	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	0.2
19-Aug	0.0	Z	0.2	0.0	0.1	0.3	0.1	0.9	0.0	0.0	0.6	0.0	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.9
20-Aug	0.7	0.3	Z	0.3	0.2	0.4	0.2	0.2	0.5	0.2	0.3	0.1	0.0	0.0	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.2	0.4	0.2	0.7
21-Aug	0.3	0.3	0.2	Z	0.5	2.1	0.2	0.5	1.0	0.5	0.1	0.5	0.5	0.4	0.2	0.3	0.1	0.2	0.1	0.3	0.4	0.1	0.0	0.1	0.4	2.1
22-Aug	0.1	0.1	0.1	0.1	Z	0.5	0.4	0.3	0.3	0.2	0.1	0.3	0.2	0.3	0.1	0.5	0.1	0.3	0.5	0.2	0.3	0.0	0.2	0.4	0.2	0.5
23-Aug	0.3	0.1	0.4	0.3	0.2	Z	0.6	0.7	0.7	0.5	0.6	0.5	0.3	0.3	0.2	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.7
24-Aug	Z	0.2	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.1	0.2	0.2	0.1	0.0	0.4	0.5	0.2	0.4	0.4	0.3	0.2	0.5	0.5	0.3	0.5
25-Aug	0.6	Z	0.4	0.2	0.2	3.8	0.8	0.7	0.3	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.4	3.8
26-Aug	0.0	0.0	Z	0.0	0.0	0.5	0.0	0.0	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
27-Aug	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.1	1.0	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	0.0	0.1	1.0
28-Aug	0.0	0.0	0.0	0.0	Z	0.4	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	0.4
29-Aug	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
30-Aug	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	0.0	0.4	0.2	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.1	0.7
31-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.8	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	0.5	0.0	0.0	0.1	0.8
																								Diurnal Average		
																								Diurnal Maximum		
Z - zerospan C - Calibration M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Jackfish 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 2/3 - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Jackfish 2/3 - August 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	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705
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	16	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705

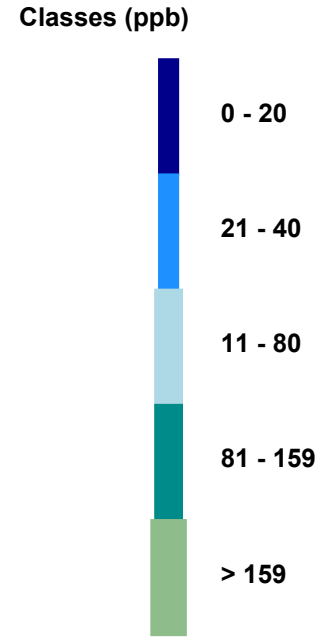
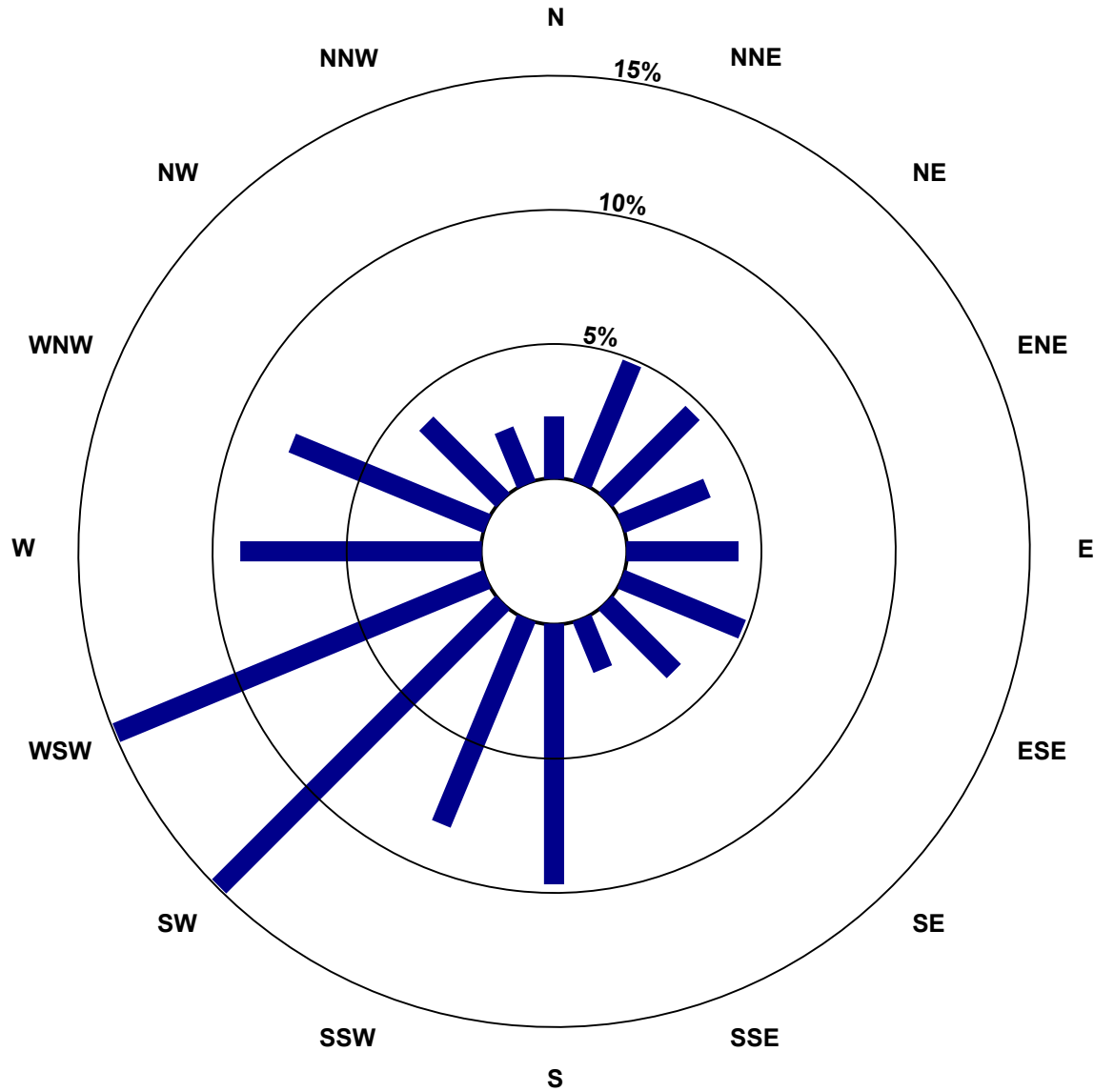
Total Number of Valid Hours: 705

Total Number of Hours: 744

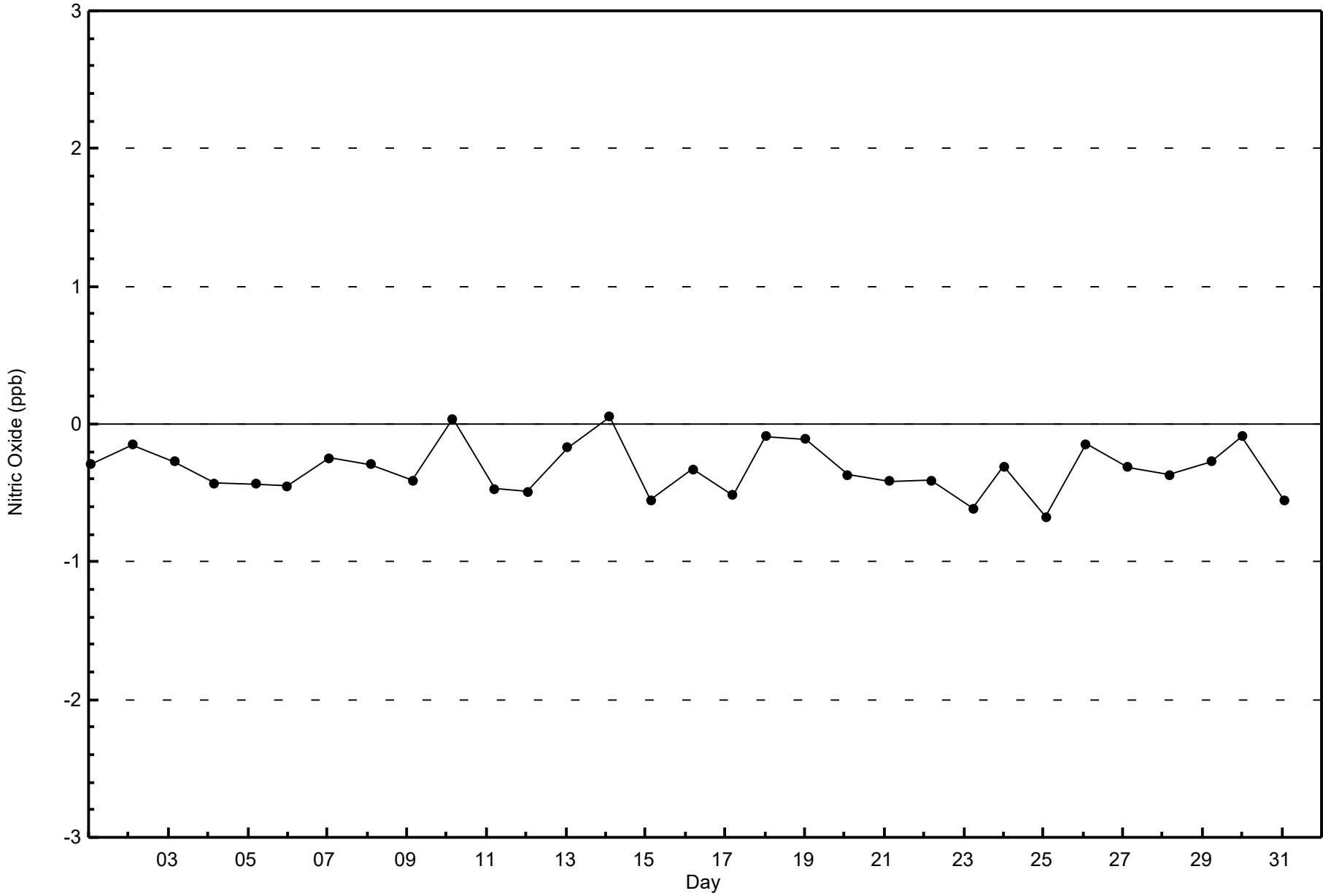


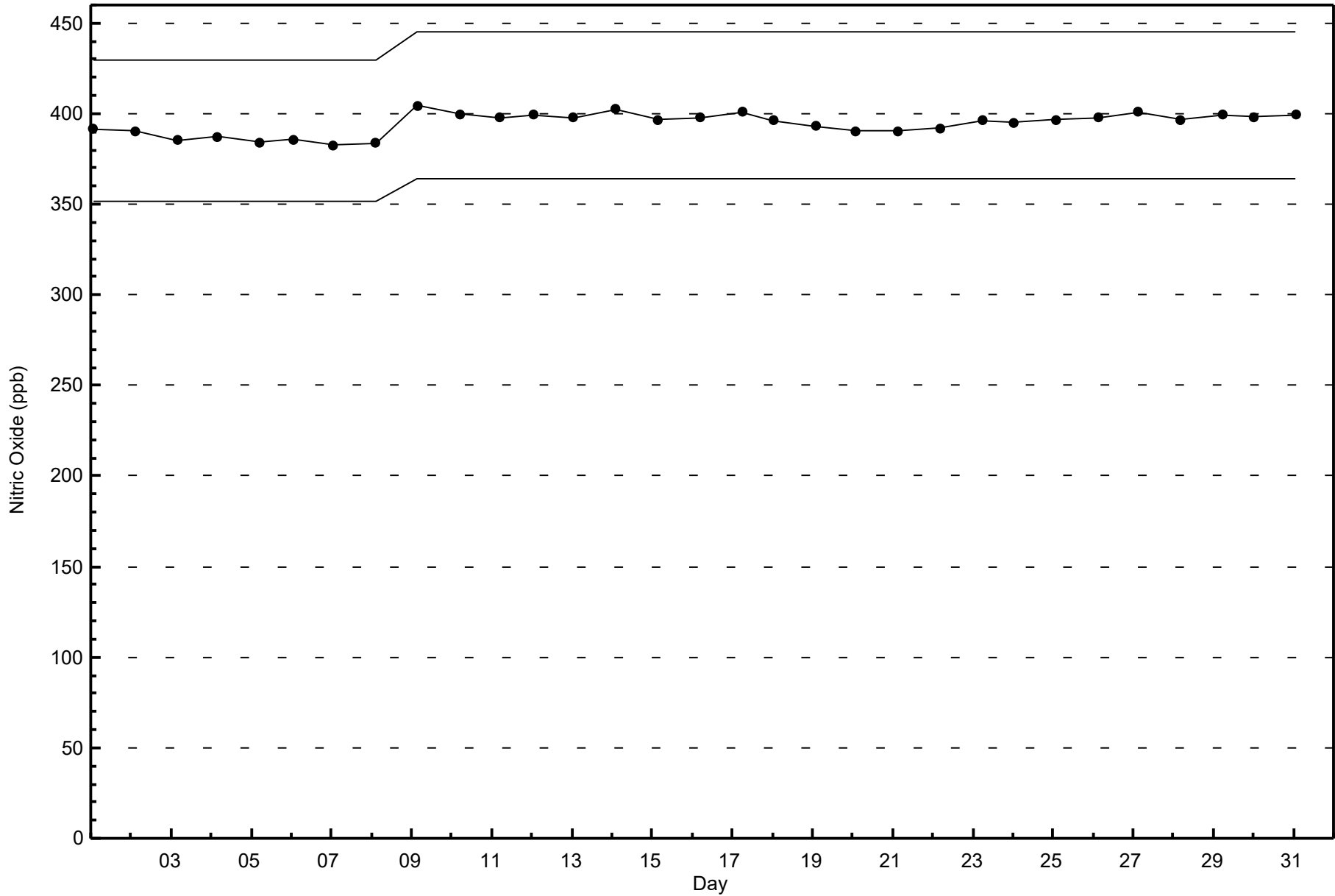
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Jackfish 2/3



Total Number of Valid Hours: 705

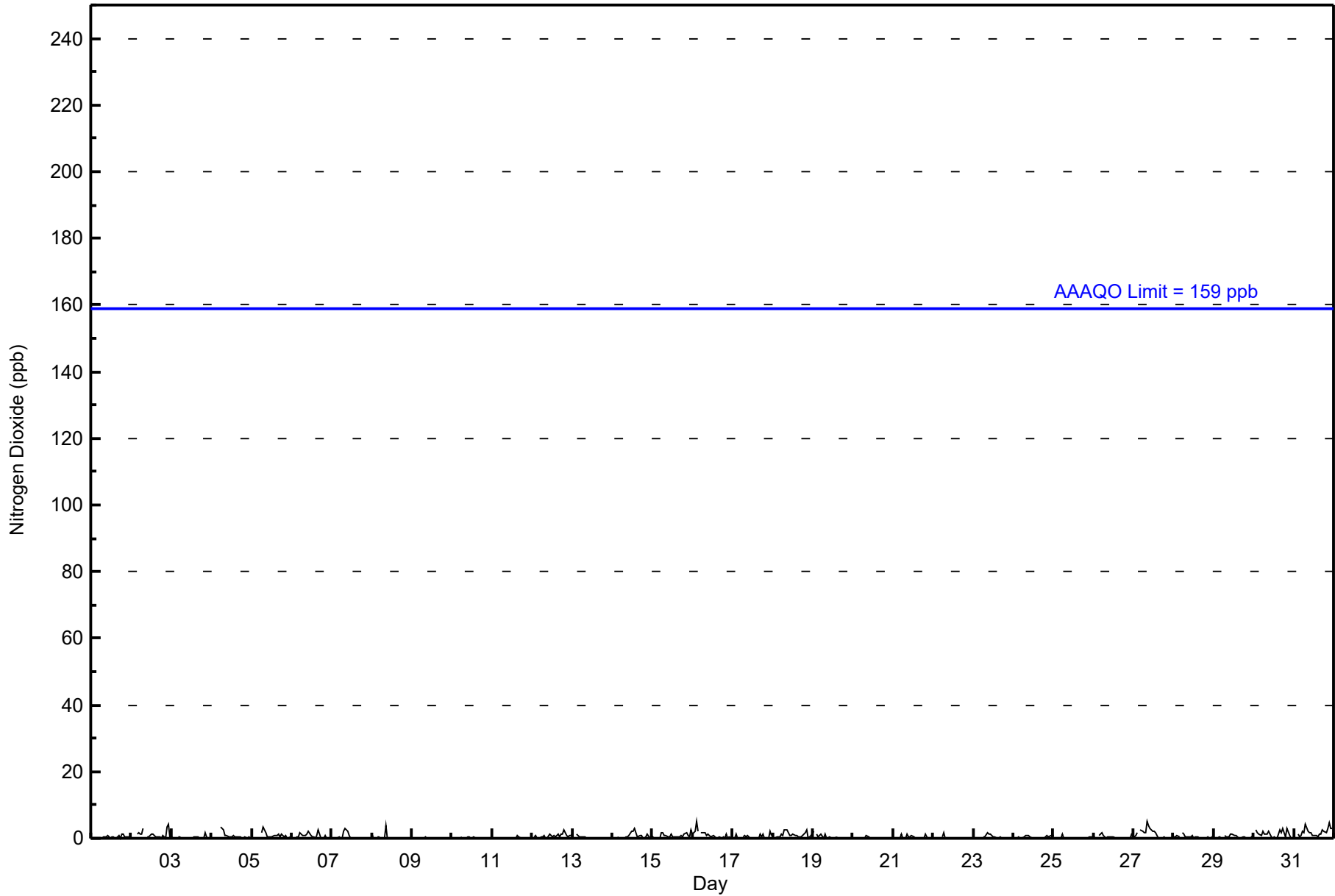






Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3 - August 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	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705
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	16	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705

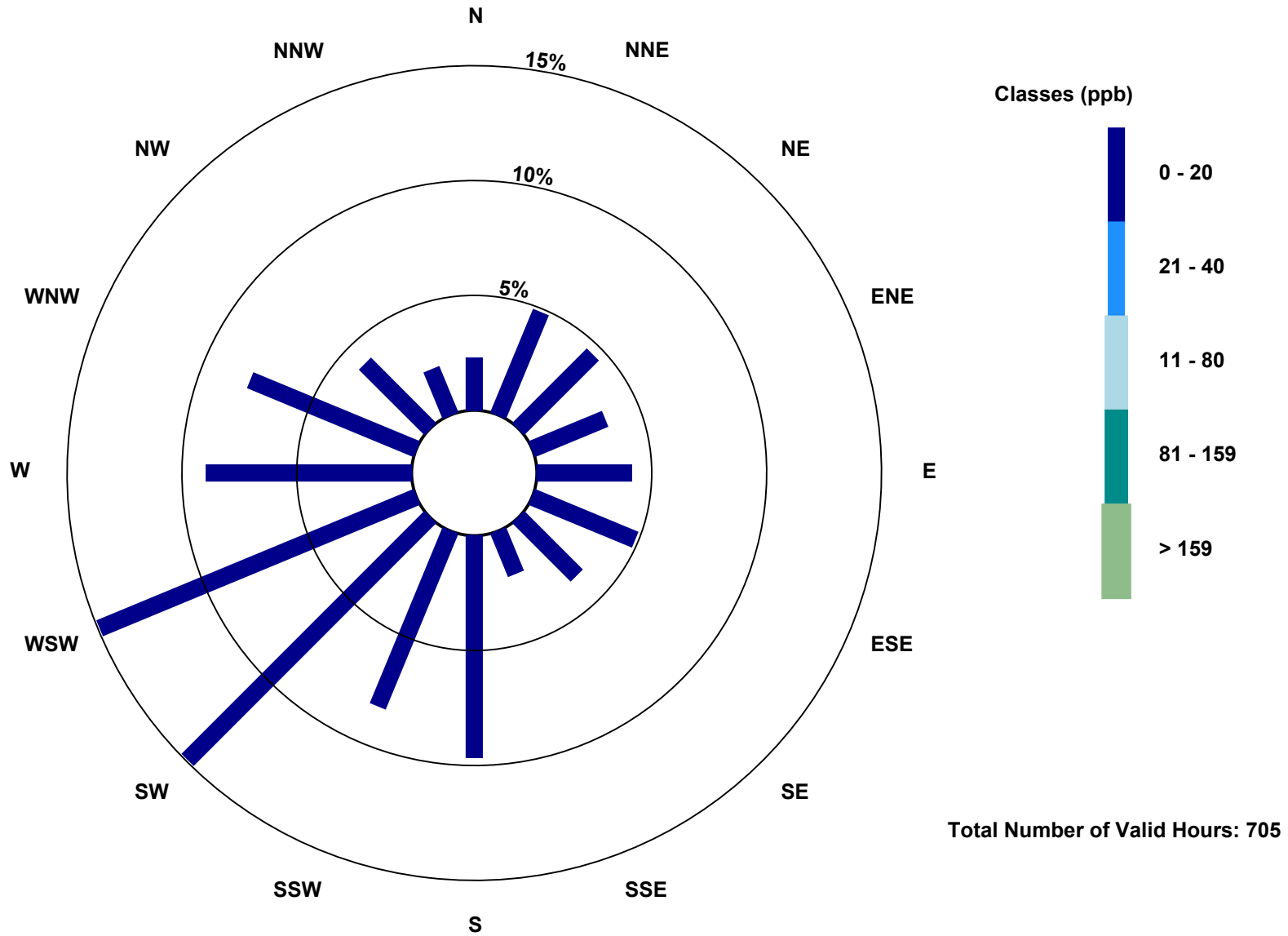
Total Number of Valid Hours: 705

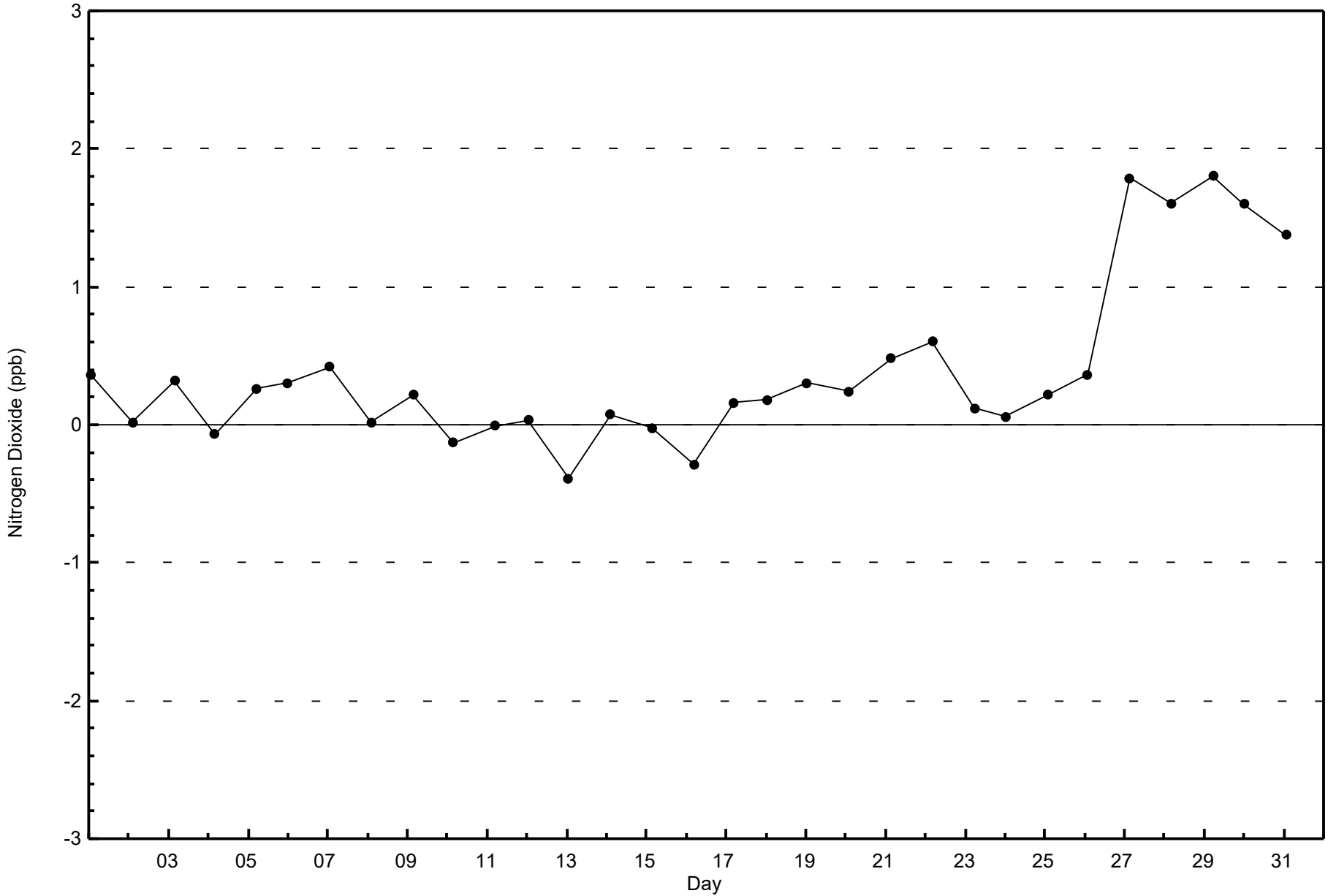
Total Number of Hours: 744

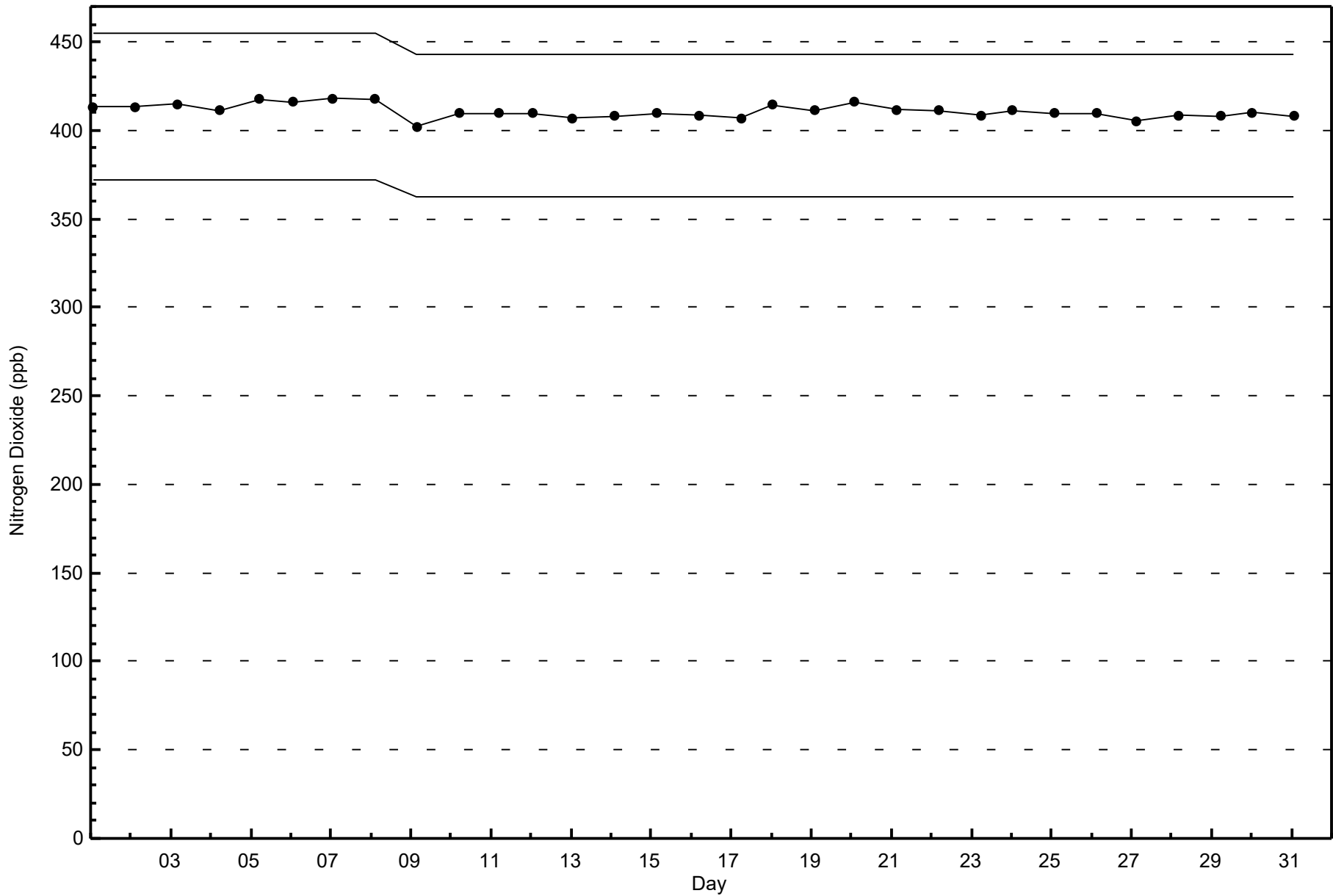


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

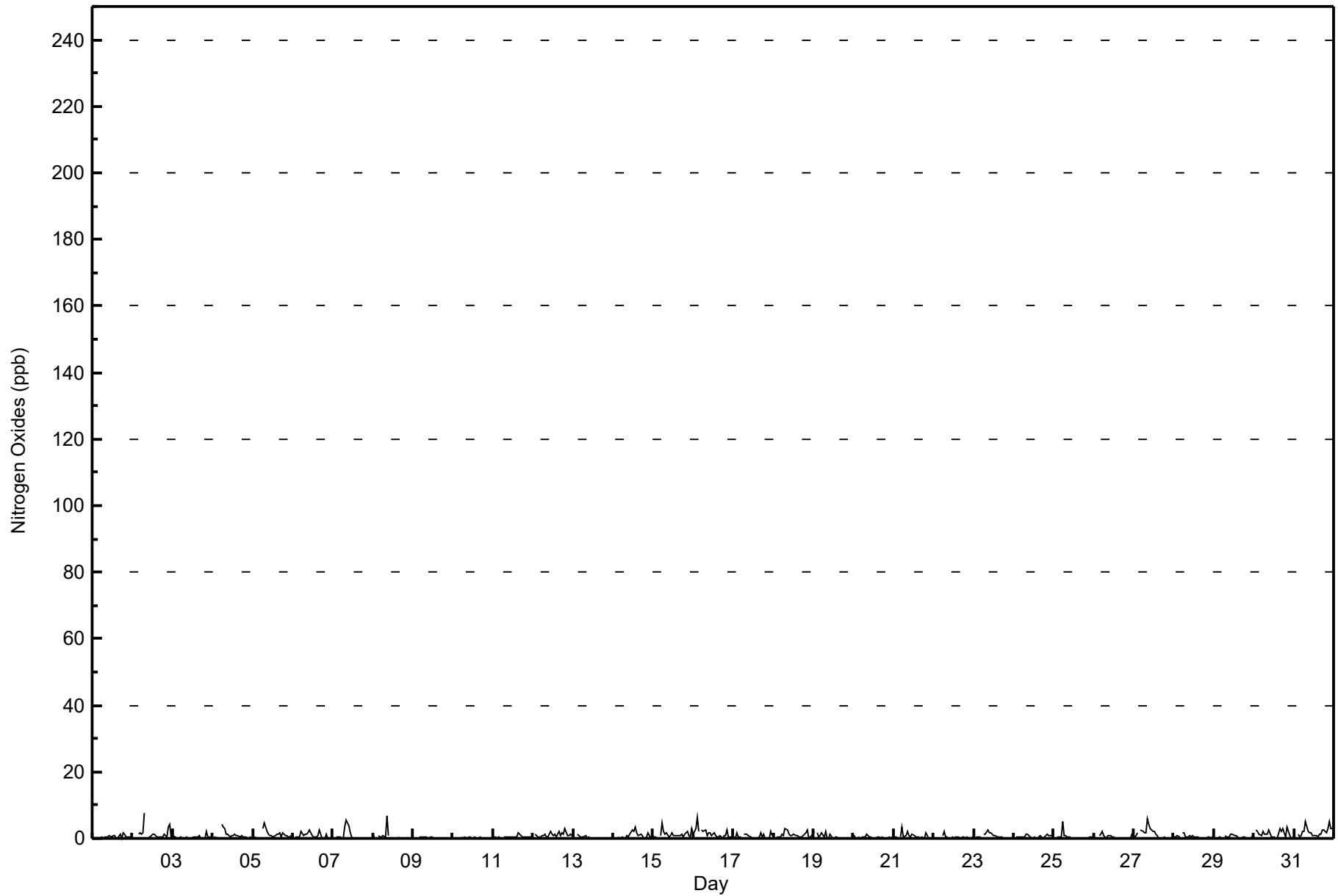
Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - August 2023

Maximum Value: 7.5 ppb on Aug 2 08:00		Maximum Daily Average: 1.9 ppb on Aug 31		Hours in Service: 744																											
Minimum Value: 0.0 ppb on Aug 1 05:00		Minimum Daily Average: 0.1 ppb on Aug 10		Hours of Data: 707																											
Maximum Diurnal Average: 1.6 ppb at hour 6		Minimum Diurnal Average: 0.4 ppb at hour 15		Hours of Missing Data: 37																											
Monthly Average: 0.74 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.4 Q ₃ = 1.0 P ₉₀ = 1.9 P ₉₉ = 4.9		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-Aug	0.2	Z	0.1	0.0	0.0	0.4	0.0	0.5	0.5	0.4	0.8	0.3	0.7	0.7	0.1	0.0	1.2	0.0	1.5	1.2	0.4	0.4	0.3	0.0	0.4	1.5					
2-Aug	0.0	0.0	Z	1.3	1.8	1.4	1.5	7.5	M	0.5	0.4	1.0	1.3	1.2	0.3	0.6	0.4	0.5	0.2	1.2	0.2	3.5	4.4	0.5	1.4	7.5					
3-Aug	0.7	0.3	0.2	Z	0.5	0.4	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.6	0.6	0.1	0.0	0.1	1.9	0.4	0.3	0.3	0.4	1.9					
4-Aug	0.2	0.2	0.1	0.3	Z	4.1	3.3	3.0	1.4	1.4	0.6	0.8	0.8	1.1	0.9	1.0	0.5	0.7	0.2	0.4	0.5	0.1	0.5	0.1	1.0	4.1					
5-Aug	0.3	0.3	0.0	0.2	0.1	Z	3.0	4.8	2.1	1.1	0.8	0.8	0.6	1.0	1.3	1.4	1.5	0.3	1.5	0.6	0.9	0.4	0.2	0.7	1.0	4.8					
6-Aug	Z	0.3	0.5	0.6	0.4	1.9	0.8	1.4	1.4	1.9	2.7	0.8	0.4	0.5	0.4	1.0	2.6	0.1	0.0	0.0	1.1	0.0	0.0	0.1	0.8	2.7					
7-Aug	0.1	Z	0.4	0.2	0.4	0.2	0.0	3.5	5.6	3.8	1.5	0.4	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.7	5.6						
8-Aug	0.2	0.9	Z	1.0	0.5	0.4	0.7	0.4	6.9	0.8	C	C	C	C	C	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.7	6.9						
9-Aug	0.0	0.0	0.1	Z	0.4	0.2	0.3	0.5	0.6	0.0	0.2	0.3	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	0.6					
10-Aug	0.0	0.0	0.0	0.0	Z	0.4	0.1	0.2	0.2	0.6	0.3	0.0	0.0	0.3	0.2	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.6					
11-Aug	0.2	0.2	0.1	0.3	0.3	Z	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.5	0.4	1.5	1.1	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.4	1.5					
12-Aug	Z	1.1	1.0	0.4	0.3	0.8	0.8	1.3	0.4	0.4	2.2	1.3	0.6	1.4	0.6	2.2	0.7	1.8	1.4	3.0	1.0	0.8	1.1	0.8	1.1	3.0					
13-Aug	1.7	Z	1.5	0.7	0.3	0.5	0.6	0.7	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.7					
14-Aug	0.0	0.0	Z	0.6	0.0	0.2	0.2	0.0	0.7	0.6	1.1	2.4	2.3	3.2	1.8	0.8	1.2	0.7	0.1	0.1	0.5	1.5	0.2	1.3	0.8	3.2					
15-Aug	0.4	0.3	0.2	Z	0.7	4.8	2.2	1.2	1.8	0.6	0.9	1.8	0.8	0.8	0.7	0.8	0.7	1.1	0.5	1.4	2.1	1.0	0.5	2.9	1.2	4.8					
16-Aug	1.4	2.8	6.2	2.3	Z	2.6	2.1	2.5	0.9	1.7	1.7	1.0	1.5	0.7	0.3	0.5	0.7	0.2	0.7	0.8	2.7	0.2	0.6	0.2	1.5	6.2					
17-Aug	0.2	0.2	1.5	0.3	0.5	Z	1.1	1.2	1.2	1.1	0.6	0.2	0.2	0.1	0.0	0.3	1.5	0.5	1.4	0.0	0.0	0.0	2.2	0.8	0.7	2.2					
18-Aug	Z	0.0	0.6	0.5	0.5	1.1	0.7	2.8	2.6	1.5	1.0	0.7	1.2	0.8	0.9	0.4	0.3	0.3	0.8	1.6	2.4	0.0	0.4	0.8	0.9	2.8					
19-Aug	2.0	Z	1.6	0.3	0.9	1.7	0.3	2.0	0.0	0.0	1.2	0.0	0.0	0.3	0.6	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.5	2.0					
20-Aug	0.9	0.3	Z	0.3	0.2	0.5	0.3	0.4	1.2	0.5	0.3	0.1	0.1	0.0	0.2	0.4	0.2	0.3	0.1	0.2	0.1	0.3	0.2	0.5	0.3	1.2					
21-Aug	0.3	0.3	0.2	Z	0.5	3.3	0.3	0.7	2.3	0.8	0.6	1.2	0.8	0.4	0.2	0.3	0.1	0.3	0.1	1.6	1.0	0.1	0.0	0.1	0.7	3.3					
22-Aug	0.1	0.1	0.2	0.1	Z	0.8	2.0	0.3	0.3	0.2	0.1	0.3	0.2	0.3	0.3	0.5	0.1	0.4	0.5	0.2	0.3	0.0	0.2	0.4	0.3	2.0					
23-Aug	0.3	0.1	0.4	0.4	0.3	Z	1.2	1.3	2.5	1.8	1.7	1.4	0.8	0.7	0.5	0.4	0.5	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.6	2.5					
24-Aug	Z	0.2	0.3	0.5	0.2	0.2	0.6	1.2	1.2	1.0	0.4	0.2	0.2	0.1	0.1	0.4	0.7	0.2	0.5	0.7	1.2	0.8	1.0	1.4	0.6	1.4					
25-Aug	1.4	Z	0.4	0.2	0.2	5.1	0.9	0.7	0.3	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.0	0.0	0.2	0.5	0.3	0.3	0.5	5.1					
26-Aug	0.3	0.3	Z	0.9	1.3	2.1	0.8	0.1	0.7	0.7	0.8	0.4	0.5	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	1.2	0.5	2.1					
27-Aug	0.3	0.9	1.9	Z	2.7	2.1	1.8	1.7	6.0	4.4	2.8	2.2	2.2	1.5	1.0	0.2	0.0	0.0	0.6	0.1	0.1	0.2	0.2	0.4	1.4	6.0					
28-Aug	0.4	0.5	0.8	0.4	Z	1.9	1.6	0.4	0.5	0.6	0.4	0.7	0.2	0.3	0.3	0.1	0.0	0.0	0.1	0.0	0.3	0.2	0.1	0.4	0.5	1.9					
29-Aug	0.2	0.2	0.1	0.4	0.4	Z	0.8	0.3	0.5	0.3	1.1	1.1	0.8	0.7	0.5	0.1	0.0	0.3	0.3	0.0	0.1	0.0	0.2	0.7	0.4	1.1					
30-Aug	Z	2.7	1.9	1.1	0.7	2.0	1.1	1.3	1.3	2.4	0.3	0.2	0.5	0.0	0.2	3.0	2.1	3.0	1.9	0.3	3.5	1.0	0.2	0.1	1.3	3.5					
31-Aug	0.0	Z	1.1	0.6	0.7	2.0	1.9	4.9	2.1	1.9	1.6	1.0	0.7	0.7	0.4	1.2	1.2	2.7	2.3	1.7	2.9	5.0	3.0	3.1	1.9	5.0					
		0.5	0.5	0.8	0.5	0.6	1.6	1.0	1.5	1.5	1.0	0.9	0.7	0.6	0.6	0.4	0.6	0.6	0.5	0.5	0.5	0.8	0.6	0.5	0.6	Diurnal Average					
		2.0	2.8	6.2	2.3	2.7	5.1	3.3	7.5	6.9	4.4	2.8	2.4	2.3	3.2	1.8	3.0	2.6	3.0	2.3	3.0	3.5	5.0	4.4	3.1	Diurnal Maximum					
Z - zerospan		C - Calibration			M - Maintenance																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	707	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3 - August 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	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705
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	16	34	32	24	29	34	25	14	68	58	105	105	63	55	28	15	705

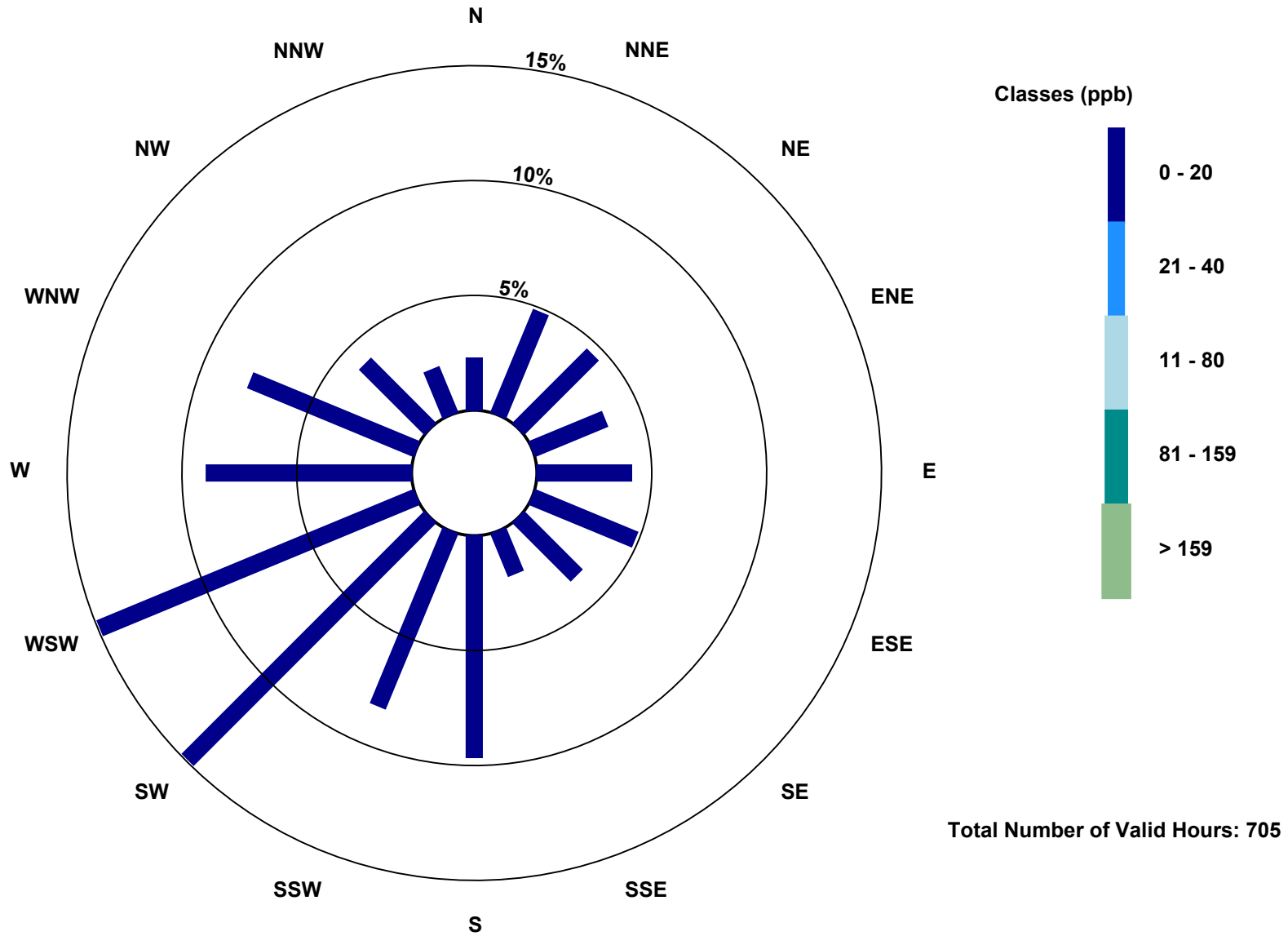
Total Number of Valid Hours: 705

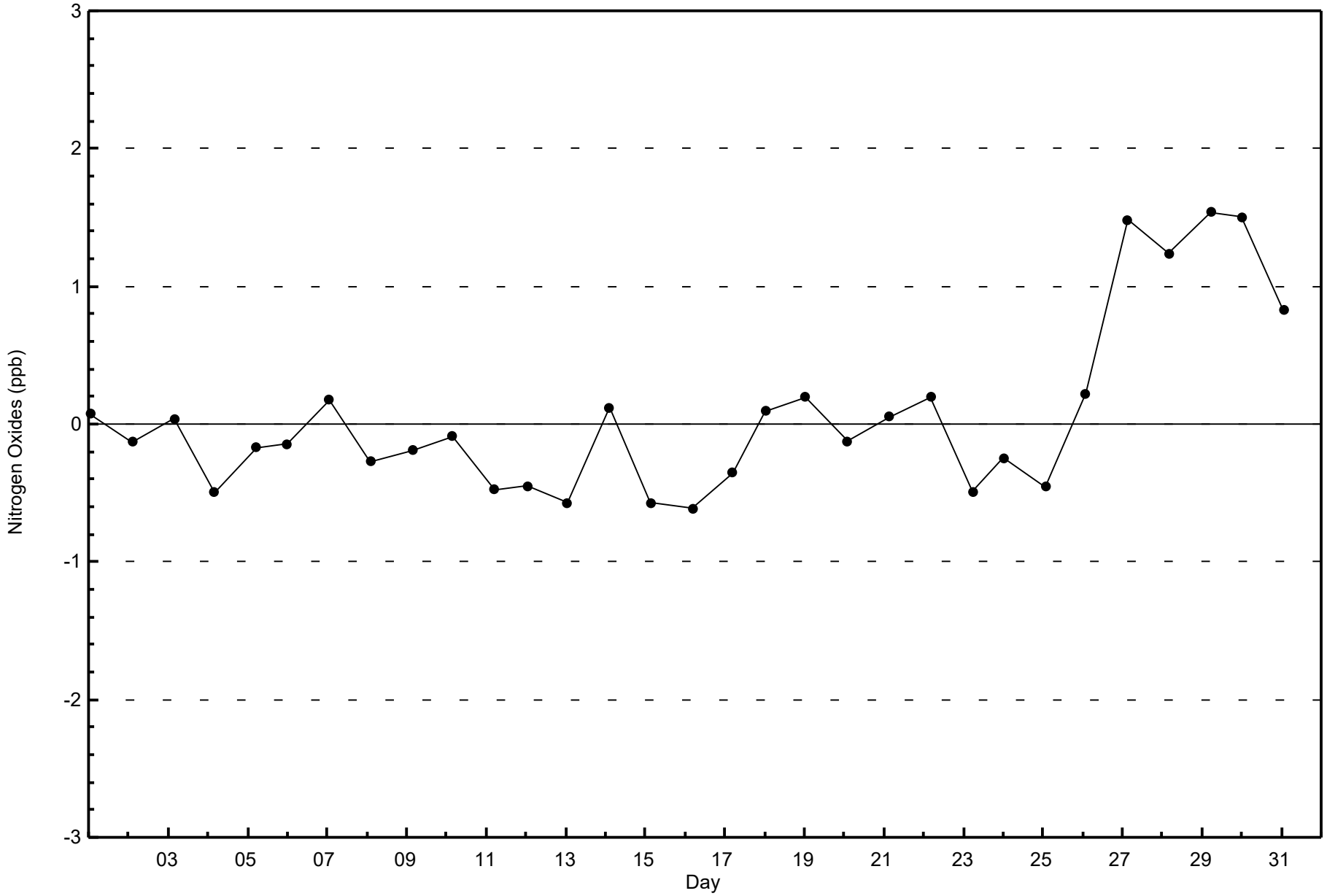
Total Number of Hours: 744

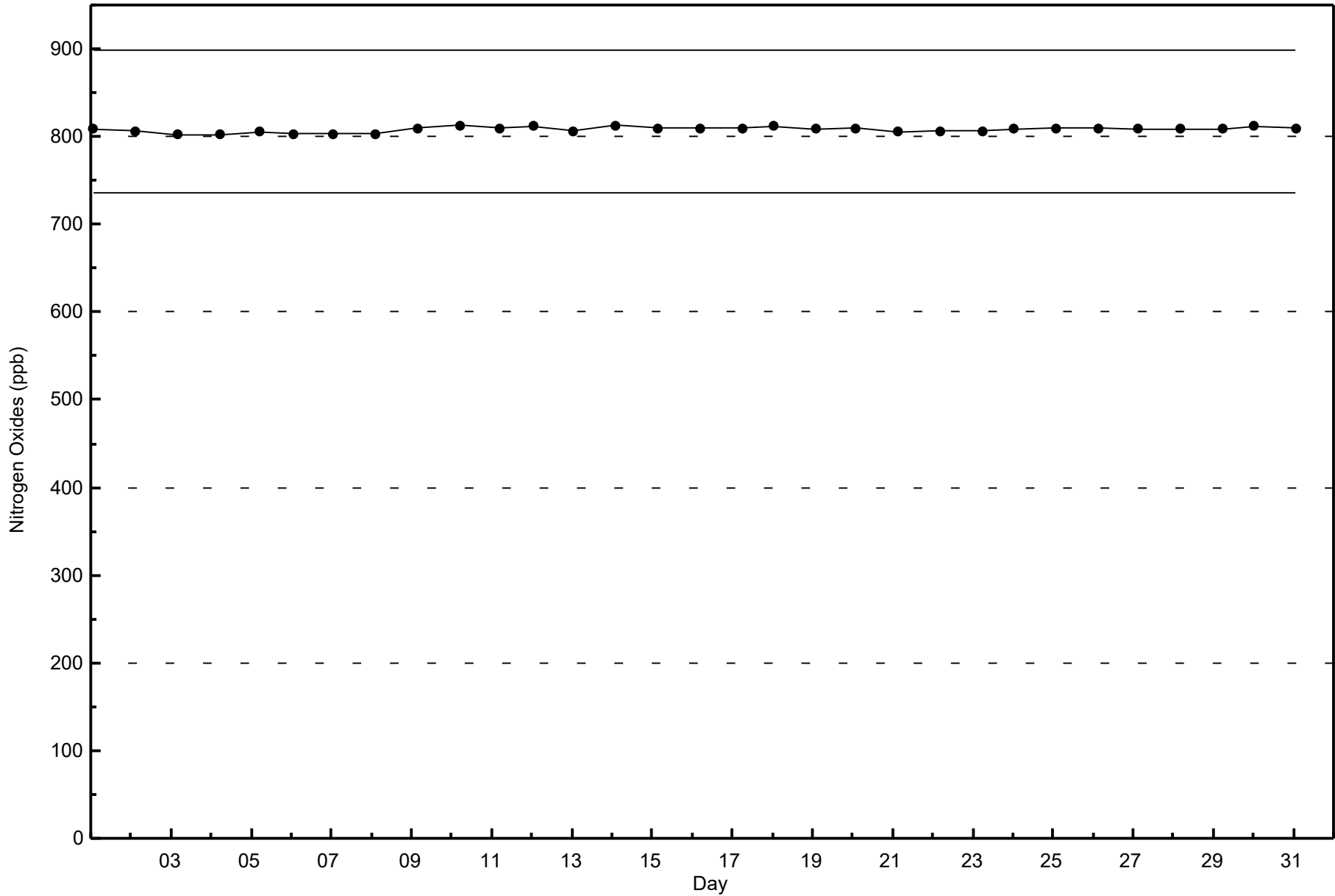


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Jackfish 2/3









Wood Buffalo Environmental Association
Summary of Hour Averages

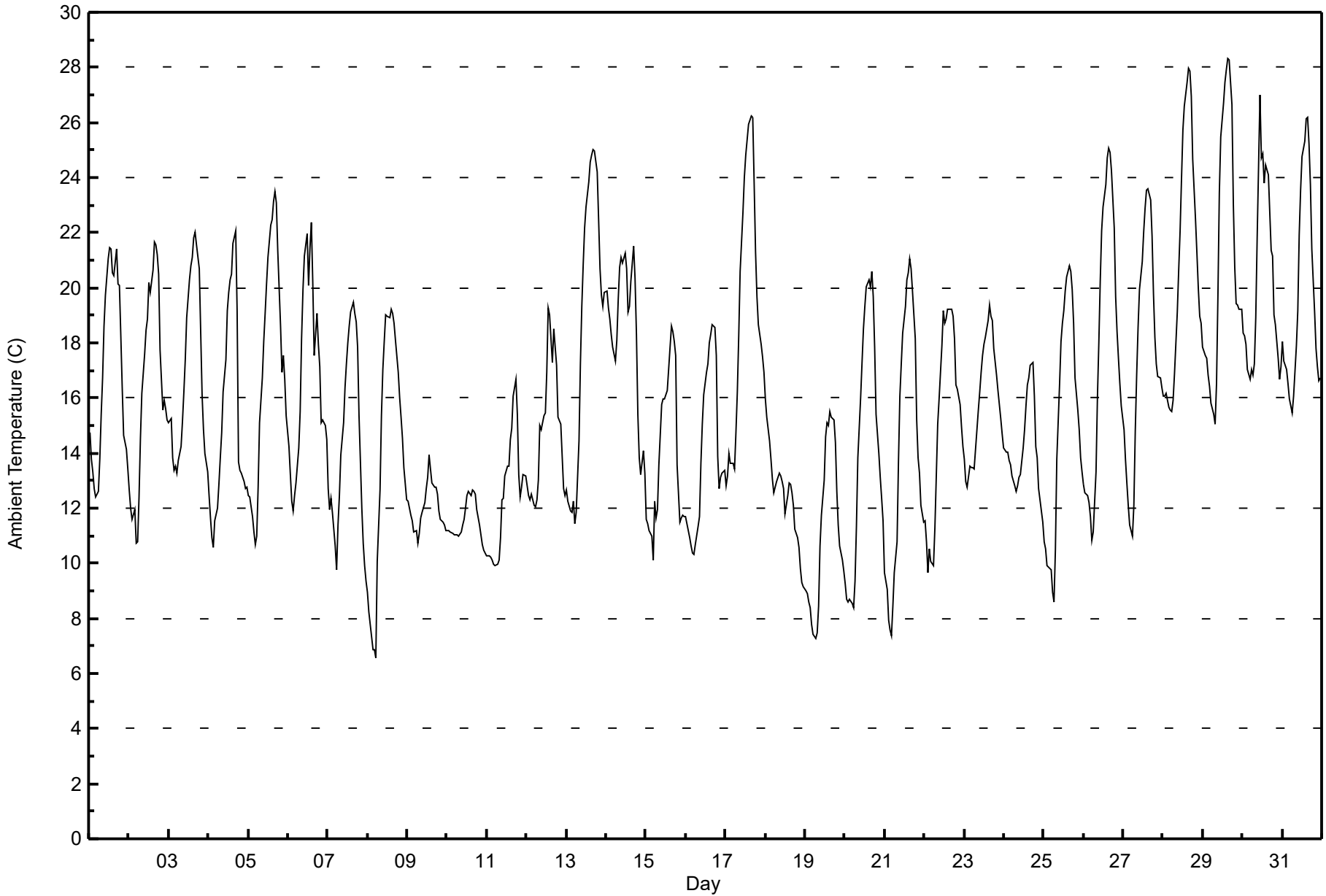
Ambient Temperature (AT) - C
Jackfish 2/3 - August 2023

Maximum Value: 28.3 C on Aug 29 16:00		Maximum Daily Average: 21.0 C on Aug 29		Hours in Service: 744																							
Minimum Value: 6.6 C on Aug 8 06:00		Minimum Daily Average: 11.2 C on Aug 19		Hours of Data: 744																							
Maximum Diurnal Average: 20.5 C at hour 16		Minimum Diurnal Average: 11.8 C at hour 6		Hours of Missing Data: 0																							
Monthly Average: 15.90 C		Percentiles: P ₁ = 7.5 P ₁₀ = 10.8 Q ₁ = 12.5 Median = 15.4 Q ₃ = 19.0 P ₉₀ = 21.8 P ₉₉ = 27.0		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-Aug	14.7	13.8	13.3	12.7	12.4	12.6	13.8	15.4	16.7	18.6	19.7	21.1	21.5	21.4	20.6	20.4	21.4	20.1	20.1	18.3	16.4	14.7	14.1	13.4	17.0	21.5	
2-Aug	12.7	12.0	11.6	11.9	10.8	10.8	12.4	14.5	16.2	17.6	18.5	18.8	20.2	19.8	20.6	21.7	21.5	21.2	20.5	17.8	15.6	15.9	15.6	15.2	16.4	21.7	
3-Aug	15.1	15.2	13.8	13.4	13.5	13.3	13.7	14.3	15.2	16.2	17.4	18.9	20.3	20.8	21.1	21.8	22.0	21.5	20.7	18.4	16.1	14.9	14.0	13.3	16.9	22.0	
4-Aug	12.5	11.6	10.9	10.6	11.6	12.0	12.8	13.8	14.7	16.2	17.4	19.2	19.8	20.3	20.5	21.6	22.1	19.2	13.7	13.4	13.2	13.0	12.7	12.7	15.2	22.1	
5-Aug	12.5	12.4	11.7	11.1	10.7	11.0	12.8	15.1	16.7	18.1	19.1	20.2	21.1	22.3	22.5	23.1	23.5	23.1	21.4	18.6	16.9	17.5	16.7	15.4	17.2	23.5	
6-Aug	14.2	13.2	12.3	11.9	12.5	12.9	14.2	15.5	18.1	19.9	21.2	22.0	20.1	21.5	22.4	20.2	17.5	19.1	18.0	17.1	15.1	15.2	15.0	14.5	16.8	22.4	
7-Aug	12.7	11.9	12.4	11.8	10.6	9.8	11.4	12.4	13.9	15.1	16.4	17.2	18.0	18.6	19.1	19.5	19.1	18.8	17.8	15.3	12.0	10.7	9.9	9.3	14.3	19.5	
8-Aug	8.9	8.2	7.3	6.8	6.8	6.6	10.1	12.7	15.4	17.0	18.1	19.0	19.0	18.9	19.2	19.1	18.7	18.1	17.0	16.0	15.3	14.5	13.5	12.3	14.1	19.2	
9-Aug	12.2	12.0	11.8	11.5	11.2	11.2	10.7	11.1	11.6	11.8	12.2	12.7	13.1	13.9	13.4	12.9	12.8	12.8	12.5	11.9	11.6	11.5	11.4	11.2	12.0	13.9	
10-Aug	11.2	11.2	11.1	11.1	11.0	11.0	11.0	11.0	11.2	11.4	11.6	12.0	12.5	12.6	12.5	12.6	12.6	12.5	12.0	11.4	11.0	10.7	10.5	10.4	11.5	12.6	
11-Aug	10.3	10.3	10.2	10.1	10.0	9.9	10.0	10.1	10.9	12.3	12.3	13.2	13.5	13.5	14.5	14.9	16.1	16.7	15.4	13.2	12.4	12.8	13.2	13.2	12.5	16.7	
12-Aug	12.8	12.5	12.3	12.5	12.1	12.1	12.3	13.0	15.0	14.8	15.4	15.4	16.9	19.3	19.0	17.3	18.5	17.8	17.2	15.3	15.1	13.9	12.7	12.5	14.8	19.3	
13-Aug	12.6	12.2	11.9	11.8	12.3	11.4	11.8	14.4	17.3	19.3	20.8	22.1	22.9	23.8	24.5	24.8	25.0	24.9	24.2	22.5	20.7	19.7	19.3	19.8	18.8	25.0	
14-Aug	19.9	19.3	18.9	18.3	17.9	17.3	18.1	19.6	20.7	21.1	20.9	21.2	20.7	19.1	19.3	20.3	21.5	20.3	18.3	15.4	13.8	13.2	14.1	13.3	18.4	21.5	
15-Aug	11.6	11.4	11.2	11.0	10.1	12.2	11.6	11.9	13.6	15.7	16.0	16.0	16.1	16.3	17.8	18.6	18.4	18.0	17.5	13.6	11.5	11.6	11.7	11.7	14.0	18.6	
16-Aug	11.7	11.2	10.9	10.6	10.4	10.3	10.7	11.3	11.7	13.6	15.0	16.1	16.9	17.2	18.0	18.3	18.7	18.6	17.5	13.9	12.7	13.1	13.3	13.4	14.0	18.7	
17-Aug	12.8	13.2	14.0	13.6	13.6	13.4	14.7	16.2	18.2	20.6	22.7	24.0	24.8	25.3	25.9	26.2	26.2	23.8	21.3	19.7	18.7	18.0	17.5	16.9	19.2	26.2	
18-Aug	16.0	15.3	14.4	13.8	13.1	12.6	12.7	13.0	13.3	13.2	13.0	12.7	11.8	12.5	12.9	12.9	12.5	12.1	11.3	10.9	10.6	9.8	9.3	9.1	12.4	16.0	
19-Aug	9.0	8.9	8.6	8.4	7.8	7.4	7.3	7.5	8.4	10.6	11.7	13.0	14.6	15.1	15.0	15.5	15.3	15.2	14.4	12.6	11.4	10.6	10.1	9.7	11.2	15.5	
20-Aug	9.3	8.7	8.6	8.7	8.5	8.4	9.4	11.3	13.8	16.0	17.3	18.5	19.3	20.0	20.3	20.0	20.6	19.7	17.8	15.4	14.0	13.1	12.4	11.5	14.3	20.6	
21-Aug	9.6	9.1	7.9	7.6	7.4	8.4	9.7	10.8	13.7	16.1	17.3	18.3	19.3	20.3	20.6	21.0	20.7	19.9	18.2	15.2	13.9	13.3	12.1	11.5	14.2	21.0	
22-Aug	11.6	10.8	9.7	10.5	10.0	9.9	11.3	13.2	15.1	16.0	17.9	19.2	18.7	18.9	19.2	19.2	19.2	19.0	18.1	16.5	16.3	15.8	15.0	14.3	15.2	19.2	
23-Aug	13.8	13.0	12.8	13.5	13.5	13.5	13.4	14.1	15.5	16.2	16.9	17.6	18.0	18.2	18.8	19.4	19.0	18.8	17.8	16.9	16.3	15.8	15.3	14.7	15.9	19.4	
24-Aug	14.2	14.0	14.0	13.7	13.6	13.2	12.8	12.6	12.8	13.1	13.2	14.2	14.9	15.7	16.5	16.7	17.2	17.3	16.1	14.2	13.8	12.7	11.9	11.5	14.2	17.3	
25-Aug	10.8	10.5	9.9	9.9	9.8	8.9	8.6	10.5	13.8	16.5	18.1	18.7	19.2	19.9	20.4	20.8	20.6	19.9	18.7	16.7	15.6	14.9	13.8	13.3	15.0	20.8	
26-Aug	12.8	12.5	12.5	12.2	11.7	10.9	11.1	13.3	16.0	18.0	20.2	22.1	22.9	23.7	24.7	25.1	24.9	24.3	22.2	19.7	18.4	17.4	16.5	15.7	17.9	25.1	
27-Aug	14.9	13.8	12.9	12.1	11.4	11.0	12.1	14.8	16.8	18.5	19.9	20.9	22.0	22.9	23.5	23.6	23.2	21.9	19.8	18.2	17.3	16.8	16.7	16.4	17.6	23.6	
28-Aug	16.1	16.1	16.2	15.7	15.6	15.5	15.9	16.9	19.1	20.6	22.0	23.9	25.7	26.6	27.5	28.0	27.9	27.0	24.6	22.5	21.3	20.0	18.9	18.7	20.9	28.0	
29-Aug	17.9	17.5	17.5	16.8	16.4	15.8	15.4	15.1	16.5	19.8	23.4	25.5	26.7	27.4	27.9	28.3	28.3	26.7	23.0	20.7	19.4	19.4	19.2	19.2	21.0	28.3	
30-Aug	18.4	18.3	17.9	17.0	16.7	17.0	16.9	17.3	18.9	21.8	27.0	24.7	24.9	23.8	24.5	24.1	22.7	21.4	21.2	19.0	18.7	17.4	16.7	17.1	20.1	27.0	
31-Aug	18.1	17.3	17.0	16.5	15.9	15.7	15.5	16.1	17.9	19.2	21.9	23.6	24.8	25.3	26.1	26.2	25.2	23.8	21.4	19.1	17.8	17.1	16.7	16.7	19.8	26.2	
		13.2	12.8	12.4	12.2	11.9	11.8	12.4	13.5	15.1	16.6	17.9	18.8	19.4	19.8	20.3	20.5	20.4	19.8	18.4	16.4	15.2	14.7	14.2	13.8	Diurnal Average	
		19.9	19.3	18.9	18.3	17.9	17.3	18.1	19.6	20.7	21.8	27.0	25.5	26.7	27.4	27.9	28.3	28.3	27.0	24.6	22.5	21.3	20.0	19.3	19.8	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Jackfish 2/3 - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Ambient Temperature (AT) - C
Jackfish 2/3 - August 2023

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	46	6.18	6.18
10 - 20	562	75.54	81.72
> 20	136	18.28	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

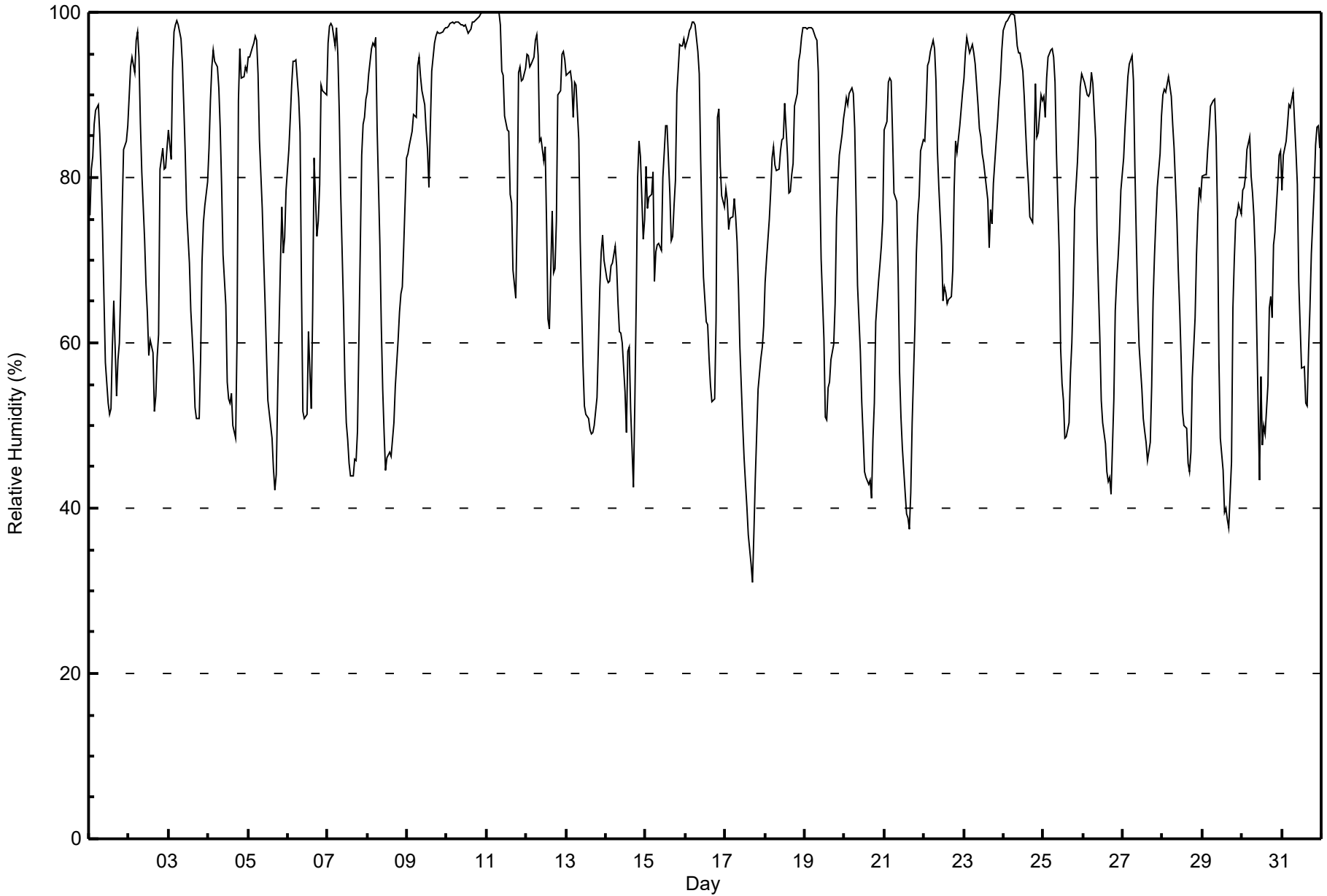
Relative Humidity (RH) - %
Jackfish 2/3 - August 2023

Maximum Value: 100.0 % on Aug 10 23:00 Maximum Daily Average: 98.8 % on Aug 10 Minimum Value: 31.0 % on Aug 17 17:00 Minimum Daily Average: 57.3 % on Aug 17 Maximum Diurnal Average: 91.5 % at hour 5 Minimum Diurnal Average: 57.8 % at hour 16 Monthly Average: 76.28 % Percentiles: P ₁ = 39.0 P ₁₀ = 50.1 Q ₁ = 62.6 Median = 80.0 Q ₃ = 91.3 P ₉₀ = 97.0 P ₉₉ = 100.0																								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-Aug	75.4	81.0	82.6	86.4	88.1	88.8	85.2	80.0	73.6	65.4	57.6	52.7	51.4	52.1	59.6	65.1	53.6	58.0	60.1	66.6	76.2	83.3	84.5	86.3	71.4	88.8
2-Aug	89.8	93.3	94.6	92.7	96.6	97.7	94.6	86.6	80.6	72.6	67.1	63.6	58.5	60.3	58.8	51.8	53.6	58.3	61.1	81.0	83.6	80.9	81.2	83.5	76.8	97.7
3-Aug	85.8	82.1	92.9	97.6	98.4	99.1	98.4	96.7	93.7	88.7	83.0	76.1	69.6	63.9	60.7	57.3	52.2	50.9	50.8	58.1	69.9	74.5	76.6	79.5	77.3	99.1
4-Aug	83.6	89.3	93.3	95.4	94.1	93.5	90.8	86.0	79.1	70.7	64.6	55.3	53.3	52.8	53.9	50.0	48.5	60.4	89.3	95.6	92.1	92.2	93.4	92.9	77.9	95.6
5-Aug	94.6	94.5	95.8	96.3	97.1	96.6	92.5	84.5	76.3	70.4	65.0	58.8	53.0	50.0	48.5	44.7	42.2	44.0	53.7	69.7	76.4	70.9	72.8	78.5	72.0	97.1
6-Aug	83.4	87.1	91.2	94.1	94.0	94.2	89.6	85.5	66.9	51.8	50.8	51.4	61.4	56.7	52.0	63.8	82.4	72.9	74.8	79.2	91.2	90.5	90.1	90.1	76.9	94.2
7-Aug	96.3	98.3	98.6	98.3	95.9	98.1	94.7	87.9	78.1	64.4	55.6	50.4	48.2	45.5	44.0	43.9	45.9	45.8	49.3	60.4	82.8	86.5	87.2	89.5	72.7	98.6
8-Aug	90.3	92.6	95.6	96.2	95.9	97.0	86.1	71.8	62.1	54.5	49.2	44.6	46.1	46.8	46.3	48.3	50.4	54.7	60.3	63.7	66.0	66.9	71.6	82.4	68.3	97.0
9-Aug	82.9	83.9	84.7	85.7	87.7	87.2	93.6	94.5	92.2	90.6	88.9	85.8	83.5	78.8	86.2	92.9	96.2	97.1	97.7	97.5	97.5	97.7	97.9	98.1	90.8	98.1
10-Aug	98.1	98.3	98.6	98.8	98.7	98.9	98.9	98.8	98.5	98.4	98.3	98.4	98.0	97.4	97.9	98.8	98.9	99.0	99.1	99.5	99.8	99.9	100.0	100.0	98.8	100.0
11-Aug	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.6	92.8	92.4	87.5	85.7	85.5	78.0	76.9	68.8	65.4	75.4	92.8	93.4	91.7	91.8	93.2	90.4	100.0
12-Aug	95.0	94.8	93.5	93.7	94.5	96.6	97.3	94.8	84.4	84.8	82.0	83.7	74.3	62.9	61.8	75.9	68.5	68.9	74.8	90.1	90.5	95.0	95.3	94.3	85.3	97.3
13-Aug	92.4	92.6	92.9	91.6	87.2	91.5	91.1	84.5	72.3	64.5	57.3	52.3	51.3	50.9	49.5	49.1	49.2	50.0	53.3	59.7	66.6	71.0	73.0	70.0	69.3	92.9
14-Aug	67.9	67.3	67.5	69.3	69.7	71.7	69.4	64.8	61.4	61.2	59.9	54.0	49.2	59.0	59.5	52.0	42.6	52.7	65.2	80.0	84.4	82.6	72.6	74.9	64.9	84.4
15-Aug	81.4	76.2	77.5	78.0	80.6	67.5	71.0	71.9	72.1	71.2	80.0	83.1	86.3	86.2	78.2	72.3	72.8	76.7	79.7	90.2	96.1	95.9	96.0	96.8	80.7	96.8
16-Aug	95.7	97.0	97.8	98.2	98.8	98.8	98.5	95.3	92.5	82.2	74.1	67.9	62.6	62.2	58.1	54.9	52.8	53.3	62.7	87.3	88.3	81.3	77.7	76.5	79.8	98.8
17-Aug	78.6	77.3	73.8	75.0	75.3	77.5	75.2	72.3	66.7	59.5	50.2	46.1	43.1	40.1	36.8	33.2	31.0	37.0	43.5	48.9	54.3	58.1	59.5	62.0	57.3	78.6
18-Aug	67.4	70.1	74.9	78.3	82.4	83.7	81.5	80.9	81.0	83.3	84.6	84.8	88.9	82.7	78.1	78.4	80.3	81.8	88.7	90.2	94.1	95.1	96.9	98.1	83.6	98.1
19-Aug	98.1	97.9	98.1	98.2	98.2	97.9	97.0	96.6	92.7	80.3	70.1	60.5	50.9	50.6	54.6	55.2	57.9	59.8	64.8	75.1	79.5	82.8	85.3	87.1	78.7	98.2
20-Aug	88.3	89.6	88.9	90.2	90.9	90.2	85.9	76.7	67.0	59.1	52.9	48.7	44.4	43.8	43.0	43.5	41.2	48.2	52.7	62.6	67.5	69.4	71.6	74.9	66.3	90.9
21-Aug	85.8	86.9	91.5	92.0	91.6	85.2	78.2	77.1	68.3	56.5	51.0	47.3	41.9	39.4	38.8	37.5	41.8	50.3	62.2	70.8	75.4	77.8	83.3	84.6	67.3	92.0
22-Aug	84.5	88.5	93.5	94.1	95.3	96.6	95.6	91.7	83.3	78.9	71.7	65.2	66.7	66.1	64.8	65.3	65.5	68.9	78.7	84.3	83.0	86.3	88.3	90.4	81.1	96.6
23-Aug	92.1	95.1	97.0	95.1	95.7	96.1	95.1	93.7	88.9	85.9	84.9	82.9	81.9	80.3	77.3	71.5	76.2	74.5	79.4	84.3	86.7	89.6	91.9	95.4	87.1	97.0
24-Aug	97.9	98.8	99.1	99.4	99.7	99.8	99.6	98.2	95.9	95.1	95.1	92.9	89.9	85.8	82.1	79.2	75.2	74.5	83.0	91.4	84.9	85.4	90.0	89.3	90.9	99.8
25-Aug	89.8	87.4	92.1	94.5	95.4	95.6	94.6	91.5	83.0	71.1	59.3	55.0	53.1	48.5	48.6	50.4	56.3	59.9	66.4	76.0	81.8	86.2	91.0	92.6	75.8	95.6
26-Aug	92.0	91.4	90.0	89.8	90.3	92.7	91.4	84.6	73.0	66.4	60.5	53.1	50.3	47.9	44.4	43.2	43.7	41.6	53.2	64.0	67.7	70.2	73.5	78.4	68.9	92.7
27-Aug	82.4	86.2	89.2	92.1	93.8	94.8	91.7	81.3	72.8	65.2	59.6	54.4	50.8	49.3	48.0	45.8	48.0	54.7	65.2	70.5	74.9	78.8	82.9	87.4	71.7	94.8
28-Aug	90.1	90.7	90.3	92.2	91.0	89.8	86.4	83.5	74.9	68.8	64.1	58.3	51.7	50.0	49.6	45.5	44.3	46.9	55.7	63.1	70.7	75.6	78.8	77.6	70.4	92.2
29-Aug	80.2	80.4	80.4	83.3	85.8	88.7	89.3	89.5	84.9	75.4	58.1	48.5	44.6	39.5	40.0	38.7	37.6	45.6	64.3	70.2	74.9	75.4	76.8	75.6	67.8	89.5
30-Aug	78.5	78.7	80.1	83.3	84.9	80.1	78.1	75.2	70.4	61.6	43.4	56.0	47.7	50.0	49.0	55.0	64.2	65.5	63.1	71.9	73.3	79.4	82.7	83.2	69.0	84.9
31-Aug	78.5	82.8	84.4	86.5	88.9	88.4	89.4	90.3	83.3	79.2	67.5	62.0	56.9	57.2	52.7	52.4	59.0	64.3	70.9	78.5	83.8	86.1	86.3	83.6	75.5	90.3
																								Diurnal Average	85.4	
																								Diurnal Maximum	100.0	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Jackfish 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Relative Humidity (RH) - %
Jackfish 2/3 - August 2023**

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	11	1.48	1.48
40 - 60	155	20.83	22.31
60 - 80	206	27.69	50.00
80 - 100	363	48.79	98.79

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 2/3 - August 2023

Maximum Speed: 16 km/h on Aug 13 13:00	Maximum Daily Speed Average: 10.3 km/h on Aug 13	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 6 21:00	Minimum Daily Speed Average: 0.4 km/h on Aug 6	Hours of Data: 742
Maximum Diurnal Speed Average: 3.6 km/h at hour 4	Minimum Diurnal Speed Average: 2.1 km/h at hour 11	Hours of Missing Data: 2
Monthly Average Velocity: 2.7 km/h 236.0 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 4 Median = 6 Q ₃ = 8 P ₉₀ = 9 P ₉₉ = 15	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-Aug	WSW11	WSW10	WSW11	WSW10	WSW12	WSW10	WSW10	W9	WSW10	W11	W10	W11	W10	W9	WSW9	WSW8	W10	WSW9	WNW6	WNW4	W3	WSW3	WSW4	WSW4	WSW8.2	WSW12	
2-Aug	WSW4	WSW4	W4	W5	WSW4	WSW3	WNW3	WNW3	NW3	NW3	NW2	NW3	W3	W2	WNW4	WSW2	NNW2	N2	NE3	E1	ENE3	ENE6	ENE6	ENE5	WNW1.4	ENE6	
3-Aug	SE4	ESE6	SW4	SW8	SW8	ESE6	SE5	S5	SE3	SSW2	SE3	SSW4	S4	WSW7	WSW8	WSW8	WSW10	WSW11	WSW8	WNW5	W4	W4	WSW6	WSW8	SW3.9	WSW11	
4-Aug	WSW6	W5	WSW6	WSW6	W5	W6	WNW6	WNW6	WNW7	WNW7	WNW7	WNW7	WNW7	W7	NW4	WNW4	W5	NW4	WSW4	SW3	WSW5	WSW5	WSW4	WSW5	W5.1	WNW7	
5-Aug	WSW4	W4	W4	WSW4	WSW5	WSW4	W4	W4	WNW5	NW5	WNW4	NW5	NW5	NW5	W7	W8	WNW7	NW4	W3	SW3	SW4	SW7	WSW7	WSW5	W4.3	W8	
6-Aug	SW4	SW3	SSW1	NNW1	NNE1	SE1	ESE1	SSW2	SSE2	S3	S1	NNW2	WSW7	WNW3	NNW2	NNE4	ESE4	SSE3	S3	SSW4	NNW0	NE4	NE5	ENE4	S0.4	WSW7	
7-Aug	S0	NNE1	NE4	NE5	NE3	NE3	NNE4	NNE6	NNE7	NE8	NNE8	NE7	NNE6	NNE5	N6	NNE7	NE7	NE6	NE6	NE4	ESE2	ESE1	E1	E2	NE4.3	NE8	
8-Aug	ENE2	SSE1	ESE1	ENE1	E2	NE3	E2	SE4	ESE4	E6	ENE4	ESE6	E6	ESE6	ESE4	E7	E8	E7	E8	E7	ESE7	ESE7	ESE6	ESE5	E4.5	E8	
9-Aug	SE3	SE2	S3	SSE4	SE5	ESE5	ESE6	ESE6	SE6	SE6	SE7	SE8	ESE9	SE8	SE6	SE6	ESE8	ESE7	SE8	ESE8	ESE8	ESE8	ESE6	ESE7	SE6.1	ESE9	
10-Aug	ESE8	ESE8	SE7	ESE8	ESE9	ESE8	E8	E8	E9	E7	E7	E7	ENE7	ENE5	NNE5	NE6	NE6	NNE7	NNE7	NNE5	NNE6	N5	NNE6	N6	ENE5.2	ESE9	
11-Aug	N5	NNW6	NNW6	NW6	NW6	NW6	NW6	NW5	NW6	NNW5	NNW4	NW4	NNW3	NW3	WNW4	W4	NW3	N3	N1	S1	SSE2	SSW5	WSW8	WSW9	NW3.4	WSW9	
12-Aug	SW9	SW8	SW9	SW10	WSW7	SW7	SW6	WSW6	W7	WSW8	W8	W7	W7	WNW8	WNW8	W7	W8	W5	W5	SW3	W3	WSW4	WSW3	WSW4	WSW6.0	SW10	
13-Aug	WSW7	SW7	SW7	SW8	SW8	SSW7	SSW7	SSW7	SSW8	SW11	SW14	SW16	SW16	SW15	WSW15	WSW15	SW15	SW13	SW11	SW8	SW8	SSW8	SW9	SW9	SW10.3	SW16	
14-Aug	WSW11	WSW11	WSW12	WSW11	WSW11	WSW11	W10	W10	NW7	NW5	WNW6	WNW6	WNW6	W6	WSW6	WNW4	NW1	SSE1	S3	S4	SSW5	WSW3	WSW4	WSW5.7	WSW12		
15-Aug	SW3	SSW3	SW4	SW5	SSW5	S6	S6	S6	S6	SSW7	SSW7	SSW4	SW6	SW9	SW10	WSW11	WSW10	SW9	SW9	W9	SW8	WSW10	W8	W9	SW6.3	WSW11	
16-Aug	WNW8	WNW7	W6	W4	W5	WSW4	WNW6	W6	W7	WNW6	WNW6	W7	WNW6	WSW8	W8	W7	WSW7	W7	SW4	SSE3	S3	S5	S5	SSW6	W4.9	WSW8	
17-Aug	SSW6	S5	S6	S6	SSW8	SSW10	SW11	SW11	SW14	WSW10	WSW12	WSW15	WSW15	WSW15	WSW13	W11	WNW9	WNW7	W5	SW5	WSW5	WSW5	W4	SW4	SW8.0	WSW15	
18-Aug	WSW1	NNW4	NNE5	NNE3	N2	N2	N4	NNE6	NNE6	NNE9	NNE10	NNE9	N7	N6	NNW5	NW4	NW5	WNW4	WNW5	WNW6	WNW5	WNW6	WNW6	WNW5	NNW4.1	NNE10	
19-Aug	WNW6	W5	WNW4	WNW6	WNW5	WNW6	WNW5	W7	WSW7	W8	W8	W9	W10	WNW7	W7	WSW8	W8	WSW9	WSW8	SW7	SW8	SW9	SW8	SW8	W6.5	W10	
20-Aug	SW8	SW8	SW9	SW8	SW9	SW9	SW9	SW12	SW11	SW11	SW13	WSW10	SW8	WSW7	SW6	SSW4	SSW3	S4	SSW6	SW5	SSW6	SSW6	SSW6	SSW6	SW7.5	SW13	
21-Aug	S4	S5	S5	S6	S6	SSW6	SSW6	SSW5	SSW2	S3	ESE4	ENE6	ENE6	E5	E6	E4	E4	ESE4	E2	SE2	S1	S3	S3	S2	SSE2.8	ENE6	
22-Aug	S3	S2	ESE2	SSE2	SE2	ESE4	E3	E3	SE4	SSE4	SSE5	ESE7	SSE4	ESE3	E3	ENE4	ENE5	ENE3	ESE2	SE2	SE2	S1	S2	S3	SE2.6	ESE7	
23-Aug	SSW4	SSW4	S5	S4	S2	SSE2	SSE3	S3	S3	NE4	NE5	NE4	NE6	NE6	NE5	ENE7	NE10	ENE9	ENE6	ENE5	ENE5	ENE5	NE5	NE4	ENE2.9	NE10	
24-Aug	NE3	NE3	ENE3	NE3	NNE3	NNE3	N3	N5	NNE7	NNE6	NNE7	NNE7	NNE6	NNE6	NNE6	NNE6	NNE6	NNE6	NNE6	W1	WSW3	WSW4	SW3	SW4	SW6	N2.7	NNE7
25-Aug	SW6	WSW7	SW8	SW8	SW7	SSW7	SSW8	SSW7	SW8	SW10	SW10	SW9	SW9	SW9	SW10	SW10	SW9	SSW9	SW9	SSW5	SSW4	S4	SSW5	S4	S4	SW7.2	SW10
26-Aug	S4	S5	S6	S6	S5	S5	S5	SSW6	SW9	SW9	SW9	WSW12	WSW14	SW13	WSW12	WSW12	WSW13	WSW11	WSW8	WSW7	WSW7	WSW5	W5	W4	SW7.4	WSW14	
27-Aug	ENE1	NE2	NE2	NE2	S0	NE1	NNE1	N2	NE4	ENE3	ENE3	NE3	SSW3	SW3	WSW4	WSW6	WSW9	SW9	SW7	SSW6	SSW7	SSW8	SW9	SW8	SW2.3	SW9	
28-Aug	SW9	SW9	SW9	SW9	SW9	SW9	SW8	SW9	WSW8	WSW7	WSW8	SW8	WSW8	WSW7	WSW6	WSW6	SW6	SW6	SW7	SW7	SSW6	SSW6	S6	SSW6	SW7.2	SW9	
29-Aug	SSW6	S7	S6	S6	S7	S8	S7	S7	S6	SSW6	C	SW9	SW8	SW10	SW8	SW8	SW7	SW4	SSW2	SSW3	S2	S3	S4	S5	SSW5.7	SW10	
30-Aug	S5	S5	S5	S4	S5	S6	S7	S6	SSW5	SSW5	SSW2	SE6	SSE6	SE5	E5	E3	SE0	SSE2	E4	E3	SE2	NNE1	UO	S3	SSE3.2	S7	
31-Aug	SSW4	ESE3	SW4	SW5	WSW3	WSW4	W5	W4	NW4	WNW4	NNW3	NNW4	NW4	NW5	NW5	NW6	WNW7	WNW8	WNW8	WNW8	W7	W6	WNW6	WNW6	WNW4.2	WNW8	

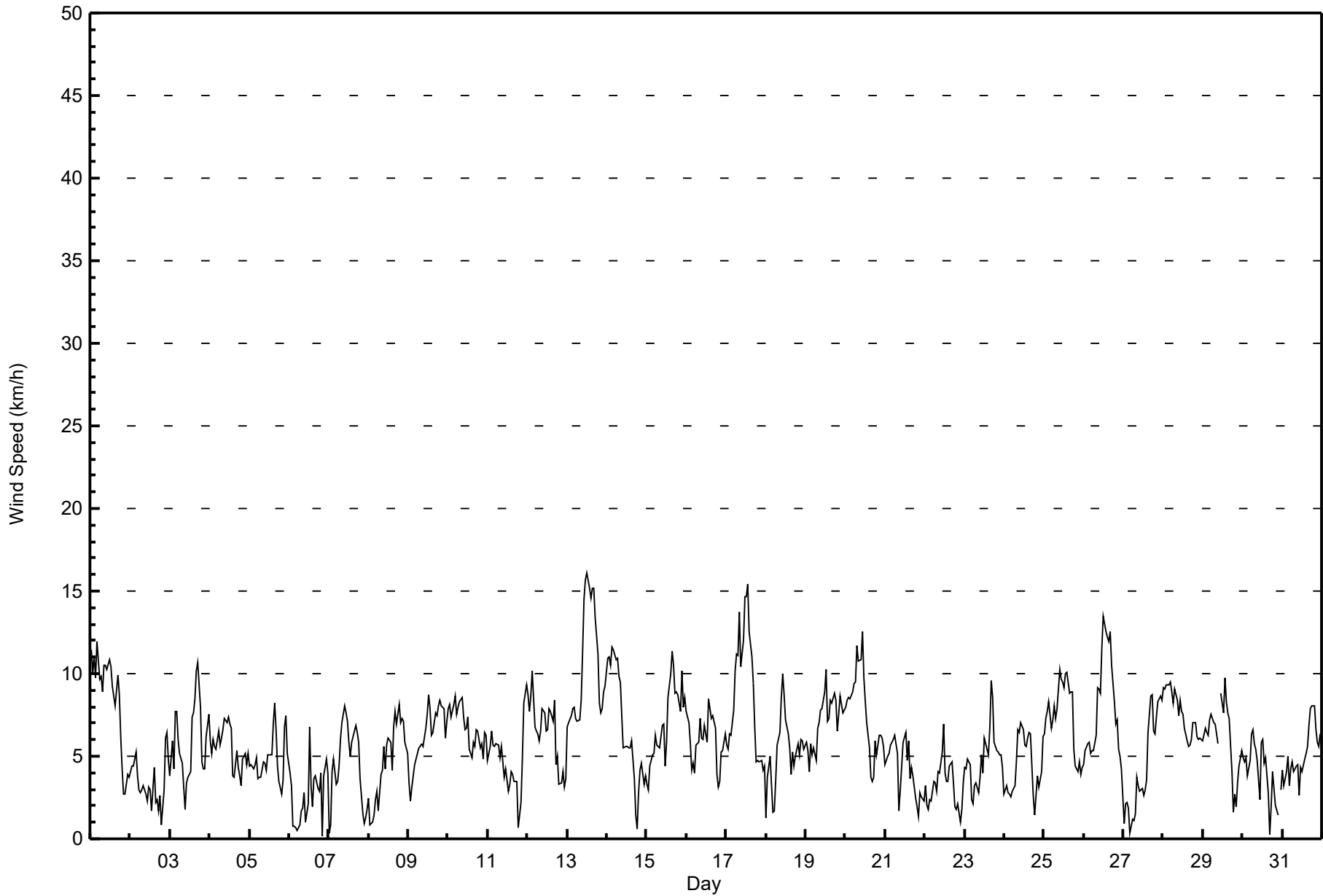
SW3.3 SW3.1 SW3.4 SW3.6 SW3.5 SW3.0 SW2.8 SW2.9	SW2.8	SW2.9	SW2.8	WSW2.4	WSW2.1	WSW2.4	WSW3.0	WSW3.4	W3.4	WSW3.2	W3.0	WSW2.4	WSW2.1	SW2.1	SSW2.3	SW2.7	SW2.6	SW2.9	Diurnal Average								
WSW11	WSW11	WSW11	WSW12	WSW12	WSW11	SW11	SW12	SW14	SW11	SW14	SW16	SW16	WSW15	WSW15	WSW15	SW15	SW13	SW11	W9	ESE8	WSW10	SW9	WSW9	Diurnal Maximum			

C - Calibration 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 2/3 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	343	46.23	46.23
6 - 11	375	50.54	96.77
12 - 19	24	3.23	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: 742

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Jackfish 2/3 - August 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	13	24	17	16	16	17	15	51	26	20	34	28	19	23	13	343
6 - 11	5	22	10	8	14	24	9	1	21	33	82	62	39	36	7	2	375
12 - 19	0	0	0	0	0	0	0	0	0	0	10	14	0	0	0	0	24
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	16	35	34	25	30	40	26	16	72	59	112	110	67	55	30	15	742

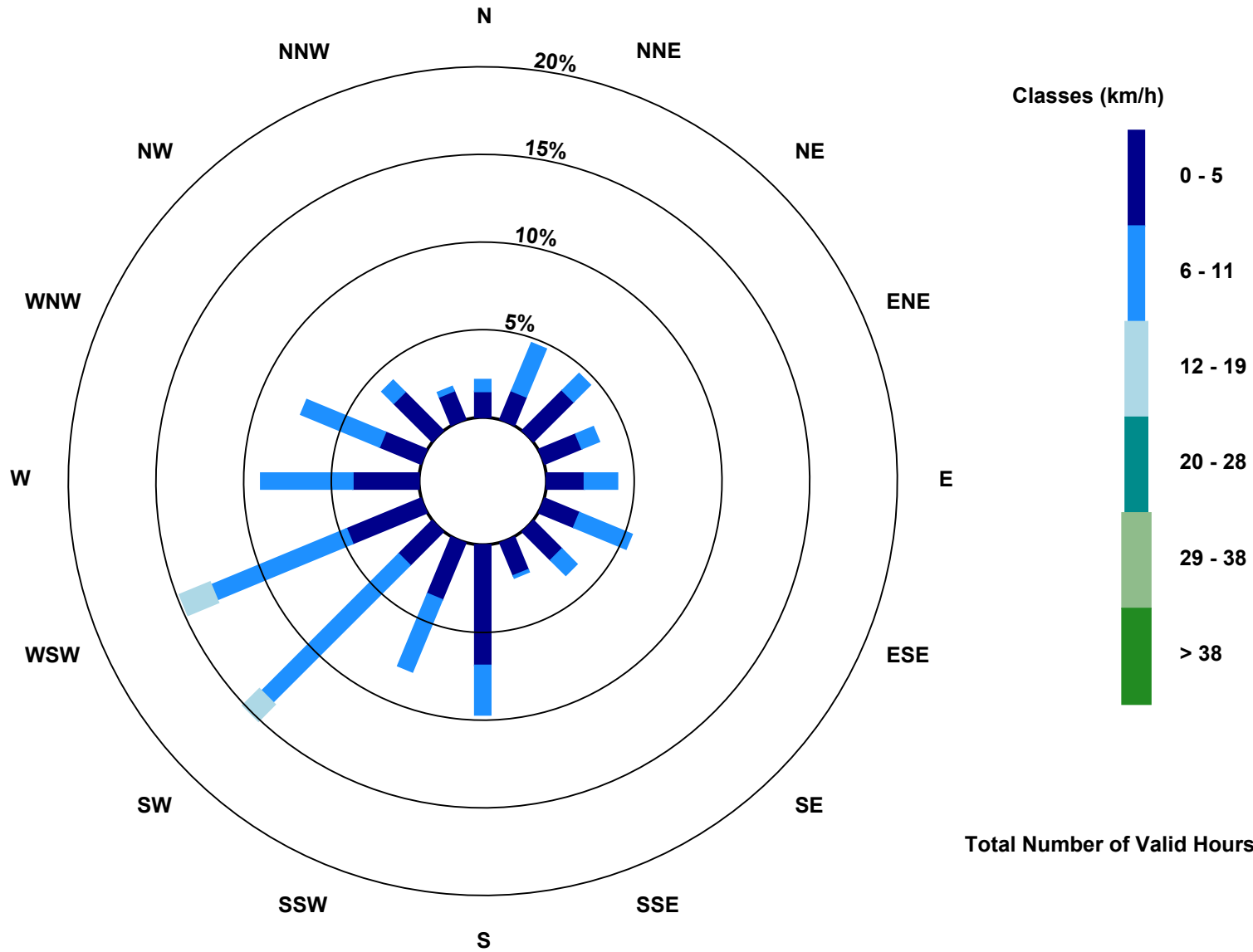
Total Number of Valid Hours: 742

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 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 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Aug 17 13:00	Hours in Service: 744 Hours of Data: 742 Hours of Missing Data: 2 Hours of Calibration: 1 Percent Operational Time: 99.9
Minimum Value: 0 km/h on Aug 14 21:00	
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 3 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-Aug	3	3	3	3	3	3	4	4	4	4	5	4	4	4	4	3	5	4	3	2	1	1	1	1	5
2-Aug	1	1	1	2	1	1	1	1	1	2	2	2	2	2	2	2	1	2	2	1	1	2	2	1	2
3-Aug	2	2	2	2	3	3	3	2	2	1	2	2	2	3	3	4	4	4	4	2	2	2	1	2	4
4-Aug	2	2	2	2	2	3	2	3	3	3	3	3	3	3	2	2	3	3	3	1	2	2	2	2	3
5-Aug	2	2	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	2	2	1	3	1	2	1	3
6-Aug	1	1	1	1	1	1	1	1	1	1	1	2	4	2	2	3	2	1	1	1	1	1	1	1	4
7-Aug	1	1	1	2	2	1	2	2	2	3	3	3	3	3	3	4	3	3	2	1	1	1	1	1	4
8-Aug	1	1	1	2	1	1	1	2	2	2	3	3	3	2	2	3	2	2	3	2	3	3	2	2	3
9-Aug	1	1	1	2	2	2	2	2	2	2	3	3	4	3	3	3	3	3	3	3	3	3	2	3	4
10-Aug	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2	2	2	2	2	3	3	3
11-Aug	2	2	3	2	2	3	3	2	3	2	2	1	1	1	2	2	2	1	1	1	1	1	2	2	3
12-Aug	2	2	3	3	2	2	1	2	3	3	3	3	3	3	4	3	4	2	3	1	2	1	1	1	4
13-Aug	2	1	1	1	2	2	1	2	3	4	5	5	5	5	5	5	5	5	4	2	2	2	2	2	5
14-Aug	3	3	3	3	3	3	4	4	4	3	2	3	2	2	2	2	2	1	1	1	0	1	1	1	4
15-Aug	1	1	1	1	1	1	1	2	2	3	3	1	2	2	3	3	3	3	2	5	3	3	3	3	5
16-Aug	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	2	3
17-Aug	2	2	2	2	2	3	3	3	4	4	4	5	5	5	4	4	4	3	2	1	1	1	2	2	5
18-Aug	1	2	2	1	1	1	2	2	2	3	3	3	3	3	3	2	3	2	2	3	2	3	3	2	3
19-Aug	2	2	2	2	2	2	2	3	3	3	3	3	4	3	3	3	3	4	3	2	2	2	2	2	4
20-Aug	2	2	2	2	2	2	2	3	3	3	4	4	3	3	3	2	2	2	2	1	1	1	1	1	4
21-Aug	1	1	1	1	1	1	1	1	2	1	2	2	2	3	3	2	2	2	1	1	1	1	1	1	3
22-Aug	1	1	1	1	1	1	1	1	2	2	2	3	2	2	2	1	1	1	2	1	1	1	1	1	3
23-Aug	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	3	3	2	1	2	2	2	1	3
24-Aug	1	1	1	1	1	1	1	2	3	2	2	2	2	2	2	3	3	2	1	1	1	1	1	1	3
25-Aug	1	1	1	2	2	2	1	1	2	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	3
26-Aug	1	2	2	2	2	2	2	2	3	3	3	4	4	4	4	4	4	3	2	2	2	1	1	2	4
27-Aug	1	1	1	1	1	1	1	2	1	1	2	2	2	2	2	3	3	2	2	2	2	2	2	2	3
28-Aug	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	1	1	1	1	3
29-Aug	1	1	1	1	1	2	1	1	2	2	C	3	3	3	3	3	2	2	1	1	1	1	2	2	3
30-Aug	2	2	2	1	2	2	2	2	1	2	1	3	3	2	2	2	1	1	1	1	1	1	UO	1	3
31-Aug	1	2	2	1	2	1	1	2	2	2	2	2	2	2	2	2	3	4	3	3	3	2	2	3	4
Diurnal Maximum																									

C - Calibration UO - Unstable Operation



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Direction (WD) - deg

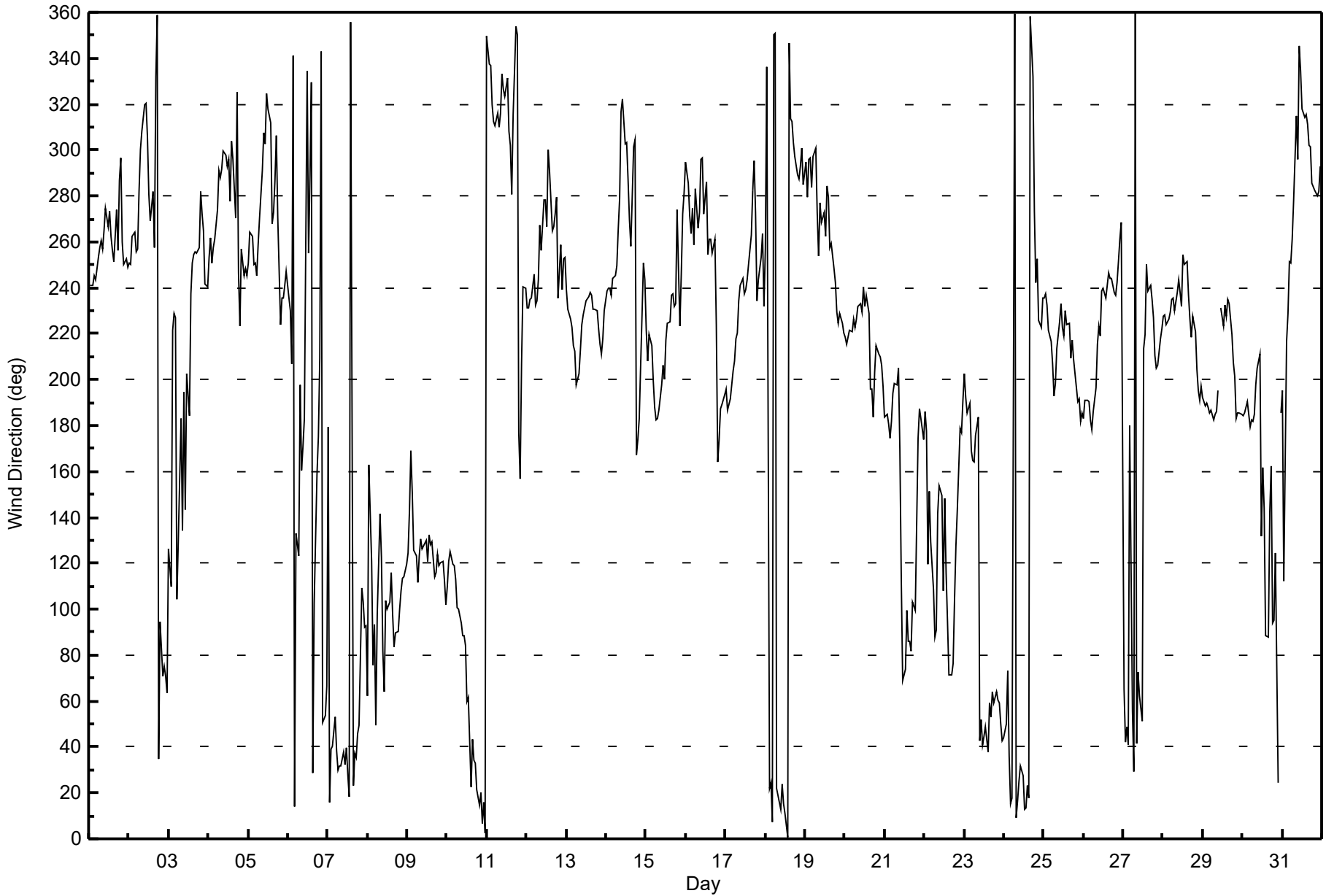
Jackfish 2/3 - August 2023

Direction of Maximum Speed: 234 deg on Aug 13 13:00																						Hours in Service: 744			
Direction of Maximum Daily Speed Average: 226.2 deg on Aug 13																						Hours of Data: 742			
Direction of Minimum Speed: 343 deg on Aug 6 21:00											Direction of Minimum Daily Speed Average: 0.4 deg on Aug 6											Hours of Missing Data: 2			
Monthly Average Direction: 236.0 deg																						Percent Operational Time: 99.9			
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-Aug	241	241	241	245	243	253	258	261	257	265	274	267	273	262	256	252	274	256	287	296	260	250	253	249	257.9
2-Aug	251	250	263	264	256	257	282	300	308	320	320	306	280	269	282	258	332	359	35	95	71	75	71	64	301.8
3-Aug	126	110	221	229	227	104	129	183	135	194	143	203	184	237	251	255	256	255	257	282	272	265	242	240	227.5
4-Aug	253	262	251	258	261	274	291	288	292	300	298	293	296	278	304	296	270	325	247	223	257	245	248	245	274.9
5-Aug	251	264	262	250	251	245	259	270	291	307	303	325	318	312	268	273	287	306	271	224	235	236	241	247	270.8
6-Aug	236	230	207	341	14	133	123	198	160	171	183	334	255	288	330	29	103	159	175	209	343	50	54	67	185.2
7-Aug	180	16	39	40	53	38	30	32	32	38	32	40	28	18	356	23	37	36	46	50	109	103	92	93	35.8
8-Aug	62	163	121	75	94	49	97	142	123	82	64	103	100	103	116	98	84	89	91	100	108	114	114	120	99.5
9-Aug	124	143	169	150	126	123	112	123	130	126	129	130	121	133	128	130	114	116	124	119	120	121	112	102	123.8
10-Aug	110	121	125	120	119	113	101	100	94	89	89	84	60	62	23	43	34	33	21	15	20	7	16	3	73.8
11-Aug	349	337	337	320	312	311	316	310	316	333	327	324	331	308	302	281	316	354	350	177	157	207	240	240	305.2
12-Aug	231	231	235	236	246	232	234	244	267	256	278	278	267	300	290	265	267	272	279	236	259	239	253	253	256.1
13-Aug	239	230	226	223	215	212	198	203	213	224	228	231	234	236	238	237	230	230	230	222	215	211	218	230	226.2
14-Aug	239	240	240	237	244	245	249	265	279	317	322	303	303	287	270	258	301	305	167	174	183	206	251	243	256.9
15-Aug	222	208	220	215	199	188	182	183	187	198	206	200	217	224	225	237	237	232	233	274	224	246	272	281	225.9
16-Aug	295	286	271	263	274	258	283	266	273	296	296	272	286	254	261	261	255	261	224	164	174	187	189	193	259.9
17-Aug	196	187	189	191	204	208	218	220	234	241	244	238	239	243	250	263	283	295	273	234	243	253	264	232	236.0
18-Aug	257	336	22	24	7	350	351	22	16	13	24	15	11	1	346	314	312	303	297	289	287	293	301	285	343.0
19-Aug	295	280	296	297	284	297	301	273	254	277	269	273	262	285	279	257	259	248	242	230	225	229	225	220	261.9
20-Aug	218	215	218	222	221	226	222	226	232	233	229	240	232	237	229	196	196	183	203	215	211	210	207	197	221.1
21-Aug	184	185	181	175	182	194	198	198	205	170	114	69	74	99	86	86	82	103	100	137	174	187	183	174	147.5
22-Aug	186	178	120	151	129	108	88	91	142	154	149	108	148	116	95	72	71	76	104	128	143	179	177	191	124.1
23-Aug	203	192	185	189	169	165	164	176	184	43	52	41	44	49	38	59	53	64	59	64	60	59	50	43	73.2
24-Aug	44	50	73	36	15	18	360	9	17	25	32	27	13	13	23	17	358	332	273	242	252	226	222	235	9.0
25-Aug	235	237	233	221	217	207	193	199	214	225	233	222	219	230	224	224	209	217	209	203	190	192	182	186	216.6
26-Aug	183	191	191	190	183	178	186	196	216	223	219	239	240	236	241	247	244	244	238	237	243	251	261	269	227.7
27-Aug	65	42	49	41	180	56	29	360	42	72	62	51	213	220	250	238	241	235	227	211	205	206	218	222	221.1
28-Aug	227	228	224	226	230	235	236	230	238	244	238	232	254	250	251	237	227	219	228	221	204	195	191	197	228.6
29-Aug	192	188	190	188	185	187	182	185	186	195	C	231	223	232	227	235	233	220	207	201	183	186	185	185	203.9
30-Aug	184	185	188	190	179	183	182	185	197	205	211	132	162	144	89	88	142	162	94	95	124	25	UO	185	165.5
31-Aug	195	112	217	229	251	251	261	278	315	296	345	334	318	314	316	311	302	301	286	282	281	280	282	293	286.5
223.3 221.8 222.6 223.4 221.1 217.1 220.8 225.6 239.4 253.1 257.9 257.3 253.2 254.4 261.2 257.1 263.1 253.9 239.0 222.7 213.3 217.0 226.5 226.9																									
Diurnal Average																									
C - Calibration 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 2/3 - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Jackfish 2/3 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 107 deg on Aug 27 01:00	Hours of Data: 742
Minimum Value: 7 deg on Aug 14 21:00	Hours of Missing Data: 2
Percentiles: P ₁ = 13 P ₁₀ = 17 Q ₁ = 24 Median = 38 Q ₃ = 52 P ₉₀ = 65 P ₉₉ = 91	Hours of Calibration: 1
	Percent Operational Time: 99.9

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-Aug	19	20	23	23	21	34	35	46	43	44	51	46	46	41	42	37	46	42	56	63	52	37	16	15	63
2-Aug	15	24	30	39	24	30	55	63	61	83	87	67	93	85	72	88	73	78	28	35	35	18	20	21	93
3-Aug	52	37	57	20	41	43	61	52	76	77	61	56	63	43	40	41	37	37	41	55	37	31	14	16	77
4-Aug	25	31	27	26	35	41	49	55	58	61	55	52	58	52	66	70	57	64	61	26	36	27	23	22	70
5-Aug	26	30	25	22	25	32	43	41	52	51	59	56	61	68	49	45	48	61	46	31	55	13	23	14	68
6-Aug	13	19	87	71	60	79	62	19	59	41	88	85	46	75	81	65	55	56	38	20	92	26	26	44	92
7-Aug	90	93	33	38	26	19	32	32	37	43	49	57	64	76	64	64	46	43	34	27	49	64	54	44	93
8-Aug	19	73	56	53	52	14	71	50	50	50	70	58	52	49	61	38	30	29	28	34	37	45	45	44	73
9-Aug	57	73	75	65	51	50	40	48	53	60	50	47	46	51	49	54	39	40	48	47	45	44	44	35	75
10-Aug	41	45	48	44	39	40	36	32	34	35	34	34	29	40	43	37	32	33	42	45	48	52	49	58	58
11-Aug	60	63	54	66	67	62	59	66	59	65	72	54	76	73	66	51	63	64	94	42	26	24	18	20	94
12-Aug	18	16	17	18	21	19	17	28	48	38	48	51	52	56	63	38	46	59	54	32	52	17	23	20	63
13-Aug	14	14	15	15	17	18	17	21	28	26	25	26	28	27	29	25	24	24	23	21	22	22	20	21	29
14-Aug	19	18	18	19	20	22	27	45	47	56	60	68	56	44	47	46	66	85	87	8	7	18	25	16	87
15-Aug	30	24	13	13	13	16	16	25	30	29	28	27	30	23	27	24	20	19	20	57	28	24	41	44	57
16-Aug	47	43	39	37	52	50	45	46	46	56	61	56	57	42	47	43	48	45	43	12	20	18	23	23	61
17-Aug	25	29	30	29	30	23	23	21	22	31	34	27	28	30	34	43	51	59	54	24	23	29	49	39	59
18-Aug	100	67	39	45	76	89	64	47	44	45	41	48	47	51	62	74	68	57	56	49	51	56	58	54	100
19-Aug	49	45	59	50	40	52	51	47	39	50	45	49	48	63	52	43	42	34	22	18	18	17	18	18	63
20-Aug	17	18	19	19	21	19	20	21	24	26	27	35	37	53	56	62	69	57	28	20	19	19	19	17	69
21-Aug	15	12	10	8	9	13	14	15	68	53	58	52	46	75	60	75	52	31	41	63	65	29	18	37	75
22-Aug	21	18	48	51	42	22	27	48	56	56	51	49	67	53	54	26	26	39	50	38	74	94	68	22	94
23-Aug	14	16	15	14	39	49	35	35	37	44	33	44	37	37	37	34	28	30	25	25	27	23	21	19	49
24-Aug	24	24	54	36	42	44	52	45	41	40	32	34	47	46	46	52	57	85	82	32	52	46	16	14	85
25-Aug	15	16	16	18	20	20	14	16	23	26	28	32	32	30	31	35	29	27	24	26	32	31	47	32	47
26-Aug	29	33	30	30	32	29	27	30	28	28	30	31	27	29	29	32	27	25	18	15	14	19	27	54	54
27-Aug	107	81	48	52	91	75	57	69	40	62	82	78	77	75	81	37	27	19	17	21	20	18	19	17	107
28-Aug	15	15	16	16	16	15	16	17	20	28	26	29	41	41	45	42	36	21	17	17	18	16	15	17	45
29-Aug	17	16	17	17	16	17	17	17	18	25	C	29	34	28	31	31	26	32	45	33	68	51	42	36	68
30-Aug	31	36	28	22	27	22	28	30	22	25	56	47	58	56	52	54	97	51	36	28	36	44	UO	26	97
31-Aug	25	61	32	19	52	20	34	45	55	49	88	58	75	56	60	57	53	48	44	43	43	40	41	52	88
	107	93	87	71	91	89	71	69	76	83	88	85	93	85	81	88	97	85	94	63	92	94	68	58	

Diurnal Maximum

C - Calibration

UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS29
SURMONT 2
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT2 (AMS29)
AUGUST 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	7.9	0	0.7	0
H2S (ppb) Average	706	36	38	99.73	1	0	0.5	0
THC(ppm) Average	710	34	34	100	3	-	2.6	-
NO2 (ppb) Average	705	37	39	99.73	9	0	2.6	-
NO (ppb) Average	705	37	39	99.73	1.7	-	0.4	-
NOX (ppb) Average	705	37	39	99.73	9.6	-	3	-
PM2.5 (ug/m3) Average	741	3	3	100	349.5	56	152	12
Temperature 2 m (C) Average	744	0	0	100	27.8	-	20.3	-
Relative Humidity (%) Average	720	0	24	96.77	100.6	-	99.9	-
Wind Speed 10 m (km/h) Average	723	0	21	97.18	11	-	8	-
Wind Direction 10 m (deg) Average	723	0	21	97.18	-	-	-	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
AUGUST 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	0.24	0.4	-	0	0	0	0.1	0.3	0.5	7.9
H2S (ppb) Average	706	0.15	0.1	-	0	0.1	0.1	0.1	0.2	0.3	1
THC (ppm) Average	710	2.34	0.1	-	2.1	2.2	2.3	2.3	2.4	2.5	3
NO2 (ppb) Average	705	1.04	1	-	0.1	0.3	0.4	0.7	1.2	2.1	9
NO (ppb) Average	705	0.26	0.2	-	0.1	0.1	0.2	0.2	0.3	0.4	1.7
NOX (ppb) Average	705	1.3	1.1	-	0.3	0.5	0.7	1	1.5	2.6	9.6
PM2.5 (ug/m3) Average	741	33.87	47	-	1.2	4	7.5	18.3	43.5	66.8	349.5
Temperature 2 m (C) Average	744	15.84	4.8	-	3.7	10.4	12.2	15.2	19.5	22.4	27.8
Relative Humidity (%) Average	720	77.5	18	-	33.4	49.7	64.7	81.3	93.6	99	100.6
Wind Speed 10 m (km/h) Average	723	4.5	2	-	0	1	3	4	6	8	11
Wind Direction 10 m (deg) Average	723	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SURMONT 2 (AMS29)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
H2S, NO2	08 Aug 2023 11:00	08 Aug 2023 12:00	2	Maintenance - sample manifold cleaned
Relative Humidity	02 Aug 2023 05:00	02 Aug 2023 05:00	1	Sensor operated out of range
Relative Humidity	03 Aug 2023 07:00	03 Aug 2023 08:00	2	Sensor operated out of range
Relative Humidity	10 Aug 2023 20:00	11 Aug 2023 00:00	5	Sensor operated out of range
Relative Humidity	11 Aug 2023 02:00	11 Aug 2023 09:00	8	Sensor operated out of range
Relative Humidity	11 Aug 2023 22:00	12 Aug 2023 00:00	3	Sensor operated out of range
Relative Humidity	13 Aug 2023 02:00	13 Aug 2023 06:00	5	Sensor operated out of range
Wind Speed, Wind Direction	03 Aug 2023 04:00	29 Aug 2023 09:00	21	Flat line in sensor output signal

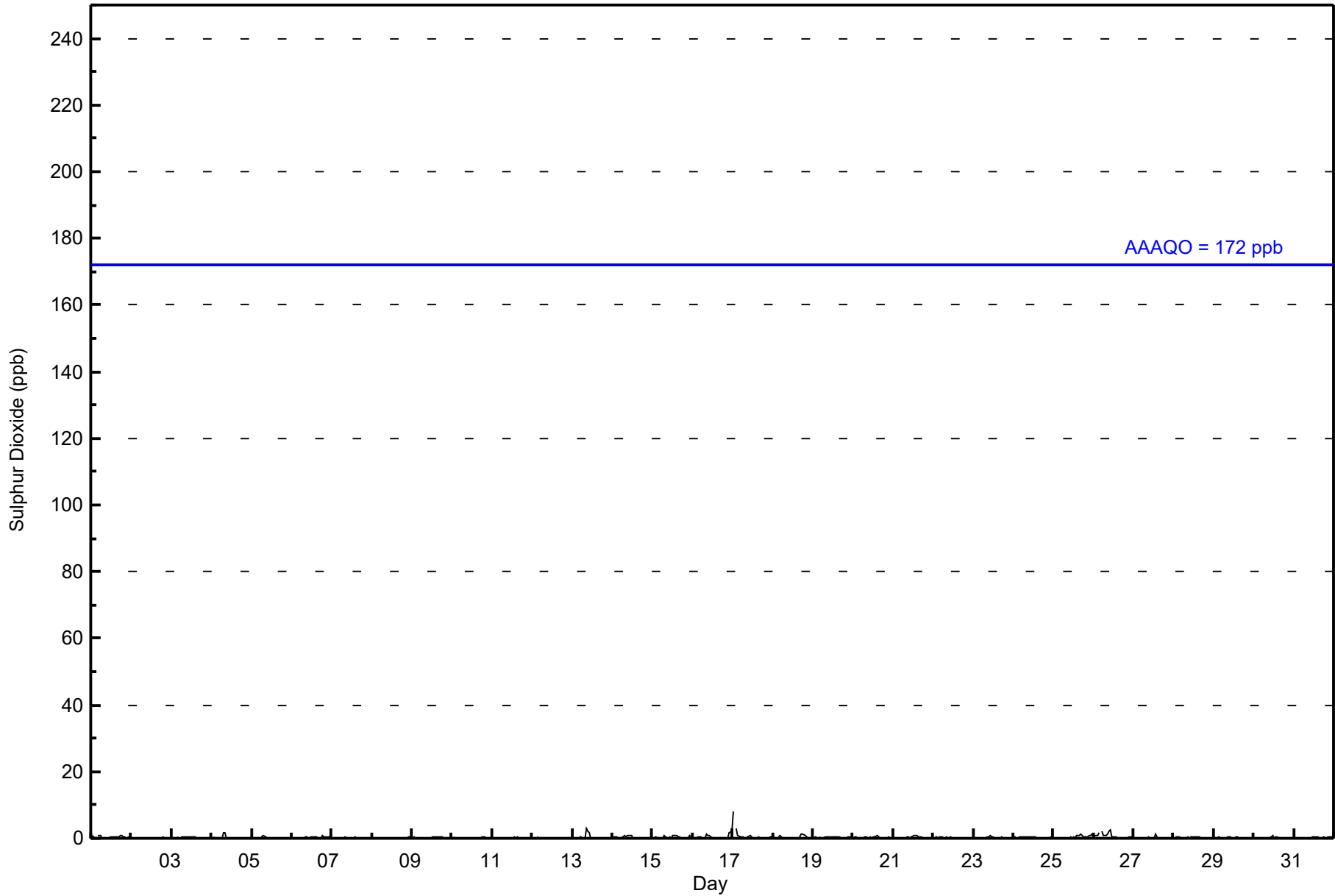


Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744							
Maximum Value: 7.9 ppb on Aug 17 01:00		Maximum Daily Average: 0.7 ppb on Aug 17		Hours of Data: 710														710									
Minimum Value: 0.0 ppb on Aug 1 07:00		Minimum Daily Average: 0.1 ppb on Aug 2		Hours of Missing Data: 34														34									
Maximum Diurnal Average: 0.5 ppb at hour 1		Minimum Diurnal Average: 0.1 ppb at hour 7		Hours of Calibration: 34														34									
Monthly Average: 0.24 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.1 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 2.0		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-Aug	0.7	0.3	0.0	Z	0.7	0.9	0.0	0.0	0.0	0.0	0.1	0.4	0.6	0.6	0.5	0.6	0.5	0.7	0.7	0.4	0.4	0.0	0.3	0.2	0.4	0.9	
2-Aug	0.2	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	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
3-Aug	0.2	0.1	0.1	0.1	0.3	Z	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
4-Aug	Z	0.2	0.2	0.0	0.2	0.2	0.0	1.6	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	
5-Aug	0.0	Z	0.1	0.2	0.2	0.2	0.3	0.8	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	
6-Aug	0.0	0.0	Z	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.2	0.5	0.4	0.4	0.4	0.3	0.0	0.1	0.9	0.6	0.5	0.3	0.3	0.2	0.3	0.9	
7-Aug	0.1	0.0	0.1	Z	0.1	0.2	0.0	0.2	0.2	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	
8-Aug	0.3	0.1	0.1	0.0	Z	0.0	0.0	0.0	0.1	0.1	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.5	0.1	0.5	
9-Aug	0.0	0.2	0.2	0.1	0.1	Z	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.2	0.1	0.2	0.0	0.1	0.2	0.6	
10-Aug	Z	0.4	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.1	0.4	
11-Aug	0.0	Z	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	
12-Aug	0.1	0.1	Z	0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.1	0.2	
13-Aug	0.0	0.0	0.1	Z	0.2	0.2	0.0	0.0	3.0	2.1	1.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	3.0	
14-Aug	0.3	0.2	0.6	0.6	Z	0.3	0.2	0.7	0.5	0.7	1.0	0.7	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.0	
15-Aug	0.0	0.0	0.2	0.0	0.0	Z	0.0	0.8	0.3	0.2	0.4	0.1	0.9	0.8	0.9	0.3	0.3	0.2	0.1	0.0	0.1	0.2	0.7	0.6	0.3	0.9	
16-Aug	Z	0.2	0.2	0.3	0.3	0.3	0.1	0.2	1.3	0.8	0.7	0.4	0.2	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	1.6	2.3	0.4	2.3	
17-Aug	7.9	Z	3.1	0.7	0.3	0.4	0.2	0.1	0.2	0.3	0.7	0.4	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.4	0.4	0.7	7.9	
18-Aug	0.9	0.4	Z	0.5	0.7	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	1.4	1.4	1.0	0.3	0.2	0.2	0.2	0.4	1.4	
19-Aug	0.2	0.3	0.3	Z	0.3	0.1	0.1	0.4	0.5	0.3	0.4	0.3	0.6	0.2	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.2	0.3	0.6	
20-Aug	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.6	0.6	0.3	0.1	0.2	0.1	0.1	0.0	0.3	0.1	0.1	0.2	0.6	
21-Aug	0.0	0.0	0.1	0.0	0.0	Z	0.0	0.0	0.4	0.3	0.2	0.3	0.7	0.9	0.8	0.4	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.9	
22-Aug	Z	0.6	0.4	0.1	0.2	0.5	0.0	0.1	0.3	0.1	0.3	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.6	
23-Aug	0.0	Z	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.4	0.7	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.7	
24-Aug	0.3	0.3	Z	0.2	0.3	0.5	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.0	0.2	0.5	
25-Aug	0.1	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.8	0.7	1.3	0.7	0.5	0.4	0.4	0.9	0.9	1.1	0.4	1.3	
26-Aug	0.4	0.8	0.8	1.9	Z	2.0	0.6	0.7	1.3	2.3	2.6	0.3	0.3	0.4	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.7	2.6	
27-Aug	0.2	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.2	0.3	0.2	0.1	0.2	1.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.3	
28-Aug	Z	0.5	0.4	0.3	0.1	0.1	0.1	0.0	0.2	0.1	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.2	0.5	
29-Aug	0.0	Z	0.3	0.2	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.3	0.3	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.3	
30-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.7	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	
31-Aug	0.0	0.0	0.0	Z	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4
																								Diurnal Average			
																								Diurnal Maximum			
																								0.5 7.9			
																								0.2 0.8			
																								0.3 3.1			
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																								0.1 0.9			
																								0.2 1.6			
																								0.2 2.3			
																								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 - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Surmont 2 - August 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
Surmont 2 - August 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	14	9	4	18	40	33	29	20	27	55	169	163	55	30	14	691
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	11	14	9	4	18	40	33	29	20	27	55	169	163	55	30	14	691

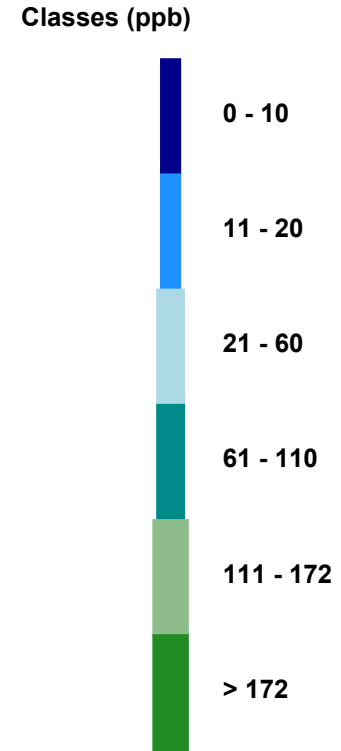
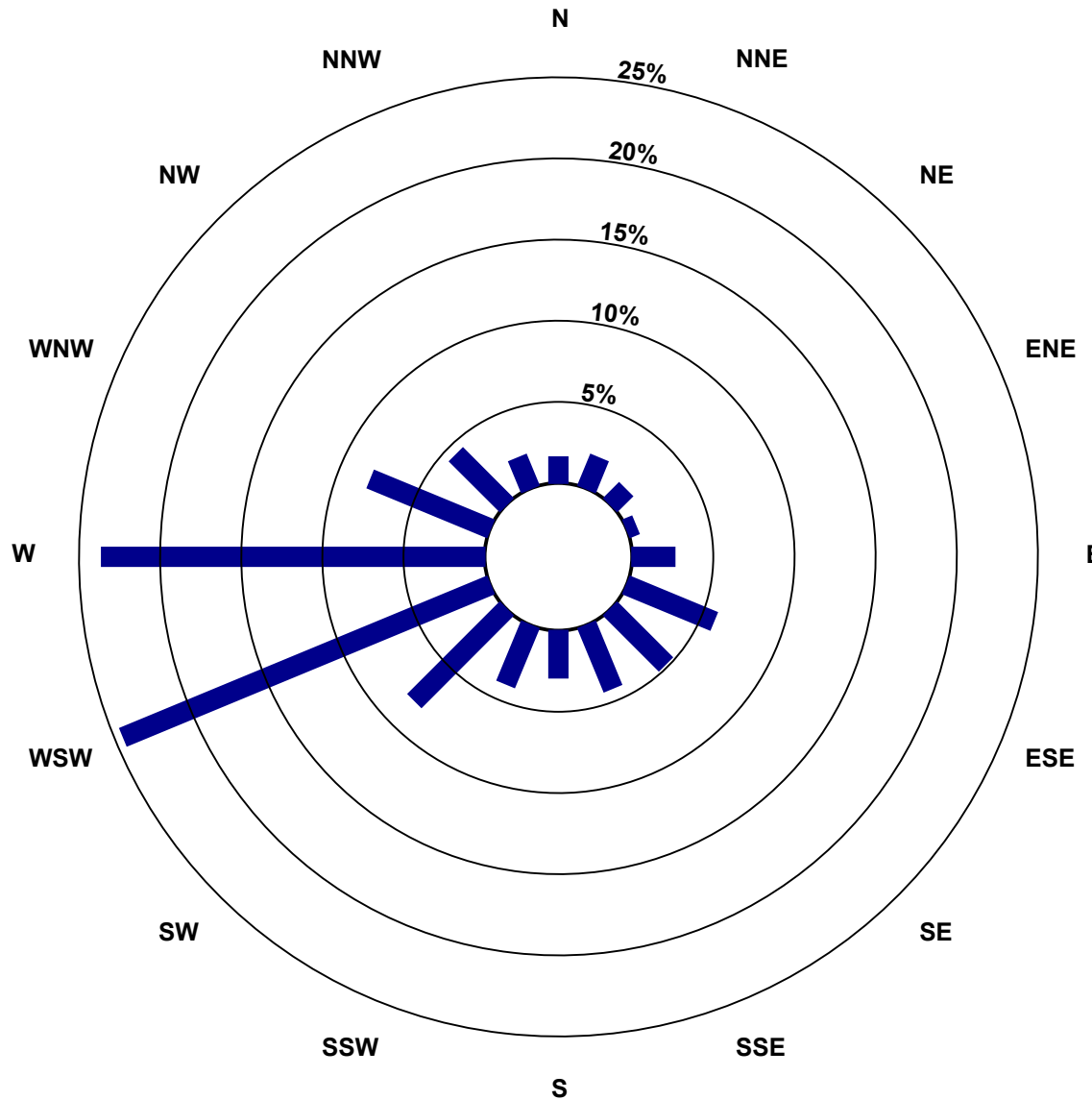
Total Number of Valid Hours: 691

Total Number of Hours: 744

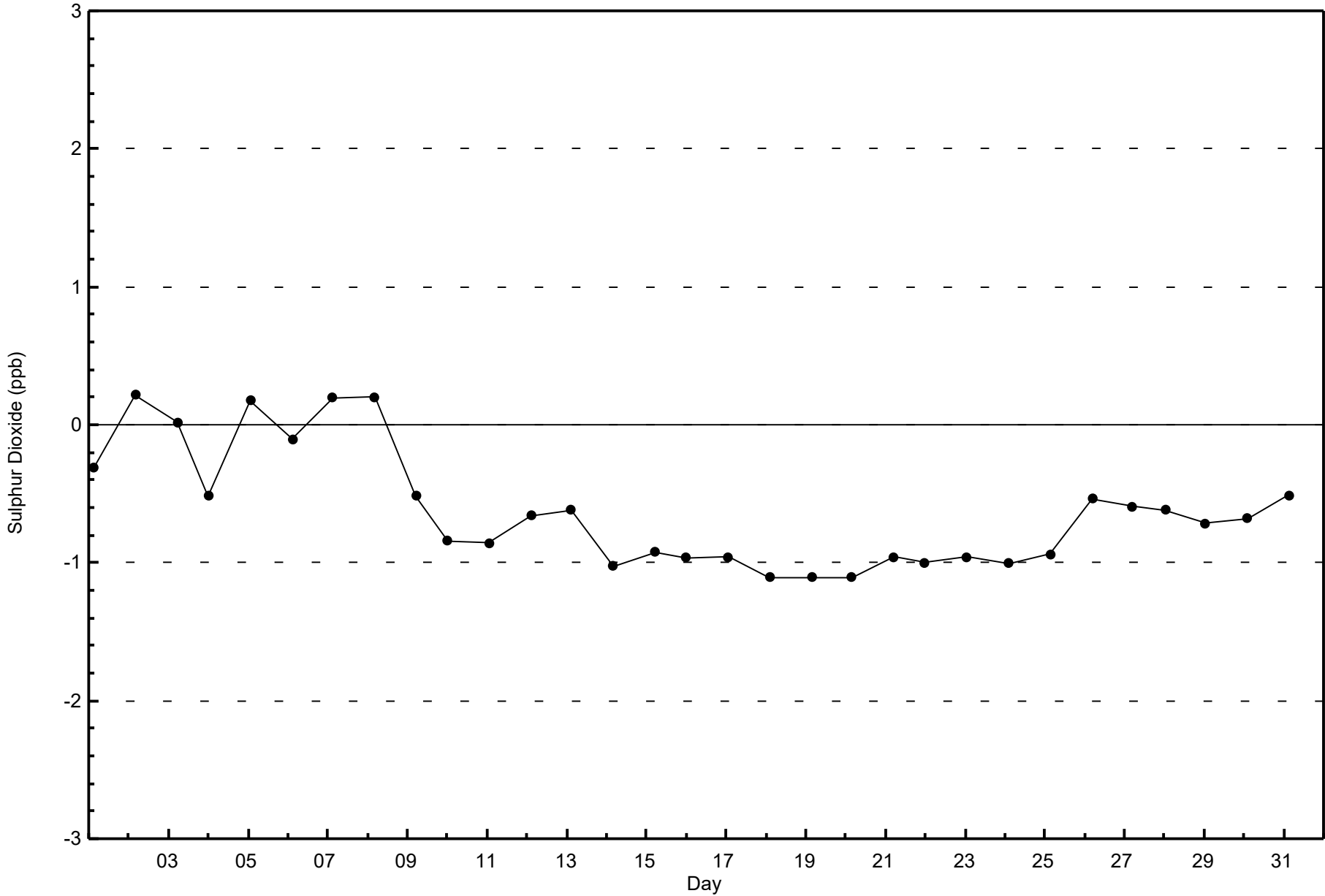


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Surmont 2



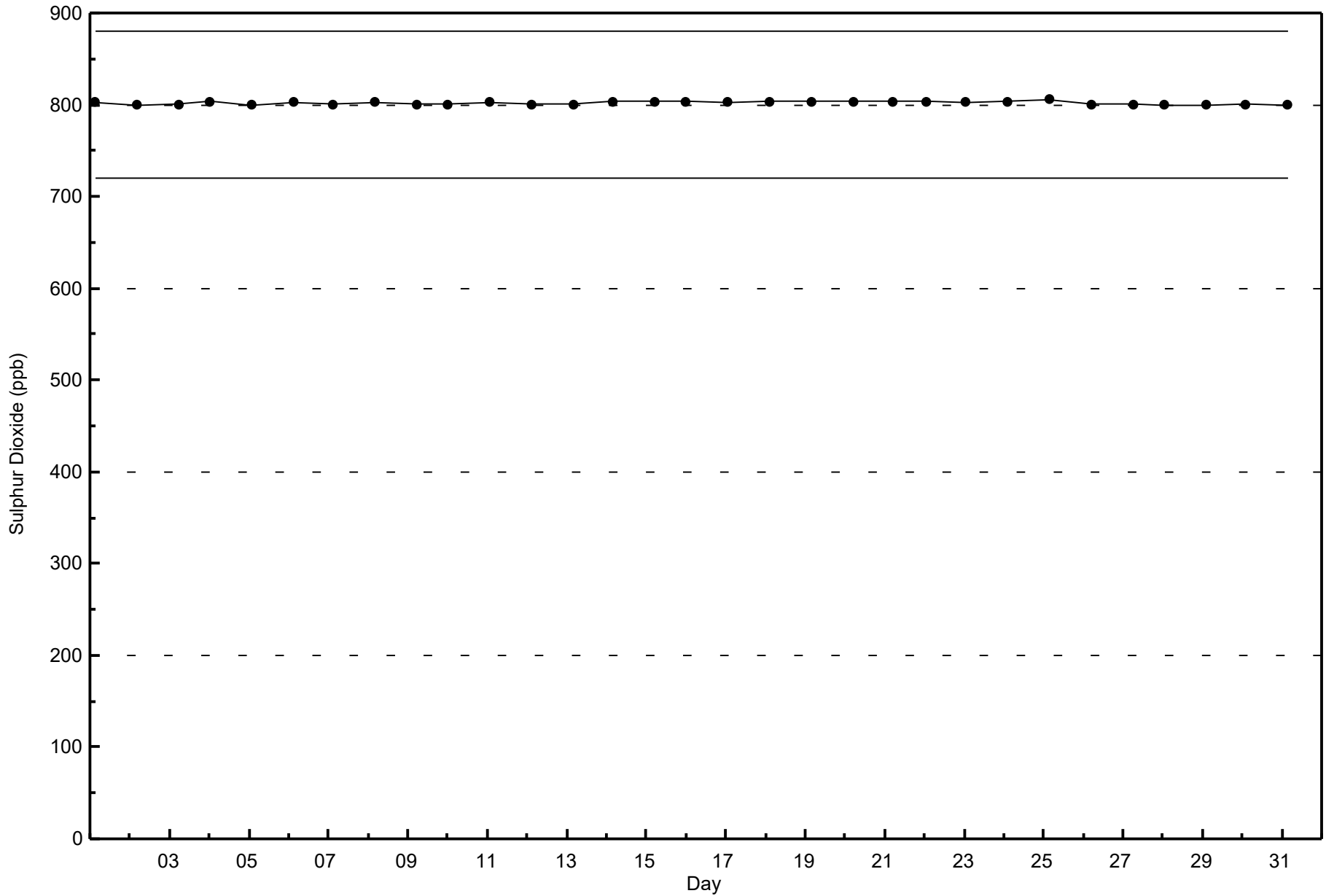
Total Number of Valid Hours: 691





Wood Buffalo Environmental Association
Span Responses

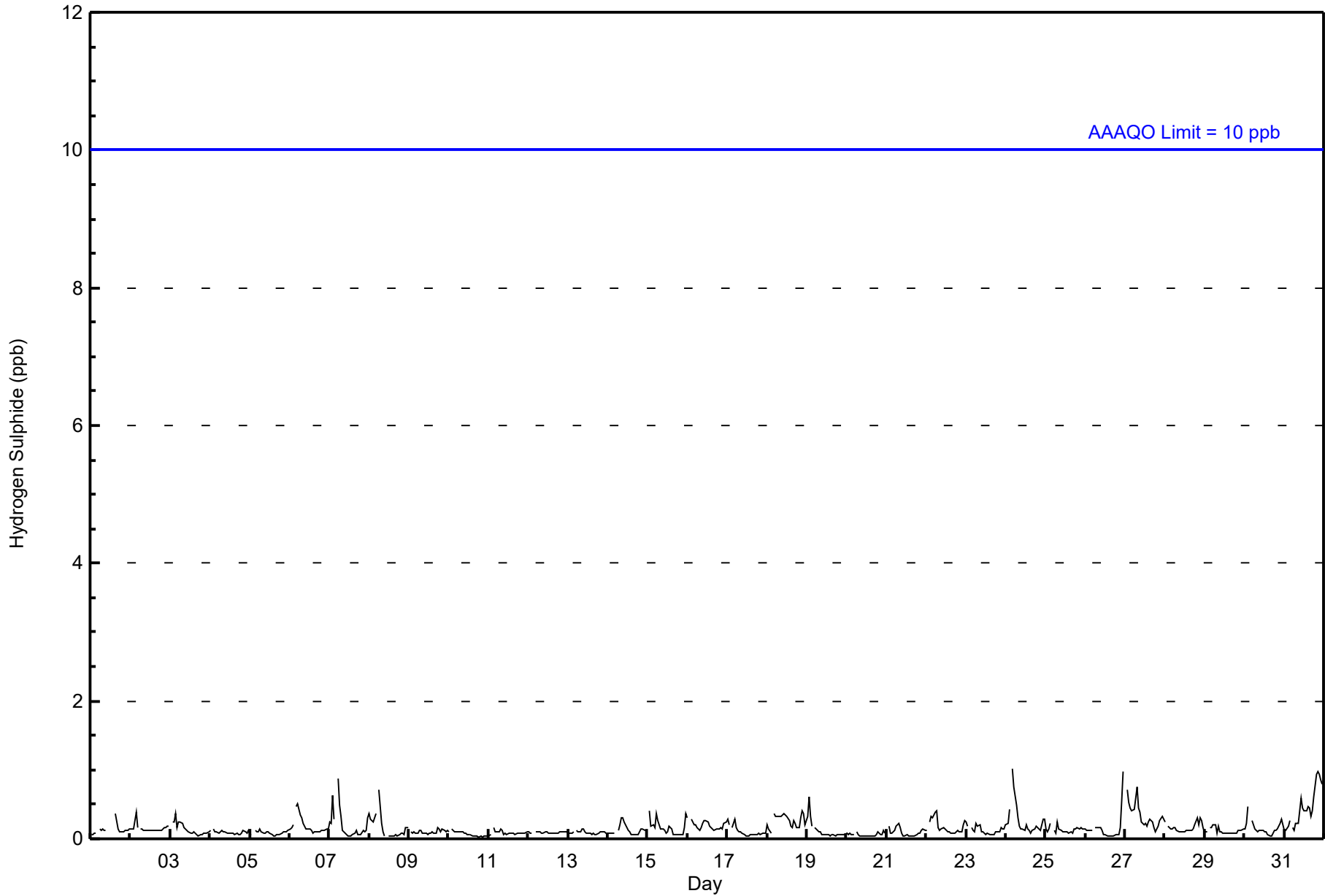
Sulphur Dioxide (SO₂) - ppb
Surmont 2 - August 2023





Wood Buffalo Environmental Association
Hourly Averages

Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - August 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**

**Hydrogen Sulphide (H₂S) - ppb
Surmont 2 - August 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	12	14	9	4	18	43	34	29	18	28	55	169	157	54	29	14	687
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	12	14	9	4	18	43	34	29	18	28	55	169	157	54	29	14	687

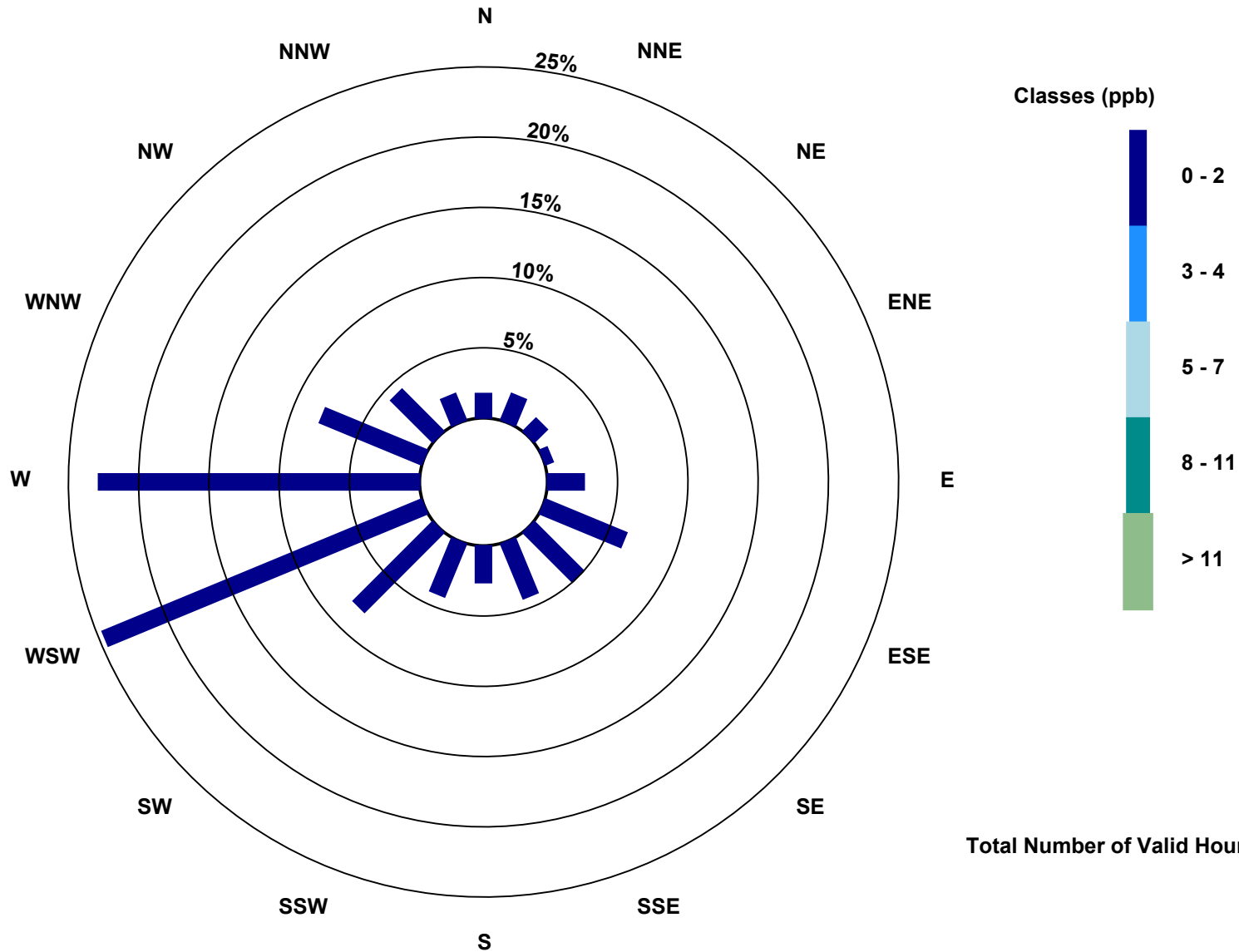
Total Number of Valid Hours: 687

Total Number of Hours: 744

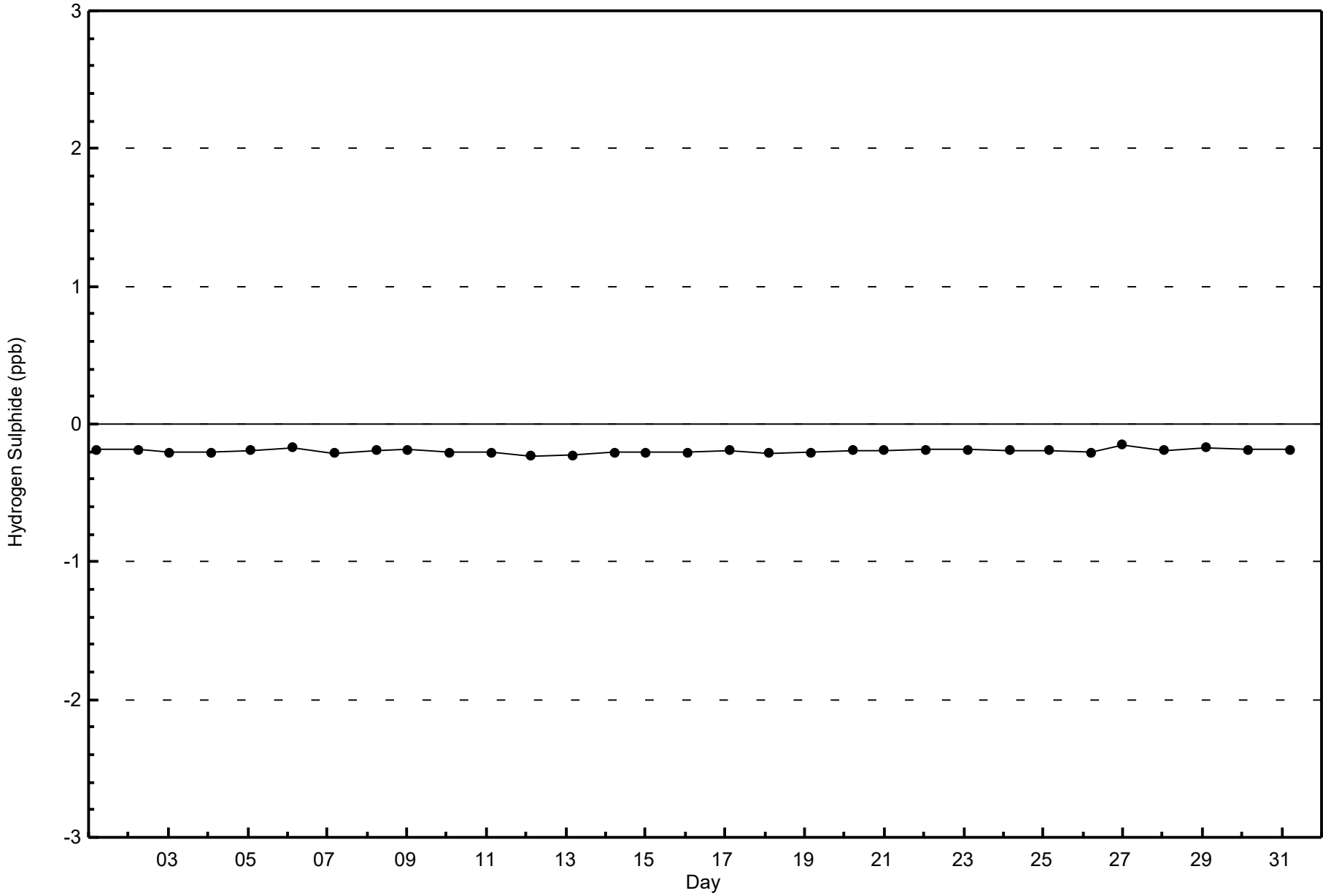


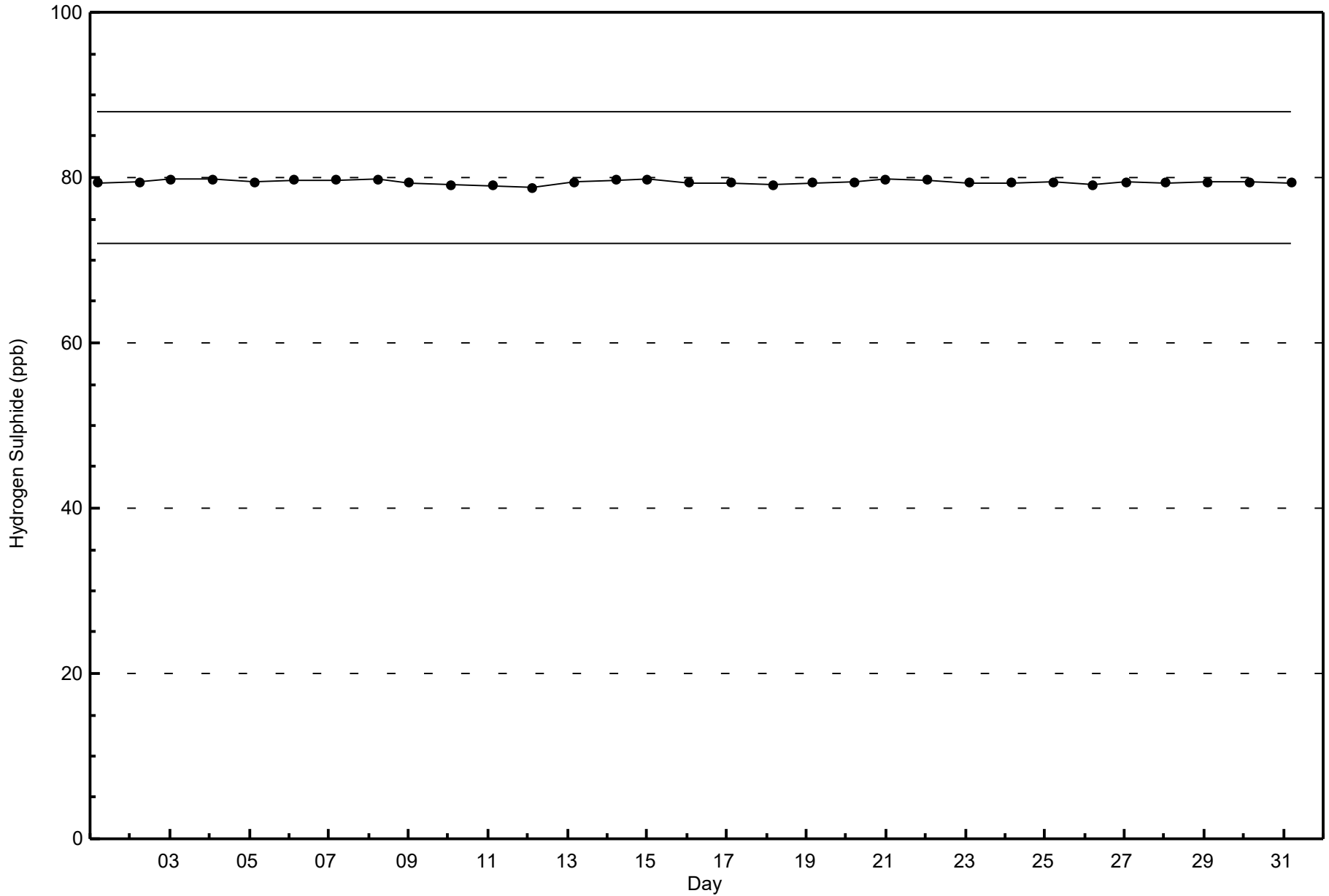
Wood Buffalo Environmental Association
Wind Rose Aug 2023

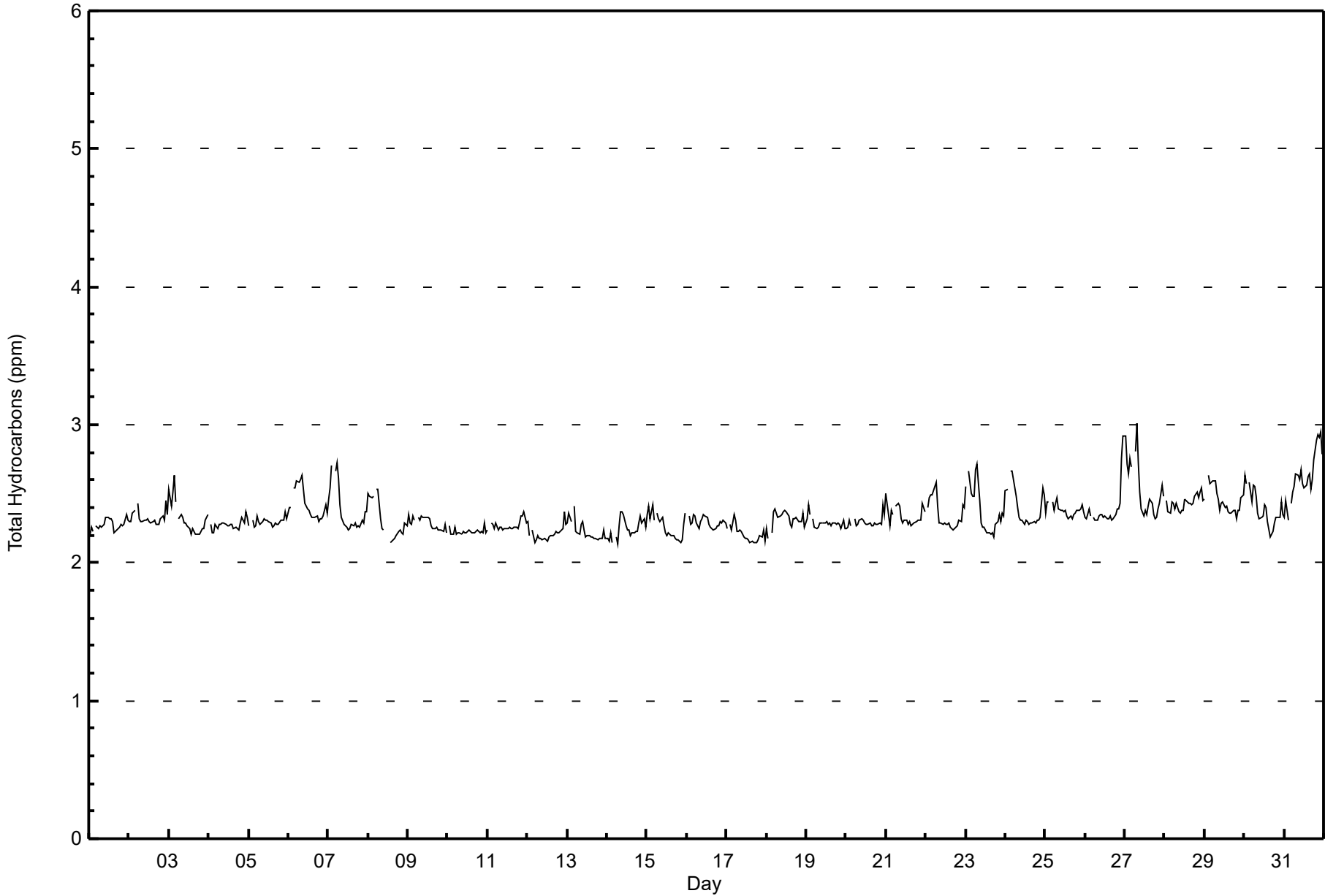
Hydrogen Sulphide (H₂S) - ppb
Surmont 2



Total Number of Valid Hours: 687









Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Surmont 2 - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	710	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: 710

Total Number of Hours: 744



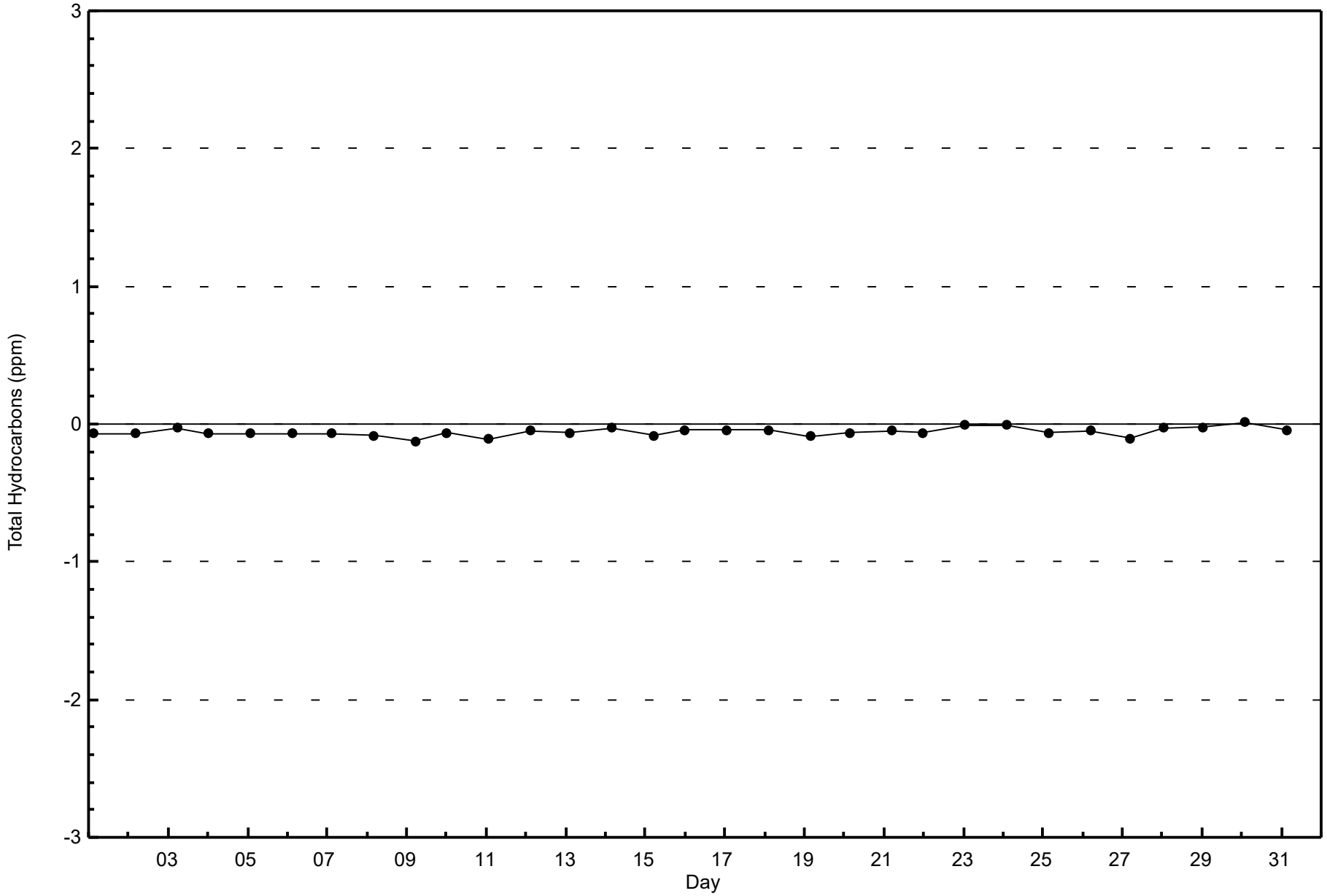
**Wood Buffalo Environmental Association
Frequency Distribution**

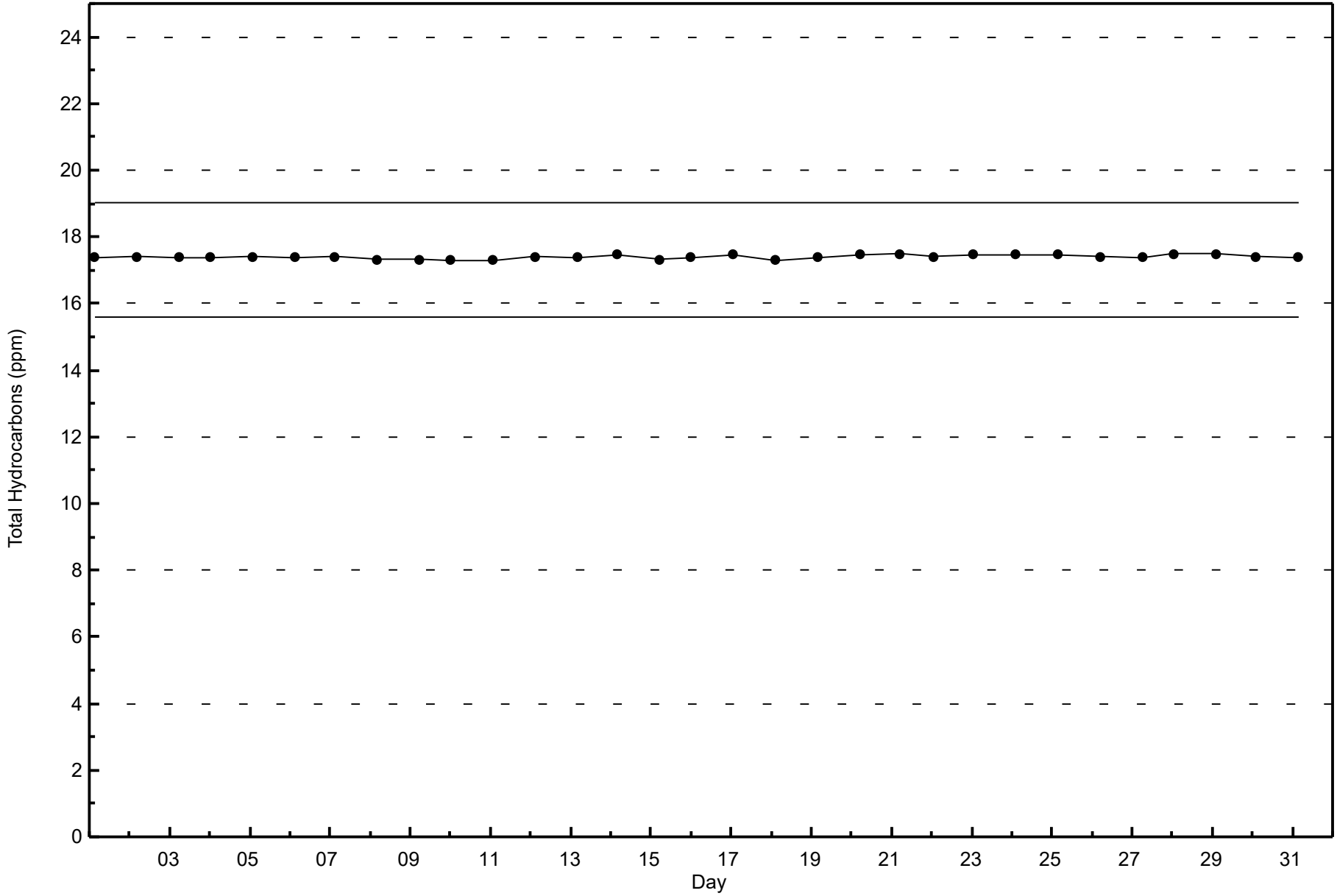
**Total Hydrocarbons (THC) - ppm
Surmont 2 - August 2023**

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	14	9	4	18	40	33	29	20	27	55	169	163	55	30	14	691
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	14	9	4	18	40	33	29	20	27	55	169	163	55	30	14	691

Total Number of Valid Hours: 691

Total Number of Hours: 744







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitric Oxide (NO) - ppb

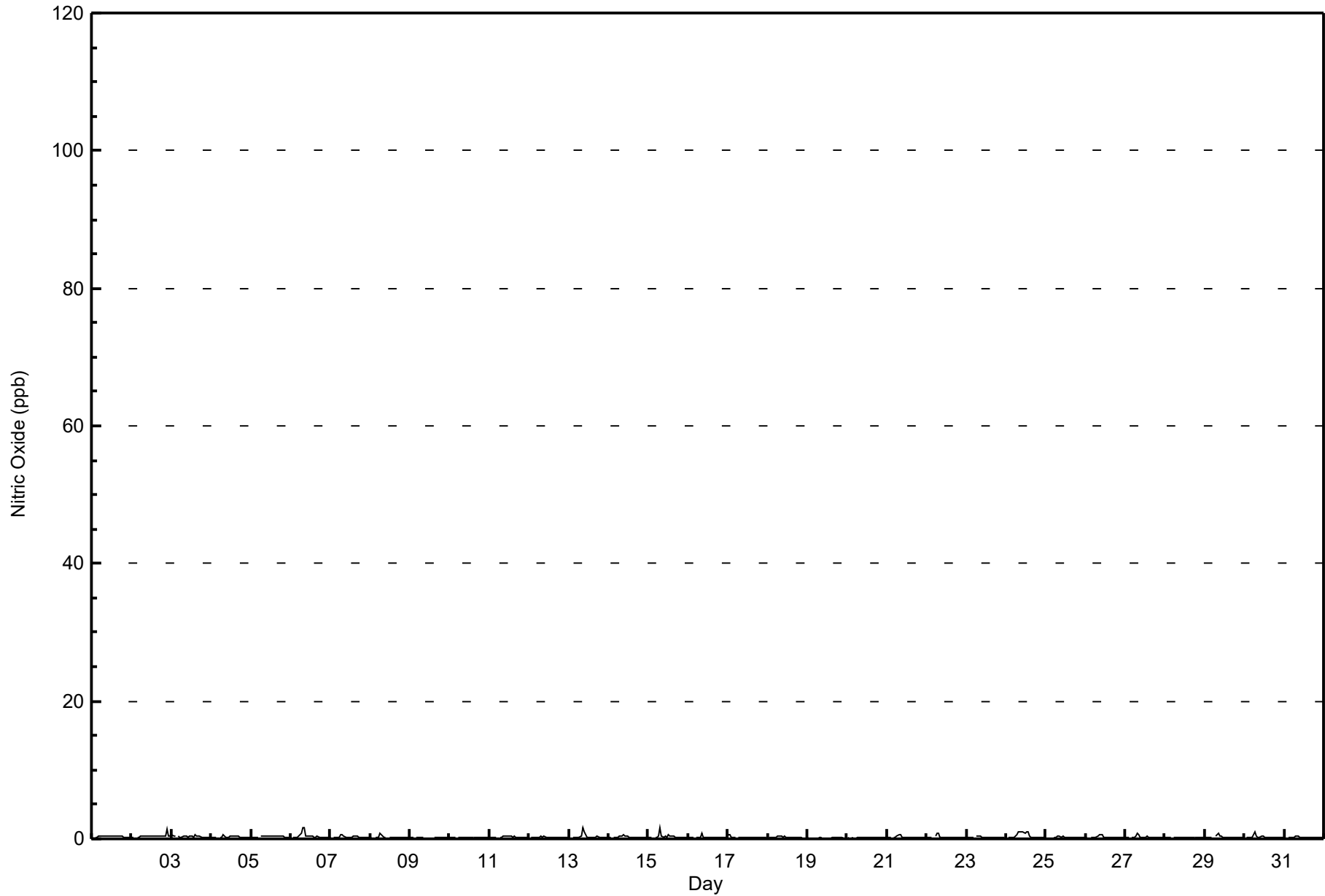
Surmont 2 - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:																744																											
Maximum Value: 1.7 ppb on Aug 6 09:00		Maximum Daily Average: 0.4 ppb on Aug 24		Hours of Data:																705																													
Minimum Value: 0.1 ppb on Aug 19 05:00		Minimum Daily Average: 0.1 ppb on Aug 19		Hours of Missing Data:																39																													
Maximum Diurnal Average: 0.5 ppb at hour 8		Minimum Diurnal Average: 0.2 ppb at hour 4		Hours of Calibration:																37																													
Monthly Average: 0.26 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.1 Q ₁ = 0.2 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.4 P ₉₉ = 1.0		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-Aug	0.2	Z	0.2	0.3	0.3	0.3	0.3	0.5	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.5																					
2-Aug	0.2	0.2	Z	0.2	0.2	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	1.4	0.4	0.4	0.4	0.4	0.4	1.4																					
3-Aug	0.6	0.4	0.3	Z	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6																					
4-Aug	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.5	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	0.2	0.2	0.2	0.2	0.2	0.2	0.5																					
5-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.5	0.4	0.3	0.4	0.3	0.4	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	0.5																					
6-Aug	Z	0.2	0.2	0.2	0.2	0.4	0.9	1.6	1.7	0.5	0.4	0.5	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	1.7																						
7-Aug	0.2	Z	0.2	0.1	0.2	0.2	0.6	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.6																						
8-Aug	0.2	0.2	Z	0.2	0.2	0.3	0.9	0.5	0.2	0.2	M	M	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	0.9																						
9-Aug	0.2	0.2	0.2	Z	0.2	0.2	0.2	0.2	0.2	C	C	C	C	C	C	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2																						
10-Aug	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-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.3	0.3	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.5																						
12-Aug	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4																						
13-Aug	0.2	Z	0.2	0.2	0.2	0.2	0.3	0.4	1.6	1.0	0.7	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.6																						
14-Aug	0.2	0.2	Z	0.2	0.2	0.3	0.3	0.3	0.4	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.6																						
15-Aug	0.1	0.2	0.1	Z	0.1	0.2	0.5	1.6	0.5	0.2	0.3	0.3	0.5	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	1.6																						
16-Aug	0.2	0.2	0.2	0.2	Z	0.2	0.3	0.3	0.7	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.7																						
17-Aug	0.6	0.6	0.2	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.6																						
18-Aug	Z	0.2	0.2	0.1	0.2	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5																						
19-Aug	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	0.1	0.1																						
20-Aug	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3																						
21-Aug	0.1	0.1	0.1	Z	0.1	0.1	0.4	0.7	0.5	0.3	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	0.7																						
22-Aug	0.1	0.1	0.1	0.1	Z	0.3	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.8																						
23-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.4	0.3	0.5	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	0.5																						
24-Aug	Z	0.2	0.2	0.2	0.2	0.2	0.6	1.0	1.0	1.0	1.0	0.8	0.9	1.0	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0																						
25-Aug	0.1	Z	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.2	0.3	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	0.4																						
26-Aug	0.2	0.1	Z	0.1	0.1	0.2	0.2	0.4	0.5	0.6	0.6	0.2	0.2	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	0.6																						
27-Aug	0.2	0.2	0.2	Z	0.2	0.2	0.4	0.8	0.6	0.3	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	0.8																						
28-Aug	0.1	0.1	0.1	0.1	Z	0.1	0.2	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	0.2	0.2	0.2	0.2	0.2	0.2	0.3																						
29-Aug	0.2	0.2	0.2	0.2	0.2	Z	0.4	0.5	0.8	0.3	0.4	0.3	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	0.8																						
30-Aug	Z	0.1	0.1	0.1	0.1	0.5	0.9	0.5	0.2	0.2	0.3	0.4	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	0.9																						
31-Aug	0.2	Z	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3																						
																								0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	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	Diurnal Average
																								0.6	0.6	0.3	0.3	0.4	0.5	0.9	1.6	1.7	1.0	1.0	0.8	0.9	1.0	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4	1.4	0.4	0.4	Diurnal Maximum
Z - zerospan																								C - Calibration								M - Maintenance																	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Surmont 2 - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Surmont 2 - August 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 - August 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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685
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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685

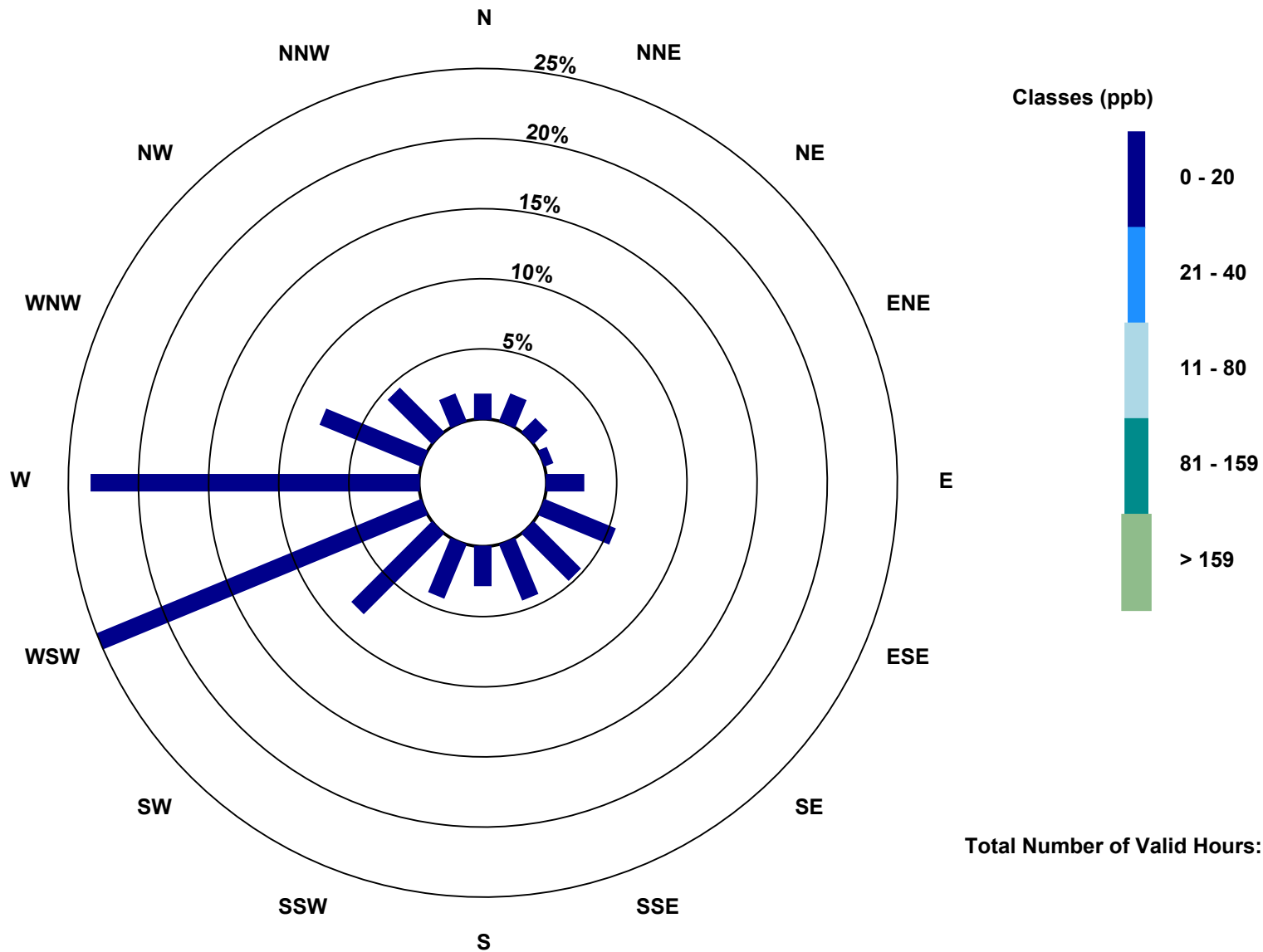
Total Number of Valid Hours: 685

Total Number of Hours: 744

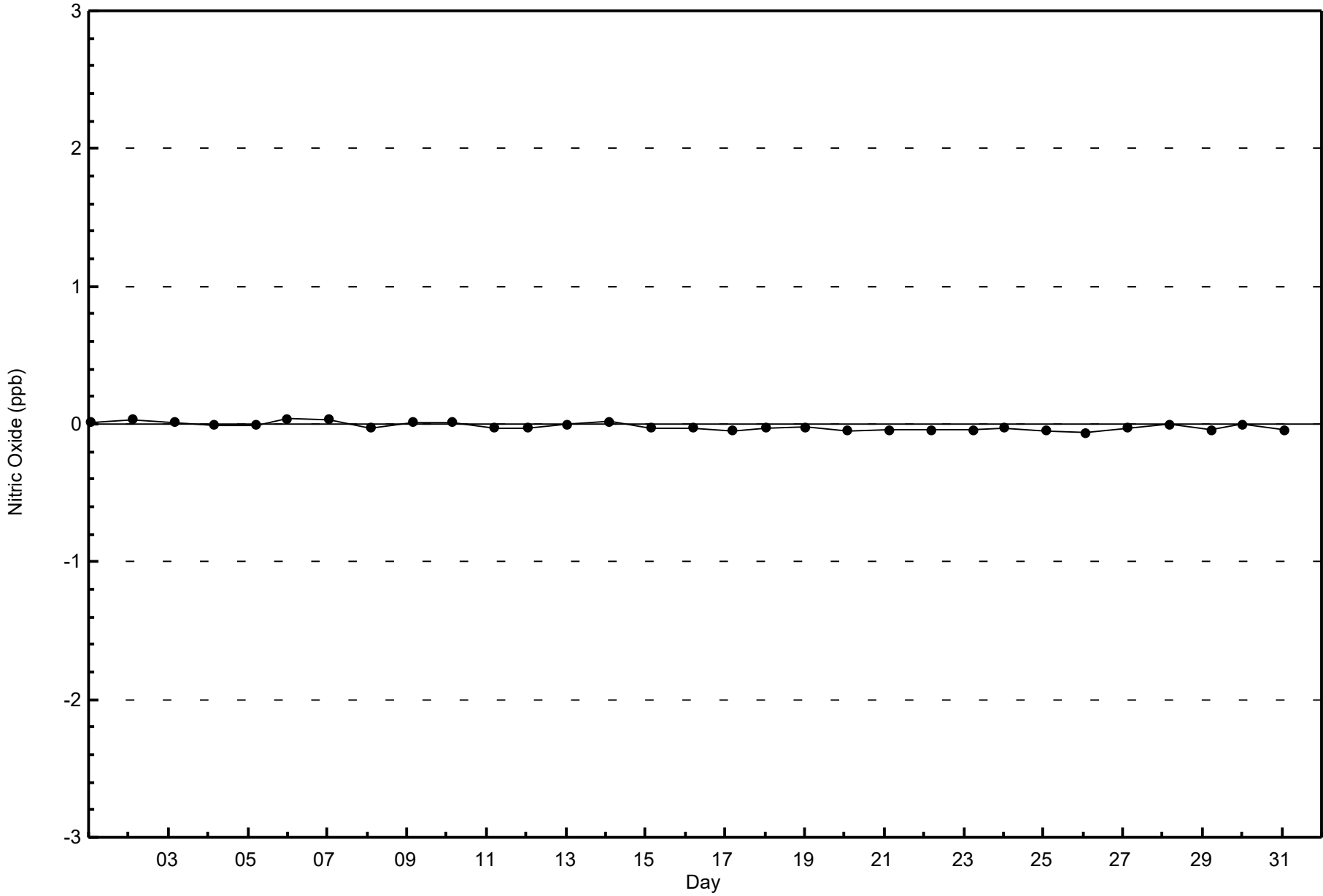


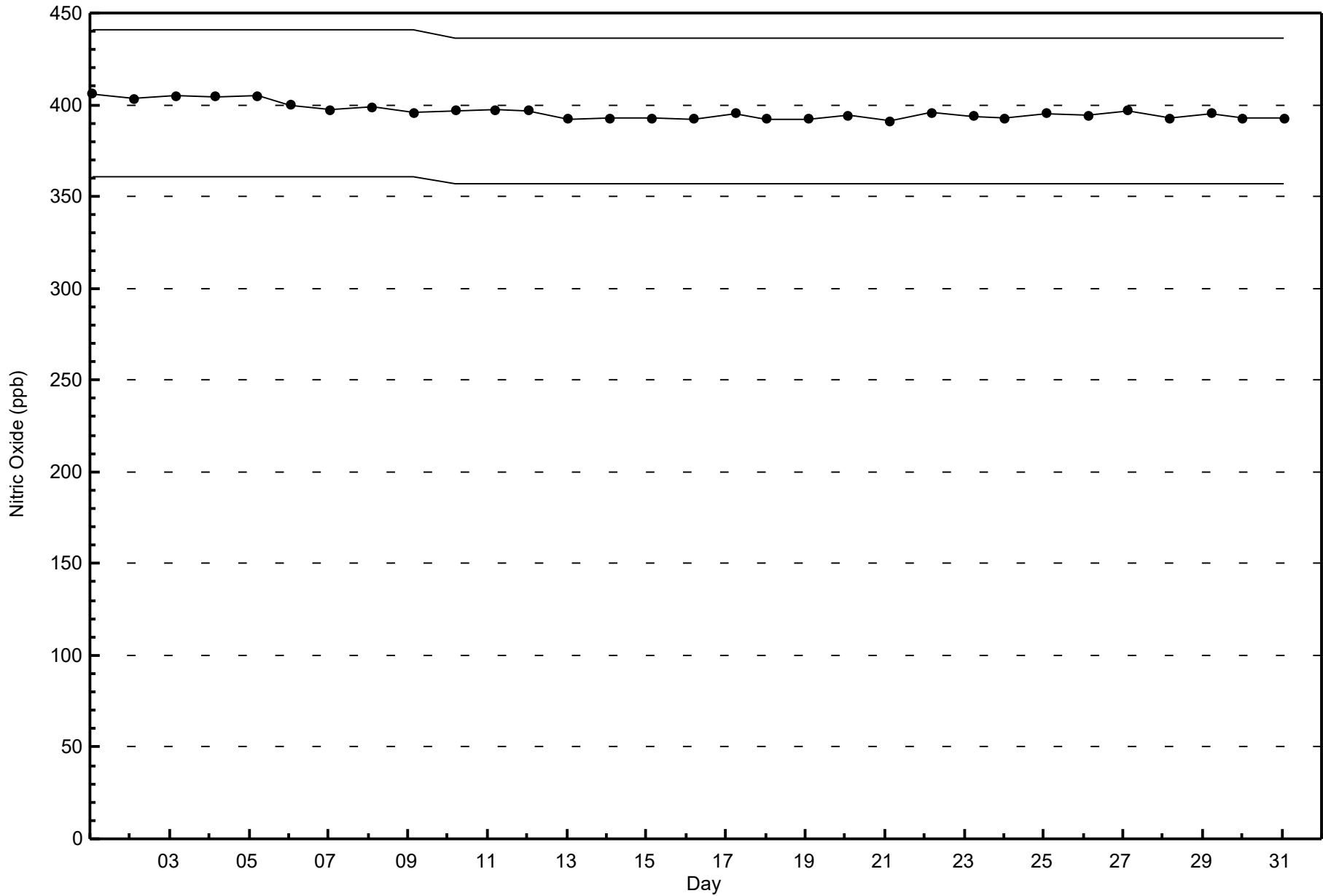
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Surmont 2



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

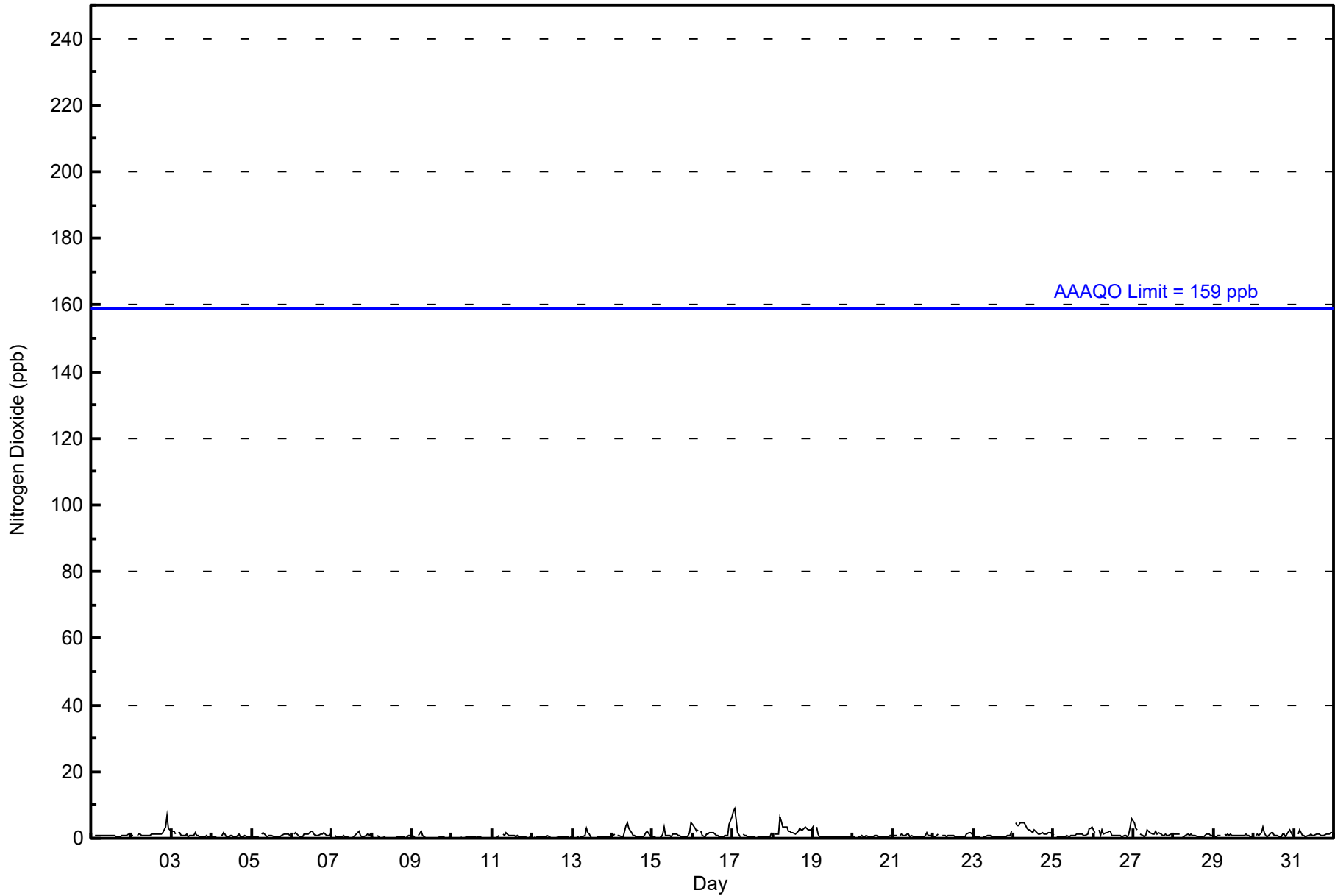
Surmont 2 - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0																		Hours in Service:	744				
Maximum Value: 9.0 ppb on Aug 17 02:00		Maximum Daily Average: 2.6 ppb on Aug 18																	Hours of Data:	705						
Minimum Value: 0.1 ppb on Aug 7 11:00		Minimum Daily Average: 0.3 ppb on Aug 10																	Hours of Missing Data:	39						
Maximum Diurnal Average: 1.6 ppb at hour 24		Minimum Diurnal Average: 0.7 ppb at hour 19																	Hours of Calibration:	37						
Monthly Average: 1.04 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.2 P ₉₀ = 2.1 P ₉₉ = 5.0																	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-Aug	0.9	Z	0.7	0.7	0.7	0.8	0.8	1.0	0.8	0.8	1.0	1.0	0.9	0.7	0.7	0.6	0.6	0.6	0.7	0.9	1.0	0.7	1.1	0.8	0.8	1.1
2-Aug	0.8	0.8	Z	0.7	1.2	1.1	0.9	0.7	0.8	0.8	1.0	1.0	1.1	1.1	1.2	1.1	1.1	1.1	1.2	1.6	3.2	6.8	2.9	2.4	1.5	6.8
3-Aug	2.3	2.3	1.3	Z	1.5	1.5	1.0	1.0	0.9	1.1	0.6	0.8	0.7	0.8	1.6	0.9	0.8	0.6	0.5	0.5	0.4	0.9	0.3	0.4	1.0	2.3
4-Aug	0.4	0.6	0.5	0.4	Z	0.8	0.7	1.5	1.2	0.6	0.5	0.8	0.8	0.5	0.4	0.5	1.1	0.4	0.4	0.3	0.7	0.6	0.4	0.6	0.6	1.5
5-Aug	0.5	0.5	0.6	0.5	0.6	Z	1.1	1.5	1.0	0.6	0.8	0.9	0.7	0.5	0.5	0.6	0.5	0.4	0.8	1.3	1.2	1.2	1.1	0.8	0.8	1.5
6-Aug	Z	1.4	1.5	1.3	0.8	0.5	0.6	1.1	1.3	1.4	1.2	2.2	2.0	1.1	1.0	1.0	1.1	1.4	1.5	1.1	1.0	0.9	2.7	1.3	2.7	
7-Aug	2.0	Z	0.7	0.6	0.3	0.3	0.4	0.9	0.6	0.3	0.1	0.2	0.2	0.4	1.0	1.5	2.0	0.9	0.6	0.6	0.9	1.1	0.7	1.4	0.8	2.0
8-Aug	0.6	0.5	Z	0.7	0.3	0.2	0.2	0.4	0.2	0.2	M	M	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.7	1.0	0.4	1.0
9-Aug	0.7	0.4	0.2	Z	0.9	2.1	1.0	0.3	0.3	C	C	C	C	C	C	0.2	0.3	0.3	0.5	0.4	0.2	0.2	0.4	0.4	--	2.1
10-Aug	0.2	0.2	0.2	0.2	Z	0.3	0.2	0.2	0.4	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	0.3	0.4
11-Aug	0.2	0.2	0.2	0.6	0.9	Z	1.1	1.0	1.5	1.1	0.8	0.7	0.8	0.8	0.5	0.7	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.7	0.6	1.5
12-Aug	Z	0.4	0.2	0.4	0.3	0.3	0.4	0.5	0.4	0.7	0.5	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.7
13-Aug	0.2	Z	0.6	0.4	0.2	0.6	0.4	0.7	2.8	1.6	1.1	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.6	2.8
14-Aug	0.7	1.2	Z	0.8	0.7	0.6	0.4	2.1	4.0	4.8	3.1	1.7	0.7	0.8	0.5	0.4	0.4	0.3	0.3	0.8	1.5	2.1	1.0	0.5	1.3	4.8
15-Aug	0.6	0.3	0.5	Z	0.4	0.6	1.2	3.5	0.9	0.7	1.0	0.6	1.2	1.2	1.1	0.7	0.7	0.5	0.3	0.3	0.6	0.7	1.7	4.8	1.0	4.8
16-Aug	4.3	3.1	2.3	2.7	Z	2.2	0.9	0.5	1.4	1.1	1.6	1.5	1.6	1.1	0.8	0.7	0.4	0.5	0.5	0.7	1.0	1.0	4.2	6.3	1.8	6.3
17-Aug	8.1	9.0	5.3	1.5	0.6	Z	1.1	0.9	0.8	0.6	0.6	0.4	0.4	0.4	0.2	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.6	1.6	1.5	9.0
18-Aug	Z	1.2	1.3	1.4	6.3	5.0	3.2	3.2	3.3	2.3	2.0	1.8	1.9	1.4	1.6	2.1	2.9	2.7	2.6	3.2	3.0	2.6	2.7	2.4	2.6	6.3
19-Aug	3.7	Z	3.6	1.4	0.6	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.7	3.7
20-Aug	0.4	0.5	Z	0.6	0.6	0.7	0.6	0.6	0.7	0.4	0.4	0.4	0.6	0.8	0.7	0.4	0.3	0.3	0.3	0.6	0.5	0.5	0.7	0.6	0.5	0.8
21-Aug	1.0	0.7	0.7	Z	0.7	1.2	1.0	1.0	1.4	1.1	0.6	0.7	0.6	0.6	0.4	0.4	0.6	0.5	0.5	1.0	1.5	0.8	0.9	1.0	0.8	1.5
22-Aug	0.5	0.5	0.8	1.2	Z	1.0	0.7	0.9	0.6	0.7	0.7	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	1.1	1.5	1.7	1.2	0.8	1.7
23-Aug	0.7	0.5	0.4	0.6	0.5	Z	0.5	0.4	1.0	0.7	0.7	0.6	0.5	0.4	0.3	0.4	0.4	0.3	0.4	0.5	0.8	0.8	0.8	2.2	0.6	2.2
24-Aug	Z	4.8	4.0	3.8	4.5	4.6	4.7	3.9	2.9	2.6	2.7	1.8	2.7	2.3	1.7	1.1	1.4	1.6	1.1	1.1	1.1	1.6	1.5	0.9	2.5	4.8
25-Aug	1.1	Z	0.6	0.4	0.5	0.5	0.3	0.6	0.8	0.5	0.8	0.7	0.9	0.9	1.2	1.1	1.3	1.2	0.7	0.7	1.2	2.9	2.8	3.6	1.1	3.6
26-Aug	2.6	1.7	Z	2.5	0.9	2.4	1.2	1.5	1.7	2.0	2.1	0.8	0.8	0.9	0.7	0.8	0.7	0.4	1.0	0.7	0.6	1.2	3.4	6.0	1.6	6.0
27-Aug	4.8	3.1	2.5	Z	1.4	1.0	0.5	0.9	2.5	2.0	1.5	1.3	1.4	2.2	1.3	1.5	1.3	0.8	0.7	1.1	1.0	1.0	1.2	1.1	1.6	4.8
28-Aug	1.1	1.2	1.2	1.2	Z	0.6	0.6	0.7	1.2	0.9	1.3	1.0	0.7	0.7	0.6	0.6	0.6	0.5	0.6	1.1	1.2	1.1	0.8	0.7	0.9	1.3
29-Aug	0.7	0.5	0.7	1.0	1.0	Z	1.1	0.8	1.3	0.9	1.2	0.9	0.9	0.9	1.0	0.9	0.8	0.8	0.8	1.1	0.9	0.7	0.6	0.5	0.9	1.3
30-Aug	Z	1.0	1.1	1.0	1.5	3.6	1.8	0.7	0.5	0.7	1.5	1.7	1.0	1.0	1.0	0.5	0.3	1.4	1.1	0.6	1.2	2.4	1.6	1.0	1.2	3.6
31-Aug	0.3	Z	1.1	2.6	1.8	0.9	0.7	0.5	0.9	0.9	1.1	1.0	1.0	1.2	1.2	1.3	0.9	0.9	1.0	1.4	1.3	1.3	1.5	1.7	1.2	2.6
																								Diurnal Average		
1.5 1.5 1.3 1.1 1.1 1.3 1.0 1.1 1.2 1.1 1.1 0.9 0.9 0.8 0.8 0.7 0.8 0.7 0.7 0.8 1.0 1.2 1.2 1.6																								Diurnal Maximum		
8.1 9.0 5.3 3.8 6.3 5.0 4.7 3.9 4.0 4.8 3.1 2.2 2.7 2.3 1.7 2.1 2.9 2.7 2.6 3.2 3.2 6.8 4.2 6.3																										
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 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Surmont 2 - August 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 - August 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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685
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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685

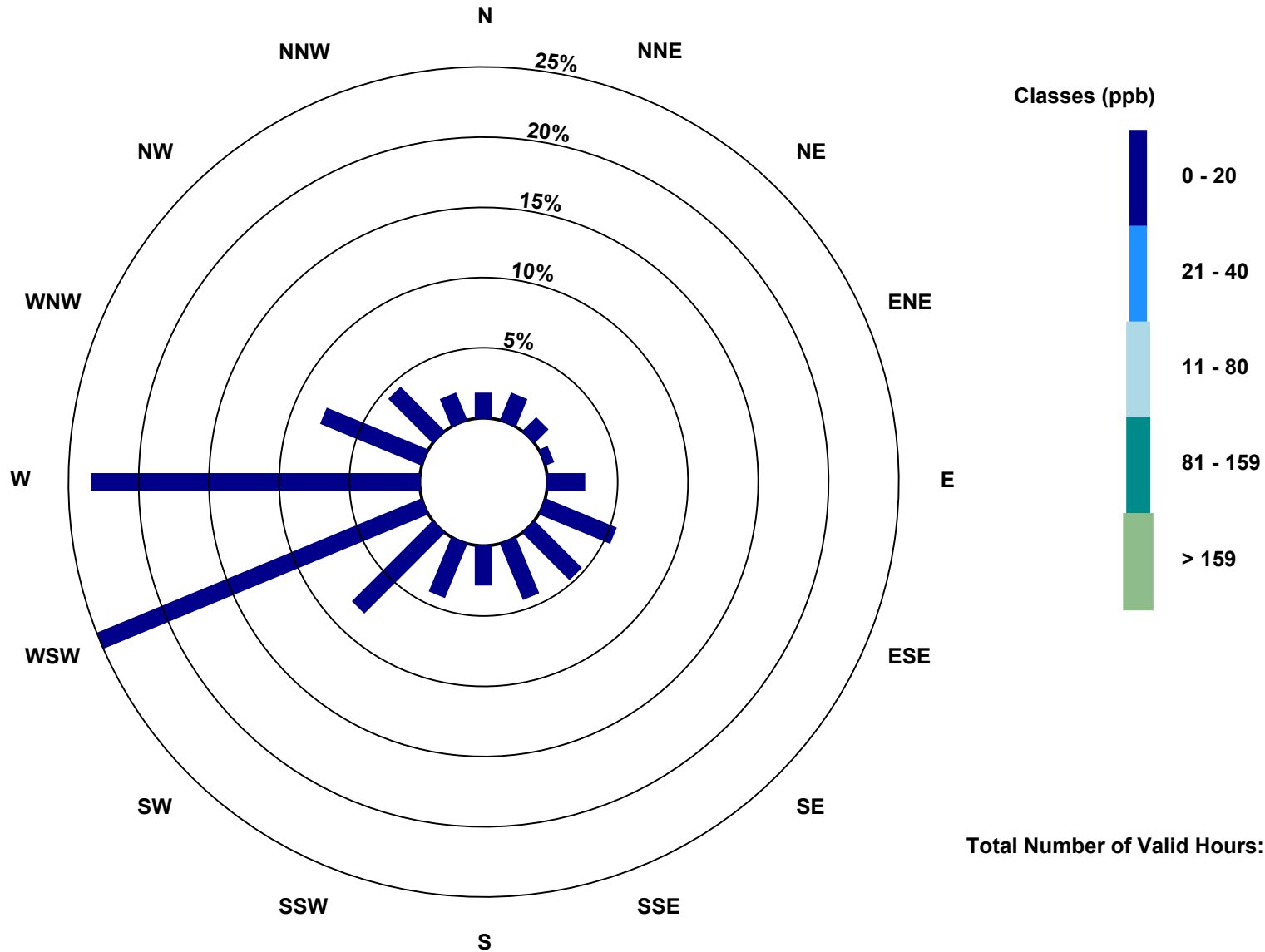
Total Number of Valid Hours: 685

Total Number of Hours: 744

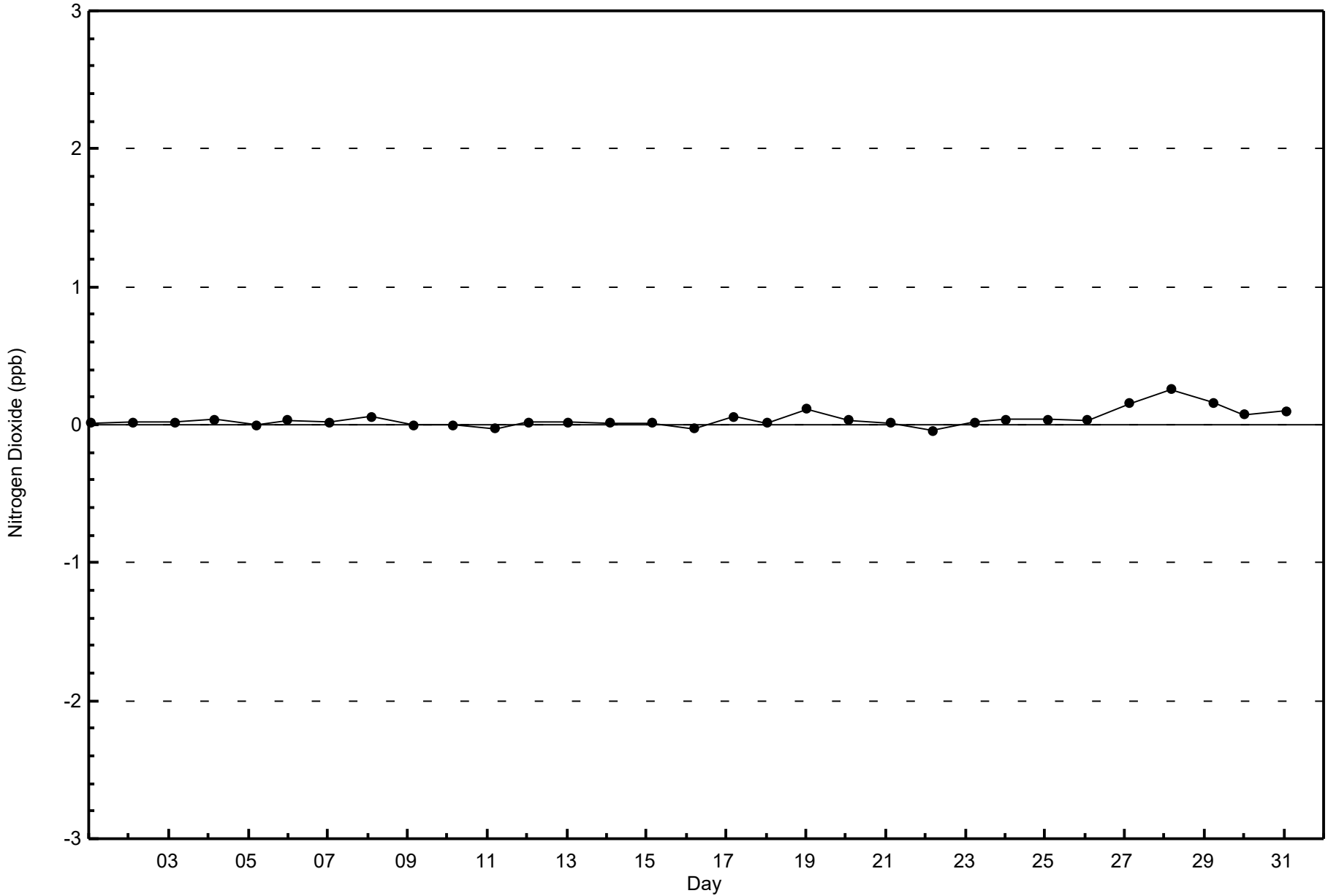


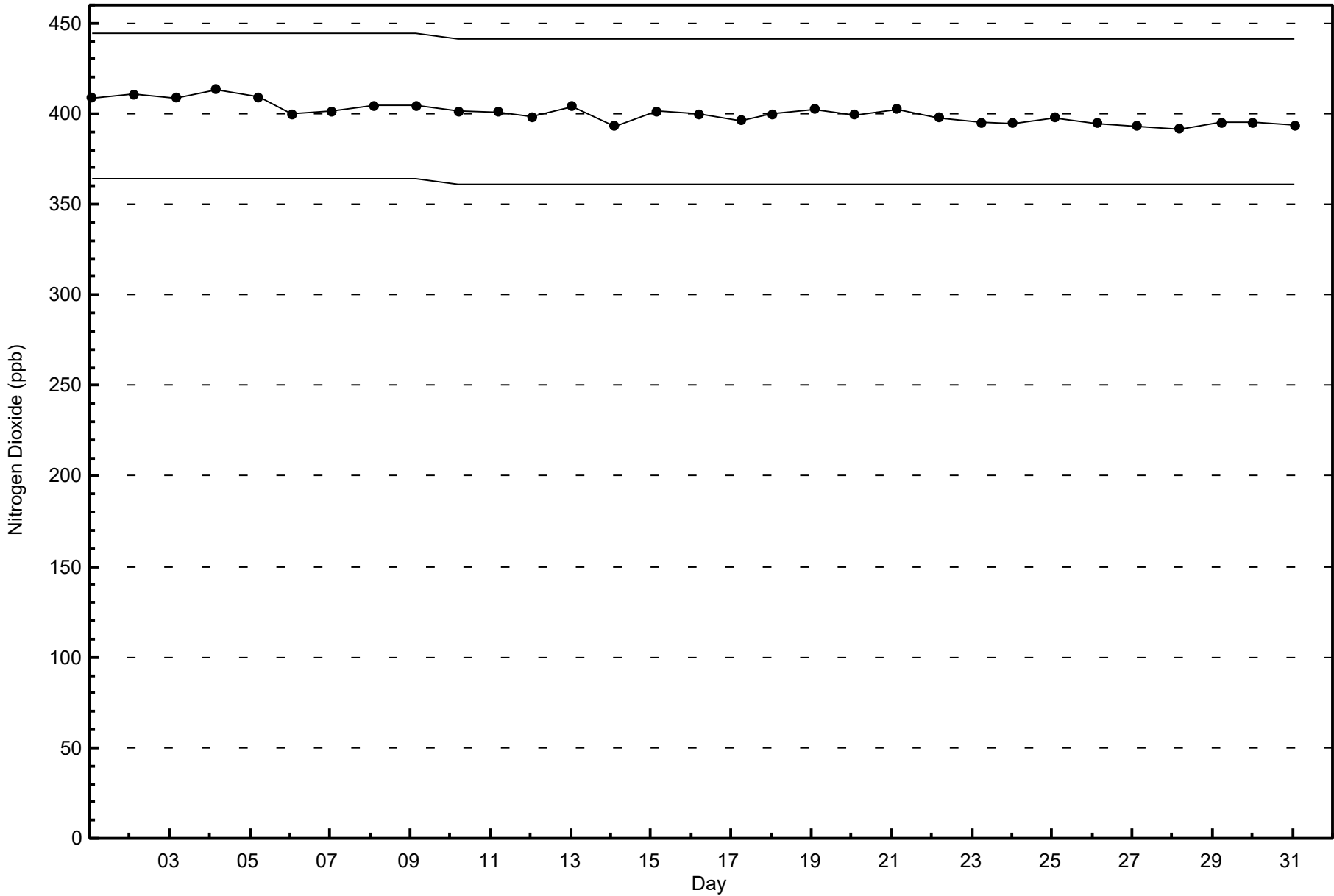
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Surmont 2



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb

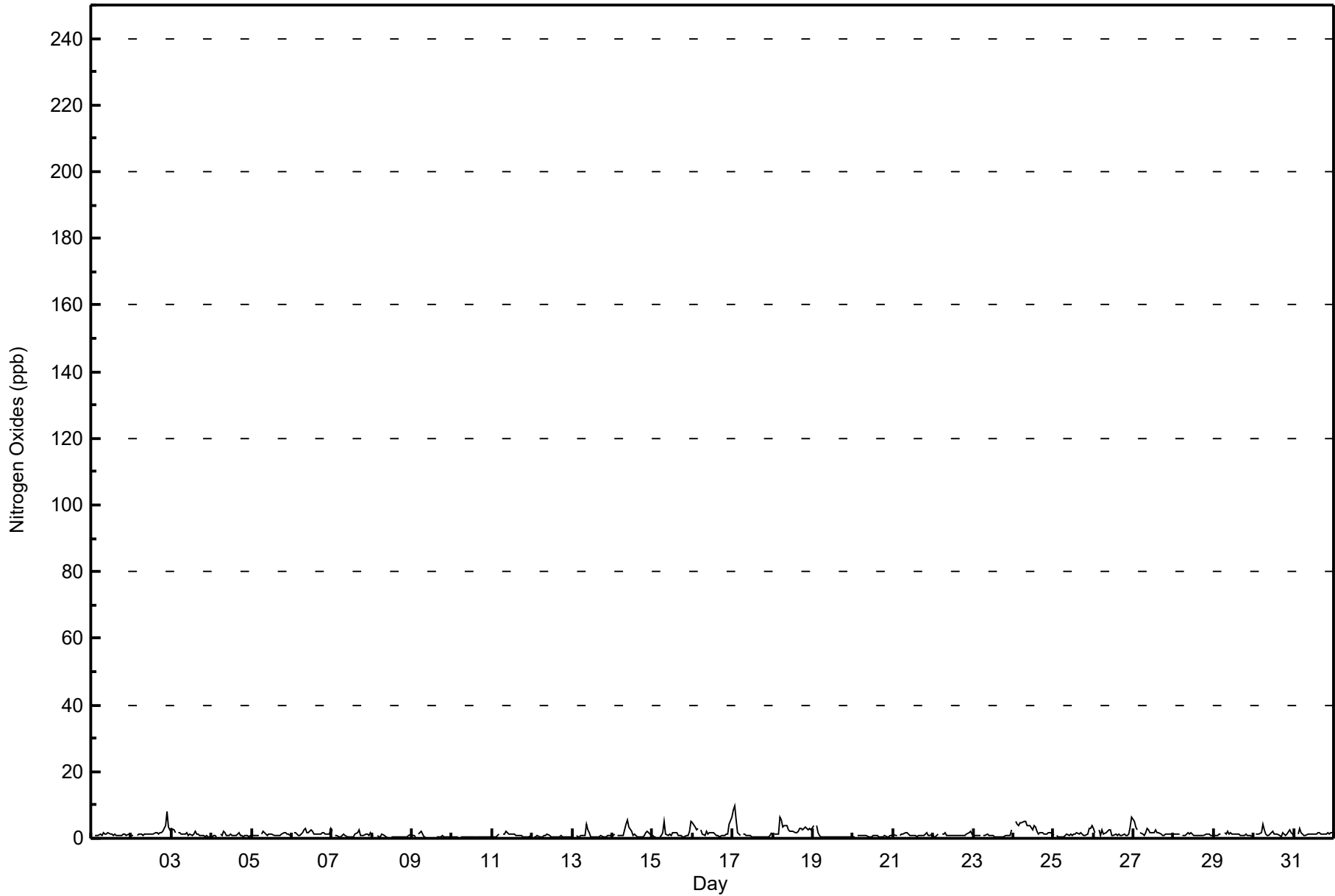
Surmont 2 - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service: 744														744																													
Maximum Value: 9.6 ppb on Aug 17 02:00		Maximum Daily Average: 3.0 ppb on Aug 24		Hours of Data: 705														705																															
Minimum Value: 0.3 ppb on Aug 7 11:00		Minimum Daily Average: 0.5 ppb on Aug 10		Hours of Missing Data: 39														39																															
Maximum Diurnal Average: 1.7 ppb at hour 24		Minimum Diurnal Average: 0.9 ppb at hour 19		Hours of Calibration: 37														37																															
Monthly Average: 1.30 ppb		Percentiles: P ₁ = 0.4 P ₁₀ = 0.5 Q ₁ = 0.7 Median = 1.0 Q ₃ = 1.5 P ₉₀ = 2.6 P ₉₉ = 5.4		Percent Operational Time: 99.7														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-Aug	1.1	Z	0.9	1.0	1.0	1.1	1.1	1.5	1.1	1.2	1.5	1.4	1.3	1.0	1.1	1.0	0.9	0.9	1.0	1.2	1.3	0.9	1.4	1.0	1.1	1.5																							
2-Aug	1.0	1.0	Z	0.9	1.4	1.4	1.3	1.0	1.2	1.1	1.3	1.4	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.9	3.6	8.2	3.3	2.8	1.9	8.2																							
3-Aug	2.9	2.7	1.6	Z	1.9	1.8	1.3	1.4	1.3	1.5	0.9	1.1	1.0	1.1	2.1	1.3	1.2	0.9	0.8	0.7	0.6	1.1	0.5	0.6	1.3	2.9																							
4-Aug	0.6	0.8	0.7	0.6	Z	1.1	1.0	2.0	1.6	0.9	0.8	1.1	1.1	0.8	0.7	0.8	1.5	0.7	0.7	0.6	1.0	0.8	0.6	0.8	0.9	2.0																							
5-Aug	0.7	0.7	0.8	0.7	0.8	Z	1.4	2.0	1.4	0.9	1.2	1.2	1.1	0.8	0.8	0.9	0.8	0.7	1.1	1.6	1.5	1.4	1.3	1.0	1.1	2.0																							
6-Aug	Z	1.6	1.7	1.5	1.0	0.9	1.5	2.7	3.0	1.9	1.6	2.7	2.3	1.4	1.3	1.3	1.4	1.6	1.7	1.3	1.2	1.1	2.9	1.7	3.0																								
7-Aug	2.2	Z	0.9	0.7	0.5	0.5	1.0	1.5	1.0	0.5	0.3	0.4	0.4	0.6	1.4	1.9	2.4	1.1	0.8	0.8	1.1	1.3	0.9	1.6	1.0	2.4																							
8-Aug	0.8	0.7	Z	0.9	0.5	0.5	1.1	0.9	0.4	0.4	M	M	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.9	1.2	0.6	1.2																							
9-Aug	0.9	0.6	0.4	Z	1.1	2.3	1.2	0.5	0.5	C	C	C	C	C	C	0.4	0.5	0.5	0.7	0.6	0.4	0.4	0.6	0.6	--	2.3																							
10-Aug	0.4	0.4	0.4	0.4	Z	0.5	0.4	0.4	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6																							
11-Aug	0.4	0.4	0.4	0.8	1.1	Z	1.4	1.3	2.0	1.6	1.2	1.1	1.1	1.1	0.7	1.0	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.9	0.9	2.0																							
12-Aug	Z	0.6	0.4	0.6	0.5	0.5	0.6	0.8	0.7	1.1	0.8	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.5	0.5	0.6	0.5	0.4	0.5	0.6	1.1																							
13-Aug	0.4	Z	0.8	0.6	0.4	0.8	0.7	1.1	4.4	2.6	1.8	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.9	4.4																							
14-Aug	0.9	1.4	Z	1.0	0.9	0.9	0.7	2.4	4.4	5.4	3.5	2.0	1.0	1.1	0.7	0.6	0.6	0.5	0.5	1.0	1.7	2.3	1.1	0.6	1.5	5.4																							
15-Aug	0.7	0.5	0.6	Z	0.5	0.8	1.7	5.1	1.4	0.9	1.3	0.9	1.7	1.6	1.6	1.0	0.9	0.7	0.5	0.5	0.7	0.8	1.9	5.0	1.4	5.1																							
16-Aug	4.5	3.3	2.5	2.9	Z	2.4	1.2	0.8	2.1	1.4	1.9	1.7	1.8	1.3	1.0	1.0	0.6	0.7	0.7	0.8	1.1	1.1	4.4	6.5	2.0	6.5																							
17-Aug	8.7	9.6	5.5	1.6	0.7	Z	1.4	1.2	1.1	0.9	0.8	0.6	0.6	0.6	0.4	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.7	1.7	1.7	9.6																							
18-Aug	Z	1.4	1.5	1.5	6.5	5.3	3.6	3.7	3.7	2.6	2.3	2.1	2.1	1.6	1.8	2.3	3.2	2.9	2.7	3.3	3.1	2.7	2.8	2.5	2.8	6.5																							
19-Aug	3.8	Z	3.7	1.5	0.7	0.5	0.4	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	0.5	0.6	0.5	0.5	0.8	3.8																							
20-Aug	0.5	0.6	Z	0.7	0.7	0.8	0.7	0.8	0.9	0.6	0.6	0.5	0.8	1.0	1.0	0.6	0.5	0.5	0.5	0.8	0.6	0.6	0.8	0.7	0.7	1.0																							
21-Aug	1.1	0.8	0.8	Z	0.8	1.3	1.4	1.7	1.9	1.4	0.8	0.9	0.8	0.8	0.6	0.6	0.8	0.7	0.7	1.2	1.6	0.9	1.0	1.1	1.0	1.9																							
22-Aug	0.6	0.6	0.9	1.3	Z	1.3	1.5	1.7	0.8	0.9	0.9	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	1.3	1.7	1.9	1.4	1.0	1.9																							
23-Aug	0.9	0.7	0.6	0.8	0.7	Z	0.9	0.7	1.5	1.0	0.9	0.8	0.7	0.6	0.5	0.6	0.6	0.5	0.6	0.7	1.0	1.0	1.0	2.4	0.9	2.4																							
24-Aug	Z	5.0	4.2	4.0	4.7	4.8	5.3	4.9	3.9	3.6	3.7	2.6	3.6	3.3	2.2	1.4	1.7	1.8	1.3	1.2	1.2	1.7	1.6	1.0	3.0	5.3																							
25-Aug	1.2	Z	0.7	0.5	0.6	0.6	0.6	0.9	1.2	0.7	1.1	0.9	1.2	1.1	1.5	1.3	1.6	1.4	0.9	0.9	1.4	3.1	3.0	3.8	1.3	3.8																							
26-Aug	2.8	1.8	Z	2.6	1.0	2.6	1.4	1.9	2.2	2.6	2.7	1.0	1.0	1.2	1.0	1.1	0.9	0.6	1.2	0.9	0.8	1.4	3.6	6.2	1.9	6.2																							
27-Aug	5.0	3.3	2.7	Z	1.6	1.2	0.9	1.7	3.1	2.3	1.7	1.5	1.6	2.5	1.5	1.7	1.5	1.0	0.8	1.2	1.1	1.1	1.3	1.2	1.8	5.0																							
28-Aug	1.2	1.3	1.3	1.3	Z	0.7	0.8	0.9	1.5	1.1	1.6	1.2	0.9	0.9	0.8	0.8	0.8	0.7	0.8	1.3	1.4	1.3	1.0	0.9	1.1	1.6																							
29-Aug	0.9	0.7	0.9	1.2	1.2	Z	1.5	1.3	2.1	1.2	1.6	1.2	1.1	1.1	1.2	1.1	1.0	1.0	1.0	1.3	1.0	0.8	0.7	0.6	1.1	2.1																							
30-Aug	Z	1.1	1.2	1.1	1.6	4.1	2.7	1.2	0.7	0.9	1.8	2.1	1.3	1.2	1.2	0.7	0.5	1.6	1.3	0.8	1.4	2.6	1.8	1.2	1.5	4.1																							
31-Aug	0.5	Z	1.3	2.8	1.9	1.1	0.9	0.8	1.2	1.1	1.3	1.2	1.2	1.4	1.5	1.6	1.1	1.1	1.2	1.5	1.5	1.4	1.6	1.8	1.3	2.8																							
																								1.7	1.7	1.4	1.3	1.3	1.5	1.3	1.6	1.7	1.4	1.4	1.2	1.2	1.1	1.0	1.0	1.0	0.9	0.9	1.0	1.1	1.4	1.4	1.7	Diurnal Average	
																								8.7	9.6	5.5	4.0	6.5	5.3	5.3	5.1	4.4	5.4	3.7	2.7	3.6	3.3	2.2	2.3	3.2	2.9	2.7	3.3	3.6	8.2	4.4	6.5	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																																											



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Surmont 2 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Surmont 2 - August 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 Oxides (NO_x) - ppb
Surmont 2 - August 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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685
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	12	14	9	4	18	37	32	29	19	28	55	171	160	53	30	14	685

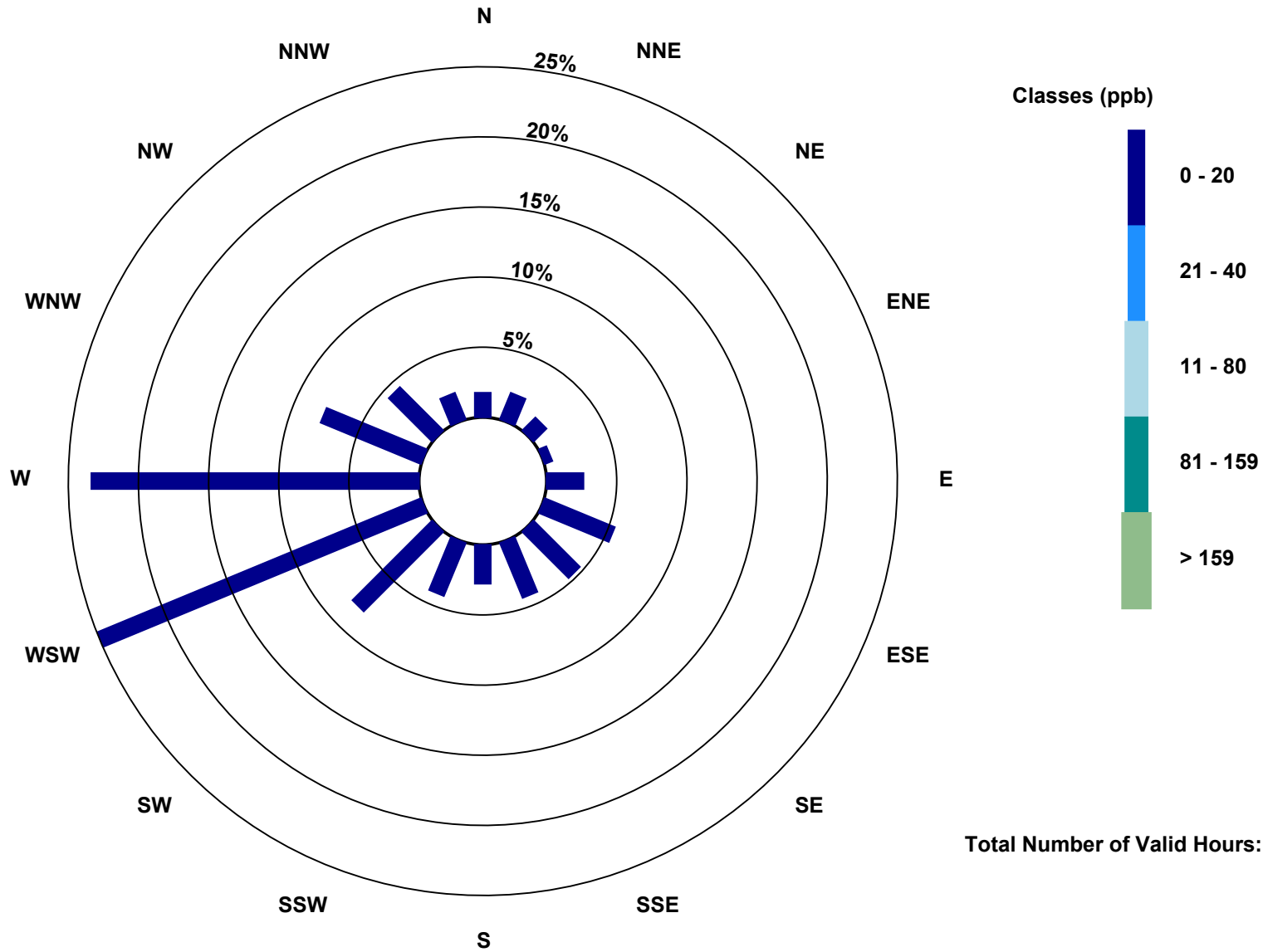
Total Number of Valid Hours: 685

Total Number of Hours: 744

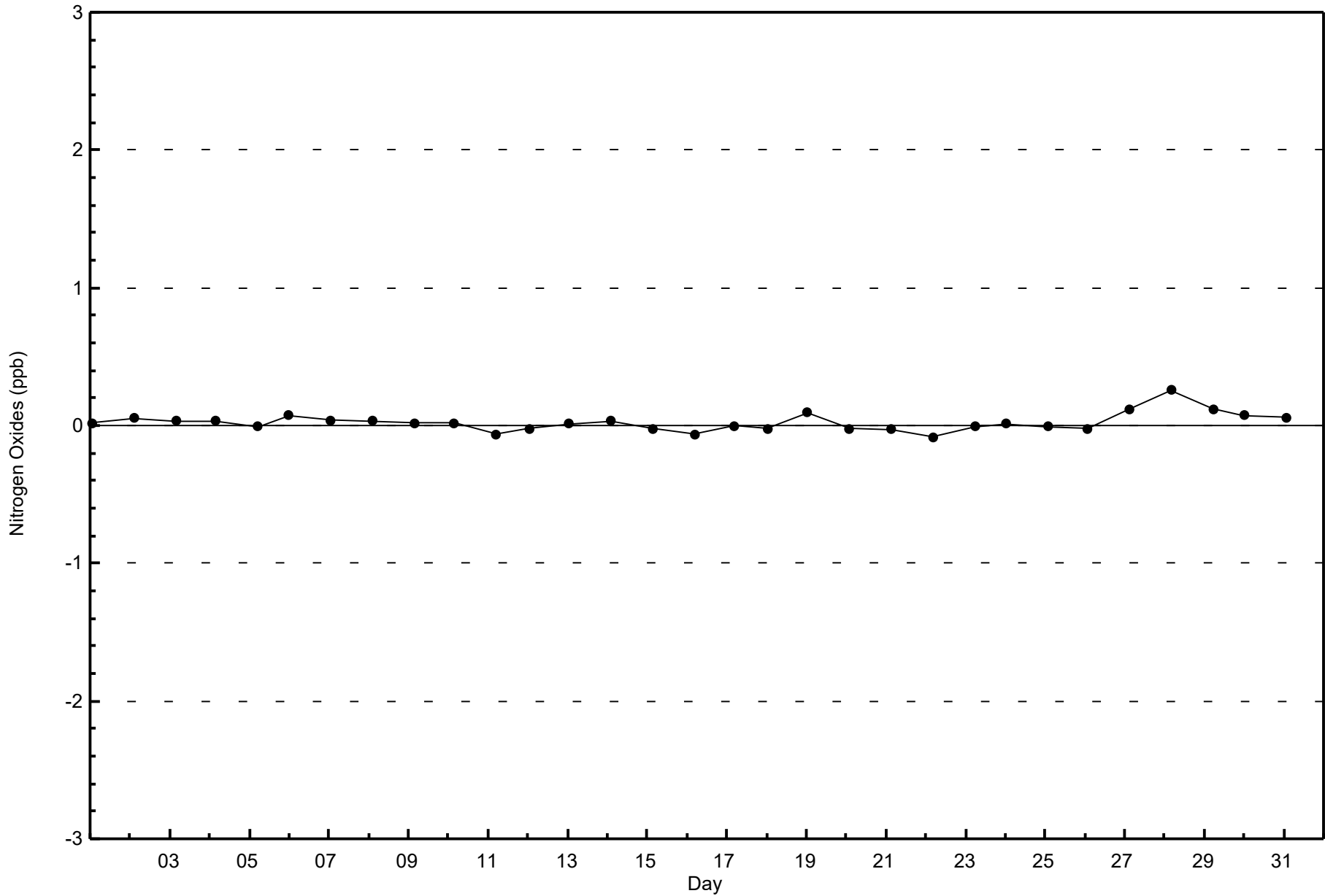


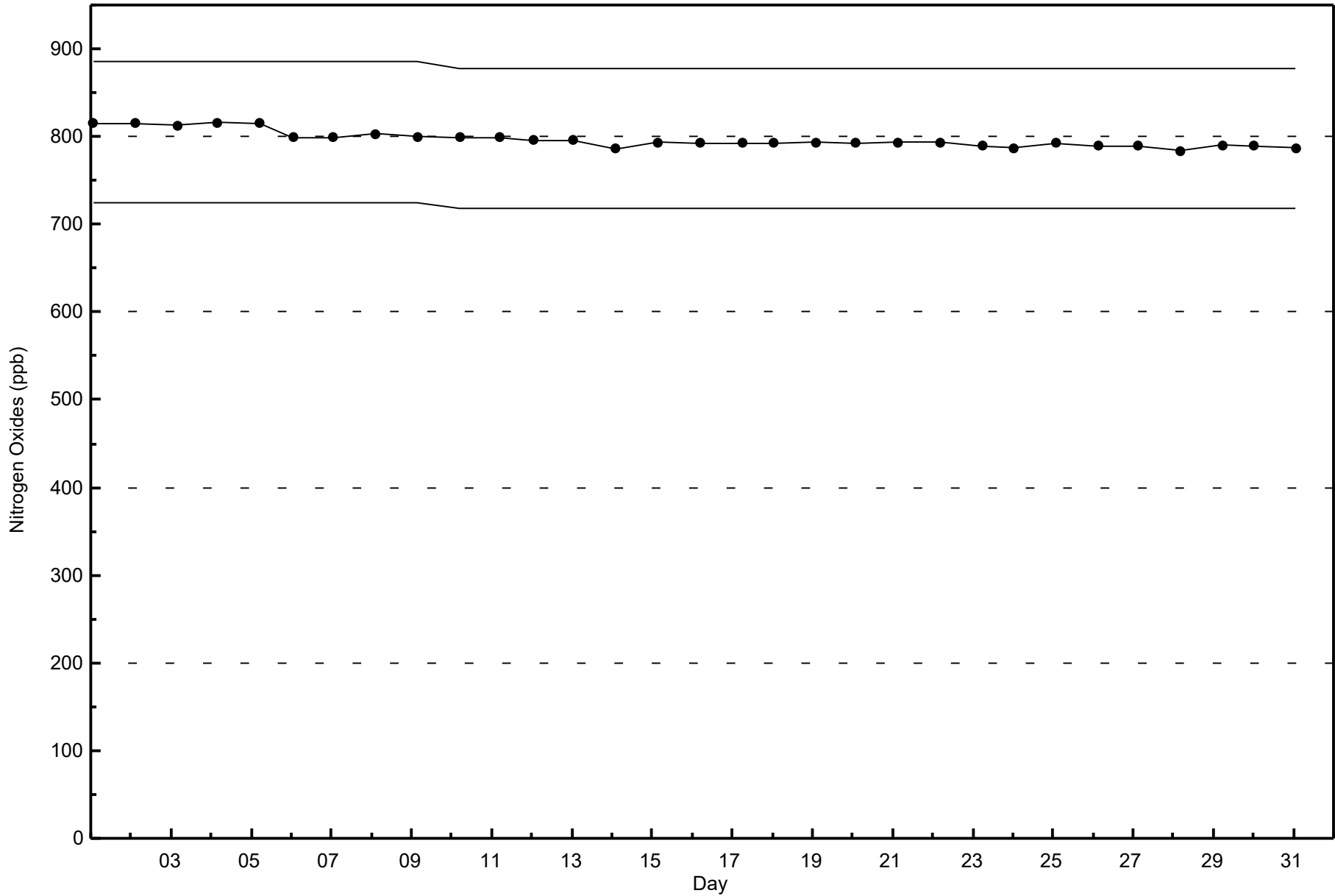
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Surmont 2



Total Number of Valid Hours: 685







Wood Buffalo Environmental Association

Summary of Hour Averages

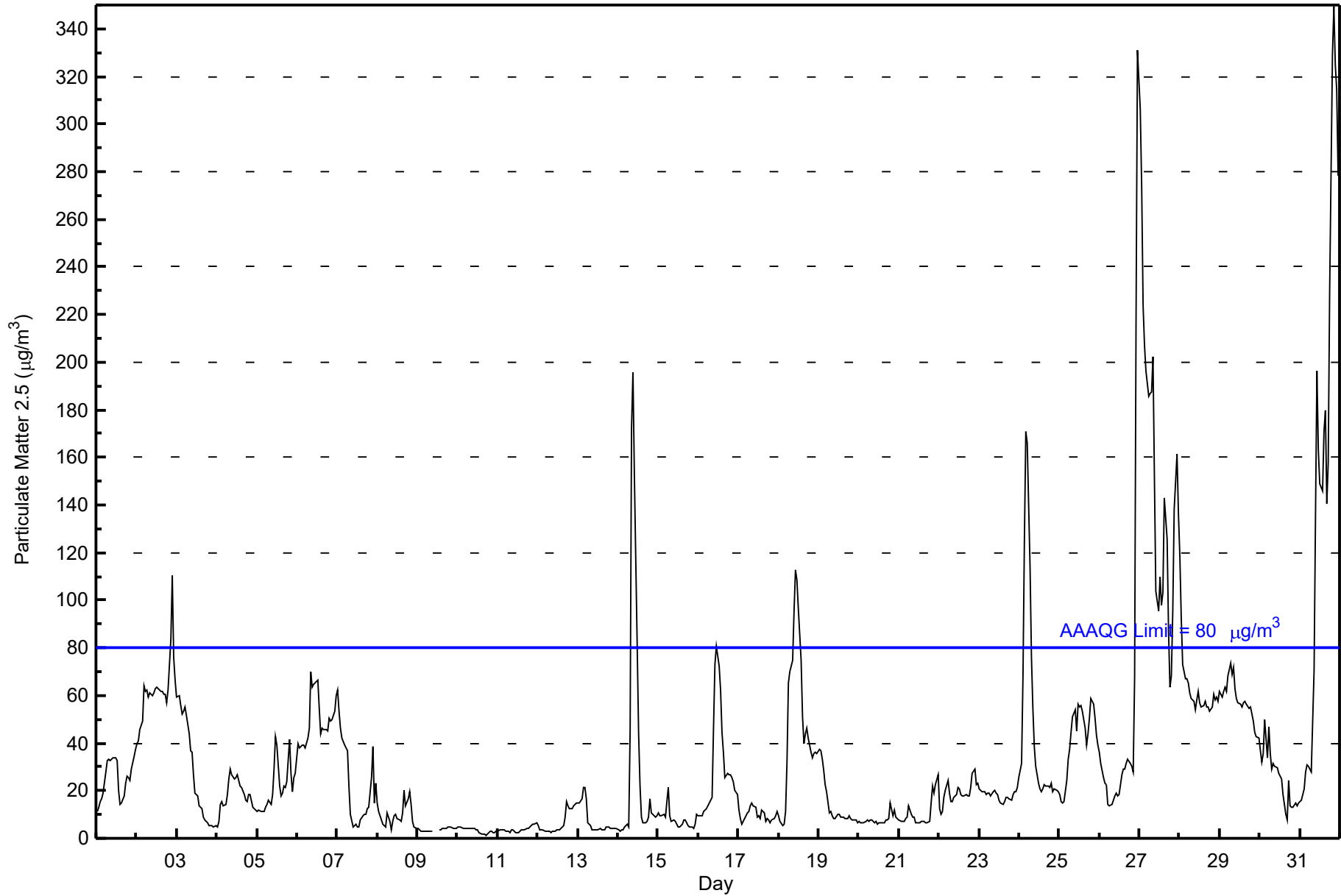
Particulate Matter 2.5 (PM_{2.5}) - µg/m³

Surmont 2 - August 2023

Number of Exceedences (AAAQO):	1-hr: 56	24-hr: 12	Hours in Service:	744
Maximum Value: 349.5 µg/m ³ on Aug 31 21:00	Maximum Daily Average: 152.0 µg/m ³ on Aug 27		Hours of Data:	741
Minimum Value: 1.2 µg/m ³ on Aug 10 18:00	Minimum Daily Average: 3.2 µg/m ³ on Aug 10		Hours of Missing Data:	3
Maximum Diurnal Average: 43.8 µg/m ³ at hour 24	Minimum Diurnal Average: 27.5 µg/m ³ at hour 17		Hours of Calibration:	3
Monthly Average: 33.87 µg/m ³	Percentiles: P ₁ = 2.4 P ₁₀ = 4.0 Q ₁ = 7.5 Median = 18.3 Q ₃ = 43.5 P ₉₀ = 66.8 P ₉₉ = 255.5		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-Aug	11.1	13.3	15.2	16.8	18.7	27.7	32.5	33.4	32.6	33.0	33.7	33.8	32.6	20.3	14.5	14.9	17.9	23.2	26.2	25.5	24.6	29.2	34.4	37.3	25.1	37.3
2-Aug	39.6	41.2	45.7	49.5	63.8	62.0	62.5	59.3	61.1	60.0	61.3	63.2	63.2	62.6	61.9	61.9	60.7	60.7	56.8	62.1	83.9	110.4	75.9	66.3	62.3	110.4
3-Aug	59.3	59.6	55.5	52.3	53.4	55.0	51.8	44.1	36.8	36.0	26.5	19.3	17.6	13.7	13.0	12.5	8.8	7.9	6.5	5.6	5.3	5.2	5.0	5.4	27.3	59.6
4-Aug	4.8	7.3	14.2	15.2	13.9	14.3	18.2	24.9	28.9	26.9	24.8	25.3	26.6	24.4	22.2	21.3	18.6	15.7	15.7	18.4	18.7	13.0	12.2	12.0	18.2	28.9
5-Aug	11.5	11.9	11.5	11.1	11.5	13.0	14.0	15.8	14.4	18.6	29.2	42.6	39.3	22.2	17.8	19.3	22.1	21.6	24.0	41.6	27.5	19.8	25.5	27.1	21.4	42.6
6-Aug	39.5	38.3	38.3	39.2	39.0	38.1	42.2	46.4	69.9	63.6	64.5	65.9	66.2	54.5	43.9	46.3	45.7	45.4	45.3	50.1	49.4	49.6	53.3	60.0	49.8	69.9
7-Aug	62.2	53.1	46.0	42.2	39.4	38.0	37.0	21.7	9.9	5.0	5.2	5.7	4.9	4.7	7.4	9.5	9.9	10.3	12.3	13.2	25.4	38.3	15.0	23.1	22.5	62.2
8-Aug	15.1	11.0	8.0	6.1	5.3	4.8	10.7	7.2	3.8	7.2	9.6	10.1	8.3	7.8	7.4	10.9	20.0	13.9	16.6	19.8	14.4	6.9	4.5	4.2	9.7	20.0
9-Aug	4.0	3.4	3.1	3.1	3.0	3.1	3.0	3.0	3.0	3.1	C	C	C	3.4	3.5	4.3	4.4	4.4	4.6	4.7	4.7	4.4	4.2	4.0	3.7	4.7
10-Aug	4.5	4.9	4.7	4.3	4.2	4.1	4.3	4.1	4.0	4.0	3.9	3.6	3.4	2.2	1.8	1.6	1.7	1.2	1.6	3.1	2.8	2.2	2.4	3.1	3.2	4.9
11-Aug	3.2	3.3	3.4	3.3	3.4	3.0	3.0	2.4	3.7	3.3	3.1	2.5	2.4	2.9	3.3	3.7	3.8	4.2	4.4	4.9	5.6	6.0	5.9	6.4	3.8	6.4
12-Aug	5.5	3.5	3.5	3.3	3.0	2.8	2.9	2.8	2.4	2.8	3.0	3.3	3.4	3.5	4.0	5.6	8.8	15.5	13.8	12.4	12.5	13.7	14.2	15.0	6.7	15.5
13-Aug	14.6	14.7	16.5	21.1	21.7	16.6	6.6	5.4	3.6	3.5	3.4	3.6	3.7	4.3	3.7	3.5	3.7	4.5	4.5	4.2	3.9	4.4	4.4	4.0	7.5	21.7
14-Aug	3.4	3.1	3.3	3.5	4.8	5.9	4.6	45.0	172.6	195.7	152.6	80.6	43.6	21.8	8.6	6.3	6.3	6.9	8.8	16.7	10.7	10.2	8.9	9.4	34.7	195.7
15-Aug	10.9	9.4	9.6	10.1	9.1	15.3	21.5	9.2	7.4	7.7	7.3	6.0	5.0	5.0	6.2	7.8	7.6	6.4	5.6	5.0	4.5	4.4	5.9	10.2	8.2	21.5
16-Aug	9.5	9.4	9.6	11.0	11.7	12.5	13.9	15.9	17.4	46.4	72.7	80.4	72.3	62.4	44.7	36.3	25.5	27.6	26.9	26.6	25.3	24.0	20.1	18.5	30.0	80.4
17-Aug	12.0	8.3	6.2	6.9	9.5	10.4	11.1	13.8	14.9	13.4	13.2	9.2	9.3	8.3	11.9	10.6	6.9	8.5	7.5	6.4	7.5	8.4	9.6	11.3	9.8	14.9
18-Aug	9.7	7.3	5.4	5.9	11.4	31.9	65.3	69.9	74.9	95.4	112.9	108.3	97.0	74.7	50.9	39.6	43.7	46.4	42.2	36.0	33.6	35.3	36.0	35.9	48.7	112.9
19-Aug	37.1	36.8	33.2	28.6	22.3	19.4	10.4	11.0	9.5	8.2	8.1	10.1	9.9	9.1	8.8	8.7	8.1	8.3	9.8	8.5	7.6	7.8	7.5	6.7	14.0	37.1
20-Aug	7.3	6.6	6.7	6.6	7.3	7.9	7.0	7.8	7.5	6.3	7.2	6.0	6.7	6.3	6.3	6.8	7.7	7.8	8.5	14.8	9.6	11.6	9.1	8.5	7.8	14.8
21-Aug	7.5	7.4	7.2	7.1	8.1	8.9	13.4	10.2	9.1	8.6	6.7	6.5	6.7	7.2	7.2	6.9	6.7	6.8	7.1	14.9	21.8	19.1	22.5	26.7	10.6	26.7
22-Aug	12.4	9.9	11.0	17.0	20.3	24.1	19.2	15.5	15.4	17.1	18.6	21.1	20.8	18.5	17.7	18.0	18.6	17.7	17.9	21.5	27.3	29.1	22.7	23.1	18.9	29.1
23-Aug	20.8	20.0	19.7	19.4	18.6	18.8	19.1	17.6	19.4	20.3	18.9	18.5	16.1	14.8	14.2	15.4	17.4	17.0	16.4	16.3	18.4	19.4	19.7	21.3	18.2	21.3
24-Aug	25.5	31.6	68.2	125.1	170.6	166.3	114.0	75.9	54.6	38.5	30.0	23.1	20.8	19.5	20.7	22.6	21.8	22.0	21.3	23.3	19.8	20.8	20.4	19.6	49.0	170.6
25-Aug	18.3	15.7	14.8	15.2	24.5	33.4	37.5	44.7	51.3	53.9	44.9	56.6	55.1	55.8	53.7	46.2	39.4	44.0	50.6	59.0	56.4	50.3	43.5	39.1	41.8	59.0
26-Aug	36.2	31.4	25.8	23.1	22.8	14.4	13.5	14.4	15.7	17.7	19.0	17.9	18.5	26.5	28.9	29.3	31.6	33.2	31.2	30.5	27.9	67.4	216.8	331.2	46.9	331.2
27-Aug	305.8	273.3	223.4	207.3	196.2	185.4	187.1	187.2	202.5	151.8	103.9	95.4	109.7	97.6	103.4	142.7	125.5	86.9	63.7	68.0	95.8	138.0	161.6	136.5	152.0	305.8
28-Aug	118.5	92.7	73.2	67.2	66.8	65.2	61.3	58.9	57.6	54.0	58.2	61.8	57.0	55.4	55.8	57.5	55.5	55.2	53.7	55.3	60.8	58.1	59.4	57.8	63.2	118.5
29-Aug	61.9	59.6	61.4	63.3	61.6	68.3	73.5	68.7	71.7	62.7	58.6	57.0	56.5	55.3	57.0	57.5	56.3	54.9	55.2	52.3	49.3	44.8	42.4	42.2	58.0	73.5
30-Aug	36.8	32.1	35.8	49.9	34.0	46.6	35.3	28.9	31.2	30.3	29.8	27.2	26.2	25.0	18.5	9.9	7.7	24.5	13.9	12.9	12.9	14.9	13.6	14.9	25.5	49.9
31-Aug	15.3	16.1	21.0	28.1	31.1	30.0	29.0	28.1	70.8	135.3	196.3	163.0	149.0	145.8	171.0	180.0	140.6	157.9	228.8	329.3	349.5	325.1	314.2	278.5	147.2	349.5
33.0 30.2 29.1 31.1 32.6 33.8 33.1 32.0 38.0 39.7 40.9 37.6 35.1 30.2 28.7 29.6 27.5 27.8 29.1 34.3 36.0 38.4 41.6 43.8																								Diurnal Average		
305.8 273.3 223.4 207.3 196.2 185.4 187.1 187.2 202.5 196.3 163.0 149.0 145.8 171.0 180.0 140.6 157.9 228.8 329.3 349.5 325.1 314.2 331.2																								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}) - $\mu\text{g}/\text{m}^3$
Surmont 2 - August 2023**

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	123	16.60	16.60
6 - 15	216	29.15	45.75
16 - 25	120	16.19	61.94
26 - 80	227	30.63	92.58
> 81.0	55	7.42	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
Surmont 2 - August 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	2	4	3	3	9	25	4	1	0	4	5	21	19	10	9	3	122
6 - 15	2	2	0	0	6	12	5	9	10	8	15	66	66	7	2	2	212
16 - 25	0	1	0	0	2	2	14	2	2	6	9	36	25	11	6	2	118
26 - 80	4	5	5	1	2	3	10	14	8	9	27	46	42	23	10	4	213
> 81.0	4	2	1	0	0	0	1	4	0	1	2	12	18	4	3	3	55
Totals	12	14	9	4	19	42	34	30	20	28	58	181	170	55	30	14	720

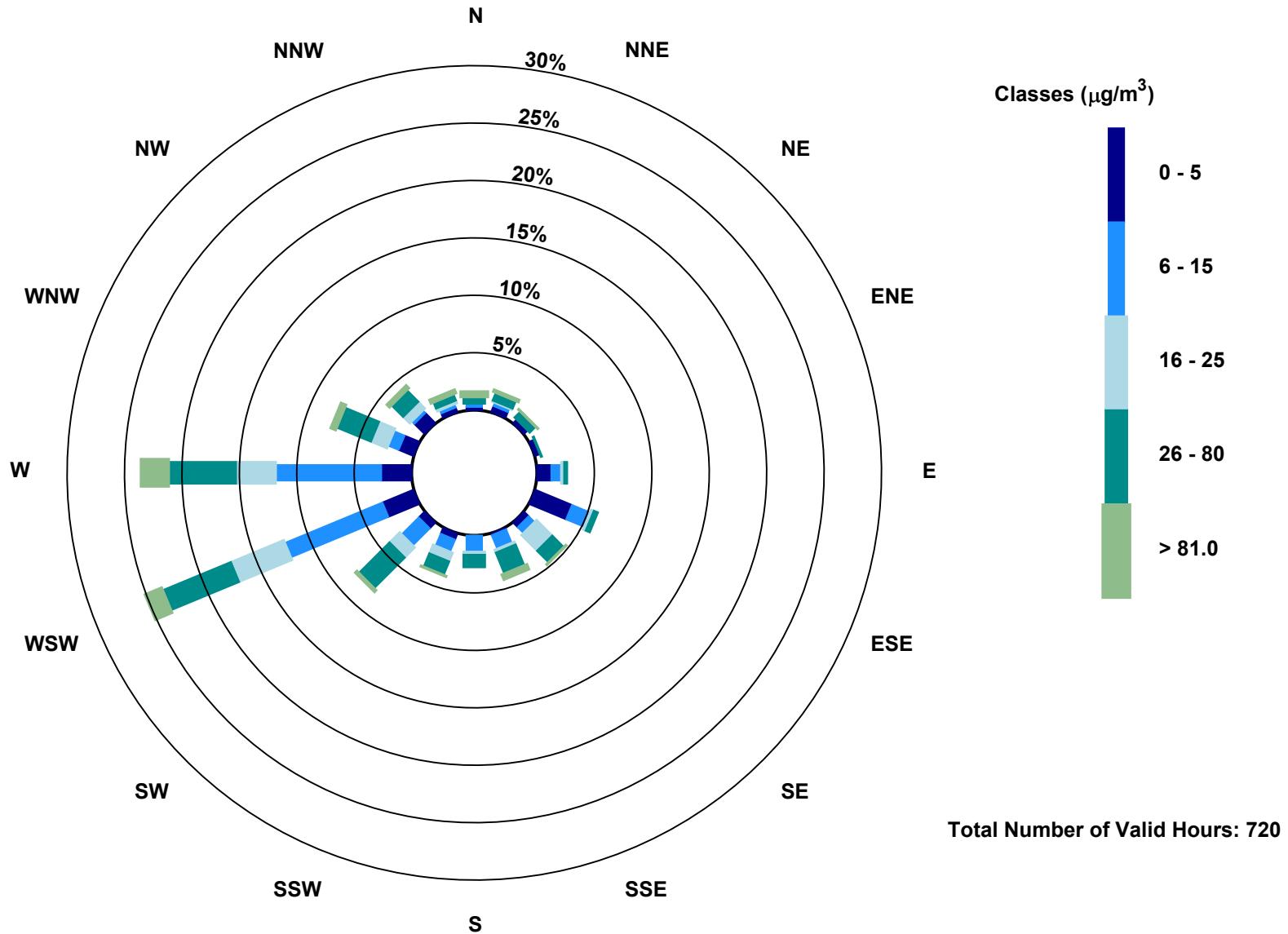
Total Number of Valid Hours: 720

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

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





Wood Buffalo Environmental Association
Summary of Hour Averages

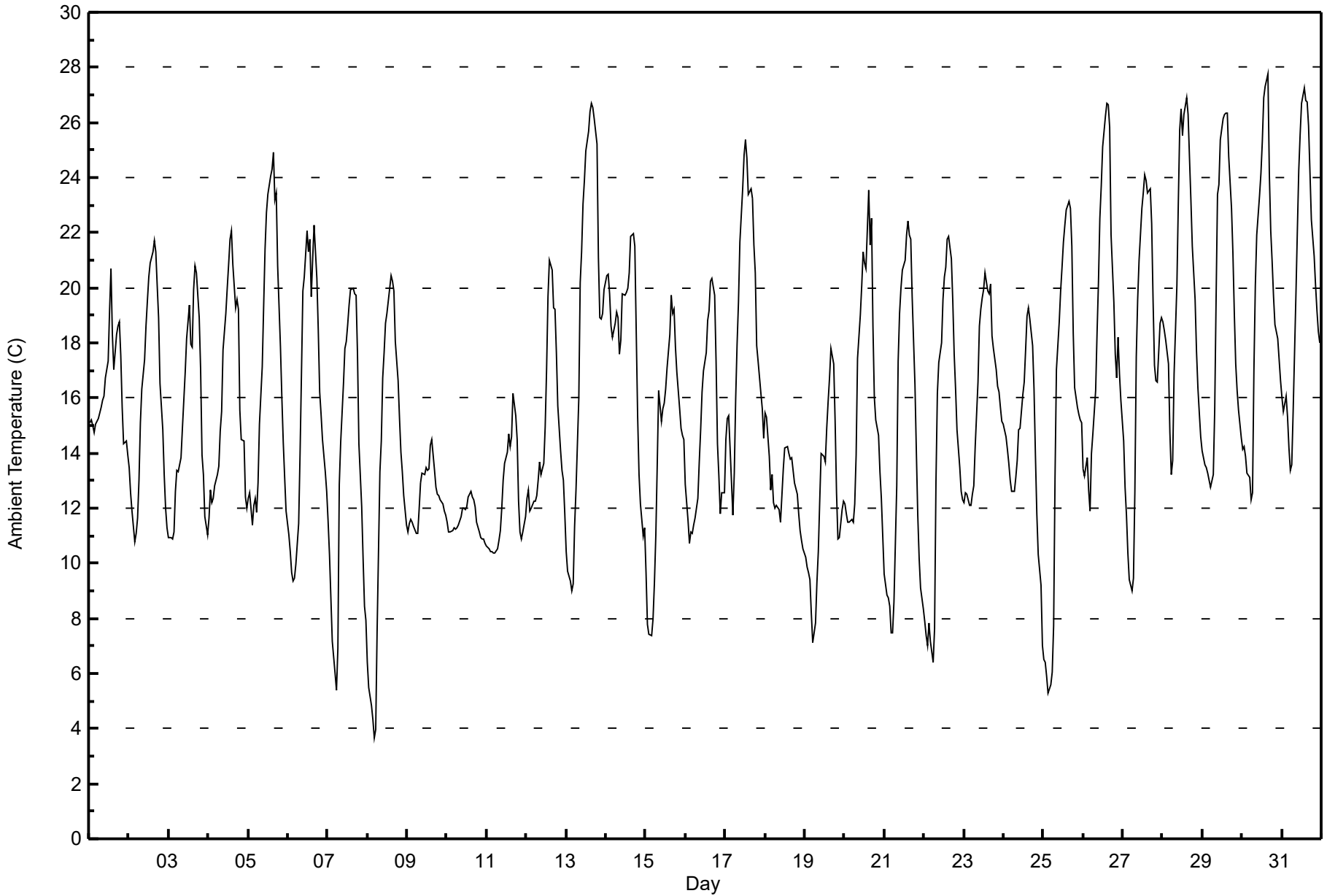
Ambient Temperature (AT) - C
Surmont 2 - August 2023

Maximum Value: 27.8 C on Aug 30 16:00		Maximum Daily Average: 20.3 C on Aug 31		Hours in Service: 744																																												
Minimum Value: 3.7 C on Aug 8 05:00		Minimum Daily Average: 11.6 C on Aug 10		Hours of Data: 744																																												
Maximum Diurnal Average: 21.1 C at hour 16		Minimum Diurnal Average: 11.0 C at hour 5		Hours of Missing Data: 0																																												
Monthly Average: 15.84 C		Percentiles: P ₁ = 5.7 P ₁₀ = 10.4 Q ₁ = 12.2 Median = 15.2 Q ₃ = 19.5 P ₉₀ = 22.4 P ₉₉ = 26.7		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-Aug	15.1	15.2	15.0	14.7	15.0	15.2	15.5	15.7	15.9	16.1	16.7	17.3	19.2	20.7	18.3	17.0	18.3	18.6	18.8	17.5	15.6	14.3	14.5	13.9	16.4	20.7																						
2-Aug	13.5	12.5	11.9	10.8	11.1	11.7	13.0	15.1	16.3	17.4	18.6	19.5	20.4	20.9	21.3	21.7	21.3	20.1	18.9	16.5	14.8	13.2	12.0	11.3	16.0	21.7																						
3-Aug	10.9	11.0	10.9	11.1	12.6	13.4	13.3	13.8	14.9	15.9	16.9	18.1	19.4	17.9	17.9	19.9	20.8	20.6	18.9	17.0	13.9	13.2	11.7	11.0	15.2	20.8																						
4-Aug	11.7	12.7	12.2	12.3	12.8	13.2	13.5	14.8	15.5	17.8	19.1	20.0	20.8	21.7	22.1	20.9	19.3	19.6	19.2	15.5	14.5	14.4	12.4	12.0	16.2	22.1																						
5-Aug	12.4	12.5	11.4	12.1	12.4	11.9	12.9	15.0	17.2	19.3	21.4	22.7	23.4	24.0	24.3	24.9	23.2	23.4	20.8	17.9	16.0	14.4	13.1	11.9	17.4	24.9																						
6-Aug	11.0	10.4	9.7	9.4	9.4	10.0	11.4	14.0	16.9	19.9	20.4	22.1	21.3	21.8	19.7	21.0	22.3	20.3	18.5	16.2	15.4	14.5	13.3	12.6	15.9	22.3																						
7-Aug	11.5	10.3	8.8	7.2	6.0	5.4	6.9	12.9	14.4	16.5	17.8	18.1	18.7	19.4	19.9	20.0	19.8	19.8	17.6	14.3	12.0	10.2	8.4	7.9	13.5	20.0																						
8-Aug	6.4	5.5	4.8	4.3	3.7	4.0	7.5	13.3	14.4	16.7	17.7	18.7	19.1	20.0	20.4	20.3	19.9	18.1	16.6	15.2	14.0	13.3	12.4	11.4	13.2	20.4																						
9-Aug	11.1	11.4	11.6	11.5	11.3	11.1	11.1	11.9	12.9	13.3	13.2	13.5	13.4	13.4	14.3	14.5	13.4	12.7	12.5	12.4	12.3	12.1	11.9	11.8	12.5	14.5																						
10-Aug	11.5	11.1	11.1	11.2	11.3	11.2	11.3	11.4	11.7	12.0	12.0	12.0	12.1	12.4	12.6	12.4	12.3	12.1	11.5	11.1	10.9	10.9	10.9	10.7	11.6	12.6																						
11-Aug	10.6	10.5	10.4	10.4	10.4	10.4	10.5	10.8	11.2	12.0	13.0	13.6	14.0	14.7	14.3	14.6	16.1	15.3	14.5	12.3	11.1	10.9	11.2	11.7	12.3	16.1																						
12-Aug	12.4	12.7	11.9	12.0	12.2	12.3	12.5	13.0	13.7	13.2	13.6	15.0	17.1	19.7	21.0	20.6	19.3	19.2	17.6	15.7	14.1	13.4	13.0	11.8	14.9	21.0																						
13-Aug	10.4	9.7	9.4	9.0	9.3	11.3	12.6	16.0	20.2	21.3	23.0	23.9	25.0	25.7	26.4	26.7	26.5	26.1	25.2	21.1	18.9	18.9	19.1	19.9	19.0	26.7																						
14-Aug	20.4	20.5	19.8	18.6	18.2	18.7	19.1	18.9	17.6	18.1	19.8	19.7	19.8	20.0	20.5	21.8	22.0	21.5	18.4	15.3	13.2	12.1	11.0	11.3	18.2	22.0																						
15-Aug	9.6	7.8	7.4	7.4	8.0	9.3	11.1	13.6	16.3	15.2	15.6	15.8	16.3	17.1	18.3	19.7	19.1	19.2	17.9	16.9	15.6	14.9	14.6	14.5	14.2	19.7																						
16-Aug	12.9	11.5	10.7	11.1	11.1	11.4	11.6	12.3	13.7	14.9	16.2	17.0	17.7	18.8	19.1	20.3	20.4	19.7	17.3	14.4	13.2	11.8	12.5	12.5	14.7	20.4																						
17-Aug	14.5	15.3	15.3	14.2	11.8	13.3	16.0	18.0	19.5	21.7	23.6	24.8	25.4	24.7	23.4	23.6	23.2	21.6	20.6	17.9	17.3	16.2	15.6	14.5	18.8	25.4																						
18-Aug	15.4	15.3	13.9	12.7	13.2	12.2	12.0	12.1	12.0	11.5	12.4	13.4	14.2	14.3	14.0	13.8	13.8	13.4	12.9	12.5	11.8	11.2	10.8	10.5	12.9	15.4																						
19-Aug	10.2	9.8	9.6	9.4	8.2	7.1	7.8	9.3	10.4	12.2	14.0	13.9	13.7	14.9	15.9	16.7	17.8	17.2	15.1	12.6	10.9	10.9	12.0	12.2	12.2	17.8																						
20-Aug	12.2	11.8	11.5	11.5	11.6	11.5	12.1	13.9	17.4	19.0	20.1	21.3	20.9	20.7	23.6	21.6	22.5	18.6	16.0	15.2	14.6	13.3	12.3	11.0	16.0	23.6																						
21-Aug	9.6	8.9	8.7	8.5	7.5	7.5	8.6	12.8	17.3	19.0	20.0	20.6	21.0	21.9	22.4	21.9	21.8	19.7	16.5	14.0	11.8	10.2	9.1	8.3	14.5	22.4																						
22-Aug	7.9	7.4	7.0	7.8	7.2	6.4	7.6	13.0	16.2	17.3	18.0	19.6	20.4	20.7	21.8	21.8	21.0	19.5	17.6	16.3	14.8	13.5	12.6	12.3	14.5	21.8																						
23-Aug	12.2	12.5	12.5	12.1	12.1	12.5	12.8	14.2	16.6	18.6	19.2	19.6	19.9	20.6	19.9	19.8	20.2	18.2	17.8	17.0	16.4	16.2	15.7	15.2	16.3	20.6																						
24-Aug	15.1	14.6	14.1	13.6	13.0	12.6	12.6	13.1	13.7	14.9	14.9	16.1	16.6	17.8	18.9	19.3	18.8	17.9	16.3	13.9	11.8	10.3	9.2	7.0	14.4	19.3																						
25-Aug	6.5	6.4	5.9	5.3	5.6	6.1	7.8	13.1	17.0	18.8	19.9	20.7	21.7	22.3	22.8	23.1	22.9	21.5	18.3	16.4	15.7	15.4	15.2	15.1	15.1	23.1																						
26-Aug	13.4	13.2	13.8	12.6	11.9	14.0	14.7	16.3	18.4	20.2	22.5	23.7	25.1	26.2	26.7	26.7	25.8	21.9	19.5	17.6	16.7	18.2	16.9	15.9	18.8	26.7																						
27-Aug	14.5	12.7	11.8	10.4	9.4	9.0	9.4	12.6	17.5	19.6	21.0	22.9	23.5	24.1	23.9	23.5	23.6	22.3	19.5	17.2	16.6	16.6	18.7	18.9	17.5	24.1																						
28-Aug	18.8	18.5	18.1	17.2	14.7	13.2	13.8	16.9	20.1	23.0	25.7	26.5	25.5	26.3	26.9	26.3	24.7	23.2	21.5	19.6	17.7	16.4	15.4	14.6	20.2	26.9																						
29-Aug	14.1	13.6	13.5	13.3	13.0	12.8	13.2	15.6	19.6	23.4	23.8	25.4	26.1	26.3	26.3	26.3	24.8	22.9	21.2	19.1	17.3	16.3	15.5	14.5	19.1	26.3																						
30-Aug	14.1	14.3	13.9	13.3	13.1	12.3	12.6	17.0	20.1	21.9	23.3	24.2	25.3	26.9	27.3	27.8	24.1	22.1	20.9	19.7	18.7	18.1	17.4	16.6	19.4	27.8																						
31-Aug	16.0	15.5	16.1	15.3	14.2	13.4	13.6	15.5	19.8	22.1	24.3	25.6	26.7	27.2	26.8	26.8	25.9	24.2	22.5	21.2	20.1	19.2	18.4	18.0	20.3	27.2																						
																								12.4	12.1	11.7	11.3	11.0	11.1	11.9	14.1	16.1	17.5	18.6	19.5	20.1	20.7	21.0	21.1	20.8	19.7	18.1	16.1	14.8	14.0	13.4	12.9	Diurnal Average
																								20.4	20.5	19.8	18.6	18.2	18.7	19.1	18.9	20.2	23.4	25.7	26.5	26.7	27.2	27.3	27.8	26.5	26.1	25.2	21.2	20.1	19.2	19.1	19.9	Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Surmont 2 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Surmont 2 - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	63	8.47	8.47
10 - 20	529	71.10	79.57
> 20	152	20.43	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

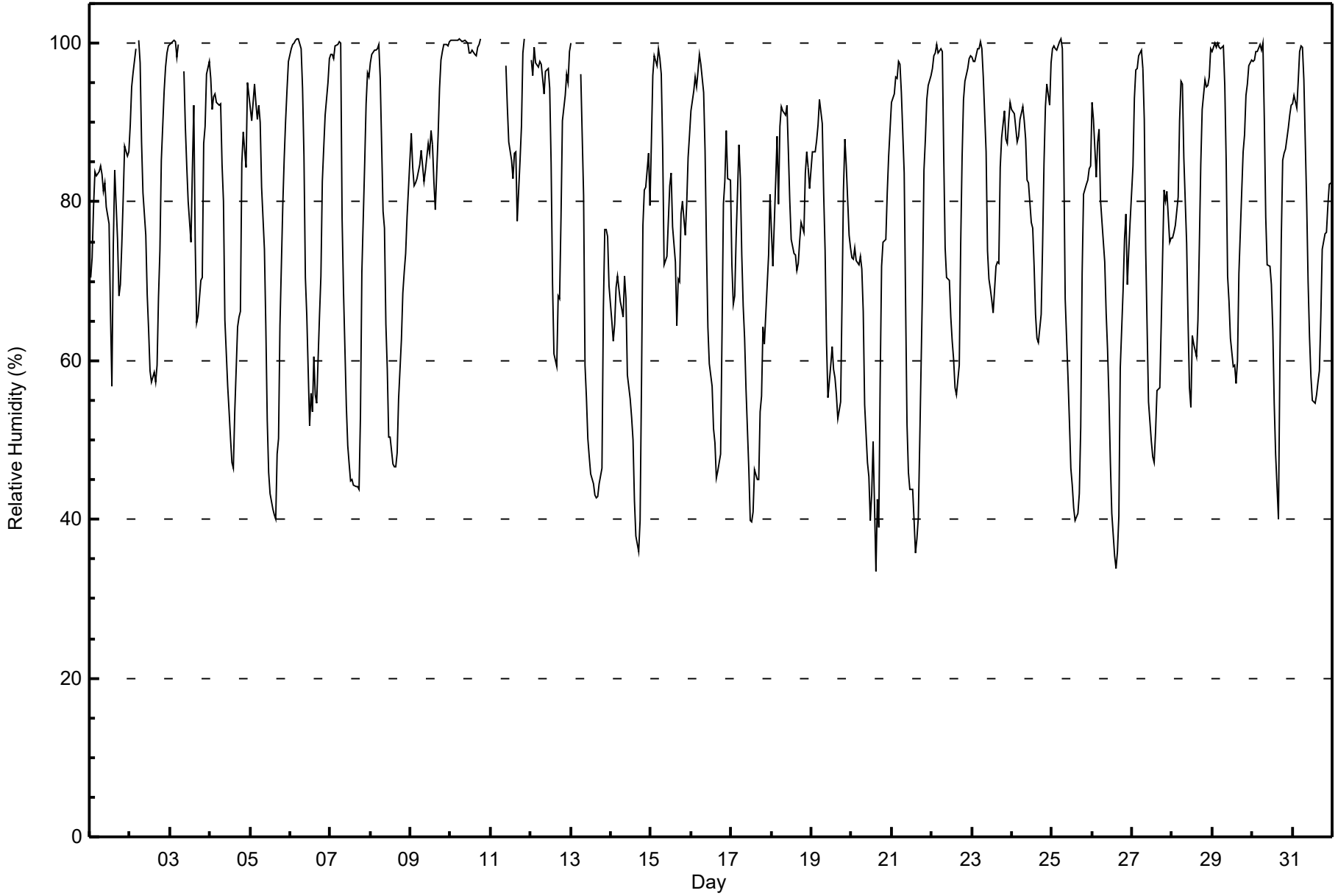
Relative Humidity (RH) - %
Surmont 2 - August 2023

Maximum Value: 100.6 % on Aug 10 19:00																								Maximum Daily Average: 99.9 % on Aug 10																								Hours in Service: 744	
Minimum Value: 33.4 % on Aug 20 15:00																								Minimum Daily Average: 61.3 % on Aug 13																								Hours of Data: 720	
Maximum Diurnal Average: 93.6 % at hour 6																								Minimum Diurnal Average: 57.0 % at hour 16																								Hours of Missing Data: 24	
Monthly Average: 77.50 %																								Percentiles: P ₁ = 38.1 P ₁₀ = 49.7 Q ₁ = 64.7 Median = 81.3 Q ₃ = 93.6 P ₉₀ = 99.0 P ₉₉ = 100.5																								Hours of Calibration: 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-Aug	70.5	73.0	79.4	83.8	83.2	83.7	84.5	83.5	81.3	82.4	79.4	77.2	66.1	56.7	74.5	83.9	75.3	68.2	69.5	74.5	80.4	87.0	85.7	86.3	77.9	87.0																							
2-Aug	89.7	94.5	96.4	99.2	OR	100.3	97.5	87.6	81.1	75.8	68.4	63.8	58.8	57.4	58.5	57.3	59.4	68.1	73.9	85.3	93.9	97.0	98.8	99.7	81.0	100.3																							
3-Aug	99.8	100.1	100.3	100.3	98.3	99.9	OR	OR	96.5	89.5	84.6	80.1	74.9	84.2	92.1	74.8	64.8	65.6	70.2	70.5	87.5	89.6	96.2	97.8	87.2	100.3																							
4-Aug	95.5	91.6	93.2	93.6	92.5	92.2	92.4	84.7	80.1	65.2	56.7	53.5	50.2	47.2	46.5	53.6	64.3	65.5	66.1	85.0	88.8	84.3	95.1	93.4	76.3	95.5																							
5-Aug	91.8	90.3	94.9	92.4	90.4	92.2	90.0	82.0	74.0	64.2	52.5	45.9	43.3	41.3	40.7	48.3	50.2	64.5	79.6	85.5	90.2	94.2	97.7	72.3	97.7																								
6-Aug	99.3	99.9	100.0	100.5	100.5	100.5	99.4	94.2	85.7	70.6	65.6	51.7	55.9	53.6	60.5	55.7	54.6	65.7	70.6	82.6	86.9	91.0	95.1	98.0	80.8	100.5																							
7-Aug	98.6	98.7	98.1	99.7	99.9	100.1	100.0	78.0	68.8	54.3	49.3	47.0	44.9	45.0	44.2	44.2	44.2	43.7	53.0	71.2	84.9	92.4	96.3	95.7	73.0	100.1																							
8-Aug	97.5	98.5	99.1	99.2	99.4	99.8	95.6	78.8	76.7	64.6	58.9	50.3	50.3	47.0	46.6	46.7	48.3	55.2	62.6	68.5	71.2	73.5	78.1	85.3	73.0	99.8																							
9-Aug	88.6	84.4	82.0	82.4	83.0	84.7	86.5	84.6	82.6	83.9	87.3	86.1	89.1	87.2	82.6	78.9	88.5	94.4	97.9	98.9	99.9	99.8	99.7	100.1	88.9	100.1																							
10-Aug	100.3	100.4	100.3	100.4	100.5	100.6	100.5	100.2	100.3	100.2	100.0	98.8	98.8	99.1	98.6	98.4	99.4	99.9	100.6	OR	OR	OR	OR	OR	99.9	100.6																							
11-Aug	100.5	OR	OR	OR	OR	OR	OR	OR	OR	97.1	92.0	87.6	85.3	83.0	86.1	86.3	77.5	85.2	89.6	98.9	100.6	OR	OR	OR	--	100.6																							
12-Aug	97.9	95.9	99.5	97.5	97.0	97.7	97.4	95.5	93.6	96.5	96.8	94.3	84.8	69.8	60.9	59.2	68.2	67.7	78.0	90.2	93.4	96.1	95.0	98.9	88.4	99.5																							
13-Aug	99.9	OR	OR	OR	OR	OR	96.2	80.7	59.4	55.4	50.1	47.9	45.7	44.5	43.0	42.7	42.9	44.5	46.5	66.5	76.5	76.5	75.6	69.4	61.3	99.9																							
14-Aug	65.0	62.5	64.6	69.2	70.7	67.5	66.5	65.5	70.6	67.8	58.2	55.3	52.8	50.0	42.3	37.9	36.0	39.8	57.2	77.1	81.6	81.8	86.0	79.6	62.7	86.0																							
15-Aug	87.6	95.9	98.4	97.1	99.3	98.1	96.2	86.8	72.0	73.1	77.5	82.0	83.6	76.8	72.4	64.4	70.3	70.0	78.4	80.0	75.7	79.7	85.6	88.5	82.9	99.3																							
16-Aug	91.5	94.0	95.7	94.5	96.4	98.5	97.4	93.7	86.5	74.5	64.3	59.6	56.8	51.5	49.7	45.2	46.1	48.3	63.1	79.7	82.5	89.0	83.0	82.8	76.0	98.5																							
17-Aug	72.1	67.1	68.1	75.4	87.1	83.0	73.4	66.9	62.8	56.4	46.3	39.9	39.7	41.0	46.3	45.0	45.1	53.6	55.5	64.2	62.0	69.5	73.4	80.9	61.4	87.1																							
18-Aug	76.4	71.9	82.6	88.3	79.7	89.5	92.1	91.4	90.9	92.2	86.3	80.1	75.2	73.4	73.3	71.3	72.3	75.1	77.4	76.2	83.6	86.3	84.3	81.7	81.3	92.2																							
19-Aug	86.4	86.3	86.4	87.7	89.6	92.9	89.9	80.9	73.8	62.2	55.3	59.4	61.8	59.0	57.9	55.7	52.6	54.8	67.7	81.6	88.0	84.6	75.8	74.2	73.5	92.9																							
20-Aug	72.9	72.8	74.3	72.7	72.1	73.1	71.6	66.2	54.5	47.2	45.4	39.9	43.2	49.8	33.4	42.6	38.9	57.5	71.8	74.9	75.3	81.1	85.9	89.1	62.8	89.1																							
21-Aug	92.5	93.6	95.8	95.6	97.7	97.3	93.7	83.7	67.3	52.0	45.9	43.7	43.8	39.8	35.7	37.6	40.2	49.7	69.7	84.0	88.0	92.9	94.6	96.0	72.1	97.7																							
22-Aug	96.8	98.4	98.8	99.8	98.7	99.3	98.9	85.7	74.3	70.5	70.1	65.5	62.5	60.2	56.6	55.7	59.5	74.6	85.5	92.8	95.2	96.9	98.1	98.4	83.0	99.8																							
23-Aug	98.3	97.8	97.8	99.2	99.4	100.1	99.3	95.7	86.2	73.9	70.3	69.1	67.7	66.0	71.8	72.5	72.2	84.4	88.1	91.6	87.9	87.4	90.2	92.6	85.8	100.1																							
24-Aug	91.7	91.1	89.3	87.5	88.3	90.5	92.0	90.3	87.9	82.7	82.3	77.4	76.7	71.9	65.9	62.9	62.3	65.8	74.5	84.9	92.0	94.8	92.3	97.5	83.0	97.5																							
25-Aug	99.3	99.7	99.2	99.0	100.2	100.5	99.4	85.5	67.9	57.8	52.4	46.4	44.3	41.5	39.8	40.8	43.3	51.6	71.0	81.0	82.2	82.8	84.2	84.5	73.1	100.5																							
26-Aug	92.5	90.4	83.2	87.5	89.2	80.3	77.5	72.5	66.0	61.3	55.3	47.1	40.8	35.3	33.8	35.9	40.5	59.0	68.9	75.3	78.4	69.5	73.8	77.5	66.3	92.5																							
27-Aug	84.6	93.1	96.7	96.8	98.5	99.2	96.9	90.4	74.0	64.3	54.9	49.7	47.9	47.1	51.0	56.2	56.5	64.7	73.2	81.6	80.1	81.3	74.9	75.4	74.5	99.2																							
28-Aug	75.5	76.3	77.1	80.7	90.2	95.3	94.9	85.6	74.7	65.0	56.7	54.1	63.2	62.1	60.5	65.1	74.7	84.7	91.7	95.4	94.4	94.7	95.8	99.3	79.5	99.3																							
29-Aug	99.0	100.0	99.4	99.9	99.5	99.2	99.7	94.6	85.1	70.7	67.5	62.8	59.3	59.5	57.1	60.0	71.0	81.3	86.3	88.4	93.5	94.8	97.1	98.0	84.3	100.0																							
30-Aug	97.6	97.9	98.9	99.0	99.9	99.2	100.0	90.4	78.1	72.1	71.9	69.6	63.9	54.5	48.2	40.1	59.4	75.3	85.2	86.1	86.6	89.4	91.0	92.1	81.1	100.0																							
31-Aug	92.3	93.4	91.9	95.3	99.0	99.7	99.5	95.4	79.8	70.0	63.0	58.0	55.0	54.7	55.7	57.4	58.7	65.5	74.1	76.0	76.2	79.6	82.3	82.3	77.3	99.7																							
90.4 90.0 91.1 92.2 92.9 93.6 92.4 85.2 77.8 71.4 66.6 62.7 60.8 58.4 57.6 57.0 59.2 65.5 73.6 81.4 85.1 86.7 88.2 89.4																								Diurnal Average																									
100.5 100.4 100.3 100.5 100.5 100.6 100.5 100.2 100.3 100.2 100.0 98.8 98.8 99.1 98.6 98.4 99.4 99.9 100.6 98.9 100.6 99.8 99.7 100.1																								Diurnal Maximum																									
OR - Out of Range																																																	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Surmont 2 - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Surmont 2 - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	15	2.08	2.08
40 - 60	134	18.61	20.69
60 - 80	196	27.22	47.92
80 - 100	346	48.06	95.97

Total Number of Valid Hours: 720

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

Wind Speed (WS) - km/h

Surmont 2 - August 2023

Maximum Speed: 11 km/h on Aug 17 13:00	Maximum Daily Speed Average: 7.2 km/h on Aug 1	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 6 01:00	Minimum Daily Speed Average: 0.8 km/h on Aug 23	Hours of Data: 723
Maximum Diurnal Speed Average: 2.9 km/h at hour 1	Minimum Diurnal Speed Average: 1.1 km/h at hour 14	Hours of Missing Data: 21
Monthly Average Velocity: 2.1 km/h 254.9 deg	Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 3 Median = 4 Q ₃ = 6 P ₉₀ = 8 P ₉₉ = 11	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-Aug	W6	W9	W7	W6	W7	W8	W9	W9	W8	W7	W8	W5	W8	W9	WSW7	W8	W8	W10	W8	W6	WSW5	WSW5	WSW6	WSW5	W7.2	W10
2-Aug	W5	WSW4	W3	W1	W3	WSW3	W3	W5	WNW5	WNW3	N4	NW4	WNW5	NNE3	NE6	NE5	N3	NNE1	WSW2	WSW3	WSW2	WSW2	SW1	WSW1	WNW1.9	NE6
3-Aug	SW1	WSW1	WSW1	UO	S2	ESE3	ESE2	SSE1	SE3	SE5	SE7	SE5	ESE7	SSE3	SSW1	W4	WSW6	WSW5	W5	W6	W3	WSW3	SW1	SW3	SSW1.7	SE7
4-Aug	WSW5	WSW8	W5	W7	W8	W7	WNW6	WNW7	WNW6	NW6	NW7	WNW7	WNW7	WNW7	NW5	WNW4	W4	W2	W3	WSW3	WSW4	W4	WSW2	SW3	W4.9	WSW8
5-Aug	W4	WSW4	W3	W5	WSW5	W3	WSW3	W4	W4	W5	W6	WNW6	WNW7	NW6	NW5	NW5	WNW5	W5	W3	WSW3	WSW3	WSW2	WSW1	UO	W4.0	WNW7
6-Aug	SW0	SW1	UO	SW0	UO	UO	UO	S0	E1	NE0	NNE4	ENE4	NNE4	NE8	E6	ESE2	NE2	NNE3	N3	W3	W3	W3	WSW3	W4	NNE1.0	NE8
7-Aug	W3	W3	UO	UO	UO	UO	UO	WNW3	N3	NE5	NNE6	NNE6	NNE6	NNE5	N6	NNE6	NNW4	NNW5	WNW3	WSW3	WSW3	W1	WSW1	WSW3	NNW2.5	NNE6
8-Aug	WSW0	SW1	WSW2	UO	SW1	UO	UO	E5	ESE7	ESE7	E5	ESE6	ESE7	E7	ESE10	ESE10	E11	E7	E6	ESE6	ESE6	SE5	SE3	SSW2	ESE5.0	E11
9-Aug	WSW1	SSE3	SE4	SE4	ESE4	ESE5	ESE6	SE6	ESE7	ESE7	ESE8	ESE8	ESE7	ESE9	ESE10	ESE10	ESE6	ESE6	ESE6	ESE8	ESE9	ESE8	ESE8	ESE9	ESE6.5	ESE10
10-Aug	ESE8	ESE9	ESE9	ESE9	ESE10	ESE10	ESE9	ESE10	E7	E8	E7	E11	E10	E9	E9	E8	E5	ENE5	ENE6	ENE6	NE5	NE5	NNE3	NNW5	E7.0	E11
11-Aug	NW5	N3	NW5	NW5	WNW4	WNW4	NW4	NW4	NW4	WNW5	WNW5	NW4	WNW3	NW4	WNW3	NNW2	N3	WNW2	WSW2	WSW2	SW2	SW1	SW2	SSW2	WNW2.8	WNW5
12-Aug	W4	W4	WSW2	W4	WNW3	W5	W5	W5	W6	W6	W6	W5	WNW5	NNW5	NW4	NW5	WNW4	W4	W3	WSW3	WSW4	WSW4	WSW4	WSW2	W3.9	W6
13-Aug	UO	SSE1	WSW1	SSW1	WSW2	W4	WSW3	WSW4	SSW3	SW6	SW8	WSW11	WSW10	WSW10	WSW10	WSW10	W10	W10	W8	WSW3	WSW2	W3	W5	WSW8	WSW5.6	WSW11
14-Aug	WSW9	WSW9	WSW7	WNW4	WSW8	WSW8	W9	WNW7	WSW2	WSW4	W7	W7	W6	W8	WNW7	NW8	WNW8	W5	WSW3	WSW3	SW4	WSW5	WSW3	WSW5	W5.7	WSW9
15-Aug	WSW3	SSW1	UO	SW2	WSW1	WSW2	SW1	SSE2	ESE4	SE5	SSW3	WSW7	SSW4	SSW5	SW6	W7	W5	W5	WSW5	WSW7	W10	W9	WNW6	WNW6	WSW3.5	W10
16-Aug	W5	W4	WSW4	WSW3	WSW4	WSW2	W3	W5	W7	W7	WNW6	WNW6	WNW6	WNW5	W6	W7	WNW7	W7	WSW3	SSW2	S3	SSW2	SSW3	WSW2	W4.1	W7
17-Aug	SW3	W2	SSE5	ESE3	E4	W2	WSW9	WSW11	WSW11	WSW8	W7	W11	W11	W9	W6	W6	W7	W5	W5	WSW3	W4	WSW4	W3	W2	WSW4.9	W11
18-Aug	W5	W4	W2	W2	WNW5	NW5	NW5	NW5	NNW6	NNW7	NNW6	N6	NW6	NNW7	NW7	NW6	NW6	WNW5	WNW5	WNW5	WNW6	WNW6	WNW5	WNW5	NW4.9	NNW7
19-Aug	WNW4	WNW4	WNW3	W4	W6	W4	W5	W7	W10	W9	W9	W8	W7	W8	W8	W7	W6	WSW7	W5	SW3	W2	W4	W6	W6	W5.8	W10
20-Aug	W7	WSW7	WSW8	WSW8	WSW8	W7	W8	W6	W7	W8	WSW7	WSW7	WSW4	SSW3	S6	WSW2	SE5	S3	SW2	W3	WSW2	SW2	S1	SSW1	WSW4.6	W8
21-Aug	S1	S1	SW1	WSW1	WSW1	SW2	SW1	S1	SSE2	SSE4	S5	SE6	SSE6	SE6	ESE8	SSE6	S5	SSW3	WSW3	WSW3	WSW2	WSW2	WSW2	WSW2	S2.2	ESE8
22-Aug	WSW2	WSW1	WSW1	WSW2	WSW2	WSW1	SW1	S2	SE5	SE6	SE6	SE7	SE4	SSE6	SE5	SSE4	SSW3	SW2	WSW2	WSW2	WSW3	WSW2	WSW2	WSW1	S2.0	SE7
23-Aug	UO	WSW1	SW1	WSW2	UO	WSW1	SW1	SSW1	SE3	SE5	SE5	SE2	SW1	E4	ESE3	ESE3	NNE1	WNW2	W2	W2	W3	W4	WSW3	W3	SSW0.8	SE5
24-Aug	W4	W3	W3	WNW4	WNW4	W4	WNW5	NW5	NNW6	N8	NNW7	NNW7	NNW6	NW6	WNW6	WNW8	WNW6	W5	W4	WSW4	WSW2	WSW2	WSW3	SSW1	WNW4.0	WNW8
25-Aug	WSW1	WSW1	SW1	SSE1	S1	SW1	UO	SSE2	WSW4	WSW8	SW7	SW6	SW6	WSW7	WSW6	SSW5	SSW5	S4	SSW3	SW2	SW3	SSW3	SSW3	SSE3	SW3.2	WSW8
26-Aug	SSE3	SSE4	SE5	SE2	SE4	WSW3	WSW6	SW5	SW5	SW6	SW7	WSW8	WSW8	W9	W11	W9	W6	WSW3	WSW3	WSW3	W3	W5	W4	W4	WSW4.1	W11
27-Aug	W3	WSW2	WSW3	W1	SW1	WSW2	WSW1	SSE1	NNE2	N3	NW2	NE3	SSW1	SSE4	SSE5	SE5	SSE4	SW2	WSW2	SW2	W4	W3	WSW9	WSW9	SW1.7	WSW9
28-Aug	WSW7	W5	W5	W4	S1	SE2	SSW1	S1	W3	WSW2	SSE2	SSE3	S3	S3	S3	SSW3	SW3	SW3	SW3	WSW3	WSW2	WSW2	WSW2	WSW1	SW2.2	WSW7
29-Aug	SW1	WSW1	WSW2	WSW2	SW3	WSW2	WSW1	UO	UO	SSE4	SSE6	SE6	SSE5	SSE5	SE5	SSE4	SW3	SW3	SW3	WSW3	SW2	SW2	WSW2	WSW2	S2.2	SE6
30-Aug	WSW2	WSW3	WSW2	WSW2	WSW2	SW2	SW1	SSW1	SSE3	SE3	SSE3	SE3	SE6	SE7	SE6	S4	WSW3	WSW2	WSW2	WSW3	WSW3	WSW2	WSW2	WSW2	S2.0	SE7
31-Aug	WSW3	SW3	SW2	SW2	SW1	SW0	WSW1	WSW2	NW1	W2	WSW3	NW3	NNE2	N3	NNW4	N3	WNW6	W6	W5	W7	W7	W6	W6	W6	W2.9	W7

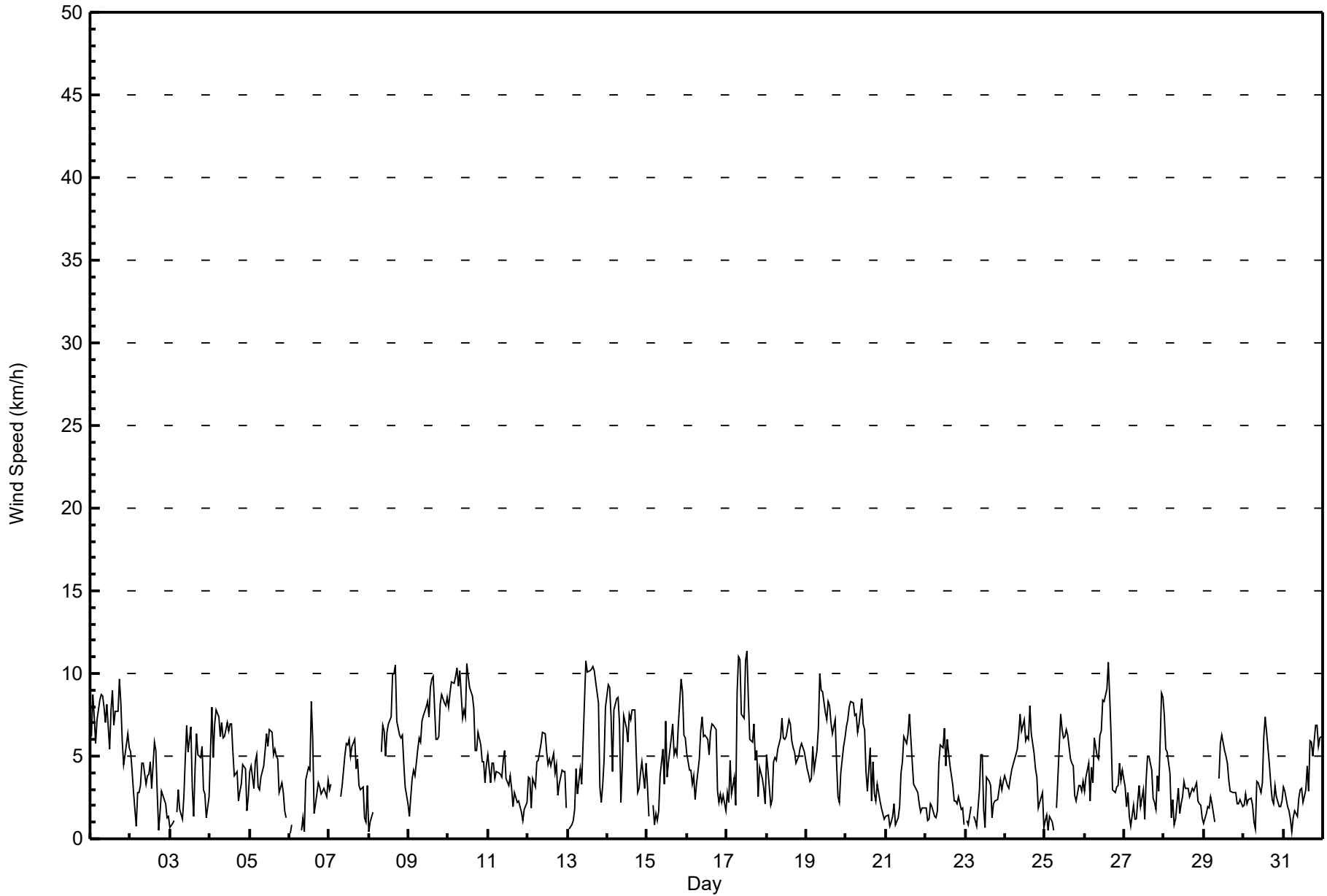
WSW2.9WSW2.5WSW2.0WSW1.9WSW2.1WSW2.3	W2.6WSW2.1	W1.6WSW1.5WSW1.8WSW1.5WSW1.6	W1.1WSW1.2	W1.5	W2.4	W2.7WSW2.4WSW2.4WSW2.4WSW2.3WSW2.4WSW2.6	Diurnal Average															
WSW9	WSW9	ESE9	ESE9	ESE10	ESE10	ESE9WSW11WSW11	W9	W9	W11	W11	WSW10	W11	WSW10	E11	W10	W8	ESE8	W10	W9	WSW9	WSW9	Diurnal Maximum

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
Surmont 2 - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	485	67.08	67.08
6 - 11	238	32.92	100.00
12 - 19	0	0.00	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: 723

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Wind Speed (WS) - km/h
Surmont 2 - August 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	9	10	7	2	6	10	23	26	19	28	50	143	93	32	21	6	485
6 - 11	3	4	2	2	13	35	11	4	1	0	8	38	77	23	9	8	238
12 - 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	12	14	9	4	19	45	34	30	20	28	58	181	170	55	30	14	723

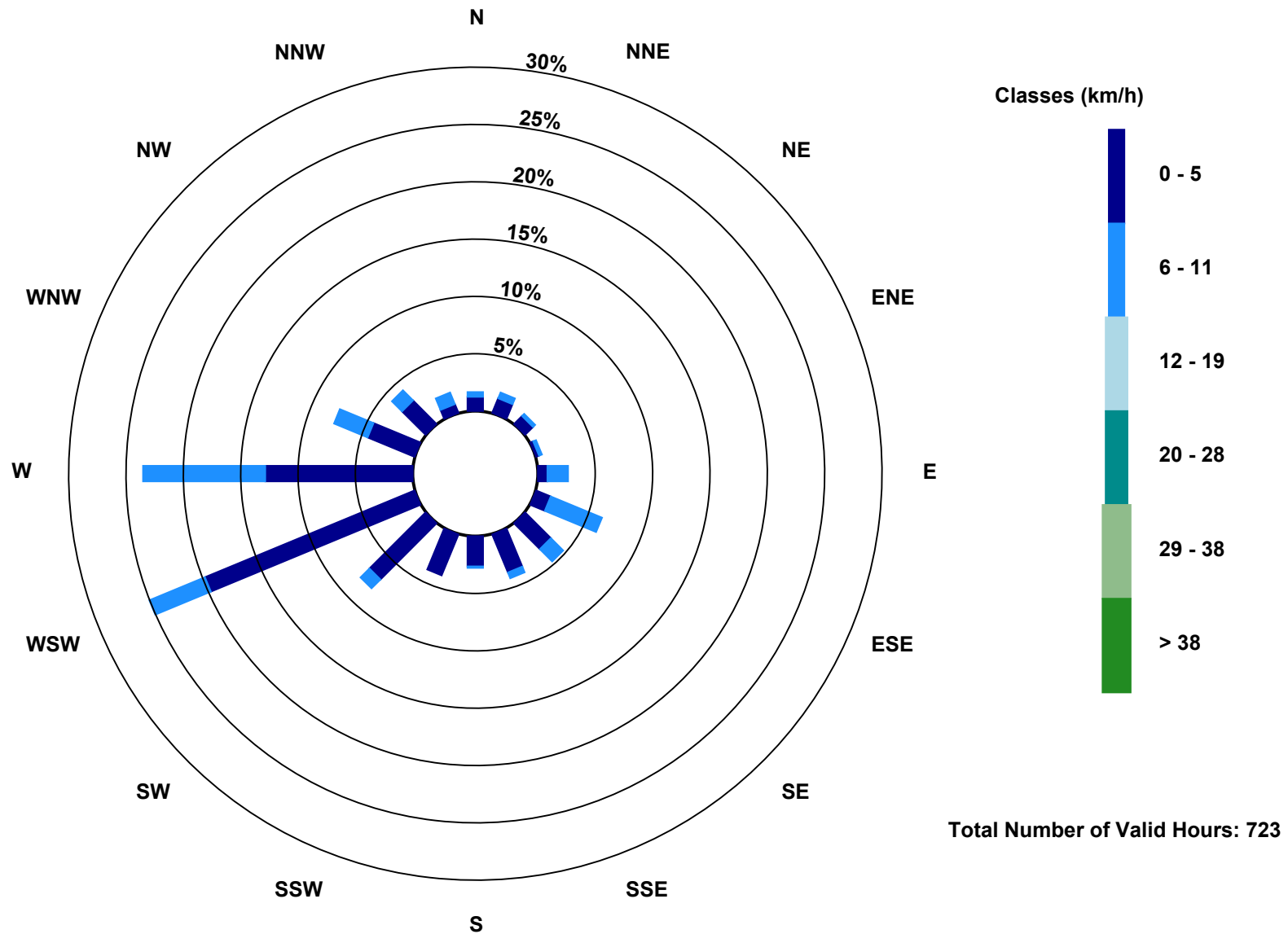
Total Number of Valid Hours: 723

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Surmont 2





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Surmont 2 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 5 km/h on Aug 13 12:00 Minimum Value: 0 km/h on Aug 21 19:00 Percentiles: P ₁ = 0 P ₁₀ = 1 Q ₁ = 1 Median = 2 Q ₃ = 2 P ₉₀ = 3 P ₉₉ = 4														Hours in Service: 744 Hours of Data: 723 Hours of Missing Data: 21 Hours of Calibration: 0 Percent Operational Time: 97.2											
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-Aug	3	3	3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	2	2	2	2	2	3
2-Aug	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	1	1	0	1	1	1	1	2
3-Aug	1	1	1	UO	1	1	1	1	2	3	3	2	2	3	1	3	3	3	2	2	1	2	1	1	3
4-Aug	1	2	3	2	3	3	2	3	2	3	3	3	3	3	2	2	2	1	1	1	1	2	1	1	3
5-Aug	2	1	1	2	1	2	1	1	2	2	2	2	2	3	2	2	3	2	1	1	2	1	1	UO	3
6-Aug	1	1	UO	1	UO	UO	UO	1	1	1	2	2	2	3	2	2	2	2	2	1	1	1	1	1	3
7-Aug	1	1	UO	UO	UO	UO	UO	1	2	2	3	3	3	3	3	3	2	2	2	1	1	1	1	2	3
8-Aug	1	1	2	UO	1	UO	UO	2	2	2	2	3	3	3	4	4	4	3	2	2	2	2	1	1	4
9-Aug	1	1	2	1	1	2	2	2	3	3	3	3	2	3	4	4	2	2	2	3	3	3	3	3	4
10-Aug	2	3	3	3	3	3	3	3	3	3	3	5	4	4	3	3	2	2	3	3	2	2	2	2	5
11-Aug	2	2	2	2	1	2	2	2	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2
12-Aug	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2	3	2	2	1	1	1	1	2	1	3
13-Aug	UO	1	1	1	0	2	1	2	2	3	4	5	4	4	4	4	4	4	3	1	1	1	2	3	5
14-Aug	3	3	3	3	3	2	3	3	1	2	3	2	2	3	3	4	3	2	1	1	1	2	1	1	4
15-Aug	2	1	UO	1	1	1	1	1	1	2	3	3	2	2	2	3	3	2	2	2	3	3	2	2	3
16-Aug	2	1	1	2	2	1	1	2	3	3	2	3	2	3	2	3	3	2	2	1	1	1	1	1	3
17-Aug	2	2	2	2	1	2	4	3	3	3	3	4	4	3	2	2	3	2	2	1	2	1	1	1	4
18-Aug	2	2	2	2	2	2	2	2	3	3	2	3	3	3	3	3	2	2	2	2	2	2	2	2	3
19-Aug	2	2	1	1	1	1	2	3	3	3	3	3	3	3	3	2	2	3	2	1	1	1	2	2	3
20-Aug	2	2	3	3	3	2	3	2	3	3	3	3	2	2	2	2	2	1	1	1	2	1	1	1	3
21-Aug	1	1	1	1	1	1	1	1	1	2	2	3	2	2	3	3	2	1	0	0	1	1	1	1	3
22-Aug	1	1	1	1	1	1	1	1	2	2	2	3	3	2	2	2	1	1	0	1	1	1	1	1	3
23-Aug	UO	1	1	1	UO	1	1	1	1	2	2	1	1	2	2	1	1	1	0	0	1	1	1	1	2
24-Aug	1	1	1	1	2	2	2	2	3	3	3	3	3	2	3	3	3	2	1	1	1	2	2	1	3
25-Aug	1	1	1	1	1	1	UO	1	2	3	3	2	3	3	3	2	2	2	1	1	1	1	1	2	3
26-Aug	1	2	2	1	2	3	2	2	2	2	3	4	3	3	4	3	3	1	1	1	1	2	1	1	4
27-Aug	1	1	1	1	1	1	1	1	2	1	1	1	2	2	2	2	2	1	1	1	2	1	3	3	3
28-Aug	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	2
29-Aug	1	1	1	1	1	1	1	UO	UO	1	2	2	2	2	2	1	1	1	1	1	2	1	1	1	2
30-Aug	1	1	1	1	1	1	1	1	2	1	1	1	3	3	3	2	1	1	1	2	1	1	1	1	3
31-Aug	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	2	2	2	3	2	2	2	2	3
Diurnal Maximum																								3	
UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Surmont 2 - August 2023

Direction of Maximum Speed: 270 deg on Aug 17 13:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 267.8 deg on Aug 1	Hours of Data: 723
Direction of Minimum Speed: 233 deg on Aug 6 01:00	Hours of Missing Data: 21
Direction of Minimum Daily Speed Average: 0.8 deg on Aug 23	Percent Operational Time: 97.2
Monthly Average Direction: 254.9 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-Aug	260	265	276	274	269	271	262	267	277	274	269	274	269	279	258	266	273	269	272	264	258	254	253	258	267.8
2-Aug	259	256	269	262	265	253	278	275	298	295	354	314	290	22	48	41	352	26	238	245	251	256	232	249	293.6
3-Aug	216	241	245	UO	187	123	108	156	143	138	135	144	119	165	210	267	249	255	268	265	264	247	229	231	199.7
4-Aug	241	253	268	262	273	275	284	292	289	317	318	295	286	297	308	291	275	269	277	250	248	263	251	236	279.1
5-Aug	272	255	266	260	257	259	249	260	266	270	271	292	300	305	310	305	297	268	263	253	257	251	248	UO	275.5
6-Aug	233	233	UO	230	UO	UO	UO	182	92	40	17	60	33	56	100	119	35	26	356	278	267	263	253	265	28.2
7-Aug	268	273	UO	UO	UO	UO	UO	292	9	49	14	32	24	12	359	17	335	337	303	250	256	275	242	254	345.3
8-Aug	239	218	243	UO	229	UO	UO	100	111	102	97	116	115	88	104	105	99	96	100	102	109	124	139	205	107.6
9-Aug	240	157	135	134	119	112	111	126	108	106	114	112	112	108	108	108	110	108	107	108	108	107	110	107	112.2
10-Aug	105	106	108	105	105	105	106	104	97	98	89	97	93	90	90	89	79	77	76	71	48	37	18	327	91.4
11-Aug	314	350	324	309	287	303	314	314	304	287	293	314	299	322	292	329	9	298	249	243	233	222	214	199	301.4
12-Aug	263	271	239	270	287	262	264	263	279	268	274	274	288	334	320	314	285	271	268	251	248	246	242	249	273.8
13-Aug	UO	163	240	210	255	268	254	244	201	221	236	248	245	252	253	253	259	260	260	251	244	271	261	247	249.4
14-Aug	249	251	256	286	254	255	275	302	244	255	273	276	277	281	284	318	284	270	237	254	233	244	249	244	267.3
15-Aug	241	204	UO	233	240	241	226	168	117	124	198	251	204	201	235	266	267	266	249	252	262	267	283	302	247.1
16-Aug	278	264	246	247	253	247	260	270	280	269	294	291	292	301	271	276	290	268	241	207	188	208	204	251	268.5
17-Aug	233	261	151	120	92	268	249	250	247	256	266	269	270	273	272	276	277	268	267	238	267	246	265	260	258.4
18-Aug	274	267	263	275	291	310	310	317	331	330	343	353	326	330	326	305	307	289	288	293	292	290	298	300	308.5
19-Aug	292	284	289	274	260	259	275	268	276	272	279	277	267	262	274	273	275	258	268	233	259	265	273	264	270.7
20-Aug	260	256	255	255	258	261	265	262	261	264	244	251	248	205	191	243	144	190	221	267	257	219	179	195	247.2
21-Aug	179	186	236	244	239	234	228	191	168	157	173	139	162	127	123	157	176	206	252	252	251	252	241	240	176.6
22-Aug	244	256	254	252	246	240	225	177	138	141	145	146	141	150	145	158	195	236	249	251	252	247	248	257	179.0
23-Aug	UO	238	236	241	UO	253	231	194	129	126	136	136	221	99	114	123	24	286	267	266	270	265	258	276	194.5
24-Aug	275	277	281	283	295	276	296	316	333	359	335	339	330	307	302	291	289	269	260	246	241	245	238	213	299.1
25-Aug	242	240	231	150	171	235	UO	154	238	244	236	235	220	241	239	203	204	176	211	227	220	192	212	168	219.2
26-Aug	164	156	130	141	135	241	242	227	223	231	222	243	255	266	262	266	269	248	240	239	260	273	277	276	241.9
27-Aug	261	240	253	260	230	246	242	150	22	354	312	55	199	164	168	142	162	236	238	230	267	262	249	252	232.8
28-Aug	254	263	269	268	186	130	192	186	278	239	155	166	177	173	182	209	222	231	234	246	242	238	239	238	228.8
29-Aug	235	239	237	242	236	240	238	UO	UO	153	154	133	151	156	144	151	222	229	216	237	231	231	246	247	189.3
30-Aug	238	241	247	237	252	235	235	195	148	142	150	141	125	139	142	170	240	237	248	243	242	242	250	238	190.3
31-Aug	245	224	235	230	234	221	243	249	307	269	254	317	28	359	342	350	282	272	264	270	271	268	278	267	276.3

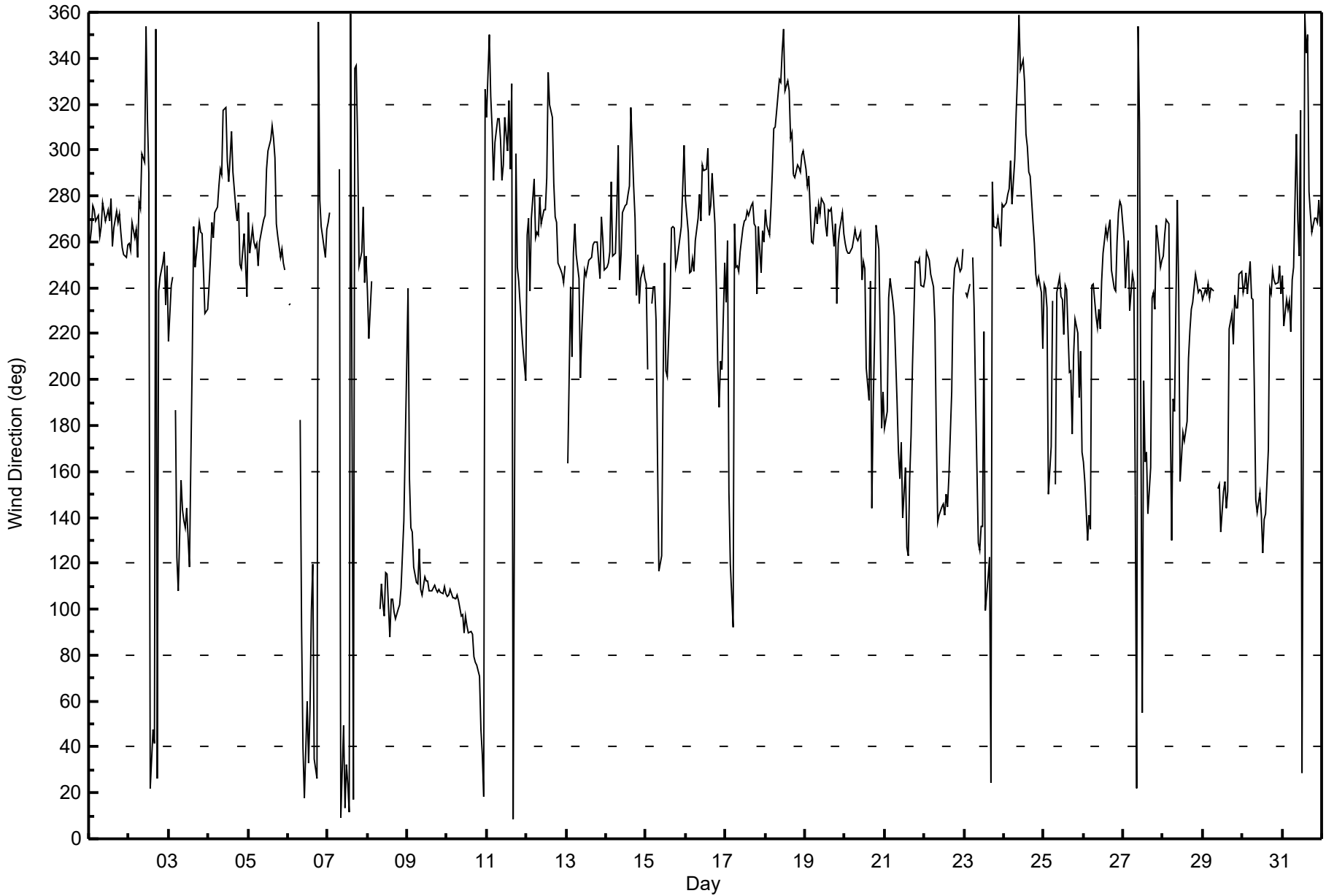
255.4 249.9 248.0 251.0 250.4 254.6 260.9 258.7 262.1 249.9 255.5 257.3 253.4 267.6 244.1 263.4 266.7 259.8 256.0 247.9 250.3 251.5 251.6 254.4
 Diurnal Average

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 - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Surmont 2 - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 108 deg on Aug 2 18:00 Minimum Value: 9 deg on Aug 22 20:00 Percentiles: P ₁ = 10 P ₁₀ = 19 Q ₁ = 28 Median = 40 Q ₃ = 56 P ₉₀ = 67 P ₉₉ = 96																			Hours in Service: 744 Hours of Data: 723 Hours of Missing Data: 21 Hours of Calibration: 0 Percent Operational Time: 97.2						
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-Aug	36	31	37	32	35	30	30	33	39	37	35	51	44	35	34	31	37	30	34	27	29	23	20	23	51
2-Aug	22	23	54	86	35	27	33	40	49	68	77	68	66	83	57	55	79	108	68	9	20	18	47	22	108
3-Aug	85	53	56	UO	95	56	93	91	69	64	56	64	41	79	79	63	45	39	32	27	19	23	28	21	95
4-Aug	13	22	42	27	33	38	40	45	49	64	56	60	45	52	56	75	47	35	45	14	16	21	19	32	75
5-Aug	29	22	33	22	23	24	24	28	29	35	39	59	51	60	66	59	54	29	25	14	15	9	42	UO	66
6-Aug	60	11	UO	71	UO	UO	UO	47	67	104	55	69	54	39	35	104	95	62	68	13	17	21	24	15	104
7-Aug	17	13	UO	UO	UO	UO	UO	42	67	67	69	64	66	73	73	61	76	61	57	16	36	29	74	40	76
8-Aug	86	31	50	UO	74	UO	UO	35	40	43	62	46	49	42	33	37	33	32	26	24	37	48	63	45	86
9-Aug	60	63	57	57	58	32	30	46	38	34	37	32	34	30	30	34	34	30	35	32	30	32	35	27	63
10-Aug	28	27	30	26	23	22	28	24	27	28	32	27	27	30	29	34	41	45	41	45	53	57	79	66	79
11-Aug	63	89	65	58	61	54	65	63	60	53	50	58	65	56	50	94	62	46	40	14	22	25	25	55	94
12-Aug	41	32	23	52	55	19	24	26	36	29	32	35	50	68	70	59	44	36	48	16	14	13	13	46	70
13-Aug	UO	81	18	52	31	40	26	41	88	58	55	42	52	43	38	37	36	32	27	26	37	31	21	88	
14-Aug	23	23	30	66	34	29	36	55	48	25	32	33	33	30	50	64	45	38	20	20	16	19	15	14	66
15-Aug	22	26	UO	13	34	11	31	66	39	42	72	39	63	69	51	43	40	30	35	30	36	30	46	61	72
16-Aug	41	34	15	58	21	23	27	26	38	37	56	58	56	62	40	43	43	32	28	29	40	52	64	90	90
17-Aug	96	104	60	82	41	103	29	28	29	35	41	35	37	36	28	33	33	28	27	27	38	15	34	36	104
18-Aug	35	36	63	69	56	63	66	58	64	62	63	63	66	63	64	61	64	48	45	51	44	51	57	64	69
19-Aug	47	47	49	39	22	26	36	42	35	37	44	42	36	34	35	40	41	33	23	21	37	22	27	28	49
20-Aug	29	28	28	30	35	38	34	38	43	40	42	55	62	54	60	92	60	51	37	32	36	47	51	71	92
21-Aug	59	54	10	46	36	11	60	37	28	60	54	47	54	53	45	52	53	39	14	10	11	32	22	27	60
22-Aug	36	32	16	13	18	36	34	70	51	50	49	56	80	51	56	56	50	19	10	9	14	20	11	45	80
23-Aug	UO	38	56	15	UO	9	42	60	50	43	44	96	98	69	64	55	86	33	15	20	18	21	34	18	98
24-Aug	21	26	40	52	60	55	56	63	63	55	63	54	63	57	63	49	49	29	18	14	51	26	13	51	63
25-Aug	38	10	48	45	86	42	UO	59	57	45	60	52	63	50	52	58	65	66	52	43	47	61	71	55	86
26-Aug	52	51	59	85	53	94	39	40	49	40	57	46	41	41	34	38	30	26	15	16	38	43	51	41	94
27-Aug	27	21	14	42	27	33	47	75	85	70	89	80	100	74	57	58	46	36	26	20	45	40	25	25	100
28-Aug	29	30	28	35	66	45	37	30	39	71	52	31	39	41	34	19	13	14	14	16	25	28	46	41	71
29-Aug	47	35	14	11	15	11	14	UO	UO	40	43	46	45	43	50	46	24	18	20	32	60	20	24	36	60
30-Aug	12	15	19	24	17	32	40	46	63	52	39	41	45	49	57	59	20	22	34	25	38	21	16	17	63
31-Aug	23	49	63	55	43	72	29	61	82	63	58	67	93	85	62	72	44	32	23	27	38	48	41	29	93
96 104 65 86 95 103 93 91 88 104 89 96 100 85 79 104 95 108 68 51 60 61 79 90																								Diurnal Maximum	
UO - Unstable Operation																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

**AMS30
ELLS RIVER
AUGUST 2023**

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
AUGUST 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	659	35	85	93.28	43.7	0	6.3	0
TRS (ppb) Average	705	36	39	99.6	2.6	0	0.8	0
THC (ppm) Average	704	35	40	99.33	4.2	-	2.6	-
NMHC (ppm) Average	704	35	40	99.33	0.457	-	0.184	-
CH4 (ppm) Average	704	35	40	99.33	4	-	2.5	-
NO2 (ppb) Average	707	36	37	99.87	24.6	0	8.5	-
NO (ppb) Average	707	36	37	99.87	54.5	-	6.7	-
NOX (ppb) Average	707	36	37	99.87	74.5	-	14.9	-
PM2.5 (ug/m3) Average	742	1	2	99.87	397.3	106	128.9	17
Temperature 2 m (C) Average	744	0	0	100	30.6	-	21.7	-
Relative Humidity (%) Average	744	0	0	100	97.6	-	93.1	-
Wind Speed 10 m (km/h) Average	740	2	4	99.73	28	-	17	-
Wind Direction 10 m (deg) Average	740	2	4	99.73	-	-	-	-
Global Solar Radiation (W/m2) Average	744	0	0	100	761.8	-	262.9	-

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

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
AUGUST 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	659	1.58	2.7	-	0	0.1	0.3	0.8	2.1	3.2	43.7
TRS (ppb) Average	705	0.5	0.2	-	0.2	0.3	0.4	0.4	0.6	0.7	2.6
THC (ppm) Average	704	2.19	0.3	-	1.9	2	2	2.1	2.2	2.5	4.2
NMHC(ppm) Average	704	0.023	0.066	-	0	0	0	0	0	0.1	0.457
CH4(ppm) Average	704	2.17	0.2	-	1.9	2	2	2.1	2.2	2.4	4
NO2 (ppb) Average	707	3.73	4.5	-	0.1	0.3	0.6	1.5	5.3	10	24.6
NO (ppb) Average	707	1.7	5.6	-	0	0	0	0.1	0.6	3.5	54.5
NOX (ppb) Average	707	5.42	8.8	-	0.1	0.3	0.7	1.7	6.4	14.3	74.5
PM2.5 (ug/m3) Average	742	41.3	53.5	-	2.1	4.8	8	20.2	58.2	100	397.3
Temperature 2 m (C) Average	744	17	4.7	-	5.7	11.8	13.6	16.3	20.4	23.5	30.6
Relative Humidity (%) Average	744	72.84	17.3	-	30.6	47.5	58.9	74.7	89	94.1	97.6
Wind Speed 10 m (km/h) Average	740	7.9	5	-	0	3	5	7	10	13	28
Wind Direction 10 m (deg) Average	740	245.5	-	-	-	-	-	-	-	-	-
Global Solar Radiation (W/m2) Average	744	160.9	201.1	-	0	0	0.1	60.9	288.3	490.5	761.8

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - ELLS RIVER (AMS30)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
ALL PARAMETERS	04 Aug 2023 08:00	04 Aug 2023 08:00	1	Maintenance - station logger/modem reset
SO2	01 Aug 2023 13:00	02 Aug 2023 04:00	16	Unstable Operation - excessive baseline drift
SO2	02 Aug 2023 06:00	03 Aug 2023 05:00	24	Unstable Operation - excessive baseline drift
SO2	03 Aug 2023 07:00	03 Aug 2023 14:00	8	Unstable Operation - excessive baseline drift
SO2, THC/NMHC/CH4/ TRS	09 Aug 2023 10:00	09 Aug 2023 10:00	1	Maintenance - sample manifold cleaned
THC/NMHC/CH4	14 Aug 2023 10:00	14 Aug 2023 12:00	3	Maintenance - replaced support gas cylinder
TRS	31 Aug 2023 08:00	31 Aug 2023 08:00	1	Maintenance - verify daily QA response
Wind Speed, Wind Direction	02 Aug 2023 21:00	02 Aug 2023 21:00	1	Flat line in sensor output signal

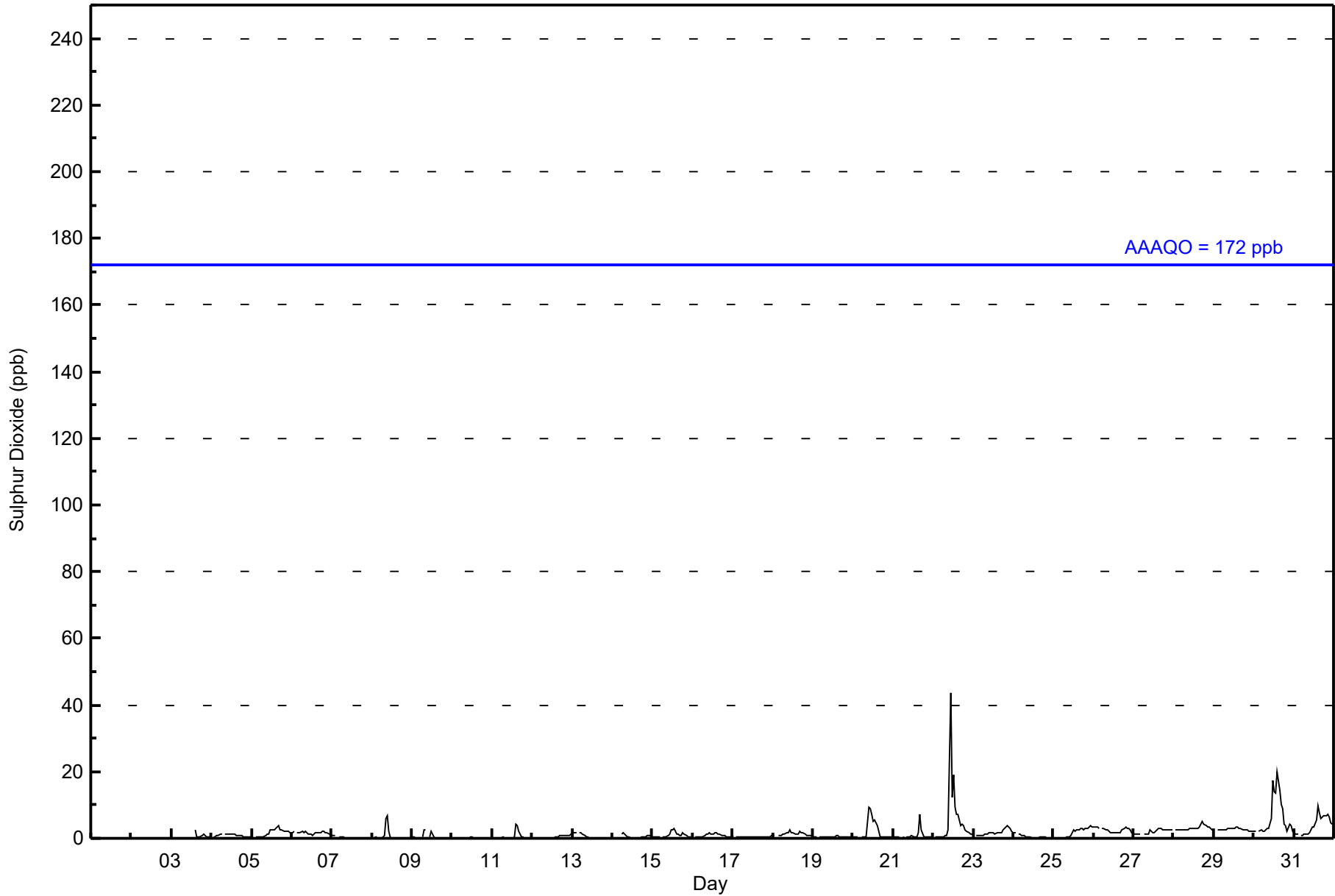


Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 43.7 ppb on Aug 22 11:00	Maximum Daily Average: 6.3 ppb on Aug 30		Hours of Data:	659
Minimum Value: 0.0 ppb on Aug 1 08:00	Minimum Daily Average: 0.1 ppb on Aug 10		Hours of Missing Data:	85
Maximum Diurnal Average: 3.1 ppb at hour 11	Minimum Diurnal Average: 0.8 ppb at hour 3		Hours of Calibration:	35
Monthly Average: 1.58 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.3 Median = 0.8 Q ₃ = 2.1 P ₉₀ = 3.2 P ₉₉ = 13.0		Percent Operational Time:	93.3

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-Aug	0.1	0.0	0.1	Z	0.1	0.0	0.0	0.0	C	C	C	C	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	0.1
2-Aug	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	UO	--	--
3-Aug	UO	UO	UO	UO	UO	Z	UO	UO	UO	UO	UO	UO	UO	UO	2.4	0.6	0.5	0.6	0.8	1.1	0.7	0.6	0.5	0.5	--	2.4
4-Aug	Z	0.5	0.4	0.7	0.8	1.1	1.2	M	1.3	1.3	1.3	1.2	1.2	1.1	1.2	0.8	1.0	0.9	0.8	0.6	0.6	0.5	0.5	0.5	0.9	1.3
5-Aug	0.6	Z	0.5	0.4	0.4	0.5	0.5	0.6	0.7	1.1	1.5	2.4	2.5	2.6	2.8	3.4	3.7	2.5	2.3	2.3	2.1	2.1	2.0	1.9	1.7	3.7
6-Aug	1.8	1.9	Z	1.8	1.8	1.8	1.9	1.9	1.9	1.6	1.1	1.1	0.9	1.3	1.5	1.6	1.7	1.7	2.2	2.1	1.6	1.5	1.3	1.1	1.6	2.2
7-Aug	1.0	0.9	0.7	Z	0.5	0.4	0.3	0.5	0.2	0.0	0.0	0.2	0.0	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	1.0
8-Aug	0.2	0.2	0.3	0.2	Z	0.2	0.2	0.7	5.9	7.0	2.0	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4	0.4	0.8	7.0
9-Aug	0.3	0.3	0.2	0.2	0.1	Z	0.2	2.7	2.5	M	0.4	2.3	1.1	0.3	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.5	2.7
10-Aug	Z	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	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
11-Aug	0.0	Z	0.1	0.1	0.1	0.2	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.3	4.1	4.0	2.3	0.4	0.4	0.2	0.1	0.1	0.1	0.2	0.6	4.1
12-Aug	0.2	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	1.2	0.4	1.2
13-Aug	1.4	1.6	1.7	Z	1.6	1.6	1.4	1.0	0.5	0.3	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	0.2	0.6	1.7
14-Aug	0.2	0.2	0.1	0.1	Z	1.2	1.5	1.3	1.0	0.5	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.9	0.8	0.6	0.6	0.5	1.5
15-Aug	0.3	0.3	0.3	0.3	0.3	Z	0.3	0.3	0.5	0.9	1.4	2.7	2.4	3.0	1.3	1.3	0.9	0.9	1.5	1.4	1.1	0.6	0.6	0.4	1.0	3.0
16-Aug	Z	0.4	0.4	0.4	0.4	0.4	0.6	0.7	1.1	1.1	1.8	1.5	1.4	1.8	1.5	1.4	1.1	0.9	0.9	0.7	0.6	0.6	0.6	0.5	0.9	1.8
17-Aug	0.8	Z	0.5	0.5	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.6	0.6	0.4	0.8
18-Aug	0.7	0.8	Z	0.8	0.9	1.0	1.1	1.4	1.6	1.6	2.5	1.8	1.7	1.3	1.2	1.3	2.0	1.6	1.6	1.1	1.0	1.0	0.8	0.7	1.3	2.5
19-Aug	0.5	0.6	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.8	0.7	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.8
20-Aug	0.4	0.4	0.4	0.4	Z	0.4	0.3	0.3	0.2	9.4	8.7	7.4	5.0	5.5	4.0	2.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	2.1	9.4
21-Aug	0.3	0.3	0.3	0.3	0.2	Z	0.2	0.2	0.3	0.4	0.6	0.7	0.6	0.5	0.5	1.8	7.0	2.4	0.5	0.5	0.5	0.4	0.4	0.4	0.8	7.0
22-Aug	Z	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.9	2.4	43.7	12.5	19.2	9.3	7.4	7.0	3.6	4.2	3.9	2.7	2.0	1.7	1.3	1.1	5.5	43.7
23-Aug	1.0	Z	1.0	1.0	1.0	0.9	1.0	1.2	1.4	1.7	1.8	1.8	1.6	1.5	1.6	1.7	1.9	2.4	3.6	3.9	3.3	2.8	2.3	1.8	3.9	
24-Aug	1.9	1.5	Z	1.3	1.2	0.9	0.7	0.5	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.4	0.6	0.3	0.2	0.1	0.1	0.1	0.5	1.9
25-Aug	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.2	0.3	0.6	0.8	1.9	2.4	2.3	2.4	2.5	2.9	2.8	2.6	2.8	3.1	3.3	3.7	3.5	1.7	3.7
26-Aug	3.3	3.3	3.3	3.2	Z	3.0	2.9	2.7	2.4	2.2	1.7	1.5	1.6	1.7	1.8	1.7	1.8	2.6	2.8	3.2	3.0	2.8	2.4	1.7	2.5	3.3
27-Aug	1.5	1.3	1.3	1.2	1.2	Z	1.2	1.2	1.3	1.3	2.5	1.7	1.8	2.0	2.6	3.0	2.9	2.6	2.6	2.6	2.4	2.5	2.7	2.6	2.0	3.0
28-Aug	Z	2.6	2.6	2.5	2.6	2.5	2.6	2.7	2.7	2.9	3.0	3.0	3.0	3.0	3.2	3.5	4.3	5.0	4.4	3.7	3.4	3.2	2.8	2.6	3.1	5.0
29-Aug	2.3	Z	2.4	2.4	2.4	2.5	2.6	2.6	2.8	2.9	2.9	3.0	3.0	3.2	3.3	3.0	3.0	2.7	2.5	2.4	2.4	2.2	2.2	2.1	2.7	3.3
30-Aug	2.0	2.0	Z	2.1	2.4	2.0	2.3	2.6	2.8	2.9	5.9	17.2	14.1	13.6	20.1	14.3	10.3	8.8	4.2	3.9	2.0	4.2	3.7	2.2	6.3	20.1
31-Aug	1.8	1.5	1.1	Z	0.9	1.0	1.1	1.3	1.3	1.9	2.4	3.2	3.4	5.7	9.9	7.6	5.7	6.5	6.6	6.8	7.1	6.2	4.6	4.1	4.0	9.9

0.9	0.9	0.8	0.9	0.8	0.9	0.9	1.0	1.3	1.7	3.1	2.5	2.5	2.2	2.6	2.3	2.0	1.8	1.6	1.5	1.4	1.4	1.3	1.1	Diurnal Average	
3.3	3.3	3.3	3.2	2.6	3.0	2.9	2.7	5.9	9.4	43.7	17.2	19.2	13.6	20.1	14.3	10.3	8.8	6.6	6.8	7.1	6.2	4.6	4.1	Diurnal Maximum	

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
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Ells River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	651	98.79	98.79
11 - 20	7	1.06	99.85
21 - 60	1	0.15	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: 659

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Ells River - August 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	51	51	14	9	12	18	27	46	86	76	64	57	48	41	25	24	649
11 - 20	0	0	0	0	0	0	2	3	2	0	0	0	0	0	0	0	7
21 - 60	0	0	0	0	0	0	0	0	1	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	51	51	14	9	12	18	29	49	89	76	64	57	48	41	25	24	657

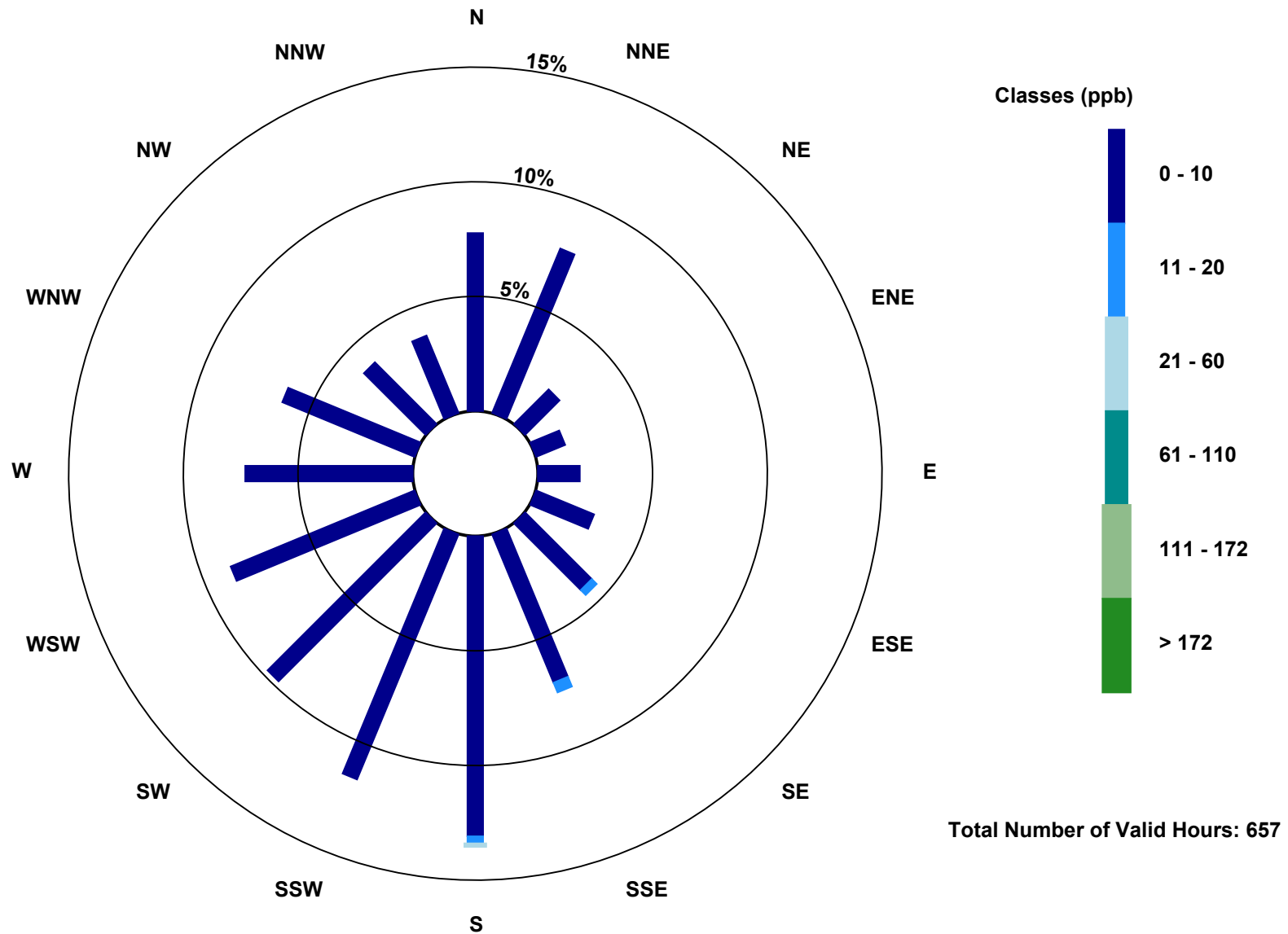
Total Number of Valid Hours: 657

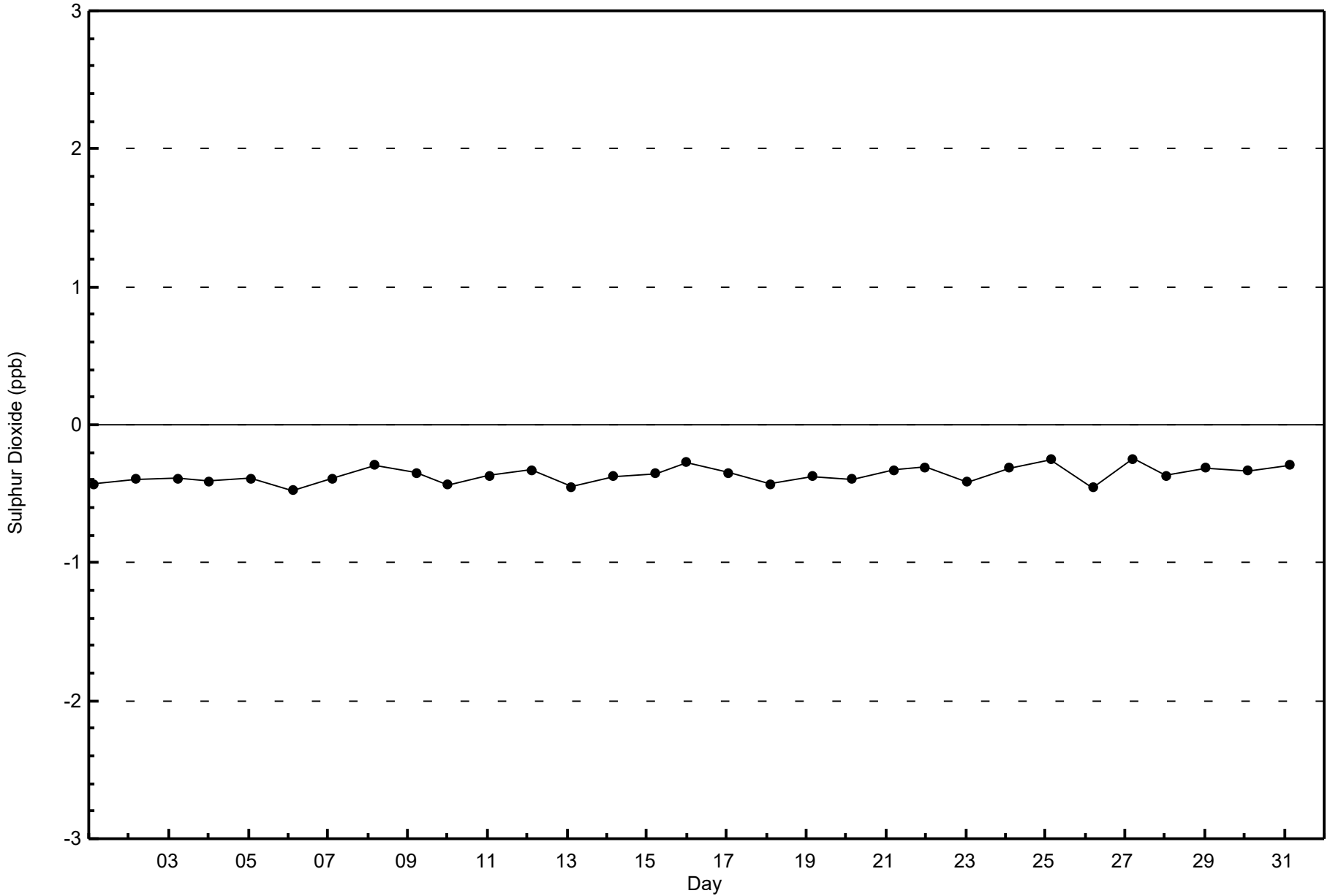
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Ells River

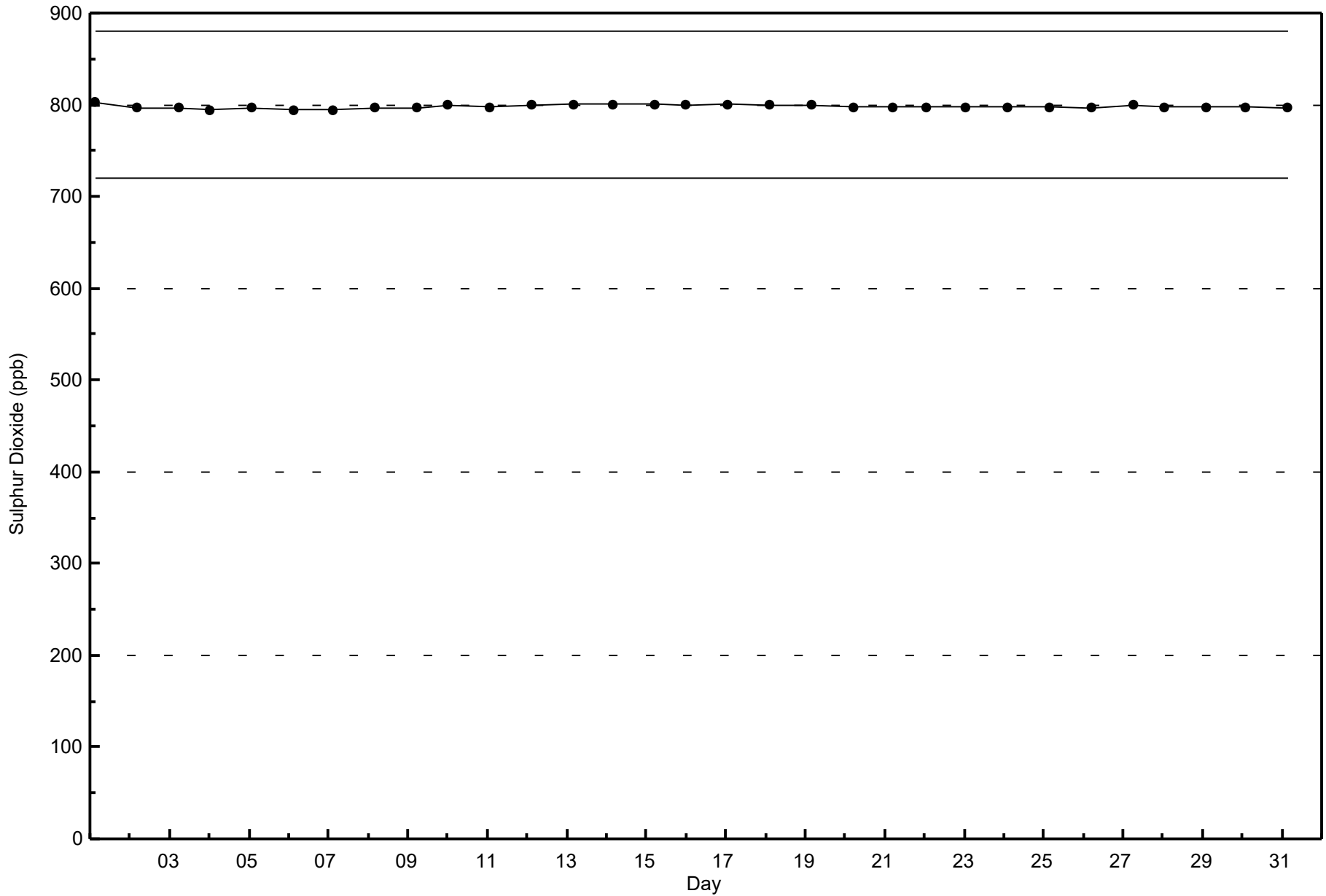


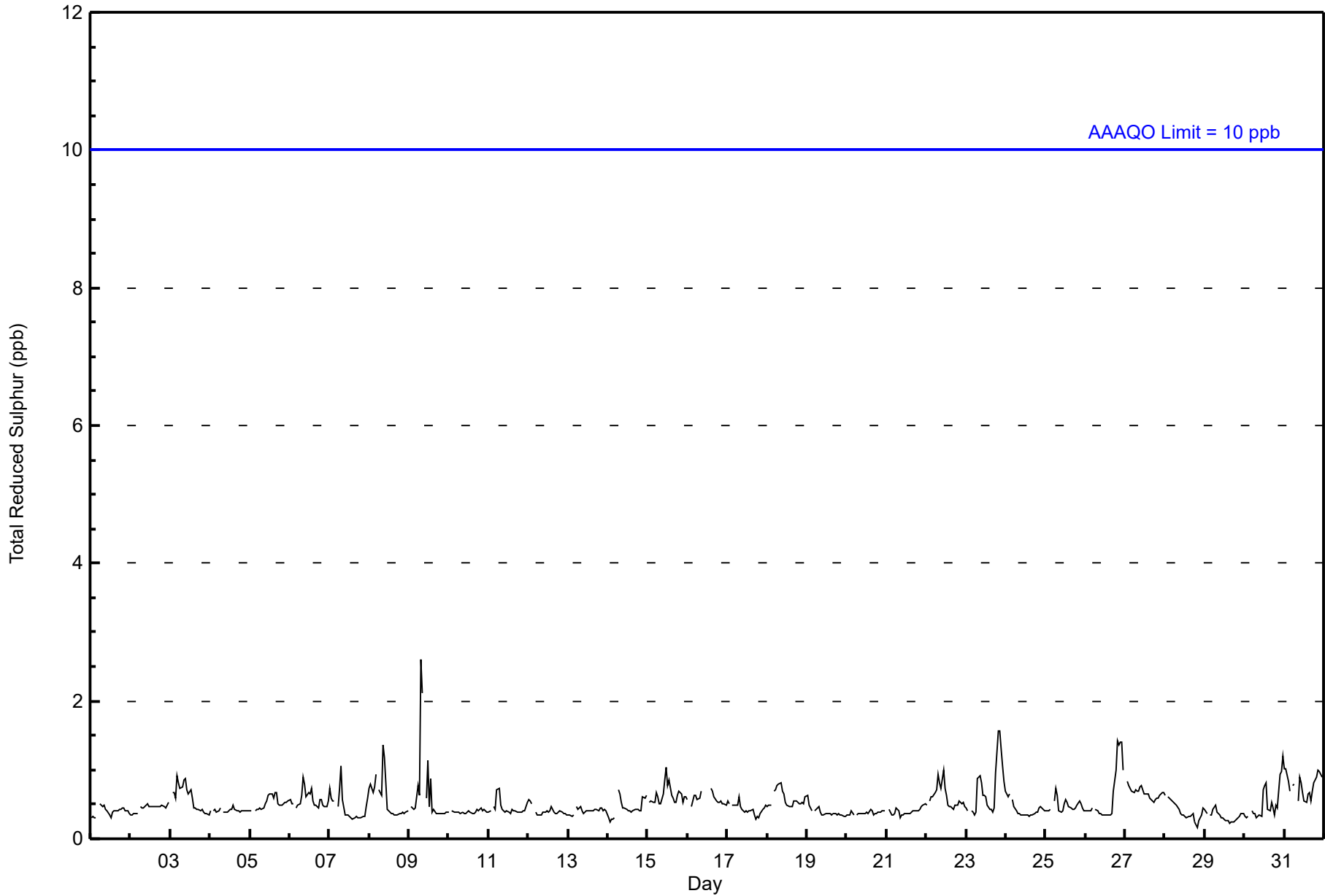




Wood Buffalo Environmental Association
Span Responses

Sulphur Dioxide (SO₂) - ppb
Ells River - August 2023







**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Ells River - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 2	704	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: 705

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Reduced Sulphur (TRS) - ppb
Ells River - August 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	52	50	14	10	13	18	32	49	94	78	64	64	52	49	32	30	701
3 - 4	0	0	0	0	0	0	0	1	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	52	50	14	10	13	18	32	50	94	78	64	64	52	49	32	30	702

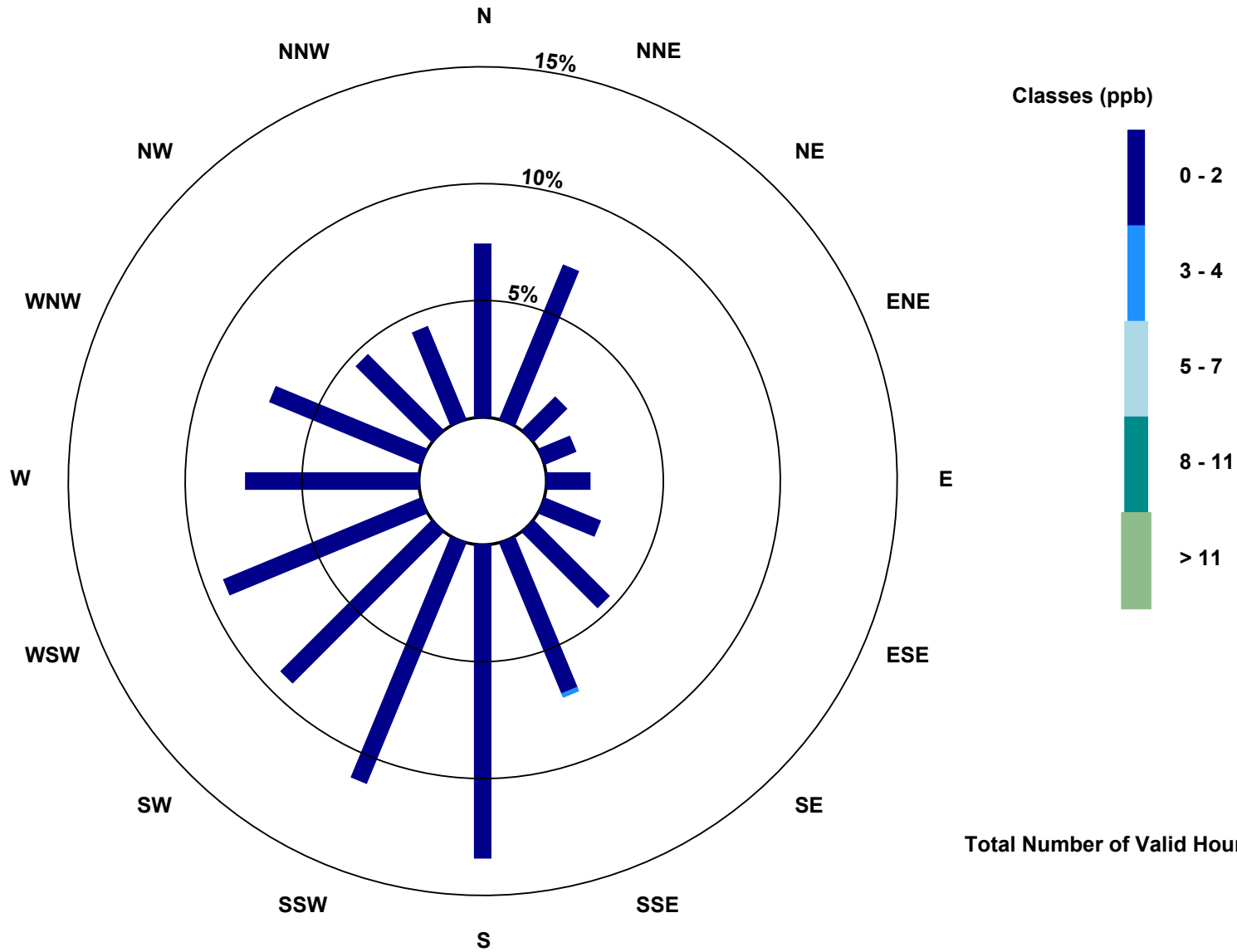
Total Number of Valid Hours: 702

Total Number of Hours: 744

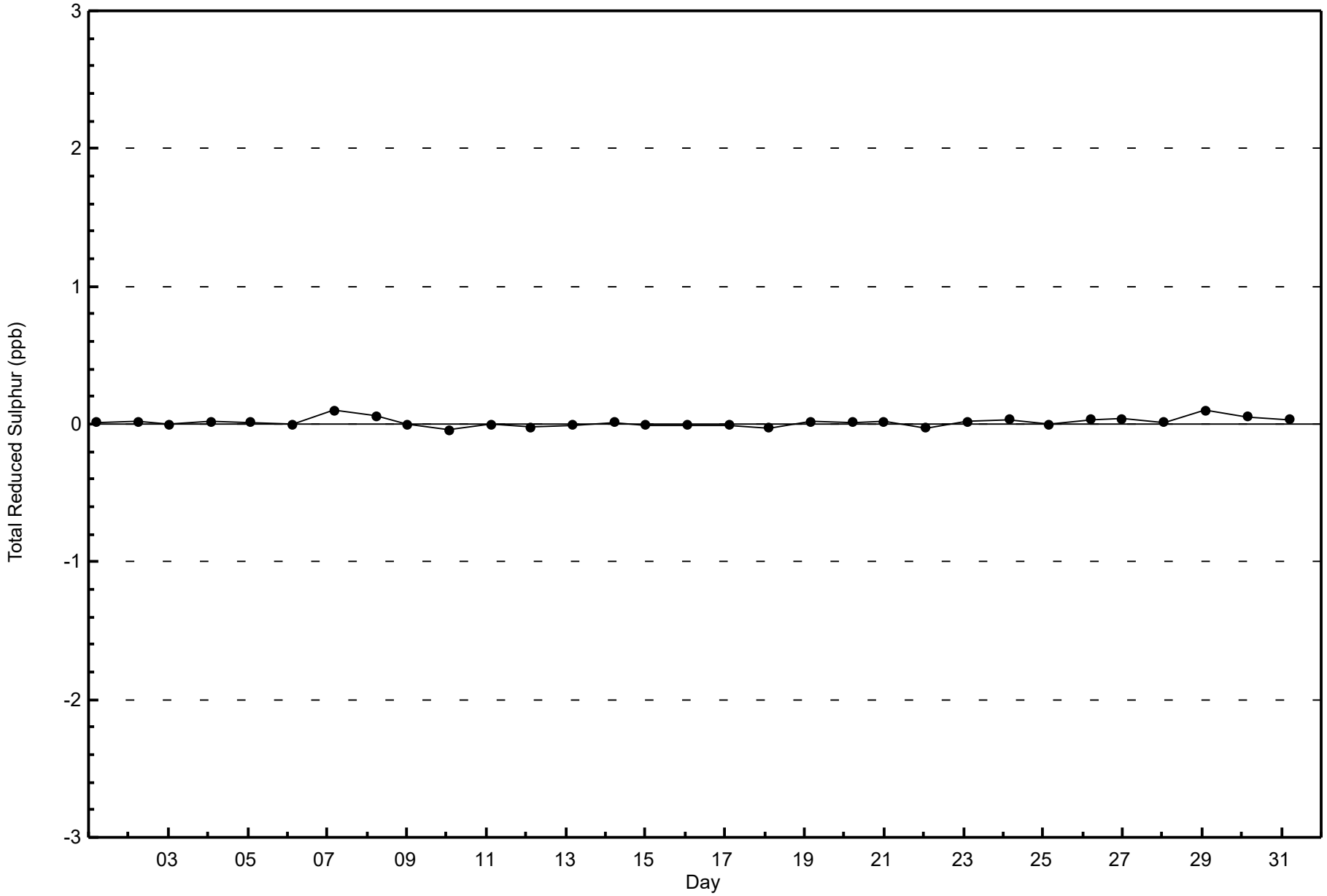


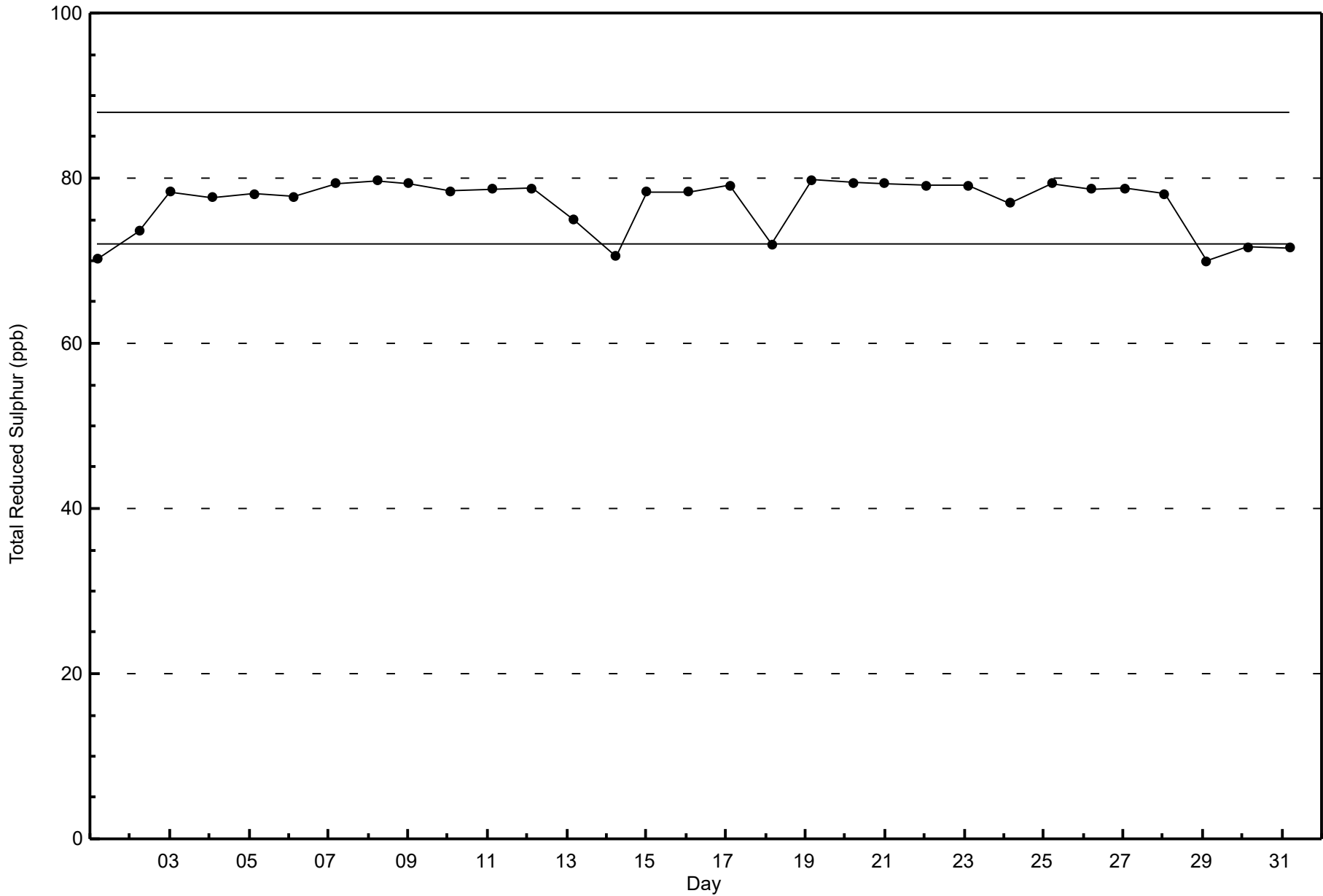
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Reduced Sulphur (TRS) - ppb
Ells River



Total Number of Valid Hours: 702

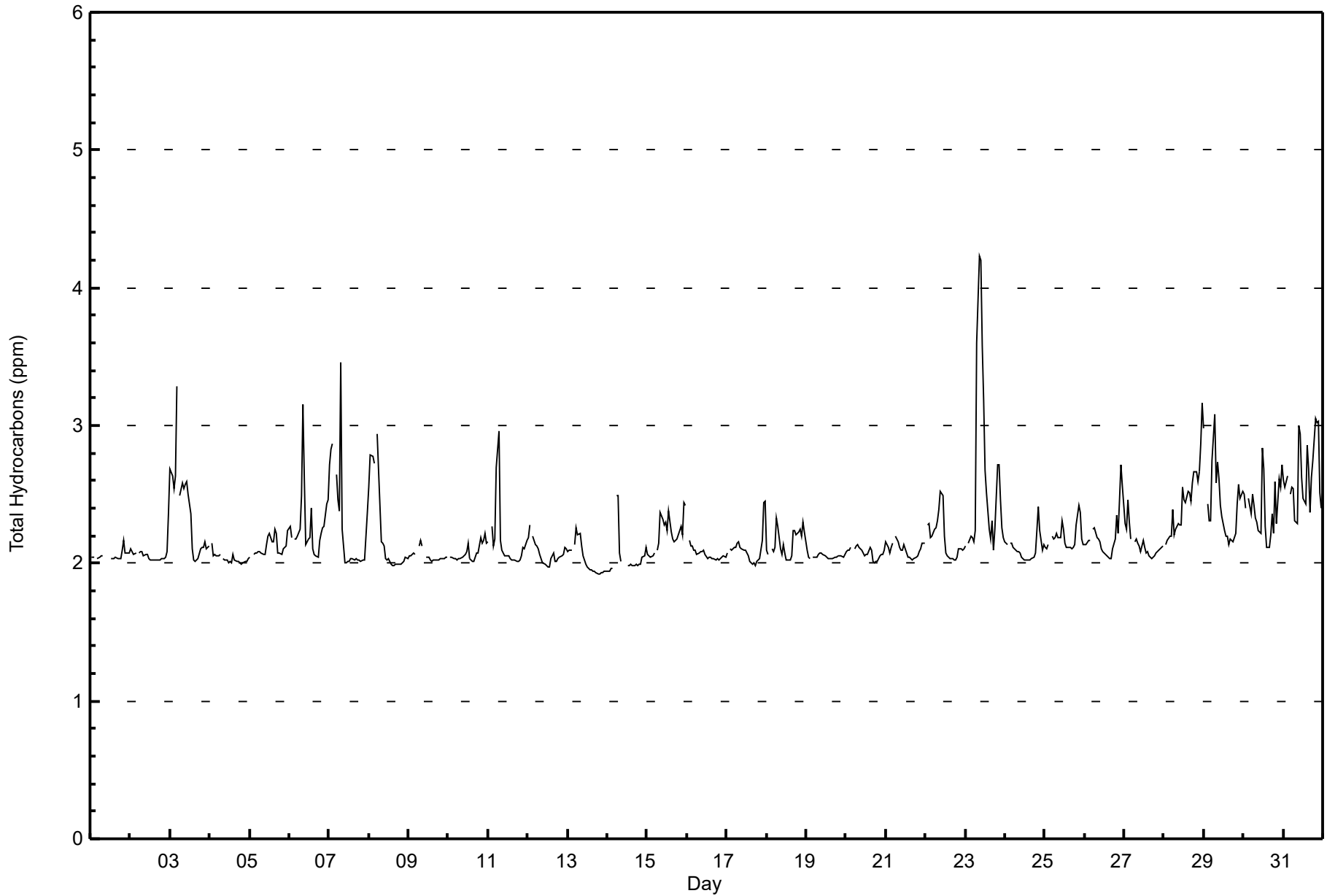






Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Ells River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Ells River - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	211	29.97	29.97
2.1 - 3.0	483	68.61	98.58
3.1 - 10.0	10	1.42	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Total Hydrocarbons (THC) - ppm
Ells River - August 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	12	14	2	3	9	14	21	5	10	18	24	36	24	9	5	4	210
2.1 - 3.0	40	37	12	7	4	4	10	46	79	59	41	23	32	35	26	26	481
3.1 - 10.0	1	0	0	0	0	0	0	1	2	0	1	1	1	2	0	1	10
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	51	14	10	13	18	31	52	91	77	66	60	57	46	31	31	701

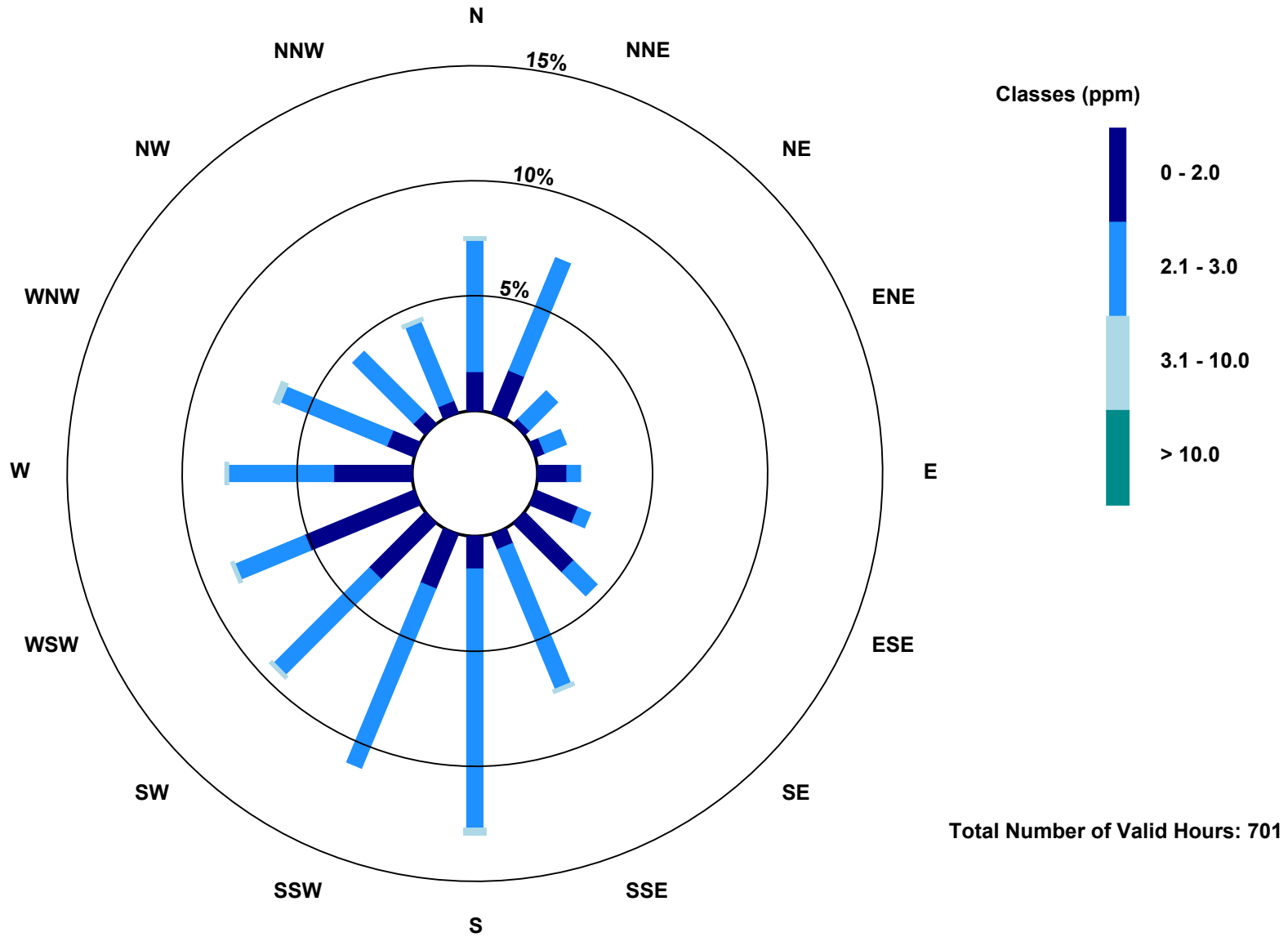
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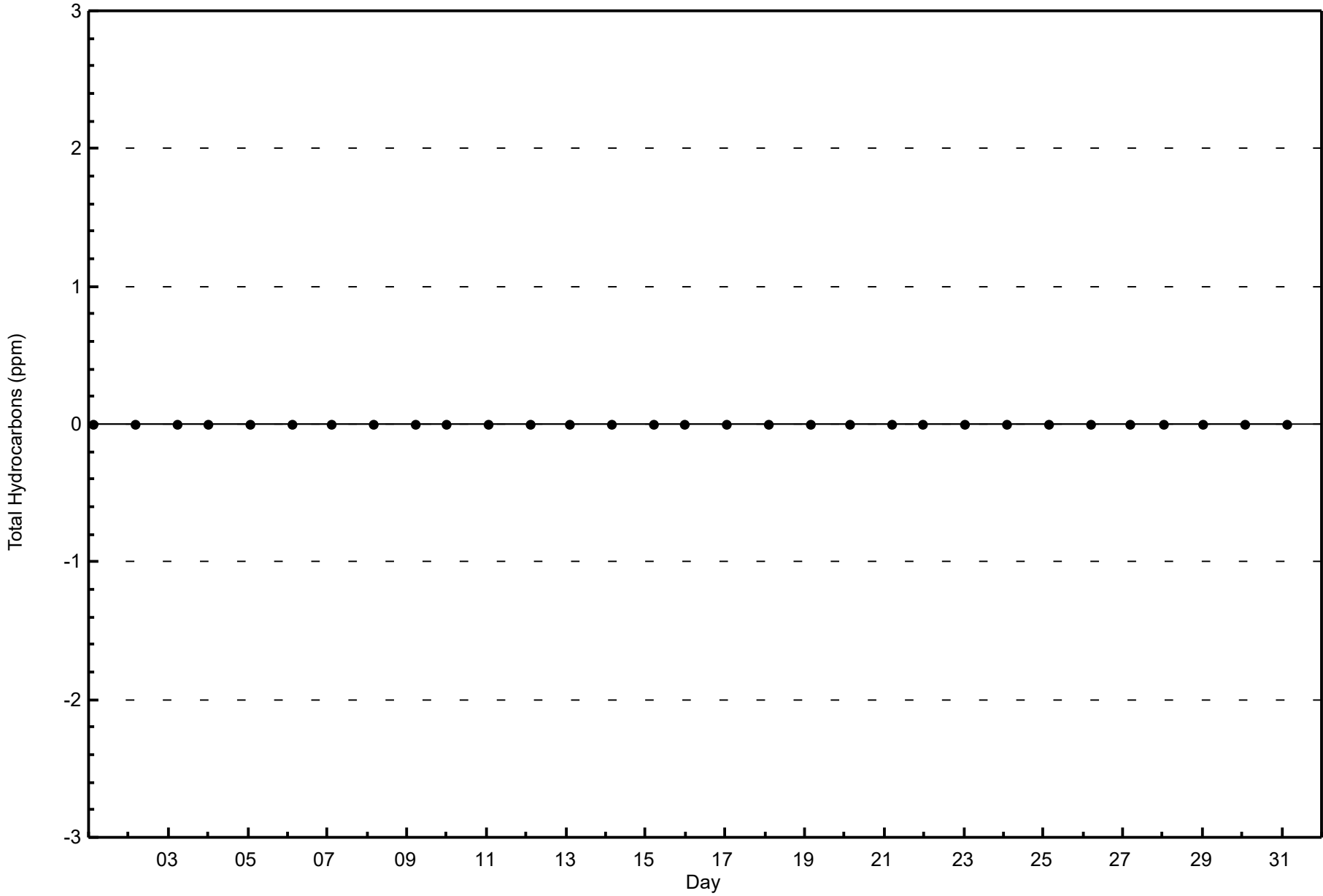
Total Number of Hours: 744

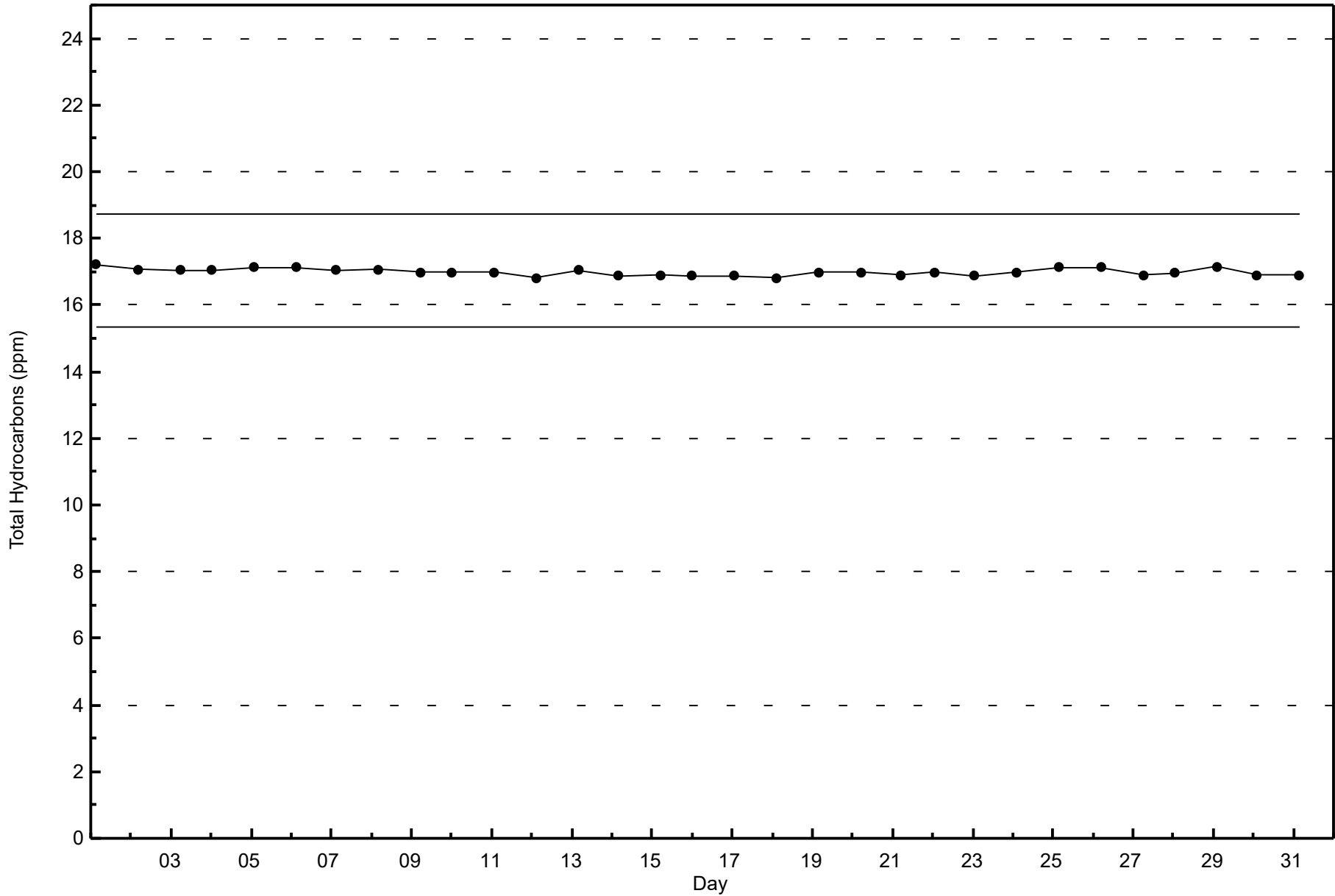


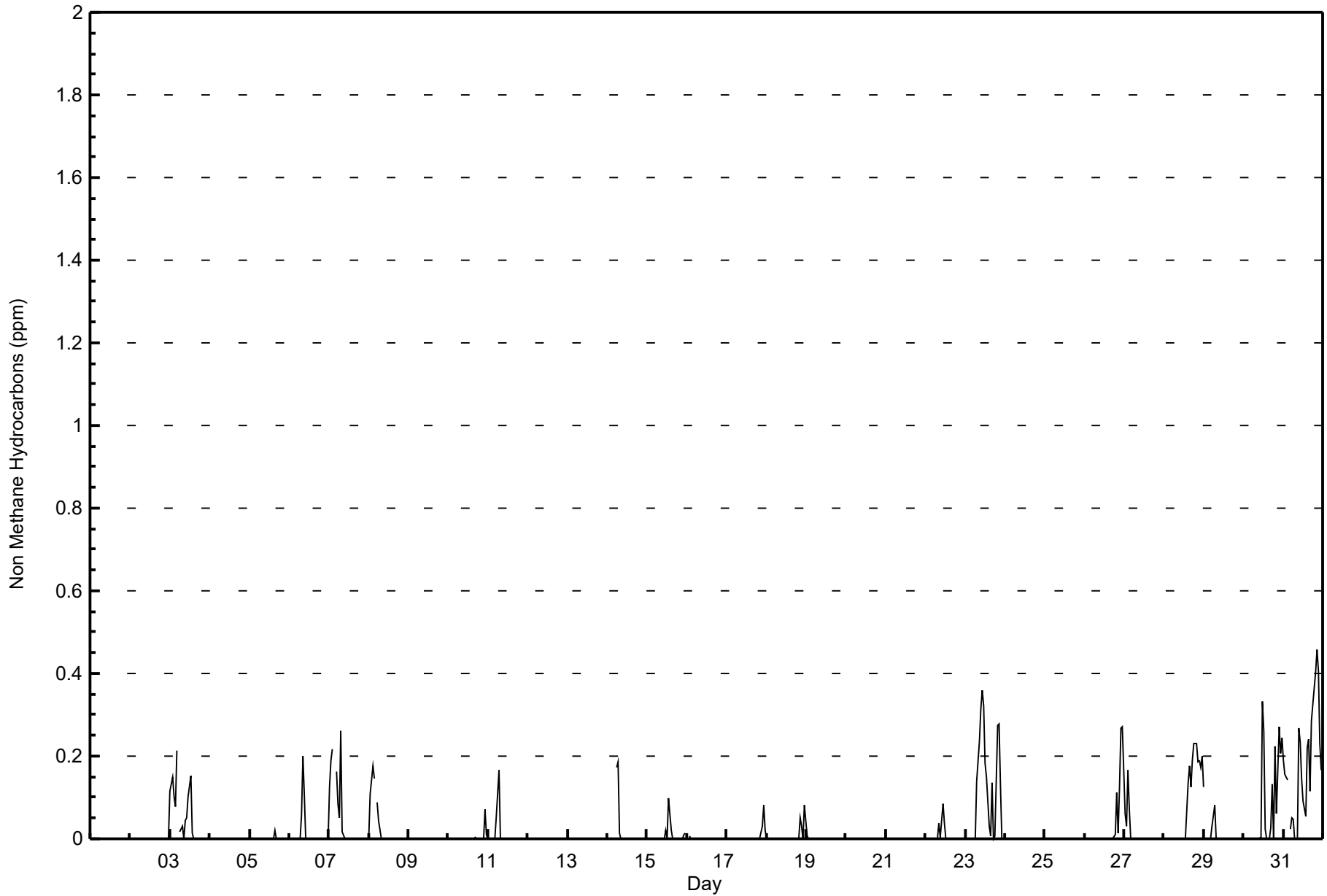
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Ells River











Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Non Methane Hydrocarbons (NMHC) - ppm
Ells River - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 0.005	584	82.95	82.95
0.006 - 0.05	37	5.26	88.21
0.06 - 0.1	34	4.83	93.04
> 0.1	49	6.96	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Non Methane Hydrocarbons (NMHC) - ppm
Ells River - August 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	37	44	12	9	11	18	27	32	79	74	62	57	50	34	16	19	581
0.006 - 0.05	4	3	0	1	2	0	1	4	4	2	1	1	2	5	4	3	37
0.06 - 0.1	7	2	2	0	0	0	1	5	4	1	0	0	1	2	5	4	34
> 0.1	5	2	0	0	0	0	2	11	4	0	3	2	4	5	6	5	49
Totals	53	51	14	10	13	18	31	52	91	77	66	60	57	46	31	31	701

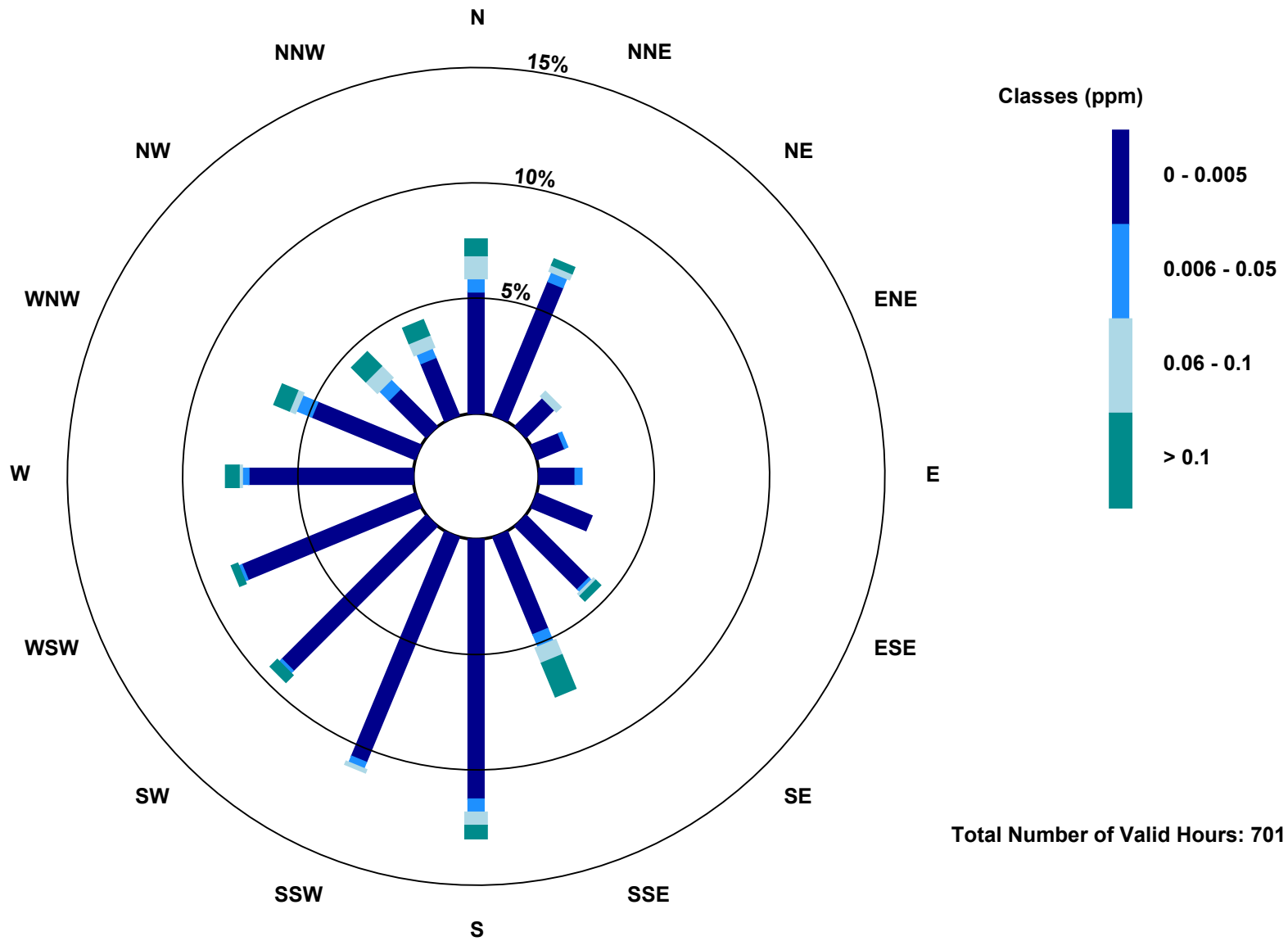
Total Number of Valid Hours: 701

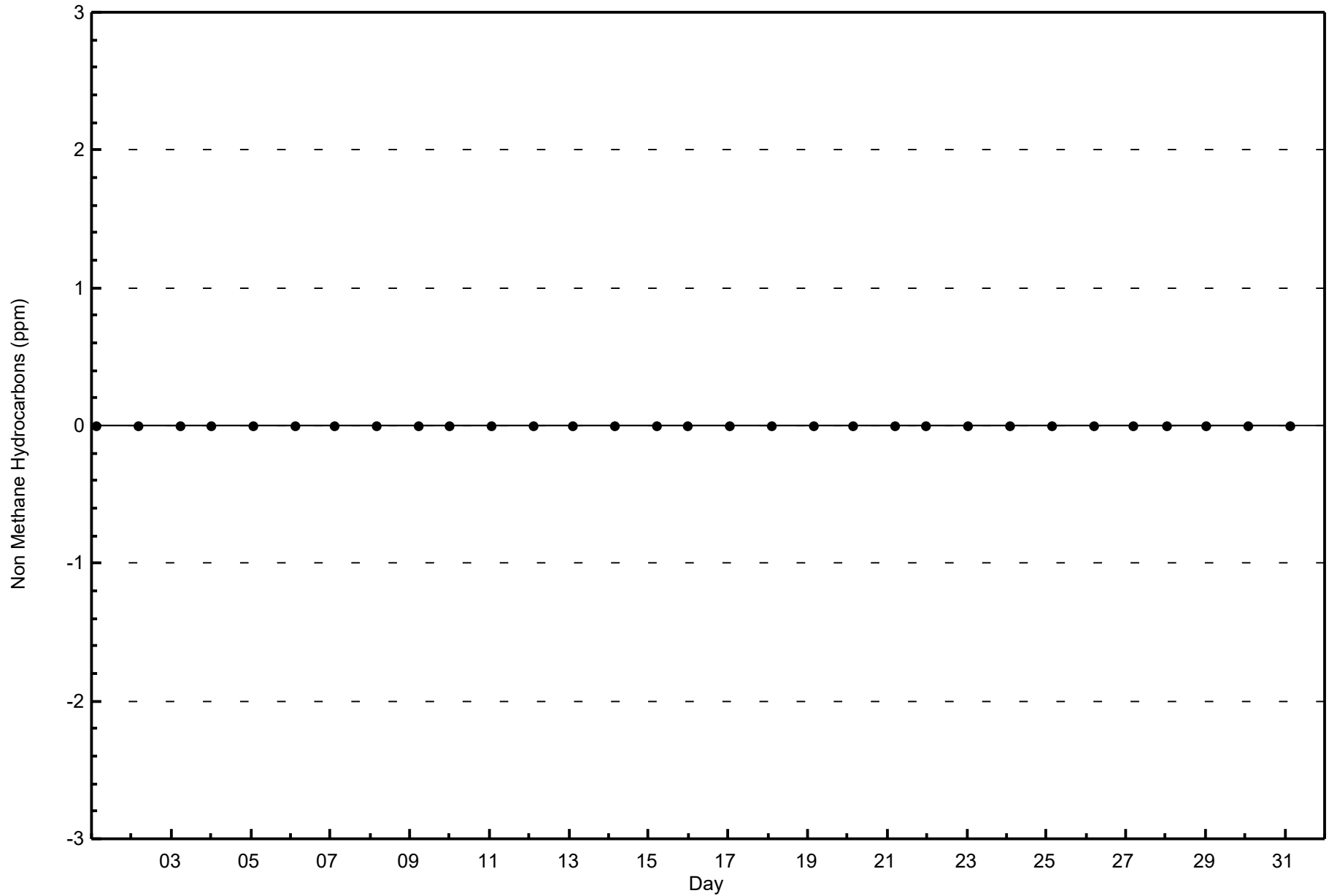
Total Number of Hours: 744

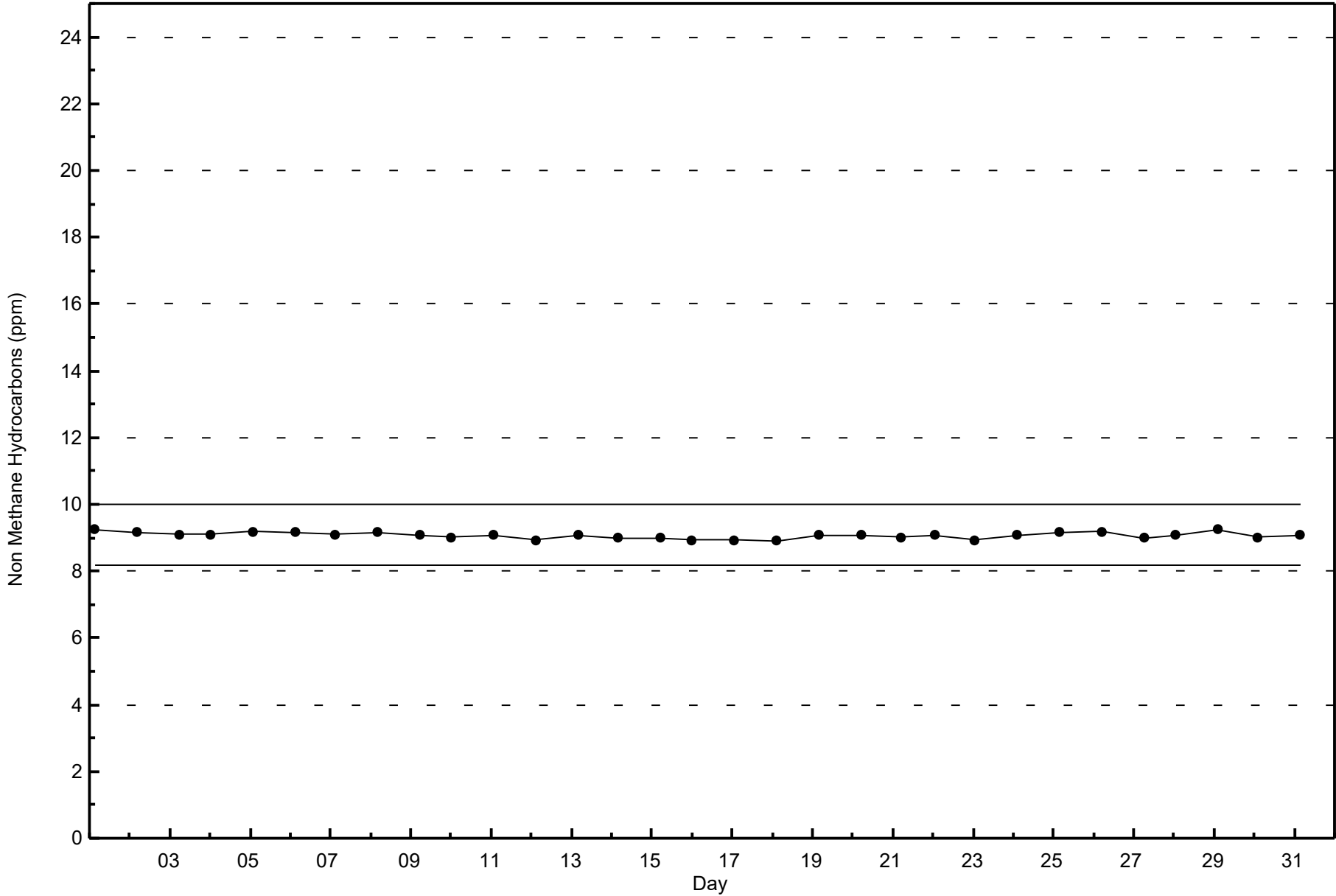


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Non Methane Hydrocarbons (NMHC) - ppm
Ells River



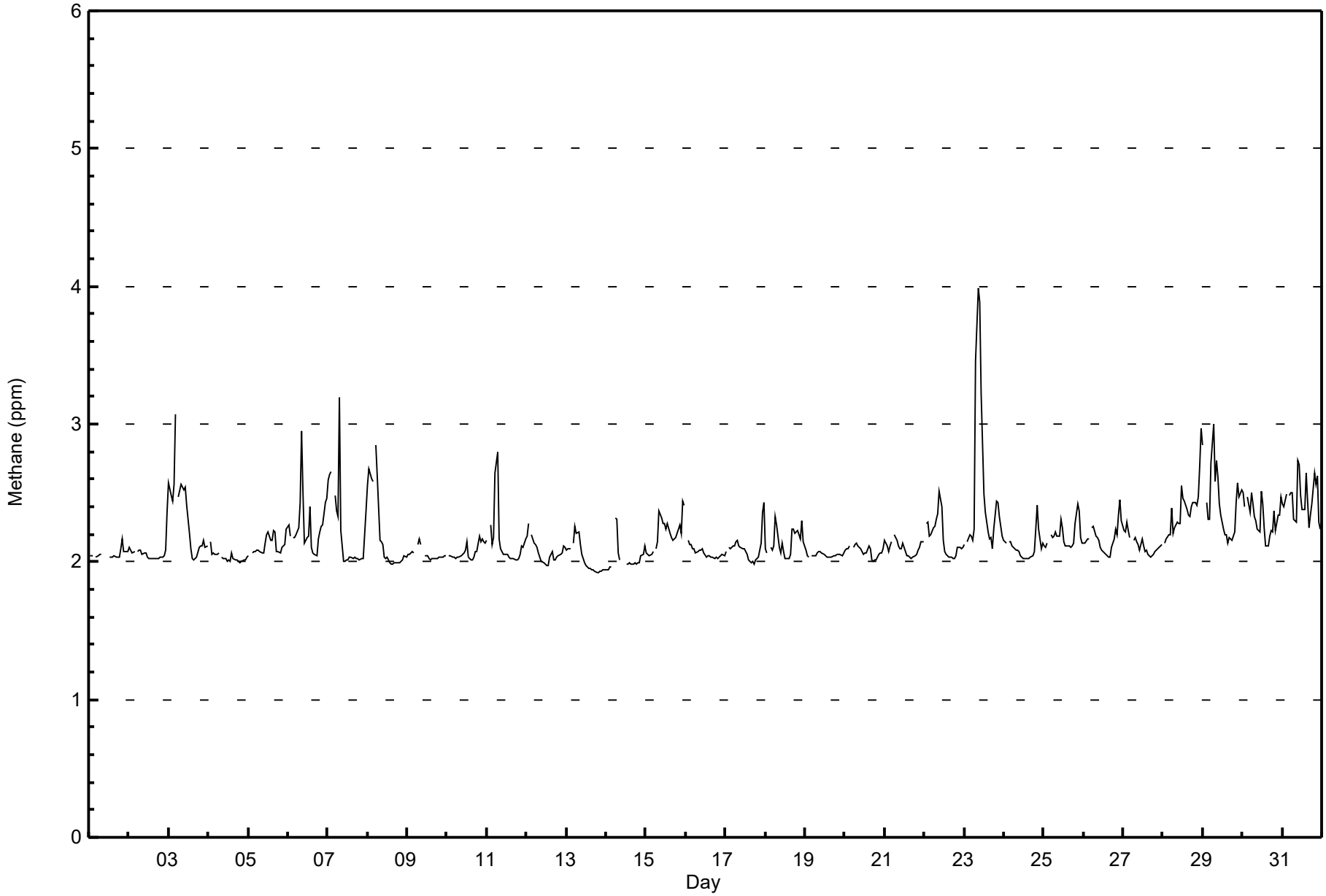






Wood Buffalo Environmental Association
Hourly Averages

Methane (CH₄) - ppm
Ells River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Methane (CH₄) - ppm
Ells River - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	211	29.97	29.97
2.1 - 3.0	487	69.18	99.15
3.1 - 10.0	6	0.85	100.00
> 10.0	0	0.00	100.00

Total Number of Valid Hours: 704

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Methane (CH₄) - ppm
Ells River - August 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	12	14	2	3	9	14	21	5	10	18	24	36	24	9	5	4	210
2.1 - 3.0	40	37	12	7	4	4	10	47	81	59	42	23	32	35	26	26	485
3.1 - 10.0	1	0	0	0	0	0	0	0	0	0	0	1	1	2	0	1	6
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	53	51	14	10	13	18	31	52	91	77	66	60	57	46	31	31	701

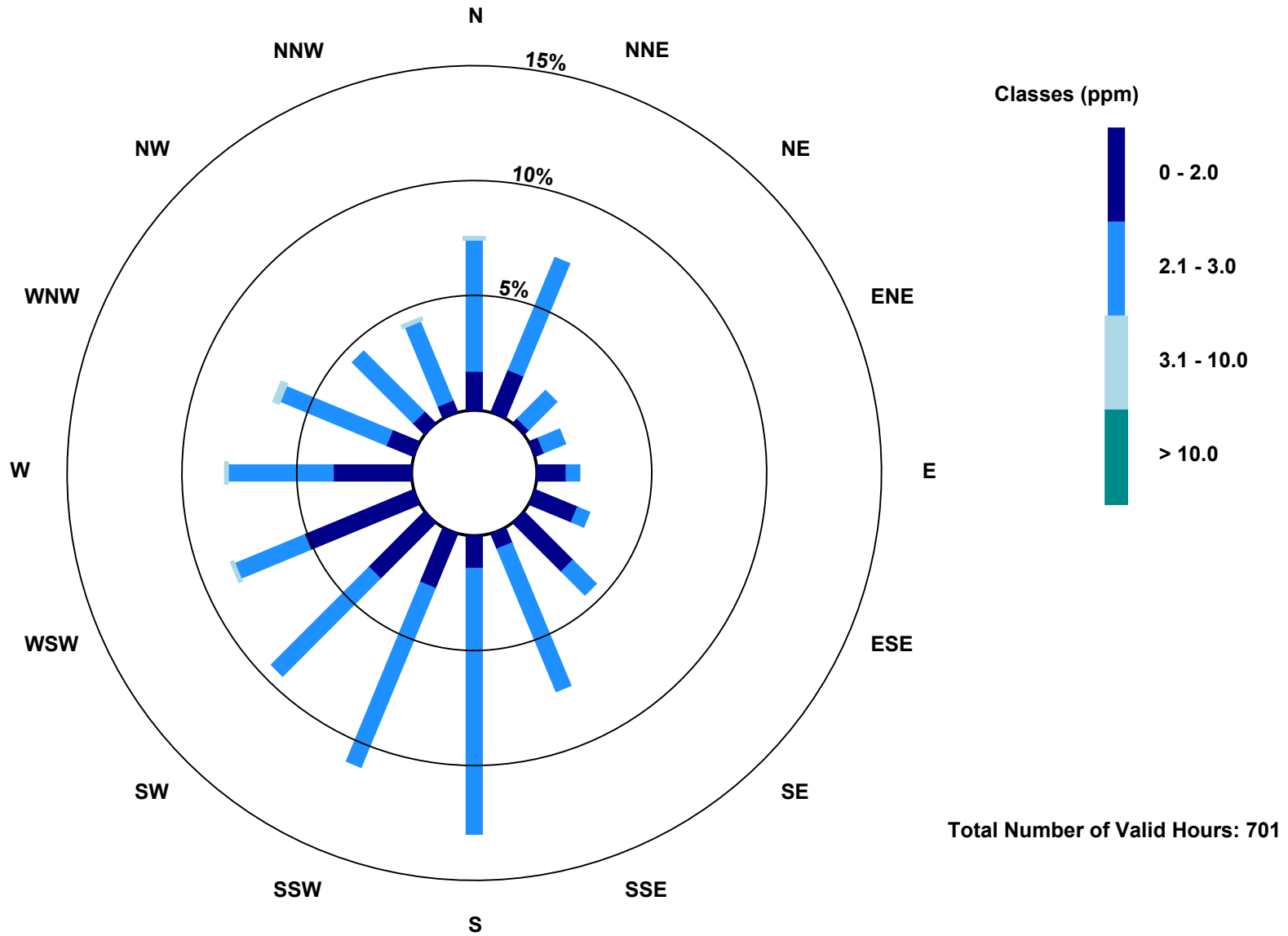
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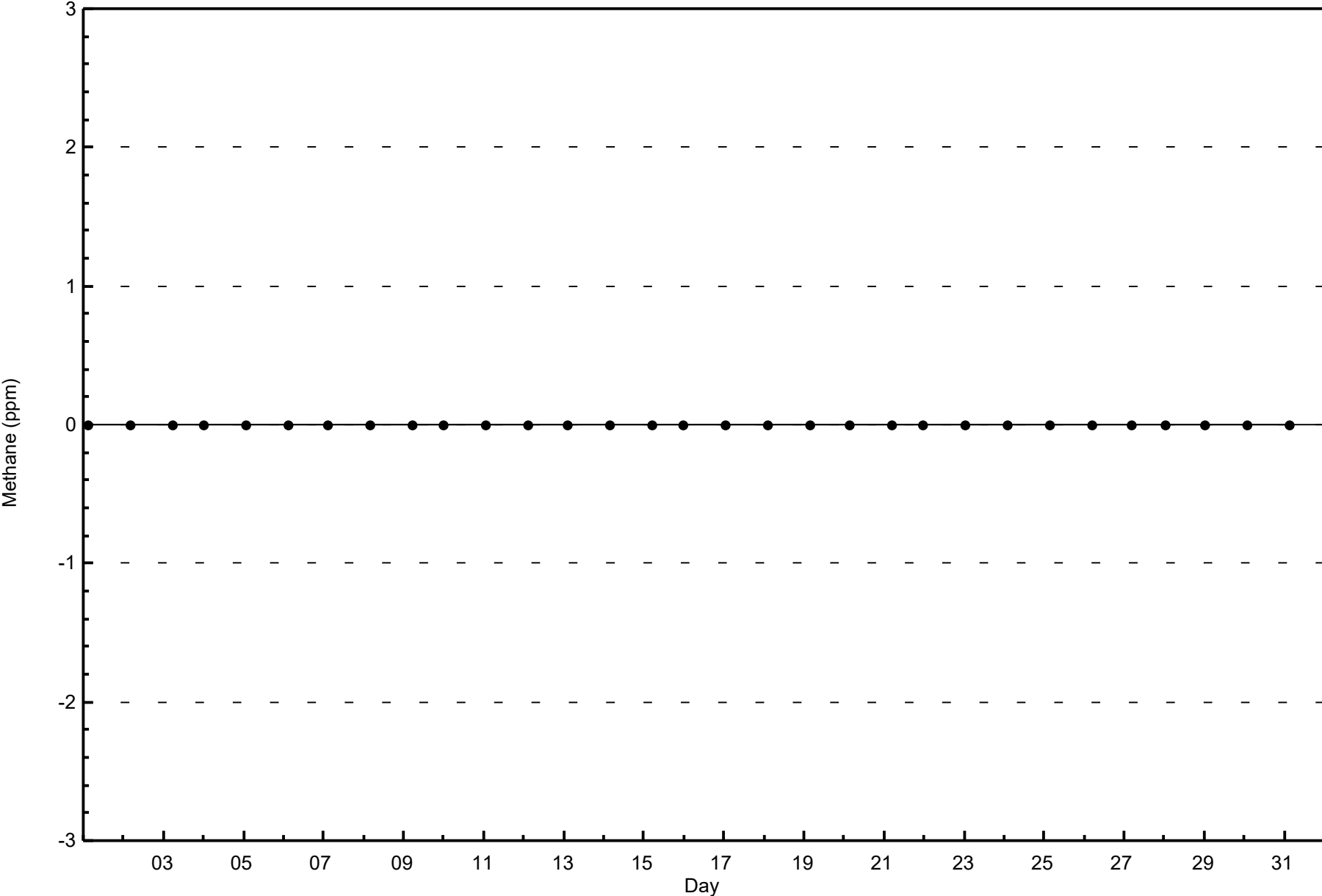
Total Number of Hours: 744

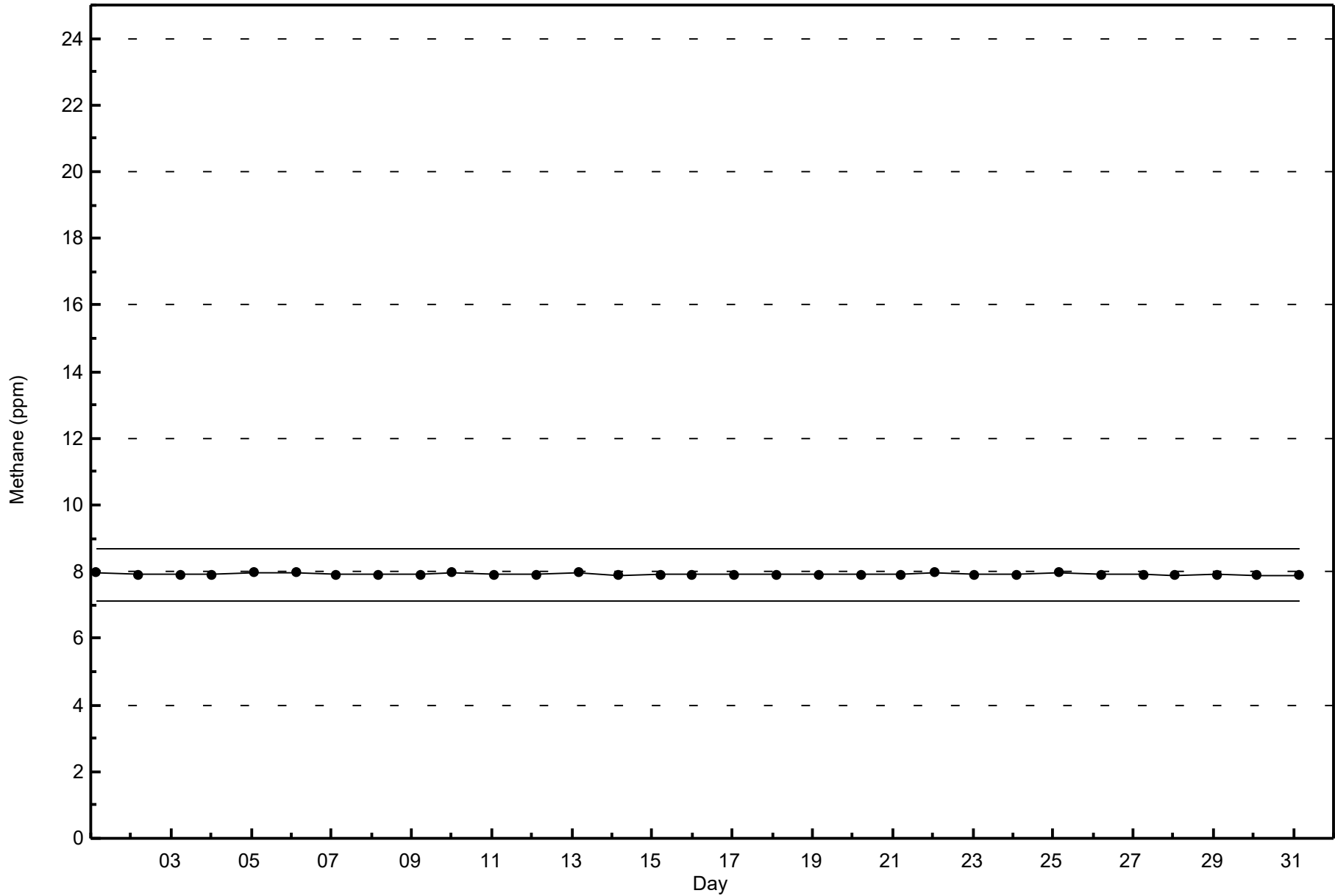


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Methane (CH₄) - ppm
Ells River



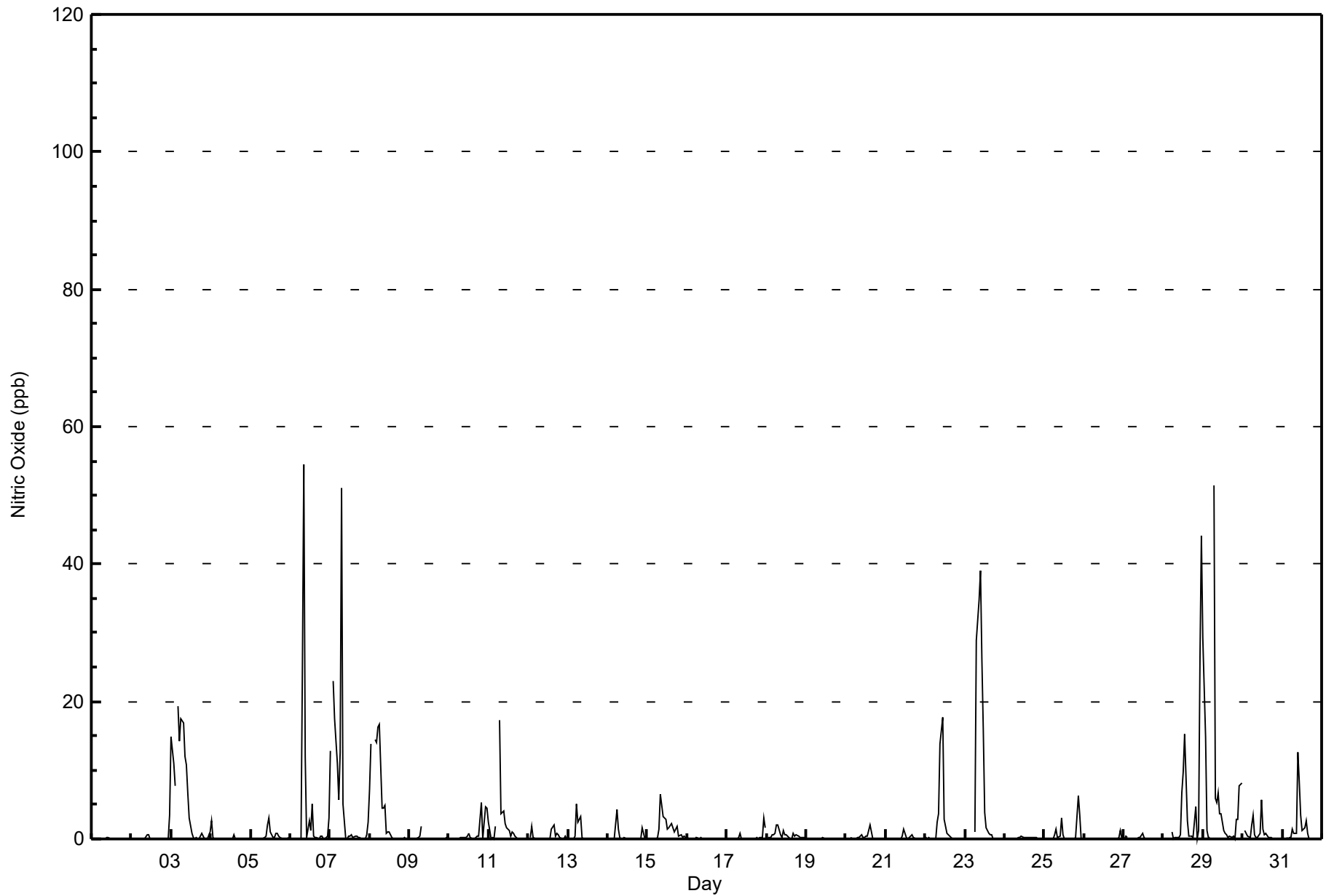






Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Ells River - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Ells River - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	695	98.30	98.30
21 - 40	8	1.13	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
Ells River - August 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	50	13	10	13	17	32	47	88	77	65	63	57	48	27	31	692
21 - 40	0	0	1	0	0	0	0	0	2	0	0	1	1	3	0	0	8
11 - 80	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	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	54	50	14	10	13	17	32	48	92	77	65	64	58	51	27	32	704

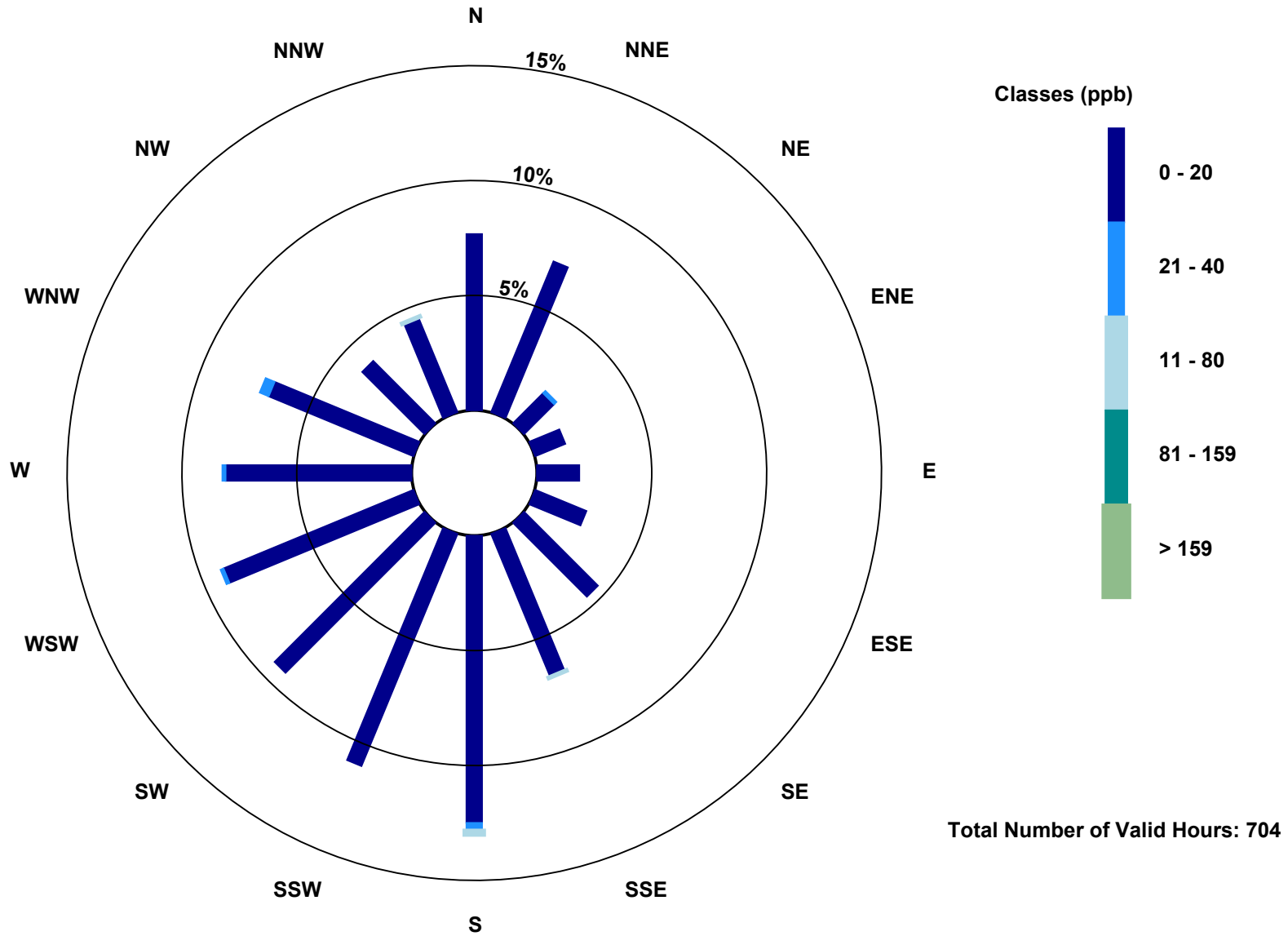
Total Number of Valid Hours: 704

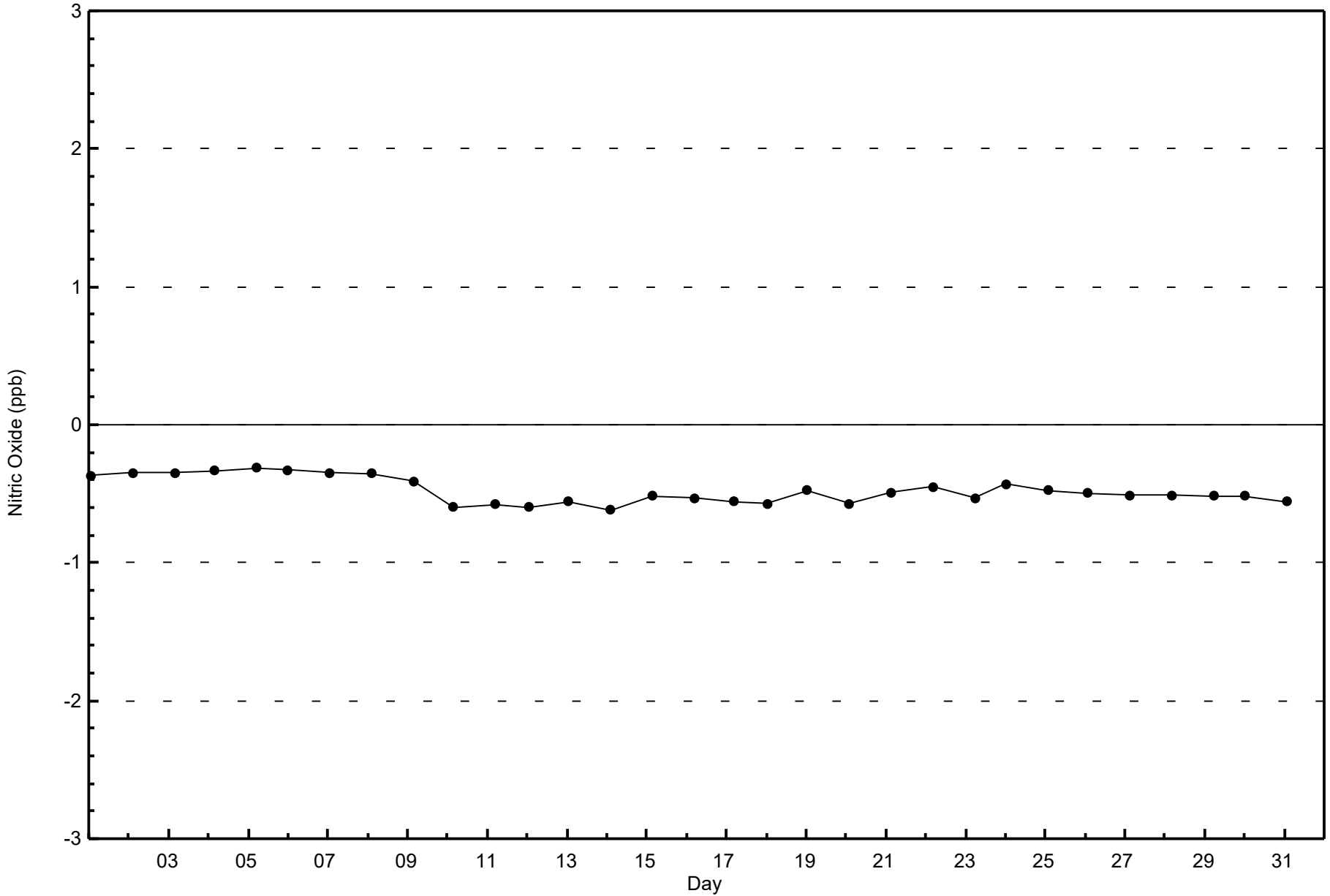
Total Number of Hours: 744

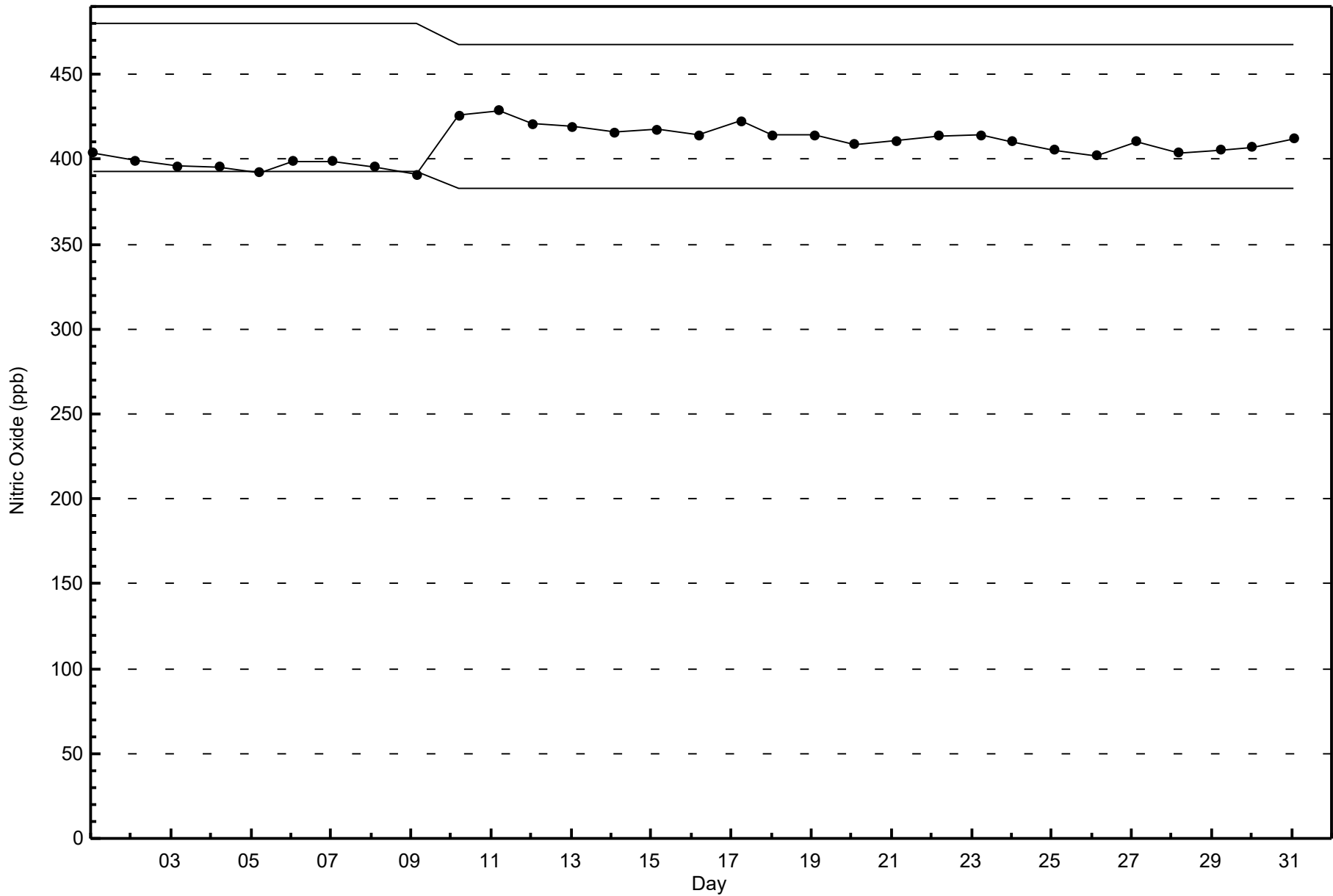


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Ells River









Wood Buffalo Environmental Association

Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb

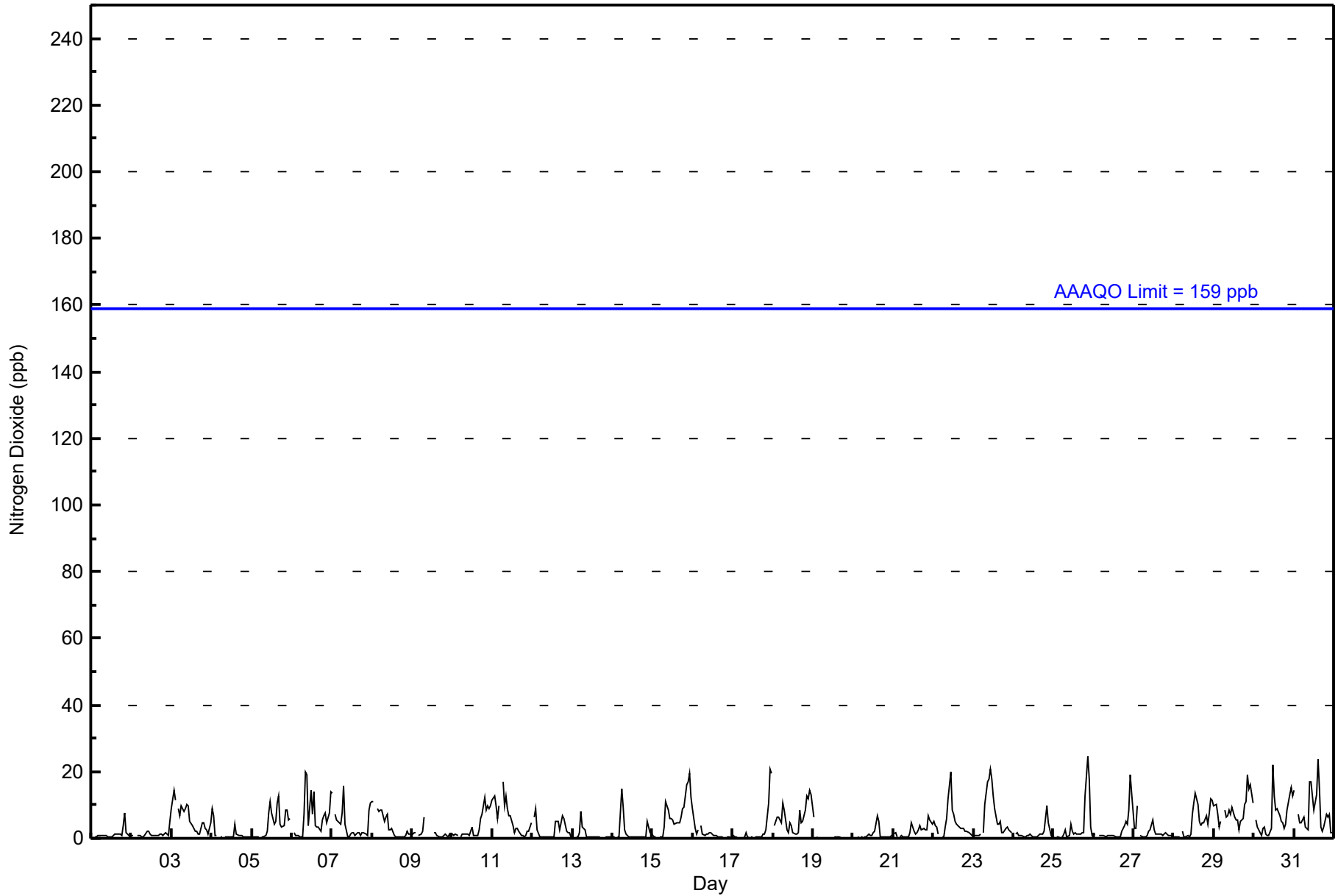
Ells River - August 2023

Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	744										
Maximum Value: 24.6 ppb on Aug 25 21:00		Maximum Daily Average: 8.5 ppb on Aug 29																	Hours of Data: 707												
Minimum Value: 0.1 ppb on Aug 17 05:00		Minimum Daily Average: 0.5 ppb on Aug 19																	Hours of Missing Data: 37												
Maximum Diurnal Average: 5.7 ppb at hour 23		Minimum Diurnal Average: 2.1 ppb at hour 4																	Hours of Calibration: 36												
Monthly Average: 3.73 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.6 Median = 1.5 Q ₃ = 5.3 P ₉₀ = 10.0 P ₉₉ = 19.7																	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-Aug	0.5	Z	0.4	0.6	0.8	0.9	0.9	0.8	0.7	0.8	0.5	0.4	0.4	0.9	1.2	1.4	1.1	1.1	1.0	3.7	7.6	1.7	0.8	0.8	1.3	7.6					
2-Aug	0.8	0.7	Z	0.7	0.7	0.7	0.6	0.6	0.8	2.0	2.3	1.3	0.8	0.9	0.9	0.9	1.1	1.3	1.0	1.6	1.2	1.0	4.9	1.2	4.9						
3-Aug	9.1	14.4	11.3	Z	8.8	6.9	9.7	8.1	8.9	10.3	9.8	5.1	3.7	3.0	2.1	2.0	1.4	1.1	4.7	4.6	2.9	2.4	1.1	4.6	5.9	14.4					
4-Aug	9.1	6.9	0.9	0.7	Z	0.6	0.5	M	0.5	0.5	0.5	0.4	0.5	0.5	4.1	1.3	0.9	1.0	0.7	0.3	0.3	0.3	0.4	0.3	1.4	9.1					
5-Aug	0.3	0.4	0.4	0.3	0.3	Z	0.3	0.4	1.0	2.2	7.5	11.1	7.7	4.3	5.2	10.4	12.6	4.4	3.6	3.7	8.3	8.6	5.3	6.1	4.5	12.6					
6-Aug	Z	1.8	0.9	0.9	0.7	0.6	0.6	7.2	20.0	19.1	3.7	14.3	7.2	13.8	3.7	3.3	3.2	2.0	5.7	6.7	7.5	4.5	7.6	13.9	6.5	20.0					
7-Aug	13.5	Z	7.3	5.7	4.6	4.4	7.8	15.8	4.4	0.4	0.5	1.1	1.5	1.8	0.8	1.5	1.5	1.0	1.6	1.5	1.3	0.8	8.4	10.6	4.3	15.8					
8-Aug	10.9	11.1	Z	9.1	7.9	8.4	8.4	5.1	6.2	7.1	2.4	2.7	2.9	0.9	0.6	0.4	0.4	0.5	0.3	0.6	0.7	2.3	1.4	1.4	4.0	11.1					
9-Aug	1.4	1.9	1.7	Z	1.0	1.2	2.0	6.4	C	C	C	C	C	1.7	1.7	1.0	0.5	0.4	0.6	0.8	1.4	0.5	1.1	1.0	1.5	6.4					
10-Aug	1.1	1.0	1.1	0.7	Z	0.6	1.3	1.2	1.4	1.1	0.7	2.2	3.5	0.8	0.8	0.8	2.5	6.0	7.2	12.2	8.5	9.8	8.7	9.8	3.6	12.2					
11-Aug	11.6	12.6	9.7	6.0	9.9	Z	17.0	9.8	12.9	8.9	6.7	6.7	3.8	1.9	2.9	3.1	2.2	1.0	0.8	0.6	0.8	2.2	2.0	4.5	6.0	17.0					
12-Aug	Z	6.3	9.0	2.6	0.5	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	5.1	5.0	2.5	4.5	6.6	6.1	2.3	1.7	1.9	0.6	2.5	9.0					
13-Aug	0.4	Z	0.5	0.5	1.9	7.9	3.5	2.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	1.0	7.9					
14-Aug	0.3	0.3	Z	0.3	0.6	14.9	9.2	2.4	1.3	0.7	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.3	0.4	4.9	1.5	1.9	1.8	14.9					
15-Aug	0.7	0.4	0.4	Z	0.3	0.4	0.6	3.4	11.2	8.5	5.8	6.1	5.3	4.1	4.5	4.7	4.5	6.2	8.8	9.3	16.2	16.9	19.7	12.2	6.5	19.7					
16-Aug	8.8	2.9	1.3	2.5	Z	3.9	1.1	1.0	1.3	1.3	1.9	1.6	1.0	1.0	0.7	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	1.4	8.8					
17-Aug	0.7	0.6	0.5	0.2	0.1	Z	0.2	0.6	1.7	0.3	0.2	0.3	0.2	0.2	0.3	0.5	0.6	0.3	1.3	1.2	2.6	10.7	20.8	19.6	2.8	20.8					
18-Aug	Z	3.9	6.2	6.5	5.5	4.5	10.8	8.5	2.7	1.6	4.6	3.7	1.9	1.4	1.1	1.9	8.6	4.7	5.1	8.5	12.5	11.9	14.3	13.2	6.2	14.3					
19-Aug	6.5	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.5	6.5					
20-Aug	0.1	0.1	Z	0.3	0.2	0.3	0.2	0.3	0.3	1.2	0.8	0.7	1.5	2.1	6.7	5.1	0.5	0.4	0.6	0.6	0.4	0.4	0.5	1.0	1.1	6.7					
21-Aug	1.3	1.6	0.6	Z	0.6	0.8	0.4	0.4	0.5	0.6	1.9	4.8	2.1	1.4	1.8	2.7	3.8	2.7	2.8	2.7	2.7	6.6	5.7	4.2	2.3	6.6					
22-Aug	4.9	4.0	3.5	1.4	Z	0.5	0.4	3.6	5.8	11.9	20.1	8.6	7.2	4.9	4.4	3.8	2.9	3.1	2.9	2.3	2.0	1.9	1.2	0.8	4.4	20.1					
23-Aug	0.8	0.8	1.0	0.9	1.4	Z	1.7	10.0	17.0	17.9	20.8	18.0	12.7	8.8	4.2	4.4	5.0	1.8	1.8	2.8	3.2	2.7	2.2	1.8	6.2	20.8					
24-Aug	Z	1.1	1.6	1.0	0.9	0.7	0.6	1.0	1.0	1.1	0.6	0.5	0.6	0.5	1.0	1.2	1.4	2.1	6.1	9.6	4.6	1.0	1.0	1.0	1.7	9.6					
25-Aug	0.6	Z	0.3	0.3	0.2	0.3	1.4	2.6	0.6	0.9	4.2	2.3	1.3	1.5	1.3	1.1	1.1	1.5	1.6	12.6	24.6	17.8	3.6	1.0	3.6	24.6					
26-Aug	1.0	1.1	Z	1.0	0.9	0.8	0.8	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.6	2.0	3.8	5.0	4.2	8.6	18.9	13.5	3.0	18.9					
27-Aug	3.0	3.0	9.6	Z	0.7	0.6	0.5	0.5	0.8	2.0	2.4	5.3	2.7	1.4	1.4	1.3	1.1	0.9	1.2	1.6	1.1	0.8	0.7	0.6	1.9	9.6					
28-Aug	0.6	0.5	0.5	0.4	Z	2.1	0.3	0.4	0.9	0.6	1.3	7.3	10.5	13.4	10.2	5.2	4.0	4.8	4.6	6.9	4.1	7.5	11.9	11.4	4.8	13.4					
29-Aug	9.7	10.1	7.1	3.6	5.0	Z	8.4	6.2	6.9	8.3	7.1	9.5	6.2	5.6	5.6	2.5	5.1	5.8	10.2	11.0	19.1	15.0	16.1	10.5	8.5	19.1					
30-Aug	Z	5.5	3.5	2.6	0.9	2.9	3.6	1.1	1.0	0.8	3.0	22.1	12.7	8.6	8.7	6.9	4.9	4.6	3.1	4.3	8.5	13.1	15.2	12.5	6.5	22.1					
31-Aug	14.2	Z	7.1	4.7	4.5	5.3	6.3	3.4	2.5	17.1	17.0	12.9	8.6	13.0	23.6	14.9	3.5	2.0	3.4	7.4	6.3	7.0	1.7	1.5	8.2	23.6					
		4.3	3.7	3.3	2.1	2.3	2.7	3.2	3.5	3.8	4.3	4.3	5.0	3.6	3.2	3.4	2.9	2.5	2.2	2.9	4.0	5.2	5.4	5.7	5.3	Diurnal Average					
		14.2	14.4	11.3	9.1	9.9	14.9	17.0	15.8	20.0	19.1	20.8	22.1	12.7	13.8	23.6	14.9	12.6	6.2	10.2	12.6	24.6	17.8	20.8	19.6	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
Ells River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Dioxide (NO₂) - ppb
Ells River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	702	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: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Ells River - August 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	50	14	10	13	17	31	47	92	77	65	64	57	51	26	31	699
21 - 40	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	1	5
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	54	50	14	10	13	17	32	48	92	77	65	64	58	51	27	32	704

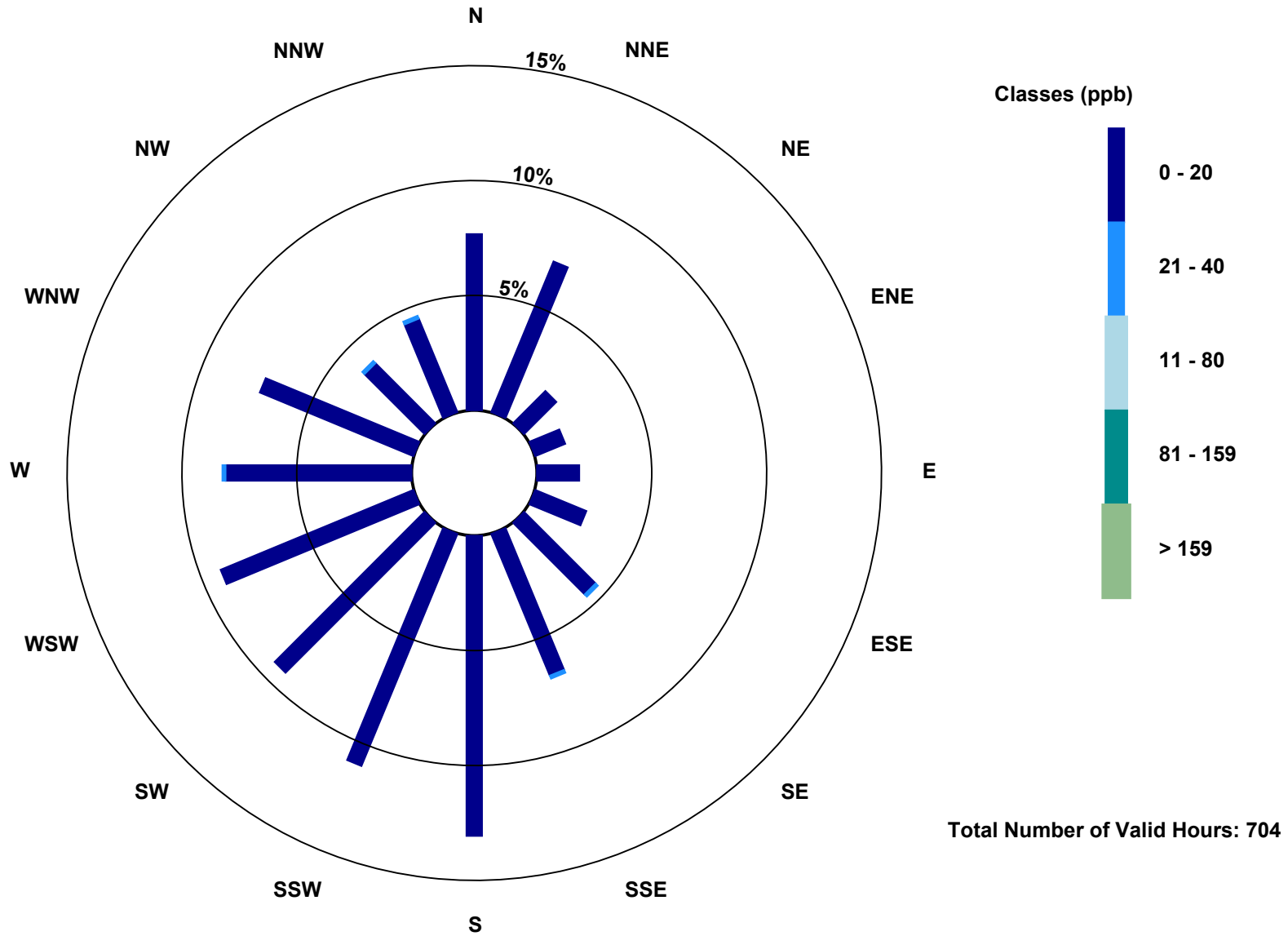
Total Number of Valid Hours: 704

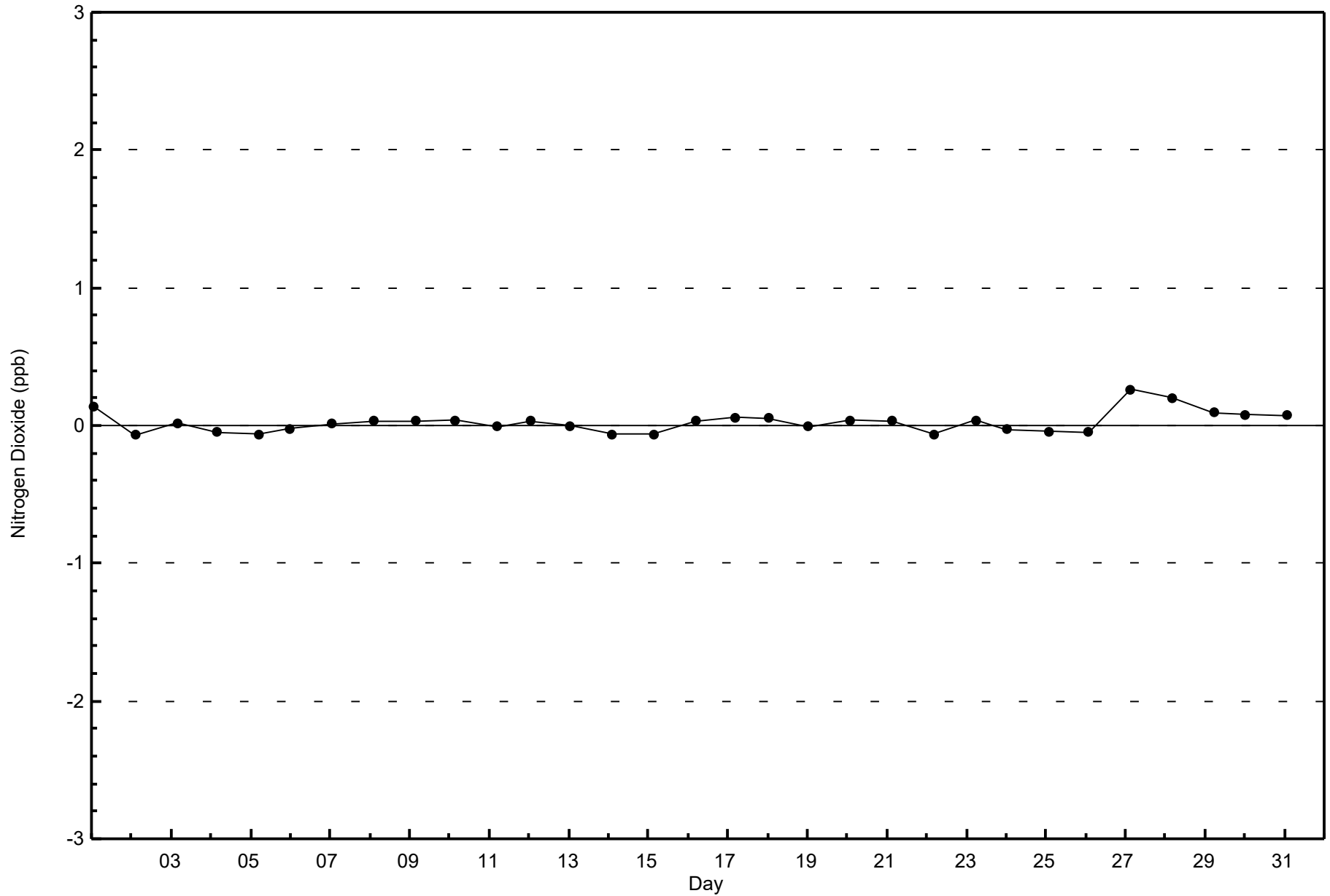
Total Number of Hours: 744

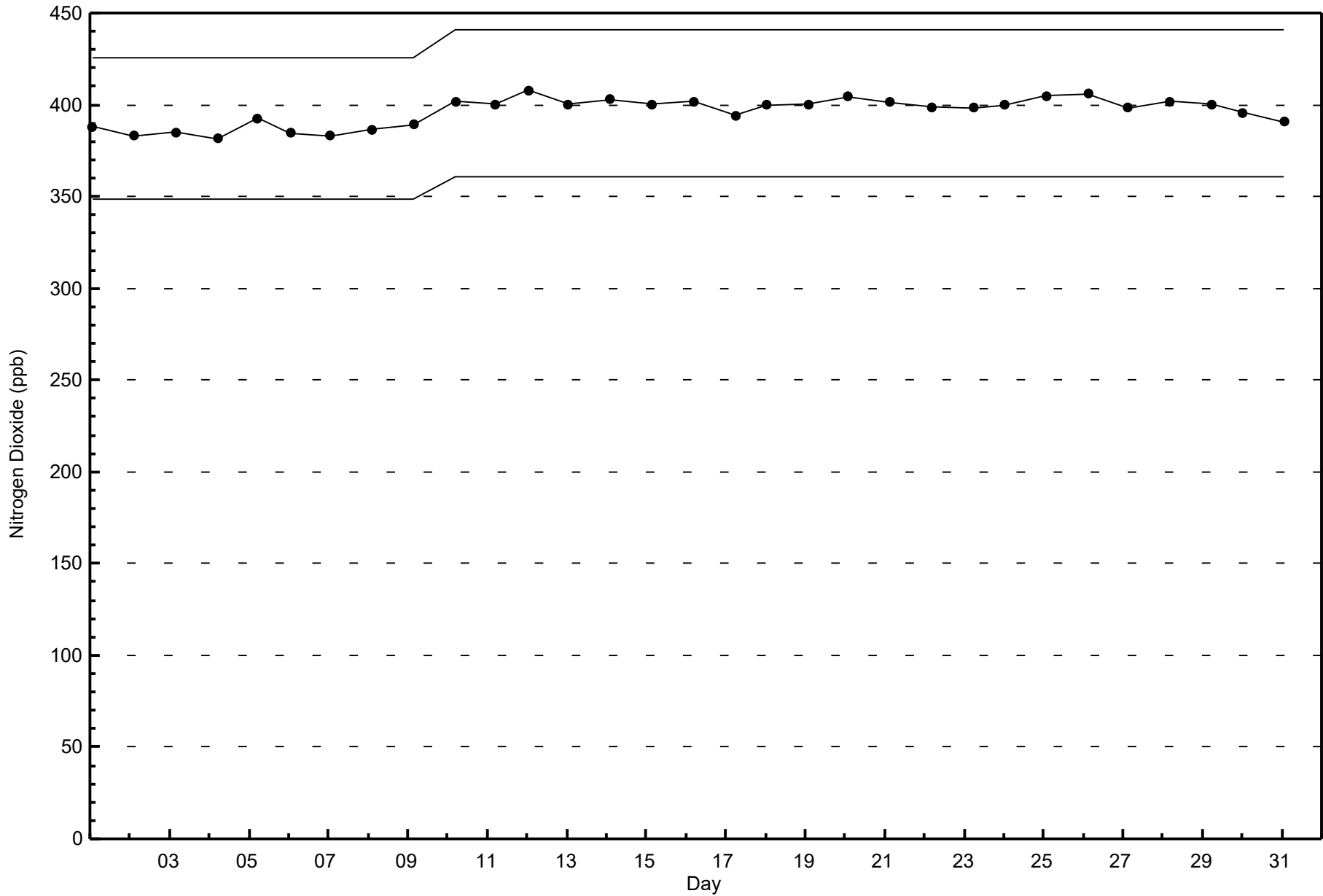


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Ells River





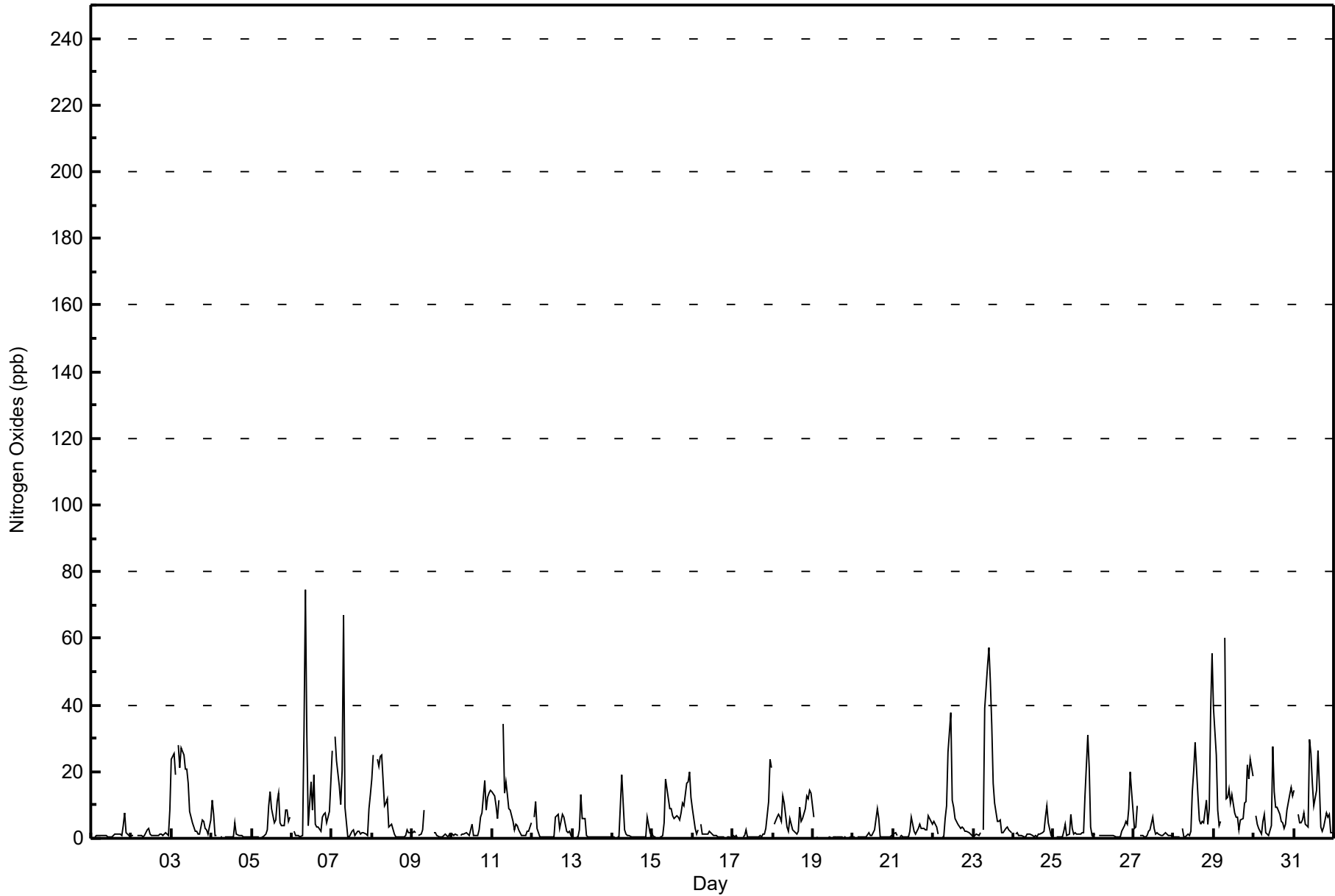




Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Oxides (NO_x) - ppb
Ells River - August 2023

Maximum Value: 74.5 ppb on Aug 6 09:00		Maximum Daily Average: 14.9 ppb on Aug 29		Hours in Service: 744																							
Minimum Value: 0.1 ppb on Aug 19 08:00		Minimum Daily Average: 0.5 ppb on Aug 19		Hours of Data: 707																							
Maximum Diurnal Average: 8.5 ppb at hour 8		Minimum Diurnal Average: 2.3 ppb at hour 18		Hours of Missing Data: 37																							
Monthly Average: 5.42 ppb		Percentiles: P ₁ = 0.2 P ₁₀ = 0.3 Q ₁ = 0.7 Median = 1.7 Q ₃ = 6.4 P ₉₀ = 14.3 P ₉₉ = 39.0		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-Aug	0.5	Z	0.5	0.7	0.9	0.9	0.9	0.9	0.8	0.9	0.6	0.4	0.4	0.9	1.2	1.4	1.1	1.1	1.0	3.7	7.7	1.7	0.8	0.8	1.3	7.7	
2-Aug	0.8	0.7	Z	0.7	0.7	0.7	0.7	0.6	0.9	2.6	2.9	1.4	0.8	0.9	0.9	0.9	0.9	1.1	1.3	1.0	1.6	1.2	1.0	8.3	1.4	8.3	
3-Aug	23.9	25.5	19.0	Z	28.2	21.1	27.1	24.9	20.9	21.0	16.5	8.1	4.6	3.2	2.1	2.2	1.4	1.2	5.4	5.0	2.9	2.4	1.1	5.6	11.9	28.2	
4-Aug	11.6	7.1	0.9	0.7	Z	0.6	0.5	M	0.5	0.5	0.5	0.4	0.5	0.5	4.8	1.3	0.9	1.0	0.7	0.3	0.3	0.3	0.4	0.3	1.6	11.6	
5-Aug	0.3	0.4	0.4	0.3	0.3	Z	0.4	0.4	1.2	2.6	9.6	14.2	8.8	4.5	5.4	11.1	13.5	4.7	3.8	3.8	8.4	8.6	5.3	6.2	5.0	14.2	
6-Aug	Z	1.9	0.9	0.9	0.7	0.6	0.7	32.4	74.5	31.0	4.0	17.0	8.3	18.9	4.2	3.5	3.4	2.1	6.2	7.1	7.6	4.5	8.1	17.0	11.1	74.5	
7-Aug	26.4	Z	30.4	23.3	15.6	10.2	20.3	66.9	9.4	0.5	0.5	1.5	1.9	2.4	0.9	2.0	1.9	1.2	1.8	1.5	1.3	0.8	8.9	13.1	10.6	66.9	
8-Aug	18.0	25.0	Z	23.6	21.8	24.6	25.1	9.6	10.7	11.9	3.2	3.7	4.0	1.1	0.6	0.4	0.4	0.5	0.3	0.6	0.7	2.5	1.5	1.5	8.3	25.1	
9-Aug	1.5	2.0	1.8	Z	1.0	1.3	2.4	8.3	C	C	C	C	C	1.7	1.7	1.0	0.5	0.4	0.6	0.8	1.4	0.5	1.2	1.0	1.6	8.3	
10-Aug	1.1	1.0	1.2	0.7	Z	0.7	1.4	1.4	1.7	1.4	0.9	2.6	4.3	0.9	0.9	0.8	2.7	6.4	7.6	17.4	8.6	12.2	13.4	14.4	4.5	17.4	
11-Aug	14.0	12.7	9.8	6.0	11.6	Z	34.2	13.5	16.8	12.9	8.9	8.3	5.1	2.3	4.0	3.9	2.5	1.0	0.8	0.6	0.8	2.3	2.0	4.5	7.8	34.2	
12-Aug	Z	6.5	10.8	2.9	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	6.4	7.1	3.0	5.3	7.2	6.4	2.3	1.8	2.3	0.6	2.9	10.8	
13-Aug	0.4	Z	0.5	0.5	2.4	13.0	5.9	5.9	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	1.5	13.0	
14-Aug	0.3	0.3	Z	0.4	0.6	19.2	10.6	2.6	1.4	0.8	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	6.5	1.5	1.9	2.2	19.2	
15-Aug	0.8	0.4	0.4	Z	0.4	0.4	0.8	4.8	17.6	11.8	8.9	9.0	6.8	5.8	6.7	6.2	5.5	7.6	10.6	9.8	16.7	17.1	20.1	12.4	7.9	20.1	
16-Aug	8.9	2.9	1.3	2.5	Z	4.1	1.2	1.1	1.4	1.4	2.0	1.6	1.0	1.0	0.7	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	1.5	8.9	
17-Aug	0.7	0.6	0.6	0.2	0.1	Z	0.3	0.7	2.4	0.4	0.3	0.3	0.2	0.2	0.3	0.5	0.7	0.3	1.4	1.2	2.8	11.0	23.9	21.3	3.1	23.9	
18-Aug	Z	4.1	6.5	7.1	6.2	5.2	12.9	10.6	3.4	1.9	5.8	4.4	2.4	1.5	1.2	2.0	9.5	5.1	5.7	8.9	12.7	12.0	14.4	13.5	6.8	14.4	
19-Aug	6.5	Z	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	6.5	
20-Aug	0.2	0.2	Z	0.4	0.3	0.4	0.3	0.4	0.4	1.7	1.0	0.8	1.8	2.5	8.8	6.1	0.5	0.4	0.6	0.6	0.4	0.4	0.5	1.0	1.3	8.8	
21-Aug	1.3	1.6	0.6	Z	0.6	0.9	0.4	0.4	0.5	0.6	2.3	6.2	2.3	1.5	2.0	3.0	4.3	2.9	2.8	2.7	2.7	6.6	5.7	4.2	2.4	6.6	
22-Aug	5.0	4.0	3.6	1.4	Z	0.5	0.4	6.0	9.5	25.7	37.7	11.5	9.1	5.7	5.0	4.1	3.0	3.2	2.9	2.3	2.0	1.9	1.2	0.8	6.4	37.7	
23-Aug	0.9	0.8	1.1	1.0	1.5	Z	2.7	38.9	51.8	57.0	46.9	33.8	16.5	10.5	4.9	5.0	5.6	1.8	1.8	2.8	3.2	2.7	2.2	1.8	12.8	57.0	
24-Aug	Z	1.1	1.6	1.0	0.9	0.7	0.6	0.6	1.2	1.3	1.4	0.7	0.6	0.7	0.6	1.2	1.4	1.7	2.3	6.2	9.7	4.6	1.0	1.0	1.8	9.7	
25-Aug	0.6	Z	0.3	0.3	0.2	0.3	2.0	4.0	0.7	1.4	7.3	3.0	1.3	1.5	1.3	1.1	1.2	1.6	1.6	12.9	30.8	21.3	3.6	1.0	4.3	30.8	
26-Aug	1.0	1.1	Z	1.0	0.9	0.9	0.9	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.6	2.0	3.8	5.1	4.3	8.8	20.1	13.8	3.0	20.1	
27-Aug	3.0	3.4	9.7	Z	0.8	0.7	0.6	0.6	0.9	2.2	2.6	6.2	2.9	1.5	1.5	1.3	1.1	0.9	1.2	1.6	1.1	0.8	0.7	0.6	2.0	9.7	
28-Aug	0.6	0.5	0.5	0.4	Z	3.0	0.4	0.5	1.1	0.8	1.9	13.9	20.3	28.7	12.8	5.6	4.3	5.2	4.9	11.5	4.2	8.8	38.4	55.6	9.7	55.6	
29-Aug	39.0	24.9	8.3	3.7	5.2	Z	60.0	12.1	12.3	14.9	10.7	13.2	7.5	6.4	6.2	2.6	5.5	6.1	10.5	11.1	21.9	17.9	23.9	18.7	14.9	60.0	
30-Aug	Z	6.7	4.3	3.1	1.1	5.0	7.1	1.8	1.3	0.9	3.8	27.7	14.0	9.2	9.4	7.2	5.1	4.7	3.1	4.3	8.5	13.1	15.3	12.6	7.4	27.7	
31-Aug	14.3	Z	7.2	4.8	4.6	5.6	7.7	4.1	3.4	29.8	25.4	16.5	9.8	14.5	26.3	15.7	3.6	2.0	3.4	7.5	6.3	7.1	1.7	1.5	9.7	29.8	
		7.0	5.4	4.7	3.4	4.1	4.7	7.4	8.5	8.3	8.0	6.9	6.9	4.6	4.2	3.9	3.2	2.7	2.3	3.0	4.4	5.5	5.8	7.1	7.6	Diurnal Average	
		39.0	25.5	30.4	23.6	28.2	24.6	60.0	66.9	74.5	57.0	46.9	33.8	20.3	28.7	26.3	15.7	13.5	7.6	10.6	17.4	30.8	21.3	38.4	55.6	Diurnal Maximum	
Z - zerospan		C - Calibration				M - Maintenance																					





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitrogen Oxides (NO_x) - ppb
Ells River - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	663	93.78	93.78
21 - 40	37	5.23	99.01
41 - 80	7	0.99	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
Ells River - August 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	49	13	9	13	17	30	44	83	76	64	62	56	48	22	25	660
21 - 40	5	1	1	1	0	0	2	3	7	1	1	1	1	2	5	6	37
11 - 80	0	0	0	0	0	0	0	1	2	0	0	1	1	1	0	1	7
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	50	14	10	13	17	32	48	92	77	65	64	58	51	27	32	704

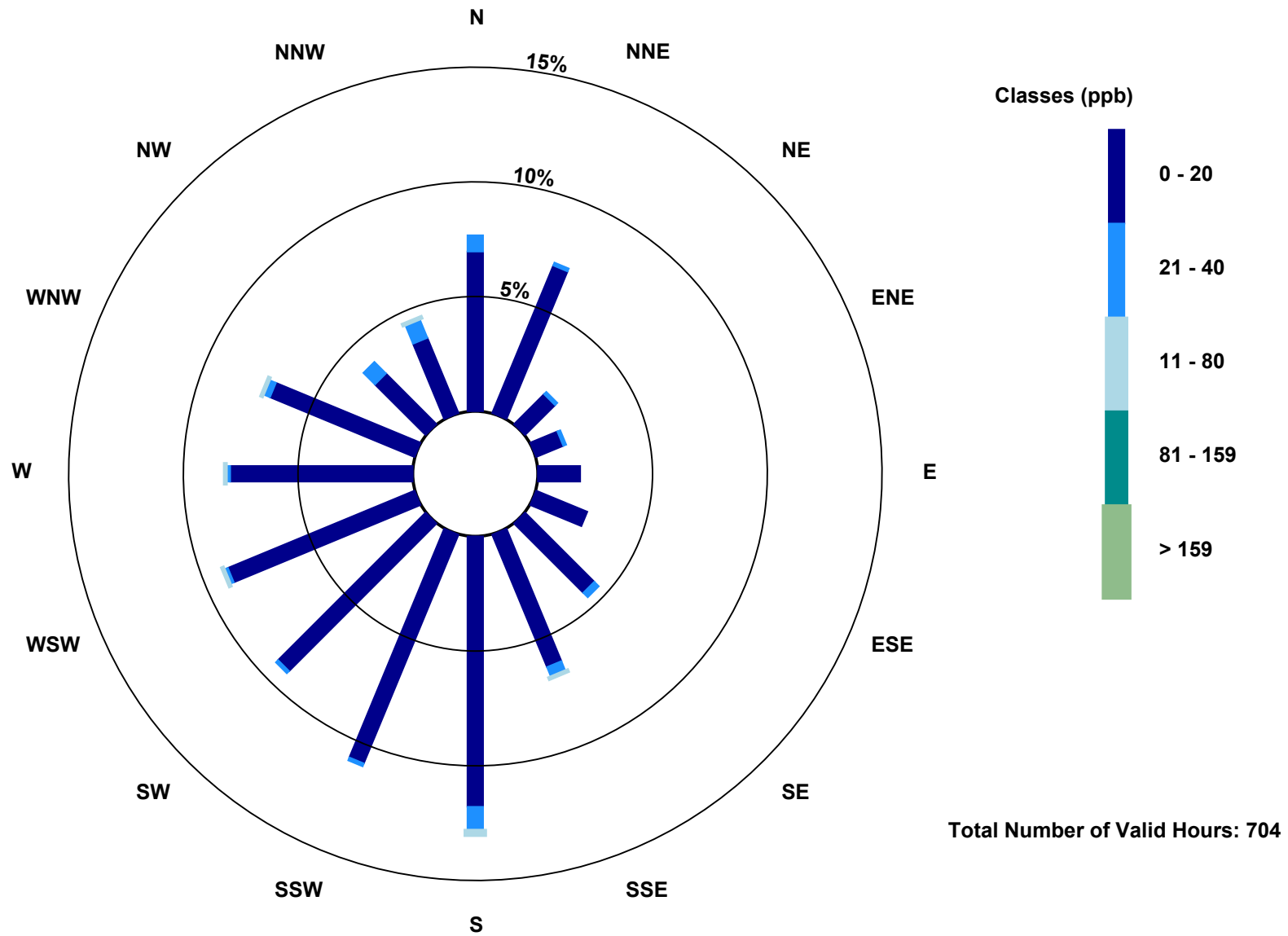
Total Number of Valid Hours: 704

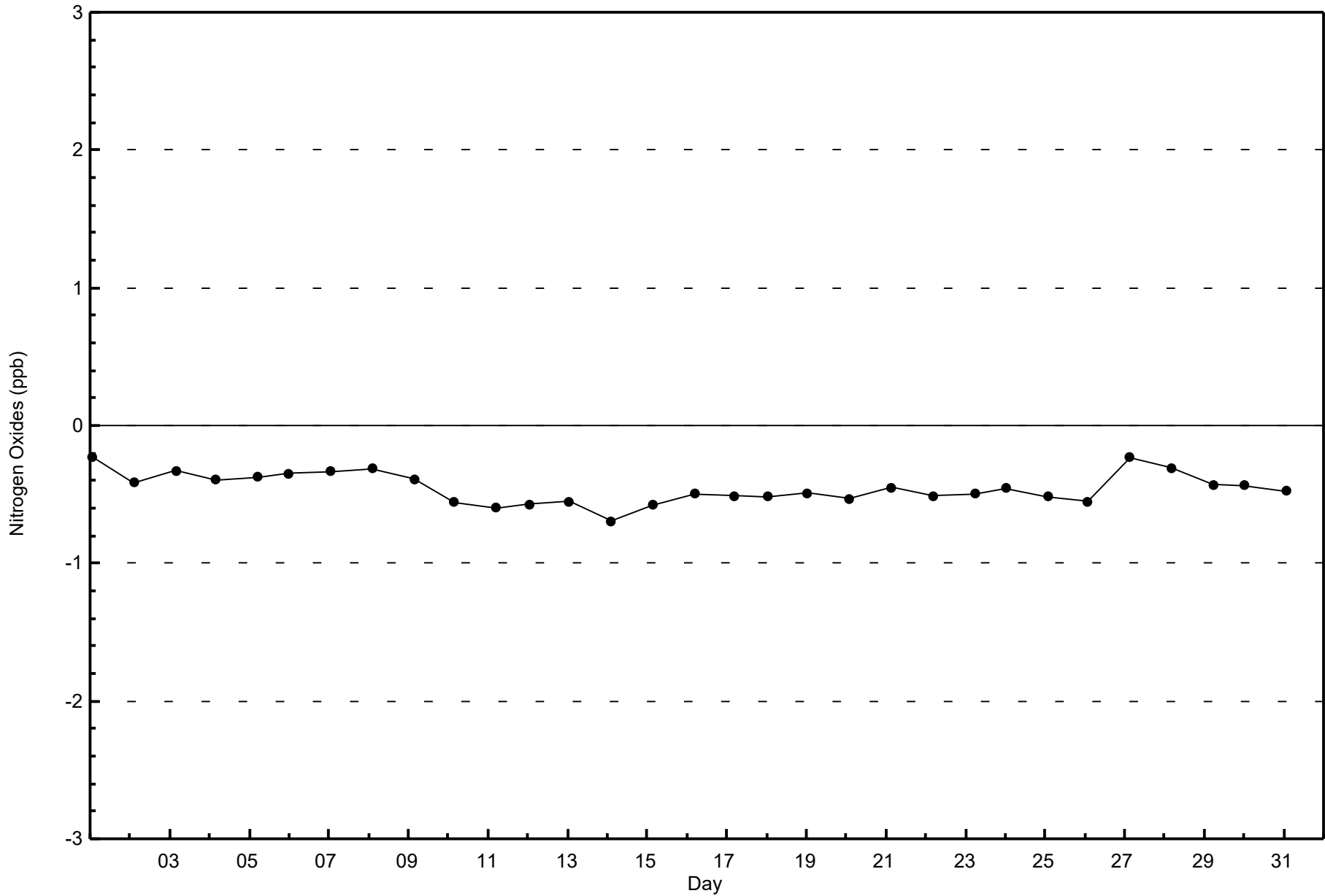
Total Number of Hours: 744

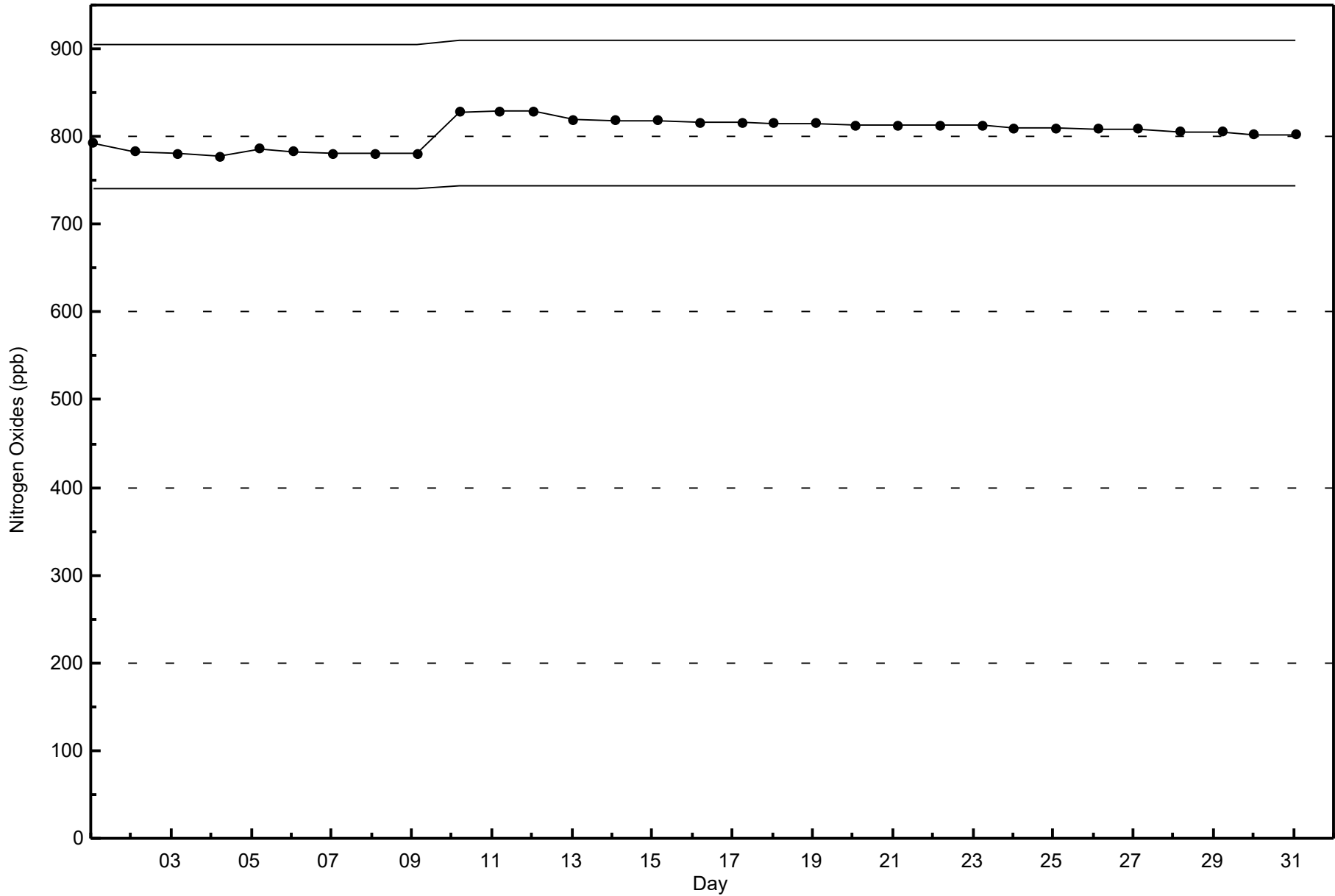


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Ells River









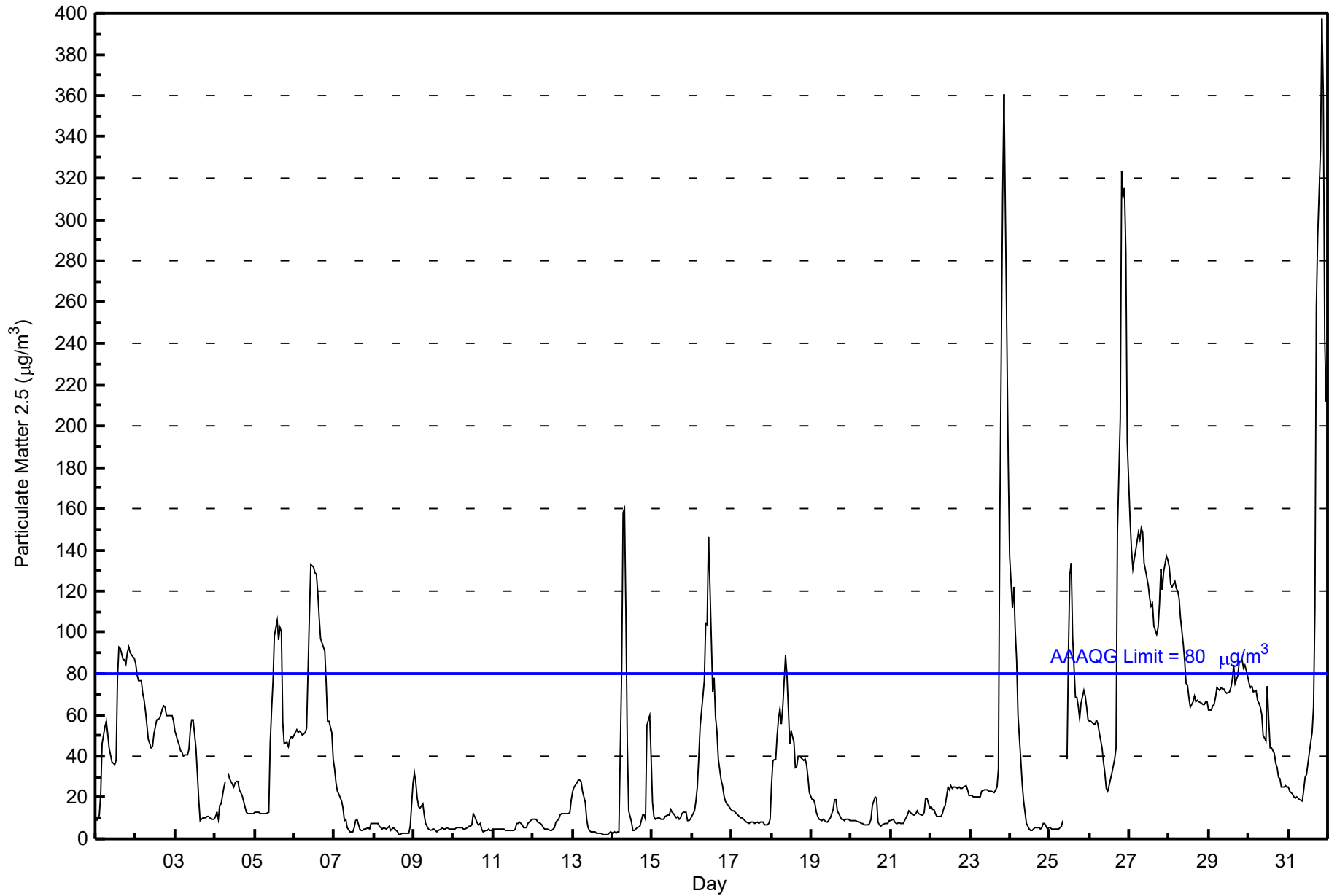
Summary of Hour Averages

Ells River - August 2023

Number of Exceedences (AAAQO):	1-hr: 106	24-hr: 17	Hours in Service:	744
Maximum Value: 397.3 µg/m ³ on Aug 31 21:00	Maximum Daily Average: 128.9 µg/m ³ on Aug 27		Hours of Data:	742
Minimum Value: 2.1 µg/m ³ on Aug 13 21:00	Minimum Daily Average: 5.5 µg/m ³ on Aug 11		Hours of Missing Data:	2
Maximum Diurnal Average: 61.4 µg/m ³ at hour 21	Minimum Diurnal Average: 34.0 µg/m ³ at hour 3		Hours of Calibration:	1
Monthly Average: 41.30 µg/m ³	Percentiles: P ₁ = 2.5 P ₁₀ = 4.8 Q ₁ = 8.0 Median = 20.2 Q ₃ = 58.2 P ₉₀ = 100.0 P ₉₉ = 306.9		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-Aug	9.0	9.3	11.5	21.9	46.2	54.4	57.2	50.6	44.3	41.0	37.1	35.9	38.0	78.1	92.9	92.3	86.9	86.9	84.7	90.0	93.0	90.1	88.3	87.3	59.5	93.0																						
2-Aug	84.4	79.6	76.7	76.5	70.2	66.8	61.5	54.8	48.2	44.1	45.0	50.9	54.6	57.6	58.0	60.7	63.1	64.1	63.6	59.6	59.8	59.9	59.6	57.1	61.5	84.4																						
3-Aug	52.2	47.6	45.3	42.7	42.2	40.1	40.5	40.5	43.6	52.6	57.9	57.9	44.3	31.7	19.1	9.1	9.4	10.0	10.1	11.1	10.7	9.9	9.5	9.6	31.2	57.9																						
4-Aug	11.2	12.8	9.3	16.5	17.1	25.3	28.1	M	31.8	29.4	26.2	25.1	27.3	28.0	27.9	23.8	21.0	18.6	15.5	13.1	12.1	12.3	11.9	12.4	19.9	31.8																						
5-Aug	12.9	12.7	12.6	12.1	12.2	12.4	12.1	12.1	13.0	46.4	62.6	75.8	98.0	105.8	96.2	102.3	100.1	55.9	45.9	46.7	44.9	48.3	49.2	49.1	47.5	105.8																						
6-Aug	51.5	52.9	51.4	52.5	51.7	50.5	51.5	53.8	80.8	107.7	133.0	131.5	128.7	128.1	119.1	107.3	97.3	92.6	90.6	75.0	57.0	56.9	51.4	38.9	79.7	133.0																						
7-Aug	33.6	27.0	23.1	21.5	18.4	14.9	9.1	9.2	5.7	3.7	3.2	3.6	5.4	8.5	9.8	4.9	4.2	3.9	4.7	4.6	5.2	4.8	7.4	7.7	10.2	33.6																						
8-Aug	7.7	7.5	7.4	6.3	5.4	5.0	5.2	4.6	5.4	6.4	4.3	4.4	5.4	4.3	3.1	2.1	2.3	2.6	2.5	2.8	3.0	2.9	6.2	27.3	5.6	27.3																						
9-Aug	31.8	27.2	20.0	15.6	15.0	17.0	11.7	7.6	6.3	4.8	4.2	5.1	5.0	3.9	3.5	4.3	5.1	5.4	5.0	4.9	5.1	5.0	5.0	5.0	9.3	31.8																						
10-Aug	4.9	5.0	5.4	5.7	5.4	5.1	4.9	4.9	5.2	5.9	6.2	6.6	12.0	10.9	7.3	6.7	7.4	4.5	3.7	3.9	4.1	4.4	4.0	4.2	5.8	12.0																						
11-Aug	4.4	4.7	4.7	4.6	4.5	4.8	4.9	3.9	4.3	4.3	3.9	3.9	3.9	4.5	7.4	7.6	8.0	6.7	5.5	5.1	5.7	7.5	8.2	9.2	5.5	9.2																						
12-Aug	9.6	9.6	9.5	8.0	7.2	6.4	5.7	5.0	4.7	4.5	4.3	4.3	4.4	5.4	7.9	9.7	11.9	12.5	11.9	12.0	12.3	12.4	13.2	19.2	8.8	19.2																						
13-Aug	22.9	25.4	27.3	28.6	28.2	27.9	23.0	17.4	9.4	5.1	3.7	3.4	3.3	3.1	2.9	2.8	2.6	2.4	2.1	2.1	2.1	2.3	2.7	3.2	10.6	28.6																						
14-Aug	2.9	3.2	3.0	3.1	3.6	82.2	157.8	159.8	108.8	46.5	13.9	7.9	4.4	4.2	4.9	5.6	6.4	8.6	11.7	11.6	9.4	54.6	59.8	39.8	33.9	159.8																						
15-Aug	17.8	11.1	9.8	10.2	10.1	9.7	9.8	9.2	10.7	11.6	11.5	14.5	12.9	12.5	10.3	10.6	9.6	9.9	12.2	12.9	13.0	9.1	8.7	9.2	11.1	17.8																						
16-Aug	10.6	13.7	18.2	24.8	38.9	54.1	61.6	76.4	104.3	103.8	146.2	122.4	70.9	77.7	59.0	52.1	38.9	28.2	25.8	21.3	18.6	17.2	16.0	14.2	50.6	146.2																						
17-Aug	13.9	13.6	13.2	11.9	10.8	10.1	10.2	9.7	9.1	8.2	7.7	7.8	8.0	8.0	7.7	8.0	7.5	8.2	7.9	8.0	7.0	7.1	7.5	9.3	9.2	13.9																						
18-Aug	26.1	38.2	39.0	50.2	58.2	62.8	55.9	63.7	89.0	79.3	63.2	45.9	52.2	47.0	34.7	35.1	39.9	39.9	39.0	37.9	38.8	35.9	30.0	22.3	46.8	89.0																						
19-Aug	19.2	18.7	16.8	12.7	11.2	9.6	8.8	9.2	9.0	8.0	8.1	9.8	12.1	14.1	19.2	19.1	13.3	10.5	9.6	9.2	9.0	9.3	9.5	9.1	11.9	19.2																						
20-Aug	8.7	8.6	8.6	8.8	8.4	8.1	7.5	7.2	6.8	6.8	6.8	7.1	9.4	16.1	20.3	19.8	8.1	6.5	6.1	6.5	7.2	7.4	7.8	8.7	9.1	20.3																						
21-Aug	8.7	9.4	8.0	7.5	7.5	8.2	7.5	7.3	9.1	10.0	11.2	13.5	12.2	11.6	11.8	12.4	13.5	11.9	11.4	11.8	13.0	19.9	19.4	14.9	11.3	19.9																						
22-Aug	15.3	14.1	14.4	12.1	11.1	10.6	10.7	12.2	15.2	16.2	25.4	23.8	25.6	24.3	25.2	25.3	24.6	25.1	24.3	24.1	25.2	25.6	24.0	20.9	19.8	25.6																						
23-Aug	21.1	20.9	20.3	20.5	20.2	20.2	20.1	22.9	23.5	23.5	23.7	23.3	22.9	23.2	22.7	23.9	25.1	34.0	155.0	310.7	360.8	301.5	244.0	183.2	82.0	360.8																						
24-Aug	136.7	111.6	122.2	101.3	86.6	59.7	38.2	26.6	18.4	12.8	7.4	5.0	4.3	4.2	4.4	5.4	5.5	5.3	4.9	5.7	7.6	7.3	5.1	5.2	33.0	136.7																						
25-Aug	5.4	5.0	5.0	4.5	4.6	5.0	5.3	6.2	8.7	C	38.6	90.9	127.9	133.9	97.6	68.8	68.2	64.2	58.0	65.9	71.6	68.9	63.5	57.6	48.9	133.9																						
26-Aug	57.1	57.3	55.7	55.9	57.3	55.6	51.6	44.0	37.0	32.1	24.4	23.0	25.9	32.1	35.1	38.8	43.9	149.0	203.4	323.3	311.3	315.5	283.8	192.1	104.4	323.3																						
27-Aug	154.4	140.3	131.0	135.4	139.4	148.4	145.2	150.7	148.2	133.3	130.4	122.4	116.3	112.5	114.1	103.3	98.7	102.2	113.7	131.0	120.6	129.4	137.2	135.0	128.9	154.4																						
28-Aug	131.4	123.5	122.3	124.8	121.0	119.9	116.3	107.1	94.5	85.8	75.0	74.4	68.6	63.9	66.3	68.9	66.6	67.1	66.4	65.8	65.2	65.2	66.4	66.7	87.2	131.4																						
29-Aug	62.5	62.6	64.7	65.3	68.2	73.1	72.0	73.3	72.4	72.6	71.3	70.6	71.0	72.9	77.2	84.1	75.2	79.6	86.2	86.1	86.4	82.6	83.8	79.0	74.7	86.4																						
30-Aug	75.1	73.2	74.0	71.5	72.1	67.3	66.0	64.1	60.4	50.0	47.3	73.6	57.5	43.9	44.4	41.4	36.8	34.8	29.7	29.2	25.3	25.1	25.7	25.1	50.6	75.1																						
31-Aug	25.1	23.0	22.0	20.2	20.0	20.1	19.9	19.1	18.3	23.4	30.1	31.5	36.6	46.6	51.4	63.5	111.7	257.7	292.4	334.1	397.3	360.3	242.0	211.3	111.6	397.3																						
																								36.4	34.5	34.0	34.0	34.6	37.3	38.1	37.8	37.0	36.0	36.6	37.9	37.7	39.3	37.5	36.1	35.9	42.2	48.5	58.9	61.4	60.0	53.2	46.3	Diurnal Average
																								154.4	140.3	131.0	135.4	139.4	148.4	157.8	159.8	148.2	133.3	146.2	131.5	128.7	133.9	119.1	107.3	111.7	257.7	292.4	334.1	397.3	360.3	283.8	211.3	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}) - $\mu\text{g}/\text{m}^3$
Ells River - August 2023

Concentration Ranges ($\mu\text{g}/\text{m}^3$)	Number of Hours	%	Cumulative %
0 - 5	120	16.17	16.17
6 - 15	218	29.38	45.55
16 - 25	85	11.46	57.01
26 - 80	213	28.71	85.71
> 81.0	106	14.29	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}) - μg/m³
Ells River - August 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	15	14	5	3	7	8	16	3	4	4	11	13	8	4	2	3	120
6 - 15	10	7	3	5	3	8	8	9	31	33	29	27	17	13	8	7	218
16 - 25	3	2	0	0	0	0	0	7	7	14	9	10	13	12	6	2	85
26 - 80	17	14	3	1	2	0	10	26	41	15	12	14	17	14	10	15	211
> 81.0	9	15	3	1	1	2	0	8	14	14	9	2	6	9	7	5	105
Totals	54	52	14	10	13	18	34	53	97	80	70	66	61	52	33	32	739

Total Number of Valid Hours: 739

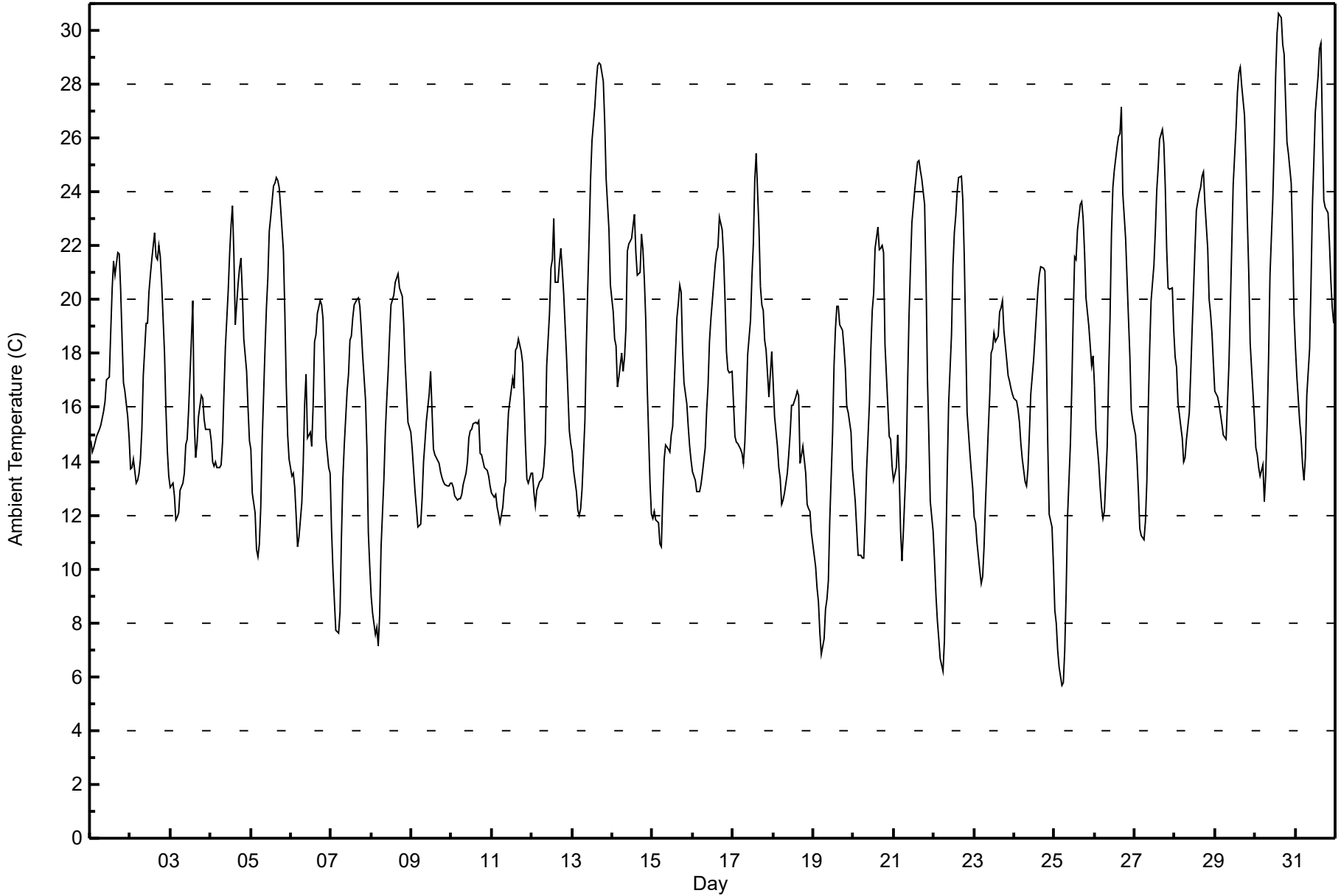
Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

Ambient Temperature (AT) - C
Ells River - August 2023

Maximum Value: 30.6 C on Aug 30 15:00		Maximum Daily Average: 21.7 C on Aug 30		Hours in Service:	744																																											
Minimum Value: 5.7 C on Aug 25 05:00		Minimum Daily Average: 13.5 C on Aug 19		Hours of Data:	744																																											
Maximum Diurnal Average: 22.0 C at hour 15		Minimum Diurnal Average: 11.8 C at hour 6		Hours of Missing Data:	0																																											
Monthly Average: 17.00 C		Percentiles: P ₁ = 7.1 P ₁₀ = 11.8 Q ₁ = 13.6 Median = 16.3 Q ₃ = 20.4 P ₉₀ = 23.5 P ₉₉ = 28.8		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-Aug	14.8	14.3	14.5	14.7	14.9	15.2	15.3	15.6	15.9	16.2	17.0	17.1	18.8	20.4	21.4	20.9	21.8	21.7	20.4	18.6	16.9	16.6	15.7	14.8	17.2	21.8																						
2-Aug	13.7	13.7	14.1	13.2	13.3	13.6	14.1	15.2	17.2	19.2	19.1	20.3	20.9	21.5	22.5	21.6	21.5	22.0	21.6	20.6	18.0	15.9	14.4	13.5	17.5	22.5																						
3-Aug	13.0	13.2	12.7	11.8	11.9	12.1	12.9	13.2	13.5	14.6	14.8	15.9	18.5	20.0	15.4	14.2	14.6	15.7	16.4	16.3	15.6	15.2	15.2	15.2	14.7	20.0																						
4-Aug	14.8	14.0	13.8	14.0	13.8	13.8	13.9	14.7	16.5	18.2	20.3	21.7	22.7	23.5	21.7	19.1	20.6	21.2	21.6	20.2	18.6	17.3	16.0	14.8	17.8	23.5																						
5-Aug	14.4	12.8	12.1	10.7	10.5	10.9	12.3	14.8	18.2	19.7	20.8	22.5	23.1	24.2	24.3	24.5	24.4	24.1	23.4	21.8	19.5	16.8	15.0	14.1	18.1	24.5																						
6-Aug	13.4	13.6	13.0	12.0	10.8	11.2	12.5	13.9	16.1	17.2	14.9	15.1	14.6	16.1	18.4	18.7	19.5	20.0	19.8	19.3	17.2	14.8	13.7	13.5	15.4	20.0																						
7-Aug	11.5	10.0	8.8	7.7	7.6	8.4	11.2	13.3	14.6	16.6	17.2	18.5	18.6	19.3	19.8	20.0	20.0	19.7	18.9	17.9	16.3	14.5	11.3	10.1	14.7	20.0																						
8-Aug	9.0	8.3	7.6	7.8	7.1	8.3	10.8	13.3	15.1	16.3	17.3	18.7	19.8	20.2	20.6	20.8	21.0	20.4	20.1	19.1	17.6	16.5	15.4	15.1	15.3	21.0																						
9-Aug	14.4	13.6	12.8	12.2	11.6	11.7	12.6	14.0	14.7	15.5	16.5	17.3	15.9	14.4	14.3	14.1	13.9	13.6	13.4	13.2	13.2	13.1	13.1	13.2	13.9	17.3																						
10-Aug	13.2	13.0	12.7	12.6	12.6	12.6	12.8	13.1	13.5	14.0	14.9	15.1	15.2	15.4	15.4	15.4	15.5	14.3	14.3	13.8	13.7	13.7	13.5	13.1	13.9	15.5																						
11-Aug	12.8	12.7	12.8	12.3	12.0	11.7	12.3	13.0	13.3	14.7	15.8	16.2	17.1	16.7	18.1	18.2	18.6	18.1	17.7	16.3	14.6	13.3	13.2	13.5	14.8	18.6																						
12-Aug	13.5	12.8	12.4	12.9	13.2	13.3	13.4	13.8	14.7	17.5	19.5	21.2	21.5	23.0	20.6	20.7	21.4	21.9	21.1	20.2	17.9	16.6	15.1	14.7	17.2	23.0																						
13-Aug	14.3	13.6	12.9	12.2	12.0	12.2	13.0	15.5	18.3	20.4	22.3	24.5	25.9	27.1	28.0	28.7	28.8	28.7	28.1	26.6	24.5	23.5	22.6	20.6	21.0	28.8																						
14-Aug	19.6	18.5	18.3	16.8	17.1	18.0	17.3	17.9	19.0	21.8	22.1	22.3	22.7	23.2	21.8	20.9	21.0	22.4	21.9	20.8	19.2	16.8	13.2	12.0	19.4	23.2																						
15-Aug	11.9	12.1	11.8	11.7	10.9	10.8	12.7	14.1	14.6	14.5	14.3	15.0	15.3	16.7	19.4	19.9	20.6	20.3	18.2	16.9	16.1	15.3	14.6	14.0	15.1	20.6																						
16-Aug	13.6	13.3	12.9	12.9	12.9	13.1	13.5	14.5	15.9	16.8	18.5	19.3	20.6	21.3	21.8	22.0	23.1	22.6	21.6	19.9	18.1	17.4	17.3	17.4	17.5	23.1																						
17-Aug	16.1	14.9	14.7	14.7	14.4	14.3	13.9	14.7	16.2	18.0	19.2	20.8	22.1	24.4	25.4	22.6	20.5	19.8	19.6	18.5	18.1	16.4	17.3	18.1	18.1	25.4																						
18-Aug	16.9	15.7	14.6	13.8	13.3	12.4	12.5	12.8	13.5	14.2	15.0	16.1	16.1	16.4	16.6	16.4	13.9	14.2	14.5	13.5	12.4	12.2	12.2	11.3	14.2	16.9																						
19-Aug	10.5	10.1	9.3	8.8	7.6	6.8	7.4	8.5	8.9	9.6	11.8	15.1	17.5	18.9	19.8	19.8	19.1	18.9	18.2	17.4	16.0	15.8	15.1	13.7	13.5	19.8																						
20-Aug	13.1	12.5	11.5	10.5	10.5	10.4	10.4	11.8	13.7	16.1	18.2	19.6	20.2	21.9	22.7	21.9	21.9	22.0	21.7	18.3	16.1	14.9	14.8	13.8	16.2	22.7																						
21-Aug	13.3	13.8	15.0	13.6	11.5	10.3	11.4	14.0	16.9	19.4	21.2	22.8	24.0	24.6	25.1	25.1	24.8	24.5	23.5	20.8	17.1	14.9	12.5	11.4	18.0	25.1																						
22-Aug	10.3	9.1	8.1	7.4	6.7	6.2	7.4	10.6	13.7	16.2	18.7	21.2	22.5	23.1	24.0	24.5	24.6	23.7	21.6	18.7	15.8	14.3	13.6	13.0	15.6	24.6																						
23-Aug	11.9	11.7	11.0	9.9	9.5	9.7	10.8	12.5	15.2	16.5	18.0	18.2	18.8	18.5	18.7	19.6	19.7	20.0	18.9	17.8	17.2	16.9	16.7	16.5	15.6	20.0																						
24-Aug	16.4	16.2	15.9	15.4	14.6	14.1	13.3	13.1	13.7	15.0	16.5	17.8	18.6	19.5	20.3	20.9	21.2	21.2	21.0	18.2	14.7	12.0	11.6	10.1	16.3	21.2																						
25-Aug	8.5	8.0	7.0	6.4	5.7	5.8	7.0	9.2	12.0	14.7	16.8	19.4	21.6	21.5	22.6	23.6	23.6	23.0	21.8	20.1	19.0	18.3	17.6	17.9	15.5	23.6																						
26-Aug	16.8	15.2	13.9	13.0	12.3	11.9	12.1	14.6	17.2	19.4	22.5	24.2	24.8	25.7	26.0	26.1	27.2	24.0	22.3	20.8	19.3	17.9	15.9	15.5	19.1	27.2																						
27-Aug	15.0	14.1	12.9	11.5	11.3	11.1	11.8	13.2	16.0	18.2	20.0	21.3	22.5	24.0	24.9	25.9	26.3	25.8	24.2	21.9	20.4	20.4	20.4	18.9	18.8	26.3																						
28-Aug	17.9	17.5	16.2	15.3	14.9	14.0	14.1	14.8	15.8	17.3	18.9	20.4	21.9	23.3	24.0	24.2	24.6	24.8	23.6	21.9	20.0	19.5	18.8	17.6	19.2	24.8																						
29-Aug	16.6	16.4	16.1	15.7	15.4	15.0	14.8	16.2	17.6	19.8	22.0	24.3	26.4	27.7	28.4	28.6	27.9	26.9	25.2	22.9	21.0	18.4	17.4	15.6	20.7	28.6																						
30-Aug	14.5	14.2	13.7	13.4	13.9	12.5	13.5	15.4	17.8	20.9	23.8	25.7	28.3	29.9	30.6	30.5	29.5	29.1	27.4	25.9	25.4	24.3	22.2	19.4	21.7	30.6																						
31-Aug	18.2	17.1	15.5	14.9	13.9	13.3	14.2	16.4	18.2	20.7	23.5	25.2	27.0	28.3	29.3	29.5	26.5	23.7	23.4	23.2	22.1	20.7	19.7	19.2	21.0	29.5																						
																								14.0	13.4	12.9	12.3	11.9	11.8	12.4	13.8	15.4	17.1	18.4	19.8	20.8	21.6	22.0	21.9	21.9	21.6	20.8	19.4	17.8	16.6	15.6	14.9	Diurnal Average
																								19.6	18.5	18.3	16.8	17.1	18.0	17.3	17.9	19.0	21.8	23.8	25.7	28.3	29.9	30.6	30.5	29.5	29.1	28.1	26.6	25.4	24.3	22.6	20.6	Diurnal Maximum





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Ells River - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	36	4.84	4.84
10 - 20	508	68.28	73.12
> 20	200	26.88	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

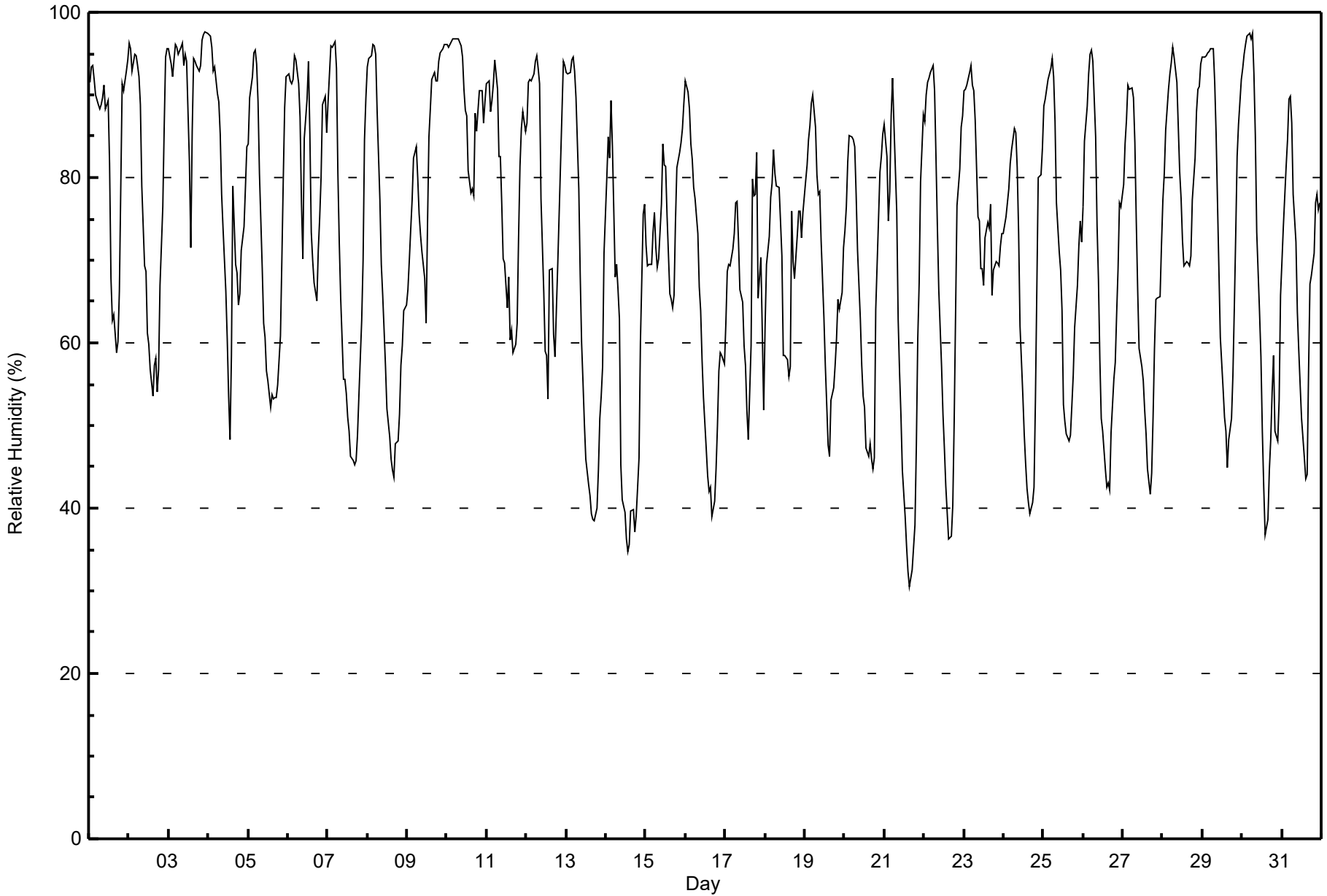
Relative Humidity (RH) - %
Ells River - August 2023

Maximum Value: 97.6 % on Aug 3 23:00																						Maximum Daily Average: 93.1 % on Aug 3																						Hours in Service: 744			
Minimum Value: 30.6 % on Aug 21 16:00																						Minimum Daily Average: 57.3 % on Aug 14																						Hours of Data: 744			
Maximum Diurnal Average: 89.9 % at hour 5																						Minimum Diurnal Average: 54.4 % at hour 15																						Hours of Missing Data: 0			
Monthly Average: 72.84 %																						Percentiles: P ₁ = 36.2 P ₁₀ = 47.5 Q ₁ = 58.9 Median = 74.7 Q ₃ = 89.0 P ₉₀ = 94.1 P ₉₉ = 97.0																						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-Aug	91.5	93.4	93.5	91.9	89.9	88.9	88.3	88.8	89.7	91.3	88.4	89.3	81.6	67.9	62.7	63.4	58.8	60.1	66.3	78.9	91.4	90.5	92.9	94.2	83.1	94.2																					
2-Aug	96.3	95.6	92.9	94.9	94.7	93.5	92.2	88.7	78.9	69.3	68.7	61.2	59.8	56.8	53.6	57.3	58.1	54.0	56.9	67.0	76.4	86.1	94.6	95.5	76.8	96.3																					
3-Aug	95.6	93.7	92.2	94.2	96.1	95.7	95.0	95.8	96.2	93.5	94.9	94.2	81.8	71.5	85.7	94.3	94.2	93.6	92.9	93.6	96.6	97.3	97.6	97.5	93.1	97.6																					
4-Aug	97.3	97.1	95.7	93.0	93.4	90.3	89.2	85.3	78.0	73.9	66.2	60.5	53.6	48.3	58.4	78.9	69.5	68.4	64.5	66.0	71.2	74.0	78.8	83.8	76.5	97.3																					
5-Aug	84.2	89.6	92.2	95.0	95.4	93.7	89.1	80.5	69.1	62.3	60.7	56.5	55.4	52.2	53.7	53.3	53.5	53.4	54.9	60.8	70.0	79.7	88.4	92.3	72.3	95.4																					
6-Aug	92.5	91.7	91.3	91.8	94.8	94.2	91.4	87.3	77.0	70.1	84.8	89.6	94.2	85.2	73.3	69.9	67.3	65.1	71.2	75.0	80.1	88.8	89.8	85.5	83.4	94.8																					
7-Aug	89.2	92.6	96.0	95.7	96.4	93.3	80.5	72.1	65.5	55.6	55.5	54.0	51.0	49.3	46.2	45.8	45.3	45.8	48.7	53.6	62.6	70.0	84.6	89.6	68.3	96.4																					
8-Aug	93.3	94.5	94.8	96.1	96.0	95.0	88.1	77.3	69.5	65.7	61.6	57.1	52.0	48.7	45.9	44.6	43.8	47.8	48.2	51.4	57.2	59.6	63.8	64.5	67.3	96.1																					
9-Aug	66.5	70.0	73.8	77.3	82.4	83.7	80.1	75.6	73.1	71.1	67.7	62.3	74.4	84.9	88.2	91.9	92.8	91.7	91.7	94.1	95.2	95.5	96.1	96.1	82.3	96.1																					
10-Aug	96.1	95.7	96.2	96.8	96.7	96.8	96.8	96.7	95.9	94.6	90.8	88.2	87.5	80.8	78.1	78.6	77.9	87.8	85.6	90.5	90.6	90.5	86.7	89.2	90.2	96.8																					
11-Aug	91.4	91.6	88.0	89.4	91.3	94.2	90.7	82.5	82.5	76.8	70.2	69.6	64.2	68.1	60.3	61.5	58.9	59.9	62.3	72.7	81.4	85.9	88.0	85.7	77.8	94.2																					
12-Aug	86.6	91.5	91.9	91.7	92.6	94.1	94.7	93.2	91.4	77.5	66.1	58.9	58.4	53.2	68.8	68.9	61.0	58.3	64.1	69.7	81.8	88.0	94.1	93.5	78.7	94.7																					
13-Aug	92.7	92.6	92.7	94.2	94.5	93.0	89.6	78.7	68.3	60.1	55.3	50.2	45.9	42.9	41.5	39.4	38.7	38.4	40.0	44.5	50.9	53.6	57.1	70.9	63.6	94.5																					
14-Aug	79.9	84.9	82.4	89.3	83.8	68.0	69.5	66.5	62.8	45.2	41.1	39.5	36.3	34.8	35.5	39.7	39.8	37.1	39.1	42.6	46.1	60.1	75.6	76.7	57.3	89.3																					
15-Aug	71.9	69.3	69.4	69.5	73.4	75.8	71.6	69.2	70.1	76.7	84.0	81.4	81.4	75.5	66.0	65.3	64.2	65.7	74.5	81.2	83.0	84.2	85.9	89.0	74.9	89.0																					
16-Aug	91.7	90.3	88.4	84.0	82.2	78.9	77.5	73.1	66.8	63.8	58.0	53.5	47.1	43.9	42.1	42.5	39.1	40.8	44.8	50.0	56.6	58.9	58.5	57.4	62.1	91.7																					
17-Aug	62.3	68.6	69.4	69.3	71.4	73.2	77.0	77.1	72.3	66.4	64.9	59.6	57.3	51.9	48.3	59.7	79.9	77.8	78.0	83.1	65.5	70.4	61.3	51.8	67.4	83.1																					
18-Aug	62.1	69.5	72.9	77.5	79.2	83.4	80.5	79.0	78.9	74.8	70.5	58.5	58.6	58.0	56.0	57.2	76.0	69.8	67.9	73.1	75.9	76.0	72.8	75.8	71.0	83.4																					
19-Aug	79.6	81.6	84.5	86.3	88.9	90.0	86.0	80.3	78.0	78.2	72.4	63.0	57.3	52.5	47.7	46.4	53.0	54.5	57.3	60.4	65.2	64.1	66.1	71.5	69.4	90.0																					
20-Aug	73.6	76.5	81.9	85.0	85.0	84.6	83.7	77.9	71.3	62.9	57.2	53.6	52.2	47.3	46.3	47.9	45.9	44.8	46.1	64.0	75.1	80.7	82.6	85.3	67.1	85.3																					
21-Aug	86.4	82.5	74.7	78.3	87.5	92.0	86.4	75.7	62.9	56.4	51.2	44.5	39.0	35.3	32.4	30.6	31.4	32.6	38.0	47.7	60.5	67.3	79.6	87.6	60.9	92.0																					
22-Aug	86.8	89.9	91.4	92.0	92.8	93.5	90.6	82.6	74.1	66.4	57.1	51.3	47.4	42.7	39.5	36.2	36.6	40.4	50.5	63.6	76.6	81.0	86.1	87.5	69.0	93.5																					
23-Aug	90.4	90.7	91.1	92.7	93.6	91.1	90.6	86.9	75.2	74.7	69.0	68.9	66.9	72.8	74.6	73.9	76.8	65.8	68.8	69.8	69.7	69.3	71.7	73.2	77.8	93.6																					
24-Aug	73.3	75.2	76.9	78.7	81.7	83.4	85.9	85.4	81.1	73.4	62.1	53.7	49.1	45.5	42.4	40.6	39.3	40.7	42.6	53.1	66.4	80.0	80.4	83.5	65.6	85.9																					
25-Aug	88.6	89.5	90.7	91.9	93.2	94.4	92.2	86.9	76.9	71.0	68.8	63.9	52.6	50.5	49.0	48.2	48.8	52.4	56.1	61.9	66.9	71.7	74.8	72.2	71.4	94.4																					
26-Aug	76.5	84.4	88.6	92.5	94.9	95.4	94.0	85.0	74.2	67.6	58.0	50.8	49.3	44.6	42.6	43.1	42.2	49.2	55.5	57.6	63.6	69.0	77.0	76.4	68.0	95.4																					
27-Aug	79.2	84.0	87.0	91.1	90.7	90.8	89.7	84.3	74.7	66.4	59.3	57.2	55.4	51.9	48.9	44.7	41.7	44.3	51.0	59.3	65.2	65.5	65.6	71.9	67.5	91.1																					
28-Aug	77.2	80.6	85.8	90.6	92.6	93.9	95.8	94.6	91.5	86.2	80.6	77.5	72.4	69.3	69.8	69.7	69.4	70.6	77.3	82.5	88.0	90.8	91.1	93.7	83.0	95.8																					
29-Aug	94.6	94.6	94.8	95.1	95.3	95.5	95.6	91.6	85.3	76.9	68.7	60.6	54.3	51.0	49.3	44.9	48.4	50.9	56.1	64.2	73.1	82.6	86.4	91.8	75.1	95.6																					
30-Aug	93.2	94.9	96.2	97.1	97.4	96.8	97.4	92.5	85.0	73.4	63.8	58.2	49.4	42.5	36.9	38.7	44.5	48.3	54.0	58.5	49.4	48.2	53.1	65.7	68.1	97.4																					
31-Aug	69.8	74.1	81.4	84.7	89.5	89.9	86.7	78.0	72.3	63.8	59.1	54.9	50.9	46.1	43.6	44.0	56.4	67.1	68.1	70.9	77.0	77.9	76.1	77.0	69.1	89.9																					
																						84.2	86.1	87.1	88.6	89.9	89.6	87.6	82.9	77.1	71.2	67.0	62.7	59.2	55.7	54.4	55.5	56.5	57.3	60.4	66.5	71.9	76.0	79.3	81.5	Diurnal Average	
																						97.3	97.1	96.2	97.1	97.4	96.8	97.4	96.7	96.2	94.6	94.9	94.2	94.2	85.2	88.2	94.3	94.2	93.6	92.9	94.1	96.6	97.3	97.6	97.5	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Ells River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Ells River - August 2023

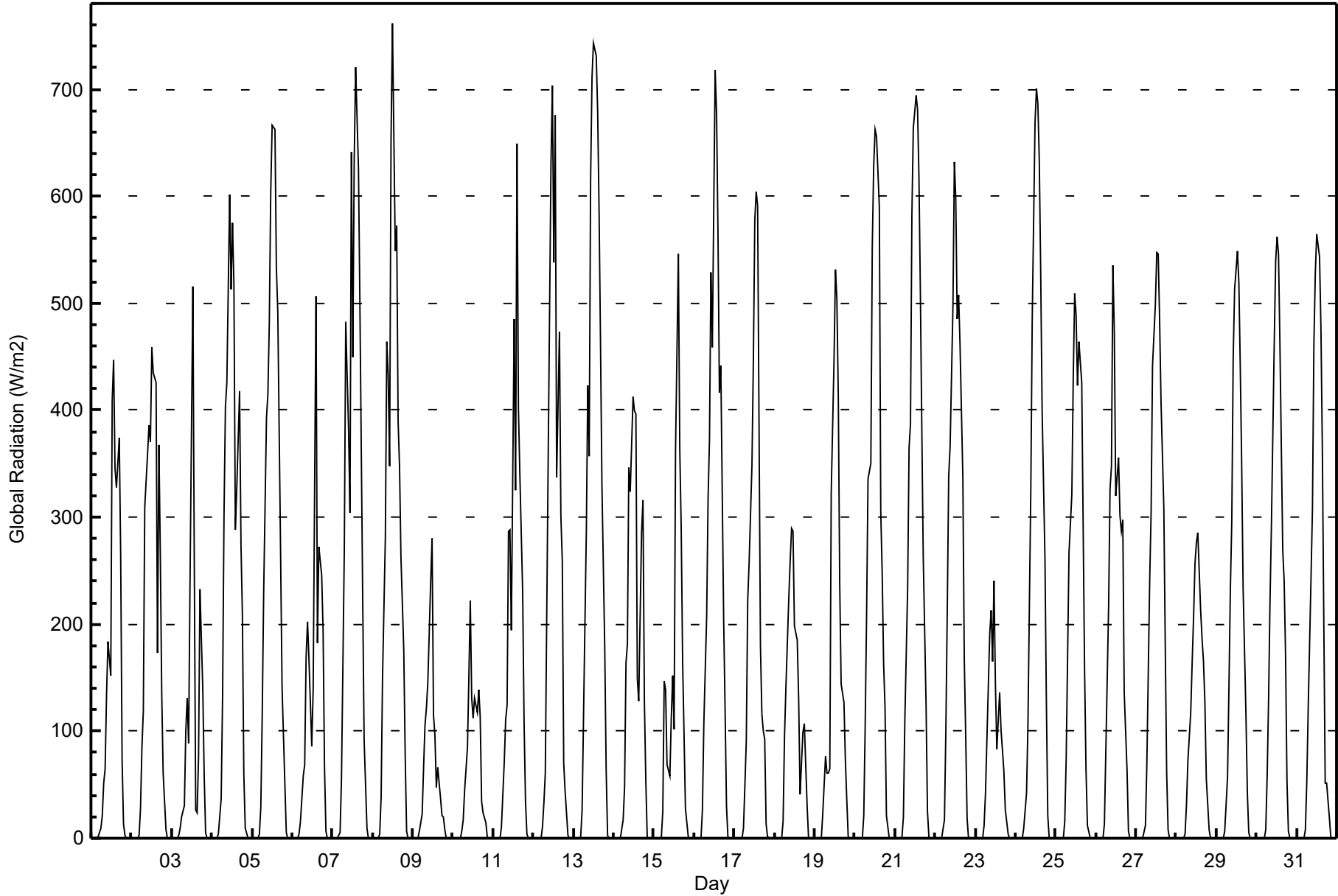
Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	26	3.49	3.49
40 - 60	169	22.72	26.21
60 - 80	249	33.47	59.68
80 - 100	300	40.32	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Maximum Value: 761.8 W/m2 on Aug 8 13:00 Maximum Daily Average: 262.9 W/m2 on Aug 13																							Hours in Service:	744		
Minimum Value: 0.0 W/m2 on Aug 1 01:00 Minimum Daily Average: 56.1 W/m2 on Aug 10																							Hours of Data:	744		
Maximum Diurnal Average: 471.0 W/m2 at hour 13 Minimum Diurnal Average: 0.0 W/m2 at hour 1																							Hours of Missing Data:	0		
Monthly Average: 160.90 W/m2 Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 60.9 Q ₃ = 288.3 P ₉₀ = 490.5 P ₉₉ = 697.9																							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-Aug	0.0	0.0	0.0	0.0	1.1	9.4	20.8	52.2	64.9	133.6	183.7	152.4	408.0	446.6	344.9	327.7	374.7	263.7	72.2	13.5	2.2	0.0	0.0	0.0	119.6	446.6
2-Aug	0.0	0.0	0.0	0.0	3.3	27.6	84.0	118.8	309.8	359.7	385.5	370.8	458.3	435.2	425.2	173.1	367.3	266.2	134.8	61.0	8.6	0.1	0.0	0.0	166.2	458.3
3-Aug	0.0	0.0	0.0	0.0	2.6	9.5	20.4	29.8	100.3	131.0	88.2	242.1	515.2	256.4	27.1	23.6	75.3	232.3	140.6	57.7	5.1	0.0	0.0	0.0	81.5	515.2
4-Aug	0.0	0.0	0.0	0.0	3.5	37.4	134.1	302.5	402.6	425.6	601.7	512.5	575.4	517.6	288.2	326.2	417.3	273.5	207.8	59.7	9.4	0.0	0.0	0.0	212.3	601.7
5-Aug	0.0	0.1	0.0	0.0	3.6	28.9	114.5	228.0	392.7	415.6	481.6	602.9	666.1	662.5	532.5	491.3	377.7	263.1	141.2	50.3	5.8	0.1	0.1	0.0	227.5	666.1
6-Aug	0.0	0.0	0.0	0.1	3.7	16.2	57.7	68.9	168.6	202.7	168.4	86.3	140.5	325.0	506.6	182.2	272.3	245.9	194.4	66.5	7.2	0.1	0.1	0.0	113.1	506.6
7-Aug	0.1	0.1	0.0	0.0	5.6	56.9	162.9	271.1	482.4	382.5	304.7	641.0	449.4	634.4	720.3	625.0	499.8	361.5	221.7	90.8	9.2	0.1	0.1	0.0	246.6	720.3
8-Aug	0.0	0.0	0.0	0.0	4.3	38.5	150.7	282.1	463.7	432.9	347.6	652.3	761.8	549.2	572.7	390.1	347.8	263.0	175.8	78.6	6.9	0.0	0.0	0.0	229.9	761.8
9-Aug	0.0	0.0	0.0	0.0	6.4	22.5	65.5	105.5	121.2	145.2	238.8	280.5	115.0	95.9	47.5	65.9	36.9	21.5	19.4	7.5	0.4	0.0	0.0	0.0	58.2	280.5
10-Aug	0.0	0.0	0.0	0.0	0.2	6.3	17.8	45.1	84.6	151.0	222.1	130.9	112.9	131.4	118.1	138.8	113.2	34.4	24.0	14.0	1.4	0.0	0.0	0.0	56.1	222.1
11-Aug	0.0	0.0	0.0	0.0	0.6	10.3	71.5	111.4	124.1	287.5	288.4	194.8	484.6	324.7	648.8	402.0	341.5	230.6	108.5	34.7	3.5	0.1	0.0	0.0	152.8	648.8
12-Aug	0.0	0.0	0.0	0.0	0.4	10.0	33.7	60.2	208.2	350.3	629.2	702.7	538.3	675.8	337.0	473.2	301.5	259.1	69.9	43.2	2.1	0.1	0.1	0.0	195.6	702.7
13-Aug	0.0	0.2	0.1	0.0	0.8	26.0	113.8	288.9	423.1	357.0	614.4	711.8	743.1	731.2	678.2	584.0	463.1	330.2	177.6	63.4	2.4	0.1	0.0	0.0	262.9	743.1
14-Aug	0.0	0.0	0.1	0.0	0.3	17.7	47.2	163.8	180.5	346.0	323.9	412.7	399.1	396.2	149.2	128.7	286.2	315.5	128.6	54.5	1.8	0.0	0.1	0.0	139.7	412.7
15-Aug	0.1	0.0	0.0	0.0	1.7	25.4	146.7	138.9	69.3	58.0	112.6	151.8	102.2	362.9	546.2	363.1	291.4	166.2	97.4	27.8	1.8	0.0	0.0	0.0	111.0	546.2
16-Aug	0.0	0.0	0.0	0.0	0.1	26.5	107.6	208.0	317.2	372.9	528.4	458.5	717.7	676.5	564.8	416.9	441.0	205.0	121.7	29.8	0.8	0.2	0.0	0.0	216.4	717.7
17-Aug	0.0	0.0	0.0	0.0	0.3	9.3	48.7	91.6	222.5	258.0	349.6	446.8	577.5	604.5	591.2	179.2	116.9	99.9	92.8	13.2	0.8	0.0	0.0	0.0	154.3	604.5
18-Aug	0.0	0.0	0.0	0.0	0.4	16.0	94.8	140.9	223.4	259.1	289.7	287.3	198.1	185.3	129.1	40.9	69.7	98.5	107.1	29.0	0.3	0.0	0.0	0.0	90.4	289.7
19-Aug	0.0	0.0	0.0	0.0	0.7	21.9	77.1	60.2	60.7	65.0	323.1	448.2	530.9	503.7	412.9	238.6	144.8	127.6	72.6	36.1	0.9	0.0	0.1	0.1	130.2	530.9
20-Aug	0.0	0.0	0.1	0.1	0.6	21.2	106.1	210.1	335.8	350.7	552.4	627.6	662.7	655.2	589.0	305.9	248.6	163.9	123.0	20.6	0.4	0.0	0.0	0.0	207.3	662.7
21-Aug	0.0	0.0	0.0	0.1	0.8	19.4	109.3	233.6	365.4	387.1	582.5	663.8	694.1	680.7	616.4	509.4	384.0	264.3	125.2	25.4	0.7	0.2	0.2	0.1	235.9	694.1
22-Aug	0.2	0.1	0.1	0.1	0.4	17.8	102.4	213.6	337.8	366.8	496.4	632.4	598.0	485.5	507.1	461.6	337.8	167.7	96.3	18.7	0.5	0.1	0.0	0.0	201.7	632.4
23-Aug	0.0	0.0	0.0	0.1	0.1	11.5	41.8	91.9	191.9	212.4	165.8	240.1	144.8	83.8	135.9	100.0	81.3	61.6	26.7	4.3	0.0	0.0	0.0	0.0	66.4	240.1
24-Aug	0.0	0.0	0.0	0.0	0.0	8.9	42.3	106.4	217.6	324.4	483.7	668.9	700.7	686.0	632.6	529.2	400.0	262.3	128.7	21.7	0.4	0.1	0.0	0.1	217.3	700.7
25-Aug	0.2	0.2	0.1	0.0	0.2	15.2	74.0	169.5	267.0	321.0	431.4	509.1	488.9	423.3	463.8	426.1	290.6	158.0	64.4	11.5	0.1	0.1	0.1	0.1	171.5	509.1
26-Aug	0.1	0.1	0.1	0.1	0.1	12.6	80.8	217.7	326.0	347.6	536.1	472.8	319.6	355.6	301.9	287.4	296.9	135.7	63.6	6.0	0.0	0.0	0.0	0.0	156.7	536.1
27-Aug	0.0	0.0	0.1	0.0	0.0	11.3	69.6	154.4	241.0	303.6	442.0	498.6	546.8	546.1	485.0	408.0	308.6	179.4	60.6	7.9	0.1	0.1	0.0	0.2	177.6	546.8
28-Aug	0.0	0.0	0.1	0.1	0.0	3.7	32.1	72.9	117.6	164.2	206.5	257.0	276.4	285.7	212.4	186.3	165.5	127.4	55.9	7.6	0.1	0.1	0.1	0.0	90.5	285.7
29-Aug	0.0	0.0	0.0	0.0	0.0	7.0	56.6	140.9	232.3	296.2	448.8	512.7	548.4	519.2	439.6	349.0	233.9	116.2	42.3	5.7	0.1	0.1	0.1	0.0	164.5	548.4
30-Aug	0.0	0.0	0.0	0.0	0.0	7.3	58.8	129.8	221.3	292.6	462.5	539.8	561.6	546.0	463.0	270.0	240.7	170.1	53.4	6.2	0.0	0.1	0.1	0.1	167.6	561.6
31-Aug	0.0	0.1	0.0	0.0	0.0	8.0	52.8	121.4	245.0	308.0	460.0	527.9	563.9	542.9	475.5	362.6	204.9	52.1	51.5	18.5	0.0	0.0	0.0	0.0	166.5	563.9
																							Diurnal Average			
																							Diurnal Maximum			





Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Speed (WS) - km/h
Ells River - August 2023

Maximum Speed: 28 km/h on Aug 26 18:00	Maximum Daily Speed Average: 16.5 km/h on Aug 24	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 17 14:00	Minimum Daily Speed Average: 0.7 km/h on Aug 15	Hours of Data: 740
Maximum Diurnal Speed Average: 2.9 km/h at hour 13	Minimum Diurnal Speed Average: 0.5 km/h at hour 21	Hours of Missing Data: 4
Monthly Average Velocity: 1.6 km/h 227.7 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 5 Median = 7 Q ₃ = 10 P ₉₀ = 13 P ₉₉ = 25	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-Aug	WSW8	WSW11	WSW8	WSW8	WSW9	W6	SW6	SW7	SW9	WSW8	WSW9	WSW8	W9	W11	NW14	NNW16	NW15	NW12	WNW8	NNW10	NW6	WNW7	WNW8	W7	W7.3	NNW16
2-Aug	SW2	W5	W5	W4	W7	W6	WNW8	WNW7	NNW9	WNW4	SW5	NNW2	WSW5	WSW6	W4	WSW5	SSW7	SE4	SE4	E5	UO	NW2	WNW4	WNW3	W3.2	NNW9
3-Aug	NNW4	N4	NNW4	NW1	N3	SE1	ENE2	W2	NNW3	S2	S5	SSE5	SSE8	SSE9	S7	SE4	ESE1	S5	S8	WSW3	SSW3	SSW4	W3	WNW5	S1.6	SSE9
4-Aug	NW7	W7	WNW8	W8	W6	W9	WSW9	M	WSW8	SW8	SSW7	SW8	WSW7	W8	E11	SSW11	S8	SW8	WSW6	W6	W5	WSW7	WSW7	WSW6	WSW5.7	SSW11
5-Aug	W8	SW4	SW6	SSW6	SSW6	SSW6	SSW5	SSW5	NNE2	N6	NNE7	N3	SSE2	ESE1	ESE8	E9	ENE9	NE11	NE11	NNE6	N4	NW3	W3	W3	NNE0.9	NE11
6-Aug	NW3	WNW7	WNW6	W3	WSW3	SW3	SSW1	NE6	SSE8	NNE11	NE8	NE7	WNW4	NNE4	NNE4	N5	NE2	NNW2	W4	NNW5	NNW6	NNW5	N6	NNW9	N2.8	NNE11
7-Aug	NW7	NW3	WNW3	WSW3	W4	WNW5	WNW4	NNW3	N8	N6	N5	N5	NNE13	NNE10	N15	NNE18	NNE17	NNE20	NNE19	N11	N8	N6	NW5	NNW3	N7.2	NNE20
8-Aug	WNW5	NW4	NW3	N3	NW5	N3	N4	ENE1	NE1	SSE7	E4	ENE11	E10	E13	E11	ESE13	ESE12	ESE14	ESE14	ESE11	ESE9	SE9	SE8	SE10	ESE5.2	ESE14
9-Aug	SSE11	SE11	SSE9	SSE8	SSW3	SSE1	SSE4	SSE10	SE10	SE11	SSE13	SSE20	SSE17	SE14	SE11	SE11	SE11	SE9	SE10	SE10	SE10	SE9	SE9	SE10	SE9.9	SSE20
10-Aug	SE12	SE14	SE11	ESE6	ESE6	E6	E5	E6	ESE8	ESE8	E8	ENE11	ENE10	E11	ESE11	ESE10	ENE11	ENE9	NE10	NE10	N8	NNE9	NE6	NNE5	E7.0	SE14
11-Aug	NE3	NNW5	N8	N7	NNE6	NW6	NNW6	NNE12	N9	N4	SSW1	WNW3	W6	WSW9	SW8	WSW7	SW7	SSW7	S5	S7	S5	S5	S7	S4	WNW1.4	NNE12
12-Aug	SW5	SE2	S7	SW7	WSW8	WSW9	WSW7	WSW7	WSW8	W6	W5	WSW5	WSW7	W5	NE7	ENE7	NE7	ENE2	ESE4	S4	SSW2	SSW5	SSW3	SW5	WSW3.0	WSW9
13-Aug	WSW8	SW6	S6	S7	S7	SSW9	S9	SSW10	SSW11	SSW13	SW15	SW15	WSW15	WSW16	SW15	WSW14	WSW12	WSW13	WSW11	SW8	SW8	SW9	WSW8	WNW10	SW9.5	WSW16
14-Aug	SSW7	SW7	SW5	WSW5	WNW9	NNW10	SW4	SW8	SW7	WNW11	WNW12	WNW14	W13	WNW14	W14	W11	W12	W10	W8	WNW9	W7	NNE5	W5	SSW6	W7.5	WNW14
15-Aug	SW6	WSW8	WSW10	WSW9	SSW8	S8	S8	S9	SSW2	N1	NW1	SE6	ESE5	SE7	E2	NE6	SE7	NNE7	NNE19	N22	N17	N9	NNW4	NW3	N0.7	NNE22
16-Aug	W3	W7	WNW8	NW9	WNW8	WNW7	WNW8	WNW7	NW9	W6	WNW8	W7	W10	WNW11	SW10	SSW10	SW10	SW10	SW10	SSW9	SSW9	SSW10	SSW11	SW8	WSW6.5	SSW11
17-Aug	S6	WSW5	SW4	SSW6	S9	S7	S6	SSW6	S12	SW6	WSW5	W8	W7	WNW0	ESE1	SE9	SSW5	SSW4	S2	W2	NNW8	NW11	NNW11	NNW11	SW2.9	S12
18-Aug	NNE15	N9	N7	NNE9	NNE9	N8	N11	NNE11	NNE13	NNE10	NNW11	NNW12	NNE12	N8	N8	N12	N16	NNW10	N11	NNW6	NW9	NNW8	NNW10	NW9	N9.7	N16
19-Aug	WNW6	W7	W7	W5	WSW7	WSW7	SW8	WSW9	WSW9	SW9	SW10	SW11	SW11	WSW11	W10	W10	WSW8	SW10	SW7	SW7	SW8	SW10	SW9	SW9	WSW8.1	SW11
20-Aug	WSW12	WSW9	S2	SSW10	SW12	SW11	SW8	WSW7	WSW5	N2	N3	N6	N6	N3	NNE5	NW6	WNW5	WSW1	SE3	SSW3	SSW3	SW2	W4	W3	WSW3.2	WSW12
21-Aug	SSE4	SSW12	SW7	SW5	S7	SSW9	S7	SSW8	SSW7	SSE6	SSE8	S9	S10	S11	SSW10	SSE12	S12	S11	SSW6	S7	S6	S6	SW2	WNW3	S7.3	SSE12
22-Aug	SSW2	SSW2	SW3	SSW5	SSW5	SSW5	S5	S6	SSE7	SSE8	S7	S10	S12	SW7	WSW2	WNW4	NW3	WNW2	WSW3	SSW4	SSW3	WSW1	WNW4	W3	SSW3.7	S12
23-Aug	W4	WNW3	NW2	WSW1	WSW2	NW0	WNW3	WNW4	WNW3	WSW3	W3	SW6	W4	W3	WSW4	WNW3	NNW4	NNE16	NNE19	NNE20	NNE20	NNE21	NNE19	NNE20	N5.5	NNE21
24-Aug	NNE23	NNE25	NNE24	NNE25	NNE26	NNE26	NNE26	NNE27	NNE22	NNE24	NNE26	NNE25	NNE22	NNE18	NNE14	N11	N10	N10	NNW8	NNW5	NW2	WNW4	W5	W3	NNE16.5	NNE27
25-Aug	SW2	SW2	SW4	S6	S8	SSW10	S7	SSW9	S11	C	C	SSW13	SSW16	SSW14	S14	S16	S11	SSE9	SSE9	S11	S11	S10	S11	S11	S9.4	S16
26-Aug	SSW8	SSW3	S7	S8	S8	SSE7	S8	S10	SSW11	SSW13	SSW15	SSW16	SW13	SW12	WSW12	WSW11	W9	N28	N22	N16	N15	NW7	WNW6	WNW9	WSW3.7	N28
27-Aug	W9	WNW8	WSW3	S4	SW4	W3	WSW3	SW5	SSW4	SSE8	S8	SSE9	S11	S13	S13	SSW12	SSW11	SSW11	S9	S8	SSW8	SSW10	SW9	SSW5	SSW6.5	S13
28-Aug	SW6	SSW8	SSW7	S7	S5	SSE6	S8	SSE6	S7	S7	S7	SSE7	SSE9	SSE8	SE9	SE9	SSE7	SSE7	SSE5	SSE5	SSE8	S9	S10	S9	S6.8	S10
29-Aug	S8	S8	S8	S9	S9	S9	S9	S9	S11	S13	S11	S12	S11	S11	S14	S13	SSE12	SSE11	SSE10	SSE9	S7	S3	SSW5	SSW4	S9.3	S14
30-Aug	S6	S6	S6	S9	SSW7	S6	SSW4	S2	SSW2	WNW2	SE2	SE9	SSE8	SSE13	SSE10	SE9	SSE10	SSE12	SSE11	SSE10	SSE13	S10	SSE5	SSE1	SSE6.8	SSE13
31-Aug	N3	SSE3	SSW4	SSW3	WNW2	SSW4	SSW7	SW7	N4	NNW2	NW2	N4	N3	NNE3	NW3	NW6	N22	N22	N15	N7	NNW8	NW8	WNW7	SW5	NNW3.7	N22

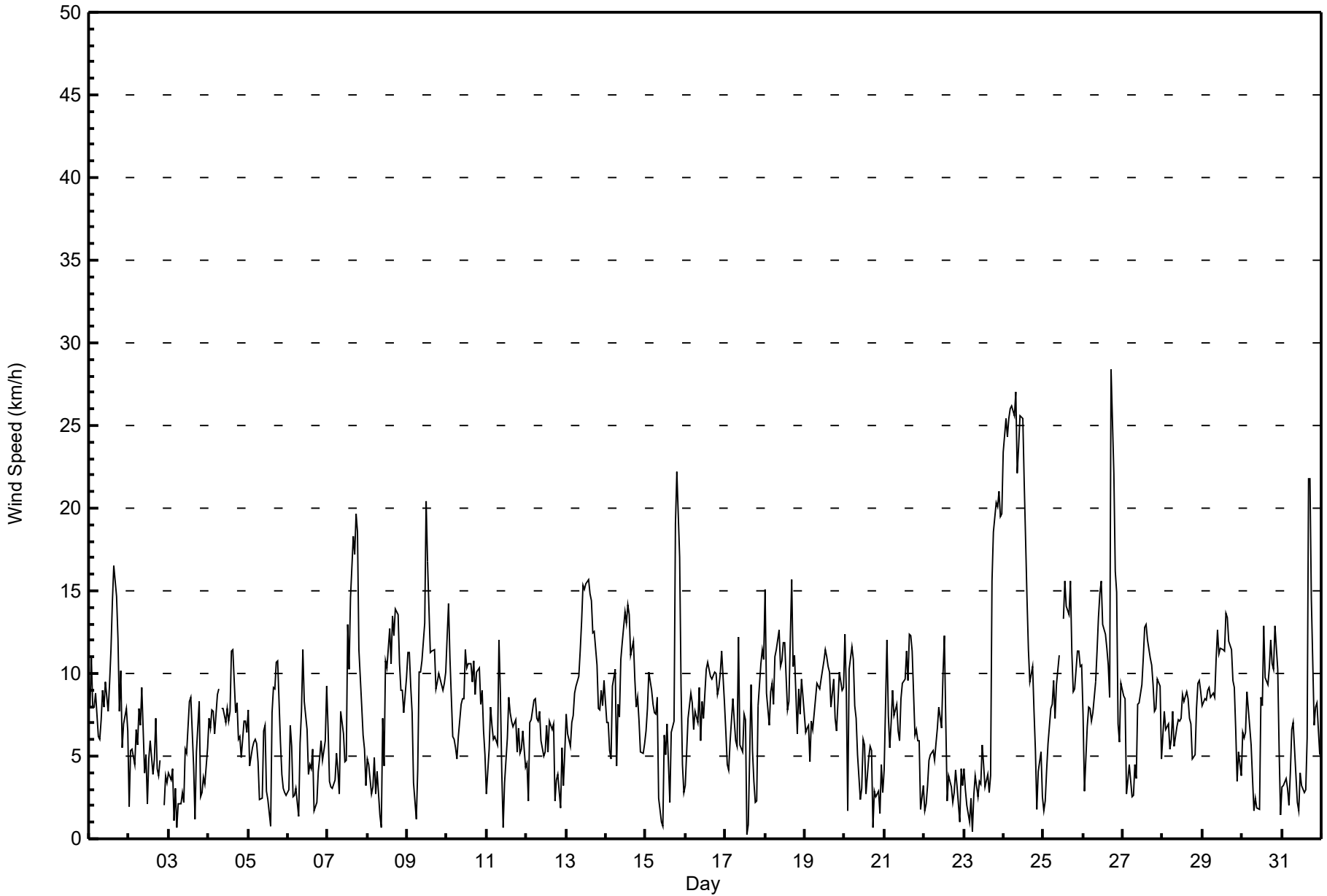
WSW2.2	WSW2.8	WSW2.3	WSW2.5	WSW2.8	WSW2.3	WSW2.6	WSW2.1	SW1.9	SSW1.6	SSW1.8	SSW2.1	SSW2.9	SSW2.8	S1.6	S1.3	S0.7	NNE0.9	NE1.1	NNE0.8	NNW0.5	WSW1.5	WSW2.3	W2.4	Diurnal Average
NNE23	NNE25	NNE24	NNE25	NNE26	NNE26	NNE26	NNE27	NNE22	NNE24	NNE26	NNE25	NNE22	NNE18	SW15	NNE18	N22	N28	N22	NNE22	NNE20	NNE21	NNE19	NNE20	Diurnal Maximum

C - Calibration M - Maintenance 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
Ells River - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Wind Speed (WS) - km/h
Ells River - August 2023

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	227	30.68	30.68
6 - 11	409	55.27	85.95
12 - 19	80	10.81	96.76
20 - 28	24	3.24	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
Ells River - August 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	7	3	3	4	5	7	10	13	33	20	20	28	24	17	14	227
6 - 11	24	12	11	7	8	9	24	35	74	38	44	39	30	25	13	16	409
12 - 19	7	14	0	0	1	4	3	7	11	9	6	7	3	3	3	2	80
20 - 28	4	19	0	0	0	0	0	1	0	0	0	0	0	0	0	0	24
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	54	52	14	10	13	18	34	53	98	80	70	66	61	52	33	32	740

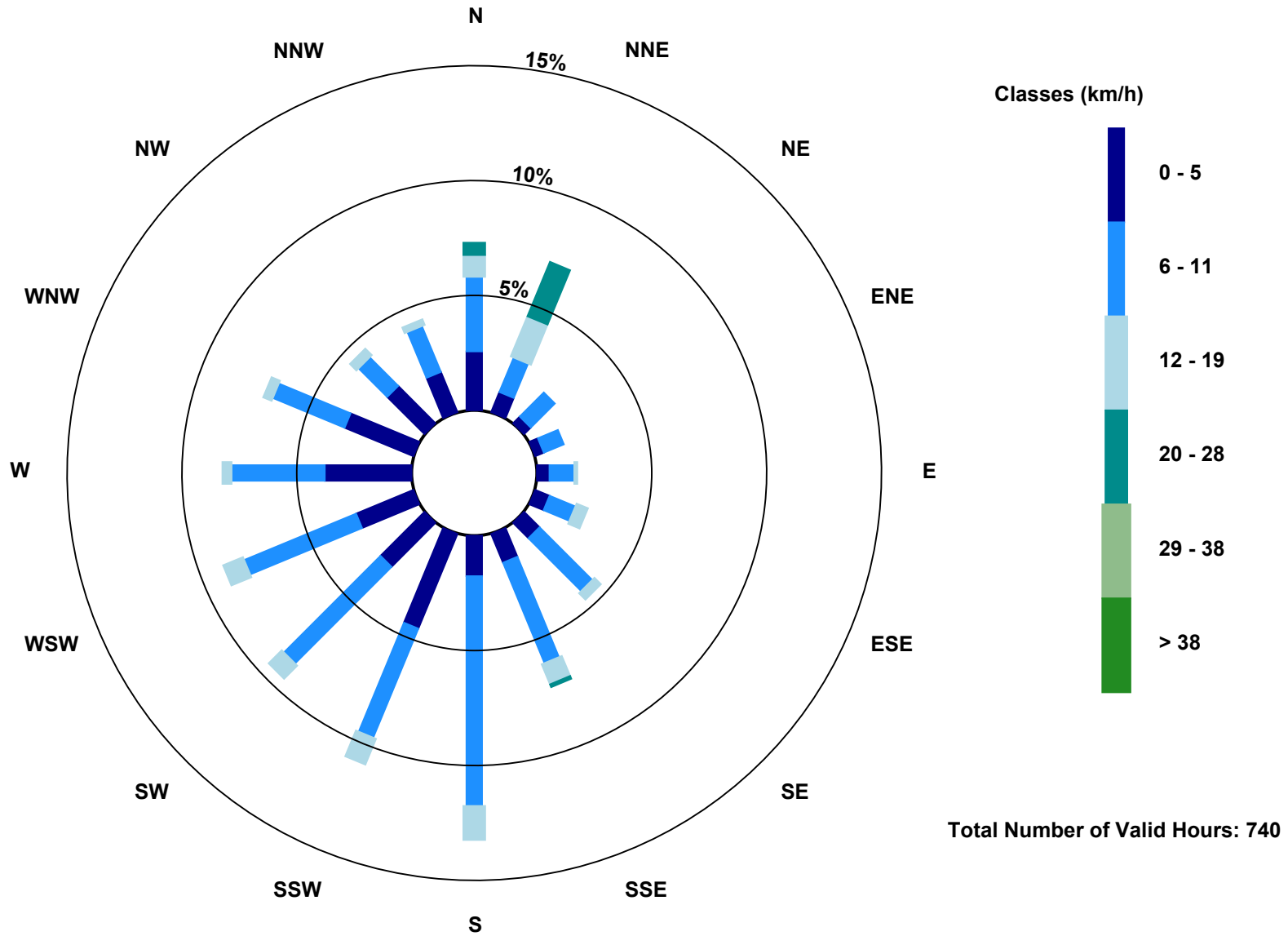
Total Number of Valid Hours: 740

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Ells River





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Ells River - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 10 km/h on Aug 3 15:00 Minimum Value: 0 km/h on Aug 5 23:00 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: 2 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-Aug	2	3	2	2	2	2	2	2	2	2	3	2	4	3	4	3	3	3	3	5	2	1	1	2	5
2-Aug	1	2	2	2	2	2	1	2	2	2	2	2	2	3	2	2	2	2	1	1	UO	1	1	1	3
3-Aug	1	1	1	2	1	2	1	2	2	1	2	1	3	3	10	4	3	2	3	2	1	2	1	10	
4-Aug	1	1	1	1	2	2	3	M	2	2	3	3	3	3	5	2	2	2	2	2	1	1	2	5	
5-Aug	2	1	2	1	1	1	1	2	1	3	3	1	2	2	2	3	2	2	2	2	1	1	0	3	
6-Aug	2	3	3	1	1	1	1	4	2	9	5	3	2	2	2	1	2	1	1	1	1	2	1	9	
7-Aug	2	2	1	1	2	2	1	1	2	2	2	3	4	4	4	4	4	4	3	2	1	1	1	4	
8-Aug	1	1	1	1	1	1	1	1	2	3	3	4	4	3	4	4	3	3	3	2	1	3	1	4	
9-Aug	2	2	2	1	1	1	3	2	2	2	4	3	4	3	2	2	2	2	2	1	1	1	2	4	
10-Aug	2	2	2	2	1	1	1	1	2	2	2	2	2	2	3	2	3	3	3	2	1	1	2	3	
11-Aug	2	1	1	1	2	1	2	2	1	1	2	1	3	2	3	3	4	2	1	1	1	1	1	4	
12-Aug	2	2	1	2	2	2	2	2	2	2	3	3	3	4	6	2	2	1	1	1	2	2	2	6	
13-Aug	2	1	1	1	1	2	1	3	3	4	5	5	5	4	5	5	4	5	3	2	1	2	3	5	
14-Aug	1	3	2	2	2	3	1	3	2	6	4	4	4	4	4	3	4	4	2	2	4	2	2	6	
15-Aug	1	2	2	3	1	2	1	1	3	2	2	1	1	2	2	3	2	8	4	3	3	2	1	8	
16-Aug	2	1	3	2	2	1	1	2	2	2	3	4	3	3	4	4	4	3	2	1	1	1	2	4	
17-Aug	1	1	2	1	2	1	1	2	3	2	2	2	3	2	2	6	3	2	2	2	5	2	2	6	
18-Aug	5	2	1	3	2	1	3	2	3	3	3	3	2	4	3	6	3	2	2	2	2	2	2	6	
19-Aug	1	2	2	2	2	2	3	3	3	3	3	3	4	3	4	4	3	3	2	1	2	2	3	4	
20-Aug	3	3	4	2	3	2	2	2	1	1	1	3	2	2	2	2	3	1	1	3	2	2	1	4	
21-Aug	3	2	2	2	1	1	1	2	2	2	3	3	4	4	4	4	3	3	2	1	1	1	1	4	
22-Aug	2	1	2	3	1	1	1	1	1	2	3	3	4	3	2	2	2	1	1	1	2	2	2	4	
23-Aug	2	2	1	1	2	1	1	2	1	1	1	1	1	1	1	3	4	3	3	2	3	3	4	4	
24-Aug	3	3	4	4	4	4	3	4	3	4	4	4	4	4	4	4	3	3	1	2	2	2	3	4	
25-Aug	1	1	1	1	1	1	2	2	2	2	C	C	4	4	4	3	4	3	1	1	2	2	2	4	
26-Aug	1	2	1	1	1	1	1	2	4	4	4	4	4	4	3	3	8	4	3	2	1	2	1	8	
27-Aug	1	2	1	1	1	2	1	1	1	3	2	3	3	3	3	3	3	3	2	1	1	2	2	3	
28-Aug	2	2	1	2	2	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	
29-Aug	1	1	1	1	1	1	2	1	2	2	2	2	3	3	3	3	2	2	2	1	1	2	2	3	
30-Aug	2	1	1	1	2	2	1	1	1	1	4	2	3	3	4	2	3	2	1	2	2	2	4	4	
31-Aug	3	2	1	3	1	3	3	2	2	0	1	1	1	1	2	3	7	4	5	1	2	2	1	7	
Diurnal Maximum																									
C - Calibration M - Maintenance UO - Unstable Operation																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Ells River - August 2023

Direction of Maximum Speed: 5 deg on Aug 26 18:00	Hours in Service: 744
Direction of Maximum Daily Speed Average: 15.3 deg on Aug 24	Hours of Data: 740
Direction of Minimum Speed: 293 deg on Aug 17 14:00	Direction of Minimum Daily Speed Average: 0.7 deg on Aug 15
Direction of Minimum Speed: 293 deg on Aug 17 14:00	Hours of Missing Data: 4
Monthly Average Direction: 227.7 deg	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-Aug	238	247	246	244	238	275	231	232	228	242	240	245	259	279	323	335	322	316	291	335	317	291	288	278	277.6
2-Aug	222	262	272	276	259	280	285	289	332	303	225	328	238	237	278	242	206	126	136	95	UO	324	292	291	266.5
3-Aug	327	350	343	321	350	127	62	273	337	173	174	167	147	157	174	129	106	188	184	246	194	203	265	293	187.5
4-Aug	308	281	297	273	278	263	243	M	245	223	213	218	238	267	95	193	183	221	246	266	266	257	249	258	245.2
5-Aug	266	235	234	212	206	210	197	236	22	6	20	6	163	123	110	86	59	39	37	23	11	325	267	280	29.5
6-Aug	304	285	285	262	237	215	195	40	154	26	52	37	302	25	30	10	36	330	281	348	341	347	359	348	353.8
7-Aug	321	315	296	256	276	284	295	337	8	10	4	7	17	28	9	23	33	31	28	9	6	353	326	328	6.9
8-Aug	303	307	310	351	313	357	353	71	38	152	98	74	80	96	100	107	104	103	121	123	119	138	144	146	104.9
9-Aug	151	146	152	159	205	163	158	165	137	139	147	155	166	144	138	136	125	129	135	136	139	132	134	141	145.2
10-Aug	143	141	141	121	111	94	89	99	113	107	82	74	78	94	102	103	63	66	55	38	7	18	46	32	87.5
11-Aug	39	341	6	3	18	326	335	17	7	349	196	294	264	251	224	241	226	210	191	170	172	169	178	171	281.4
12-Aug	218	137	188	232	242	252	249	256	258	269	259	241	245	259	38	68	36	66	103	179	205	208	193	235	236.6
13-Aug	244	220	191	181	187	192	182	195	201	210	220	225	242	254	234	258	251	250	249	222	220	236	251	291	228.5
14-Aug	196	235	220	257	295	333	232	227	221	301	293	282	270	282	276	265	260	264	281	288	279	16	264	213	270.5
15-Aug	232	247	239	237	198	188	175	170	199	6	311	135	115	148	95	48	128	25	18	11	1	352	338	307	7.4
16-Aug	266	273	296	315	299	298	294	283	309	272	289	280	271	283	221	205	225	231	214	198	198	196	206	214	252.3
17-Aug	182	254	216	213	178	183	184	202	189	231	240	266	269	293	116	134	205	198	183	268	345	316	332	338	232.0
18-Aug	21	10	9	13	21	11	6	14	15	17	336	345	26	9	359	3	356	346	1	348	326	340	333	315	0.5
19-Aug	302	270	275	265	243	246	235	239	237	221	232	230	234	250	269	266	248	232	225	223	221	224	222	231	241.5
20-Aug	240	242	170	210	228	225	216	238	243	8	358	350	0	349	26	317	294	251	129	208	209	236	268	265	249.6
21-Aug	156	204	223	225	190	195	191	201	212	167	155	189	183	176	195	161	175	182	192	185	180	188	223	292	188.0
22-Aug	195	199	221	193	198	196	187	185	157	160	176	188	178	214	238	284	310	293	244	210	208	257	294	280	201.1
23-Aug	278	282	311	251	243	309	294	303	295	247	277	233	274	267	247	303	328	19	17	17	20	19	25	19	359.4
24-Aug	16	17	20	22	19	15	15	20	25	18	24	16	23	21	16	10	11	7	347	336	325	287	281	269	15.3
25-Aug	218	226	222	189	186	188	196	179	197	188	C	C	203	199	203	185	183	170	167	161	169	176	184	189	187.1
26-Aug	193	212	174	178	175	162	173	187	212	198	203	205	217	230	251	258	270	5	7	6	3	324	298	291	244.8
27-Aug	281	293	238	188	226	271	237	216	212	168	173	159	177	185	178	195	205	197	180	172	195	207	224	203	198.8
28-Aug	223	212	193	188	191	152	185	164	174	174	173	156	162	148	136	136	152	156	155	149	164	173	180	178	169.2
29-Aug	171	179	179	178	178	172	181	173	172	178	171	172	184	179	172	176	164	158	162	163	184	175	193	200	174.2
30-Aug	186	185	177	178	196	177	202	191	207	292	137	146	154	147	156	144	149	148	149	162	161	173	155	161	163.0
31-Aug	2	168	194	211	284	210	192	221	359	339	315	354	7	22	308	320	9	1	354	356	337	309	303	235	335.6

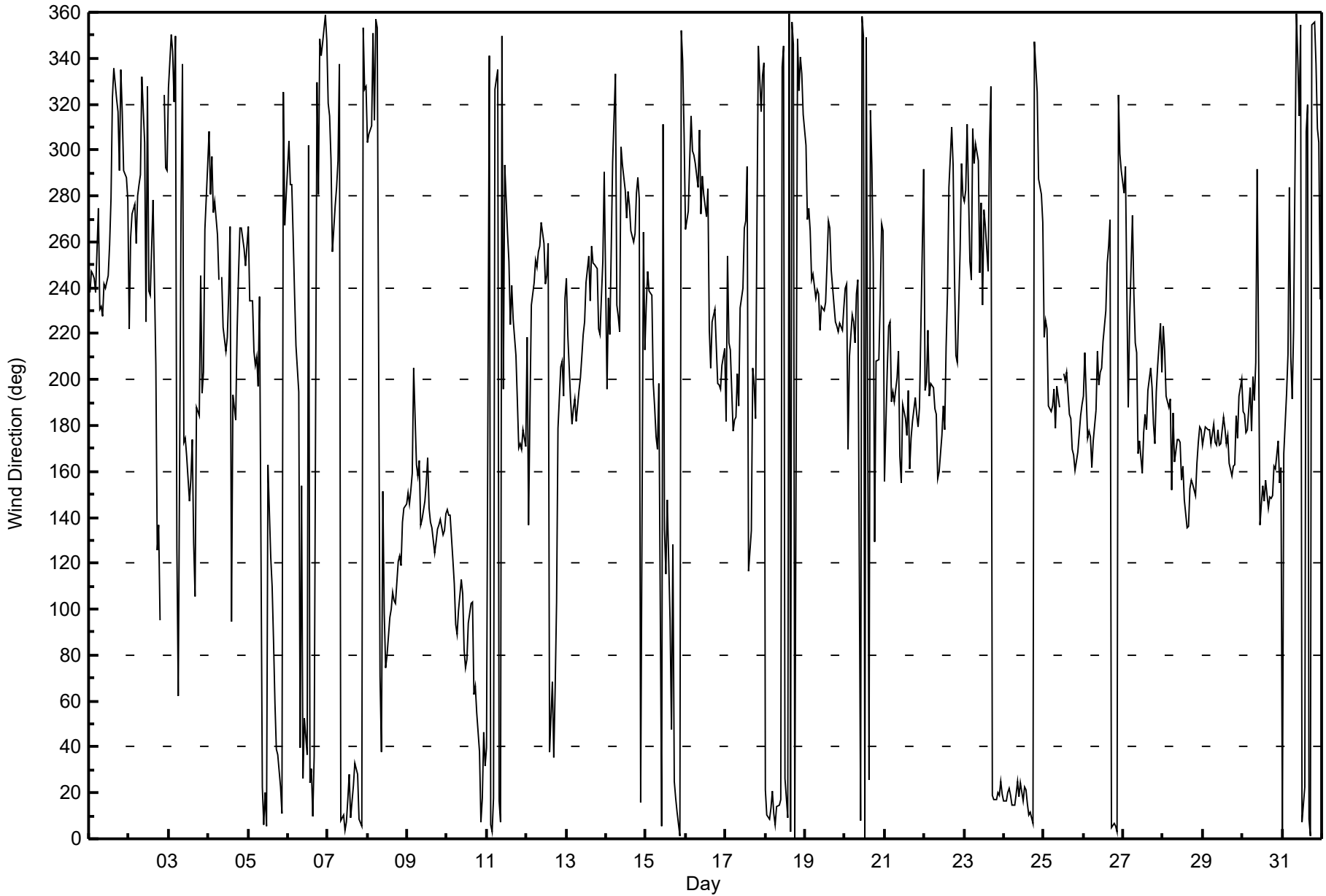
248.4 247.1 236.9 225.1 231.9 234.2 222.1 217.8 218.1 207.1 211.3 204.5 211.6 210.0 190.9 180.4 189.9 28.6 43.0 29.6 294.2 254.3 257.9 263.8
 Diurnal Average

C - Calibration M - Maintenance 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 - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Ells River - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 109 deg on Aug 17 14:00	Hours of Data: 740
Minimum Value: 4 deg on Aug 30 04:00	Hours of Missing Data: 4
Percentiles: P ₁ = 6 P ₁₀ = 9 Q ₁ = 13 Median = 21 Q ₃ = 33 P ₉₀ = 55 P ₉₉ = 90	Hours of Calibration: 2
	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-Aug	15	15	17	19	21	38	29	18	18	25	22	21	28	25	19	14	15	15	20	24	19	14	9	35	38
2-Aug	47	21	25	22	28	30	14	21	15	49	44	74	40	49	66	38	31	35	34	16	UO	18	15	21	74
3-Aug	13	30	18	79	21	84	49	56	49	58	26	25	24	23	90	81	84	48	23	63	44	39	25	21	90
4-Aug	12	12	21	14	21	17	16	M	22	31	41	29	41	35	40	18	25	17	24	19	23	14	15	22	41
5-Aug	22	31	28	18	15	16	21	82	34	25	36	65	90	99	30	28	23	14	9	15	18	17	14	35	99
6-Aug	33	19	32	31	33	30	78	63	13	31	43	34	67	44	37	20	65	67	30	21	9	10	12	13	78
7-Aug	12	55	32	41	23	21	21	46	13	23	43	65	15	24	19	19	15	11	8	10	16	12	17	65	
8-Aug	18	23	36	42	20	52	23	72	85	34	60	35	40	25	33	22	21	14	13	11	11	9	9	7	85
9-Aug	9	7	11	8	35	54	29	12	12	11	14	11	13	11	8	13	12	11	8	8	8	9	8	9	54
10-Aug	8	8	8	19	13	14	14	15	12	13	18	13	18	15	15	17	16	20	15	9	10	13	11	30	30
11-Aug	47	8	12	14	22	22	24	9	11	22	94	56	42	23	42	37	43	29	23	10	9	15	12	22	94
12-Aug	30	46	13	18	17	15	16	16	15	37	73	63	38	74	79	26	24	67	30	28	80	43	41	28	80
13-Aug	17	16	20	8	16	16	10	21	20	24	21	24	23	27	25	29	28	25	23	15	12	16	31	28	31
14-Aug	26	30	39	55	21	14	48	19	15	30	21	20	22	21	20	18	21	23	24	17	22	72	24	45	72
15-Aug	19	16	17	18	14	12	12	11	85	104	102	20	31	21	89	32	44	71	8	9	13	15	25	55	104
16-Aug	47	15	10	11	11	23	17	20	20	44	47	50	34	34	39	30	39	22	13	8	7	7	11	13	50
17-Aug	12	35	39	27	13	11	13	27	15	37	36	29	41	109	97	45	44	66	72	89	28	14	17	14	109
18-Aug	13	13	12	18	10	21	11	11	13	16	29	25	14	33	34	23	12	13	12	18	12	16	13	13	34
19-Aug	23	18	21	25	21	23	21	20	22	19	22	22	26	25	32	22	23	21	17	15	15	18	16	19	32
20-Aug	20	26	91	11	17	17	20	26	31	62	26	34	33	67	40	53	29	88	51	65	52	59	37	53	91
21-Aug	62	9	17	48	13	8	12	18	25	43	25	34	40	34	40	31	16	18	13	5	11	12	59	30	62
22-Aug	56	56	30	33	11	11	14	16	15	25	38	32	27	40	90	56	69	32	17	19	24	97	25	49	97
23-Aug	35	42	65	72	56	78	50	41	48	44	29	19	25	30	27	23	37	8	8	7	7	6	8	8	78
24-Aug	8	6	9	7	8	7	7	7	8	10	10	11	11	15	20	20	24	18	16	16	37	26	21	66	66
25-Aug	59	43	29	12	10	7	8	14	15	21	C	C	24	16	19	20	14	12	10	7	9	9	10	10	59
26-Aug	12	60	8	5	10	11	12	17	23	21	19	20	20	26	26	23	26	21	12	9	11	25	20	13	60
27-Aug	11	11	33	43	31	48	55	33	35	21	30	31	33	23	22	24	20	15	10	7	9	15	19	21	55
28-Aug	21	17	20	14	40	18	12	16	16	15	22	15	14	13	10	6	9	8	12	11	7	5	5	9	40
29-Aug	8	9	9	9	9	9	11	12	12	14	19	17	18	23	21	15	15	9	7	4	17	44	15	21	44
30-Aug	25	9	10	4	13	16	26	63	74	82	84	19	25	17	25	13	11	10	8	9	12	14	55	63	84
31-Aug	64	51	46	73	54	54	35	25	52	33	71	32	47	75	74	33	18	12	15	19	18	15	14	36	75
	64	60	91	79	56	84	78	82	85	104	102	74	90	109	97	81	84	88	72	89	80	97	59	66	

Diurnal Maximum

C - Calibration M - Maintenance UO - Unstable Operation



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS505
SAWBONES BAY
AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
AUGUST 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	11.1	0	2.8	0
H2S (ppb) Average	708	36	36	100	1.7	0	0.5	0
NO2 (ppb) Average	632	31	112	89.11	16.1	0	4.9	-
NO (ppb) Average	632	31	112	89.11	13.1	-	2.8	-
NOX (ppb) Average	632	31	112	89.11	23.3	-	7.1	-
Temperature 2 m (C) Average	744	0	0	100	29.5	-	20.7	-
Relative Humidity (%) Average	640	0	104	86.02	98.7	-	86.7	-
Wind Speed 10 m (km/h) Average	744	0	0	100	26	-	18	-
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 - SAWBONES BAY (AMS505)
AUGUST 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	0.86	1.6	-	0	0	0.1	0.2	0.8	2.6	11.1
H2S (ppb) Average	708	0.24	0.2	-	0	0.1	0.1	0.2	0.3	0.5	1.7
NO2 (ppb) Average	632	2.28	2.5	-	0	0.2	0.6	1.4	3.1	5.4	16.1
NO (ppb) Average	632	0.6	1.5	-	0	0	0	0	0.3	1.9	13.1
NOX (ppb) Average	632	2.89	3.8	-	0	0.2	0.6	1.5	3.6	6.9	23.3
Temperature 2 m (C) Average	744	16.27	4.7	-	4.9	10.7	12.8	15.6	19.7	22.7	29.5
Relative Humidity (%) Average	640	70.89	18	-	30.8	44.8	54.6	74.2	87	92.2	98.7
Wind Speed 10 m (km/h) Average	744	9.1	5	-	0	3	6	9	12	15	26
Wind Direction 10 m (deg) Average	744	240.1	0	-	0	-	-	-	-	-	0

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - SAWBONES BAY (AMS505)
AUGUST 2023

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
NO2	01 Aug 2023 01:00	02 Aug 2023 08:00	32	Analyzer Failure - degrading sample pump
NO2	02 Aug 2023 09:00	02 Aug 2023 09:00	1	Maintenance - remote troubleshooting
NO2	02 Aug 2023 10:00	03 Aug 2023 09:00	24	Analyzer Failure - degrading sample pump
NO2	03 Aug 2023 10:00	04 Aug 2023 09:00	24	Maintenance - stabilization post maintenance
Relative Humidity	03 Aug 2023 06:00	30 Aug 2023 07:00	104	Sensor operated out of range



Number of Exceedences (AAAQO):	1-hr: 0	24-hr: 0	Hours in Service:	744
Maximum Value: 11.1 ppb on Aug 28 08:00	Maximum Daily Average: 2.8 ppb on Aug 1		Hours of Data:	710
Minimum Value: 0.0 ppb on Aug 5 18:00	Minimum Daily Average: 0.0 ppb on Aug 9		Hours of Missing Data:	34
Maximum Diurnal Average: 1.1 ppb at hour 10	Minimum Diurnal Average: 0.3 ppb at hour 23		Hours of Calibration:	34
Monthly Average: 0.86 ppb	Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.8 P ₉₀ = 2.6 P ₉₉ = 7.1		Percent Operational Time:	100.0

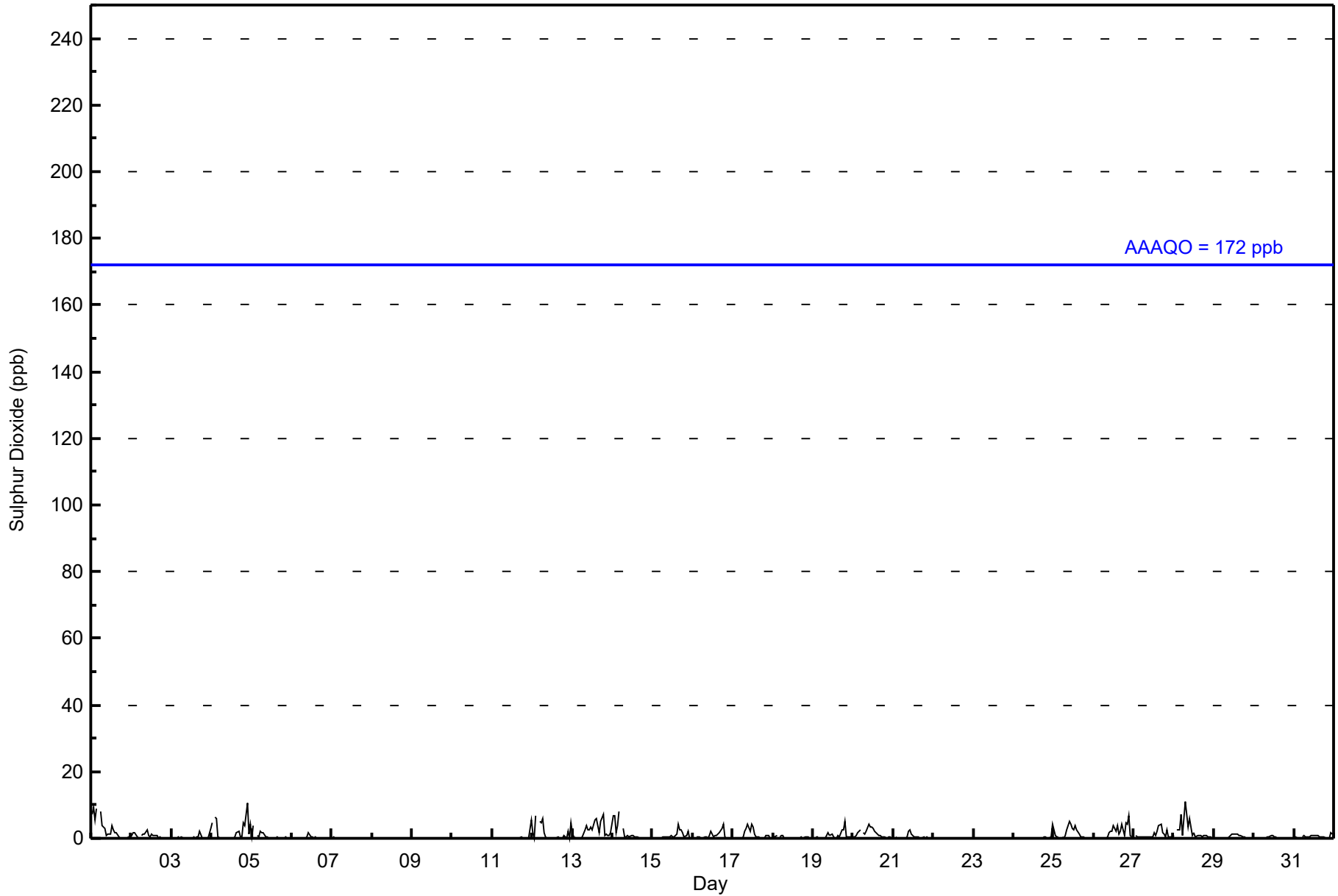
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																								
1-Aug	7.1	9.5	5.6	8.7	Z	7.9	4.0	3.4	2.8	0.8	1.3	1.2	4.0	2.4	1.8	1.7	0.4	0.1	0.2	0.1	0.1	0.2	0.3	0.9	2.8	9.5																						
2-Aug	0.7	1.5	1.9	0.3	0.1	Z	0.7	1.4	1.2	2.4	1.0	0.6	1.1	0.8	0.7	0.9	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.7	2.4																						
3-Aug	Z	0.0	0.1	0.1	0.4	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.4	0.1	0.2	0.4	2.1	0.1	0.1	0.1	0.2	0.1	3.0	0.4	3.0																							
4-Aug	4.8	Z	6.4	6.0	0.5	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.6	1.5	2.0	0.3	0.6	4.5	4.0	10.6	1.2	4.3	2.1	10.6																						
5-Aug	0.4	3.7	Z	0.8	0.6	2.3	1.6	1.5	0.3	0.3	0.1	0.0	0.2	0.2	0.1	0.4	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.6	0.6	3.7																						
6-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.1	0.3	1.8	0.5	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.2	1.8																						
7-Aug	0.2	0.3	0.1	0.1	Z	0.1	0.1	0.1	0.0	0.0	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	0.1	0.1	0.3																						
8-Aug	0.1	0.0	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	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1																						
9-Aug	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1																						
10-Aug	0.0	Z	0.2	0.1	0.1	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	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2																						
11-Aug	0.1	0.1	Z	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	5.5	0.3	5.5																							
12-Aug	1.6	0.2	6.7	Z	5.2	4.5	5.8	1.5	0.2	0.2	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.0	0.0	0.8	0.0	2.0	0.0	4.9	1.5	6.7																						
13-Aug	1.8	0.3	0.0	0.0	Z	0.2	0.5	2.4	3.7	2.5	2.7	3.3	2.3	5.6	6.0	3.9	1.9	5.2	7.2	1.0	1.2	0.6	0.7	1.6	2.4	7.2																						
14-Aug	6.9	6.8	1.6	3.7	7.8	Z	3.2	0.5	0.2	0.7	0.6	0.8	0.9	0.4	0.2	0.5	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	1.6	7.8																						
15-Aug	Z	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.3	0.4	0.9	0.4	0.5	1.1	4.4	2.7	2.4	1.6	0.3	0.9	2.1	0.2	0.1	0.9	4.4																						
16-Aug	0.3	Z	0.4	0.4	0.2	0.1	0.2	0.6	0.2	0.2	0.8	2.2	0.5	0.7	0.9	1.5	1.6	3.0	4.4	0.2	0.2	0.2	0.2	0.2	0.8	4.4																						
17-Aug	0.2	0.2	Z	0.2	0.1	0.1	0.6	2.2	3.1	4.1	2.0	4.0	3.6	1.3	0.6	0.5	0.1	0.1	0.0	0.1	1.0	0.9	0.1	0.2	1.1	4.1																						
18-Aug	0.2	0.6	0.7	Z	0.3	0.8	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.6	0.5	0.2	0.1	0.2	0.8	0.8																						
19-Aug	0.1	0.2	0.4	0.4	Z	0.2	0.1	0.2	1.0	1.8	0.7	1.3	0.5	0.1	0.2	0.8	0.5	2.5	2.5	5.1	0.3	0.3	0.4	0.4	0.9	5.1																						
20-Aug	0.6	0.6	0.9	1.7	2.5	Z	1.7	1.4	2.0	4.4	3.6	3.3	2.9	2.1	1.4	0.9	0.7	0.4	0.4	0.2	0.2	0.3	0.4	0.2	1.4	4.4																						
21-Aug	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	2.2	2.5	1.3	0.6	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.4	2.5																						
22-Aug	0.1	Z	0.2	0.1	0.1	0.2	0.1	0.0	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	0.0	0.1	0.1	0.1	0.2																						
23-Aug	0.0	0.0	Z	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1																						
24-Aug	0.0	0.1	0.0	Z	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.6	4.3	0.3	4.3																						
25-Aug	2.7	0.8	0.4	0.2	Z	0.2	0.2	1.0	2.4	5.2	4.1	3.1	2.7	3.8	2.4	1.1	0.6	0.6	0.2	0.2	0.1	0.0	0.0	0.0	1.4	5.2																						
26-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.1	0.0	0.6	1.5	2.0	2.0	3.7	2.2	3.9	1.5	1.9	4.4	1.0	4.6	4.2	7.0	0.9	0.3	1.8	7.0																						
27-Aug	Z	0.7	0.5	0.4	0.4	0.3	0.3	0.6	0.4	0.3	0.4	1.6	1.0	2.1	3.7	4.2	1.5	1.4	0.5	2.4	0.4	0.4	0.6	0.6	1.1	4.2																						
28-Aug	0.7	Z	2.4	2.5	7.0	0.7	5.8	11.1	3.5	6.1	3.5	0.7	1.6	0.5	0.8	0.6	0.9	0.5	0.8	0.6	0.5	0.4	0.3	0.1	2.2	11.1																						
29-Aug	0.2	0.1	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.8	1.3	1.2	1.2	1.4	0.9	0.9	0.4	0.3	0.1	0.1	0.1	0.2	0.1	0.4	1.4																						
30-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.3	0.3	0.9	0.8	0.6	0.3	0.2	0.1	0.2	0.2	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.9																						
31-Aug	0.1	0.3	0.1	0.1	Z	0.4	1.1	0.5	0.5	0.3	0.7	0.8	0.8	0.9	0.7	0.6	0.6	0.4	0.4	0.2	0.2	0.2	1.9	1.1	0.6	1.9																						
																								1.1	1.0	1.1	1.0	1.0	0.7	0.9	1.0	0.8	1.1	1.0	1.0	1.0	0.8	0.9	0.9	0.7	0.8	0.7	0.7	0.6	0.9	0.3	0.9	Diurnal Average
																								7.1	9.5	6.7	8.7	7.8	7.9	5.8	11.1	3.7	6.1	4.1	4.0	4.0	5.6	6.0	4.4	4.2	5.2	7.2	5.1	4.2	10.6	1.9	5.5	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
Sawbones Bay - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	708	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: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - August 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	46	28	20	11	28	49	32	43	76	52	47	35	55	116	39	31	708
11 - 20	0	0	0	0	0	0	0	0	0	0	0	0	2	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	46	28	20	11	28	49	32	43	76	52	47	35	57	116	39	31	710

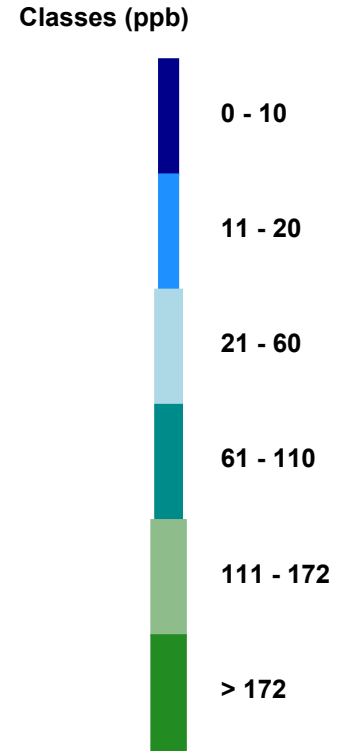
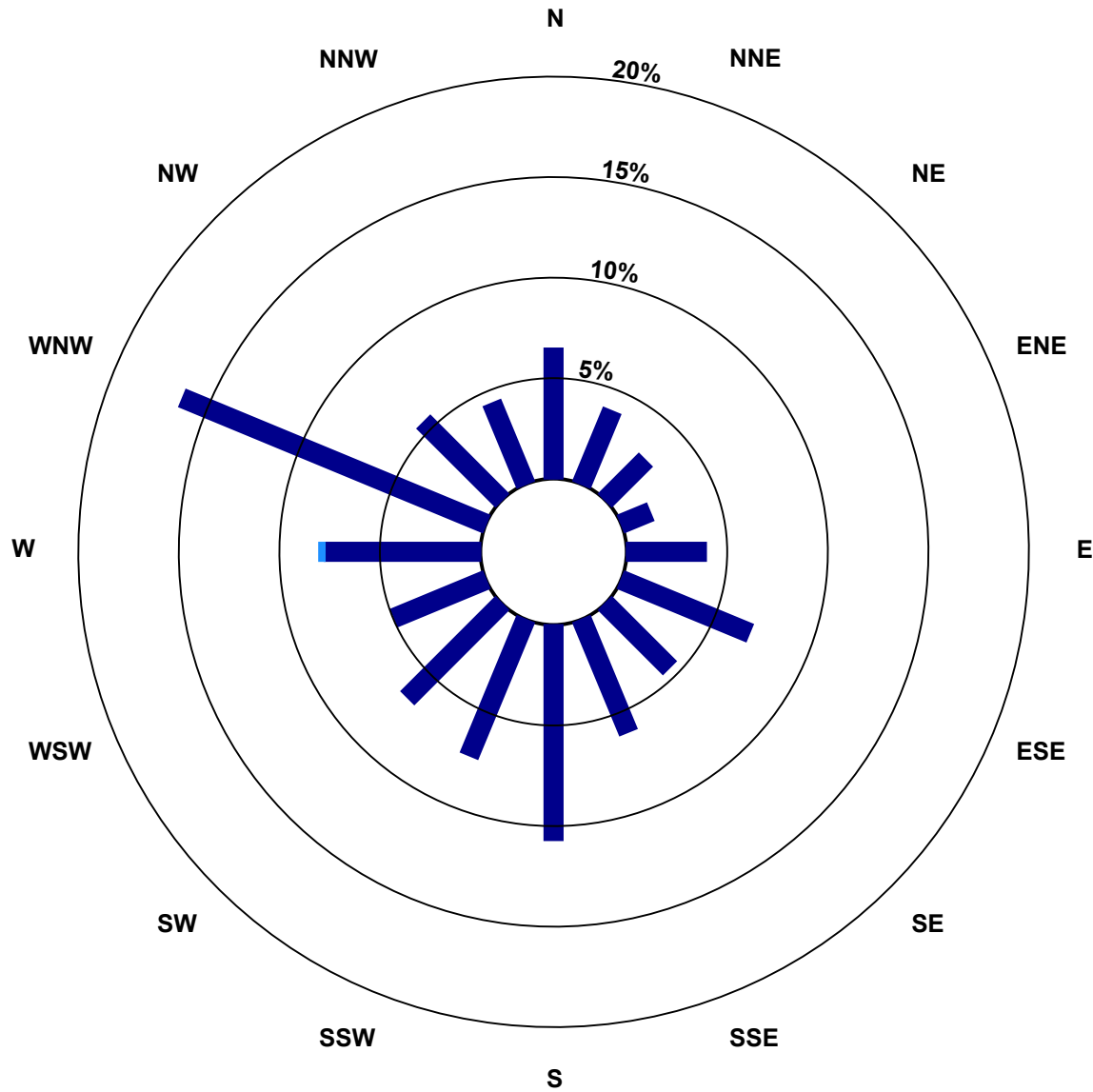
Total Number of Valid Hours: 710

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay

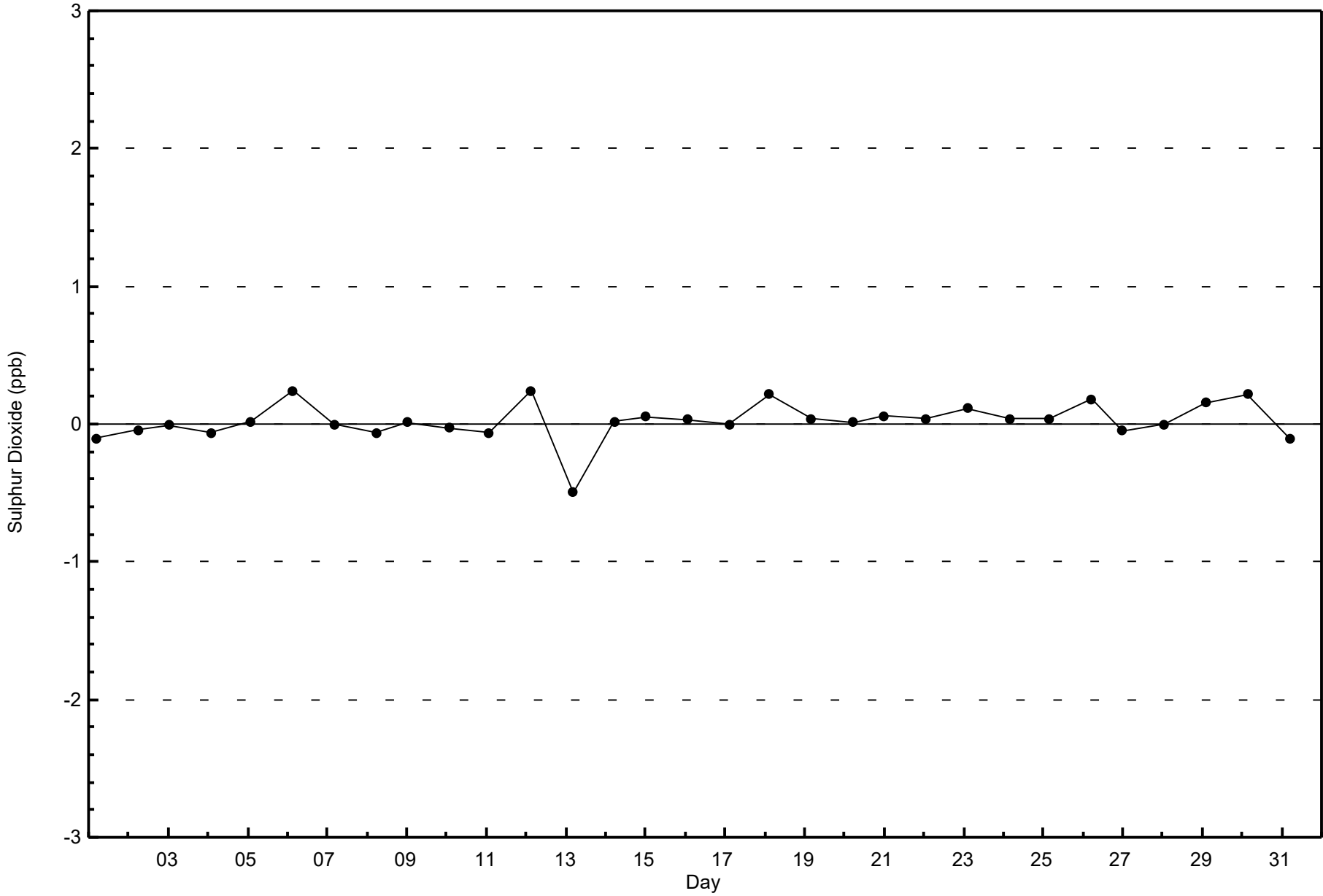


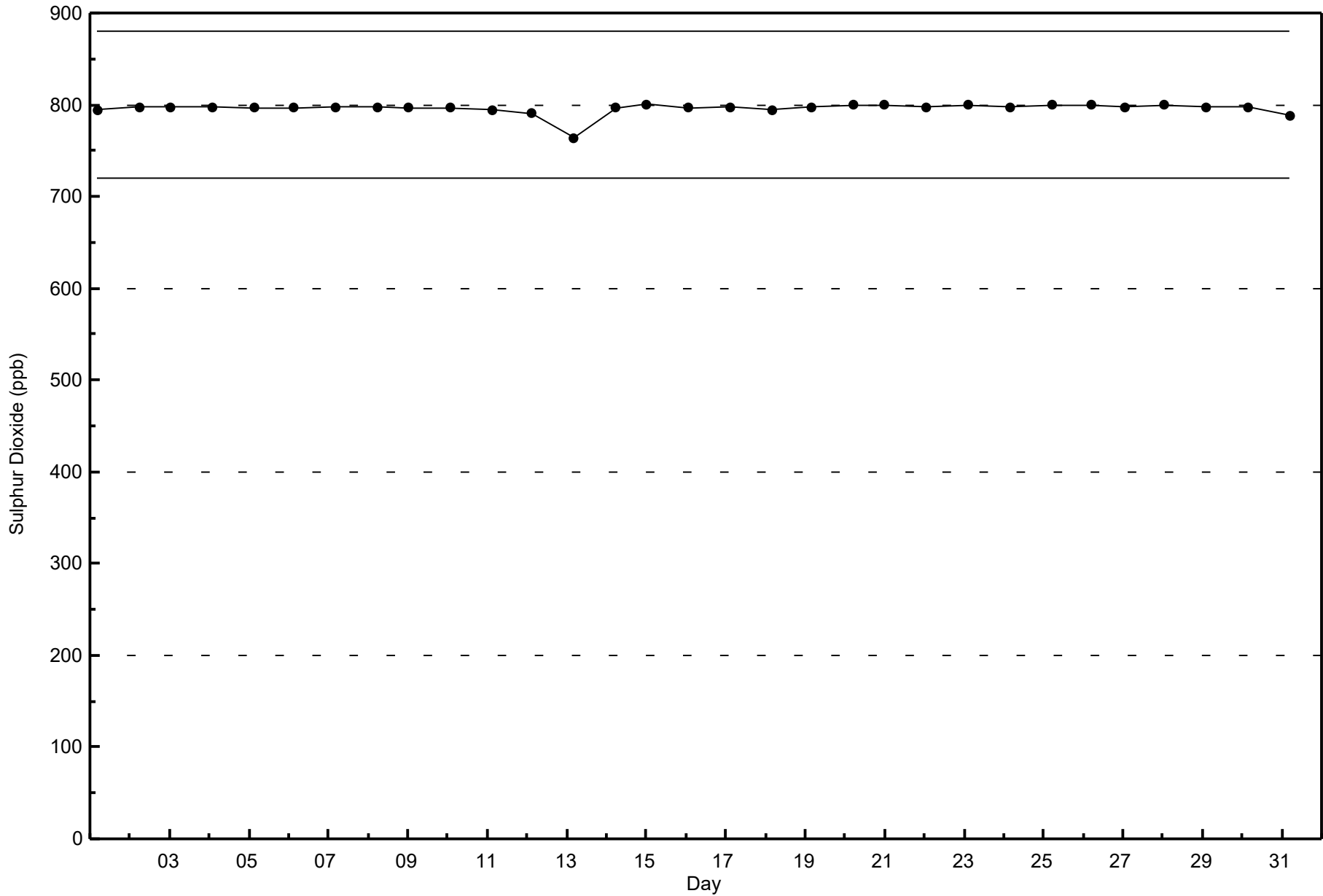
Total Number of Valid Hours: 710



Wood Buffalo Environmental Association
Zero Responses

Sulphur Dioxide (SO₂) - ppb
Sawbones Bay - August 2023



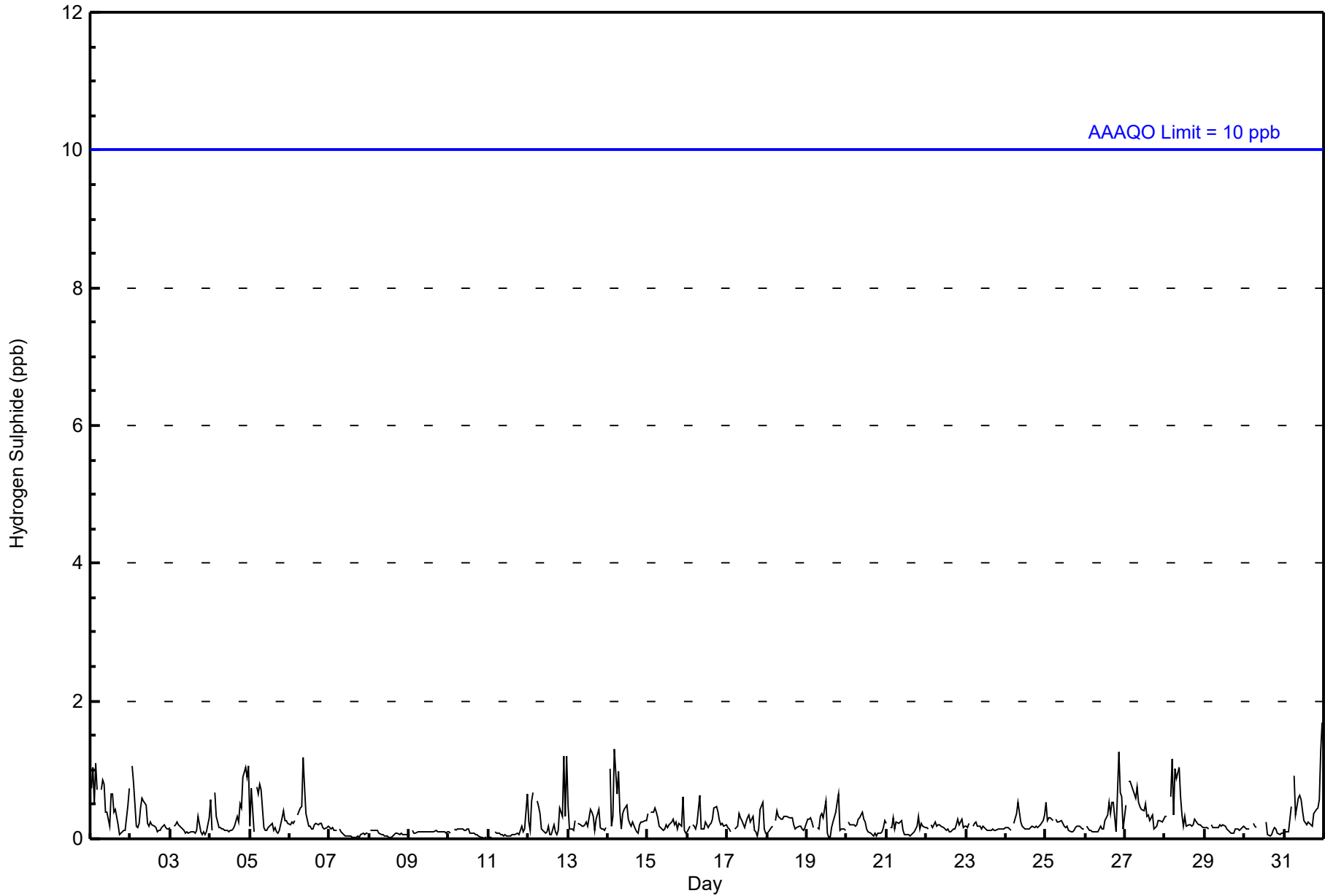




Wood Buffalo Environmental Association
Summary of Hour Averages

Hydrogen Sulphide (H2S) - ppb
Sawbones Bay - August 2023

Number of Exceedences (AAAQO):		1-hr: 0 24-hr: 0		Hours in Service:		744																				
Maximum Value: 1.7 ppb on Sep 1 00:00		Maximum Daily Average: 0.5 ppb on Aug 1		Hours of Data:		708																				
Minimum Value: 0.0 ppb on Aug 11 00:00		Minimum Daily Average: 0.1 ppb on Aug 8		Hours of Missing Data:		36																				
Maximum Diurnal Average: 0.3 ppb at hour 5		Minimum Diurnal Average: 0.2 ppb at hour 17		Hours of Calibration:		36																				
Monthly Average: 0.24 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.1 Q ₁ = 0.1 Median = 0.2 Q ₃ = 0.3 P ₉₀ = 0.5 P ₉₉ = 1.2		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-Aug	0.7	1.0	0.5	1.1	0.7	Z	0.7	0.8	0.8	0.4	0.4	0.2	0.7	0.7	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.5	0.7	0.5	1.1
2-Aug	Z	1.0	0.8	0.2	0.2	0.2	0.5	0.6	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.3	1.0
3-Aug	0.2	Z	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	0.3	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.3
4-Aug	0.6	0.1	Z	0.7	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.5	0.5	0.9	1.0	0.9	1.1	0.4	1.1
5-Aug	0.2	0.7	0.1	Z	0.8	0.7	0.8	0.7	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.4	0.3	0.3	0.2	0.3	0.8
6-Aug	0.2	0.2	0.2	0.3	Z	0.4	0.5	0.5	1.2	0.7	0.4	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	1.2
7-Aug	0.2	0.1	0.2	0.1	0.1	Z	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	0.1	0.1	0.1	0.1	0.1	0.2
8-Aug	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9-Aug	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	0.1
10-Aug	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
11-Aug	0.0	0.0	0.0	Z	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.7	0.1	0.7
12-Aug	0.2	0.1	0.6	0.7	Z	0.5	0.5	0.4	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.4	0.3	1.2	0.3	1.2	0.3	1.2
13-Aug	0.5	0.2	0.1	0.1	0.3	Z	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.4	0.3	0.1	0.3	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.5
14-Aug	Z	1.0	0.2	0.3	1.3	0.6	1.0	0.4	0.1	0.4	0.4	0.5	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4	1.3
15-Aug	0.4	Z	0.4	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.6	0.1	0.1	0.3	0.6
16-Aug	0.1	0.2	Z	0.2	0.2	0.1	0.2	0.6	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.6
17-Aug	0.2	0.1	0.1	Z	0.1	0.2	0.2	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.1	0.1	0.0	0.1	0.4	0.5	0.1	0.1	0.2	0.5
18-Aug	0.1	0.1	0.2	0.2	Z	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.4
19-Aug	0.3	0.3	0.3	0.2	0.2	Z	0.2	0.1	0.3	0.4	0.3	0.5	0.1	0.0	0.0	0.2	0.3	0.4	0.5	0.7	0.1	0.1	0.1	0.1	0.3	0.7
20-Aug	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.4
21-Aug	0.2	Z	0.2	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3
22-Aug	0.2	0.1	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	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3
23-Aug	0.2	0.2	0.2	Z	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3
24-Aug	0.2	0.2	0.1	0.1	Z	0.2	0.4	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.5
25-Aug	0.5	0.3	0.3	0.3	0.3	Z	0.3	0.2	0.3	0.3	0.2	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	0.2	0.5
26-Aug	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.5	0.4	0.5	0.5	0.1	0.7	1.3	0.7	0.6	0.1	0.3	1.3
27-Aug	0.5	Z	0.8	0.8	0.8	0.6	0.6	0.7	0.5	0.5	0.4	0.4	0.5	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.8
28-Aug	0.3	0.3	Z	0.6	1.2	0.3	1.0	0.9	1.0	0.6	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.4	1.2
29-Aug	0.2	0.2	0.1	Z	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	0.2	0.2	0.1	0.2
30-Aug	0.2	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	C	C	C	C	C	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2
31-Aug	0.1	0.1	0.1	0.3	0.5	Z	0.9	0.3	0.6	0.6	0.6	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.4	0.4	0.5	0.6	1.3	1.7	0.5	1.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.2 0.3 0.2 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 0.2 0.2 0.3 0.2 0.3		
																								0.7 1.0 0.8 1.1 1.3 0.7 1.0 0.9 1.2 0.7 0.6 0.5 0.7 0.7 0.5 0.4 0.5 0.5 0.5 0.5 0.7 1.3 1.2 1.3 1.7		
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

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay - August 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
Sawbones Bay - August 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	28	19	11	27	54	33	40	75	52	46	35	56	116	40	29	708
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	47	28	19	11	27	54	33	40	75	52	46	35	56	116	40	29	708

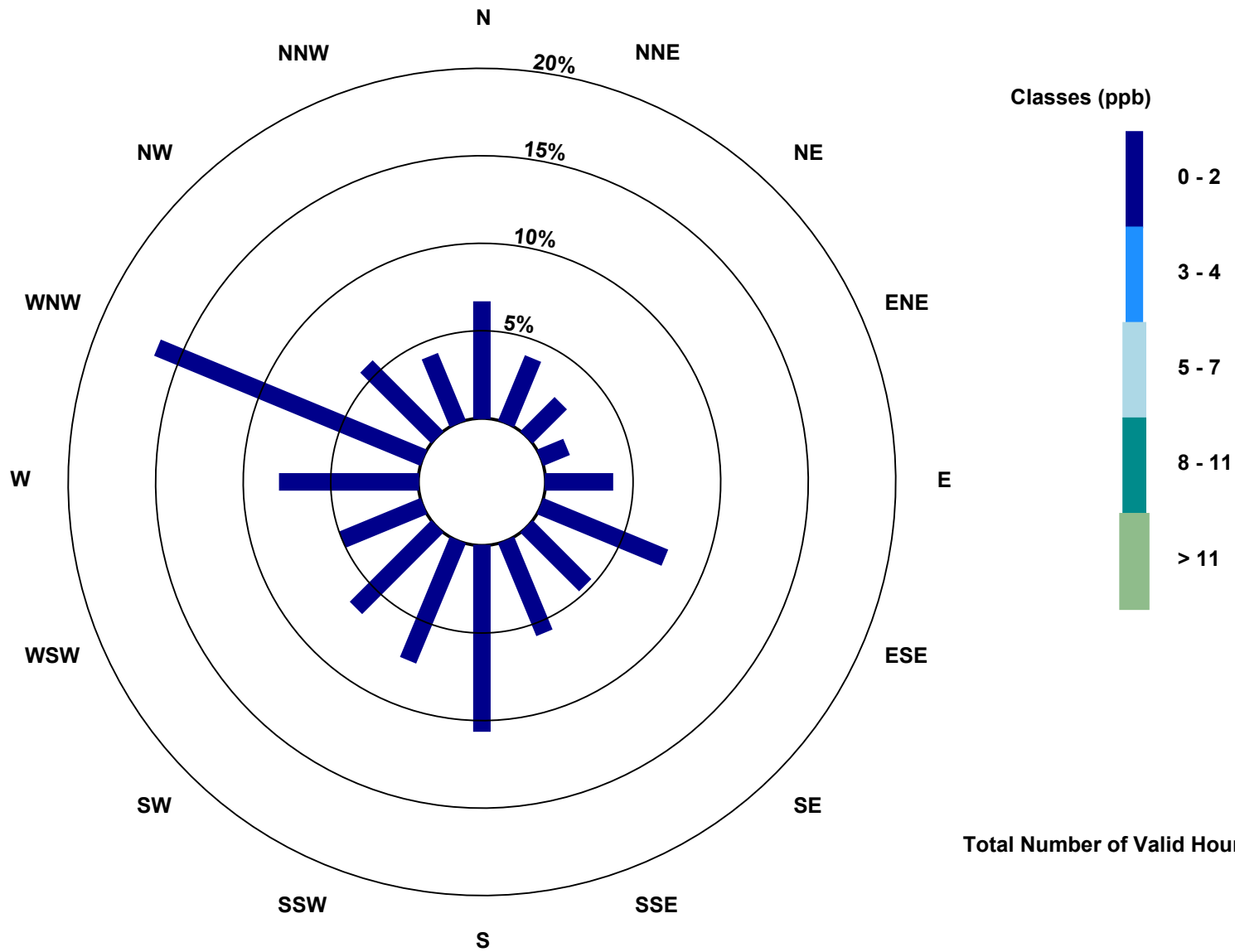
Total Number of Valid Hours: 708

Total Number of Hours: 744

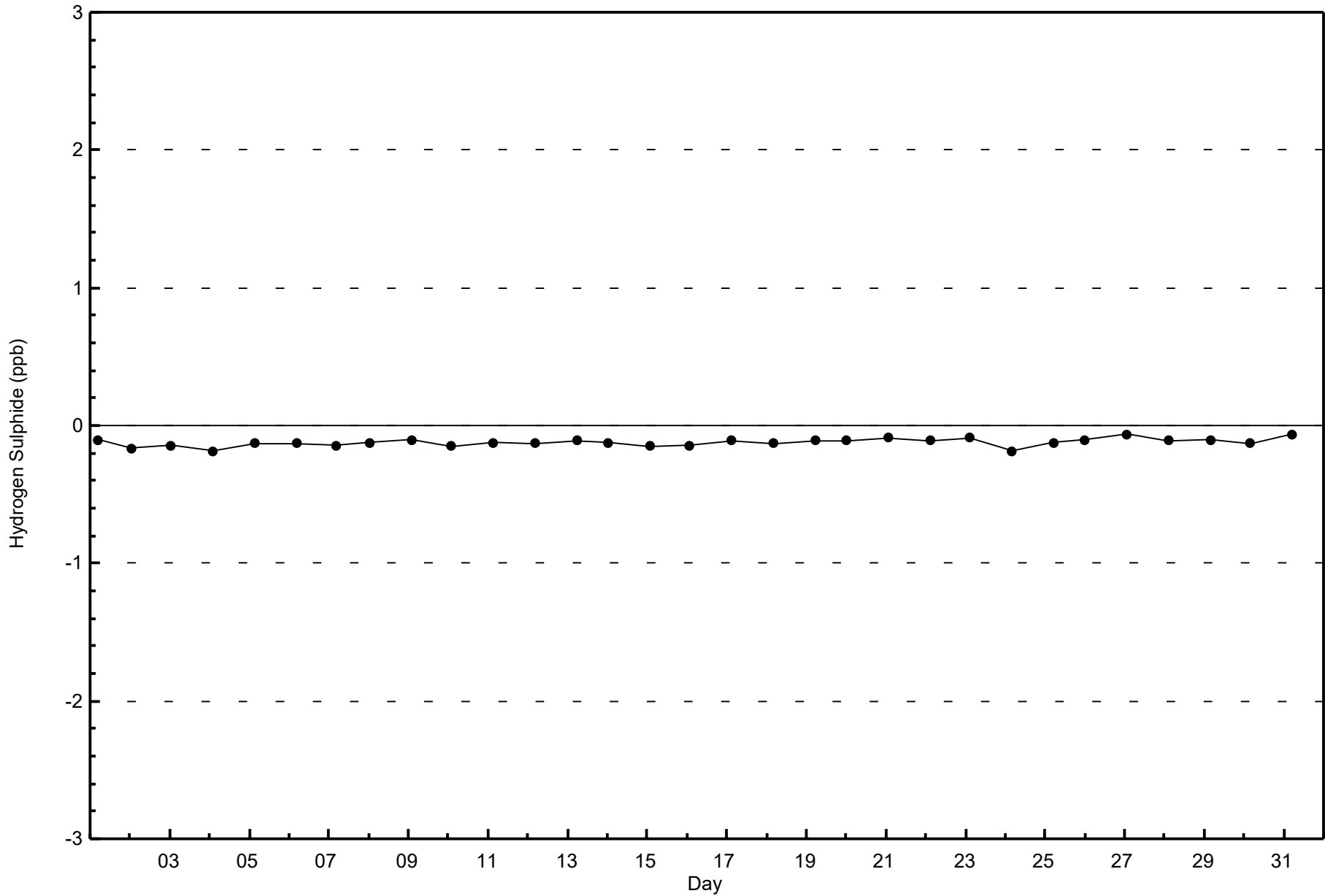


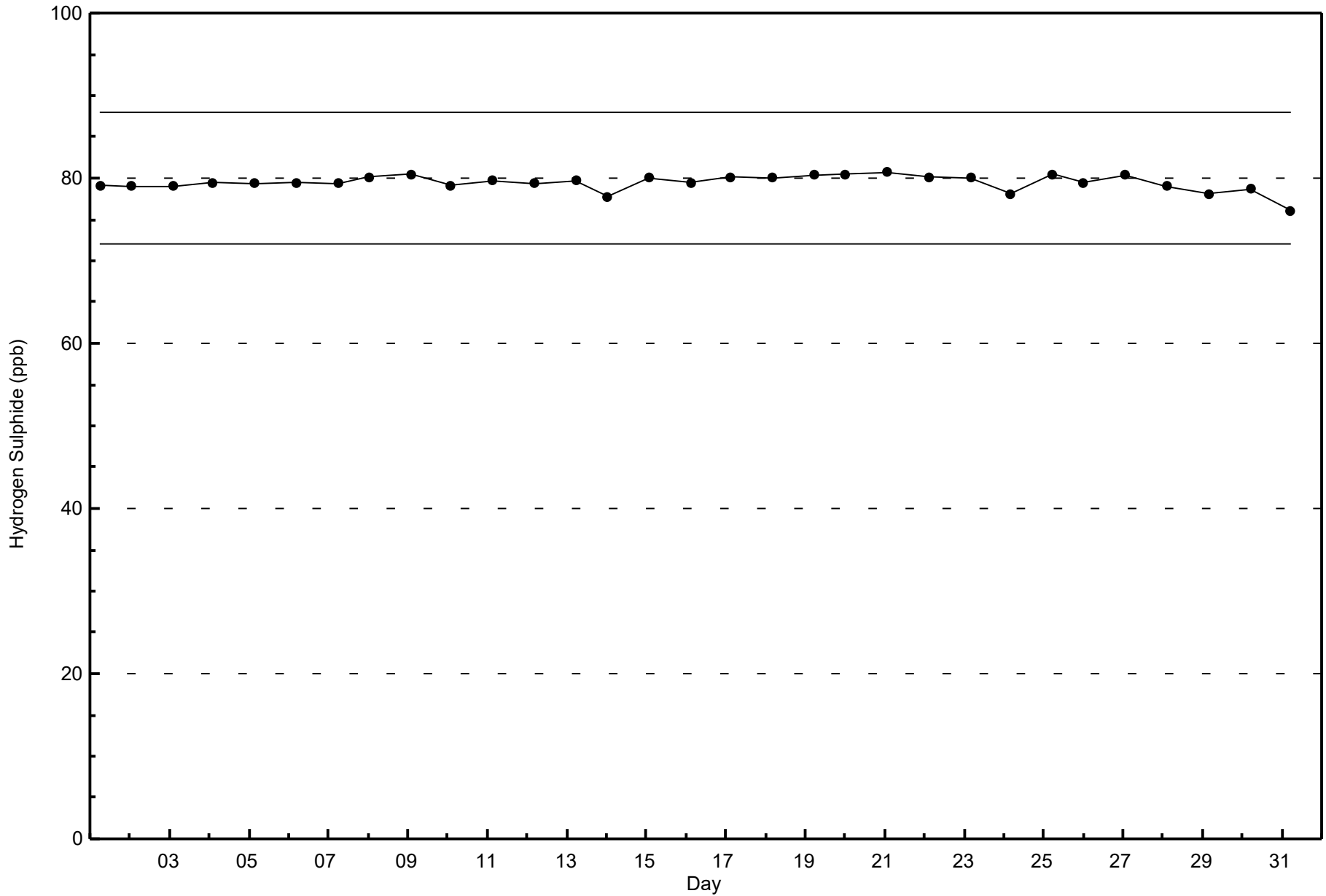
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Hydrogen Sulphide (H₂S) - ppb
Sawbones Bay



Total Number of Valid Hours: 708





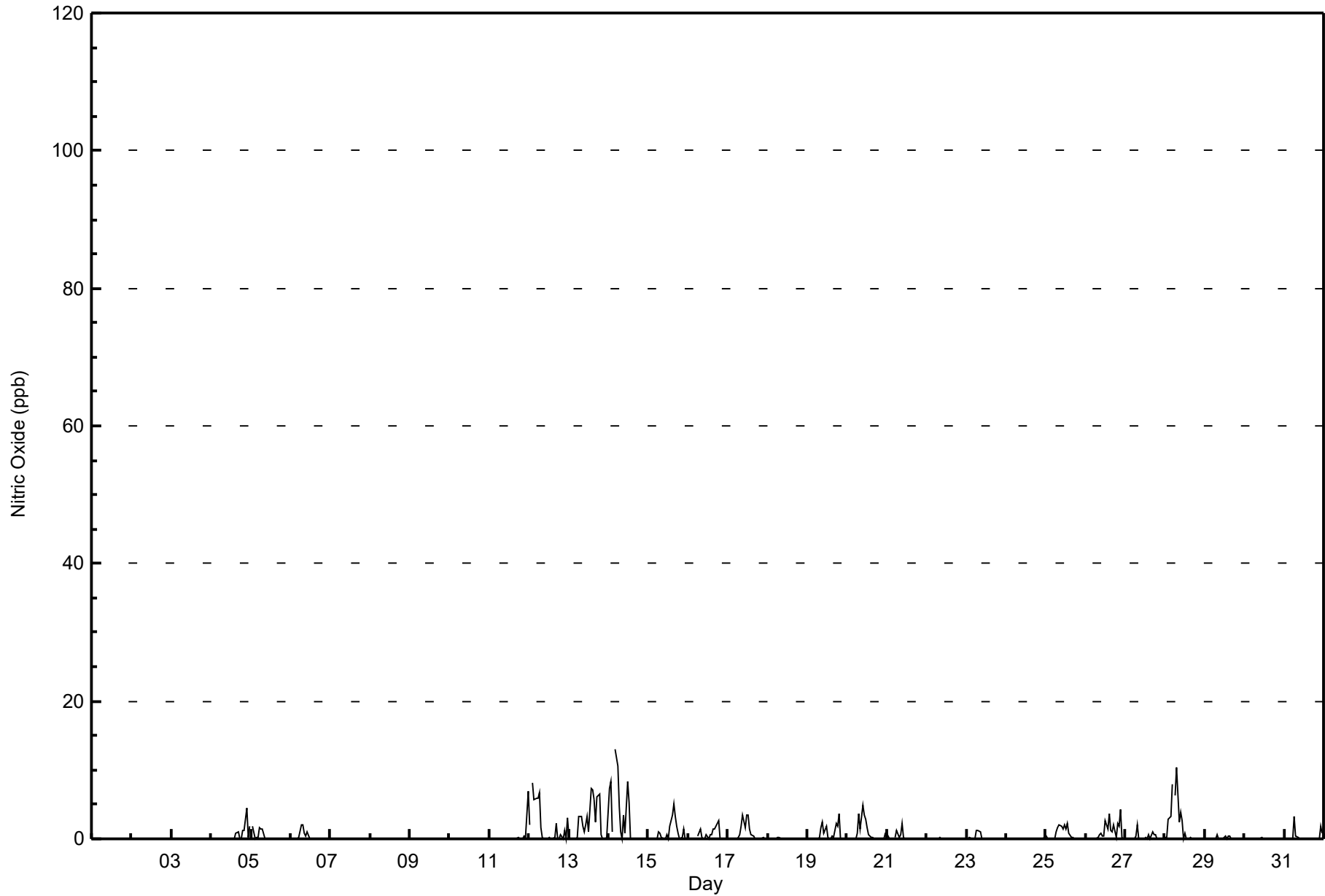


Maximum Value: 13.1 ppb on Aug 14 05:00		Maximum Daily Average: 2.8 ppb on Aug 14		Hours in Service: 744																																													
Minimum Value: 0.0 ppb on Aug 4 14:00		Minimum Daily Average: 0.0 ppb on Aug 7		Hours of Data: 632																																													
Maximum Diurnal Average: 1.3 ppb at hour 7		Minimum Diurnal Average: 0.1 ppb at hour 23		Hours of Missing Data: 112																																													
Monthly Average: 0.60 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.3 P ₉₀ = 1.9 P ₉₉ = 7.7		Hours of Calibration: 31																																													
				Percent Operational Time: 89.1																																													
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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
2-Aug	AF	AF	AF	AF	AF	AF	AF	AF	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
3-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																							
4-Aug	M	M	M	M	M	M	M	M	M	C	C	C	C	0.0	0.1	0.8	1.0	0.0	0.0	1.3	1.2	4.4	0.1	1.8	--	4.4																							
5-Aug	Z	1.9	0.0	0.2	0.3	1.6	1.4	1.5	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	0.3	1.9																							
6-Aug	0.0	Z	0.0	0.0	0.0	0.2	2.1	0.8	0.4	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.1																							
7-Aug	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																						
8-Aug	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																						
9-Aug	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	0.0																						
10-Aug	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	0.0																						
11-Aug	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	0.3	0.0	0.0	0.0	0.5	0.1	6.8	0.3	6.8																								
12-Aug	2.0	Z	8.2	5.7	5.8	5.9	6.6	1.7	0.1	0.1	0.0	0.0	0.2	0.0	0.1	2.2	0.0	0.0	0.6	0.0	1.1	0.0	3.0	1.9	8.2																								
13-Aug	0.3	0.0	Z	0.0	0.0	0.2	3.2	3.2	1.8	1.1	2.1	3.3	1.1	7.3	7.2	5.6	2.4	6.1	6.6	0.6	0.0	0.0	0.3	2.3	7.3																								
14-Aug	7.3	8.4	1.0	Z	13.1	10.6	4.6	1.0	0.0	3.5	0.8	8.4	5.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.8	13.1																								
15-Aug	0.0	0.0	0.1	0.0	Z	0.0	1.0	0.7	0.2	0.1	0.0	0.6	0.0	1.8	3.4	5.0	3.2	1.8	0.7	0.0	0.3	1.4	0.0	0.9	5.0																								
16-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.3	1.4	0.1	0.0	0.1	0.6	0.0	0.6	0.7	1.4	1.4	2.1	2.7	0.0	0.0	0.0	0.0	0.5	2.7																								
17-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.1	0.6	1.8	3.4	1.7	3.4	3.4	1.4	0.6	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.7	3.4																								
18-Aug	0.0	Z	0.0	0.0	0.0	0.0	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	0.2																							
19-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	1.7	2.5	0.8	1.9	0.2	0.0	0.0	0.5	0.3	2.2	1.9	3.7	0.0	0.0	0.0	0.7	3.7																								
20-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.9	3.7	1.4	4.8	3.5	2.9	1.7	0.7	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.9	4.8																								
21-Aug	0.9	0.0	0.0	0.0	Z	0.3	1.3	0.3	0.7	2.2	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	0.3	2.2																								
22-Aug	0.0	0.0	0.0	0.0	0.0	Z	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	0.1																							
23-Aug	Z	0.0	0.2	0.1	0.0	0.0	1.3	1.2	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	0.2	1.3																								
24-Aug	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	0.6	0.0	0.6																								
25-Aug	0.5	0.0	Z	0.0	0.0	0.1	1.0	1.6	2.0	1.7	1.4	2.0	1.5	2.2	0.9	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.2																								
26-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.1	0.6	0.8	0.4	0.4	2.7	1.5	3.8	1.3	1.1	2.1	0.2	2.2	1.9	4.3	0.2	1.0	4.3																								
27-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.5	1.9	0.1	0.0	0.0	0.0	0.2	0.0	0.5	0.0	1.0	0.6	0.6	0.0	0.0	0.0	0.0	0.2	1.9																								
28-Aug	0.2	0.3	2.9	3.3	7.9	Z	6.3	10.4	2.4	3.8	2.7	0.1	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	10.4																								
29-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	0.0	0.0	0.1	0.3	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7																								
30-Aug	0.0	Z	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	0.0	0.0	0.0	0.2																							
31-Aug	0.0	0.0	Z	0.0	0.0	0.1	3.3	0.4	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	1.8	0.8	0.3	3.3																								
																								0.5	0.5	0.6	0.4	1.2	0.8	1.3	1.2	0.6	0.9	0.6	0.9	0.6	0.6	0.6	0.4	0.5	0.5	0.3	0.1	0.4	0.1	0.5	Diurnal Average		
																								7.3	8.4	8.2	5.7	13.1	10.6	6.6	10.4	2.4	4.8	3.5	8.4	5.4	7.3	7.2	5.6	3.2	6.1	6.6	3.7	1.9	4.4	1.8	6.8	Diurnal Maximum	
Z - zerospan																								C - Calibration				M - Maintenance				AF - Analyzer Failure																	



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Sawbones Bay - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Nitric Oxide (NO) - ppb
Sawbones Bay - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	632	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: 632

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitric Oxide (NO) - ppb
Sawbones Bay - August 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	25	18	9	25	51	32	39	73	51	41	32	41	87	33	28	632
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	47	25	18	9	25	51	32	39	73	51	41	32	41	87	33	28	632

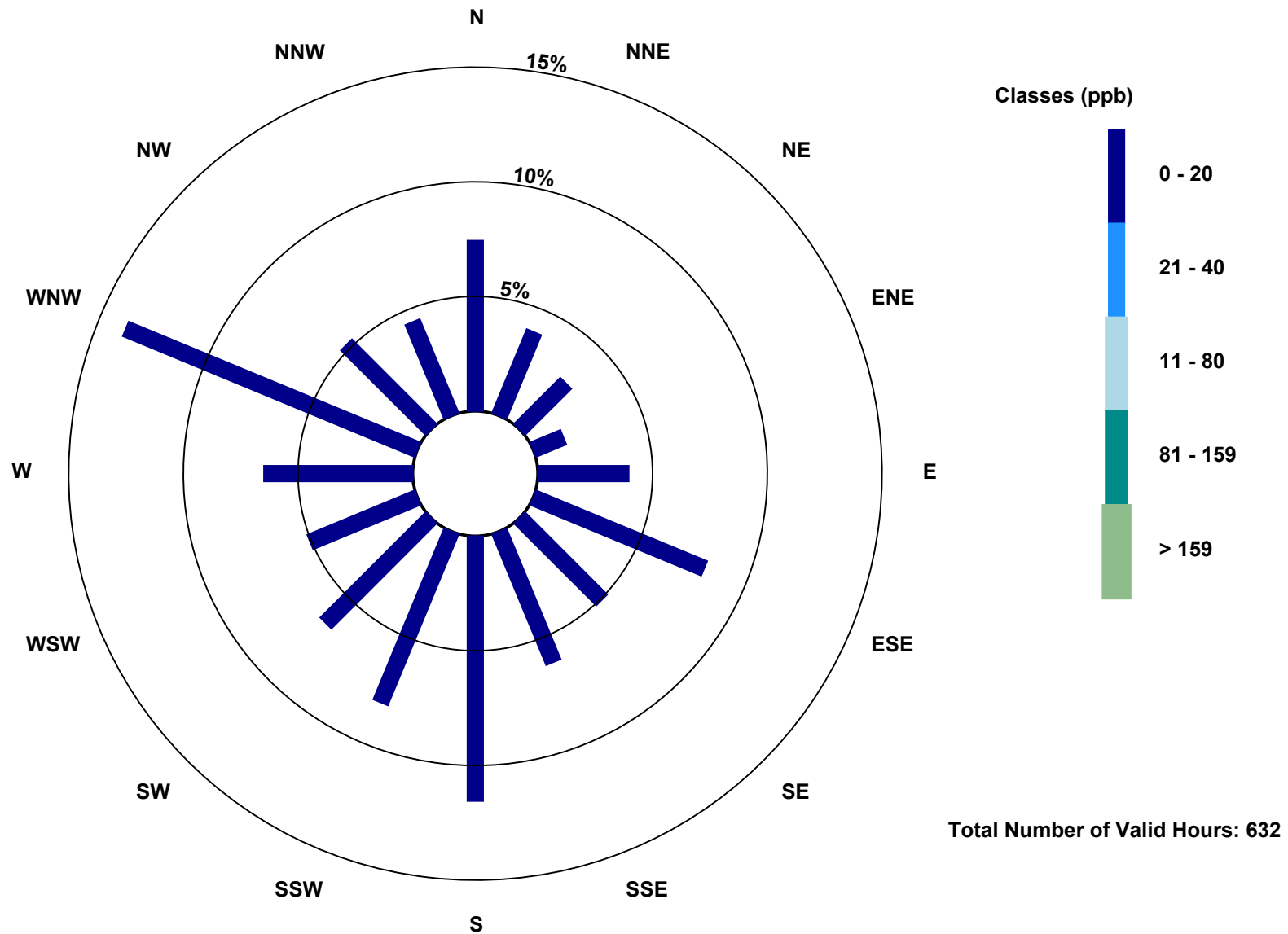
Total Number of Valid Hours: 632

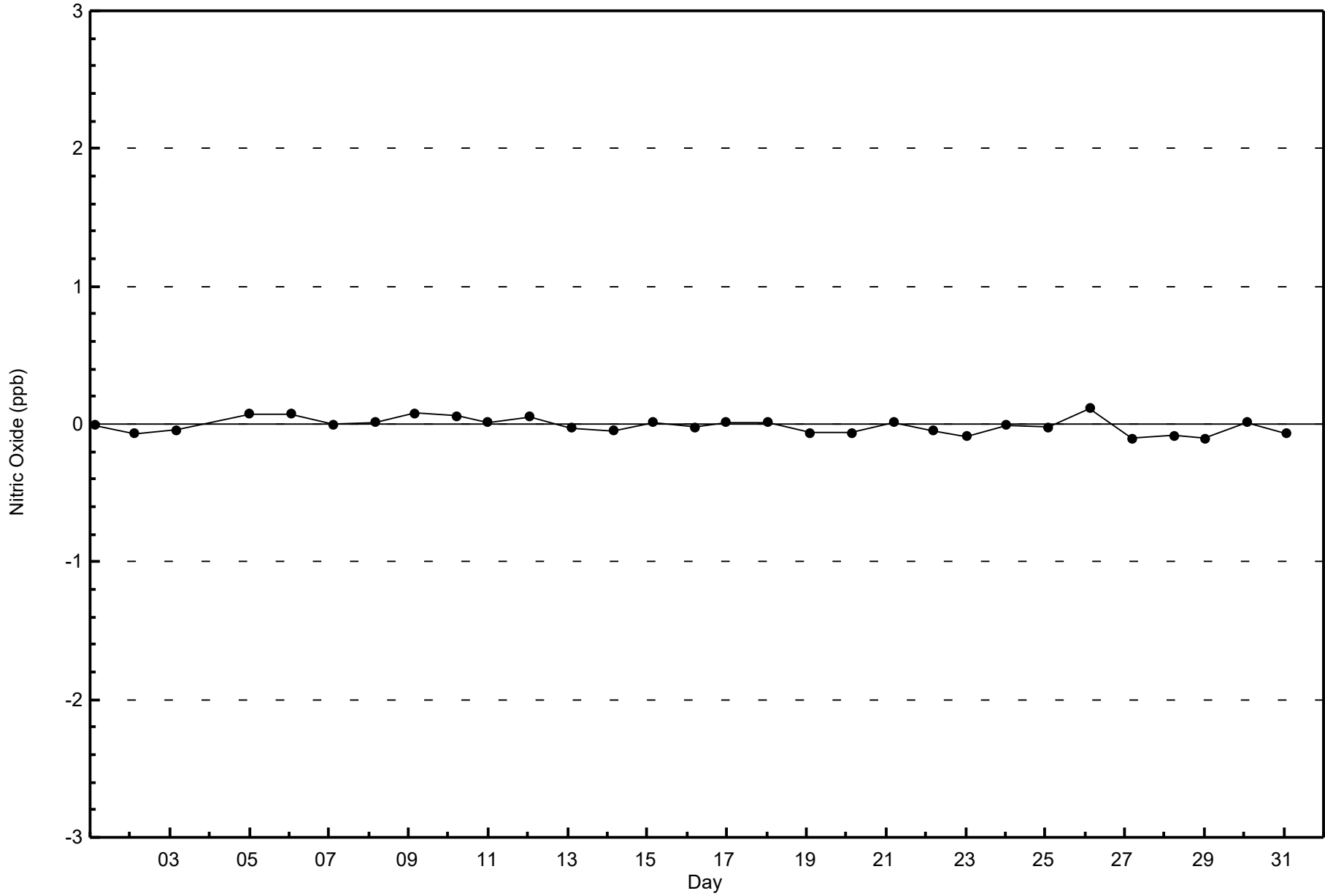
Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Sawbones Bay

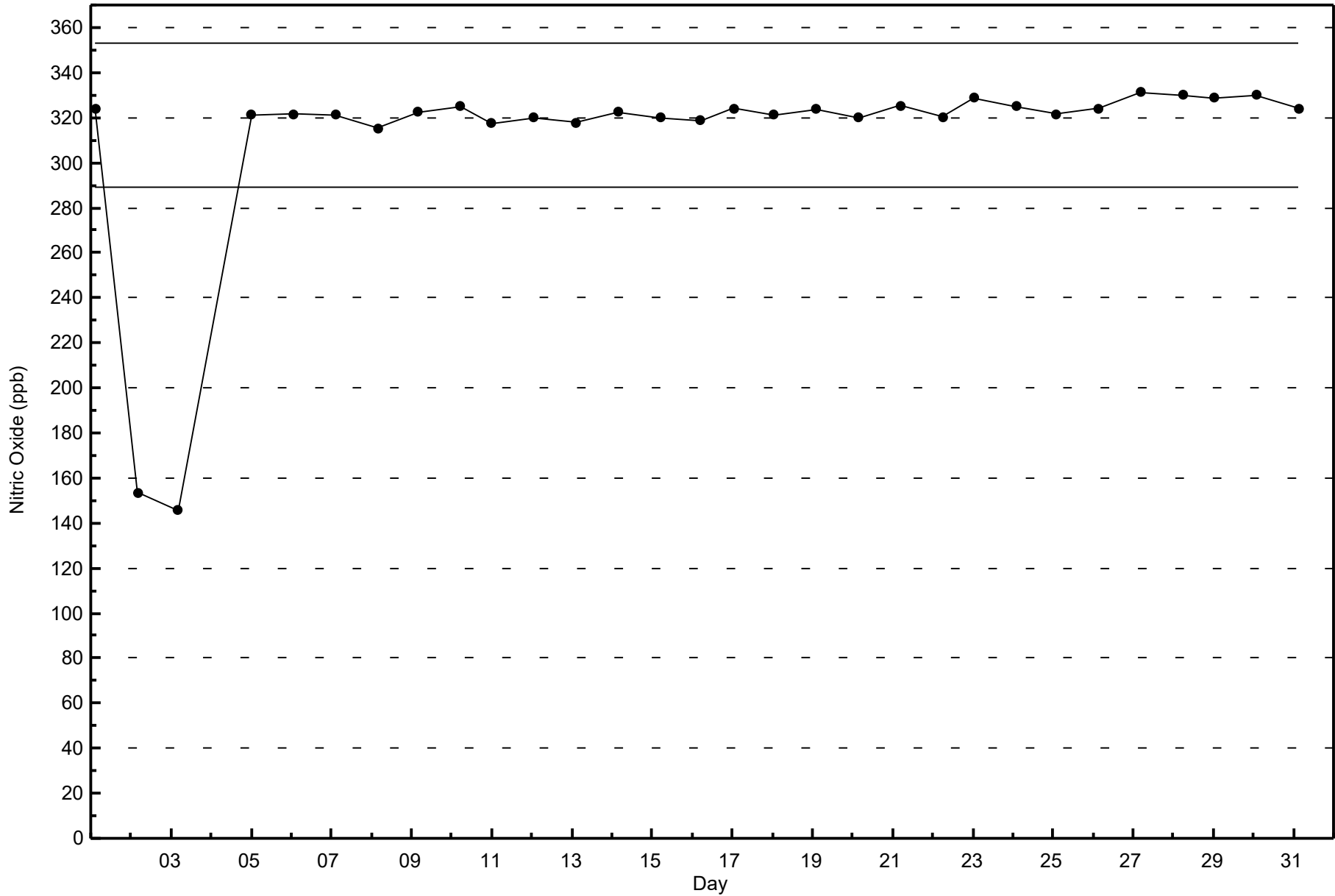






Wood Buffalo Environmental Association
Span Responses

Nitric Oxide (NO) - ppb
Sawbones Bay - August 2023





Wood Buffalo Environmental Association
Summary of Hour Averages

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0	Hours in Service: 744
Maximum Value: 16.1 ppb on Aug 26 20:00	Maximum Daily Average: 4.9 ppb on Aug 26
Minimum Value: 0.0 ppb on Aug 7 13:00	Hours of Data: 632
Maximum Diurnal Average: 3.1 ppb at hour 7	Hours of Missing Data: 112
Monthly Average: 2.28 ppb	Hours of Calibration: 31
Minimum Daily Average: 0.2 ppb on Aug 9	Percent Operational Time: 89.1
Minimum Diurnal Average: 1.4 ppb at hour 23	
Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.6 Median = 1.4 Q ₃ = 3.1 P ₉₀ = 5.4 P ₉₉ = 11.7	

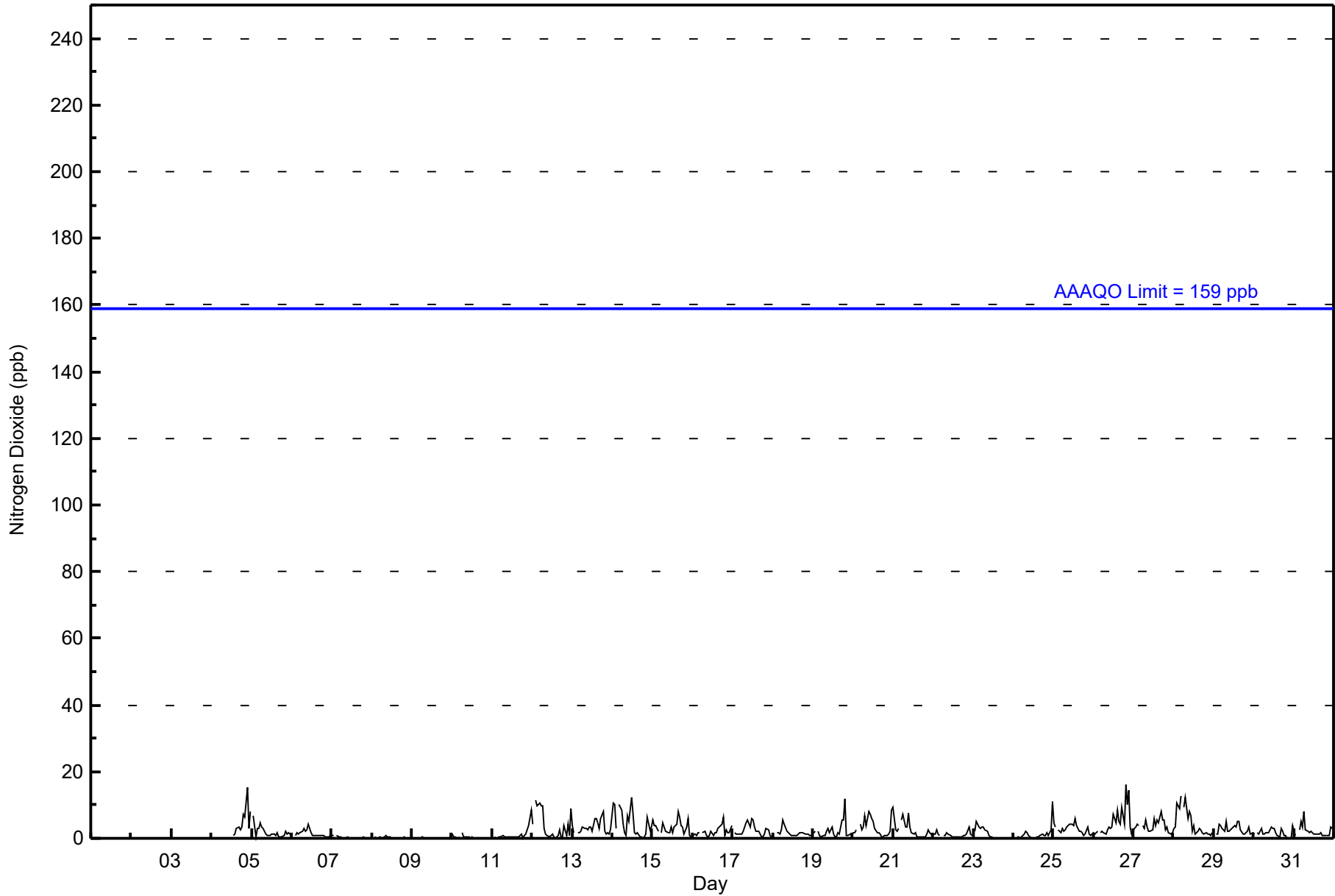
Day	Hourly Period Ending At (MST)																								Daily Average	Daily Maximum																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24																									
1-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
2-Aug	AF	AF	AF	AF	AF	AF	AF	AF	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--																							
3-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--																							
4-Aug	M	M	M	M	M	M	M	M	M	C	C	C	C	0.8	1.4	2.8	3.6	2.6	3.2	7.0	6.3	15.1	3.1	8.0	--	15.1																							
5-Aug	Z	6.7	0.6	2.8	2.9	4.6	3.6	3.1	1.1	0.7	0.8	0.8	1.2	1.4	1.0	1.6	0.6	0.4	0.4	0.8	2.1	1.3	1.9	1.4	1.8	6.7																							
6-Aug	1.4	Z	1.0	1.7	1.2	1.7	2.1	2.8	2.3	2.6	4.3	1.6	1.0	0.9	0.9	0.9	0.7	1.0	0.9	1.0	0.5	0.5	0.6	1.1	1.4	4.3																							
7-Aug	0.7	0.8	Z	0.9	0.5	0.4	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.9																							
8-Aug	0.1	0.2	0.5	Z	0.4	0.3	0.2	0.5	0.8	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.0	0.1	0.3	0.8																							
9-Aug	0.1	0.1	0.1	0.1	Z	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	1.2	0.2	1.2																							
10-Aug	1.4	0.3	0.3	0.2	0.3	Z	1.5	0.6	0.3	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.3	1.5																							
11-Aug	Z	0.4	0.2	0.2	0.3	0.3	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.3	0.4	0.4	1.3	0.2	0.9	1.4	2.5	3.9	8.6	1.1	8.6																							
12-Aug	4.1	Z	11.6	9.9	10.5	9.9	9.7	3.0	1.1	0.8	0.5	0.9	1.1	0.4	0.2	1.0	2.5	0.3	0.6	4.0	1.0	4.2	1.0	8.9	3.8	11.6																							
13-Aug	4.0	1.5	Z	1.8	1.8	2.3	3.2	3.0	3.0	2.6	3.3	3.6	2.1	6.0	5.8	4.5	3.1	5.8	8.1	2.1	1.3	1.5	1.2	2.5	3.2	8.1																							
14-Aug	10.7	10.0	3.1	Z	10.2	8.5	4.4	1.6	0.7	6.6	4.9	12.3	7.2	1.7	1.1	1.9	0.5	0.3	0.1	0.4	1.4	6.2	2.5	3.3	4.3	12.3																							
15-Aug	5.3	3.8	3.9	2.2	Z	1.8	4.6	3.4	2.0	1.8	1.5	3.4	1.8	3.5	4.1	8.1	6.3	3.7	3.4	1.2	3.6	6.1	0.9	0.5	3.3	8.1																							
16-Aug	0.9	1.4	1.0	1.6	1.5	Z	1.6	2.2	0.8	0.5	1.0	2.1	0.9	1.8	1.9	2.8	3.2	4.4	6.3	0.8	2.4	1.8	1.8	3.9	2.0	6.3																							
17-Aug	Z	1.6	1.1	1.2	1.1	1.1	2.1	3.4	4.5	5.5	3.6	5.9	5.4	3.2	2.1	2.1	1.1	0.6	0.3	1.1	3.1	2.7	1.0	0.3	2.4	5.9																							
18-Aug	0.4	Z	1.5	1.6	1.4	2.4	5.4	4.2	2.2	1.5	1.1	1.0	1.0	1.0	1.4	1.5	1.8	1.7	1.3	1.4	1.4	0.7	0.9	1.6	5.4																								
19-Aug	1.5	2.0	Z	2.2	0.8	0.5	0.8	0.9	2.3	2.9	1.7	3.3	1.2	0.5	0.4	1.6	1.4	5.3	5.3	11.8	0.7	1.0	1.1	1.3	2.2	11.8																							
20-Aug	1.6	1.9	2.5	Z	4.2	2.7	3.4	6.6	3.8	8.0	7.1	6.0	4.9	3.0	1.8	1.9	1.3	0.6	0.6	1.0	1.0	1.2	2.3	8.3	3.3	8.3																							
21-Aug	9.3	2.7	2.3	2.9	Z	5.7	7.0	3.5	3.5	7.7	3.2	1.6	1.1	1.6	0.6	0.4	0.5	0.5	0.5	0.5	1.2	2.4	1.8	0.7	2.7	9.3																							
22-Aug	1.4	1.1	2.5	1.1	1.0	Z	0.8	1.0	1.6	1.2	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.8	0.8	1.4	3.2	1.1	0.8	1.1	3.2																							
23-Aug	Z	2.2	4.9	3.6	3.1	3.2	3.6	2.4	2.3	0.7	0.6	0.6	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	1.3	4.9																							
24-Aug	0.2	Z	0.5	0.3	0.2	0.6	1.4	2.0	1.6	0.8	0.4	0.2	0.2	0.1	0.3	0.4	0.9	1.1	1.0	0.8	1.6	0.9	2.5	11.0	1.3	11.0																							
25-Aug	4.7	3.4	Z	2.4	1.5	2.9	2.1	2.6	3.6	4.3	4.2	4.4	3.7	5.9	4.0	2.2	2.1	1.7	0.9	1.2	3.2	1.3	0.7	1.3	2.8	5.9																							
26-Aug	1.9	1.3	2.0	Z	1.9	2.3	1.8	1.4	2.4	3.3	2.9	3.2	7.1	4.6	8.5	5.0	4.1	9.3	4.2	16.1	10.0	14.4	3.5	1.2	4.9	16.1																							
27-Aug	2.8	3.6	4.1	3.9	Z	3.7	2.8	5.7	3.5	2.3	2.2	2.4	6.0	4.0	5.6	4.7	7.9	5.3	5.4	2.6	3.6	1.8	1.3	1.6	3.8	7.9																							
28-Aug	3.1	3.5	10.8	9.0	12.6	Z	9.3	12.3	5.8	7.9	6.9	2.2	3.9	1.4	2.2	2.8	2.5	1.7	1.2	1.7	1.2	1.1	1.0	1.8	4.6	12.6																							
29-Aug	Z	1.2	1.4	4.1	3.9	2.9	2.1	4.9	2.3	2.0	2.6	2.9	4.0	3.2	4.9	5.0	2.4	1.3	1.2	1.9	2.3	3.3	1.4	1.8	2.7	5.0																							
30-Aug	1.2	Z	1.8	1.4	2.9	1.1	1.4	1.7	1.9	1.8	3.2	2.9	2.9	1.5	1.0	0.3	2.9	2.1	0.9	0.8	0.2	0.2	0.2	4.0	1.7	4.0																							
31-Aug	2.1	1.0	Z	2.5	5.1	3.2	7.9	2.6	2.2	1.5	2.1	1.7	1.3	1.3	1.1	1.3	1.6	0.7	0.9	0.9	0.9	1.0	3.2	2.9	2.1	7.9																							
																								2.7	2.3	2.6	2.5	3.0	2.7	3.1	2.8	2.1	2.5	2.2	2.4	2.2	1.8	1.8	1.9	1.9	1.9	1.7	2.2	1.9	2.7	1.4	2.8	Diurnal Average	
																								10.7	10.0	11.6	9.9	12.6	9.9	9.7	12.3	5.8	8.0	7.1	12.3	7.2	6.0	8.5	8.1	7.9	9.3	8.1	16.1	10.0	15.1	3.9	11.0	Diurnal Maximum	

Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure
 Alberta Ambient Air Quality Objectives (AAAQO): 1-hr 159 ppb



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	632	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: 632

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay - August 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	25	18	9	25	51	32	39	73	51	41	32	41	87	33	28	632
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	47	25	18	9	25	51	32	39	73	51	41	32	41	87	33	28	632

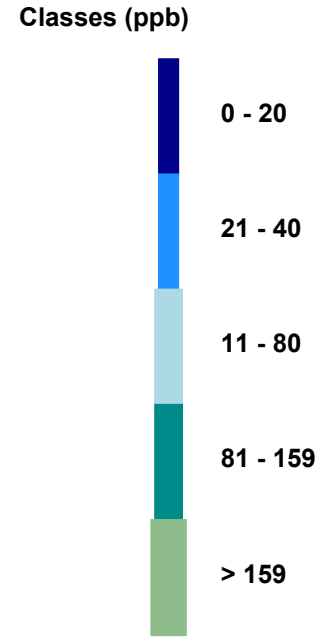
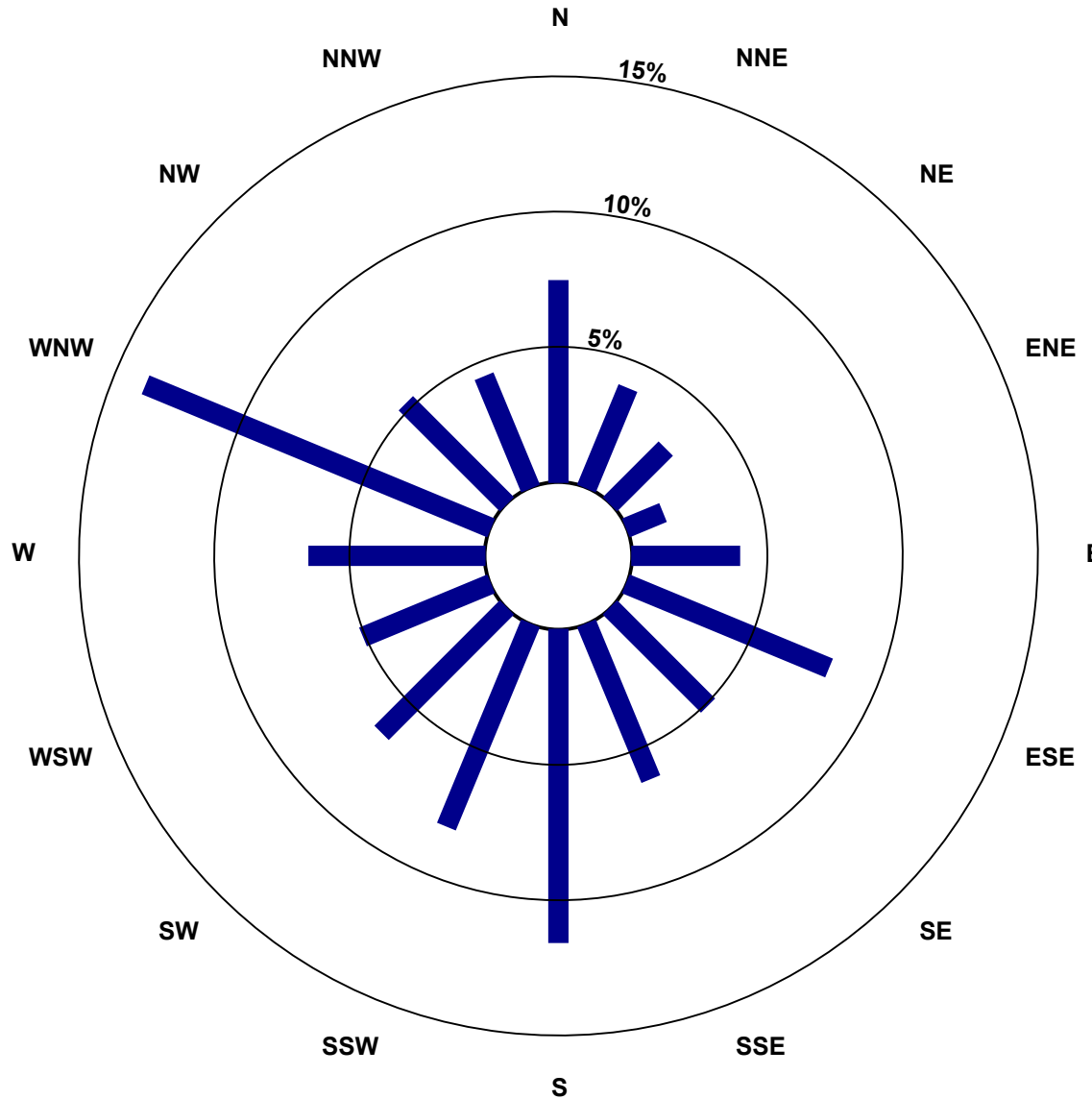
Total Number of Valid Hours: 632

Total Number of Hours: 744

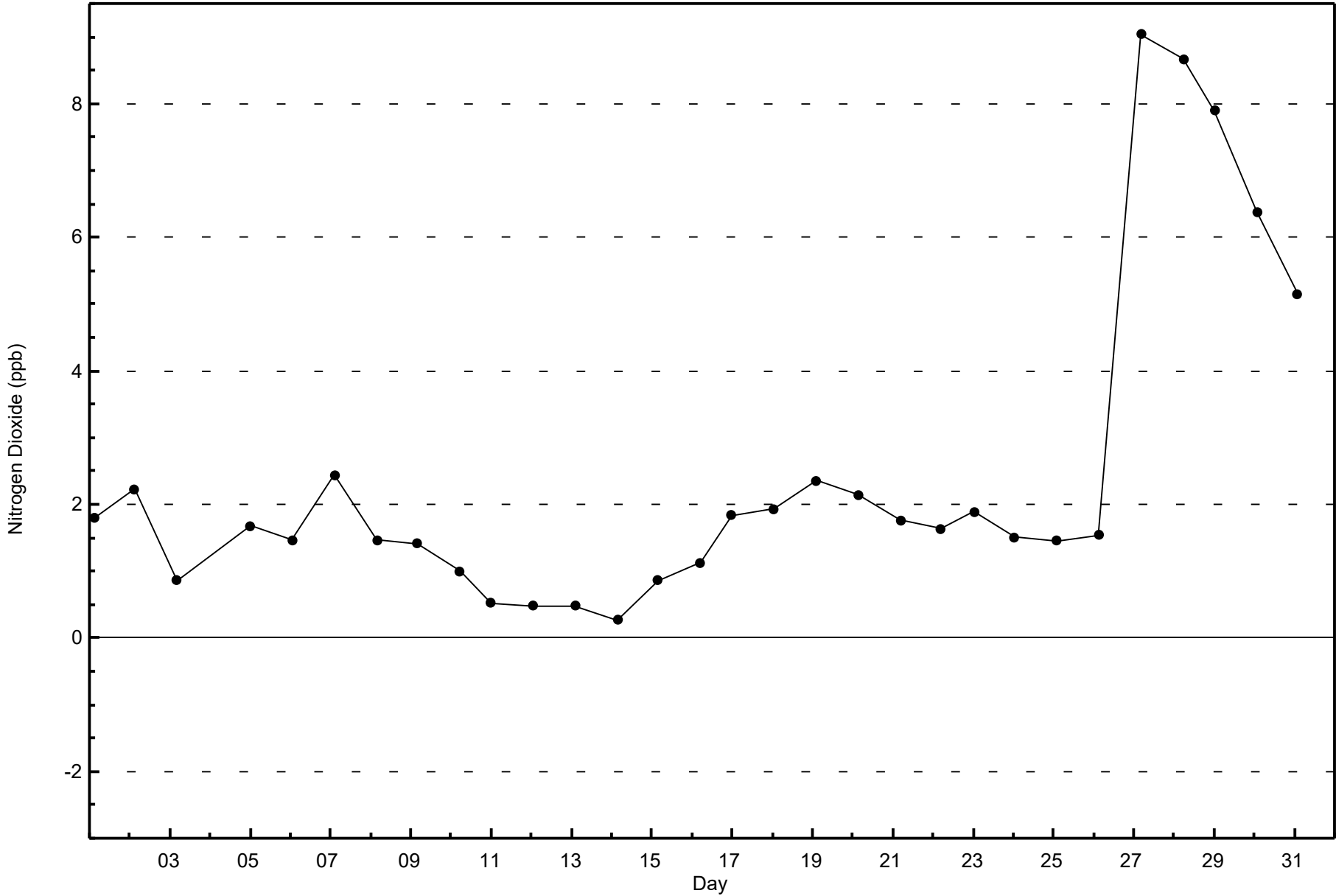


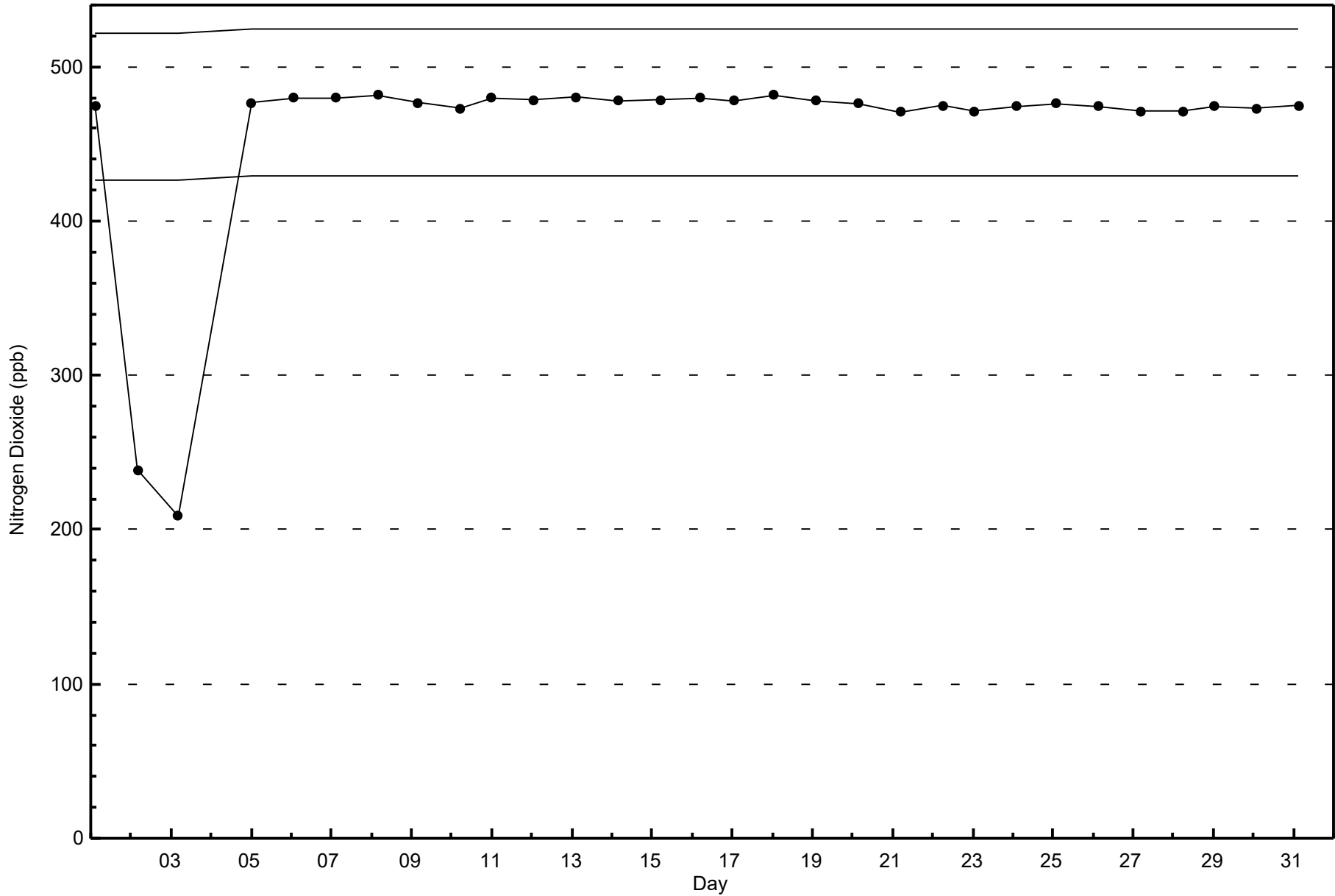
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Sawbones Bay



Total Number of Valid Hours: 632







Wood Buffalo Environmental Association
Summary of Hour Averages

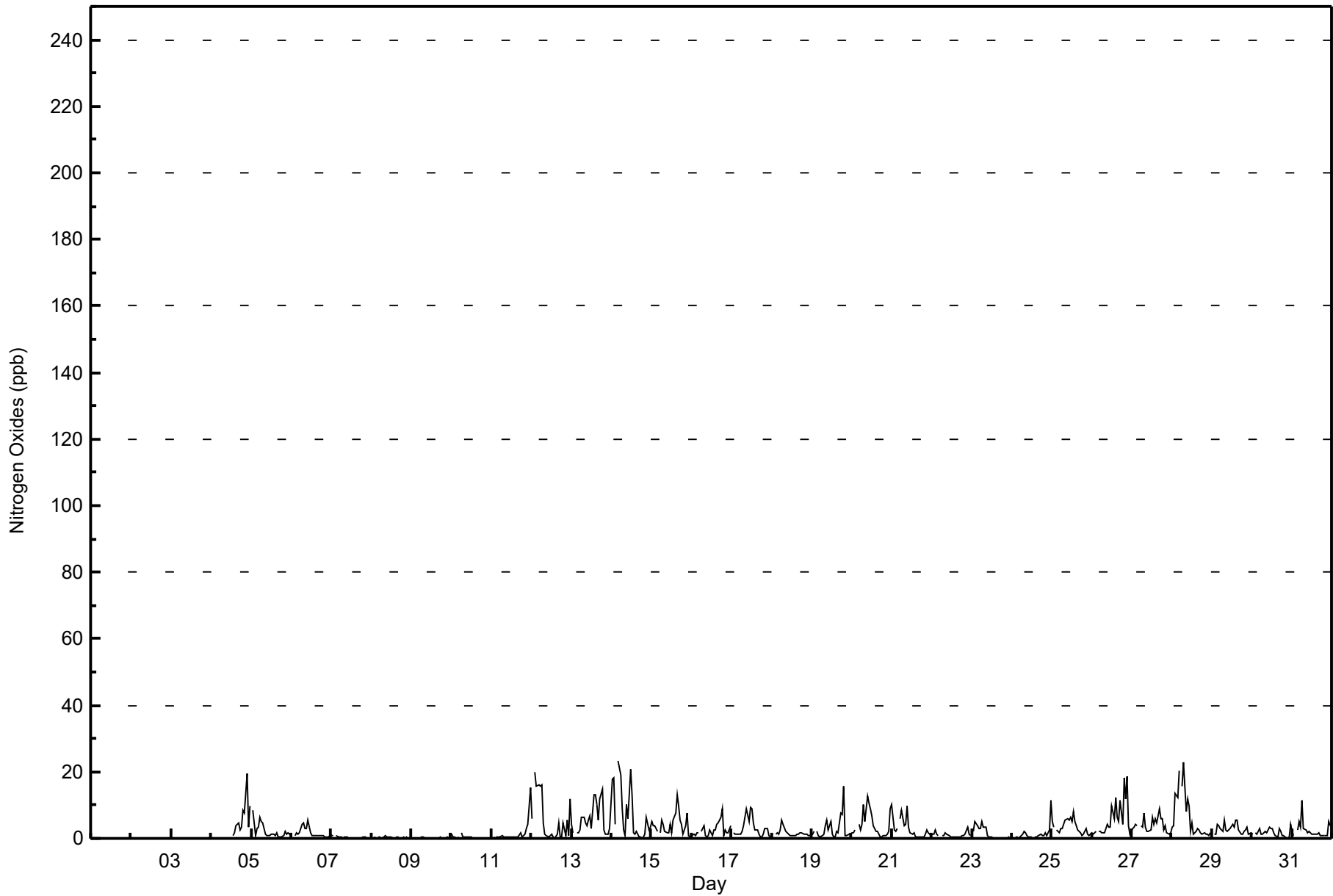
Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - August 2023

Maximum Value: 23.3 ppb on Aug 14 05:00		Maximum Daily Average: 7.1 ppb on Aug 14		Hours in Service: 744																						
Minimum Value: 0.0 ppb on Aug 8 23:00		Minimum Daily Average: 0.2 ppb on Aug 9		Hours of Data: 632																						
Maximum Diurnal Average: 4.4 ppb at hour 7		Minimum Diurnal Average: 1.5 ppb at hour 23		Hours of Missing Data: 112																						
Monthly Average: 2.89 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.2 Q ₁ = 0.6 Median = 1.5 Q ₃ = 3.6 P ₉₀ = 6.9 P ₉₉ = 18.9		Hours of Calibration: 31																						
				Percent Operational Time: 89.1																						
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-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
2-Aug	AF	AF	AF	AF	AF	AF	AF	AF	M	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF	--	--
3-Aug	AF	AF	AF	AF	AF	AF	AF	AF	AF	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	--	--
4-Aug	M	M	M	M	M	M	M	M	M	C	C	C	C	0.8	1.5	3.6	4.6	2.6	3.2	8.3	7.5	19.5	3.2	9.8	--	19.5
5-Aug	Z	8.6	0.6	3.0	3.2	6.2	5.0	4.6	1.1	0.7	0.8	0.8	1.2	1.4	1.0	1.7	0.6	0.4	0.4	0.8	2.1	1.3	1.9	1.4	2.1	8.6
6-Aug	1.4	Z	1.0	1.7	1.2	1.9	4.2	4.8	3.1	3.0	5.4	1.6	1.0	0.9	0.9	0.9	0.7	1.0	0.9	1.0	0.5	0.5	0.6	1.1	1.7	5.4
7-Aug	0.7	0.8	Z	0.9	0.5	0.4	0.2	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.9
8-Aug	0.1	0.2	0.5	Z	0.4	0.3	0.2	0.5	0.8	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.0	0.1	0.3	0.8
9-Aug	0.1	0.1	0.1	0.1	Z	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.2	1.2	0.2	1.2
10-Aug	1.4	0.3	0.3	0.2	0.3	Z	1.5	0.6	0.3	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.3	1.5
11-Aug	Z	0.4	0.2	0.2	0.3	0.3	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.3	0.4	0.4	1.6	0.2	0.9	1.4	3.0	4.0	15.4	1.4	15.4
12-Aug	6.1	Z	19.8	15.6	16.3	15.8	16.3	4.7	1.2	0.9	0.5	0.9	1.3	0.4	0.2	1.1	4.7	0.3	0.6	4.6	1.0	5.3	1.0	11.9	5.7	19.8
13-Aug	4.3	1.5	Z	1.8	1.8	2.5	6.4	6.2	4.8	3.7	5.4	6.9	3.2	13.3	13.0	10.1	5.5	11.9	14.7	2.7	1.3	1.5	1.2	2.8	5.5	14.7
14-Aug	18.0	18.4	4.1	Z	23.3	19.1	9.0	2.6	0.7	10.1	5.7	20.7	12.6	1.7	1.1	2.0	0.5	0.3	0.1	0.4	1.4	6.2	2.5	3.4	7.1	23.3
15-Aug	5.3	3.8	4.0	2.2	Z	1.8	5.6	4.1	2.2	1.9	1.5	4.0	1.8	5.3	7.5	13.1	9.5	5.5	4.1	1.2	3.9	7.5	0.9	0.5	4.2	13.1
16-Aug	0.9	1.4	1.0	1.6	1.5	Z	1.9	3.6	0.9	0.5	1.1	2.7	0.9	2.4	2.6	4.2	4.6	6.5	9.0	0.8	2.4	1.8	1.8	3.9	2.5	9.0
17-Aug	Z	1.6	1.1	1.2	1.1	1.1	2.2	4.0	6.3	8.9	5.3	9.3	8.8	4.6	2.7	2.5	1.1	0.6	0.3	1.1	3.1	2.9	1.0	0.3	3.1	9.3
18-Aug	0.4	Z	1.5	1.6	1.4	2.4	5.6	4.4	2.2	1.5	1.1	1.0	1.0	1.0	1.4	1.5	1.8	1.7	1.3	1.4	1.4	0.7	0.9	1.7	5.6	
19-Aug	1.5	2.0	Z	2.2	0.8	0.5	0.8	1.1	4.0	5.4	2.5	5.2	1.4	0.5	0.4	2.1	1.7	7.5	7.2	15.5	0.7	1.0	1.1	1.3	2.9	15.5
20-Aug	1.6	1.9	2.5	Z	4.2	2.7	4.3	10.3	5.2	12.8	10.6	8.9	6.6	3.7	2.0	2.1	1.3	0.6	0.6	1.0	1.0	1.2	2.3	9.0	4.2	12.8
21-Aug	10.2	2.7	2.3	2.9	Z	6.0	8.3	3.8	4.2	9.9	3.5	1.6	1.1	1.6	0.6	0.4	0.5	0.5	0.5	0.5	1.2	2.4	1.8	0.7	2.9	10.2
22-Aug	1.4	1.1	2.5	1.1	1.0	Z	0.8	1.0	1.7	1.2	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.8	0.8	1.4	3.2	1.1	0.8	1.1	3.2
23-Aug	Z	2.2	5.1	3.7	3.1	3.2	4.9	3.6	3.3	0.7	0.6	0.6	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	1.4	5.1
24-Aug	0.2	Z	0.5	0.3	0.2	0.6	1.4	2.0	1.6	0.8	0.4	0.2	0.2	0.1	0.3	0.4	0.9	1.1	1.0	0.8	1.6	0.9	2.5	11.6	1.3	11.6
25-Aug	5.2	3.4	Z	2.4	1.5	3.0	3.1	4.2	5.6	6.0	5.6	6.4	5.2	8.1	4.9	2.4	2.2	1.7	0.9	1.2	3.2	1.3	0.7	1.3	3.4	8.1
26-Aug	1.9	1.3	2.0	Z	1.9	2.3	1.8	1.5	3.0	4.1	3.3	3.6	9.8	6.1	12.3	6.3	5.2	11.4	4.4	18.3	11.9	18.7	3.7	1.2	5.9	18.7
27-Aug	2.8	3.6	4.1	3.9	Z	3.7	3.3	7.6	3.6	2.3	2.2	2.4	6.2	4.0	6.1	4.7	8.9	5.9	6.0	2.6	3.6	1.8	1.3	1.6	4.0	8.9
28-Aug	3.3	3.8	13.7	12.3	20.5	Z	15.6	22.7	8.2	11.7	9.6	2.3	4.6	1.4	2.2	2.9	2.5	1.7	1.2	1.7	1.2	1.1	1.0	1.8	6.4	22.7
29-Aug	Z	1.2	1.4	4.1	3.9	2.9	2.1	5.6	2.4	2.0	2.6	3.0	4.3	3.2	5.3	5.4	2.4	1.3	1.2	1.9	2.3	3.3	1.4	1.8	2.8	5.6
30-Aug	1.2	Z	1.8	1.4	2.9	1.1	1.4	1.7	1.9	1.8	3.4	2.9	2.9	1.5	1.0	0.3	2.9	2.1	0.9	0.8	0.2	0.2	0.2	4.0	1.7	4.0
31-Aug	2.1	1.0	Z	2.5	5.1	3.3	11.2	3.0	2.5	1.5	2.1	1.7	1.3	1.3	1.1	1.3	1.6	0.7	0.9	0.9	0.9	1.0	5.0	3.7	2.4	11.2
																								Diurnal Average		
																								Diurnal Maximum		
																								3.2 2.8 3.2 2.9 4.2 3.5 4.4 4.0 2.7 3.4 2.8 3.3 2.9 2.3 2.5 2.5 2.3 2.4 2.2 2.5 2.0 3.1 1.5 3.3		
																								18.0 18.4 19.8 15.6 23.3 19.1 16.3 22.7 8.2 12.8 10.6 20.7 12.6 13.3 13.0 13.1 9.5 11.9 14.7 18.3 11.9 19.5 5.0 15.4		
Z - zerospan C - Calibration M - Maintenance AF - Analyzer Failure																										



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	628	99.37	99.37
21 - 40	4	0.63	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: 632

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Sawbones Bay - August 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	25	18	9	25	51	32	39	73	51	41	30	40	86	33	28	628
21 - 40	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	4
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	47	25	18	9	25	51	32	39	73	51	41	32	41	87	33	28	632

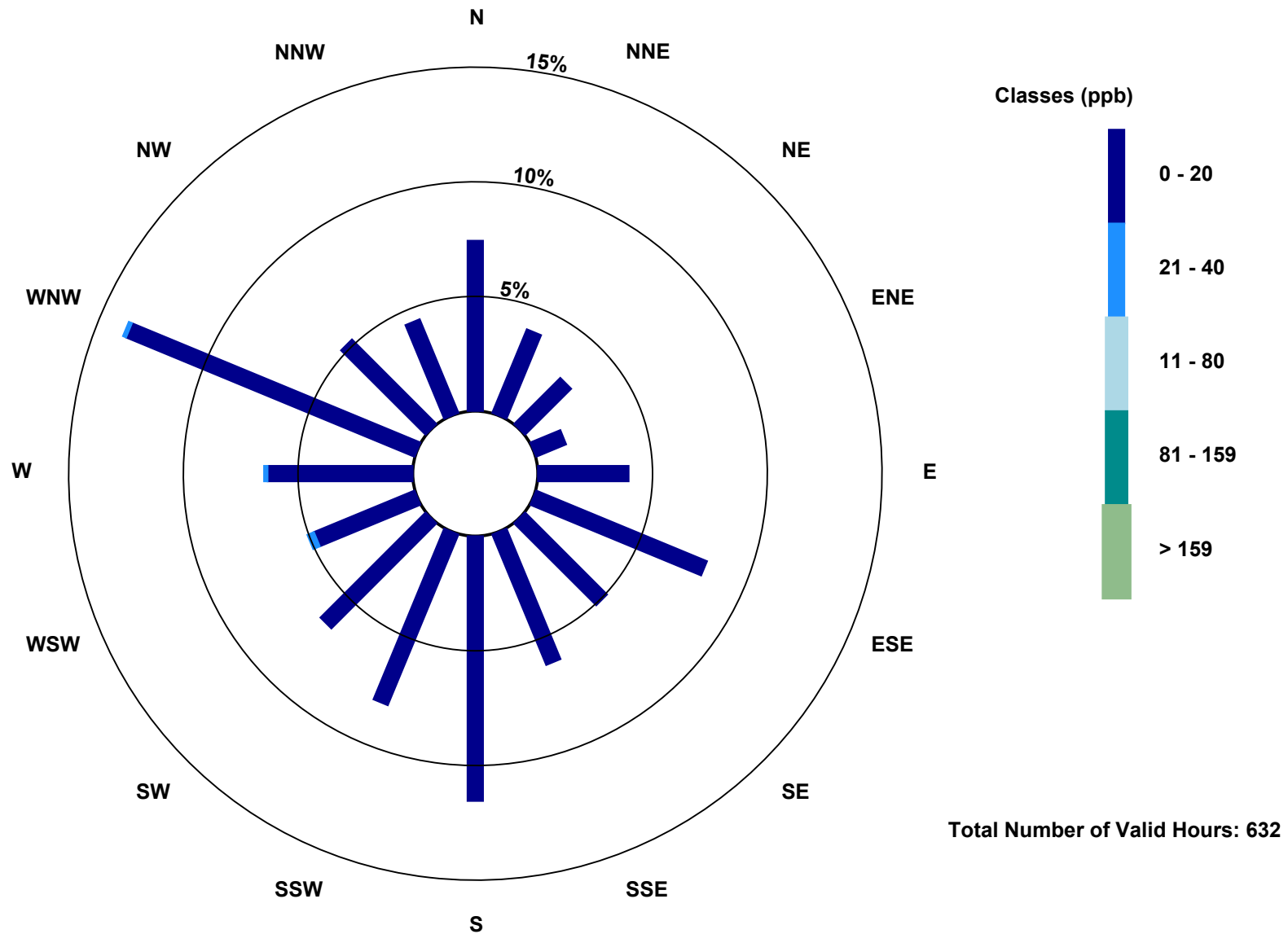
Total Number of Valid Hours: 632

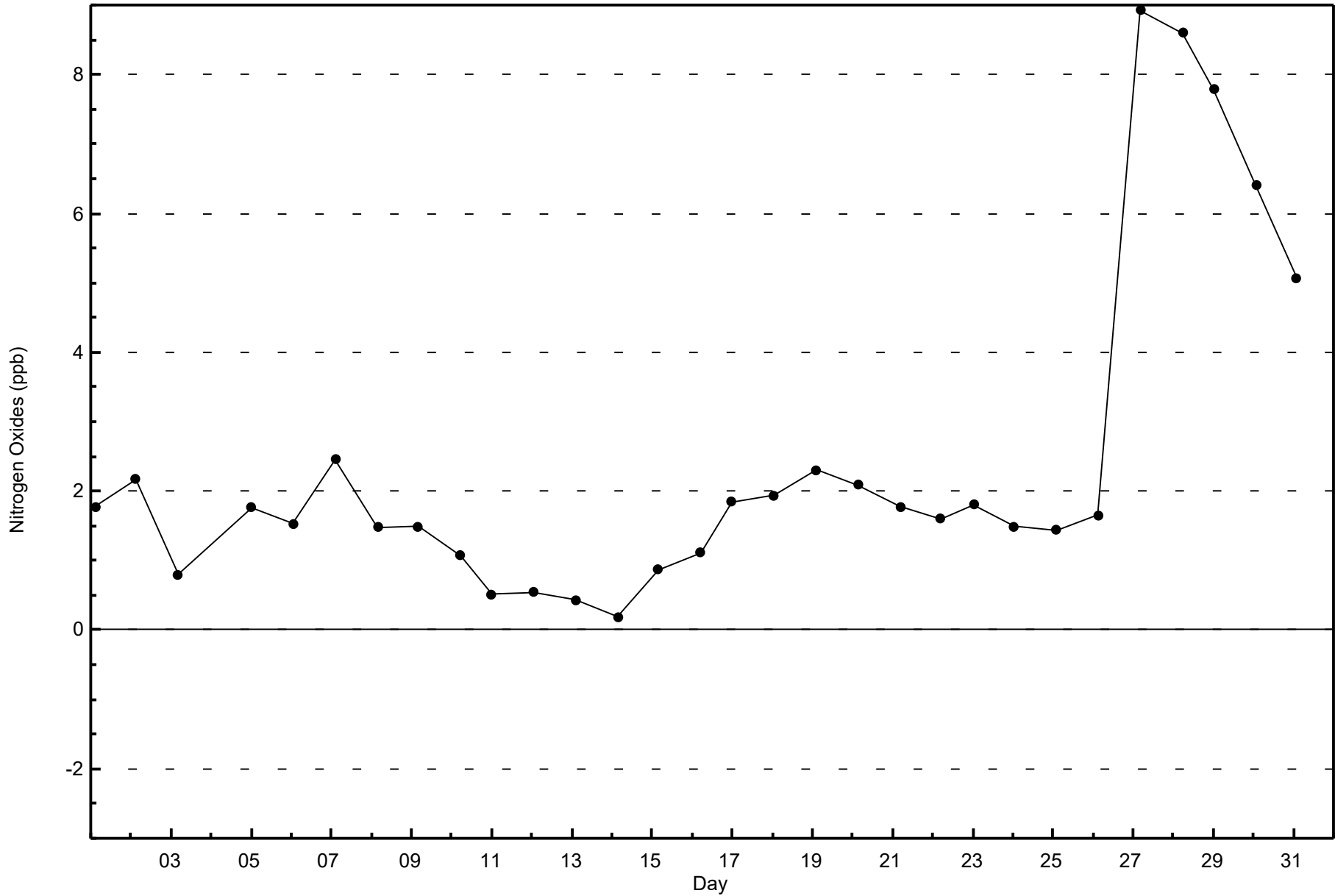
Total Number of Hours: 744

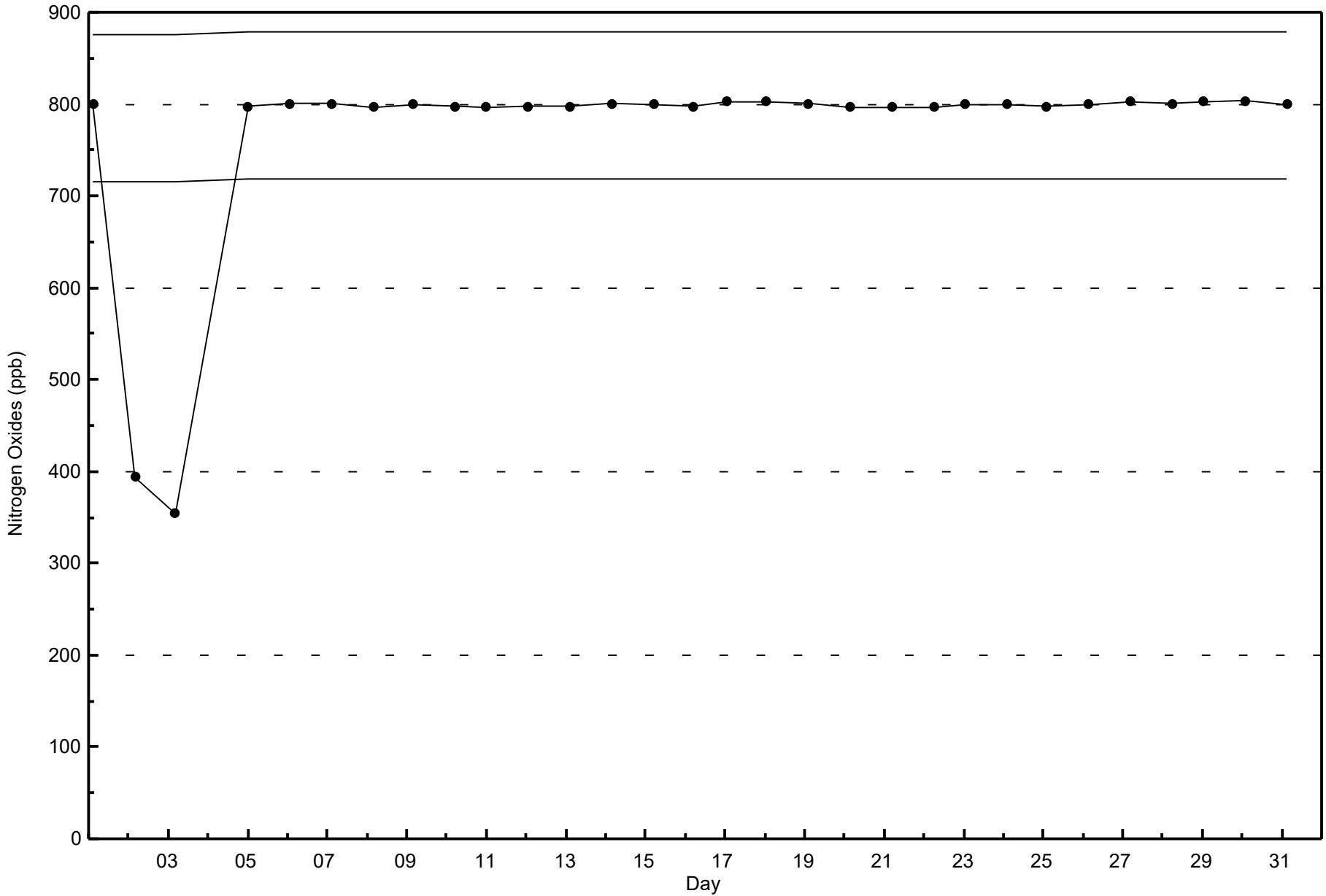


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Sawbones Bay









Wood Buffalo Environmental Association
Summary of Hour Averages

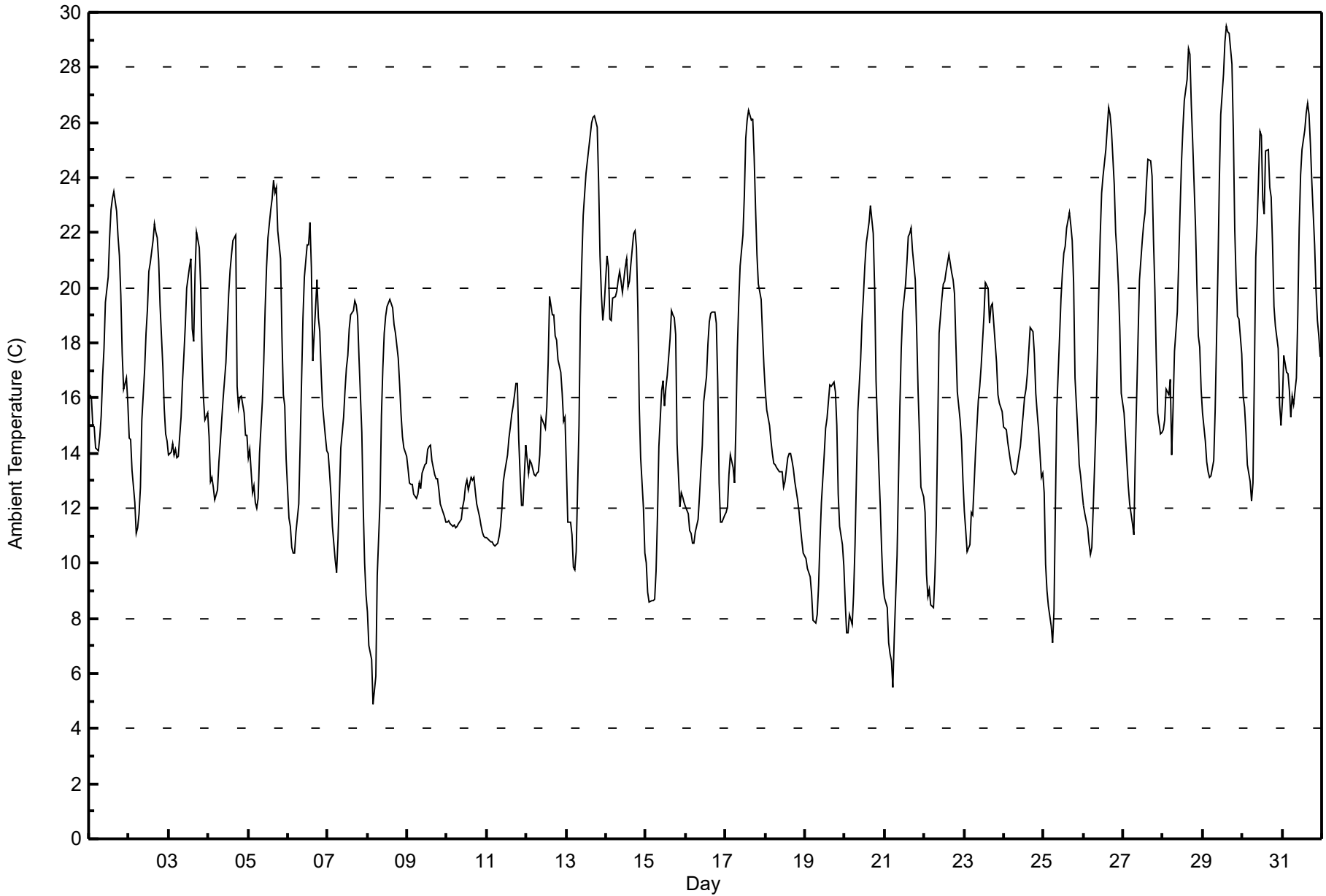
Ambient Temperature (AT) - C
Sawbones Bay - August 2023

Maximum Value: 29.5 C on Aug 29 15:00		Maximum Daily Average: 20.7 C on Aug 28		Hours in Service: 744																																													
Minimum Value: 4.9 C on Aug 8 04:00		Minimum Daily Average: 11.9 C on Aug 10		Hours of Data: 744																																													
Maximum Diurnal Average: 21.1 C at hour 17		Minimum Diurnal Average: 11.4 C at hour 6		Hours of Missing Data: 0																																													
Monthly Average: 16.27 C		Percentiles: P ₁ = 7.1 P ₁₀ = 10.7 Q ₁ = 12.8 Median = 15.6 Q ₃ = 19.7 P ₉₀ = 22.7 P ₉₉ = 27.7		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-Aug	16.1	16.0	15.0	14.9	14.2	14.1	14.6	15.3	16.8	17.8	19.5	20.4	21.8	22.8	23.2	23.5	22.8	21.9	21.2	19.7	17.6	16.3	16.7	15.8	18.3	23.5																							
2-Aug	14.5	14.5	13.4	12.2	11.1	11.3	11.8	12.8	15.2	17.0	18.4	19.2	20.6	20.9	21.7	22.3	22.0	21.8	21.0	19.4	17.1	15.6	14.7	14.4	16.8	22.3																							
3-Aug	13.9	14.0	14.3	13.9	14.1	13.8	13.9	15.3	16.6	17.5	18.6	20.0	20.8	21.1	18.5	18.0	20.5	22.0	21.4	20.1	17.5	15.9	15.2	15.4	17.2	22.0																							
4-Aug	14.6	13.0	13.1	12.8	12.3	12.6	13.7	14.4	15.2	15.9	17.3	18.5	19.8	20.7	21.2	21.7	21.9	16.4	15.6	16.0	16.1	15.4	14.7	14.6	16.1	21.9																							
5-Aug	13.8	14.1	12.6	12.8	12.2	12.0	12.3	14.0	15.8	17.3	19.2	20.8	21.8	22.8	23.2	23.9	23.5	23.6	22.1	21.0	18.2	16.1	15.7	13.8	17.6	23.9																							
6-Aug	11.6	11.3	10.6	10.4	10.4	11.1	12.2	14.4	16.6	18.9	20.4	21.6	21.6	22.4	20.7	17.3	18.3	20.3	18.9	18.4	16.9	15.7	14.6	14.1	16.2	22.4																							
7-Aug	14.0	13.3	12.5	11.3	10.1	9.6	10.9	12.5	14.2	15.3	16.3	17.1	17.6	18.5	19.0	19.1	19.5	19.4	18.9	17.4	14.8	12.1	10.0	8.8	14.7	19.5																							
8-Aug	8.2	7.0	6.5	4.9	5.4	5.9	9.6	12.3	15.3	17.1	18.3	19.0	19.3	19.6	19.4	19.3	18.6	18.3	17.5	16.5	15.4	14.6	14.2	13.9	14.0	19.6																							
9-Aug	13.4	12.9	12.9	12.9	12.5	12.4	12.5	12.9	12.7	13.3	13.6	13.6	14.1	14.2	14.3	13.8	13.2	13.1	13.1	12.7	12.1	11.9	11.7	11.5	13.0	14.3																							
10-Aug	11.5	11.5	11.4	11.3	11.4	11.3	11.3	11.4	11.6	12.1	12.3	12.8	13.0	12.7	13.1	13.0	13.1	12.6	12.1	11.7	11.4	11.1	11.0	10.9	11.9	13.1																							
11-Aug	10.9	10.8	10.8	10.8	10.7	10.6	10.7	11.0	11.4	12.0	13.0	13.3	13.9	14.6	15.0	15.4	15.7	16.5	16.5	14.5	13.2	12.1	12.1	14.3	12.9	16.5																							
12-Aug	13.8	13.3	13.7	13.6	13.2	13.2	13.3	13.3	13.9	15.3	15.0	14.9	15.6	17.3	19.7	19.0	19.0	18.2	18.1	17.4	16.9	16.2	15.2	15.3	15.6	19.7																							
13-Aug	13.5	11.5	11.5	11.1	9.9	9.8	10.4	15.0	19.0	21.0	22.6	23.4	24.2	25.1	25.5	26.0	26.2	26.3	25.8	23.9	21.2	19.7	18.8	19.4	19.2	26.3																							
14-Aug	21.2	20.7	18.9	18.8	19.6	19.7	19.9	20.3	20.6	20.2	19.8	20.7	21.1	20.0	20.2	20.8	21.9	22.1	21.5	19.3	15.7	13.8	12.0	10.4	19.1	22.1																							
15-Aug	10.0	8.9	8.6	8.7	8.6	8.7	9.7	11.7	14.2	16.2	16.6	15.7	16.4	16.8	18.2	19.2	19.0	18.9	18.3	14.3	12.1	12.6	12.4	12.2	13.7	19.2																							
16-Aug	12.1	11.8	11.2	11.1	10.8	10.7	11.2	11.6	12.5	13.4	14.3	15.9	16.8	18.0	18.8	19.1	19.1	19.1	18.7	16.6	12.9	11.5	11.5	11.8	14.2	19.1																							
17-Aug	11.9	12.1	13.2	13.9	13.5	12.9	15.0	17.8	19.5	20.8	21.9	23.3	25.4	26.1	26.5	26.1	26.2	24.8	22.9	21.2	20.1	19.6	18.3	17.1	19.6	26.5																							
18-Aug	16.2	15.5	15.0	14.4	14.0	13.7	13.6	13.5	13.3	13.3	13.3	13.3	12.8	13.0	13.8	14.0	14.0	13.7	13.4	13.0	12.3	11.9	11.4	10.8	10.4	13.3	16.2																						
19-Aug	10.2	9.8	9.7	9.5	8.9	7.9	7.9	8.2	9.2	10.8	12.2	14.0	14.9	15.3	15.9	16.5	16.4	16.6	16.2	15.0	12.5	11.3	10.7	9.9	12.1	16.6																							
20-Aug	8.6	7.5	7.5	8.1	7.8	8.9	10.7	13.1	15.5	17.4	18.8	19.7	20.8	21.6	22.4	23.0	22.5	21.9	20.0	16.6	13.4	12.1	10.5	9.2	14.9	23.0																							
21-Aug	8.8	8.4	7.1	6.7	6.5	5.5	7.3	10.3	13.0	15.7	17.8	19.1	20.1	20.9	21.9	21.9	22.1	21.3	20.3	18.4	16.3	14.7	12.7	12.4	14.6	22.1																							
22-Aug	11.8	9.6	8.8	9.1	8.5	8.4	9.6	11.4	14.8	18.4	19.6	20.1	20.3	20.6	20.9	21.2	20.5	20.3	19.8	17.9	16.2	15.2	14.5	13.0	15.4	21.2																							
23-Aug	11.9	11.2	10.4	10.7	11.8	11.7	12.9	14.0	15.9	16.4	17.2	18.1	18.9	20.2	20.0	18.7	19.3	19.4	18.7	17.3	16.1	15.8	15.7	15.5	15.7	20.2																							
24-Aug	14.9	14.8	14.4	14.1	13.7	13.4	13.2	13.2	13.6	13.9	14.2	15.4	16.0	16.3	16.9	17.7	18.5	18.4	17.6	16.2	15.4	14.8	13.1	13.3	15.1	18.5																							
25-Aug	12.6	9.9	9.0	8.4	7.8	7.1	8.3	12.1	15.6	18.3	19.6	20.5	21.3	21.5	22.2	22.7	22.3	21.7	20.2	16.8	14.7	13.6	13.1	12.6	15.5	22.7																							
26-Aug	12.1	11.8	11.3	10.7	10.3	10.6	12.0	15.1	17.6	19.9	21.9	23.5	24.1	25.0	25.8	26.5	26.3	25.7	23.7	22.0	21.2	20.1	18.4	16.2	18.8	26.5																							
27-Aug	15.5	14.6	13.7	12.8	12.2	11.5	11.0	13.9	16.0	18.2	20.3	21.7	22.3	22.7	23.8	24.6	24.6	24.0	21.8	19.9	17.4	15.4	14.7	14.8	17.8	24.6																							
28-Aug	14.8	15.2	16.3	16.1	16.7	13.9	15.7	17.7	19.1	20.9	22.8	24.6	25.8	26.8	27.6	28.7	28.5	26.6	25.3	22.2	20.1	18.2	17.8	16.3	20.7	28.7																							
29-Aug	15.5	14.5	13.7	13.3	13.1	13.2	13.7	15.5	18.1	20.6	23.8	26.3	27.7	28.9	29.5	29.3	29.3	28.1	25.7	22.1	20.2	19.0	18.8	17.6	20.7	29.5																							
30-Aug	16.1	15.6	14.7	13.6	13.0	12.2	12.9	16.8	21.1	22.3	25.7	25.5	23.2	22.7	25.0	25.0	23.7	23.3	21.5	19.3	18.6	17.8	15.7	15.0	19.2	25.7																							
31-Aug	15.9	17.5	16.9	16.9	16.3	15.3	16.1	15.7	16.7	19.0	22.2	24.1	25.0	25.7	26.4	26.7	26.3	25.2	23.8	21.6	19.9	18.8	18.3	17.5	20.3	26.7																							
																								13.2	12.7	12.2	11.9	11.6	11.4	12.2	13.8	15.5	17.0	18.3	19.2	19.9	20.5	21.0	21.1	20.7	19.7	18.0	16.2	15.1	14.3	13.8	Diurnal Average		
																								21.2	20.7	18.9	18.8	19.6	19.7	19.9	20.3	21.1	22.3	25.7	26.3	27.7	28.9	29.5	29.3	29.3	28.1	25.8	23.9	21.2	20.1	18.8	19.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Sawbones Bay - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Sawbones Bay - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	52	6.99	6.99
10 - 20	518	69.62	76.61
> 20	174	23.39	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association

Summary of Hour Averages

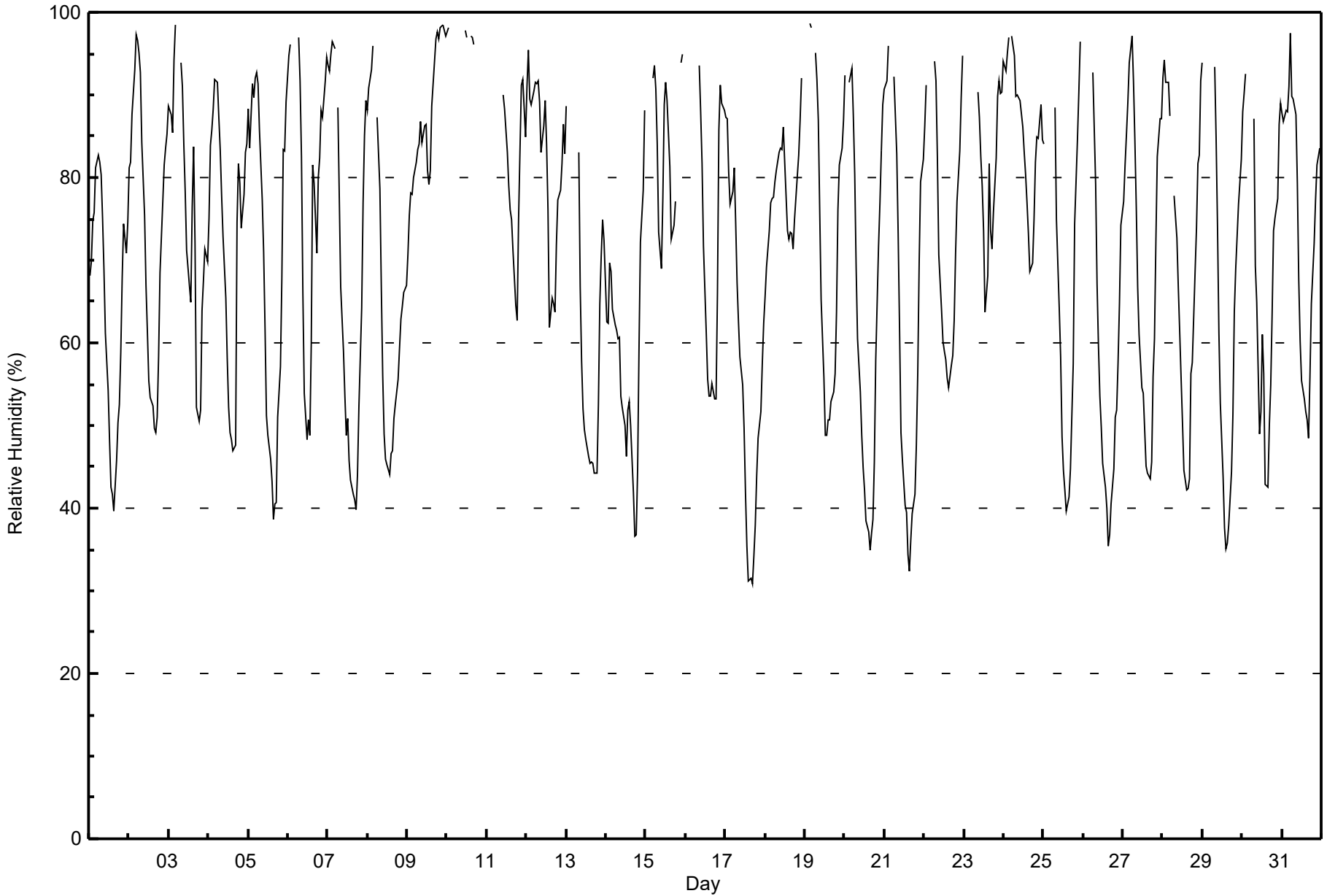
Relative Humidity (RH) - %
Sawbones Bay - August 2023

Maximum Value: 98.7 % on Aug 19 04:00																						Maximum Daily Average: 86.7 % on Aug 9																						Hours in Service: 744																											
Minimum Value: 30.8 % on Aug 17 17:00																						Minimum Daily Average: 54.8 % on Aug 26																						Hours of Data: 640																											
Maximum Diurnal Average: 88.4 % at hour 5																						Minimum Diurnal Average: 54.3 % at hour 15																						Hours of Missing Data: 104																											
Monthly Average: 70.89 %																						Percentiles: P ₁ = 35.0 P ₁₀ = 44.8 Q ₁ = 54.6 Median = 74.2 Q ₃ = 87.0 P ₉₀ = 92.2 P ₉₉ = 97.8																						Hours of Calibration: 0																											
																																												Percent Operational Time: 86.0																											
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-Aug	68.2	69.8	74.8	75.7	81.1	82.7	81.9	80.3	75.1	68.8	61.2	54.3	48.2	42.6	41.8	39.7	45.7	50.4	52.6	58.8	67.9	74.4	70.9	74.6	64.2	82.7																																													
2-Aug	81.1	81.9	87.7	93.1	97.4	96.6	95.1	92.8	84.2	75.4	66.9	61.3	55.5	53.5	52.3	49.7	49.2	51.0	58.4	68.4	77.1	81.6	83.6	85.3	74.1	97.4																																													
3-Aug	88.7	87.6	85.4	94.2	98.5	OR	OR	93.8	91.1	84.0	78.2	71.2	66.9	64.9	76.4	83.8	72.0	52.2	50.5	51.8	63.9	67.4	71.3	69.9	75.6	98.5																																													
4-Aug	75.1	83.9	85.7	88.4	91.9	91.6	87.3	83.3	77.7	73.0	65.3	58.2	52.2	49.2	48.4	47.0	47.6	74.6	81.7	79.4	73.9	78.0	83.1	84.1	73.4	91.9																																													
5-Aug	88.2	83.6	91.3	89.7	92.1	92.7	91.4	85.8	77.3	71.1	61.7	51.2	48.8	45.9	43.3	38.6	40.6	40.6	51.0	57.2	67.8	83.4	83.3	89.1	69.4	92.7																																													
6-Aug	94.7	96.1	OR	OR	OR	OR	96.9	91.7	82.5	66.1	53.9	48.3	50.6	48.9	60.0	81.5	79.4	70.8	79.9	82.3	88.2	87.3	91.7	94.6	77.3	96.9																																													
7-Aug	93.5	92.9	94.9	96.4	95.6	OR	88.4	77.6	66.8	59.0	53.5	48.9	50.8	45.7	43.3	41.6	41.1	39.8	44.1	52.2	64.2	77.0	85.0	89.3	67.0	96.4																																													
8-Aug	88.1	90.8	93.0	96.0	OR	OR	87.4	78.6	66.7	56.2	48.9	45.9	45.3	44.1	46.7	47.0	50.9	52.5	55.7	59.4	63.0	64.5	66.1	67.0	64.3	96.0																																													
9-Aug	70.6	75.4	78.1	78.0	80.0	81.9	83.4	84.1	86.8	84.3	86.4	86.4	80.8	79.1	80.9	88.6	94.0	96.7	97.6	96.8	98.1	98.5	97.8	97.2	86.7	98.5																																													
10-Aug	97.6	98.2	OR	OR	OR	OR	OR	OR	OR	OR	OR	97.8	96.9	OR	97.1	97.0	96.0	OR	OR	OR	OR	OR	OR	OR	--	98.2																																													
11-Aug	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	90.1	88.4	83.0	78.9	76.1	74.9	71.1	64.6	62.7	74.9	83.2	91.1	91.8	84.9	--	91.8																																													
12-Aug	91.1	95.5	89.5	88.9	90.4	91.6	91.3	91.7	89.2	83.1	86.2	89.4	84.1	76.2	61.9	65.4	64.7	63.7	71.9	77.4	78.4	81.6	86.4	82.9	82.2	95.5																																													
13-Aug	88.7	OR	OR	OR	OR	OR	OR	83.0	66.8	57.8	52.1	49.4	48.3	46.3	45.4	45.6	45.4	44.3	44.3	52.6	64.7	70.5	74.9	72.4	58.5	88.7																																													
14-Aug	62.6	62.4	69.7	68.7	64.1	62.2	61.5	60.5	60.6	53.5	52.2	50.0	46.2	51.9	52.9	50.0	41.9	36.6	36.7	44.8	59.6	72.2	78.5	88.2	57.8	88.2																																													
15-Aug	OR	OR	OR	OR	92.1	93.5	90.7	84.0	73.5	69.1	77.4	88.8	91.5	89.3	81.4	72.6	73.4	74.2	77.1	OR	OR	94.0	94.9	OR	--	94.9																																													
16-Aug	OR	OR	OR	OR	OR	OR	OR	OR	93.6	87.9	81.7	71.6	61.2	55.7	53.6	53.6	55.0	53.2	53.2	66.1	85.8	91.1	89.0	88.2	--	93.6																																													
17-Aug	87.3	87.1	80.6	76.7	78.3	81.2	74.6	67.2	62.5	58.4	54.9	49.6	41.9	35.4	31.2	31.5	30.8	34.3	38.0	43.9	48.4	51.6	57.5	62.4	56.9	87.3																																													
18-Aug	65.5	69.1	73.6	76.9	77.5	77.7	79.5	80.8	83.1	83.6	83.5	86.0	81.9	73.5	72.5	73.4	73.3	71.4	74.9	80.2	82.8	87.0	92.0	OR	78.3	92.0																																													
19-Aug	OR	OR	OR	98.7	98.1	OR	95.0	91.9	87.0	75.9	65.2	55.7	48.8	48.8	50.7	50.6	52.8	54.1	56.3	63.7	76.0	81.5	83.5	87.0	71.1	98.7																																													
20-Aug	92.3	OR	OR	91.6	93.2	87.4	80.3	69.2	60.5	54.0	48.8	45.0	42.2	38.4	37.2	35.0	37.0	38.6	45.7	58.0	71.8	77.0	83.2	88.8	62.5	93.2																																													
21-Aug	90.7	91.8	95.9	OR	OR	OR	92.2	82.9	73.2	61.7	49.1	45.9	40.3	39.5	34.4	32.4	36.1	39.4	41.7	47.6	56.5	69.7	79.5	82.2	61.1	95.9																																													
22-Aug	86.2	91.1	OR	95.0	OR	OR	94.1	91.7	82.6	70.7	63.8	60.2	58.9	58.0	55.7	54.6	57.3	58.4	62.7	70.9	77.2	83.2	89.7	94.8	74.1	95.0																																													
23-Aug	OR	OR	OR	OR	OR	OR	OR	OR	90.4	87.3	82.5	78.9	73.6	63.7	68.1	81.7	73.5	71.3	75.8	82.3	89.9	91.6	90.1	90.3	--	91.6																																													
24-Aug	94.0	92.9	95.0	97.0	OR	97.1	94.8	89.8	90.0	89.6	89.3	86.0	83.0	80.3	76.9	73.2	68.6	69.6	74.9	81.9	84.9	84.8	88.8	84.5	85.5	97.1																																													
25-Aug	84.1	OR	OR	OR	OR	OR	OR	88.5	75.0	64.2	58.2	48.6	44.6	42.2	39.7	41.3	44.7	51.2	57.4	74.4	84.5	90.3	96.5	OR	--	96.5																																													
26-Aug	OR	OR	OR	OR	OR	OR	92.6	79.1	67.1	59.7	53.6	49.8	45.4	42.6	40.0	35.4	36.8	40.6	44.7	51.1	51.8	57.6	64.7	74.3	54.8	92.6																																													
27-Aug	77.2	81.6	85.3	89.2	94.0	97.1	91.8	84.6	76.4	66.7	61.1	54.6	53.9	49.5	45.0	44.3	43.6	45.5	55.9	60.5	72.3	82.6	87.2	87.1	70.3	97.1																																													
28-Aug	92.1	94.2	91.5	91.5	87.5	OR	OR	77.8	72.8	66.7	61.4	55.8	50.3	44.6	42.1	42.3	43.6	56.3	57.6	68.6	74.0	81.8	82.7	91.8	69.4	94.2																																													
29-Aug	93.8	OR	OR	OR	OR	OR	OR	93.4	84.7	74.1	61.2	52.7	43.8	37.7	35.1	35.7	38.0	44.4	51.4	63.7	69.0	72.8	76.8	82.2	61.7	93.8																																													
30-Aug	88.0	90.1	92.5	OR	OR	OR	OR	87.1	69.3	64.9	49.0	51.7	61.0	56.3	42.9	42.6	50.0	54.9	63.5	73.5	75.1	77.5	86.4	89.0	68.3	92.5																																													
31-Aug	87.7	86.8	88.2	88.0	91.0	97.5	89.9	89.6	87.7	79.3	67.6	60.1	55.4	53.3	51.6	50.6	48.5	56.0	64.7	72.0	77.3	81.6	82.5	83.5	74.6	97.5																																													
																						85.1		85.8		86.3		88.1		88.4		87.9		87.6		83.7		77.7		70.6		65.5		62.6		59.2		54.5		54.3		54.9		54.9		55.0		59.4		66.0		73.3		79.4		83.0		83.9		Diurnal Average	
																						97.6		98.2		95.9		98.7		98.5		97.5		96.9		93.8		93.6		89.6		90.1		97.8		96.9		89.3		97.1		97.0		96.0		96.7		97.6		96.8		98.1		98.5		97.8		97.2		Diurnal Maximum	
OR - Out of Range																																																																							



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Sawbones Bay - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Sawbones Bay - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	29	4.53	4.53
40 - 60	170	26.56	31.09
60 - 80	186	29.06	60.16
80 - 100	255	39.84	100.00

Total Number of Valid Hours: 640

Total Number of Hours: 744



Maximum Speed: 26 km/h on Aug 1 14:00	Maximum Daily Speed Average: 16.9 km/h on Aug 1	Hours in Service: 744
Minimum Speed Value: 0 km/h on Aug 6 09:00	Minimum Daily Speed Average: 1.0 km/h on Aug 6	Hours of Data: 744
Maximum Diurnal Speed Average: 5.6 km/h at hour 14	Minimum Diurnal Speed Average: 1.8 km/h at hour 21	Hours of Missing Data: 0
Monthly Average Velocity: 3.3 km/h 263.1 deg	Percentiles: P ₁ = 1 P ₁₀ = 3 Q ₁ = 6 Median = 9 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 22	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-Aug	WSW14	WSW18	WSW13	WSW19	WSW15	WSW16	W19	W19	W21	WNW21	W19	WNW21	W23	W26	W23	W25	WNW22	NW19	WNW16	NW12	NW8	WNW8	W13	WNW13	W16.9	W26	
2-Aug	WNW11	W13	WNW14	WNW15	WNW8	WNW7	W6	W3	SW3	WNW3	NW5	NW7	WNW6	WNW6	SW7	W7	NW8	NNW6	NNE7	NNE5	ENE3	E4	NE3	E5	WNW4.8	WNW15	
3-Aug	ESE5	E5	E5	SSW7	SW13	SSE7	ESE9	NNE1	SSE5	SSE8	SSE8	S7	S4	SW1	N6	ENE4	WNW1	W16	WNW17	WNW14	WNW10	WNW10	WNW13	W13	WSW2.7	WNW17	
4-Aug	W13	WNW11	W13	W12	WNW15	WNW13	WNW13	WNW15	WNW17	WNW15	WNW13	WNW12	WNW15	WNW13	WNW13	W12	W9	NW5	W4	WSW7	W14	W13	WNW10	W11	WNW11.7	WNW17	
5-Aug	WNW12	W14	WNW10	W13	W13	W11	W11	W10	WNW10	WNW10	WNW11	WNW12	NW11	WNW13	NW11	NW8	NW7	NNW8	NW0	SSE2	S6	SE4	SSE2	WNW7.9	W14		
6-Aug	NNE1	N3	NE1	S3	WNW2	WSW1	S1	S1	NNW0	WNW2	NW3	N1	N3	NW7	N8	NNE7	E6	S5	SSW5	NE2	NNE6	NE5	ENE2	S3	NNE1.0	N8	
7-Aug	N6	N6	N5	NNE6	N5	N5	N7	NNE8	NNE9	NNE11	NNE11	NNE9	N9	NNW10	N12	N13	N13	N12	N11	N7	N6	NNE6	NNE4	NNE3	N7.9	N13	
8-Aug	NE3	E3	ESE2	NE2	NE5	ENE4	E5	ESE6	SE6	ESE6	SSE4	ESE7	E9	E7	ENE10	E9	E10	E12	ESE12	ESE11	ESE13	ESE13	SE10	SE9	ESE6.8	ESE13	
9-Aug	SE7	SE7	SE7	SE8	SE9	SE8	ESE8	SE9	SE10	SE9	SE10	ESE11	ESE14	SE13	SE11	SE10	ESE11	ESE10	SE10	SE13	ESE14	SE12	ESE11	ESE10	SE10.0	ESE14	
10-Aug	ESE12	ESE13	ESE14	ESE13	ESE13	ESE12	ESE11	ESE11	E10	E9	E10	E8	E8	ENE8	NE8	NE8	NE7	NNE9	NNE9	NNE10	N9	N11	N11	N10	ENE7.6	ESE14	
11-Aug	NNW10	NNW12	NNW12	NNW12	NNW11	NNW13	NNW11	NNW12	NW11	NNW10	NNW10	NW9	NW9	NW9	NW10	NW9	NW10	WNW9	NW7	NW1	ESE2	SSE4	S5	WSW13	NW7.8	WSW13	
12-Aug	SW7	SW5	WSW12	WSW12	WSW10	WSW10	W13	WNW13	WNW11	WNW15	WNW15	WNW13	WNW15	WNW9	NW13	NNW7	NW9	WNW10	WNW8	W8	WNW12	WNW12	WNW11	W10	WNW10.1	WNW15	
13-Aug	SW5	S5	SSW5	S4	S5	S6	SSE6	S7	SSW10	SSW15	SW17	SW20	SW20	WSW20	WSW22	SW21	SW20	SW19	WSW16	SSW11	SSW8	SSW9	SSW8	SSW10	SW11.4	WSW22	
14-Aug	WSW14	WSW13	SW11	SW13	WSW18	W21	W20	WNW21	WNW21	NNW14	NNW8	WNW13	WNW17	WNW12	WNW14	WNW11	NW11	WNW11	NNW8	N1	SSE2	S4	NNW2	S3	W9.7	WNW21	
15-Aug	S5	S4	S5	S6	S5	S5	S6	S9	S12	S10	SSW11	SW8	S7	SSW9	SSW10	SW14	SW12	SW12	SW10	WNW15	SW8	W17	WNW17	WNW12	SW7.0	WNW17	
16-Aug	WNW12	WNW13	WNW14	WNW9	WNW9	WNW11	WNW11	WNW14	WNW16	WNW13	WNW13	WNW12	WNW13	WNW15	W13	W14	WSW13	WSW13	WSW11	SE2	SSE7	S8	S10	S9	W9.2	WNW16	
17-Aug	S10	S9	SSE11	S10	S10	S8	S8	SSW11	SW14	SW17	SW15	WSW14	WSW18	WNW23	WNW23	WNW23	WNW20	WNW18	WNW12	WNW9	WNW11	WNW14	WNW9	NW5	WSW9.8	WNW23	
18-Aug	N6	NNW7	N8	N7	N8	N9	N11	N13	N13	N16	N16	N16	N14	N14	N14	NNW14	NNW15	NNW12	NW9	NW8	NW10	NW10	WNW10	WNW9	NNW10.3	N16	
19-Aug	WNW9	NW8	NW8	NW10	NW9	WNW11	WNW15	WNW15	W16	W15	W17	W17	WNW16	WNW16	WNW15	WNW15	W16	W16	W15	WSW11	SSW7	SSW6	SSW8	SSW7	W11.1	W17	
20-Aug	S8	S8	S8	SSW9	SSW9	SSW10	SSW9	SW13	SW13	SW15	WSW14	WSW13	SW11	SW10	SSW7	SSW7	SSW7	S7	S9	SSW8	S7	S6	S5	S7	SSW8.7	SW15	
21-Aug	S6	SSE4	SSE2	S4	SSE4	S4	SSW3	SSE2	SSE4	SSW3	SSW3	SSE4	SE4	ESE7	SSE9	SE8	SSE8	SSE6	ESE5	ESE5	E5	SE6	SE5	ESE6	SSE4.4	SSE9	
22-Aug	SE6	ESE4	E5	E4	ESE6	ESE6	E5	ESE4	SSE4	SSW5	SE10	SSE9	SSE9	SE8	ESE9	ESE8	ESE6	ESE6	ESE5	ENE3	E4	ESE6	SE6	SE3	ESE5.4	SE10	
23-Aug	SE3	ESE5	ESE3	SSE3	E2	E5	ESE4	SE1	SE2	NNE3	NE5	E6	E4	ENE3	NE2	NNE9	NE6	NE7	NE5	NE4	NNE6	NNE5	NE3	NE4	ENE3.1	NNE9	
24-Aug	NE3	E3	NNE3	N5	N6	N9	N11	N13	N14	NNE15	NNE13	NNE13	N12	N13	N12	NNW13	NNW13	NW10	NW7	NW6	WNW9	WNW9	WSW3	SW4	N7.8	NNE15	
25-Aug	W6	S3	S6	S7	S7	SSW4	S3	S5	S7	SSW9	SW11	SW12	SW13	SW13	SW12	SSW12	SW12	SSW11	SSW9	S6	S7	S9	S9	S8	SSW7.7	SW13	
26-Aug	S8	S10	SSE9	S9	S9	SSE10	S11	S10	SSW12	SSW10	SSW11	SW13	SW16	WSW16	WSW17	W15	W19	WSW13	SW11	WSW10	W15	W14	W13	NW8	SW9.1	W19	
27-Aug	N8	NNW5	NNW7	N7	NNW5	WNW2	SE1	WNW2	NNW3	N3	SSW3	S3	WSW4	W7	WSW6	SSW7	SW8	SSW11	SSW12	SW12	SSW7	S6	S6	SSW3	WSW3.0	SW12	
28-Aug	SSW6	SSW6	SW6	SW7	WSW8	S7	WSW7	W14	W11	W9	WSW7	SW8	W7	WNW11	WNW10	SW5	SW3	SSE4	ESE4	SSW8	S8	S3	S2	S3	SW5.2	W14	
29-Aug	S5	S7	SSE4	SSE5	SSE6	SSE6	SSE6	SSE5	SSE6	S7	S8	S9	SSW10	SW11	SSW11	SW10	SSW7	S5	SSE5	S6	SSE7	SE6	ESE8	SE7	S6.2	SW11	
30-Aug	SSE7	SSE6	ESE6	E3	ENE2	E3	ESE2	S2	SSE5	SSE4	NNW1	SSE7	S5	ESE7	ESE9	ESE7	ESE9	E1	ENE2	NNE4	NE4	E3	NNE1	SE5	ESE3.3	ESE9	
31-Aug	ESE8	SSW11	SSE5	SSW4	WSW3	SSW4	W8	WNW12	WNW8	WNW9	W5	WNW5	NW7	WNW8	NW9	NW9	WNW14	WNW15	WNW15	WNW15	WNW15	WNW13	WNW10	W13	W14	WNW7.4	WNW15

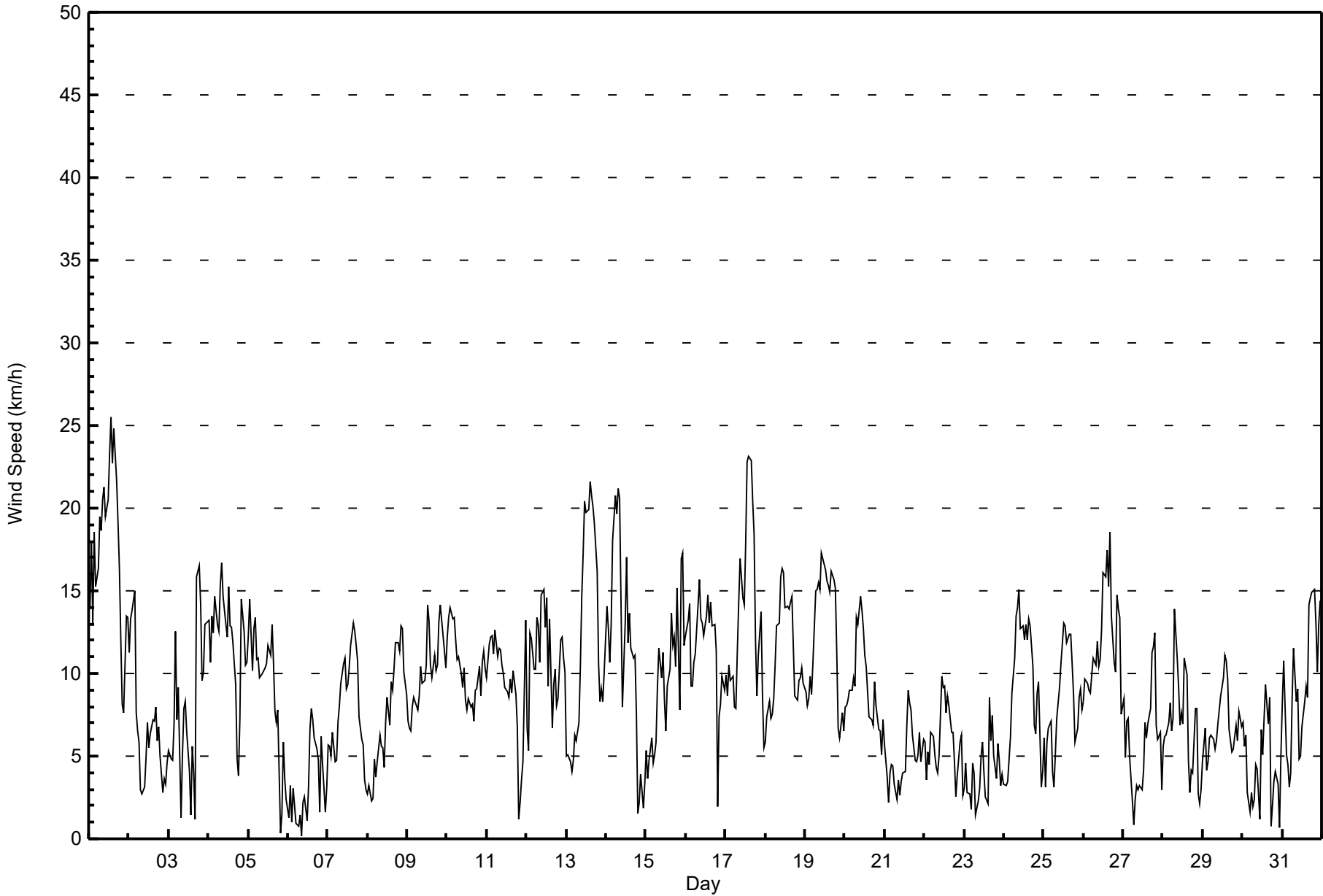
SW2.4 SW2.6 SW2.1WSW2.9WSW3.1WSW2.8WSW2.7 W3.7 W3.9 W3.9 W3.7 W4.2 W5.0 W5.6WNW5.4NNW4.8NNW4.7 W4.6 W3.5 W2.7WSW1.8WSW2.3WSW2.4WSW2.7	Diurnal Average
WSW14WSW18WNW14WSW19WSW18 W21 W20WNW21WNW21WNW21 W19WNW21 W23 W26WNW23 W25WNW22 NW19WNW17WNW15 W15 W17WNW17 W14	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Sawbones Bay - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Sawbones Bay - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	181	24.33	24.33
6 - 11	349	46.91	71.24
12 - 19	192	25.81	97.04
20 - 28	22	2.96	100.00
29 - 38	0	0.00	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
Sawbones Bay - August 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	9	10	15	10	17	14	8	24	30	11	7	4	3	7	6	6	181
6 - 11	24	15	5	2	11	30	23	22	50	39	15	10	13	44	31	15	349
12 - 19	17	3	0	0	1	11	3	0	1	4	21	22	35	60	3	11	192
20 - 28	0	0	0	0	0	0	0	0	0	0	4	2	7	9	0	0	22
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	28	20	12	29	55	34	46	81	54	47	38	58	120	40	32	744

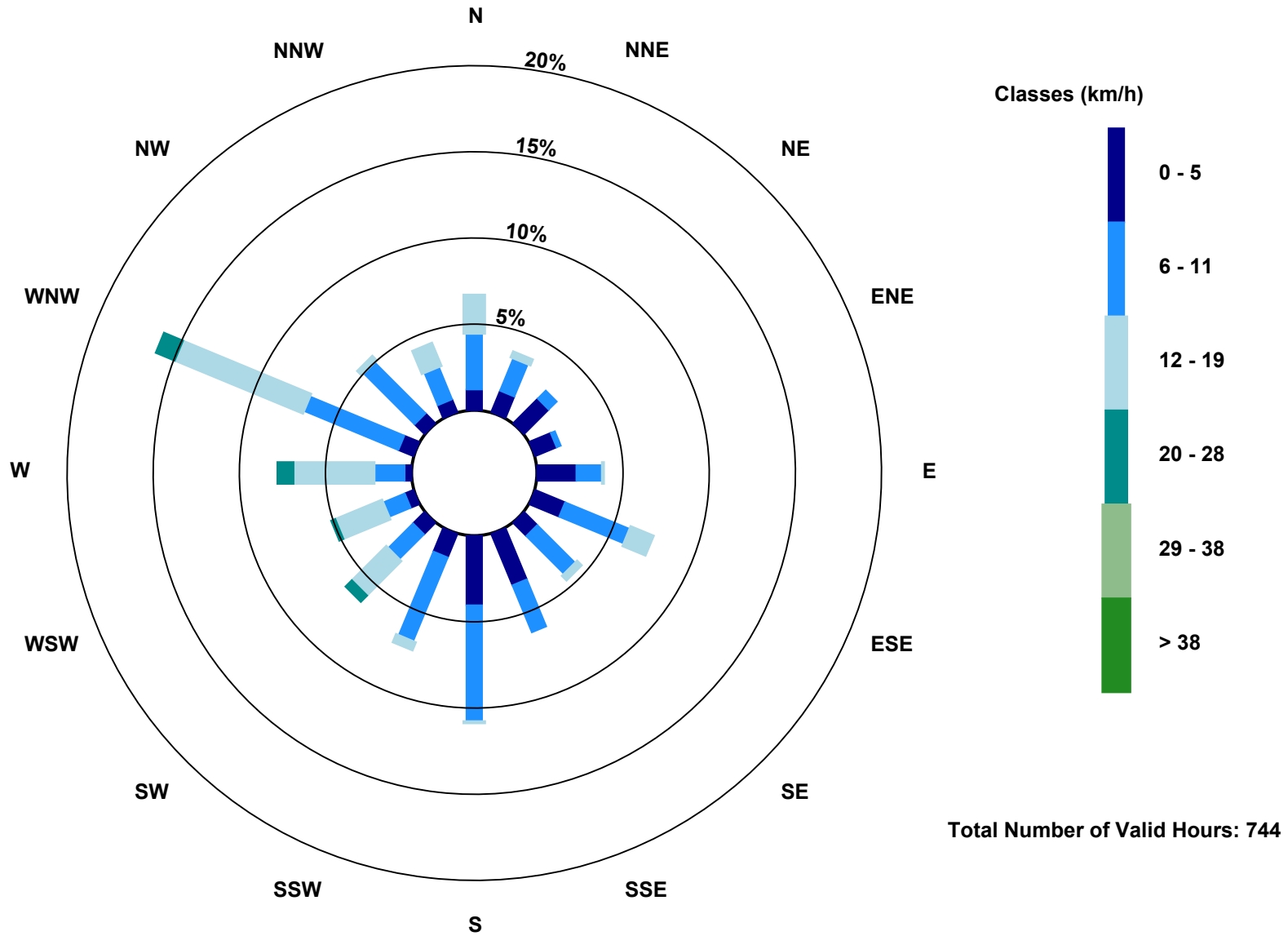
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Sawbones Bay





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Sawbones Bay - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 11 km/h on Aug 15 20:00														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 km/h on Aug 29 20:00																									
Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 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-Aug	4	4	5	4	5	4	4	4	5	5	4	5	6	6	6	6	5	5	4	3	1	1	3	3	6
2-Aug	3	3	3	3	2	2	2	2	1	2	3	2	3	3	4	3	2	2	2	1	1	1	1	2	4
3-Aug	1	2	2	3	3	2	3	1	3	3	3	3	2	2	4	1	5	4	4	3	1	1	2	4	5
4-Aug	4	3	3	3	3	2	2	4	3	3	3	4	4	4	4	4	3	8	4	4	4	3	2	3	8
5-Aug	3	3	2	3	3	2	2	2	2	2	2	3	3	4	4	4	2	2	4	2	1	2	1	2	4
6-Aug	1	1	1	2	1	1	1	1	1	2	2	2	3	3	3	3	2	2	1	2	1	2	1	1	3
7-Aug	2	2	2	1	2	1	2	2	3	3	3	3	4	4	4	4	3	3	2	1	1	1	1	1	4
8-Aug	1	1	2	2	1	1	2	2	2	3	2	4	3	4	3	3	4	3	3	3	3	3	2	2	4
9-Aug	1	1	1	2	2	2	1	2	2	3	3	3	4	4	3	2	2	2	3	4	3	3	3	2	4
10-Aug	3	3	3	3	3	2	3	3	3	3	3	2	3	3	2	3	2	2	2	2	2	2	3	2	3
11-Aug	2	2	3	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	4	4
12-Aug	3	3	3	4	4	3	3	3	2	3	3	4	3	2	4	3	6	3	3	3	2	3	2	2	6
13-Aug	2	1	1	1	1	2	1	2	4	4	5	5	5	6	5	6	5	5	5	2	2	2	2	3	6
14-Aug	5	4	2	3	4	4	4	5	4	5	2	3	4	3	3	3	2	1	2	1	1	2	2	5	5
15-Aug	1	2	2	1	2	1	1	2	2	2	3	3	2	3	3	4	3	4	3	11	3	5	4	2	11
16-Aug	3	4	3	2	2	2	3	3	3	3	3	4	3	4	4	4	4	4	5	2	1	1	1	1	5
17-Aug	1	1	2	2	2	2	2	3	4	4	4	4	5	5	5	5	5	4	4	3	4	3	2	2	5
18-Aug	1	2	2	2	1	2	2	3	3	3	4	4	3	4	3	3	3	3	2	1	2	2	2	2	4
19-Aug	2	2	2	2	1	2	3	3	3	4	4	4	4	4	4	3	4	4	4	4	2	2	2	2	4
20-Aug	1	1	1	2	1	2	3	3	4	4	4	4	4	4	3	3	3	3	2	2	1	2	2	3	4
21-Aug	3	2	1	2	1	2	2	2	1	1	1	3	3	3	4	3	3	2	1	1	1	1	1	1	4
22-Aug	1	1	1	1	1	1	1	1	2	2	3	4	4	3	3	2	2	2	1	1	1	1	1	1	4
23-Aug	2	1	2	2	2	1	2	1	1	1	1	2	2	2	3	2	2	2	2	1	1	1	1	1	3
24-Aug	1	1	1	1	1	2	2	3	3	4	3	3	3	3	3	3	3	3	1	1	1	1	1	1	4
25-Aug	3	2	1	2	1	2	1	2	2	3	3	4	4	4	4	4	4	3	3	1	1	1	1	1	4
26-Aug	1	1	1	1	1	1	2	3	3	3	3	4	5	5	4	4	4	4	3	3	3	3	2	1	5
27-Aug	1	1	2	1	2	2	1	2	1	1	1	2	3	3	3	2	3	3	3	3	2	1	1	2	3
28-Aug	2	1	2	2	4	1	4	3	3	3	2	2	2	3	2	2	2	2	1	2	1	3	2	2	4
29-Aug	2	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	2	1	1	0	1	1	1	1	3
30-Aug	1	1	1	1	1	1	3	2	2	1	2	4	4	3	4	2	3	1	1	1	1	2	2	2	4
31-Aug	2	4	2	2	3	2	3	2	2	2	2	3	3	3	3	3	4	3	3	3	3	4	4	4	4
														Diurnal Maximum											



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Sawbones Bay - August 2023

Direction of Maximum Speed: 267 deg on Aug 1 14:00 Direction of Maximum Daily Speed Average: 275.4 deg on Aug 1	Hours in Service: 744 Hours of Data: 744 Hours of Missing Data: 0
Direction of Minimum Speed: 335 deg on Aug 6 09:00 Direction of Minimum Daily Speed Average: 1.0 deg on Aug 6	Percent Operational Time: 100.0
Monthly Average Direction: 263.1 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-Aug	251	258	251	257	253	258	266	262	265	282	276	285	266	267	280	280	298	304	297	312	318	299	279	285	275.4
2-Aug	286	279	284	286	295	283	281	277	234	299	314	315	286	289	233	277	316	328	18	26	58	80	53	90	297.3
3-Aug	120	98	94	204	216	156	115	19	152	154	163	171	177	216	9	61	301	275	289	293	299	303	292	265	245.9
4-Aug	268	293	266	279	286	286	296	299	292	302	298	291	297	296	303	278	279	304	275	251	272	265	284	272	285.6
5-Aug	288	276	295	278	280	271	279	281	286	287	297	290	294	306	294	304	326	316	344	310	154	175	143	158	288.8
6-Aug	24	351	47	178	290	247	181	181	335	282	317	4	358	306	9	21	97	179	195	41	16	37	60	169	11.9
7-Aug	351	354	0	21	359	360	7	18	18	22	16	28	357	347	6	8	359	10	1	1	9	12	24	22	7.7
8-Aug	49	79	120	44	48	68	87	102	124	109	148	102	88	97	63	93	100	99	109	106	108	117	128	138	101.7
9-Aug	136	133	140	137	134	127	121	130	137	132	136	121	120	127	132	128	112	116	131	129	119	125	117	112	126.3
10-Aug	112	114	115	115	113	113	103	103	96	92	98	97	84	69	53	56	49	27	16	22	5	6	2	355	75.7
11-Aug	346	342	336	335	328	327	332	329	322	327	331	312	322	323	312	323	306	302	319	324	103	149	187	250	321.2
12-Aug	228	228	257	253	248	252	263	286	295	289	295	292	286	300	313	331	325	297	286	273	286	283	287	270	281.5
13-Aug	226	178	193	189	171	178	165	184	193	213	223	226	225	237	237	231	228	232	237	213	203	198	197	212	217.8
14-Aug	247	247	225	231	255	261	264	285	301	330	336	295	296	303	296	291	311	303	332	10	150	184	332	183	280.6
15-Aug	174	182	184	182	186	169	169	172	169	172	195	215	182	197	209	227	229	222	222	297	218	268	288	292	218.9
16-Aug	284	284	289	301	295	291	291	285	293	300	294	287	292	282	275	276	246	242	258	138	168	174	169	177	273.7
17-Aug	175	170	160	184	189	188	190	210	224	228	226	238	252	282	282	282	289	290	296	286	288	285	301	315	253.3
18-Aug	350	343	6	10	356	3	1	5	2	5	10	357	1	360	353	342	337	339	326	306	309	306	302	293	347.0
19-Aug	299	304	307	306	306	290	289	291	280	274	278	270	293	296	300	288	279	262	269	251	202	200	210	204	279.2
20-Aug	191	186	191	196	196	203	202	216	219	236	237	245	225	217	201	205	194	179	189	193	191	189	179	179	206.7
21-Aug	174	165	162	174	164	172	199	161	165	201	194	164	124	117	147	142	167	151	122	108	90	137	146	120	149.0
22-Aug	127	113	97	95	106	102	97	118	160	192	140	148	147	139	120	112	106	110	108	67	94	115	143	142	123.0
23-Aug	136	118	118	157	85	101	122	145	145	21	54	98	95	61	40	23	44	37	36	39	26	33	41	42	63.8
24-Aug	34	79	20	11	9	3	2	1	8	16	17	13	359	356	351	344	334	326	324	310	288	287	251	224	351.4
25-Aug	276	173	181	188	184	196	189	186	188	196	215	233	223	227	222	208	214	204	202	178	172	177	174	169	202.7
26-Aug	170	175	168	169	172	168	169	183	199	204	203	219	232	244	256	260	274	253	214	245	269	268	281	320	227.5
27-Aug	350	347	348	350	332	297	139	295	348	352	198	190	244	281	239	212	229	212	213	222	195	180	182	200	243.3
28-Aug	207	210	227	224	241	171	242	264	269	266	243	218	270	291	289	231	226	168	120	196	187	169	188	174	234.9
29-Aug	173	171	159	157	161	158	159	161	163	175	182	190	210	215	209	214	207	183	168	170	162	146	117	132	176.8
30-Aug	162	160	119	80	65	84	109	169	168	161	328	148	186	118	106	102	113	84	68	17	42	86	25	138	121.4
31-Aug	121	202	160	197	250	197	274	287	285	286	267	286	312	287	306	308	300	299	296	293	296	292	275	281	282.5

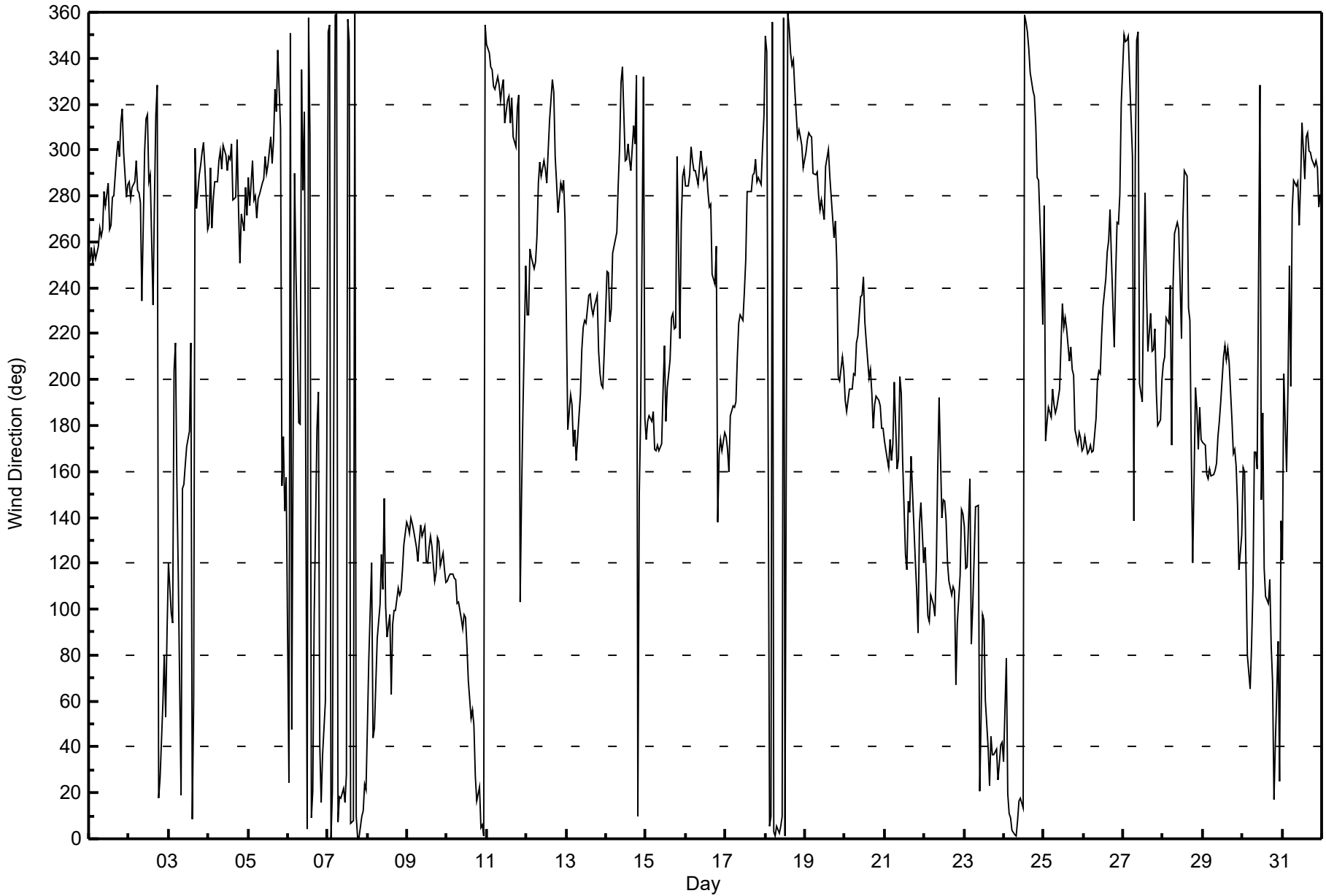
233.8 233.6 234.9 240.9 245.7 237.7 257.7 268.7 262.4 272.4 262.9 259.9 268.1 277.9 284.6 281.7 283.0 274.2 274.2 270.3 255.2 242.0 250.5 237.9
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Sawbones Bay - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Sawbones Bay - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 103 deg on Aug 23 15:00 Minimum Value: 4 deg on Aug 29 20:00 Percentiles: P ₁ = 7 P ₁₀ = 12 Q ₁ = 14 Median = 19 Q ₃ = 29 P ₉₀ = 51 P ₉₉ = 91																			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-Aug	16	13	21	12	18	16	15	14	14	16	18	16	17	16	17	18	22	17	14	12	11	11	11	12	22
2-Aug	16	14	12	9	12	21	29	50	58	66	65	36	64	46	62	48	25	25	24	12	33	32	42	34	66
3-Aug	28	25	42	16	18	39	28	87	51	23	25	39	60	91	73	34	93	19	12	12	10	9	11	24	93
4-Aug	23	17	14	16	11	10	15	14	15	18	20	19	20	25	23	32	40	98	85	57	14	13	12	19	98
5-Aug	12	14	13	12	12	14	15	13	11	12	16	19	26	26	19	32	22	31	19	80	76	16	38	77	80
6-Aug	73	32	66	62	43	62	64	36	95	55	64	100	85	43	31	39	25	30	23	78	15	37	65	33	100
7-Aug	22	15	20	11	25	13	13	18	20	25	27	35	36	39	32	24	25	21	20	13	7	9	26	29	39
8-Aug	33	36	72	34	21	26	26	23	39	50	62	59	44	52	35	32	23	22	15	14	15	16	18	16	72
9-Aug	15	17	13	16	16	19	15	19	18	18	20	16	17	19	17	16	14	16	17	18	15	16	15	14	20
10-Aug	14	13	13	13	14	14	17	19	22	26	23	25	30	33	31	34	30	17	14	15	15	16	16	15	34
11-Aug	16	14	13	15	13	13	15	15	14	19	23	22	17	18	18	24	18	20	17	97	50	29	56	17	97
12-Aug	26	27	17	15	20	17	14	15	14	13	15	15	13	19	21	38	35	14	25	24	8	14	10	12	38
13-Aug	44	15	14	35	12	18	13	22	21	21	19	19	20	22	18	21	17	18	22	16	16	17	16	19	44
14-Aug	16	18	17	20	13	11	14	13	17	16	18	17	14	16	13	16	24	17	14	77	42	21	70	68	77
15-Aug	10	32	18	8	18	9	11	12	14	16	19	27	21	22	21	20	21	23	20	52	41	16	12	12	52
16-Aug	9	9	10	12	14	11	12	11	13	15	14	22	21	22	28	23	32	26	32	75	5	9	8	10	75
17-Aug	10	12	14	18	19	16	19	19	19	17	18	23	28	19	16	18	14	13	11	34	25	14	14	22	34
18-Aug	25	23	14	16	12	14	16	15	16	17	17	17	18	19	18	16	15	15	14	11	12	10	11	13	25
19-Aug	12	12	11	12	13	10	9	11	19	22	18	21	22	16	18	22	19	19	16	18	23	26	26	23	26
20-Aug	14	12	13	15	14	16	20	16	21	21	23	30	31	31	40	31	51	32	19	18	13	20	53	16	53
21-Aug	73	20	49	25	10	52	28	60	19	46	54	71	70	49	39	33	26	25	17	6	17	17	16	11	73
22-Aug	13	24	10	14	11	14	18	23	42	45	29	35	46	36	27	32	19	19	14	27	12	15	14	16	46
23-Aug	31	23	63	77	93	18	31	53	42	30	38	30	48	72	103	16	26	22	26	24	10	23	32	32	103
24-Aug	35	37	26	16	12	13	15	16	17	14	16	19	18	19	20	19	15	13	14	7	7	7	47	29	47
25-Aug	62	43	19	14	12	26	44	31	24	24	25	26	31	22	24	22	24	23	19	11	10	10	10	9	62
26-Aug	7	9	8	7	8	9	12	21	21	25	25	24	21	29	27	28	17	20	19	18	15	15	14	22	29
27-Aug	13	13	10	12	14	74	80	62	38	58	60	74	63	40	48	39	32	18	17	15	18	11	10	41	80
28-Aug	22	18	20	20	31	14	34	13	16	22	36	28	40	23	23	56	64	47	27	20	14	68	58	53	68
29-Aug	22	9	17	7	7	8	10	13	14	20	24	29	30	24	25	23	25	18	11	4	9	20	8	13	30
30-Aug	12	5	13	21	45	18	74	47	27	22	92	42	56	37	20	24	25	85	33	15	23	51	67	26	92
31-Aug	17	23	64	46	79	37	26	11	13	13	43	53	34	29	25	35	20	15	11	11	13	14	14	14	79
	73	43	72	77	93	74	80	87	95	66	92	100	85	91	103	56	93	98	85	97	76	68	70	77	
Diurnal Maximum																									



WOOD BUFFALO ENVIRONMENTAL ASSOCIATION

CONTINUOUS AMBIENT AIR QUALITY
MONITORING PROGRAM
MONTHLY REPORT

AMS507
KIRBY SOUTH
AUGUST 2023

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

September 29, 2023

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS 507)
AUGUST 2022

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	690	34	54	97.31	9.7	0	2.3	0
H2S (ppb) Average	708	36	36	100	1	0	0.4	0
THC (ppm) Average	710	34	34	100	3.9	-	2.7	-
NO2 (ppb) Average	707	37	37	100	43.4	0	10.9	-
NO (ppb) Average	707	37	37	100	128.2	-	34.3	-
NOX (ppb) Average	707	37	37	100	171.6	-	45.2	-
Temperature 2 m (C) Average	744	0	0	100	28.4	-	21.1	-
Relative Humidity (%) Average	744	0	0	100	99.1	-	97.2	-
Wind Speed 10 m (km/h) Average	744	0	0	100	24	-	16	-
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 - KIRBY SOUTH(AMS507)
AUGUST 2022

MONTHLY SUMMARY FOR AIR QUALITY/ METEOROLOGICAL MONITORING MEASUREMENTS

Parameter	Number	Mean	StnDev	Total	Percentile						
					Min	P10	Q1	Median	Q3	P90	Max
SO2 (ppb) Average	690	0.53	1	-	0	0	0.1	0.2	0.5	1.2	9.7
H2S (ppb) Average	708	0.14	0.1	-	0	0	0.1	0.1	0.2	0.3	1
THC (ppm) Average	710	2.43	0.2	-	2.1	2.2	2.3	2.4	2.5	2.7	3.9
NO2 (ppb) Average	707	1.32	2.8	-	0	0.3	0.4	0.7	1.2	2.4	43.4
NO (ppb) Average	707	1.38	8.9	-	0	0	0	0	0	0.8	128.2
NOX (ppb) Average	707	2.7	11.5	-	0	0.3	0.4	0.7	1.3	3	171.6
Temperature 2 m (C) Average	744	15.8	4.4	-	5.3	10.7	12.6	15.4	18.9	21.7	28.4
Relative Humidity (%) Average	744	74.13	18	-	34.1	47	59.4	76.8	90.6	95.8	99.1
Wind Speed 10 m (km/h) Average	744	10.1	4	-	1	5	7	10	12	15	24
Wind Direction 10 m (deg) Average	744	-	-	-	-	-	-	-	-	-	-

WOOD BUFFALO ENVIRONMENTAL ASSOCIATION - KIRBY SOUTH (AMS507)
AUGUST 2022

OPERATIONAL NOTES

Parameter	Period Start	Period End	Duration (Hours)	Notes
SO2	21 Aug 2023 17:00	22 Aug 2023 08:00	16	Unstable Operation - excessive baseline noise
SO2	22 Aug 2023 09:00	22 Aug 2023 12:00	4	Maintenance - analyzer rebooted and QA check



Wood Buffalo Environmental Association

Summary of Hour Averages

Sulphur Dioxide (SO₂) - ppb

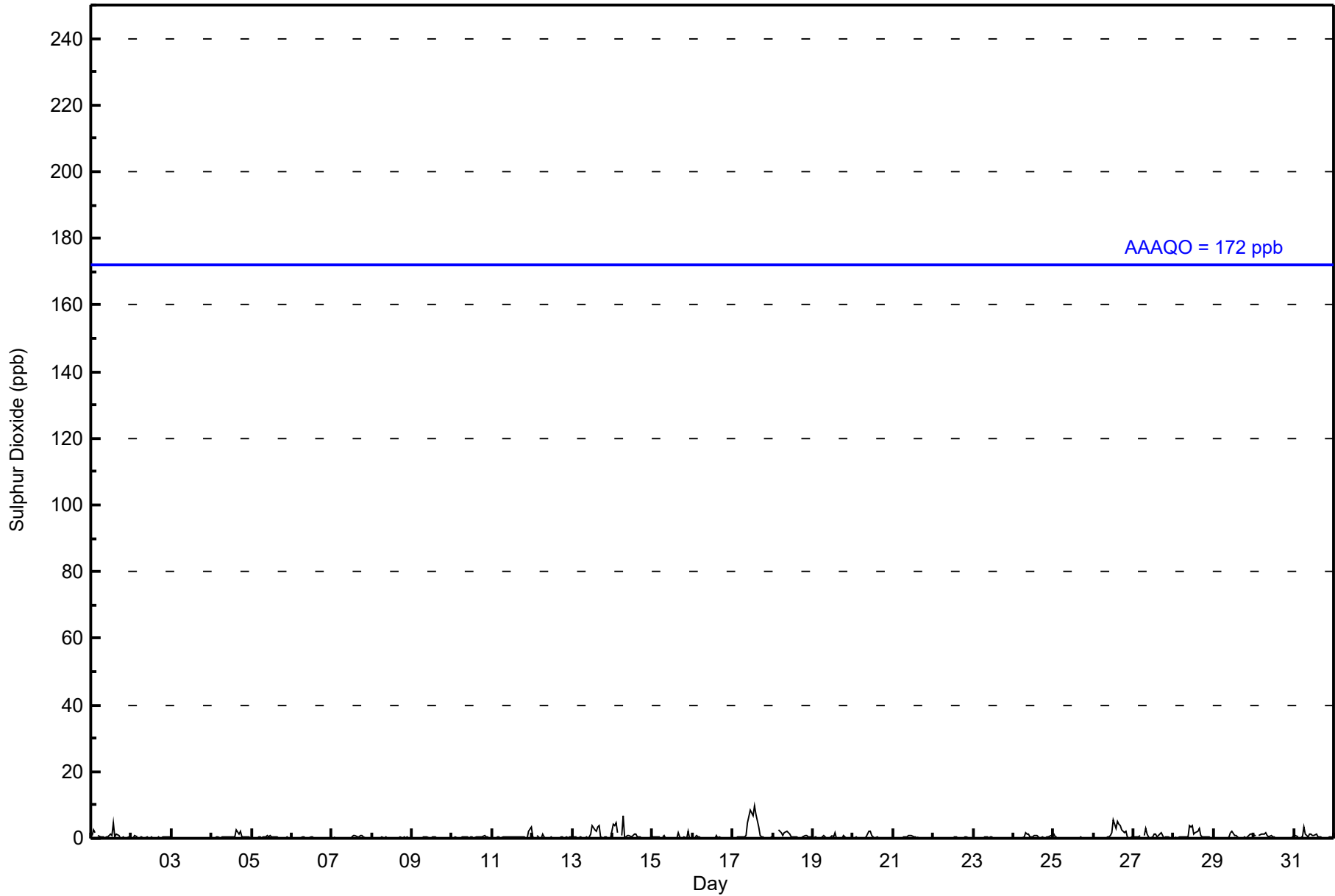
Kirby South - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																																								
Maximum Value: 9.7 ppb on Aug 17 14:00		Maximum Daily Average: 2.3 ppb on Aug 17		Minimum Value: 0.0 ppb on Aug 3 02:00		Minimum Daily Average: 0.0 ppb on Aug 3		Hours of Data: 690																																								
Maximum Diurnal Average: 1.1 ppb at hour 14		Minimum Diurnal Average: 0.2 ppb at hour 21		Hours of Missing Data: 54		Hours of Calibration: 34		Percent Operational Time: 97.3																																								
Monthly Average: 0.53 ppb		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 = 5.3																																														
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-Aug	0.7	2.6	1.5	Z	0.7	0.2	0.4	0.5	0.2	0.6	0.3	1.1	0.8	4.5	0.5	1.3	1.0	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.8	4.5																						
2-Aug	0.1	0.1	0.6	0.4	Z	0.3	0.5	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.2	0.0	0.1	0.3	0.5	0.4	0.3	0.3	0.2	0.6																						
3-Aug	0.1	0.0	0.0	0.2	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	C	C	C	C	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2																						
4-Aug	Z	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.4	0.6	0.6	0.4	0.3	0.3	0.4	2.5	1.1	2.2	0.4	0.3	0.6	0.3	0.3	0.1	0.5	2.5																						
5-Aug	0.0	Z	0.0	0.1	0.2	0.4	0.1	0.2	0.2	0.8	0.6	0.6	0.5	0.5	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.8																						
6-Aug	0.0	0.0	Z	0.0	0.1	0.1	0.3	0.6	0.1	0.1	0.2	0.4	0.3	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.6																						
7-Aug	0.0	0.1	0.3	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.8	0.8	0.5	0.4	0.7	0.7	0.4	0.0	0.0	0.0	0.0	0.2	0.8																						
8-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.3	0.2	0.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.0	0.1	0.1	0.3																						
9-Aug	0.0	0.0	0.1	0.2	0.2	Z	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.2	0.3																						
10-Aug	Z	0.1	0.3	0.1	0.1	0.1	0.5	0.3	0.3	0.3	0.1	0.3	0.4	0.1	0.4	0.4	0.4	0.4	0.3	0.7	0.3	0.6	0.2	0.2	0.3	0.7																						
11-Aug	0.2	Z	0.1	0.4	0.2	0.0	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.6	0.4	0.0	0.1	2.1	3.3	0.5	3.3																						
12-Aug	0.5	0.2	Z	1.0	0.1	0.0	1.1	0.5	0.2	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.0	0.3	0.3	0.0	0.5	0.1	0.2	0.3	0.3	1.1																						
13-Aug	0.4	0.3	0.3	Z	0.3	0.2	0.1	0.2	0.3	0.2	0.4	1.3	3.8	2.5	2.1	3.5	3.8	0.4	0.2	0.3	0.3	0.2	0.2	0.0	0.9	3.8																						
14-Aug	4.4	4.0	4.8	1.5	Z	0.8	6.9	0.5	0.6	0.7	0.7	0.6	0.7	1.1	1.1	0.6	0.5	0.1	0.0	0.1	0.2	0.0	0.8	1.3	6.9																							
15-Aug	0.5	0.6	0.3	0.3	0.2	Z	0.3	0.7	0.1	0.1	0.0	0.1	0.2	0.1	0.0	1.8	0.5	0.2	0.0	0.3	0.0	2.1	0.0	0.0	0.4	2.1																						
16-Aug	Z	0.6	0.8	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.7	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.8																						
17-Aug	0.0	Z	0.1	0.2	0.3	0.4	0.6	0.5	1.0	4.7	8.4	7.6	6.9	9.7	7.3	3.3	0.8	0.4	0.4	0.1	0.1	0.1	0.1	0.4	2.3	9.7																						
18-Aug	0.5	0.6	Z	2.6	2.0	1.6	0.9	1.7	2.0	1.8	1.3	0.5	0.5	0.3	0.4	0.2	0.1	0.1	0.5	0.7	0.8	0.5	0.5	0.2	0.9	2.6																						
19-Aug	0.1	0.2	0.4	Z	0.0	0.0	0.7	0.4	0.1	0.0	0.0	0.7	0.5	1.7	0.0	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0	0.0	0.3	1.7																						
20-Aug	0.0	0.1	0.2	0.1	Z	0.1	0.1	0.2	0.4	2.2	2.1	1.0	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.2																						
21-Aug	0.0	0.0	0.0	0.1	0.1	Z	0.2	0.4	0.5	0.7	0.7	0.8	0.3	0.2	0.2	0.4	UO	UO	UO	UO	UO	UO	UO	UO	--	0.8																						
22-Aug	UO	UO	UO	UO	UO	UO	UO	UO	UO	M	M	M	M	0.3	0.4	0.2	0.0	0.0	0.0	0.1	0.3	0.4	0.1	0.1	0.0	--	0.4																					
23-Aug	0.1	Z	0.1	0.0	0.0	0.0	0.0	0.3	0.3	0.0	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	0.1	0.3																						
24-Aug	0.0	0.1	Z	0.0	0.0	0.0	0.4	1.8	1.5	1.1	0.3	0.3	0.7	0.9	0.7	0.4	0.2	0.4	0.1	0.1	0.2	0.6	0.9	0.8	0.5	1.8																						
25-Aug	1.1	0.5	0.4	Z	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1																						
26-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.3	0.6	0.8	1.7	5.5	2.8	5.3	4.4	3.7	2.7	1.8	1.9	0.6	0.2	0.0	0.2	1.4	5.5																						
27-Aug	0.3	0.4	0.5	0.6	0.7	Z	1.0	2.9	1.3	0.3	0.1	0.5	1.4	1.1	0.6	1.0	1.8	0.8	0.2	0.3	0.3	0.3	0.2	0.2	0.7	2.9																						
28-Aug	Z	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.5	3.7	3.2	4.0	1.2	1.8	2.3	3.1	0.8	0.5	0.5	0.5	0.4	0.2	0.2	0.2	1.1	4.0																						
29-Aug	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	1.9	2.1	0.8	0.8	0.3	0.1	0.1	0.2	0.2	0.2	0.5	0.7	1.1	1.2	0.5	2.1																						
30-Aug	0.7	1.0	Z	1.0	1.3	1.4	1.4	1.6	0.8	0.5	0.7	0.6	0.4	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.4	0.6	1.6																						
31-Aug	1.0	0.7	0.4	Z	0.3	0.3	3.2	1.2	0.4	1.2	1.2	0.9	0.9	1.2	0.3	0.3	0.3	0.2	0.2	0.0	0.1	0.6	0.2	0.5	0.7	3.2																						
																								0.4	0.5	0.5	0.4	0.3	0.3	0.7	0.6	0.4	0.7	0.8	0.9	0.9	1.1	0.8	0.9	0.6	0.4	0.3	0.3	0.2	0.3	0.2	0.3	Diurnal Average
																								4.4	4.0	4.8	2.6	2.0	1.6	6.9	2.9	2.0	4.7	8.4	7.6	6.9	9.7	7.3	4.4	3.8	2.7	1.8	1.9	0.8	2.1	2.1	3.3	Diurnal Maximum
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
Kirby South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - August 2023

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 10	690	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: 690

Total Number of Hours: 744



Wood Buffalo Environmental Association
Frequency Distribution

Sulphur Dioxide (SO₂) - ppb
Kirby South - August 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	20	38	24	23	19	12	39	24	30	56	91	43	67	99	77	28	690
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	20	38	24	23	19	12	39	24	30	56	91	43	67	99	77	28	690

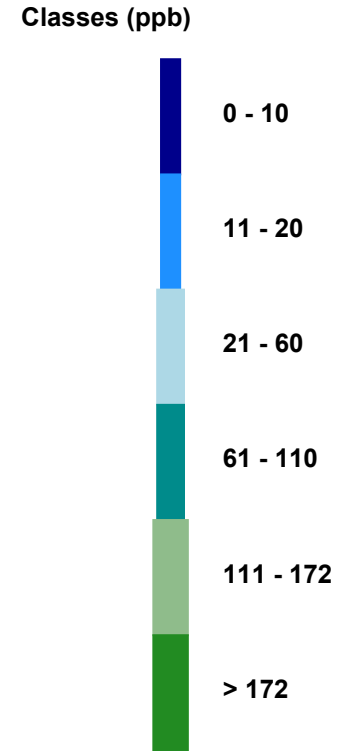
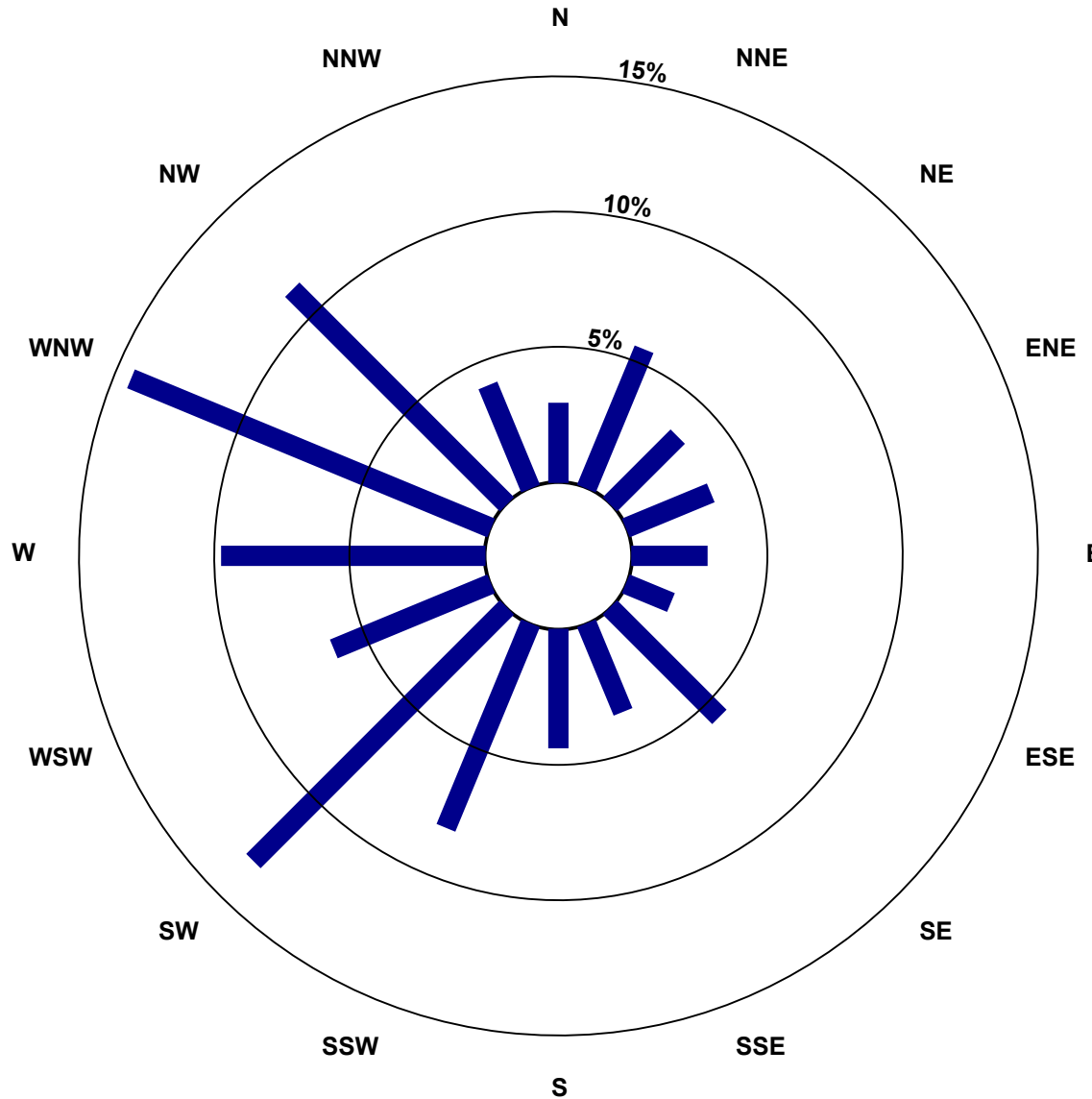
Total Number of Valid Hours: 690

Total Number of Hours: 744

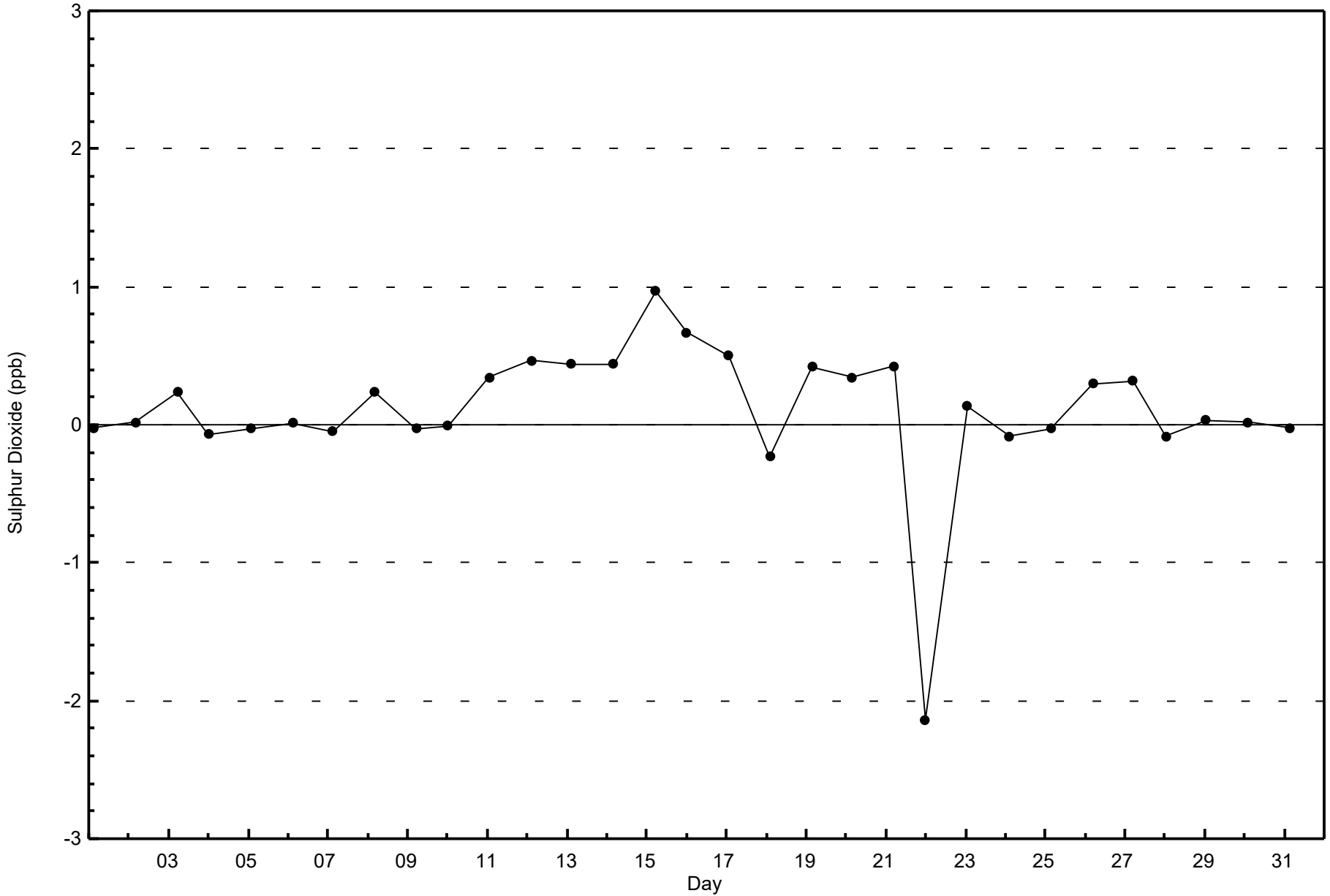


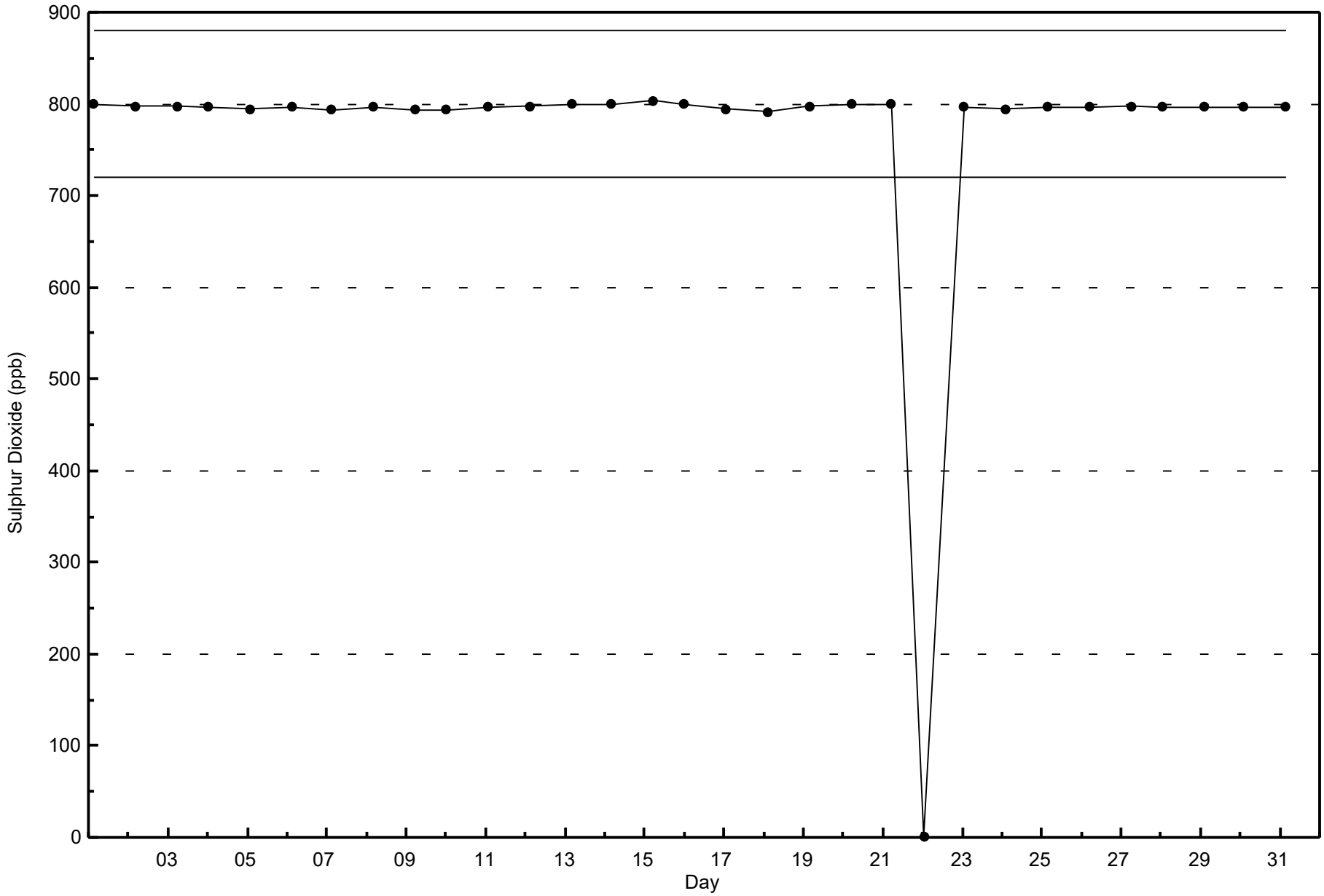
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Sulphur Dioxide (SO₂) - ppb
Kirby South



Total Number of Valid Hours: 690







Wood Buffalo Environmental Association

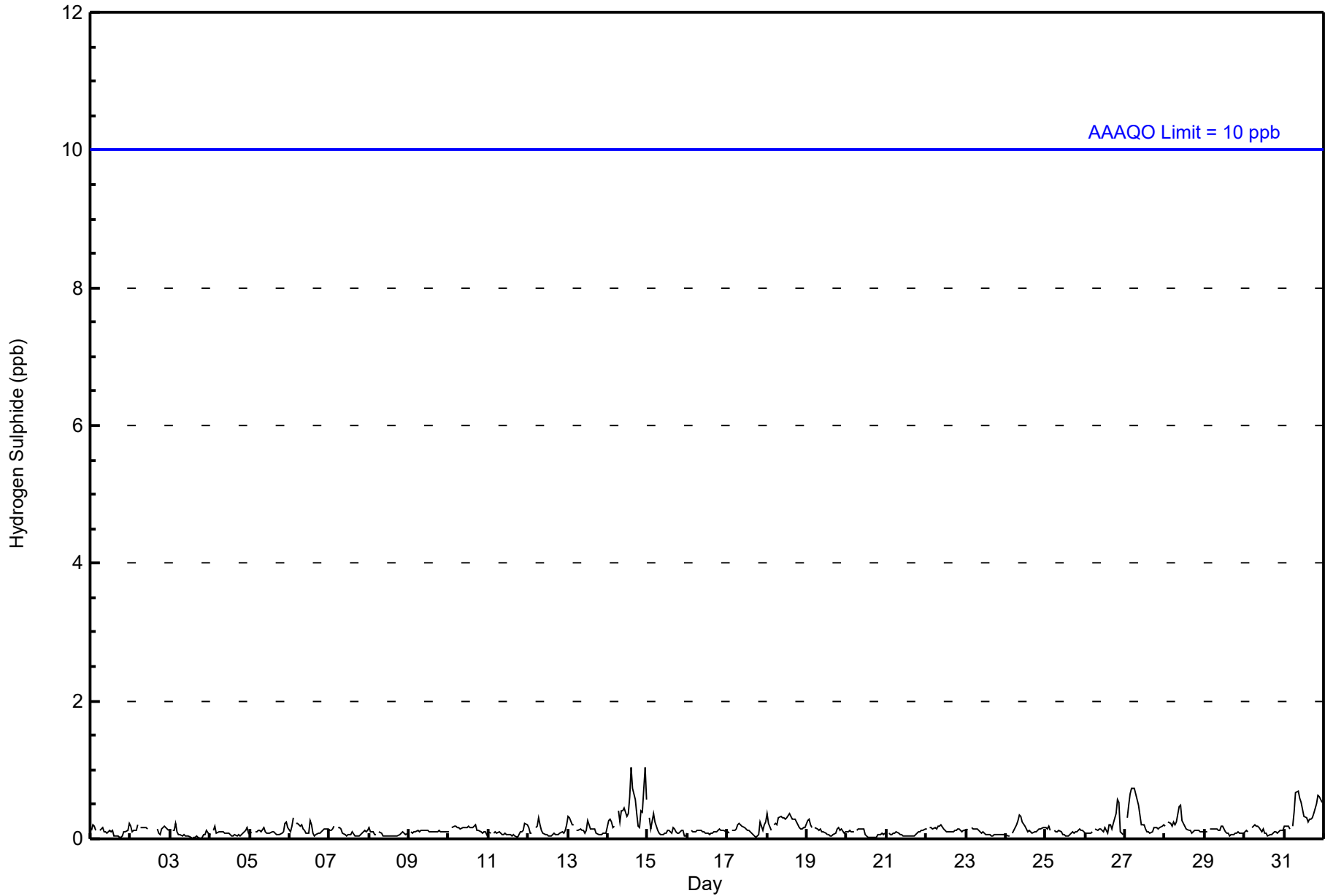
Summary of Hour Averages

Hydrogen Sulphide (H₂S) - ppb

Kirby South - August 2023

Number of Exceedences (AAAQO):		1-hr: 0		24-hr: 0		Hours in Service:		744																		
Maximum Value: 1.0 ppb on Aug 14 23:00		Maximum Daily Average: 0.4 ppb on Aug 14		Minimum Value: 0.0 ppb on Aug 3 19:00		Minimum Daily Average: 0.1 ppb on Aug 3		Hours of Data: 708																		
Maximum Diurnal Average: 0.2 ppb at hour 9		Minimum Diurnal Average: 0.1 ppb at hour 18		Hours of Missing Data: 36		Hours of Calibration: 36		Percent Operational Time: 100.0																		
Monthly Average: 0.14 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.1 Median = 0.1 Q ₃ = 0.2 P ₉₀ = 0.3 P ₉₉ = 0.7																								
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-Aug	0.1	0.2	0.2	0.1	Z	0.1	0.1	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	0.1	0.1	0.1	0.2	0.1	0.2
2-Aug	0.2	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.2	0.2	0.1	C	C	C	C	C	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2
3-Aug	Z	0.1	0.1	0.2	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2
4-Aug	0.1	Z	0.1	0.2	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	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2
5-Aug	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
6-Aug	0.1	0.2	0.3	Z	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3
7-Aug	0.1	0.1	0.1	0.2	Z	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
8-Aug	0.2	0.1	0.1	0.1	0.1	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
9-Aug	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	0.1
10-Aug	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11-Aug	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	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
12-Aug	0.2	0.1	0.1	Z	0.2	0.2	0.3	0.2	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	0.2	0.1	0.3
13-Aug	0.3	0.3	0.2	0.2	Z	0.1	0.1	0.1	0.1	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	0.1	0.1	0.3
14-Aug	0.3	0.3	0.3	0.2	0.2	Z	0.4	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.6	1.0	0.7	0.6	0.4	0.2	0.2	0.4	0.4	1.0	0.6	1.0
15-Aug	Z	0.3	0.1	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	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.4
16-Aug	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	0.1
17-Aug	0.1	0.1	Z	0.1	0.1	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	0.1	0.2	0.1	0.2	0.2	0.1	0.2
18-Aug	0.4	0.2	0.1	Z	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.4
19-Aug	0.3	0.3	0.2	0.2	Z	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3
20-Aug	0.1	0.1	0.1	0.1	0.1	Z	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	0.1	0.1	0.1	0.1
21-Aug	Z	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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
22-Aug	0.1	Z	0.2	0.2	0.1	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	0.1	0.1	0.1	0.1	0.1	0.2
23-Aug	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	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
24-Aug	0.1	0.0	0.0	Z	0.1	0.1	0.2	0.3	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	0.2	0.2	0.2	0.2	0.3
25-Aug	0.2	0.1	0.2	0.1	Z	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	0.2
26-Aug	0.1	0.1	0.1	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.4	0.6	0.5	0.1	0.1	0.1	0.1	0.6
27-Aug	Z	0.3	0.5	0.6	0.7	0.7	0.7	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.7
28-Aug	0.2	Z	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	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.5
29-Aug	0.1	0.1	Z	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
30-Aug	0.1	0.1	0.1	Z	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
31-Aug	0.2	0.2	0.2	0.1	Z	0.2	0.4	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.7
																								Diurnal Average		
																								Diurnal Maximum		
																								0.1 0.2 0.1 0.2 0.1 0.2 0.1 0.2 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 0.1 0.2 0.1 0.2		
																								0.4 0.3 0.5 0.6 0.7 0.7 0.7 0.7 0.7 0.6 0.5 0.4 0.4 0.6 1.0 0.7 0.6 0.4 0.4 0.6 0.6 0.6 1.0 0.6		

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
Kirby South - August 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 South - August 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	19	39	24	23	23	16	43	27	34	58	91	46	68	96	74	27	708
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	19	39	24	23	23	16	43	27	34	58	91	46	68	96	74	27	708

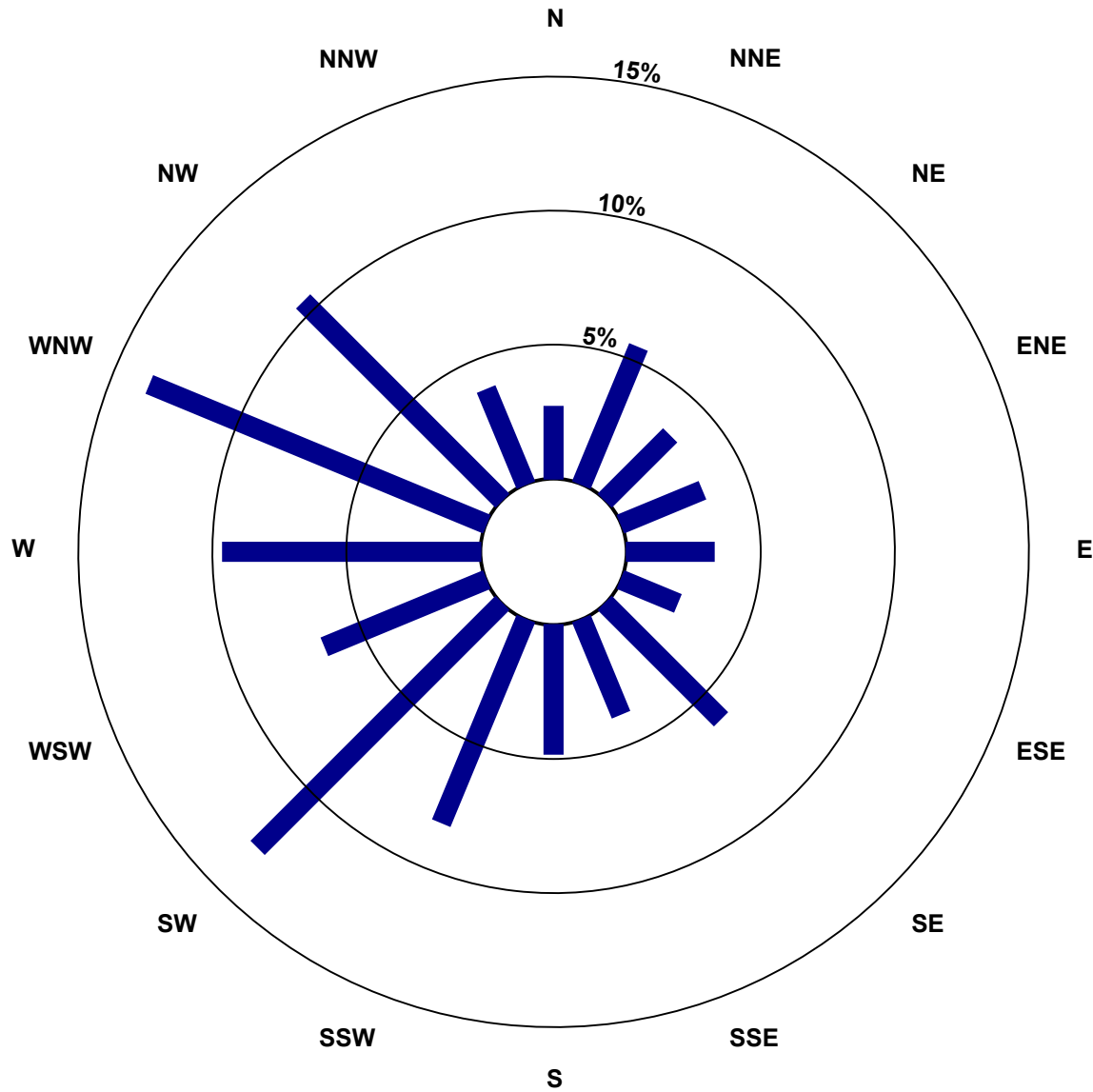
Total Number of Valid Hours: 708

Total Number of Hours: 744

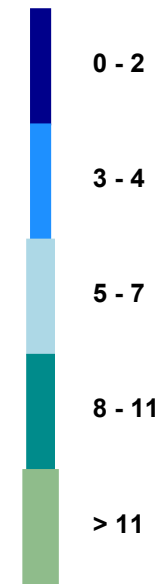


Wood Buffalo Environmental Association
Wind Rose Aug 2023

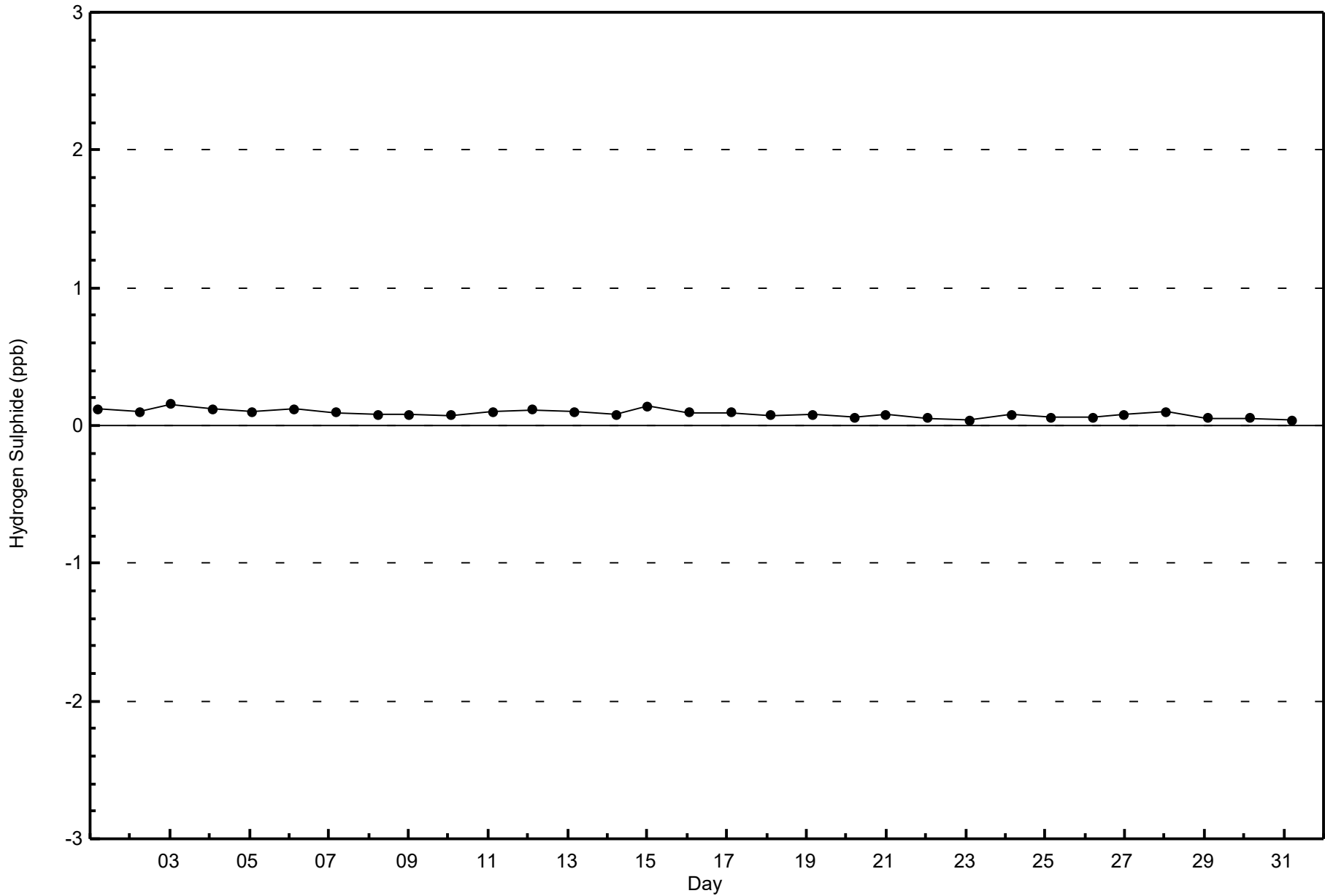
Hydrogen Sulphide (H₂S) - ppb
Kirby South

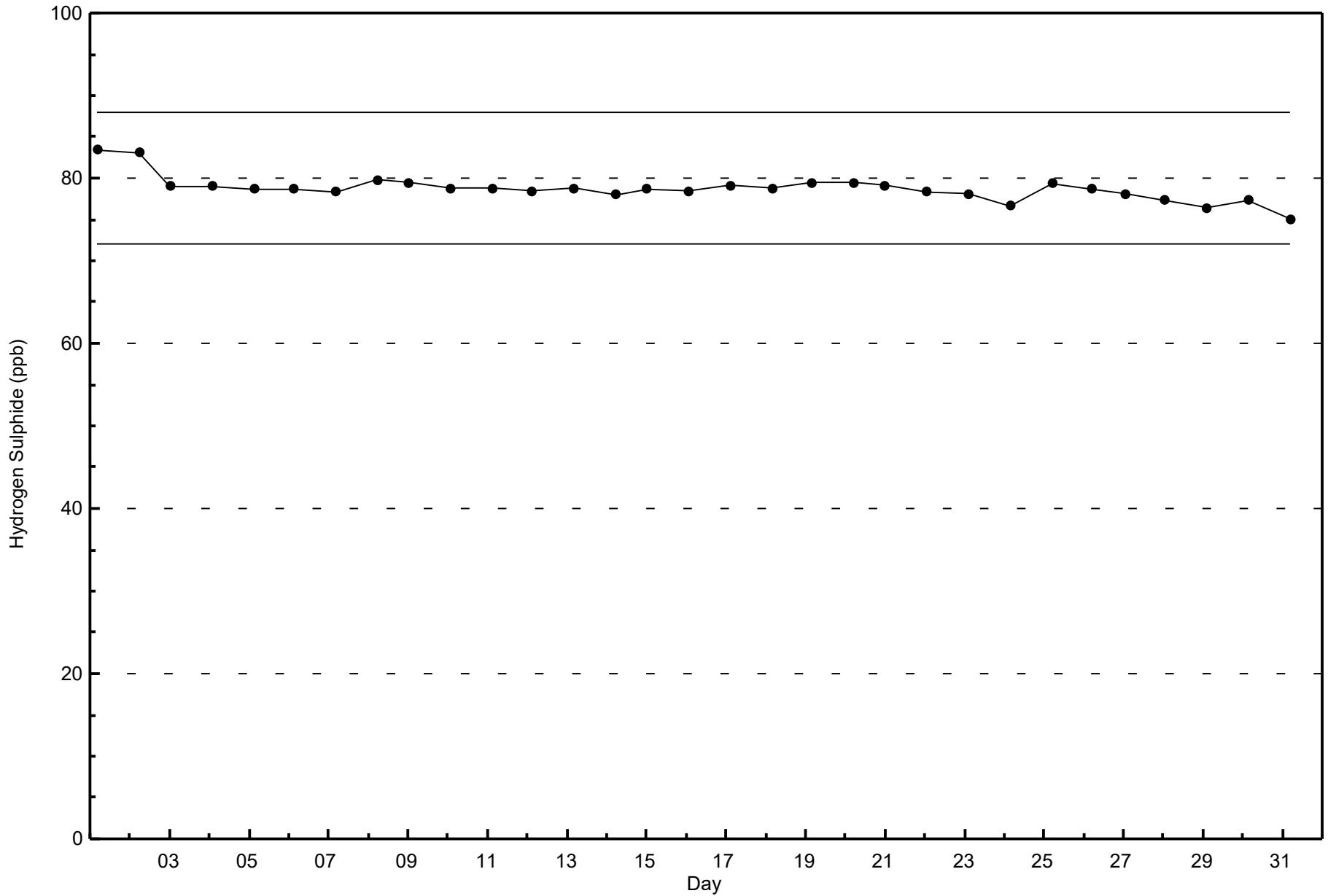


Classes (ppb)



Total Number of Valid Hours: 708







Wood Buffalo Environmental Association
Summary of Hour Averages

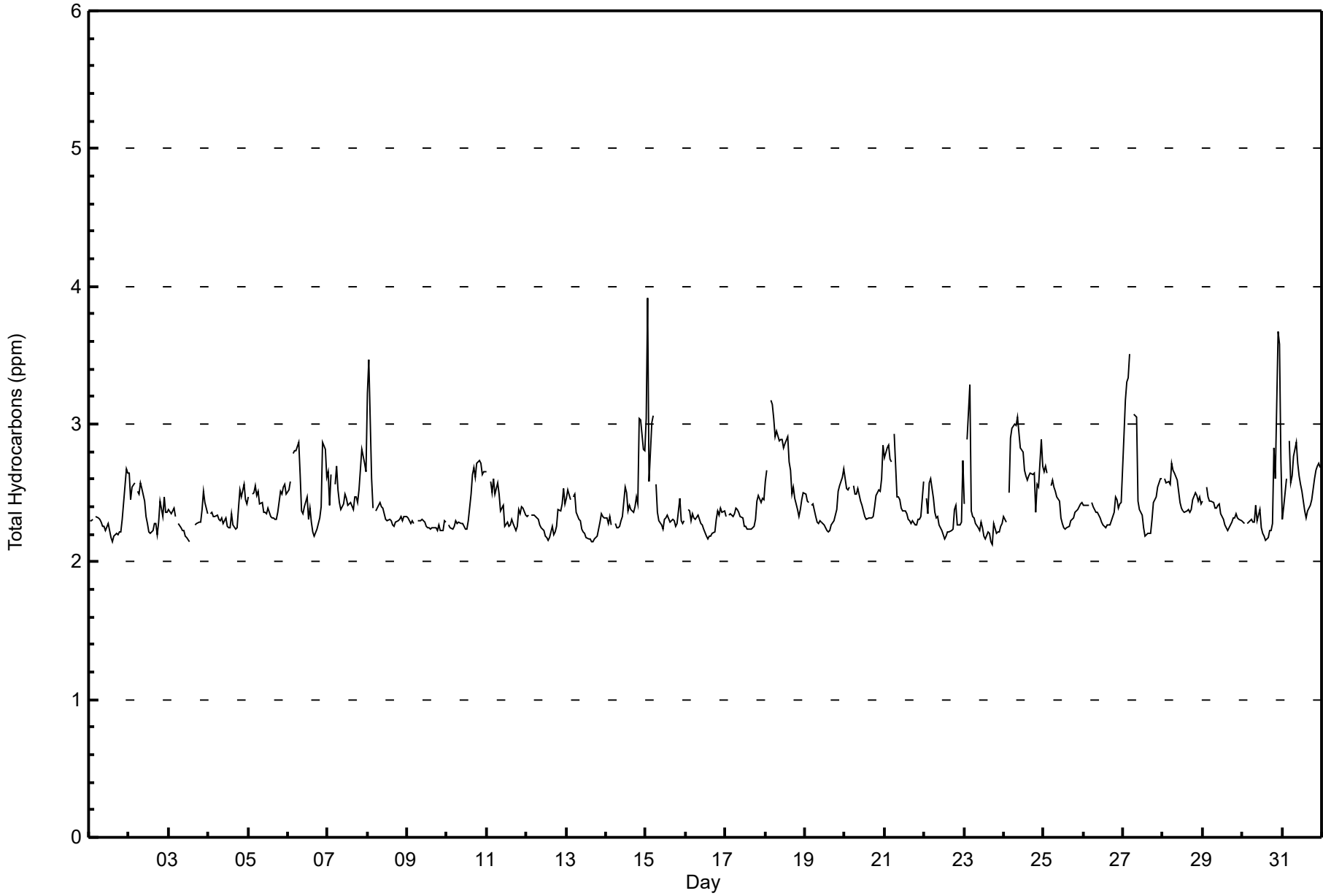
Total Hydrocarbons (THC) - ppm
Kirby South - August 2023

Maximum Value: 3.9 ppm on Aug 15 02:00		Maximum Daily Average: 2.7 ppm on Aug 18		Hours in Service: 744																																														
Minimum Value: 2.1 ppm on Aug 23 18:00		Minimum Daily Average: 2.3 ppm on Aug 9		Hours of Data: 710																																														
Maximum Diurnal Average: 2.6 ppm at hour 5		Minimum Diurnal Average: 2.3 ppm at hour 15		Hours of Missing Data: 34																																														
Monthly Average: 2.43 ppm		Percentiles: P ₁ = 2.2 P ₁₀ = 2.2 Q ₁ = 2.3 Median = 2.4 Q ₃ = 2.5 P ₉₀ = 2.7 P ₉₉ = 3.3		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-Aug	2.3	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.2	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.7	2.6	2.3	2.7																								
2-Aug	2.6	2.5	2.5	2.6	Z	2.5	2.5	2.6	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.2	2.3	2.4	2.3	2.5	2.4	2.4	2.4	2.6																								
3-Aug	2.4	2.4	2.4	2.4	2.3	Z	2.3	2.2	2.2	2.2	2.2	2.1	C	C	C	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.4	2.4	2.3	2.5																								
4-Aug	Z	2.3	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.3	2.3	2.2	2.3	2.4	2.5	2.5	2.6	2.4	2.4	2.3	2.6																									
5-Aug	2.5	Z	2.5	2.5	2.6	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.5	2.4	2.6																								
6-Aug	2.5	2.6	Z	2.8	2.8	2.8	2.9	2.6	2.4	2.4	2.4	2.5	2.3	2.4	2.3	2.2	2.2	2.2	2.3	2.3	2.4	2.9	2.8	2.6	2.5	2.9																								
7-Aug	2.7	2.4	2.6	Z	2.6	2.7	2.5	2.4	2.4	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.4	2.5	2.8	2.8	2.7	2.7	2.5	2.8																								
8-Aug	3.2	3.5	2.6	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	2.3	2.3	2.3	2.3	2.3	2.3	2.4	3.5																								
9-Aug	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	2.2	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.3	2.3	2.3	2.3																								
10-Aug	Z	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	2.5	2.6	2.7	2.6	2.7	2.7	2.7	2.6	2.7	2.7	2.4	2.7																								
11-Aug	2.7	Z	2.6	2.5	2.6	2.5	2.6	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.4	2.4	2.4	2.4	2.3	2.4	2.7																								
12-Aug	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	2.2	2.2	2.3	2.4	2.4	2.4	2.5	2.4	2.3	2.5																								
13-Aug	2.5	2.5	2.4	Z	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.5																								
14-Aug	2.3	2.3	2.3	2.3	Z	2.3	2.2	2.2	2.3	2.3	2.3	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5	2.4	3.0	3.0	2.8	2.8	2.5	3.0																								
15-Aug	3.0	3.9	2.6	3.0	3.1	Z	2.6	2.4	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.5	2.3	2.3	2.3	2.5	3.9																								
16-Aug	Z	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	2.2	2.3	2.4	2.3	2.4	2.4	2.4	2.3	2.4																								
17-Aug	2.3	Z	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.4	2.5	2.4	2.5	2.5	2.3	2.5																							
18-Aug	2.6	2.7	Z	3.2	3.1	3.0	2.9	3.0	2.9	2.9	2.9	2.9	2.8	2.9	2.9	2.7	2.7	2.5	2.5	2.5	2.4	2.3	2.4	2.5	2.5	2.7	3.2																							
19-Aug	2.5	2.4	2.4	Z	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.4	2.7																								
20-Aug	2.6	2.5	2.5	2.5	Z	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.6	2.8	2.5	2.8																								
21-Aug	2.8	2.8	2.9	2.7	2.7	Z	2.9	2.5	2.5	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	2.6	2.5	2.9																								
22-Aug	Z	2.5	2.4	2.6	2.6	2.5	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4	2.4	2.3	2.3	2.3	2.7	2.3	2.7																							
23-Aug	2.4	Z	2.9	3.3	2.4	2.3	2.3	2.3	2.3	2.2	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.3	2.2	2.2	2.2	2.3	2.3	2.3	3.3																								
24-Aug	2.3	2.3	Z	2.5	2.9	3.0	3.0	3.0	3.0	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.6	2.6	2.6	2.4	2.6	2.5	2.9	2.7	2.7	3.0																								
25-Aug	2.7	2.7	2.6	Z	2.6	2.6	2.5	2.5	2.5	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.7																								
26-Aug	2.4	2.4	2.4	2.4	Z	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	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.5																								
27-Aug	2.9	3.2	3.3	3.3	3.5	Z	3.1	3.1	3.1	2.4	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.3	2.4	2.5	2.5	2.5	2.6	2.6	2.7	3.5																								
28-Aug	Z	2.6	2.6	2.6	2.6	2.7	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	2.5	2.5	2.5	2.4	2.5	2.4	2.5	2.7																							
29-Aug	2.4	Z	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.5																								
30-Aug	2.3	2.3	Z	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.8	2.6	3.7	3.6	2.7	2.4	3.7																								
31-Aug	2.3	2.4	2.6	Z	2.9	2.6	2.6	2.8	2.9	2.7	2.6	2.6	2.5	2.4	2.3	2.4	2.4	2.4	2.5	2.6	2.7	2.7	2.7	2.7	2.6	2.9																								
																								2.5	2.6	2.5	2.6	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	Diurnal Average			
																								3.2	3.9	3.3	3.3	3.5	3.0	3.1	3.1	3.1	2.9	2.9	2.9	2.8	2.9	2.9	2.7	2.7	2.7	2.6	2.7	2.8	3.0	3.7	3.6	2.8	Diurnal Maximum	
Z - zerospan C - Calibration																																																		



Wood Buffalo Environmental Association
Hourly Averages

Total Hydrocarbons (THC) - ppm
Kirby South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Total Hydrocarbons (THC) - ppm
Kirby South - August 2023

Concentration Ranges (ppm)	Number of Hours	%	Cumulative %
0 - 2.0	0	0.00	0.00
2.1 - 3.0	694	97.75	97.75
3.1 - 10.0	16	2.25	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
Kirby South - August 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	17	34	19	21	23	15	43	29	33	56	90	44	67	99	77	27	694
3.1 - 10.0	3	4	5	2	0	0	0	0	0	0	1	0	0	0	0	1	16
> 10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	20	38	24	23	23	15	43	29	33	56	91	44	67	99	77	28	710

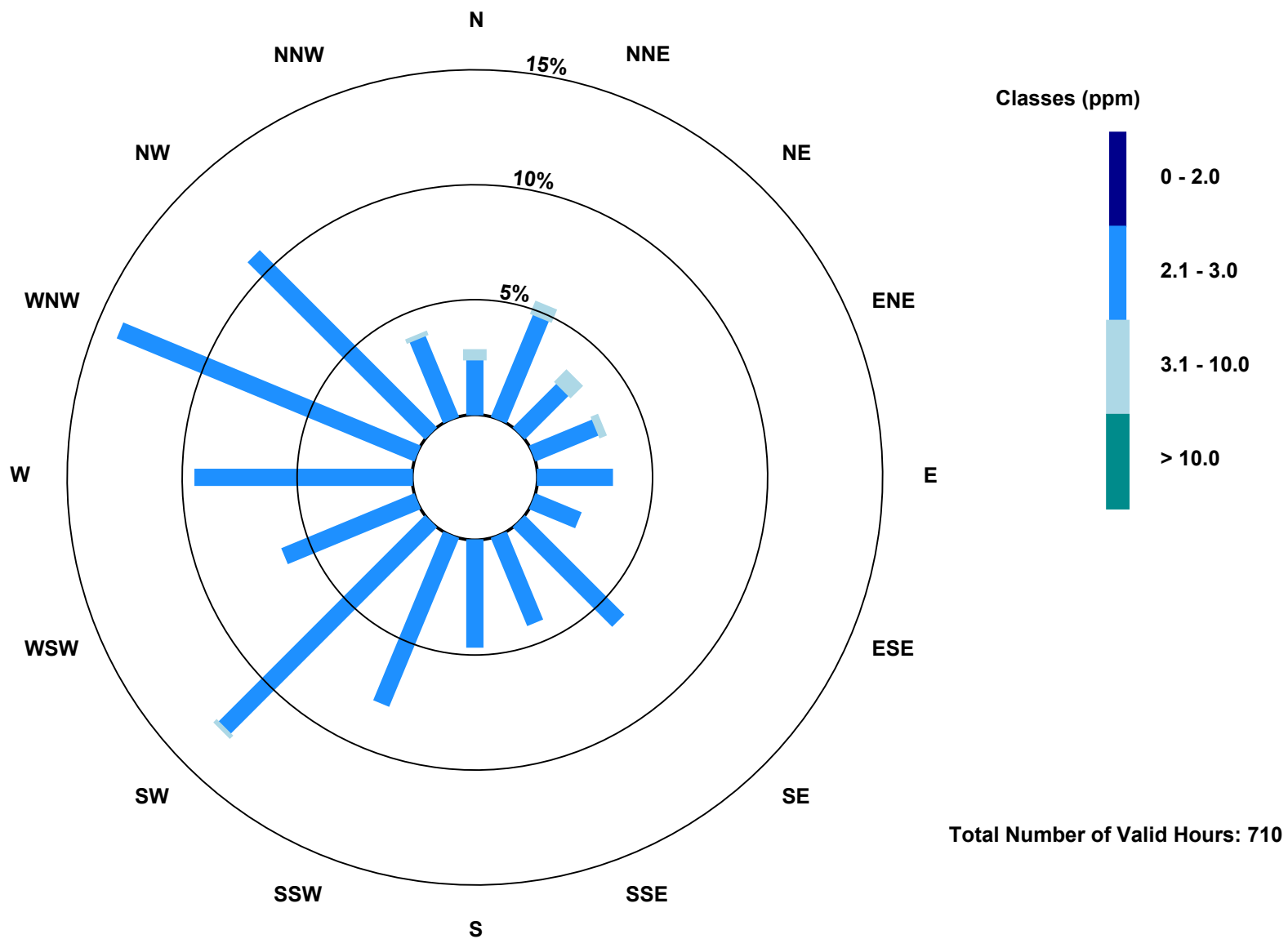
Total Number of Valid Hours: 710

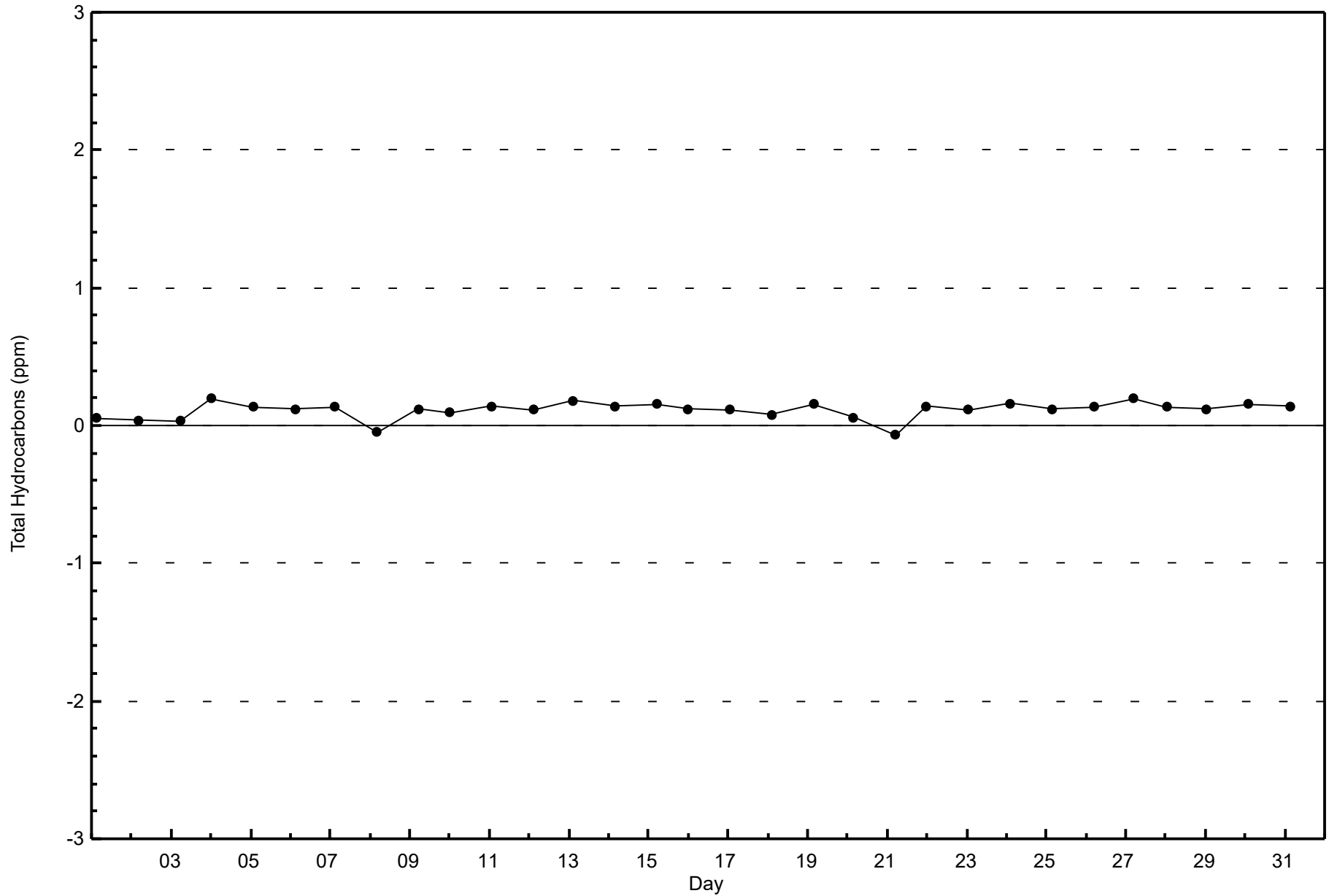
Total Number of Hours: 744

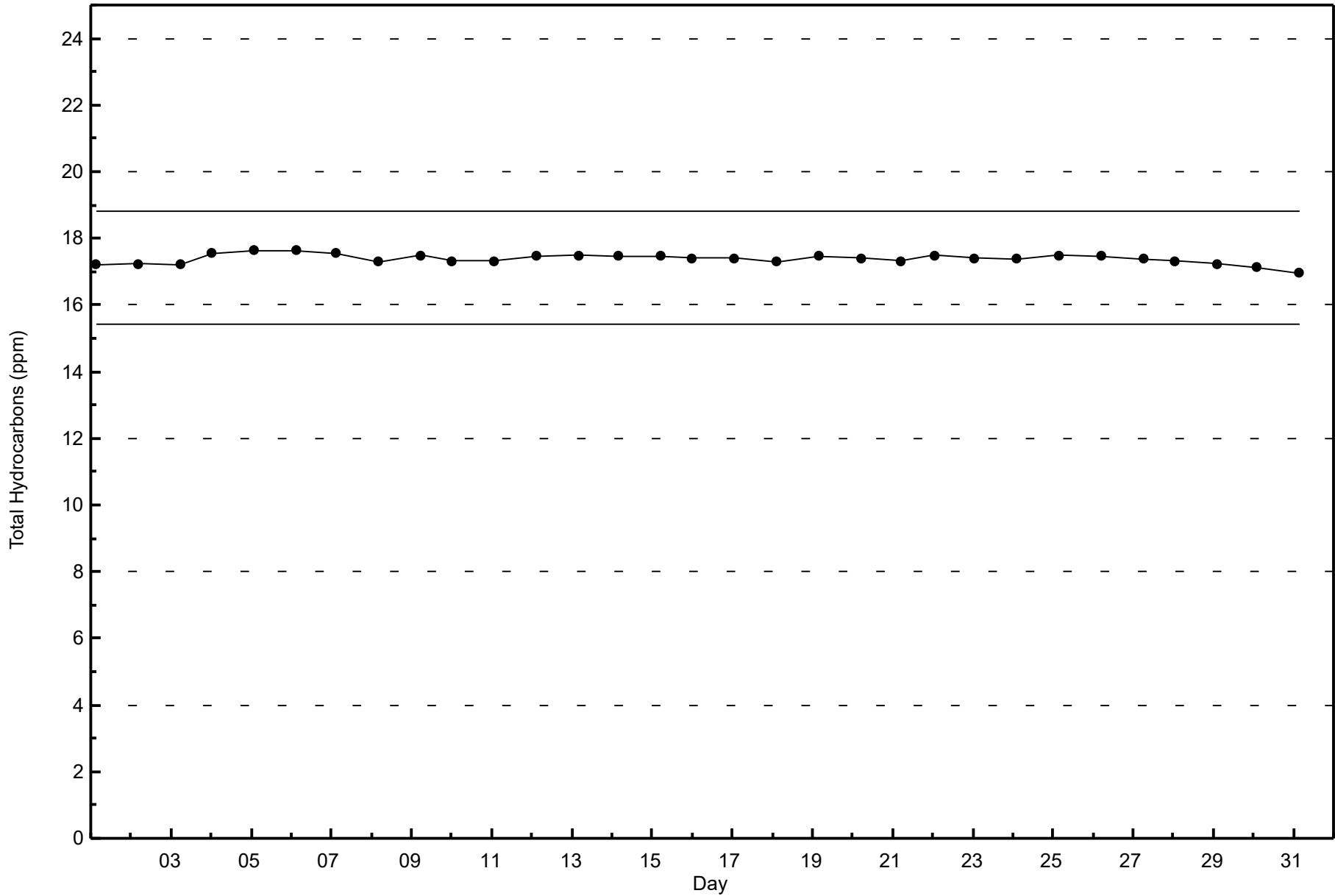


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Total Hydrocarbons (THC) - ppm
Kirby South









Wood Buffalo Environmental Association
Summary of Hour Averages

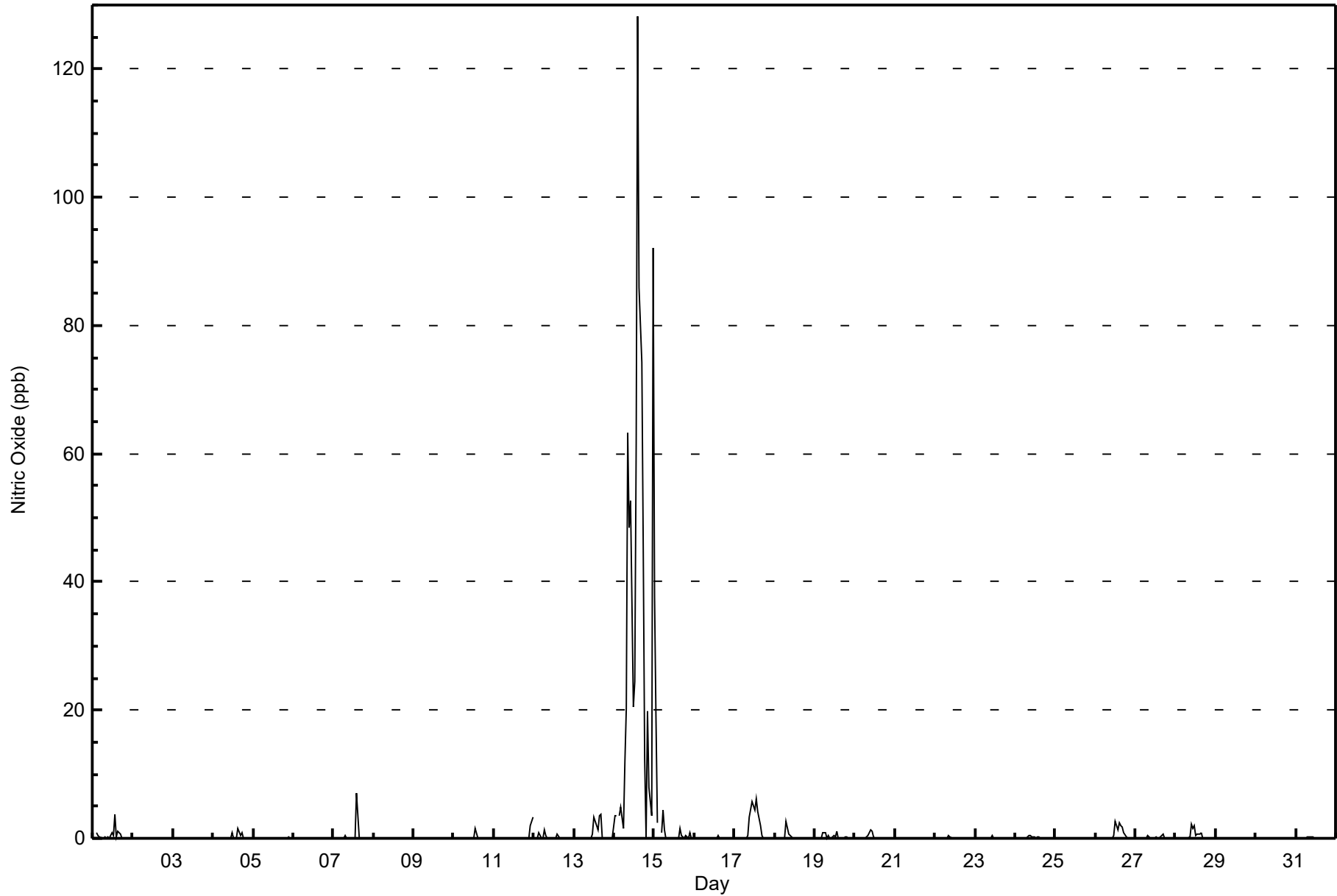
Nitric Oxide (NO) - ppb
Kirby South - August 2023

Maximum Value: 128.2 ppb on Aug 14 15:00		Maximum Daily Average: 34.3 ppb on Aug 14		Hours in Service:	744																						
Minimum Value: 0.0 ppb on Aug 1 06:00		Minimum Daily Average: 0.0 ppb on Aug 9		Hours of Data:	707																						
Maximum Diurnal Average: 4.7 ppb at hour 15		Minimum Diurnal Average: 0.0 ppb at hour 20		Hours of Missing Data:	37																						
Monthly Average: 1.38 ppb		Percentiles: P ₁ = 0.0 P ₁₀ = 0.0 Q ₁ = 0.0 Median = 0.0 Q ₃ = 0.0 P ₉₀ = 0.8 P ₉₉ = 48.2		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-Aug	0.3	Z	0.9	0.3	0.1	0.0	0.1	0.3	0.0	0.2	0.0	0.8	0.4	3.8	0.2	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.8	
2-Aug	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	
3-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.0	C	C	C	C	C	C	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.1	
4-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	1.4	0.4	0.9	0.0	0.0	0.0	0.0	0.0	0.2	1.4		
5-Aug	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	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0		
6-Aug	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		
7-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	7.1	
8-Aug	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	
9-Aug	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	
10-Aug	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	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.6		
11-Aug	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	2.0	3.4	0.2	3.4	
12-Aug	Z	0.0	0.0	0.8	0.0	0.0	1.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	
13-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.2	2.0	1.4	3.6	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	3.8	
14-Aug	3.5	3.5	Z	3.5	4.9	1.6	12.0	20.3	63.3	48.4	52.7	20.5	24.4	61.6	128.2	86.0	74.2	44.9	12.3	0.1	19.9	8.0	3.5	92.1	34.3	128.2	
15-Aug	37.6	18.7	2.5	Z	0.8	4.4	1.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.5	0.4	0.2	0.0	0.5	0.0	0.9	0.0	0.0	3.0	37.6	
16-Aug	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	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	
17-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.4	3.3	5.8	5.0	4.4	6.3	4.1	2.1	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4	6.3	
18-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.7	0.5	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	0.2	2.6	
19-Aug	0.0	Z	0.0	0.0	0.0	1.0	1.0	0.1	0.5	0.0	0.0	0.5	0.2	1.2	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.2	1.2	
20-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.2	0.4	1.3	1.1	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	0.1	1.3	
21-Aug	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	
22-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.5	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	0.5	
23-Aug	0.0	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.0	0.0	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	0.4	
24-Aug	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.4	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	
25-Aug	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	
26-Aug	0.0	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5	2.7	1.4	2.4	1.9	1.8	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.5	2.7	
27-Aug	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.4	0.2	0.0	0.0	0.1	0.3	0.1	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	
28-Aug	0.0	0.0	0.0	0.0	Z	0.0	0.0	0.1	0.3	2.2	1.6	1.9	0.4	0.7	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	2.2	
29-Aug	0.0	0.0	0.0	0.0	0.0	Z	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	0.1	
30-Aug	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	
31-Aug	0.0	Z	0.0	0.0	0.0	0.0	0.0	0.2	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	0.0	0.0	0.2	
		1.6	0.9	0.1	0.2	0.2	0.3	0.5	0.8	2.2	1.9	2.1	1.1	1.2	2.5	4.7	3.2	2.7	1.5	0.4	0.0	0.6	0.3	0.2	3.1	Diurnal Average	
		37.6	18.7	2.5	3.5	4.9	4.4	12.0	20.3	63.3	48.4	52.7	20.5	24.4	61.6	128.2	86.0	74.2	44.9	12.3	0.5	19.9	8.0	3.5	92.1	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitric Oxide (NO) - ppb
Kirby South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitric Oxide (NO) - ppb
Kirby South - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	696	98.44	98.44
21 - 40	2	0.28	98.73
41 - 80	6	0.85	99.58
81 - 159	3	0.42	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
Kirby South - August 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	39	24	22	22	17	43	26	32	59	90	42	67	94	72	26	696
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	2	4	0	6
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	21	39	24	22	22	17	43	26	32	59	90	42	67	99	77	27	707

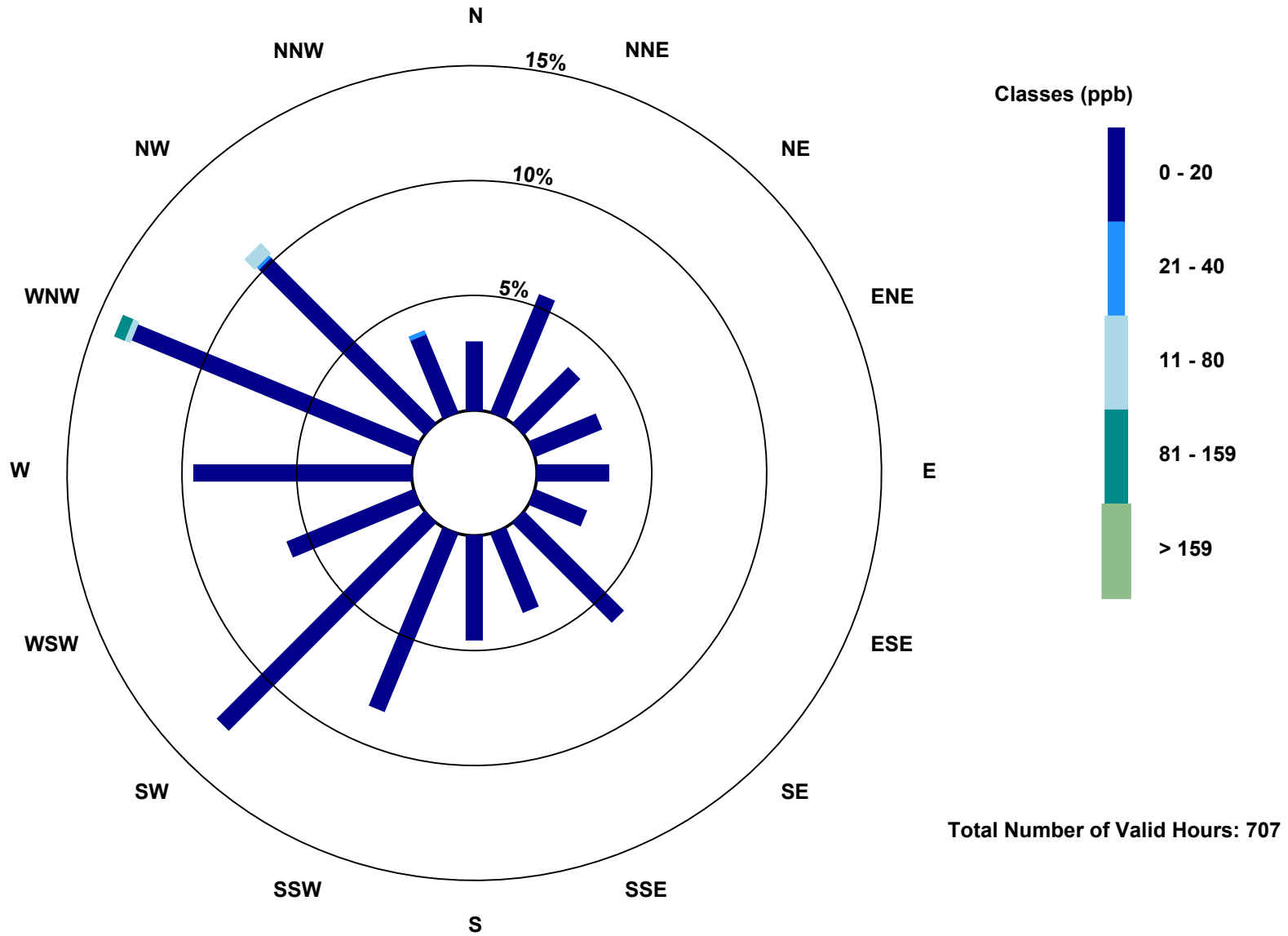
Total Number of Valid Hours: 707

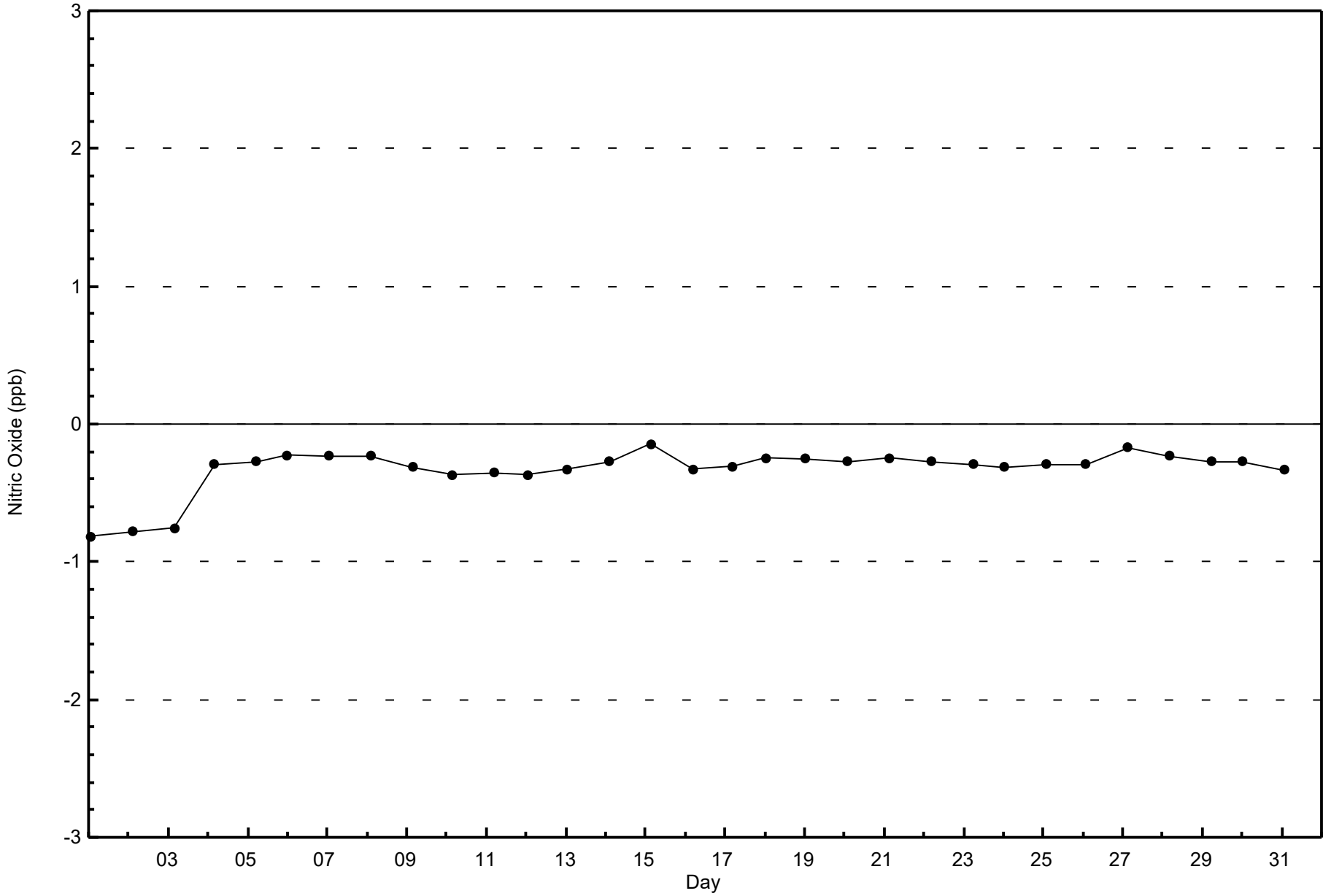
Total Number of Hours: 744

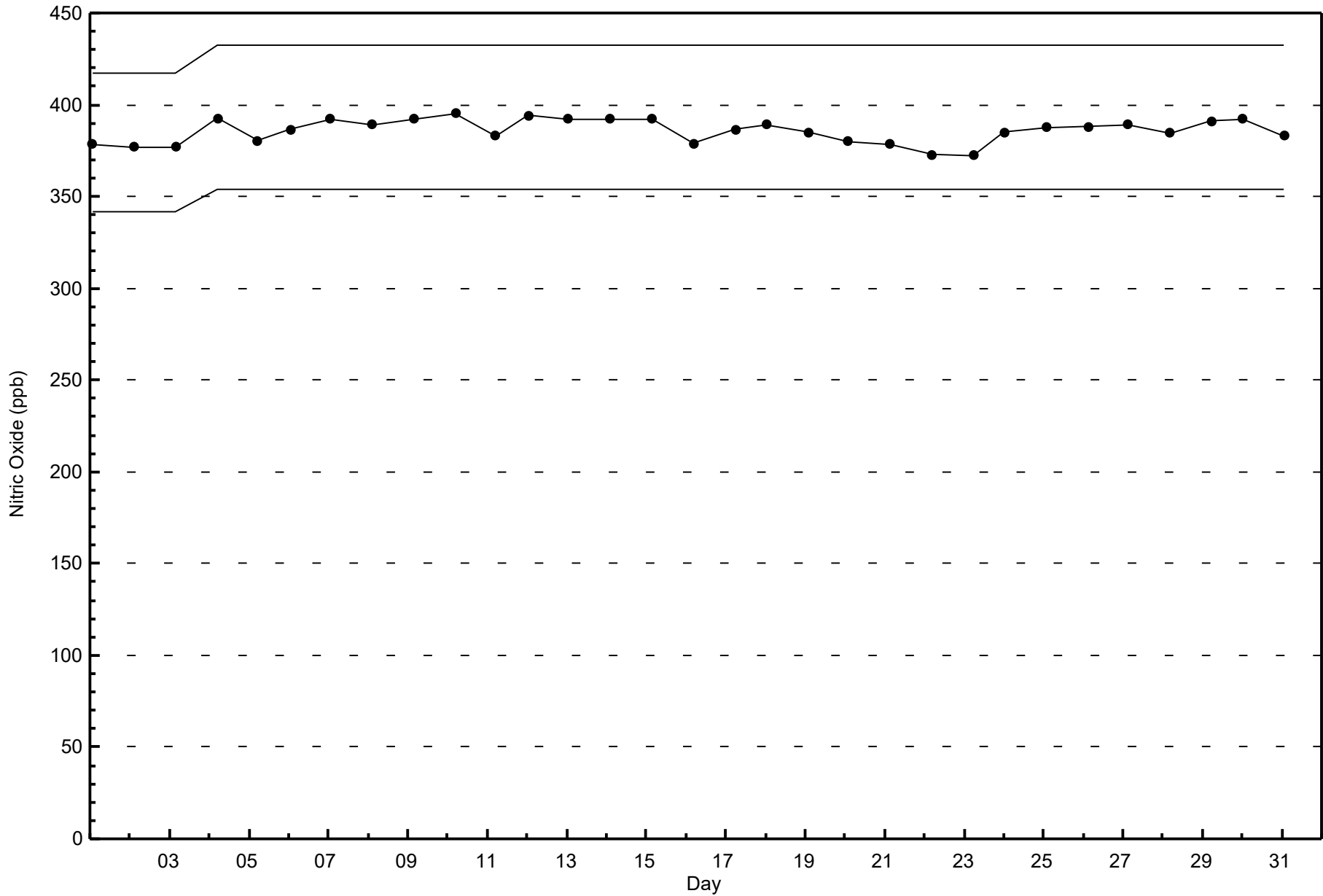


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitric Oxide (NO) - ppb
Kirby South







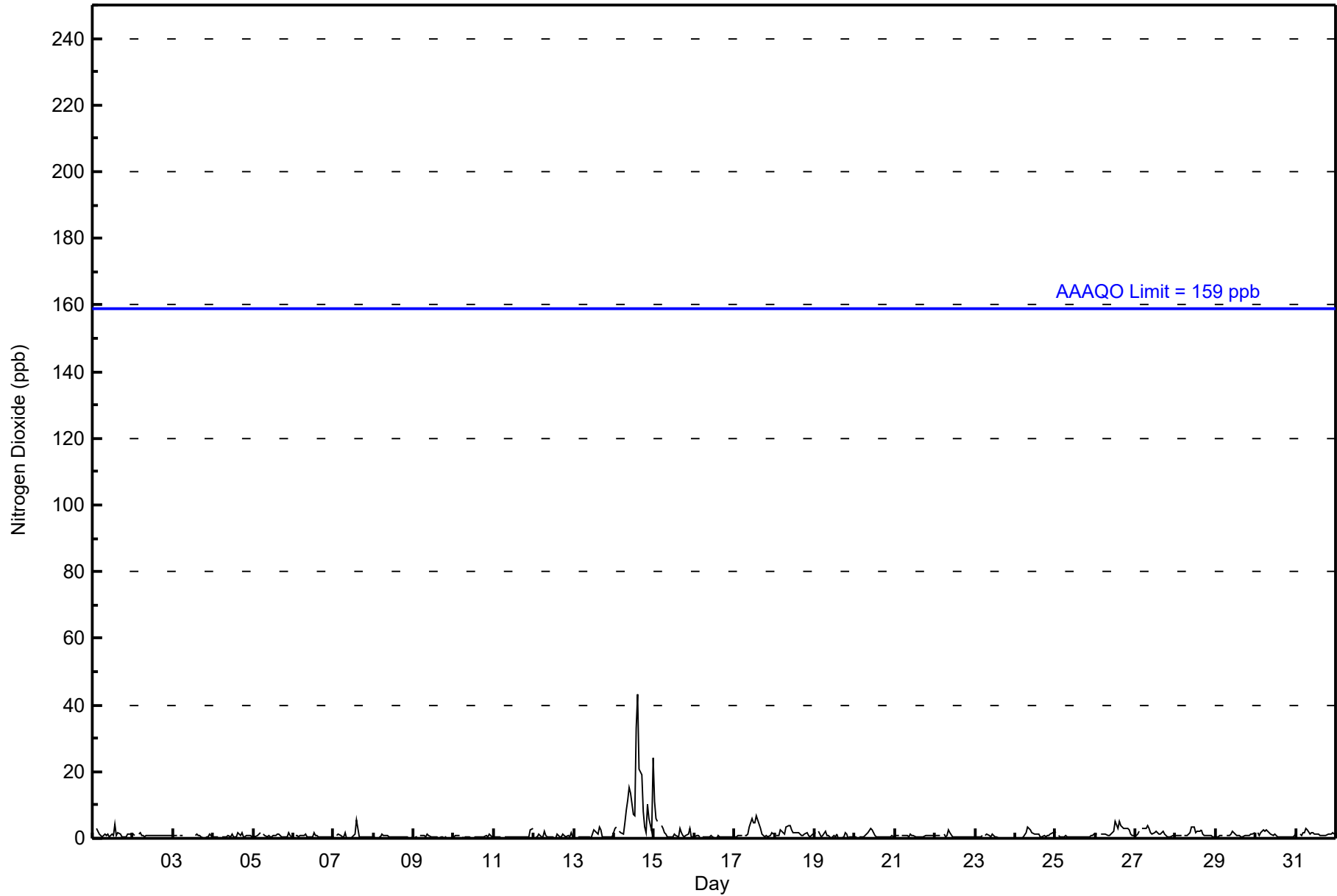


Number of Exceedences (AAAQO):		1-hr: 0	24-hr: 0	Hours in Service: 744																	Daily Average		Daily Maximum				
Maximum Value: 43.4 ppb on Aug 14 15:00		Maximum Daily Average: 10.9 ppb on Aug 14		Hours of Data: 707																	0.9		1.6				
Minimum Value: 0.0 ppb on Aug 8 23:00		Minimum Daily Average: 0.4 ppb on Aug 9		Hours of Missing Data: 37																	--		1.4				
Maximum Diurnal Average: 2.6 ppb at hour 15		Minimum Diurnal Average: 0.7 ppb at hour 20		Hours of Calibration: 37																	0.7		1.9				
Monthly Average: 1.32 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.2 P ₉₀ = 2.4 P ₉₉ = 11.6		Percent Operational Time: 100.0																	0.8		1.6				
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-Aug	1.8	Z	2.8	2.0	1.1	0.5	0.8	1.2	0.7	1.1	0.6	1.3	0.8	4.1	0.8	1.5	1.1	0.4	0.4	0.6	0.5	1.2	1.1	0.8	1.2	4.1	
2-Aug	1.2	1.0	Z	1.1	1.6	1.0	0.9	0.6	0.7	0.8	0.9	1.0	0.9	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.9	0.9	0.8	0.7	0.9	1.6	
3-Aug	0.7	0.7	0.9	Z	0.8	0.8	0.7	C	C	C	C	C	C	0.8	1.1	1.0	0.7	0.6	0.2	0.1	0.4	0.5	1.4	0.4	--	1.4	
4-Aug	0.3	0.3	0.3	0.5	Z	0.4	0.6	0.5	0.6	0.7	0.6	1.1	0.4	0.4	1.9	1.0	1.9	0.4	0.4	0.8	0.8	0.8	0.4	0.7	1.9		
5-Aug	0.9	0.5	0.9	1.2	1.5	Z	1.1	0.7	0.6	0.8	0.5	0.6	0.8	0.9	1.1	1.1	0.8	0.6	0.5	0.4	0.6	1.6	0.7	0.4	0.8	1.6	
6-Aug	Z	0.8	0.8	0.6	0.9	0.8	1.0	1.1	0.5	0.5	0.6	0.6	1.5	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6	0.6	0.7	1.5	
7-Aug	0.5	Z	0.9	1.2	0.7	0.6	0.5	1.5	0.2	0.1	0.1	0.6	1.0	1.1	5.3	0.5	0.4	0.5	0.6	0.4	0.3	0.4	0.5	0.6	0.8	5.3	
8-Aug	0.4	0.4	Z	0.3	0.5	1.2	0.9	0.7	0.8	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.3	0.1	0.0	0.3	0.5	1.2	
9-Aug	0.2	0.4	0.6	Z	0.7	0.8	0.9	0.6	1.1	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.1	0.1	0.1	0.2	0.4	1.1	
10-Aug	0.6	0.8	0.7	0.9	Z	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.5	0.3	0.4	0.6	0.3	0.5	0.9	0.5	1.2	1.0	0.5	0.5	1.2	
11-Aug	0.6	0.4	0.3	0.4	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.3	0.3	2.7	2.9	0.6	2.9	
12-Aug	Z	0.3	0.5	1.2	0.4	0.3	2.0	1.0	0.5	0.5	0.4	0.4	0.2	0.2	1.4	0.6	0.3	1.1	0.7	0.3	0.9	0.6	1.6	0.6	0.7	2.0	
13-Aug	0.5	Z	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	1.1	2.5	1.6	1.4	3.6	2.5	0.4	0.3	0.5	0.3	0.3	0.5	0.6	0.8	3.6	
14-Aug	3.1	3.2	Z	2.3	1.8	1.4	4.8	8.5	11.6	15.3	13.5	7.0	6.6	32.9	43.4	20.9	18.9	8.2	3.3	1.5	10.1	5.9	2.3	24.3	10.9	43.4	
15-Aug	10.9	6.0	5.0	Z	3.9	3.0	1.6	1.2	0.5	0.3	0.5	0.5	1.2	0.7	0.5	2.8	1.7	0.9	0.4	1.0	1.3	3.1	0.3	0.3	2.1	10.9	
16-Aug	0.5	0.8	0.9	0.4	Z	0.6	0.5	0.6	0.6	0.5	0.7	0.3	0.2	0.2	0.9	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.5	0.9	
17-Aug	0.3	0.5	0.7	0.9	0.9	Z	1.0	0.9	1.4	3.6	5.8	4.7	4.6	6.6	5.5	2.8	1.3	0.9	0.4	1.0	0.3	0.9	1.7	1.2	2.1	6.6	
18-Aug	Z	0.9	0.9	2.4	2.1	1.6	1.1	3.6	4.0	3.7	2.7	1.9	1.8	1.9	1.5	1.1	1.0	0.9	1.4	1.7	0.9	0.5	0.8	1.1	1.7	4.0	
19-Aug	1.6	Z	2.2	1.3	0.6	1.0	2.3	0.7	0.7	0.4	0.2	0.8	0.6	1.4	0.2	0.1	0.2	0.4	1.5	1.3	0.2	0.3	0.4	0.3	0.8	2.3	
20-Aug	0.4	0.5	Z	0.6	0.5	0.5	1.0	1.2	1.5	3.0	2.4	1.7	0.7	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.5	0.7	0.6	0.8	3.0	
21-Aug	0.7	0.8	0.9	Z	1.0	0.8	0.8	0.7	0.6	1.1	1.0	0.8	0.5	0.6	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.7	1.1	1.1
22-Aug	0.8	0.7	0.7	0.8	Z	1.1	0.6	0.8	2.4	1.8	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.7	2.4	
23-Aug	0.5	0.6	0.6	0.6	0.7	Z	0.7	1.3	0.9	0.5	1.4	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.4	
24-Aug	Z	0.2	0.2	0.2	0.2	0.4	1.6	3.4	3.0	2.6	1.8	1.4	1.2	1.4	1.3	0.6	0.6	0.8	0.5	0.8	0.9	1.2	1.6	2.0	1.2	3.4	
25-Aug	1.8	Z	0.9	0.6	0.6	0.5	0.8	0.5	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.6	0.6	0.5	0.4	0.4	0.5	0.7	0.8	1.2	0.6	1.8	
26-Aug	1.2	1.2	Z	1.4	1.4	1.3	1.2	1.0	1.0	1.2	1.6	2.2	5.0	3.0	5.0	4.0	3.4	3.0	3.1	2.8	2.7	1.1	1.0	0.8	2.2	5.0	
27-Aug	0.9	1.4	2.3	Z	3.0	3.1	2.9	3.9	3.0	1.7	1.1	1.5	2.1	1.8	1.3	1.4	2.1	1.4	0.7	0.6	0.5	0.6	0.7	0.7	1.7	3.9	
28-Aug	0.7	0.7	0.7	0.7	Z	0.7	0.7	1.0	1.5	3.3	3.2	3.5	1.9	2.2	2.3	2.7	1.1	0.7	0.7	0.9	0.9	0.8	0.6	0.6	1.4	3.5	
29-Aug	0.6	0.5	0.7	0.9	1.0	Z	0.8	0.9	0.9	1.3	2.2	1.7	1.0	1.0	0.7	0.6	0.6	0.7	0.8	0.8	1.0	1.1	1.4	1.6	1.0	2.2	
30-Aug	Z	1.6	0.9	1.6	2.4	2.2	2.4	2.2	1.5	1.3	1.0	1.2	0.9	0.6	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.5	0.6	0.9	1.1	2.4	
31-Aug	1.9	Z	1.2	0.9	1.8	1.8	3.0	2.4	1.4	1.9	1.6	1.4	1.3	1.2	0.8	0.9	0.9	0.9	0.9	1.3	1.3	1.4	1.7	1.2	1.4	3.0	
		1.3	1.0	1.1	1.0	1.2	1.0	1.2	1.5	1.5	1.7	1.6	1.3	1.3	2.2	2.6	1.7	1.5	1.0	0.7	0.7	0.9	0.9	1.5	Diurnal Average		
		10.9	6.0	5.0	2.4	3.9	3.1	4.8	8.5	11.6	15.3	13.5	7.0	6.6	32.9	43.4	20.9	18.9	8.2	3.3	2.8	10.1	5.9	2.7	24.3	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
Kirby South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Dioxide (NO₂) - ppb
Kirby South - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	703	99.43	99.43
21 - 40	3	0.42	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 Dioxide (NO₂) - ppb
Kirby South - August 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	39	24	22	22	17	43	26	32	59	90	42	67	96	76	27	703
21 - 40	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3
41 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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	21	39	24	22	22	17	43	26	32	59	90	42	67	99	77	27	707

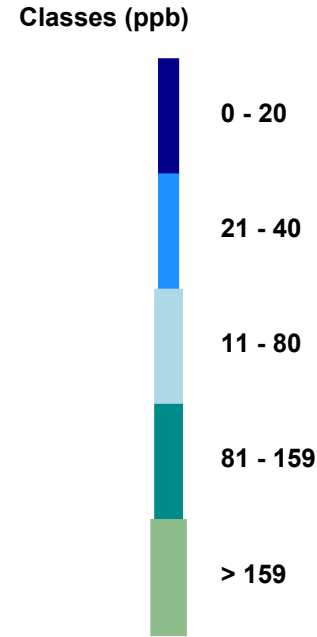
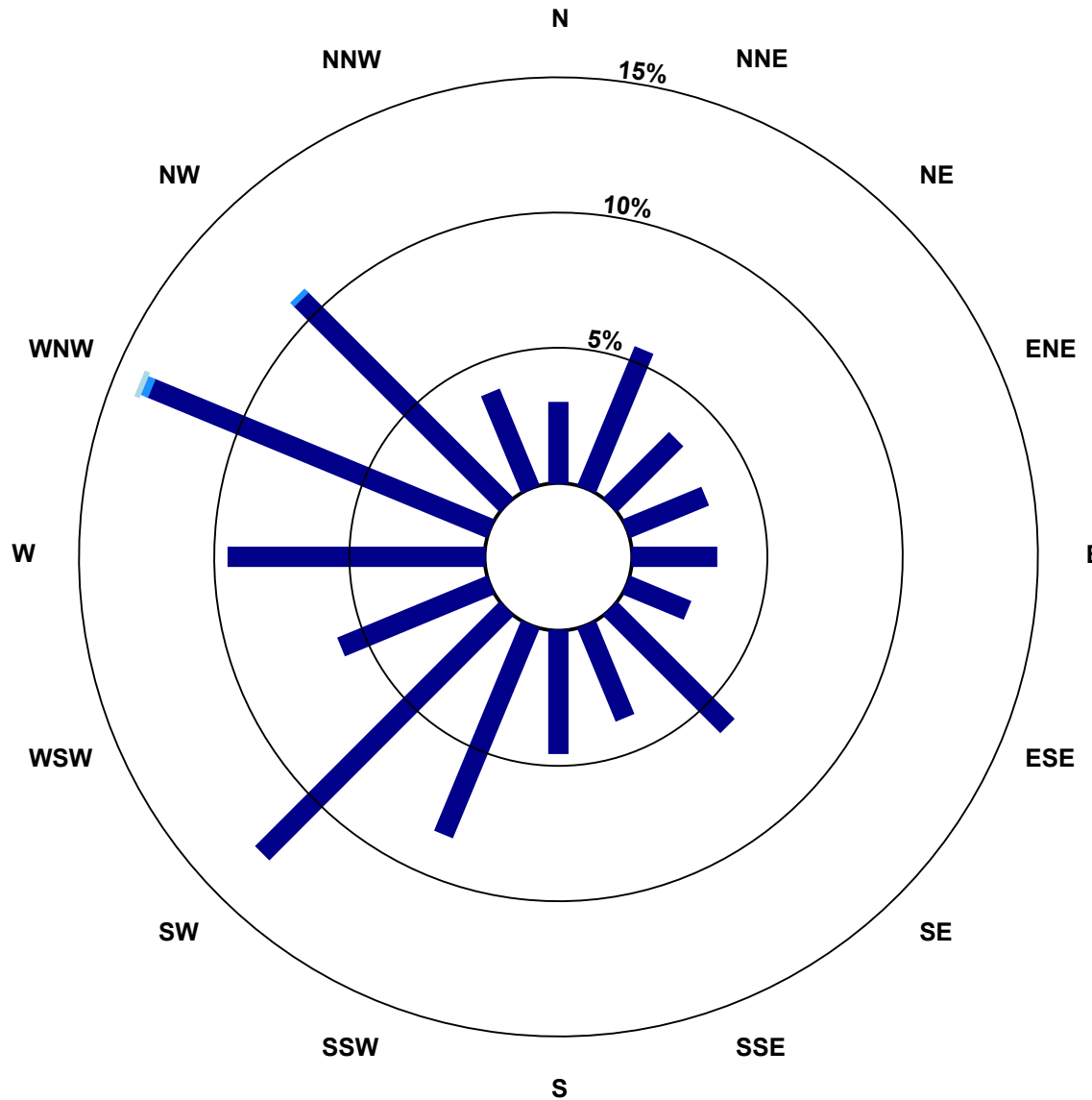
Total Number of Valid Hours: 707

Total Number of Hours: 744

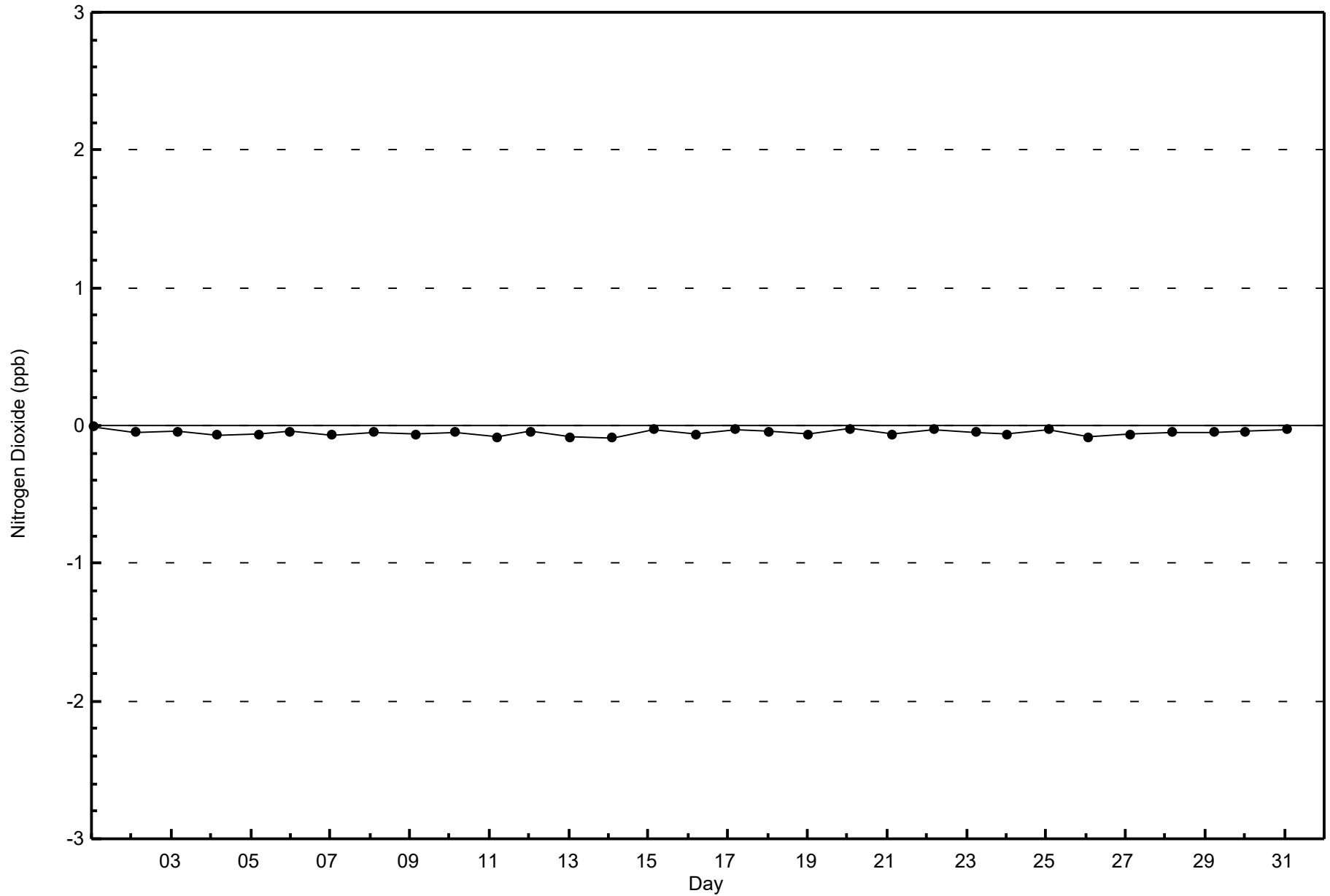


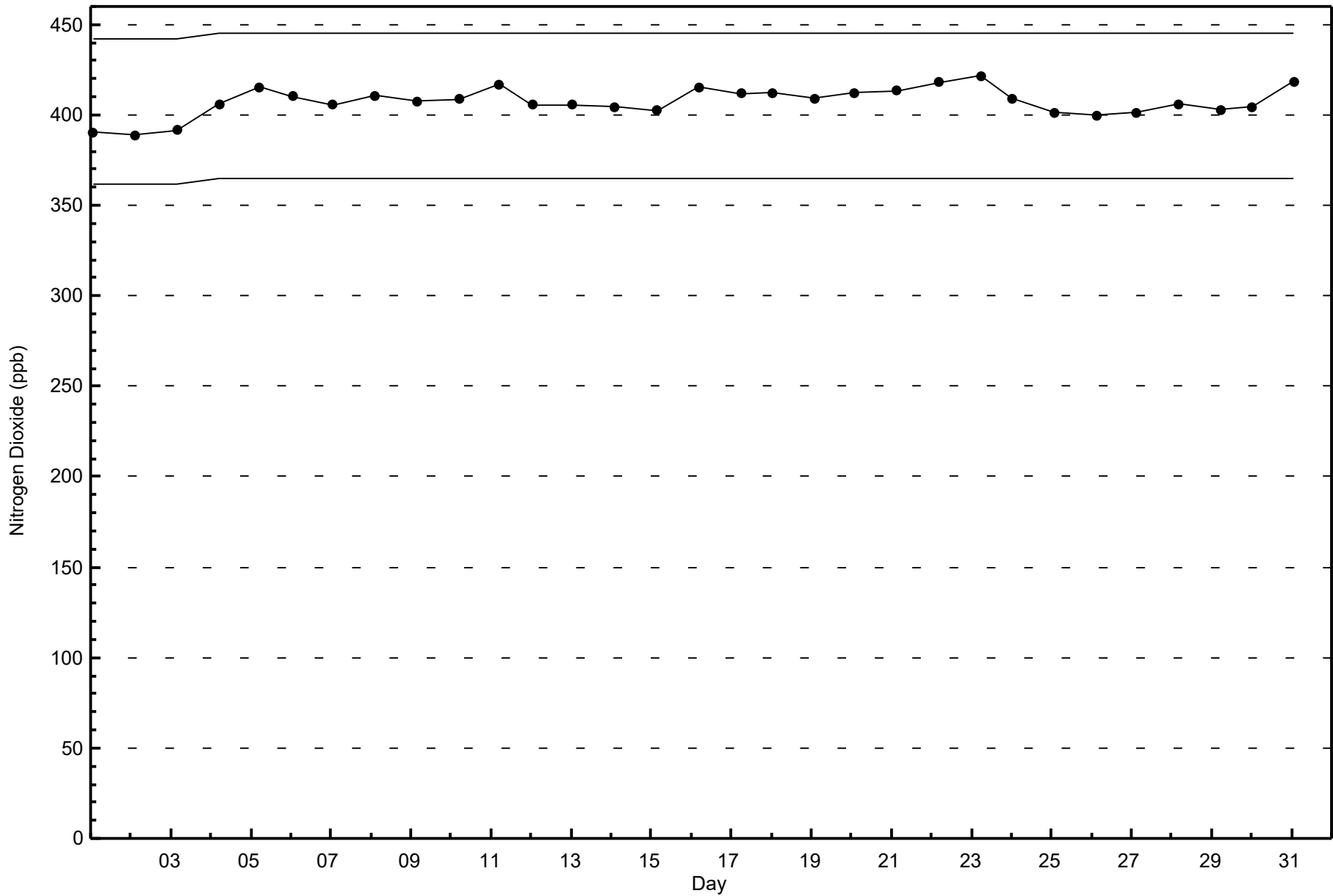
Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Dioxide (NO₂) - ppb
Kirby South



Total Number of Valid Hours: 707







Wood Buffalo Environmental Association
Summary of Hour Averages

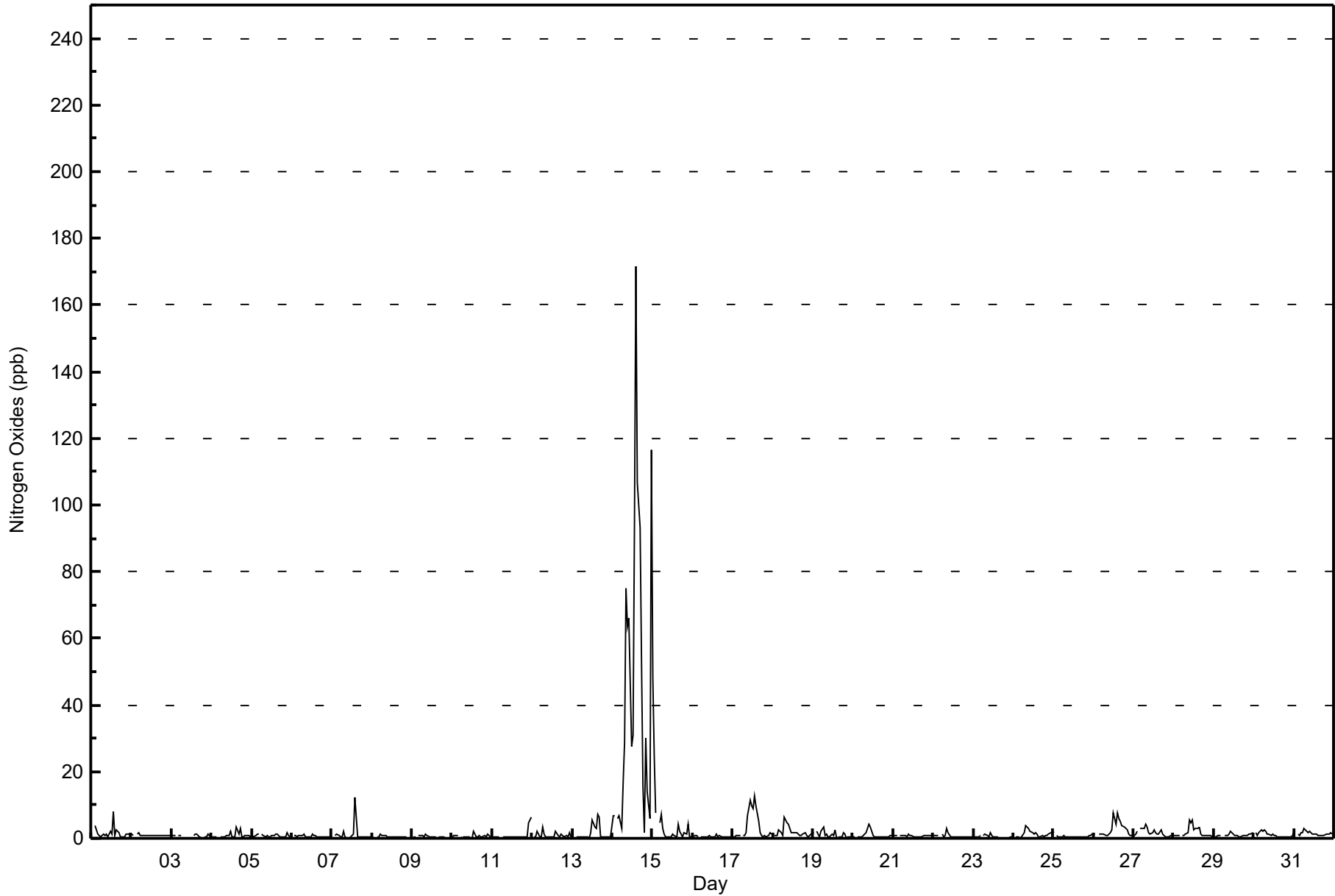
Nitrogen Oxides (NO_x) - ppb
Kirby South - August 2023

Maximum Value: 171.6 ppb on Aug 14 15:00		Maximum Daily Average: 45.2 ppb on Aug 14		Hours in Service: 744																							
Minimum Value: 0.0 ppb on Aug 8 23:00		Minimum Daily Average: 0.4 ppb on Aug 9		Hours of Data: 707																							
Maximum Diurnal Average: 7.3 ppb at hour 15		Minimum Diurnal Average: 0.8 ppb at hour 20		Hours of Missing Data: 37																							
Monthly Average: 2.70 ppb		Percentiles: P ₁ = 0.1 P ₁₀ = 0.3 Q ₁ = 0.4 Median = 0.7 Q ₃ = 1.3 P ₉₀ = 3.0 P ₉₉ = 63.1		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-Aug	2.1	Z	3.7	2.3	1.2	0.5	0.9	1.5	0.7	1.3	0.6	2.1	1.2	7.9	1.0	2.5	1.7	0.4	0.4	0.6	0.5	1.2	1.1	0.8	1.6	7.9	
2-Aug	1.2	1.0	Z	1.1	1.6	1.0	0.9	0.6	0.7	0.8	0.9	1.0	0.9	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.9	0.9	0.8	0.7	0.9	1.6	
3-Aug	0.7	0.7	0.9	Z	0.8	0.8	0.7	C	C	C	C	C	C	0.9	1.2	1.1	0.7	0.6	0.2	0.1	0.4	0.5	1.4	0.4	--	1.4	
4-Aug	0.3	0.3	0.3	0.5	Z	0.4	0.6	0.5	0.6	0.7	0.6	1.9	0.4	0.4	0.4	3.3	1.4	2.8	0.4	0.4	0.8	0.8	0.8	0.4	0.8	3.3	
5-Aug	0.9	0.5	0.9	1.2	1.5	Z	1.1	0.7	0.6	0.8	0.5	0.6	0.8	0.9	1.2	1.2	0.8	0.6	0.5	0.4	0.6	1.8	0.7	0.4	0.8	1.8	
6-Aug	Z	0.8	0.8	0.6	0.9	0.8	1.0	1.1	0.5	0.5	0.6	0.6	1.5	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6	0.6	0.7	1.5	
7-Aug	0.5	Z	0.9	1.2	0.7	0.6	0.5	1.9	0.2	0.1	0.1	0.6	1.0	1.1	12.4	0.5	0.4	0.5	0.6	0.4	0.3	0.4	0.5	0.6	1.1	12.4	
8-Aug	0.4	0.4	Z	0.3	0.5	1.2	0.9	0.7	0.8	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.3	0.1	0.0	0.3	0.5	1.2	
9-Aug	0.2	0.4	0.6	Z	0.7	0.8	0.9	0.6	1.1	0.8	0.5	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.1	0.1	0.1	0.2	0.4	1.1	
10-Aug	0.6	0.8	0.7	0.9	Z	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	2.1	0.3	0.4	0.6	0.3	0.5	0.9	0.5	1.2	1.0	0.5	0.6	2.1	
11-Aug	0.6	0.4	0.3	0.4	0.5	Z	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.5	0.3	0.3	4.7	6.3	0.8	6.3	
12-Aug	Z	0.3	0.5	2.0	0.4	0.3	3.4	1.4	0.5	0.5	0.4	0.4	0.2	2.1	0.7	0.3	1.2	0.7	0.3	0.9	0.6	1.6	0.6	0.8	3.4		
13-Aug	0.5	Z	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	1.9	5.7	3.6	2.8	7.2	6.3	0.4	0.3	0.5	0.3	0.3	0.5	0.6	1.5	7.2		
14-Aug	6.6	6.7	Z	5.8	6.7	3.0	16.8	28.8	74.9	63.7	66.2	27.5	31.0	94.5	171.6	106.9	93.1	53.1	15.6	1.6	30.0	13.9	5.8	116.4	45.2	171.6	
15-Aug	48.5	24.7	7.5	Z	4.7	7.4	2.9	1.2	0.5	0.3	0.5	0.5	1.3	0.7	0.5	4.3	2.1	1.1	0.4	1.5	1.3	4.0	0.3	0.3	5.1	48.5	
16-Aug	0.5	0.8	0.9	0.4	Z	0.6	0.5	0.6	0.6	0.5	0.7	0.3	0.2	0.2	1.4	0.4	0.7	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.5	1.4	
17-Aug	0.3	0.5	0.7	0.9	0.9	Z	1.0	0.9	1.8	6.9	11.6	9.7	9.0	12.9	9.6	4.9	1.7	1.0	0.4	1.0	0.3	0.9	1.7	1.2	3.5	12.9	
18-Aug	Z	0.9	0.9	2.4	2.1	1.6	1.1	6.2	4.7	4.2	3.0	1.9	1.8	1.9	1.5	1.1	1.0	0.9	1.4	1.7	0.9	0.5	0.8	1.1	1.9	6.2	
19-Aug	1.6	Z	2.2	1.3	0.6	2.0	3.3	0.8	1.2	0.4	0.2	1.3	0.8	2.6	0.2	0.1	0.2	0.4	1.7	1.4	0.2	0.3	0.4	0.3	1.0	3.3	
20-Aug	0.4	0.5	Z	0.6	0.5	0.5	1.0	1.4	1.9	4.3	3.5	2.0	0.7	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.5	0.7	0.6	1.0	4.3	
21-Aug	0.7	0.8	0.9	Z	1.0	0.8	0.8	0.7	0.6	1.1	1.0	0.8	0.5	0.6	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.7	1.1	1.1
22-Aug	0.8	0.7	0.7	0.8	Z	1.1	0.6	0.8	2.9	1.9	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.7	2.9	
23-Aug	0.5	0.6	0.6	0.6	0.7	Z	0.7	1.3	0.9	0.5	1.8	0.7	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.5	1.8	
24-Aug	Z	0.2	0.2	0.2	0.2	0.4	1.6	3.6	3.5	3.0	1.9	1.6	1.3	1.6	1.5	0.6	0.6	0.8	0.5	0.8	0.9	1.2	1.6	2.0	1.3	3.6	
25-Aug	1.8	Z	0.9	0.6	0.6	0.5	0.8	0.5	0.4	0.3	0.5	0.4	0.3	0.3	0.3	0.6	0.6	0.5	0.4	0.4	0.5	0.7	0.8	1.2	0.6	1.8	
26-Aug	1.2	1.2	Z	1.4	1.4	1.3	1.2	1.0	1.0	1.3	1.7	2.7	7.7	4.4	7.4	5.9	5.2	3.9	3.4	2.8	2.7	1.1	1.0	0.8	2.7	7.7	
27-Aug	0.9	1.4	2.3	Z	3.0	3.1	3.0	4.3	3.2	1.7	1.1	1.6	2.4	1.9	1.3	1.5	2.7	1.4	0.7	0.6	0.5	0.6	0.7	0.7	1.8	4.3	
28-Aug	0.7	0.7	0.7	0.7	Z	0.7	0.7	1.1	1.8	5.5	4.8	5.4	2.3	2.9	3.0	3.5	1.1	0.7	0.7	0.9	0.9	0.8	0.6	0.6	1.8	5.5	
29-Aug	0.6	0.5	0.7	0.9	1.0	Z	0.8	0.9	0.9	1.3	2.3	1.7	1.0	1.0	0.7	0.6	0.6	0.7	0.8	0.8	1.0	1.1	1.4	1.6	1.0	2.3	
30-Aug	Z	1.6	0.9	1.6	2.4	2.2	2.4	2.2	1.5	1.3	1.0	1.2	0.9	0.6	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.5	0.6	0.9	1.1	2.4	
31-Aug	1.9	Z	1.2	0.9	1.8	1.8	3.0	2.6	1.5	2.1	1.7	1.4	1.3	1.2	0.8	0.9	0.9	0.9	0.9	1.3	1.3	1.4	1.7	1.2	1.5	3.0	
		2.9	1.9	1.2	1.2	1.4	1.3	1.7	2.3	3.7	3.6	3.6	2.4	2.5	4.8	7.3	4.9	4.1	2.5	1.1	0.8	1.6	1.2	1.1	4.6	Diurnal Average	
		48.5	24.7	7.5	5.8	6.7	7.4	16.8	28.8	74.9	63.7	66.2	27.5	31.0	94.5	171.6	106.9	93.1	53.1	15.6	2.8	30.0	13.9	5.8	116.4	Diurnal Maximum	
Z - zerospan		C - Calibration																									



Wood Buffalo Environmental Association
Hourly Averages

Nitrogen Oxides (NO_x) - ppb
Kirby South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby South - August 2023**

Concentration Ranges (ppb)	Number of Hours	%	Cumulative %
0 - 20	692	97.88	97.88
21 - 40	5	0.71	98.59
41 - 80	5	0.71	99.29
81 - 159	4	0.57	99.86
> 159	1	0.14	100.00

Total Number of Valid Hours: 707

Total Number of Hours: 744



**Wood Buffalo Environmental Association
Frequency Distribution**

**Nitrogen Oxides (NO_x) - ppb
Kirby South - August 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	20	39	24	22	22	17	43	26	32	59	90	42	66	93	72	25	692
21 - 40	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	5
11 - 80	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	5
81 - 159	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	4
> 159	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Totals	21	39	24	22	22	17	43	26	32	59	90	42	67	99	77	27	707

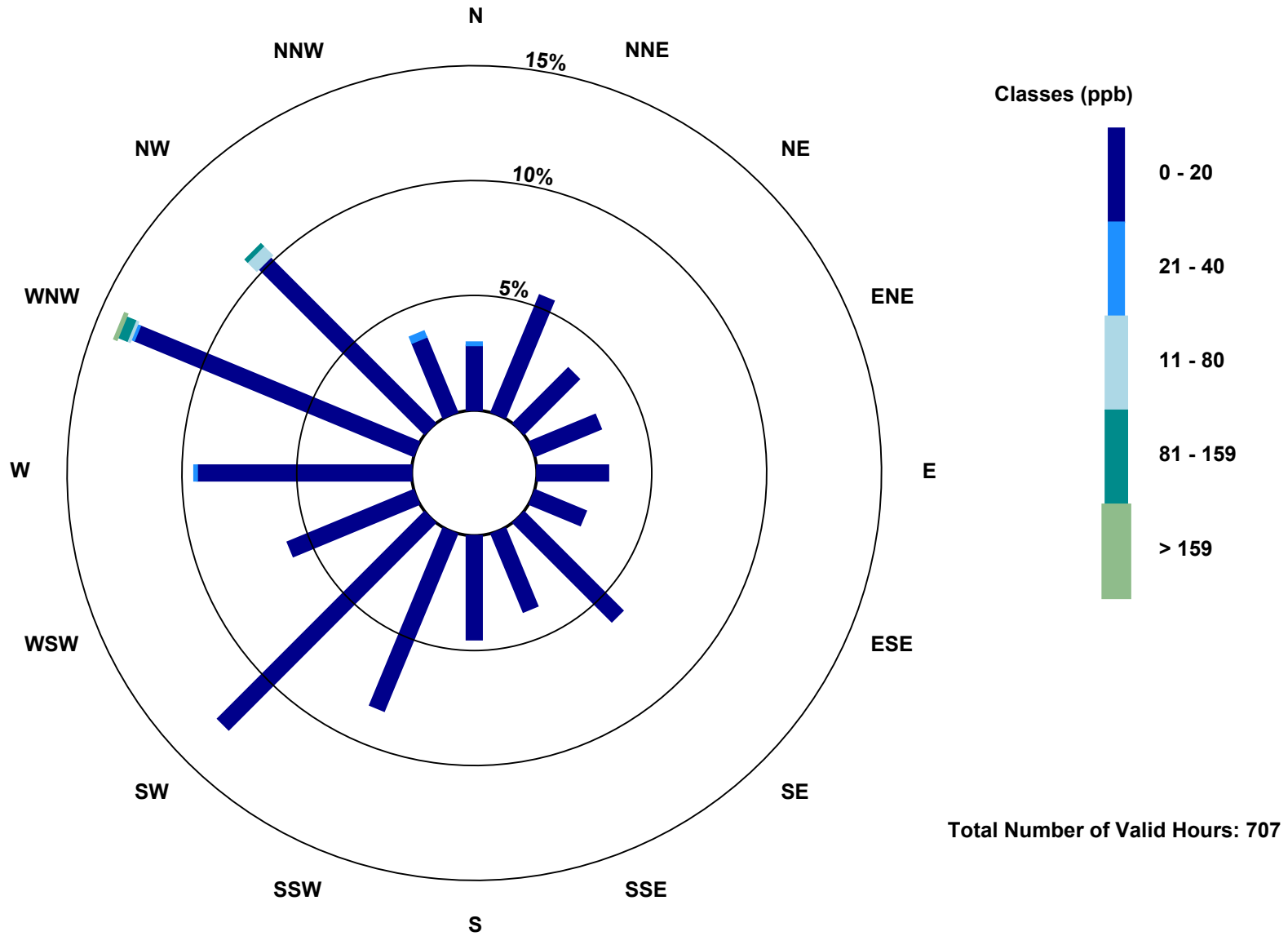
Total Number of Valid Hours: 707

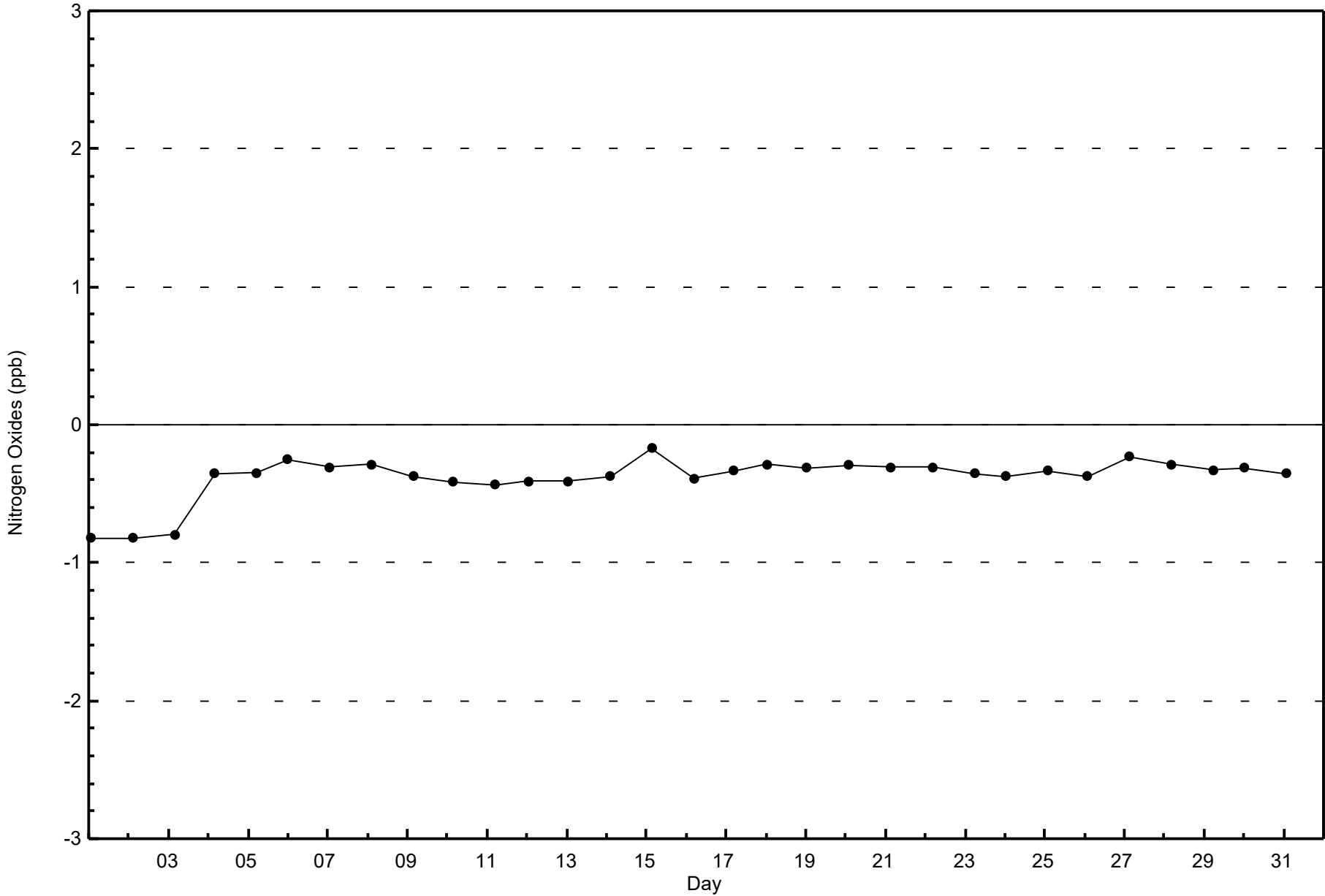
Total Number of Hours: 744

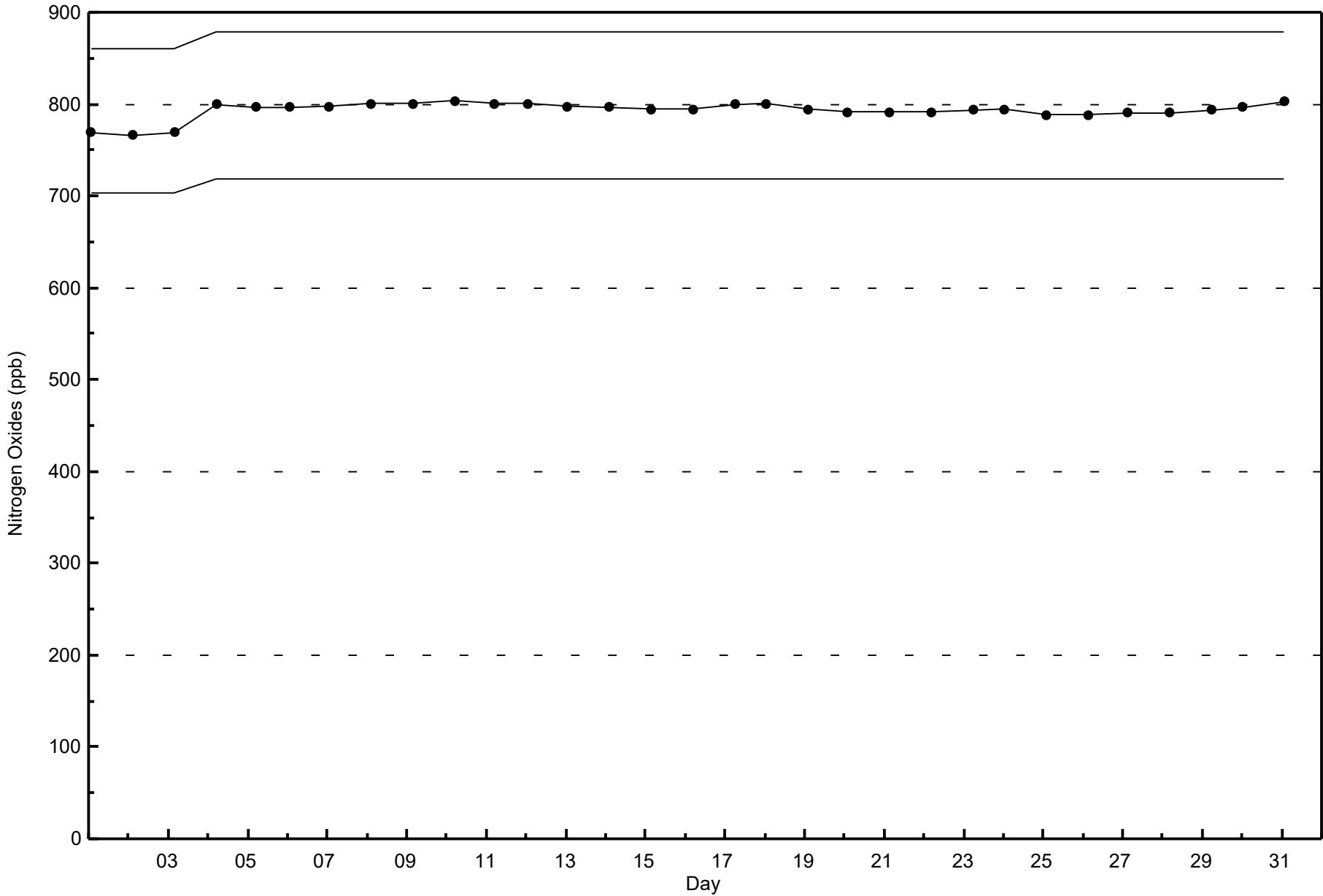


Wood Buffalo Environmental Association
Wind Rose Aug 2023

Nitrogen Oxides (NO_x) - ppb
Kirby South







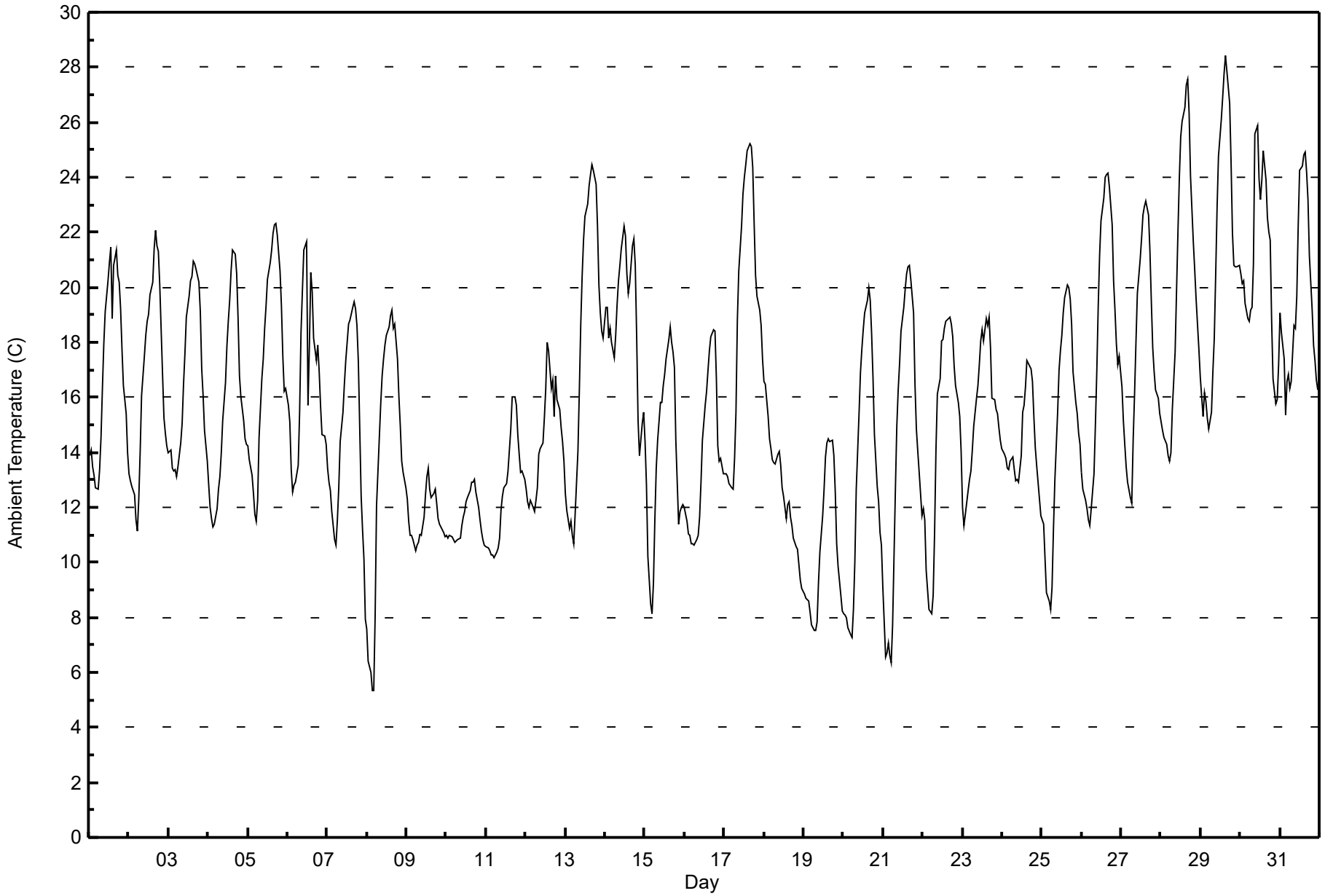


Maximum Value: 28.4 C on Aug 29 16:00		Maximum Daily Average: 21.1 C on Aug 29		Hours in Service: 744																																													
Minimum Value: 5.3 C on Aug 8 05:00		Minimum Daily Average: 10.5 C on Aug 19		Hours of Data: 744																																													
Maximum Diurnal Average: 20.0 C at hour 16		Minimum Diurnal Average: 11.7 C at hour 6		Hours of Missing Data: 0																																													
Monthly Average: 15.80 C		Percentiles: P ₁ = 6.9 P ₁₀ = 10.7 Q ₁ = 12.6 Median = 15.4 Q ₃ = 18.9 P ₉₀ = 21.7 P ₉₉ = 26.4		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-Aug	13.9	14.1	13.5	13.2	12.7	12.7	13.4	14.6	16.3	17.9	19.1	20.2	20.9	21.5	18.9	20.8	21.4	20.4	20.2	19.2	17.8	16.4	15.4	14.0	17.0	21.5																							
2-Aug	13.2	13.0	12.8	12.4	11.5	11.1	12.3	14.0	16.1	17.5	18.2	18.8	19.0	19.7	20.2	21.4	22.1	21.5	21.3	20.1	16.9	15.3	14.7	14.2	16.6	22.1																							
3-Aug	14.0	14.1	13.4	13.3	13.3	13.1	13.5	14.3	15.1	16.5	17.6	18.9	19.7	20.3	20.4	21.0	20.9	20.7	20.2	19.1	17.1	16.1	14.8	13.7	16.7	21.0																							
4-Aug	12.8	12.0	11.6	11.3	11.4	12.0	12.6	13.1	14.0	15.2	16.5	17.8	18.8	19.5	20.6	21.4	21.2	20.5	18.8	16.8	16.0	15.2	14.5	14.3	15.7	21.4																							
5-Aug	14.2	13.7	13.2	12.5	11.7	11.5	12.2	14.6	16.7	17.4	18.5	19.3	20.3	20.9	21.4	22.0	22.2	22.3	21.9	20.6	19.3	17.5	16.2	16.3	17.4	22.3																							
6-Aug	15.7	15.1	13.4	12.6	12.8	12.9	13.5	15.4	18.3	19.9	21.4	21.7	15.7	17.9	20.5	19.8	18.1	17.3	17.9	16.9	15.7	14.6	14.6	14.3	16.5	21.7																							
7-Aug	13.4	12.9	12.6	11.8	10.8	10.6	11.5	12.7	14.4	15.5	16.5	17.4	18.0	18.7	18.8	19.3	19.5	19.2	18.6	17.3	12.4	11.2	10.1	7.9	14.6	19.5																							
8-Aug	7.6	6.4	6.0	5.3	5.3	8.0	12.1	14.6	15.8	16.8	17.4	17.9	18.3	18.5	19.0	19.2	18.5	18.7	17.4	16.0	15.0	13.7	13.3	12.7	13.9	19.2																							
9-Aug	12.3	11.5	11.0	11.0	10.8	10.4	10.6	10.7	11.1	11.0	11.6	12.5	13.1	13.4	12.7	12.3	12.5	12.6	12.2	11.6	11.4	11.2	11.1	10.9	11.6	13.4																							
10-Aug	11.0	10.9	11.0	10.9	10.9	10.7	10.8	10.8	10.9	11.3	11.6	11.8	12.2	12.4	12.6	12.9	12.9	13.0	12.6	12.0	11.5	11.1	10.8	10.6	11.6	13.0																							
11-Aug	10.6	10.5	10.4	10.3	10.3	10.2	10.4	10.5	10.9	11.9	12.4	12.7	12.9	13.3	14.1	14.8	16.0	16.0	15.7	14.7	13.9	13.3	13.3	13.0	12.6	16.0																							
12-Aug	12.7	12.2	12.0	12.3	12.0	11.9	12.2	12.7	14.0	14.1	14.4	15.3	16.3	18.0	17.7	16.3	16.6	15.3	16.8	15.9	15.5	14.9	14.4	13.7	14.5	18.0																							
13-Aug	12.5	11.9	11.2	11.5	11.0	10.7	11.7	14.0	16.2	18.6	20.4	21.7	22.6	23.0	23.7	24.1	24.4	24.3	23.8	22.2	20.1	19.1	18.4	18.1	18.1	24.4																							
14-Aug	19.3	19.3	18.2	18.5	18.0	17.5	18.2	19.4	20.3	20.8	21.4	22.2	21.9	20.5	19.8	20.2	21.5	21.8	20.8	18.2	15.1	13.9	15.1	15.5	19.0	22.2																							
15-Aug	14.4	12.8	10.2	8.5	8.2	9.3	11.5	13.4	14.5	15.8	15.8	16.4	16.8	17.4	18.1	18.6	18.0	17.6	17.1	14.4	11.4	11.9	12.0	12.1	14.0	18.6																							
16-Aug	12.0	11.5	11.0	11.0	10.7	10.7	10.6	10.8	11.0	11.6	12.9	14.5	15.7	16.2	17.0	17.7	18.2	18.4	18.4	16.7	14.2	13.7	13.8	13.2	13.8	18.4																							
17-Aug	13.2	13.2	13.1	12.9	12.7	12.7	13.8	15.5	18.8	20.6	22.2	23.4	24.0	24.5	24.9	25.2	25.1	24.4	22.3	20.4	19.7	19.2	18.6	17.4	19.1	25.2																							
18-Aug	16.6	16.5	15.3	14.5	14.1	13.7	13.6	13.6	13.9	14.0	13.5	12.7	12.4	11.6	12.1	12.2	11.7	11.4	10.9	10.6	10.5	9.9	9.4	9.1	12.7	16.6																							
19-Aug	8.8	8.7	8.6	8.6	8.2	7.7	7.5	7.5	7.8	9.2	10.4	11.7	12.6	13.8	14.4	14.5	14.4	14.4	13.9	12.6	10.7	9.9	8.8	8.3	10.5	14.5																							
20-Aug	8.1	8.1	8.0	7.6	7.4	7.3	8.3	10.0	12.7	15.4	16.9	17.8	18.4	19.1	19.5	20.0	19.5	18.3	16.7	14.6	12.8	12.2	11.1	10.6	13.3	20.0																							
21-Aug	9.1	6.5	6.7	7.1	6.6	6.3	7.7	12.7	14.9	16.3	17.2	18.4	19.3	19.9	20.5	20.7	20.8	20.3	19.1	16.5	14.8	14.0	13.3	11.7	14.2	20.8																							
22-Aug	11.9	11.5	9.7	9.0	8.3	8.1	8.8	11.0	14.1	16.1	16.7	18.0	18.1	18.5	18.8	18.8	18.9	18.6	18.2	17.1	16.4	15.8	15.3	14.0	14.7	18.9																							
23-Aug	12.0	11.4	11.8	12.6	13.0	13.3	14.1	14.9	15.9	16.4	17.2	18.0	18.4	18.0	18.9	18.6	18.9	17.8	15.9	15.9	15.6	15.4	14.9	14.4	15.6	18.9																							
24-Aug	14.1	13.9	13.8	13.4	13.4	13.7	13.8	13.4	13.0	13.0	12.9	13.9	15.5	15.7	16.4	17.4	17.3	17.0	16.6	15.3	14.2	13.5	12.3	11.7	14.4	17.4																							
25-Aug	11.6	11.4	10.1	8.9	8.6	8.3	9.1	11.2	13.0	15.5	17.0	17.7	18.3	19.1	19.6	20.1	20.0	19.6	18.7	16.9	15.8	15.4	14.7	14.3	14.8	20.1																							
26-Aug	13.2	12.7	12.3	12.0	11.5	11.4	12.0	13.2	15.0	17.0	19.3	21.2	22.4	23.3	24.0	24.1	24.2	23.7	22.3	20.2	19.1	17.9	17.2	17.5	17.8	24.2																							
27-Aug	16.4	15.1	14.3	13.5	12.9	12.3	12.2	14.4	16.1	18.0	19.8	21.0	21.8	22.6	23.0	23.1	22.6	21.3	19.5	17.8	16.9	16.3	16.0	15.4	17.6	23.1																							
28-Aug	15.1	14.8	14.6	14.3	13.9	13.7	14.0	15.6	17.6	19.8	22.0	24.0	25.5	26.1	26.5	27.3	27.5	26.3	24.1	21.7	20.6	19.6	18.7	17.7	20.0	27.5																							
29-Aug	16.7	15.3	16.2	15.9	15.2	14.9	15.4	16.9	18.2	20.5	22.9	24.7	26.1	26.9	27.8	28.4	27.8	26.7	24.6	22.0	20.8	20.8	20.8	20.8	21.1	28.4																							
30-Aug	20.5	20.1	20.2	19.4	18.9	18.8	19.2	19.3	20.9	25.6	25.9	24.0	23.2	23.9	24.9	23.9	22.5	22.0	21.7	18.8	16.7	15.8	15.9	17.2	20.8	25.9																							
31-Aug	19.1	18.4	17.4	15.4	16.6	16.8	16.3	16.6	18.6	18.5	19.7	22.2	24.2	24.4	24.8	24.9	24.2	23.2	21.2	19.1	17.9	17.3	16.6	16.3	19.6	24.9																							
																								13.4	12.9	12.4	12.0	11.7	11.7	12.4	13.6	15.0	16.4	17.4	18.3	18.8	19.3	19.7	20.0	20.0	19.5	18.7	17.1	15.7	14.9	14.4	13.9	Diurnal Average	
																								20.5	20.1	20.2	19.4	18.9	18.8	19.2	19.4	20.9	25.6	25.9	24.7	26.1	26.9	27.8	28.4	27.8	26.7	24.6	22.2	20.8	20.8	20.8	20.8		Diurnal Maximum



Wood Buffalo Environmental Association
Hourly Averages

Ambient Temperature (AT) - C
Kirby South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Ambient Temperature (AT) - C
Kirby South - August 2023**

Concentration Ranges (C)	Number of Hours	%	Cumulative %
-50 - -20	0	0.00	0.00
-20 - 0	0	0.00	0.00
0 - 10	49	6.59	6.59
10 - 20	560	75.27	81.85
> 20	135	18.15	100.00

Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Summary of Hour Averages

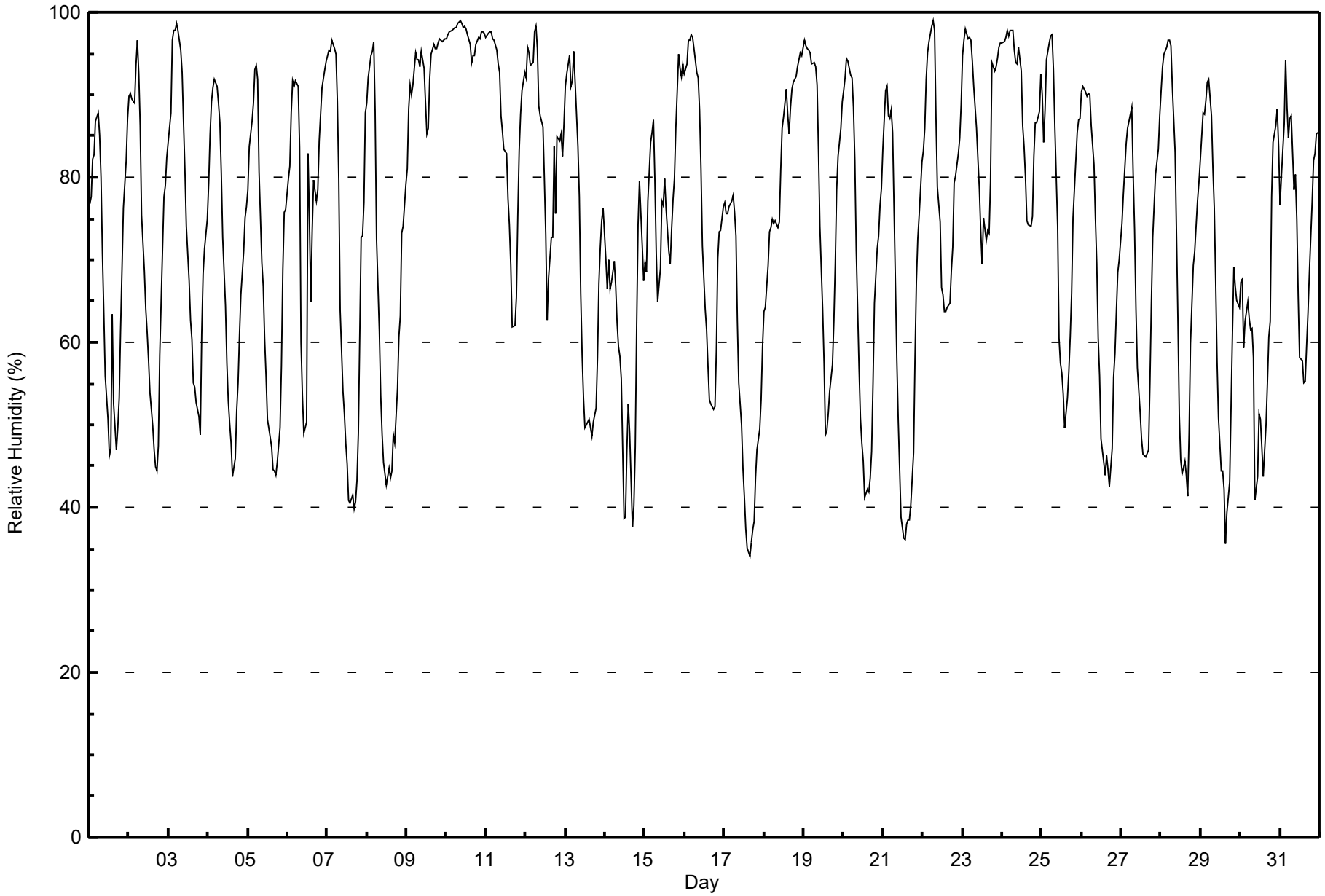
Relative Humidity (RH) - %
Kirby South - August 2023

Maximum Value: 99.1 % on Aug 10 09:00																						Maximum Daily Average: 97.2 % on Aug 10																						Hours in Service: 744			
Minimum Value: 34.1 % on Aug 17 16:00																						Minimum Daily Average: 55.5 % on Aug 17																						Hours of Data: 744			
Maximum Diurnal Average: 90.6 % at hour 6																						Minimum Diurnal Average: 56.4 % at hour 16																						Hours of Missing Data: 0			
Monthly Average: 74.13 %																						Percentiles: P ₁ = 37.6 P ₁₀ = 47.0 Q ₁ = 59.4 Median = 76.8 Q ₃ = 90.6 P ₉₀ = 95.8 P ₉₉ = 98.2																						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-Aug	76.8	77.6	82.2	82.8	86.8	87.8	85.1	79.9	70.9	63.6	56.0	50.7	46.2	47.0	63.3	52.5	46.9	49.6	53.3	61.5	68.9	76.3	82.0	87.2	68.1	87.8																					
2-Aug	89.8	90.1	89.5	89.1	93.6	96.7	92.5	86.3	75.4	68.7	64.1	61.2	57.9	53.8	49.8	46.9	45.0	44.4	47.4	58.5	71.4	77.6	78.9	82.4	71.3	96.7																					
3-Aug	84.2	87.7	96.6	97.8	97.8	98.6	97.8	95.4	92.7	86.6	80.9	74.0	67.4	62.7	60.4	55.0	54.6	52.7	51.0	48.9	61.0	68.4	71.4	75.0	75.8	98.6																					
4-Aug	79.3	85.3	89.1	90.8	91.8	91.0	89.0	86.6	80.5	72.8	64.4	57.4	52.9	50.2	47.8	43.8	45.9	51.7	55.1	60.8	65.8	71.0	75.1	76.4	69.8	91.8																					
5-Aug	78.5	83.7	86.7	89.1	93.1	93.6	91.9	80.8	69.7	66.7	60.3	56.0	50.8	48.4	47.4	44.5	44.4	43.8	45.4	49.7	57.1	68.7	75.8	76.1	66.8	93.6																					
6-Aug	79.9	81.4	87.8	91.7	91.1	91.8	91.0	83.6	60.1	53.6	48.9	50.4	83.0	75.0	64.9	73.5	79.6	77.0	78.5	84.4	87.6	90.9	93.0	94.1	78.9	94.1																					
7-Aug	94.7	95.5	95.2	96.6	95.7	94.9	89.2	79.6	63.8	54.0	51.4	47.7	45.2	40.9	40.5	41.5	39.8	40.6	43.2	49.1	72.8	72.9	77.0	87.9	67.1	96.6																					
8-Aug	89.0	92.0	94.7	95.3	96.4	88.0	72.6	61.4	53.6	48.8	45.5	44.0	42.7	44.7	43.5	44.5	48.8	47.8	54.4	60.7	63.2	73.2	74.1	79.2	64.9	96.4																					
9-Aug	81.0	88.3	91.2	90.0	91.2	95.1	94.2	94.3	93.4	95.3	93.3	89.2	85.2	85.9	91.9	94.9	96.0	95.6	95.6	96.3	96.7	96.5	96.6	96.9	92.7	96.9																					
10-Aug	96.8	97.4	97.7	97.8	97.9	98.1	98.2	98.6	99.1	98.6	98.1	98.3	98.0	97.3	96.2	93.8	94.7	94.7	96.2	97.0	96.7	97.6	97.7	97.4	97.2	99.1																					
11-Aug	97.0	97.4	97.7	97.6	96.8	96.6	95.4	93.8	92.7	87.5	85.6	83.5	82.9	77.5	74.3	69.4	61.9	62.1	65.5	75.2	83.1	87.6	90.4	92.8	85.2	97.7																					
12-Aug	92.1	95.8	95.2	93.5	93.9	97.6	98.3	95.7	88.6	87.4	86.0	79.8	73.1	62.7	67.8	72.7	72.7	83.7	75.5	85.0	84.5	85.3	82.6	86.5	84.8	98.3																					
13-Aug	91.0	92.5	94.7	91.0	91.7	95.2	91.5	83.7	77.6	66.0	58.4	53.1	49.6	50.4	50.6	49.7	48.6	50.3	52.1	58.1	67.0	71.6	74.7	76.3	70.2	95.2																					
14-Aug	70.0	66.5	70.0	66.4	67.3	69.8	66.8	62.4	59.5	58.4	55.6	38.6	38.8	47.0	52.5	49.0	37.6	40.2	47.3	62.1	74.3	79.4	71.6	67.5	59.1	79.4																					
15-Aug	69.7	68.5	77.1	84.3	85.4	87.0	79.8	70.9	64.8	69.0	77.0	76.7	79.8	76.3	71.1	69.5	73.7	77.3	79.9	86.0	94.9	93.2	92.2	93.7	79.1	94.9																					
16-Aug	92.6	93.8	96.6	96.7	97.3	96.9	95.6	92.7	92.0	88.2	81.0	71.7	64.0	61.5	57.1	53.1	52.5	51.9	52.2	59.2	70.1	73.5	73.5	76.4	76.7	97.3																					
17-Aug	76.9	75.7	75.6	76.4	77.1	77.9	75.8	72.8	62.6	55.1	50.0	44.8	41.3	37.5	35.1	34.1	35.8	37.2	38.3	43.6	47.0	49.5	53.1	59.6	55.5	77.9																					
18-Aug	63.8	64.2	69.3	73.4	73.9	75.0	74.5	74.8	74.0	74.6	80.8	85.9	87.3	90.7	87.6	85.3	88.5	90.7	91.6	92.2	93.4	94.3	95.2	94.7	82.3	95.2																					
19-Aug	96.6	95.9	95.6	95.4	95.1	93.8	94.0	93.4	91.2	83.3	74.1	63.9	57.4	48.9	49.4	51.3	54.1	57.4	62.6	69.5	78.5	82.5	85.9	89.2	77.4	96.6																					
20-Aug	90.6	92.1	94.4	94.1	92.3	92.0	88.4	82.1	71.2	56.9	50.8	47.9	45.7	41.2	42.2	41.9	43.6	46.8	55.0	64.8	71.4	73.0	76.7	78.6	68.1	94.4																					
21-Aug	83.4	90.6	90.9	87.5	87.2	88.2	85.4	67.3	57.9	50.7	44.7	38.9	36.3	36.1	38.0	38.6	38.4	40.3	46.7	58.0	67.4	72.5	75.3	81.9	62.6	90.9																					
22-Aug	83.2	85.9	91.9	95.1	96.5	98.3	98.9	97.8	87.3	78.8	74.6	66.6	65.8	63.7	63.6	64.2	64.7	68.7	71.5	79.4	80.2	82.8	84.7	88.9	80.5	98.9																					
23-Aug	94.8	96.7	97.9	96.8	96.9	96.6	94.0	91.0	85.9	82.2	78.7	73.6	69.5	75.2	72.4	73.6	73.2	79.5	93.9	92.9	93.4	94.3	95.8	96.3	87.3	97.9																					
24-Aug	96.3	96.5	97.0	97.9	97.2	97.8	97.8	95.4	93.9	93.7	95.8	92.9	86.2	83.7	79.9	74.7	74.2	74.0	75.2	82.5	86.6	86.7	88.0	92.5	89.0	97.9																					
25-Aug	90.0	84.3	88.1	94.3	96.3	97.1	97.3	93.1	86.2	74.1	60.5	57.4	56.3	53.7	49.6	53.2	56.5	60.7	65.9	75.2	82.1	85.4	86.9	87.2	76.3	97.3																					
26-Aug	90.3	91.0	90.4	89.8	90.2	90.0	86.4	81.6	75.2	69.4	60.6	55.9	48.3	45.4	43.9	46.2	44.6	42.5	47.2	55.8	58.7	63.8	68.5	70.0	66.9	91.0																					
27-Aug	74.4	78.0	81.0	84.0	85.9	87.7	88.5	80.3	73.8	64.0	56.9	51.6	48.4	46.5	46.2	46.1	46.9	55.2	64.5	72.7	76.5	80.3	83.3	87.4	69.2	88.5																					
28-Aug	90.6	93.3	94.9	95.8	96.6	96.7	96.0	91.1	83.0	72.8	62.8	51.2	45.8	44.1	45.5	43.9	41.3	48.9	59.8	69.4	71.0	74.1	77.2	79.4	71.9	96.7																					
29-Aug	82.0	87.9	87.7	89.3	91.6	91.8	87.4	81.2	76.3	67.2	57.6	50.8	44.5	44.5	42.1	35.7	39.3	43.0	52.2	61.2	69.1	66.8	65.0	64.3	65.8	91.8																					
30-Aug	67.2	67.6	59.3	62.5	65.0	62.9	61.5	61.7	58.2	40.8	43.7	51.3	50.7	47.3	43.7	49.9	55.1	60.6	62.5	77.6	84.3	86.3	88.2	83.8	62.2	88.2																					
31-Aug	76.6	80.2	86.4	94.3	88.6	84.8	87.1	87.4	78.5	80.3	74.9	65.7	58.1	57.9	55.1	55.3	59.5	63.6	68.4	77.0	82.0	83.0	85.3	85.5	75.6	94.3																					
																						84.5	86.2	88.5	89.6	90.3	90.6	88.4	83.8	77.1	71.3	66.9	62.3	60.0	58.0	57.2	56.4	56.7	59.1	62.8	69.8	76.0	79.3	81.2	83.4	Diurnal Average	
																						97.0	97.4	97.9	97.9	97.9	98.6	98.9	98.6	99.1	98.6	98.1	98.3	98.0	97.3	96.2	94.9	96.0	95.6	96.2	97.0	96.7	97.6	97.7	97.4	Diurnal Maximum	



Wood Buffalo Environmental Association
Hourly Averages

Relative Humidity (RH) - %
Kirby South - August 2023





Wood Buffalo Environmental Association
Cumulative Frequency Distribution

Relative Humidity (RH) - %
Kirby South - August 2023

Concentration Ranges (%)	Number of Hours	%	Cumulative %
0 - 20	0	0.00	0.00
20 - 40	18	2.42	2.42
40 - 60	172	23.12	25.54
60 - 80	222	29.84	55.38
80 - 100	332	44.62	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 South - August 2023

Maximum Speed: 24 km/h on Aug 17 14:00	Maximum Daily Speed Average: 15.5 km/h on Aug 1	Hours in Service: 744
Minimum Speed Value: 1 km/h on Aug 23 04:00	Minimum Daily Speed Average: 1.9 km/h on Aug 6	Hours of Data: 744
Maximum Diurnal Speed Average: 6.1 km/h at hour 14	Minimum Diurnal Speed Average: 3.3 km/h at hour 9	Hours of Missing Data: 0
Monthly Average Velocity: 4.2 km/h 265.5 deg	Percentiles: P ₁ = 2 P ₁₀ = 5 Q ₁ = 7 Median = 10 Q ₃ = 12 P ₉₀ = 15 P ₉₉ = 21	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-Aug	WSW12	W15	W16	W15	W17	W17	W17	W20	WNW18	WNW19	WNW21	WNW21	WNW23	W22	WNW17	W20	WNW20	NW19	WNW16	NW10	NW8	WNW7	WNW6	W6	WNW15.5	WNW23	
2-Aug	W8	WNW9	NW8	NW7	WNW6	WNW7	NW7	NNW6	NNE6	NNW6	NW5	NW7	WNW9	WNW7	NW10	NNW5	NNW3	WNW7	NNW2	NE6	ENE6	ENE6	E6	E6	NW4.4	NW10	
3-Aug	ESE7	SE9	SSW10	WSW12	WSW11	E8	SE9	SSE10	SSE9	SSE4	S2	SSW7	WSW5	W8	WNW11	WNW13	WNW16	WNW16	WNW14	WNW13	NW7	NW6	W10	W11	WSW4.9	WNW16	
4-Aug	WNW12	WNW13	W13	W12	WNW12	WNW14	NW14	NW14	NW14	NW15	NW13	NW15	WNW15	NW14	NW9	WNW14	WNW15	WNW13	NNW12	NNW5	WNW8	WNW5	W8	W9	WNW11.5	WNW15	
5-Aug	WNW8	WNW10	WNW9	WNW9	WNW9	WNW9	WNW9	WNW9	NW8	NW9	WNW10	NW11	NW11	NW10	WNW12	WNW13	WNW13	WNW13	WNW12	WNW10	WNW8	W10	WSW10	WSW9	W11	WNW9.8	WNW13
6-Aug	WNW9	WNW9	W6	WNW5	W4	W3	WNW2	SSW2	ESE6	E6	NNW4	N4	W12	WSW2	SW7	S7	SE7	S9	S5	SW7	SW6	NNW3	NNE7	NE5	WSW1.9	W12	
7-Aug	NE6	NE6	NE8	NE9	NE7	NE7	NE8	NE12	NE12	NE13	NNE11	NNE9	N8	NNE10	NNE8	NE11	NNE11	NE11	NE11	NE6	NNE4	NNE6	NNE4	ENE3	NE8.2	NE13	
8-Aug	NE1	NE5	ENE2	ENE3	ESE4	SSE5	SSE6	SSE8	S8	S7	S6	S6	SSE6	SSW6	ESE8	SE11	SSE9	SSE7	S7	SE7	SE8	SE10	SE11	SSE12	SSE5.8	SSE12	
9-Aug	SSE10	S10	SSE10	S11	SSE10	SSE8	SE10	SE10	SSE12	SE12	SE12	SE13	SE13	SSE12	SSE13	SE13	SE14	SSE12	SE16	SE16	SE16	SE15	SE12	SE13	SE11.9	SE16	
10-Aug	SE15	SE14	SE14	SE15	SE13	SE13	SE12	ESE10	ESE11	ESE11	ESE10	E9	ENE9	NE9	NNE6	N7	NNE8	NNE9	NNE8	NNE10	NNE9	NNE9	NNE10	NNE11	E6.6	SE15	
11-Aug	N11	N11	N12	N13	N11	NNW11	N11	N12	NNW12	NNW10	NNW9	NW10	NW10	NW10	WNW10	NW9	NW6	WNW7	WNW6	WSW4	SW8	SW9	WSW10	W16	NW7.8	W16	
12-Aug	W12	WSW12	WSW15	W15	WSW9	SW9	W11	W9	WNW11	WNW14	WNW15	NW15	NW13	NW18	WNW14	NW11	NW14	WNW8	WNW9	NW2	WNW8	NW6	WNW8	W8	WNW10.1	NW18	
13-Aug	WSW6	WSW7	SW8	WSW10	SW10	SW10	SW10	SW11	SW12	SW15	SW18	WSW19	WSW22	WSW22	WSW20	WSW21	WSW21	WSW20	WSW17	SW12	SW10	SW11	SW11	SW11	WSW13.8	WSW22	
14-Aug	W13	W14	W12	W17	W16	W17	W18	W19	WNW20	NW17	NW15	N14	NNW12	NW13	WNW10	WNW9	WNW9	NW8	WNW5	WSW3	WNW2	WSW5	W7	WNW9	WNW10.7	WNW20	
15-Aug	NW7	NNW6	NW4	W4	SW5	SW6	SW10	SSW9	SSW12	SSW12	SSW11	SW8	SW8	SW15	WSW15	WSW14	WSW13	WSW13	WSW13	WSW13	WNW15	W6	W14	WNW19	WNW18	WSW8.7	WNW19
16-Aug	NW17	NNW14	NW11	NW11	WNW12	NW13	NW13	NW12	SSW13	WNW16	WNW15	WNW14	WNW16	WNW15	WNW14	WNW13	WNW12	NW10	WNW8	SW6	SSW9	SW11	SSW10	SSW11	WNW10.2	NW17	
17-Aug	SSW12	SSW13	SSW14	SSW15	SSW14	SW13	SW12	SW15	WSW17	W18	W19	W22	W23	W24	W22	WNW19	WNW17	WNW15	NW10	W9	W7	W9	W7	SW6	WSW12.6	W24	
18-Aug	WSW4	NW7	NNE8	NNE9	NNE8	N8	N9	NNE11	NE14	NE15	NNE15	NNE15	NNE12	NNE11	N10	NNW10	NNW11	NNW9	NNW11	NW12	NW13	NNW12	NNW13	NNW11	N9.2	NE15	
19-Aug	NNW10	NNW11	NNW10	NNW11	NW11	NNW11	NW11	NW13	WNW13	WNW13	WNW15	WNW17	NW14	WNW16	WNW16	WNW15	WNW12	WNW15	W11	W10	SW9	SW9	SW8	SW7	WNW10.4	WNW17	
20-Aug	SW10	SW10	SW10	SW10	SW10	SW10	SW11	SW12	SW14	WSW17	WSW14	WSW12	SSW13	SSW9	SW8	SW9	SW11	SSW13	SSW10	SW7	SW8	SSW7	SW10	SW8	SW10.3	WSW17	
21-Aug	SSW5	SSW6	SSW6	SSW6	SSW7	SSW6	SW5	S3	S5	SE7	SE9	SE8	SE8	SE8	SSE8	SSE9	SE8	SSE9	SSE8	S7	S9	S7	SSE6	SE4	SSE6.0	SSE9	
22-Aug	S7	SSE5	ESE5	E5	E4	E5	E5	ESE5	SE6	SSE8	SE10	ESE10	SE8	SE6	SE4	S3	E4	ENE5	ENE4	SE3	S7	S7	S7	SSW3	SE4.7	ESE10	
23-Aug	SSW6	SSW2	WNW1	ENE1	E3	SSE4	SSE5	SSE4	ESE4	ESE5	ENE8	E8	E7	E8	E12	ENE12	ENE11	E11	ENE7	ENE8	ENE8	E7	E6	ENE6	E5.3	E12	
24-Aug	ENE7	ENE6	ENE5	ENE4	NNE5	NNE5	NNE7	NNE10	NNE11	NE11	NE11	NE11	NNE12	NNE13	N11	NNE12	NNE13	N11	N6	NW6	NW6	WNW7	WNW7	WNW8	NNE7.0	NNE13	
25-Aug	WNW7	WNW7	WSW6	SW9	SW10	SW9	SW8	SW10	SW11	SW12	SW14	SW14	SW13	SW13	SW14	SW14	SW15	SW12	SSW9	SSW9	SSW11	SSW12	SSW12	SSW12	SW10.4	SW15	
26-Aug	SSW11	SSW11	SSW13	SSW13	SSW13	SSW14	SSW14	SSW13	SW15	SW12	SW13	SW13	WSW18	WSW17	W18	WSW19	W19	W18	W13	W9	W12	W10	WNW9	NW11	WSW11.4	WSW19	
27-Aug	N8	N8	N8	NNE7	N6	NNE6	NE1	NE5	ENE5	ESE3	E5	S3	WSW3	SW6	W7	WSW10	W13	WSW12	SW9	SW9	SW11	SW10	SW10	SW10	W2.8	W13	
28-Aug	SW11	SW11	SW11	SW12	SW11	WSW7	WSW8	WSW9	W8	W10	W12	W13	W14	WNW13	W9	W9	W8	WSW11	SW11	SW9	SW10	SSW10	SW9	SSW8	WSW9.3	W14	
29-Aug	SSW7	SSW7	SSW8	SSW8	SSW7	SW8	SSW7	SSW9	SSW8	SW9	SW10	SW11	SW11	SSW12	SSW11	SW12	SSW11	S9	S7	S7	S9	S10	S10	S12	SSW8.8	SSW12	
30-Aug	S13	S12	S10	S9	S10	SSW11	S12	SSW10	SW5	SSW2	E4	SSE13	SE9	ESE9	E10	E7	SE3	E5	E5	ENE3	E3	NNE2	NE1	SSE5	SSE5.5	S13	
31-Aug	SSW11	SW8	ESE1	SW2	WNW8	NW7	NW11	NW10	NNW9	NW9	NW8	NW8	NW9	WNW12	NW12	NW15	NW16	NW16	NW17	NW17	NW16	NW12	NW12	NW11	NW9.6	NW17	

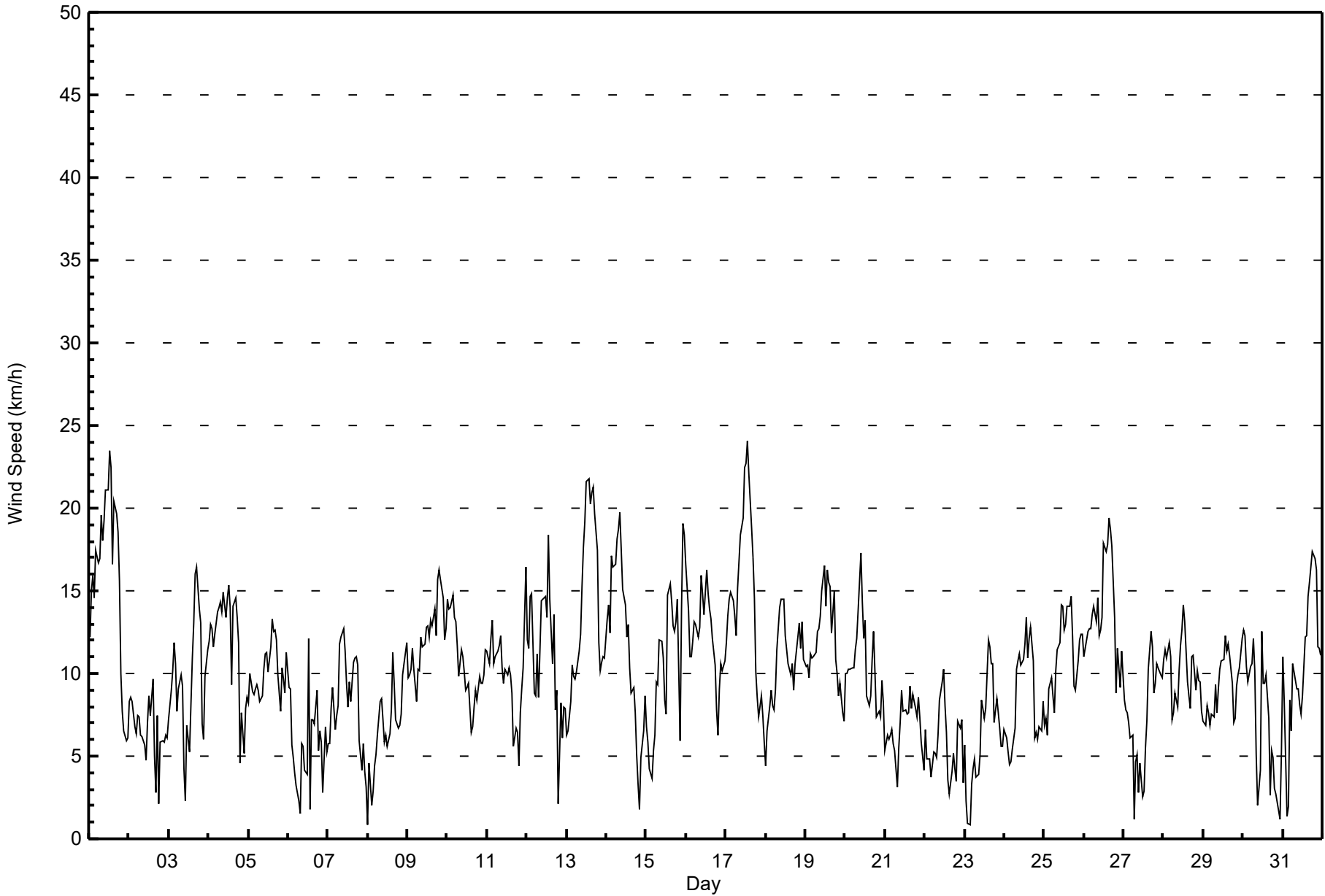
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NW17	W15	W16	W17	W17	W17	W18	W20	WNW20	WNW19	WNW21	W22	WNW23	W24	W22	WSW21	WSW21	WSW20	WSW17	NW17	NW16	SE15	WNW19	WNW18	Diurnal Maximum

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Speed (WS) - km/h
Kirby South - August 2023





**Wood Buffalo Environmental Association
Cumulative Frequency Distribution**

**Wind Speed (WS) - km/h
Kirby South - August 2023**

Wind Speed Ranges (km/h)	Number of Hours	%	Cumulative %
0 - 5	91	12.23	12.23
6 - 11	403	54.17	66.40
12 - 19	232	31.18	97.58
20 - 28	18	2.42	100.00
29 - 38	0	0.00	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
Kirby South - August 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	5	6	10	11	7	4	7	6	6	3	7	3	6	3	6	91
6 - 11	16	28	15	12	11	10	21	17	25	37	67	14	29	42	42	17	403
12 - 19	4	7	4	2	1	0	19	6	4	19	25	19	32	51	33	6	232
20 - 28	0	0	0	0	0	0	0	0	0	0	0	6	7	5	0	0	18
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	21	40	25	24	23	17	44	30	35	62	95	46	71	104	78	29	744

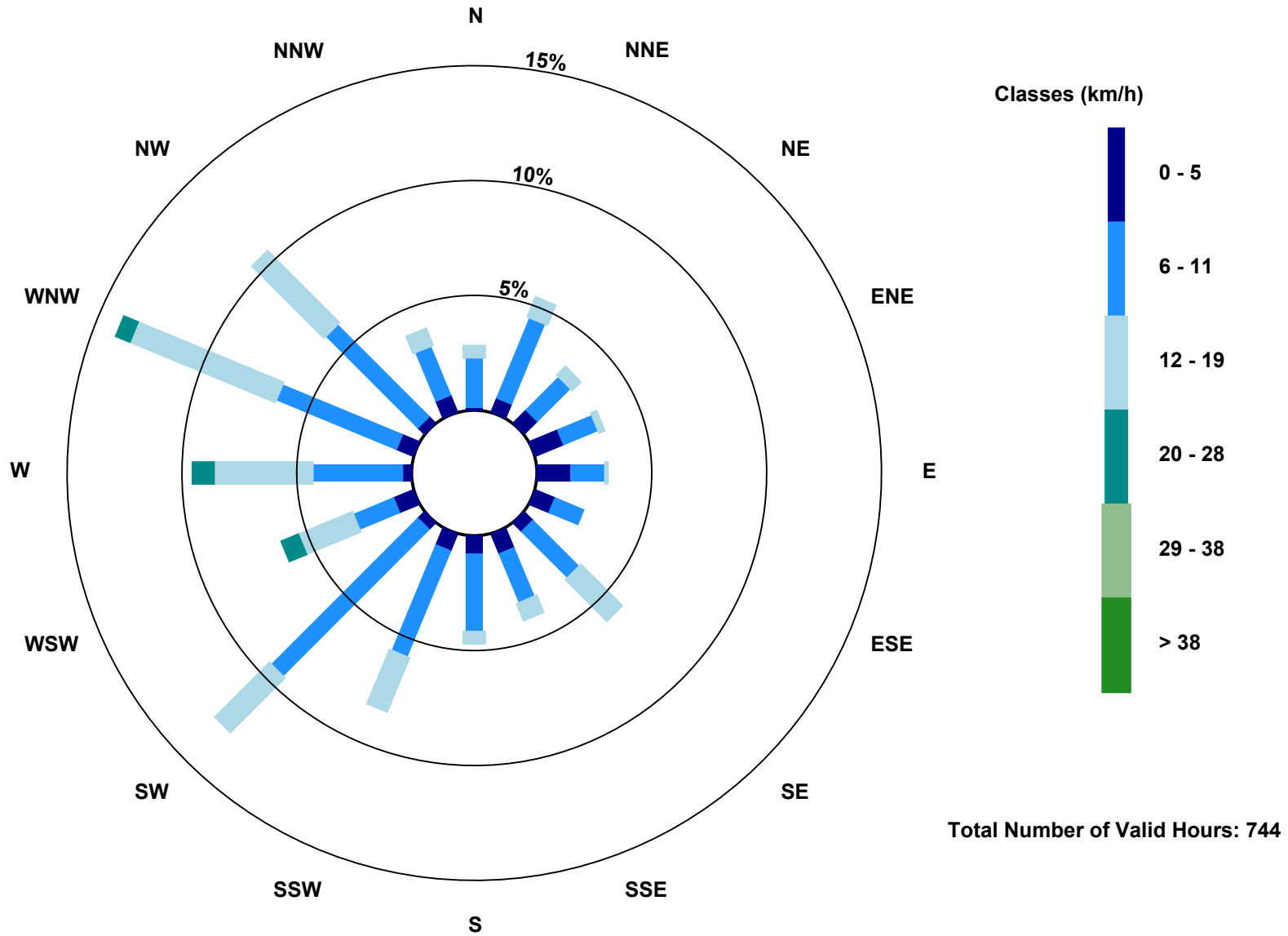
Total Number of Valid Hours: 744

Total Number of Hours: 744



Wood Buffalo Environmental Association
Wind Rose Aug 2023

Wind Speed (WS) - km/h
Kirby South





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Speed (WS) - km/h
Kirby South - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 9 km/h on Aug 15 20:00 Minimum Value: 1 km/h on Aug 30 23:00 Percentiles: P ₁ = 1 P ₁₀ = 1 Q ₁ = 2 Median = 2 Q ₃ = 3 P ₉₀ = 4 P ₉₉ = 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 Maximum
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1-Aug	3	4	4	3	3	3	3	4	4	4	5	5	5	5	5	5	5	4	4	3	2	1	1	1	5
2-Aug	2	2	2	2	1	2	2	2	2	2	2	3	2	3	3	3	3	2	2	1	1	1	1	1	3
3-Aug	2	3	3	3	5	3	3	3	3	3	2	3	2	4	3	4	4	4	3	3	1	1	2	2	5
4-Aug	2	2	2	2	2	3	3	3	4	3	3	4	4	4	3	4	4	3	5	1	2	2	3	2	5
5-Aug	2	2	2	2	1	2	2	2	2	2	3	3	3	3	3	3	4	3	2	1	2	2	2	2	4
6-Aug	2	1	1	1	1	1	1	1	2	2	2	3	7	1	3	3	3	2	1	2	2	2	3	2	7
7-Aug	1	1	2	2	1	1	2	2	3	3	3	4	4	4	3	4	4	3	3	2	1	1	2	1	4
8-Aug	1	1	1	1	1	1	1	2	2	3	3	4	3	3	3	3	2	2	2	2	2	2	3	3	4
9-Aug	3	2	2	3	3	2	2	2	3	3	3	3	4	3	3	3	3	3	5	4	4	4	3	3	5
10-Aug	4	3	3	4	3	3	3	2	3	3	3	2	2	2	2	2	2	2	2	3	2	2	3	3	4
11-Aug	3	3	3	4	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	1	1	2	2	3	4
12-Aug	3	3	4	4	2	2	3	2	3	3	3	3	3	4	5	3	6	2	2	2	3	4	1	1	6
13-Aug	1	1	1	2	2	2	2	3	3	4	4	5	5	5	5	5	5	5	4	3	2	2	2	2	5
14-Aug	3	3	3	3	3	3	3	5	4	5	4	5	3	3	2	2	2	2	1	1	1	2	1	1	5
15-Aug	1	1	1	1	2	1	1	2	3	3	2	3	2	4	3	3	3	3	3	9	4	3	4	4	9
16-Aug	4	3	2	2	3	4	3	3	3	3	3	4	4	4	4	3	3	2	2	2	1	1	2	2	4
17-Aug	3	3	3	3	3	3	3	3	4	5	5	6	6	6	6	5	4	4	3	2	2	2	2	3	6
18-Aug	2	2	2	2	2	2	2	3	3	3	4	3	3	4	3	3	3	2	2	2	3	3	3	3	4
19-Aug	2	2	2	2	2	3	3	3	3	3	3	4	3	4	4	3	3	3	3	3	2	2	2	2	4
20-Aug	2	2	2	2	2	2	2	3	3	4	4	3	4	3	3	4	3	3	2	1	1	1	1	1	4
21-Aug	2	1	1	1	1	1	1	1	2	2	3	3	4	3	4	3	3	3	2	1	1	1	1	2	4
22-Aug	1	1	1	1	1	1	1	1	2	4	3	3	2	2	1	1	2	1	1	2	1	1	1	1	4
23-Aug	1	1	1	1	1	1	1	1	1	1	2	2	2	2	4	3	3	3	1	2	2	1	1	1	4
24-Aug	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	2	3
25-Aug	1	1	2	1	1	2	2	2	2	3	3	3	3	3	4	3	4	3	2	1	2	2	2	2	4
26-Aug	2	2	3	3	2	3	3	3	3	3	3	4	5	4	4	5	4	4	3	2	2	1	2	3	5
27-Aug	2	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2	2	2	1	3
28-Aug	1	1	1	1	2	1	2	2	2	2	3	3	3	3	3	3	2	3	2	1	1	1	1	1	3
29-Aug	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	2	1	1	1	1	1	2	3
30-Aug	2	2	1	1	2	2	4	2	2	2	2	4	3	4	3	2	2	1	1	1	1	1	1	3	4
31-Aug	2	2	2	1	2	2	2	2	2	2	2	2	3	3	3	4	3	4	4	4	3	3	2	2	4
Diurnal Maximum																									



Wood Buffalo Environmental Association
Summary of Hour Averages

Wind Direction (WD) - deg
Kirby South - August 2023

Direction of Maximum Speed: 272 deg on Aug 17 14:00		Hours in Service:	744
Direction of Maximum Daily Speed Average: 283.9 deg on Aug 1		Hours of Data:	744
Direction of Minimum Speed: 59 deg on Aug 23 04:00		Hours of Missing Data:	0
Direction of Minimum Daily Speed Average: 1.9 deg on Aug 6		Percent Operational Time:	100.0
Monthly Average Direction: 265.5 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-Aug	253	269	273	277	277	278	277	278	283	286	286	283	284	268	292	278	299	307	302	308	316	299	297	278	283.9
2-Aug	277	296	321	321	288	297	325	343	12	347	319	306	288	291	305	346	341	295	341	42	63	72	79	79	326.2
3-Aug	119	140	204	250	238	101	133	154	167	165	185	201	243	269	301	290	287	293	297	285	305	305	276	275	255.5
4-Aug	283	283	280	276	285	287	311	308	309	307	315	306	295	309	324	294	283	282	331	328	292	285	277	281	297.0
5-Aug	295	292	296	299	297	291	303	314	319	296	312	316	313	291	285	289	297	300	300	287	280	256	254	278	294.3
6-Aug	293	289	275	299	275	271	291	197	113	94	336	357	272	257	215	173	136	170	191	218	235	335	15	42	253.4
7-Aug	41	54	38	43	46	40	47	53	56	48	30	30	10	26	27	45	29	40	42	44	27	32	30	69	39.5
8-Aug	43	50	64	77	111	149	156	164	180	190	188	183	159	199	116	136	152	167	189	144	124	132	134	151	150.4
9-Aug	167	172	164	179	167	154	139	134	147	139	146	145	140	154	148	141	143	150	144	133	132	132	129	128	145.6
10-Aug	140	141	143	136	135	130	127	114	111	112	106	97	71	55	28	10	20	25	20	12	12	23	20	15	87.3
11-Aug	5	359	356	349	351	344	351	349	335	340	340	316	320	307	301	313	320	303	288	256	216	224	258	273	321.7
12-Aug	265	242	246	265	254	233	272	279	293	283	298	306	306	308	303	316	305	295	293	313	297	324	288	279	286.0
13-Aug	238	239	232	237	231	226	222	225	225	234	234	240	250	252	249	250	250	244	240	232	229	226	232	236	238.8
14-Aug	264	269	267	274	273	271	271	279	295	315	321	352	338	316	302	297	301	318	286	239	284	256	259	293	290.8
15-Aug	321	346	324	266	234	230	220	211	203	207	208	218	231	234	240	255	247	248	241	298	260	276	285	303	251.9
16-Aug	323	329	306	307	302	306	309	323	320	303	300	303	300	301	297	294	286	308	291	223	212	217	212	204	295.2
17-Aug	207	199	198	198	208	217	226	231	247	269	261	265	265	272	273	284	283	291	318	278	272	270	275	236	253.8
18-Aug	253	316	20	31	17	8	7	33	39	35	25	24	14	16	353	347	334	338	330	322	317	327	336	341	359.0
19-Aug	336	327	327	328	324	331	322	313	287	292	296	290	311	294	301	291	286	287	272	262	226	228	221	225	295.1
20-Aug	226	227	228	226	229	228	229	234	236	253	248	239	213	208	229	225	215	199	210	216	215	211	215	223	225.9
21-Aug	212	207	208	203	208	211	215	191	172	136	130	145	125	146	167	160	125	155	152	176	186	180	157	143	167.9
22-Aug	172	147	115	80	80	88	93	114	131	149	130	123	136	132	133	182	92	74	68	132	176	177	184	201	132.0
23-Aug	213	194	282	59	89	148	165	155	118	115	75	83	84	82	79	74	77	82	59	71	75	80	84	76	88.3
24-Aug	64	66	76	75	32	24	20	33	31	35	41	34	25	33	10	24	26	10	351	320	309	303	293	295	19.6
25-Aug	292	286	239	233	234	231	229	231	223	219	215	217	214	218	217	226	215	213	197	197	200	198	203	203	220.5
26-Aug	208	204	197	197	200	197	204	210	220	227	220	231	255	256	265	257	279	277	276	263	274	280	290	317	242.4
27-Aug	357	11	11	15	11	19	38	46	69	105	84	171	248	215	259	249	264	251	229	229	229	228	229	232	262.3
28-Aug	230	232	230	230	232	237	240	252	261	272	276	281	278	286	273	273	262	247	234	223	220	213	216	213	247.5
29-Aug	209	201	208	202	205	214	210	213	202	221	230	217	219	212	210	220	199	190	186	176	170	170	175	174	201.8
30-Aug	172	173	169	173	181	194	181	195	222	206	91	158	139	119	98	79	135	96	85	61	79	29	34	167	154.3
31-Aug	206	229	122	214	296	305	316	322	336	307	314	310	318	286	307	306	307	306	310	309	313	317	305	307	304.3

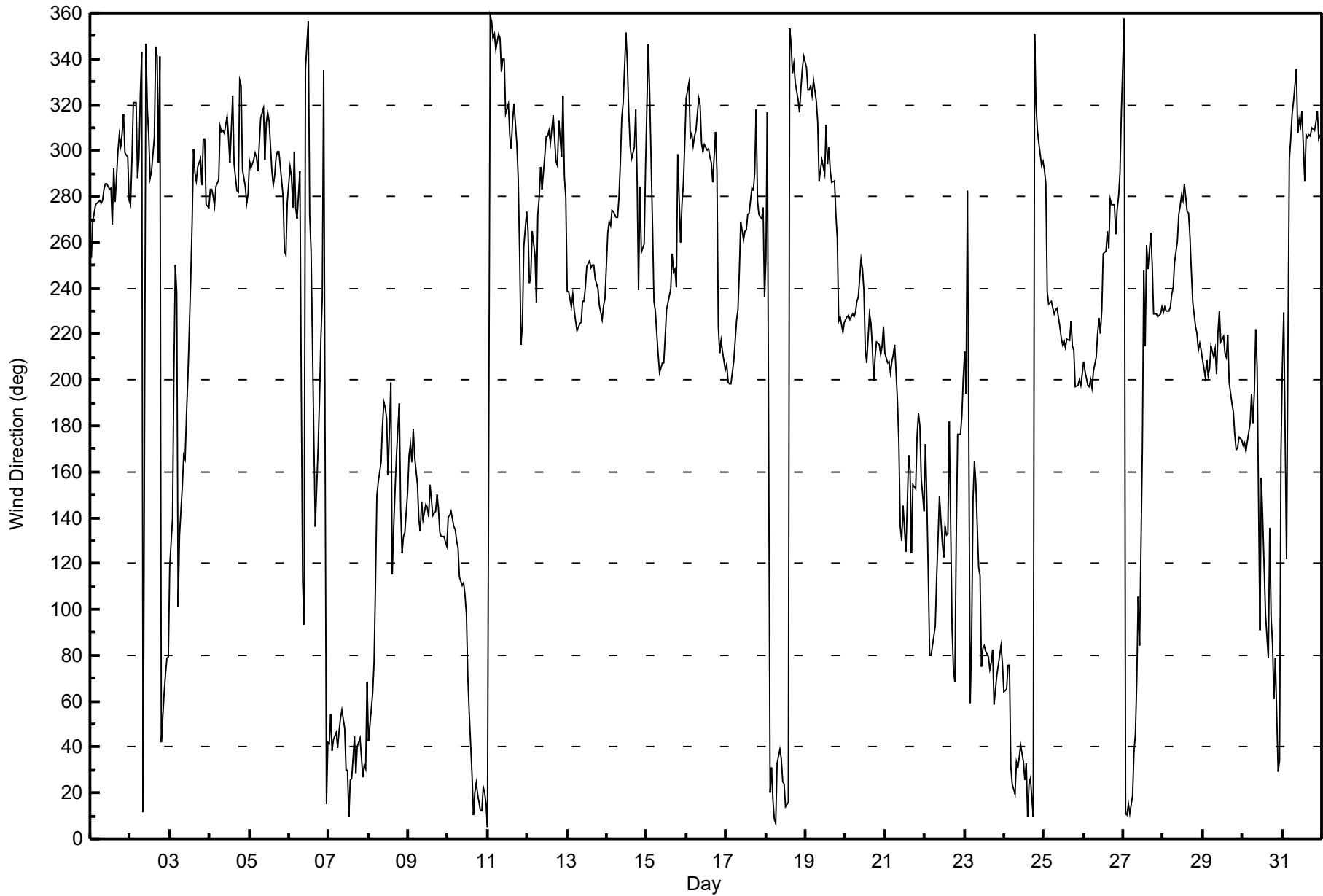
248.9 252.0 247.6 253.6 252.6 253.0 256.8 261.8 264.3 273.7 280.8 273.4 278.1 274.5 279.8 277.0 279.8 277.1 276.8 264.1 248.1 244.3 250.9 256.5
 Diurnal Average

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



Wood Buffalo Environmental Association
Hourly Averages

Wind Direction (WD) - deg
Kirby South - August 2023





Wood Buffalo Environmental Association
Summary of Hour Standard Deviations

Wind Direction (WD) - deg
Kirby South - August 2023

Number of Exceedences (AAAQO): 1-hr: 0 24-hr: 0 Maximum Value: 99 deg on Aug 2 17:00 Minimum Value: 4 deg on Aug 21 03:00 Percentiles: P ₁ = 6 P ₁₀ = 10 Q ₁ = 13 Median = 17 Q ₃ = 21 P ₉₀ = 36 P ₉₉ = 76																	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-Aug	20	13	13	12	11	12	11	12	14	17	16	19	18	18	20	12	19	15	15	14	15	15	7	12	20
2-Aug	10	15	18	20	22	21	19	26	37	50	63	36	21	49	27	66	99	20	83	14	15	17	15	12	99
3-Aug	24	21	29	15	34	46	21	17	20	46	73	43	58	39	19	19	15	15	14	9	13	14	10	9	73
4-Aug	9	9	11	12	11	12	15	15	19	18	22	22	22	19	32	29	17	15	39	29	13	47	12	9	47
5-Aug	13	14	13	13	12	14	13	18	25	19	21	21	30	23	18	25	19	18	13	8	9	14	19	13	30
6-Aug	10	16	24	13	28	19	47	61	21	45	67	77	39	75	37	38	35	19	18	13	28	63	26	40	77
7-Aug	13	11	11	11	11	11	12	12	17	27	24	36	50	38	43	35	34	22	17	14	14	11	17	29	50
8-Aug	61	12	32	15	14	24	16	20	31	45	43	52	44	42	40	23	20	21	24	16	17	14	15	17	61
9-Aug	16	19	13	14	19	15	16	15	16	15	17	17	19	16	16	16	15	16	17	16	15	16	16	15	19
10-Aug	16	18	15	16	16	16	16	18	17	18	17	18	17	16	33	23	18	18	19	17	17	19	18	19	33
11-Aug	20	20	20	19	21	20	20	19	18	20	23	17	19	16	21	34	51	31	30	22	15	15	18	12	51
12-Aug	15	15	12	19	21	14	13	13	17	14	15	16	19	20	24	36	21	18	14	63	17	24	12	9	63
13-Aug	12	11	11	7	10	12	12	14	17	18	18	20	18	18	18	19	18	15	15	13	11	12	12	11	20
14-Aug	14	11	15	10	10	11	12	13	16	22	23	25	25	16	15	16	19	28	14	20	61	23	11	8	61
15-Aug	19	16	11	19	9	10	9	14	13	15	16	17	28	15	15	18	17	15	14	46	78	11	11	15	78
16-Aug	15	15	15	18	14	14	15	18	16	15	18	20	19	17	26	22	24	17	14	24	6	9	12	12	26
17-Aug	13	14	14	14	14	13	16	14	17	16	17	17	17	14	18	18	17	20	18	14	19	20	17	45	45
18-Aug	42	39	27	15	21	20	19	16	14	15	17	17	20	20	20	20	15	17	15	13	14	17	15	18	42
19-Aug	17	15	14	14	15	17	16	18	19	19	19	20	19	24	21	19	18	15	16	20	15	11	12	14	24
20-Aug	11	11	12	12	12	12	13	13	14	17	21	27	26	43	52	49	23	14	13	8	6	7	5	5	52
21-Aug	11	6	4	6	5	5	9	20	18	30	32	37	43	55	47	35	32	24	13	10	7	6	20	28	55
22-Aug	8	17	17	13	14	15	15	20	23	29	26	28	24	34	47	46	43	15	15	45	11	8	13	25	47
23-Aug	10	67	66	47	21	16	11	25	21	25	22	28	23	20	21	19	19	19	13	15	16	16	13	13	67
24-Aug	13	14	14	26	18	19	18	18	15	18	18	17	22	17	20	20	19	20	20	14	12	12	7	8	26
25-Aug	10	10	19	8	7	11	16	13	14	19	20	19	22	23	20	20	19	19	16	10	12	12	13	12	23
26-Aug	13	13	13	13	13	13	15	15	15	19	20	27	18	22	21	18	14	13	11	12	10	9	14	19	27
27-Aug	21	16	17	16	17	15	91	24	34	68	73	85	88	55	42	23	20	16	14	11	11	11	10	9	91
28-Aug	8	7	8	9	10	12	13	15	16	15	13	12	12	15	26	32	32	15	14	10	7	7	7	5	32
29-Aug	5	5	8	6	6	7	10	14	18	17	18	18	21	20	21	23	19	14	9	6	7	8	9	10	23
30-Aug	11	10	9	8	11	14	15	17	24	76	48	20	19	33	21	22	56	17	16	22	22	38	60	57	76
31-Aug	15	13	86	45	11	16	12	15	18	21	34	33	43	18	20	19	16	13	13	13	13	17	15	17	86
61 67 86 47 34 46 91 61 37 76 73 85 88 75 52 66 99 31 83 63 78 63 60 57																									
Diurnal Maximum																									



Appendix 1 - Summary of Ambient Air Quality Objectives (AAAQOs) and Ambient Air Quality Guidelines (AAAQGs) in August 2023 - Revised on November, 2023

<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	1Aug23, 01:00	417580	1-hr	214	214.2	exc
Fort Chip	PM2.5	1Aug23, 02:00	417580	1-hr	222	221.5	exc
Fort Chip	PM2.5	1Aug23, 03:00	417580	1-hr	197	197.2	exc
Fort Chip	PM2.5	1Aug23, 04:00	417580	1-hr	196	196.2	exc
Fort Chip	PM2.5	1Aug23, 05:00	417580	1-hr	176	176.3	exc
Fort Chip	PM2.5	1Aug23, 06:00	417580	1-hr	191	191.3	exc
Fort Chip	PM2.5	1Aug23, 07:00	417580	1-hr	197	196.5	exc
Fort Chip	PM2.5	1Aug23, 08:00	417580	1-hr	194	193.7	exc
Fort Chip	PM2.5	1Aug23, 09:00	417580	1-hr	185	184.9	exc
Fort Chip	PM2.5	1Aug23, 10:00	417580	1-hr	177	176.8	exc
Fort Chip	PM2.5	1Aug23, 11:00	417580	1-hr	171	171.1	exc
Fort Chip	PM2.5	1Aug23, 12:00	417580	1-hr	167	167.2	exc
Fort Chip	PM2.5	1Aug23, 13:00	417580	1-hr	149	148.9	exc
Fort Chip	PM2.5	1Aug23, 14:00	417580	1-hr	114	114.1	exc
Fort Chip	PM2.5	1Aug23, 15:00	417580	1-hr	86	86.5	exc
Barge Landing	PM2.5	1Aug23, 15:00	417581	1-hr	81	81	exc
Fort Hills	PM2.5	1Aug23, 15:00	417320	1-hr	89	89.4	exc
Ells River	PM2.5	1Aug23, 15:00	417319	1-hr	93	92.9	exc
Bertha Ganter	PM2.5	1Aug23, 15:00	417582	1-hr	95	94.8	exc
Ft. McKay S	PM2.5	1Aug23, 15:00	417583	1-hr	89	89.4	exc
Barge Landing	PM2.5	1Aug23, 16:00	417581	1-hr	88	88.1	exc
Wapasu	PM2.5	1Aug23, 16:00	417584	1-hr	81	80.5	exc
Fort Hills	PM2.5	1Aug23, 16:00	417320	1-hr	89	89.2	exc
Ells River	PM2.5	1Aug23, 16:00	417319	1-hr	92	92.3	exc
Bertha Ganter	PM2.5	1Aug23, 16:00	417582	1-hr	100	100.1	exc
Ft. McKay S	PM2.5	1Aug23, 16:00	417583	1-hr	94	94.4	exc
Ft. McKay S	PM2.5	1Aug23, 17:00	417583	1-hr	94	93.8	exc
Wapasu	PM2.5	1Aug23, 17:00	417584	1-hr	87	87.1	exc
Fort Hills	PM2.5	1Aug23, 17:00	417320	1-hr	85	85.1	exc
Ells River	PM2.5	1Aug23, 17:00	417319	1-hr	87	86.9	exc
Bertha Ganter	PM2.5	1Aug23, 17:00	417582	1-hr	93	93	exc
Barge Landing	PM2.5	1Aug23, 17:00	417581	1-hr	82	82	exc
Buffalo Viewpoint	PM2.5	1Aug23, 18:00	417585	1-hr	80	80.1	exc
Ft. McKay S	PM2.5	1Aug23, 18:00	417583	1-hr	92	92.4	exc
Wapasu	PM2.5	1Aug23, 18:00	417584	1-hr	88	88.3	exc
Fort Hills	PM2.5	1Aug23, 18:00	417320	1-hr	83	83.2	exc
Ells River	PM2.5	1Aug23, 18:00	417319	1-hr	87	86.9	exc
Bertha Ganter	PM2.5	1Aug23, 18:00	417582	1-hr	92	92.1	exc
Barge Landing	PM2.5	1Aug23, 18:00	417581	1-hr	81	80.5	exc
Ft. McKay S	PM2.5	1Aug23, 19:00	417583	1-hr	91	91.4	exc
Wapasu	PM2.5	1Aug23, 19:00	417584	1-hr	88	88.4	exc
Fort Hills	PM2.5	1Aug23, 19:00	417320	1-hr	87	86.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ells River	PM2.5	1Aug23, 19:00	417319	1-hr	85	84.7	exc
Bertha Ganter	PM2.5	1Aug23, 19:00	417582	1-hr	92	92.1	exc
Barge Landing	PM2.5	1Aug23, 19:00	417581	1-hr	80	80.4	exc
Buffalo Viewpoint	PM2.5	1Aug23, 20:00	417585	1-hr	84	84.3	exc
Ft. McKay S	PM2.5	1Aug23, 20:00	417583	1-hr	87	87.5	exc
Wapasu	PM2.5	1Aug23, 20:00	417584	1-hr	93	93.3	exc
Fort Hills	PM2.5	1Aug23, 20:00	417320	1-hr	81	80.5	exc
Ells River	PM2.5	1Aug23, 20:00	417319	1-hr	90	90	exc
Bertha Ganter	PM2.5	1Aug23, 20:00	417582	1-hr	91	90.6	exc
Buffalo Viewpoint	PM2.5	1Aug23, 21:00	417585	1-hr	116	115.6	exc
Ft. McKay S	PM2.5	1Aug23, 21:00	417583	1-hr	97	97.3	exc
Wapasu	PM2.5	1Aug23, 21:00	417584	1-hr	104	104.4	exc
Fort Hills	PM2.5	1Aug23, 21:00	417320	1-hr	88	87.8	exc
Ells River	PM2.5	1Aug23, 21:00	417319	1-hr	93	93	exc
Bertha Ganter	PM2.5	1Aug23, 21:00	417582	1-hr	96	96.4	exc
Buffalo Viewpoint	PM2.5	1Aug23, 22:00	417585	1-hr	99	99.4	exc
Ft. McKay S	PM2.5	1Aug23, 22:00	417583	1-hr	93	93.3	exc
Wapasu	PM2.5	1Aug23, 22:00	417584	1-hr	100	99.8	exc
Fort Hills	PM2.5	1Aug23, 22:00	417320	1-hr	94	93.5	exc
Ells River	PM2.5	1Aug23, 22:00	417319	1-hr	90	90.1	exc
Bertha Ganter	PM2.5	1Aug23, 22:00	417582	1-hr	97	96.9	exc
Buffalo Viewpoint	PM2.5	1Aug23, 23:00	417585	1-hr	101	100.6	exc
Ft. McKay S	PM2.5	1Aug23, 23:00	417583	1-hr	91	91.1	exc
Wapasu	PM2.5	1Aug23, 23:00	417584	1-hr	85	84.7	exc
Fort Hills	PM2.5	1Aug23, 23:00	417320	1-hr	90	89.8	exc
Ells River	PM2.5	1Aug23, 23:00	417319	1-hr	88	88.3	exc
Bertha Ganter	PM2.5	1Aug23, 23:00	417582	1-hr	97	96.6	exc
Athabasca Valley	PM2.5	1Aug23, 23:00	417586	1-hr	83	83.4	exc
Barge Landing	PM2.5	1Aug23, 23:00	417581	1-hr	81	81.2	exc
Buffalo Viewpoint	PM2.5	1Aug23, 24:00	417585	1-hr	106	105.6	exc
Ft. McKay S	PM2.5	1Aug23, 24:00	417583	1-hr	93	93.2	exc
Fort Hills	PM2.5	1Aug23, 24:00	417320	1-hr	85	84.8	exc
Ells River	PM2.5	1Aug23, 24:00	417319	1-hr	87	87.3	exc
Bertha Ganter	PM2.5	1Aug23, 24:00	417582	1-hr	97	96.9	exc
Bertha Ganter	PM2.5	1Aug23, 24:00	417582	24-hr	62	61.6	exc
Buffalo Viewpoint	PM2.5	1Aug23, 24:00	417585	24-hr	55	55.1	exc
Patricia McInnes	PM2.5	1Aug23, 24:00	417587	24-hr	35	35.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	1Aug23, 24:00	417586	1-hr	83	82.8	exc
Athabasca Valley	PM2.5	1Aug23, 24:00	417586	24-hr	36	36.2	exc
Fort Chip	PM2.5	1Aug23, 24:00	417580	24-hr	133	132.9	exc
Barge Landing	PM2.5	1Aug23, 24:00	417581	1-hr	85	84.6	exc
Barge Landing	PM2.5	1Aug23, 24:00	417581	24-hr	54	54.1	exc
Ft. McKay S	PM2.5	1Aug23, 24:00	417583	24-hr	58	58.2	exc
Wapasu	PM2.5	1Aug23, 24:00	417584	24-hr	57	56.7	exc
Fort Hills	PM2.5	1Aug23, 24:00	417320	24-hr	61	61.5	exc
Ells River	PM2.5	1Aug23, 24:00	417319	24-hr	59	59.5	exc
Buffalo Viewpoint	PM2.5	2Aug23, 01:00	417585	1-hr	104	104	exc
Ft. McKay S	PM2.5	2Aug23, 01:00	417583	1-hr	90	89.6	exc
Ells River	PM2.5	2Aug23, 01:00	417384	1-hr	84	84.4	exc
Bertha Ganter	PM2.5	2Aug23, 01:00	417582	1-hr	95	94.9	exc
Athabasca Valley	PM2.5	2Aug23, 01:00	417586	1-hr	81	81.2	exc
Barge Landing	PM2.5	2Aug23, 01:00	417581	1-hr	85	84.9	exc
Buffalo Viewpoint	PM2.5	2Aug23, 02:00	417585	1-hr	100	99.7	exc
Ft. McKay S	PM2.5	2Aug23, 02:00	417583	1-hr	87	86.5	exc
Bertha Ganter	PM2.5	2Aug23, 02:00	417582	1-hr	91	91	exc
Barge Landing	PM2.5	2Aug23, 02:00	417581	1-hr	82	81.8	exc
Buffalo Viewpoint	PM2.5	2Aug23, 03:00	417585	1-hr	93	92.7	exc
Ft. McKay S	PM2.5	2Aug23, 03:00	417583	1-hr	82	82.2	exc
Bertha Ganter	PM2.5	2Aug23, 03:00	417582	1-hr	87	86.5	exc
Buffalo Viewpoint	PM2.5	2Aug23, 04:00	417585	1-hr	88	87.6	exc
Ft. McKay S	PM2.5	2Aug23, 04:00	417583	1-hr	81	81.1	exc
Bertha Ganter	PM2.5	2Aug23, 04:00	417582	1-hr	81	81.4	exc
Buffalo Viewpoint	PM2.5	2Aug23, 05:00	417585	1-hr	83	82.7	exc
Conklin	PM2.5	2Aug23, 13:00	417588	1-hr	82	81.9	exc
Buffalo Viewpoint	PM2.5	2Aug23, 14:00	417585	1-hr	80	80.3	exc
Buffalo Viewpoint	PM2.5	2Aug23, 15:00	417585	1-hr	85	85.1	exc
Buffalo Viewpoint	PM2.5	2Aug23, 16:00	417585	1-hr	86	85.8	exc
Buffalo Viewpoint	PM2.5	2Aug23, 17:00	417585	1-hr	85	85.3	exc
Buffalo Viewpoint	PM2.5	2Aug23, 18:00	417585	1-hr	84	83.6	exc
Buffalo Viewpoint	PM2.5	2Aug23, 19:00	417585	1-hr	84	84.1	exc
Buffalo Viewpoint	PM2.5	2Aug23, 20:00	417585	1-hr	87	87.1	exc
Buffalo Viewpoint	PM2.5	2Aug23, 21:00	417585	1-hr	95	94.6	exc
Conklin	PM2.5	2Aug23, 21:00	417588	1-hr	96	95.5	exc
Surmont 2	PM2.5	2Aug23, 21:00	417589	1-hr	84	83.9	exc
Buffalo Viewpoint	PM2.5	2Aug23, 22:00	417585	1-hr	94	93.5	exc
Surmont 2	PM2.5	2Aug23, 22:00	417589	1-hr	110	110.4	exc
Buffalo Viewpoint	PM2.5	2Aug23, 23:00	417585	1-hr	91	90.8	exc
Mannix	H2S	2Aug23, 23:00	417382	1-hr	14	13.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	2Aug23, 24:00	417585	1-hr	88	88.1	exc
Ft. McKay S	PM2.5	2Aug23, 24:00	417583	24-hr	65	65.1	exc
Anzac	PM2.5	2Aug23, 24:00	417590	24-hr	63	63.3	exc
Wapasu	PM2.5	2Aug23, 24:00	417584	24-hr	57	57	exc
Stony Mtn.	PM2.5	2Aug23, 24:00	417591	24-hr	53	52.7	exc
Conklin	PM2.5	2Aug23, 24:00	417588	24-hr	54	53.7	exc
Janvier	PM2.5	2Aug23, 24:00	417592	24-hr	52	51.8	exc
Fort Hills	PM2.5	2Aug23, 24:00	417383	24-hr	58	58	exc
Ells River	PM2.5	2Aug23, 24:00	417384	24-hr	62	61.5	exc
Bertha Ganter	PM2.5	2Aug23, 24:00	417582	24-hr	67	67.1	exc
Buffalo Viewpoint	PM2.5	2Aug23, 24:00	417585	24-hr	83	83	exc
Patricia McInnes	PM2.5	2Aug23, 24:00	417587	24-hr	65	64.5	exc
Athabasca Valley	PM2.5	2Aug23, 24:00	417586	24-hr	67	67.1	exc
Fort Chip	PM2.5	2Aug23, 24:00	417580	24-hr	52	52.3	exc
Surmont 2	PM2.5	2Aug23, 24:00	417589	24-hr	62	62.3	exc
Buffalo Viewpoint	PM2.5	3Aug23, 01:00	417585	1-hr	86	85.8	exc
Buffalo Viewpoint	PM2.5	3Aug23, 02:00	417585	1-hr	80	-	ret
Buffalo Viewpoint	PM2.5	3Aug23, 05:00	417585	1-hr	89	89.3	exc
Buffalo Viewpoint	PM2.5	3Aug23, 07:00	417585	1-hr	82	82.3	exc
Buffalo Viewpoint	PM2.5	3Aug23, 08:00	417585	1-hr	81	80.8	exc
Barge Landing	PM2.5	2Aug23, 24:00	417581	24-hr	59	59.4	exc
Lower Camp	H2S	3Aug23, 18:00	417434	1-hr	15	14.6	exc
Bertha Ganter	PM2.5	3Aug23, 24:00	417582	24-hr	40	39.6	exc
Buffalo Viewpoint	PM2.5	3Aug23, 24:00	417585	24-hr	46	45.6	exc
Patricia McInnes	PM2.5	3Aug23, 24:00	417587	24-hr	34	34	exc
Athabasca Valley	PM2.5	3Aug23, 24:00	417586	24-hr	39	38.6	exc
Barge Landing	PM2.5	3Aug23, 24:00	417581	24-hr	36	36.6	exc
Ft. McKay S	PM2.5	3Aug23, 24:00	417583	24-hr	35	35.2	exc
Anzac	PM2.5	3Aug23, 24:00	417590	24-hr	32	32.2	exc
Wapasu	PM2.5	3Aug23, 24:00	417584	24-hr	35	35	exc
Fort Hills	PM2.5	3Aug23, 24:00	417436	24-hr	33	32.6	exc
Ells River	PM2.5	3Aug23, 24:00	417437	24-hr	31	31.2	exc
Fort Chip	PM2.5	3Aug23, 24:00	417580	24-hr	46	46.2	exc
Fort Chip	PM2.5	4Aug23, 24:00	417580	24-hr	43	43.3	exc
Fort Chip	PM2.5	5Aug23, 04:00	417580	1-hr	132	132.1	exc
Fort Chip	PM2.5	5Aug23, 05:00	417580	1-hr	198	197.7	exc
Fort Chip	PM2.5	5Aug23, 06:00	417580	1-hr	191	191.3	exc
Fort Chip	PM2.5	5Aug23, 07:00	417580	1-hr	141	140.9	exc
Fort Chip	PM2.5	5Aug23, 08:00	417580	1-hr	111	111.5	exc
Fort Chip	PM2.5	5Aug23, 09:00	417580	1-hr	131	131.3	exc
Fort Chip	PM2.5	5Aug23, 10:00	417580	1-hr	187	187	exc
Wapasu	PM2.5	5Aug23, 10:00	417584	1-hr	90	90	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	5Aug23, 11:00	417580	1-hr	151	151	exc
Wapasu	PM2.5	5Aug23, 11:00	417584	1-hr	81	82.2	exc
Buffalo Viewpoint	PM2.5	5Aug23, 12:00	417585	1-hr	87	86.6	exc
Fort Chip	PM2.5	5Aug23, 12:00	417580	1-hr	96	96.4	exc
Bertha Ganter	PM2.5	5Aug23, 13:00	417582	1-hr	83	82.7	exc
Buffalo Viewpoint	PM2.5	5Aug23, 13:00	417585	1-hr	117	117	exc
Ells River	PM2.5	5Aug23, 13:00	417492	1-hr	98	98	exc
Bertha Ganter	PM2.5	5Aug23, 14:00	417582	1-hr	92	91.8	exc
Buffalo Viewpoint	PM2.5	5Aug23, 14:00	417585	1-hr	142	141.8	exc
Fort Chip	PM2.5	5Aug23, 14:00	417580	1-hr	87	87.1	exc
Fort Hills	PM2.5	5Aug23, 14:00	417491	1-hr	97	96.7	exc
Ells River	PM2.5	5Aug23, 14:00	417492	1-hr	106	105.8	exc
Barge Landing	PM2.5	5Aug23, 14:00	417581	1-hr	86	85.6	exc
Ft. McKay S	PM2.5	5Aug23, 14:00	417583	1-hr	84	84.2	exc
Bertha Ganter	PM2.5	5Aug23, 15:00	417582	1-hr	100	100.5	exc
Buffalo Viewpoint	PM2.5	5Aug23, 15:00	417585	1-hr	107	106.9	exc
Fort Hills	PM2.5	5Aug23, 15:00	417491	1-hr	97	96.6	exc
Ells River	PM2.5	5Aug23, 15:00	417492	1-hr	96	96.2	exc
Barge Landing	PM2.5	5Aug23, 15:00	417581	1-hr	88	88.4	exc
Ft. McKay S	PM2.5	5Aug23, 15:00	417583	1-hr	91	90.9	exc
Bertha Ganter	PM2.5	5Aug23, 16:00	417582	1-hr	107	107	exc
Buffalo Viewpoint	PM2.5	5Aug23, 16:00	417585	1-hr	101	101.2	exc
Ells River	PM2.5	5Aug23, 16:00	417492	1-hr	102	102.3	exc
Barge Landing	PM2.5	5Aug23, 16:00	417581	1-hr	90	89.6	exc
Ft. McKay S	PM2.5	5Aug23, 16:00	417583	1-hr	93	93.1	exc
Bertha Ganter	PM2.5	5Aug23, 17:00	417582	1-hr	111	110.8	exc
Buffalo Viewpoint	PM2.5	5Aug23, 17:00	417585	1-hr	107	106.8	exc
Ft. McKay S	PM2.5	5Aug23, 17:00	417583	1-hr	104	104.2	exc
Ells River	PM2.5	5Aug23, 17:00	417492	1-hr	100	100.1	exc
Barge Landing	PM2.5	5Aug23, 17:00	417581	1-hr	83	82.9	exc
Buffalo Viewpoint	PM2.5	5Aug23, 18:00	417585	1-hr	106	106.4	exc
Buffalo Viewpoint	PM2.5	5Aug23, 19:00	417585	1-hr	90	90.4	exc
Patricia McInnes	PM2.5	5Aug23, 20:00	417587	1-hr	82	82.4	exc
Conklin	PM2.5	5Aug23, 21:00	417588	1-hr	83	83	exc
Fort Hills	PM2.5	5Aug23, 22:00	417491	1-hr	111	110.5	exc
Fort Chip	PM2.5	5Aug23, 23:00	417580	1-hr	103	103.3	exc
Fort Hills	PM2.5	5Aug23, 23:00	417491	1-hr	119	118.7	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Bertha Ganter	PM2.5	5Aug23, 24:00	417582	24-hr	48	47.7	exc
Buffalo Viewpoint	PM2.5	5Aug23, 24:00	417585	24-hr	58	58	exc
Fort Chip	PM2.5	5Aug23, 24:00	417580	1-hr	150	149.9	exc
Fort Hills	PM2.5	5Aug23, 24:00	417491	24-hr	52	51.5	exc
Ells River	PM2.5	5Aug23, 24:00	417492	24-hr	47	47.5	exc
Patricia McInnes	PM2.5	5Aug23, 24:00	417587	24-hr	36	36.3	exc
Athabasca Valley	PM2.5	5Aug23, 24:00	417586	24-hr	39	39.1	exc
Fort Chip	PM2.5	5Aug23, 24:00	417580	24-hr	101	100.9	exc
Barge Landing	PM2.5	5Aug23, 24:00	417581	24-hr	45	44.5	exc
Ft. McKay S	PM2.5	5Aug23, 24:00	417583	24-hr	46	45.9	exc
Wapasu	PM2.5	5Aug23, 24:00	417584	24-hr	45	44.4	exc
Fort Chip	PM2.5	6Aug23, 01:00	417580	1-hr	154	154	exc
Fort Chip	PM2.5	6Aug23, 02:00	417580	1-hr	163	162.5	exc
Fort Chip	PM2.5	6Aug23, 03:00	417580	1-hr	174	173.9	exc
Fort Chip	PM2.5	6Aug23, 04:00	417580	1-hr	166	166.1	exc
Fort Chip	PM2.5	6Aug23, 05:00	417580	1-hr	167	166.7	exc
Wapasu	PM2.5	6Aug23, 05:00	417584	1-hr	86	86.3	exc
Fort Chip	PM2.5	6Aug23, 06:00	417580	1-hr	112	112.3	exc
Wapasu	PM2.5	6Aug23, 06:00	417584	1-hr	103	103	exc
Fort Chip	PM2.5	6Aug23, 07:00	417580	1-hr	110	110.4	exc
Wapasu	PM2.5	6Aug23, 07:00	417584	1-hr	101	101.2	exc
Fort Chip	PM2.5	6Aug23, 08:00	417580	1-hr	120	120.4	exc
Wapasu	PM2.5	6Aug23, 08:00	417584	1-hr	107	107.1	exc
Fort Hills	PM2.5	6Aug23, 08:00	417516	1-hr	82	82.3	exc
Buffalo Viewpoint	PM2.5	6Aug23, 09:00	417585	1-hr	84	84.2	exc
Fort Chip	PM2.5	6Aug23, 09:00	417580	1-hr	81	81.1	exc
Wapasu	PM2.5	6Aug23, 09:00	417584	1-hr	123	122.6	exc
Fort Hills	PM2.5	6Aug23, 09:00	417516	1-hr	120	120	exc
Ells River	PM2.5	6Aug23, 09:00	417517	1-hr	81	80.8	exc
Bertha Ganter	PM2.5	6Aug23, 10:00	417582	1-hr	84	83.5	exc
Buffalo Viewpoint	PM2.5	6Aug23, 10:00	417585	1-hr	118	118.3	exc
Barge Landing	PM2.5	6Aug23, 10:00	417581	1-hr	90	90.1	exc
Ft. McKay S	PM2.5	6Aug23, 10:00	417583	1-hr	84	83.7	exc
Wapasu	PM2.5	6Aug23, 10:00	417584	1-hr	119	118.8	exc
Fort Hills	PM2.5	6Aug23, 10:00	417516	1-hr	115	115.1	exc
Ells River	PM2.5	6Aug23, 10:00	417517	1-hr	108	107.7	exc
Bertha Ganter	PM2.5	6Aug23, 11:00	417582	1-hr	129	129.2	exc
Buffalo Viewpoint	PM2.5	6Aug23, 11:00	417585	1-hr	124	124	exc
Patricia McInnes	PM2.5	6Aug23, 11:00	417587	1-hr	87	86.7	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	6Aug23, 11:00	417581	1-hr	120	120.4	exc
Ft. McKay S	PM2.5	6Aug23, 11:00	417583	1-hr	128	127.6	exc
Wapasu	PM2.5	6Aug23, 11:00	417584	1-hr	126	125.6	exc
Fort Hills	PM2.5	6Aug23, 11:00	417516	1-hr	121	121.4	exc
Ells River	PM2.5	6Aug23, 11:00	417517	1-hr	133	133	exc
Bertha Ganter	PM2.5	6Aug23, 12:00	417582	1-hr	137	136.9	exc
Buffalo Viewpoint	PM2.5	6Aug23, 12:00	417585	1-hr	158	158.4	exc
Patricia McInnes	PM2.5	6Aug23, 12:00	417587	1-hr	80	80.3	exc
Barge Landing	PM2.5	6Aug23, 12:00	417581	1-hr	119	119.4	exc
Ft. McKay S	PM2.5	6Aug23, 12:00	417583	1-hr	137	137.3	exc
Anzac	PM2.5	6Aug23, 12:00	417590	1-hr	90	90.4	exc
Wapasu	PM2.5	6Aug23, 12:00	417584	1-hr	129	129.3	exc
Fort Hills	PM2.5	6Aug23, 12:00	417516	1-hr	119	118.7	exc
Ells River	PM2.5	6Aug23, 12:00	417517	1-hr	132	131.5	exc
Bertha Ganter	PM2.5	6Aug23, 13:00	417582	1-hr	138	137.6	exc
Buffalo Viewpoint	PM2.5	6Aug23, 13:00	417585	1-hr	153	152.9	exc
Patricia McInnes	PM2.5	6Aug23, 13:00	417587	1-hr	89	88.6	exc
Athabasca Valley	PM2.5	6Aug23, 13:00	417586	1-hr	87	87.1	exc
Barge Landing	PM2.5	6Aug23, 13:00	417581	1-hr	116	116.1	exc
Ft. McKay S	PM2.5	6Aug23, 13:00	417583	1-hr	134	133.6	exc
Wapasu	PM2.5	6Aug23, 13:00	417584	1-hr	131	131.3	exc
Fort Hills	PM2.5	6Aug23, 13:00	417516	1-hr	120	119.8	exc
Ells River	PM2.5	6Aug23, 13:00	417517	1-hr	129	128.7	exc
Bertha Ganter	PM2.5	6Aug23, 14:00	417582	1-hr	142	142.2	exc
Buffalo Viewpoint	PM2.5	6Aug23, 14:00	417585	1-hr	157	157	exc
Patricia McInnes	PM2.5	6Aug23, 14:00	417587	1-hr	88	88.1	exc
Athabasca Valley	PM2.5	6Aug23, 14:00	417586	1-hr	89	88.8	exc
Barge Landing	PM2.5	6Aug23, 14:00	417581	1-hr	115	115.1	exc
Ft. McKay S	PM2.5	6Aug23, 14:00	417583	1-hr	138	137.7	exc
Wapasu	PM2.5	6Aug23, 14:00	417584	1-hr	119	118.5	exc
Fort Hills	PM2.5	6Aug23, 14:00	417516	1-hr	135	135.3	exc
Ells River	PM2.5	6Aug23, 14:00	417517	1-hr	128	128.1	exc
Bertha Ganter	PM2.5	6Aug23, 15:00	417582	1-hr	149	148.7	exc
Buffalo Viewpoint	PM2.5	6Aug23, 15:00	417585	1-hr	164	164.2	exc
Patricia McInnes	PM2.5	6Aug23, 15:00	417587	1-hr	87	87.2	exc
Athabasca Valley	PM2.5	6Aug23, 15:00	417586	1-hr	97	96.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	6Aug23, 15:00	417581	1-hr	124	123.9	exc
Ft. McKay S	PM2.5	6Aug23, 15:00	417583	1-hr	145	144.7	exc
Wapasu	PM2.5	6Aug23, 15:00	417584	1-hr	94	94.3	exc
Fort Hills	PM2.5	6Aug23, 15:00	417516	1-hr	126	125.8	exc
Ells River	PM2.5	6Aug23, 15:00	417517	1-hr	119	119.1	exc
Bertha Ganter	PM2.5	6Aug23, 16:00	417582	1-hr	133	132.5	exc
Buffalo Viewpoint	PM2.5	6Aug23, 16:00	417585	1-hr	147	146.9	exc
Patricia McInnes	PM2.5	6Aug23, 16:00	417587	1-hr	96	95.9	exc
Athabasca Valley	PM2.5	6Aug23, 16:00	417586	1-hr	108	107.5	exc
Barge Landing	PM2.5	6Aug23, 16:00	417581	1-hr	120	119.5	exc
Ft. McKay S	PM2.5	6Aug23, 16:00	417583	1-hr	135	135.3	exc
Wapasu	PM2.5	6Aug23, 16:00	417584	1-hr	95	94.6	exc
Fort Hills	PM2.5	6Aug23, 16:00	417516	1-hr	91	91.5	exc
Ells River	PM2.5	6Aug23, 16:00	417517	1-hr	107	107.3	exc
Bertha Ganter	PM2.5	6Aug23, 17:00	417582	1-hr	122	121.7	exc
Buffalo Viewpoint	PM2.5	6Aug23, 17:00	417585	1-hr	132	132	exc
Patricia McInnes	PM2.5	6Aug23, 17:00	417587	1-hr	89	89	exc
Athabasca Valley	PM2.5	6Aug23, 17:00	417586	1-hr	108	107.9	exc
Barge Landing	PM2.5	6Aug23, 17:00	417581	1-hr	106	106.3	exc
Ft. McKay S	PM2.5	6Aug23, 17:00	417583	1-hr	128	127.6	exc
Wapasu	PM2.5	6Aug23, 17:00	417584	1-hr	103	102.8	exc
Fort Hills	PM2.5	6Aug23, 17:00	417516	1-hr	88	88.5	exc
Ells River	PM2.5	6Aug23, 17:00	417517	1-hr	97	97.3	exc
Bertha Ganter	PM2.5	6Aug23, 18:00	417582	1-hr	117	117.3	exc
Buffalo Viewpoint	PM2.5	6Aug23, 18:00	417585	1-hr	113	113.4	exc
Patricia McInnes	PM2.5	6Aug23, 18:00	417587	1-hr	87	87.3	exc
Athabasca Valley	PM2.5	6Aug23, 18:00	417586	1-hr	97	97.1	exc
Barge Landing	PM2.5	6Aug23, 18:00	417581	1-hr	112	111.8	exc
Ft. McKay S	PM2.5	6Aug23, 18:00	417583	1-hr	114	114.2	exc
Ells River	PM2.5	6Aug23, 18:00	417517	1-hr	93	92.6	exc
Bertha Ganter	PM2.5	6Aug23, 19:00	417582	1-hr	96	96.1	exc
Buffalo Viewpoint	PM2.5	6Aug23, 19:00	417585	1-hr	120	120.4	exc
Patricia McInnes	PM2.5	6Aug23, 19:00	417587	1-hr	90	89.9	exc
Athabasca Valley	PM2.5	6Aug23, 19:00	417586	1-hr	99	99.2	exc
Barge Landing	PM2.5	6Aug23, 19:00	417581	1-hr	98	98.3	exc
Ft. McKay S	PM2.5	6Aug23, 19:00	417583	1-hr	105	104.9	exc
Ells River	PM2.5	6Aug23, 19:00	417517	1-hr	91	90.6	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	6Aug23, 20:00	417585	1-hr	129	128.5	exc
Patricia McInnes	PM2.5	6Aug23, 20:00	417587	1-hr	88	87.8	exc
Athabasca Valley	PM2.5	6Aug23, 20:00	417586	1-hr	84	84.5	exc
Barge Landing	PM2.5	6Aug23, 20:00	417581	1-hr	81	80.7	exc
Ft. McKay S	PM2.5	6Aug23, 20:00	417583	1-hr	90	89.8	exc
Bertha Ganter	PM2.5	6Aug23, 20:00	417582	1-hr	81	81.3	exc
Buffalo Viewpoint	PM2.5	6Aug23, 21:00	417585	1-hr	122	121.7	exc
Patricia McInnes	PM2.5	6Aug23, 21:00	417587	1-hr	86	86.1	exc
Athabasca Valley	PM2.5	6Aug23, 21:00	417586	1-hr	87	86.6	exc
Ft. McKay S	PM2.5	6Aug23, 21:00	417583	1-hr	85	85.3	exc
Buffalo Viewpoint	PM2.5	6Aug23, 22:00	417585	1-hr	95	95.4	exc
Patricia McInnes	PM2.5	6Aug23, 22:00	417587	1-hr	86	86	exc
Athabasca Valley	PM2.5	6Aug23, 22:00	417586	1-hr	86	86.4	exc
Patricia McInnes	PM2.5	6Aug23, 23:00	417587	1-hr	93	93.3	exc
Athabasca Valley	PM2.5	6Aug23, 23:00	417586	1-hr	93	92.9	exc
Patricia McInnes	PM2.5	6Aug23, 24:00	417587	1-hr	93	93	exc
Athabasca Valley	PM2.5	6Aug23, 24:00	417586	1-hr	98	97.7	exc
Anzac	PM2.5	6Aug23, 24:00	417590	24-hr	59	59.3	exc
Wapasu	PM2.5	6Aug23, 24:00	417584	24-hr	85	84.7	exc
Stony Mtn.	PM2.5	6Aug23, 24:00	417591	24-hr	40	40.2	exc
Conklin	PM2.5	6Aug23, 24:00	417588	24-hr	39	39.3	exc
Janvier	PM2.5	6Aug23, 24:00	417592	24-hr	43	42.6	exc
Fort Hills	PM2.5	6Aug23, 24:00	417516	24-hr	80	79.5	exc
Bertha Ganter	PM2.5	6Aug23, 24:00	417582	24-hr	87	86.5	exc
Buffalo Viewpoint	PM2.5	6Aug23, 24:00	417585	24-hr	101	101.5	exc
Patricia McInnes	PM2.5	6Aug23, 24:00	417587	24-hr	73	73.1	exc
Athabasca Valley	PM2.5	6Aug23, 24:00	417586	24-hr	76	75.7	exc
Fort Chip	PM2.5	6Aug23, 24:00	417580	24-hr	59	59.3	exc
Barge Landing	PM2.5	6Aug23, 24:00	417581	24-hr	79	79.5	exc
Ft. McKay S	PM2.5	6Aug23, 24:00	417583	24-hr	89	88.8	exc
Surmont 2	PM2.5	6Aug23, 24:00	417589	24-hr	50	49.8	exc
Ells River	PM2.5	6Aug23, 24:00	417517	24-hr	80	79.7	exc
Athabasca Valley	PM2.5	7Aug23, 01:00	417817	1-hr	84	84.2	exc
Conklin	PM2.5	7Aug23, 05:00	417818	1-hr	82	82.2	exc
Fort Chip	PM2.5	14Aug23, 02:00	418118	1-hr	136	136.5	exc
Fort Chip	PM2.5	14Aug23, 03:00	418118	1-hr	243	243	exc
Fort Chip	PM2.5	14Aug23, 04:00	418118	1-hr	453	452.5	exc
Fort Chip	PM2.5	14Aug23, 05:00	418118	1-hr	353	353.2	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	14Aug23, 06:00	418118	1-hr	243	243.2	exc
Wapasu	PM2.5	14Aug23, 06:00	418119	1-hr	159	158.8	exc
Fort Hills	PM2.5	14Aug23, 06:00	417823	1-hr	144	144.1	exc
Ells River	PM2.5	14Aug23, 06:00	417825	1-hr	82	82.2	exc
Fort Chip	PM2.5	14Aug23, 07:00	418118	1-hr	166	165.8	exc
Wapasu	PM2.5	14Aug23, 07:00	418119	1-hr	285	284.9	exc
Fort Hills	PM2.5	14Aug23, 07:00	417823	1-hr	209	209.4	exc
Ells River	PM2.5	14Aug23, 07:00	417825	1-hr	158	157.8	exc
Bertha Ganter	PM2.5	14Aug23, 08:00	418120	1-hr	112	111.5	exc
Buffalo Viewpoint	PM2.5	14Aug23, 08:00	418121	1-hr	164	164.4	exc
Fort Chip	PM2.5	14Aug23, 08:00	418118	1-hr	235	234.9	exc
Ft. McKay S	PM2.5	14Aug23, 08:00	418122	1-hr	135	135	exc
Anzac	PM2.5	14Aug23, 08:00	418123	1-hr	113	113.2	exc
Wapasu	PM2.5	14Aug23, 08:00	418119	1-hr	274	274.5	exc
Fort Hills	PM2.5	14Aug23, 08:00	417823	1-hr	170	169.8	exc
Ells River	PM2.5	14Aug23, 08:00	417825	1-hr	160	159.8	exc
Bertha Ganter	PM2.5	14Aug23, 09:00	418120	1-hr	116	116	exc
Buffalo Viewpoint	PM2.5	14Aug23, 09:00	418121	1-hr	141	141.5	exc
Patricia McInnes	PM2.5	14Aug23, 09:00	418124	1-hr	127	127	exc
Athabasca Valley	PM2.5	14Aug23, 09:00	418125	1-hr	87	87.4	exc
Fort Chip	PM2.5	14Aug23, 09:00	418118	1-hr	363	363.3	exc
Barge Landing	PM2.5	14Aug23, 09:00	418126	1-hr	102	101.8	exc
Ft. McKay S	PM2.5	14Aug23, 09:00	418122	1-hr	122	121.8	exc
Anzac	PM2.5	14Aug23, 09:00	418123	1-hr	159	159	exc
Wapasu	PM2.5	14Aug23, 09:00	418119	1-hr	283	282.5	exc
Janvier	PM2.5	14Aug23, 09:00	418127	1-hr	82	82	exc
Fort Hills	PM2.5	14Aug23, 09:00	417823	1-hr	126	126.1	exc
Surmont 2	PM2.5	14Aug23, 09:00	418128	1-hr	173	172.6	exc
Ells River	PM2.5	14Aug23, 09:00	417825	1-hr	109	108.8	exc
Buffalo Viewpoint	PM2.5	14Aug23, 10:00	418121	1-hr	95	95.1	exc
Athabasca Valley	PM2.5	14Aug23, 10:00	418125	1-hr	102	102.1	exc
Fort Chip	PM2.5	14Aug23, 10:00	418118	1-hr	633	632.7	exc
Anzac	PM2.5	14Aug23, 10:00	418123	1-hr	149	149.4	exc
Wapasu	PM2.5	14Aug23, 10:00	418119	1-hr	164	164.2	exc
Janvier	PM2.5	14Aug23, 10:00	418127	1-hr	185	185.2	exc
Surmont 2	PM2.5	14Aug23, 10:00	418128	1-hr	196	195.7	exc
Fort Chip	PM2.5	14Aug23, 11:00	418118	1-hr	806	806	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	14Aug23, 11:00	418123	1-hr	84	83.7	exc
Stony Mtn.	PM2.5	14Aug23, 11:00	418129	1-hr	95	94.8	exc
Conklin	PM2.5	14Aug23, 11:00	418130	1-hr	102	101.6	exc
Janvier	PM2.5	14Aug23, 11:00	418127	1-hr	194	194.5	exc
Surmont 2	PM2.5	14Aug23, 11:00	418128	1-hr	153	152.6	exc
Fort Chip	PM2.5	14Aug23, 12:00	418118	1-hr	812	812.1	exc
Stony Mtn.	PM2.5	14Aug23, 12:00	418129	1-hr	174	173.6	exc
Conklin	PM2.5	14Aug23, 12:00	418130	1-hr	191	191.2	exc
Janvier	PM2.5	14Aug23, 12:00	418127	1-hr	189	189	exc
Surmont 2	PM2.5	14Aug23, 12:00	418128	1-hr	81	80.6	exc
Fort Chip	PM2.5	14Aug23, 13:00	418118	1-hr	773	772.9	exc
Stony Mtn.	PM2.5	14Aug23, 13:00	418129	1-hr	130	130.2	exc
Conklin	PM2.5	14Aug23, 13:00	418130	1-hr	148	148.1	exc
Janvier	PM2.5	14Aug23, 13:00	418127	1-hr	118	118.7	exc
Fort Chip	PM2.5	14Aug23, 14:00	418118	1-hr	729	729.2	exc
Stony Mtn.	PM2.5	14Aug23, 14:00	418129	1-hr	114	114.2	exc
Conklin	PM2.5	14Aug23, 14:00	418130	1-hr	117	116.6	exc
Janvier	PM2.5	14Aug23, 14:00	418127	1-hr	90	90	exc
Fort Chip	PM2.5	14Aug23, 15:00	418118	1-hr	602	602.4	exc
Fort Chip	PM2.5	14Aug23, 16:00	418118	1-hr	453	453	exc
Fort Chip	PM2.5	14Aug23, 17:00	418118	1-hr	244	244.4	exc
Fort Chip	PM2.5	14Aug23, 18:00	418118	1-hr	244	243.9	exc
Fort Chip	PM2.5	14Aug23, 19:00	418118	1-hr	162	162.1	exc
Conklin	PM2.5	14Aug23, 20:00	418130	1-hr	122	122.4	exc
Fort Hills	PM2.5	14Aug23, 22:00	417823	1-hr	92	92	exc
Fort Hills	PM2.5	14Aug23, 23:00	417823	1-hr	92	91.5	exc
Buffalo Viewpoint	PM2.5	14Aug23, 24:00	418121	24-hr	30	30	exc
Stony Mtn.	PM2.5	14Aug23, 24:00	418129	24-hr	33	32.8	exc
Conklin	PM2.5	14Aug23, 24:00	418130	24-hr	44	44.3	exc
Janvier	PM2.5	14Aug23, 24:00	418127	24-hr	43	42.6	exc
Fort Hills	PM2.5	14Aug23, 24:00	417823	24-hr	48	47.7	exc
Surmont 2	PM2.5	14Aug23, 24:00	418128	24-hr	35	34.7	exc
Ells River	PM2.5	14Aug23, 24:00	417825	24-hr	34	33.9	exc
Fort Chip	PM2.5	14Aug23, 24:00	418118	24-hr	328	327.8	exc
Wapasu	PM2.5	14Aug23, 24:00	418119	24-hr	61	61.3	exc
Fort Chip	PM2.5	15Aug23, 11:00	418118	1-hr	84	83.8	exc
Fort Chip	PM2.5	15Aug23, 20:00	418118	1-hr	84	84.2	exc
Fort Chip	PM2.5	15Aug23, 21:00	418118	1-hr	111	110.9	exc
Fort Chip	PM2.5	15Aug23, 22:00	418118	1-hr	113	113.2	exc
Fort Chip	PM2.5	15Aug23, 23:00	418118	1-hr	105	105.2	exc
Fort Chip	PM2.5	15Aug23, 24:00	418118	1-hr	125	125.3	exc
Fort Chip	PM2.5	15Aug23, 24:00	418118	24-hr	62	62.4	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	16Aug23, 01:00	418118	1-hr	218	217.9	exc
Fort Chip	PM2.5	16Aug23, 02:00	418118	1-hr	256	256.3	exc
Fort Chip	PM2.5	16Aug23, 03:00	418118	1-hr	219	218.6	exc
Fort Chip	PM2.5	16Aug23, 04:00	418118	1-hr	219	218.7	exc
Fort Chip	PM2.5	16Aug23, 05:00	418118	1-hr	212	212.4	exc
Fort Chip	PM2.5	16Aug23, 06:00	418118	1-hr	191	190.9	exc
Fort Chip	PM2.5	16Aug23, 07:00	418118	1-hr	153	153	exc
Fort Hills	PM2.5	16Aug23, 07:00	417925	1-hr	87	87.1	exc
Buffalo Viewpoint	PM2.5	16Aug23, 08:00	418121	1-hr	84	84.3	exc
Fort Chip	PM2.5	16Aug23, 08:00	418118	1-hr	129	129.3	exc
Fort Hills	PM2.5	16Aug23, 08:00	417925	1-hr	99	99.2	exc
Buffalo Viewpoint	PM2.5	16Aug23, 09:00	418121	1-hr	90	90.3	exc
Fort Chip	PM2.5	16Aug23, 09:00	418118	1-hr	120	119.6	exc
Barge Landing	PM2.5	16Aug23, 09:00	418126	1-hr	89	89.1	exc
Wapasu	PM2.5	16Aug23, 09:00	418119	1-hr	92	91.8	exc
Ells River	PM2.5	16Aug23, 09:00	417924	1-hr	104	104.3	exc
Bertha Ganter	PM2.5	16Aug23, 09:00	418120	1-hr	96	96	exc
Ft. McKay S	PM2.5	16Aug23, 09:00	418122	1-hr	94	93.8	exc
Fort Hills	PM2.5	16Aug23, 09:00	417925	1-hr	123	122.6	exc
Buffalo Viewpoint	PM2.5	16Aug23, 10:00	418121	1-hr	111	110.7	exc
Athabasca Valley	PM2.5	16Aug23, 10:00	418125	1-hr	96	95.9	exc
Fort Chip	PM2.5	16Aug23, 10:00	418118	1-hr	103	102.7	exc
Barge Landing	PM2.5	16Aug23, 10:00	418126	1-hr	107	106.9	exc
Wapasu	PM2.5	16Aug23, 10:00	418119	1-hr	137	137.5	exc
Ells River	PM2.5	16Aug23, 10:00	417924	1-hr	104	103.8	exc
Bertha Ganter	PM2.5	16Aug23, 10:00	418120	1-hr	111	110.7	exc
Patricia McInnes	PM2.5	16Aug23, 10:00	418124	1-hr	89	88.5	exc
Ft. McKay S	PM2.5	16Aug23, 10:00	418122	1-hr	110	110.2	exc
Fort Hills	PM2.5	16Aug23, 10:00	417925	1-hr	131	131.1	exc
Buffalo Viewpoint	PM2.5	16Aug23, 11:00	418121	1-hr	161	161	exc
Patricia McInnes	PM2.5	16Aug23, 11:00	418124	1-hr	93	92.6	exc
Athabasca Valley	PM2.5	16Aug23, 11:00	418125	1-hr	109	108.7	exc
Fort Chip	PM2.5	16Aug23, 11:00	418118	1-hr	96	96	exc
Barge Landing	PM2.5	16Aug23, 11:00	418126	1-hr	121	121.3	exc
Wapasu	PM2.5	16Aug23, 11:00	418119	1-hr	162	162.1	exc
Ells River	PM2.5	16Aug23, 11:00	417924	1-hr	146	146.2	exc
Bertha Ganter	PM2.5	16Aug23, 11:00	418120	1-hr	126	125.9	exc
Ft. McKay S	PM2.5	16Aug23, 11:00	418122	1-hr	125	125.1	exc
Fort Hills	PM2.5	16Aug23, 11:00	417925	1-hr	146	146.4	exc
Buffalo Viewpoint	PM2.5	16Aug23, 12:00	418121	1-hr	138	137.7	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Patricia McInnes	PM2.5	16Aug23, 12:00	418124	1-hr	88	88	exc
Athabasca Valley	PM2.5	16Aug23, 12:00	418125	1-hr	95	95.5	exc
Wapasu	PM2.5	16Aug23, 12:00	418119	1-hr	155	155	exc
Ells River	PM2.5	16Aug23, 12:00	417924	1-hr	122	122.4	exc
Bertha Ganter	PM2.5	16Aug23, 12:00	418120	1-hr	120	120	exc
Barge Landing	PM2.5	16Aug23, 12:00	418126	1-hr	117	117.3	exc
Ft. McKay S	PM2.5	16Aug23, 12:00	418122	1-hr	112	111.6	exc
Fort Hills	PM2.5	16Aug23, 12:00	417925	1-hr	165	164.8	exc
Surmont 2	PM2.5	16Aug23, 12:00	418128	1-hr	80	80.4	exc
Buffalo Viewpoint	PM2.5	16Aug23, 13:00	418121	1-hr	86	85.6	exc
Athabasca Valley	PM2.5	16Aug23, 13:00	418125	1-hr	83	83.4	exc
Wapasu	PM2.5	16Aug23, 13:00	418119	1-hr	157	157.4	exc
Fort Hills	PM2.5	16Aug23, 13:00	417925	1-hr	92	91.7	exc
Wapasu	PM2.5	16Aug23, 14:00	418119	1-hr	126	125.5	exc
Wapasu	PM2.5	16Aug23, 24:00	418119	24-hr	58	58.1	exc
Surmont 2	PM2.5	16Aug23, 24:00	418128	24-hr	30	30	exc
Ells River	PM2.5	16Aug23, 24:00	417924	24-hr	51	50.6	exc
Bertha Ganter	PM2.5	16Aug23, 24:00	418120	24-hr	48	48	exc
Buffalo Viewpoint	PM2.5	16Aug23, 24:00	418121	24-hr	54	53.6	exc
Patricia McInnes	PM2.5	16Aug23, 24:00	418124	24-hr	39	38.7	exc
Athabasca Valley	PM2.5	16Aug23, 24:00	418125	24-hr	41	40.8	exc
Fort Chip	PM2.5	16Aug23, 24:00	418118	24-hr	101	100.9	exc
Barge Landing	PM2.5	16Aug23, 24:00	418126	24-hr	45	45.3	exc
Ft. McKay S	PM2.5	16Aug23, 24:00	418122	24-hr	49	49	exc
Anzac	PM2.5	16Aug23, 24:00	418123	24-hr	32	31.5	exc
Fort Hills	PM2.5	16Aug23, 24:00	417925	24-hr	59	58.7	exc
Mannix	H2S	17Aug23, 20:00	417993	1-hr	14	14.3	exc
Fort Chip	PM2.5	17Aug23, 23:00	418118	1-hr	164	164.2	exc
Fort Chip	PM2.5	17Aug23, 24:00	418118	1-hr	116	115.6	exc
Fort Chip	PM2.5	17Aug23, 24:00	418118	24-hr	31	31.4	exc
Fort Chip	PM2.5	18Aug23, 01:00	418118	1-hr	88	88	exc
Fort Chip	PM2.5	18Aug23, 02:00	418118	1-hr	98	98	exc
Fort Hills	PM2.5	18Aug23, 02:00	418035	1-hr	87	86.7	exc
Fort Chip	PM2.5	18Aug23, 03:00	418118	1-hr	103	103.4	exc
Fort Chip	PM2.5	18Aug23, 04:00	418118	1-hr	103	102.6	exc
Fort Chip	PM2.5	18Aug23, 05:00	418118	1-hr	108	108	exc
Buffalo Viewpoint	PM2.5	18Aug23, 06:00	418121	1-hr	101	101	exc
Fort Chip	PM2.5	18Aug23, 06:00	418118	1-hr	97	96.6	exc
Buffalo Viewpoint	PM2.5	18Aug23, 07:00	418121	1-hr	94	94	exc
Athabasca Valley	PM2.5	18Aug23, 07:00	418125	1-hr	82	82.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	18Aug23, 07:00	418126	1-hr	84	84.1	exc
Fort Hills	PM2.5	18Aug23, 07:00	418035	1-hr	89	88.7	exc
Bertha Ganter	PM2.5	18Aug23, 08:00	418120	1-hr	86	85.9	exc
Buffalo Viewpoint	PM2.5	18Aug23, 08:00	418121	1-hr	132	131.5	exc
Patricia McInnes	PM2.5	18Aug23, 08:00	418124	1-hr	96	96.4	exc
Athabasca Valley	PM2.5	18Aug23, 08:00	418125	1-hr	116	116.1	exc
Barge Landing	PM2.5	18Aug23, 08:00	418126	1-hr	89	89.2	exc
Ft. McKay S	PM2.5	18Aug23, 08:00	418122	1-hr	92	92.4	exc
Wapasu	PM2.5	18Aug23, 08:00	418119	1-hr	91	91.3	exc
Fort Hills	PM2.5	18Aug23, 08:00	418035	1-hr	105	104.8	exc
Bertha Ganter	PM2.5	18Aug23, 09:00	418120	1-hr	91	91.3	exc
Buffalo Viewpoint	PM2.5	18Aug23, 09:00	418121	1-hr	131	130.9	exc
Patricia McInnes	PM2.5	18Aug23, 09:00	418124	1-hr	119	119.4	exc
Athabasca Valley	PM2.5	18Aug23, 09:00	418125	1-hr	110	109.5	exc
Fort Chip	PM2.5	18Aug23, 09:00	418118	1-hr	126	126.4	exc
Ft. McKay S	PM2.5	18Aug23, 09:00	418122	1-hr	90	90.4	exc
Anzac	PM2.5	18Aug23, 09:00	418123	1-hr	106	106	exc
Wapasu	PM2.5	18Aug23, 09:00	418119	1-hr	130	130.5	exc
Fort Hills	PM2.5	18Aug23, 09:00	418035	1-hr	118	118.2	exc
Ells River	PM2.5	18Aug23, 09:00	418036	1-hr	89	89	exc
Buffalo Viewpoint	PM2.5	18Aug23, 10:00	418121	1-hr	120	119.5	exc
Patricia McInnes	PM2.5	18Aug23, 10:00	418124	1-hr	107	107.2	exc
Athabasca Valley	PM2.5	18Aug23, 10:00	418125	1-hr	110	110.3	exc
Fort Chip	PM2.5	18Aug23, 10:00	418118	1-hr	116	115.7	exc
Ft. McKay S	PM2.5	18Aug23, 10:00	418122	1-hr	104	104.4	exc
Anzac	PM2.5	18Aug23, 10:00	418123	1-hr	133	132.6	exc
Wapasu	PM2.5	18Aug23, 10:00	418119	1-hr	116	115.6	exc
Surmont 2	PM2.5	18Aug23, 10:00	418128	1-hr	95	95.4	exc
Buffalo Viewpoint	PM2.5	18Aug23, 11:00	418121	1-hr	86	85.7	exc
Patricia McInnes	PM2.5	18Aug23, 11:00	418124	1-hr	86	85.7	exc
Athabasca Valley	PM2.5	18Aug23, 11:00	418125	1-hr	94	94.2	exc
Fort Chip	PM2.5	18Aug23, 11:00	418118	1-hr	86	86.5	exc
Anzac	PM2.5	18Aug23, 11:00	418123	1-hr	129	129	exc
Stony Mtn.	PM2.5	18Aug23, 11:00	418129	1-hr	85	84.8	exc
Janvier	PM2.5	18Aug23, 11:00	418127	1-hr	93	92.5	exc
Surmont 2	PM2.5	18Aug23, 11:00	418128	1-hr	113	112.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Anzac	PM2.5	18Aug23, 12:00	418123	1-hr	105	105.3	exc
Stony Mtn.	PM2.5	18Aug23, 12:00	418129	1-hr	95	95.1	exc
Janvier	PM2.5	18Aug23, 12:00	418127	1-hr	110	109.8	exc
Surmont 2	PM2.5	18Aug23, 12:00	418128	1-hr	108	108.3	exc
Anzac	PM2.5	18Aug23, 13:00	418123	1-hr	81	80.6	exc
Stony Mtn.	PM2.5	18Aug23, 13:00	418129	1-hr	99	99.2	exc
Conklin	PM2.5	18Aug23, 13:00	418130	1-hr	107	106.8	exc
Janvier	PM2.5	18Aug23, 13:00	418127	1-hr	105	105.1	exc
Surmont 2	PM2.5	18Aug23, 13:00	418128	1-hr	97	97	exc
Stony Mtn.	PM2.5	18Aug23, 14:00	418129	1-hr	85	84.7	exc
Conklin	PM2.5	18Aug23, 14:00	418130	1-hr	95	94.8	exc
Janvier	PM2.5	18Aug23, 14:00	418127	1-hr	98	97.8	exc
Stony Mtn.	PM2.5	18Aug23, 15:00	418129	1-hr	80	80.1	exc
Conklin	PM2.5	18Aug23, 15:00	418130	1-hr	84	83.8	exc
Janvier	PM2.5	18Aug23, 15:00	418127	1-hr	84	83.9	exc
Bertha Ganter	PM2.5	18Aug23, 24:00	418120	24-hr	50	50.3	exc
Buffalo Viewpoint	PM2.5	18Aug23, 24:00	418121	24-hr	70	70.1	exc
Patricia McInnes	PM2.5	18Aug23, 24:00	418124	24-hr	54	54.2	exc
Athabasca Valley	PM2.5	18Aug23, 24:00	418125	24-hr	56	55.7	exc
Fort Chip	PM2.5	18Aug23, 24:00	418118	24-hr	67	66.8	exc
Ft. McKay S	PM2.5	18Aug23, 24:00	418122	24-hr	54	54.1	exc
Anzac	PM2.5	18Aug23, 24:00	418123	24-hr	54	54.2	exc
Stony Mtn.	PM2.5	18Aug23, 24:00	418129	24-hr	41	40.5	exc
Conklin	PM2.5	18Aug23, 24:00	418130	24-hr	31	-	ret
Janvier	PM2.5	18Aug23, 24:00	418127	24-hr	47	47	exc
Fort Hills	PM2.5	18Aug23, 24:00	418035	24-hr	68	68.1	exc
Barge Landing	PM2.5	18Aug23, 24:00	418126	24-hr	48	47.6	exc
Wapasu	PM2.5	18Aug23, 24:00	418119	24-hr	54	53.7	exc
Surmont 2	PM2.5	18Aug23, 24:00	418128	24-hr	49	48.7	exc
Ells River	PM2.5	18Aug23, 24:00	418036	24-hr	47	46.8	exc
Fort Hills	PM2.5	20Aug23, 19:00	418067	1-hr	85	84.9	exc
Fort Hills	PM2.5	20Aug23, 20:00	418067	1-hr	134	133.6	exc
Fort Hills	PM2.5	20Aug23, 21:00	418067	1-hr	150	149.8	exc
Fort Hills	PM2.5	20Aug23, 24:00	418067	24-hr	39	38.6	exc
Fort Hills	PM2.5	21Aug23, 20:00	418131	1-hr	364	363.7	exc
Fort Hills	PM2.5	21Aug23, 21:00	418131	1-hr	187	187.2	exc
Fort Hills	PM2.5	21Aug23, 22:00	418131	1-hr	134	134.2	exc
Fort Hills	PM2.5	21Aug23, 23:00	418131	1-hr	214	214.4	exc
Fort Hills	PM2.5	21Aug23, 24:00	418131	1-hr	208	207.8	exc
Fort Hills	PM2.5	21Aug23, 24:00	418131	24-hr	58	58.2	exc
Fort Hills	PM2.5	22Aug23, 01:00	418173	1-hr	932	932.3	exc
Fort Hills	PM2.5	22Aug23, 02:00	418173	1-hr	308	308.4	exc
Fort Hills	PM2.5	22Aug23, 03:00	418173	1-hr	388	388.4	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	22Aug23, 04:00	418173	1-hr	172	172	exc
Fort Hills	PM2.5	22Aug23, 05:00	418173	1-hr	155	155.2	exc
Fort Hills	PM2.5	22Aug23, 20:00	418173	1-hr	545	545.1	exc
Fort Hills	PM2.5	22Aug23, 21:00	418173	1-hr	765	765	exc
Fort Hills	PM2.5	22Aug23, 22:00	418173	1-hr	497	497.5	exc
Fort Hills	PM2.5	22Aug23, 23:00	418173	1-hr	499	499.2	exc
Conklin	PM2.5	22Aug23, 24:00	418449	24-hr	30	30.1	exc
Fort Hills	PM2.5	22Aug23, 24:00	418173	1-hr	831	831.1	exc
Fort Hills	PM2.5	22Aug23, 24:00	418173	24-hr	231	230.9	exc
Barge Landing	PM2.5	22Aug23, 24:00	418450	24-hr	33	32.6	exc
Fort Chip	PM2.5	23Aug23, 14:00	418451	1-hr	105	105.1	exc
Fort Chip	PM2.5	23Aug23, 15:00	418451	1-hr	126	125.6	exc
Fort Chip	PM2.5	23Aug23, 16:00	418451	1-hr	158	157.8	exc
Fort Chip	PM2.5	23Aug23, 17:00	418451	1-hr	157	156.9	exc
Fort Chip	PM2.5	23Aug23, 18:00	418451	1-hr	98	97.7	exc
Fort Hills	PM2.5	23Aug23, 18:00	418236	1-hr	110	109.6	exc
Bertha Ganter	PM2.5	23Aug23, 19:00	418452	1-hr	153	152.8	exc
Ft. McKay S	PM2.5	23Aug23, 19:00	418455	1-hr	100	100.1	exc
Wapasu	PM2.5	23Aug23, 19:00	418456	1-hr	143	143	exc
Fort Hills	PM2.5	23Aug23, 19:00	418236	1-hr	326	326.3	exc
Ells River	PM2.5	23Aug23, 19:00	418235	1-hr	155	155	exc
Barge Landing	PM2.5	23Aug23, 19:00	418450	1-hr	127	128.4	exc
Bertha Ganter	PM2.5	23Aug23, 20:00	418452	1-hr	394	394.2	exc
Buffalo Viewpoint	PM2.5	23Aug23, 20:00	418457	1-hr	199	198.8	exc
Ft. McKay S	PM2.5	23Aug23, 20:00	418455	1-hr	330	330.5	exc
Wapasu	PM2.5	23Aug23, 20:00	418456	1-hr	302	302.1	exc
Fort Hills	PM2.5	23Aug23, 20:00	418236	1-hr	453	452.6	exc
Ells River	PM2.5	23Aug23, 20:00	418235	1-hr	311	310.7	exc
Barge Landing	PM2.5	23Aug23, 20:00	418450	1-hr	333	334.4	exc
Bertha Ganter	PM2.5	23Aug23, 21:00	418452	1-hr	474	473.7	exc
Buffalo Viewpoint	PM2.5	23Aug23, 21:00	418457	1-hr	368	368	exc
Patricia McInnes	PM2.5	23Aug23, 21:00	418458	1-hr	166	165.6	exc
Athabasca Valley	PM2.5	23Aug23, 21:00	418459	1-hr	85	84.9	exc
Ft. McKay S	PM2.5	23Aug23, 21:00	418455	1-hr	448	448.3	exc
Wapasu	PM2.5	23Aug23, 21:00	418456	1-hr	221	221.2	exc
Fort Hills	PM2.5	23Aug23, 21:00	418236	1-hr	449	449.1	exc
Ells River	PM2.5	23Aug23, 21:00	418235	1-hr	361	360.8	exc
Barge Landing	PM2.5	23Aug23, 21:00	418450	1-hr	449	451.1	exc
Bertha Ganter	PM2.5	23Aug23, 22:00	418452	1-hr	411	411	exc
Buffalo Viewpoint	PM2.5	23Aug23, 22:00	418457	1-hr	464	464.4	exc
Patricia McInnes	PM2.5	23Aug23, 22:00	418458	1-hr	271	270.9	exc
Athabasca Valley	PM2.5	23Aug23, 22:00	418459	1-hr	296	295.6	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	23Aug23, 22:00	418455	1-hr	404	404.1	exc
Wapasu	PM2.5	23Aug23, 22:00	418456	1-hr	136	136.4	exc
Fort Hills	PM2.5	23Aug23, 22:00	418236	1-hr	356	356.1	exc
Ells River	PM2.5	23Aug23, 22:00	418235	1-hr	301	301.5	exc
Barge Landing	PM2.5	23Aug23, 22:00	418450	1-hr	414	415.9	exc
Bertha Ganter	PM2.5	23Aug23, 23:00	418452	1-hr	321	321.3	exc
Buffalo Viewpoint	PM2.5	23Aug23, 23:00	418457	1-hr	477	477.4	exc
Patricia McInnes	PM2.5	23Aug23, 23:00	418458	1-hr	285	285.4	exc
Athabasca Valley	PM2.5	23Aug23, 23:00	418459	1-hr	298	298.3	exc
Ft. McKay S	PM2.5	23Aug23, 23:00	418455	1-hr	328	327.7	exc
Wapasu	PM2.5	23Aug23, 23:00	418456	1-hr	155	154.9	exc
Fort Hills	PM2.5	23Aug23, 23:00	418236	1-hr	269	269.1	exc
Ells River	PM2.5	23Aug23, 23:00	418235	1-hr	244	244	exc
Barge Landing	PM2.5	23Aug23, 23:00	418450	1-hr	324	325.9	exc
Bertha Ganter	PM2.5	23Aug23, 24:00	418452	1-hr	247	246.7	exc
Buffalo Viewpoint	PM2.5	23Aug23, 24:00	418457	1-hr	419	418.6	exc
Buffalo Viewpoint	PM2.5	23Aug23, 24:00	418457	24-hr	113	112.8	exc
Mannix	H2S	23Aug23, 24:00	418234	24-hr	3	2.9	nae
Patricia McInnes	PM2.5	23Aug23, 24:00	418458	1-hr	325	324.8	exc
Patricia McInnes	PM2.5	23Aug23, 24:00	418458	24-hr	66	66.4	exc
Athabasca Valley	PM2.5	23Aug23, 24:00	418459	1-hr	332	332	exc
Athabasca Valley	PM2.5	23Aug23, 24:00	418459	24-hr	66	66.1	exc
Ft. McKay S	PM2.5	23Aug23, 24:00	418455	1-hr	250	249.6	exc
Wapasu	PM2.5	23Aug23, 24:00	418456	1-hr	193	193.5	exc
Wapasu	PM2.5	23Aug23, 24:00	418456	24-hr	70	69.5	exc
Fort Hills	PM2.5	23Aug23, 24:00	418236	1-hr	224	224.2	exc
Ells River	PM2.5	23Aug23, 24:00	418235	1-hr	183	183.2	exc
Ells River	PM2.5	23Aug23, 24:00	418235	24-hr	82	82	exc
Bertha Ganter	PM2.5	23Aug23, 24:00	418452	24-hr	108	109.7	exc
Fort Chip	PM2.5	23Aug23, 24:00	418451	24-hr	53	53.1	exc
Barge Landing	PM2.5	23Aug23, 24:00	418450	1-hr	249	251.1	exc
Barge Landing	PM2.5	23Aug23, 24:00	418450	24-hr	102	106.2	exc
Ft. McKay S	PM2.5	23Aug23, 24:00	418455	24-hr	96	96.2	exc
Fort Hills	PM2.5	23Aug23, 24:00	418236	24-hr	117	116.5	exc
Bertha Ganter	PM2.5	24Aug23, 01:00	418452	1-hr	187	187	exc
Buffalo Viewpoint	PM2.5	24Aug23, 01:00	418457	1-hr	318	317.6	exc
Patricia McInnes	PM2.5	24Aug23, 01:00	418458	1-hr	344	344	exc
Barge Landing	PM2.5	24Aug23, 01:00	418450	1-hr	182	183.7	exc
Ft. McKay S	PM2.5	24Aug23, 01:00	418455	1-hr	186	186.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	24Aug23, 01:00	418456	1-hr	216	215.6	exc
Fort Hills	PM2.5	24Aug23, 01:00	418293	1-hr	185	184.8	exc
Ells River	PM2.5	24Aug23, 01:00	418294	1-hr	137	136.7	exc
Athabasca Valley	PM2.5	24Aug23, 01:00	418459	1-hr	372	372.2	exc
Bertha Ganter	PM2.5	24Aug23, 02:00	418452	1-hr	140	139.6	exc
Buffalo Viewpoint	PM2.5	24Aug23, 02:00	418457	1-hr	209	209.1	exc
Patricia McInnes	PM2.5	24Aug23, 02:00	418458	1-hr	317	317.5	exc
Barge Landing	PM2.5	24Aug23, 02:00	418450	1-hr	135	137	exc
Ft. McKay S	PM2.5	24Aug23, 02:00	418455	1-hr	140	139.8	exc
Wapasu	PM2.5	24Aug23, 02:00	418456	1-hr	146	146.4	exc
Fort Hills	PM2.5	24Aug23, 02:00	418293	1-hr	168	168.2	exc
Ells River	PM2.5	24Aug23, 02:00	418294	1-hr	112	111.6	exc
Athabasca Valley	PM2.5	24Aug23, 02:00	418459	1-hr	360	359.9	exc
Bertha Ganter	PM2.5	24Aug23, 03:00	418452	1-hr	139	138.8	exc
Buffalo Viewpoint	PM2.5	24Aug23, 03:00	418457	1-hr	159	159.3	exc
Patricia McInnes	PM2.5	24Aug23, 03:00	418458	1-hr	207	206.9	exc
Barge Landing	PM2.5	24Aug23, 03:00	418450	1-hr	124	125.9	exc
Ft. McKay S	PM2.5	24Aug23, 03:00	418455	1-hr	122	122.4	exc
Anzac	PM2.5	24Aug23, 01:00	418460	1-hr	105	105.2	exc
Anzac	PM2.5	24Aug23, 02:00	418460	1-hr	157	156.8	exc
Anzac	PM2.5	24Aug23, 03:00	418460	1-hr	193	193.4	exc
Wapasu	PM2.5	24Aug23, 03:00	418456	1-hr	95	95.3	exc
Fort Hills	PM2.5	24Aug23, 03:00	418293	1-hr	189	189.3	exc
Ells River	PM2.5	24Aug23, 03:00	418294	1-hr	122	122.2	exc
Athabasca Valley	PM2.5	24Aug23, 03:00	418459	1-hr	240	240.4	exc
Bertha Ganter	PM2.5	24Aug23, 04:00	418452	1-hr	132	131.6	exc
Buffalo Viewpoint	PM2.5	24Aug23, 04:00	418457	1-hr	130	130.4	exc
Patricia McInnes	PM2.5	24Aug23, 04:00	418458	1-hr	126	125.8	exc
Barge Landing	PM2.5	24Aug23, 04:00	418450	1-hr	121	122.7	exc
Ft. McKay S	PM2.5	24Aug23, 04:00	418455	1-hr	126	126.5	exc
Fort Hills	PM2.5	24Aug23, 04:00	418293	1-hr	155	155.1	exc
Surmont 2	PM2.5	24Aug23, 04:00	418461	1-hr	125	125.1	exc
Ells River	PM2.5	24Aug23, 04:00	418294	1-hr	101	101.3	exc
Athabasca Valley	PM2.5	24Aug23, 04:00	418459	1-hr	144	144	exc
Bertha Ganter	PM2.5	24Aug23, 05:00	418452	1-hr	93	92.6	exc
Buffalo Viewpoint	PM2.5	24Aug23, 05:00	418457	1-hr	97	96.9	exc
Patricia McInnes	PM2.5	24Aug23, 05:00	418458	1-hr	88	88.4	exc
Barge Landing	PM2.5	24Aug23, 05:00	418450	1-hr	82	83.4	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	24Aug23, 05:00	418455	1-hr	88	88.2	exc
Fort Hills	PM2.5	24Aug23, 05:00	418293	1-hr	125	124.8	exc
Surmont 2	PM2.5	24Aug23, 05:00	418461	1-hr	171	170.6	exc
Ells River	PM2.5	24Aug23, 05:00	418294	1-hr	87	86.6	exc
Athabasca Valley	PM2.5	24Aug23, 05:00	418459	1-hr	106	105.8	exc
Anzac	PM2.5	24Aug23, 04:00	418460	1-hr	230	230	exc
Anzac	PM2.5	24Aug23, 05:00	418460	1-hr	221	220.8	exc
Anzac	PM2.5	24Aug23, 06:00	418460	1-hr	151	150.6	exc
Surmont 2	PM2.5	24Aug23, 06:00	418461	1-hr	166	166.3	exc
Anzac	PM2.5	24Aug23, 07:00	418460	1-hr	100	99.5	exc
Janvier	PM2.5	24Aug23, 07:00	418462	1-hr	117	117.3	exc
Surmont 2	PM2.5	24Aug23, 07:00	418461	1-hr	114	114	exc
Janvier	PM2.5	24Aug23, 08:00	418462	1-hr	106	106.2	exc
Bertha Ganter	PM2.5	24Aug23, 24:00	418452	24-hr	40	39.8	exc
Buffalo Viewpoint	PM2.5	24Aug23, 24:00	418457	24-hr	54	54.5	exc
Ft. McKay S	PM2.5	24Aug23, 24:00	418455	24-hr	40	41.6	exc
Anzac	PM2.5	24Aug23, 24:00	418460	24-hr	65	65.2	exc
Wapasu	PM2.5	24Aug23, 24:00	418456	24-hr	31	30.5	exc
Stony Mtn.	PM2.5	24Aug23, 24:00	418463	24-hr	30	30.3	exc
Fort Hills	PM2.5	24Aug23, 24:00	418293	24-hr	49	48.9	exc
Surmont 2	PM2.5	24Aug23, 24:00	418461	24-hr	49	49	exc
Ells River	PM2.5	24Aug23, 24:00	418294	24-hr	33	33	exc
Patricia McInnes	PM2.5	24Aug23, 24:00	418458	24-hr	60	59.8	exc
Athabasca Valley	PM2.5	24Aug23, 24:00	418459	24-hr	66	65.8	exc
Barge Landing	PM2.5	24Aug23, 24:00	418450	24-hr	37	38	exc
Conklin	PM2.5	24Aug23, 24:00	418449	24-hr	34	34.4	exc
Janvier	PM2.5	24Aug23, 24:00	418462	24-hr	35	35.1	exc
Fort Hills	PM2.5	25Aug23, 01:00	418345	1-hr	116	116.3	exc
Stony Mtn.	PM2.5	25Aug23, 03:00	418463	1-hr	89	88.7	exc
Fort Hills	PM2.5	25Aug23, 03:00	418345	1-hr	109	108.7	exc
Stony Mtn.	PM2.5	25Aug23, 04:00	418463	1-hr	97	97	exc
Stony Mtn.	PM2.5	25Aug23, 05:00	418463	1-hr	91	91.2	exc
Stony Mtn.	PM2.5	25Aug23, 06:00	418463	1-hr	82	82.4	exc
Patricia McInnes	PM2.5	25Aug23, 10:00	418458	1-hr	94	93.8	exc
Patricia McInnes	PM2.5	25Aug23, 11:00	418458	1-hr	110	109.9	exc
Athabasca Valley	PM2.5	25Aug23, 11:00	418459	1-hr	81	81.1	exc
Ft. McKay S	PM2.5	25Aug23, 11:00	418455	1-hr	82	83.8	exc
Buffalo Viewpoint	PM2.5	25Aug23, 12:00	418457	1-hr	129	128.6	exc
Patricia McInnes	PM2.5	25Aug23, 12:00	418458	1-hr	110	110	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	25Aug23, 12:00	418459	1-hr	107	106.9	exc
Fort Chip	PM2.5	25Aug23, 12:00	418451	1-hr	105	105.1	exc
Barge Landing	PM2.5	25Aug23, 12:00	418450	1-hr	90	90.6	exc
Ft. McKay S	PM2.5	25Aug23, 12:00	418455	1-hr	110	110.7	exc
Fort Hills	PM2.5	25Aug23, 12:00	418345	1-hr	92	92.1	exc
Ells River	PM2.5	25Aug23, 12:00	418341	1-hr	91	90.9	exc
Bertha Ganter	PM2.5	25Aug23, 12:00	418452	1-hr	121	121	exc
Bertha Ganter	PM2.5	25Aug23, 13:00	418452	1-hr	131	130.8	exc
Buffalo Viewpoint	PM2.5	25Aug23, 13:00	418457	1-hr	117	117.3	exc
Patricia McInnes	PM2.5	25Aug23, 13:00	418458	1-hr	106	106.1	exc
Athabasca Valley	PM2.5	25Aug23, 13:00	418459	1-hr	110	109.9	exc
Fort Chip	PM2.5	25Aug23, 13:00	418451	1-hr	120	120.4	exc
Barge Landing	PM2.5	25Aug23, 13:00	418450	1-hr	119	119.5	exc
Ft. McKay S	PM2.5	25Aug23, 13:00	418455	1-hr	130	130.8	exc
Wapasu	PM2.5	25Aug23, 13:00	418456	1-hr	84	83.9	exc
Fort Hills	PM2.5	25Aug23, 13:00	418345	1-hr	132	131.9	exc
Ells River	PM2.5	25Aug23, 13:00	418341	1-hr	128	127.9	exc
Bertha Ganter	PM2.5	25Aug23, 14:00	418452	1-hr	138	137.8	exc
Buffalo Viewpoint	PM2.5	25Aug23, 14:00	418457	1-hr	97	96.8	exc
Athabasca Valley	PM2.5	25Aug23, 14:00	418459	1-hr	99	99.1	exc
Fort Chip	PM2.5	25Aug23, 14:00	418451	1-hr	123	123.1	exc
Barge Landing	PM2.5	25Aug23, 14:00	418450	1-hr	137	137.6	exc
Ft. McKay S	PM2.5	25Aug23, 14:00	418455	1-hr	136	137.2	exc
Wapasu	PM2.5	25Aug23, 14:00	418456	1-hr	110	110.5	exc
Fort Hills	PM2.5	25Aug23, 14:00	418345	1-hr	175	174.9	exc
Ells River	PM2.5	25Aug23, 14:00	418341	1-hr	134	133.9	exc
Bertha Ganter	PM2.5	25Aug23, 15:00	418452	1-hr	106	105.9	exc
Patricia McInnes	PM2.5	25Aug23, 14:00	418458	1-hr	86	85.6	exc
Athabasca Valley	PM2.5	25Aug23, 15:00	418459	1-hr	89	88.9	exc
Fort Chip	PM2.5	25Aug23, 15:00	418451	1-hr	114	114.4	exc
Barge Landing	PM2.5	25Aug23, 15:00	418450	1-hr	106	106.6	exc
Ft. McKay S	PM2.5	25Aug23, 15:00	418455	1-hr	96	96.6	exc
Wapasu	PM2.5	25Aug23, 15:00	418456	1-hr	115	114.6	exc
Fort Hills	PM2.5	25Aug23, 15:00	418345	1-hr	149	148.9	exc
Ells River	PM2.5	25Aug23, 15:00	418341	1-hr	98	97.6	exc
Buffalo Viewpoint	PM2.5	25Aug23, 15:00	418457	1-hr	81	80.9	exc
Athabasca Valley	PM2.5	25Aug23, 16:00	418459	1-hr	81	80.6	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	25Aug23, 16:00	418451	1-hr	108	107.8	exc
Ft. McKay S	PM2.5	25Aug23, 16:00	418455	1-hr	82	82.7	exc
Wapasu	PM2.5	25Aug23, 16:00	418456	1-hr	87	86.7	exc
Fort Hills	PM2.5	25Aug23, 16:00	418345	1-hr	105	105.2	exc
Buffalo Viewpoint	PM2.5	25Aug23, 16:00	418457	1-hr	82	82	exc
Fort Chip	PM2.5	25Aug23, 17:00	418451	1-hr	110	110.4	exc
Wapasu	PM2.5	25Aug23, 17:00	418456	1-hr	84	84.1	exc
Fort Hills	PM2.5	25Aug23, 17:00	418345	1-hr	83	82.8	exc
Fort Chip	PM2.5	25Aug23, 18:00	418451	1-hr	106	106.4	exc
Fort Hills	PM2.5	25Aug23, 18:00	418345	1-hr	86	86.2	exc
Fort Chip	PM2.5	25Aug23, 19:00	418451	1-hr	139	138.6	exc
Fort Hills	PM2.5	25Aug23, 19:00	418345	1-hr	93	93.2	exc
Fort Chip	PM2.5	25Aug23, 20:00	418451	1-hr	145	145.2	exc
Fort Hills	PM2.5	25Aug23, 20:00	418345	1-hr	104	103.6	exc
Fort Chip	PM2.5	25Aug23, 21:00	418451	1-hr	120	119.6	exc
Conklin	PM2.5	25Aug23, 21:00	418449	1-hr	87	87.3	exc
Fort Chip	PM2.5	25Aug23, 22:00	418451	1-hr	87	86.6	exc
Bertha Ganter	PM2.5	25Aug23, 24:00	418452	24-hr	55	54.8	exc
Barge Landing	PM2.5	25Aug23, 24:00	418450	24-hr	53	54.5	exc
Ft. McKay S	PM2.5	25Aug23, 24:00	418455	24-hr	56	57.4	exc
Anzac	PM2.5	25Aug23, 24:00	418460	24-hr	46	47.9	exc
Wapasu	PM2.5	25Aug23, 24:00	418456	24-hr	48	47.9	exc
Stony Mtn.	PM2.5	25Aug23, 24:00	418463	24-hr	53	53.5	exc
Conklin	PM2.5	25Aug23, 24:00	418449	24-hr	48	47.9	exc
Janvier	PM2.5	25Aug23, 24:00	418462	24-hr	42	42	exc
Buffalo Viewpoint	PM2.5	25Aug23, 24:00	418457	24-hr	55	55.2	exc
Patricia McInnes	PM2.5	25Aug23, 24:00	418458	24-hr	55	55.1	exc
Athabasca Valley	PM2.5	25Aug23, 24:00	418459	24-hr	54	54.3	exc
Fort Chip	PM2.5	25Aug23, 24:00	418451	24-hr	65	64.8	exc
Surmont 2	PM2.5	25Aug23, 24:00	418461	24-hr	42	41.8	exc
Ells River	PM2.5	25Aug23, 24:00	418341	24-hr	49	48.9	exc
Fort Hills	PM2.5	25Aug23, 21:00	418345	1-hr	85	84.9	exc
Fort Hills	PM2.5	25Aug23, 22:00	418345	1-hr	84	84.4	exc
Fort Hills	PM2.5	25Aug23, 23:00	418345	1-hr	85	85.3	exc
Fort Hills	PM2.5	25Aug23, 24:00	418345	1-hr	86	86.3	exc
Fort Hills	PM2.5	25Aug23, 24:00	418345	24-hr	73	73.3	exc
Fort Chip	PM2.5	26Aug23, 14:00	418451	1-hr	90	90.3	exc
Fort Chip	PM2.5	26Aug23, 15:00	418451	1-hr	147	146.6	exc
Fort Chip	PM2.5	26Aug23, 16:00	418451	1-hr	200	199.9	exc
Fort Chip	PM2.5	26Aug23, 17:00	418451	1-hr	274	273.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	26Aug23, 17:00	418365	1-hr	81	-	ret
Bertha Ganter	PM2.5	26Aug23, 18:00	418452	1-hr	119	118.7	exc
Fort Chip	PM2.5	26Aug23, 18:00	418451	1-hr	376	375.8	exc
Barge Landing	PM2.5	26Aug23, 18:00	418450	1-hr	113	114.2	exc
Ft. McKay S	PM2.5	26Aug23, 18:00	418455	1-hr	84	85.2	exc
Wapasu	PM2.5	26Aug23, 18:00	418456	1-hr	173	172.5	exc
Ells River	PM2.5	26Aug23, 18:00	418366	1-hr	149	149	exc
Fort Hills	PM2.5	26Aug23, 18:00	418365	1-hr	199	-	ret
Bertha Ganter	PM2.5	26Aug23, 19:00	418452	1-hr	237	237.1	exc
Buffalo Viewpoint	PM2.5	26Aug23, 19:00	418457	1-hr	212	211.9	exc
Fort Chip	PM2.5	26Aug23, 19:00	418451	1-hr	473	473	exc
Barge Landing	PM2.5	26Aug23, 19:00	418450	1-hr	208	208.7	exc
Ft. McKay S	PM2.5	26Aug23, 19:00	418455	1-hr	216	216.5	exc
Wapasu	PM2.5	26Aug23, 19:00	418456	1-hr	313	313.4	exc
Ells River	PM2.5	26Aug23, 19:00	418366	1-hr	203	203.4	exc
Fort Hills	PM2.5	26Aug23, 19:00	418365	1-hr	293	-	ret
Bertha Ganter	PM2.5	26Aug23, 20:00	418452	1-hr	394	394.4	exc
Buffalo Viewpoint	PM2.5	26Aug23, 20:00	418457	1-hr	331	330.6	exc
Patricia McInnes	PM2.5	26Aug23, 20:00	418458	1-hr	174	174.2	exc
Athabasca Valley	PM2.5	26Aug23, 20:00	418459	1-hr	218	218.3	exc
Fort Chip	PM2.5	26Aug23, 20:00	418451	1-hr	421	421	exc
Barge Landing	PM2.5	26Aug23, 20:00	418450	1-hr	370	370.5	exc
Ft. McKay S	PM2.5	26Aug23, 20:00	418455	1-hr	365	366	exc
Wapasu	PM2.5	26Aug23, 20:00	418456	1-hr	342	342.3	exc
Fort Hills	PM2.5	26Aug23, 20:00	418365	1-hr	401	-	ret
Ells River	PM2.5	26Aug23, 20:00	418366	1-hr	323	323.3	exc
Bertha Ganter	PM2.5	26Aug23, 21:00	418452	1-hr	376	376.4	exc
Buffalo Viewpoint	PM2.5	26Aug23, 21:00	418457	1-hr	423	423.2	exc
Patricia McInnes	PM2.5	26Aug23, 21:00	418458	1-hr	321	320.8	exc
Athabasca Valley	PM2.5	26Aug23, 21:00	418459	1-hr	355	354.8	exc
Fort Chip	PM2.5	26Aug23, 21:00	418451	1-hr	337	336.6	exc
Barge Landing	PM2.5	26Aug23, 21:00	418450	1-hr	348	350.3	exc
Ft. McKay S	PM2.5	26Aug23, 21:00	418455	1-hr	352	353.7	exc
Anzac	PM2.5	26Aug23, 21:00	418460	1-hr	86	85.9	exc
Wapasu	PM2.5	26Aug23, 21:00	418456	1-hr	243	243	exc
Ells River	PM2.5	26Aug23, 21:00	418366	1-hr	311	311.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	26Aug23, 21:00	418365	1-hr	394	-	ret
Buffalo Viewpoint	PM2.5	26Aug23, 22:00	418457	1-hr	398	398	exc
Patricia McInnes	PM2.5	26Aug23, 22:00	418458	1-hr	324	323.8	exc
Athabasca Valley	PM2.5	26Aug23, 22:00	418459	1-hr	382	381.5	exc
Fort Chip	PM2.5	26Aug23, 22:00	418451	1-hr	244	244.4	exc
Barge Landing	PM2.5	26Aug23, 22:00	418450	1-hr	351	352.8	exc
Ft. McKay S	PM2.5	26Aug23, 22:00	418455	1-hr	352	353.6	exc
Anzac	PM2.5	26Aug23, 22:00	418460	1-hr	274	274.3	exc
Wapasu	PM2.5	26Aug23, 22:00	418456	1-hr	217	216.8	exc
Ells River	PM2.5	26Aug23, 22:00	418366	1-hr	315	315.5	exc
Bertha Ganter	PM2.5	26Aug23, 22:00	418452	1-hr	383	382.8	exc
Fort Hills	PM2.5	26Aug23, 22:00	418365	1-hr	396	-	ret
Buffalo Viewpoint	PM2.5	26Aug23, 23:00	418457	1-hr	388	387.6	exc
Patricia McInnes	PM2.5	26Aug23, 23:00	418458	1-hr	326	326.4	exc
Athabasca Valley	PM2.5	26Aug23, 23:00	418459	1-hr	362	361.8	exc
Fort Chip	PM2.5	26Aug23, 23:00	418451	1-hr	190	190.1	exc
Barge Landing	PM2.5	26Aug23, 23:00	418450	1-hr	352	353.4	exc
Ft. McKay S	PM2.5	26Aug23, 23:00	418455	1-hr	360	361.7	exc
Anzac	PM2.5	26Aug23, 23:00	418460	1-hr	351	360.9	exc
Wapasu	PM2.5	26Aug23, 23:00	418456	1-hr	209	209.3	exc
Fort Hills	PM2.5	26Aug23, 23:00	418365	1-hr	381	-	ret
Surmont 2	PM2.5	26Aug23, 23:00	418461	1-hr	217	216.8	exc
Ells River	PM2.5	26Aug23, 23:00	418366	1-hr	284	283.8	exc
Bertha Ganter	PM2.5	26Aug23, 23:00	418452	1-hr	374	373.5	exc
Buffalo Viewpoint	PM2.5	26Aug23, 24:00	418457	1-hr	394	393.6	exc
Patricia McInnes	PM2.5	26Aug23, 24:00	418458	1-hr	322	321.9	exc
Patricia McInnes	PM2.5	26Aug23, 24:00	418458	24-hr	84	84.4	exc
Athabasca Valley	PM2.5	26Aug23, 24:00	418459	1-hr	357	356.5	exc
Athabasca Valley	PM2.5	26Aug23, 24:00	418459	24-hr	100	99.8	exc
Fort Chip	PM2.5	26Aug23, 24:00	418451	1-hr	173	173.3	exc
Barge Landing	PM2.5	26Aug23, 24:00	418450	1-hr	348	350.1	exc
Barge Landing	PM2.5	26Aug23, 24:00	418450	24-hr	119	120.2	exc
Ft. McKay S	PM2.5	26Aug23, 24:00	418455	1-hr	342	343.6	exc
Ft. McKay S	PM2.5	26Aug23, 24:00	418455	24-hr	119	120.5	exc
Anzac	PM2.5	26Aug23, 24:00	418460	1-hr	318	317.8	exc
Anzac	PM2.5	26Aug23, 24:00	418460	24-hr	65	65.7	exc
Wapasu	PM2.5	26Aug23, 24:00	418456	1-hr	198	198.4	exc
Stony Mtn.	PM2.5	26Aug23, 24:00	418463	24-hr	31	31	exc
Janvier	PM2.5	26Aug23, 24:00	418462	1-hr	129	129	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	26Aug23, 24:00	418461	1-hr	331	331.2	exc
Ells River	PM2.5	26Aug23, 24:00	418366	1-hr	192	192.1	exc
Bertha Ganter	PM2.5	26Aug23, 24:00	418452	1-hr	343	343	exc
Bertha Ganter	PM2.5	26Aug23, 24:00	418452	24-hr	126	126.3	exc
Buffalo Viewpoint	PM2.5	26Aug23, 24:00	418457	24-hr	125	124.7	exc
Fort Chip	PM2.5	26Aug23, 24:00	418451	24-hr	151	151.4	exc
Wapasu	PM2.5	26Aug23, 24:00	418456	24-hr	98	97.7	exc
Conklin	PM2.5	26Aug23, 24:00	418449	24-hr	37	37.1	exc
Fort Hills	PM2.5	26Aug23, 24:00	418365	1-hr	319	-	ret
Fort Hills	PM2.5	26Aug23, 24:00	418365	24-hr	142	-	ret
Surmont 2	PM2.5	26Aug23, 24:00	418461	24-hr	47	46.9	exc
Ells River	PM2.5	26Aug23, 24:00	418366	24-hr	104	104.4	exc
Buffalo Viewpoint	PM2.5	27Aug23, 01:00	418457	1-hr	386	386.1	exc
Patricia McInnes	PM2.5	27Aug23, 01:00	418458	1-hr	319	318.8	exc
Athabasca Valley	PM2.5	27Aug23, 01:00	418459	1-hr	349	349.4	exc
Fort Chip	PM2.5	27Aug23, 01:00	418451	1-hr	199	199.4	exc
Barge Landing	PM2.5	27Aug23, 01:00	418450	1-hr	349	350.4	exc
Anzac	PM2.5	27Aug23, 01:00	418460	1-hr	302	301.6	exc
Wapasu	PM2.5	27Aug23, 01:00	418456	1-hr	220	220.2	exc
Stony Mtn.	PM2.5	27Aug23, 01:00	418463	1-hr	131	131	exc
Conklin	PM2.5	27Aug23, 01:00	418449	1-hr	95	95	exc
Janvier	PM2.5	27Aug23, 01:00	418462	1-hr	257	256.8	exc
Fort Hills	PM2.5	27Aug23, 01:00	418382	1-hr	248	-	ret
Surmont 2	PM2.5	27Aug23, 01:00	418461	1-hr	306	305.8	exc
Ells River	PM2.5	27Aug23, 01:00	418383	1-hr	154	154.4	exc
Bertha Ganter	PM2.5	27Aug23, 01:00	418452	1-hr	299	299.3	exc
Ft. McKay S	PM2.5	27Aug23, 01:00	418455	1-hr	318	319.8	exc
Buffalo Viewpoint	PM2.5	27Aug23, 02:00	418457	1-hr	330	329.7	exc
Patricia McInnes	PM2.5	27Aug23, 02:00	418458	1-hr	321	320.5	exc
Athabasca Valley	PM2.5	27Aug23, 02:00	418459	1-hr	347	346.7	exc
Fort Chip	PM2.5	27Aug23, 02:00	418451	1-hr	214	214.4	exc
Barge Landing	PM2.5	27Aug23, 02:00	418450	1-hr	344	345.9	exc
Anzac	PM2.5	27Aug23, 02:00	418460	1-hr	299	298.8	exc
Wapasu	PM2.5	27Aug23, 02:00	418456	1-hr	225	225.3	exc
Stony Mtn.	PM2.5	27Aug23, 02:00	418463	1-hr	215	215	exc
Conklin	PM2.5	27Aug23, 02:00	418449	1-hr	146	146.2	exc
Janvier	PM2.5	27Aug23, 02:00	418462	1-hr	315	314.6	exc
Fort Hills	PM2.5	27Aug23, 02:00	418382	1-hr	245	-	ret



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Surmont 2	PM2.5	27Aug23, 02:00	418461	1-hr	273	273.3	exc
Ells River	PM2.5	27Aug23, 02:00	418383	1-hr	140	140.3	exc
Bertha Ganter	PM2.5	27Aug23, 02:00	418452	1-hr	270	269.8	exc
Ft. McKay S	PM2.5	27Aug23, 02:00	418455	1-hr	264	266.1	exc
Buffalo Viewpoint	PM2.5	27Aug23, 03:00	418457	1-hr	225	225.4	exc
Patricia McInnes	PM2.5	27Aug23, 03:00	418458	1-hr	315	315.4	exc
Athabasca Valley	PM2.5	27Aug23, 03:00	418459	1-hr	348	347.9	exc
Fort Chip	PM2.5	27Aug23, 03:00	418451	1-hr	235	234.7	exc
Anzac	PM2.5	27Aug23, 03:00	418460	1-hr	322	321.9	exc
Wapasu	PM2.5	27Aug23, 03:00	418456	1-hr	220	220.4	exc
Stony Mtn.	PM2.5	27Aug23, 03:00	418463	1-hr	300	300.2	exc
Conklin	PM2.5	27Aug23, 03:00	418449	1-hr	158	157.9	exc
Janvier	PM2.5	27Aug23, 03:00	418462	1-hr	311	310.5	exc
Surmont 2	PM2.5	27Aug23, 03:00	418461	1-hr	223	223.4	exc
Ells River	PM2.5	27Aug23, 03:00	418383	1-hr	131	131	exc
Bertha Ganter	PM2.5	27Aug23, 03:00	418452	1-hr	211	210.9	exc
Barge Landing	PM2.5	27Aug23, 03:00	418450	1-hr	274	275.8	exc
Ft. McKay S	PM2.5	27Aug23, 03:00	418455	1-hr	195	197.2	exc
Fort Hills	PM2.5	27Aug23, 03:00	418382	1-hr	194	-	ret
Buffalo Viewpoint	PM2.5	27Aug23, 04:00	418457	1-hr	234	234	exc
Patricia McInnes	PM2.5	27Aug23, 04:00	418458	1-hr	278	278.3	exc
Athabasca Valley	PM2.5	27Aug23, 04:00	418459	1-hr	344	344.3	exc
Fort Chip	PM2.5	27Aug23, 04:00	418451	1-hr	245	244.9	exc
Ft. McKay S	PM2.5	27Aug23, 04:00	418455	1-hr	168	170	exc
Anzac	PM2.5	27Aug23, 04:00	418460	1-hr	329	329.3	exc
Wapasu	PM2.5	27Aug23, 04:00	418456	1-hr	196	196.3	exc
Stony Mtn.	PM2.5	27Aug23, 04:00	418463	1-hr	304	303.5	exc
Conklin	PM2.5	27Aug23, 04:00	418449	1-hr	173	173.2	exc
Janvier	PM2.5	27Aug23, 04:00	418462	1-hr	301	300.8	exc
Fort Hills	PM2.5	27Aug23, 04:00	418382	1-hr	171	-	ret
Surmont 2	PM2.5	27Aug23, 04:00	418461	1-hr	207	207.3	exc
Ells River	PM2.5	27Aug23, 04:00	418383	1-hr	135	135.4	exc
Bertha Ganter	PM2.5	27Aug23, 04:00	418452	1-hr	181	180.8	exc
Barge Landing	PM2.5	27Aug23, 04:00	418450	1-hr	202	203.5	exc
Buffalo Viewpoint	PM2.5	27Aug23, 05:00	418457	1-hr	214	213.9	exc
Patricia McInnes	PM2.5	27Aug23, 05:00	418458	1-hr	244	244.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	27Aug23, 05:00	418459	1-hr	325	325.4	exc
Fort Chip	PM2.5	27Aug23, 05:00	418451	1-hr	281	280.6	exc
Ft. McKay S	PM2.5	27Aug23, 05:00	418455	1-hr	171	172.8	exc
Anzac	PM2.5	27Aug23, 05:00	418460	1-hr	332	332.1	exc
Wapasu	PM2.5	27Aug23, 05:00	418456	1-hr	180	180.1	exc
Stony Mtn.	PM2.5	27Aug23, 05:00	418463	1-hr	278	278.2	exc
Conklin	PM2.5	27Aug23, 05:00	418449	1-hr	190	190	exc
Janvier	PM2.5	27Aug23, 05:00	418462	1-hr	288	288.3	exc
Fort Hills	PM2.5	27Aug23, 05:00	418382	1-hr	179	-	ret
Surmont 2	PM2.5	27Aug23, 05:00	418461	1-hr	196	196.2	exc
Ells River	PM2.5	27Aug23, 05:00	418383	1-hr	139	139.4	exc
Bertha Ganter	PM2.5	27Aug23, 05:00	418452	1-hr	174	174.2	exc
Barge Landing	PM2.5	27Aug23, 05:00	418450	1-hr	176	178.3	exc
Buffalo Viewpoint	PM2.5	27Aug23, 06:00	418457	1-hr	236	235.7	exc
Patricia McInnes	PM2.5	27Aug23, 06:00	418458	1-hr	173	172.5	exc
Athabasca Valley	PM2.5	27Aug23, 06:00	418459	1-hr	330	330.4	exc
Fort Chip	PM2.5	27Aug23, 06:00	418451	1-hr	250	250.5	exc
Ft. McKay S	PM2.5	27Aug23, 06:00	418455	1-hr	182	183.8	exc
Anzac	PM2.5	27Aug23, 06:00	418460	1-hr	328	328.1	exc
Wapasu	PM2.5	27Aug23, 06:00	418456	1-hr	158	158.1	exc
Stony Mtn.	PM2.5	27Aug23, 06:00	418463	1-hr	223	223.4	exc
Conklin	PM2.5	27Aug23, 06:00	418449	1-hr	200	200.4	exc
Janvier	PM2.5	27Aug23, 06:00	418462	1-hr	262	261.9	exc
Fort Hills	PM2.5	27Aug23, 06:00	418382	1-hr	170	-	ret
Surmont 2	PM2.5	27Aug23, 06:00	418461	1-hr	185	185.4	exc
Ells River	PM2.5	27Aug23, 06:00	418383	1-hr	148	148.4	exc
Bertha Ganter	PM2.5	27Aug23, 06:00	418452	1-hr	179	178.8	exc
Barge Landing	PM2.5	27Aug23, 06:00	418450	1-hr	169	171.2	exc
Buffalo Viewpoint	PM2.5	27Aug23, 07:00	418457	1-hr	236	235.8	exc
Patricia McInnes	PM2.5	27Aug23, 07:00	418458	1-hr	162	162.4	exc
Athabasca Valley	PM2.5	27Aug23, 07:00	418459	1-hr	312	311.8	exc
Fort Chip	PM2.5	27Aug23, 07:00	418451	1-hr	234	234.3	exc
Ft. McKay S	PM2.5	27Aug23, 07:00	418455	1-hr	190	191.6	exc
Anzac	PM2.5	27Aug23, 07:00	418460	1-hr	300	299.5	exc
Wapasu	PM2.5	27Aug23, 07:00	418456	1-hr	145	144.9	exc
Stony Mtn.	PM2.5	27Aug23, 07:00	418463	1-hr	181	180.5	exc
Conklin	PM2.5	27Aug23, 07:00	418449	1-hr	194	193.7	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	27Aug23, 07:00	418462	1-hr	229	229.5	exc
Fort Hills	PM2.5	27Aug23, 07:00	418382	1-hr	178	-	ret
Surmont 2	PM2.5	27Aug23, 07:00	418461	1-hr	187	187.1	exc
Ells River	PM2.5	27Aug23, 07:00	418383	1-hr	145	145.2	exc
Bertha Ganter	PM2.5	27Aug23, 07:00	418452	1-hr	179	178.8	exc
Barge Landing	PM2.5	27Aug23, 07:00	418450	1-hr	172	173.8	exc
Buffalo Viewpoint	PM2.5	27Aug23, 08:00	418457	1-hr	226	225.7	exc
Patricia McInnes	PM2.5	27Aug23, 08:00	418458	1-hr	151	150.9	exc
Athabasca Valley	PM2.5	27Aug23, 08:00	418459	1-hr	290	289.8	exc
Fort Chip	PM2.5	27Aug23, 08:00	418451	1-hr	214	213.8	exc
Ft. McKay S	PM2.5	27Aug23, 08:00	418455	1-hr	188	189.8	exc
Anzac	PM2.5	27Aug23, 08:00	418460	1-hr	237	236.7	exc
Wapasu	PM2.5	27Aug23, 08:00	418456	1-hr	132	132.2	exc
Stony Mtn.	PM2.5	27Aug23, 08:00	418463	1-hr	181	180.9	exc
Conklin	PM2.5	27Aug23, 08:00	418449	1-hr	225	224.7	exc
Janvier	PM2.5	27Aug23, 08:00	418462	1-hr	186	186.1	exc
Fort Hills	PM2.5	27Aug23, 08:00	418382	1-hr	180	-	ret
Surmont 2	PM2.5	27Aug23, 08:00	418461	1-hr	187	187.2	exc
Ells River	PM2.5	27Aug23, 08:00	418383	1-hr	151	150.7	exc
Bertha Ganter	PM2.5	27Aug23, 08:00	418452	1-hr	180	180.1	exc
Barge Landing	PM2.5	27Aug23, 08:00	418450	1-hr	167	169	exc
Buffalo Viewpoint	PM2.5	27Aug23, 09:00	418457	1-hr	214	214	exc
Patricia McInnes	PM2.5	27Aug23, 09:00	418458	1-hr	136	136.2	exc
Athabasca Valley	PM2.5	27Aug23, 09:00	418459	1-hr	268	267.8	exc
Fort Chip	PM2.5	27Aug23, 09:00	418451	1-hr	174	174.4	exc
Ft. McKay S	PM2.5	27Aug23, 09:00	418455	1-hr	179	181.3	exc
Anzac	PM2.5	27Aug23, 09:00	418460	1-hr	198	198.5	exc
Wapasu	PM2.5	27Aug23, 09:00	418456	1-hr	128	127.5	exc
Stony Mtn.	PM2.5	27Aug23, 09:00	418463	1-hr	186	185.8	exc
Conklin	PM2.5	27Aug23, 09:00	418449	1-hr	214	213.7	exc
Janvier	PM2.5	27Aug23, 09:00	418462	1-hr	172	171.6	exc
Fort Hills	PM2.5	27Aug23, 09:00	418382	1-hr	171	-	ret
Surmont 2	PM2.5	27Aug23, 09:00	418461	1-hr	202	202.5	exc
Ells River	PM2.5	27Aug23, 09:00	418383	1-hr	148	148.2	exc
Bertha Ganter	PM2.5	27Aug23, 09:00	418452	1-hr	175	174.5	exc
Barge Landing	PM2.5	27Aug23, 09:00	418450	1-hr	162	163.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	27Aug23, 10:00	418457	1-hr	189	188.6	exc
Patricia McInnes	PM2.5	27Aug23, 10:00	418458	1-hr	136	135.6	exc
Athabasca Valley	PM2.5	27Aug23, 10:00	418459	1-hr	239	239.1	exc
Fort Chip	PM2.5	27Aug23, 10:00	418451	1-hr	158	157.8	exc
Ft. McKay S	PM2.5	27Aug23, 10:00	418455	1-hr	168	170.2	exc
Anzac	PM2.5	27Aug23, 10:00	418460	1-hr	193	193.3	exc
Wapasu	PM2.5	27Aug23, 10:00	418456	1-hr	122	122.2	exc
Stony Mtn.	PM2.5	27Aug23, 10:00	418463	1-hr	166	165.6	exc
Conklin	PM2.5	27Aug23, 10:00	418449	1-hr	209	208.9	exc
Janvier	PM2.5	27Aug23, 10:00	418462	1-hr	170	169.6	exc
Fort Hills	PM2.5	27Aug23, 10:00	418382	1-hr	175	-	ret
Surmont 2	PM2.5	27Aug23, 10:00	418461	1-hr	152	151.8	exc
Ells River	PM2.5	27Aug23, 10:00	418383	1-hr	133	133.3	exc
Bertha Ganter	PM2.5	27Aug23, 10:00	418452	1-hr	173	173.3	exc
Barge Landing	PM2.5	27Aug23, 10:00	418450	1-hr	151	153	exc
Buffalo Viewpoint	PM2.5	27Aug23, 11:00	418457	1-hr	191	191.4	exc
Patricia McInnes	PM2.5	27Aug23, 11:00	418458	1-hr	153	152.9	exc
Athabasca Valley	PM2.5	27Aug23, 11:00	418459	1-hr	195	194.7	exc
Fort Chip	PM2.5	27Aug23, 11:00	418451	1-hr	150	150.4	exc
Ft. McKay S	PM2.5	27Aug23, 11:00	418455	1-hr	168	169.4	exc
Anzac	PM2.5	27Aug23, 11:00	418460	1-hr	179	178.9	exc
Wapasu	PM2.5	27Aug23, 11:00	418456	1-hr	92	92.1	exc
Stony Mtn.	PM2.5	27Aug23, 11:00	418463	1-hr	169	169.2	exc
Conklin	PM2.5	27Aug23, 11:00	418449	1-hr	201	201.3	exc
Janvier	PM2.5	27Aug23, 11:00	418462	1-hr	177	177	exc
Fort Hills	PM2.5	27Aug23, 11:00	418382	1-hr	166	-	ret
Surmont 2	PM2.5	27Aug23, 11:00	418461	1-hr	104	103.9	exc
Ells River	PM2.5	27Aug23, 11:00	418383	1-hr	130	130.4	exc
Bertha Ganter	PM2.5	27Aug23, 11:00	418452	1-hr	167	166.6	exc
Barge Landing	PM2.5	27Aug23, 11:00	418450	1-hr	142	143.1	exc
Buffalo Viewpoint	PM2.5	27Aug23, 12:00	418457	1-hr	182	181.8	exc
Patricia McInnes	PM2.5	27Aug23, 12:00	418458	1-hr	130	130	exc
Athabasca Valley	PM2.5	27Aug23, 12:00	418459	1-hr	169	168.9	exc
Fort Chip	PM2.5	27Aug23, 12:00	418451	1-hr	135	134.9	exc
Barge Landing	PM2.5	27Aug23, 12:00	418450	1-hr	152	153.1	exc
Ft. McKay S	PM2.5	27Aug23, 12:00	418455	1-hr	151	152.3	exc
Anzac	PM2.5	27Aug23, 12:00	418460	1-hr	96	95.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	27Aug23, 12:00	418456	1-hr	88	88.4	exc
Stony Mtn.	PM2.5	27Aug23, 12:00	418463	1-hr	165	165.2	exc
Conklin	PM2.5	27Aug23, 12:00	418449	1-hr	216	215.5	exc
Janvier	PM2.5	27Aug23, 12:00	418462	1-hr	199	199.1	exc
Fort Hills	PM2.5	27Aug23, 12:00	418382	1-hr	158	158.5	exc
Surmont 2	PM2.5	27Aug23, 12:00	418461	1-hr	95	95.4	exc
Ells River	PM2.5	27Aug23, 12:00	418383	1-hr	122	122.4	exc
Bertha Ganter	PM2.5	27Aug23, 12:00	418452	1-hr	169	168.6	exc
Buffalo Viewpoint	PM2.5	27Aug23, 13:00	418457	1-hr	181	180.6	exc
Patricia McInnes	PM2.5	27Aug23, 13:00	418458	1-hr	108	108.1	exc
Athabasca Valley	PM2.5	27Aug23, 13:00	418459	1-hr	129	128.9	exc
Fort Chip	PM2.5	27Aug23, 13:00	418451	1-hr	94	94.2	exc
Barge Landing	PM2.5	27Aug23, 13:00	418450	1-hr	144	144.4	exc
Ft. McKay S	PM2.5	27Aug23, 13:00	418455	1-hr	150	151.4	exc
Anzac	PM2.5	27Aug23, 13:00	418460	1-hr	108	107.6	exc
Wapasu	PM2.5	27Aug23, 13:00	418456	1-hr	114	114.1	exc
Stony Mtn.	PM2.5	27Aug23, 13:00	418463	1-hr	104	104.3	exc
Conklin	PM2.5	27Aug23, 13:00	418449	1-hr	158	157.8	exc
Janvier	PM2.5	27Aug23, 13:00	418462	1-hr	128	128.4	exc
Fort Hills	PM2.5	27Aug23, 13:00	418382	1-hr	164	163.9	exc
Surmont 2	PM2.5	27Aug23, 13:00	418461	1-hr	110	109.7	exc
Ells River	PM2.5	27Aug23, 13:00	418383	1-hr	116	116.3	exc
Bertha Ganter	PM2.5	27Aug23, 13:00	418452	1-hr	148	148.2	exc
Buffalo Viewpoint	PM2.5	27Aug23, 14:00	418457	1-hr	157	156.9	exc
Patricia McInnes	PM2.5	27Aug23, 14:00	418458	1-hr	120	119.8	exc
Athabasca Valley	PM2.5	27Aug23, 14:00	418459	1-hr	140	139.7	exc
Fort Chip	PM2.5	27Aug23, 14:00	418451	1-hr	132	132	exc
Barge Landing	PM2.5	27Aug23, 14:00	418450	1-hr	132	132.6	exc
Ft. McKay S	PM2.5	27Aug23, 14:00	418455	1-hr	137	137.5	exc
Anzac	PM2.5	27Aug23, 14:00	418460	1-hr	107	106.5	exc
Wapasu	PM2.5	27Aug23, 14:00	418456	1-hr	141	140.7	exc
Stony Mtn.	PM2.5	27Aug23, 14:00	418463	1-hr	99	99.2	exc
Conklin	PM2.5	27Aug23, 14:00	418449	1-hr	131	130.7	exc
Janvier	PM2.5	27Aug23, 14:00	418462	1-hr	108	107.6	exc
Fort Hills	PM2.5	27Aug23, 14:00	418382	1-hr	155	154.9	exc
Surmont 2	PM2.5	27Aug23, 14:00	418461	1-hr	98	97.6	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ells River	PM2.5	27Aug23, 14:00	418383	1-hr	113	112.5	exc
Bertha Ganter	PM2.5	27Aug23, 14:00	418452	1-hr	138	137.9	exc
Buffalo Viewpoint	PM2.5	27Aug23, 15:00	418457	1-hr	135	135.1	exc
Patricia McInnes	PM2.5	27Aug23, 15:00	418458	1-hr	110	110.2	exc
Athabasca Valley	PM2.5	27Aug23, 15:00	418459	1-hr	133	132.6	exc
Fort Chip	PM2.5	27Aug23, 15:00	418451	1-hr	96	96.5	exc
Barge Landing	PM2.5	27Aug23, 15:00	418450	1-hr	126	127.4	exc
Ft. McKay S	PM2.5	27Aug23, 15:00	418455	1-hr	136	136.6	exc
Anzac	PM2.5	27Aug23, 15:00	418460	1-hr	96	95.8	exc
Wapasu	PM2.5	27Aug23, 15:00	418456	1-hr	145	144.8	exc
Conklin	PM2.5	27Aug23, 15:00	418449	1-hr	89	88.6	exc
Janvier	PM2.5	27Aug23, 15:00	418462	1-hr	99	99	exc
Fort Hills	PM2.5	27Aug23, 15:00	418382	1-hr	143	143.4	exc
Surmont 2	PM2.5	27Aug23, 15:00	418461	1-hr	103	103.4	exc
Ells River	PM2.5	27Aug23, 15:00	418383	1-hr	114	114.1	exc
Bertha Ganter	PM2.5	27Aug23, 15:00	418452	1-hr	135	135.1	exc
Buffalo Viewpoint	PM2.5	27Aug23, 16:00	418457	1-hr	128	128.1	exc
Patricia McInnes	PM2.5	27Aug23, 16:00	418458	1-hr	103	102.7	exc
Athabasca Valley	PM2.5	27Aug23, 16:00	418459	1-hr	117	117.2	exc
Fort Chip	PM2.5	27Aug23, 16:00	418451	1-hr	115	114.7	exc
Barge Landing	PM2.5	27Aug23, 16:00	418450	1-hr	116	117	exc
Ft. McKay S	PM2.5	27Aug23, 16:00	418455	1-hr	118	118.6	exc
Anzac	PM2.5	27Aug23, 16:00	418460	1-hr	94	93.5	exc
Wapasu	PM2.5	27Aug23, 16:00	418456	1-hr	121	121.4	exc
Janvier	PM2.5	27Aug23, 16:00	418462	1-hr	93	93.1	exc
Fort Hills	PM2.5	27Aug23, 16:00	418382	1-hr	145	145.3	exc
Surmont 2	PM2.5	27Aug23, 16:00	418461	1-hr	143	142.7	exc
Ells River	PM2.5	27Aug23, 16:00	418383	1-hr	103	103.3	exc
Bertha Ganter	PM2.5	27Aug23, 16:00	418452	1-hr	119	119.1	exc
Bertha Ganter	PM2.5	27Aug23, 17:00	418452	1-hr	106	106.3	exc
Buffalo Viewpoint	PM2.5	27Aug23, 17:00	418457	1-hr	124	123.6	exc
Patricia McInnes	PM2.5	27Aug23, 17:00	418458	1-hr	103	102.8	exc
Athabasca Valley	PM2.5	27Aug23, 17:00	418459	1-hr	116	116.1	exc
Fort Chip	PM2.5	27Aug23, 17:00	418451	1-hr	121	120.9	exc
Barge Landing	PM2.5	27Aug23, 17:00	418450	1-hr	101	102	exc
Ft. McKay S	PM2.5	27Aug23, 17:00	418455	1-hr	109	109.5	exc
Anzac	PM2.5	27Aug23, 17:00	418460	1-hr	99	99.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	27Aug23, 17:00	418456	1-hr	116	115.5	exc
Fort Hills	PM2.5	27Aug23, 17:00	418382	1-hr	132	131.6	exc
Surmont 2	PM2.5	27Aug23, 17:00	418461	1-hr	126	125.5	exc
Ells River	PM2.5	27Aug23, 17:00	418383	1-hr	99	98.7	exc
Bertha Ganter	PM2.5	27Aug23, 18:00	418452	1-hr	114	114.2	exc
Buffalo Viewpoint	PM2.5	27Aug23, 18:00	418457	1-hr	128	128.2	exc
Patricia McInnes	PM2.5	27Aug23, 18:00	418458	1-hr	109	108.6	exc
Athabasca Valley	PM2.5	27Aug23, 18:00	418459	1-hr	114	113.7	exc
Fort Chip	PM2.5	27Aug23, 18:00	418451	1-hr	123	123.4	exc
Barge Landing	PM2.5	27Aug23, 18:00	418450	1-hr	110	111	exc
Ft. McKay S	PM2.5	27Aug23, 18:00	418455	1-hr	119	120.1	exc
Anzac	PM2.5	27Aug23, 18:00	418460	1-hr	110	110.3	exc
Wapasu	PM2.5	27Aug23, 18:00	418456	1-hr	120	119.6	exc
Fort Hills	PM2.5	27Aug23, 18:00	418382	1-hr	129	128.6	exc
Surmont 2	PM2.5	27Aug23, 18:00	418461	1-hr	87	86.9	exc
Ells River	PM2.5	27Aug23, 18:00	418383	1-hr	102	102.2	exc
Bertha Ganter	PM2.5	27Aug23, 19:00	418452	1-hr	144	144.3	exc
Buffalo Viewpoint	PM2.5	27Aug23, 19:00	418457	1-hr	132	131.9	exc
Patricia McInnes	PM2.5	27Aug23, 19:00	418458	1-hr	112	111.9	exc
Athabasca Valley	PM2.5	27Aug23, 19:00	418459	1-hr	116	115.8	exc
Fort Chip	PM2.5	27Aug23, 19:00	418451	1-hr	144	143.6	exc
Barge Landing	PM2.5	27Aug23, 19:00	418450	1-hr	134	134.9	exc
Ft. McKay S	PM2.5	27Aug23, 19:00	418455	1-hr	161	161.4	exc
Anzac	PM2.5	27Aug23, 19:00	418460	1-hr	110	109.7	exc
Wapasu	PM2.5	27Aug23, 19:00	418456	1-hr	112	112.2	exc
Conklin	PM2.5	27Aug23, 19:00	418449	1-hr	81	81.2	exc
Fort Hills	PM2.5	27Aug23, 19:00	418382	1-hr	133	133.3	exc
Ells River	PM2.5	27Aug23, 19:00	418383	1-hr	114	113.7	exc
Bertha Ganter	PM2.5	27Aug23, 20:00	418452	1-hr	161	160.6	exc
Buffalo Viewpoint	PM2.5	27Aug23, 20:00	418457	1-hr	147	146.9	exc
Patricia McInnes	PM2.5	27Aug23, 20:00	418458	1-hr	100	100.1	exc
Athabasca Valley	PM2.5	27Aug23, 20:00	418459	1-hr	110	110.4	exc
Fort Chip	PM2.5	27Aug23, 20:00	418451	1-hr	147	146.8	exc
Barge Landing	PM2.5	27Aug23, 20:00	418450	1-hr	149	149.9	exc
Ft. McKay S	PM2.5	27Aug23, 20:00	418455	1-hr	158	158.7	exc
Anzac	PM2.5	27Aug23, 20:00	418460	1-hr	92	92.1	exc
Wapasu	PM2.5	27Aug23, 20:00	418456	1-hr	109	108.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Hills	PM2.5	27Aug23, 20:00	418382	1-hr	161	160.8	exc
Ells River	PM2.5	27Aug23, 20:00	418383	1-hr	131	131	exc
Bertha Ganter	PM2.5	27Aug23, 21:00	418452	1-hr	144	143.5	exc
Buffalo Viewpoint	PM2.5	27Aug23, 21:00	418457	1-hr	142	141.8	exc
Patricia McInnes	PM2.5	27Aug23, 21:00	418458	1-hr	101	101	exc
Athabasca Valley	PM2.5	27Aug23, 21:00	418459	1-hr	112	111.6	exc
Fort Chip	PM2.5	27Aug23, 21:00	418451	1-hr	147	146.9	exc
Barge Landing	PM2.5	27Aug23, 21:00	418450	1-hr	140	140.8	exc
Ft. McKay S	PM2.5	27Aug23, 21:00	418455	1-hr	141	141.6	exc
Anzac	PM2.5	27Aug23, 21:00	418460	1-hr	115	115.4	exc
Wapasu	PM2.5	27Aug23, 21:00	418456	1-hr	114	114.1	exc
Stony Mtn.	PM2.5	27Aug23, 21:00	418463	1-hr	118	118.1	exc
Conklin	PM2.5	27Aug23, 21:00	418449	1-hr	89	89.4	exc
Fort Hills	PM2.5	27Aug23, 21:00	418382	1-hr	159	158.8	exc
Ells River	PM2.5	27Aug23, 21:00	418383	1-hr	121	120.6	exc
Surmont 2	PM2.5	27Aug23, 21:00	418461	1-hr	96	95.8	exc
Bertha Ganter	PM2.5	27Aug23, 22:00	418452	1-hr	147	147.3	exc
Buffalo Viewpoint	PM2.5	27Aug23, 22:00	418457	1-hr	136	135.8	exc
Patricia McInnes	PM2.5	27Aug23, 22:00	418458	1-hr	117	117.1	exc
Athabasca Valley	PM2.5	27Aug23, 22:00	418459	1-hr	115	115.3	exc
Fort Chip	PM2.5	27Aug23, 22:00	418451	1-hr	155	154.9	exc
Barge Landing	PM2.5	27Aug23, 22:00	418450	1-hr	136	138	exc
Ft. McKay S	PM2.5	27Aug23, 22:00	418455	1-hr	143	144.5	exc
Anzac	PM2.5	27Aug23, 22:00	418460	1-hr	140	139.7	exc
Wapasu	PM2.5	27Aug23, 22:00	418456	1-hr	116	115.6	exc
Stony Mtn.	PM2.5	27Aug23, 22:00	418463	1-hr	169	169.4	exc
Conklin	PM2.5	27Aug23, 22:00	418449	1-hr	138	138.4	exc
Fort Hills	PM2.5	27Aug23, 22:00	418382	1-hr	155	154.6	exc
Surmont 2	PM2.5	27Aug23, 22:00	418461	1-hr	138	138	exc
Ells River	PM2.5	27Aug23, 22:00	418383	1-hr	129	129.4	exc
Bertha Ganter	PM2.5	27Aug23, 23:00	418452	1-hr	144	143.8	exc
Buffalo Viewpoint	PM2.5	27Aug23, 23:00	418457	1-hr	129	128.5	exc
Patricia McInnes	PM2.5	27Aug23, 23:00	418458	1-hr	160	160.1	exc
Athabasca Valley	PM2.5	27Aug23, 23:00	418459	1-hr	142	141.8	exc
Fort Chip	PM2.5	27Aug23, 23:00	418451	1-hr	185	184.8	exc
Barge Landing	PM2.5	27Aug23, 23:00	418450	1-hr	135	136.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	27Aug23, 23:00	418455	1-hr	152	153.3	exc
Anzac	PM2.5	27Aug23, 23:00	418460	1-hr	153	153.3	exc
Wapasu	PM2.5	27Aug23, 23:00	418456	1-hr	117	117.3	exc
Stony Mtn.	PM2.5	27Aug23, 23:00	418463	1-hr	186	186	exc
Conklin	PM2.5	27Aug23, 23:00	418449	1-hr	178	177.6	exc
Janvier	PM2.5	27Aug23, 23:00	418462	1-hr	121	121.4	exc
Fort Hills	PM2.5	27Aug23, 23:00	418382	1-hr	164	163.8	exc
Surmont 2	PM2.5	27Aug23, 23:00	418461	1-hr	162	161.6	exc
Ells River	PM2.5	27Aug23, 23:00	418383	1-hr	137	137.2	exc
Bertha Ganter	PM2.5	27Aug23, 24:00	418452	1-hr	149	148.9	exc
Buffalo Viewpoint	PM2.5	27Aug23, 24:00	418457	1-hr	144	144.3	exc
Buffalo Viewpoint	PM2.5	27Aug23, 24:00	418457	24-hr	189	189.3	exc
Patricia McInnes	PM2.5	27Aug23, 24:00	418458	1-hr	183	183.1	exc
Patricia McInnes	PM2.5	27Aug23, 24:00	418458	24-hr	164	164.3	exc
Athabasca Valley	PM2.5	27Aug23, 24:00	418459	1-hr	151	150.9	exc
Athabasca Valley	PM2.5	27Aug23, 24:00	418459	24-hr	209	208.8	exc
Fort Chip	PM2.5	27Aug23, 24:00	418451	1-hr	218	217.7	exc
Fort Chip	PM2.5	27Aug23, 24:00	418451	24-hr	174	173.6	exc
Barge Landing	PM2.5	27Aug23, 24:00	418450	1-hr	144	146.1	exc
Ft. McKay S	PM2.5	27Aug23, 24:00	418455	1-hr	148	150	exc
Anzac	PM2.5	27Aug23, 24:00	418460	1-hr	130	129.6	exc
Anzac	PM2.5	27Aug23, 24:00	418460	24-hr	186	186.1	exc
Wapasu	PM2.5	27Aug23, 24:00	418456	1-hr	129	128.9	exc
Wapasu	PM2.5	27Aug23, 24:00	418456	24-hr	140	140	exc
Stony Mtn.	PM2.5	27Aug23, 24:00	418463	1-hr	167	167.2	exc
Conklin	PM2.5	27Aug23, 24:00	418449	1-hr	198	197.6	exc
Conklin	PM2.5	27Aug23, 24:00	418449	24-hr	147	147.3	exc
Janvier	PM2.5	27Aug23, 24:00	418462	1-hr	150	150.4	exc
Janvier	PM2.5	27Aug23, 24:00	418462	24-hr	165	164.8	exc
Fort Hills	PM2.5	27Aug23, 24:00	418382	1-hr	172	171.9	exc
Fort Hills	PM2.5	27Aug23, 24:00	418382	24-hr	169	-	ret
Surmont 2	PM2.5	27Aug23, 24:00	418461	1-hr	136	136.5	exc
Ells River	PM2.5	27Aug23, 24:00	418383	1-hr	135	135	exc
Ells River	PM2.5	27Aug23, 24:00	418383	24-hr	129	128.9	exc
Bertha Ganter	PM2.5	27Aug23, 24:00	418452	24-hr	167	166.9	exc
Barge Landing	PM2.5	27Aug23, 24:00	418450	24-hr	168	169.2	exc
Ft. McKay S	PM2.5	27Aug23, 24:00	418455	24-hr	167	168.6	exc
Stony Mtn.	PM2.5	27Aug23, 24:00	418463	24-hr	154	153.9	exc
Surmont 2	PM2.5	27Aug23, 24:00	418461	24-hr	152	152	exc
Bertha Ganter	PM2.5	28Aug23, 01:00	418914	1-hr	149	149.3	exc
Buffalo Viewpoint	PM2.5	28Aug23, 01:00	418915	1-hr	174	174.1	exc
Patricia McInnes	PM2.5	28Aug23, 01:00	418916	1-hr	181	181.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Athabasca Valley	PM2.5	28Aug23, 01:00	418917	1-hr	155	154.6	exc
Fort Chip	PM2.5	28Aug23, 01:00	418918	1-hr	230	230.3	exc
Barge Landing	PM2.5	28Aug23, 01:00	418919	1-hr	144	146.1	exc
Ft. McKay S	PM2.5	28Aug23, 01:00	418920	1-hr	151	153.3	exc
Anzac	PM2.5	28Aug23, 01:00	418921	1-hr	108	108.3	exc
Wapasu	PM2.5	28Aug23, 01:00	418922	1-hr	151	151.4	exc
Stony Mtn.	PM2.5	28Aug23, 01:00	418923	1-hr	143	143.3	exc
Conklin	PM2.5	28Aug23, 01:00	418924	1-hr	198	198.4	exc
Janvier	PM2.5	28Aug23, 01:00	418925	1-hr	171	171	exc
Fort Hills	PM2.5	28Aug23, 01:00	418453	1-hr	161	160.7	exc
Surmont 2	PM2.5	28Aug23, 01:00	418926	1-hr	119	118.5	exc
Ells River	PM2.5	28Aug23, 01:00	418454	1-hr	131	131.4	exc
Bertha Ganter	PM2.5	28Aug23, 02:00	418914	1-hr	150	150	exc
Buffalo Viewpoint	PM2.5	28Aug23, 02:00	418915	1-hr	161	161.1	exc
Patricia McInnes	PM2.5	28Aug23, 02:00	418916	1-hr	186	186.3	exc
Athabasca Valley	PM2.5	28Aug23, 02:00	418917	1-hr	158	158.2	exc
Fort Chip	PM2.5	28Aug23, 02:00	418918	1-hr	235	234.8	exc
Barge Landing	PM2.5	28Aug23, 02:00	418919	1-hr	143	144.7	exc
Ft. McKay S	PM2.5	28Aug23, 02:00	418920	1-hr	153	154.4	exc
Wapasu	PM2.5	28Aug23, 02:00	418922	1-hr	161	161	exc
Conklin	PM2.5	28Aug23, 02:00	418924	1-hr	189	189.1	exc
Janvier	PM2.5	28Aug23, 02:00	418925	1-hr	180	180.5	exc
Fort Hills	PM2.5	28Aug23, 02:00	418453	1-hr	161	161.2	exc
Surmont 2	PM2.5	28Aug23, 02:00	418926	1-hr	93	92.7	exc
Ells River	PM2.5	28Aug23, 02:00	418454	1-hr	124	123.5	exc
Stony Mtn.	PM2.5	28Aug23, 02:00	418923	1-hr	109	108.6	exc
Bertha Ganter	PM2.5	28Aug23, 03:00	418914	1-hr	159	159.3	exc
Buffalo Viewpoint	PM2.5	28Aug23, 03:00	418915	1-hr	175	175.4	exc
Patricia McInnes	PM2.5	28Aug23, 03:00	418916	1-hr	184	184	exc
Athabasca Valley	PM2.5	28Aug23, 03:00	418917	1-hr	164	164.1	exc
Fort Chip	PM2.5	28Aug23, 03:00	418918	1-hr	247	247	exc
Barge Landing	PM2.5	28Aug23, 03:00	418919	1-hr	148	149.4	exc
Ft. McKay S	PM2.5	28Aug23, 03:00	418920	1-hr	156	158.3	exc
Wapasu	PM2.5	28Aug23, 03:00	418922	1-hr	172	172	exc
Stony Mtn.	PM2.5	28Aug23, 03:00	418923	1-hr	88	88.2	exc
Conklin	PM2.5	28Aug23, 03:00	418924	1-hr	183	182.9	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	28Aug23, 03:00	418925	1-hr	174	174	exc
Fort Hills	PM2.5	28Aug23, 03:00	418453	1-hr	167	166.7	exc
Ells River	PM2.5	28Aug23, 03:00	418454	1-hr	122	122.3	exc
Bertha Ganter	PM2.5	28Aug23, 04:00	418914	1-hr	163	163.2	exc
Buffalo Viewpoint	PM2.5	28Aug23, 04:00	418915	1-hr	175	175.3	exc
Patricia McInnes	PM2.5	28Aug23, 04:00	418916	1-hr	169	169.4	exc
Athabasca Valley	PM2.5	28Aug23, 04:00	418917	1-hr	159	159.4	exc
Fort Chip	PM2.5	28Aug23, 04:00	418918	1-hr	295	295.3	exc
Barge Landing	PM2.5	28Aug23, 04:00	418919	1-hr	158	160	exc
Ft. McKay S	PM2.5	28Aug23, 04:00	418920	1-hr	165	167	exc
Wapasu	PM2.5	28Aug23, 04:00	418922	1-hr	172	172	exc
Stony Mtn.	PM2.5	28Aug23, 04:00	418923	1-hr	92	92.4	exc
Conklin	PM2.5	28Aug23, 04:00	418924	1-hr	179	178.9	exc
Janvier	PM2.5	28Aug23, 04:00	418925	1-hr	158	157.8	exc
Fort Hills	PM2.5	28Aug23, 04:00	418453	1-hr	164	163.9	exc
Ells River	PM2.5	28Aug23, 04:00	418454	1-hr	125	124.8	exc
Bertha Ganter	PM2.5	28Aug23, 05:00	418914	1-hr	174	174.4	exc
Buffalo Viewpoint	PM2.5	28Aug23, 05:00	418915	1-hr	190	190.2	exc
Patricia McInnes	PM2.5	28Aug23, 05:00	418916	1-hr	142	141.6	exc
Athabasca Valley	PM2.5	28Aug23, 05:00	418917	1-hr	155	155.3	exc
Fort Chip	PM2.5	28Aug23, 05:00	418918	1-hr	336	336.5	exc
Barge Landing	PM2.5	28Aug23, 05:00	418919	1-hr	163	165	exc
Ft. McKay S	PM2.5	28Aug23, 05:00	418920	1-hr	164	166.1	exc
Wapasu	PM2.5	28Aug23, 05:00	418922	1-hr	182	182.3	exc
Conklin	PM2.5	28Aug23, 05:00	418924	1-hr	164	164.2	exc
Janvier	PM2.5	28Aug23, 05:00	418925	1-hr	145	145.3	exc
Fort Hills	PM2.5	28Aug23, 05:00	418453	1-hr	159	159.3	exc
Ells River	PM2.5	28Aug23, 05:00	418454	1-hr	121	121	exc
Bertha Ganter	PM2.5	28Aug23, 06:00	418914	1-hr	173	173.1	exc
Buffalo Viewpoint	PM2.5	28Aug23, 06:00	418915	1-hr	194	194.2	exc
Patricia McInnes	PM2.5	28Aug23, 06:00	418916	1-hr	122	121.7	exc
Athabasca Valley	PM2.5	28Aug23, 06:00	418917	1-hr	148	148.2	exc
Fort Chip	PM2.5	28Aug23, 06:00	418918	1-hr	357	356.5	exc
Barge Landing	PM2.5	28Aug23, 06:00	418919	1-hr	169	171.1	exc
Ft. McKay S	PM2.5	28Aug23, 06:00	418920	1-hr	160	161.4	exc
Wapasu	PM2.5	28Aug23, 06:00	418922	1-hr	180	179.8	exc
Conklin	PM2.5	28Aug23, 06:00	418924	1-hr	142	142.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	28Aug23, 06:00	418925	1-hr	131	130.5	exc
Fort Hills	PM2.5	28Aug23, 06:00	418453	1-hr	176	175.8	exc
Ells River	PM2.5	28Aug23, 06:00	418454	1-hr	120	119.9	exc
Bertha Ganter	PM2.5	28Aug23, 07:00	418914	1-hr	165	164.7	exc
Buffalo Viewpoint	PM2.5	28Aug23, 07:00	418915	1-hr	200	199.9	exc
Patricia McInnes	PM2.5	28Aug23, 07:00	418916	1-hr	108	108.3	exc
Fort Chip	PM2.5	28Aug23, 07:00	418918	1-hr	457	456.7	exc
Barge Landing	PM2.5	28Aug23, 07:00	418919	1-hr	163	164.6	exc
Ft. McKay S	PM2.5	28Aug23, 07:00	418920	1-hr	147	148.6	exc
Wapasu	PM2.5	28Aug23, 07:00	418922	1-hr	170	169.7	exc
Conklin	PM2.5	28Aug23, 07:00	418924	1-hr	129	129.1	exc
Janvier	PM2.5	28Aug23, 07:00	418925	1-hr	106	105.8	exc
Fort Hills	PM2.5	28Aug23, 07:00	418453	1-hr	163	163.2	exc
Ells River	PM2.5	28Aug23, 07:00	418454	1-hr	116	116.3	exc
Bertha Ganter	PM2.5	28Aug23, 08:00	418914	1-hr	158	157.9	exc
Buffalo Viewpoint	PM2.5	28Aug23, 08:00	418915	1-hr	181	181.1	exc
Patricia McInnes	PM2.5	28Aug23, 08:00	418916	1-hr	89	89.3	exc
Fort Chip	PM2.5	28Aug23, 08:00	418918	1-hr	420	419.7	exc
Barge Landing	PM2.5	28Aug23, 08:00	418919	1-hr	156	158.2	exc
Ft. McKay S	PM2.5	28Aug23, 08:00	418920	1-hr	131	133.2	exc
Wapasu	PM2.5	28Aug23, 08:00	418922	1-hr	148	148	exc
Conklin	PM2.5	28Aug23, 08:00	418924	1-hr	110	109.8	exc
Janvier	PM2.5	28Aug23, 08:00	418925	1-hr	85	85.2	exc
Fort Hills	PM2.5	28Aug23, 08:00	418453	1-hr	159	159.5	exc
Ells River	PM2.5	28Aug23, 08:00	418454	1-hr	107	107.1	exc
Bertha Ganter	PM2.5	28Aug23, 09:00	418914	1-hr	155	155.3	exc
Buffalo Viewpoint	PM2.5	28Aug23, 09:00	418915	1-hr	153	153.5	exc
Athabasca Valley	PM2.5	28Aug23, 09:00	418917	1-hr	102	-	ret
Fort Chip	PM2.5	28Aug23, 09:00	418918	1-hr	355	355.4	exc
Barge Landing	PM2.5	28Aug23, 09:00	418919	1-hr	146	148.2	exc
Ft. McKay S	PM2.5	28Aug23, 09:00	418920	1-hr	135	136.6	exc
Wapasu	PM2.5	28Aug23, 09:00	418922	1-hr	133	132.7	exc
Conklin	PM2.5	28Aug23, 09:00	418924	1-hr	95	95.4	exc
Fort Hills	PM2.5	28Aug23, 09:00	418453	1-hr	132	132.5	exc
Ells River	PM2.5	28Aug23, 09:00	418454	1-hr	94	94.5	exc
Bertha Ganter	PM2.5	28Aug23, 10:00	418914	1-hr	141	140.6	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	28Aug23, 10:00	418915	1-hr	133	133.1	exc
Athabasca Valley	PM2.5	28Aug23, 10:00	418917	1-hr	84	83.9	exc
Fort Chip	PM2.5	28Aug23, 10:00	418918	1-hr	413	412.7	exc
Barge Landing	PM2.5	28Aug23, 10:00	418919	1-hr	116	117.4	exc
Ft. McKay S	PM2.5	28Aug23, 10:00	418920	1-hr	127	128.6	exc
Wapasu	PM2.5	28Aug23, 10:00	418922	1-hr	117	117.1	exc
Conklin	PM2.5	28Aug23, 10:00	418924	1-hr	84	83.7	exc
Fort Hills	PM2.5	28Aug23, 10:00	418453	1-hr	127	126.8	exc
Ells River	PM2.5	28Aug23, 10:00	418454	1-hr	86	85.8	exc
Bertha Ganter	PM2.5	28Aug23, 11:00	418914	1-hr	115	115.4	exc
Buffalo Viewpoint	PM2.5	28Aug23, 11:00	418915	1-hr	100	100.3	exc
Fort Chip	PM2.5	28Aug23, 11:00	418918	1-hr	372	371.6	exc
Barge Landing	PM2.5	28Aug23, 11:00	418919	1-hr	94	95.1	exc
Ft. McKay S	PM2.5	28Aug23, 11:00	418920	1-hr	83	84.6	exc
Wapasu	PM2.5	28Aug23, 11:00	418922	1-hr	115	114.8	exc
Fort Hills	PM2.5	28Aug23, 11:00	418453	1-hr	123	122.7	exc
Bertha Ganter	PM2.5	28Aug23, 12:00	418914	1-hr	93	93	exc
Buffalo Viewpoint	PM2.5	28Aug23, 12:00	418915	1-hr	88	88.2	exc
Barge Landing	PM2.5	28Aug23, 12:00	418919	1-hr	81	81.6	exc
Ft. McKay S	PM2.5	28Aug23, 12:00	418920	1-hr	82	82.5	exc
Wapasu	PM2.5	28Aug23, 12:00	418922	1-hr	119	118.9	exc
Fort Hills	PM2.5	28Aug23, 12:00	418453	1-hr	109	108.9	exc
Fort Chip	PM2.5	28Aug23, 12:00	418918	1-hr	283	283.4	exc
Bertha Ganter	PM2.5	28Aug23, 13:00	418914	1-hr	84	84.4	exc
Ft. McKay S	PM2.5	28Aug23, 13:00	418920	1-hr	84	85.4	exc
Wapasu	PM2.5	28Aug23, 13:00	418922	1-hr	104	104.3	exc
Fort Hills	PM2.5	28Aug23, 13:00	418453	1-hr	104	104	exc
Fort Chip	PM2.5	28Aug23, 13:00	418918	1-hr	299	298.5	exc
Bertha Ganter	PM2.5	28Aug23, 14:00	418914	1-hr	83	82.9	exc
Fort Chip	PM2.5	28Aug23, 14:00	418918	1-hr	322	322.4	exc
Wapasu	PM2.5	28Aug23, 14:00	418922	1-hr	90	90.2	exc
Fort Hills	PM2.5	28Aug23, 14:00	418453	1-hr	93	92.6	exc
Bertha Ganter	PM2.5	28Aug23, 15:00	418914	1-hr	81	80.8	exc
Bertha Ganter	PM2.5	28Aug23, 16:00	418914	1-hr	82	82.1	exc
Bertha Ganter	PM2.5	28Aug23, 17:00	418914	1-hr	80	80.3	exc
Fort Chip	PM2.5	28Aug23, 15:00	418918	1-hr	264	263.8	exc
Fort Chip	PM2.5	28Aug23, 16:00	418918	1-hr	154	153.7	exc
Fort Chip	PM2.5	28Aug23, 17:00	418918	1-hr	134	134.3	exc
Fort Chip	PM2.5	28Aug23, 18:00	418918	1-hr	128	128.5	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	28Aug23, 15:00	418922	1-hr	85	84.9	exc
Wapasu	PM2.5	28Aug23, 16:00	418922	1-hr	84	83.9	exc
Wapasu	PM2.5	28Aug23, 17:00	418922	1-hr	82	81.5	exc
Wapasu	PM2.5	28Aug23, 18:00	418922	1-hr	81	80.9	exc
Conklin	PM2.5	28Aug23, 18:00	418924	1-hr	113	113.1	exc
Fort Hills	PM2.5	28Aug23, 15:00	418453	1-hr	90	90.1	exc
Fort Hills	PM2.5	28Aug23, 16:00	418453	1-hr	103	103.1	exc
Fort Hills	PM2.5	28Aug23, 17:00	418453	1-hr	109	109	exc
Fort Hills	PM2.5	28Aug23, 18:00	418453	1-hr	99	99.2	exc
Fort Chip	PM2.5	28Aug23, 19:00	418918	1-hr	127	126.7	exc
Conklin	PM2.5	28Aug23, 19:00	418924	1-hr	114	114	exc
Fort Hills	PM2.5	28Aug23, 19:00	418453	1-hr	91	90.6	exc
Fort Chip	PM2.5	28Aug23, 20:00	418918	1-hr	104	103.6	exc
Fort Hills	PM2.5	28Aug23, 20:00	418453	1-hr	109	108.5	exc
Bertha Ganter	PM2.5	28Aug23, 21:00	418914	1-hr	88	88.3	exc
Fort Hills	PM2.5	28Aug23, 21:00	418453	1-hr	102	101.6	exc
Fort Chip	PM2.5	28Aug23, 21:00	418918	1-hr	100	99.6	exc
Fort Hills	PM2.5	28Aug23, 22:00	418453	1-hr	86	85.5	exc
Fort Chip	PM2.5	28Aug23, 22:00	418918	1-hr	81	81.2	exc
Fort Hills	PM2.5	28Aug23, 23:00	418453	1-hr	82	81.8	exc
Fort Chip	PM2.5	28Aug23, 23:00	418918	1-hr	89	89	exc
Bertha Ganter	PM2.5	28Aug23, 24:00	418914	24-hr	114	114.5	exc
Fort Chip	PM2.5	28Aug23, 24:00	418918	1-hr	98	97.8	exc
Fort Hills	PM2.5	28Aug23, 24:00	418453	1-hr	81	81.3	exc
Buffalo Viewpoint	PM2.5	28Aug23, 24:00	418915	24-hr	117	117.3	exc
Patricia McInnes	PM2.5	28Aug23, 24:00	418916	24-hr	88	88.2	exc
Athabasca Valley	PM2.5	28Aug23, 24:00	418917	24-hr	90	96.8	exc
Fort Chip	PM2.5	28Aug23, 24:00	418918	24-hr	246	245.8	exc
Barge Landing	PM2.5	28Aug23, 24:00	418919	24-hr	106	107	exc
Ft. McKay S	PM2.5	28Aug23, 24:00	418920	24-hr	105	106.7	exc
Anzac	PM2.5	28Aug23, 24:00	418921	24-hr	65	64.6	exc
Wapasu	PM2.5	28Aug23, 24:00	418922	24-hr	115	115.1	exc
Stony Mtn.	PM2.5	28Aug23, 24:00	418923	24-hr	70	69.5	exc
Conklin	PM2.5	28Aug23, 24:00	418924	24-hr	105	105.5	exc
Janvier	PM2.5	28Aug23, 24:00	418925	24-hr	86	85.7	exc
Fort Hills	PM2.5	28Aug23, 24:00	418453	24-hr	123	122.9	exc
Surmont 2	PM2.5	28Aug23, 24:00	418926	24-hr	63	63.2	exc
Ells River	PM2.5	28Aug23, 24:00	418454	24-hr	87	87.2	exc
Fort Hills	PM2.5	29Aug23, 01:00	418550	1-hr	82	82.2	exc
Fort Chip	PM2.5	29Aug23, 01:00	418918	1-hr	110	110.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	29Aug23, 02:00	418918	1-hr	105	104.7	exc
Fort Hills	PM2.5	29Aug23, 02:00	418550	1-hr	81	80.6	exc
Buffalo Viewpoint	PM2.5	29Aug23, 02:00	418915	1-hr	81	81.2	exc
Fort Chip	PM2.5	29Aug23, 03:00	418918	1-hr	100	100.2	exc
Fort Hills	PM2.5	29Aug23, 03:00	418550	1-hr	83	83.1	exc
Buffalo Viewpoint	PM2.5	29Aug23, 03:00	418915	1-hr	83	83.2	exc
Buffalo Viewpoint	PM2.5	29Aug23, 04:00	418915	1-hr	83	83.3	exc
Fort Hills	PM2.5	29Aug23, 04:00	418550	1-hr	86	86.3	exc
Fort Chip	PM2.5	29Aug23, 04:00	418918	1-hr	97	96.9	exc
Buffalo Viewpoint	PM2.5	29Aug23, 05:00	418915	1-hr	85	84.9	exc
Fort Chip	PM2.5	29Aug23, 05:00	418918	1-hr	92	92.2	exc
Fort Hills	PM2.5	29Aug23, 05:00	418550	1-hr	88	88.3	exc
Buffalo Viewpoint	PM2.5	29Aug23, 06:00	418915	1-hr	88	88	exc
Fort Chip	PM2.5	29Aug23, 06:00	418918	1-hr	91	90.8	exc
Ft. McKay S	PM2.5	29Aug23, 06:00	418920	1-hr	81	82.7	exc
Fort Hills	PM2.5	29Aug23, 06:00	418550	1-hr	91	91.1	exc
Bertha Ganter	PM2.5	29Aug23, 06:00	418914	1-hr	82	81.7	exc
Buffalo Viewpoint	PM2.5	29Aug23, 07:00	418915	1-hr	91	91.1	exc
Fort Chip	PM2.5	29Aug23, 07:00	418918	1-hr	87	87.4	exc
Ft. McKay S	PM2.5	29Aug23, 07:00	418920	1-hr	84	85.5	exc
Fort Hills	PM2.5	29Aug23, 07:00	418550	1-hr	93	93	exc
Bertha Ganter	PM2.5	29Aug23, 07:00	418914	1-hr	80	80	nae
Buffalo Viewpoint	PM2.5	29Aug23, 08:00	418915	1-hr	88	88.1	exc
Fort Chip	PM2.5	29Aug23, 08:00	418918	1-hr	84	83.8	exc
Ft. McKay S	PM2.5	29Aug23, 08:00	418920	1-hr	85	87.2	exc
Fort Hills	PM2.5	29Aug23, 08:00	418550	1-hr	93	92.7	exc
Barge Landing	PM2.5	29Aug23, 08:00	418919	1-hr	80	82.3	exc
Buffalo Viewpoint	PM2.5	29Aug23, 09:00	418915	1-hr	87	86.8	exc
Ft. McKay S	PM2.5	29Aug23, 09:00	418920	1-hr	86	87.5	exc
Fort Hills	PM2.5	29Aug23, 09:00	418550	1-hr	93	93.3	exc
Bertha Ganter	PM2.5	29Aug23, 09:00	418914	1-hr	81	80.8	exc
Fort Chip	PM2.5	29Aug23, 09:00	418918	1-hr	82	81.7	exc
Bertha Ganter	PM2.5	29Aug23, 10:00	418914	1-hr	81	81.3	exc
Buffalo Viewpoint	PM2.5	29Aug23, 10:00	418915	1-hr	83	83.2	exc
Fort Chip	PM2.5	29Aug23, 10:00	418918	1-hr	82	81.9	exc
Fort Hills	PM2.5	29Aug23, 10:00	418550	1-hr	94	93.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 11:00	418915	1-hr	82	82	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	29Aug23, 11:00	418918	1-hr	84	84	exc
Ft. McKay S	PM2.5	29Aug23, 11:00	418920	1-hr	85	85.6	exc
Fort Hills	PM2.5	29Aug23, 11:00	418550	1-hr	93	92.8	exc
Bertha Ganter	PM2.5	29Aug23, 11:00	418914	1-hr	83	83.2	exc
Buffalo Viewpoint	PM2.5	29Aug23, 12:00	418915	1-hr	82	81.6	exc
Ft. McKay S	PM2.5	29Aug23, 12:00	418920	1-hr	87	87.6	exc
Fort Hills	PM2.5	29Aug23, 12:00	418550	1-hr	89	88.8	exc
Bertha Ganter	PM2.5	29Aug23, 12:00	418914	1-hr	87	87	exc
Fort Chip	PM2.5	29Aug23, 12:00	418918	1-hr	87	87	exc
Barge Landing	PM2.5	29Aug23, 12:00	418919	1-hr	80	81	exc
Buffalo Viewpoint	PM2.5	29Aug23, 13:00	418915	1-hr	82	81.6	exc
Fort Chip	PM2.5	29Aug23, 13:00	418918	1-hr	90	90.4	exc
Ft. McKay S	PM2.5	29Aug23, 13:00	418920	1-hr	84	85.2	exc
Fort Hills	PM2.5	29Aug23, 13:00	418550	1-hr	92	91.5	exc
Bertha Ganter	PM2.5	29Aug23, 13:00	418914	1-hr	87	86.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 14:00	418915	1-hr	84	84	exc
Fort Chip	PM2.5	29Aug23, 14:00	418918	1-hr	91	90.8	exc
Conklin	PM2.5	29Aug23, 14:00	418924	1-hr	82	82.5	exc
Fort Hills	PM2.5	29Aug23, 14:00	418550	1-hr	98	97.7	exc
Bertha Ganter	PM2.5	29Aug23, 14:00	418914	1-hr	81	81.3	exc
Buffalo Viewpoint	PM2.5	29Aug23, 15:00	418915	1-hr	87	87.5	exc
Fort Chip	PM2.5	29Aug23, 15:00	418918	1-hr	105	105.3	exc
Fort Hills	PM2.5	29Aug23, 15:00	418550	1-hr	101	101.2	exc
Buffalo Viewpoint	PM2.5	29Aug23, 16:00	418915	1-hr	92	91.9	exc
Fort Chip	PM2.5	29Aug23, 16:00	418918	1-hr	100	100	exc
Ft. McKay S	PM2.5	29Aug23, 16:00	418920	1-hr	88	89	exc
Wapasu	PM2.5	29Aug23, 16:00	418922	1-hr	85	84.8	exc
Fort Hills	PM2.5	29Aug23, 16:00	418550	1-hr	99	98.8	exc
Ells River	PM2.5	29Aug23, 16:00	418551	1-hr	84	84.1	exc
Bertha Ganter	PM2.5	29Aug23, 16:00	418914	1-hr	85	84.6	exc
Barge Landing	PM2.5	29Aug23, 16:00	418919	1-hr	85	86	exc
Buffalo Viewpoint	PM2.5	29Aug23, 17:00	418915	1-hr	94	94.3	exc
Fort Chip	PM2.5	29Aug23, 17:00	418918	1-hr	105	104.7	exc
Ft. McKay S	PM2.5	29Aug23, 17:00	418920	1-hr	88	89	exc
Wapasu	PM2.5	29Aug23, 17:00	418922	1-hr	87	87.2	exc
Fort Hills	PM2.5	29Aug23, 17:00	418550	1-hr	101	101.3	exc
Bertha Ganter	PM2.5	29Aug23, 17:00	418914	1-hr	86	86.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	29Aug23, 17:00	418919	1-hr	84	84.6	exc
Buffalo Viewpoint	PM2.5	29Aug23, 18:00	418915	1-hr	98	97.7	exc
Fort Chip	PM2.5	29Aug23, 18:00	418918	1-hr	132	132.2	exc
Ft. McKay S	PM2.5	29Aug23, 18:00	418920	1-hr	90	91.3	exc
Wapasu	PM2.5	29Aug23, 18:00	418922	1-hr	91	90.5	exc
Fort Hills	PM2.5	29Aug23, 18:00	418550	1-hr	98	97.9	exc
Bertha Ganter	PM2.5	29Aug23, 18:00	418914	1-hr	91	91.5	exc
Barge Landing	PM2.5	29Aug23, 18:00	418919	1-hr	87	87.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 19:00	418915	1-hr	99	99.4	exc
Patricia McInnes	PM2.5	29Aug23, 19:00	418916	1-hr	80	80.3	exc
Ft. McKay S	PM2.5	29Aug23, 19:00	418920	1-hr	87	87.9	exc
Wapasu	PM2.5	29Aug23, 19:00	418922	1-hr	88	88.3	exc
Conklin	PM2.5	29Aug23, 19:00	418924	1-hr	84	84.2	exc
Fort Hills	PM2.5	29Aug23, 19:00	418550	1-hr	108	108	exc
Ells River	PM2.5	29Aug23, 19:00	418551	1-hr	86	86.2	exc
Bertha Ganter	PM2.5	29Aug23, 19:00	418914	1-hr	89	89.1	exc
Fort Chip	PM2.5	29Aug23, 19:00	418918	1-hr	233	233.3	exc
Barge Landing	PM2.5	29Aug23, 19:00	418919	1-hr	86	86.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 20:00	418915	1-hr	94	93.7	exc
Barge Landing	PM2.5	29Aug23, 20:00	418919	1-hr	90	90.6	exc
Ft. McKay S	PM2.5	29Aug23, 20:00	418920	1-hr	89	90.2	exc
Wapasu	PM2.5	29Aug23, 20:00	418922	1-hr	87	86.8	exc
Conklin	PM2.5	29Aug23, 20:00	418924	1-hr	104	103.8	exc
Fort Hills	PM2.5	29Aug23, 20:00	418550	1-hr	126	126	exc
Ells River	PM2.5	29Aug23, 20:00	418551	1-hr	86	86.1	exc
Bertha Ganter	PM2.5	29Aug23, 20:00	418914	1-hr	91	91.3	exc
Fort Chip	PM2.5	29Aug23, 20:00	418918	1-hr	225	225.1	exc
Buffalo Viewpoint	PM2.5	29Aug23, 21:00	418915	1-hr	92	92.1	exc
Athabasca Valley	PM2.5	29Aug23, 21:00	418917	1-hr	82	81.9	exc
Barge Landing	PM2.5	29Aug23, 21:00	418919	1-hr	88	89.6	exc
Ft. McKay S	PM2.5	29Aug23, 21:00	418920	1-hr	97	99.1	exc
Wapasu	PM2.5	29Aug23, 21:00	418922	1-hr	88	88.3	exc
Fort Hills	PM2.5	29Aug23, 21:00	418550	1-hr	110	110	exc
Ells River	PM2.5	29Aug23, 21:00	418551	1-hr	86	86.4	exc
Bertha Ganter	PM2.5	29Aug23, 21:00	418914	1-hr	100	99.7	exc
Fort Chip	PM2.5	29Aug23, 21:00	418918	1-hr	143	142.7	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Buffalo Viewpoint	PM2.5	29Aug23, 22:00	418915	1-hr	94	93.5	exc
Fort Chip	PM2.5	29Aug23, 22:00	418918	1-hr	116	115.6	exc
Barge Landing	PM2.5	29Aug23, 22:00	418919	1-hr	87	88.4	exc
Ft. McKay S	PM2.5	29Aug23, 22:00	418920	1-hr	102	104.3	exc
Wapasu	PM2.5	29Aug23, 22:00	418922	1-hr	84	84.1	exc
Fort Hills	PM2.5	29Aug23, 22:00	418550	1-hr	116	115.7	exc
Ells River	PM2.5	29Aug23, 22:00	418551	1-hr	83	82.6	exc
Bertha Ganter	PM2.5	29Aug23, 22:00	418914	1-hr	103	103.4	exc
Bertha Ganter	PM2.5	29Aug23, 23:00	418914	1-hr	101	100.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 23:00	418915	1-hr	93	92.9	exc
Fort Chip	PM2.5	29Aug23, 23:00	418918	1-hr	120	120.2	exc
Barge Landing	PM2.5	29Aug23, 23:00	418919	1-hr	90	91.8	exc
Ft. McKay S	PM2.5	29Aug23, 23:00	418920	1-hr	95	97	exc
Fort Hills	PM2.5	29Aug23, 23:00	418550	1-hr	121	121	exc
Ells River	PM2.5	29Aug23, 23:00	418551	1-hr	84	83.8	exc
Bertha Ganter	PM2.5	29Aug23, 24:00	418914	1-hr	93	92.5	exc
Buffalo Viewpoint	PM2.5	29Aug23, 24:00	418915	1-hr	90	90.2	exc
Fort Chip	PM2.5	29Aug23, 24:00	418918	1-hr	119	119	exc
Barge Landing	PM2.5	29Aug23, 24:00	418919	1-hr	100	102.1	exc
Ft. McKay S	PM2.5	29Aug23, 24:00	418920	1-hr	86	88	exc
Stony Mtn.	PM2.5	29Aug23, 24:00	418923	24-hr	52	51.9	exc
Fort Hills	PM2.5	29Aug23, 24:00	418550	1-hr	111	111.3	exc
Fort Hills	PM2.5	29Aug23, 24:00	418550	24-hr	98	97.8	exc
Bertha Ganter	PM2.5	29Aug23, 24:00	418914	24-hr	85	84.8	exc
Buffalo Viewpoint	PM2.5	29Aug23, 24:00	418915	24-hr	88	88	exc
Patricia McInnes	PM2.5	29Aug23, 24:00	418916	24-hr	66	66.4	exc
Athabasca Valley	PM2.5	29Aug23, 24:00	418917	24-hr	66	65.6	exc
Fort Chip	PM2.5	29Aug23, 24:00	418918	24-hr	112	111.7	exc
Barge Landing	PM2.5	29Aug23, 24:00	418919	24-hr	81	82.2	exc
Ft. McKay S	PM2.5	29Aug23, 24:00	418920	24-hr	84	85.5	exc
Anzac	PM2.5	29Aug23, 24:00	418921	24-hr	66	65.6	exc
Wapasu	PM2.5	29Aug23, 24:00	418922	24-hr	78	77.6	exc
Conklin	PM2.5	29Aug23, 24:00	418924	24-hr	66	65.5	exc
Janvier	PM2.5	29Aug23, 24:00	418925	24-hr	56	56.4	exc
Surmont 2	PM2.5	29Aug23, 24:00	418926	24-hr	58	58	exc
Ells River	PM2.5	29Aug23, 24:00	418551	24-hr	75	74.7	exc
Bertha Ganter	PM2.5	30Aug23, 01:00	418914	1-hr	92	92.5	exc
Buffalo Viewpoint	PM2.5	30Aug23, 01:00	418915	1-hr	84	84	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Barge Landing	PM2.5	30Aug23, 01:00	418919	1-hr	101	102.9	exc
Ft. McKay S	PM2.5	30Aug23, 01:00	418920	1-hr	86	88.1	exc
Fort Hills	PM2.5	30Aug23, 01:00	418610	1-hr	121	121.5	exc
Fort Chip	PM2.5	30Aug23, 01:00	418918	1-hr	117	117	exc
Bertha Ganter	PM2.5	30Aug23, 02:00	418914	1-hr	96	95.7	exc
Buffalo Viewpoint	PM2.5	30Aug23, 02:00	418915	1-hr	82	81.7	exc
Fort Chip	PM2.5	30Aug23, 02:00	418918	1-hr	113	112.6	exc
Barge Landing	PM2.5	30Aug23, 02:00	418919	1-hr	85	86.9	exc
Ft. McKay S	PM2.5	30Aug23, 02:00	418920	1-hr	86	88.3	exc
Fort Hills	PM2.5	30Aug23, 02:00	418610	1-hr	104	104.1	exc
Bertha Ganter	PM2.5	30Aug23, 03:00	418914	1-hr	93	92.9	exc
Fort Chip	PM2.5	30Aug23, 03:00	418918	1-hr	109	109.3	exc
Barge Landing	PM2.5	30Aug23, 03:00	418919	1-hr	83	84.8	exc
Ft. McKay S	PM2.5	30Aug23, 03:00	418920	1-hr	89	90.9	exc
Fort Hills	PM2.5	30Aug23, 03:00	418610	1-hr	106	105.8	exc
Bertha Ganter	PM2.5	30Aug23, 04:00	418914	1-hr	88	87.7	exc
Fort Chip	PM2.5	30Aug23, 04:00	418918	1-hr	108	108	exc
Ft. McKay S	PM2.5	30Aug23, 04:00	418920	1-hr	88	89.9	exc
Fort Hills	PM2.5	30Aug23, 04:00	418610	1-hr	100	99.8	exc
Bertha Ganter	PM2.5	30Aug23, 05:00	418914	1-hr	86	86.2	exc
Fort Chip	PM2.5	30Aug23, 05:00	418918	1-hr	106	105.9	exc
Barge Landing	PM2.5	30Aug23, 05:00	418919	1-hr	81	82.7	exc
Ft. McKay S	PM2.5	30Aug23, 05:00	418920	1-hr	84	85.7	exc
Fort Hills	PM2.5	30Aug23, 05:00	418610	1-hr	103	102.6	exc
Bertha Ganter	PM2.5	30Aug23, 06:00	418914	1-hr	84	84.1	exc
Fort Hills	PM2.5	30Aug23, 06:00	418610	1-hr	94	94	exc
Fort Chip	PM2.5	30Aug23, 06:00	418918	1-hr	103	103.1	exc
Bertha Ganter	PM2.5	30Aug23, 07:00	418914	1-hr	81	80.7	exc
Fort Chip	PM2.5	30Aug23, 07:00	418918	1-hr	99	98.9	exc
Fort Hills	PM2.5	30Aug23, 07:00	418610	1-hr	88	87.8	exc
Fort Chip	PM2.5	30Aug23, 08:00	418918	1-hr	95	95.3	exc
Fort Hills	PM2.5	30Aug23, 08:00	418610	1-hr	83	83	exc
Fort Chip	PM2.5	30Aug23, 09:00	418918	1-hr	94	93.6	exc
Fort Chip	PM2.5	30Aug23, 10:00	418918	1-hr	91	90.5	exc
Fort Chip	PM2.5	30Aug23, 11:00	418918	1-hr	85	85.3	exc
Bertha Ganter	PM2.5	30Aug23, 12:00	418914	1-hr	82	82.1	exc
Fort Chip	PM2.5	30Aug23, 12:00	418918	1-hr	83	83	exc
Fort Chip	PM2.5	30Aug23, 13:00	418918	1-hr	81	81.4	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	30Aug23, 14:00	418918	1-hr	81	80.7	exc
Fort Chip	PM2.5	30Aug23, 15:00	418918	1-hr	80	80.2	exc
Fort Chip	PM2.5	30Aug23, 16:00	418918	1-hr	85	84.5	exc
Fort Chip	PM2.5	30Aug23, 17:00	418918	1-hr	85	85	exc
Fort Chip	PM2.5	30Aug23, 18:00	418918	1-hr	82	82.4	exc
Conklin	PM2.5	30Aug23, 19:00	418924	1-hr	84	83.8	exc
Lower Camp	H2S	30Aug23, 22:00	418609	1-hr	16	16.4	exc
Buffalo Viewpoint	PM2.5	30Aug23, 24:00	418915	24-hr	48	48.5	exc
Patricia McInnes	PM2.5	30Aug23, 24:00	418916	24-hr	36	36.5	exc
Athabasca Valley	PM2.5	30Aug23, 24:00	418917	24-hr	40	39.7	exc
Ft. McKay S	PM2.5	30Aug23, 24:00	418920	24-hr	55	56.4	exc
Wapasu	PM2.5	30Aug23, 24:00	418922	24-hr	34	34.5	exc
Conklin	PM2.5	30Aug23, 24:00	418924	24-hr	36	36.4	exc
Fort Hills	PM2.5	30Aug23, 24:00	418610	24-hr	68	67.9	exc
Ells River	PM2.5	30Aug23, 24:00	418611	24-hr	51	50.6	exc
Bertha Ganter	PM2.5	30Aug23, 24:00	418914	24-hr	58	58.3	exc
Fort Chip	PM2.5	30Aug23, 24:00	418918	24-hr	87	87.3	exc
Barge Landing	PM2.5	30Aug23, 24:00	418919	24-hr	56	57	exc
Fort Chip	PM2.5	31Aug23, 05:00	418918	1-hr	80	80.4	exc
Stony Mtn.	PM2.5	31Aug23, 06:00	418923	1-hr	84	84.2	exc
Fort Chip	PM2.5	31Aug23, 06:00	418918	1-hr	80	80.4	exc
Fort Chip	PM2.5	31Aug23, 07:00	418918	1-hr	82	81.6	exc
Stony Mtn.	PM2.5	31Aug23, 07:00	418923	1-hr	265	264.6	exc
Fort Chip	PM2.5	31Aug23, 08:00	418918	1-hr	84	83.8	exc
Anzac	PM2.5	31Aug23, 08:00	418921	1-hr	128	127.6	exc
Stony Mtn.	PM2.5	31Aug23, 08:00	418923	1-hr	304	303.9	exc
Conklin	PM2.5	31Aug23, 08:00	418924	1-hr	223	222.7	exc
Patricia McInnes	PM2.5	31Aug23, 09:00	418916	1-hr	137	137.2	exc
Fort Chip	PM2.5	31Aug23, 09:00	418918	1-hr	104	104.2	exc
Anzac	PM2.5	31Aug23, 09:00	418921	1-hr	270	269.9	exc
Stony Mtn.	PM2.5	31Aug23, 09:00	418923	1-hr	263	263.2	exc
Conklin	PM2.5	31Aug23, 09:00	418924	1-hr	288	288	exc
Buffalo Viewpoint	PM2.5	31Aug23, 10:00	418915	1-hr	147	146.9	exc
Patricia McInnes	PM2.5	31Aug23, 10:00	418916	1-hr	238	238	exc
Athabasca Valley	PM2.5	31Aug23, 10:00	418917	1-hr	181	181.3	exc
Fort Chip	PM2.5	31Aug23, 10:00	418918	1-hr	126	126.3	exc
Anzac	PM2.5	31Aug23, 10:00	418921	1-hr	280	280.3	exc
Stony Mtn.	PM2.5	31Aug23, 10:00	418923	1-hr	234	233.7	exc
Conklin	PM2.5	31Aug23, 10:00	418924	1-hr	257	257.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Janvier	PM2.5	31Aug23, 10:00	418925	1-hr	83	83	exc
Surmont 2	PM2.5	31Aug23, 10:00	418926	1-hr	135	135.3	exc
Buffalo Viewpoint	PM2.5	31Aug23, 11:00	418915	1-hr	135	135.4	exc
Patricia McInnes	PM2.5	31Aug23, 11:00	418916	1-hr	229	229.4	exc
Athabasca Valley	PM2.5	31Aug23, 11:00	418917	1-hr	264	264.2	exc
Fort Chip	PM2.5	31Aug23, 11:00	418918	1-hr	99	99.1	exc
Anzac	PM2.5	31Aug23, 11:00	418921	1-hr	279	278.6	exc
Stony Mtn.	PM2.5	31Aug23, 11:00	418923	1-hr	211	211.5	exc
Conklin	PM2.5	31Aug23, 11:00	418924	1-hr	231	231.2	exc
Surmont 2	PM2.5	31Aug23, 11:00	418926	1-hr	196	196.3	exc
Buffalo Viewpoint	PM2.5	31Aug23, 12:00	418915	1-hr	129	128.9	exc
Patricia McInnes	PM2.5	31Aug23, 12:00	418916	1-hr	240	239.9	exc
Athabasca Valley	PM2.5	31Aug23, 12:00	418917	1-hr	264	263.9	exc
Anzac	PM2.5	31Aug23, 12:00	418921	1-hr	257	257	exc
Stony Mtn.	PM2.5	31Aug23, 12:00	418923	1-hr	198	198.4	exc
Conklin	PM2.5	31Aug23, 12:00	418924	1-hr	216	215.6	exc
Surmont 2	PM2.5	31Aug23, 12:00	418926	1-hr	163	163	exc
Buffalo Viewpoint	PM2.5	31Aug23, 13:00	418915	1-hr	115	115.3	exc
Patricia McInnes	PM2.5	31Aug23, 13:00	418916	1-hr	198	198.3	exc
Athabasca Valley	PM2.5	31Aug23, 13:00	418917	1-hr	251	251.4	exc
Ft. McKay S	PM2.5	31Aug23, 13:00	418920	1-hr	118	118.9	exc
Anzac	PM2.5	31Aug23, 13:00	418921	1-hr	229	229	exc
Stony Mtn.	PM2.5	31Aug23, 13:00	418923	1-hr	167	166.8	exc
Conklin	PM2.5	31Aug23, 13:00	418924	1-hr	191	191.5	exc
Surmont 2	PM2.5	31Aug23, 13:00	418926	1-hr	149	149	exc
Buffalo Viewpoint	PM2.5	31Aug23, 14:00	418915	1-hr	95	95	exc
Patricia McInnes	PM2.5	31Aug23, 14:00	418916	1-hr	169	168.6	exc
Athabasca Valley	PM2.5	31Aug23, 14:00	418917	1-hr	244	244.3	exc
Fort Chip	PM2.5	31Aug23, 14:00	418918	1-hr	189	188.8	exc
Ft. McKay S	PM2.5	31Aug23, 14:00	418920	1-hr	96	97.4	exc
Anzac	PM2.5	31Aug23, 14:00	418921	1-hr	207	207.1	exc
Stony Mtn.	PM2.5	31Aug23, 14:00	418923	1-hr	115	115.4	exc
Conklin	PM2.5	31Aug23, 14:00	418924	1-hr	142	142.2	exc
Surmont 2	PM2.5	31Aug23, 14:00	418926	1-hr	146	145.8	exc
Buffalo Viewpoint	PM2.5	31Aug23, 15:00	418915	1-hr	89	-	ret
Patricia McInnes	PM2.5	31Aug23, 15:00	418916	1-hr	181	180.9	exc
Athabasca Valley	PM2.5	31Aug23, 15:00	418917	1-hr	210	210.3	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Fort Chip	PM2.5	31Aug23, 15:00	418918	1-hr	354	353.7	exc
Anzac	PM2.5	31Aug23, 15:00	418921	1-hr	200	200.2	exc
Stony Mtn.	PM2.5	31Aug23, 15:00	418923	1-hr	127	127.1	exc
Conklin	PM2.5	31Aug23, 15:00	418924	1-hr	132	131.6	exc
Janvier	PM2.5	31Aug23, 15:00	418925	1-hr	83	83.2	exc
Surmont 2	PM2.5	31Aug23, 15:00	418926	1-hr	171	171	exc
Patricia McInnes	PM2.5	31Aug23, 16:00	418916	1-hr	141	141.2	exc
Athabasca Valley	PM2.5	31Aug23, 16:00	418917	1-hr	214	214.1	exc
Fort Chip	PM2.5	31Aug23, 16:00	418918	1-hr	471	471.5	exc
Anzac	PM2.5	31Aug23, 16:00	418921	1-hr	182	181.6	exc
Stony Mtn.	PM2.5	31Aug23, 16:00	418923	1-hr	114	114.1	exc
Conklin	PM2.5	31Aug23, 16:00	418924	1-hr	122	121.9	exc
Janvier	PM2.5	31Aug23, 16:00	418925	1-hr	94	94.1	exc
Fort Hills	PM2.5	31Aug23, 16:00	418674	1-hr	97	97.4	exc
Surmont 2	PM2.5	31Aug23, 16:00	418926	1-hr	180	180	exc
Bertha Ganter	PM2.5	31Aug23, 17:00	418914	1-hr	121	120.6	exc
Buffalo Viewpoint	PM2.5	31Aug23, 17:00	418915	1-hr	127	126.7	exc
Patricia McInnes	PM2.5	31Aug23, 17:00	418916	1-hr	173	173.4	exc
Athabasca Valley	PM2.5	31Aug23, 17:00	418917	1-hr	166	166.5	exc
Fort Chip	PM2.5	31Aug23, 17:00	418918	1-hr	443	442.8	exc
Barge Landing	PM2.5	31Aug23, 17:00	418919	1-hr	90	90.9	exc
Anzac	PM2.5	31Aug23, 17:00	418921	1-hr	213	213.2	exc
Stony Mtn.	PM2.5	31Aug23, 17:00	418923	1-hr	121	120.8	exc
Conklin	PM2.5	31Aug23, 17:00	418924	1-hr	122	121.9	exc
Janvier	PM2.5	31Aug23, 17:00	418925	1-hr	92	92.1	exc
Fort Hills	PM2.5	31Aug23, 17:00	418674	1-hr	245	245.2	exc
Surmont 2	PM2.5	31Aug23, 17:00	418926	1-hr	141	140.6	exc
Ells River	PM2.5	31Aug23, 17:00	418675	1-hr	112	111.7	exc
Bertha Ganter	PM2.5	31Aug23, 18:00	418914	1-hr	245	244.9	exc
Buffalo Viewpoint	PM2.5	31Aug23, 18:00	418915	1-hr	145	145	exc
Patricia McInnes	PM2.5	31Aug23, 18:00	418916	1-hr	243	242.6	exc
Athabasca Valley	PM2.5	31Aug23, 18:00	418917	1-hr	242	242.2	exc
Fort Chip	PM2.5	31Aug23, 18:00	418918	1-hr	411	411.4	exc
Barge Landing	PM2.5	31Aug23, 18:00	418919	1-hr	200	200.9	exc
Ft. McKay S	PM2.5	31Aug23, 18:00	418920	1-hr	189	189.6	exc
Anzac	PM2.5	31Aug23, 18:00	418921	1-hr	260	260.2	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Wapasu	PM2.5	31Aug23, 18:00	418922	1-hr	181	181.1	exc
Stony Mtn.	PM2.5	31Aug23, 18:00	418923	1-hr	140	139.9	exc
Conklin	PM2.5	31Aug23, 18:00	418924	1-hr	154	153.6	exc
Janvier	PM2.5	31Aug23, 18:00	418925	1-hr	97	97.2	exc
Fort Hills	PM2.5	31Aug23, 18:00	418674	1-hr	341	341	exc
Surmont 2	PM2.5	31Aug23, 18:00	418926	1-hr	158	157.9	exc
Ells River	PM2.5	31Aug23, 18:00	418675	1-hr	258	257.7	exc
Bertha Ganter	PM2.5	31Aug23, 19:00	418914	1-hr	321	321.2	exc
Buffalo Viewpoint	PM2.5	31Aug23, 19:00	418915	1-hr	178	178.4	exc
Patricia McInnes	PM2.5	31Aug23, 19:00	418916	1-hr	341	341.3	exc
Athabasca Valley	PM2.5	31Aug23, 19:00	418917	1-hr	391	391.2	exc
Fort Chip	PM2.5	31Aug23, 19:00	418918	1-hr	415	415.2	exc
Barge Landing	PM2.5	31Aug23, 19:00	418919	1-hr	256	256.9	exc
Ft. McKay S	PM2.5	31Aug23, 19:00	418920	1-hr	263	263.9	exc
Anzac	PM2.5	31Aug23, 19:00	418921	1-hr	304	304	exc
Wapasu	PM2.5	31Aug23, 19:00	418922	1-hr	227	227.4	exc
Stony Mtn.	PM2.5	31Aug23, 19:00	418923	1-hr	180	180	exc
Conklin	PM2.5	31Aug23, 19:00	418924	1-hr	170	170.3	exc
Janvier	PM2.5	31Aug23, 19:00	418925	1-hr	123	123.3	exc
Fort Hills	PM2.5	31Aug23, 19:00	418674	1-hr	381	380.6	exc
Surmont 2	PM2.5	31Aug23, 19:00	418926	1-hr	229	228.8	exc
Ells River	PM2.5	31Aug23, 19:00	418675	1-hr	292	292.4	exc
Bertha Ganter	PM2.5	31Aug23, 20:00	418914	1-hr	350	350.5	exc
Buffalo Viewpoint	PM2.5	31Aug23, 20:00	418915	1-hr	242	241.7	exc
Patricia McInnes	PM2.5	31Aug23, 20:00	418916	1-hr	107	107.4	exc
Athabasca Valley	PM2.5	31Aug23, 20:00	418917	1-hr	148	147.7	exc
Fort Chip	PM2.5	31Aug23, 20:00	418918	1-hr	445	445.2	exc
Barge Landing	PM2.5	31Aug23, 20:00	418919	1-hr	345	346.3	exc
Ft. McKay S	PM2.5	31Aug23, 20:00	418920	1-hr	288	289.3	exc
Anzac	PM2.5	31Aug23, 20:00	418921	1-hr	382	381.8	exc
Wapasu	PM2.5	31Aug23, 20:00	418922	1-hr	253	252.9	exc
Stony Mtn.	PM2.5	31Aug23, 20:00	418923	1-hr	268	267.7	exc
Conklin	PM2.5	31Aug23, 20:00	418924	1-hr	272	272	exc
Janvier	PM2.5	31Aug23, 20:00	418925	1-hr	191	190.7	exc
Fort Hills	PM2.5	31Aug23, 20:00	418674	1-hr	431	431.3	exc
Surmont 2	PM2.5	31Aug23, 20:00	418926	1-hr	329	329.3	exc
Ells River	PM2.5	31Aug23, 20:00	418675	1-hr	334	334.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Bertha Ganter	PM2.5	31Aug23, 21:00	418914	1-hr	371	370.5	exc
Buffalo Viewpoint	PM2.5	31Aug23, 21:00	418915	1-hr	304	304.5	exc
Patricia McInnes	PM2.5	31Aug23, 21:00	418916	1-hr	174	174.3	exc
Athabasca Valley	PM2.5	31Aug23, 21:00	418917	1-hr	167	166.6	exc
Fort Chip	PM2.5	31Aug23, 21:00	418918	1-hr	435	435.4	exc
Barge Landing	PM2.5	31Aug23, 21:00	418919	1-hr	377	378.3	exc
Ft. McKay S	PM2.5	31Aug23, 21:00	418920	1-hr	311	311.9	exc
Anzac	PM2.5	31Aug23, 21:00	418921	1-hr	351	351.4	exc
Wapasu	PM2.5	31Aug23, 21:00	418922	1-hr	309	308.8	exc
Stony Mtn.	PM2.5	31Aug23, 21:00	418923	1-hr	278	277.9	exc
Conklin	PM2.5	31Aug23, 21:00	418924	1-hr	283	283.5	exc
Janvier	PM2.5	31Aug23, 21:00	418925	1-hr	198	198.4	exc
Fort Hills	PM2.5	31Aug23, 21:00	418674	1-hr	475	475.4	exc
Surmont 2	PM2.5	31Aug23, 21:00	418926	1-hr	350	349.5	exc
Ells River	PM2.5	31Aug23, 21:00	418675	1-hr	397	397.3	exc
Bertha Ganter	PM2.5	31Aug23, 22:00	418914	1-hr	461	460.8	exc
Buffalo Viewpoint	PM2.5	31Aug23, 22:00	418915	1-hr	307	307.3	exc
Patricia McInnes	PM2.5	31Aug23, 22:00	418916	1-hr	225	225.3	exc
Athabasca Valley	PM2.5	31Aug23, 22:00	418917	1-hr	236	236.4	exc
Fort Chip	PM2.5	31Aug23, 22:00	418918	1-hr	398	398.4	exc
Barge Landing	PM2.5	31Aug23, 22:00	418919	1-hr	380	380.9	exc
Ft. McKay S	PM2.5	31Aug23, 22:00	418920	1-hr	367	368	exc
Anzac	PM2.5	31Aug23, 22:00	418921	1-hr	324	324	exc
Wapasu	PM2.5	31Aug23, 22:00	418922	1-hr	406	406	exc
Stony Mtn.	PM2.5	31Aug23, 22:00	418923	1-hr	264	263.7	exc
Conklin	PM2.5	31Aug23, 22:00	418924	1-hr	289	288.6	exc
Janvier	PM2.5	31Aug23, 22:00	418925	1-hr	262	262.3	exc
Fort Hills	PM2.5	31Aug23, 22:00	418674	1-hr	454	454.5	exc
Surmont 2	PM2.5	31Aug23, 22:00	418926	1-hr	325	325.1	exc
Ells River	PM2.5	31Aug23, 22:00	418675	1-hr	360	360.3	exc
Bertha Ganter	PM2.5	31Aug23, 23:00	418914	1-hr	306	306	exc
Buffalo Viewpoint	PM2.5	31Aug23, 23:00	418915	1-hr	245	244.8	exc
Patricia McInnes	PM2.5	31Aug23, 23:00	418916	1-hr	226	225.9	exc
Athabasca Valley	PM2.5	31Aug23, 23:00	418917	1-hr	252	251.5	exc
Fort Chip	PM2.5	31Aug23, 23:00	418918	1-hr	386	385.5	exc
Barge Landing	PM2.5	31Aug23, 23:00	418919	1-hr	391	393.1	exc



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	31Aug23, 23:00	418920	1-hr	298	299.8	exc
Anzac	PM2.5	31Aug23, 23:00	418921	1-hr	319	318.6	exc
Wapasu	PM2.5	31Aug23, 23:00	418922	1-hr	442	441.7	exc
Stony Mtn.	PM2.5	31Aug23, 23:00	418923	1-hr	259	259.5	exc
Conklin	PM2.5	31Aug23, 23:00	418924	1-hr	282	282.4	exc
Janvier	PM2.5	31Aug23, 23:00	418925	1-hr	294	294.4	exc
Fort Hills	PM2.5	31Aug23, 23:00	418674	1-hr	426	426.4	exc
Ells River	PM2.5	31Aug23, 23:00	418675	1-hr	242	242	exc
Bertha Ganter	PM2.5	31Aug23, 24:00	418914	1-hr	262	261.6	exc
Bertha Ganter	PM2.5	31Aug23, 24:00	418914	24-hr	128	127.6	exc
Buffalo Viewpoint	PM2.5	31Aug23, 24:00	418915	1-hr	218	218.3	exc
Buffalo Viewpoint	PM2.5	31Aug23, 24:00	418915	24-hr	124	124.2	exc
Patricia McInnes	PM2.5	31Aug23, 24:00	418916	1-hr	191	191.1	exc
Patricia McInnes	PM2.5	31Aug23, 24:00	418916	24-hr	140	140.5	exc
Athabasca Valley	PM2.5	31Aug23, 24:00	418917	1-hr	234	234.3	exc
Athabasca Valley	PM2.5	31Aug23, 24:00	418917	24-hr	154	154.4	exc
Fort Chip	PM2.5	31Aug23, 24:00	418918	1-hr	346	346.2	exc
Fort Chip	PM2.5	31Aug23, 24:00	418918	24-hr	224	224	exc
Barge Landing	PM2.5	31Aug23, 24:00	418919	1-hr	289	291.3	exc
Barge Landing	PM2.5	31Aug23, 24:00	418919	24-hr	120	121.1	exc
Ft. McKay S	PM2.5	31Aug23, 24:00	418920	1-hr	249	251.1	exc
Ft. McKay S	PM2.5	31Aug23, 24:00	418920	24-hr	115	116.3	exc
Anzac	PM2.5	31Aug23, 24:00	418921	1-hr	273	272.7	exc
Anzac	PM2.5	31Aug23, 24:00	418921	24-hr	191	191.3	exc
Wapasu	PM2.5	31Aug23, 24:00	418922	1-hr	478	478.1	exc
Wapasu	PM2.5	31Aug23, 24:00	418922	24-hr	120	119.5	exc
Stony Mtn.	PM2.5	31Aug23, 24:00	418923	1-hr	263	262.9	exc
Stony Mtn.	PM2.5	31Aug23, 24:00	418923	24-hr	166	166.3	exc
Conklin	PM2.5	31Aug23, 24:00	418924	1-hr	286	285.5	exc
Conklin	PM2.5	31Aug23, 24:00	418924	24-hr	160	160	exc
Janvier	PM2.5	31Aug23, 24:00	418925	1-hr	280	280	exc
Janvier	PM2.5	31Aug23, 24:00	418925	24-hr	94	93.8	exc
Fort Hills	PM2.5	31Aug23, 24:00	418674	1-hr	378	377.9	exc
Fort Hills	PM2.5	31Aug23, 24:00	418674	24-hr	165	165.2	exc
Ells River	PM2.5	31Aug23, 24:00	418675	1-hr	211	211.3	exc
Ells River	PM2.5	31Aug23, 24:00	418675	24-hr	112	111.6	exc
Surmont 2	PM2.5	31Aug23, 23:00	418926	1-hr	314	314.1	exc
Surmont 2	PM2.5	31Aug23, 24:00	418926	1-hr	278	278.5	exc
Surmont 2	PM2.5	31Aug23, 24:00	418926	24-hr	147	147.2	exc
Wapasu	O3	31Aug23, 16:00	418683	1-hr	77.163	77.163	exc
Ells River	TSP	27Aug23, 24:00	419791	24-hr	129	129	exc
Barge Landing	PM2.5	29Aug23, 09:00	418919	1-hr	-	-	ret
Barge Landing	PM2.5	29Aug23, 10:00	418919	1-hr	-	-	ret
Barge Landing	PM2.5	29Aug23, 13:00	418919	1-hr	-	-	ret
Barge Landing	PM2.5	30Aug23, 04:00	418919	1-hr	-	-	ret
Barge Landing	PM2.5	30Aug23, 06:00	418919	1-hr	80.1	80.1	nae
Ft. McKay S	PM2.5	29Aug23, 10:00	418920	1-hr	-	-	ret



<u>Site</u>	<u>Parameter</u>	<u>Date / Time</u>	<u>Reference</u>	<u>Period</u>	<u>Reported</u>	<u>Final</u>	<u>Status</u>
Ft. McKay S	PM2.5	29Aug23, 15:00	418920	1-hr	-	-	ret
Bertha Ganter	Dustfall		420153	30-day	62.8	62.8	exc

*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

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

November 30, 2023
11:02:05 AM
Request # 4617747

Submitted by: EN6138
Submission Date: Nov 30, 2023 11:01:58 AM

File Type
Ambient Data

File Name
AMB-WBEA-202308-V01.xml

Total Number of Files: 1

*** End of Report ***

**ELECTRONIC TRANSFER SYSTEM
AIRDATA
SUBMISSION REPORT**

November 30, 2023
1:17:26 PM
Request # 4617878

Submitted by: EN6138_DENNY
Submission Date: Nov 30, 2023 1:17:13 PM

File Type

Airshed Monitoring Report

File Name

WBEA-202308-V01.pdf

Total Number of Files: 1

*** End of Report ***



End of Report